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Aging and Trans
Part 2
General conditions

Thursday 18th August 2016
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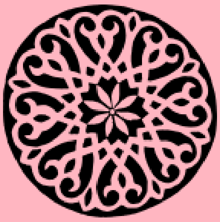

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Chapter 1

Preface

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Acknowledgements

Thanks to all the people, too many to list individually, who contributed to my research for this book, and its parts. Any errors or omissions are nobodies fault except my own, but I would also refer you back to the disclaimer.

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About the author

My name is Sharon Kimble, and I am a former Registered General Nurse and a State Enrolled Nurse, living and working in the United Kingdom.

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Thursday 18th August 2016

I have used many different sources in this document in an attempt to give information without scaring people, in a manner that is simple and easy to understand. Where I have used medical terminology I've tried to explain what it means, both in the text and in the glossary.

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Chapter 2

Introduction

This is written to be read online, or offline with your favourite PDF reader. If you were to print it out you would lose access to all the cross-references, and other stuff too.

I have placed the various sections in what I consider to be a logical order, but also in alphabetical order within the chapters.

Some terms need defining from the beginning as they will appear in all four parts.

Health

I am using the definition of health as provided by the World Health Organisation in 1948 (WHO, 1948).

> “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

Quality of life

Quality of life [1] refers to many things (MEDICINENET, 2016), and I am using the following definition as a simple guideline. A more comprehensive definition can be found at Quality of life.

> “The individuals’s ability to enjoy normal life activities. Quality of life is an important consideration in medical care. Some medical treatments can seriously impair quality of life without providing appreciable benefit, whereas others greatly enhance quality of life.”

Onwards!

This is called ”Aging and Trans” because now that I’ve reached the age of 60+ I’m more aware of being aged and what some of the problems are. And I believe that ’Trans’ is a particular subset of the aged, with many of the same problems but also some others that relate only to transfolk.

Very little information seems to be available for the aged transperson, so I’m hoping to slightly fill that gap. Whether I succeed remains to be seen.

What is ’aged’ and what does it mean?

The dictionary definition of ’aged’ is - ”Being of advanced age, or old”. But my working definition of **aged** is *anyone over the age of 60.*

I have known some people who were in their early-sixties and had physically aged far older than their birth-age yet their mental age remained youthful.

So where are we going?

This book ”Aging and Trans” is written in four parts -

Aging and Trans - Part 1 - General Health
Aging and Trans - Part 2 - General Conditions

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[1] The individuals’s ability to enjoy normal life activities. Quality of life is an important consideration in medical care. Some medical treatments can seriously impair quality of life without providing appreciable benefit, whereas others greatly enhance quality of life

Aging and Trans - Part 3 - Mental Health
Aging and Trans - Part 4 - Cancer

I've been looking at certain areas of life which are important for the aged to know about -

- Normal aging - see Aging and Trans - Part 1 - General Health,
- Exercise - see Aging and Trans - Part 1 - General Health,
- Falls - see Aging and Trans - Part 1 - General Health,
- Aging - see Aging and Trans - Part 1 - General Health,
- Diet - see Aging and Trans - Part 1 - General Health,
- Stroke at page 391,
- Osteoarthritis at page 312,
- Constipation - see Aging and Trans - Part 1 - General Health.

According to the American Society of Consultant Pharmacists, the most common chronic [2] diseases afflicting the elderly are -

- Alzheimer's disease - see Aging and Trans - Part 3 - Mental Health.
- Arthritis at page 35,
- Coronary heart disease at page 134,
- Cataracts at page 108,
- Dementia - see Aging and Trans - Part 3 - Mental Health.
- Depression - see Aging and Trans - Part 3 - Mental Health.
- Diabetes at page 156,
- Glaucoma at page 248,
- Parkinson's disease - see Aging and Trans - Part 3 - Mental Health.
- Age-related Macular degeneration at page 21,
- Osteoporosis at page 326 (PARENTGIVING, 2016).

Other problems

- Urinary incontinence at page 410,
- Sleep - see Aging and Trans - Part 1 - General Health,
- delirium - see Aging and Trans - Part 3 - Mental Health.
- dementia - see Aging and Trans - Part 3 - Mental Health.

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[2] A health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time

The 15 most common health concerns for the aged

Arthritis

"*Arthritis is probably the number one condition that people 65 or older contend with*", said geriatrician Marie Bernard, MD, deputy director of the National Institute on Aging in Bethesda, Maryland. It affects 49.7% of all adults over 65 and can lead to pain and lower quality of life for some seniors. Although arthritis can discourage you from being active, it's important to work with your doctor to develop a personalised activity plan that, along with other treatment, can help maintain senior health (Vann, 2015).

Heart Disease

According to the U.S. Centers for Disease Control and Prevention (CDC), heart disease remains the leading killer of adults over age 65, accounting for 488,156 deaths in 2013, the most recent statistics. As a chronic condition, heart disease affects 37% of men and 26% of women 65 and older. As people age, they're increasingly living with risk factors, such as high blood pressure and high cholesterol, that increase the chances of having a stroke or developing heart disease. Dr. Bernard's advice for addressing this senior health risk not only helps with heart disease but can improve senior health across the board - "*Exercise, eat well, get a good night's rest. Eating well means eating in a fashion that will allow you to keep a healthy weight with a well-balanced and healthy diet*" (Vann, 2015).

Cancer

Cancer is the second leading cause of death among people over age 65, with 407,558 deaths in 2013. According to the CDC, 28% of men and 21% of women over age 65 are living with cancer. If caught early through screenings such as mammograms, colonoscopies, and skin checks, many types of cancer are treatable. And though you're not always able to prevent cancer, you can improve quality of life as a senior living with cancer, including during treatment, by working with your medical team and maintaining their healthy senior living recommendations (Vann, 2015).

Respiratory Diseases

Chronic lower respiratory diseases, such as Chronic obstructive pulmonary disease (COPD), are the third most common cause of death among people 65 and older, annually taking 127,194 lives. About 10% of men and 13% of women are living with asthma, and another 10% of men and 11% of women are living with chronic bronchitis or emphysema, according to the CDC. Although having a chronic respiratory disease increases senior health risks, making you more vulnerable to infections such as pneumonia, getting lung function tests and taking the correct medications or using oxygen as instructed will go a long way toward preserving senior health and your quality of life (Vann, 2015).

Alzheimer's Disease

Alzheimer's disease accounted for 83,786 deaths of people over age 65 in 2013, according to the CDC. The Alzheimer's Association reports that one in nine people age 65 and older, which is about 11%, live with Alzheimer's disease, but because diagnosis is challenging, it's difficult to know exactly how many people are living with this chronic condition. However, experts acknowledge that cognitive impairment has a significant impact on senior health across the spectrum, from issues of safety and self-care to the cost burden of care in the home or a care home (Vann, 2015). Also see Aging and Trans - Part 3 - Mental Health.

Osteoporosis

"*Osteoporosis can contribute to becoming less mobile and potentially disabled should you fall and have a fracture or as the collapse of vertebral bodies*," Bernard said. The National Osteoporosis Foundation estimates that 54 million Americans over the age 50 are affected by low bone mass or osteoporosis, putting them at risk for a fracture or break that could lead to poor senior health and reduced quality of life. What's more: They estimate that by the year 2020 that number will rise to 64.4 million (Vann, 2015).

Diabetes

About 24% of men and 18% of women older than 65 are living with diabetes, a significant senior health risk. According to CDC data, diabetes caused 53,751 deaths among adults over age 65 in 2013. Diabetes can be identified and addressed early with simple blood tests for blood sugar levels. The sooner you know that you have or are at risk for diabetes, the sooner you can start making changes to control the disease and improve your long-term senior health outlook (Vann, 2015).

Influenza and Pneumonia

Although the flu and pneumonia are not chronic conditions, these infections are among the top seven causes of death in people over age 65, just behind diabetes. Seniors are more vulnerable to these diseases and less able to fight them off. Senior health care recommendations include getting an annual flu shot and getting the pneumonia vaccine if recommended by your doctor to prevent these infections and their life-threatening complications. (Vann, 2015).

Falls

The risk for falls requiring emergency room care increases with age. In 2013, 473 per 10,000 men and 767.2 per 10,000 women found themselves at the hospital because of falls, data from the CDC shows. That is more than any other age group. And, one-third of people who go to the emergency department for a fall may find themselves there again in one year, reports an August 2015 study published in the American Journal of Emergency Medicine. Be aware: most falls occur in the home, where tripping hazards include area rugs and slippery bathroom floors, according to a 2013 Journal of Injury and Violence Research study (Vann, 2015).

Substance Abuse

An analysis of data from the National Epidemiologic Survey of Alcohol and Related Conditions suggests that one in five people over 65 have had a substance or alcohol abuse problem at some point in their lives. Alcohol and tobacco topped the list of nonmedical substances abused by survey participants. Substance and alcohol abuse are a concern for senior health because of possible interactions with prescription medications, their impact on overall health, and the increased senior health risks, such as falls, associated with intoxication (Vann, 2015).

Obesity

Obesity is an important senior health risk factor for heart disease, diabetes, and cancer - chronic conditions that impact quality of life. As the numbers on the scale increase, so does the risk for disease. Of the adults between 65 and 74, 76.9%

of men and 73.8% of women are overweight - meaning that their body mass index is greater than or equal to 25. It can also be a signal that an older adult isn't as active or mobile as he or she once was (VANN, 2015).

Depression

According to the American Psychological Association, 15% to 20% of Americans over 65 have experienced depression, a threat to senior health. Depression can lower immunity and can compromise a person's ability to fight infections. In addition to treatment with medication and therapy to improve mood, possible solutions to improve senior living might be to increase physical activity - 59.4% of adults 65 and older do not meet national recommendations for exercise - or to interact more socially - seniors report spending just 8% to 11% of their free time with family and friends (VANN, 2015). Also see Aging and Trans - Part 3 - Mental Health.

Oral Health

Healthy teeth and gums are important not just for a pretty smile and easy eating, but also for overall senior health. According to the CDC, 25% of adults over 65 have no natural teeth. As you age, your mouth tends to become dryer and cavities are more difficult to prevent, so proper oral health care, including regular dental checkups, should be a senior health care priority, Dr. Wei said (VANN, 2015).

Poverty

In 2013, 45% of adults ages 65 and older had incomes below the poverty level, according to a 2015 Kaiser Family Foundation report. This number takes into account: available financial resources, including liabilities such as taxes, value benefits such as food stamps, out-of-pocket medical expenses, geographic variations in housing expenses, and other factors. Older women are slightly more likely than men to be living in poverty, however; that gap widens in those over 80. Single older adults are also significantly more likely to live alone with fewer resources. Poverty affects senior health if you're unable to afford doctor visits, medication for chronic conditions, and other essential senior health care needs (VANN, 2015).

Shingles

Remember that bout of chicken pox you had as a child? It comes back as shingles in an adult: one out of three people over 60 will get it. The National Institutes of Health say that 50% of all American will experience shingles before they are 80. It usually affects only one side of your body and starts out with severe pain or tingling, and then develops into an itchy rash and possibly blisters. There is a vaccine available, so talk to your doctor about it (Vann, 2015).

Chapter 3

Conditions and illnesses

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These are listed in alphabetical order, not in order of likely occurrence.

Age-related Macular degeneration

Age-related macular degeneration (AMD) is a painless eye condition that causes you to lose central vision, usually in both eyes.

Central vision is what you see when you focus straight ahead. In AMD, this vision becomes increasingly blurred, which means -

- reading becomes difficult,
- colours appear less vibrant,
- people's faces are difficult to recognise (NHS, 2015k).

This sight loss usually happens gradually over time, although it can sometimes be rapid.

AMD doesn't affect your peripheral vision [3] (side vision), which means it will not cause complete blindness.

Symptoms

AMD isn't a painful condition. Some people don't realise they have it until they notice a loss of vision.

The main symptom of macular degeneration is blurring of your central vision (what you see when you focus straight ahead). This means -

- **you lose visual acuity** - the ability to see fine detail, so reading and driving become difficult,
- **you lose contrast sensitivity** - the ability to distinguish between objects such as faces against a background,

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[3] vision to either side

- **images, writing or faces can become distorted in the centre** - most commonly associated with wet AMD (NHS, 2015k).

Figure 3.1: Looking through the eyes of someone with macular degeneration

Your peripheral vision isn't affected. Glasses won't be able to correct your blurred central vision.

Both eyes tend to eventually be affected by AMD, although you may only notice problems in one eye to begin with (NHS, 2015k).

Dry AMD

If you have dry AMD [4], it may take 5 to 10 years before your loss of vision significantly affects your daily life.

Sometimes your healthy eye will compensate for any blurring or vision loss if only one of your eyes is affected. This means it will take longer before your symptoms become noticeable.

You may have dry AMD if -

- you need brighter light than normal when reading,
- text appears blurry,
- colours appear less vibrant,
- you have difficulty recognising people's faces,
- your vision seems hazy or less well defined (NHS, 2015k).

If you're experiencing any of these symptoms, you should make an appointment with your General Practitioner, a community-based doctor (GP) or local

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[4] the most common form. In this type of macular degeneration, the delicate tissues of the macula become thinned and cease to function properly

optometrist (a healthcare professional trained to recognise signs of eye problems) (NHS, 2015k).

Wet AMD

In most cases, wet AMD [5] develops in people who've already had dry AMD.

If you have wet AMD, any blurring in your central vision will suddenly worsen.

You may also experience other symptoms, such as -

- **visual distortions** - for example, straight lines may appear wavy or crooked,
- **blind spots** - these usually appear in the middle of your visual field and become larger the longer they're left untreated,
- **hallucinations** - seeing shapes, people or animals that aren't really there (NHS, 2015k).

See Complications of AMD for more information.

Book an emergency appointment with an optometrist if you experience sudden changes in your vision, such as those described above.

Wet AMD needs to be treated as soon as possible to stop your vision getting worse (NHS, 2015k).

Causes

The exact cause of macular degeneration isn't known, but the condition develops as the eye ages.

AMD is caused by a problem with part of the eye called the macula. The macula is the spot at the centre of your retina [6].

The macula is where incoming rays of light are focused. It helps you see things directly in front of you and is used for close, detailed activities, such as reading and writing (NHS, 2015k).

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[5] less common, but is typically more damaging. This is caused by the growth of abnormal blood vessels behind the macula. The abnormal blood vessels tend to haemorrhage or leak, with the result being the formation of scar tissue if left untreated

[6] the nerve tissue that lines the back of your eye

Dry AMD

As you get older, the light-sensitive cells in the macula can start to break down. This tends to occur gradually, often over many years.

Waste products can also begin to build up in your retina, forming small deposits called drusen. Drusen are a common feature of dry AMD and tend to increase in size as the condition progresses.

As dry AMD progresses, you'll have fewer light-sensitive cells in your macula, causing your central vision to deteriorate. A blurred spot will develop in the centre of your vision, making your central vision less well-defined. As a result, you may need more light when reading and carrying out other close work (NHS, 2015k).

Wet AMD

In cases of wet AMD, tiny new blood vessels begin to grow underneath the macula. It's thought these blood vessels form as an attempt by the body to clear away the drusen from the retina.

Unfortunately, the blood vessels form in the wrong place and cause more harm than good. They can leak blood and fluid into the eye, which can cause scarring and damage to your macula.

The damage and scarring causes the more serious symptoms of wet AMD to develop, such as distorted vision and blind spots (NHS, 2015k).

Increased risk

It's unclear what triggers the processes that lead to AMD, but a number of things increase your risk of developing it. These are described below.

- **Age** - The older a person gets, the more likely they are to develop at least some degree of AMD. Most cases start developing in people aged 50 or over and rise sharply with age. It's estimated 1 in every 10 people over 65 has some signs of AMD.
- **Family history** - AMD has been known to run in families. If your parents, brothers or sisters develop AMD, it's thought your risk of also developing the condition is increased. This suggests certain genes you inherit from your parents may increase your risk of getting AMD. However, it's not clear which genes are involved and how they're passed through families.

- **Smoking** - A person who smokes is up to four times more likely to develop AMD than someone who's never smoked. The longer you've been smoking, the greater your risk of getting AMD. You're at even greater risk if you smoke and have a family history of AMD.
- **Ethnicity** - Studies have found rates of AMD are highest in white and Chinese people, and lower in black people. This could be the result of genetics (NHS, 2015k).

Other possible risk factors

The following things may increase your risk of developing AMD, although this hasn't yet been proven.

- **Alcohol** - It's possible drinking more than four units of alcohol a day over many years may increase your risk of developing early AMD.
- **Sunlight** - If you're exposed to lots of sunlight during your lifetime, your risk of developing macular degeneration may be increased. To protect yourself, you should wear UV-absorbing sunglasses if you spend long periods of time outside in bright sunlight.
- **Obesity** - Some studies have reported being obese - having a body mass index (BMI) of 30 or greater - may increase your chance of developing AMD.
- **High blood pressure and heart disease** - There's some limited evidence that having a history of high blood pressure (hypertension) or coronary heart disease may increase your risk of developing AMD (NHS, 2015k).

Diagnosis

In some cases, early AMD may be detected during a routine eye test before it starts to cause symptoms.

If you're experiencing symptoms of macular degeneration, such as blurred central vision, visit your GP or make an appointment with an optometrist, a healthcare professional trained to recognise signs of eye problems (NHS, 2015k).

Referral

If your GP or optometrist suspects macular degeneration, you'll be referred to an ophthalmologist, a doctor who specialises in diagnosing and treating eye conditions.

Your appointment will usually be at a hospital eye department. If you need to travel by car to the hospital, ask someone else to drive you back as the eye drops given to you may make your vision blurry (NHS, 2015k).

Eye examination

The ophthalmologist will examine your eyes. You'll be given eye drops to enlarge your pupils. These take around half an hour to start working, and may make your vision blurry or your eyes sensitive to light. The effect of the eye drops will wear off after a few hours.

The ophthalmologist will use a magnifying device with a light attached to look at the back of your eyes, where your retina and macula are. They'll check for any abnormalities around your retina.

The ophthalmologist will then carry out a series of tests to confirm a diagnosis of macular degeneration (NHS, 2015k).

Amsler grid

One of the first tests involves asking you to look at a special grid, known as an Amsler grid. The grid is made up of vertical and horizontal lines, with a dot in the middle.

If you have macular degeneration, it's likely some of the lines will appear faded, broken or distorted. Saying which lines are distorted or broken will give your ophthalmologist a better idea of the extent of the damage to your macula.

As the macula controls your central field of vision, it's usually the lines nearest to the centre of the grid that appear distorted.

Eyecare Trust has a version of the Amsler grid on its website that you can print off and use at home to check for possible signs of AMD (NHS, 2015k).

Retinal imaging

As part of your diagnosis, your ophthalmologist will need to photograph your retinas to see what damage, if any, macular degeneration has caused.

As well as confirming the diagnosis, the images will prove useful in planning your treatment. There are several different ways of taking pictures of the retina (NHS, 2015k).

Fundus photography

A fundus camera is a special camera used to take photographs of the inside of your eye. It can capture three-dimensional images of your macula. Your ophthalmologist can then look at the different layers of your retina to see what damage, if any, has occurred (NHS, 2015k).

Fluorescein angiography

Angiography is an examination that creates detailed images of your blood vessels and the bloodflow inside them. A special dye is injected into your blood vessels and pictures are taken that show any abnormalities inside them.

The procedure can confirm which type of AMD you have. It may be carried out if your ophthalmologist suspects wet AMD.

Your ophthalmologist will inject a special dye called fluorescein into a vein in your arm. The dye will move through your blood vessels into your retina. They will look into your eyes using a magnifying device and take a series of pictures using a special camera.

These images will allow your ophthalmologist to see whether any of the dye is leaking from the blood vessels behind your macula. If it is, this may confirm you have wet AMD (NHS, 2015k).

Indocyanine green (ICG) angiography

The technique used for indocyanine green (ICG) angiography is the same as for fluorescein angiography, but the dye is different. ICG dye can highlight slightly different problems in your eyes (NHS, 2015k).

Optical coherence tomography (OCT)

Optical coherence tomography (OCT) uses special rays of light to scan your retina and produce an image of it. This can provide detailed information about your macula. For example, it will tell your ophthalmologist whether your macula is thickened or abnormal, and whether any fluid has leaked into the retina (NHS, 2015k).

Staging of AMD

Once these tests have been completed, your ophthalmologist should be able to tell you how far your AMD has progressed.

Dry AMD has three main stages, described below -

- **early** - at this stage there may be many small collections of drusen (deposits) inside the eye, a few medium-sized drusen, or some minor damage to your retina; early AMD may not cause any noticeable symptoms,
- **intermediate** - there may be some larger drusen inside the eye or some tissue damage to the outer section of the macula; you'll have a blurred spot in the centre of your vision,
- **advanced** - the centre of the macula is damaged; you'll have a large blurred central spot and find it difficult to read and recognise faces (NHS, 2015k).

Wet AMD is always considered to be an advanced form of AMD (NHS, 2015k).

Visual acuity

You may hear your GP or eye specialist referring to your ”visual acuity”. This is a measure of your ability to see fine detail and is often used as a way to describe how good your vision is.

Visual acuity is made up of two figures. For example, if your visual is 6/60, it means you can see from six metres or less what someone with normal vision can see from 60 metres away (NHS, 2015k).

Treatment

There's currently no cure for either type of AMD, although vision aids and treatments may help (NHS, 2015k).

Dry AMD

With dry AMD, the deterioration of vision can be very slow. You won't go completely blind, as your peripheral (side) vision shouldn't be affected.

Help is available to make tasks such as reading and writing easier. Getting practical help may improve your quality of life and make it easier for you to carry out your daily activities (NHS, 2015k).

You may be referred to a low vision clinic. Staff at the clinic can provide useful advice and practical support to help minimise the effect dry AMD has on your life. For example, you may wish to try -

- magnifying lenses,
- large-print books,
- very bright reading lights,
- screen-reading software on your computer so you can ”read” emails and documents, and browse the internet (NHS, 2015k).

Diet and nutrition

There's some evidence a diet high in vitamins A (beta-carotene), C and E - as well as substances called lutein and zeaxanthin - may slow the progression of dry AMD, and possibly even reduce your risk of getting wet AMD. Talk to an ophthalmologist about whether these could help you (NHS, 2015k).

Foods high in vitamins A, C and E include -

- oranges,
- kiwis,
- leafy green vegetables,
- tomatoes,
- carrots (NHS, 2015k).

Leafy green vegetables are also a good source of lutein, as are peas, mangoes and sweetcorn.

There's no definitive proof eating these foods will be effective for everyone with dry AMD, but this type of healthy diet has other important health benefits, too.

Dietary supplements are also available, some of which claim to specifically improve eye health. However, these are rarely prescribed on the NHS [7] so you'll usually have to buy them. It's important to check with your GP before taking supplements as they may not be suitable for everyone (NHS, 2015k).

Wet AMD

The two main treatment options for wet AMD are -

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[7] The 'National Health Service' is the publicly funded national healthcare system in the UK. The organisation, funded primarily by taxation, provides free or low-cost healthcare to all legal residents of the UK. Medications are subsidised as well and prescriptions may be free when situations warrant

- Anti-VEGF medication - to prevent the growth of new blood vessels in the eye,
- laser surgery - to destroy abnormal blood vessels in the eye (NHS, 2015k).

These treatments are described below (NHS, 2015k).

Anti-VEGF medication

VEGF stands for vascular endothelial growth factor. It's one of the chemicals responsible for the growth of new blood vessels in the eye caused by wet AMD. Anti-VEGF medicines block this chemical, stopping it producing blood vessels and preventing wet AMD getting worse.

The medication is injected into your eye using a very fine needle. You'll be given local anaesthetic [8] eye drops so the procedure doesn't hurt. Most people tolerate this very well, with minimal discomfort.

In some cases, anti-VEGF medication can shrink the blood vessels in the eye and restore some of the sight lost as a result of macular degeneration. But your sight won't be restored completely, and not everyone will see an improvement.

The anti-VEGF medications currently available on the NHS are ranibizumab and aflibercept, but these will only be prescribed if there's clear evidence using the medication will help improve or maintain your eyesight (NHS, 2015k).

Current recommendations are that Ranibizumab (Lucentis) and Aflibercept (Eylea) should only be used if -

- your visual acuity (ability to detect fine detail) is between 6/12 and 6/96,
- there's no permanent damage to the fovea, the part of the eye that helps you see things in sharp detail,
- the area affected by AMD is no larger than 12 times the size of the area inside the eye where the optic nerve connects to the retina,
- there are signs the condition has been getting worse (NHS, 2015k).

Your ophthalmologist should be able to tell you if you're suitable for treatment with ranibizumab or aflibercept (NHS, 2015k).

Ranibizumab (Lucentis)

Studies show ranibizumab (brand name Lucentis) can help slow loss of visual acuity in more than 90% of people, and may even increase visual acuity in around a third of people.

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[8] involves numbing an area of the body using a type of medication called a local anaesthetic

You'll be given one injection of ranibizumab into your affected eye once a month for three months. After this time, you'll be monitored during a maintenance phase.

If your vision deteriorates and it's thought to be caused by further leakage of fluid during this maintenance phase, you may be given another injection of ranibizumab. This monitoring will continue and you'll have injections as necessary, with at least one month between injections.

Treatment will be stopped if your condition doesn't show signs of improvement with ranibizumab or continues to get worse (NHS, 2015k).

Common side-effects of ranibizumab include -

- minor bleeding in the eye,
- feeling like there's something in the eye,
- inflammation or irritation of the eye,
- increased pressure within the eye (NHS, 2015k).

Aflibercept (Eylea)

Aflibercept (brand name Eylea) is a newer type of anti-VEGF medication for wet AMD. Studies have shown it's at least as effective as ranibizumab in treating people with the condition.

At first you'll be given one injection of aflibercept into your affected eye once a month for three months. Injections may be given once every two months.

After a year of treatment the intervals between injections can be extended depending on how well the medication is working.

On average, treatment with aflibercept tends to involve fewer injections and monitoring visits than treatment with ranibizumab. Common side-effects of aflibercept are similar to ranibizumab (NHS, 2015k).

Surgery

Photodynamic therapy

Photodynamic therapy (PDT) was developed in the 1990s. It involves having a light-sensitive medicine called verteporfin injected into a vein in your arm.

The verteporfin attaches itself to the abnormal blood vessels in your macula. A low-powered laser is then shone into your damaged eye over a circular area just larger than the affected area in your eye. This usually takes around one minute.

The light from the laser is absorbed by the verteporfin and activates the drug. The activated verteporfin destroys the abnormal vessels in your macula while reducing harm to other delicate tissues in your eye.

Destroying the blood vessels stops them leaking blood or fluid, preventing damage and therefore stopping the macular degeneration getting worse. You may need this treatment every few months to ensure any new blood vessels that start growing are kept under control.

PDT isn't suitable for everyone - it will depend on where the blood vessels are growing and how severely they've affected your macula. It may be suitable if your visual acuity is 6/60 or better. This means you can see from a distance of six metres what someone with normal vision can see from a distance of 60 metres (NHS, 2015k).

Laser photocoagulation

Laser photocoagulation can also be used to treat some cases of wet AMD. This type of surgery is only suitable if the abnormal blood vessels aren't close to the fovea, as performing surgery close to this part of the eye can cause permanent vision loss.

Around one in seven people may be suitable for treatment with laser photocoagulation. A powerful laser is used to burn sections of the retina. These sections harden, which prevents the blood vessels moving up into the macula.

The surgery is carried out under local anaesthetic to numb the eye, so it isn't painful. One side-effect of laser photocoagulation is a permanent black or grey patch developing in your field of vision. This loss of vision is usually - but not always - less severe than untreated wet AMD.

If you're considering laser photocoagulation, you should discuss the pros and cons of the treatment with the doctor in charge of your care. The results tend to be less effective than the other treatments discussed above, so it only tends to be used in people who cannot be treated with anti-VEGF medication or PDT (NHS, 2015k).

Radiotherapy

Radiotherapy [9] has been used to treat wet AMD in the past with varying results. Research was carried out recently to see whether using radiotherapy in combi-

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[9] a treatment involving the use of high-energy radiation. It's commonly used to treat cancer

nation with anti-VEGF injections may be of benefit in reducing the number of injections needed. The early results of some studies are encouraging, but the long-term benefits are still unknown.

Radiotherapy may be available as part of a clinical trial. You'll need to be advised by your ophthalmologist as to whether you may be suitable for the treatment (NHS, 2015k).

Newer types of surgery

In recent years, two new surgical techniques have been developed to treat wet AMD. These are -

- **macular translocation** - where the macula is repositioned over a healthier section of the eyeball not affected by abnormal blood vessels,
- **lens implantation** - where the lens of the eye is removed and replaced with an artificial lens designed to enhance central vision (NHS, 2015k).

Both approaches tend to achieve better results than laser surgery, but there are also disadvantages, such as -

- limited access to these treatments - they may only be available in the context of a clinical trial,
- uncertainty about whether these treatments are safe and effective in the long term,
- they carry a higher risk of serious complications than laser surgery (NHS, 2015k).

The National Institute for Health and Care Excellence (NICE) has more information about macular translocation, and lens implantation on its website (NHS, 2015k).

Stem cell therapy

Research is underway to try to create new retinal cells using stem cells (the body's "master" cells). Stem cells can potentially be grown into retinal cells in the lab, and can then be transplanted.

A number of promising trials are currently being carried out across the world. See the Macular Society website for more information about stem cell therapy (NHS, 2015k).

Complications

Being told you have AMD can be frustrating and upsetting, as simple everyday tasks such as reading become more difficult.

Speak to your GP if macular degeneration is having a significant effect on your daily life. They should be able to put you in touch with local support groups, who can provide guidance and practical help (NHS, 2015k).

Depression and anxiety

Having to cope with losing part of your vision and coming to terms with the loss of some of your independence can be difficult, and it can affect your mental health.

It's estimated around a third of people with AMD may have some form of depression or anxiety.

If you're struggling with the changes to your life, you should speak to your GP or ophthalmologist (eye specialist). They'll be able to discuss treatment options with you, such as counselling, or they can refer you to a mental health professional for further assessment (NHS, 2015k).

Driving

You'll need to inform the Driver and Vehicle Licensing Agency (DVLA) and your insurance company if you're diagnosed with AMD and you drive, as the condition may affect your ability to drive.

If your eyesight is only slightly affected, it may still be safe for you to drive a vehicle. However, you'll probably need to have a series of sight tests to prove this. Central vision is very important for driving, and you won't be able to drive if you don't meet the standards set by the DVLA.

The GOV.UK website has more information and advice about macular degeneration and driving (NHS, 2015k).

Visual hallucinations

Some people with macular degeneration experience visual hallucinations caused by their low vision. This is known as Charles Bonnet syndrome. It's estimated about 1 in 10 people with AMD experiences Charles Bonnet syndrome.

As AMD can prevent you from receiving the visual stimulation you're used to, your brain can sometimes compensate by creating fantasy images or using images stored in your memory. These are known as hallucinations.

The hallucinations you experience may include unusual patterns or shapes, animals, faces, or an entire scene. They can be either black and white or colour, and may last from a few minutes to several hours. They're usually pleasant images, although they may be unsettling and scary to experience.

Many people with Charles Bonnet syndrome don't tell their GP about their symptoms because they worry it may be a sign of a mental condition. However, the hallucinations experienced with this syndrome are usually the result of a problem with your vision and not a reflection of your mental state.

Speak to your GP if you experience any kind of visual hallucination. There are ways they can help you learn how to cope. The hallucinations will usually last for around 18 months, although they may last years for some people (NHS, 2015k).

Alzheimer's disease

See its main article in Aging and Trans - Part 3 - Mental Health.

Arthritis

Arthritis is a common condition that causes pain and inflammation in a joint.

In the UK, around 10 million people have arthritis. It affects people of all ages, including children.

Types of arthritis

The two most common types of arthritis are -

- Osteoarthritis,
- Rheumatoid arthritis.

Asthma

Asthma is a common long-term condition that can cause coughing, wheezing, chest tightness and breathlessness.

The severity of these symptoms varies from person to person. Asthma can be controlled well in most people most of the time, although some people may have more persistent problems.

Occasionally, asthma symptoms can get gradually or suddenly worse. This is known as an ”asthma attack”, although doctors sometimes use the term ”exacerbation”.

Severe attacks may require hospital treatment and can be life threatening, although this is unusual (NHS, 2014a).

Who is affected?

In the UK, around 5.4 million people are currently receiving treatment for asthma.

That’s the equivalent of 1 in every 12 adults and 1 in every 11 children. Asthma in adults is more common in women than men (NHS, 2014a).

Symptoms

The symptoms of asthma can range from mild to severe. Most people will only experience occasional symptoms, although a few people will have problems most of the time (NHS, 2014a).

The main symptoms of asthma are -

- wheezing (a whistling sound when you breathe),
- shortness of breath,
- a tight chest - which may feel like a band is tightening around it,
- coughing (NHS, 2014a).

These symptoms are often worse at night and early in the morning, particularly if the condition is not well controlled. They may also develop or become worse in response to a certain trigger, such as exercise or exposure to an allergen.

Speak to your GP if you think you or your child may have asthma. You should also talk to your doctor or asthma nurse if you have been diagnosed with asthma and you are finding it difficult to control the symptoms (NHS, 2014a).

Asthma attacks

When asthma symptoms get significantly worse, it is known as an asthma attack or ”acute asthma exacerbation”.

Asthma attacks often develop slowly, sometimes taking a couple of days or more to become serious, although some people with asthma are prone to sudden, unexpected severe attacks. It is important to recognise attacks early and take appropriate action.

During an asthma attack, the symptoms described above may get worse and - if you're already on treatment - your inhaler medication may not work as well as it normally does.

You might be monitoring your asthma using a device called a 'peak flow meter', and there may be a drop in your peak expiratory flow (NHS, 2014a).

Signs of a particularly severe asthma attack can include -

- your reliever inhaler (which is usually blue) is not helping symptoms as much as usual, or at all,
- wheezing, coughing and chest tightness becoming severe and constant,
- being too breathless to eat, speak or sleep,
- breathing faster,
- a rapid heartbeat,
- feeling drowsy, exhausted or dizzy,
- your lips or fingers turning blue (cyanosis) (NHS, 2014a).

Call 999 to seek immediate help if you or someone else has symptoms of a severe asthma attack (NHS, 2014a).

Often, using your reliever inhaler will be enough to relieve your symptoms when you start having an attack. But sometimes symptoms are more severe and urgent action is needed.

If you go to A&E or are admitted to hospital, take the details of all of your medicines with you if possible (NHS, 2014b).

What to do if you're having an asthma attack

Asthma UK's guidelines for children and adults having an asthma attack are to -

1. Take one to two puffs of your reliever inhaler (usually blue) immediately.
2. Sit down and try to take slow, steady breaths.
3. If you do not start to feel better, take two puffs of your reliever inhaler (one puff at a time) every two minutes. You can take up to 10 puffs.
4. If you don't feel better after taking your inhaler as above, or if you are worried at any time, call 999.
5. If an ambulance doesn't arrive within 10 minutes and you are still feeling unwell, repeat step 3 (NHS, 2014b).

If your symptoms improve and you don't need to call 999, you still need to see a GP or asthma nurse within 24 hours (NHS, 2014b).

After an asthma attack

Asthma UK advises that you should make an appointment with your doctor or asthma nurse within 48 hours of your attack.

You can then discuss any changes that may need to be made to manage your condition safely. For example, the dose of your preventative treatment may need to be adjusted.

If you've had an attack or you're needing to use your reliever inhaler regularly, arrange to see your doctor or nurse - the dose of your preventative treatment may need to be adjusted (NHS, 2014b).

Preventing asthma attacks

Most people who have asthma attacks will have warning signs for a few days before the attack.

These include having to use your blue reliever inhaler more often, changes in your peak flow meter readings, and increased symptoms, such as waking up in the night.

Don't ignore these warning signs as they indicate that your asthma control is poor and you risk having a severe attack.

Follow your Personal asthma action plan. If your symptoms continue to get worse, make an urgent appointment to see your doctor or asthma nurse.

Never be frightened of calling for help in an emergency (NHS, 2014b).

Friends and relatives of people with asthma

It's important that friends and family know how to help in an emergency. Asthma UK provides a free Asthma Attack Card, which helps you learn to recognise an asthma attack and explains what to do in that situation.

This includes helping the person having the attack to sit up comfortably, talking to them to calm them, helping them use their reliever treatment, and calling for help if their condition doesn't improve (NHS, 2014b).

Causes

It's not clear exactly what causes asthma, although it is likely to be a combination of factors.

Some of these may be genetic. However, a number of environmental factors are thought to play a role in the development of asthma. These include air pollution, chlorine in swimming pools and modern hygiene standards (known as the ”hygiene hypothesis”).

There is currently not enough evidence to be certain whether any of these can cause asthma, although a variety of environmental irritants, such as dust, cold air and smoke, may make it worse (NHS, 2014a).

Who is at risk?

Although the cause of asthma is unknown, a number of things that can increase your chances of developing the condition have been identified. These include -

- a family history of asthma or other related allergic conditions (known as atopic conditions) such as eczema, food allergy or hay fever,
- having another atopic condition,
- having bronchiolitis (a common childhood lung infection) as a child,
- childhood exposure to tobacco smoke, particularly if your mother also smoked during pregnancy,
- being born prematurely, especially if you needed a ventilator to support your breathing after birth,
- having a low birth weight as a result of restricted growth within the womb (NHS, 2014a).

Some people may also be at risk of developing asthma through their job (NHS, 2014a).

Asthma triggers

In people with asthma, the small tubes (bronchi) that carry air in and out of the lungs become inflamed and more sensitive than normal.

This means that when you come into contact with something that irritates your lungs (a trigger), your airways become narrow, the muscles around them tighten, and there is an increase in the production of sticky mucus (phlegm) (NHS, 2014a).

Asthma symptoms can have a range of triggers (listed in alphabetical order to make it easier to find them), such as -

- **airborne irritants** - including cigarette smoke, chemical fumes and atmospheric pollution.
- **allergens** - including pollen, dust mites, animal fur or feathers.
- **emotions** - including stress or laughing.
- **exercise**.
- **food allergies** - including allergies to nuts or other food items.
- **foods containing sulphites** - naturally occurring substances found in some food and drinks, such as concentrated fruit juice, jam, prawns and many processed or pre-cooked meals.
- **indoor conditions** - including mould or damp, house dust mites and chemicals in carpets and flooring materials.
- **medicines** - particularly the class of painkillers called non-steroidal anti-inflammatory drug (NSAID)s, which includes aspirin and ibuprofen [10], and beta-blockers sometimes given for high blood pressure or some types of heart disease.
- **respiratory tract infections** - particularly infections affecting the upper airways, such as colds and the flu.
- **weather conditions** - including a sudden change in temperature, cold air, windy days, thunderstorms, poor air quality and hot, humid days (NHS, 2014a).

Once you know your asthma triggers, you may be able to help control your condition by trying to avoid them (NHS, 2014a).

Understanding asthma triggers

Knowing what your asthma triggers are and how to deal with them means you're more likely to stay well with your asthma (ASTHMA.ORG, 2016a).

What's an asthma trigger?

An asthma trigger is anything that can set off your asthma by irritating your sensitive airways even more. You may find, for example, that being around cats or dust sets your symptoms off. Or it might be pollen, cold weather, or being near someone who's smoking (ASTHMA.ORG, 2016a).

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[10] a NSAID used to treat mild to moderate pain, controlling a high temperature and easing inflammation and swelling

How many asthma triggers can you have?

You can have one or more asthma triggers. What sets off your asthma symptoms may be different to what sets off someone else's. Everyone with asthma has their own personal mix of triggers (ASTHMA.ORG, 2016a).

Why do asthma triggers sometimes not cause symptoms?

The sensitivity of your airways can vary day to day, month to month, year to year. If your asthma's well managed, your triggers are less likely to cause symptoms.

Also, your asthma symptoms can be caused by more than one asthma trigger at the same time. If this happens, it could cause a stronger reaction - for example, if you have a cold and you also come into contact with a cat. This can be why sometimes triggers do cause symptoms and why sometimes they don't (ASTHMA.ORG, 2016a).

How do you know which asthma triggers affect you?

If you understand which things trigger your asthma you might be able to avoid them. Sometimes it's obvious what your triggers are. Sometimes it's not. Asking yourself these two questions can help you work out which triggers affect you -

- **Have I got any obvious triggers?** - Often it's obvious which things trigger your asthma - for example, when your symptoms start after you've come into contact with a cat or dog. Or you might find that your asthma symptoms are set off by a food allergy, alcohol, cigarette smoke or smoke from open fires.
- **What are your other triggers?** - Sometimes it's not easy to pinpoint exactly what triggers your asthma. This is because some triggers are invisible (such as grass pollen); you may have more than one trigger; and sometimes you may have a delayed reaction to a trigger. A bit of extra detective work may be needed - try keeping a diary of activities and symptoms to help you spot any patterns (ASTHMA.ORG, 2016a).

Can you avoid asthma triggers?

"*It's impossible to avoid all triggers but you can cut your risk of developing asthma symptoms when you're exposed to them,*" says Dr Samantha Walker, Asthma UK.

Some asthma triggers are easily avoidable - cigarette smoke, pets and alcohol for example. But it's impossible to avoid many common asthma triggers - things like pollen, pollution, colds, dust mites and cold weather (ASTHMA.ORG, 2016a).

How can you deal with asthma triggers?

There are proven steps you can take to cut your risk of asthma triggers causing asthma symptoms or an asthma attack -

1. Take your preventer medicine every day - The best way to help your body cope well with any asthma triggers is to take your preventer inhaler every day as prescribed. Your preventer medicine is specially designed to work away in the background to help reduce sensitivity and irritation in your airways. Taking it every day means there's less chance of a reaction if you come into contact with any triggers - so you're more likely to able to go to work, have fun with your family and enjoy socialising with friends.
2. Use a written asthma action plan - There's space on your written asthma action plan to note down your triggers to help you spot when your asthma needs extra help. Using an action plan cuts your risk of ending up in hospital due to your asthma. If you haven't got one, download one and fill it in with your GP or asthma nurse as soon as possible.
3. Go for an asthma review at least once a year - An asthma review gives you and your GP or asthma nurse a chance to make sure your written asthma action plan is up to date. It's important to check regularly that you're taking the right medicines in the right way and at the right doses so they're always giving you the best protection against your triggers as possible (ASTHMA.ORG, 2016a).

If you're taking your medicines as prescribed but still having asthma symptoms, speak to your GP or asthma nurse so you can come up with a plan to improve things. It might be that something as simple as a change of inhaler technique could solve the problem (ASTHMA.ORG, 2016a).

Alcohol

Have you ever found that alcohol seems to make your asthma symptoms worse? For some people, symptoms are triggered when they drink any kind of alcohol, while others may only find symptoms come on when they have a particular kind of drink, such as wine or beer. Actor, writer and presenter Stephen Fry, for example, finds champagne can lead to symptoms. "*I have to make sure that I avoid too much champagne because it triggers my asthma symptoms*," he says. "*Cham-*

pagne can leave a lot of people feeling poorly the next day, but for me it is far more serious because it could trigger a potentially fatal asthma attack" (ASTHMA.ORG, 2015a).

Why can alcohol increase your risk of asthma symptoms or an asthma attack? You might be surprised to know that it's usually the different substances found in alcoholic drinks, rather than the alcohol itself, that trigger symptoms, according to current research. As well as ethanol (pure alcohol), alcoholic drinks contain a natural food chemical called histamine, which is found at particularly high levels in red wine and some beers. Histamine is the same substance that's released in the body when you have an allergic reaction. In some people, the histamine in alcohol may trigger asthma symptoms.

Preservatives called sulphites are added to some alcoholic drinks, including wine. Between 3% and 10% of people with asthma are sensitive to sulphites, and symptoms can vary from mild wheezing to a potentially life-threatening asthma attack (ASTHMA.ORG, 2015a).

When's the trigger most likely to affect you? You're most likely to notice symptoms almost immediately after drinking, but people's sensitivity varies. Some may be able to have one or two drinks without noticing symptoms, whereas others may have symptoms after just a few sips (ASTHMA.ORG, 2015a).

What's the best way to reduce the risk of the trigger affecting you? If you think a particular drink is triggering your symptoms, try avoiding it. White wine and cider tend to have high levels of sulphites, while red wine and some beers have high levels of histamine. It's possible to get hold of low-sulphite wines - companies that specialise in organic alcohol often offer these and you may even find some in your local supermarket. Clear spirits like gin and vodka are better options, too, as they're very low in histamines and sulphites. Always keep your reliever inhaler (usually blue) with you when you're drinking, in case you experience symptoms.

Remember that triggers can change, so even if you notice an alcoholic drink has only recently become a trigger, that's not unusual. Your responses to a trigger tend to be worse when your asthma isn't well managed. If you're having a reaction to alcohol, see your GP or asthma nurse for a review (ASTHMA.ORG, 2015a).

Other ways alcohol can affect your asthma If you drink alcohol a lot, you're more likely to feel anxious and depressed, which might mean you don't look after your health so well, and that could affect your asthma. Know your limits - check out Drinkaware's Unit Calculator to track what you're drinking and get more facts about alcohol and your health (ASTHMA.ORG, 2015a).

Animals and pets

Animals are a common trigger of asthma symptoms. You might be allergic to just one animal or more than one. Often it's cats, dogs or horses - but other animals such as rabbits, mice, hamsters, guinea pigs and gerbils can also make asthma symptoms worse. For some people, birds may also trigger asthma symptoms.

Pet allergies can develop at any stage of life. This means that even if you had a dog when you were younger and did not react to it, you could be allergic to dogs now. Sometimes, even if you have been around an animal for some time without developing allergies, it's possible to become allergic years later (ASTHMA.ORG, 2015b).

Why do animals cause asthma symptoms? *"If animals are a trigger for your asthma you probably have what's known as 'allergic asthma',"* says Samantha Walker, Asthma UK's Director of Research and Policy.

The allergens (which cause the allergic reaction in some people) are actually proteins found in the animal's saliva, flakes of skin (dander), faeces and urine - and are harmless for most people.

In people who are sensitive to these proteins, touching or inhaling animal allergens causes the immune system to overreact and release a chemical called histamine, leading to an allergic reaction. Symptoms can include red, itchy and watery eyes and nose; sneezing; coughing; scratchy or sore throat; itchy skin; and most serious of all, difficulty breathing. For many people with asthma, this release of histamine can make asthma symptoms worse (ASTHMA.ORG, 2015b).

How do you know if animals are your trigger? If you or your child is slightly allergic to animals, your allergy symptoms (itching, redness, sneezing, coughing) may not appear until after several days of contact with the animal.

For people who are highly allergic to animals, this can cause severe breathing problems - coughing, wheezing and shortness of breath - within 15 to 30 minutes of coming into contact with the animal. Sometimes highly allergic people also get a rash on the face, neck and upper chest.

An easy way to tell if you are allergic to an animal is to stay away from it and see if your asthma symptoms get better. Of course, this isn't always possible. As

Sonia Munde, our Head of Helpline advises: ”*Moving your pet to a different room, putting it outside, or re-homing it won't get rid of all the allergens straight away - and you may still have symptoms for some time*”.

The best way to confirm you have an animal allergy is by getting your GP to refer you for a skin prick test and/or blood test to confirm whether or not you're allergic to animals (asthma.org, 2015b).

How do I cut my risk of reacting to animals?

1. If you don't keep pets - but you know you'll be coming into contact with an animal that triggers your asthma, take an antihistamine or nasal spray beforehand, or wear a mask or scarf to cover your nose and mouth. If you regularly come into contact with animals and cannot avoid it, you may need to talk to your GP or asthma nurse about a regular nasal spray.
2. If you live with pets - If you decide to carry on living with pets when you have allergic asthma, here are some things you can do to cut your risk of symptoms -
    - Try to keep pets out of your bedroom and, where possible, living area.
    - Regular grooming and bathing of cats and dogs can help. You can ask your vet for advice on how to do this properly.
    - If your pet lives in a cage, it may be a good idea to get someone else to clean it out. Ideally it would be better to keep them in their cage as much as possible and limit where they go in the house.
    - You could try using air filters and an efficient vacuum cleaner. This might be helpful for people who have cat allergies, but the evidence on the benefit of these remains unclear.
3. If you're thinking about re-homing your pet because of your allergies, it's important to consider getting an allergy test first, because you may be reacting to something else such as smoke, dust or pollen. If you're confident that you (or anyone else who shares your home) doesn't have pet allergies, it's okay to have a pet if you have asthma. If you or someone you live with starts having asthma symptoms - and you suspect that this is being caused by your pet or a certain animal - have an asthma review with your GP or asthma nurse as soon as possible. Your inhalers could be adjusted or you may need to have another medicine added on to make sure your asthma is as well controlled as possible.
4. If you're considering which pet is less likely to cause an allergic reaction - First, consider whether you already have any other type of allergies, since people who do are more likely to develop others. It's a good idea to set up a trial run by spending some time in the home of a friend or family member

> who already has a pet you are hoping to get. You could even ask whether you can borrow the animal to stay in your own home for a short time to see if you react to it, and if you have any problems with dander that's left around your house (ASTHMA.ORG, 2015b).

If no-one in your immediate circle of contacts has a pet similar to the one you want, another option would be to call your local animal shelter and ask if you can volunteer and get some pet contact that way (ASTHMA.ORG, 2015b).

Hypoallergenic pets Some people believe that hypoallergenic pets including cats and dogs are safe for people with asthma. While its true that some animals produce many more allergens than others (for example dogs with longer fur), all animals produce dander, faeces, urine and saliva which can also trigger asthma symptoms. This means that they can't be classed as truly hypoallergenic.

A 2011 research study compared dust samples from homes with dog breeds reported to be hypoallergenic and those of homes with other dogs. The levels of dog allergen in homes with 'hypoallergenic' dogs did not differ from the levels in homes with other breeds.

Our Head of Helpline, Sonia Munde, says: "*Having a short-haired or fur-less breed is not going to make a difference to someone who is allergic to animals. No breed is completely non-allergenic*" (ASTHMA.ORG, 2015b).

Birds When most people think about pets triggering asthma symptoms, they think of cats and dogs. However, anyone with asthma, allergies or any respiratory problem can also experience breathing problems from bird feathers and feather dander (also known as feather powder).

Feather dander is released when birds clean their feathers, play or wash. Cockatoos, cockatiels and African Grey parrots are the most common culprits, but all birds do release it.

Please be aware that birds can cause other respiratory conditions as well, so if you do spend a lot of time around birds in your working or home life and experience on-going symptoms, speak to your GP for more advice (ASTHMA.ORG, 2015b).

Reptiles and amphibians Scaly animals such as fish, frogs, turtles, lizards and snakes could be a good option as pets because they don't have fur and are not usually allergenic.

However, if you find that your asthma is affected by reptiles and amphibians, you can ask your GP for an allergy test. Sometimes, you could be allergic to something connected with the pet - for example the cage or tank they're kept in, the food they eat, the antibacterial hand gel you use after touching them, or the cleaning products you use.

Also, as with all pets, there could be other health risks to think about with reptiles and amphibians. This includes salmonella infection, especially in children with a weakened immune system. Talk to your local pet shop, or find out more here (ASTHMA.ORG, 2015b).

Colds and flu

Coughs, sneezes and a sore throat? Colds and flu can be miserable for anyone, but if you have asthma they can potentially trigger symptoms. These viruses are very common triggers for people with asthma and they're almost impossible to avoid - but there are steps you can take to lower your risk (ASTHMA.ORG, 2015c).

Why can they increase your risk of asthma symptoms or an asthma attack? Although experts have known for some time that colds and flu can raise your risk of having an asthma attack, the exact reason for the link hasn't been well understood. The latest research we have suggests that when people with asthma get a cold or flu, there's a rise in levels of an inflammatory protein in the cells that line the airways. This can set off a range of other inflammatory reactions, including narrowing of the airways, which can lead to an asthma attack (ASTHMA.ORG, 2015c).

Can you prevent colds and flu? Unfortunately, there's no guaranteed way to avoid catching a cold or flu. But it's worth taking simple steps to reduce your risk (ASTHMA.ORG, 2015c).

1. Wash your hands - Cold and flu viruses are most often spread when you touch an infected surface, like a door handle, then touch your face. This can transfer the virus into your nose or eyes. Washing your hands frequently with hot water and soap helps to reduce the risk of this happening. And try not to touch your nose or eyes too much. Washing your hands properly is the best way to prevent infection but antiviral hand foams can be helpful, particularly if you're out and about and can't wash your hands.
2. Look after yourself - To support your immune system, eat a varied, balanced diet with plenty of fresh fruit and vegetables, exercise regularly and make sure you're getting enough sleep.
3. Consider a flu jab - Speak to your GP or asthma nurse about whether you should have a flu vaccination before the flu season begins each year. This

is designed to help protect you against the specific flu viruses predicted to be in the UK in the winter, although it doesn't protect you from all flu viruses. But not everyone with asthma needs to be vaccinated. Your GP or asthma nurse may suggest you have the flu jab if -

- you take a preventer inhaler,
- you take steroid tablets,
- you've had to go to hospital because of an asthma attack,
- you have another condition or risk factor that means a jab is advisable - the NHS website has a full list of these (ASTHMA.ORG, 2015c).

If your GP or asthma nurse recommends the flu jab, you should have it between September and early November, before flu viruses begin to go around (ASTHMA.ORG, 2015c).

What's the best way to reduce the risk of the trigger affecting you? Although you can't always prevent colds and flu, you can lower the risk of these viruses triggering an asthma attack. If you've been prescribed a preventer inhaler, take it every day, as prescribed. It helps to control inflammation in your lungs, meaning you're less likely to have an asthma attack even if you do come into contact with a trigger such as a cold or flu virus. Also, have a written asthma action plan. We know people who have an asthma action plan are four times less likely to need to go to hospital with an asthma attack.

There's no cure for colds and flu, and there isn't any benefit for your asthma in taking cold remedies if you're affected. But some cold and flu medicines might make you feel better. If you want to take an over-the-counter medicine or a herbal supplement, speak to your GP, asthma nurse or pharmacist first, as some medicines and herbal treatments aren't safe for people with asthma.

If you think you have flu and you have any concerns, call your GP practice for advice (ASTHMA.ORG, 2015c).

Emotions

Have you ever wondered whether the way you're feeling is an asthma trigger? If you've had asthma symptoms when you've been laughing, crying or experiencing strong emotions, you might be surprised to know it's quite common (ASTHMA.ORG, 2015d).

Why do emotions trigger asthma? Everyone feels emotions such as love, hate, anger, and excitement. Sometimes we react by expressing ourselves: for example, crying when we feel sad or laughing when we feel happy or excited.

Asthma symptoms can be triggered by our emotions, and by the way we express them (ASTHMA.ORG, 2015d).

How common is this trigger? Studies have shown that there's a link between strong emotions, including stress, and asthma symptoms getting worse - 69% of people with asthma tell us that stress is a trigger for their asthma.

GINA (Global initiative for asthma) lists laughter as a main asthma trigger, and the American Thoracic Society did a study which showed that half of its study group had laughter as a trigger for their asthma (ASTHMA.ORG, 2015d).

Who is most at risk? Emotions are not going to be an asthma trigger for everyone all of the time. But you're more at risk of symptoms coming on or getting worse during those times when your emotions are strongest. This could be a time of stress, such as exams, or of excitement, such as a big family wedding or birthday (ASTHMA.ORG, 2015d).

Anyone with asthma can find emotions trigger their asthma symptoms, but there are certain groups more at risk -

- **People whose asthma is not well managed** - If you're looking after your asthma well, strong emotions are less likely to trigger asthma symptoms. Your written asthma action plan will help you do this. People whose asthma is not well managed are more at risk from all their triggers, including emotions.
- **Children** - Children react quickly to things going on around them, and are more likely to cry or laugh than adults, often all on the same day. A child can often run around happily one minute and fall over and have a tantrum the next. Strong emotional reactions could trigger asthma symptoms. Excitement could trigger asthma symptoms, and parents and carers often tell us they're worried about their child around birthday parties or Christmas because in the past they've had asthma symptoms, and even asthma attacks, around exciting events like this.
- **Teenagers** - Teenagers are known for their strong emotional reactions and mood swings. At this age, the part of the brain linked to managing and controlling emotions isn't fully developed, so young people experiencing strong emotions have less ability to control how they react and express them. Teenagers are also going through big hormonal changes and this

can influence how they feel and react. Sometimes this can mean they're more likely to do things such as smoking and drinking - these things also put them at risk of asthma symptoms and asthma attacks.

- **Women** - Women cry more than men - according to studies women cry up to 64 times a year and men up to 17. Women also cry for longer, and their crying is more likely to turn to sobbing. Women are also more likely to have strong emotions influenced by hormones, at times such as pregnancy, menopause or before a period. (ASTHMA.ORG, 2015d).

How do emotions trigger asthma? Strong emotions such as fear, excitement or anger can affect the way we breathe. Our breathing might be quicker and less regular and we might take short quick breaths through our mouths. Because this air hasn't passed through our noses, it hasn't been warmed, so it hits our airways while it's dry and cold. This kind of breathing can trigger asthma symptoms for some people.

The same happens when we laugh or cry a lot - the cold, dry air reaches our airways which react with asthma symptoms, such as uncontrollable coughing and a tight chest.

There's a higher risk with uncontrollable laughter or sobbing because our breathing will be even more quick and irregular and we'll be breathing through our mouths. Asthma symptoms can come on very quickly sometimes and could move on to an asthma attack (ASTHMA.ORG, 2015d).

How do you know if this is a trigger for you? Keeping a symptom diary is a useful way to find out if your asthma, or your child's asthma, is being triggered by emotions and emotional reactions. If you notice your asthma is worse when you're upset, angry or excited then make a note of it. You might start to notice a pattern.

Using a written asthma action plan can help you keep an eye on any change in asthma symptoms and tell you what to do when you notice these (ASTHMA.ORG, 2015d).

Cut your risk As with all asthma triggers, your best line of defence is to make sure you're managing your asthma well.

Experiencing emotions is part of life, so we can't avoid them, but we can be aware of them. If you know you're going through an emotional time be aware that it might have an effect on your asthma. Use a written asthma action plan to help you stay on top of your asthma - whatever's going on in your life (ASTHMA.ORG, 2015d).

Exercise

Some people with asthma find that exercise triggers their asthma. In theory, any form of physical activity - from a stroll or climbing the stairs to a Zumba class or a game of tennis - can trigger asthma symptoms or an asthma attack. But the good news is that it's possible to reduce the risk of this happening so that you can enjoy the many benefits of exercise. Here's how you can join in, have fun and keep fit! (ASTHMA.ORG, 2015e)

Why can exercise increase your risk of asthma symptoms or an asthma attack? Usually, you breathe in through your nose, so the air is warmed and moistened. When you exercise, you tend to breathe faster and in through your mouth, so the air you inhale is colder and drier. In some people with asthma, the airways are sensitive to these changes in temperature and humidity and they react by getting narrower. This can lead to asthma symptoms, such as coughing, wheezing, a shortness of breath and tightness in the chest. Exercise is more likely to trigger asthma symptoms if your asthma isn't well managed (ASTHMA.ORG, 2015e).

What is exercise-induced asthma? Some people find that they have symptoms of asthma only when they exercise and not at any other times. This is sometimes known as exercise-induced asthma. The symptoms of exercise-induced asthma are the same, but are usually most intense after exercising and then gradually improve. Some people with exercise-induced asthma already have a diagnosis of asthma, while others only get asthma symptoms when they exercise.

If you think you have asthma that comes on only after you exercise, let your GP or asthma nurse know. To help you manage your asthma they may ask you to record some peak flow readings.

If you do have exercise-induced asthma, the treatment is the same and you can still exercise. You just need to find ways to reduce the risk of exercising affecting you. Start by talking to your GP or asthma nurse and reading our tips below (ASTHMA.ORG, 2015e).

How do I know exercise is a trigger? When you're exercising, it's normal if

-

- you're breathing faster and harder,
- your heart is beating faster,
- you're feeling hot and sweaty,
- you look flushed (ASTHMA.ORG, 2015e).

You know that exercise has triggered asthma symptoms and you need to stop if you -

- start coughing/wheezing,
- are gasping for air/very short of breath/can't get enough air,
- feel tightness in the chest,
- have trouble speaking in short sentences (ASTHMA.ORG, 2015e).

You're having an asthma attack and you need to get help immediately if -

- your reliever inhaler doesn't help,
- your symptoms are getting worse (cough, breathlessness, wheeze or tight chest),
- you're too breathless to speak (ASTHMA.ORG, 2015e).

What's the best way to reduce the risk of exercise affecting you? The best way to avoid exercise triggering asthma symptoms is to manage your asthma well -

- take your medication regularly exactly as prescribed,
- check with your GP or asthma nurse that you're using your inhaler correctly,
- use an up to date written asthma action plan and keep it where you can see it (on the fridge, for example),
- go for regular asthma reviews (ASTHMA.ORG, 2015e).

You can also try these practical tips -

- warm up and warm down for 10–15 minutes before and after exercising,
- if you're exercising with someone else, make sure they know you have asthma, and that you have a reliever inhaler with you,
- if you have symptoms when you exercise, stop, take your reliever inhaler and wait until you feel better before starting again,
- in colder weather, symptoms are even more likely during exercise because when the air is cold it can irritate the sensitive airways. One way to avoid this problem is to exercise indoors during the winter months. Or, consider doing less vigorous exercise - go for a power walk instead of a run, for example,
- dress appropriately. If it's cold, make sure your chest and throat are covered and keep a scarf around your nose,

- if you regularly have asthma symptoms when you exercise, speak to your GP or asthma nurse who can assess your treatment (ASTHMA.ORG, 2015e).

Food

The good news is that very few people with asthma need a special diet. For most people with asthma, healthy eating advice is exactly the same as it is for everyone else: follow a balanced diet that includes plenty of fresh and unprocessed food and is low in sugar, salt and saturated fat.

But a small number of people with asthma are also allergic to certain foods. Coming into contact with a food allergen can lead to an allergic reaction, which may include asthma symptoms such as wheezing, coughing and difficulty breathing.

There's some evidence that if you have both asthma and a food allergy, you may be at greater risk of having an asthma attack that's life-threatening, so it's important to strictly avoid the food. You should also make sure your asthma is well managed, to lower your risk of having an asthma attack (ASTHMA.ORG, 2015g).

Why can food increase your risk of asthma symptoms or an asthma attack? When you come into contact with a food allergen, your immune system overreacts and releases a chemical called histamine. The release of histamine causes the symptoms of an allergic reaction. These can include red, itchy, watery eyes and nose, sneezing, a scratchy or sore throat and itchy skin. For anyone with a food allergy, symptoms can also include wheezing and coughing. In people who have asthma, it can also trigger asthma symptoms such as coughing, tightness in the chest and difficulty breathing. And this is where it can get confusing, because it can be hard to tell the difference between an allergic reaction to a food and an asthma attack.

The signs and symptoms of a food allergy, including asthma symptoms, usually come up seconds or minutes after you've come into contact with the allergen. But it's also possible that you may not start getting symptoms until as much as 48 hours later.

Food allergy shouldn't be confused with food intolerance, which isn't connected with asthma symptoms. Food intolerance is common, causing symptoms such as stomach ache and bloating hours to days after eating a food. An example is lactose intolerance, where someone lacks the enzyme needed to process the sugars found in milk products, leading to bloating and diarrhoea. If you have a food intolerance, rather than a true allergy, there's no evidence to suggest it will trigger asthma symptoms (ASTHMA.ORG, 2015g).

How do you know it's a trigger? Check with your GP or asthma nurse if you think a food is affecting your asthma. Your GP can carry out or refer you for skin prick testing to work out whether you're allergic to the food you suspect. They may ask you to try to remember what you'd eaten in the days before you had a reaction (ASTHMA.ORG, 2015g).

What's the best way to reduce the risk of the trigger affecting you? If you know you have a food allergy, you will need to avoid the food completely, recognise the symptoms of a reaction and know what to do if it happens. Your GP should refer you to an allergy specialist to help you achieve this.

If you're concerned you may have an allergy but haven't been diagnosed, speak to your GP or asthma nurse. Don't start cutting out foods as you may then miss out on important nutrients.

It's impossible to avoid all triggers so it's important to manage your asthma. If you've been prescribed a preventer inhaler, take it every day, as prescribed. It helps to control inflammation in your lungs, meaning you're less likely to have an asthma attack even if you do come into contact with a trigger such as a food allergen (ASTHMA.ORG, 2015g).

Other tips that could help You can also try some of the tips shared below by people with asthma who have food allergies -

- **obtain "free from" lists** - Supermarkets can provide these free of charge for most allergens, showing all the products free from the allergen you have to avoid,
- **eat fresh, whole foods** - A diet based mainly on fresh foods which you prepare yourself can help you avoid allergens more easily, as you'll be able to control exactly what goes into each meal,
- **plan ahead for eating out** - When you book a table, make sure the staff know about your allergy. As well as telling the chef and kitchen staff, you also need to make sure waiting staff know about the importance of avoiding cross-contamination,
- **read labels** - By law, the 14 major allergens (including wheat, milk, nuts and egg) have to be clearly listed on pre-packed manufactured foods throughout the EU. Get into the habit of reading the full ingredients list on food, particularly if your allergy is to an ingredient that doesn't have to be clearly listed. Avoid unlabelled foods. For more detailed information on food labelling, visit the Food Standards Agency website (ASTHMA.ORG, 2015g).

Which foods and ingredients can cause allergies? The most common are -

- **milk and milk products** - You may have heard there's a link between dairy foods and asthma, but only a very small percentage of people are allergic to milk products. For them, eating these foods may result in wheezing. Dairy allergy is more common in children but they often grow out of it as their digestive system matures. Calcium-rich dairy products are essential for healthy bones, especially for children and adolescents. And people with asthma can be at higher risk of the bone disease osteoporosis (which causes thinning, brittle bones and increased risk of fractures) because of the use of steroid medication. So you should only avoid dairy products if necessary, ensuring you replace them with other sources of calcium under the guidance of your GP, nurse or a dietitian.
- **eggs** - This allergy is more common in children, who often grow out of it. Many of those with egg allergy are able to eat well-cooked eggs and foods containing them, and are more likely to react to raw or under-cooked eggs. Remember foods that contain eggs may also cause reactions.
- **nuts, including peanuts** - This is the most common food allergy in adults and children. Reactions can vary from mild (such as rashes) to severe, including anaphylactic shock, which can be life-threatening.
- **seeds** - Most people with an allergy to seeds are allergic to sesame. It can cause severe reactions in people who are susceptible, and the allergy is becoming more common in the UK because we're eating more sesame, for example, in bread and muesli. It's also possible to be allergic to other seeds, such as sunflower and poppy seeds, but this is far less common.
- **fish and shellfish** - Allergy to fish affects about one in 200 people, while shellfish allergy affects one in 100 in places where a lot of these foods are eaten. Reactions can be severe and some people can even be sensitive to the vapours produced when seafood is cooked.
- **wheat** - People can have different reactions to wheat, but the form that can be associated with asthma symptoms is usually true, immediate wheat allergy. This causes instant symptoms, which may include rashes, wheezing, conjunctivitis, diarrhoea and a worsening of eczema. There have also been reports of people working in bakeries developing asthma-like symptoms as a result of inhaling flour.
- **soya** - Soya is found in lots of processed foods, from the obvious such as soy sauce to the more surprising, like margarine and soups.
- **food additives** - Sulphites, tartrazine, monosodium glutamate (MSG) and aspartame are the most common allergy-triggering additives. Sulphites are salts used for preserving processed foods and are often found in pickled

products, wine and dried fruit. Tartrazine is a yellow food colouring. MSG is a flavour enhancer found in processed foods and aspartame is an artificial sweetener. Rarely, other food preservatives includings benzoates, butylhydroxyanisol (BHA), butylhydroxytoluen (BHT) and nitrites can cause reactions.

- **salicylates** - Salicylates are chemicals found naturally in plant foods including tea, coffee and dried herbs and spices, and are also a main ingredient of anti-inflammatory painkillers such as aspirin. Some people with asthma are sensitive to these substances in painkillers but it's rarer to have a reaction to salicylates in foods (ASTHMA.ORG, 2015g).

Female hormones

Hormones are chemicals that travel around your body in your bloodstream. They affect many things, including growth, fertility and the digestive system. Female hormones all work together and play a large role in key stages such as puberty, pregnancy and birth, and menopause. They include oestrogen, progesterone, follicle stimulating hormone (FSH) and luteinising hormone (LH). If you have asthma, these hormones can also affect asthma symptoms (ASTHMA.ORG, 2015f).

Why can hormones increase your risk of asthma symptoms or an asthma attack? There are certain times in a woman's life when hormone levels go up and down a lot. It is not known exactly why these hormonal changes affect asthma symptoms, or why they affect some women but not others. One theory is that they may directly affect the airways and/or cause the body to have a stronger inflammatory response to infection, but more research is needed before we can know for certain (ASTHMA.ORG, 2015f).

When are hormones most likely to affect you? Research shows that girls and women with asthma often notice a difference in their asthma symptoms -

- **during puberty** - before puberty, asthma occurs more often in boys than girls, but it is more common in teenage girls than teenage boys. Most girls begin puberty between the ages of 8 and 14 years of age and reach full sexual maturity within four years,
- **just before and/or during a period** - research shows that just over one-third of women find their asthma symptoms are worse just before or during their period,
- **during pregnancy** - some women first develop asthma during or shortly after pregnancy; during pregnancy some women find their asthma im-

proves, some have no change in their asthma at all and some, mostly those women who already have severe asthma, find their asthma gets worse (ASTHMA.ORG, 2015f).

Around the menopause and perimenopause (the time leading up to the menopause) - some women find that their symptoms get worse and some women first develop asthma before and after menopause. The average age for a woman to reach menopause is 51, although some women experience it in their 30's or 40's (ASTHMA.ORG, 2015f).

What's the best way to reduce the risk of hormones affecting you? The best way to avoid the risk of hormones affecting you is to manage your asthma well.

- take your medication regularly exactly as prescribed,
- check with your GP or asthma nurse that you're using your inhaler correctly,
- use a written asthma action plan,
- go for regular asthma reviews (ASTHMA.ORG, 2015f).

You can also ask your GP or asthma nurse if it's suitable for you to -

- adjust your asthma medication according to your period cycle - your GP or asthma nurse will talk you through the details,
- use hormonal treatments - your GP or asthma nurse will give you individual advice (ASTHMA.ORG, 2015f).

House dust mites

You may have heard people talking about being allergic to dust or finding that dust triggers their asthma symptoms. In fact, it's the droppings of house dust mites which cause the problems. These tiny creatures live in the dust that builds up around homes in carpets, bedding, cushions and soft furnishings, for example. They're invisible to the naked eye and 90% of people with asthma are sensitive to them (ASTHMA.ORG, 2015h).

Why can they increase your risk of asthma symptoms or an asthma attack? House dust mite droppings contain substances that can trigger reactions (ASTHMA.ORG, 2015h).

How do you know it's a trigger? You might notice you have more symptoms when dust is disturbed - for example, when you're cleaning, moving furniture or making a bed. Or you might simply find your asthma symptoms are often worse indoors (ASTHMA.ORG, 2015h).

What's the best way to reduce the risk of the trigger affecting you?

- take your asthma medicines as your doctor prescribed them - ”*If your asthma is triggered by dust mites, the best way to reduce asthma symptoms is to look after your asthma and make sure it's well managed, as this reduces the likelihood of you reacting to the dust mite droppings when you come into contact with them - they are impossible to avoid*,” says Dr Samantha Walker, Asthma UK's Research Director. Your preventer inhaler works by reducing inflammation in your lungs, meaning they're less sensitive, so less likely to be triggered by dust mite droppings. Help ensure your asthma is as well controlled as possible by taking your preventer inhaler as prescribed, and using a written asthma action plan to help you work out if your symptoms are getting worse, and what to do if they are.
- consider whether you really do benefit from dust mite control methods - People with asthma often tell us what methods they have tried to reduce the number of house dust mites in their homes. These include pesticides that kill mites (acaricides), mattress and pillow case protectors, regular vacuuming, good ventilation, freezing soft toys, 60 degree washes, air filters and purifiers. Some people have told us these methods have helped them, but unfortunately, there's no firm evidence they work (ASTHMA.ORG, 2015h).

In fact, research has shown there's not a lot you can do to make a useful difference to the number of dust mites in your home, especially in the UK climate (dust mites thrive in damp environments). So before you start trying methods that can be expensive, take up a lot of time and are hard to maintain, speak to your GP or asthma nurse to find out whether they think it is worthwhile. And if you try these suggestions and it makes no difference to your symptoms, you don't need to continue with them. Your time and effort is better spent focusing on taking your asthma medicines as prescribed, to help reduce your likelihood of reacting to your triggers (ASTHMA.ORG, 2015h).

Indoor environment

Know your indoor triggers

- Central heating,
- Open fires,
- Carpets and furniture,

- Cleaning,
- Decorating,
- Building work and repairs,
- Other steps that may help,
- Humidifiers and de-humidifiers,
- Good ventilation (ASTHMA.ORG, 2015i).

Many things that potentially trigger asthma symptoms can be found in your home, including carpets, certain furnishings and cleaning products. You may also come across triggers in other people's houses or in your workplace. But there are steps you can take to reduce the risk of any indoor allergens leading to an asthma attack (ASTHMA.ORG, 2015i).

What's the best way to reduce the risk of triggers in the home affecting you? Whatever's triggering your asthma, the reality is that it's impossible to get rid of all allergens in your home. And if you only get rid of some, it might not make any difference to your asthma. The evidence is clear that when it comes to coping with asthma triggers - including indoor ones - the best thing you can do is stay on top of your asthma. If you manage your asthma well, your body is in a better position to cope when you come into contact with any asthma triggers (ASTHMA.ORG, 2015i).

The best ways to manage your asthma are -

- take your preventer medication exactly as your GP has prescribed. It is specially designed to work in the background every day to help reduce your body's reaction to triggers you meet in your daily life,
- use your written asthma action plan to help you identify when your asthma needs extra help and what to discuss with your GP or asthma nurse,
- get your asthma reviewed regularly, so you and your GP or asthma nurse can make sure the medicines you're taking are doing the best possible job for you (ASTHMA.ORG, 2015i).

Some common triggers in the home House dust mites, animals, mould and cigarette smoke are all common asthma triggers in the home. But there are other things found indoors that can also potentially trigger your asthma in different ways. Speak to your GP or asthma nurse about what you can realistically do to reduce your risk of an asthma attack. You can also call the Asthma UK Helpline on 0300 222 5800 and talk to an asthma nurse specialist, Monday to Friday from 9am to 5pm (ASTHMA.ORG, 2015i).

Central heating Some people find that their asthma gets worse when the heating is turned on in the autumn and better when it goes off in the spring. This could be because once the heating is turned on, dust mites multiply very quickly and for some people these are an asthma trigger.

However, "*research actually suggests that asthma symptoms are harder to control for people who don't have central heating at home*", says Dr Samantha Walker, Executive Director of Research and Policy at Asthma UK. One reason for this is that central heating gives out a dry heat, and asthma is worse in homes that are damp.

Central heating also helps keep a good background level of warmth. This works well for people with asthma who need to avoid sudden changes in temperature (such as going from a heated room into a cold hall) and makes it a better choice of heating than a gas or electric fire just warming one room (ASTHMA.ORG, 2015i).

Open fires Open fires, or wood-burning stoves, can make asthma symptoms worse for some people. Burning wood gives off fine particles and breathing them in can make the airways inflamed. If you have a wood or coal fire make sure any flues are in good condition and working well, and the chimney is swept regularly, so that the smoke can escape.

Whatever kind of heating you're using, be aware of any new asthma symptoms when you first start using it as the weather changes. You might want to book an asthma review with your GP or asthma nurse if you know there is going to be a weather change so you can be prepared. Ask your GP or asthma nurse about increasing your medicines for a time, or keeping your home well ventilated by opening windows. Good ventilation can cut the risk of your asthma being triggered by smoke. It can also reduce the humidity that can result in dust mite levels increasing when the heating goes on (ASTHMA.ORG, 2015i).

Carpets and furniture A chemical called formaldehyde is sometimes used in the manufacture of carpets, furniture, shelving, flooring and bedding. This chemical is a type of volatile organic compound (VOC), which means it becomes a gas at room temperature. Although there's little solid evidence it can trigger asthma symptoms, some people tell us the smell of new carpets and furniture can make their symptoms worse. If you think this applies to you, it makes sense to limit your exposure. Here are some steps that might be helpful -

- ask the shop to unroll a new carpet and air it before you bring it home,
- buy second-hand furniture instead - after a few years, products stop giving off formaldehyde,

- keep rooms well aired when you first bring new furniture or carpets into the home,
- consider feather bedding instead of synthetic bedding. Some research has suggested feather bedding is less likely to trigger wheezing. However, some people with asthma find feather bedding can make symptoms worse, so it's a question of finding what suits you,
- when you're moving house it's a good idea to check with previous owners if they had a pet. If pets trigger your asthma you might want to get the carpets in your new home professionally cleaned before moving in (ASTHMA.ORG, 2015i).

Cleaning A lot of the cleaning products we use every day contain VOCs. They are found in furniture polish, air fresheners, carpet cleaners, oven cleaners and in the chemicals used in dry cleaning. Sprays can be more likely to trigger asthma than solid or liquid cleaning products, because you end up inhaling the chemicals. Some people also tell us the smell of cleaning products and air fresheners can trigger their asthma. Professional cleaners and others who use a lot of cleaning products all the time are at more risk of developing asthma (ASTHMA.ORG, 2015i).

These steps may help -

- avoid spray cleaners - It's better to use solid or liquid cleaning stuffs, rather than sprays, as sprays get into the air, so they can be inhaled more easily and get further down into the airways, causing irritation. If you can, use as little of the product as possible, and open windows when you're cleaning for good ventilation. Even using spray cleaning products now and again can trigger asthma.
- avoid scented products - If you think the smell of cleaning products triggers asthma symptoms, go for unscented products.
- consider other cleaning methods - The best way to avoid exposure to the chemicals found in cleaning products is to avoid using them. Use a damp cloth for cleaning instead whenever possible and look for products which are labelled allergy friendly, as these have lower levels of VOCs and are usually fragrance-free (ASTHMA.ORG, 2015i).

Decorating The products used in decorating and DIY contain certain VOCs. Some people tell us these products can trigger their asthma symptoms, although there hasn't been much research into this. If you find being around paint, glue and varnishes triggers your asthma, try these steps -

- look for paints low in VOCs - There are now lots available at big DIY stores and paints are clearly labelled with their VOC levels. Low-odour,

water-based gloss paints might also be slightly better for some people with asthma,
- always keep windows open when you're decorating (ASTHMA.ORG, 2015i).

Building work and repairs There's a link between poor housing and asthma so it's important to make sure problems like damp, mould and poor ventilation are sorted out as soon as possible. If you have work done in your home, make sure you're not putting your asthma at greater risk.

Cavity wall insulation keeps a home warm and free from damp. However, some insulation materials give off VOCs, and some people feel exposure to these gases makes their asthma worse, although there's little evidence to show this happens. If you're concerned, find out what type of material is going to be used and whether it gives off VOCs, and make sure the insulation material is properly sealed once it's installed.

If you've got any building work planned in your home there's likely to be more dust and fumes about. Ask your GP or asthma nurse if you should take more asthma medicines while the work is going on. If you can stay with friends or family while the work is being carried out, that would help your asthma even more (ASTHMA.ORG, 2015i).

Other steps that may help People with asthma have told us they've tried these tips for helping to reduce their risk of having an asthma attack due to triggers in the home -

- air filters and purifiers - Air filters and purifiers clean the air and can reduce the number of asthma triggers such as pet dander (flakes of skin), mould spores, dust and tobacco smoke particles. Some people tell us having an air filter or air purifier helps them with their asthma symptoms. However more research is needed to prove this. Most studies suggest that they do improve symptoms, but only if used alongside other methods. They can't remove all allergens and even a few left behind can trigger asthma symptoms (ASTHMA.ORG, 2015i).

If you're thinking of using an air filter or purifier, you need to -

- check what type of allergens it captures,
- check that the air purifier is ozone-free. Some purifiers give out low levels of ozone which can make asthma symptoms worse,
- clean and replace all filters when necessary (ASTHMA.ORG, 2015i).

Humidifiers and de-humidifiers Some people with asthma tell us that humidifiers and dehumidifiers help with their asthma symptoms, but once again only if used alongside other methods. There isn't much research evidence about how effective they are (ASTHMA.ORG, 2015i).

Good ventilation Keeping your home well ventilated by opening windows or using extractor fans reduces humidity. Less humidity means fewer house dust mites and mould spores. Good ventilation also helps get rid of gases produced by heating and cooking.

Opening a window is better than using a fan, or extractor fan. Fans or extractor fans need to be put in the right place so they don't just blow allergens around the room (ASTHMA.ORG, 2015i).

Moulds and fungi

There are many types of fungi and they can be found everywhere in very large numbers - in the soil and the air, in lakes, rivers, and seas, on and within plants and animals, in food and clothing, and in the human body.

Mushrooms are the most commonly known type of fungi. Mould is another type.

Britain is especially prone to indoor mould because it's damp and cold so often, and because a lot of the houses and buildings are old.

The common places for mould to grow in houses are wallpaper, flooring, behind wall tiles and on window frames. Outdoors, mould can grow on rotting logs and fallen leaves, in compost piles and on grasses and grains.

Mould is usually noticeable and can be white, black, yellow, blue or green in colour. It can also have a velvety, fuzzy or rough appearance, and usually has a musty or stale smell (ASTHMA.ORG, 2015j).

How do moulds affect asthma? Fungi, including moulds, release 'seeds' called spores in to the air. Outside they're usually spread by the wind. Spore numbers increase when there's a sudden rise in temperature in a moist environment, such as when central heating is turned on in a damp house, when wet clothes are dried next to a radiator or when the sun comes out after it's been raining on a warm day.

It's the spores that can cause allergic reactions in some people. Mould and fungal spores are often invisible to the naked eye, which means it's hard to avoid them.

Normally, when people breathe in these spores, their immune system helps get rid of them by coughing or sneezing. If you aren't sensitive to mould, you may never even experience a reaction. But for some people with asthma who are sensitive to mould spores, it can act as a trigger, causing asthma symptoms to get worse (ASTHMA.ORG, 2015j).

Who is most likely to be affected by mould and fungus? Around 3%–4% of all people and 10% of people with allergies get symptoms from fungal and mould spores. If you have cold-like symptoms that don't end when seasons change, you may be allergic to the spores of mould or other fungi. People with asthma who are more likely to have their asthma triggered by fungal and mould spores include -

- babies and children,
- elderly people,
- people with existing skin problems, such as eczema,
- people with a weakened immune system,
- people with severe asthma (ASTHMA.ORG, 2015j).

Common moulds Different types of moulds release their spores at different times of the year. Have a look at the fungal spore page here for more information on fungal spore seasons in the UK (ASTHMA.ORG, 2015j).

- **Alternaria** - this is usually found indoors in damp places, such as showers or under leaky sinks. It grows all year round but is most common in July, August and September.
- **Aspergillus** - this is often found indoors growing on dust, powdery food items such as flour, and building materials, such as drywall. It grows throughout the year, with a small peak in August and September and the highest peak in January and February.
- **Cladosporium** - this grows in both cool and warm places and is usually found on fabrics and wood surfaces. It is found in low amounts most of the year, but peaks in July and August.
- **Didymella** - this is also known as ”wet weather spores” and is common during mild, humid nights in the summer between the months of June to September. Didymella can be found outdoors and is widespread on grasses and cereals, particularly wheat and barley.
- **Penicillium** - this is present everywhere, particularly in food causing it to spoil (for example bread and fruits, giving it a blue fuzzy texture) and other organic, biodegradable substances such as wood, leaves and grass. It

is found throughout the year, with a small peak in August and September and the highest peak in January and February.

- **Toxic black mould** or 'black mould' is a name commonly used for **Stachybotrys chartarum**. It is usually slimy because of a wet layer on the top. It is extremely dangerous to people, particularly people with asthma. If you find what you think might be Stachybotrys the only way you can tell for sure is to have a mould expert look at a sample under a microscope (ASTHMA.ORG, 2015j).

How to reduce your risk of moulds affecting you Because fungal mould spores are around all year, the best thing you can do to reduce your risk of asthma symptoms is to keep your asthma as well managed as possible. You can find useful tips and advice here (ASTHMA.ORG, 2015j).

You can also try some of the tips shared below by people with asthma -

- keep an eye on the outdoor fungal spore count so you can be extra sure to stay on top of your asthma when levels are high. Have a look at the fungal spore forecast produced by the University of Worcester (remember that this is the national spore count so this may be different to your area).
- check for any water leaks under your sinks, fridge, dishwasher and washing machine, as well as around the toilet, bathtub, shower and hot water tank.
- keep the garden clear of fallen leaves and other debris.
- if mould spores are a trigger for you, avoid areas (such as woodlands, parks, gardens or compost) that may contain mould spores.
- to prevent mould building up indoors, ensure your house is well ventilated by opening windows regularly.
- when showering or cooking, use your extractor fan and keep doors closed to prevent damp air spreading through the house.
- try not to dry clothes indoors, store clothes in damp cupboards or pack clothes too tightly in wardrobes.
- remove any mould from your home. If you suspect mould is a trigger for your asthma, don't try to remove the mould by yourself. Ask someone else such as a friend, family member or a professional to remove it for you instead. Remember to keep the room ventilated when the mould is being removed as there may be spores lingering in the air.
- if you have toxic [11] black mould in your home, never try to remove it yourself. Disturbing toxic black mould can make it release huge amounts of

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[11] Capable of causing injury or death, especially by chemical means; poisonous

spores and toxins throughout your home, making your asthma symptoms much worse. Call a professional to remove it for you.
- if you're living in rented or council accommodation and your home is constantly mouldy and damp even after regular cleaning, contact the housing charity Shelter (0808 800 4444 - calls are free from UK landlines and main mobile networks); or speak to your landlord or the housing department at your local authority (ASTHMA.ORG, 2015j).

Pollen

You may have heard that pollen is a common trigger for people with asthma. Here's all you need to know (ASTHMA.ORG, 2015k).

What is pollen? Pollen is a tiny powder-like substance produced by certain types of trees, grasses and weeds. It is spread by insects and the wind. An allergy to grass or hay pollen is known as hayfever. The term hayfever is now also widely used to include allergies to other pollens (such as trees and weeds) (ASTHMA.ORG, 2015k).

Who is most likely to have hay fever? Hayfever is very common. It affects about 1 in 5 people in the UK. Teenagers and young adults are most commonly affected, although it can develop any at age. The condition is more common in boys than in girls. In adults, men and women are equally affected.

Hayfever and asthma are closely linked. Research results vary but its thought that between 20% and 60% of people with hayfever also have asthma. Approximately 80% of people with asthma also have a pollen allergy (which means their asthma symptoms are triggered by pollen) (ASTHMA.ORG, 2015k).

Symptoms of hayfever The most common symptoms of hayfever are -

- blocked nose,
- watery, runny nose,
- sneezing,
- itchy nose,
- watery eyes (ASTHMA.ORG, 2015k).

Other symptoms include -

- headaches,
- reduced sense of smell,

- itchy eyes,
- disrupted sleep and tiredness,
- earache (ASTHMA.ORG, 2015k).

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Why can pollen increase your risk of asthma symptoms or an asthma attack? Pollen contains proteins that are harmless for most people. In people with hayfever these proteins cause the immune system to overreact and release a chemical called histamine. This chemical causes the nose, eyes, throat and sinuses [12] to become swollen, irritated and inflamed.

For many people with asthma, this release of histamine (caused by hayfever) can make asthma symptoms worse.

Having a blocked nose can also affect asthma control. Usually when you breathe in, you breathe in through your nose so the air is warmed and moistened by the nasal passages. When you breathe in through your mouth, the air you're inhaling is colder and drier. In some people with asthma, the airways are sensitive to this and react. This can lead to asthma symptoms, such as coughing, wheezing, a shortness of breath and tightness in the chest (ASTHMA.ORG, 2015k).

How do you know if pollen is your trigger? Keeping a diary can help you notice if pollen is a trigger for your asthma symptoms. If, for example, you get symptoms after you've been in the garden or walking in the woods at a certain time of the year, it could suggest a pollen allergy.

Noting the daily pollen count can also help you spot whether or not your allergy symptoms are worse when the count is high.

Your GP may prescribe some medicines to see if they help your symptoms. Or they may refer you for a skin prick test and/or blood test to confirm whether or not you're allergic to pollen and to identify which pollen(s) you're allergic to (ASTHMA.ORG, 2015k).

When is pollen most likely to affect you? There are hundreds of different types of grasses, trees and weeds in the UK. Different types of pollen are released at different times of the year in different parts of the country (due to variations in climate and plant life). In the UK -

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[12] small air-filled cavities behind your cheekbones and forehead

- tree pollens tend to affect people from March to May each year, but can cause symptoms from as early as January. About 25% of people with hayfever are allergic to birch tree pollen. Oak and plane trees (common in many streets in London) also affect lots of people.
- grass pollens are the most common cause of hayfever and usually affect people in May, June and July.
- weed pollens (such as nettles and docks) usually release pollen from early spring to early autumn (ASTHMA.ORG, 2015k).

If you know pollen is a trigger for your asthma, speak to your GP or asthma nurse to include hayfever medicine in your action plan.

It is possible to be allergic to more than one type of pollen (ASTHMA.ORG, 2015k).

Can the weather affect hayfever symptoms? On hot, sunny days, more pollen is released so the pollen count tends to be higher. Air pollution can peak during warm, dry days too, and the combination of both can cause ’grey fever’. Less pollen is released on cooler, cloudy days.

If air pollution levels are high, this can make hayfever symptoms worse because it creates a smog which traps pollen, preventing it from escaping into the upper atmosphere.

During a thunderstorm when the humidity is high, high levels of pollen can be swept up high into the air where the moisture breaks them into much smaller pieces. As the pollen settles back down, these smaller pieces can be breathed into the smaller airways of the lungs where they can irritate the airways and trigger asthma symptoms (ASTHMA.ORG, 2015k).

Can a bunch of flowers trigger hayfever symptoms? In very rare cases, people may have a slight allergic reaction to the pollen in a bunch of flowers. Some people, though, may find the smell of cut flowers can trigger asthma symptoms (ASTHMA.ORG, 2015k).

What’s the best way to reduce the risk of pollen affecting you? It’s difficult to avoid pollen completely, but there are a number of ways you can reduce the risk of pollen affecting you.

1. Take the Asthma UK Risk Test. Most people don’t think they’re at risk of a potentially fatal asthma attack. Around 75% of emergency hospital admissions could be preventable with better management and support. In

just 60 seconds, it will reveal your risk of having an asthma attack and tell you how you can reduce it.

2. Manage your asthma well. This is the best way to reduce the risk of pollen making your asthma symptoms worse. You can do this by -
    - taking your medication regularly as prescribed.
    - using a written asthma action plan.
    - going for regular asthma reviews.
3. Take medicines for hayfever. Research shows that anyone with asthma who also has hayfever can significantly reduce their risk of going to A&E or being hospitalised if they treat their hayfever. This could include nasal steroids, anti-histamines or anti-inflammatory eye-drops; so ask your pharmacist or GP which one is right for you.
4. Try these practical tips that people with asthma have shared with us. This is especially important on dry, warm and sunny days when the pollen count is usually higher
    - keep doors and windows closed when you're indoors.
    - wear wraparound sunglasses to stop pollen getting in your eyes when you're outside.
    - change your clothes and have a shower when you've been outside.
    - don't cut the grass and avoid walking in grassy areas.
    - if possible, avoid drying your clothes outside as pollen will stick to them.
    - remember that pollen counts are generally higher in the early morning and late afternoon/early evening, so it may be better to avoid being outside at these times if possible.
    - dust with a damp cloth and vacuum with a HEPA (high-efficiency particle arresting) filter regularly.
    - don't smoke or let other people Smoking and second-hand smoke around you because it can make hayfever (and asthma) symptoms worse.
    - Alcohol can increase your sensitivity to pollen so it may be worth avoiding it when the pollen count is high and/or your symptoms are severe.
    - if possible, don't go outside before, during or just after a Weather.
    - keep an eye on air pollution levels on the Defra website and, if possible, avoid going out when air pollution levels are particularly high.
    - when you're booking a holiday, remember that the pollen count is likely to be lower in locations by the sea.
    - if you're going abroad, check the local pollen information and forecast before travelling.

- we also have useful advice for anyone taking exams during the hayfever season (ASTHMA.ORG, 2015k).

Pollution

Two thirds of people with asthma tell us poor air quality makes their asthma worse, which puts them at higher risk of an asthma attack. Pollution is an asthma trigger that's hard to avoid, which is why it's so important to manage your asthma well. If you're taking your preventer medicines regularly every day your airways are more likely to cope with high pollution days.

Poor indoor air quality can affect asthma too. Most of us spend a lot of our time inside so it's important to be aware of what can make indoor air unhealthy, including cigarette smoke, cleaning products and wood-burning stoves.

There's evidence that air pollution also plays a part in causing asthma in children and adults (ASTHMA.ORG, 2016b).

- Why are people with asthma more at risk from pollution?,
- Are some people with asthma more at risk than others?,
- How do you know if air pollution is triggering your asthma?,
- Can being exposed to pollution actually cause asthma?,
- What are the main pollutants in the air we breathe?,
- What are the pollution hot spots?,
- When are pollution levels likely to be higher?,
- How to cope with high pollution days,
- Pollution Top Tips (ASTHMA.ORG, 2016b).

Why are people with asthma more at risk from pollution? When pollution levels are high we all breathe in harmful substances; but if you've got asthma you're much more likely to feel the effects. You might notice you're coughing or wheezing, your chest is tight, or your nose and throat feel scratchy. Pollution is more of a risk for people with asthma because -

- pollutants, such as the chemicals in traffic fumes, can quickly irritate the airways and trigger asthma symptoms,
- the tiny particles found in dust, soot, and diesel fumes are small enough to get right into the lungs, causing inflammation and making your asthma symptoms worse,
- pollution can make you more sensitive to your usual asthma triggers (such as house dust mites, pollen, pets, moulds and fungi) (ASTHMA.ORG, 2016b).

Are some people with asthma more at risk than others? Air pollution is a risk factor for everyone with asthma but if your asthma is well managed and you rarely have symptoms you'll be much more able to cope with the effects.

Some people with asthma need to take extra care -

- children and young adults with asthma are more at risk from the effects of pollution because they have faster breathing rates, and their lungs are still developing,
- children living in areas with high pollution are more likely to have reduced lung function as adults,
- older people with asthma, particularly if they have underlying COPD or another long-term condition such as heart disease may find it harder to cope with pollution,
- people with severe asthma or asthma that's difficult to manage may find their symptoms get worse even on low pollution days,
- people who are exposed to pollution on a daily basis, for example because they live or work near a busy main road (ASTHMA.ORG, 2016b).

How do you know if air pollution is triggering your asthma? Keeping a symptom diary for you or your child and noting pollution levels can help you identify patterns. When pollution levels are high, and for up to a day afterwards, you might notice -

- you're more sensitive than usual to your other asthma triggers,
- your symptoms are worse and harder to control,
- your peak flow score is lower than your usual score, a sign that your airways are reacting to a trigger, which could be pollution,
- you need to take your reliever inhaler more (ASTHMA.ORG, 2016b).

Can being exposed to pollution actually cause asthma? Being exposed long-term to high concentrations of air pollution can cause asthma in both children and adults. If you're exposed to high levels of pollution when you're pregnant, whether you have asthma yourself or not, your baby could be more likely to develop asthma. Particulates can cross through the placenta to the developing baby (ASTHMA.ORG, 2016b).

What are the main pollutants in the air we breathe? Today the most dangerous and widespread air pollutants are nitrogen dioxide, sulphur dioxide and particulates. These are mainly produced by factories, industrial sites, and traffic fumes. Ozone is produced when sunlight combines and chemically reacts with nitrogen dioxide, particulates and other gases produced by car, bus and lorry engines (particularly diesel vehicles), factories, chemical power plants and smoke from the burning of coal and oil.

On high pollution days a combination of these pollutants can cause smog. Smog can happen in both winter and summer, when the air is still. Air pollution is mostly invisible but smog can often be seen as it has a yellow or black tinge.

Pollution can stay in the air for days or even weeks, especially if the air is still and there's no wind to blow it away (ASTHMA.ORG, 2016b).

What are the pollution hot spots?

Busy main roads Levels of nitrogen dioxide and particulates are higher on busy urban roads, particularly when traffic is moving slowly. The biggest polluters are vehicles using diesel; half of all cars now run on diesel, as well as buses, vans, and taxis. Vehicles on the road also generate particulates like road dust and the tiny particles from brake and tyre wear. If you're walking or cycling on main roads, or you're driving with the car windows open you'll be more at risk (ASTHMA.ORG, 2016b).

Airports Higher concentrations of pollutants can be found close to airports. Aircraft produce a whole range of pollutants and studies suggest that people living near airports have higher rates of asthma and other respiratory conditions. Busy, congested airports where planes are taxiing and waiting for take-off are thought to produce the most pollution. But pollution is emitted into the air when the plane is cruising too, so the problem is not just localised to the area around an airport (ASTHMA.ORG, 2016b).

Seaports Large container ships, ferries and tankers give out pollution close to seaports and coastal areas. The pollutants can also be carried inland by wind (ASTHMA.ORG, 2016b).

Industrial sites If you live or work near a building site, an industrial site or a power station you'll be more exposed to pollution both from the dust, and the diesel-powered lorries and trucks (ASTHMA.ORG, 2016b).

Bonfires and barbecues Smoke from any type of fire can make asthma symptoms worse, including barbecues, bonfires, and chimney smoke. Wood burning stoves or coal fires affect indoor air quality and also add to outdoor pollution. The smoke from fireworks and bonfires on Bonfire Night can add to winter smog and put your asthma at risk (ASTHMA.ORG, 2016b).

When are pollution levels likely to be higher?

- **On sunny days with no wind** pollution is often worse. The sun reacts with nitrogen dioxide and ozone and creates toxic smog. Ozone gas levels are often higher in sunnier climates and on hot summer days.
- **Dry, warm weather can also mean high Pollen levels** - and the combination of pollen and pollution can cause symptoms known as 'grey fever'.
- **Thunderstorms** usually mean hot, still air before the storm breaks. This can make pollution worse because the pollutants are allowed to build up.
- **On cold, still, foggy days** pollution can get trapped close to the ground and build up over time causing what's known as winter smog.
- **During afternoons and evenings** pollution is generally higher because the pollution has had a chance to build up during the day.
- **During the morning and evening rush hours**, when there are larger numbers of vehicles on the road.
- **Atmospheric changes** can sometimes bring pollutants from southern Europe into the UK, topping up local pollution levels and often resulting in smog alerts here.
- **Saharan dust** is a mixture of sand and dust from the Sahara. A Saharan dust storm can happen several times a year, usually in the summer months, and the dust can be carried over to the UK on high winds causing poor air quality in the UK (ASTHMA.ORG, 2016b).

How to cope with high pollution days It's difficult to avoid air pollution, but the best way to minimise the effect it has on you is to make sure you're looking after your asthma well all of the time. This means -

- taking your preventer medicines every day as prescribed, so that you're keeping down the inflammation in your airways,
- making sure you, and your child, have regular asthma reviews,
- using a written asthma action plan helps you look after your asthma by reminding you what symptoms to look out for and what action to take when you get them (ASTHMA.ORG, 2016b).

If your asthma is well-managed you'll be more able to deal with all your asthma triggers, including pollution, and our pollution top tips will be more effective (ASTHMA.ORG, 2016b).

Does wearing a mask help? There's not enough evidence to say that wearing a face mask to avoid pollution will make a difference to your asthma symptoms. A face mask can make breathing feel more of an effort (ASTHMA.ORG, 2016b).

If you do want to try a mask though make sure -

- the seal is a good fit around your face,
- it has a fine filter to catch the smaller particles,
- you change the filter often,
- you stop using it if it makes it harder to breathe,
- you continue to take your prescribed asthma medicines (ASTHMA.ORG, 2016b).

Pollution Top Tips

- **Be prepared!** DEFRA produces daily and a five-day UK-wide pollution forecast, so you can check to see if your local area is likely to be affected in advance. Follow Asthma UK on Twitter and Facebook for asthma specific advice when there's high pollution alerts.
- **Keep your reliever inhaler with you** so you can quickly deal with symptoms if you get them.
- **Limit the time you spend outside** on high pollution days.
- **Avoid physical activities and exercise** close to main roads.
- **Keep your car windows closed**, especially if you're stuck in a jam of slow-moving traffic.
- **Go out earlier in the day** when air quality tends to be better.
- **Stick to back streets** if possible if you're walking or cycling.
- **Avoid rush hour** if possible.
- **Keep windows and doors closed** so outdoor pollution can't get in.
- **Stand well back from the smoke** if you're going to a barbecue, or a Bonfire Night party
- **Get advice from the environmental health department of your local authority** if you're worried about neighbours having barbecues or bonfires all the time.
- **Avoid cigarette smoke** whether indoors or out (ASTHMA.ORG, 2016b).

Recreational drugs

If you take recreational drugs it's important to know the facts - the more you know the better. Here you'll find some information about taking recreational drugs and how it can affect you and your asthma (ASTHMA.ORG, 2015l).

What are recreational drugs? The term recreational drugs covers all drugs that are taken to alter your mood; some are legal and some illegal. Legal recreational drugs include alcohol and nicotine, whereas illegal drugs include cannabis, cocaine, ecstasy and mephedrone, amongst others. This information covers illegal drugs (ASTHMA.ORG, 2015l).

Drugs can be divided into three categories, based on their effects -

- Stimulants - make you feel like you have lots of energy and confidence; these include cocaine, speed, ecstasy and mephedrone,
- Depressants - slow your body's responses, making you feel relaxed and chilled out; these include alcohol, cannabis, ketamine and heroin,
- Hallucinogens - cause you to see or sense things that aren't real; these include magic mushrooms and LSD (ASTHMA.ORG, 2015l).

Drugs can lead to problems with your physical and your mental health so it's important for you to know and understand how they can affect you (ASTHMA.ORG, 2015l).

The facts about drugs and asthma

- Drugs can make your asthma worse, trigger symptoms and lower your mood (which can trigger your asthma).
- Drugs can affect your asthma in ways you may not expect. For example, ecstasy or speed can make you feel more energetic so you may find yourself dancing longer. This increased activity may bring on asthma symptoms. Smoking cannabis can make you feel anxious, which can bring on asthma symptoms.
- Research has shown that cocaine use (both snorted and smoked) can lead to much worse asthma symptoms and more severe asthma attacks.
- Smoking cigarettes and cannabis can trigger asthma symptoms and lead to long-term lung damage.
- There are heavy penalties for possessing and supplying illegal drugs, even if you're giving them to a friend.
- Beware of 'legal highs', these are now covered by the current misuse of drugs laws.
- One danger with taking drugs is that it's impossible to know what other ingredients they may contain, and what effect these will have on your body.
- Research has shown that taking recreational drugs means its more likely you'll miss taking your asthma medicine. It's really important that you take your asthma medicines regularly as prescribed, to get the protective effect, and that you have your reliever inhaler with you all the time (ASTHMA.ORG, 2015l).

Staying safe It's always important to take care of yourself. If you plan to use other recreational drugs, make sure you consider the risks and stay as safe as possible (ASTHMA.ORG, 2015l).

Remember -

- Always take your reliever inhaler with you when you go out.
- Make sure that you take your preventer inhaler every day, and as prescribed, and using the right inhaler technique to get the asthma medicines into your lungs.
- Having a written asthma action plan will help you to understand your medicines and when to take them.
- It's okay to say no to drugs.
- If you're dancing all night try to take some time to rest at regular intervals.
- Make sure you stay hydrated (drinking enough water or soft drinks).
- Don't mix alcohol and drugs (ASTHMA.ORG, 2015l).

Getting help!

- Don't keep your problems to yourself. It's good to talk.
- A confidential helpline might be a good place to start, like Frank on 0800 77 66 00.
- Many drug treatment services accept self-referrals so if you're not comfortable talking to your GP you may be able to approach your drug treatment service directly.
- Your GP can also talk about your concerns with you, assess the nature of your problems and help you choose the most appropriate treatment or refer you to a local specialist drug service (ASTHMA.ORG, 2015l).

For more information, help and advice -

Frank Helpline: 0800 77 66 00 Text: 82111 Open 24 hours a day, 365 days a year

NHS Choices

DrugsScope

ADFAM: (Information and support for the families of drug and alcohol users) (ASTHMA.ORG, 2015l).

Sex

If you've ever heard stories on chatrooms or read about sex being a trigger for asthma, it can make you feel nervous - the idea of coughing or getting short of breath when you're supposed to be having a romantic moment can feel a bit embarrassing or stressful. But if your asthma is well managed, it doesn't need to stop you from enjoying your love life - so don't let it put you off! (ASTHMA.ORG, 2015m)

Why can sex increase your risk of asthma symptoms or having an asthma attack? Sex, or any sexual activity, can sometimes trigger symptoms in people with asthma for different reasons.

- When you're sexually excited, your heart rate increases and your breathing gets quicker and changes (you might start breathing through your mouth). This can trigger asthma symptoms.
- Worrying about having symptoms during sex can increase stress levels and stress can be a trigger for some people.
- Experiencing heightened emotions can be an asthma trigger for some people, too.
- Sometimes, the Indoor environment might be a source of triggers - such as perfumed candles or House dust mites (ASTHMA.ORG, 2015m).

How can I reduce the risk of sex triggering asthma symptoms? The best way to avoid getting asthma symptoms during sex is to manage your asthma well -

- Take your medicine regularly exactly as prescribed,
- Check with your GP or asthma nurse that you're using your inhaler correctly,
- Use a written asthma action plan,
- Go for regular asthma reviews (ASTHMA.ORG, 2015m).

If you're in a new relationship, take the time to explain to your partner before you have sex that you have asthma and that you may need to use your inhaler when you're having sex. Being open in this way may feel difficult at first, but means you're likely to feel more relaxed (and less likely to have any asthma symptoms) when things get intimate (ASTHMA.ORG, 2015m).

What should I do if my asthma gets worse during sex? If sex triggers your asthma, it probably means that your asthma isn't as well managed as it could be, so see your GP or asthma nurse as soon as possible to get your treatment on track. You can also try these practical tips -

- Keep your reliever inhaler close by so that if you have asthma symptoms during sex, you can use it straight away. You can then rest for five minutes.

Once your symptoms have stopped and you feel well, if the mood is right and you both still want to carry on, there's no reason why you can't.

- If your asthma symptoms become worse during sex, your GP may suggest you take one or two puffs of your reliever inhaler (usually blue) beforehand.
- You might find it more comfortable to try positions where your chest isn't weighed down. For example, both of you lay on your sides, either facing each other or with one partner behind. If your partner prefers to go on top, it's important that he or she doesn't press down on your chest (ASTHMA.ORG, 2015m).

If you avoid having sex because you have asthma or if sex often triggers asthma symptoms, talk about it with your GP or asthma nurse. They'll be able to check your medicines and discuss solutions. You may feel embarrassed talking to a health professional about sex, but remember that it's likely they've had lots of conversations with people who are going through similar experiences (ASTHMA.ORG, 2015m).

"*GPs and asthma nurses are used to talking about things you might consider embarrassing, such as sex. For us it's not awkward at all, it's our job! But we can only help you to find answers to problems if you're honest with us,*" says Delia Balan, a specialist asthma nurse. "*Some people find it helps to write things down before coming to the appointment. You can then read out the question, or if you feel really uncomfortable, hand it over*".

You can also speak, in confidence, to one of our asthma nurse specialists on our Helpline on **0300 222 5800** (9am - 5pm, Mon- Fri) (ASTHMA.ORG, 2015m).

If you know you have a latex allergy People with asthma often have allergies as well. Most condoms contain latex, which is a common allergen and can cause redness, irritation and itching. Latex-free condoms are available from most supermarkets and pharmacies. The female condom is latex-free (ASTHMA.ORG, 2015m).

Smoking and second-hand smoke

You might have heard that smoking - and breathing in other people's smoke - makes asthma worse over the long term by causing permanent damage to the lungs. It can also trigger asthma symptoms or even an asthma attack in the short term - 82% of people with asthma tell us that tobacco smoke affects their asthma.

It's not just the smoke from cigarettes that causes a problem. The smoke from cigars, pipes, and hand-rolled cigarettes also puts dangerous pollutants into the air we breathe (ASTHMA.ORG, 2015n).

What is second-hand smoke? When someone smokes they breathe smoke into their lungs. This is known as 'mainstream' smoke. Mainstream smoke, and all the chemicals in it, gets absorbed into the blood stream and body tissue. Some of this mainstream smoke is exhaled.

'Sidestream' smoke is the smoke given out by the lit end of the cigarette. Sidestream smoke gives out more than half of all the pollution given out by a cigarette.

Second-hand smoke is a combination of the mainstream smoke breathed out by the smoker, and the sidestream smoke coming out of the lit end of their cigarette (ASTHMA.ORG, 2015n).

Who is most likely to have second-hand smoke as a trigger? Anyone with asthma or other conditions affecting the lungs is likely to find second-hand smoke can be a trigger. This is because the chemicals in tobacco smoke irritate the airways and the lungs and trigger asthma symptoms (ASTHMA.ORG, 2015n).

Parents need to be very aware that second-hand smoke can increase their child's risk of an asthma attack -

- Babies and children take more smoke into their lungs than adults. Because they're still growing and their immune system isn't fully developed yet, they're at greater risk from the toxins given out in the smoke.
- Babies and small children exposed to tobacco smoke are more likely to have respiratory infections and wheeze, and are more likely to go on to develop asthma as they get older.
- Older children diagnosed with asthma or being treated for asthma are at a high risk of smoke triggering asthma symptoms or an asthma attack (ASTHMA.ORG, 2015n).

Why is tobacco smoke a high risk trigger? Smoke contains more than 4,000 chemicals, including carbon monoxide. Carbon monoxide makes it harder for oxygen to circulate round the body, because the red blood cells in our blood (haemoglobin) have a greater affinity for carbon monoxide than for oxygen. Or in other words, the haemoglobin cannot hold the oxygen molecules because its already holding the carbon monoxide molecule.

When you smoke, or breathe in smoke, you're taking the smoke right into your lungs. The chemicals in cigarette smoke irritate and inflame the airways and lungs. If you're a smoker, or regularly exposed to tobacco smoke, you'll have more symptoms and need more medicines to keep on top of your asthma. If your asthma symptoms get worse you're at risk of an asthma attack.

Even if you're not a smoker yourself, symptoms can come on quite quickly when you come into contact with someone else smoking (ASTHMA.ORG, 2015n).

When am I most at risk? You're most at risk of second-hand smoke triggering your asthma in small enclosed spaces such as bedrooms, living rooms and cars. This is because if people are smoking in a small place there'll be a very high concentration of toxic pollutants. Even opening a window won't make a significant difference. Tobacco smoke hangs around in the environment, and can stay in the room for several hours. If you smoke another cigarette in the room it tops up the pollutants already there. Smoke can stick to clothes and soft furnishings.

Cigarette smoke in a car is in very high concentrations. Smoking in cars is of particular risk to children because its such an enclosed space. Smoke can stay in the car for up to two and a half hours.

A new law, in force in England and Wales from 1 October 2015, makes it illegal to smoke in a car, or any vehicle, with anyone under 18 present. The law is designed to protect children and young people from the known dangers of second-hand smoke, one of which is to make asthma symptoms worse, increasing the risk of an asthma attack (ASTHMA.ORG, 2015n).

What about e-cigarettes and asthma? E-cigarettes release doses of vaporised nicotine for the user to inhale.

While e-cigarettes are not risk-free, a recent review of the evidence suggests that they are significantly less harmful than cigarettes in the short term - both for those who smoke them, and those who are around them. But very little research has been done so far looking at the effects on non-smokers with asthma exposed to e-cigarette vapours.

The new ban on smoking in cars with under 18s present doesn't apply to e-cigarettes. However, e-cigarettes have been banned from indoor use in other countries in Europe.

This is an issue where more evidence is emerging all the time. In the meantime, Asthma UK advises people with asthma to avoid inhaling anything into their lungs which may be harmful, as it could make their asthma worse (ASTHMA.ORG, 2015n).

Shisha pipes Shisha should be thought of as having the same risks as tobacco smoke. Shisha is linked to the same diseases. The same amount of smoke can be inhaled during a typical hour-long session as from more than 100 tobacco cigarettes. If you're around someone else smoking shisha there's a risk it will trigger asthma symptoms (ASTHMA.ORG, 2015n).

What's the best way to cut your risk of this trigger affecting you? If you smoke, give up. Giving up smoking can be difficult, but it is one of the most important things that you can do to improve your asthma and your general health, and the health of your family. Once you are less exposed to cigarette smoke you'll really notice a difference - you'll have fewer asthma symptoms, be less breathless, and need to use fewer asthma medicines (ASTHMA.ORG, 2015n).

- If you live with a smoker, or have guests who smoke, ask them to smoke outside, well away from the door so the smoke doesn't drift into the house. Remember that even if people are smoking outside they'll be bringing particles in with them on their clothes.
- Keep your home smoke-free - for children in particular there's no safe level of exposure to second-hand smoke (ASTHMA.ORG, 2015n).

Stress and anxiety

Most of us will feel stress at some point in our lives because there are so many situations and experiences that can put extra mental or emotional pressure on us. Feeling lonely, anxious or worrying a lot can lead to stress, as can poor sleep, diet, or problems with money.

If you have asthma, and you're going through a stressful time, keep an eye on your asthma symptoms - 69% of people with asthma tell us stress is an asthma trigger for them (ASTHMA.ORG, 2015o).

Why is stress an asthma trigger? Stress causes a surge of stress hormones in our bodies. These are released to prepare us to either run away from danger or fight it (the "fight or flight" response). We react with symptoms such as a faster heart rate, tense muscles and breathing that is shallow and fast (hyperventilating). This change to our breathing pattern can put us at a higher risk of all our usual asthma symptoms, such as tight chest and coughing.

Another reason why stress can trigger someone's asthma is because of the things people do when they're stressed. You may notice that you lose your temper more easily when you're under stress, and anger is itself an emotional asthma trigger. Stress can mean we drink or smoke more, both asthma triggers in their own right. People with asthma who are stressed may also feel less able or willing to take their asthma medicines as prescribed, especially if long term stress means they're also dealing with anxiety and depression (ASTHMA.ORG, 2015o).

How do I know if stress is triggering my asthma symptoms? It's usually not that difficult to recognise the things that are making us stressed. But sometimes we don't make the connection between stressful events and our asthma symptoms.

- If you think you might be under more stress than usual, ask yourself if your asthma's feeling worse than usual.
- If you've noticed your asthma is feeling worse than usual, consider what's going on in your life at the moment. Could a stressful situation have triggered your asthma symptoms?
- Try keeping a record of stressful situations alongside a symptom diary - this might show a pattern and help you recognise stressful situations or events that trigger your asthma symptoms (ASTHMA.ORG, 2015o).

A written asthma action plan helps you keep an eye on worsening symptoms and know what to do if you notice any (ASTHMA.ORG, 2015o).

When is stress most likely to trigger asthma? Stress can affect any of us at any time, and especially around big life events such as moving house, getting married, starting a new job, illness, redundancy and bereavement.

Someone who is constantly under stress is more likely to react with "fight or flight" reactions to stressful situations, meaning they'll be at more risk of asthma symptoms.

There are also certain times in our lives when we're more likely to react to stressful situations: women might find they're more stressed at certain times in their menstrual cycle, or during menopause. Teenagers and young people are dealing with hormones as well as peer pressure, exams or problems at home which can all add to their stress levels at an age when they're less likely to manage their stress levels well.

Studies show that stressful experiences in a child's life trigger asthma attacks and this is worse if the child has a lot of background stress all of the time and is exposed to a negative life event (ASTHMA.ORG, 2015o).

How can I cut the risk of stress affecting my asthma? Stress is most likely to trigger asthma symptoms if your asthma is not well managed. So make sure you're managing your asthma as well as you can, by taking your medicines as prescribed. Speak to your GP or asthma nurse for advice. You can also talk to one of our asthma nurse specialists on the Asthma UK Helpline on **0300 222 5800**, 9am to 5pm, Monday to Friday if you're worried about your asthma.

Be prepared. We don't always have control over stressful life events or circumstances. But if you know there's something coming up that's stressful for you, or you're going through a difficult time, talk to your GP or asthma nurse about how to deal with any asthma symptoms, or how you can stop asthma symptoms developing in the first place. You may need to take more of your asthma medicines for a while until you feel less stressed (ASTHMA.ORG, 2015o).

Top stress tips We can't always avoid stress in our lives but there are things we can do to help manage it. Whatever's going on for you, being aware of how stress is affecting you and your body is the first step to managing it. There's lots of advice on stress in books and online and plenty of methods you can try that may help you feel better and help you learn coping skills (ASTHMA.ORG, 2015o).

Finding ways to reduce stress in your life is good for you and your asthma. Here are a few ideas to get you started -

1. **Recognise your stress triggers** - if you're not sure what's causing your stress, keep a diary and make a note of stressful episodes for two to four weeks. Then review it to spot the triggers.
2. **Me time** - take some time out for you and do something you like doing but don't usually get time to do. Taking a step back from things can help you to relax and to feel more in control so you're able to deal with it all better when you go back to it.
3. **Stay healthy**
    - Eat a healthy, balanced diet, with plenty of fruit and vegetables. Try not to eat sugary, processed foods because these can cause your blood sugar levels to go up and down too quickly, which makes your stress symptoms worse.
    - Do some exercise - even if it's only a walk round the park, exercise is great for stress. Try yoga, or go swimming. Try to learn some relaxation exercises too.
    - Try not to drink alcohol - you might be tempted to have a drink to calm yourself down, but alcohol actually increases stress levels.
    - Try not to smoke - if you're a smoker and you're under stress, you might be more likely to reach for the cigarettes. Smoking is high risk

for your asthma. It's not only bad for your asthma - it actually makes feeling stressed worse, not better. If you can cut down, or better still, stop altogether, you'll be helping both your stress levels and your asthma.

4. **Talk to friends or family** - don't be afraid to talk to a good friend or someone in your family about how you're feeling. Other people can often help us see things in a new way. Most people feel a bit better about things after talking them through with someone.
5. **Organise the things you have to do** - writing down everything you have to do helps clear your head and gives you back some control over what you have to do. Do the most important things first (ASTHMA.ORG, 2015o).

Weather

Have you noticed that a sudden change in weather can trigger your asthma symptoms? If so you're not the only one. In a recent survey, 75% of people said that cold air can trigger asthma symptoms. Damp weather, thunderstorms, really hot weather and a sudden change in temperature also trigger symptoms for some people (ASTHMA.ORG, 2015p).

Why can a change in weather increase your risk of asthma symptoms or an asthma attack? People with asthma have airways that are very sensitive.

Hot weather can trigger asthma symptoms in some people. It's not known why, but one theory is that breathing in hot air can cause the airways to narrow, leading to coughing and shortness of breath. Another theory is that hot weather can increase the amount of pollutants and mould in the air - both can trigger asthma symptoms. And if both pollen and air pollution levels are high, you might experience 'grey fever',

Thunderstorms can trigger serious asthma attacks in people with asthma, especially children and young adults. It's not fully understood why this happens, but it's thought that when the humidity is high, the windy conditions during a thunderstorm can cause high levels of pollen and mould spores to be swept up high into the air where the moisture breaks them into much smaller pieces. As the pollen and mould particles then settle back down, these smaller pieces of pollen and mould can be breathed into the smaller airways of the lungs where they irritate the airway and trigger asthma symptoms.

Cold or damp air can enter the airways and trigger them to go into spasm, causing asthma symptoms, such as coughing, wheezing, shortness of breath and tightness in the chest.

A **sudden change in temperature** can have the same effect - if you're in a warm house with central heating and you step outside on a cold wintery day or you walk into an air-conditioned room on a hot day in summer, for example (ASTHMA.ORG, 2015p).

What's the best way to reduce the risk of a change in weather affecting you? The best way to avoid a change in weather triggering asthma symptoms is to manage your asthma well -

- Take your medication regularly exactly as prescribed.
- Check with your GP or asthma nurse that you're using your inhaler(s) correctly.
- Use a written asthma action plan and keep it where you can see it (on the fridge, for example). You can also take a photo of it on your phone so you can refer to it whenever you need it.
- Go for regular asthma reviews.
- Keep an eye on the weather forecast here (ASTHMA.ORG, 2015p).

You can also try these practical tips -

- If the weather's cold and/or damp
  - Carry your reliever inhaler with you at all times and keep taking your regular preventer inhaler as prescribed by your GP.
  - If you need to use your inhaler more often than usual, or use more puffs, speak to your doctor about reviewing your medication.
  - Keep warm and dry - wear gloves, a scarf and a hat, and carry an umbrella.
  - Wrap a scarf loosely over your nose and mouth - this will help to warm up the air before you breathe it in.
  - Try breathing in through your nose instead of your mouth as your nose is designed to warm the air as you breathe it in (ASTHMA.ORG, 2015p).
- If it's really hot
  - Carry your blue reliever inhaler with you at all times and keep taking your regular preventer inhaler as prescribed by your GP.
  - Don't leave your inhalers in direct sunlight or anywhere they might get too hot, such as the glove compartment of your car or a conservatory. This will stop them working as well.
  - If the pollen count is high and you're allergic to pollen, make sure you're managing your hayfever well. Hayfever symptoms can make asthma symptoms worse for some people.

  - Avoid exercising outdoors during the hottest part of the day (11am - 3pm).
  - Plan any outdoor activities for earlier in the day when the air quality tends to be better.
  - Drink lots of water to prevent you getting dehydrated.
  - When you're indoors, keep the doors and windows closed (ASTHMA.ORG, 2015p).
- If a thunderstorm is forecast
  - If possible, stay indoors before, during and after the storm and keep the windows closed.
  - Change your clothes and have a shower when you've been outside to wash off any pollen.
  - Avoid any of your known asthma triggers, such as exercise, alcohol or stress.
  - Have your reliever inhaler to hand.
  - If you have hayfever, take your usual preventer medicine for the condition, such as a nasal spray and/or antihistamines. If you're not sure, speak to your pharmacist or GP about the best hayfever treatment for you.
  - Don't smoke or let other people smoke around you because it can make asthma symptoms worse.
  - Make sure you can recognise when your asthma is getting worse and that you know what to do if it is (ASTHMA.ORG, 2015p).

Occupational asthma

In some cases, asthma is associated with substances you may be exposed to at work. This is known as "occupational asthma" (NHS, 2014a).

Some of the most commonly reported causes of occupational asthma include exposure to -

- isocyanates (chemicals often found in spray paint),
- flour and grain dust,
- colophony (a substance often found in solder fumes),
- latex,
- animals,
- wood dust (NHS, 2014a).

You may be at an increased risk of developing occupational asthma if you are regularly exposed to substances such as these through your work.

Occupations that are commonly associated with the condition include paint sprayers, bakers and pastry makers, nurses, chemical workers, animal handlers, welders, food processing workers and timber workers (NHS, 2014a).

Diagnosis

If you have typical asthma symptoms, your GP will often be able to make a diagnosis.

They will want to know when the symptoms happen and how often, and if you have noticed anything that might trigger them.

Your GP may also ask whether you have any allergic (atopic) conditions such as eczema and hayfever, which often occur alongside asthma.

A number of tests can be carried out to confirm the diagnosis. These are described below (NHS, 2014a).

Spirometry

A breathing test called spirometry will often be carried out to assess how well your lungs work. This involves taking a deep breath and exhaling as fast as you can through a mouthpiece attached to a machine called a spirometer.

The spirometer takes two measurements - the volume of air you can breathe out in the first second of exhalation (the forced expiratory volume in one second, or FEV1) and the total amount of air you breathe out (the forced vital capacity or FVC).

You may be asked to breathe into the spirometer a few times to get an accurate reading.

The readings are then compared with average measurements for people your age, sex and height, which can show if your airways are obstructed.

Sometimes an initial set of measurements is taken, and you are then given a medicine to open up your airways (a reliever inhaler) to see if this improves your breathing when another reading is taken.

This is known as reversibility testing, and it can be useful in distinguishing asthma from other lung conditions, such as COPD (NHS, 2014a).

Peak expiratory flow test

A small hand-held device known as a peak flow meter can be used to measure how fast you can blow air out of your lungs in one breath. This is your peak expiratory flow (PEF) and the test is usually called a peak flow test.

This test requires a bit of practise to get it right, so your GP or nurse will show you how to do it and may suggest you take the best of two or three readings.

You may be given a peak flow meter to take home and a diary to record measurements of your peak flow over a period of weeks. This is because asthma is variable and your lung function may change throughout the day.

Your diary may also have a space to record your symptoms. This helps to diagnose asthma and, once diagnosed, will help you recognise when your asthma is getting worse and aid decisions about what action to take.

To help diagnose asthma that may be related to your work (occupational asthma), your GP may ask you to take measurements of your peak expiratory flow both at work and when you are away from work. Your GP may then refer you to a specialist to confirm the diagnosis (NHS, 2014a).

Other tests

Some people may also need a number of more specialised tests. The tests may confirm the diagnosis of asthma or help diagnose a different condition. This will help you and your GP to plan your treatment (NHS, 2014a).

Airways responsiveness This test is sometimes used to diagnose asthma when the diagnosis is not clear from the more simple tests discussed above. It measures how your airways react when they come into contact with a trigger.

You will be asked to breathe in a medication that deliberately irritates or constricts your airways slightly if you have asthma, causing a small decrease in your FEV1 measured using spirometry and possibly triggering mild asthma symptoms. If you do not have asthma, your airways will not respond to this stimulus.

The test often involves inhaling progressively increasing amounts of the medication at intervals, with spirometry measurement of FEV1 in between to see if it falls below a certain threshold. In some cases, however, exercise may be used as a trigger (NHS, 2014a).

Testing airway inflammation It may also be useful in some cases to carry out tests to check for inflammation in your airways. This can be done in two main ways -

- **a mucus sample** - the doctor may take a sample of mucus (phlegm) so it can be tested for signs of inflammation in the airways,
- **nitric oxide concentration** - as you breathe out, the level of nitric oxide in your breath is measured using a special machine; a high level of nitric oxide can be a sign of airway inflammation (NHS, 2014a).

Allergy tests Skin testing or a blood test can be used to confirm whether your asthma is associated with specific allergies, such as dust mites, pollen or foods.

Tests can also be carried out to see if you are allergic or sensitive to certain substances known to cause occupational asthma (NHS, 2014a).

Treatment

If you have asthma you should be able to lead a full and unrestricted life. For most people, the treatments are effective and they should enable you to keep the condition under control.

The various treatments for asthma are outlined below (NHS, 2014a).

Taking asthma medicines

Inhalers Asthma medicines are usually given by inhalers - devices that deliver medication directly into the lungs as you breathe in.

This is an effective way of taking an asthma medicine as most goes straight to the lungs, with very little ending up elsewhere in the body.

Each inhaler works in a slightly different way. You should have training from your GP or nurse in how to use your device or how to help your child use theirs. This should be checked at least once a year.

Some inhalers are pressurised canisters - similar to a spray deodorant or an air freshener. You press the inhaler while breathing in, so the vapour containing the medication can pass into your lungs.

Some inhalers are not pressurised canisters but contain the medication in dry powder form, usually in a capsule that is punctured when the inhaler is ”primed”.

It is not possible to use a spacer with these inhalers and, unlike pressurised canisters, the powder must be inhaled quickly and forcefully if the medication is to reach the lungs (NHS, 2014a).

Spacers Pressurised canister inhalers can work better if given through a spacer - a hollow plastic or metal container with a mouthpiece at one end and a hole for the inhaler at the other.

When using a spacer, the vapour from the inhaler is released into the container, where it is held while you breathe in slowly and progressively until your lungs are full. You should then hold in your breath before relaxing so the vapour has time to settle in your lungs.

This can make the medication more effective because much more of it reaches your lungs and much less stays in your mouth or is swallowed, where it has no effect on your lungs but is more likely to cause possible unwanted effects.

Spacers are also good for reducing the risk of thrush in the mouth or throat, which can be a side effect of some inhaled asthma preventer medicines.

Spacers can also be very helpful for people who find using inhalers difficult, such as young children. As spacers also improve the distribution of medication into the lungs, their regular use is preferred in many cases - particularly for preventer medications - even in people who use inhalers well (NHS, 2014a).

Reliever inhalers Reliever inhalers - usually blue - are taken to relieve asthma symptoms quickly.

The inhaler usually contains a medicine called a short-acting beta2-agonist, which works by relaxing the muscles surrounding the narrowed airways. This allows the airways to open wider, making it easier to breathe again.

Reliever inhalers do not reduce the inflammation in the airways, so they do not make asthma better in the long term - they are intended only for the relief of symptoms.

Examples of reliever medicines include salbutamol and terbutaline. They are generally safe medicines with few side-effects, unless overused.

However, they should rarely, if ever, be necessary if asthma is well controlled, and anyone needing to use them three or more times a week should have their treatment reviewed.

Everyone with asthma should be given a reliever inhaler, also known simply as a ”reliever” (NHS, 2014a).

Preventer inhalers Preventer inhalers - usually brown, red or orange - work over time to reduce the amount of inflammation and sensitivity of the airways, and reduce the chances of asthma attacks occurring.

They must be used regularly (typically twice or occasionally once daily) and indefinitely to keep asthma under control.

You will need to use the preventer inhaler daily for some time before you gain the full benefit. You may still occasionally need the blue reliever inhaler to relieve your symptoms, but your treatment should be reviewed if you continue to need them often.

The preventer inhaler usually contains a medicine called an inhaled corticosteroid. Examples of preventer medicines include beclometasone, budesonide, fluticasone, ciclesonide and mometasone.

Preventer treatment should be taken regularly if you have anything more than occasional symptoms from your asthma, and certainly if you feel the need to use a reliever inhaler more than twice a week.

Some inhaled corticosteroids can occasionally cause a mild fungal infection (oral thrush) in the mouth and throat, so make sure you rinse your mouth thoroughly after inhaling a dose. The use of a spacer device also reduces this risk. For more information on side-effects, see below.

Smoking can reduce the effects of preventer inhalers (NHS, 2014a).

Other treatments and 'add-on' therapy

Long-acting reliever inhalers If your asthma does not respond to initial treatment, the dose of preventer inhaler you take may be increased in agreement with your healthcare team.

If this does not control your asthma symptoms, you may be given an inhaler containing a medicine called a long-acting reliever (long-acting bronchodilator/long-acting beta2-agonist, or LABA) to take as well.

These work in the same way as short-acting relievers. Although they take slightly longer to work, their effects can last for up to 12 hours. This means that taking them regularly twice a day provides 24-hour cover.

Regular use of long-acting relievers can also help reduce the dosage of preventer medication needed to control asthma. Examples of long-acting relievers include formoterol and salmeterol, and recently vilanterol, which may last up to 24 hours.

However, like short-acting relievers, long-acting relievers do not reduce the inflammation in the airways. If they are taken without a preventer, this may allow the condition to get worse while masking the symptoms, increasing the chance of a sudden and potentially life-threatening severe asthma attack.

You should therefore always use a long-acting reliever inhaler in combination with a preventer inhaler, and never by itself.

In view of this, most long-acting relievers are prescribed in a ”combination” inhaler, which contains both an inhaled steroid (as a preventer) and a long-acting bronchodilator in the one device.

Examples of combination inhalers include Seretide, Symbicort, Fostair, Flutiform and Relvar. These are usually (but not always) purple, red and white, or maroon (NHS, 2014a).

Other preventer medicines If regular efficient administration of treatment with a preventer and a long-acting reliever still fails to control asthma symptoms, additional medicines may be tried. Two possible alternatives include -

- leukotriene receptor antagonists - tablets that block part of the chemical reaction involved in the swelling (inflammation) of the airways,
- theophyllines - tablets that help widen the airways by relaxing the muscles around them, and are also relatively weak anti-inflammatory agents (NHS, 2014a).

Oral steroids If your asthma is still not under control, you may be prescribed regular steroid tablets. This treatment is usually monitored by a respiratory specialist (an asthma specialist) (NHS, 2014a).

Oral steroids are powerful anti-inflammatory preventers, which are generally used in two ways -

- to regain control of asthma when it is temporarily upset - for example, by a lapse in regular medication or an unexpected chest infection; in these cases, they are typically given for one or two weeks, then stopped.
- when long-term control of asthma remains a problem, despite maximal dosages of inhaled and other medications - in these cases, oral steroids may be given for prolonged periods, or even indefinitely, while maintaining maximum treatment with inhalers as this maximises the chance of being able to stop the oral steroids again in the future (NHS, 2014a).

Long-term use of oral steroids has serious possible side-effects, so they are only used once other treatment options have been tried, and after discussing the risks and benefits with your healthcare team.

See below for more information on the side- effects of steroid tablets (NHS, 2014a).

Omalizumab (Xolair) Omalizumab, also known as Xolair, is the first of a new category of medication that binds to one of the proteins involved in the immune response and reduces its level in the blood. This lowers the chance of an immune reaction happening and causing an asthma attack.

It is licensed for use in adults and children over six years of age with asthma.

The National Institute for Heath and Care Excellence (NICE) recommends that omalizumab can be used in people with allergy-related asthma who need continuous or frequent treatment with oral corticosteroids.

Omalizumab is given as an injection every two to four weeks. It should only be prescribed in a specialist centre. If omalizumab does not control asthma symptoms within 16 weeks, the treatment should be stopped (NHS, 2014a).

Bronchial thermoplasty Bronchial thermoplasty is a relatively new procedure that can be used in some cases of severe asthma. It works by destroying some of the muscles surrounding the airways in the lungs, which can reduce their ability to narrow the airways.

The procedure is carried out either with sedation or under general anaesthetic [13]. A bronchoscope (a long, flexible tube) containing a probe is inserted into the lungs through the mouth or nose so it touches the airways.

The probe then uses controlled heat to damage the muscles around the airways. Three treatment sessions are usually needed, with at least three weeks between each session.

There is some evidence to show this procedure may reduce asthma attacks and improve the quality of life of someone with severe asthma.

However, the long-term risks and benefits are not yet fully understood. There is a small risk it will trigger an asthma attack, which sometimes requires hospital admission.

You should discuss this procedure fully with your clinician if the treatment is offered (NHS, 2014a).

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[13] a state of controlled unconsciousness caused by medications sending you to sleep in a controlled way

Side-effects of treatments

Side-effects of relievers and preventers Relievers are a safe and effective medicine, and have few side-effects as long as they are not used too much. The main side-effects include a mild shaking of the hands (tremors), headaches and muscle cramps. These usually only happen with high doses of reliever inhaler and usually only last for a few minutes.

Preventers are very safe at usual doses, although they can cause a range of side-effects at high doses, especially with long-term use.

The main side-effect of preventer inhalers is a fungal infection of the mouth or throat (oral candidiasis). You may also develop a hoarse voice and sore throat.

Using a spacer can help prevent these side-effects, as can rinsing your mouth or cleaning your teeth after using your preventer inhaler.

Your doctor or nurse will discuss with you the need to balance control of your asthma with the risk of side-effects, and how to keep side-effects to a minimum (NHS, 2014a).

Side-effects of add-on therapy Long-acting relievers may cause similar side-effects to short-acting relievers. You should be monitored at the beginning of your treatment and reviewed regularly. If you find there is no benefit to using the long-acting reliever, it should be stopped.

Theophylline tablets have been known to cause side-effects in some people, including nausea, vomiting, tremors and noticeable heartbeats (palpitations).

These can usually be avoided by adjusting the dose according to periodic measurement of the theophylline concentration in the blood.

Side-effects of leukotriene receptor agonists can include tummy (abdominal) pain and headaches (NHS, 2014a).

Side-effects of steroid tablets Oral steroids carry a risk if they are taken for more than three months or if they are taken frequently (more than three or four courses of steroids a year) (NHS, 2014a).

Side-effects can include -

- osteoporosis (fragile bones),
- high blood pressure (hypertension),
- diabetes,
- increased appetite, leading to weight gain,
- cataracts and glaucoma (eye disorders),

- thinning of the skin,
- easy bruising,
- muscle weakness (NHS, 2014a).

With the exception of increased appetite, which is very commonly experienced by people taking oral steroids, most of these unwanted effects are uncommon.

However, it is a good idea to keep an eye out for them regularly, especially side-effects that are not immediately obvious, such as high blood pressure, thinning of the bones, diabetes and glaucoma.

You will need regular appointments to check for these (NHS, 2014a).

Asthma attacks

A personal asthma action plan (see below) will help you recognise the initial symptoms of an asthma attack, know how to respond, and when to seek medical attention (NHS, 2014a).

In most cases, the following actions will be recommended -

- Take one to two puffs of your reliever inhaler (usually blue) immediately,
- Sit down and try to take slow, steady breaths,
- If you do not start to feel better, take two puffs of your reliever inhaler (one puff at a time) every two minutes (you can take up to 10 puffs) - this is easier using a spacer, if you have one,
- If you do not feel better after taking your inhaler as above or if you are worried at any time, call 999,
- If an ambulance does not arrive within 10 minutes and you are still feeling unwell, repeat step three,
- If your symptoms improve and you do not need to call 999, you still need to see your GP or asthma nurse within 24 hours,
- If you are admitted to hospital, you will be given a combination of oxygen, reliever and preventer medicines to bring your asthma under control (NHS, 2014a).

Your personal asthma action plan will need to be reviewed after an asthma attack, so reasons for the attack can be identified and avoided in future (NHS, 2014a).

Personal asthma action plan

As part of your initial assessment, you should be encouraged to draw up a personal asthma action plan with your GP or asthma nurse.

If you've been admitted to hospital because of an asthma attack, you should be offered an action plan (or the opportunity to review an existing action plan) before you go home.

The action plan should include information about your asthma medicines, and will help you recognise when your symptoms are getting worse and what steps to take. You should also be given information about what to do if you have an asthma attack.

Your personal asthma action plan should be reviewed with your GP or asthma nurse at least once a year, or more frequently if your symptoms are severe.

As part of your asthma plan, you may be given a peak flow meter. This will give you another way of monitoring your asthma, rather than relying only on symptoms, so you can recognise deterioration earlier and take appropriate steps (NHS, 2014a).

What is good asthma care?

Your GP or nurse will tailor your asthma treatment to your symptoms. Sometimes you may need to be on higher levels of medication than at others (NHS, 2014a).

You should be offered -

- care at your GP surgery provided by doctors and nurses trained in asthma management,
- full information about your condition and how to control it,
- involvement in making decisions about your treatment,
- regular checks to ensure your asthma is under control and your treatment is right for you (this should be at least once a year),
- a written personal asthma action plan agreed with your GP or nurse (NHS, 2014a).

It is also important that your GP or pharmacist teaches you how to properly use your inhaler, as this is an important part of good asthma care (NHS, 2014a).

Occupational asthma

If it is possible you have asthma associated with your job (occupational asthma), you will be referred to a respiratory specialist to confirm the diagnosis.

If your employer has an occupational health service, they should also be informed, along with your health and safety officer.

Your employer has a responsibility to protect you from the causes of occupational asthma. It may sometimes be possible to substitute or remove the substance triggering your occupational asthma from your workplace, to redeploy you to another role within the company, or to wear protective breathing equipment.

However, you may need to consider changing your job or relocating away from your work environment, ideally within 12 months of your symptoms developing.

Some people with occupational asthma may be entitled to Industrial Injuries Disablement Benefit (NHS, 2014a).

Complementary therapies

A number of complementary therapies have been suggested for the treatment of asthma, including -

- breathing exercises,
- traditional Chinese herbal medicine,
- acupuncture,
- ionisers - devices that use an electric current to charge (ionise) molecules of air,
- manual therapies - such as chiropractic,
- hypnosis,
- homoeopathy,
- dietary supplements (NHS, 2014a).

However, there is little evidence that any of these treatments, other than breathing exercises, are effective.

There is some evidence that breathing exercises can improve symptoms and reduce the need for reliever medicines in some people. These include breathing exercises taught by a physiotherapist, yoga and the Buteyko method (a technique involving slowed, controlled breathing) (NHS, 2014a).

Living with asthma

Your asthma may get better or worse at different times. There may be periods when you have asthma symptoms, but in between you may be generally well, possibly for many years.

Below are some things you can do to help keep your asthma under control (NHS, 2014a).

Self care

Self care is an integral part of daily life. It involves taking responsibility for your own health and wellbeing, with support from those involved in your care.

It includes what you do every day to stay fit and maintain good physical and mental health, prevent illness or accidents, and care more effectively for minor ailments and long-term conditions.

People living with long-term conditions can benefit enormously from being supported to care for themselves. They can live longer, have a better quality of life, and be more active and independent (NHS, 2014a).

Take your medication

It's important that you take any medication as prescribed, even if you start to feel better.

Taking a preventer medication every day using the correct technique will help keep asthma under control and can help prevent asthma attacks.

If you have any questions or concerns about medication you are taking, or its side-effects, talk to your GP or asthma nurse (NHS, 2014a).

Regular reviews

As asthma is a long-term condition, you'll be in regular contact with your healthcare team. You should have checks to ensure the condition is under control and that your current treatment is still appropriate at least once a year.

A good relationship with your team means you can easily discuss your symptoms or concerns. The more the team knows, the more they can help (NHS, 2014a).

Vaccinations

If you have asthma, you may be advised to have a yearly flu jab to protect against flu, as getting flu may make your asthma more difficult to control.

You may also be advised to have a pneumococcal vaccination, a one-off injection that protects against a specific serious chest infection called pneumococcal pneumonia (NHS, 2014a).

Stop smoking

If you smoke and have asthma, you should stop smoking as this can significantly reduce the severity and frequency of your symptoms. Smoking can also reduce the effectiveness of asthma medication.

NHS Smokefree can offer advice and encouragement to help you quit smoking. You can call them on 0300 123 1044, or visit the NHS Smokefree website.

If you do not smoke and have asthma, try to avoid being exposed to tobacco smoke because this may trigger your symptoms (NHS, 2014a).

Daily life

With the right treatment and management, asthma shouldn't restrict your daily life (including your sleep) in any way. You should work with your healthcare professionals and strive to achieve this goal.

You should also be confident about how to recognise when your asthma is getting out of control, and what to do if it does (NHS, 2014a).

Sleeping Asthma symptoms are often worse at night. This means you might wake up some nights coughing or with a tight chest.

Effectively controlling asthma with the treatment your GP or nurse recommends will reduce the symptoms, so you should sleep better (NHS, 2014a).

Exercise Very occasionally, people with asthma develop symptoms only during exercise. However, usually this is a sign that your asthma could be better controlled generally.

If you have asthma symptoms during or after exercise, speak to your GP or asthma nurse. It is likely they will review your general symptoms and personal asthma plan to make sure the condition is under control (NHS, 2014a).

Your GP or asthma nurse may also advise that -

- you make sure the people you are exercising with know you have asthma,
- you increase your fitness levels gradually,
- you always have your reliever inhaler (usually blue) with you when you exercise,
- you use your reliever inhaler immediately before you warm up,
- you ensure that you always warm up and down thoroughly,

- if you have symptoms while you are exercising, stop what you're doing, take your reliever inhaler and wait until you feel better before starting again (NHS, 2014a).

Diet Most people with asthma can eat a normal, healthy diet. Occasionally, people with asthma may have food-based allergic triggers and will need to avoid foods such as cows' milk, eggs, fish, shellfish, yeast products, nuts, and some food colourings and preservatives. However, this is uncommon (NHS, 2014a).

Know your triggers

It's important to identify possible asthma triggers by making a note of any worsening symptoms or by using your peak flow meter during exposure to certain situations.

Some triggers, such as air pollution, illnesses and certain weather conditions, can be hard to avoid. However, it may be possible to avoid other triggers, such as dust mites, fungal spores, pet fur and certain medications that trigger your symptoms.

Make sure your healthcare team knows about and investigates triggers for your symptoms that you may have noticed yourself (NHS, 2014a).

Complications of asthma

Quality of life Badly controlled asthma can have an adverse effect on your quality of life. The condition can result in -

- fatigue [14],
- underperformance or absence from work,
- psychological problems - including stress, anxiety and depression,
- disruption of your work and leisure because of unexpected visits to your GP or hospital (NHS, 2014a).

Respiratory complications In rare cases, asthma can lead to a number of serious respiratory complications, including -

- pneumonia,
- the collapse of part or all of the lung,

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[14] extreme tiredness

- respiratory failure - where levels of oxygen in the blood become dangerously low, or levels of carbon dioxide become dangerously high,
- status asthmaticus (severe asthma attacks that do not respond to normal treatment) (NHS, 2014a).

All these complications are life-threatening and will need medical treatment (NHS, 2014a).

Death Although most people are able to effectively control their symptoms, asthma can be a life-threatening condition.

Often, people who die from asthma do so at home because they do not recognise when their condition is getting worse or leave it too long to take action.

Do not let this happen to you. Be confident in recognising deterioration of your asthma and what action to take. Take action promptly - never ignore severe asthma (NHS, 2014a).

Financial support

Depending on how severely asthma affects you on a daily basis, you may be entitled to some benefits, such as -

- **Employment and Support Allowance (ESA)** - a benefit paid to people who are not able to work because of ill health or disability,
- **Disability Living Allowance (DLA)** - a benefit for disabled children and adults under 65 to help with the extra costs you may have because you have a disability,
- **Attendance Allowance** - a benefit for help with the extra costs you may have if you're 65 or over and have a physical or mental disability, and need someone to help look after you (NHS, 2014a).

If you are on a low income, you may also be entitled to some help with healthcare costs (NHS, 2014a).

Occupational asthma If you develop asthma because of your work, and this is fully documented by your doctor and your employer, you can make a claim for Industrial Injuries Disablement Benefit from the Benefits Agency.

This is a weekly amount paid to people with asthma caused by exposure to a specific substance through their work and is known to be associated with asthma (a complete list is available from the Health and Safety Executive).

If you want to take legal action against your employer because of occupational asthma, your lawyer must act within three years of diagnosis (NHS, 2014a).

Get in touch with others

Many people with a long-term health condition experience feelings of stress, anxiety and depression.

You may find it helpful to talk about your experience of asthma with others in a similar position. Patient organisations have local groups where you can meet others who have been diagnosed with asthma and have undergone treatment.

If you experience feelings of depression, talk to your GP. They will be able to give advice and support. Alternatively, find depression support services in your area (NHS, 2014a).

Asthma in the cold weather

Cold weather is a major trigger for asthma symptoms. Here are five tips for keeping asthma at bay as the winter temperatures drop.

Cold weather can have a serious impact on the 5.4 million people with asthma in the UK. According to Asthma UK, three quarters of people with asthma say that cold air is a trigger for their symptoms and 90% reckon that having a cold or flu makes their asthma considerably worse.

Cher Piddock, a nurse for Asthma UK, says: ”*Hospital admissions for asthma traditionally peak during periods of particularly cold weather. This can be due to breathing cold air into the lungs, which can in turn trigger asthma, as well as picking up colds and flu.*”

”*People whose asthma is well-controlled are more likely to be able to withstand the risks of winter months. You can help keep your asthma under control by making sure you have a regular asthma review with your GP or asthma nurse and that you have a* personal asthma action plan” (NHS, 2015a).

Five tips for preventing cold weather asthma symptoms

Asthma UK has this advice on how to control your asthma symptoms during the cold weather -

- Keep taking your regular preventer medicines as prescribed by your GP.
- Keep your blue reliever inhaler with you at all times.

- If you find you are using your inhaler more often than usual, ask for a medication review.
- Wrap up well and wear a scarf over your nose and mouth - this will help to warm up the air before you breathe it in.
- Take extra care when exercising in cold weather. Warm up for 10–15 minutes and ask your GP if they suggest taking one or two puffs of your reliever inhaler before you start (NHS, 2015a).

Asthma attacks in winter

With the onset of very cold weather, it's a good idea to make sure you and your friends and family know what to do if you have an asthma attack.

The key signs are -

- coughing more than usual,
- getting short of breath,
- wheezing,
- feeling a tightness in your chest,
- having difficulty speaking in full sentences (NHS, 2015a).

If you have questions about any aspect of asthma, you can also call the Asthma UK helpline staffed by asthma nurse specialists, on 0300 222 5800. It's open from Monday to Friday 9am to 5pm (NHS, 2015a).

Bronchitis

Bronchitis is an infection of the main airways of the lungs (bronchi), causing them to become irritated and inflamed.

The main symptom is a cough, which may bring up yellow-grey mucus (phlegm). Bronchitis may also cause a sore throat and wheezing (NHS, 2014c).

Complications

Pneumonia is the most common complication of bronchitis. It happens when the infection spreads further into the lungs, causing air sacs inside the lungs to fill up with fluid. 1 in 20 cases of bronchitis leads to pneumonia (NHS, 2014c).

People at an increased risk of developing pneumonia include -

- elderly people,
- people who smoke,

- people with other health conditions, such as heart, liver or kidney disease,
- people with a weakened immune system (NHS, 2014c).

Mild pneumonia can usually be treated with antibiotics at home. More severe cases may require admission to hospital (NHS, 2014c).

Who is affected

Acute bronchitis is one of the most common types of lung infection, and is one of the top five reasons for GP visits.

Acute bronchitis can affect people of all ages, but is most common in younger children under the age of five. It is more common in winter, and often develops following a cold, sore throat or flu.

It is estimated that there are around 2 million people in the UK affected by chronic bronchitis. Most of these are adults over the age of 50 (NHS, 2014c).

Symptoms

The main symptom of bronchitis is a hacking cough. It is likely that your cough will bring up thick yellow-grey mucus (phlegm), although this does not always happen (NHS, 2014c).

Other symptoms of bronchitis are similar to those of other infections, such as the common cold or sinusitis, and may include -

- sore throat,
- headache,
- runny or blocked nose,
- aches and pains,
- tiredness (NHS, 2014c).

If you have bronchitis, your cough may last for several weeks after other symptoms have gone. You may also find that the continual coughing makes your chest and stomach muscles sore.

Some people may experience shortness of breath or wheezing, due to inflamed airways. However, this is more common with long-term (chronic) bronchitis (NHS, 2014c).

Long-term (chronic) bronchitis

Chronic bronchitis is often known as Chronic obstructive pulmonary disease (COPD).

The symptoms of COPD can include -

- wheezing,
- increasing breathlessness when exercising or moving around,
- a persistent cough that brings up mucus (phlegm),
- frequent chest infections (NHS, 2014c).

The symptoms are often worse in the winter, and it is common to have two or more flare-ups a year. A flare-up is when your symptoms are particularly bad (NHS, 2014c).

When to see your GP

See your GP as soon as possible if -

- your cough is very severe or lasts longer than three weeks,
- you have a constant fever (a temperature of 38℃ - 100.4°F - or above) for more than three days - this may be a sign of flu or a more serious condition, such as pneumonia,
- you cough up mucus streaked with blood,
- you develop rapid breathing (more than 30 breaths a minute) or chest pains,
- you become drowsy or confused,
- you have had repeated bouts of bronchitis (NHS, 2014c).

You should also contact your GP if you have an underlying heart or lung condition, such as -

- Asthma,
- heart failure - weakness in the heart that leads to fluid in your lungs,
- Emphysema - damage to the small airways in your lungs (NHS, 2014c).

If you cough most days for at least three months

Some people, particularly smokers, may cough all the time without realising that they have a long-term condition. If you cough most days, for at least three months, see your GP, because you may have chronic bronchitis (NHS, 2014c).

Causes

The bronchitis infection can be caused by either a virus or bacteria, although viral bronchitis is much more common.

In most cases, bronchitis is caused by the same viruses that cause the common cold or flu. The virus is contained in the millions of tiny droplets that come out of the nose and mouth when someone coughs or sneezes.

These droplets typically spread about 1m (3ft). They hang suspended in the air for a while, then land on surfaces where the virus can survive for up to 24 hours. Anyone who touches these surfaces can spread the virus further by touching something else.

Everyday items at home and in public places, such as door handles and keyboards, may have traces of the virus on them. People usually become infected by picking up the virus on their hands from contaminated objects, and then placing their hands near their nose or mouth. It is also possible to breathe in the virus if it is suspended in airborne droplets (NHS, 2014c).

Breathing in irritant substances

Bronchitis can also be triggered by breathing in irritant substances, such as smog, chemicals in household products or tobacco smoke.

Smoking is the main cause of long-term (chronic) bronchitis, and it can affect people who inhale second-hand smoke, as well as smokers themselves (NHS, 2014c).

Occupational exposure

You may also be at risk of bronchitis and other forms of COPD if you are often exposed to materials that can damage your lungs, such as -

- grain dust,
- textiles (fabric fibres),
- ammonia,
- strong acids,
- chlorine (NHS, 2014c).

This is sometimes referred to as ”occupational bronchitis”, and usually eases once you are no longer exposed to the irritant substance.

You can also read the Health and Safety Executive’s 2013 report on COPD in Great Britain attributed to occupational exposure (NHS, 2014c).

Treatment

Most cases of bronchitis do not require treatment from a GP, and the symptoms can be easily managed at home.

There is no cure for chronic bronchitis, but healthy living will help. In particular, you should stop smoking, if you smoke (NHS, 2014c).

Managing symptoms at home

If you have bronchitis -

- get plenty of rest,
- drink lots of fluids - this helps prevent dehydration and thins the mucus in your lungs, making it easier to cough up,
- treat headaches, fever, and aches and pains with paracetamol [15] or ibuprofen - although ibuprofen is not recommended if you have asthma (NHS, 2014c).

There is little evidence that cough medicines work. The Medicines and Healthcare Products Regulatory Agency (MHRA) has recommended that over-the-counter cough medicines should not be given to children under the age of six.

As an alternative to an over-the-counter cough medicine, try making your own mixture of honey and lemon, which can help soothe a sore throat and ease your cough (NHS, 2014c).

Stop smoking

If you smoke, you should stop immediately. Smoking aggravates bronchitis and increases your risk of developing a chronic condition.

Stopping smoking while you have bronchitis can also be the perfect opportunity to quit altogether (NHS, 2014c).

Antibiotics

Although treatment from a GP is rarely necessary, there may be times when you should see one - read more about when to see your GP.

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[15] a commonly used medicine that can help treat mild or moderate pain and reduce a high temperature

Your GP will not routinely prescribe antibiotics, as bronchitis is nearly always caused by a virus. Antibiotics have no effect on viruses, and prescribing them when they are unnecessary can, over time, make bacteria more resistant to antibiotic treatment (NHS, 2014c).

Your GP will only prescribe antibiotics if you have an increased risk of developing complications, such as pneumonia. Antibiotics may be recommended for -

- premature babies,
- elderly people over the age of 80,
- people with a history of heart, lung, kidney or liver disease,
- people with a weakened immune system, which could be the result of an underlying condition or a side-effect of a treatment such as steroid medication,
- people with cystic fibrosis (NHS, 2014c).

If you are prescribed antibiotics for bronchitis, it is likely to be a five-day course of amoxicillin, oxytetracycline or doxycycline.

Possible side-effects of these medicines include nausea, vomiting and diarrhoea, but they are uncommon (NHS, 2014c).

Chronic bronchitis

Chronic bronchitis is treated in the same way as COPD (NHS, 2014c).

For example -

- a type of medication called mucolytics can be used to make mucus easier to cough up,
- an exercise programme known as pulmonary rehabilitation can help you cope better with your symptoms (NHS, 2014c).

Stopping smoking is also very important if you have been diagnosed with chronic bronchitis or COPD (NHS, 2014c).

Cataracts

Cataracts occur when changes in the lens of the eye cause it to become less transparent (clear). This results in cloudy or misty vision.

The lens is the crystalline structure that sits just behind your pupil (the black circle in the centre of your eye).

When light enters your eye, it passes through the cornea [16] and the lens, which focuses it on the light-sensitive layer of cells at the back of your eye (the retina).

Cataracts sometimes start to develop in a person's lens as they get older, stopping some of the light from reaching the back of the eye.

Over time, cataracts become worse and start to affect vision. Eventually, surgery will be needed to remove and replace the affected lens (NHS, 2016b).

This is a gradual process that usually happens as we get older. It does not hurt. The early stages of a cataract do not necessarily affect your sight (LOOKAFTERYOUREYES, 2016).

Symptoms of cataracts

As cataracts develop over many years, problems may be unnoticeable at first. Cataracts often develop in both eyes, although each eye may be affected differently.

You'll usually have blurred, cloudy or misty vision, or you may have small spots or patches where your vision is less clear.

Cataracts may also affect your sight in the following ways -

- you may find it more difficult to see in dim or very bright light,
- the glare from bright lights may be dazzling or uncomfortable to look at,
- colours may look faded or less clear,
- everything may have a yellow or brown tinge,
- you may have double vision,
- you may see a halo (a circle of light) around bright lights, such as car headlights or street lights,
- if you wear glasses, you may find that they become less effective over time (NHS, 2016b).
- many people with a cataract notice that they need the prescription for their glasses changing. If you are long-sighted, you may even notice that you need your glasses less than you did before you had the cataract!
- you may experience difficulties moving from shade to sunlit areas,
- colours may look different too and become faded or yellowed (LOOKAFTERYOUREYES, 2016).

Cataracts aren't painful and don't irritate your eyes or make them red (NHS, 2016b).

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[16] the transparent layer of tissue at the front of the eye

When to see an optician

If you have problems with your vision, make an appointment to see your optician (also known as an optometrist). They can examine your eyes and test your sight.

The optician may look at your eyes with a slit lamp or ophthalmoscope. These instruments magnify your eye and have a bright light at one end that allows the optician to look inside and check for cataracts.

If your optician thinks you have cataracts, they may refer you to an ophthalmologist or an ophthalmic surgeon, who can confirm the diagnosis and plan your treatment. These doctors specialise in eye conditions, such as cataracts, and their treatment (NHS, 2016b).

Who's affected

Cataracts are very common and they're the main cause of impaired vision worldwide.

In the UK, most people who are aged 65 or older have some degree of visual impairment caused by cataracts. Men and women are equally affected (NHS, 2016b).

What causes age-related cataracts?

The reasons why age-related cataracts develop aren't fully understood. Like grey hair, cataracts are an inevitable part of ageing that affect different people at different ages.

Cataracts are the result of changes in the structure of the lens over time. It's thought that the cloudy areas in the lens may be caused by changes in the proteins that make up the lens. However, it's not clear how or why getting older cause these changes to occur (NHS, 2016b).

As well as your age, there are a number of other factors that may increase your risk of developing cataracts. These include -

- having a family history of cataracts,
- having diabetes,
- having other eye conditions, such as long-term uveitis,
- eye surgery or an eye injury,
- taking a high dose of corticosteroid medication, or taking corticosteroids for a prolonged period of time (NHS, 2016b).

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Other factors that may possibly be linked to the development of cataracts include -

- smoking,
- regularly drinking excessive amounts of alcohol,
- a poor diet lacking in vitamins,
- lifelong exposure to sunlight (NHS, 2016b).

As the exact cause of age-related cataracts isn't clear, there's no known way to prevent them.

Treating age-related cataracts

If your cataracts aren't too bad, stronger glasses and brighter reading lights may help. However, as cataracts get worse over time, it's likely that you'll eventually need treatment.

Surgery is the only type of treatment that's proven to be effective for cataracts. It's usually recommended if loss of vision has a significant effect on your daily activities, such as driving or reading.

Cataract surgery involves removing the cloudy lens through a small incision in your eye and replacing it with a clear, plastic one. In most cases, the procedure is carried out under local anaesthetic (where you're conscious, but the eye is numbed) and you can usually go home the same day.

Almost everyone who has cataract surgery experiences an improvement in their vision, although it can sometimes take a few days or weeks for your vision to settle. You should be able to return to most of your normal activities within about two weeks.

After the operation, your plastic lens will be set up for a certain level of vision, so you may need to wear glasses to see objects that are either far away or close by. If you wore glasses previously, your prescription will probably change. However, your optician will need to wait until your vision has settled before they can give you a new prescription (NHS, 2016b).

Driving with an eye condition

If you have cataracts, it could affect your ability to drive. It's your legal obligation to inform the Driver and Vehicle Licensing Agency (DVLA) about a medical condition that could impact your driving.

You can read more about driving with a health condition on the GOV.UK website (NHS, 2016b).

Prevention

There are various supplements on the market which claim to help slow the progression of cataracts and some eye drops have been marketed as a treatment for them. There is no scientific evidence to suggest that any of these can prevent or treat cataracts. The best advice to try to prevent cataracts, or to stop them getting worse, is to stop smoking and to wear good-quality sunglasses with UV protection. You cannot make cataracts worse by using your eyes too much (LOOKAFTERYOUREYES, 2016).

Prognosis

If you have had a cataract removed from one eye, it is likely that you will need the same treatment for the other eye at some point in the future (LOOKAFTERYOUREYES, 2016).

Cataract surgery

Cataract surgery is a procedure used to treat cataracts, where changes in the lens of the eye cause cloudy, blurry, or misty vision.

It's the most common operation performed in the UK, with more than 300,000 procedures carried out each year (NHS, 2016a).

When its offered

Cataract surgery is usually offered on the NHS if you have cataracts that are affecting your ability to carry out daily activities.

For example, surgery may be offered if problems with your vision are causing difficulties reading, driving, or looking after someone in your care.

In the past, people with cataracts were encouraged to wait until they could hardly see. However, these days surgery to remove a cataract can be carried out at any stage once your sight has been affected.

There are no national guidelines stating what your level of vision needs to be before cataract surgery is carried out, although individual NHS clinical commissioning groups (CCGs) may have their own criteria outlining when cataract surgery should be offered.

In some cases, cataract surgery may be recommended if you have another eye condition, such as diabetic retinopathy, that can't be monitored or treated properly if you have cataracts (NHS, 2016a).

Waiting to have surgery

Cataracts tend to get gradually worse over time, although it isn't possible to predict how quickly this will happen.

Most people with cataracts will need surgery eventually, but immediate treatment may not be necessary if your vision isn't significantly affected.

It doesn't become more difficult to remove a cataract if you decide to wait before having surgery (NHS, 2016a).

If immediate treatment isn't necessary or you decide to wait before having surgery, other measures may be helpful in the meantime, such as -

- new glasses,
- brighter lighting,
- anti-glare sunglasses,
- magnifying lenses (NHS, 2016a).

There are no medications, eye drops, or dietary supplements that have been proven to improve cataracts or stop them getting worse (NHS, 2016a).

How its performed

Before having cataract surgery, you'll be referred to a specialist eye doctor (an ophthalmologist or ophthalmic surgeon) for an assessment.

The specialist will assess your eyes and general health, and check for any other eye conditions that may be affecting your vision.

A member of the eye care team will take measurements of your eyes to assess the strength of the artificial lens that will replace your natural lens.

This is also a good time to discuss the procedure in detail and ask any questions you may have.

If you have cataracts that affect your vision in both eyes, you'll need two separate operations, usually carried out 6 to 12 weeks apart.

This will give the first eye that's been treated time to heal and your vision time to return. It also allows the surgeon to know your new glasses prescription in the first eye (NHS, 2016a).

The procedure

Cataract surgery is a common and relatively straightforward procedure that usually takes up to 30 to 45 minutes.

It's usually carried out as day surgery under local anaesthetic, which means you're conscious during the procedure and can go home on the same day.

The most common surgical technique used is known as phacoemulsification.

Before the operation, a nurse will put drops in your eye to widen (dilate) your pupil.

You'll also be given a local anaesthetic, which can be applied as eye drops or given as an injection into the tissue around your eye.

The surgeon will make a tiny cut in your cornea, the transparent layer of tissue at the front of your eye.

A small probe that emits ultrasound waves is inserted through your cornea into the eye to break the affected lens into pieces. The pieces are then liquified and sucked out. A second probe sucks out the remaining soft pieces of outer lens.

After the affected lens has been removed, the surgeon will insert a small plastic lens in its place.

The replacement lens is usually curled up in an injector and injected through the cut in the cornea. When it's in place, it unfolds itself and adopts the natural position of the old lens.

In a few cases, it may be necessary to make a slightly larger incision in the eye to replace the affected lens, which may need to be closed with tiny stitches that are removed a few weeks later (NHS, 2016a).

Replacement lenses

After the cloudy lens has been removed, it will be replaced with an artificial clear plastic lens. The replacement lens is called an intraocular implant, or intraocular lens (IOL) (NHS, 2016a).

There are three types of IOL available. They are -

- **fixed strength (monofocal) lenses** - which are set for one level of vision, usually distance vision; this type of lens is used in the majority of cataract operations,
- **multifocal lenses** - which can be set at two or more different strengths, such as near and distance vision,
- **accommodating lenses** - which allow the eye to focus on both near and distant objects in a similar way to a natural lens (NHS, 2016a).

Using multifocal or accommodating lenses can potentially reduce the chances of needing reading glasses after surgery, although most people will need to wear glasses in some situations after surgery regardless of the type of lenses they had fitted.

Multifocal and accommodating lenses aren't usually available on the NHS. If you would like multifocal or accommodating lenses, you may be able to have them by paying for cataract surgery privately (NHS, 2016a).

After surgery

Most people are able to go home a few hours after having cataract surgery, although you'll need to arrange for someone to collect you and take you home. You'll usually have a pad over your eye when you go home.

It's also a good idea to arrange for someone to help look after you when you get home as you may feel out of sorts for 24 hours.

If the vision in your other eye is poor, you may struggle with your vision for the first few days as it settles down.

It's likely you'll experience some discomfort in and around your eye after the procedure, but this should improve within a few days.

Complications in the days and weeks after surgery are rare, but you should contact the hospital as soon as possible if you experience increasing pain or vision loss at any point (NHS, 2016a).

Recovery

You should be able to go home on the day you have cataract surgery, but you'll need to arrange for someone to collect you and take you home.

You'll probably have a pad and plastic shield over your eye when you leave hospital, which can usually be removed the following day.

However, you may be advised to wear the shield at night for the first week or so to stop you touching or rubbing your eye while you're asleep.

Feeling should start to return to your eye within a few hours of surgery, but it may take a few days for your vision to fully return.

You may find it useful to arrange for someone to help take care of you until your vision returns, particularly if the vision in your other eye is poor.

Before you leave hospital, you'll be given some eye drops to use for four weeks to help your eye heal and prevent infection. You'll be advised further about the use of eye drops at your follow-up appointment (NHS, 2016a).

Recovering at home

Take it easy for the first two or three days after having cataract surgery. Start using the eye drops after removing the eye shield the day after your operation, and continue to use them until you're advised you can stop - they'll usually be needed for four weeks (NHS, 2016a).

After surgery, you'll probably experience -

- mild pain in and around your eye,
- an itchy or sticky eye,
- blurred vision,
- a feeling of grittiness in your eye,
- a slight headache,
- bruising of the skin around the eye,
- discomfort when looking at bright lights (NHS, 2016a).

These side-effects are completely normal and should improve within a few days.

Taking an over-the-counter painkiller, such as paracetamol or ibuprofen, will help reduce any pain. Wearing sunglasses may also help avoid any short-term discomfort caused by bright lights (NHS, 2016a).

When to seek medical advice

Upon leaving hospital, you'll be given a 24-hour phone number to call if you have any problems. Seek medical advice as soon as possible if you experience -

- a throbbing or severe pain in or around your eye,
- a severe frontal headache with or without nausea and vomiting,
- a sudden deterioration or loss of vision,

- increasing redness in your eye,
- the sudden appearance of black dots, specks or streaks in your field of vision (floaters) or flashes of light in your eye (NHS, 2016a).

These problems may be a sign of a complication of cataract surgery.

Activities

Your surgeon will advise you about any activities you need to avoid while recovering from your operation (NHS, 2016a).

In most cases, you'll be able to be up and about, bathe, shower, and wash your face and hair. However, you should -

- avoid strenuous activities, such as lifting heavy objects,
- avoid bending with your head below waist level for extended periods of time,
- avoid touching, rubbing or knocking your eye,
- keep soap and shampoo out of your eyes,
- avoid wearing eye make-up for one week,
- avoid swimming for two to four weeks,
- avoid sports and activities where there's a risk of your eye being knocked for two to four weeks (NHS, 2016a).

You can read and watch television almost immediately without doing any harm, although your vision may be blurry until your eye gets used to its new lens or you have new glasses fitted.

If you work, how soon you can return will largely depend on what your job involves. Most people can return after a few days, but you may need a few weeks off if your job involves strenuous activities or potential exposure to liquid or dust that could get into your eye (NHS, 2016a).

Driving

Up to 90% of people who have cataract surgery will eventually have a good enough level of vision to start driving again if they don't have another eye condition.

The Driver and Vehicle Licensing Agency (DVLA) states you can start driving again if you can read a number plate 20 metres (about 65.5 feet) away with both eyes open.

Many people who have cataract surgery will need glasses to be able to do this, in which case you'll need to wait until your new glasses are fitted a few weeks after surgery.

If your vision is good in the other eye, you may be able to do this sooner, but in either case you also need to be confident doing an emergency stop (NHS, 2016a).

Wearing glasses after cataract surgery

Most people will need to wear glasses for either long or short distance vision after cataract surgery, even if they didn't need to before the operation. This is because artificial lens implants can't focus on a range of different distances.

Natural lenses can do this in people under the age of 50, but this ability is gradually lost with age, so most people require reading glasses before surgery anyway.

A review of a number of studies found 95% of people with a monofocal lens and about 70% of people with a multifocal lens needed glasses after having cataract surgery.

Another type of artificial lens called an accommodating lens is designed to act in a similar way to a natural lens. This should allow for a better range of focus after cataract surgery.

However, while there's evidence these lenses improve the range of focus, the National Institute for Health and Care Excellence (NICE) says more evidence is needed to be sure they improve how the lens adapts to focus images before they're made routinely available on the NHS (NHS, 2016a).

Follow-up

When you're discharged from hospital after your cataract operation, you'll be told when to return for a follow-up appointment.

Follow-up arrangements vary, but may include a check by a nurse or optometrist after a week. You should also have another follow-up appointment four to six weeks after your operation, which may be at a high street optician.

During your appointment, an eye care professional will check your eye and tell you when you can stop using the eye drops.

If you need new glasses, you'll be told when you should visit an optometrist (optician) to have your eyes tested and glasses fitted.

It's usually necessary to wait several weeks for your vision to settle down before an optometrist can give you a new glasses prescription (NHS, 2016a).

Risks

The risk of serious complications developing as a result of cataract surgery is very low. Most common complications are treatable and don't have a long-term impact on your vision.

The risk of complications is higher in people with other eye conditions, such as uveitis, severe short-sightedness (high myopia) or diabetic retinopathy.

The risk of complications is also higher if you can't lie flat easily, have problems breathing, or are taking tablets for prostate problems.

Ask your eye surgeon (ophthalmologist) to explain the possible risks before the operation (NHS, 2016a).

Cloudy vision

The main problem that can occur after cataract surgery is a condition called posterior capsule opacification (PCO).

This is where part of the lens capsule - the ”pocket” the lens sits inside – thickens, which can cause cloudy vision. This isn't the cataract returning, but a skin or membrane growing over the back of the artificial lens.

Less than 10% of people who have cataract surgery will eventually develop PCO, usually within two years.

If you develop PCO and your vision is affected, you may need laser eye surgery to correct it. During this procedure, the cloudy part of the lens capsule will be removed, leaving enough of the capsule to hold the artificial lens in place.

Laser eye surgery for PCO is a short and relatively simple procedure that usually takes about 15 minutes.

Your vision should either be improved immediately or within a few days and, as no surgical incisions or stitches are necessary, you should be able to return to your normal activities straight away (NHS, 2016a).

Other complications

Other complications of cataract surgery are much less common, but can include those listed below (NHS, 2016a).

During the operation -

- inability to remove all of the cataract,
- tearing of the lens capsule,

- bleeding inside the eye,
- a bit of the cataract dropping into the back of the eye,
- damage to other parts of the eye, such as the transparent outer layer of the eye (cornea) (NHS, 2016a).

After the operation -

- swelling and redness (inflammation) in the eye,
- swelling of the retina (cystoid macular oedema) - where fluid builds up between layers of the retina at the back of the eye, sometimes affecting vision,
- swelling of the cornea - where fluid builds up in the cornea at the front of the eye; this usually clears itself,
- retinal detachment [17]- a rare complication where the retina (the layer of nerve cells inside the back of the eye) becomes separated from the inner wall of the eye,
- infection in the eye - such as endophthalmitis (a rare bacterial infection) (NHS, 2016a).

You should seek immediate medical advice if you experience any loss of vision or increasing pain or redness after cataract surgery.

It's usually possible to successfully treat complications that arise from cataract surgery with medication or further surgery.

Rarely, your vision may be worse than it was before surgery. There's also a very small risk - around 1 in 1,000 - of permanent damage to your eye, causing a loss of sight.

However, the majority of people have a good result from surgery and are happy with the improvement in their vision (NHS, 2016a).

Chronic obstructive pulmonary disease (COPD)

COPD is the name for a collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease.

People with COPD have difficulties breathing, primarily due to the narrowing of their airways, this is called airflow obstruction (NHS, 2015c).

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[17] Retinal detachment occurs when the thin lining at the back of your eye called the retina begins to pull away from the blood vessels that supply it with oxygen and nutrients. Without prompt treatment, it will lead to blindness in the affected eye

Who is affected?

COPD is one of the most common respiratory diseases in the UK. It usually only starts to affect people over the age of 35, although most people are not diagnosed until they are in their 50s.

It is thought there are more than 3 million people living with the disease in the UK, of which only about 900,000 have been diagnosed. This is because many people who develop symptoms of COPD do not get medical help because they often dismiss their symptoms as a 'smoker's cough'.

COPD affects more men than women, although rates in women are increasing (NHS, 2015c).

Symptoms

Symptoms of COPD usually develop over a number of years, so you may not be aware you have the condition.

COPD does not usually become noticeable until after the age of 35 and most people diagnosed with the condition are over 50 years old (NHS, 2015c).

See your GP if you have the following symptoms -

- increasing breathlessness when exercising or moving around,
- a persistent cough with phlegm that never seems to go away,
- frequent chest infections, particularly in winter,
- wheezing (NHS, 2015c).

Middle-aged smokers and ex-smokers who have a persistent chesty cough (especially in the morning), breathlessness on slight exertion or persistent coughs and colds in the winter should see their GP or practice nurse for a simple breathing test.

If you have COPD, the airways of the lungs become inflamed and narrowed. As the air sacs get permanently damaged, it will become increasingly difficult to breathe out.

While there is currently no cure for COPD, the sooner the condition is diagnosed and appropriate treatment begins, the less chance there is of severe lung damage (NHS, 2015c).

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Flare-ups

Symptoms of COPD are often worse in winter, and it is common to have two or more flare-ups a year. A flare-up (also known as an exacerbation) is when your symptoms are particularly bad. This is one of the most common reasons for people being admitted to hospital in the UK (NHS, 2015c).

Other signs of COPD

Other signs of COPD can include -

- weight loss,
- tiredness and fatigue,
- swollen ankles (NHS, 2015c).

Chest pain and coughing up blood (haemoptysis) are not common symptoms of COPD. They are usually caused by other conditions such as a chest infection or, less commonly, lung cancer (NHS, 2015c).

Causes

There are several things that may increase your risk of developing COPD, many of which can be avoided (NHS, 2015c).

Things you can change

You can reduce your risk of developing COPD by not smoking and avoiding exposure to certain substances at work (NHS, 2015c).

Smoking

Smoking is the main cause of COPD and is thought to be responsible for around 90% of cases. The lining of the airways becomes inflamed and permanently damaged by smoking and this damage cannot be reversed.

Up to 25% of smokers develop COPD (NHS, 2015c).

Passive smoking

Exposure to other people's smoke increases the risk of COPD (NHS, 2015c).

Fumes and dust

Exposure to certain types of dust and chemicals at work, including grains, isocyanates, cadmium and coal, has been linked to the development of COPD, even in people who do not smoke.

The risk of COPD is even higher if you breathe in dust or fumes in the workplace and you smoke (NHS, 2015c).

Air pollution

According to some research, air pollution may be an additional risk factor for COPD. However, at the moment it is not conclusive and research is continuing (NHS, 2015c).

Things you cannot change

There are a few factors for COPD that you cannot change (NHS, 2015c).

Having a brother or sister with severe COPD A research study has shown that smokers who have brothers and sisters with severe COPD are at greater risk of developing the condition than smokers who do not (NHS, 2015c).

Having a genetic tendency to COPD There is a rare genetic tendency to develop COPD called alpha-1-antitrypsin deficiency. This causes COPD in a small number of people (about 1%). Alpha-1-antitrypsin is a protein that protects your lungs. Without it, the lungs can be damaged by other enzymes that occur naturally in the body.

People who have an alpha-1-antitrypsin deficiency usually develop COPD at a younger age, often under 35 (NHS, 2015c).

Diagnosis

COPD is usually diagnosed after a consultation with your GP, as well as breathing tests.

If you are concerned about the health of your lungs and have symptoms that could be COPD, see your GP as soon as you can.

Being diagnosed early means you will receive appropriate treatment, advice and help to stop or slow the progression of COPD.

At a consultation, your doctor will ask about your symptoms, how long you have had them, and whether you smoke, or used to smoke. They will examine you and listen to your chest using a stethoscope. You may also be weighed and measured to calculate your BMI.

Your doctor will also check how well your lungs are working with a lung function test called spirometery (NHS, 2015c).

Spirometry

To assess how well your lungs work, a breathing test called spirometry is carried out. You will be asked to breathe into a machine called a spirometer.

The spirometer takes two measurements: the volume of air you can breathe out in one second (called the forced expiratory volume in one second or FEV1) and the total amount of air you breathe out (called the forced vital capacity or FVC).

You may be asked to breathe out a few times to get a consistent reading.

The readings are compared with normal measurements for your age, which can show if your airways are obstructed (NHS, 2015c).

Other tests

You may have other tests as well as spirometry. Often, these other tests will help the doctor rule out other conditions that cause similar symptoms (NHS, 2015c).

Chest X-ray A chest X-ray will show whether you have another lung condition which may be causing symptoms, such as a chest infection or lung cancer (NHS, 2015c).

Blood test A blood test will show whether your symptoms could be due to anaemia, as this can also cause breathlessness (NHS, 2015c).

Further tests

Some people may need more tests. The tests may confirm the diagnosis or indicate the severity of your COPD. This will help you and your doctor plan your treatment (NHS, 2015c).

Electrocardiogram (ECG) and echocardiogram An electrocardiogram (ECG) or echocardiogram may be used to check the condition of your heart.

An ECG involves attaching electrodes (sticky metal patches) to your arms, legs and chest to pick up the electrical signals from your heart.

An echocardiogram uses sound waves to build a detailed picture of your heart. This is similar to an ultrasound scan (NHS, 2015c).

Peak flow test To confirm you have COPD and not asthma, you may be asked to take regular measurements of your breathing using a peak flow meter, at different times over several days. The peak flow meter measures how fast you can breathe out (NHS, 2015c).

Blood oxygen level The level of oxygen in your blood is measured using a pulse oximeter, which looks like a peg and is attached to the finger. If you have low levels of oxygen, you may need an assessment to see whether extra oxygen would help you (NHS, 2015c).

Blood test for alpha-1-antitrypsin deficiency If the condition runs in your family or you developed the symptoms of COPD under the age of 35 and have never smoked, you will probably have a blood test to see if you are alpha-1-antitrypsin deficient (NHS, 2015c).

Computerised tomography (CT) scan Some people may need a computerised tomography (CT) scan. This provides more information than an X-ray and can be useful in diagnosing other lung diseases or assessing changes to your lungs due to COPD (NHS, 2015c).

Other breathing tests

If your symptoms seem worse than would be expected from your spirometry results, your doctor may decide you need more detailed lung function tests. You may be referred to a hospital specialist for these tests (NHS, 2015c).

Phlegm sample The doctor may take a sample of phlegm (sputum) to check whether it has been infected (NHS, 2015c).

Treatment

There is no cure for COPD, but treatment can help slow the progression of the condition and reduce the symptoms.

If you smoke, the best way to prevent COPD from getting quickly worse is to stop smoking and avoid further damage to your lungs.

There are also medicines that can help relieve the symptoms of COPD. The type of medicine you take will depend on how severe your COPD is and what symptoms you have. You may have to try different medicines to find which suits you best.

Often, people with COPD have to take a combination of medicines. In addition, many people keep different medicines available in case they have a flare-up, when symptoms are particularly bad. Your doctor will discuss the best options with you.

The National Institute for Health and Care Excellence (NICE) has produced guidance about the diagnosis and treatment of COPD. The Department of Health has been working with patients and healthcare providers to produce a strategy for COPD (NHS, 2015c).

Stop smoking

Stopping smoking is the most effective way for people with COPD to help themselves feel better and is the only proven way to reduce the rate of decline in lung function.

Stopping smoking at an early stage of the disease makes a huge difference. Any damage already done to the airways cannot be reversed, but giving up smoking can slow the rate at which the condition worsens.

If COPD is in the early stages and symptoms are mild, no other treatments may be needed. However, it is never too late to stop smoking. Even people with fairly advanced COPD are likely to benefit from quitting, which may prevent further damage to the airways.

Research has shown you are up to four times more likely to give up smoking successfully if you use NHS support along with stop-smoking medicines such as tablets, patches or gum. Ask your doctor about this or go to the NHS Smokefree website (NHS, 2015c).

Inhalers

If an inhaler is prescribed for you, your GP, practice nurse or pharmacist can explain how to use it. They will check you are using it properly.

Most people learn to use an inhaler successfully, but if you are having problems, a spacer or a different type of inhaler device may help you take your medicines correctly. A spacer is a device that increases the amount of medication that reaches the lungs (NHS, 2015c).

Short-acting bronchodilator inhalers Short-acting bronchodilator inhalers deliver a small dose of medicine directly to your lungs, causing the muscles in your airways to relax and open up (NHS, 2015c).

There are two types of short-acting bronchodilator inhaler -

- beta-2 agonist inhalers, such as salbutamol and terbutaline,
- antimuscarinic inhalers, such as ipratropium (NHS, 2015c).

The inhaler should be used when you feel breathless and this should relieve the symptoms (NHS, 2015c).

Long-acting bronchodilator inhalers If a short-acting bronchodilator inhaler does not help relieve your symptoms, your GP may recommend a long-acting bronchodilator inhaler. This works in a similar way to a short-acting bronchodilator, but each dose lasts for at least 12 hours (NHS, 2015c).

There are two types of long-acting bronchodilator inhalers -

- beta-2 agonist inhalers, such as salmeterol, formoterol and indacaterol,
- antimuscarinic inhalers, such as tiotropium, glycopyronium and aclidinium (NHS, 2015c).

Steroid inhalers Steroid inhalers, also called corticosteroid inhalers, work by reducing the inflammation in your airways.

If you are still getting breathless or having flare-ups even when taking long-acting bronchodilator inhalers, your GP may suggest including a steroid inhaler as part of your treatment. Most people with COPD will be prescribed a steroid inhaler as part of a combination inhaler (NHS, 2015c).

Medicines

Theophylline tablets If you are getting breathless or having flare-ups when using a combination of inhalers, your GP may prescribe theophylline tablets. Theophylline causes the muscles of your airways to relax and open up.

When you have been taking theophylline tablets regularly, you may need to give a blood sample to measure the amount of theophylline in your blood and help your GP prescribe the appropriate dose of tablet. This will allow you to get the correct dose of theophylline while reducing the likelihood of side effects.

Due to the risk of potential side-effects, such as increased heart rate and headaches, other medicines, such as a bronchodilator inhaler, are usually tried before theophylline (NHS, 2015c).

Mucolytic tablets or capsules Mucolytics, such as carbocisteine, make the mucus and phlegm in your throat thinner and easier to cough up. They are particularly beneficial for people with a persistent cough with lots of thick phlegm or who have frequent or bad flare-ups (NHS, 2015c).

Antibiotics and steroid tablets If you have a chest infection, your GP may prescribe a short course of antibiotics.

Steroid tablets may also be prescribed as a short course if you have a bad flare-up. They work best if they are taken as the flare-up starts, so your GP may give you a course to keep at home. Occasionally, you may have to take a longer course of steroid tablets. Your GP will give you the lowest effective dose and monitor you for side-effects. Side-effects are uncommon if steroid tablets are given for less than three weeks (NHS, 2015c).

Other types of treatment

Nebulised medication Nebulised medication can be used for severe cases of COPD if other inhaler devices have not worked effectively. A compressor is a machine that administers nebulised medicine through a mouthpiece or a face mask. The medicine is in a liquid form and is converted into a fine mist. This enables a large dose of medicine to be taken in one go.

You can usually choose whether to use nebulised medication with a mouthpiece or a facemask. Your GP will advise you on how to use the machine correctly (NHS, 2015c).

Long-term oxygen therapy If the oxygen level in your blood is low, you may be advised to have oxygen at home through nasal tubes, also called a nasal cannula, or through a mask. Oxygen is not a treatment for breathlessness, but it is helpful for some patients with persistently low oxygen levels in the blood.

You will probably be referred for more detailed assessment to see whether you might benefit from long-term oxygen therapy.

If you are prescribed long term oxygen therapy, it must be taken for at least 15 hours a day to be effective. However, the longer you use it, the more effective it is.

The tubes from the machine are long so you will be able to move around your home while you are connected. Portable oxygen tanks are available if you need to use oxygen away from home.

The aim of long-term oxygen therapy is to extend your life.

Do not smoke when you are using oxygen. The increased level of oxygen produced is highly flammable, and a lit cigarette could trigger a fire or explosion (NHS, 2015c).

Ambulatory oxygen therapy Part of the oxygen assessment is likely to consider if you may benefit from ambulatory oxygen - oxygen used when you walk or are active in other ways.

If your oxygen levels are normal while you are resting, but fall when you exercise, you may not need long-term oxygen therapy alongside ambulatory oxygen therapy (NHS, 2015c).

Non-invasive ventilation (NIV) non-invasive ventilation (NIV) helps a person breathe using a portable machine connected to a mask covering the nose or face. You may receive it if you are taken to hospital because of a flare-up. You may be referred to a specialist centre to see if home NIV could help you. NIV is used to improve the functioning of your lungs (NHS, 2015c).

*Pulmonary rehabilitation programmes

Pulmonary rehabilitation is a programme of exercise and education designed to help people with chronic lung problems. It can increase your exercise capacity, mobility and self-confidence.

Pulmonary rehabilitation is based on a programme of physical exercise training tailored to your needs. It usually involves walking or cycling, and arm and strength-building exercises. It also includes education about your disease for you and your family, dietary assessment and advice, and psychological, social and behavioural changes designed to help you cope better.

A rehabilitation programme is provided by a multidisciplinary team, which includes physiotherapists, respiratory nurse specialists and dietitians.

Pulmonary rehabilitation takes place in a group and the course usually lasts for about six weeks. During the course, you will learn more about your COPD and how to control your symptoms.

Pulmonary rehabilitation can greatly improve your quality of life (NHS, 2015c).

Living with COPD

COPD can affect many aspects of your life. However, there are some simple tips and techniques to help reduce its impact (NHS, 2015c).

Self-care

Self-care involves taking responsibility for your own health and wellbeing with support from people involved in your care.

People living with long-term conditions can benefit enormously if they receive support for self-care. They can live longer, have less pain, anxiety, depression and fatigue, a better quality of life and are more active and independent (NHS, 2015c).

Take your medication

It's important to take your medication as prescribed, even if you start to feel better. Continuous medication can help prevent flare-ups. If you have questions or concerns about the medication you're taking or side-effects, talk to your healthcare team.

It may also be useful to read the information leaflet that comes with the medication about possible interactions with other drugs or supplements. Check with your healthcare team if you plan to take any over-the-counter remedies, such as painkillers, or any nutritional supplements. This is because these can sometimes interfere with your medication (NHS, 2015c).

Regular reviews Because COPD is a long-term condition, you'll be in regular contact with your healthcare team. A good relationship with the team allows you to easily discuss your symptoms or concerns. The more the team knows, the more they can help you (NHS, 2015c).

Regular meetings with a healthcare professional may also mean that any complications of COPD are spotted early. These include -

- cor pulmonale, a condition where there is raised pressure in the arteries of the lungs (the pulmonary arteries), and the body retains fluid,
- depression (NHS, 2015c).

Keeping well Everyone with a long-term condition such as COPD is encouraged to get a yearly flu jab each autumn to protect against flu. They are also recommended to get an anti-pneumococcal vaccination, a one-off injection that protects against serious infection caused by pneumococcal bacteria (NHS, 2015c).

Check the weather Check the forecast as the weather might have an effect on COPD symptoms. Cold spells lasting at least a week and periods of hot weather and humidity can cause breathing problems (NHS, 2015c).

Watch what you breathe To reduce symptoms of COPD and chances of a flare-up, there are certain things that should be avoided if possible, including -

- dusty places,
- fumes, such as car exhausts,
- smoke,
- air freshener sprays or plug-ins,
- strong-smelling cleaning products, unless there is plenty of ventilation,
- hairspray,
- perfume (NHS, 2015c).

Healthy living

Exercise People with COPD who exercise or keep active regularly have improved breathing, less severe symptoms and a better quality of life.

For most people with COPD who are disabled by their breathlessness, a structured programme of pulmonary rehabilitation provided by experienced healthcare professionals does the most good. Getting breathless is unpleasant but it isn't harmful. Every patient should exercise as much as they can, however limited that may be, twice a day. Even chair-bound people can do some arm and upper-body movements.

Research shows that pulmonary rehabilitation improves exercise capacity, breathlessness and health-related quality of life. It results in people seeing doctors less often and spending less time in hospital (NHS, 2015c).

Maintain a healthy weight Carrying extra weight can make breathlessness worse. Therefore, it is a good idea to lose weight if you are overweight. This can be difficult because the breathlessness caused by COPD can make it hard to exercise.

However, some people with COPD find that they lose weight. Eating food high in protein and taking in enough calories is important to maintain a healthy weight.

Research has shown that people with COPD who are underweight will have fewer COPD symptoms if they increase their weight (NHS, 2015c).

Breathing techniques There are various breathing techniques that some people find helpful for breathlessness. These include breathing control, which involves breathing gently, using the least effort, with the shoulders supported. This can help when people with COPD feel short of breath (NHS, 2015c).

Breathing techniques for people who are more active include -

- relaxed, slow deep breathing,
- breathing through pursed lips, as if whistling,
- breathing out hard when doing an activity that needs a big effort,
- paced breathing, using a rhythm in time with the activity, such as climbing stairs (NHS, 2015c).

Talk to others If you have questions, your GP or nurse may be able to reassure you. You may find it helpful to talk to a trained counsellor or psychologist, or someone at a specialist helpline. Your GP surgery will have information on these.

Some people find it helpful to talk to other people who have COPD, either at a local support group or in an internet chat room (NHS, 2015c).

Relationships and sex

Relationships with friends and family Having a chronic illness such as COPD can put a strain on any relationship. Difficulty breathing and coughing can make people with COPD feel very tired and depressed. It is also inevitable that their spouse, partner or carer will feel anxious or frustrated about their breathing problems. It is important to talk about your worries together.

Being open about how you feel and what your family and friends can do to help may put them at ease. But do not feel shy about telling them that you need some time to yourself, if that is what you want (NHS, 2015c).

Your sex life As COPD progresses, the increasing breathlessness can make it difficult to take part in activities. The breathlessness may occur during sexual activity, which may mean your sex life can suffer.

Communicate with your partner and stay open-minded. Explore what you both like sexually. Simply touching, being touched and being close to someone helps a person feel loved and special.

Your doctor, nurse or physiotherapist may also be able to suggest ways to help manage breathlessness during sex (NHS, 2015c).

Flying

If you have COPD and are planning to fly, go to your GP for a fitness-to-fly assessment. This involves checking your breathing using spirometry and measuring your oxygen levels.

Before travelling, remember to pack all your medication, such as inhalers, in your hand luggage.

If you are using oxygen therapy, tell your travel operator and airline before you book your holiday, as you may need to get a medical form from your GP. If you are using long-term oxygen therapy, arrange to take an adequate oxygen supply with you abroad (NHS, 2015c).

Money and financial support

People with COPD often have to give up work because their breathlessness stops them from doing what they need to do for their job. This can cause financial pressure (NHS, 2015c).

There are several benefits for which people with COPD may be eligible -

- If you have a job but cannot work because of your illness, you are entitled to Statutory Sick Pay from your employer.
- If you do not have a job and cannot work because of your illness, you may be entitled to Employment and Support Allowance.
- If you are caring for someone with COPD, you may be entitled to Carer's Allowance.

- You may be eligible for other benefits if you have children living at home or if you have a low household income (NHS, 2015c).

End of life care

COPD is a serious condition. At least 25,000 people die each year from the end stages of COPD.

As with other conditions that cannot be reversed or cured, it is important to receive good care at the end of life. Talking about this and planning it in advance can be helpful. This is called palliative care.

It can be difficult to talk about dying with your doctor and, particularly with family and friends, but many people find that it helps. Support is also available for your family and friends.

It may be helpful to discuss which symptoms you may have as you become more seriously ill, and the treatments that are available to reduce these.

As COPD progresses, your doctor should work with you to establish a clear management plan based on your and your carer's wishes. This will include whether you would prefer to go to hospital, a hospice or be looked after at home as you become more ill.

You may want to discuss drawing up an advance decision, also called a living will, which sets out your wishes for treatment if you become too ill to be consulted. This might include whether you want to be resuscitated if you stop breathing, and whether you want artificial ventilation to be continued (NHS, 2015c).

Coronary heart disease

coronary heart disease (CHD) is the leading cause of death both in the UK and worldwide.

It's responsible for more than 73,000 deaths in the UK each year. About 1 in 6 men and 1 in 10 women die from CHD.

In the UK, there are an estimated 2.3 million people living with CHD and around 2 million people affected by angina (the most common symptom of coronary heart disease) (NHS, 2014e).

It has been the subject of extensive research so that we now know more about what causes it and what can be done to prevent and treat it (AGEUK, 2016b).

CHD generally affects more men than women, although from the age of 50 the chances of developing the condition are similar for both sexes.

CHD is sometimes called ischaemic heart disease (NHS, 2014e).

What is coronary heart disease?

Coronary heart disease develops due to a build up of fatty substances in the walls of the coronary arteries - the arteries that supply the heart with blood. Over time, this build up makes your arteries narrower and restricts the amount of oxygen-rich blood getting through to your heart.

Angina is the most common symptom of coronary heart disease.

This term describes a collection of symptoms, the most common one being chest pain, that you may experience when your heart is working harder than normal - such as when you climb stairs or exercise or are feeling stressed.

The pain usually comes on gradually and in most cases, lasts only a few minutes and improves if you rest. You may also feel pain in your back, shoulder, arm, throat or jaw. This is not a life-threatening condition but is a warning sign that you are at increased risk of a heart attack. If you experience these symptoms, you should make an immediate appointment to see your GP.

The above symptoms describe stable angina. Unstable angina is a more serious form. The pain can occur when you're sitting down or in bed and doesn't tend to follow a pattern. The pain can be more intense and last for much longer. If you experience this kind of pain, you should call 999 for advice as it may indicate you are likely to have a heart attack.

A heart attack usually occurs when a blood clot forms and blocks one of the narrowed coronary arteries. This starves your heart of oxygen and, if the blood supply to the heart is stopped for long enough causes permanent damage to the heart muscle. You don't need to have a history of angina to have a heart attack (AGEUK, 2016b).

Symptoms

The most common symptoms of CHD are chest pain (angina) and a heart attack.

You can also experience other symptoms, such as heart palpitations and unusual breathlessness. In some cases, people may not have any symptoms before they are diagnosed (NHS, 2014e).

Angina

If your coronary arteries become partially blocked, it can cause chest pain (angina).

This can be a mild, uncomfortable feeling similar to indigestion. However, a severe angina attack can cause a painful feeling of heaviness or tightness, usually in the centre of the chest, which may spread to the arms, neck, jaw, back or stomach.

Angina is often triggered by physical activity or stressful situations. Symptoms usually pass in less than 10 minutes, and can be relieved by resting or using a nitrate tablet or spray (NHS, 2014e).

Heart attacks

If your arteries become completely blocked, it can cause a heart attack (myocardial infarction).

Heart attacks can permanently damage the heart muscle and, if not treated straight away, can be fatal.

Dial 999 for immediate medical assistence if you think you're having a heart attack.

Although symptoms can vary, the discomfort or pain of a heart attack is usually similar to that of angina, but it's often more severe.

During a heart attack, you may also experience the following symptoms -

- pain in other parts of the body - it can feel as if the pain is travelling from your chest to your arms, jaw, neck, back and abdomen,
- lightheadedness,
- sweating,
- nausea,
- breathlessness (NHS, 2014e).

The symptoms of a heart attack can also be similar to indigestion. For example, they may include a feeling of heaviness in your chest, a stomach ache or heartburn.

A heart attack can occur at any time, including while you're resting. If heart pains last longer than 15 minutes, it may be the start of a heart attack.

Unlike angina, the symptoms of a heart attack aren't usually relieved using a nitrate tablet or spray.

In some cases, a heart attack can occur without any symptoms. This is known as a silent myocardial infarction and is more common in people with diabetes (NHS, 2014e).

Heart failure

Heart failure can also occur in people with CHD when the heart becomes too weak to pump blood around the body. This can cause fluid to build up in the lungs, making it increasingly difficult to breathe.

Heart failure can occur suddenly (acute heart failure) or gradually over time (chronic heart failure) (NHS, 2014e).

What to do if someone has a heart attack

When someone has a heart attack, a bystander - often a relative with no medical expertise - is usually the first on the scene.

However, less than 1% of the population have attended an emergency life support course.

Heartstart (funded by the British Heart Foundation), British Red Cross and St John Ambulance can teach you how to help someone having a heart attack (NHS, 2014e).

Causes

Coronary heart disease (CHD) is usually caused by a build-up of fatty deposits on the walls of the arteries around the heart (coronary arteries).

The fatty deposits, called atheroma, are made up of cholesterol and other waste substances (NHS, 2014e).

The build-up of atheroma on the walls of the coronary arteries makes the arteries narrower, restricting the flow of blood to the heart muscle. This process is called atherosclerosis. Your risk of developing atherosclerosis is significantly increased if you -

- smoke,
- have high blood pressure (hypertension),
- have a high blood cholesterol level,
- don’t take regular exercise,
- have diabetes (NHS, 2014e).

Other risk factors for developing atherosclerosis include being obese or overweight and having a family history of CHD (the risk is increased if you have a male relative under the age of 55, or a female relative under 65, with CHD) (NHS, 2014e).

Cholesterol

Cholesterol is a fat made by the liver from the saturated fat in your diet. Cholesterol is essential for healthy cells, but too much in the blood can lead to CHD.

Cholesterol is carried in the bloodstream by molecules called lipoproteins. There are several different types of lipoproteins, but two of the main ones are low-density lipoprotein - known as the ”bad” cholesterol (LDL) and high-density lipoprotein - known as the ”good” cholesterol (HDL).

LDL, often referred to as ”bad cholesterol”, takes cholesterol from the liver and delivers it to cells. LDL cholesterol tends to build up on the walls of the coronary arteries, increasing your risk of heart disease.

HDL, often referred to as ”good cholesterol”, carries cholesterol away from the cells and back to the liver, where it's broken down or passed from the body as a waste product (NHS, 2014e).

In the UK, the government recommends that total cholesterol levels should be -

- 5mmol/L or less for healthy adults,
- 4mmol/L or less for those at high risk (NHS, 2014e).

Levels of LDL should be -

- 3mmol/L or less for healthy adults,
- 2mmol/L or less for those at high risk (NHS, 2014e).

An ideal level of HDL is above 1mmol/L. A lower level of HDL can increase your risk of heart disease.

Your ratio of total cholesterol to HDL may also be calculated. This is your total cholesterol level divided by your HDL level. Generally, this ratio should be below four because a higher ratio increases your risk of heart disease (NHS, 2014e).

High blood pressure

High blood pressure (its medical name is 'hypertension') puts a strain on your heart and can lead to CHD.

Blood pressure is measured at two points during the blood circulation cycle. Your -

- systolic pressure - is a measure of your blood pressure as the heart contracts and pumps blood out,
- diastolic pressure - is a measure of your blood pressure when your heart is relaxed and filling up with blood (NHS, 2014e).

Blood pressure is measured in terms of millimetres of mercury (mmHg).

When you have your blood pressure measured, the systolic pressure is the first, higher number to be recorded. The diastolic pressure is the second, lower number to be recorded.

High blood pressure is defined as a systolic pressure of 140mmHg or more, or a diastolic pressure of 90mmHg or more (NHS, 2014e).

Smoking

Smoking is a major risk factor for coronary heart disease. Both nicotine and carbon monoxide (from the smoke) put a strain on the heart by making it work faster. They also increase your risk of blood clots.

Other chemicals in cigarette smoke can damage the lining of your coronary arteries, leading to furring of the arteries. If you smoke, you increase your risk of developing heart disease by 24% (NHS, 2014e).

Diabetes

A high blood sugar level doesn't directly increase your risk of developing CHD, but it may lead to diabetes, which can more than double your risk of developing CHD.

Diabetes can lead to CHD because it may cause the lining of blood vessels to become thicker, which can restrict blood flow (NHS, 2014e).

Thrombosis

A thrombosis is a blood clot in a vein or artery. If a thrombosis occurs in a coronary artery (coronary thrombosis), it will cause the artery to narrow, preventing the blood supply from reaching the heart muscle. This increases your chance of having a heart attack.

A coronary thrombosis usually happens at the same place the atherosclerosis is forming (NHS, 2014e).

Could you be at risk?

You are more likely to develop heart disease if you -

- have a family history of heart disease with a father or brother under the age of 55 or mother/sister under the age of 65 when diagnosed,
- are of South Asian origin - if you live in the UK but your family is originally from India, Bangladesh, Pakistan or Sri Lanka, you are one and a half times more likely to die from coronary heart disease before the age of 75 than the rest of the UK population,
- are a smoker or used to smoke,
- are not physically active,
- have high blood cholesterol - particularly the type of cholesterol known as LDL cholesterol,
- have high blood pressure,
- have diabetes,
- are overweight (AGEUK, 2016b).

What about gender?

You may think heart disease and heart attacks are mainly a problem for men but women are at risk too, particularly after the menopause. So men and women need to be alert to the symptoms and do the same things to reduce their risk of heart disease (AGEUK, 2016b).

Can you reduce your risk?

You should make an appointment with your GP practice if your family history or ethnicity suggests you could be at risk of heart disease.

They can check your blood pressure and cholesterol and take account of your other risk factors, before discussing the steps you could take to reduce your risk.

If you have diabetes, high blood pressure or high cholesterol, you probably know you are at increased risk of coronary heart disease and have been offered support to make the lifestyle changes described below. You may be taking prescribed medication to manage your diabetes, blood pressure or cholesterol.

Even if the above risk factors don't apply to you, eating a healthy diet and keeping physically active has benefits not just for your heart. It also helps reduce your risk of stroke and dementia - both are more likely if arteries in your brain are narrowed by the build up of fatty substances (AGEUK, 2016b).

Helping you make changes

The British Heart Foundation can help you to improve your heart health (AGEUK, 2016b).

These suggestions can help you on your way -

- **If you smoke, take steps to stop** - This is the most significant change you can make. The difficulties of giving up smoking are well known, so ask your GP or practice nurse how the NHS can help you. You may have the choice of one-to-one sessions or joining a local group so you can share experiences and tips with others who are trying to give up. Nicotine products and other medication are available on prescription. You may prefer to look on the NHS Smokefree website for more information or call their helpline for advice.
- **Check out your diet** - it should be one that has plenty of fruit and vegetables, plenty of starchy foods such as bread and potatoes and is low in sugar, salt and fat, particularly saturated fat.
- **Do you drink too much?** - although some research suggests some alcohol might be good for your heart, binge drinking and drinking more than the recommended units each week is not. `Drinkline` [18] is the national alcohol helpline.
- **Do you take enough regular exercise?** - aim for activities that you enjoy, are relatively easy to build into your daily routine and that make you feel slightly breathless but do not cause pain or discomfort. Building up to 30 minutes on 5 days a week is recommended. As well as increasing your fitness, it can help control your weight, blood cholesterol and blood pressure (AGEUK, 2016b).

If you've had a heart attack, there is medication you can take and lifestyle changes you can make to reduce your risk of further heart problems (AGEUK, 2016b).

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[18] Phone 0800 917 8282

Recognising symptoms

The symptoms of angina and a heart attack can be similar - a pain, ache or tightness in the chest that can spread down your arm and to other parts of your upper body. So if you haven't been diagnosed with heart disease or angina and you experience the symptoms described below, you should call 999 immediately for advice.

If you have been diagnosed with angina but your symptoms don't disappear when you take your medication or if they feel more like the classic symptoms described below, you should call 999 for advice.

Symptoms can vary from one person to another but these are the ones to remember (AGEUK, 2016b).

Classic symptoms include -

- central chest pain that may or may not be accompanied by sweating, feeling sick or breathlessness,
- chest pain that spreads to your arm, neck or jaw (AGEUK, 2016b).

Less common symptoms include -

- dull pain, ache or heaviness in your chest,
- chest pain that spreads to your back or stomach,
- rather than a pain in your chest, mild discomfort that makes you feel generally unwell,
- chest pain along with feeling light-headed or dizzy,
- chest pain that feels like a bad dose of indigestion (AGEUK, 2016b).

Women having a heart attack are more likely to experience the less common symptoms and before a heart attack they may feel tired, have problems sleeping, experience shortness of breath or have indigestion.

If you experience any of the symptoms described above don't delay, you might be having a heart attack. Call 999 and explain your symptoms to the operator (AGEUK, 2016b).

Diagnosis

CHD is usually diagnosed after a risk assessment and some further tests (AGEUK, 2016b).

Risk assessment

If your doctor thinks you may be at risk of developing CHD, they may carry out a risk assessment for cardiovascular disease, heart attack or stroke. This may be carried out as part of an NHS Health Check.

Your doctor will ask about your medical and family history, check your blood pressure, and do a blood test to assess your cholesterol level.

Before having the cholesterol test, you may be asked not to eat for 12 hours so there is no food in your body that could affect the result.

Your GP or practice nurse can carry out the blood test. A sample will be taken either using a needle and a syringe or by pricking your finger.

Your GP will also ask about your lifestyle, how much exercise you do and whether you smoke. All these factors will be considered as part of the diagnosis (AGEUK, 2016b).

Further tests

To confirm a suspected diagnosis, you may be referred for more tests. A number of different tests are used to diagnose heart-related problems, including -

- electrocardiogram (ECG),
- exercise stress tests,
- X-rays,
- echocardiogram,
- blood tests,
- coronary angiography,
- radionuclide tests,
- magentic resonance imaging (MRI) scans,
- CT scans (AGEUK, 2016b).

Electrocardiogram (ECG) An ECG records the rhythm and electrical activity of your heart. A number of electrodes (small sticky patches) are put on your arms, legs and chest. The electrodes are connected to a machine that records the electrical signals of each heartbeat.

Although an ECG can detect problems with your heart rhythm, an abnormal reading does not always mean there is anything wrong. Similarly, a normal reading does not always rule out heart problems.

In some cases, you may have an exercise ECG test, or ”stress test”. This is when an ECG recording is taken while you are exercising (usually on a treadmill or exercise bike). If you experience pain while exercising, the test can help identify whether your symptoms are caused by angina, which is usually a result of CHD (NHS, 2014e).

X-rays An X-ray may be used to look at the heart, lungs and chest wall. This can help rule out any other conditions that may be causing your symptoms (NHS, 2014e).

Echocardiogram (echo) An echocardiogram is similar to the ultrasound scan used in pregnancy. It produces an image of your heart using sound waves.

The test can identify the structure and pumping function of the heart, the thickness of the heart muscle and the movement of each heart valve, and can be used to create a detailed picture of the heart.

During an echocardiogram, you will be asked to remove your top and a small handheld device called a transducer will be passed over your chest.

Lubricating gel is put on to your skin to allow the transducer to move smoothly and make sure there is continuous contact between the sensor and the skin (NHS, 2014e).

Blood tests In addition to cholesterol testing, you may need to have a number of blood tests to monitor the activity of the heart. These may include cardiac enzyme tests, which can show whether there has been recent damage to the heart muscle (NHS, 2014e).

Coronary angiography Coronary angiography, also known as a cardiac catheter test, can identify whether the coronary arteries are narrowed and how severe any blockages are. It also provides information about the pressure inside your heart chambers and how well your heart is functioning.

In an angiogram, a catheter (flexible tube) is passed into an artery in your groin or arm and guided into the coronary arteries using X-rays. A dye is injected into the catheter to show up the arteries supplying your heart with blood.

A number of X-ray pictures are then taken, which will highlight any blockages. It is usually performed under local anaesthetic.

A coronary angiogram is relatively safe and serious complications are rare. The risk of having a heart attack, stroke or dying during the procedure is estimated at about 1 or 2 in every 1,000 (NHS, 2014e). However, after having a coronary angiogram you may experience some minor side-effects, including -

- a slightly strange sensation when the dye is put down the catheter,
- a small amount of bleeding when the catheter is removed,
- a bruise in your groin or arm (NHS, 2014e).

Radionuclide tests Radionuclide tests can indicate how strongly your heart pumps and show the flow of blood to the muscular walls of your heart. They provide more detailed information than the exercise ECG test.

During a radionuclide test, a small amount of a radioactive substance called an isotope is injected into your blood (sometimes during exercise).

If you have difficulty exercising, you may be given some medication to make your heart beat faster. A camera placed close to your chest picks up the radiation transmitted by the isotope as it passes through your heart, highlighting areas where there is poor blood supply (NHS, 2014e).

Magnetic resonance imaging (MRI) An MRI scan can be used to produce detailed pictures of your heart. During an MRI scan, you lie inside a tunnel-like scanner that has a magnet around the outside. The scanner uses a magnetic field and radio waves to produce images (NHS, 2014e).

Computerised tomography (CT) scan A CT scan uses X-rays and a computer to create detailed images of the inside of your body. During a CT scan, you lie on a bed while a small tube that takes X-rays moves and rotates around your body (NHS, 2014e).

Diagnosis and treatment of angina

It isn't always easy to diagnose angina as there can be many reasons for chest pain. As well as a physical examination, you may have blood tests, an electrocardiogram (also called an ECG) to see how well your heart is working and tests to see how well you heart performs when you exercise.

The test results will indicate your best treatment options (AGEUK, 2016b).

Diagnosis and treatment of a heart attack

If you call 999 and are suspected of having a heart attack, ambulance paramedics are trained to assess your condition and if appropriate, start treatment that breaks down the clot and restores the blood supply to your heart.

Once at the hospital, you may have an angioplasty operation to open up the narrowed arteries. This operation may also be offered as part of your longer term treatment, once your condition has stabilised.

Tests that confirm whether you have had a heart attack and its effect on your heart can also indicate your future treatment options. Your doctor should explain the risks and benefits of these options, which are likely to include medication and lifestyle changes and in some cases surgery.

You can find more information about treatment that may be proposed if you have angina or have had a heart attack on the British Heart Foundation and NHS Choices websites.

You are likely to find that doctors and health professionals at the hospital and at your GP practice are keen to help you understand more about your heart condition and work in partnership with you to make decisions about your care and help you to manage it on a day-to-day basis.

There is a section on NHS Choices that explains what you can expect from the NHS to manage long term conditions such as heart disease (ageuk, 2016b).

Treatment

Although CHD cannot be cured, treatment can help manage the symptoms and reduce the risk of further problems.

CHD can be managed effectively with a combination of lifestyle changes, medicine and, in some cases, surgery. With the right treatment, the symptoms of CHD can be reduced and the functioning of the heart improved.

The various treatments for CHD are outlined below. You can also read a summary of the pros and cons of the treatments for CHD, allowing you to compare your treatment options (NHS, 2014e).

Lifestyle changes

If you have been diagnosed with CHD, you can reduce your risk of further episodes by making simple lifestyle changes.

For example, stopping smoking after a heart attack will quickly reduce your risk of having a heart attack in the future to near that of a non-smoker.

Other lifestyle changes, such as eating more healthily and doing regular exercise, will also reduce your future risk of heart disease (NHS, 2014e).

Medicines

Many different medicines are used to treat CHD. Usually they either aim to reduce blood pressure or widen your arteries.

Some heart medicines have side-effects, so it may take a while to find one that works for you. Your GP or specialist will discuss the various options with you.

Heart medicines should not be stopped suddenly without the advice of your doctor as there is a risk this may make your symptoms worse (NHS, 2014e).

Antiplatelets Antiplatelets are a type of medicine that can help reduce the risk of a heart attack by thinning your blood and preventing it clotting.

Common antiplatelet medicines include low-dose aspirin, clopidogrel, ticagrelor and prasugrel (NHS, 2014e).

Statins If you have a high cholesterol level, a cholesterol-lowering medicine called statins may be prescribed. Examples include atorvastatin, simvastatin, rosuvastatin and pravastatin.

Statins work by blocking the formation of cholesterol and increasing the number of LDL receptors in the liver, which helps remove the LDL cholesterol from your blood. This helps slow the progression of CHD, and will make having a heart attack less likely.

Not all statins are suitable for everyone, so you may need to try several different types until you find one that is suitable (NHS, 2014e).

Beta-blockers Beta-blockers - including atenolol, bisoprolol, metoprolol and nebivolol - are often used to prevent angina and treat high blood pressure.

They work by blocking the effects of a particular hormone in the body, which slows down your heartbeat and improves blood flow (NHS, 2014e).

Nitrates Nitrates are used to widen your blood vessels. Doctors sometimes refer to nitrates as vasodilators. They are available in a variety of forms, including tablets, sprays and skin patches such as glyceryl trinitrate and isosorbide mononitrate.

Nitrates work by relaxing your blood vessels, letting more blood pass through them. This lowers your blood pressure and relieves any heart pain you have.

Nitrates can have some mild side-effects, including headaches, dizziness and flushed skin (NHS, 2014e).

ACE (angiotensin-converting enzyme) inhibitors ACE inhibitors are commonly used to treat high blood pressure. Examples include ramipril and lisinopril. They block the activity of a hormone called angiotensin II, which causes the blood vessels to narrow. As well as stopping the heart working so hard, ACE inhibitors improve the flow of blood around the body.

Your blood pressure will be monitored while you are taking ACE inhibitors, and regular blood tests will be needed to check that your kidneys are working properly. Around 1 in 10 people have kidney problems as a result of taking the drug.

Side-effects of ACE inhibitors can include a dry cough and dizziness (NHS, 2014e).

Angiotensin II receptor antagonists Angiotensin II receptor antagonists work in a similar way to ACE inhibitors. They are used to lower your blood pressure by blocking angiotensin II. Mild dizziness is usually the only side-effect. They are often prescribed as an alternative to ACE inhibitors, as they do not cause a dry cough (NHS, 2014e).

Calcium channel blockers Calcium channel blockers also work to decrease blood pressure by relaxing the muscles that make up the walls of your arteries. This causes the arteries to become wider, reducing your blood pressure.

Examples include amlodipine, verapamil and diltiazem. Side effects include headaches and facial flushing, but these are mild and usually decrease over time (NHS, 2014e).

Diuretics Sometimes known as water pills, diuretics work by flushing excess water and salt from the body through urine (NHS, 2014e).

Procedures and surgery

If your blood vessels are narrow as the result of a build-up of atheroma (fatty deposits) or if your symptoms cannot be controlled using medication, interventional procedures or surgery may be needed to open up or bypass blocked arteries.

Some of the main procedures used to treat blocked arteries are outlined below (NHS, 2014e).

Coronary angioplasty Coronary angioplasty is also known as percutaneous coronary intervention (PCI), percutaneous transluminal coronary angioplasty (PTCA), or balloon angioplasty.

Angioplasty may be a planned procedure for some people with angina, or an urgent treatment if the symptoms have become unstable. Having a coronary angiogram will determine if you are suitable for treatment. Coronary angioplasty is also performed as an emergency treatment during a heart attack.

During angioplasty, a small balloon is inserted to push the fatty tissue in the narrowed artery outwards. This allows the blood to flow more easily. A metal stent (a wire mesh tube) is usually placed in the artery to hold it open. Drug-eluting stents can also be used. These release drugs to stop the artery narrowing again (NHS, 2014e).

Coronary artery bypass graft Coronary artery bypass grafting (CABG), generally known as 'cabbage', is also known as bypass surgery, heart bypass, or coronary artery bypass surgery.

It is performed in patients where the arteries become narrowed or blocked. A coronary angiogram will determine if you are suitable for treatment. Off-pump coronary artery bypass (OPCAB) is a type of coronary artery bypass surgery. It is performed while the heart continues to pump blood by itself without the need for a heart-lung machine.

A blood vessel is inserted (grafted) between the aorta (the main artery leaving the heart) and a part of the coronary artery beyond the narrowed or blocked area. Sometimes one of your own arteries that supplies blood to the chest wall is used and diverted to one of the heart arteries. This allows the blood to bypass (get around) the narrowed sections of coronary arteries (NHS, 2014e).

Heart transplant In a small number of cases, when the heart is severely damaged and medicine is not effective, or when the heart becomes unable to adequately pump blood around the body (heart failure), a heart transplant may be needed.

A heart transplant involves replacing a heart that is damaged or is not working properly with a healthy donor heart (NHS, 2014e).

Recovery

After having heart surgery or problems like a heart attack, it is possible to resume a normal life (NHS, 2014e).

Cardiac rehabilitation programme

If you have heart surgery, a member of the cardiac rehabilitation team may visit you in hospital to give you information about your condition and the procedure you are having.

This care will usually continue after you have left hospital. For the first few weeks after your surgery, a member of the cardiac rehabilitation team may visit you at home or call you to check on your progress (NHS, 2014e).

What happens in cardiac rehabilitation programmes can vary widely throughout the country, but most will cover the following basic areas -

- exercise,
- education,
- relaxation and emotional support (NHS, 2014e).

Once you have completed your rehabilitation programme, it is important you continue to take regular exercise and lead a healthy lifestyle. This will help protect your heart and reduce the risk of further heart-related problems (NHS, 2014e).

Self care

Self care is an integral part of daily life, and is all about you taking responsibility for your own health and wellbeing with the support of those involved in your care.

Self care includes actions you take for yourself every day so you stay fit and maintain good physical and mental health, and to prevent illness or accidents and care more effectively for minor ailments and long-term conditions.

People living with long-term conditions can benefit enormously from being supported so they can achieve self care. They can live longer, have less pain, anxiety, depression and fatigue, have a better quality of life, and be more active and independent (NHS, 2014e).

Support groups

If you have or have had a heart condition, or if you are caring for someone with a heart condition, you might find it useful to meet other people in your area who are in a similar situation.

There are a number of heart support groups around the UK that organise regular exercise sessions, such as walking groups, as well as other social activities. Your GP or specialist can provide you with details about your nearest group (NHS, 2014e).

Relationships and sex

Coming to terms with a long-term condition such as heart disease can put a strain on you, your family and your friends. It can be difficult to talk to people about your condition, even if they are close to you.

Be open about how you feel and let your family and friends know what they can do to help. But do not feel shy about telling them you need some time to yourself (NHS, 2014e).

Your sex life If you have CHD or you have recently had heart surgery, you may be concerned about having sex. Usually, you can resume sexual activity as soon as you feel well enough.

Communicate with your partner and stay open-minded. Explore what you both like sexually. Simply touching, being touched and being close to someone helps a person feel loved and special (NHS, 2014e).

Returning to work

After recovering from heart surgery, you should be able to return to work, but it may be necessary to change the type of work you do. For example, you may not be able to do a job that involves heavy physical exertion.

Your specialist will be able to advise you about when you can return to work and what type of activities you should avoid (NHS, 2014e).

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Financial support

If you are unable to work after having heart surgery, you may be entitled to financial support, such as -

- GOV.UK: Attendance Allowance,
- GOV.UK: Disability Living Allowance,
- GOV.UK: Statutory Sick Pay (NHS, 2014e).

If you are caring for someone who has heart disease, you may also be entitled to financial support.

To find out if you are entitled to financial support, you can contact your local Social Security department. To request a claim form, contact the Disability Benefits Centre (NHS, 2014e).

Recovery following a heart attack

Many people make a full recovery from a heart attack and are back to normal in a couple of months. Others find they are not able to do as much as before.

Many hospitals run cardiac rehabilitation programmes. These often start while you are in hospital and continue for a while once you go home. Joining one increases your chances of getting back to normal as quickly as possible.

Programmes are likely to include supervised exercise sessions that take account of your heart condition, information to help you understand and manage your condition. This might include learning techniques to help you relax and looking at how you can build any necessary lifestyle changes into your everyday life (AGEUK, 2016b).

Best treatment guidance

The National Institute for health and Clinical Excellence (NICE) has issued a guideline for preventing another heart attack. It covers the treatment, advice and support that people who have had a heart attack should be offered by their general practice and local hospital, to help them avoid a further heart attack (AGEUK, 2016b).

A patient version of this guideline is available on request or can be downloaded from their website (AGEUK, 2016b).

Help and support

How you are affected by angina or after a heart attack can vary from person to person. You may find it frustrating if it's more difficult to do things that you took for granted before or may feel nervous about doing more energetic things.

The British Heart Foundation is a registered UK charity that provides advice and support to people with heart conditions, including people who've had a heart attack. It has a comprehensive website and range of publications that cover many heart conditions, healthy lifestyle information and questions commonly asked when people are diagnosed with heart disease such as can I still drive or will having a heart attack affect my travel insurance next time I go on holiday?

Their `helpline` [19] is staffed by nurses and they have over 300 heart support groups that give people who have a heart condition and their families an opportunity to meet others who have similar experiences (AGEUK, 2016b).

Financial support

If you are of working age and angina affects your ability to work or you are unable to return to work immediately after a heart attack it can have an impact on your finances. Discuss your work prospects with your GP and before financial issues become a problem, contact your employer or JobCentre Plus office for information about your entitlements.

If you have difficulty managing personal care or day-to-day tasks due to your heart condition or need watching over to make sure you are all right, you may be eligible to claim a non means-tested benefit - Disability Living Allowance if you are under 65 years old and Attendance Allowance if you are 65 and older. You can find out more about these and other benefits you may be entitled to claim by calling Age UK (AGEUK, 2016b).

Social care support

If you find walking or getting washed and dressed very tiring, contact your local social services department and explain the difficulties you are having. They can arrange to assess what help you are eligible to receive and recommend equipment and gadgets that can make life easier. You may have to pay for any services you receive (AGEUK, 2016b).

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[19] Phone 0300 330 3311

Preventing heart disease

There are several ways you can help reduce your risk of developing CHD, such as lowering your blood pressure and cholesterol levels.

There are a number of ways you can do this, which are discussed below (NHS, 2014e).

Eat a healthy, balanced diet

A low-fat, high-fibre diet is recommended, which should include plenty of fresh fruit and vegetables (five portions a day) and whole grains.

You should limit the amount of salt you eat to no more than 6g (0.2oz) a day, as too much salt will increase your blood pressure. 6g of salt is about one teaspoonful.

There are two types of fat: saturated and unsaturated. You should avoid food containing saturated fats, because these will increase the levels of bad cholesterol in your blood (NHS, 2014e).

Foods high in saturated fat include -

- meat pies,
- sausages and fatty cuts of meat,
- butter,
- ghee - a type of butter often used in Indian cooking,
- lard,
- cream,
- hard cheese,
- cakes and biscuits,
- foods that contain coconut or palm oil (NHS, 2014e).

However, a balanced diet should still include unsaturated fats, which have been shown to increase levels of good cholesterol and help reduce any blockage in your arteries (NHS, 2014e).

Foods high in unsaturated fat include -

- oily fish,
- avocados,
- nuts and seeds,
- sunflower, rapeseed, olive and vegetable oils (NHS, 2014e).

You should also try to avoid too much sugar in your diet, as this can increase your chances of developing diabetes, which is proven to dramatically increase your chances of developing CHD (NHS, 2014e).

Be more physically active

Combining a healthy diet with regular exercise is the best way of maintaining a healthy weight. Having a healthy weight reduces your chances of developing high blood pressure.

Regular exercise will make your heart and blood circulatory system more efficient, lower your cholesterol level, and also keep your blood pressure at a healthy level (NHS, 2014e).

Keep to a healthy weight

Your GP or practice nurse can tell you what your ideal weight is in relation to your height and build (NHS, 2014e).

Give up smoking

If you smoke, giving up will reduce your risk of developing CHD. Smoking is a major risk factor for developing atherosclerosis (furring of the arteries). It also causes the majority of cases of coronary thrombosis in people under the age of 50.

Research has shown you are up to four times more likely to successfully give up smoking if you use NHS support together with stop-smoking medicines, such as patches or gum. Ask your GP about this or visit NHS Smokefree (NHS, 2014e).

Reduce your alcohol consumption

If you drink, don’t exceed the maximum recommended limits.

- men and women are advised not to regularly drink more than 14 units a week,
- spread your drinking over three days or more if you drink as much as 14 units a week (NHS, 2014e).

Always avoid binge drinking, as this increases the risk of a heart attack (NHS, 2014e).

Keep your blood pressure under control

You can keep your blood pressure under control by eating a healthy diet low in saturated fat, exercising regularly and, if required, taking the appropriate medication to lower your blood pressure.

Your target blood pressure should be below 140/85mmHg. If you have high blood pressure, ask your GP to check your blood pressure regularly (NHS, 2014e).

Keep your diabetes under control

You have a greater risk of developing CHD if you are diabetic. If you have diabetes, being physically active and controlling your weight and blood pressure will help manage your blood sugar level.

If you are diabetic, your target blood pressure level should be below 130/80mmHg (NHS, 2014e).

Take any medication prescribed for you

If you have CHD, you may be prescribed medication to help relieve your symptoms and stop further problems developing.

If you do not have CHD but do have high cholesterol, high blood pressure or a history of family heart disease, your doctor may prescribe medication to prevent you developing heart-related problems.

If you are prescribed medication, it is vital you take it and follow the correct dosage. Do not stop taking your medication without consulting your doctor first, as doing so is likely to make your symptoms worse and put your health at risk (NHS, 2014e).

Depression

See its main article in Aging and Trans - Part 3 - Mental Health.

Diabetes

Diabetes is a lifelong condition that causes a person's blood sugar (glucose) level to become too high.

The hormone insulin - produced by the pancreas - is responsible for controlling the amount of glucose in the blood (NHS, 2014f).

There are two main types of diabetes -

- Type 1 diabetes - where the pancreas doesn't produce any insulin,
- Type 2 diabetes - where the pancreas doesn't produce enough insulin or the body's cells don't react to insulin (NHS, 2014f).

Type 2 diabetes

Type 2 diabetes occurs when the body doesn't produce enough insulin to function properly, or the body's cells don't react to insulin. This means that glucose stays in the blood and isn't used as fuel for energy (NHS, 2014f).

The high blood sugar level makes you -

- feel thirsty,
- pee more than usual, particularly at night,
- feel tired all the time (NHS, 2014f).

Untreated diabetes can damage your organs, so it's important that it's diagnosed as early as possible.

A growing problem

Type 2 diabetes is often associated with obesity and tends to be diagnosed in older people. It's far more common than type 1 diabetes. It's estimated that more than 1 in 16 people in the UK has diabetes (diagnosed or undiagnosed), and this figure is rising rapidly. There are currently 3.9 million people living with diabetes in the UK, with 90% of those affected having type 2 diabetes (NHS, 2014f).

The danger of type 2 diabetes

Diabetes can cause serious long-term health problems. It's the most common cause of vision loss and blindness in people of working age. Everyone with diabetes aged 12 or over should be invited to have their eyes screened once a year for diabetic retinopathy.

Diabetes is also responsible for most cases of kidney failure and lower limb amputation (other than accidents).

People with diabetes are up to five times more likely to have cardiovascular disease (such as a stroke) than those without diabetes (NHS, 2014f).

What Causes Diabetes?

Diabetes is a number of diseases that involve problems with the hormone insulin. While not everyone with type 2 diabetes is overweight, obesity and lack of physical activity are two of the most common causes of this form of diabetes.

Your pancreas makes a hormone called insulin. It's what lets your cells turn glucose from the food you eat into energy. People with type 2 diabetes make insulin, but their cells don't use it as well as they should. Doctors call this insulin resistance.

At first, the pancreas makes more insulin to try to get glucose into the cells. But eventually it can't keep up, and the sugar builds up in your blood instead (WEBMD, 2014).

In a healthy person, the pancreas (an organ behind the stomach) releases insulin to help the body store and use the sugar from the food you eat. Diabetes happens when one of the following occurs -

- when the pancreas does not produce any insulin,
- when the pancreas produces very little insulin,
- when the body does not respond appropriately to insulin, a condition called ”insulin resistance” (WEBMD, 2014).

Usually a combination of things cause type 2 diabetes, including -

- **Genes** - Scientists have found different bits of DNA that affect how your body makes insulin.
- **Extra weight** - Being overweight or obese can cause insulin resistance, especially if you carry your extra pounds around the middle. Now type 2 diabetes affects kids and teens as well as adults, mainly because of childhood obesity.
- **Metabolic syndrome** - People with insulin resistance often have a group of conditions including high blood glucose, extra fat around the waist, high blood pressure, and high cholesterol and triglycerides.
- **Too much glucose from your liver** - When your blood sugar is low, your liver makes and sends out glucose. After you eat, your blood sugar goes up, and usually the liver will slow down and store its glucose for later. But some people's livers don't. They keep cranking out sugar.
- **Bad communication between cells** - Sometimes cells send the wrong signals or don't pick up messages correctly. When these problems affect how your cells make and use insulin or glucose, a chain reaction can lead to diabetes.

- **Broken beta cells** - If the cells that make the insulin send out the wrong amount of insulin at the wrong time, your blood sugar gets thrown off. High blood glucose can damage these cells, too (WEBMD, 2014).

Unlike people with type 1 diabetes, people with type 2 diabetes produce insulin; however, the insulin their pancreas secretes is either not enough or the body is unable to recognize the insulin and use it properly (insulin resistance). When there isn't enough insulin or the insulin is not used as it should be, glucose (sugar) can't get into the body's cells and builds up in the bloodstream instead. When glucose builds up in the blood instead of going into cells, it causes damage in multiple areas of the body. Also, since cells aren't getting the glucose they need, they can't function properly (WEBMD, 2014).

The Role of Insulin in the Cause of Type 2 Diabetes

To understand why insulin is important, it helps to know more about how the body uses food for energy. Your body is made up of millions of cells. To make energy, these cells need food in a very simple form. When you eat or drink, much of the food is broken down into a simple sugar called "glucose." Then, glucose is transported through the bloodstream to these cells where it can be used to provide the energy the body needs for daily activities.

The amount of glucose in the bloodstream is tightly regulated by insulin and other hormones. Insulin is always being released in small amounts by the pancreas. When the amount of glucose in the blood rises to a certain level, the pancreas will release more insulin to push more glucose into the cells. This causes the glucose levels in the blood (blood glucose levels) to drop.

To keep blood glucose levels from getting too low (hypoglycemia or low blood sugar), the body signals you to eat and releases some glucose from the stores kept in the liver; it also signals the body to lower the amount of insulin being released.

People with diabetes either don't make insulin or their body's cells no longer are able to recognise insulin, leading to high blood sugars. By definition, diabetes is having a blood glucose level of greater than or equal to 126 milligrams per deciliter (mg/dL) after an overnight fast (not eating anything), or by having a non-fasting glucose level greater than or equal to 200 mg/dL along with symptoms of diabetes, or a glucose level of greater than or equal to 200 mg/dL on a 2-hour glucose tolerance test, or an A1C greater than or equal to 6.5%. Diabetes must be confirmed by meeting at least two of these test criteria, or by repeating one of these tests on a different day (WEBMD, 2014).

Health Risk Factors for Type 2 Diabetes

Type 2 diabetes is believed to have a strong genetic link, meaning that it tends to run in families. Several genes are being studied that may be related to the cause of type 2 diabetes. If you have any of the following type 2 diabetes risk factors, it's important to ask your doctor about a diabetes test. With a proper diabetes diet and healthy lifestyle habits, along with diabetes medication, if necessary, can manage type 2 diabetes just like you manage other areas of your life. Be sure to continue seeking the latest information on type 2 diabetes as you become your own health advocate (WEBMD, 2014).

Other type 2 diabetes risk factors include the following -

- High blood pressure,
- High blood triglyceride (fat) levels,
- Gestational diabetes or giving birth to a baby weighing more than 9 pounds,
- High-fat and carbohydrate diet,
- High alcohol intake,
- Sedentary lifestyle,
- Obesity or being overweight (WEBMD, 2014),
- Ethnicity - People of south Asian, Chinese, African-Caribbean and black African are more likely to develop type 2 diabetes (NHS, 2014f),
- Aging - Increasing age is a significant risk factor for type 2 diabetes. The risk of developing type 2 diabetes begins to rise significantly at about age 45, and rises considerably after age 65 (WEBMD, 2014).

Being overweight or obese You're more likely to develop type 2 diabetes if you're overweight or obese (with a BMI of 30 or more).

In particular, fat around your tummy (abdomen) increases your risk. This is because it releases chemicals that can upset the body's cardiovascular and metabolic systems.

This increases your risk of developing a number of serious conditions, including coronary heart disease, stroke and some types of cancer.

Measuring your waist is a quick way of assessing your diabetes risk. This is a measure of abdominal obesity, which is a particularly high-risk form of obesity.

Women have a higher risk of developing type 2 diabetes if their waist measures 80cm (31.5 inches) or more. Asian men with a waist size of 89cm (35 inches) or over have a higher risk, as do white or black men with a waist size of 94cm (37 inches) or over (NHS, 2014f).

Symptoms of Type 2 Diabetes

Type 2 diabetes can cause serious health complications. That's why it is very important to know how to spot type 2 diabetes symptoms. Even prediabetes can increase the chance of heart disease, just like type 1 or type 2 diabetes. Talk to your doctor about preventive measures you can take now to reduce the chance of developing type 2 diabetes and heart disease (WEBMD, 2014).

The symptoms of type 2 diabetes due to high blood sugar may include -

- increased thirst,
- increased hunger (especially after eating),
- dry mouth (WEBMD, 2014),
- urinating more often than usual, particularly at night,
- unexplained weight loss (even though you are eating and feel hungry) (NHS, 2014f).
- fatigue (weak, tired feeling),
- headaches,
- loss of consciousness (rare) (WEBMD, 2014).
- itching around the penis or vagina, or frequent episodes of thrush,
- cuts or wounds that heal slowly,
- blurred vision (caused by the lens of the eye becoming dry) (NHS, 2014f).
- velvety dark skin changes of the neck, armpit, and groin, called acanthosis nigricans,
- numbness and tingling of the hands and feet,
- impotency (WEBMD, 2014).

Type 2 diabetes is usually not diagnosed until health complications have occurred. Most often, there are no diabetes symptoms or a very gradual development of the above symptoms of type 2 diabetes. In fact, about one out of every four people with type 2 diabetes don't know they have it (WEBMD, 2014).

The signs and symptoms of type 2 diabetes aren't always as obvious, and it's often diagnosed during a routine check-up. This is because the symptoms are often mild and develop gradually over a number of years. This means that you may have type 2 diabetes for many years without realising it (NHS, 2014f).

Hyperglycaemia

Type 2 diabetes occurs when the pancreas (a large gland behind the stomach) can't produce enough insulin to control your blood glucose level, or when the cells in your body don't respond properly to the insulin that is produced.

Because of the lack of insulin or its inability to regulate blood glucose, your blood glucose levels may become very high. This is known as hyperglycaemia (NHS, 2014f).

Hyperglycaemia can occur for several reasons, including -

- eating too much,
- being unwell,
- ineffective - or not taking enough - diabetes medication (NHS, 2014f).

Hyperglycaemia causes the main symptoms of diabetes, which include extreme thirst and frequent urination (NHS, 2014f).

What is prediabetes

Prediabetes is a wake-up call that you're on the path to diabetes. But it's not too late to turn things around.

If you have it, your blood sugar (glucose) level is higher than it should be, but not in the diabetes range. People used to call it "borderline" diabetes.

Normally, your body makes a hormone called insulin to help control your blood sugar. When you have prediabetes, that system doesn't work as well as it should. You might not be able to make enough insulin after eating, or your body might not respond to insulin properly.

Prediabetes makes you more likely to get heart disease or have a stroke. But you can take action to lower those risks (WEBMD, 2014).

Pre-diabetes is sometimes also called impaired fasting glycaemia (IFG) or impaired glucose tolerance (IGT) (NHS, 2014f).

Diagnosis

Your doctor will give you one of three simple blood tests -

Fasting plasma glucose test - You won't eat for 8 hours before taking this blood test. The results are -

- Normal if your blood sugar is less than 100,
- Prediabetes if your blood sugar is 100–125,
- Diabetes if your blood sugar is 126 or higher (WEBMD, 2014).

Oral glucose tolerance test - First, you'll take the fasting glucose test. Then you'll drink a sugary solution. Two hours after that, you'll take another blood test. The results are -

- Normal if your blood sugar is less than 140 after the second test,
- Prediabetes if your blood sugar is 140–199 after the second test,
- Diabetes if your blood sugar is 200 or higher after the second test (WEBMD, 2014).

Haemoglobin A1C (or average blood sugar) test - This blood test shows your average blood sugar level for the past 3 to 4 months. Doctors can use it to diagnose prediabetes or diabetes or, if you already know you have diabetes, it helps show whether it's under control. The results are -

- Normal: 5.6% or less,
- Prediabetes: 5.7 to 6.4%,
- Diabetes: 6.5% or above (WEBMD, 2014).

You may need to take the test again to confirm the results (WEBMD, 2014).

Four key lifestyle changes to make now

Lifestyle changes can help many people with prediabetes delay or prevent it from becoming diabetes.

In a large research study called the Diabetes Prevention Program, these changes cut the odds of getting diabetes -

1. **Weight control** - If you're overweight, your prediabetes is more likely to turn into diabetes. Research shows that shedding just 5% to 10% of your body weight is often enough to get blood sugar levels back into the normal range and avoid diabetes or at least delay its onset. To reach your goal, limit portion sizes; cut calories; and eat fewer foods that are high in fat (especially saturated fat), sugar, and carbohydrates. You should also eat a wide variety of fruits, vegetables, lean protein, and whole grains (WEBMD, 2014).
2. **Exercise** - Leading an active life is a must. Aim for 30 minutes of aerobic activity (something that raises your heart rate, like walking, biking, or swimming) 5 days a week (150 minutes per week). Plus, do some strength-training exercise, like lifting weights or using resistance bands, at least twice a week. Strength work builds muscle, which helps lower your blood sugar level, helps your body respond better to insulin (which controls

blood sugar), and burns calories even when you're not moving (WEBMD, 2014).

3. **Nutrition** - Go for meals that mix low-fat protein, vegetables, and whole grains. Limit calories, serving sizes, sugar, and starchy carbs. Favour fibre-rich foods, which help you feel full and not eat too much (WEBMD, 2014).
4. **If You Smoke, Stop** - Smoking is strongly linked to diabetes: People who smoke are 30% to 40% more likely to develop type 2 diabetes than those who don't. And people with diabetes who continue smoking are more likely to develop complications such as heart disease and blindness. So the sooner you ditch the cigarettes, the better (WEBMD, 2014).

Diet

Increasing the amount of fibre in your diet and reducing your fat intake, particularly saturated fat, can help prevent type 2 diabetes, as well as manage the condition if you already have it. You should -

- increase your consumption of high-fibre foods, such as wholegrain bread and cereals, beans and lentils, and fruit and vegetables,
- choose foods that are low in fat - replace butter, ghee and coconut oil with low-fat spreads and vegetable oil,
- choose skimmed and semi-skimmed milk, and low-fat yoghurts,
- eat fish and lean meat rather than fatty or processed meat, such as sausages and burgers,
- grill, bake, poach or steam food instead of frying or roasting it,
- avoid high-fat foods, such as mayonnaise, chips, crisps, pasties, poppadums and samosas,
- eat fruit, unsalted nuts and low-fat yoghurts as snacks instead of cakes, biscuits, bombay mix or crisps (NHS, 2014f).

Weight

If you're overweight or obese (you have a BMI of 30 or over), you should lose weight, by gradually by reducing your calorie intake and becoming more physically active (see below) (NHS, 2014f).

Losing 5–10% of your overall body weight over the course of a year is a realistic initial target. You should aim to continue to lose weight until you've achieved and maintained a BMI within the healthy range, which is -

- 18.5–24.9kg/m^2 for the general population,

- 18.5–22.9kg/m^2 for people of south Asian or Chinese origin ('south Asian' means Bangladesh, Bhutan, India, Indian-Caribbean, Maldives, Nepal, Pakistan and Sri Lanka) (NHS, 2014f).

If you have a BMI of 30kg/m^2 or more (27.5kg/m^2 or more for people of south Asian or Chinese origin), you need a structured weight loss programme, which should form part of an intensive lifestyle change programme.

To help you achieve changes in your behaviour, you may be referred to a dietitician or a similar healthcare professional for a personal assessment and tailored advice about diet and physical activity (NHS, 2014f).

Physical activity

Being physically active is very important in preventing or managing type 2 diabetes.

For adults who are 19–64 years of age, the government recommends a minimum of -

- 150 minutes (2 hours and 30 minutes) of "moderate-intensity" aerobic activity - such as cycling or fast walking - a week, which can be taken in sessions of 10 minutes or more, and
- muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, tummy (abdomen), chest, shoulders and arms) (NHS, 2014f).

An alternative recommendation is to do a minimum of -

- 75 minutes of "vigorous-intensity" aerobic activity, such as running or a game of tennis every week, and
- muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders and arms) (NHS, 2014f).

In cases where the above activity levels are unrealistic, even small increases in physical activity will be beneficial to your health and act as a basis for future improvements.

Reduce the amount of time spent watching television or sitting in front of a computer. Going for a daily walk - for example, during your lunch break - is a good way of introducing regular physical activity into your schedule.

If you're overweight or obese (see above), you may need to be more physically active to help you lose weight and maintain weight loss.

Your GP, diabetes care team or dietician can give you more information and advice about losing weight and becoming more physically active (NHS, 2014f).

Do you need medication?

If you're at high risk for the disease, your doctor may recommend taking medication to hold it off. Several studies show that various types of diabetes drugs, along with a healthy lifestyle, can cut the odds that you'll get it

One study showed that people most likely to get it could lower their odds by 31%. They took the prescription diabetes drug metformin and made lifestyle and diet changes.

That's good. But the study also showed that drastic lifestyle changes are the best way to avoid diabetes. You'll need to work with a dietitian to come up with a meal plan and talk to a trainer about how to get more exercise (WEBMD, 2014).

Type 2 diabetes usually gets worse over time. Making lifestyle changes, such as adjusting your diet and taking more exercise, may help you control your blood glucose levels at first, but they not be enough in the long term.

You may eventually need to take medication to help control your blood glucose levels. Initially, this will usually be in the form of tablets, and can sometimes be a combination of more than one type of tablet. It may also include insulin or other medication that you inject (NHS, 2014f).

Metformin Metformin is usually the first medicine that's used to treat type 2 diabetes. It works by reducing the amount of glucose that your liver releases into your bloodstream. It also makes your body's cells more responsive to insulin.

Metformin is recommended for adults with a high risk of developing type 2 diabetes, whose blood glucose is still progressing towards type 2 diabetes, despite making necessary lifestyle changes.

If you're overweight, it's also likely you'll be prescribed metformin. Unlike some other medicines used to treat type 2 diabetes, metformin shouldn't cause additional weight gain.

However, it can sometimes cause mild side-effects, such as nausea and diarrhoea, and you may not be able to take it if you have kidney damage (NHS, 2014f).

Sulphonylureas Sulphonylureas increase the amount of insulin that's produced by your pancreas. Examples of sulphonylureas include -

- glibenclamide,

- gliclazide,
- glimepiride,
- glipizide,
- gliquidone (NHS, 2014f).

You may be prescribed one of these medicines if you can't take metformin, or if you aren't overweight. Alternatively, you may be prescribed sulphonylurea and metformin if metformin doesn't control blood glucose on its own.

Sulphonylureas can increase the risk of hypoglycaemia (low blood sugar), because they increase the amount of insulin in your body. They can also sometimes cause side-effects including weight gain, nausea and diarrhoea (NHS, 2014f).

Glitazones (thiazolidinediones, TZDs) Thiazolidinedione medicines (pioglitazone) make your body's cells more sensitive to insulin so that more glucose is taken from your blood.

They're usually used in combination with metformin or sulphonylureas, or both. They may cause weight gain and ankle swelling (oedema [20]). You shouldn't take pioglitazone if you have heart failure or a high risk of bone fracture.

Another thiazolidinedione, rosiglitazone, was withdrawn from use in 2010 due to an increased risk of cardiovascular disorders, including heart attack and heart failure (NHS, 2014f).

Gliptins (DPP-4 inhibitors) Gliptins work by preventing the breakdown of a naturally occurring hormone called GLP-1. GLP-1 helps the body produce insulin in response to high blood glucose levels, but is rapidly broken down.

By preventing this breakdown, the gliptins (linagliptin, saxagliptin, sitagliptin and vildagliptin) prevent high blood glucose levels, but don't result in episodes of hypoglycaemia.

You may be prescribed a gliptin if you're unable to take sulphonylureas or glitazones, or in combination with them. They're not associated with weight gain (NHS, 2014f).

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[20] the medical term for fluid retention in the body. Oedema often causes swelling in the feet and ankles

GLP-1 agonists Exenatide is a GLP-1 agonist, an injectable treatment that acts in a similar way to the natural hormone GLP-1, also see Gliptins (DPP-4 inhibitors).

It's injected twice a day and boosts insulin production when there are high blood glucose levels, reducing blood glucose without the risk of hypoglycaemia episodes ("hypos").

It also leads to modest weight loss in many people who take it. It's mainly used in people on metformin plus sulphonylurea, who are obese. A once-weekly product has also been introduced.

Another GLP-1 agonist called liraglutide is a once-daily injection (exenatide is given twice a day). Like exenatide, liraglutide is mainly used for people on metformin plus sulphonylurea, who are obese, and in clinical trials [21] it's been shown to cause modest weight loss (NHS, 2014f).

Acarbose Acarbose helps prevent your blood glucose level from increasing too much after you eat a meal. It slows down the rate at which your digestive system breaks carbohydrates down into glucose.

Acarbose isn't often used to treat type 2 diabetes because it usually causes side effects, such as bloating and diarrhoea. However, it may be prescribed if you can't take other types of medicine for type 2 diabetes (NHS, 2014f).

Nateglinide and repaglinide Nateglinide and repaglinide stimulate the release of insulin by your pancreas. They're not commonly used, but may be an option if you have meals at irregular times. This is because their effects don't last very long, but they're effective when taken just before you eat.

Nateglinide and repaglinide can cause side effects, such as weight gain and hypoglycaemia (low blood sugar) (NHS, 2014f).

Insulin treatment

If glucose-lowering tablets aren't effective in controlling your blood glucose levels, you may need to have insulin treatment. This can be taken instead of or alongside your tablets, depending on the dose and the way that you take it.

Insulin comes in several different preparations, and each works slightly differently. For example, some last up to a whole day (long-acting), some last up to

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[21] these compare the effects - both wanted and unwanted - of two or more treatments

eight hours (short-acting) and some work quickly but don't last very long (rapid-acting).

Your treatment may include a combination of these different insulin preparations (NHS, 2014f).

Insulin injections Insulin must be injected because if it were taken as a tablet, it would be broken down in your stomach like food and unable to enter your bloodstream. If you need to inject insulin, your diabetes care team will advise you about when you need to do it. They will show you how to inject it yourself and will also give you advice about storing your insulin and disposing of your needles properly.

Insulin injections are given using either a syringe or an injection pen, which is also called an insulin pen (auto-injector). Most people need between two and four injections of insulin a day.

Your GP or diabetes nurse will also teach a relative or a close friend how to inject the insulin properly (NHS, 2014f).

Treatment for low blood sugar (hypoglycaemia)

If you have type 2 diabetes that's controlled using insulin or certain types of tablets, you may experience episodes of hypoglycaemia.

Hypoglycaemia is where your blood glucose levels become very low. Mild hypoglycaemia (a "hypo") can make you feel shaky, weak and hungry, but it can usually be controlled by eating or drinking something sugary.

If you have a hypo, you should initially have a form of carbohydrate that will act quickly, such as a sugary drink or glucose tablets. This should be followed by a longer-acting carbohydrate, such as a cereal bar, sandwich or piece of fruit. In most cases, these measures will be enough to raise your blood glucose level to normal, although it may take a few hours.

If you develop severe hypoglycaemia, you may become drowsy and confused, and you may even lose consciousness. If this occurs, you may need to have an injection of glucagon into your muscle or glucose into a vein. Glucagon is a hormone that quickly increases your blood glucose levels.

Your diabetes care team can advise you on how to avoid a hypo and what to do if you have one (NHS, 2014f).

Other treatments

If you have type 2 diabetes, your risk of developing heart disease, stroke and kidney disease is increased (NHS, 2014f).

To reduce your risk of developing other serious health conditions, you may be advised to take other medicines, including -

- anti-hypertensive medicines to control high blood pressure,
- a statin, such as simvastatin or atorvastatin, to reduce high cholesterol,
- low-dose aspirin to prevent a stroke,
- an angiotensin-converting enzyme (ACE) inhibitor, such as enalapril, lisinopril or ramipril, if you have the early signs of diabetic kidney disease (NHS, 2014f).

Diabetic kidney disease is identified by the presence of small amounts of albumin (a protein) in your urine. If treated early enough, it may be reversible (NHS, 2014f).

Monitoring blood glucose levels

If you have type 2 diabetes, your GP or diabetes care team will need to take a reading of your blood glucose level about every two to six months. This will show how stable your glucose levels have been in the recent past and how well your treatment plan is working.

The HbA1c test is used to measure blood glucose levels over the previous two to three months. HbA1c is a form of haemoglobin, the chemical that carries oxygen in red blood cells, which also has glucose attached to it.

A high HbA1c level means that your blood glucose level has been consistently high over recent weeks, and your diabetes treatment plan may need to be changed.

Your diabetes care team can help you set a target HbA1c level to aim for. This will usually be less than 59mmol/mol (7.5%). However, it can be as low as 48mmol/mol (6.5%) for some people (NHS, 2014f).

Monitoring your own blood glucose

If you have type 2 diabetes, as well as having your blood glucose level checked by a healthcare professional every two to six months, you may be advised to monitor your own blood glucose levels at home.

Even if you have a healthy diet and are taking tablets or using insulin therapy, exercise, illness and stress can affect your blood glucose levels. Other factors that may affect your blood glucose levels include drinking alcohol, taking other medicines and, for women, hormonal changes during the menstrual cycle. A blood glucose meter is a small device that measures the concentration of glucose in your blood. It can be useful in detecting high blood sugar (hyperglycaemia) or low blood sugar (hypoglycaemia).

If blood glucose monitoring is recommended, you should be trained in how to use a blood glucose meter and what you should do if the reading is too high or too low.

Blood glucose meters aren't currently available for free on the NHS but, in some cases, blood monitoring strips may be. Ask a member of your diabetes care team if you're unsure.

Regularly monitoring your blood glucose levels will ensure that your blood glucose is as normal and stable as possible. As your blood glucose level is likely to vary throughout the day, you may need to check it several times a day, depending on the treatment you're taking.

In home testing, blood glucose levels are usually measured by how many millimoles of glucose are in a litre of blood. A millimole is a measurement used to define the concentration of glucose in your blood. The measurement is expressed as millimoles per litre, or mmol/l for short.

A normal blood glucose level is 4–6 mmol/l before meals (preprandial) and less than 10 mmol/l two hours after meals (postprandial), although this can vary from person to person. Your diabetes care team can discuss your blood glucose level with you in more detail (NHS, 2014f).

Complications caused by diabetes

If diabetes isn't treated, it can lead to a number of other health problems.

High glucose levels can damage blood vessels, nerves and organs.

Even a mildly raised glucose level that doesn't cause any symptoms can have long-term damaging effects (NHS, 2014f).

Heart disease and stroke

If you have diabetes, you're up to five times more likely to develop heart disease or have a stroke.

Prolonged, poorly controlled blood glucose levels increase the likelihood of atherosclerosis (where the blood vessels become clogged up and narrowed by fatty substances).

This may result in poor blood supply to your heart, causing angina [22]. It also increases the chance that a blood vessel in your heart or brain will become blocked, leading to a heart attack or stroke (NHS, 2014f).

Nerve damage

High blood glucose levels can damage the tiny blood vessels in your nerves. This can cause a tingling or burning pain that spreads from your fingers and toes up through your limbs. It can also cause numbness, which can lead to ulceration of the feet.

Damage to the peripheral nervous system, which includes all parts of the nervous system that lie outside the central nervous system, is known as peripheral neuropathy.

If the nerves in your digestive system are affected, you may experience nausea, vomiting, diarrhoea or constipation (NHS, 2014f).

Diabetic retinopathy

Diabetic retinopathy is when the retina (the light-sensitive layer of tissue at the back of the eye) becomes damaged. Blood vessels in the retina can become blocked or leaky or can grow haphazardly. This prevents light from fully passing through to your retina. If it isn't treated, it can damage your vision.

Annual eye checks are usually organised by a regional photographic unit. If significant damage is detected, you may be referred to an ophthalmologist (a doctor who specialises in treating eye conditions).

The better you control your blood glucose levels, the lower your risk of developing serious eye problems.

Diabetic retinopathy can be managed using laser treatment if it's caught early enough. However, this will only preserve the sight you have rather than improve it (NHS, 2014f).

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[22] a dull, heavy or tight pain in the chest

Kidney disease

If the small blood vessels of your kidney become blocked and leaky, your kidneys will work less efficiently. It's usually associated with high blood pressure, and treating this is a key part of management.

In rare, severe cases, kidney disease can lead to kidney failure, and a kidney replacement treatment with dialysis [23], or sometimes kidney transplantation, will be necessary (NHS, 2014f).

Foot problems

Damage to the nerves of the foot can mean small nicks and cuts aren't noticed, and this, in combination with poor circulation, can lead to a foot ulcer. About 1 in 10 people with diabetes get a foot ulcer, which can cause a serious infection.

If you have diabetes, look out for sores and cuts that don't heal, puffiness or swelling, and skin that feels hot to the touch. You should also have your feet examined at least once a year.

If poor circulation or nerve damage is detected, check your feet every day and report any changes to your doctor, nurse or podiatrist (foot care specialist) (NHS, 2014f).

Sexual dysfunction

In men with diabetes, particularly those who smoke, nerve and blood vessel damage can lead to erection problems. This can usually be treated with medication (NHS, 2014f).

Women with diabetes may experience -

- a reduced sex drive (loss of libido),
- less pleasure from sex,
- vaginal dryness,
- less ability to orgasm,
- pain during sex (NHS, 2014f).

If you experience a lack of vaginal lubrication, or you find sex painful, you can use a vaginal lubricant or a water-based gel (NHS, 2014f).

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[23] treatment to replicate the functions of the kidneys

Looking after your eyes with diabetes

The NHS Diabetic Eye Screening Programme will arrange for you to have your eyes checked every year.

Everyone who is on a diabetes register will be given the opportunity to have a digital picture taken of the back of their eye. Speak to your GP to register (NHS, 2014f).

Looking after yourself

If you have type 2 diabetes, you'll need to look after your health very carefully.

Caring for your health will make treating your diabetes easier and minimise your risk of developing complications of diabetes (NHS, 2014f).

Self care

Self care is an integral part of daily life. It means you take responsibility for your own health and wellbeing, with support from those involved in your care.

Self care includes things you do each day to stay fit, maintain good physical and mental health, prevent illness or accidents, and effectively deal with minor ailments and long-term conditions.

People living with long-term conditions can benefit enormously if they receive self care support. They can live longer, experience less pain, anxiety, depression and fatigue, have a better quality of life and be more active and independent (NHS, 2014f).

Regular reviews

As type 2 diabetes is a long-term condition, you'll be in regular contact with your diabetes care team. Developing a good relationship with the team will enable you to freely discuss your symptoms or any concerns you have.

The more the team knows, the more they can help you. Your GP or diabetes care team will also need to check your eyes, feet and nerves regularly, because they can also be affected by diabetes (NHS, 2014f).

HbA1c test You should be tested regularly (at least once a year) to check how well your diabetes is being controlled over the long term.

A blood sample will be taken from your arm and a test known as the HbA1c test carried out. It measures how much glucose is in the red blood cells, and gives your blood glucose levels for the previous two to three months.

The HbA1c target for most people with diabetes is below 48 mmol/mol. There's evidence that this level can reduce the risk of complications, such as nerve damage, eye disease, kidney disease and heart disease.

An HbA1c of less than 58 mmol/mol is recommended for those at risk of severe hypoglycaemia (an abnormally low blood glucose level). The Diabetes UK website has more information about the HbA1c test (NHS, 2014f).

Healthy eating

Eating a healthy, balanced diet is very important if you have diabetes. However, you don't need to avoid certain food groups altogether.

As long as you eat regularly and make healthy choices, you can have a varied diet and enjoy a wide range of foods.

You can make adaptations when cooking meals, such as reducing the amount of fat, salt and sugar, and increasing the amount of fibre.

You don't need to completely exclude sugary and high fat foods from your diet, but they should be limited.

The important thing in managing diabetes through your diet is to eat regularly and include starchy carbohydrates, such as pasta, as well as plenty of fruit and vegetables. If your diet is well balanced, you should be able to achieve a good level of health and maintain a healthy weight (NHS, 2014f).

Regular exercise

As physical activity lowers your blood glucose level, it's very important to exercise regularly if you have diabetes.

Like anyone else, you should aim to do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity, such as cycling or fast walking, every week.

However, before starting a new activity, speak to your GP or diabetes care team first. As exercise will affect your blood glucose level, your care team may have to adjust your insulin treatment or diet to keep your blood glucose level steady (NHS, 2014f).

Don’t smoke

If you have diabetes, your risk of developing a cardiovascular disease, such as a heart attack or stroke, is increased.

As well as increasing this risk further, smoking also increases your risk of many other serious smoking-related conditions, such as lung cancer.

If you want to give up smoking, your GP can provide you with advice, support and treatment to help you quit (NHS, 2014f).

Limit alcohol

If you have diabetes and decide to drink alcohol, avoid drinking more than the recommended daily amounts, and never drink alcohol on an empty stomach.

Depending on the amount you drink, alcohol can cause either high or low blood glucose levels (hyperglycaemia or hypoglycaemia).

Drinking alcohol may also affect your ability to carry out insulin treatment or blood glucose monitoring, so always be careful not to drink too much.

Men and women are advised not to regularly drink more than 14 units a week (NHS, 2014f).

Keeping well

People with long-term conditions, such as type 2 diabetes, are encouraged to get a flu jab each autumn to protect against flu (influenza).

A pneumoccocal vaccination, which protects against a serious chest infection called pneumococcal pneumonia, is also recommended (NHS, 2014f).

Look after your feet

If you have diabetes, you’re at greater risk of developing problems with your feet, including foot ulcers and infections from minor cuts and grazes.

This is because diabetes is associated with poor blood circulation in the feet, and blood glucose can damage the nerves.

To prevent problems with your feet, keep your nails short and wash your feet daily using warm water. Wear shoes that fit properly, and see a podiatrist or chiropodist (foot care specialist) regularly so that any problems can be detected early.

Regularly check your feet for cuts, blisters or grazes because you may not be able to feel them if the nerves in your feet are damaged. See your GP if you have a minor foot injury that doesn't start to heal within a few days (NHS, 2014f).

Regular eye tests

If you have type 2 diabetes, you should be invited to have your eyes screened once a year to check for diabetic retinopathy.

Diabetic retinopathy is an eye condition where the small blood vessels in your eye become damaged. It can occur if your blood glucose level is too high for a long period of time (hyperglycaemia). If left untreated, retinopathy can eventually lead to sight loss (NHS, 2014f).

Get educated

You'll be best equipped to manage your diabetes day-to-day if you're given information and education when you're diagnosed and on an ongoing basis.

The National Institute for Health and Care Excellence (NICE) recommends that all people who have diabetes should be offered a structured patient education programme, providing information and education to help them care for themselves (NHS, 2014f).

Structured patient education means there's a planned course that -

- covers all aspects of diabetes,
- is flexible in content,
- is relevant to a person's clinical and psychological needs,
- is adaptable to a person's educational and cultural background (NHS, 2014f).

For type 2 diabetes, there's a national patient education programme that meets all the key criteria for structured education. It's called the Diabetes Education and Self Management for Ongoing and Newly Diagnosed (DESMOND).

There are also several local adult education programmes, many of which are working towards the criteria for structured education. Ask your diabetes care team about the adult education programmes they provide (NHS, 2014f).

Talk to others

Many people find it helpful to talk to others in a similar position, and you may find support from a group for people with diabetes. Patient organisations have local groups where you can meet others diagnosed with the condition (NHS, 2014f).

Financial support and benefits

People with diabetes controlled by medication are entitled to free prescriptions and eye examinations.

Some people with diabetes may also be eligible for disability and incapacity benefits, depending on the impact that the condition has on their lives. The main groups likely to qualify for welfare benefits are children, the elderly, those with learning disabilities or mental health problems, and those with diabetes complications.

People over the age of 65 who are severely disabled may qualify for a type of disability benefit called Attendance Allowance.

Carers may also be entitled to some benefit, depending on their involvement in caring for the person with diabetes.

Your local Citizen's Advice Bureau (CAB) can check whether you're getting all the benefits you're entitled to. They, as well as your diabetes specialist nurse, should also provide advice about filling in the forms (NHS, 2014f).

Type 1 diabetes

It's very important for diabetes to be diagnosed as soon as possible, because it will get progressively worse if left untreated.

You should therefore visit your GP if you have symptoms, which include feeling thirsty, passing urine more often than usual and feeling tired all the time (see the list below for more diabetes symptoms) (NHS, 2014l).

Symptoms

The symptoms of type 1 diabetes can develop very quickly (over a few days or weeks), particularly in children.

In older adults, the symptoms can often take longer to develop (a few months).

However, they should disappear when you start taking insulin and you get the condition under control (NHS, 2014l).

The main symptoms of diabetes are -

- feeling very thirsty,
- urinating more frequently than usual, particularly at night,
- feeling very tired,
- weight loss and loss of muscle bulk,
- itchiness around the genital area, or regular bouts of thrush (a yeast infection),
- blurred vision caused by the lens of your eye changing shape,
- slow healing of cuts and grazes (NHS, 2014l).

{Vomiting or heavy, deep breathing can also occur at a later stage. This is a dangerous sign and requires immediate admission to hospital for treatment} (NHS, 2014l).

When to seek urgent medical attention

You should seek urgent medical attention if you have diabetes and develop -

- a loss of appetite,
- nausea or vomiting,
- a high temperature,
- stomach pain,
- fruity smelling breath - which may smell like pear drops or nail varnish (others will usually be able to smell it, but you won't) (NHS, 2014l).

Hypoglycaemia (low blood glucose)

If you have diabetes, your blood glucose levels can become very low. This is known as hypoglycaemia (or a "hypo"), and it's triggered when injected insulin in your body moves too much glucose out of your bloodstream.

In most cases, hypoglycaemia occurs as a result of taking too much insulin, although it can also develop if you skip a meal, exercise very vigorously or drink alcohol on an empty stomach (NHS, 2014l).

Symptoms of a "hypo" include -

- feeling shaky and irritable,
- sweating,
- tingling lips,
- feeling weak,
- feeling confused,
- hunger,
- nausea (NHS, 2014l).

A hypo can be brought under control simply by eating or drinking something sugary.

If it isn't brought under control, a hypo can cause confusion, slurred speech and, eventually, unconsciousness.

In this case, an emergency injection of a hormone called glucagon will be needed. Glucagon increases the glucose in your blood (NHS, 2014l).

Hyperglycaemia (high blood glucose)

As diabetes occurs as a result of your body being unable to produce any, or enough, insulin to regulate your blood glucose, your blood glucose levels may become very high. This happens because there's insufficient insulin to move glucose out of your bloodstream and into your cells to produce energy (NHS, 2014l).

If your blood glucose levels become too high, you may experience hyperglycaemia. The symptoms of hyperglycaemia are similar to the main symptoms of diabetes, but they may come on suddenly and be more severe. They include -

- extreme thirst,
- a dry mouth,
- blurred vision,
- drowsiness,
- a need to pass urine frequently (NHS, 2014l).

Left untreated, hyperglycaemia can lead to diabetic ketoacidosis. This is a serious condition, where the body breaks down fat and muscle as an alternative source of energy. This leads to a build-up of acids in your blood, which can cause vomiting, dehydration, unconsciousness and even death (NHS, 2014l).

Diagnosing

It's important to diagnose diabetes as early as possible, so that treatment can be started.

If you experience the symptoms of diabetes, you should visit your GP as soon as possible. They'll ask about your symptoms and may request a urine and blood test (NHS, 2014l).

Urine and blood tests Your urine sample will be tested to see whether it contains glucose. Urine doesn't usually contain glucose, but if you have diabetes, some glucose can overflow through the kidneys and into the urine. Your urine may also be tested for ketones (chemicals) that indicate type 1 diabetes.

If your urine contains glucose, a blood test can be used to confirm the diagnosis of diabetes. A sample of your blood will be taken in the morning, before you've had anything to eat, and it will be tested to measure your blood glucose levels.

If your blood glucose levels aren't high enough for your GP to diagnose diabetes, you may need to have an oral glucose tolerance test (OGTT), which is also sometimes referred to as a glucose tolerance test (GTT).

After drinking a glucose drink, samples of your blood will be taken every half an hour, for two hours. The samples will be tested to find out how your body is dealing with the glucose (NHS, 2014l).

Glycated haemoglobin (HbA1c) The glycated haemoglobin (HbA1c) test is another blood test that can be used to diagnose diabetes.

In people who've already been diagnosed with diabetes, the HbA1c test is often used to show how well their diabetes is being controlled.

The HbA1c test gives your average blood glucose level over the previous two to three months. The results can indicate whether the measures you're taking to control your diabetes are working (NHS, 2014l).

Antibody tests There are blood tests for specific antibodies that can identify type 1 diabetes (NHS, 2014l).

If you've been diagnosed with diabetes, it's recommended that you have your HbA1c measured at least twice a year. However, you may need to have your HbA1c measured more frequently if -

- you've recently been diagnosed with diabetes,
- your blood glucose remains too high,
- your treatment plan has been changed (NHS, 2014l).

Unlike other tests, such as the GTT, the HbA1c test can be carried out at any time of day and doesn't require any special preparation, such as fasting. However, it's less reliable in certain situations, such as during pregnancy.

The advantages associated with the HbA1c test make it the preferred method of assessing how well blood glucose levels are being controlled in a person with diabetes.

HbA1c is also increasingly being used as a diagnostic test for type 2 diabetes, and as a screening test for people at high risk of diabetes (NHS, 2014l).

Treating type 1 diabetes

There's no cure for diabetes, so treatment aims to keep your blood glucose levels as normal as possible and to control your symptoms to prevent health problems developing later in life.

If you've been diagnosed with diabetes, you'll be referred for specialist treatment from a diabetes care team. They'll be able to explain your condition in detail and help you understand your treatment. They'll also closely monitor your condition to identify any health problems that may occur (NHS, 2014l).

Insulin treatment Type 1 diabetes occurs because your body can't produce enough insulin. This means you'll need regular insulin treatment to keep your glucose levels normal.

Insulin comes in several different preparations, each of which works slightly differently. For example, some last up to a whole day (long-acting), some last up to eight hours (short-acting) and some work quickly but don't last very long (rapid-acting). Your treatment is likely to include a combination of these different insulin preparations (NHS, 2014l).

Insulin injections If you have type 1 diabetes, you'll probably need insulin injections. Insulin must be injected, because if it were taken as a tablet, it would be broken down in your stomach - like food - and would be unable to enter your bloodstream.

When you're first diagnosed, your diabetes care team will help you with your insulin injections, before showing you how and when to do it yourself. They'll also show you how to store your insulin and dispose of your needles properly.

Insulin injections are usually given by an injection pen, which is also known as an insulin pen or auto-injector. However, injections are sometimes given using a syringe. Most people need two to four injections a day.

Your GP or diabetes nurse may also teach one of your close friends or relatives how to inject the insulin properly (NHS, 2014l).

Insulin pump therapy Insulin pump therapy is an alternative to injecting insulin. An insulin pump is a small device that holds insulin and is about the size of a pack of playing cards.

The pump is attached to you by a long, thin piece of tubing, with a needle at the end, which is inserted under your skin. Most people insert the needle into their stomach, but you could also insert it into your hips, thighs, buttocks or arms.

The pump allows insulin to continuously flow into your bloodstream at a rate you can control. This means you no longer need to give yourself injections, although you'll need to monitor your blood glucose levels very closely to ensure you're receiving the right amount of insulin.

Insulin pump therapy can be used by adults, teenagers and children (with adult supervision) who have type 1 diabetes. However, it may not be suitable for everyone. Your diabetes care team may suggest pump therapy if you have frequent episodes of low blood glucose (hypoglycaemia) (NHS, 2014l).

Monitoring blood glucose An important part of your treatment is to make sure that your blood sugar level is as normal and stable as possible.

You'll be able to manage this using insulin treatment and by eating a healthy, balanced diet, but you will also have to regularly check your blood glucose levels to make sure they're not too high or too low.

Exercise, illness, stress, drinking alcohol, taking other medicines and, for women, changes to your hormone levels during your monthly period can all affect your blood sugar levels.

In most cases, you'll need to check your blood glucose levels during the day, both at home and at work or school, using a simple finger prick blood test. You may need to do this up to four or more times a day, depending on the type of insulin treatment you're taking. Your diabetes care team will talk to you about your ideal blood glucose level.

The normal blood sugar level is 4.0–7.0 mmol/l before meals and less than 9.0 mmol/l two hours after meals. Mmol/l means millimoles per litre, and it's a way of defining the concentration of glucose in your blood (NHS, 2014l).

Having your blood glucose levels checked You'll be measuring your blood glucose yourself every day, to check your levels.

Your GP or diabetes care team will also carry out a different blood test every two to six months, called the HbA1c test.

This gives a clearer idea of how well your treatment plan is working, by measuring how stable your glucose levels have been over the past 6–12 weeks.

It measures the amount of haemoglobin, which is the oxygen-carrying substance in red blood cells that has glucose attached to it. A high HbA1c level may indicate that your blood glucose level is consistently high and that your diabetes treatment plan needs to be altered.

The ideal HbA1c target for people with diabetes is below 48 mmol/mol (NHS, 2014l).

Treating hypoglycaemia (low blood glucose) Hypoglycaemia can occur when your blood glucose level becomes very low. It's likely that you'll develop hypoglycaemia from time to time.

Mild hypoglycaemia (or a "hypo") can make you feel shaky, weak and hungry, and can be controlled by eating or drinking something sugary, such as a fizzy drink (not a diet version), sugar cubes or raisins. You may also be able to take pure glucose, in the form of a tablet or fluid, if you need to control the symptoms of a hypo quickly.

If you develop severe hypoglycaemia, you can become drowsy and confused, and you may even lose consciousness. If this occurs, you'll need assistance from another person who may be able to give you a glucose gel rubbed into your cheeks or an injection of glucagon into your muscle. Glucagon is a hormone that quickly increases your blood glucose levels.

Your diabetes care team may show several of your family members and close friends how to inject glucagon or give you glucose gel, should you need it. Once you begin to come round, you'll need to eat something sugary when you're alert enough to do so. If you lose consciousness as a result of hypoglycaemia, there's a risk that it could happen again within a few hours, so you'll need to rest afterwards and have someone with you.

If the glucagon injection into your muscle doesn't work, and you're still drowsy or unconscious 10 minutes after the injection, you'll need urgent medical attention.

You'll need to have another injection of glucagon straight into a vein, which must be given by a trained healthcare professional.

If you have type 1 diabetes, it's recommended that you carry identification with you so that people are aware of the problem if you become hypoglycaemic (NHS, 2014l).

Islet cell transplantation Some people with type 1 diabetes may benefit from a fairly new procedure known as islet cell transplantation. It involves implanting healthy islet cells from the pancreas of a deceased donor into the pancreas of someone with type 1 diabetes.

In 2008, a government-funded islet cell transplant programme was introduced, and the procedure is now available through the NHS for people who satisfy certain criteria (see below) (NHS, 2014l).

You may be suitable for an islet cell transplant if you've had -

- two or more severe hypos within the last two years and you have a poor awareness of hypoglycaemia,
- a working kidney transplant, severe hypos and poor hypoglycaemia awareness, or poor blood glucose control even after receiving the best medical treatment (NHS, 2014l).

You may not be suitable for an islet cell transplant if you -

- weigh over 85kg (13st 5.4lb),
- have poor kidney function,
- need a lot of insulin - for example, over 50 units a day for a 70kg (11st) person (NHS, 2014l).

An islet cell transplant is a minor, low-risk procedure that's carried out under local anaesthetic.

The procedure has been shown to be effective at reducing the risk of severe hypos. So far, the results of islet cell transplants carried out in the UK have shown a significant reduction in the number of hypos, from 23 per person per year before transplantation to less than one per person per year afterwards (NHS, 2014l).

Pancreas transplant People with type 1 diabetes who are having a kidney transplant from a donor may also be offered a pancreas transplant at the same time.

Others may be offered a pancreas transplant after they've had a kidney transplant because they're already on anti-rejection tablets.

If you're having repeated, severe and life-threatening hypoglycaemic attacks, a pancreas transplant may also be recommended.

During the procedure, your faulty pancreas will be replaced with a healthy pancreas from a donor. This will allow you to get a new source of insulin.

Pancreas transplants are complicated operations and, like other types of major surgery, there's a risk of complications. In the UK, about 200 pancreas transplants are carried out each year, with more than 300 people on the waiting list.

The waiting time for a pancreas transplant is one to two years, because there's a shortage of suitable donor organs (NHS, 2014l).

Treating hyperglycaemia (high blood glucose) Hyperglycaemia can occur when your blood glucose levels become too high. It can happen for several reasons, such as eating too much, being unwell or not taking enough insulin.

If you develop hyperglycaemia, you may need to adjust your diet or your insulin dose to keep your glucose levels normal. Your diabetes care team can advise you about the best way to do this.

If hyperglycaemia isn't treated, it can lead to a condition called diabetic ketoacidosis, where the body begins to break down fats for energy instead of glucose, resulting in a build-up of ketones (acids) in your blood.

Diabetic ketoacidosis is very serious and, if not addressed quickly, it can lead to unconsciousness and, eventually, death (NHS, 2014l).

The signs of diabetic ketoacidosis include -

- frequently passing urine,
- thirst,
- tiredness and lethargy (lack of energy),
- blurry vision,
- abdominal (stomach) pain,
- nausea and vomiting,
- deep breathing,
- smell of ketones on breath (described as smelling like pear drops),
- collapse and unconsciousness (NHS, 2014l).

Your healthcare team will educate you on how to decrease your risk of ketoacidosis by testing your own blood for ketones using blood ketone sticks if you're unwell.

If you develop diabetic ketoacidosis, you'll need urgent hospital treatment. You'll be given insulin directly into a vein (intravenously). You may also need other fluids given by a drip if you're dehydrated, including salt solution and potassium (NHS, 2014l).

Other treatments Type 1 diabetes can lead to long-term complications. If you have the condition, you have an increased risk of developing heart disease, stroke and kidney disease. To reduce the chance of this, you may be advised to take -

- anti-hypertensive medicines to control high blood pressure,
- a statin - such as simvastatin - to reduce high cholesterol levels,
- low-dose aspirin to prevent stroke,

- angiotensin-converting enzyme (ACE) inhibitor - such as enalapril, lisinopril or ramipril if you have the early signs of diabetic kidney disease (NHS, 2014l).

Diabetic kidney disease is identified by the presence of small amounts of a protein called albumin in your urine. It's often reversible if treated early enough (NHS, 2014l).

Complications caused by diabetes

If diabetes isn't treated, it can lead to a number of different health problems. High glucose levels can damage blood vessels, nerves and organs.

Even a mildly raised glucose level that doesn't cause any symptoms can have damaging effects in the long term (NHS, 2014l).

Heart disease and stroke If you have diabetes, you're up to five times more likely to develop heart disease or have a stroke.

Prolonged, poorly controlled blood glucose levels increase the likelihood of developing atherosclerosis (furring and narrowing of your blood vessels).

This may result in a poor blood supply to your heart, causing angina (a dull, heavy or tight pain in the chest). It also increases the chance that a blood vessel in your heart or brain will become completely blocked, leading to a heart attack or stroke (NHS, 2014l).

Nerve damage High blood glucose levels can damage the tiny blood vessels of your nerves. This can cause a tingling or burning pain that spreads from your fingers and toes up through your limbs. If the nerves in your digestive system are affected, you may experience nausea, vomiting, diarrhoea or constipation (NHS, 2014l).

Retinopathy Retinopathy is where the retina (the light-sensitive layer of tissue) at the back of the eye is damaged. Blood vessels in the retina can become blocked or leaky, or can grow haphazardly. This prevents the light from fully passing through to your retina. If it isn't treated, it can damage your vision.

The better you control your blood sugar levels, the lower your risk of developing serious eye problems. Having an annual eye check with a specialist (an ophthalmologist or optometrist) can help pick up signs of a potentially serious eye problem early so that it can be treated.

If it's caught early enough, diabetic retinopathy can be managed using laser treatment. However, this will only preserve the sight you have, rather than make it better (NHS, 2014l).

Kidney disease If the small blood vessels in your kidney become blocked and leaky, your kidneys will work less efficiently.

In rare, severe cases, this can lead to kidney failure and the need for dialysis. In some cases, a kidney transplant may be necessary (NHS, 2014l).

Foot problems Damage to the nerves of the foot can mean that small nicks and cuts aren't noticed, which can lead to a foot ulcer developing. About 1 in 10 people with diabetes get a foot ulcer, which can cause serious infection.

If you develop nerve damage, you should check your feet every day and report any changes to your \GP, nurse or podiatrist. Look out for sores and cuts that don't heal, puffiness or swelling, and skin that feels hot to the touch. You should also have a foot examination at least once a year (NHS, 2014l).

Sexual dysfunction In men with diabetes, particularly those who smoke, nerve and blood vessel damage can lead to erection problems. This can usually be treated with medication (NHS, 2014l).

Women with diabetes may experience -

- a reduced sex drive (loss of libido),
- reduced pleasure from sex,
- vaginal dryness,
- a reduced ability to orgasm,
- pain during sex (NHS, 2014l).

If you experience a lack of vaginal lubrication, or you find sex painful, you can use a vaginal lubricant or a water-based gel (NHS, 2014l).

Looking after your eyes The NHS Diabetic Eye Screening Programme will arrange for you to have your eyes checked every year.

Everyone who's on a diabetes register will be given the opportunity to have a digital picture taken of the back of their eye. Speak to your GP to register (NHS, 2014l).

Living with type 1 diabetes

If you have type 1 diabetes, you'll need to look after your health very carefully.

Caring for your health will make treating your diabetes easier and minimise your risk of developing complications (NHS, 2014l).

Regular reviews Type 1 diabetes is a long-term condition, which means you'll be in regular contact with your diabetes care team. Developing a good relationship with the team will enable you to freely discuss your symptoms or any concerns that you have.

The more they know, the more they can help you. Your GP or diabetes care team will also need to check your eyes, feet and nerves regularly, because they can also be affected by diabetes (NHS, 2014l).

HbA1c test You should be tested each year to see how well your diabetes is being controlled over the long term.

A blood sample will be taken from your arm and a test known as the HbA1c test carried out. It measures how much glucose is in your red blood cells, and gives your blood glucose levels for the previous two to three months.

The HbA1c target for most people with diabetes is below 48 mmol/mol. There's evidence to show that this level can reduce the risk of complications, such as nerve damage, eye disease, kidney disease and heart disease.

An HbA1c of less than 58 mmol/mol is recommended for those at risk of severe hypoglycaemia (an abnormally low level of blood glucose) (NHS, 2014l).

Healthy eating It's not true that if you have diabetes you'll need to stick to a special diet. You should eat a healthy diet that's high in fibre and fruit and vegetables, and low in fat, salt and sugar.

Different foods will affect you in different ways, so it's important to know what to eat and when to get the right amount of glucose for the insulin you're taking. A diabetes dietitian can help you work out a dietary plan that can be adapted to your specific needs.

It's fine for people with diabetes to eat carbohydrates. Your dietitian will explain ”carb counting” to you - matching your insulin requirement with the volume of carbohydrates that you eat or drink (NHS, 2014l).

Regular exercise As physical activity lowers your blood glucose level, it's very important to exercise regularly if you have diabetes.

Like anyone else, you should aim to do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity, such as cycling or fast walking, every week. However, speak to your GP or diabetes care team before starting a new activity.

As exercise will affect your blood glucose level, you and your care team may have to adjust your insulin treatment or diet to keep your blood glucose level steady (NHS, 2014l).

Don't smoke If you have diabetes, your risk of developing a cardiovascular disease, such as a heart attack or stroke, is increased.

As well as increasing this risk further, smoking also increases your risk of developing many other serious smoking-related conditions, such as lung cancer. If you want to give up smoking, your GP can provide you with advice, support and treatment to help you quit (NHS, 2014l).

Limit alcohol If you have diabetes, drink alcohol in moderation (if you drink), and never drink alcohol on an empty stomach. Depending on the amount you drink, alcohol can cause either high or low blood glucose levels (hyperglycaemia or hypoglycaemia).

Drinking alcohol may also affect your ability to carry out insulin treatment or blood glucose monitoring, so always be careful not to drink too much. The recommended alcohol limit is 14 units a week for men and women (NHS, 2014l).

Keeping well People with a long-term condition, such as type 1 diabetes, are encouraged to get a flu jab each autumn to protect against flu (influenza). A pneumoccocal vaccination, which protects against a serious chest infection called pneumococcal pneumonia, is also recommended (NHS, 2014l).

Look after your feet Having diabetes means that you're more likely to develop problems with your feet, including foot ulcers and infections from minor cuts and grazes. This is because blood glucose can damage the nerves in your feet.

To prevent problems with your feet, keep your nails short and wash your feet daily using warm water. Wear shoes that fit properly and see a podiatrist or chiropodist (a foot care specialist) regularly so that any problems are detected early.

Regularly check your feet for cuts, blisters or grazes because you may not be able to feel them if the nerves in your feet are damaged. See your GP if you have a minor foot injury that doesn't start to heal within a few days (NHS, 2014l).

Regular eye tests If you have type 1 diabetes, you should be invited to have your eyes screened at once a year to check for diabetic retinopathy.

Retinopathy is an eye condition where the small blood vessels in your eye become damaged. It can occur if your blood glucose level is too high for a long time (hyperglycaemia). If it isn't treated, retinopathy can eventually cause sight loss (NHS, 2014l).

Education You'll be best equipped to manage your diabetes if you're given information and education when you're diagnosed, and then on an ongoing basis.

The National Institute for Health and Care Excellence (NICE) strongly recommends that all people who have diabetes should be offered a structured patient education programme, providing information and education to help them care for themselves.

This gives people the best chance of developing the skills they need to effectively treat their condition, maintain their glucose levels at a normal level and help prevent long-term complications. It also reduces the risk of developing hypoglycaemia (low blood glucose levels) (NHS, 2014l).

Structured patient education Structured patient education means there's a planned course that -

- covers all aspects of diabetes,
- is flexible in content,
- is relevant to a person's clinical and psychological needs,
- is adaptable to a person's educational and cultural background (NHS, 2014l).

For type 1 diabetes, there's a national patient education programme called Dose Adjustment For Normal Eating (DAFNE).

DAFNE is a skills-based course where people with type 1 diabetes learn how to adjust their insulin dose to suit what they eat, rather than having to eat to match their insulin doses.

There are also several local adult education programmes, many of which are working towards the criteria for structured education. Ask your diabetes care team about the adult education programmes they provide (NHS, 2014l).

Help and support Many people find it helpful to talk to others in a similar position, and you may find support from a group for people with diabetes.

Patient organisations have local groups where you can meet others who've been diagnosed with the condition (NHS, 2014l).

Financial support and benefits If your diabetes is controlled by medication, you're entitled to free prescriptions and eye examinations.

Some people with diabetes may be eligible to receive disability benefits and incapacity benefits, depending on the impact the condition has on their life.

The main groups likely to qualify for welfare benefits are children, elderly people, people with learning disabilities or mental health problems, and those with complications of diabetes.

People over 65 who are severely disabled, may qualify for a type of disability benefit called Attendance Allowance.

Carers may also be entitled to some benefit too, depending on their involvement in caring for the person with diabetes.

Staff at your local Citizen's Advice Bureau (CAB) can check whether you're getting all of the benefits you're entitled to. Both they and your diabetes specialist nurse should also be able to give you advice about filling in the forms (NHS, 2014l).

Dysarthria

Dysarthria is difficulty speaking caused by problems controlling the muscles used in speech (NHS, 2014g). These muscles are weak, or you might have difficulty in controlling them (MAYOCLINIC, 2015).

Common causes of dysarthria include nervous system (neurological) disorders such as stroke, brain injury, brain tumours, and conditions that cause facial paralysis or tongue or throat muscle weakness. Certain medications also can cause dysarthria (MAYOCLINIC, 2015).

Symptoms

Signs and symptoms of dysarthria vary, depending on the underlying cause and the type of dysarthria, and may include -

- slurred, nasal-sounding or breathy speech (NHS, 2014g),
- nasal, raspy or strained voice (MAYOCLINIC, 2015),
- excessively loud or quiet speech,
- problems speaking in a regular rhythm, with frequent hesitations,
- ”gurgly”-sounding or monotone speech,
- difficulty with tongue and lip movements,
- difficulty swallowing (see Dysphagia), which may lead to constant drooling (NHS, 2014g).

As a result of these problems, a person with dysarthria may be difficult to understand. In some cases, they may only be able to produce short phrases, single words, or no useful speech at all.

Dysarthria does not affect intelligence or understanding, but a person with the condition may also have problems in these areas. Speech problems can also affect social interaction, employment and education.

If you have dysarthria, you may find it helpful to see a speech and language therapist. Ask your GP to refer you, or contact your nearest speech and language therapy clinic (NHS, 2014g).

What causes dysarthria?

The muscles used for speech are controlled by the brain and nervous system. Dysarthria can develop if either of these is damaged in some way (NHS, 2014g).

Dysarthria can either be -

- developmental - when it occurs as a result of brain changes before or during birth, such as cerebral palsy,
- acquired - when it occurs as the result of brain changes later in life, such as damage caused by a stroke, a head injury, a brain tumour, or a progressive condition such as Parkinson’s disease or motor neurone disease (NHS, 2014g).

Dysarthria in children is usually developmental while dysarthria in adults is often acquired, although both types can affect people of any age.

Conditions that may result in dysarthria include -

- Amyotrophic lateral sclerosis (ALS, or Lou Gehrig’s disease),

- Brain injury,
- Brain tumour,
- Cerebral palsy,
- Guillain-Barre syndrome,
- Head injury,
- Huntington's disease,
- Lyme disease,
- Multiple sclerosis,
- Muscular dystrophy,
- Myasthenia gravis,
- Parkinson's disease,
- Stroke,
- Wilson's disease (MAYOCLINIC, 2015).

Some medications, such as narcotics or sedatives, also can cause dysarthria (MAYOCLINIC, 2015).

Whether dysarthria will improve with speech and language therapy depends on what has caused the condition and the extent of the brain damage or dysfunction. Some cases may remain stable while others may worsen over time (NHS, 2014g).

How can a speech and language therapist help?

speech and language therapist (SLT)s play an important role in identifying and assessing children and adults with dysarthria.

However, there's no guarantee that speech and language therapy can improve the speech of everyone with dysarthria.

Treatment success depends on the extent and location of the brain damage or brain dysfunction, or the stage of the progressive condition that's causing it (NHS, 2014g).

Diagnosing dysarthria

To assess the extent of the speech problem, an SLT may ask you or your child to try any of the following tasks -

- make different sounds,
- talk about a familiar topic,
- count numbers or recite days of the week,
- read a passage aloud (NHS, 2014g).

The therapist may also want to examine the movement of the muscles in the mouth and voice box (larynx), and may wish to make a recording (NHS, 2014g).

Besides conducting a physical examination, your GP might order tests, including -

- **Imaging tests** - Imaging tests, such as an MRI or CT scan, create detailed images of your brain, head and neck that may help identify the cause of your speech problem,
- **Brain and nerve studies** - These can help pinpoint the source of your symptoms. An electroencephalogram measures electrical activity in your brain. An electromyogram evaluates electrical activity in your nerves as they transmit messages to your muscles. Nerve conduction studies measure the strength and speed of the electrical signals as they travel through your nerves to your muscles,
- **Blood and urine tests** - These can help determine if an infectious or inflammatory disease is causing your symptoms,
- **Lumbar puncture (spinal tap)** - In this procedure, a doctor or nurse inserts a needle in your lower back to remove a small sample of cerebrospinal fluid for laboratory testing. A lumbar puncture can help diagnose serious infections, disorders of the central nervous system, and cancers of the brain or spinal cord,
- **Brain biopsy** - If a brain tumour is suspected, your doctor may remove a small sample of your brain tissue to test,
- **Neuropsychological tests** - These measure your thinking (cognitive) skills, your ability to understand speech, your ability to understand reading and writing, and other skills. Dysarthria doesn't affect your cognitive skills and understanding of speech and writing, but an underlying condition can (MAYOCLINIC, 2015).

Treating dysarthria

Your treatment will depend on the cause and severity of your symptoms and the type of dysarthria you have.

Your doctor will treat the cause of your dysarthria when possible, which may improve your speech. If your dysarthria is caused by prescription medications, talk to your doctor about changing or discontinuing such medications (MAYOCLINIC, 2015).

An SLT will try to improve and maximise your ability to talk, help you find different ways of communicating, and help you and your family adapt to your new situation.

They will work as part of a team of health professionals that includes people from the health, social and voluntary sector.

It's difficult to generalise about what will be effective, as successful treatment is determined by an individual's underlying condition and personal circumstances (NHS, 2014g).

An SLT may recommend -

- strategies to improve speech, such as slowing speech down,
- a programme of exercises to improve the volume or clarity of speech,
- assistive devices, such as a simple alphabet board, an amplifier, or a computerised voice output system (NHS, 2014g).

Some SLTs may be able to offer a short loan of a communication aid.

Complications

Because of the communication problems dysarthria causes, complications can include -

- Social difficulty - communication problems may affect your relationships with family and friends and make social situations challenging,
- Depression - in some people, dysarthria may lead to social isolation and depression (MAYOCLINIC, 2015).

Communication tips

Tips for people with dysarthria

If you have dysarthria, you may find it helpful to -

- take a good breath before you start speaking,
- put extra effort into stressing key words,
- speak slowly, saying one word at a time if necessary,
- leave a clear space between each word,
- make sure you are in the same room when talking and face your listener,
- attract the listener's attention (for example, by touch or calling their name) before you begin talking to them,
- keep sentences short and avoid long conversations if you are feeling tired,
- reduce background noise - for example, switch off the TV or radio,
- repeat yourself if needed (NHS, 2014g).

Tips for family, friends and carers

If you are speaking to a person with dysarthria, you may find the following advice helpful -

- reduce distractions and background noise when you have a conversation,
- look at the person as they talk,
- after speaking, allow them plenty of time to respond - if they feel rushed or pressured to speak, they may become anxious, which can affect their ability to communicate,
- avoid finishing their sentences or correcting any errors in their language as this may cause resentment and frustration - ask what the person prefers,
- if you do not understand what they are trying to communicate, do not pretend you understand as they may find this patronising and upsetting - it's always best to be honest about your lack of understanding,
- if necessary, you could ask for clarification by asking yes/no questions or paraphrasing - for example, say: "Did you ask me if I'd done the shopping?" (NHS, 2014g).

Dysphagia

Dysphagia [24] is the medical term for swallowing difficulties.

Some people with dysphagia have problems swallowing certain foods or liquids, while others can't swallow at all (NHS, 2015d).

Other signs of dysphagia include -

- coughing or choking when eating or drinking,
- bringing food back up, sometimes through the nose,
- a sensation that food is stuck in your throat or chest,
- persistent drooling of saliva (NHS, 2015d).

Over time, dysphagia can also cause symptoms such as weight loss and repeated chest infections. You should see your GP if you have swallowing difficulties (NHS, 2015d).

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[24] difficulty swallowing

Causes

As swallowing is a complex process, there are many reasons why dysphagia can develop.

Some causes of dysphagia are explained below (NHS, 2015d).

Neurological causes

The nervous system is made up of the brain, nerves and spinal cord. Damage to the nervous system can interfere with the nerves responsible for starting and controlling swallowing. This can lead to dysphagia (NHS, 2015d).

Some neurological causes of dysphagia include -

- a stroke,
- neurological conditions that cause damage to the brain and nervous system over time, including Parkinson's disease, multiple sclerosis, dementia, and motor neurone disease,
- brain tumours,
- myasthenia gravis - a rare condition that causes your muscles to become weak (NHS, 2015d).

Congenital and developmental conditions

The term "congenital" refers to something you're born with. Developmental conditions affect the way you develop (NHS, 2015d).

Congenital or developmental conditions that may cause dysphagia include: -

- learning disabilities - where learning, understanding, and communicating are difficult,
- cerebral palsy - a group of neurological conditions that affect movement and co-ordination,
- a cleft lip and palate - a common birth defect that results in a gap or split in the upper lip or roof of the mouth (NHS, 2015d).

Obstruction

Conditions that cause an obstruction in the throat or a narrowing of the oesophagus [25] can make swallowing difficult (NHS, 2015d).

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[25] the tube that carries food from your mouth to the stomach

Some causes of obstruction and narrowing include -

- mouth cancer or throat cancer, such as laryngeal cancer or oesophageal cancer - once these cancers are treated, the obstruction may no longer be an issue,
- pharyngeal (throat) pouches, also known as Zenker diverticulum - where a large sac develops in the upper part of the oesophagus, which reduces the ability to swallow both liquids and solids; it's a rare condition that mainly affects older people,
- eosinophilic oesophagitis - where a type of white blood cell known as an eosinophil builds up in the lining of the oesophagus as the result of a reaction to foods, allergens, or acid reflux; the build-up damages the lining of the oesophagus and causes swallowing difficulties,
- radiotherapy treatment - this can cause scar tissue, which narrows the passageway in your throat and oesophagus,
- gastro-oesophageal reflux disease (GORD) - stomach acid can cause scar tissue to develop, narrowing your oesophagus,
- infections, such as tuberculosis or thrush - these can lead to inflammation of the oesophagus (oesophagitis) (NHS, 2015d).

Muscular conditions

Any condition that affects the muscles used to push food down the oesophagus and into the stomach can cause dysphagia, although such conditions are rare (NHS, 2015d).

Two muscular conditions associated with dysphagia are -

- scleroderma - where the immune system (the body's natural defence system) attacks healthy tissue, leading to a stiffening of the throat and oesophagus muscles,
- achalasia - where muscles in the oesophagus lose their ability to relax and open to allow food or liquid to enter the stomach (NHS, 2015d).

Other causes

As you get older, the muscles used for swallowing can become weaker. This may explain why dysphagia is relatively common in elderly people. Treatment is available to help people with age-related dysphagia.

COPD is a collection of lung conditions that make it difficult to breathe in and out properly. Breathing difficulties can sometimes affect your ability to swallow.

Dysphagia can also sometimes develop as a complication of head or neck surgery (NHS, 2015d).

Diagnosis

See your GP if you're having any difficulty swallowing. They'll carry out an initial assessment and may refer you for further tests and treatment.

Tests will help determine whether your dysphagia is the result of a problem with your mouth or throat (oropharyngeal, or ”high” dysphagia), or your oesophagus, the tube that carries food from the mouth to the stomach (oesophageal, or ”low” dysphagia).

Diagnosing the specific type of dysphagia can make treatment more effective and reduce your chances of developing complications of dysphagia, such as choking or pneumonia (NHS, 2015d).

Your GP will want to know -

- how long you've had dysphagia,
- whether your symptoms come and go, or are getting worse,
- whether dysphagia has affected your ability to swallow solids, liquids, or both,
- whether you've lost weight (NHS, 2015d).

Specialist referral

Depending on the suspected cause, you may be referred for further tests with -

- an ear, nose and throat (ENT) specialist,
- a SLT,
- a neurologist - a specialist in conditions that affect the brain, nerves, and spinal cord,
- a gastroenterologist - a specialist in treating conditions of the gullet, stomach, and intestines,
- a geriatrician - a specialist in the care of elderly people (NHS, 2015d).

The types of tests you might need are explained below.

Water swallow test A water swallow test is usually carried out by a \SLT, and can give a good initial assessment of your swallowing abilities. You'll be given 150ml of water and asked to swallow it as quickly as possible.

The time it takes you to drink all of the water and the number of swallows required will be recorded. You may also be asked to swallow a soft piece of pudding or fruit.

Videofluoroscopy A videofluoroscopy, or modified barium swallow, is one of the most effective ways of assessing your swallowing ability and finding exactly where the problem is.

An X-ray machine records a continuous moving X-ray on to video, allowing your swallowing problems to be studied in detail.

You'll be asked to swallow different types of food and drink of different consistencies, mixed with a non-toxic liquid called barium that shows up on X-rays.

A videofluoroscopy usually takes about 30 minutes. You may feel sick after the test, and the barium may cause constipation. Your stools may also be white for a few days as the barium passes through your system (NHS, 2015d).

Nasoendoscopy A nasendoscopy, sometimes also known as fibreoptic endoscopic evaluation of swallowing (FEES), is a procedure that allows the nose and upper airways to be closely examined using a very small flexible tube known as an endoscope.

The endoscope is inserted into your nose so the specialist can look down on to your throat and upper airways. It has a light and camera at the end so images of the throat can be viewed on a television screen. This allows any blockages or problem areas to be identified.

FEES can also be used to test for oropharyngeal dysphagia after you're asked to swallow a small amount of test liquid (usually coloured water or milk).

Before the procedure, you may have local anaesthetic spray into your nose, but because the camera doesn't go as far as your throat, it doesn't cause retching. The procedure is safe and usually only takes a few minutes (NHS, 2015d).

Manometry and 24-hour pH study Manometry is a procedure to assess the function of your oesophagus. It involves passing a small tube (catheter) with pressure sensors through your nose and into your oesophagus to monitor its function.

The test measures the pressures within your oesophagus when you swallow, which determines how well it's working.

The 24-hour pH study involves inserting a tube into your oesophagus through your nose to measure the amount of acid that flows back from your stomach. This can help determine the cause of any swallowing difficulties (NHS, 2015d).

Diagnostic gastroscopy Diagnostic gastroscopy, also known as diagnostic endoscopy of the stomach, or oesophagogastroduodenoscopy (OGD), is an internal examination using an endoscope.

The endoscope is passed down your throat and into your oesophagus, and images of the inside of your body are transmitted to a television screen. It can often detect cancerous growths or scar tissue (NHS, 2015d).

Nutritional assessment

If dysphagia has affected your ability to eat, you may need a nutritional assessment to check that you're not lacking nutrients (malnourished). This could involve -

- measuring your weight,
- calculating your BMI to check whether you're a healthy weight for your height,
- carrying out blood tests (NHS, 2015d).

Treatment

Most swallowing problems can be treated, although the treatment you receive will depend on the type of dysphagia you have.

Treatment will depend on whether your swallowing problem is in the mouth or throat (oropharyngeal, or ”high” dysphagia), or in the oesophagus (oesophageal, or ”low” dysphagia).

The cause of dysphagia is also considered when deciding on treatment. In some cases, treating the underlying cause, such as mouth cancer or oesophageal cancer, can help relieve swallowing problems.

Treatment for dysphagia may be managed by a group of specialists known as a multidisciplinary team (MDT). Your MDT may include a SLT, a surgeon, and a dietitian (NHS, 2015d).

High (oropharyngeal) dysphagia

High dysphagia is swallowing difficulties caused by problems with the mouth or throat.

It can be difficult to treat if it's caused by a condition that affects the nervous system. This is because these problems can't usually be corrected using medication or surgery (NHS, 2015d).

There are three main treatments for high dysphagia -

- swallowing therapy,
- dietary changes,
- feeding tubes (NHS, 2015d).

Swallowing therapy You may be referred to a SLT for swallowing therapy if you have high dysphagia.

An SLT is a healthcare professional trained to work with people with feeding or swallowing difficulties.

SLTs use a range of techniques that can be tailored for your specific problem, such as teaching you swallowing exercises (NHS, 2015d).

Dietary changes You may be referred to a dietitian (specialist in nutrition) for advice about changes to your diet to make sure you receive a healthy, balanced diet.

An SLT can give you advice about softer foods and thickened fluids that you may find easier to swallow. They may also try to ensure you're getting the support you need at meal times (NHS, 2015d).

Feeding tubes Feeding tubes can be used to provide nutrition while you're recovering your ability to swallow. They may also be required in severe cases of dysphagia that put you at risk of malnutrition and dehydration.

A feeding tube can also make it easier for you to take the medication you may need for other conditions (NHS, 2015d).

There are two types of feeding tubes -

- a nasogastric tube - a tube that is passed down your nose and into your stomach,
- a percutaneous endoscopic gastrostomy (PEG) tube - a tube that is implanted directly into your stomach (NHS, 2015d).

Nasogastric tubes are designed for short-term use. The tube will need to be replaced and swapped to the other nostril after about a month. PEG tubes are designed for long-term use and last several months before they need to be replaced.

Most people with dysphagia prefer to use a PEG tube because it can be hidden under clothing. However, they carry a greater risk of complications compared with nasogastric tubes.

Minor complications of PEG tubes include tube displacement, skin infection, and a blocked or leaking tube. Two major complications of PEG tubes are infection and internal bleeding.

Resuming normal feeding may be more difficult with a PEG tube compared with using a nasogastric tube. The convenience of PEG tubes can make people less willing to carry out swallowing exercises and dietary changes than those who use nasogastric tubes.

You should discuss the pros and cons of both types of feeding tubes with your treatment team (NHS, 2015d).

Low (oesophageal) dysphagia

Low dysphagia is swallowing difficulties caused by problems with the oesophagus (NHS, 2015d).

Medication Depending on the cause of low dysphagia, it may be possible to treat it with medication. For example, proton pump inhibitor (PPI)s used to treat indigestion may improve symptoms caused by narrowing or scarring of the oesophagus (NHS, 2015d).

Botulinum toxin Botulinum toxin can sometimes be used to treat achalasia. This is a condition where the muscles in the oesophagus become too stiff to allow food and liquid to enter the stomach.

It can be used to paralyse the tightened muscles that prevent food from reaching the stomach. However, the effects only last for around six months (NHS, 2015d).

Surgery

Other cases of low dysphagia can usually be treated with surgery (NHS, 2015d).

Endoscopic dilatation Endoscopic dilation is widely used to treat dysphagia caused by obstruction. It can also be used to stretch your oesophagus if it's scarred.

Endoscopic dilatation will be carried out during an internal examination of your oesophagus (gastroscopy) using an endoscopy.

An endoscope is passed down your throat and into your oesophagus, and images of the inside of your body are transmitted to a television screen.

Using the image as guidance, a small balloon or a bougie (a thin, flexible medical instrument) is passed through the narrowed part of your oesophagus to widen it. If a balloon is used, it will be gradually inflated to widen your oesophagus before being deflated and removed.

You may be given a mild sedative before the procedure to relax you. There's a small risk that the procedure could cause a tear or perforate your oesophagus (NHS, 2015d).

Inserting a stent If you have oesophageal cancer that can't be removed, it's usually recommended that you have a stent inserted instead of endoscopic dilatation. This is because, if you have cancer, there's a higher risk of perforating your oesophagus if it's stretched.

A stent (usually a metal mesh tube) is inserted into your oesophagus during an endoscopy or under X-ray guidance.

The stent then gradually expands to create a passage wide enough to allow food to pass through. You'll need to follow a particular diet to keep the stent open without having blockages (NHS, 2015d).

Complications

The main complication of dysphagia is coughing and choking, which can lead to pneumonia (NHS, 2015d).

Coughing and choking

If you have dysphagia, there's a risk of food, drink or saliva going down the ”wrong way”. It can block your airway, making it difficult to breathe and causing you to cough or choke.

If you have dysphagia, you may also develop a fear of choking. However, it's very important you don't avoid eating and drinking, as it could cause dehydration and malnutrition.

If you often choke on your food because of dysphagia, you may also be at an increased risk of developing a condition called aspiration pneumonia (NHS, 2015d).

Aspiration pneumonia

Aspiration pneumonia is a chest infection that can develop after accidentally inhaling something, such as a small piece of food. It causes irritation in the lungs, or damages them. Older people are particularly at risk of developing aspiration pneumonia (NHS, 2015d).

The symptoms of aspiration pneumonia include -

- **a cough** - this may be a dry cough, or you may produce phlegm that's yellow, green, brown, or bloodstained,
- **a high temperature** of 38'C (100.4'F) or over,
- **chest pain**,
- **difficulty breathing** - your breathing may be rapid and shallow and you may feel breathless, even at rest (NHS, 2015d).

Contact your treatment team immediately if you're being treated for dysphagia and you develop these symptoms. If this isn't possible, contact your local out-of-hours service or call NHS 111.

Symptoms of aspiration pneumonia can range from mild to severe, and it is usually treated with antibiotics. Severe cases will require hospital admission and treatment with intravenous antibiotics (through a drip).

In particularly old or frail people, there's a chance the infection could lead to their lungs becoming filled with fluid, preventing them working properly. This is known as acute respiratory distress syndrome (ARDS).

Your chances of developing pneumonia as a result of dysphagia are higher if you have a weakened immune system, COPD, or if your oral and dental hygiene is poor (NHS, 2015d).

Emphysema

Emphysema is a long-term, progressive disease of the lungs that primarily causes shortness of breath due to over-inflation of the alveoli [26]. In people with emphysema, the lung tissue involved in exchange of gases (oxygen and carbon dioxide) is impaired or destroyed. Emphysema is included in a group of diseases called chronic obstructive pulmonary disease COPD (pulmonary refers to the lungs). Emphysema is called an obstructive lung disease because airflow on exhalation is slowed or stopped because over-inflated alveoli do not exchange gases when a person breaths due to little or no movement of gases out of the alveoli.

Emphysema changes the anatomy of the lung in several important ways. This is due to in part to the destruction of lung tissue around smaller airways. This tissue normally holds these small airways, called bronchioles, open, allowing air to leave the lungs on exhalation. When this tissue is damaged, these airways collapse, making it difficult for the lungs to empty and the air (gases) becomes trapped in the alveoli.

Normal lung tissue looks like a new sponge. Emphysematous lung looks like an old used sponge, with large holes and a dramatic loss of "springy-ness" or elasticity. When the lung is stretched during inflation (inhalation), the nature of the stretched tissue wants to relax to its resting state. In emphysema, this elastic function is impaired, resulting in air trapping in the lungs. Emphysema destroys this spongy tissue of the lung and also severely affects the small blood vessels (capillaries of the lung) and airways that run throughout the lung. Thus, not only is airflow affected but so is blood flow. This has dramatic impact on the ability for the lung not only to empty its air sacs called alveoli (pleural for alveolus) but also for blood to flow through the lungs to receive oxygen (Schiffman and Davis, 2016).

Prevention

The prevention of emphysema is closely linked to the prevention of smoking. The primary risk factor for this disease that you can control is the smoking of cigarettes. Those who are daily smokers put themselves and their health at increasing risk with every pack of cigarettes and with every year they continue to smoke. For individuals that have emphysema caused by other causes such as air pollution, avoiding the pollution is the best first step toward prevention.

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[26] air sacs in the lung, having the appearance of a bunch of grapes

Flare-ups of emphysema can be reduced or prevented by taking medications as prescribed and seeking medical care for any signs or symptoms of respiratory infection or shortness of breath. Also, if you have emphysema, you should keep current on vaccines that can prevent respiratory infection. It is important to obtain the pneumococcal vaccine every 5 years and the influenza virus vaccine every year, before flu season (Schiffman and Davis, 2016).

Prognosis

Emphysema is a chronic lower respiratory disease, and it is a chronic, progressive disease that affects the quality of life at least as much as the length of life.

Similar to many chronic diseases, the prognosis is affected by too many variables to be discussed here. There is no cure, but there are effective methods of treatment, which can slow the progression of the disease and allow for a normal life.

In short, the diagnosis of emphysema is not a death sentence. Rather, it is a medical condition that should prompt you to take an active role in the management of your disease. Quitting smoking is the best first step. Regular visits to your doctor and taking medications as prescribed are also very important. However, the prognosis decreases if the individual decides to continue to smoke (Schiffman and Davis, 2016).

Symptoms

Shortness of breath is the most common symptom of emphysema. Cough, sometimes caused by the production of mucous, and wheezing may also be symptoms of emphysema. You may notice that your tolerance for exercise decreases over time. Emphysema usually develops slowly. You may not have any acute episodes of shortness of breath. Slow deterioration is the rule, and it may go unnoticed. This is especially the case if you are a smoker or have other medical problems that limit your ability to exercise.

One of the hallmark signs of emphysema is ”pursed-lip breathing.” The person with emphysema struggles to exhale completely, in an attempt to empty trapped air. They purse their lips, leaving only a small opening. Then, when they exhale, the lips block the flow of air, increasing pressure in the collapsed airways, and opening them, allowing the trapped air to empty.

People with emphysema may develop a ”barrel chest,” where the distance from the chest to the back, which is normally less than the distance side to side, becomes more pronounced. This is a direct result of air becoming trapped behind obstructed airways (Schiffman and Davis, 2016).

When to Seek Medical Care

If you have new or worsening shortness of breath, seek medical attention from your GP. Shortness of breath can occur with other diseases, particularly heart disease and other lung diseases, so it is important not to overlook or minimise this symptom. A gradual decrease in the ability to exercise or perform daily activities, a persistent cough, and wheezing also suggest a visit to the doctor.

Because cigarette smoking is such a dangerous risk factor for emphysema, you may also wish to contact your doctor for help with making a plan to quit smoking, even in the absence of shortness of breath or other symptoms. Doctors can offer you many options to help you stop smoking. The support from a doctor may make the process easier than doing it alone. Many recent studies have shown that up to 25% of smokers may have COPD and not know it.

Shortness of breath should always be taken seriously, especially if it comes on suddenly or if it gets worse over a relatively short period of time; this situation is usually considered a medical emergency so medical care should be sought immediately (Schiffman and Davis, 2016).

- If you know you have emphysema, go to the hospital's emergency department with any new, severe, or worsening shortness of breath. The inability to speak in full sentences may be a sign of shortness of breath.
- Any hint of the lips, tongue, fingernails, or skin turning a shade of blue should prompt a visit to the hospital's emergency department. This sign, called cyanosis, can indicate severe worsening of your lung condition.
- The failure of shortness of breath to improve or worsening shortness of breath in spite of home medications can indicate the need for emergency department care.
- A new or worsening cough can be a sign of an infection, such as pneumonia, and should prompt a timely visit to a primary care physician or a hospital's emergency department for evaluation. Increased sputum production may also be a sign of infection. Infections make emphysema worse and can lead to long-term problems (Schiffman and Davis, 2016).

Causes

Cigarette smoking is by far the most dangerous behavior that causes people to develop emphysema, and it is also the most preventable cause. Other risk factors include a deficiency of an enzyme called alpha-1-antitrypsin, air pollution, airway reactivity, heredity, male sex, and age.

The importance of cigarette smoking as a risk factor for developing emphysema cannot be overemphasized. Cigarette smoke contributes to this disease process in two ways. It destroys lung tissue, which results in the obstruction of air flow, and it causes inflammation and irritation of airways that can add to air flow obstruction (Schiffman and Davis, 2016).

- Destruction of lung tissue occurs in several ways. First, cigarette smoke directly affects the cells in the airway responsible for clearing mucus and other secretions. Occasional smoking temporarily disrupts the sweeping action of tiny hairs called cilia that line the airways. Continued smoking leads to longer dysfunction of the cilia. Long-term exposure to cigarette smoke causes the cilia to disappear from the cells lining the air passages. Without the constant sweeping motion of the cilia, mucous secretions cannot be cleared from the lower respiratory tract. Furthermore, smoke causes mucous secretion to be increased at the same time that the ability to clear the secretions is decreased. The resulting mucous buildup can provide bacteria and other organisms with a rich source of food and lead to infection.
- The immune cells in the lung, whose job it is to prevent and fight infection, are also affected by cigarette smoke. They cannot fight bacteria as effectively or clear the lungs of the many particles (such as tar) that cigarette smoke contains. In these ways cigarette smoke sets the stage for frequent lung infections. Although these infections may not even be serious enough to require medical care, the inflammation caused by the immune system constantly attacking bacteria or tar leads to the release of destructive enzymes from the immune cells.
- Over time, enzymes released during this persistent inflammation lead to the loss of proteins responsible for keeping the lungs elastic. In addition, the tissue separating the air cells (alveoli) from one another also is destroyed. Over years of chronic exposure to cigarette smoke, the decreased elasticity and destruction of alveoli leads to the slow destruction of lung function.
- Alpha-1-antitrypsin (also known as alpha-1-antiprotease) is a substance that fights a destructive enzyme in the lungs called trypsin (or protease). Trypsin is a digestive enzyme, most often found in the digestive tract, where it is used to help the body digest food. It is also released by immune cells in their attempt to destroy bacteria and other material. People with alpha-1-antitrypsin deficiency cannot fight the destructive effects of trypsin once it is released in the lung. The destruction of tissue by trypsin produces similar effects to those seen with cigarette smoking. The lung

tissue is slowly destroyed, thus decreasing the ability of the lungs to perform appropriately. The imbalance that develops between trypsin and antitrypsin results in an ”innocent bystander” effect. Foreign objects (e.g. bacteria) are trying to be destroyed but this enzyme destroys normal tissue since the second enzyme (antiprotease) responsible for controlling the first enzyme (protease) is not available or is poorly functioning. This is referred to as the ”Dutch” hypothesis of emphysema formation.

- Air pollution acts in a similar manner to cigarette smoke. The pollutants cause inflammation in the airways, leading to lung tissue destruction.
- Close relatives of people with emphysema are more likely to develop the disease themselves. This is probably because the tissue sensitivity or response to smoke and other irritants may be inherited. The role of genetics in the development of emphysema, however, remains unclear.
- Abnormal airway reactivity, such as bronchial asthma, has been shown to be a risk factor for the development of emphysema.
- Men are more likely to develop emphysema than women. The exact reason for this is unknown, but differences between male and female hormones are suspected.
- Older age is a risk factor for emphysema. Lung function normally declines with age. Therefore, it stands to reason that the older the person, the more likely they will have enough lung tissue destruction to produce emphysema (Schiffman and Davis, 2016).

It is important to emphasize that COPD is often not purely emphysema or bronchitis, but varying combinations of both (Schiffman and Davis, 2016).

Diagnosis

When a doctor suspects you have emphysema, based on your complaints, a physical examination will be performed. The doctor will pay particular attention to your breathing sounds, your heart sounds, and your general physical appearance. A number of tests may be ordered or performed, and these tests serve to clarify the extent of the disease, the remaining lung function, and the presence of lung infections (Schiffman and Davis, 2016).

- A chest X-ray helps the doctor to identify changes in your lung that may indicate emphysema. The X-ray also may show the presence of an infection or a mass in the lung (such as a tumour) that could explain your symptoms. Shortness of breath has many causes. The chest X-ray is considered by most doctors to be the quickest and easiest test to begin to separate the different possible causes and formulate a diagnosis.

- Lung function tests can give the doctor specific information about how the lungs work mechanically. These tests involve having you breathe into a tube that is connected to a computer or some other monitoring device, which can record the necessary information. The tests measure how much air your lungs can hold, how quickly your lungs can expel air during expiration, and how much reserve capacity your lungs have for increased demand, such as during exercise.
- If you have a family history of alpha-1-antitrypsin deficiency, the doctor may wish to send a blood test to evaluate for this genetic disease.
- Blood tests may also be used to check your white blood cell count, which can sometimes indicate an acute infection. This information can be used with the chest X-ray to evaluate for pneumonia, bronchitis, or other respiratory infections that can make emphysema worse.
- Another blood test that may be helpful, especially in the hospital setting, is called the arterial blood gas. This test helps doctors determine how much oxygen and carbon dioxide are in your blood (Schiffman and Davis, 2016).

Treatment

Treatment for emphysema can take many forms. Different approaches to treatment are available. Generally, a doctor will prescribe these treatments in a stepwise approach, depending on the severity of your condition (Schiffman and Davis, 2016).

- **Stop smoking** - Although not strictly a treatment, most doctors make this recommendation for people with emphysema (and everyone). Quitting smoking may halt the progression of the disease and should improve the function of the lungs to some extent. Lung function deteriorates with age. In those susceptible to developing COPD, smoking can result in a five-fold deterioration of lung function. Smoking cessation may return lung function from this rapid deterioration to its normal rate after smoking is stopped. A doctor may be able to prescribe medications to help in breaking the addiction and can also recommend behavioral therapies, such as support groups. You and your doctor should work to find an approach that results in the successful end to cigarette smoking and, in the process, the beginning of improved lung function and quality of life.
- **Bronchodilating medications** - These medications, which cause the air passages to open more fully and allow better air exchange, are usually the first medications that a doctor will prescribe for emphysema. In very mild cases, bronchodilators may be used only as needed, for episodes of shortness of breath.

- The most common bronchodilator for mild cases of emphysema is albuterol (Proventil or Ventolin). It acts quickly, and 1 dose usually provides relief for 4–6 hours. Albuterol is most commonly available as a metered-dose inhaler or MDI, and this is the form that is used most often for patients with mild emphysema, with intermittent shortness of breath. When used for this purpose, some people refer to their albuterol inhaler as a ”rescue” medication. It acts to rescue them from a more serious attack of shortness of breath.
- If you have some degree of shortness of breath at rest, a doctor may prescribe the albuterol to be given at regularly scheduled intervals, either through the MDI, or by nebulization. Nebulization involves breathing in liquid medication that has been vaporized by a continuous flow of air (in much the same way a whole-room vaporiser causes liquid droplets to enter the air by the flow of air through water). Nebulized albuterol may be prescribed once scheduled doses via inhaler are no longer adequate to alleviate shortness of breath.
- Ipratropium bromide (Atrovent) is another bronchodilating medication that is used for relatively mild emphysema. Similar to albuterol, it is available in both an inhaler and as a liquid for nebulization. Unlike albuterol, however, ipratropium bromide is usually given in scheduled intervals. Therefore, it is not usually prescribed for ”rescue” purposes. Atrovent lasts longer than albuterol, however, and often provides greater relief. Tiotropium (Spiriva) is a long acting form of ipratropium. This once a day medicine has shown to result in a fewer hospitalisations and possible increased survival in some patients with COPD.
- Methylxanthines (Theophylline) and other bronchodilating medications are available that have varying properties that may make them useful in certain cases. Theophylline (Theo-Dur, Uniphyl) is a medication given orally (tablets). It can have a sustained effect on keeping air passageways open. Theophylline levels must be monitored by blood tests. This medicine is used less frequently today due to its narrow therapeutic window. Too much theophylline can produce an overdose; too little, and there will not be enough relief of shortness of breath. In addition, other drugs can interact with theophylline, altering the blood level without warning. For this reason, doctors now prescribe theophylline after very carefully considering its potential for other drug interactions. If you take theophylline, take the medication as prescribed and check with your doctor before starting any new medication. Some new studies are suggesting that very low dose theophylline may have anti-inflammatory properties as well. Theo-

    phylline used to be widely prescribed; currently it is prescribed infrequently and usually only in special circumstances because of its narrow range of effectiveness, necessity of blood level monitoring and its interactions with other drugs.

- **Steroid medications** - They decrease inflammation in the body. They are used for this effect in the lung and elsewhere and have been shown to be of some benefit in emphysema. However, not all people will respond to steroid therapy. Steroids may either be given orally or inhaled through an MDI or another form of inhaler.
- **Antibiotics** - These medications are often prescribed for people with emphysema who have increased shortness of breath. Even when the chest X-ray does not show pneumonia or evidence of infection, people treated with antibiotics tend to have shorter episodes of shortness of breath. It is suspected that infection may play a role in an acute bout of emphysema, even before the infection worsens into a pneumonia or acute bronchitis.
    - Data now suggests that when patients with COPD have a sudden worsening of their symptoms of cough and shortness of breath (also termed an exacerbation), brief and immediate use of steroids and antibiotics can reduce hospitalisations.
- **Oxygen** - If you have shortness of breath and go to a hospital's emergency department, you often are given oxygen. It may even be necessary to give oxygen by placing a tube in your windpipe and allowing a machine to assist your breathing (also termed tracheal intubation). In some cases, it may be necessary for you to receive oxygen at home as well. There are home-based oxygen tanks available and portable units that enable you to be mobile and engage in normal day-to-day activities (Schiffman and Davis, 2016).

Surgery

Surgical options are available to some people with advanced emphysema (Schiffman and Davis, 2016).

Lung Volume Reduction surgery (LVRS) Although it may not make sense that reducing the size of the lung could help the shortness of breath from emphysema, it is important to remember that emphysema causes an abnormal expansion of the chest wall, which decreases the efficiency of breathing. This surgery is only effective if both upper lobes of the lungs are involved. Removal of this involved lung allows for better expansion of the lower portion of lungs. In a select group of emphysema patients this can improve quality of life for a period of years. Newer studies are underway using one way valves placed in the airways to simulate this volume reduction. The effectiveness of this less invasive procedure is undergoing study at this time (Schiffman and Davis, 2016).

Lung transplant For people with the most advanced disease, transplantation of either one or both lungs can produce a near-cure. Transplantation brings with it another set of risks and benefits. People who undergo transplantation, however, will have to take medication to prevent the rejection of the transplant by the body. Also, not everyone qualifies for transplantation, and those who do are limited by the short supply of available organs (Schiffman and Davis, 2016).

Pulmonary Rehabilitation

Pulmonary rehabilitation is probably the most effective therapy for COPD patients with emphysema. Graded physical exercise, proper breathing techniques, education about the disease and available therapies empowers the patient. It improves quality of life and decreases hospitalisations (Schiffman and Davis, 2016).

Emphysema Follow-up

If you have emphysema, follow-up care is crucial to managing this disease. You need to become a partner with your doctor in the management of your health.

As Benjamin Franklin wrote, "*An ounce of prevention is worth a pound of cure*". Realistically, the "cures" or treatments available to doctors and people dealing with emphysema are far more difficult and far less effective than preventing the progression of the disease in the first place (Schiffman and Davis, 2016).

Foot problems

Bunions

A bunion is a bony deformity of the joint at the base of the big toe, which often results in the toe pointing inwards, towards the other toes.

It's not known exactly what causes them, but wearing badly-fitting shoes is thought to make the problem worse. Women are more likely to be affected than men, and research suggests that they may run in families.

Figure 3.2: Bunions

'*Other conditions, including arthritis and gout, are associated with bunions, so it's important to talk to your GP or podiatrist* [27] *if you notice any pain, tenderness or swelling at the base of your big toe. There are a range of treatment options available, including surgery*' says Mike O'Neill, Consultant Podiatrist and spokesperson for the College of Podiatry (AGEUK, 2016a).

A bunion is a bony deformity of the joint at the base of the big toe. The medical name is hallux valgus.

The main sign of a bunion is the big toe pointing towards the other toes on the same foot, which may force the foot bone attached to it (the first metatarsal) to stick outwards (NHS, 2014d).

Other symptoms may include -

- a swollen, bony bump on the outside edge of your foot,
- pain and swelling over your big toe joint that's made worse by pressure from wearing shoes,
- hard, callused and red skin caused by your big toe and second toe overlapping,
- sore skin over the top of the bunion,
- changes to the shape of your foot, making it difficult to find shoes that fit (NHS, 2014d).

These symptoms can sometimes get worse if the bunion is left untreated, so it's best to see a GP. They'll ask you about your symptoms and examine your foot. In some cases, an X-ray may be recommended to assess the severity of your bunion.

Anyone can develop a bunion, but they're more common in women than men. This may be because of the style of footwear that women wear (NHS, 2014d).

Causes

A bunion is the result of a deformity in the joint of your big toe. The exact cause isn't clear.

However, possible causes may include -

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[27] they are health care professionals who have been trained to prevent, diagnose, treat and rehabilitate abnormal conditions of the feet and lower limbs. They also prevent and correct deformity, keep people mobile and active, relieve pain and treat infections. They are also known as 'chiropodists'

- Family history,
- Arthritis,
- Other conditions - such as cerebral palsy and Marfan syndrome
- Poorly fitting shoes (NHS, 2014d).

Family history If other members of your family have bunions, your risk of developing them is increased. However, this doesn't mean you'll definitely develop bunions (NHS, 2014d).

Arthritis The types of arthritis thought to cause bunions are -

- rheumatoid arthritis - inflammation and pain in the joints because of the immune system attacking the joint lining. See also Rheumatoid arthritis,
- gout - a type of arthritis that commonly affects the big toe,
- psoriatic arthritis - a type of arthritis associated with the skin condition psoriasis (NHS, 2014d).

Arthritis in the toe may also develop as a result of a bunion (NHS, 2014d).

Other conditions A number of other conditions are also thought to increase your chances of developing bunions.

For example, conditions associated with loose ligaments, flexible joints and low muscle tone could increase the likelihood of bunions developing.

These include neuromuscular conditions, such as cerebral palsy, and connective tissue disorders, such as Marfan syndrome (NHS, 2014d).

Poorly fitting shoes Poorly fitting shoes can contribute to the development of bunions. Bunions are rare in populations that don't wear shoes.

Wearing shoes that are too tight and don't fit properly is likely to make an existing bunion worse.

Shoes that are too tight may rub against your big toe joint. High-heeled shoes that are too tight will squeeze your feet, causing your big toe to remain in a bent position. This can stretch the toe, put pressure on the nerves around it and lead to pain.

High heels also push most of your body weight forwards onto the front of your foot, which places considerable strain on your toe joints (NHS, 2014d).

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Treatment

A bunion may only need to be treated if it's severe and causing significant pain and discomfort.

The various treatments for bunions are outlined below (NHS, 2014d).

Non-surgical treatment If possible, non-surgical treatment for bunions will be used, which your GP can discuss with you.

Non-surgical treatments can ease the pain and discomfort caused by a bunion, but they can't change the shape of your foot or prevent a bunion from getting worse over time (NHS, 2014d).

Non-surgical treatments include -

- Painkillers,
- Bunion pads,
- Orthotics,
- wearing Suitable footwear (NHS, 2014d).

These are discussed in more detail below.

Painkillers If your bunion is painful, over-the-counter painkillers such as paracetamol or ibuprofen may be recommended.

When using painkillers, always read the patient information leaflet that comes with the medicine and follow the recommended dose (NHS, 2014d).

Bunion pads Bunion pads may also ease the pain of a bunion. Reusable bunion pads, made of either gel or fleece, are available over the counter from pharmacies.

Some are adhesive and stick over the bunion, while others are held against your foot by a small loop that fits over your big toe.

Bunion pads stop your foot rubbing on your shoe and relieve the pressure over the enlarged joint at the base of your big toe (NHS, 2014d).

Orthotics Orthotics are placed inside your shoes to help realign the bones of your foot. They may help relieve the pressure on your bunion, which can ease the pain. However, there's little evidence that orthotics are effective in the long term.

It's important that the orthotic fits properly, so you may want to seek advice from your GP or podiatrist, who can suggest the best ones for you.

You can buy orthotics over the counter from pharmacies, or they can be custom-made by a podiatrist to fit your feet. Whether you need to buy an over-the-counter orthotic or have one specially made will depend on your individual circumstances and the severity of your bunion.

You can also use special bunion splints, worn over the top of your foot and your big toe to help straighten its alignment. Splints are available for both daytime and night-time use. However, there's little evidence that splints are effective.

Toe spacers are also available, which can help reduce the pain caused by bunions. However, toe spacers or orthotics may be of limited use because they often compete with the bunion for the already limited space in the shoe (NHS, 2014d).

1. Ice packs
   If your toe joint is painful and swollen, applying an ice pack to the affected area several times a day can help to relieve the pain and inflammation. Never apply ice directly to your skin. Wrap it in a cloth or tea towel. A bag of frozen vegetables makes a good ice pack (NHS, 2014d).

Suitable footwear It's recommended that you wear flat or low-heeled, wide-fitting shoes if you have a bunion. Shoes made from soft leather are ideal because they'll relieve any pressure on the bunion.

Avoid narrow or slip-on shoes. High heels can also make your bunion worse by putting excessive pressure on your toes (NHS, 2014d).

Surgery Surgery is the only way to correct a bunion. A bunion will usually get worse over time, so if it's left untreated it's likely to get bigger and become more painful.

If your bunion is causing a significant amount of pain and affecting your quality of life, your GP may refer you to be assessed for bunion surgery.

The aim of surgery is to relieve pain and improve the alignment of your big toe. Surgery isn't usually carried out for cosmetic reasons alone. Even after surgery, there may still be limits to the styles of shoe you can wear.

Bunion surgery is often carried out as a day procedure, which means you won't have to stay in hospital overnight. The procedure will either be carried out under a local anaesthetic or a general anaesthetic (NHS, 2014d).

Deciding to have surgery When deciding whether to have bunion surgery, there are several things to consider including -

- **your age** - in children, bunion surgery is often delayed because of the risk of the bunion returning,
- **your medical history and general health** - problems with wound healing and infections are more likely in certain conditions such as diabetes; you're also more likely to develop problems if your bunion is caused by a condition such as rheumatoid arthritis,
- **your occupation and lifestyle** - bunion surgery can make your toes less flexible, and you may be unable to return to the same level of physical activity,
- **your expectations of surgery** - bunion surgery has about an 85% success rate, but there's no guarantee that your foot will be perfectly straight or pain-free; the success of surgery depends on the type of procedure, the experience of the surgeon and your ability to rest after the operation,
- **the severity of your symptoms** - surgery will usually only be recommended if your bunions are causing considerable pain and non-surgical treatments have been unsuccessful (NHS, 2014d).

Types of surgery There are a number of different surgical procedures used to treat bunions. The type of surgery recommended for you will depend on the severity of the deformity.

Your surgeon may use pins, wires or screws to hold the bones in place while they heal. Depending on the type of surgery you have, these may be left in your foot or removed later on.

Some of the surgical procedures for bunions are described below (NHS, 2014d).

Osteotomy Osteotomy is the most commonly used and proven type of bunion surgery. Although there are many different types of osteotomy, they generally involve cutting and removing part of the bone in your toe.

During the procedure, your surgeon will remove the bony lump and realign the bones inside your big toe. They'll also move your toe joint back in line, which may involve removing other pieces of bone, possibly from the neighbouring toes.

A procedure called distal soft tissue realignment may be combined with an osteotomy. This involves altering the tissue in your foot to help correct the deformity and improve the stability and appearance of the foot (NHS, 2014d).

Arthrodesis Arthrodesis involves fusing together two bones in your big toe joint (metatarsophalangeal joint).

The procedure is usually only recommended for people with severe deformities of the big toe joint, which make it too difficult for doctors to completely fix the joint, or when there's advanced degeneration of the joint.

After arthrodesis, the movement of your big toe will be severely limited and you won't be able to wear high heels (NHS, 2014d).

Excision (Keller's) arthroplasty An excision arthroplasty involves removing the bunion and the toe joint. A false joint is created by scar tissue that forms as a result of the operation.

The procedure involves pinning the joint in place with wires, which will be removed around three weeks after surgery is carried out.

An excision arthroplasty can only be used in certain circumstances, and is usually reserved for severe, troublesome bunions in elderly people (NHS, 2014d).

Minimally invasive bunion surgery In 2010, the National Institute for Health and Care Excellence (NICE) published guidance about a minimally invasive surgical procedure to treat bunions. The aim of the procedure is to repair the tilting of the big toe.

The technique can be carried out under a local anaesthetic or a general anaesthetic, using X-rays or an endoscope for guidance. The type of endoscope used will be a long, thin, rigid tube with a light source and video camera at one end.

One or more incisions will be made near the big toe so that bone-cutting instruments can be inserted. These will be used to remove the bunion and to divide one or more bones located at the front of the foot.

Wires, screws or plates will be used to keep the divided bones in place. After the procedure, you may need to wear a plaster cast or dressing to keep your foot in the correct position until the bones have healed. You may be given a special surgical shoe that enables you to walk on your heel.

As the procedure is relatively new, there's little in the way of reliable evidence regarding its safety or effectiveness.

See the NICE guidance about the surgical correction of hallux valgus using minimal access techniques (NHS, 2014d).

After surgery After bunion surgery, your foot and ankle may be swollen for three months or longer. While you're recovering, you'll need to keep your foot raised to reduce swelling, and you'll need crutches to move around.

It's likely that you'll be unable to wear normal shoes for at least six months after surgery. You may have a cast or bandage and postoperative shoes (shoes specially designed to allow heel walking and protect the bony cuts) before you can start wearing regular footwear. This will keep the bones and soft tissues in place while they heal (NHS, 2014d).

Complications

Bunion surgery can sometimes cause further problems, as can leaving bunions untreated (NHS, 2014d).

Untreated bunions Many bunions will never cause problems, but some may get worse if left untreated, so it's worth seeing your GP if you have one.

Untreated bunions can lead to further problems, such as arthritis in the joint of the big toe. The big toe can also cause deformity of the second toe, by pushing it out of place (NHS, 2014d).

Surgical complications In less than 10% of cases, complications occur after bunion surgery. These will depend on the type of surgery you have and can include -

- infection,
- deep vein thrombosis (DVT),
- stiffness in your toe joints,
- a delay or failure of the bone to heal, or the bone healing in the wrong position,
- pain under the ball of your foot,
- damage to the nerves in your foot,
- prolonged swelling and continued pain,
- the need for further surgery,
- thickened scar tissue,
- the bunion returning,
- complex regional pain syndrome - a condition that causes long-term burning pain in one of the limbs (NHS, 2014d).

Speak to your GP or surgeon if you have any concerns after surgery, or if you experience any of these complications. They can advise you on how to deal with these complications, including further treatment options (NHS, 2014d).

Calluses

Callus is an extended area of thickened, hard skin on the soles of the feet. It is usually symptomatic of an underlying problem such as a bony deformity, a particular style of walking or inappropriate footwear. Some people have a natural tendency to form callus because of their skin type. Elderly people have less fatty tissue in their skin and this can lead to callus forming on the ball of the foot (SCPOD, 2016).

Calluses are hard, rough areas of skin that are often yellowish in colour. They can develop on the -

- feet - usually around the heel area or on the skin under the ball of the foot,
- palms of the hands,
- knuckles (NHS, 2016c)

Calluses are larger than corns and don't have such a well-defined edge. As callused skin is thick, it's often less sensitive to touch than the surrounding skin.

Calluses develop when the skin rubs against something, such as a bone, a shoe or the ground. They often form over the ball of your foot because this area takes most of your weight when you walk.

Activities that put repeated pressure on the foot, such as running or walking barefoot, can cause calluses to form. Athletes are particularly susceptible to them (NHS, 2016c).

Other possible causes of calluses include -

- dry skin,
- reduced fatty padding - elderly people have less fatty tissue in their skin,
- regularly holding objects such as a hammer or racquet (NHS, 2016c).

Treatment

You should only treat calluses yourself after a podiatrist has identified the cause and advised you about treatment.

The podiatrist may be able to treat corns or badly callused areas using a sharp blade to remove the thickened area of skin. This is painless and should help reduce pain and discomfort. They can also provide advice on self-care and prescribe special insoles (NHS, 2016c).

Prevention

See also Prevention.

Chilblains

Chilblains are small, itchy swellings on the skin that occur as a reaction to cold temperatures. They most often affect the body's extremities, such as the toes, fingers, heels, earlobes and nose, (NHS, 2015b) which tend to be more vulnerable to the cold. Chilblains tend to be very itchy and may be accompanied by a burning sensation (FOOT, 2014).

Figure 3.3: Chilblains

Chilblains can be uncomfortable but rarely cause any permanent damage. They normally heal within a few weeks if further exposure to the cold is avoided (NHS, 2015b).

Chilblains start as red lumps that can be painful and tender, and sometimes these lumps can blister. Chilblains will typically last about seven days and will heal on their own. However, if a blister or ulcer forms, there is a risk of infection. Some people will get chilblains each winter and should take extra care to keep their extremities as warm as possible (FOOT, 2014).

Symptoms

Chilblains usually develop several hours after exposure to the cold. They typically cause a burning and itching sensation in the affected areas, which can become more intense if you go into a warm room.

The affected skin may also swell and turn red or dark blue. In severe cases, the surface of the skin may break and sores or blisters can develop.

It's important not to scratch the skin as it can break easily and become infected (NHS, 2015b).

When to seek medical advice

Most people don't need to seek medical advice if they have chilblains as they usually heal within a few weeks and don't cause any permanent problems (NHS, 2015b).

However, see your GP or chiropodist for advice if you have -

- severe or recurring chilblains,
- chilblains that don't improve within a few weeks (NHS, 2015b).

You should also seek medical advice if you think your skin may have become infected. Signs of infection include -

- swelling and pus forming in the affected area,
- feeling generally unwell,
- a high temperature (fever) of 38'C (100.4'F) or above,
- swollen glands (NHS, 2015b).

Causes

Chilblains are the result of an abnormal reaction to the cold. They are common in the UK because damp, cold weather is usual in the winter. Some people develop chilblains every winter that last for several months.

When the skin is cold, blood vessels near its surface get narrower. If the skin is then exposed to heat, the blood vessels become wider.

If this happens too quickly, blood vessels near the surface of the skin can't always handle the increased blood flow. This can cause blood to leak into the surrounding tissue, which may cause the swelling and itchiness associated with chilblains (NHS, 2015b).

Some people are more at risk of chilblains than others. This includes people with -

- poor circulation,
- a family history of chilblains,
- regular exposure to cold, damp or draughty conditions,
- a poor diet or low body weight,
- lupus [28] - a long-term condition that causes swelling in the body's tissues,

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[28] an incurable immune system illness, probably genetic in origin and mainly suffered by females

- Raynaud's phenomenon [29] - a common condition that affects the blood supply to certain parts of the body, usually the fingers and toes (NHS, 2015b).

People who smoke are more at risk of chilblains as nicotine constricts blood vessels.

Chilblains can also occur on areas of the feet that are exposed to pressure, such as a Bunions or a toe that's squeezed by tight shoes (NHS, 2015b).

Treatment

Chilblains often get better on their own without treatment after a week or two.

It may help to use a soothing lotion, such as calamine or witch hazel, to relieve itching. Your pharmacist may also be able to recommend a suitable product.

If your chilblains are severe and keep returning, speak to your GP. They may recommend taking a daily tablet or capsule of a medication called nifedipine. This works by relaxing the blood vessels, improving your circulation.

Nifedipine can be used to help existing chilblains heal or can be taken during the winter to stop them developing (NHS, 2015b).

Prevention

If you're susceptible to chilblains, you can reduce your risk of developing them by -

- limiting your exposure to the cold,
- looking after your feet,
- taking steps to improve your circulation (NHS, 2015b).

If your skin gets cold, it's important to warm it up gradually. Heating the skin too quickly, for example by placing your feet in hot water or near a heater, is one of the main causes of chilblains (NHS, 2015b).

The following advice should help -

- **stop smoking** - nicotine causes the blood vessels to constrict, which can make chilblains worse,
- **keep active** - this helps improve your circulation,

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[29] a common condition that affects the blood supply to certain parts of the body - usually the fingers and toes

- **wear warm clothes and insulate your hands, feet and legs** - wearing long johns, long boots, tights, leg warmers or long socks will help, and it's a good idea to wear a clean pair of socks if you get cold feet in bed,
- **avoid tight shoes and boots** - these can restrict the circulation to your toes and feet,
- **moisturise your feet regularly** - this stops them drying out and the skin cracking,
- **eat at least one hot meal during the day** - this will help warm your whole body, particularly in cold weather,
- **warm your shoes on the radiator before you put them on** - make sure damp shoes are dry before you wear them; if your feet are already cold, make sure your shoes aren't too hot to avoid causing chilblains,
- **warm your hands before going outdoors** - soak them in warm water for several minutes and dry thoroughly, and wear cotton-lined waterproof gloves if necessary; if your hands are already cold, make sure not to warm them up too quickly to avoid causing chilblains,
- **keep your house well heated** - try to keep one room in the house warm and avoid drafts,
- **if you are diabetic, regularly check your feet** (or ask someone else to do this) - people with diabetes may not be able to feel their feet and could have infected chilblains without realising it (NHS, 2015b).

Complications

If you have severe or recurring chilblains, there's a small risk of further problems developing, such as -

- infection from blistered or scratched skin,
- ulcers forming on the skin,
- permanent discolouration of the skin,
- scarring of the skin (NHS, 2015b).

It's often possible to avoid these complications by -

- not scratching or rubbing the affected areas of skin,
- not directly overheating the chilblains (by using hot water, for example) (NHS, 2015b).

You can also help reduce your risk of infection by cleaning any breaks in your skin with antiseptic and covering the area with an antiseptic dressing. The dressing should be changed every other day until the skin heals.

If the skin does become infected, antibiotics may be prescribed to treat the infection (NHS, 2015b).

Corns

Corns are the small, hard areas of dry skin that most commonly appear on the tops of the toes. Pressure from footwear causes a callus to form, and the central portion then grows rapidly into the skin, putting pressure on the underlying nerves and joints.

'*Corns can be very painful, so it's better to go and see a podiatrist than try to manage them yourself,*' '*Corn pads contain an acid that can irritate the surrounding skin, but a podiatrist will reduce the hard skin and advise you on the correct footwear to help minimise the pressure*' (AGEUK, 2016a).

Corns are often caused by -

- wearing shoes that fit poorly - shoes that are too loose can allow your foot to slide and rub,
- certain shoe designs that place excessive pressure on an area of the foot - for example, high-heeled shoes can squeeze the toes (NHS, 2016c).

Figure 3.4: Corns

Corns often occur on bony feet as there's a lack of natural cushioning. They can also develop as a symptom of another foot problem, such as -

- a bunion - where the joint of the big toe sticks outwards as the big toe begins to point towards the other toes on the same foot,
- hammer toe - where the toe is bent at the middle joint (NHS, 2016c).

Treating corns

Corns on feet won't get better unless the cause of the pressure is removed. If the cause isn't removed, the skin could become thicker and more painful over time.

A corn is a symptom of an underlying problem. You should only treat it yourself if you know the cause and you've spoken to a podiatrist about the best way to manage it.

Over-the-counter treatments for corns, such as corn plasters, are available from pharmacists. However, they don't treat the cause of the corn and may affect the normal, thinner skin surrounding the corn.

Corn plasters may not be suitable for certain people, such as those with diabetes, circulation problems, or fragile skin (NHS, 2016c).

Prevention

You can also help prevent corns and calluses by looking after your feet and choosing the right shoes to wear.

Follow the advice below to help stop any hard dry skin developing -

- Dry your feet thoroughly after washing them and apply a special moisturising foot cream (not body lotion).
- Use a pumice stone or foot file regularly to gently remove hard skin. If you use a pumice stone, make sure it dries completely between uses and doesn't harbour bacteria.
- Wear comfortable footwear that fits properly. Always shop for shoes in the afternoon, because your feet swell as the day goes on. This means shoes that fit in the afternoon will be comfortable. You should be able to move your toes inside the shoe with a small gap between the front of the shoe and your longest toe. If possible, avoid wearing heels as they increase the pressure on the front of your feet.
- Don't put up with foot pain as if it's normal. Either see a podiatrist directly or go to your GP, who may refer you to a podiatrist. They'll be able to investigate the underlying cause of your foot pain (NHS, 2016c).

Cracked heels

'*This often affects women who wear sandals in the summer,*' says Mike O'Neill. '*If the skin in this area becomes dry and leathery it loses flexibility and cracks can develop. These are as sore as paper cuts and can easily get infected if you don't wear socks or closed shoes.*'

'*In most cases heel balm - which you can buy in the chemist - will fix the problem. It contains lactic acid to remove some of the dry skin, and a rich emollient to nourish your feet. However, if you are diabetic, if more cracks develop or if there is any sign of infection, see a podiatrist*' (AGEUK, 2016a).

Gout

Gout is a type of arthritis in which small crystals form inside and around the joints. It causes sudden attacks of severe pain and swelling.

It's estimated that between one and two in every 100 people in the UK are affected by gout.

The condition mainly affects men over 30 and women after the menopause. Overall, gout is more common in men than women.

Gout can be extremely painful and debilitating, but treatments are available to help relieve the symptoms and prevent further attacks (NHS, 2015g).

Figure 3.5: Gout

Symptoms

The main symptom of gout is a sudden attack of severe pain in one or more joints, typically your big toe (NHS, 2015g).

Other symptoms can include -

- the joint feeling hot and very tender, to the point of being unable to bear anything touching it,
- swelling in and around the affected joint,
- red, shiny skin over the affected joint,
- peeling, itchy and flaky skin as the swelling goes down (NHS, 2015g).

The intense pain can make getting around difficult. Even the light pressure of a bed cover or blanket can be unbearable (NHS, 2015g).

Which joints can be affected? Gout can affect almost any joint and can occur in more than one joint at the same time.

The joints towards the ends of the limbs tend to be affected more often, including the -

- toes - particularly the big toe joint,
- midfoot (where your shoelaces sit),
- ankles,
- knees,
- fingers,
- wrists,

- elbows (NHS, 2015g).

If gout is left untreated, it's likely to affect more joints over time (NHS, 2015g).

Pattern of symptoms Attacks of gout tend to -

- occur at night, although they can happen at any time,
- develop quickly over a few hours,
- last between three and 10 days - after this time, the affected joint should start to return to normal, but the problem can persist if treatment isn't started early,
- come back – you may experience attacks every few months or years,
- become more frequent over time if not treated (NHS, 2015g).

It's difficult to predict how often attacks will occur and when exactly they will happen (NHS, 2015g).

When to seek medical advice See your GP if you suspect you have gout and it hasn't been previously diagnosed.

Contact your GP immediately or call NHS 111 if you have both -

- severe, worsening joint pain and swelling,
- a high temperature (fever) of 38'C (100.4'F) or above (NHS, 2015g).

This could mean you have an infection inside the joint (septic arthritis [30]).

If you've already been diagnosed with gout and you have an attack, see your GP if any medication you've been prescribed doesn't start working within a couple of days (NHS, 2015g).

Causes

Gout is caused by small crystals forming in the joints, resulting in severe pain, tenderness and swelling.

These crystals can grow when a waste product called uric acid starts to build up to high levels in the body (NHS, 2015g).

Uric acid Uric acid is created when the body breaks down chemicals known as purines.

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[30] the inflammation of a joint caused by a bacterial infection. It is also known as infectious or bacterial arthritis

If your kidneys don't filter out enough uric acid, or your body is producing unusually high levels of it, it can build up in the body and turn into microscopic crystals.

These crystals usually form in and around the joints, possibly because the temperature in these areas is slightly lower than the rest of the body. If they get into the space between joints, the crystals can cause painful inflammation (redness and swelling) (NHS, 2015g).

What can increase your risk?

A high level of uric acid in the blood is the main factor that increases your risk of developing gout. However, it's still uncertain why some people with a high level of uric acid in the blood develop gout, while others with an equally high level don't.

Other factors that may increase your risk of developing gout are outlined below (NHS, 2015g).

Medical conditions Some underlying medical conditions can increase your risk of developing gout, including -

- high blood pressure,
- Diabetes,
- kidney disease,
- high levels of fat and cholesterol in your blood,
- obesity,
- metabolic syndrome (a combination of diabetes, high blood pressure and obesity),
- psoriasis (a skin condition that causes red, flaky, crusty patches of skin covered with silvery scales),
- Osteoarthritis (NHS, 2015g).

Medication Certain medications can increase your uric acid levels and your risk of developing gout. These include -

- diuretics (water tablets) - used to treat high blood pressure or an abnormal build-up of fluid in your body,
- certain medicines used to treat high blood pressure - including beta-blockers and ACE inhibitors,
- low-dose aspirin - used to reduce the risk of blood clots,
- niacin - used to treat high cholesterol,

- ciclosporin - used to treat conditions such as psoriasis,
- some chemotherapy medicines (NHS, 2015g).

Diet Uric acid is created when the body breaks down purines. Eating foods that contain a high level of purines can increase your risk of gout (NHS, 2015g).

Foods naturally high in purines include -

- red meat - such as beef, lamb and pork,
- seafood - especially shellfish and oily fish,
- offal - such as liver, kidneys and heart (NHS, 2015g).

Alcohol Alcoholic drinks can raise the level of uric acid in the blood.

Beer, fortified wines like port, and spirits do this more than wine. Moderate consumption of wine - one or two glasses a day - shouldn't significantly increase your risk of gout (NHS, 2015g).

Sugary drinks Certain sugary drinks may also increase your risk of gout.

Some research has found that drinking sugar-sweetened soft drinks and drinks with high levels of fructose (a naturally occurring sugar found in many fruits) had an increased risk of gout (NHS, 2015g).

Family history Studies have shown that gout often runs in families. Around one in five people with gout have a close family member with the condition (NHS, 2015g).

Diagnosis

Your GP may suspect gout based on your symptoms. Sometimes further tests will be needed to confirm the diagnosis and rule out other possible causes (NHS, 2015g).

Seeing your GP See your GP if you experience symptoms of gout for the first time.

Your GP will ask about your symptoms and medical history, and examine the affected area, to help make a diagnosis.

They may also ask you about your diet, particularly your intake of beer, spirits and foods high in purines, such as red meat and seafood (NHS, 2015g).

Further tests

Many conditions can cause gout-like symptoms.

Your GP may be unable to make a firm diagnosis straight away and you may be referred for further tests. These will either confirm the diagnosis of gout or rule out other conditions (NHS, 2015g).

Joint fluid test A sample of fluid may be taken from the affected joint. The fluid can be checked for the small crystals that cause gout, and it can be tested for infection to rule out septic arthritis (NHS, 2015g).

Blood test A blood test known as a serum uric acid test may be used to measure the amount of uric acid in your blood. A high level or uric acid is often associated with gout.

It's sometimes best to wait until two to four weeks after an attack of gout before this test is carried out, as the level of uric acid in your blood is often not raised at the time of an attack. This is because the level of uric acid in your blood can drop when uric acid crystals form in the joints (NHS, 2015g).

X-ray An X-ray is rarely used to diagnose gout because the condition isn't usually detectable using this method.

However, an X-ray is sometimes used to help rule out similar conditions that affect the joints, such as chondrocalcinosis (a build-up of calcium crystals in the joints) or to assess whether there has been any joint damage due to repeated or persistent attacks of gout (NHS, 2015g).

Ultrasound scan An ultrasound scan of an affected joint is a simple and safe investigation that's increasingly used to detect crystals in the joints. It can also detect crystals deep in the skin that aren't obvious during a physical examination (NHS, 2015g).

Treatment

Treatment for gout includes pain relief to help you cope with a gout attack, as well as medication and lifestyle changes to prevent further attacks (NHS, 2015g).

Pain relief for a gout attack

What to do during an attack

- take any medication you've been prescribed as early as possible after you notice an attack (see below) - this should start to have an effect within two or three days,
- rest and raise the limb,
- avoid knocking or damaging the affected joint,
- keep the joint cool - remove surrounding clothing and apply an ice pack, such as a bag of frozen peas wrapped in a towel,
- ensure you're well hydrated (NHS, 2015g).

Apply the ice pack to your joint for around 20 minutes. Don't apply ice directly to your skin and don't apply it for more than 20 minutes at a time because this could damage the skin.

If necessary, you can keep reapplying an ice pack to your skin during an attack, but you should wait until your skin has returned to a normal temperature first (NHS, 2015g).

NSAIDs Non-steroidal anti-inflammatory drugs (NSAIDs) are usually recommended as the first treatment for gout. They work by reducing pain and inflammation during an attack.

NSAIDs used to treat gout include naproxen, diclofenac and etoricoxib.

If you've been prescribed NSAIDs, it's a good idea to have them with you at all times so you can use them at the first sign of a gout attack. Continue to take your medication throughout the attack and for 48 hours afterwards.

Your GP may also prescribe a medication called a proton pump inhibitor (PPI), to take alongside your NSAID. This reduces the risk of the NSAID causing indigestion, stomach ulcers and bleeding from the stomach (NHS, 2015g).

Colchicine If you're unable to take NSAIDs or if NSAIDs are ineffective, a medicine called colchicine can be used instead.

Colchicine reduces some of the swelling and pain associated with a gout attack.

It's best to have it with you at all times so you can use it at the first sign of a gout attack. Your GP will tell you how long to take it for and how often.

When taken in high doses, side-effects of colchicine include feeling sick, abdominal (tummy) pain and diarrhoea (NHS, 2015g).

Corticosteroids Corticosteroids are sometimes used to treat severe cases of gout if other treatments don't work or you're unable to take an NSAID or colchicine (NHS, 2015g).

A short course of steroid tablets often provides relief, but they can't be used long-term in high doses as they cause side-effects, including -

- weight gain,
- thinning of the bones (osteoporosis),
- easy bruising,
- muscle weakness (NHS, 2015g).

Corticosteroids can also be given by injection to provide rapid pain relief. This can be either into a muscle, a vein or directly into the affected joint (NHS, 2015g).

Medication and lifestyle changes to prevent further attacks

You can reduce your chances of having further gout attacks by taking medication and making lifestyle changes to reduce the level of uric acid in your body (NHS, 2015g).

Medication Medication to reduce uric acid levels - known as urate-lowering therapy (ULT) - is usually recommended if you have recurrent attacks of gout or you have complications of gout.

Most people with gout will eventually need to have ULT, so you may want to discuss the advantages and disadvantages of this treatment with your GP as soon as you've been diagnosed with gout.

They should explain that while ULT can significantly reduce your risk of having further attacks, the medication needs to be taken on a daily basis for the rest of your life and there's a small risk of side-effects.

If you decide to start ULT, a medicine called allopurinol is usually tried first. If this isn't suitable or doesn't work, other medications may be used instead. These medications are described below (NHS, 2015g).

Allopurinol Allopurinol helps reduce the production of uric acid. It can help prevent gout attacks, although it won't help relieve symptoms during an attack.

Allopurinol is a tablet taken once a day. When you first start taking it, your dose will be adjusted to make sure the level of uric acid in your blood is low enough.

Regular blood tests will be needed to monitor this until the most effective dose is found.

Allopurinol can sometimes cause a gout attack soon after you start taking it and it can take up to a year or two before no further attacks occur. It's important to persevere with treatment even if you do have attacks during this time.

To help relieve attacks, your doctor will prescribe one of the pain relieving medications described above to take alongside your allopurinol at first (NHS, 2015g).

Most people taking allopurinol won't experience any significant side-effects. However, side-effects can include -

- a rash - this is usually mild and goes away on its own, but it can be a sign of an allergy; if you develop a rash, stop taking the medication immediately and contact your GP for advice,
- indigestion,
- headaches,
- diarrhoea (NHS, 2015g).

Febuxostat Like allopurinol, febuxostat is a medication taken once a day that reduces the body's production of uric acid. It's often used if allopurinol isn't suitable or causes troublesome side-effects.

As with allopurinol, febuxostat can make your symptoms worse when you first start taking it. Your doctor will initially prescribe one of the pain relieving medications described in case you experience attacks (NHS, 2015g).

Side-effects of febuxostat can include -

- diarrhoea,
- feeling sick,
- headaches,
- a rash (NHS, 2015g).

Other medications Less commonly used ULT medications include benzbromarone and sulfinpyrazone.

These types of medication tend to only be used if people are unable to take allopurinol or febuxostat. They need to be prescribed under the supervision of a specialist (NHS, 2015g).

Lifestyle changes Certain lifestyle changes can also help reduce your risk of experiencing further attacks of gout, including -

- **avoiding foods containing high levels of purine** (the chemical involved in the production of uric acid), such as red meat, offal, oily fish, seafood and foods containing yeast extract - see the gout and diet leaflet produced by the UK Gout Society,
- **avoiding sugary drinks and snacks** - these are associated with an increased risk of gout,
- **maintaining a healthy weight** - follow a balanced diet; don't crash diet or try high-protein, low-carbohydrate diets,
- **taking regular exercise** - try activities that don't put too much strain on your joints, such as swimming,
- **drinking plenty of water** - keeping yourself well hydrated will reduce the risk of crystals forming in your joints,
- **cutting down on alcohol** - avoid beer and spirits in particular and don't binge drink (NHS, 2015g).

There's some evidence to suggest that taking regular vitamin C supplements can reduce gout attacks, although the effect may only be small. Talk to your GP first if you're thinking about taking vitamin C supplements, as they aren't suitable or safe for everyone (NHS, 2015g).

Complications

Complications of gout can include small lumps forming under the skin (tophi), joint damage and kidney stones. These are more likely to occur if gout is left untreated (NHS, 2015g).

Tophi Gout is caused by a chemical called uric acid forming small crystals in and around the joints. These crystals also often build up under the skin and form small white or yellow lumps known as tophi.

Tophi are usually painless, but they can form in awkward places, such as at the ends of your fingers and around your toes. Sometimes they can make everyday tasks such as preparing food or getting dressed difficult.

They can also can become inflamed and produce a toothpaste-like discharge (NHS, 2015g).

Tophi can develop anywhere in the body, but usually form on the -

- toes,
- heels,
- knees,
- fingers,

- ears,
- forearms,
- elbows (NHS, 2015g).

It normally takes several years after the first attack of gout for tophi to develop, but some people develop them even before experiencing an attack. They're usually a sign of severe gout and a good reason to start treatment to reduce the level of uric acid in your body.

Successful treatment will prevent the tophi from getting any bigger, and long term treatment often gradually shrinks them.

If you have very large or painful tophi, they may have to be surgically removed (NHS, 2015g).

Joint damage Without treatment, gout attacks may become more frequent and prolonged, and your likelihood of developing permanent joint damage will increase.

In the most serious cases, surgery may be required to repair or replace a damaged joint (NHS, 2015g).

Kidney stones Occasionally, high levels of uric acid can lead to the formation of kidney stones.

Some kidney stones interfere with the flow of urine, resulting in pain when you pass urine, and can make you feel that you need to pass urine more often.

You may be prescribed medication to make your urine less acidic, which should help dissolve any kidney stones that have developed (NHS, 2015g).

Psychological and emotional effects Gout can also affect your mood, work and home life. The severe pain that gout causes can make it difficult to do everyday tasks and to get around, which in turn can lead to feelings of depression or anxiety.

If gout is affecting your mood or making everyday life difficult, talk to your GP. They will be able to offer treatment and support.

There are also a number of organisations that offer information and advice for people who have gout, including The UK Gout Society, Arthritis Research UK and Arthritis Care.

Hammer toe

A hammer toe is a common deformity of the second, third or fourth toe, which makes it look as if it is permanently bent at the joint. This can be present from birth, but often develops over time as a result of injury, rheumatoid arthritis, bunions or badly-fitting shoes.

’*If the joint sticks out, you’re more likely to have problems with shoes rubbing and may also develop corns and calluses. Corrective insoles can help but severe cases may require surgery*’ says Mike O’Neill (AGEUK, 2016a).

Figure 3.6: Hammer toe

Hammer toe can cause other problems. Because the toe joint sticks out, it is more susceptible to shoes rubbing, meaning corns and calluses can develop. Hammer toes can also cause stress on the ball of the foot, which can lead to pain known as metatarsalgia (FOOT, 2014).

Ingrown toenail

This occurs when the sides of the toenail grow into the surrounding skin, making it red and sore. The big toe is the most commonly-affected and they are a particular problem for older people as the nails naturally get thicker with age.

Figure 3.7: Ingrown toenail

’*Badly-cut toenails and tight shoes are the most likely causes but you can prevent problems by cutting your nails straight across, wearing comfortable shoes, washing your feet regularly and gently pushing the skin away from the nail using a cotton bud.*’

’*If it doesn’t improve, a podiatrist may suggest removing part or all of your toenail to prevent further problems*’, says Mike O’Neill (AGEUK, 2016a).

Verrucas

Verrucas are warts on the soles of the feet - often found on the heel or ball of the foot. They

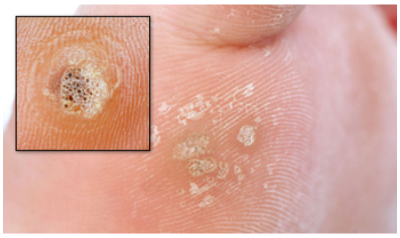

Figure 3.8: Veruccas

are caused by a virus (human papillomavirus) and range in size from approximately 1mm to 10mm. They can appear in pairs or groups and are flat, rough areas of skin - sometimes with a cluster of black dots at their centre.

Verrucas (like warts) are contagious but the risk of passing them on to others is low. The skin is most vulnerable when damaged, in contact with rough surfaces or if it's wet, for example in swimming pools and changing rooms. Verrucas are rarely painful and will often disappear without treatment within a year of appearing. Salicylic acid can speed up the process and is available from pharmacies (FOOT, 2014).

Gender dysphoria

You might be elderly and not transitioned, so this section may help you. Or you may have transitioned some time ago, so this section may help you by telling you the updated thinking about gender dysphoria.

Gender dysphoria is a condition where a person experiences discomfort or distress because there's a mismatch between their biological sex and gender identity. It's sometimes known as gender identity disorder (GID), gender incongruence or transgenderism.

Biological sex is assigned at birth, depending on the appearance of the genitals. Gender identity is the gender that a person ”identifies” with or feels themselves to be.

While biological sex and gender identity are the same for most people, this isn't the case for everyone. For example, some people may have the anatomy of a man, but identify themselves as a woman, while others may not feel they're definitively either male or female.

This mismatch between sex and gender identity can lead to distressing and uncomfortable feelings that are called gender dysphoria. Gender dysphoria is a recognised medical condition, for which treatment is sometimes appropriate. It's not a mental illness.

Some people with gender dysphoria have a strong and persistent desire to live according to their gender identity, rather than their biological sex. These people are sometimes called transsexual or trans people. Some trans people have treatment to make their physical appearance more consistent with their gender identity (NHS, 2016d).

Symptoms

There are no physical symptoms of gender dysphoria, but people with the condition may experience and display a range of feelings and behaviours.

In many cases, a person with gender dysphoria begins to feel a mismatch between their biological sex and gender identity during early childhood. For others, this may not happen until adulthood.

If you're a teenager or an adult whose feelings of gender dysphoria begun in childhood, you may now have a much clearer sense of your gender identity and how you want to deal with it. Many people with strong feelings of gender dysphoria are fully transsexual during their teenage years (NHS, 2016d).

If you're a teenager or adult with gender dysphoria, you may feel -

- without doubt that your gender identity is at odds with your biological sex,
- comfortable only when in the gender role of your preferred gender identity,
- a strong desire to hide or be rid of the physical signs of your sex, such as breasts, body hair or muscle definition,
- a strong dislike for - and a strong desire to change or be rid of - the genitalia of your biological sex (NHS, 2016d).

Without appropriate help and support, some people may try to suppress their feelings and attempt to live the life of their biological sex. Ultimately, however, most people are unable to keep this up.

Having or suppressing these feelings is often very difficult to deal with and, as a result, many transsexuals and people with gender dysphoria experience depression, self-harm or suicidal thoughts.

See your GP as soon as possible if you've been feeling depressed or suicidal.

Alternatively, you can call the Samaritans for free on 116 123. They're available 24 hours a day to talk through any issues you may be experiencing, and will do so in total confidence. Alternatively, you can email jo@samaritans.org (NHS, 2016d).

Treatment

Treatment for gender dysphoria aims to help people with the condition live the way they want to, in their preferred gender identity.

What this means will vary from person to person, and is different for children, young people and adults. Your specialist care team will work with you on a treatment plan that's tailored to your needs (NHS, 2016d).

Adults with gender dysphoria should be referred to a specialist gender identity clinic (GIC) [31], and these clinics can offer ongoing assessments, treatments, support and advice, including -

- mental health support, such as counselling,
- cross-sex Hormone therapy,
- speech and language therapy - to help alter your voice, to sound more typical of your gender identity,
- hair removal treatments, particularly facial hair,
- peer support groups, to meet other people with gender dysphoria,
- relatives' support groups, for your family (NHS, 2016d).

For some people, support and advice from a clinic are all they need to feel comfortable in their gender identity. Others will need more extensive treatment, such as a full transition to the opposite sex. The amount of treatment you have is completely up to you (NHS, 2016d).

Hormone therapy

Hormone therapy for adults means taking the hormones of your preferred gender -

- a transman (female to male) will take testosterone (masculinising hormones),
- a transwoman (male to female) will take oestrogen (feminising hormones) (NHS, 2016d).

The aim of hormone therapy is to make you more comfortable with yourself, both in terms of physical appearance and how you feel. These hormones start the process of changing your body into one that is more female or more male, depending on your gender identity. They usually need to be taken indefinitely, even if you have genital reconstructive surgery.

Hormone therapy may be all the treatment you need to enable you to live with your gender dysphoria. The hormones may improve how you feel and mean that you don't need to start living in your preferred gender or have surgery (NHS, 2016d).

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[31] gender identity clinic

Changes in transwomen

If you're a transwoman, changes that you may notice from hormone therapy include -

- your penis and testicles getting smaller,
- less muscle,
- more fat on your hips,
- your breasts becoming lumpy and increasing in size slightly,
- less facial and body hair (NHS, 2016d).

Hormone therapy won't affect the voice of a transwoman. To make the voice higher, transwomen will need voice therapy and, rarely, voice modifying surgery (NHS, 2016d).

Changes in transmen

If you're a transman, changes you may notice from hormone therapy include -

- more body and facial hair,
- more muscle,
- your clitoris (a small, sensitive part of the female genitals) getting bigger,
- your periods stopping,
- an increased sex drive (libido) (NHS, 2016d).

Your voice may also get slightly deeper, but it may not be as deep as other men's voices (NHS, 2016d).

Risks

There's some uncertainty about the possible risks of long-term masculinising and feminising hormone treatment. You should be made aware of the potential risks and the importance of regular monitoring before treatment begins (NHS, 2016d).

Some of the potential problems most closely associated with hormone therapy include -

- blood clots,
- gallstones,
- weight gain,
- acne,
- hair loss from the scalp,
- sleep apnoea - a condition that causes interrupted breathing during sleep (NHS, 2016d).

Hormone therapy will also make both trans men and trans women less fertile and, eventually, completely infertile. Your specialist should discuss the implications for fertility before starting treatment, and they may talk to you about the option of storing eggs or sperm (known as gamete storage) in case you want to have children in the future. However, this isn't likely to be available on the NHS.

There's no guarantee that fertility will return to normal if hormones are stopped (NHS, 2016d).

Monitoring

While you're taking these hormones, you'll need to have regular check-ups, either at your GIC or your local GP surgery. You'll be assessed, to check for any signs of possible health problems and to find out if the hormone treatment is working.

If you don't think that hormone treatment is working, talk to the healthcare professionals who are treating you. If necessary, you can stop taking the hormones (although some changes are irreversible, such as a deeper voice in trans men and breast growth in trans women).

Alternatively, you may be frustrated with how long hormone therapy takes to produce results, as it will take a few months for some changes to develop. Hormones can't change the shape of your skeleton, such as how wide your shoulders or your hips are. It also can't change your height.

Hormones for gender dysphoria are also available from other sources, such as the internet, and it may be tempting to get them from here instead of through your clinic. However, hormones from other sources may not be licensed and safe. If you decide to use these hormones, let your doctors know so they can monitor you (NHS, 2016d).

Social gender role transition

If you want to have genital reconstructive surgery, you'll usually first need to live in your preferred gender identity full time for at least a year. This is known as ”social gender role transition” (previously known as ”real life experience” or ”RLE”) and it will help in confirming whether permanent surgery is the right option.

You can start your social gender role transition as soon as you're ready, after discussing it with your care team, who can offer support throughout the process.

The length of the transition period recommended can vary, but it's usually one to two years. This will allow enough time for you to have a range of experiences in your preferred gender role, such as work, holidays and family events.

For some types of surgery, such as a bilateral mastectomy (removal of both breasts) in trans men, you may not need to complete the entire transition period before having the operation (NHS, 2016d).

Surgery

Once you've completed your social gender role transition and you and your care team feels you're ready, you may decide to have surgery to permanently alter your sex.

The most common options are discussed below, but you can talk to members of your team and the surgeon at your consultation about the full range available (NHS, 2016d).

Transman surgery

For trans men, surgery may involve -

- a bilateral masectomy [32],
- a hysterectomy [33],
- a salpingo-oophorectomy [34]
- phalloplasty [35] or metoidioplasty [36],
- scrotoplasty [37] and testicular implants,
- a penile implant (NHS, 2016d).

A phalloplasty uses the existing vaginal tissue and skin taken from the inner forearm or lower abdominal wall to create a penis. A metoidioplasty involves creating a penis from the clitoris, which has been enlarged through hormone therapy.

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[32] surgical removal of both breasts

[33] removal of the womb

[34] removal of the fallopian tubes and ovaries

[35] surgical construction of a penis

[36] involves cutting the surrounding labial tissues of the clitoris and suspensory ligament to "free up" and relocate the clitoris in a more forward position, to more closely approximate the position of a penis

[37] construction of a scrotum

The aim of this type of surgery is to create a functioning penis, which allows you to pass urine standing up and to retain sexual sensation. You'll usually need to have more than one operation to achieve this (NHS, 2016d).

Transwoman surgery

For trans women, surgery may involve -

- an orchidectomy [38],
- a penectomy [39],
- vaginoplasty [40],
- vulvoplasty [41],
- clitoroplasty [42],
- breast implants,
- facial feminisation surgery [43] (NHS, 2016d).

The vagina is usually created and lined with skin from the penis, with tissue from the scrotum (the sack that holds the testes) used to create the labia. The urethra [44] is shortened and repositioned. In some cases, a piece of bowel may be used during a vaginoplasty if hormone therapy has caused the penis and scrotum to shrink a significant amount.

The aim of this type of surgery is to create a functioning vagina with an acceptable appearance and retained sexual sensation.

Some trans women can't have a full vaginoplasty for medical reasons, or they may not want to have a functioning vagina. In such cases, a cosmetic vulvoplasty and clitoroplasty is an option, as well as removing the testes and penis (NHS, 2016d).

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[38] removal of the testes

[39] removal of the penis

[40] construction of a vagina

[41] construction of the vulva

[42] construction of a clitoris with sensation

[43] surgery to make your face a more feminine shape

[44] the tube through which you urinate

Life after surgery

After surgery, most transsexuals are happy with their new sex and feel comfortable with their gender identity. One review of a number of studies that were carried out over a 20-year period found that 96% of people who had genital reconstructive surgery were satisfied (NHS, 2016d).

Despite high levels of personal satisfaction, people who have had genital reconstructive surgery may face prejudice or discrimination because of their condition. Treatment can sometimes leave people feeling -

- isolated, if they're not with people who understand what they're going through,
- stressed about or afraid of not being accepted socially,
- discriminated against at work (NHS, 2016d).

There are legal safeguards to protect against discrimination (see guidelines for gender dysphoria), but other types of prejudice may be harder to deal with. If you're feeling anxious or depressed since having your treatment, speak to your GP or a healthcare professional at your clinic (NHS, 2016d).

Sexual orientation

Once transition has been completed, it's possible for a trans man or woman to experience a change of sexual orientation. For example, a trans woman who was attracted to women before surgery may be attracted to men after surgery. However, this varies greatly from person to person, and the sexual orientation of many transsexuals doesn't change.

If you're a transsexual going through the process of transition, you may not know what your sexual preference will be until it's complete. However, try not to let this worry you. For many people, the issue of sexual orientation is secondary to the process of transition itself (NHS, 2016d).

Glaucoma

Glaucoma is a condition which can affect sight, usually due to build up of pressure within the eye.

Glaucoma often affects both eyes, usually to varying degrees. One eye may develop glaucoma quicker than the other.

The eyeball contains a fluid called aqueous humour which is constantly produced by the eye, with any excess drained though tubes.

Glaucoma develops when the fluid cannot drain properly and pressure builds up, known as the intraocular pressure.

This can damage the optic nerve (which connects the eye to the brain) and the nerve fibres from the retina (the light-sensitive nerve tissue that lines the back of the eye) (NHS, 2015f).

Symptoms

Types of glaucoma

There are four main types of glaucoma -

- **chronic open-angle glaucoma** - this is the most common type of glaucoma and develops very slowly,
- **primary angle-closure glaucoma** - this is rare and can occur slowly (chronic) or may develop rapidly (acute) with a sudden, painful build-up of pressure in the eye,
- **secondary glaucoma** - this mainly occurs as a result of an eye injury or another eye condition, such as uveitis (inflammation of the middle layer of the eye),
- **developmental glaucoma (congenital glaucoma)** - a rare but sometimes serious type of glaucoma which occurs in very young children, caused by an abnormality of the eye (NHS, 2015f).

Chronic open-angle glaucoma

In cases of chronic glaucoma, there are usually no noticeable symptoms because the condition develops very slowly. People don't often realise their sight is being damaged because the first part of the eye to be affected is the outer field of vision (peripheral vision). Vision is lost from the outer rim of the eye, slowly working inwards towards the centre.

Changes in vision are often linked to getting older, which is why it is so important to have your eyes checked regularly. You should have an eye test at least every two years, or more frequently if your optometrist (healthcare professional who tests sight) recommends it (NHS, 2015f).

Acute angle-closure glaucoma

Acute angle-closure glaucoma develops rapidly. Symptoms are often severe. They include -

- intense pain,
- redness of the eye,
- headache,
- tender eye area,
- seeing halos or 'rainbow-like' rings around lights,
- misty vision,
- loss of vision in one or both eyes that progresses very quickly (NHS, 2015f).

As a result of these symptoms, some people may also feel sick or be sick.

Symptoms of acute glaucoma are not constant. They can last for one or two hours before disappearing again. But each time the symptoms occur, your vision is damaged a little more.

It's important to contact your GP straight away if you have any of the above symptoms, because early treatment can prevent further damage occurring (NHS, 2015f).

Secondary glaucoma

Secondary glaucoma is caused by other conditions, such as uveitis (inflammation of the middle layer of the eye). It can also be caused by eye injuries and certain treatments, such as medication or operations.

It's possible for the symptoms of glaucoma to be confused with the symptoms of another condition. For example, uveitis often causes painful eyes and headaches.

However, the glaucoma may still cause misty vision and rings or halos around lights (NHS, 2015f).

Causes

Glaucoma is caused by a blockage in part of the eye. This prevents fluid draining out of the eye and increases pressure in the eye, called intraocular pressure (NHS, 2015f).

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How the eye works

The eyeball is filled with a watery substance called aqueous humour, which creates pressure in the eye to give it shape. In healthy eyes, this fluid constantly flows in and out of the eye. It drains back into the bloodstream at the same rate that it's produced to maintain the correct pressure.

Glaucoma occurs when the drainage tubes (trabecular meshwork) within the eye become slightly blocked, preventing the aqueous humour from draining properly. An obstruction within the eye, such as a blood vessel blocking the trabecular meshwork, can also prevent fluid from draining properly.

When the fluid cannot drain properly, the pressure in the eye builds up and can damage the optic nerve (the nerve that connects the eye to the brain) and the nerve fibres from the retina (the light-sensitive nerve tissue that lines the back of the eye).

It's often unclear why the drainage tubes become blocked or why other parts of the eye obstruct the tubes (NHS, 2015f).

Increased risk

There are a number of things that can increase your risk of developing glaucoma -

- **age (glaucoma becomes more likely as you get older)** - in the UK, chronic open-angle glaucoma affects up to two in every 100 people over 40 years old and around five in every 100 people over 80 years old,
- **ethnic origin** - people of African or Afro-Caribbean origin are at increased risk of developing chronic open-angle glaucoma and people of Asian origin are at increased risk of developing acute angle-closure glaucoma,
- **short sightedness (myopia)** - people who are short-sighted are more likely to develop chronic open-angle glaucoma,
- **ocular hypertension (OHT - raised pressure in the eye)** - your optometrist will be able to diagnose OHT (see diagnosing glaucoma), which increases your risk of developing chronic open-angle glaucoma,
- **family history** - if you have a close relative, such as a parent, brother or sister who has glaucoma, you are at increased risk of developing the condition yourself,
- **medical history** - people with diabetes may be at increased risk of developing glaucoma (NHS, 2015f).

Diagnosis

It's important to have regular eye tests so eye problems, such as glaucoma, can be diagnosed and treated as early as possible.

If you have glaucoma, it can take a long time before you realise you have a problem with your eyesight. This is because glaucoma usually damages the outer edge of the eye and works slowly inwards. You may not notice a problem until the glaucoma is near the centre of your eye.

You should have an eye test at least every two years or more frequently if advised by your optometrist (a healthcare professional who tests sight). For example, they may suggest you have more frequent eye tests if you have a close relative with glaucoma, such as a parent, brother or sister (NHS, 2015f).

NHS eye tests

You qualify for a free NHS-funded sight test if you are -

- aged under 16, or aged under 19 and in full-time education,
- aged 60 or over,
- registered blind or partially sighted,
- diagnosed with diabetes or glaucoma,
- aged 40 or over and you are the parent, brother, sister, son or daughter of a person diagnosed with glaucoma, or you have been advised by an ophthalmologist that you are at risk of glaucoma,
- eligible for an NHS complex lens voucher (NHS, 2015f).

You are also entitled to a free NHS sight test if -

- you receive Income Support or Income-based Jobseeker's Allowance (not contribution based),
- you receive Pension Credit Guarantee Credit,
- you receive Income-based Employment and Support Allowance,
- you are awarded Universal Credit,
- you are entitled to, or named on, a valid NHS tax credit exemption certificate,
- you are named on a valid NHS certificate for full help with health costs (HC2) (NHS, 2015f).

People named on an NHS certificate for partial help with health costs (HC3) may also get help (NHS, 2015f).

Tests for glaucoma

There are several glaucoma tests that can be carried out by your optometrist. They are painless and quite quick. The tests should be carried out during the same appointment to ensure results are as accurate as possible (NHS, 2015f).

Eye pressure test (tonometry)

An eye pressure test (tonometry) uses an instrument called a tonometer to measure the pressure inside your eye.

A small amount of anaesthetic (painkilling medication) and dye is placed onto the transparent layer of tissue that covers the front of the eye (your cornea). A blue light from the head of the tonometer is held against your eye to measure the intraocular pressure.

Tonometry can diagnose ocular hypertension (OHT - raised pressure in the eye), which is a risk factor for chronic open-angle glaucoma (NHS, 2015f).

Central corneal thickness

The thickness of your cornea will be measured because this is thought to affect how the intraocular pressure is interpreted (NHS, 2015f).

Gonioscopy

Gonioscopy is an examination of the front outer edge of your eye, between the cornea and the iris (the coloured part of your eye). This is the area where the fluid should drain out of your eye.

A gonioscopy can help to determine whether this angle is open or closed (blocked) (NHS, 2015f).

Visual field test

A visual field test - sometimes called perimetry - checks for missing areas of vision. You will be shown a sequence of light spots and asked which ones you can see. Some dots will appear in your peripheral vision (around the sides of your eyeball), which is where glaucoma begins.

If you can't see the spots in your peripheral vision, it may indicate the glaucoma has damaged your vision (NHS, 2015f).

Optic nerve assessment

Your optic nerve connects your eye to your brain. Your optometrist will use eye drops to enlarge your pupils. They will then examine your eyes using a slit lamp (a microscope with a very bright light) and assess whether your optic nerve has been damaged by the glaucoma.

The eye drops used to widen your pupils could affect your ability to drive. You should make alternative arrangements for getting home after your appointment (NHS, 2015f).

Referral

If your optometrist suspects glaucoma, you will be referred to an ophthalmologist for further tests. Your ophthalmologist will confirm your diagnosis and find out -

- how far the condition has developed,
- how much damage the glaucoma has done to your eyes,
- what may have caused the glaucoma (NHS, 2015f).

They will then be able to advise on treatment.

In some cases, your ophthalmologist will continue to treat you. But if you have chronic open-angle glaucoma, you may be referred back to your optometrist who will continue your treatment (NHS, 2015f).

Treatment

Treatment aims to reduce the pressure in the affected eye, called intraocular pressure.

Any damage to your vision caused by glaucoma can't be repaired so it's important to get an early diagnosis and treatment to prevent further damage (NHS, 2015f).

Eye drops

Chronic open-angle glaucoma is often treated using eye drops. There are several different types of eye drops available, the type prescribed may depend on -

- how your condition is progressing,
- whether you have other medical conditions,

- whether you are taking any other medications,
- whether the eye drops cause side-effects when you use them (NHS, 2015f).

Using eye drops

It's important to use eye drops as directed. Even if you have not yet noticed any problems with your vision, without treatment glaucoma can cause permanent vision loss (NHS, 2015f).

To use eye drops -

- use your finger to gently pull down your lower eyelid,
- hold the bottle over your eye and allow a single drop to fall into the pocket you have created in your lower lid,
- close your eye and keep it closed for several minutes (NHS, 2015f).

If you are using two different types of eye drops, allow at least five to 10 minutes between using the different types.

Also follow any other advice your optometrist or ophthalmologist has given you (NHS, 2015f).

Contact lenses

If you usually wear contact lenses and have been prescribed eye drops, you may need to stop wearing your lenses and wear glasses instead.

This is because medication in the eye drops can build up in the lenses and may harm your eyes. You should discuss this with healthcare professionals treating you (NHS, 2015f).

Types of eye drops

The different types of eye drops are described below. You can read medicines information for more details about your medication (NHS, 2015f).

Prostaglandin analogue

Prostaglandin analogues increase the flow of fluid (aqueous humour) out of your eye, which reduces the pressure within your eye (the intraocular pressure). These eye drops are usually used once a day (NHS, 2015f).

Side-effects include -

- enlarged blood vessels in the white part of your eye, making your eye look red,
- changes to your eye colour - it often gets darker,
- eyelashes growing thicker and darker,
- eye pain and irritation,
- blepharitis - a condition where the rims of your eyelids become red and swollen,
- dry eyes,
- headaches,
- sensitivity to light (NHS, 2015f).

Some types of prostaglandin analogues that you may be prescribed include -

- latanoprost,
- bimatoprost,
- tafluprost,
- travoprost (NHS, 2015f).

Beta-blockers

It is thought that beta-blockers reduce intraocular pressure by slowing down the production of aqueous humour in your eye. They are used once or twice a day and can cause side-effects such as -

- a stinging or burning sensation in your eye,
- dry eyes,
- itchy eyes (NHS, 2015f).

Beta-blockers can make some medical conditions worse, so do not use them if you have -

- asthma,
- a heart condition, such as heart block (NHS, 2015f).

Some types of beta-blockers you may be prescribed include -

- betaxolol hydrochloride,
- levobunolol hydrochloride,
- timolol (NHS, 2015f).

Carbonic anhydrase inhibitors

Carbonic anhydrase inhibitors reduce the amount of aqueous humour produced in your eye, which reduces intraocular pressure. These drops are used two or three times a day and may cause -

- a bitter taste in your mouth,
- nausea (feeling sick),
- a dry mouth,
- eye irritation (NHS, 2015f).

Some types of carbonic anhydrase inhibitors you may be prescribed include -

- Brinzolamide,
- dorzolamide (NHS, 2015f).

Sympathomimetics

Sympathomimetics are thought to reduce the rate of production of aqueous humour and increase the flow of aqueous humour out of the eyes. These eye drops are used twice a day and may cause your eyes to become painful and red (NHS, 2015f).

Some types of sympathomimetics can only be used with caution in people who have -

- high blood pressure,
- heart disease (NHS, 2015f).

A type of sympathomimetic that you may be prescribed is brimonidine tartrate (NHS, 2015f).

Other treatments

If the use of eye drops does not improve your symptoms, a different type of treatment may be recommended, such as laser treatment or surgery. These are described in more detail below (NHS, 2015f).

Laser treatment

Laser treatment, which uses high energy beams of light, can be used to open up the blocked trabecular meshwork (drainage tubes) within your eye. This is called laser trabeculoplasty.

Anaesthetic (painkilling) eye drops will be put into your eye and a special lens placed in front of your eye. The laser will be shone through the lens and will make small holes in the trabecular meshwork. This allows more fluid to drain out of your eye and reduces the intraocular pressure.

An alternative to laser trabeculoplasty is cyclodiode laser treatment. This involves destroying some of the tissue in the eye that produces aqueous humour. It creates less fluid in the eye, which reduces the intraocular pressure.

Laser treatments are usually quick and painless, although during the procedure you may feel a brief twinge of pain or heat. You may still need to use eye drops (see above) after having laser treatment (NHS, 2015f).

Surgery

A trabeculectomy is the most common type of glaucoma surgery. It involves removing part of the trabecular meshwork to allow fluid to flow through the eye's drainage system.

The procedure will be carried out under local anaesthetic (you are awake) or general anaesthetic (you are unconscious) (NHS, 2015f).

Other types of surgery include -

- **a viscocanalostomy** - this operation removes part of the sclera (the white outer covering of the eyeball), enabling the fluid to filter out of your eye and into your body,
- **a deep sclerectomy operation** - this operation involves implanting a tiny device inside your eye to widen the trabecular meshwork,
- **an aqueous shunt implant** - this operation involves placing a tube device into your eye to increase the drainage of fluid out of your eye (NHS, 2015f).

Speak to your surgeon to find out more about your procedure and risks involved.

If you are having surgery, your surgeon may choose to use anti-scarring medicines. These can improve the success of the operation by preventing scar tissue forming as your eye heals (NHS, 2015f).

You may be prescribed either -

- mitomycin C,
- 5-fluorouracil (NHS, 2015f).

These medications are unlicensed for the treatment of glaucoma. This means that the manufacturers of these medications have not applied for a licence for their medication to be used to treat glaucoma.

But many specialists will use an unlicensed medication if they think the medication is likely to be effective and benefits of treatment outweigh associated risk. The National Institute for Health and Care Excellence (NICE) has issued guidance for the treatment of chronic open-angle glaucoma. It suggests these medicines can be used.

If your ophthalmologist is considering prescribing an unlicensed medication, they should inform you that it is unlicensed, and discuss possible risks and benefits with you (NHS, 2015f).

Acute angle-closure glaucoma

As acute glaucoma develops rapidly, the condition needs to be treated quickly. The most common forms of treatment for this type of glaucoma include -

- **eye drops** - see Types of eye drops,
- **systemic medicines** - these are injected into your bloodstream to quickly reduce the pressure in your eye,
- **laser treatment (called laser iridotomy)** - this uses high-energy beams of light to create holes in your iris (coloured part of the eye) to open the angle and enable fluid to flow; both eyes may need to be treated, even if only one has acute angle-closure glaucoma, because this form of glaucoma may develop in both eyes at some point,
- **surgery** - a trabeculectomy (surgery to remove part of the drainage tubes) is the most common form of surgery for acute glaucoma (NHS, 2015f).

If you also have a Cataracts (a cloudy patch in the lens of your eye), removing it may open the angle in your eye and control the intraocular pressure (NHS, 2015f).

Miotics

Acute angle-closure glaucoma may also be treated with a medication called a miotic, such as pilocarpine. Miotics work by opening up the blocked trabecular meshwork, which should improve the drainage of aqueous humour out of your eye. You may need to use these eye drops up to four times a day (NHS, 2015f).

Miotics should be used with caution in people who have certain medical conditions, including -

- heart disease,
- high blood pressure,
- asthma (NHS, 2015f).

Miotics can also cause side-effects, such as -

- a headache, which may be severe during the first two to four weeks of treatment,
- burning or itchy eyes,
- blurred vision, which may affect your ability to drive (NHS, 2015f).

Treating other types of glaucoma

For other types of glaucoma, your specialist will usually recommend eye drops, laser treatment or surgery. Your treatment will depend on the type of glaucoma you have and how advanced it is (NHS, 2015f).

Monitoring your condition

If you have been diagnosed with glaucoma your condition will be closely monitored to check for further damage to your vision (NHS, 2015f).

Depending on how your glaucoma is progressing, you may need further appointments every one to four months or up to 12–24 months apart. These will either be with -

- **an optometrist** - a healthcare professional who examines eyes, tests vision and is trained to recognise eye diseases and vision defects,
- **an ophthalmologist** - a medical doctor who specialises in eye diseases and their treatment and surgery (NHS, 2015f).

Complications

The main complication of glaucoma is loss of vision that can't be repaired. This is why early diagnosis and treatment is so important (NHS, 2015f).

Loss of vision

In the UK, glaucoma is responsible for around one in 10 cases of visual impairment.

If you have some loss of vision due to glaucoma, more information is available on the Royal National Institute of Blind People (RNIB) website. The RNIB offers advice about -

- living with sight loss,

- registering your sight loss - this may allow you to access certain benefits (NHS, 2015f).

Complications from treatment

If you have surgery to treat glaucoma, there is always a risk of infection. Most infections can be treated with a course of antibiotics.

You may also have a reaction to certain types of eye drops. Speak to the healthcare professionals treating you if you feel unwell while being treated for glaucoma (NHS, 2015f).

Driving

If you have glaucoma, it could affect your ability to drive. It's your legal obligation to inform the DVLA about a medical condition that could affect your driving ability.

Visit GOV.UK to find out how to tell the DVLA about a medical condition (NHS, 2015f).

Hearing loss

Hearing loss is a common problem that often develops with age or is caused by repeated exposure to loud noises.

Action on Hearing Loss estimates that there are more than 10 million (about 1 in 6) people in the UK with some degree of hearing impairment or deafness (NHS, 2015i).

Hearing loss can occur suddenly, but usually develops gradually. General signs of hearing loss can include -

- difficulty hearing other people clearly and misunderstanding what they say,
- asking people to repeat themselves,
- listening to music or watching television with the volume turned up higher than other people require (NHS, 2015i).

Signs of hearing loss

Hearing loss is sometimes sudden, but often it's gradual and you may not notice it at first. Being aware of the early signs can help you identify the problem quickly.

It's important to spot hearing loss as soon as possible, because treatment is often more beneficial if started early (NHS, 2015i).

General signs of hearing loss

Early signs of hearing loss can include -

- difficulty hearing other people clearly and misunderstanding what they say, especially in group situations,
- asking people to repeat themselves,
- listening to music or watching television with the volume higher than other people need,
- difficulty hearing the telephone or doorbell,
- finding it difficult to tell which direction noise is coming from,
- regularly feeling tired or stressed, from having to concentrate while listening (NHS, 2015i).

In some cases, you may recognise signs of hearing loss in someone else before they notice it themselves. Research suggests it takes 10 years from the time someone notices they have hearing loss, before they do anything about it.

If you also hear a ringing, buzzing or whistling sound in your ears, this could be a sign of tinnitus [45], which is often associated with hearing loss (NHS, 2015i).

Seeking medical help

Make an appointment to see your GP if you're having problems with your hearing, or your child is showing signs of hearing difficulties.

If you wake up with a sudden loss of hearing in one ear or lose the hearing in one ear within a couple of days, you should see your GP as soon as possible (NHS, 2015i).

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[45] a ringing, roaring, or hissing sound in one or both ears

Causes of hearing loss

Hearing loss is the result of sound signals not reaching the brain. There are two main types of hearing loss, depending on where the problem lies (NHS, 2015i).

- **Sensorineural hearing loss** is caused by damage to the sensitive hair cells inside the inner ear or damage to the auditory nerve. This occurs naturally with age or as a result of injury.
- **Conductive hearing loss** happens when sounds are unable to pass from your outer ear to your inner ear, often because of a blockage such as earwax or glue ear (NHS, 2015i).

These causes are explained below.

Age

Age is the biggest single cause of hearing loss. Hearing loss that develops as a result of getting older is often known as age-related hearing loss or presbycusis.

Most people begin to lose a small amount of their hearing from around 40 years of age. This hearing loss increases as you get older. By the age of 80, most people have significant hearing problems.

As your hearing starts to deteriorate, high-frequency sounds, such as female or children's voices, may become difficult to hear. It may also be harder to hear consonants such as "s", "f" and "th". This can make understanding speech in background noise very difficult (NHS, 2015i).

Symptoms of presbycusis

- The speech of others seems mumbled or slurred,
- High-pitched sounds such as "s" and "th" are difficult to hear and tell apart,
- Conversations are difficult to understand, especially when there is background noise,
- A man's voice is easier to hear than the higher pitches of a woman's voice,
- Certain sounds seem annoying or overly loud,
- Tinnitus may also occur (CLEVELANDCLINIC, 2010).

Loud noises

Another common cause of hearing loss is damage to the ear from repeated exposure to loud noises over time. This is known as noise-induced hearing loss, and it occurs when the sensitive hair cells inside the cochlea become damaged (NHS, 2015i).

You're at higher risk of developing noise-induced hearing loss if you -

- work with noisy equipment, such as pneumatic drills or compressed-air hammers,
- work in environments where there's loud music, such as a nightclub,
- regularly listen to music at a high volume through headphones (NHS, 2015i).

Hearing loss can also occur suddenly after exposure to an exceptionally loud noise, such as an explosion. This is known as **acoustic trauma** (NHS, 2015i).

Other types of sensorineural hearing loss

Sensorineural hearing loss occurs if the sensitive hair cells inside the cochlea are damaged, or as a result of damage to the auditory nerve (which transmits sound to the brain). In some cases, both may be damaged.

Hearing loss caused by age and exposure to loud noises are both types of sensorineural hearing loss (NHS, 2015i).

Sensorineural hearing loss can also be caused by -

- **the genes you inherit** - some people may be born deaf or become deaf over time because of a genetic abnormality,
- **viral infections of the inner ear** - such as mumps or measles,
- **viral infections of the auditory nerve** - such as mumps or rubella,
- **Meniere's disease** - where a person suffers with vertigo [46], spells of hearing loss, tinnitus and the feeling of a blockage in the ear,
- **acoustic neuroma** - a non-cancerous (benign) growth on or near the auditory nerve,
- **meningitis** - an infection of the protective membranes that surround the brain and spinal cord,
- **encephalitis** - inflammation of the brain,
- **multiple sclerosis** - a neurological condition affecting the central nervous system (brain and spinal cord),
- **a head injury**,
- **an autoimmune condition**,
- **malformation of the ear**,

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[46] a feeling that the environment around you is spinning

- **stroke** - where the blood supply to the brain is cut off or interrupted (NHS, 2015i).

Some treatments and medicines, such as radiotherapy for nasal and sinus cancer, certain chemotherapy [47] medicines or certain antibiotics can also damage the cochlea and the auditory nerve, causing sensorineural hearing loss.

People with diabetes, chronic kidney disease and cardiovascular disease are also at increased risk of hearing loss.

Sensorineural hearing loss is permanent and hearing aids are often required to improve hearing in these cases (NHS, 2015i).

Causes of conductive hearing loss

Conductive hearing loss is usually caused by a blockage, such as having too much ear wax, a build-up of fluid in the ear (glue ear), or an ear infection (NHS, 2015i).

Conductive hearing loss can also be caused by -

- **a perforated eardrum** - where the eardrum is torn or has a hole in it,
- **otosclerosis** - an abnormal growth of bone in the middle ear which causes the inner hearing bone (the stapes) to be less mobile and less effective at transmitting sound,
- **damage to the hearing bones from injury, a collapsed ear drum or conditions such as cholesteatoma**,
- **swelling around the eustachian tube** - caused by jaw surgery or radiotherapy for nasal and sinus cancer,
- **malformation of the ear**,
- **Eustachian tube dysfunction**,
- **something becoming trapped in the ear** (a foreign body) (NHS, 2015i).

Conductive hearing loss is usually temporary and can often be treated with medication or minor surgery (NHS, 2015i).

Diagnosing hearing loss

See your GP if you're having problems with your hearing. They'll examine your ears and carry out some simple hearing tests (NHS, 2015i).

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[47] a type of cancer treatment, with medicine used to kill cancer cells

Ear examination

During an ear examination, an instrument with a light at the end called an auriscope (or otoscope) is used to look for anything abnormal, including -

- a blockage caused by earwax, fluid or an object,
- an ear canal infection,
- a bulging ear drum - indicating an infection inside the middle ear,
- fluid behind the ear drum - known as glue ear,
- a perforated ear drum,
- a collapsed ear drum,
- skin collected in the middle ear (cholesteatoma) (NHS, 2015i).

Your GP will ask if you have any pain in your ear and when you first noticed the hearing loss (NHS, 2015i).

Referral to a specialist

Your GP may refer you to an ENT specialist or an audiologist (a hearing specialist). The specialist will carry out further hearing tests to help determine what's causing your hearing loss and recommend the best course of treatment (NHS, 2015i).

Some of the hearing tests you may have include -

- tuning fork test (sometimes performed by your GP),
- pure tone audiometry,
- bone conduction test (NHS, 2015i).

These tests are described below (NHS, 2015i).

Tuning fork test A tuning fork is a Y-shaped, metallic object. It produces sound waves at a fixed pitch when it's gently tapped and can be used to test different aspects of your hearing.

The tester taps the tuning fork on their elbow or knee to make it vibrate, before holding it at different places around your head.

This test can help determine if you have conductive hearing loss, which is hearing loss caused by sounds not being able to pass freely into the inner ear, or sensorineural hearing loss, where the inner ear or hearing nerve isn't working properly (NHS, 2015i).

Pure tone audiometry Pure tone audiometry tests the hearing of both ears. During the test, a machine called an audiometer produces sounds at various volumes and frequencies (pitches). You listen to the sounds through headphones and respond when you hear them, usually by pressing a button (NHS, 2015i).

Bone conduction test A bone conduction test is often carried out as part of a routine pure tone audiometry test in adults. It's used to check if you have sensorineural hearing loss, by testing how well your inner ear is working.

Bone conduction involves placing a vibrating probe against the mastoid bone behind the ear. It tests how well sounds transmitted through the bone are heard.

Bone conduction is a more sophisticated version of the tuning fork test, and when used together with pure tone audiometry, it can help to determine whether hearing loss comes from the outer and middle ear (conductive hearing loss), the inner ear (sensorineural hearing loss), or both (NHS, 2015i).

Levels of hearing loss

Very few people with hearing loss hear nothing at all. There are four different levels of hearing loss, which are defined by the quietest sound you're able to hear, measured in decibels (dB). These are described below (NHS, 2015i).

Mild deafness If you're mildly deaf, the quietest sound you can hear is 21 to 40dB. Mild deafness can sometimes make hearing speech difficult, particularly in noisy situations (NHS, 2015i).

Moderate deafness If you're moderately deaf, the quietest sound you can hear is 41 to 70dB. You may have difficulty following speech without using a hearing aid and may find it difficult to hear announcements, for example (NHS, 2015i).

Severe deafness If you're severely deaf, the quietest sound you're able to hear is 71 to 90dB. People who are severely deaf usually need to lip-read or use sign language, even with the use of a hearing aid (NHS, 2015i).

Profound deafness If you're profoundly deaf, the quietest sound you can hear is more than 90dB. People who are profoundly deaf can benefit from a cochlear implant. Other forms of communication include lip reading and British sign language or signed English (NHS, 2015i).

Treating hearing loss

How hearing loss is treated depends on the underlying cause of the condition.

Hearing loss that occurs when sounds are unable to pass into the inner ear (conductive hearing loss) is often temporary and treatable.

For example, earwax build-up can be removed by drops, a syringe or suction. Hearing loss caused by a bacterial infection can be treated with antibiotics. Surgery can be used to drain a fluid build-up, repair a perforated eardrum, or correct problems with the hearing bones.

However, hearing loss caused by damage to the inner ear or to the nerves that transmit sound to brain (sensorineural hearing loss) is permanent.

If your hearing is impaired, treatment can improve your hearing and quality of life. Some of these treatments are discussed below (NHS, 2015i).

Hearing aids

If you have hearing problems, you may be able to wear a hearing aid. About 1.4 million people regularly use hearing aids in the UK, and many more would benefit from them.

A hearing aid is an electronic device that consists of a microphone, an amplifier, a loudspeaker and a battery. It increases the volume of sound entering your ear, so you can hear things more clearly.

The microphone picks up sound, which is made louder by the amplifier. Hearing aids are fitted with devices that can distinguish between background noise, such as traffic, and foreground noise, such as conversation.

Modern hearing aids are very small and discreet, and can often be worn inside your ear.

Hearing aids help improve hearing, but don't give you your hearing back. They're suitable for most people, but may be less effective for people with profound hearing impairment or certain conditions. Your GP or audiologist (hearing specialist) can advise you about whether a hearing aid is suitable for you.

If a hearing aid is recommended, an audiologist may take an impression of your ear so the hearing aid fits you perfectly or may show you an open fit hearing aid. The hearing aid will be adjusted to suit your level of hearing impairment. You'll also be shown how to use and care for it.

After your hearing aid has been fitted, you should have a follow-up appointment within 12 weeks.

If you experience problems using a hearing aid - such as distortion and repeated infections - that can't be corrected by an audiologist, you may benefit from different treatments. An ENT surgeon can discuss these with you. An ENT surgeon with a special interest in ear surgery is called an otologist (NHS, 2015i).

NHS hearing aids

The NHS loans hearing aids to people with hearing loss free of charge. This includes free repairs, batteries and servicing. Many areas now charge for lost hearing aids, but you'll be told about any costs at your fitting appointment.

In the UK, both analogue and digital hearing aids are commonly used. Most hearing aids prescribed through the NHS are now digital.

Instead of having moving parts, digital hearing aids contain a very small computer that processes sounds. This enables the hearing aid to be programmed to suit different environments, such as a small, quiet room or a large, noisy workshop.

The type of digital hearing aids available through the NHS are usually the behind-the-ear (BTE) type (see below). Other types of hearing aid may be issued in cases where a medical condition prevents an individual from using BTE hearing aids. You can also choose to pay privately for another type of hearing aid if it's not available on the NHS (NHS, 2015i).

Types of hearing aids

The different types of hearing aids are described below (NHS, 2015h).

Behind-the-ear (BTE) hearing aids BTE hearing aids usually have an earmould, which sits inside your ear. The rest of the hearing aid is connected to the earmould and lies behind your ear.

Some types of BTE hearing aids have two microphones that enable you to listen to sounds in the general vicinity or to focus on sounds that are coming from a specific direction. This can be particularly useful in noisy environments.

Open fit hearing aids may also be available, which are suitable for those with mild to moderate hearing loss. The tube sits in the ear, instead of an earmould (NHS, 2015h).

Receiver in-the-ear (RITE) hearing aids Receiver in-the ear (RITE) hearing aids are similar to BTE hearing aids, but the piece worn behind the ear is connected by a wire to a receiver (loudspeaker) located within the ear canal.

This means RITE hearing aids are usually less visible than BTE devices (NHS, 2015h).

In-the-ear (ITE) hearing aids In-the-ear (ITE) hearing aids are like an earmould. They fill the area just outside your ear canal and fill the opening of your ear canal.

The working parts of the hearing aid are inside the shell (NHS, 2015h).

In-the-canal (ITC) hearing aids In-the-canal (ITC) hearing aids fill the outer part of the ear canal and are just visible (NHS, 2015h).

Completely in-the-canal (CIC) hearing aids Completely in-the-canal (CIC) hearing aids are even smaller and less visible than ITE or ITC hearing aids.

However, they may not be recommended if you have severe hearing loss or frequent ear infections (NHS, 2015h).

Body-worn (BW) hearing aids Body-worn (BW) hearing aids have a small box containing the microphone. The box can be clipped to your clothes or you can put it inside a pocket. A lead connects the box to an earphone, which delivers sound to your ear.

This type of hearing aid is an option for people with poor dexterity, who require a high-powered hearing aid (NHS, 2015h).

CROS/BiCROS CROS hearing aids are recommended for people who only have hearing in one ear. They work by picking up sounds from the side that doesn't have hearing and transmitting them to the ear that's able to hear. The sound is sometimes transmitted through wires, although wireless models are available.

BiCROS hearing aids work in a similar way to CROS hearing aids, but they amplify the noise entering the ear that's able to hear. They're useful for people who don't have any hearing in one ear, with some hearing loss in the other ear (NHS, 2015h).

Bone conduction hearing aids Bone conduction hearing aids are recommended for people with conductive or mixed hearing loss who can't wear a more conventional type of hearing aid. Bone conduction hearing aids vibrate in response to the sounds going into the microphone.

They can also sometimes help people with no hearing in one ear and normal or mild hearing loss in the other ear.

The part of the hearing aid that vibrates is held against the bone behind the ear (mastoid) by a headband. The vibrations pass through the mastoid bone to the cochlea and are converted into sound in the usual way. They can be very effective, but can be uncomfortable to wear for long periods (NHS, 2015h).

Bone Anchored Hearing Aids (BAHA) A Bone Anchored Hearing Aid (BAHA) transmits sound directly to the cochlea by vibrating the mastoid bone. A minor operation is needed to fix a screw to the skull, on which the hearing aid can be clipped on and off. A BAHA is removed at night and when you swim or take a shower.

Unlike a bone conduction hearing aid, it's not uncomfortable to wear and is used for patients with conductive hearing loss, or in some patients who have no hearing in one of their ears.

Some people may benefit from newer types of implantable bone conduction hearing aids that are held onto the head with magnets instead of a connector through the skin. However, these are only available at some BAHA centres and may require a referral to a different BAHA centre (NHS, 2015h).

Middle ear implants These are surgically implanted devices that attach to the hearing bones and make them vibrate.

They're suitable for people who can't use a hearing aid, but have hearing loss at a level where a BAHA would not help (NHS, 2015h).

Disposable hearing aids Disposable hearing aids are sometimes recommended for people who have mild to moderate hearing loss.

The battery inside a disposable hearing aid usually lasts for about 12 weeks, after which time the hearing aid is thrown away and replaced. Disposable hearing aids tend to be expensive in the long term and are only available privately (NHS, 2015h).

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Cochlear implants Cochlear implants are small hearing devices fitted under the skin behind your ear during surgery.

They have an external sound processor and internal parts, including a receiver coil, an electronics package and a long wire with electrodes on it (an electrode array).

The external processor takes in sound, analyses it and then converts it to signals that are transmitted across the skin to an internal receiver-stimulator, which sends the signals along the electrode array into a part of the inner ear called the cochlea. The signal is then sent to the brain along the hearing nerve as normal. This means cochlear implants are only suitable for people whose hearing nerves are functioning normally.

A cochlear implant is sometimes recommended for adults or children who have severe to profound sensorineural hearing loss in both ears, which isn't helped by hearing aids.

Both ears are usually implanted for children, whereas adults are usually only able to have one implant on the NHS.

Before a cochlear implant is recommended, you'll be assessed to find out whether it will help improve your hearing. During the assessment, any disabilities or communication problems you have will be taken into consideration, which may mean the usual hearing tests aren't suitable.

If a cochlear implant is recommended, it will be inserted into your ear (or both ears) during an operation and switched on a few weeks later.

There are currently around 11,000 people in the UK with cochlear implants and the number is increasing each year (NHS, 2015h).

Safety According to the Medicines & Healthcare products Regulatory Agency (MHRA), evidence suggests that patients with cochlear implants may be at an increased risk from pneumococcal meningitis, especially if they haven't been immunised against pneumococcal disease.

In August 2002, the Department of Health included cochlear implant patients in the population groups who should be immunised against pneumococcal infection.

Although the risk of contracting bacterial meningitis is low, it's slightly higher than for the general population (NHS, 2015h).

Auditory brainstem implants In some cases of severe to profound hearing loss, where there are problems with the nerve that transmits sound to the brain, an auditory brainstem implant (ABI) may be used (NHS, 2015h).

An ABI is an electrical device made up of -

- electrodes implanted into the part of the brain responsible for processing sound (in the brainstem),
- a receiver device placed under the skin behind your ear,
- a small sound processor outside your ear (NHS, 2015h).

When the microphone in the sound processor picks up sound, it turns it into an electrical signal and transmits this to the brain through the receiver and electrodes.

An ABI will not fully restore your hearing, but it can usually restore some degree of hearing and can make lip-reading easier. It's often used as a treatment for hearing loss associated with a condition called neurofibromatosis type 2 (NF2) (NHS, 2015h).

Lip reading and sign language

Hearing loss can sometimes affect your speech, as well as your ability to understand other people. Many people with significant hearing loss learn to communicate in other ways instead of, or as well as, spoken English.

For people who experience hearing loss after they've learnt to talk, lip-reading can be a very useful skill. Lip-reading is where you watch a person's mouth movements while they're speaking, to understand what they're saying.

For people born with a hearing impairment, lip-reading is much more difficult. Those who are born with a hearing impairment often learn sign language, such as British Sign Language (BSL), which is a form of communication that uses hand movements and facial expressions to convey meaning.

BSL is completely different from spoken English and has its own grammar and syntax (word order). Other types of sign language include Signed English and Paget Gorman Signed Speech (NHS, 2015h).

Preventing hearing loss

The ears are fragile structures that can be damaged in many ways, so it's not always possible to prevent hearing loss.

The risk of your hearing being damaged by loud noises depends on how loud the noises are and how long you're exposed to them. Experts agree that continued exposure to noise at or above 85dB (similar to a lawn mower or loud traffic) can, over time, cause hearing loss (NHS, 2015i).

However, by following the advice below it's possible to reduce your risk of noise-induced hearing loss (hearing loss from loud noise) -

- **Don't have your television, radio or music on too loud** - This is particularly important if you have young children in the house, because their ears are more delicate than an adult's. If you can't have a comfortable conversation with someone who is two metres (about 6.5ft) away from you, turn the volume down. You shouldn't have dull hearing or ringing in your ears after listening to music.
- **Use headphones that block out more outside noise** - rather than turning up the volume. You can buy add-ons for your existing headphones that block out more outside noise, or noise cancelling headphones.
- **Use ear protection equipment such as ear muffs or ear plugs if you work in a noisy environment** - such as a pub, nightclub, a garage workshop or on a building site. It's important to insert ear plugs correctly to gain the benefit of wearing them.
- **Use ear-protection equipment at loud concerts** and at other events where there are high noise levels, such as motor races.
- **Don't insert objects into your ears or your children's ears**. This includes fingers, cotton buds, cotton wool and tissue.
- **Be aware of the symptoms of common causes of hearing loss**, such as ear infections (otitis media) and Ménière's disease.
- **Visit your GP if you or your child are experiencing hearing problems** (NHS, 2015i).

Communication tips

If you have a hearing loss or know someone who has, share these tips with family members, friends, and colleagues (CLEVELANDCLINIC, 2010).

- Face the person who has a hearing loss so that he or she can see your face when you speak.
- Be sure that lighting is in front of you when you speak. This allows a person with a hearing impairment to observe facial expressions, gestures, and lip and body movements that provide communication clues.
- During conversations, turn off the radio or television.

- Avoid speaking while chewing food or covering your mouth with your hands.
- Speak slightly louder than normal, but don't shout. Shouting may distort your speech.
- Speak at your normal rate, and do not exaggerate sounds.
- Clue the person with the hearing loss about the topic of the conversation whenever possible.
- Rephrase your statement into shorter, simpler sentences if it appears you are not being understood.
- In restaurants and social gatherings, choose seats or conversation areas away from crowded or noisy areas (CLEVELANDCLINIC, 2010).

HIV/AIDS and older adults: fact versus fiction

human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) have long been subject to many myths and misconceptions, many of which concern older adults. Thanks to recent advancements in HIV/AIDS treatments, particularly highly active antiretroviral therapies (HAART), many people living with HIV/AIDS are living long, healthy lives, transforming HIV into a chronic but manageable illness. Therefore, it is no surprise that research shows that adults age 50 and over comprise a significant - and growing - number of people living with HIV/AIDS (PLWHA), as well as those newly diagnosed with HIV and AIDS each year. What are some of the myths - and the facts - when it comes to older adults and HIV/AIDS? (LGBTAGINGCENTER, 2016)

Older adults - those age 50 and older - are not at risk for HIV or AIDS

False. The rates of HIV/AIDS among older adults 50 and over have increased more than 61% from 2001 to 2007 (Cahill et al., 2010). Research shows that those age 50 and older now comprise 27% of the overall population of people living with HIV/AIDS, and by 2015 will become the majority of all people living with HIV /AIDS. In addition, the latest national data show that adults 50 and older account for -

- 15% of all new HIV/AIDS diagnoses,
- 29% of all persons living with AIDS (CDC, 2008).

Despite these sharp increases in HIV/AIDS among older adults, this population is still marginalised and generally overlooked in data collection instruments, treatment studies, and education and prevention programs, to name a few (LGBTAGINGCENTER, 2016).

HIV/AIDS only affects those who are gay, lesbian, transgender, and/or have same-sex contact

False. While many of these populations are disproportionately affected by HIV/AIDS, HIV and AIDS can infect anyone, regardless of age, race, ethnicity, religion, sexual orientation or gender identity. HIV and AIDS are not the products of orientations or identities, but experiences and behaviours, and are most commonly transmitted through unprotected sex or sharing needles (LGBTAGINGCENTER, 2016).

Older adults are not sexually active

False. Research shows heterosexual and lesbian, gay, bisexual and transgender (LGBT) older adults are sexually active well into their mid-80s, with a 2007 national study showing 53% of adults age 65–74 and 26% of adults age 75–85 as being active with one or more partners (LGBTAGINGCENTER, 2016), (Lindau et al., 2007).

Older adults are less likely to be tested for HIV/AIDS than other age groups

True. Older adults are less likely to be tested because they are not perceived to be at risk, including being sexually active and/or intravenous drug users (NIA, 2009), (CDC, 2008), (KAISER, 2009). In addition, doctors are less likely to ask older patients about sexual activity - including numbers of sexual partners, using protection and their risk for HIV/AIDS - due to discomfort as well as a common, but mistaken, belief that older adults are not sexually active (CDC, 2008). One study found that only 19% of adults age 50 and older reported talking to their medical provider about HIV/AIDS (KAISER, 2009).

Women are not at risk for HIV

False. Women account for 25% of all people living with HIV and 27% of all new HIV infections per year, with heterosexual sex cited as the main mode of transmission across all racial and ethnic groups (KAISER, 2011d), (CDC, 2011a). In addition, women of colour are particularly affected by HIV/AIDS, with African

American women having an HIV infection rate nearly 15 times higher than white women, and four times higher than Latina/Hispanic women (KAISER, 2011d).

The level of knowledge about HIV/AIDS transmission, risk and its effects is uniform across age groups

False. A 2009 national study found that older adults ages 50–65+ had the most misinformation about how HIV can be transmitted, thinking that transmission can occur by sharing a drinking glass, touching a toilet seat and swimming in a pool with someone who is HIV-positive (KAISER, 2009).

Lesbians, bisexual women, and women who have sex with women (WSW) are not at risk for HIV/AIDS

False. According to the Lesbian AIDS Project report, some lesbians, bisexual women and WSW engage in high-risk behaviors for HIV transmission, including having oral sex without a protective barrier, sharing sex toys without a protective barrier and/or disinfecting them after use, and sexual play that involves the potential exchange of vaginal fluids. In addition, some lesbians, bisexual women and women who have sex with women (WSW) have sexual histories with HIV-positive men or intravenous drug users, and have self-reported participating in sex work for money or drugs—behaviours and experiences that pose great risk for HIV/AIDS infection (Doel and Heath-Toby, 2009). While there are no documented cases of HIV/AIDS transmission between women, this may be due to the general lack of studies on lesbians, bisexual women and WSW because they are not perceived to be at risk.

An older adult who recently contracted HIV has the same health needs and concerns as someone who has been aging with the disease

False. Research and self-reported surveys show that newly diagnosed and/or infected people with HIV/AIDS report needing or seeking a case manager to navigate HIV/AIDS services and programmes, as well as Medicaid Part D and understanding true out-of-pocket (TROOP) costs. In addition, newly diagnosed/infected people are also more likely to report feelings of stigma and ”blame” for their disease, as well as needing help adjusting to their medication regimen. Those who have been aging with HIV/AIDS have reported wanting or seeking help for depression, anxiety and other dual-infections, including arthritis, hepatitis, and hypertension (Cahill et al., 2010), (Karpiak and Shippy, 2006).

Transgender people's risk for HIV/AIDS is heightened because of stigma, transphobia and discrimination

True. Studies show that transgender people experience high rates of discrimination and stigma, leading to lower self-esteem, higher rates of depression, and loneliness. This may make them more likely to engage in risky behaviours, including having unprotected sex with multiple partners, having sex while under the influence of alcohol or other substances, or using intravenous drugs with others (CDC, 2011b).

Older adults do not use intravenous drugs

False. Intravenous drug use is the second most prevalent method of HIV transmission and infection among those 45 years and older, at a transmission rate of 28% for women and 50% for men (CDC, 2009b), (CDC, 2009a), (Cahill et al., 2010), (Karpiak and Shippy, 2006).

Rates of HIV and AIDS infection are uniform across racial and ethnic populations

False. Research has shown that the African American population is disproportionately affected by HIV/AIDS. African Americans account for nearly half of all new HIV infections and AIDS diagnoses - nine times greater than their white counterparts - while the Latino population accounted for 17% of all new HIV infections in 2006 and 21% of new AIDS diagnoses in 2009 (kaiser, 2011a), (kaiser, 2011c), (CDC, 2010a), (CDC, 2010b). These higher rates of HIV/AIDS infections in the African American and Latino populations are thought to be the result of compounding factors, including overall higher rates of contracting sexually transmitted infections (Sexually transmitted infection (STI)s), less access to health care, less HIV prevention education and unstable housing, to name a few.

The homeless population has a higher rate of HIV infection than the general population

True. The U.S. homeless population has an HIV-infection rate up to nine times greater than the general population. This higher rate has been largely attributed to lack of stable housing, higher rates of chronic diseases, drug use and unprotected sex (NCH, 2009).

Medical professionals, such as doctors, dentists, nurses, and home aides, must possess special HIV/AIDS training and knowledge in order to treat HIV/AIDS positive patients

False. According to the U.S. Department of Justice, ”Health care providers are required to treat all persons as if they are infectious for HIV and other blood borne pathogens, and must use universal precautions (gloves, mask, gown, etc.) to protect themselves from the transmission of infectious diseases.” All medical professionals can treat PLWHA, and rarely will they refer them to a medical specialist (Division, 2009).

The symptoms of being HIV-positive or having AIDS are distinct and easily identifiable

False. In fact, diagnosing HIV/AIDS in older adults can be especially difficult because the symptoms are often mistaken for normal signs of aging, including -

- Headaches, fevers,
- Persistent coughs,
- Swollen glands,
- Lethargy and loss of appetite,
- Diarrhea and abdominal cramps,
- Weight loss,
- Rashes, and oral and body sores (CDC, 2008), (NIA, 2009).

The only effective way to know if you have HIV or AIDS is to get tested.

Once infected with HIV, the person will immediately look and feel sick

False. A person can be HIV-positive but remain asymptomatic for months, even years, after contracting the virus, and can unwillingly pass on the virus to others. The best way to protect yourself and your loved ones is to get tested (CDC, 2008), (NIA, 2009).

After 30 years, the stigma of having HIV/AIDS has mostly disappeared

False. According to the Center for HIV Law & Policy 36 states have laws that criminalize HIV exposure, such as protected sexual contact between two consenting adults. Unfortunately - despite national and community-based organisations' prevention, education and training programs and federal, state and local laws protecting their rights - PLWHA are still discriminated against in employment, housing, public accommodation, education and other areas (HIVLAWANDPOLICY, 2010), (KAISER, 2006), (KAISER, 2011b).

Older adults living with HIV/AIDS are thought to experience a ”double stigma” of being both old and HIV/AIDS positive

True. Research shows that ageism - the discrimination or stereotyping of people based on age - as well as the discomfort surrounding HIV/AIDS is especially heightened among older adults. Older adults are more likely to be blamed for ”getting themselves infected,” and HIV-positive older adults report higher rates of self-blame, and are less likely to disclose their HIV/AIDS status out of fear it will negatively impact the lives of their friends and family (CAHILL et al., 2010), (NIA, 2009), (KAISER, 2009). For older adults with HIV who are also LGBT, the stigma and discrimination is often even more magnified because of homophobia and transphobia.

Influenza

Flu is a common infectious viral illness spread by coughs and sneezes. It can be very unpleasant, but you’ll usually begin to feel better within about a week.

You can catch flu - short for influenza - all year round, but it’s especially common in winter, which is why it’s also known as ”seasonal flu”.

It’s not the same as the common cold. Flu is caused by a different group of viruses and the symptoms tend to start more suddenly, be more severe and last longer (NHS, 2015e).

Some of the main symptoms of flu include -

- a high temperature (fever) of 38’C (100.4’F) or above,
- tiredness and weakness,
- a headache,
- general aches and pains,
- a dry, chesty cough (NHS, 2015e).

Cold-like symptoms - such as a blocked or runny nose, sneezing, and a sore throat - can also be caused by flu, but they tend to be less severe than the other symptoms you have.

Flu can make you feel so exhausted and unwell that you have to stay in bed and rest until you feel better (NHS, 2015e).

What to do

If you're otherwise fit and healthy, there's usually no need to see a doctor if you have flu-like symptoms.

The best remedy is to rest at home, keep warm and drink plenty of water to avoid dehydration. You can take paracetamol or ibuprofen to lower a high temperature and relieve aches if necessary.

Stay off work or school until you're feeling better. For most people, this will take about a week (NHS, 2015e).

When to see your GP

Consider visiting your GP if -

- you're 65 years of age or over,
- you're pregnant,
- you have a long-term medical condition - such as diabetes, heart disease, lung disease, kidney disease or a neurological disease,
- you have a weakened immune system - for example, because you're having chemotherapy or have HIV,
- you develop chest pain, shortness of breath or difficulty breathing, or start coughing up blood,
- your symptoms are getting worse over time or haven't improved after a week (NHS, 2015e).

In these situations, you may need medication to treat or prevent complications of flu. Your doctor may recommend taking antiviral medicine to reduce your symptoms and help you recover more quickly (NHS, 2015e).

How long does flu last and is it serious?

If you have flu, you generally start to feel ill within a few days of being infected.

You should begin to feel much better within a week or so, although you may feel tired for much longer.

You will usually be most infectious from the day your symptoms start and for a further three to seven days. Children and people with weaker immune systems may remain infectious for longer.

Most people will make a full recovery and won't experience any further problems, but elderly people and people with certain long-term medical conditions are more likely to have a bad case of flu or develop a serious complication, such as a chest infection (NHS, 2015e).

How you catch flu

The flu virus is contained in the millions of tiny droplets that come out of the nose and mouth when someone who is infected coughs or sneezes.

These droplets typically spread about one metre. They hang suspended in the air for a while before landing on surfaces, where the virus can survive for up to 24 hours.

Anyone who breathes in the droplets can catch flu. You can also catch the virus by touching the surfaces that the droplets have landed on if you pick up the virus on your hands and then touch your nose or mouth.

Everyday items at home and in public places can easily become contaminated with the flu virus, including food, door handles, remote controls, handrails, telephone handsets and computer keyboards. Therefore, it's important to wash your hands frequently.

You can catch flu many times, because flu viruses change regularly and your body won't have natural resistance to the new versions (NHS, 2015e).

Preventing the spread of flu

You can help stop yourself catching flu or spreading it to others with good hygiene measures (NHS, 2015e).

Always wash your hands regularly with soap and warm water, as well as -

- regularly cleaning surfaces such as your computer keyboard, telephone and door handles to get rid of germs,
- using tissues to cover your mouth and nose when you cough or sneeze,
- putting used tissues in a bin as soon as possible (NHS, 2015e).

You can also help stop the spread of flu by avoiding unnecessary contact with other people while you're infectious. You should stay off work or school until you're feeling better.

In some people at risk of more serious flu, an annual flu vaccine (see below) or antiviral medication may be recommended to help reduce the risk of becoming infected (NHS, 2015e).

The flu vaccine

A flu vaccine is available for free on the NHS for -

- anyone over the age of 65,
- pregnant women,
- anyone who is very overweight (with a body mass index over 40),
- children and adults with an underlying health condition (particularly long-term heart or lung disease),
- children and adults with weakened immune systems (NHS, 2015e).

An annual flu vaccine nasal spray is also now offered to healthy children aged two, three and four years old, and to children in school years one and two.

The best time to have the vaccine is in the autumn, between September and early November. If you think you might need it, contact your local GP surgery.

You should have the flu vaccination every year so you stay protected, as the viruses that cause flu change every year (NHS, 2015e).

Symptoms

The symptoms of flu usually develop within one to three days of becoming infected. Most people will feel better within a week.

However, you may have a lingering cough and still feel very tired for a further couple of weeks (NHS, 2015e).

Main symptoms

Flu can give you any of the following symptoms -

- a sudden fever - a temperature of 38'C (100.4'F) or above,
- a dry, chesty cough,
- a headache,
- tiredness and weakness,
- chills,
- aching muscles,
- limb or joint pain,
- diarrhoea or abdominal (tummy) pain,
- nausea and vomiting,
- a sore throat,
- a runny or blocked nose,
- sneezing,

- loss of appetite,
- difficulty sleeping (NHS, 2015e).

Is it flu or a cold?

It can sometimes be difficult to tell if you have flu or just a cold, as the symptoms can be quite similar. The main differences are -

Flu symptoms -

- come on quickly,
- usually include fever and aching muscles,
- make you feel too unwell to continue your usual activities (NHS, 2015e).

Cold symptoms -

- come on gradually,
- mainly affect your nose and throat,
- are fairly mild, so you can still get around and are usually well enough to go to work (NHS, 2015e).

Treatment

Usually, you can manage flu symptoms yourself at home and there's no need to see a GP. Most people feel better within a week (NHS, 2015e).

You should consider seeing your GP if you're at a higher risk of becoming more seriously ill. This includes people who -

- are 65 or over
- are pregnant
- have a lung, heart, kidney, liver or neurological disease
- have a weakened immune system
- have diabetes (NHS, 2015e).

In these cases, your GP may suggest taking antiviral medication (NHS, 2015e).

Managing your symptoms at home

If you're otherwise healthy, you can look after yourself at home by resting, keeping warm and drinking plenty of water to avoid dehydration.

If you feel unwell and have a fever, you can take paracetamol or anti-inflammatory medicines such as ibuprofen to lower your temperature and relieve aches. Children under 16 shouldn't be given aspirin.

Stay off work or school until you're feeling better. For most people, this will take about a week. See your GP if your symptoms get worse or last longer than a week (NHS, 2015e).

Antiviral medication

In 2009, the National Institute for Health and Care Excellence (NICE) recommended that doctors should consider treating people in the at-risk groups mentioned above with the antiviral medications oseltamivir (Tamiflu) or zanamivir (Relenza) to reduce the risk of complications of flu.

Antivirals work by stopping the flu virus from multiplying in the body. They won't cure flu, but they may help slightly reduce the length of the illness and relieve some of the symptoms.

Recent research has suggested that Tamiflu and Relenza may not be effective at reducing the risk of flu complications and could cause side-effects, so not all doctors agree they should be used.

But there is evidence that antivirals can reduce the risk of death in patients hospitalised with flu. In the light of this evidence, Public Health England says it is important that doctors treating severely unwell patients continue to prescribe these drugs where appropriate (NHS, 2015e).

Antibiotics

Antibiotics aren't prescribed for flu as they have no effect on viruses, although they may be prescribed if you develop a complication of flu, such as a bacterial chest infection (NHS, 2015e).

Complications

Complications of flu mostly affect people in high-risk groups, such as the elderly, pregnant women and those who have a long-term medical condition or weakened immune system.

This is why it's important for people in these groups to have the annual flu vaccination and consider seeing their GP if they develop symptoms of flu (NHS, 2015e).

Chest infections

The most common complication of flu is a bacterial chest infection, such as Bronchitis. Occasionally, this can become serious and develop into Pneumonia.

A course of antibiotics usually cures a chest infection or pneumonia, but it can very occasionally become life-threatening, particularly in the frail and elderly (NHS, 2015e).

Worsening of existing conditions

In some people with long-term health conditions, getting flu can make their condition worse.

For example, people with lung conditions such as asthma or COPD may find that their symptoms become more severe when they get the flu.

In people with diabetes, flu can affect blood sugar levels, potentially causing hyperglycaemia (high blood sugar) or, in people with type 1 diabetes, diabetic ketoacidosis (a dangerous condition caused by a lack of insulin in the body).

If you have type 1 diabetes or have type 2 diabetes and take insulin, it's a good idea to monitor your blood sugar level more closely while you're feeling unwell (NHS, 2015e).

Rare complications

Less common complications of flu include -

- tonsillitis - inflammation of the tonsils,
- otitis media - an infection of the middle ear,
- sinusitis - inflammation of the lining of the sinuses,
- febrile seizures (convulsions) - a fit that can happen when a child has a fever,
- meningitis - infection in the brain and spinal cord,
- encephalitis - inflammation of the brain (NHS, 2015e).

Prevention

There are three main ways of preventing flu: good hygiene, such as handwashing and cleaning, the flu vaccination and antiviral medication (NHS, 2015e).

Good hygiene

To reduce your risk of getting flu or spreading it to other people, you should always -

- make sure you wash your hands regularly with soap and warm water,
- clean surfaces such as your keyboard, telephone and door handles regularly to get rid of germs,
- use tissues to cover your mouth and nose when you cough or sneeze,
- put used tissues in a bin as soon as possible (NHS, 2015e).

The flu vaccine

The annual flu vaccine can help reduce your risk of getting flu each year, although it's not 100% effective because it doesn't work against every possible type of flu virus (NHS, 2015e).

A flu vaccine is available for free on the NHS for -

- anyone over the age of 65,
- pregnant women,
- anyone who is very overweight (with a BMI over 40),
- children and adults with an underlying health condition (particularly long-term heart or lung disease),
- children and adults with weakened immune systems (NHS, 2015e).

Adults over 18 and children aged six months to two years in these groups are given an annual injection, while children aged two to 18 are given an annual nasal spray.

The annual nasal spray is also now given to healthy children aged two, three and four years old, and to children in school years one and two.

The best time to have the vaccine is in the autumn, between September and early November. If you think you need it, contact your local GP surgery.

You should have the flu vaccination every year so you stay protected. The viruses that cause flu change every year, so this winter's flu will be different from last winter's (NHS, 2015e).

For most people, flu is an unpleasant illness, but it's not serious. If you are otherwise healthy, you will usually recover from flu within a week.

However, certain people are more likely to develop potentially serious complications of flu, such as bronchitis and pneumonia. These people are advised to have a flu jab each year (NHS, 2015r).

People who should have a flu jab The injected flu vaccine is offered free of charge on the NHS to people who are at risk. This is to ensure they are protected against catching flu and developing serious complications (NHS, 2015r).

You are eligible to receive a free flu jab if you -

- are 65 years of age or over,
- are pregnant,
- have certain medical conditions,
- are very overweight,
- are living in a long-stay residential care home or other long-stay care facility,
- receive a carer's allowance, or you are the main carer for an elderly or disabled person whose welfare may be at risk if you fall ill,
- are a front-line health and social care worker. It is your employer's responsibility to arrange vaccination for you (NHS, 2015r).

Flu jab for people with medical conditions The injected flu vaccine is offered free of charge on the NHS to anyone with a serious long-term health condition. That includes these types of illnesses -

- chronic (long-term) respiratory diseases, such as asthma (which requires an inhaled or tablet steroid treatment, or has led to hospital admission in the past), COPD, or bronchitis,
- chronic heart disease, such as heart failure,
- chronic kidney disease,
- chronic liver disease, such as hepatitis,
- chronic neurological conditions, such as Parkinson's disease or motor neurone disease,
- diabetes,
- problems with your spleen - for example, sickle cell disease or if you have had your spleen removed,
- a weakened immune system as the result of conditions such as HIV and AIDS, or medication such as steroid tablets or chemotherapy (NHS, 2015r).

This list of conditions isn't definitive. It's always an issue of clinical judgement.

Your GP can assess you individually to take into account the risk of flu exacerbating any underlying illness you may have, as well as your risk of serious illness from flu itself.

The vaccine should always be offered in such cases, even if you are not technically in one of the risk groups above.

If you live with someone who has a weakened immune system, you may also be advised to have a flu vaccine. Speak to your GP or pharmacist about this (NHS, 2015r).

Flu jab for health and social care workers Outbreaks of flu can occur in health and social care settings, and, because flu is so contagious, staff, patients and residents are all at risk of infection.

If you're a front-line health and social care worker, you are eligible for an NHS flu jab to protect yourself, your colleagues and other members of the community.

It is your employer's responsibility to arrange vaccination for you. So, if you are an NHS-employed front-line healthcare worker, the NHS will pay for your vaccination. If you are a social care worker, your employer - for example, your local authority - will pay for vaccination.

In the case of health and social care workers employed by private companies, those companies will arrange and pay for the vaccinations.

The NHS has this advice on flu vaccination of health and social care workers (NHS, 2015r).

Flu jab for carers If you care for someone who is elderly or disabled, speak to your GP or pharmacist about having a flu jab along with the person you care for.

This NHS leaflet gives information about the flu vaccination 2015-16 aimed at carers of and people with a learning disability (NHS, 2015r).

How the flu jab works The injected flu vaccine stimulates your body's immune system to make antibodies to attack the flu virus.

Antibodies are proteins that recognise and fight off germs, such as viruses, that have invaded your blood.

If you're exposed to the flu virus after you've had the flu vaccine, your immune system will recognise the virus and immediately produce antibodies to fight it.

It may take 10 to 14 days for your immunity to build up fully after you have had the flu shot. You need to have a flu jab every year, as the antibodies that protect you from flu decline over time, and flu strains can also change from year to year (NHS, 2015j).

How the annual flu jab changes In February each year, the World Health Organization (WHO) assesses the strains of flu virus that are most likely to be circulating in the northern hemisphere over the following winter.

Based on this assessment, WHO recommends which three flu strains the vaccines should contain for the forthcoming winter. Vaccine manufacturers then produce flu vaccines based on WHO's recommendations. These flu jabs are used in all the countries in the northern hemisphere, not just the UK.

Production of the vaccine starts in March each year after WHO's announcement. The vaccine is usually available in the UK from September (NHS, 2015j).

Types of flu virus There are three types of flu viruses. They are -

- **type A flu virus** - this is usually the more serious type. The virus is most likely to mutate into a new version that people are not resistant to. The H1N1 (swine flu) strain is a type A virus, and flu pandemics in the past were type A viruses,
- **type B flu virus** - this generally causes a less severe illness and is responsible for smaller outbreaks. It mainly affects young children,
- **type C flu virus** - this usually causes a mild illness similar to the common cold (NHS, 2015j).

Most years, one or two strains of type A flu circulate as well as type B (NHS, 2015j).

Deactivated viruses The injectable flu vaccine contains three different types of flu virus (usually two A types and one B type).

For most flu vaccines, the three strains of the viruses are grown in hens' eggs. The viruses are then killed (deactivated) and purified before being made into the vaccine.

Because the injected flu vaccine is a killed vaccine, it cannot cause flu (NHS, 2015j).

Flu jab ingredients As there are lots of different flu vaccines produced each year, for more detailed information on ingredients ask your doctor or nurse for the patient information leaflet for the specific vaccine being offered (NHS, 2015j).

Antiviral medication

Taking the antiviral medicines oseltamivir (Tamiflu) or zanamivir (Relenza) to prevent flu is recommended if all of the following apply -

- there is a lot of flu around,
- you're over 65, pregnant, or have a medical condition that puts you at risk of complications of flu, such as diabetes, heart disease, lung disease, kidney disease or a neurological disease,
- you have been in contact with someone with a flu-like illness and can start antiviral treatment within 36–48 hours,
- you have not been effectively protected by vaccination (NHS, 2015r).

You are not effectively protected by vaccination if you -

- have not been vaccinated since last winter,
- cannot be vaccinated or have been vaccinated, but it hasn't taken effect yet (this can take up to two weeks),
- have been vaccinated against a form of flu virus that's different to the type going around (NHS, 2015r).

If there's an outbreak of flu in a residential or nursing home - where the flu virus can often spread very quickly - antiviral medication may be offered to people if they have been in contact with someone with confirmed flu.

For more information, read the guidelines from the National Institute for Health and Care Excellence (NICE) on antivirals to prevent influenza (NHS, 2015r).

Leg ulcers

A leg ulcer is a long-lasting (chronic) sore that takes more than four to six weeks to heal. They usually develop on the inside of the leg, just above the ankle.

The symptoms of a venous leg ulcer include pain, itching and swelling in the affected leg. There may also be discoloured or hardened skin around the ulcer, and the sore may produce a foul-smelling discharge.

See your GP if you think you have a leg ulcer, as it will need specialist treatment to help it heal.

Your GP will examine your leg and may carry out additional tests to rule out other conditions (NHS, 2016f).

Symptoms

Venous leg ulcers are open, often painful, sores in the skin that take more than a month to heal. They usually develop on the inside of the leg, just above the ankle (NHS, 2016f).

If you have a venous leg ulcer, you may also have -

- oedema,
- discolouration and darkening of the skin around the ulcer,
- hardened skin around the ulcer, which may make your leg feel hard or even resemble the shape of an upside-down champagne bottle,
- a heavy feeling in your legs,
- aching or swelling in your legs,
- red, flaky, scaly and itchy skin on your legs (varicose eczema),
- swollen and enlarged veins on your legs (varicose veins),
- an unpleasant and foul-smelling discharge from the ulcer (NHS, 2016f).

Signs of an infection

A venous leg ulcer can be susceptible to bacterial infection. Symptoms of an infected leg ulcer can include -

- worsening pain,
- a green or unpleasant discharge coming from the ulcer,
- redness and swelling of the skin around the ulcer,
- a high temperature (fever) (NHS, 2016f).

When to seek medical advice

Contact your GP if you think you've developed a venous leg ulcer. They're unlikely to get better on their own, as they usually require specialist medical treatment.

You should also contact your GP or leg ulcer specialist if you've been diagnosed with a venous leg ulcer and have symptoms that suggest it could be infected (NHS, 2016f).

Causes

A venous leg ulcer can develop after a minor injury if there's a problem with the circulation of blood in your leg veins. If this happens, pressure inside the veins increases.

This constant high pressure can gradually damage the tiny blood vessels in your skin and make it fragile. As a result, your skin can easily break and form an ulcer after a knock or scratch.

Unless you have treatment to improve the circulation in your legs, the ulcer may not heal (NHS, 2016f).

Who's most at risk?

A number of factors can increase your risk of developing a venous leg ulcer, including -

- obesity or being overweight - this increases the pressure in the leg veins,
- if you have difficulty walking - this can weaken the calf muscles, which can affect circulation in the leg veins,
- previous DVT - blood clots that develop in the leg can damage valves in the veins,
- varicose veins - swollen and enlarged veins caused by malfunctioning valves,
- previous injury to the leg, such as a broken or fractured bone, which may cause DVT or impair walking,
- previous surgery to the leg, such as a hip replacement or knee replacement, which can prevent you from moving about,
- increasing age - people find it harder to move around as they get older, particularly if they suffer from arthritis (NHS, 2016f).

Diagnosis

See your GP if you think you have a venous leg ulcer. The ulcer is unlikely to heal without specialist treatment.

Diagnosis is largely based on your symptoms and examination of your affected leg, although additional tests may be required (NHS, 2016f).

Medical history and examination

Your GP or practice nurse will ask whether you have any other symptoms associated with venous leg ulcers, such as -

- swelling in your ankles,
- discoloured or hard skin (NHS, 2016f).

They'll try to determine the cause of the ulcer by asking about underlying conditions or previous injuries, such as -

- diabetes,
- DVT,
- injury or surgery in the affected leg,
- a previous leg ulcer (NHS, 2016f).

They'll also examine your leg, both when you're standing up and lying down. Varicose veins will be more obvious when you're standing up, and it will be easier to look at the ulcer when you're lying down.

They'll also feel your pulse at your ankles to make sure the arteries in your leg are working properly (NHS, 2016f).

Doppler study

To rule out peripheral arterial disease (a condition affecting the arteries) as a possible cause of your symptoms, your GP or nurse will carry out a test known as a Doppler study.

The involves measuring the blood pressure in the arteries at your ankles and comparing it to the pressure in your arms. If you have peripheral arterial disease, the blood pressure in your ankles will be lower than your arms.

It's important to carry out this check as the main treatment for venous ulcers is compression bandages or stockings to improve the vein circulation in your legs. It's not safe to apply compression if the ankle artery pressures are low (NHS, 2016f).

Referral to a specialist

In some cases, your GP or nurse may decide to refer you to a specialist in conditions affecting the blood vessels (vascular specialist).

For example, you may be referred to a vascular specialist if your GP or nurse is unsure about your diagnosis, or if they suspect your ulcer may be caused by artery diseases, diabetes or rheumatoid arthritis.

After taking your medical history and examining you, the vascular specialist may need to arrange further investigations to plan your treatment (NHS, 2016f).

Treatment

With appropriate treatment, most venous leg ulcers heal within three to four months.

Treatment should always be carried out by a healthcare professional trained in compression therapy for leg ulcers. Usually, this will be a practice or district nurse (NHS, 2016f).

Cleaning and dressing the ulcer

The first step is to remove any debris or dead tissue from the ulcer and apply an appropriate dressing. This provides the best conditions for the ulcer to heal.

A simple, non-sticky dressing will be used to dress your ulcer. This usually needs to be changed once a week. Many people find they can manage cleaning and dressing their own ulcer under the supervision of a nurse (NHS, 2016f).

Compression To improve vein circulation in your legs and treat swelling, your nurse will apply a firm compression bandage over the affected leg. These bandages are designed to squeeze your legs and encourage blood to flow upwards, towards your heart.

There are many different types of bandage or elastic stockings used to treat venous leg ulcers, which may be made in two, three or four different layers. The application of a compression bandage is a skilled procedure and they should only be applied by trained healthcare staff.

The bandage is changed once a week, when the dressing is changed.

When compression bandages are first applied to an unhealthy ulcer, it's usually painful. Ideally, you should have paracetamol or an alternative painkiller prescribed by your GP. The pain will lessen once the ulcer starts to heal, but this can take up to 10–12 days.

It's important to wear your compression bandage exactly as instructed. If you have any problems, it's usually best to contact your nurse, instead of trying to remove it yourself. If the compression bandage feels a little too tight and is uncomfortable in bed at night, getting up for a short walk will usually help (NHS, 2016f).

However, you'll need to cut the bandage off if -

- you get severe pain at the front of your ankle,
- you get severe pain on the top of your foot,
- your toes become blue and swollen (NHS, 2016f).

Once you remove the bandage, make sure you keep your leg highly elevated and contact your doctor or nurse as soon as possible.

In some clinics, specialist teams are using new alternatives to compression bandages, such as special stockings or other compressive devices. These may not be available in every clinic but could change the way ulcers are treated in future. Your specialist will be able to advise you whether a different approach may help you (NHS, 2016f).

Treating associated symptoms

Swelling in the legs and ankles Venous leg ulcers are often accompanied by swelling of your feet and ankles oedema, which is caused by fluid. This can be controlled by compression bandages.

Keeping your leg elevated whenever possible, ideally with your toes at the same level as your eyes, will also help ease swelling. You should put a suitcase, sofa cushion or foam wedge under the bottom of your mattress, to help keep your legs raised while you sleep.

You should also keep as active as possible and aim to continue with your normal activities. Regular exercise, such as a daily walk, will help reduce leg swelling. However, you should avoid sitting or standing still with your feet down. You should elevate your feet at least every hour (NHS, 2016f).

Itchy skin Some people with venous leg ulcers develop rashes with scaly and itchy skin.

This is often due to varicose eczema, which can be treated with a moisturiser (emollient) and occasionally a mild corticosteroid cream or ointment. In rare cases, you may need to be referred to a dermatologist (skin specialist) for treatment.

Itchy skin can also sometimes be caused by an allergic reaction to the dressings or creams applied by your nurse. If this happens, you may need to be tested for allergies.

It's important to avoid scratching your legs if they feel itchy, because this damages the skin and may lead to further ulcers (NHS, 2016f).

Looking after yourself during treatment

To help your ulcer heal more quickly, follow the advice below -

- Try to keep active by walking regularly. Sitting and standing still without elevating your legs can make venous leg ulcers and swelling worse,
- Whenever you're sitting or lying down, keep your affected leg elevated - with your toes level with your eyes,
- Regularly exercise your legs by moving your feet up and down, and rotating them at the ankles. This can help encourage better circulation,
- If you're overweight, try to reduce your weight with a healthy diet and regular exercise,
- Stop smoking and moderate your alcohol consumption. This can help the ulcer heal faster,
- Be careful not to injure your affected leg, and wear comfortable, well-fitting footwear (NHS, 2016f).

You may also find it helpful to attend a local healthy leg club, such as those provided by the Lindsay Leg Club Foundation, for support and advice (NHS, 2016f).

Treating an infected ulcer

An ulcer sometimes produces a large amount of discharge and becomes more painful. There may also be redness around the ulcer. These symptoms and feeling unwell are signs of infection.

If your ulcer becomes infected, it should be cleaned and dressed as usual.

You should also elevate your leg most of the time and you'll be prescribed a seven-day course of antibiotics.

The aim of antibiotic treatment is to clear the infection. However, antibiotics don't heal ulcers and should only be used in short courses to treat infected ulcers (NHS, 2016f).

Follow-up

You should visit your nurse once a week to have your dressings and compression bandages changed. They'll also monitor the ulcer to see how well it's healing. Once your ulcer is healing well, your nurse will see you less often (NHS, 2016f).

After the ulcer has healed

Once you've had a venous leg ulcer, another ulcer could develop within months or years.

The most effective method of preventing this is to wear compression stockings at all times when you're out of bed. Your nurse will help you find a stocking that fits correctly and that you can manage yourself.

Various accessories are available to help you put them on and take them off (NHS, 2016f).

Prevention

You can help reduce your risk of developing a venous leg ulcer in several ways, such as wearing a compression stocking, losing weight and taking care of your skin.

People most at risk of developing a venous leg ulcer are those who have previously had a leg ulcer (NHS, 2016f).

Compression stockings

If you've previously had a venous leg ulcer, or you're at risk of developing one, treatment with compression stockings may be recommended by your GP.

These stockings are specially designed to squeeze your legs, improving your circulation. They're usually tightest at the ankle and less tight further up your leg - this encourages blood to flow upwards, towards your heart.

To be most effective, these stockings should be put on as you get up and only taken off at night.

Compression stockings are available in a variety of different sizes, colours, styles and pressures. A nurse can help you find a stocking that fits correctly and that you can manage yourself. There are various accessories you can buy to help get the stockings on and off (NHS, 2016f).

Losing weight

If you're obese or overweight, losing weight can help treat and prevent venous leg ulcers. Excess weight leads to high pressure in the veins in your legs, which can damage your skin. Venous ulcers are much more common among people who are overweight.

To help you lose weight, regular exercise and a healthy, balanced diet are recommended. You should also avoid sitting or standing for long periods. Elevating your legs whenever possible can also help (NHS, 2016f).

Treating underlying problems

Treating severe varicose veins may help prevent leg swelling or ulcers. This may involve a procedure where a catheter (a thin, flexible tube) is inserted into the affected veins with high-frequency radio waves or lasers used to seal them.

Alternatively, you may need surgery to repair the damage to your leg veins, or to remove the affected veins altogether (NHS, 2016f).

Meniere's disease

Meniere's disease is a rare disorder that affects the inner ear. It can cause vertigo, tinnitus, hearing loss, and a feeling of pressure deep inside the ear.

People with Meniere's disease usually experience some or all of these symptoms during sudden attacks, which typically last around two to three hours, although it can take a day or two for the symptoms to disappear completely.

It's worth noting, however, that the symptoms and severity of Meniere's disease vary widely from person to person. Some people may experience frequent attacks of vertigo along with hearing loss, while others may have severe tinnitus with minor vertigo. Other symptoms include sensitivity to sound (hyperacusis) or distorted sound.

See your GP if you experience any of the symptoms of Meniere's disease, so they can try to identify the problem and refer you to a specialist if necessary (NHS, 2015l).

Symptoms

The symptoms of Meniere's disease vary from person to person. They often begin as sudden attacks, lasting for a few hours. Some people may experience several attacks each week or they may be separated by weeks, months or even years (NHS, 2015l).

Main symptoms

The main symptoms of Meniere's disease are -

- **vertigo** - the sensation that you, or the environment around you, is moving or spinning,
- **tinnitus** - hearing sounds from inside your body, rather than from an outside source,
- **hearing loss**, with a particular difficulty hearing deep or low sounds,
- a **sense of pressure** or fullness deep inside the ear (NHS, 2015l).

These symptoms usually only affect one ear at first, but both ears often become affected over time. Vertigo and tinnitus are described in more detail below (NHS, 2015l).

Vertigo

Vertigo is one of the most common and noticeable symptoms of Meniere's disease.

As well as a sensation of spinning, you may also experience additional symptoms during an attack of vertigo, such as dizziness, feeling or being sick, and problems with balance. You may have difficulty standing or walking. Occasionally, you may have "drop attacks", where you suddenly fall to the ground.

During a severe attack, you may also experience sweating, diarrhoea and rapid or irregular heartbeats (NHS, 2015l).

Tinnitus

Tinnitus is usually more noticeable when you're tired or when it's quiet, as there's less background noise to distract you from sounds coming from inside your body.

Examples of sounds you may hear include buzzing, humming, grinding, hissing and whistling (NHS, 2015l).

Stages of Meniere's disease

Meniere's disease is often divided into early, middle and late stages.

However, the progression of Meniere's disease varies between individuals. You may not necessarily pass through each of these stages and the severity of the symptoms may also vary. In general, people experience more attacks during the first few years, and then as the attacks decrease in frequency over time, the hearing loss becomes progressively worse (NHS, 2015l).

Some or all of the following symptoms may be experienced before an attack -

- loss of balance,
- dizziness and lightheadedness,
- headache and increased ear pressure,
- increased hearing loss or tinnitus,
- sensitivity to sound,
- a feeling of uneasiness (NHS, 2015l).

If a person is aware of these warning symptoms, it can allow them to move to a safer or more comfortable situation before an attack.

The stages of Meniere's disease are described in more detail below (NHS, 2015l).

Early stage

The early stage of Meniere's disease consists of sudden and unpredictable attacks of vertigo. These are usually accompanied by nausea, vomiting and dizziness. You may lose some hearing during the attack, and you may experience tinnitus at the same time. Your ear may also feel blocked and uncomfortable, with a sense of fullness. Some people may also experience sensitivity to sound.

Attacks of vertigo at this stage can last from 20 minutes to 24 hours, but usually last around two to three hours. Your hearing and the full sensation in your ear usually returns to normal between attacks (NHS, 2015l).

Middle stage

The middle stage of Meniere's disease consists of continuing attacks of vertigo, with the attacks becoming less severe for some people. However, tinnitus and hearing loss often become worse.

During the middle stage, you may experience some periods of remission (where your symptoms go away), which can last for up to several months. Some people may still experience symptoms of tinnitus, sensitivity to sound or loss of balance between attacks of vertigo (NHS, 2015l).

Late stage

During the late stage of Meniere's disease, the episodes of vertigo occur far less frequently. There may be months or even several years between attacks or they may stop altogether. However, you may be left with balance problems, and you may be unsteady on your feet, particularly in the dark.

Hearing problems and tinnitus tend to become progressively worse during the late stage of Meniere's disease (NHS, 2015l).

Causes

The exact cause of Meniere's disease isn't clear, although it's thought to be caused by a problem with the pressure in the inner ear (NHS, 2015l).

The inner ear is made up of -

- the cochlea - a coiled, spiral tube that contains two fluid-filled chambers and is responsible for hearing,
- the vestibular apparatus - a complex set of tubes that help to control balance (NHS, 2015l).

The fluid inside the inner ear is called endolymph.

If the pressure of the endolymph fluid changes - for example, because there is too much fluid - it can result in symptoms such as vertigo and tinnitus.

It's thought that this pressure change is responsible for Meniere's disease, although it hasn't been proven (NHS, 2015l).

Increased risk

Although the exact cause of Meniere's disease is unknown, the following factors may increase the risk of developing the condition -

- **autoimmunity** - when your immune system attacks your own tissues and organs by mistake,
- **genetic (inherited) factors** - for example, if you have a family history of the condition,
- **a chemical imbalance in the fluid in your inner ear** - as a result of too little or too much sodium or potassium in your body,

- **a problem with the blood vessels** - there's a link between Meniere's disease and migraines, which are thought to be caused by the narrowing and widening of blood vessels,
- **some viral infections** - such as meningitis (NHS, 2015l).

Diagnosis

There's no single test for Meniere's disease, and the condition can be difficult to distinguish from other conditions with similar symptoms.

For example, migraines and ear infections can also affect your balance and hearing. A viral infection of the balance nerve (vestibular neuronitis) or the inner ear (labyrinthitis) can also produce similar vertigo attacks (NHS, 2015l).

Seeing your GP

See your GP if you experience any of the symptoms of Meniere's disease.

They'll ask you to describe your symptoms to find out if a pattern is emerging that could indicate Meniere's disease (NHS, 2015l).

For Meniere's disease to be diagnosed, you'll need to have the following characteristic symptoms -

- vertigo - at least two episodes of vertigo lasting 20 minutes or more within a single Meniere's disease attack,
- hearing loss - tests must confirm that hearing loss is caused by damage to the sensitive hair cells inside the cochlea (the coiled tube in the inner ear),
- tinnitus or a feeling of pressure in your ear (NHS, 2015l).

Your GP may also carry out a general physical examination to rule out other possible causes of your symptoms. This may involve listening to your heartbeat, checking your blood pressure and examining the inside of your ears (NHS, 2015l).

Seeing a specialist

If necessary, your GP can refer you to a specialist for further tests.

In most cases, you'll probably be referred to an ENT specialist at the ENT department of your local hospital.

You can also be referred to a specialist in audiovestibular medicine for hearing and balance assessment, although this service may not be available in every hospital (NHS, 2015l).

Hearing tests The specialist will be able to assess the extent of your hearing loss by using hearing tests, such as an audiometry test.

During an audiometry test, you listen to sounds of different volume and pitch produced by a machine and signal when you hear a sound, either by raising your hand or pressing a button (NHS, 2015l).

Videonystagmography Videonystagmography (VNG) may be used to check for signs of uncontrollable eye movements (nystagmus) because this can indicate a problem with balance.

During this test, special goggles are placed over your eyes and you'll be asked to look at various still and moving targets. The goggles are fitted with a video camera to record your eye movements (NHS, 2015l).

Caloric testing A caloric test involves putting warm and cool water or air in your ear for about 30 seconds. The change in temperature stimulates the balance organ in the ear, allowing the specialist to check how well it's working.

This test isn't painful, although it's normal to feel dizzy for a few minutes afterwards (NHS, 2015l).

Electrocochleography Electrocochleography is a test used to measure how your hearing nerves respond to sound.

During this test, a series of electrodes are attached to your head and a thin probe or needle is passed into your ear so it touches or passes through your eardrum. Local anaesthetic will be used to numb your eardrum before the procedure if a needle is going to be passed through it.

You will then listen to a series of loud clicks, while the activity of your nerves is picked up by the electrodes and probe or needle (NHS, 2015l).

Scans

In some cases, a MRI scan of your head may be carried out to look for any abnormalities in your brain - such as an acoustic neuroma (a non-cancerous tumour) - that could be causing your symptoms (NHS, 2015l).

Treatment

Treatment can usually help to control the symptoms of Meniere's disease, although there's currently no cure (NHS, 2015l).

Your ENT specialist and your GP can help you manage your symptoms. Possible treatments include -

- dietary advice - particularly a low-salt diet,
- medication to treat and prevent attacks,
- treatment for tinnitus,
- treatment for hearing loss,
- treatment called vestibular rehabilitation to cope with balance problems,
- treatment for stress, anxiety and depression,
- surgery (NHS, 2015l).

Your GP and ENT specialist should provide you with advice tailored to your individual needs, and should develop a plan to help you manage your symptoms.

In some cases, the treatment available may depend on what your local NHS Clinical Commissioning Group (CCG) can provide (NHS, 2015l).

Treatment during an attack

During an attack of Meniere's disease, you may be prescribed medication to treat the symptoms of vertigo, nausea and vomiting.

This is usually prochlorperazine or an antihistamine. If these work, you may be given a supply to keep, so you can take them quickly during an attack (NHS, 2015l).

Prochlorperazine Prochlorperazine can cause side-effects including tremors (shaking) and involuntary body or facial movements. It can also make some people feel sleepy.

Check the patient information leaflet that comes with your medicine for the full list of possible side-effects.

If you experience vomiting during your attacks, you can take a type of prochlorperazine called Buccastem. This comes as a tablet that you place between your gums and your cheek, on the inside of your mouth. The tablet dissolves and is absorbed into your body (NHS, 2015l).

Antihistamines Antihistamines you may be prescribed include cinnarizine, cyclizine and promethazine teoclate.

Antihistamines can make you feel sleepy. Headaches and an upset stomach are also possible side-effects. Check the patient information leaflet that comes with your medicine for the full list of possible side-effects (NHS, 2015l).

What to do during an attack

During an attack, take your medication as soon as possible and grab the nearest available support. Get into a position in which you feel most stable or comfortable, and keep as still as possible. If you need to move, do so slowly and carefully. Close your eyes or keep them fixed on objects in front of you, and don't turn your head quickly.

Once your symptoms start to improve, it's best to gradually try to move around, as this encourages your brain to use your vision and other senses to compensate for the problems in your inner ear (NHS, 2015l).

Severe attacks If you suffer severe vertigo, dizziness, nausea and vomiting during an attack of Meniere's disease, you may need to be injected with prochlorperazine by your doctor.

If you suffer severe vertigo with or without nausea during an attack, your doctor may also prescribe you a tablet of Buccastem that dissolves very quickly in your mouth (see above).

In particularly severe cases, you may need to be admitted to hospital to receive intravenous fluids (through a vein) to keep you hydrated (NHS, 2015l).

Preventing attacks

Your GP can prescribe a medication called betahistine to help reduce the frequency and severity of attacks of Meniere's disease, or you may be advised to change your diet (NHS, 2015l).

Special diets Although it has not been proven to be consistently effective, following a diet without added salt can help some people to control their symptoms. It's possible that this type of diet might alter the fluids in your inner ear.

Avoiding excessive caffeine, found in drinks such as tea and coffee, is also usually recommended (NHS, 2015l).

Betahistine Betahistine is thought to reduce the pressure of the fluid in your inner ear, relieving the symptoms of Meniere's disease. Your GP may recommend trying them to see if they help.

Betahistines are usually available as tablets to be taken three times a day. Your GP will discuss how long you need to take them for, which could be a few weeks, or up to a year. Possible side-effects include a headache, upset stomach and a rash (NHS, 2015l).

Treating tinnitus

A number of different treatments can be used to treat tinnitus caused by Meniere's disease. Some possibilities include -

- **Sound therapy** - the effects of tinnitus are often more pronounced in quiet environments. The aim of sound therapy is to fill the silence with neutral, often repetitive sounds to distract you from the sound of tinnitus.
- **Relaxation techniques** - tinnitus can be a distressing and intrusive condition. Relaxing by practising yoga or special breathing techniques may help you to avoid stress and anxiety.
- **Cognitive behavioural therapy (CBT)** - this is a therapy based on the knowledge that Meniere's symptoms can have a significant psychological effect, resulting in negative thoughts and changes in behaviour. This may aggravate your symptoms and create a vicious circle. cognitive behavioural therapy (CBT) is given by a specially trained professional who aims to change the way you think and behave, to break this cycle (NHS, 2015l).

Treating hearing loss

You may experience permanent hearing loss if Meniere's disease is in the middle or end stages. Meniere's disease tends to make you more sensitive to loud sounds, and also makes it more difficult for you to distinguish low-pitched sounds.

There are a variety of hearing aids available. Hearing therapists and organisations, such as Action on Hearing Loss, can provide you with helpful advice for dealing with hearing loss (NHS, 2015l).

Vestibular rehabilitation

vestibular rehabilitation (VRT) is usually provided by a hearing specialist or physiotherapist. Your GP may be able to refer you for VRT, although it will depend on the availability in your area.

A vestibular therapist or specially trained physiotherapist can help improve your balance by teaching you vestibular rehabilitation techniques. These exercises teach you how to cope with the disorientating signals coming from your inner ear. You’re taught to use alternative signals from your eyes, ankles, legs and neck, to keep you balanced.

Vestibular therapy is usually used in the middle or late stages of Meniere’s disease, after the severe attacks of vertigo have stopped, but when balance problems may remain.

In some cases, it may be possible to use VRT without specialist help. Research has shown that some people can improve their symptoms by using self-help VRT booklets. However, you should discuss this with your doctor first. If it’s likely to be useful, you can download a copy of these booklets from the Meniere’s Society (NHS, 2015l).

Surgery

In severe cases, surgery can be performed to control the attacks of vertigo. However, surgical procedures are usually only used if other treatments have failed (NHS, 2015l).

The type of surgery you have will depend on your symptoms, and whether both ears are affected. You could have -

- non-destructive surgery,
- selectively destructive surgery,
- destructive surgery (NHS, 2015l).

Non-destructive surgery

Non-destructive surgery may be used if your hearing in the affected ear is ”socially adequate” (you can hear sounds that are below 50 decibels). This type of surgery aims to change the progression of Meniere’s disease by reducing the severity and frequency of your symptoms (NHS, 2015l).

Types of non-destructive surgery include -

- **endolymphatic sac decompression** - this can help to reduce the pressure in your inner ear by increasing the drainage of the fluid of your inner ear, although evidence of its effectiveness for Meniere's disease is limited,
- **inserting ventilation tubes (grommets)** - these are inserted into your ear to reduce the changes in pressure that cause Meniere's disease,
- **injecting steroid medication through the eardrum** - although there's only limited evidence to suggest that this is an effective treatment,
- **micropressure therapy** - a newer type of treatment with little evidence regarding its safety and effectiveness; grommets are inserted into your ear and attached to a small pressure generator for a few minutes, several times a day, to alter the pressure in the inner ear (NHS, 2015l).

The National Institute for Health and Care Excellence (NICE) has more information on micropressure therapy for Meniere's disease.

Selectively destructive surgery

In selectively destructive surgery, the balance part of the inner ear is destroyed with a medicine called gentamicin. This is injected through the ear drum (the thin layer of tissue separating the outer ear from the middle ear) and enters the labyrinth (the system of tubes in the inner ear).

Gentamicin should mainly damage the balance part of your ear, but there's a risk it could damage your hearing as well.

Some surgeons prefer to apply the gentamicin directly to the inner ear during a minor operation. This means they can control the exact dose of gentamicin that enters your ear (NHS, 2015l).

Destructive surgery

Destructive surgery may be considered if only one ear is affected by Meniere's disease. The hearing in the affected ear must be considered to be ”socially inadequate” (you can't hear enough to function in social situations). As an approximate guide, if you can't hear sounds below 50 decibels, this may count as socially inadequate.

Destructive surgery is used to destroy the part of your inner ear causing your vertigo attacks. However, these operations can cause permanent hearing loss in the treated ear, so will only be considered if you already have permanently reduced hearing in the affected ear (NHS, 2015l).

Destructive surgery can be done by -

- **destroying the balance part of your audio-vestibular nerve** - the nerve transmitting sounds and balance information to the brain,
- **destroying part of your vestibular labyrinth (labyrinthectomy**) - the system of tiny, fluid-filled channels in the ear (NHS, 2015l).

After surgery, your other ear will take over your hearing and balance functions (NHS, 2015l).

Safety and effectiveness of surgery

There are very few clinical trials looking into the effectiveness of surgery for Meniere's disease, which is why surgery is rarely considered. If your ENT specialist thinks you may benefit from having surgery, they'll discuss the procedure and any risks in more detail with you (NHS, 2015l).

Support groups and charities

There are several support groups and charities that can provide you with useful information and advice about living with Meniere's disease. They can also put you in touch with other people with the condition (NHS, 2015l).

Meniere's disease and the placebo effect

The placebo effect is the unusual psychological effect that can occur when a person is given a "dummy" medication, such as a sugar pill. They feel better after taking the pill, because they think they're being given real medication.

Although there's limited scientific evidence to suggest that many of the self-help measures and treatments used for Meniere's disease are consistently effective, they can help some people to control their symptoms because of the placebo effect (NHS, 2015l).

Living with Meniere's disease

Living with Meniere's disease can be difficult and frustrating. Your balance and hearing may be significantly impaired during an attack, meaning that certain activities can be dangerous (NHS, 2015l).

The unpredictable nature of the condition means you may need to change your daily activities so you don't place yourself, or others, in danger. Situations you may need to avoid include -

- swimming,
- climbing ladders or scaffolding,
- operating heavy machinery,
- driving (see below) (NHS, 2015l).

You may also need to make sure that someone is with you most of the time, in case you need help during an attack. These restrictions may leave you feeling stressed, anxious, or depressed. Speak to your GP if you're finding it difficult to come to terms with the effect that Meniere's disease is having on your life. They can offer advice and support (NHS, 2015l).

Support groups and charities

There are also several support groups and charities that provide useful information and advice about living with Meniere's disease. They can put you in touch with other people who have the condition, so you can share experiences and provide support to one another.

The UK Meniere's Society offers a range of resources and information for people with Meniere's disease and for those who care for them.

As the symptoms of Meniere's disease can affect your work and family life, you may need advice on financial and relationship issues. The Citizens Advice Bureau and GOV.UK may be useful (NHS, 2015l).

Driving

If you experience sudden episodes of vertigo and dizziness, you must inform the Driver and Vehicle Licensing Agency (DVLA) about your condition before driving.

You'll need to fill in a form about your condition and the DVLA will ask for permission to obtain reports on your condition from your doctor or specialist.

Your case will be assessed on an individual basis, but it's likely that you won't be allowed to continue driving if you experience sudden attacks of vertigo and dizziness without any warning signs.

Driving won't be permitted again until you have control of your symptoms, in which case you'll need to reapply for a licence. Your GP or ENT specialist will have to confirm your symptoms have improved and are under control.

If you drive a heavy goods vehicle or a passenger-carrying vehicle and you're diagnosed with Meniere's disease, you usually have to be symptom-free for a year before you can reapply for a licence.

Visit GOV.UK for more information about driving with a disability or health condition (NHS, 2015l).

Osteoarthritis

Osteoarthritis is a condition that causes the joints to become painful and stiff. It is the most common type of arthritis in the UK.

The severity of osteoarthritis symptoms can vary greatly from person to person, and between different affected joints. For some people, the symptoms may be mild and may come and go, whereas others can experience more continuous and severe problems.

Almost any joint can be affected by osteoarthritis, but the condition most often causes problems in the knees, hips, and small joints of the hands.

The pain and stiffness in the joints can make carrying out everyday activities difficult for some people with the condition (NHS, 2015m).

Symptoms

The main symptoms of osteoarthritis are pain and stiffness in your joints, which can make it difficult to move the affected joints and do certain activities.

The symptoms may come and go in episodes, which can be related to things such as your activity levels and even the weather. In more severe cases, the symptoms can be continuous (NHS, 2015m).

Other symptoms you or your doctor may notice include -

- joint tenderness,
- increased pain and stiffness when you have not moved your joints for a while,
- joints appearing slightly larger or more 'knobbly' than usual,
- a grating or crackling sound or sensation in your joints,
- limited range of movement in your joints,
- weakness and muscle wasting [48] (NHS, 2015m).

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[48] loss of muscle bulk

Osteoarthritis can affect any joint in the body, but the most common areas affected are the knees, hips, and small joints in the hands. Often, you will only experience symptoms in one joint or a few joints at any one time (NHS, 2015m).

Knee

If you have osteoarthritis in your knees, it is likely both your knees will be affected over time, unless it has occurred as the result of an injury or another condition affecting only one knee.

Your knees may be most painful when you walk, particularly when walking up or down hills or stairs.

Sometimes, your knees may 'give way' beneath you or make it difficult to straighten your legs. You may also hear a soft, grating sound when you move the affected joint (NHS, 2015m).

Hip

Osteoarthritis in your hips often causes difficulty moving your hip joints. For example, you may find it difficult to put your shoes and socks on or to get in and out of a car.

You will also usually have pain in the groin or outside the hip. This will often be worse when you move the hip joints, although it can also affect you when you are resting or sleeping (NHS, 2015m).

Hand

Osteoarthritis often affects three main areas of your hand -

- the base of your thumb,
- the joints closest to your fingertips, and the
- middle joints of your fingers (NHS, 2015m).

Your fingers may become stiff, painful and swollen and you may develop bumps on your finger joints. But over time the pain may decrease and eventually disappear altogether, although the bumps and swelling can remain.

Your fingers may bend sideways slightly at your affected joints or you may develop painful cysts (fluid-filled lumps) on the backs of your fingers.

In some cases, you may also develop a bump at the base of your thumb where it joins your wrist. This can be painful and you may find it difficult to perform some manual tasks, such as writing, opening jars or turning keys (NHS, 2015m).

Causes

Osteoarthritis occurs when there is damage in and around the joints that the body can't fully repair. The exact causes are not known but there are several factors thought to increase your risk of developing the condition.

As part of normal life, your joints are exposed to a constant low level of damage. In most cases, your body will repair the damage itself. Usually, the repair process will pass unnoticed and you will not experience any symptoms.

However, in cases of osteoarthritis, the damage to the joints is not fully repaired and instead some of the cartilage [49] in the joint can be lost, bony growths can develop, and the area can become slightly inflamed (looking red and swollen).

These changes are what cause the typical symptoms of pain, stiffness and swelling (NHS, 2015m).

Contributory factors

It is not known why problems develop in the repair process in cases of osteoarthritis, although, several factors are thought to increase your risk of developing the condition. These include -

- **Joint injury** - Osteoarthritis can develop in a joint damaged by an injury or operation. Overusing your joint when it has not had enough time to heal after an injury or operation can also contribute to osteoarthritis in later life.
- **Other conditions (secondary arthritis)** - Sometimes, osteoarthritis can occur in joints severely damaged by a previous or existing condition, such as rheumatoid arthritis or gout. It is possible for secondary osteoarthritis to develop many years after the initial damage to your joint.
- **Age** - Osteoarthritis is not a normal part of ageing, but your risk of developing the condition does increase as you get older. Most cases affect adults who are 45 years of age or older.

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[49] the protective surface that allows your joints to move smoothly

- **Family history** - In some cases, osteoarthritis may run in families. Genetic studies have not identified a single gene responsible, so it seems likely that many genes make small contributions.
- **Obesity** - Research into the causes of osteoarthritis has shown that being obese puts excess strain on your joints, particularly those that bear most of your weight, such as your knees and hips. As a result, osteoarthritis can often be worse in obese people (NHS, 2015m).

Although it is not possible to prevent osteoarthritis altogether, making some lifestyle changes to reduce your risk of joint injury and maintain a healthy weight may lower your chances of developing the condition (NHS, 2015m).

Diagnosis

There is no definitive test to diagnose osteoarthritis, so your GP will ask about your symptoms and examine your joints to help determine whether you have the condition (NHS, 2015m). Your GP may suspect osteoarthritis if -

- you are 45 years of age or older,
- you have joint pain that gets worse the more you use your joints,
- you have stiffness in your joints in the morning that lasts less than 30 minutes, or no stiffness at all (NHS, 2015m).

If your symptoms are slightly different from those listed above, this may indicate that you have another joint condition. For example, prolonged joint stiffness in the morning can be a sign of rheumatoid arthritis.

Further tests - such as X-rays or blood tests - are not usually necessary to confirm a diagnosis of osteoarthritis, although they may be used to rule out other possible causes of your symptoms, such as rheumatoid arthritis or a fractured bone.

X-rays can also allow doctors to assess the level of damage to your joints, but this is rarely helpful as the extent of damage visible on an X-ray isn't a good indicator of how severe your symptoms are (NHS, 2015m).

Treatment

There is no cure for osteoarthritis, but the condition doesn't necessarily get any worse over time and a number of treatments are available to help relieve the symptoms.

The main treatments for osteoarthritis include lifestyle measures - such as maintaining a healthy weight and exercising regularly - medication to relieve your pain, and supportive therapies to help make everyday activities easier.

In a few cases, where other treatments have not been helpful, surgery to repair, strengthen or replace damaged joints may also be considered. (NHS, 2015m).

Lifestyle changes

Exercise Exercise is one of the most important treatments for people with osteoarthritis, whatever your age or level of fitness. Your physical activity should include a combination of exercises to strengthen your muscles and exercises to improve your general fitness.

If osteoarthritis causes you pain and stiffness, you may think exercise will make your symptoms worse.

But usually, regular exercise that keeps you active and mobile and builds up muscle, thereby strengthening the joints, will improve symptoms.

Exercise is also good for losing weight, improving your posture and relieving stress, all of which will ease symptoms.

Your GP, or possibly a physiotherapist, will discuss the benefits you can expect from your exercise programme and can give you an exercise plan to follow at home.

It's important to follow this plan because there is a risk that doing too much exercise too quickly, or doing the wrong sort of exercise, may damage your joints. (NHS, 2015m).

Losing weight Being overweight or obese often makes osteoarthritis worse as it can place some of your joints under increased strain.

If you are overweight, try to lose weight by doing more physical activity and eating a healthier diet.

Discuss any new exercise plan with your GP or physiotherapist before you start. They can help plan a suitable exercise programme for you. Your GP and practice nurse can also advise about how to lose weight slowly and safely (NHS, 2015m).

Medication Your doctor will talk to you about medicines which can control symptoms of osteoarthritis, including painkillers.

Sometimes a combination of therapies - medicines, exercise, assistive devices or surgery - may be needed to help control your pain (NHS, 2015m).

Painkillers The type of painkiller (analgesic) your GP may recommend for you will depend on the severity of your pain and other conditions or health problems you have. The main medications used are described below (NHS, 2015m).

1. Paracetamol
   If you have pain caused by osteoarthritis, your GP may suggest taking paracetamol to begin with. This is available over the counter in pharmacies without a prescription. It is best to take it regularly rather than waiting until your pain becomes unbearable.
   However, when taking paracetamol, always follow the dosage your GP recommends and do not exceed the maximum dose stated on the pack (NHS, 2015m).
2. Non-steroidal anti-inflammatory drugs (NSAIDs)
   If paracetamol does not effectively control the pain of your osteoarthritis, your GP may prescribe a stronger painkiller. This may be a NSAID.
   NSAIDs are painkillers that work by reducing inflammation. There are two types of NSAID and they work in slightly different ways: traditional NSAIDs - such as ibuprofen, naproxen or diclofenac
   COX-2 inhibitors - often called coxibs - such as celecoxib and etoricoxib
   Some NSAIDs are available as creams (topical NSAIDs) that you apply directly to the affected joints. Some topical NSAIDs are available without a prescription. They can be particularly effective if you have osteoarthritis in your knees or hands. As well as helping to ease pain, they can also help reduce any swelling in your joints.
   Your doctor will discuss with you the type of NSAID you should take and the benefits and risks associated with it.
   NSAID tablets may not be suitable for people with certain conditions, such as asthma, a peptic ulcer or angina, or if you have had a heart attack or stroke. If you are taking low-dose aspirin, ask your GP whether you should use an NSAID.
   If your GP recommends or prescribes an NSAID to be taken by mouth, they will usually also prescribe a medicine called a PPI to take at the same time. NSAIDs can break down the lining in your stomach that protects it against stomach acid. PPIs reduce the amount of acid produced by the stomach, reducing the risk of damage to your stomach lining.
   COX-2 drugs have a lower risk of causing stomach problems, but still need to be used with a PPI if you take them regularly (NHS, 2015m).
3. Opioids

Opioids, such as codeine, are another type of painkiller that may ease your pain if paracetamol does not work. Opioids can help relieve severe pain, but can also cause side-effects such as drowsiness, nausea and constipation. Codeine is found in combination with paracetamol in common preparations such as co-codamol.
Other opioids that may be prescribed for osteoarthritis include tramadol (brand names include Zamadol and Zydol), and dihydrocodeine (brand name DF 118 Forte). Both come in tablet form and as an injection.
Tramadol is not suitable if you have uncontrolled epilepsy, and dihydrocodeine is not recommended for patients with COPD.
If you need to take an opioid regularly, your GP may prescribe a laxative to take alongside it to prevent constipation. (NHS, 2015m).

4. Capsaicin cream
   If you have osteoarthritis in your hands or knees and topical NSAIDs have not been effective in easing your pain, your GP may prescribe capsaicin cream.
   Capsaicin cream works by blocking the nerves that send pain messages in the treated area. You may have to use it for a while before it has an effect. You should experience some pain relief within the first two weeks of using the cream, but it may take up to a month for the treatment to be fully effective.
   Apply a pea-sized amount of capsaicin cream to your affected joints up to four times a day, but not more often than every four hours. Do not use capsaicin cream on broken or inflamed skin and always wash your hands after applying it.
   Be careful not to get any capsaicin cream on delicate areas, such as your eyes, mouth, nose and genitals. Capsaicin is made from chillies, so if you get it on sensitive areas of your body, it is likely to be very painful for a few hours. However, it will not cause any damage.
   You may notice a burning sensation on your skin after applying capsaicin cream. This is nothing to worry about, and the more you use it, the less it should happen. But avoid using too much cream or having a hot bath or shower before or after applying it, because it can make the burning sensation worse (NHS, 2015m).
5. Corticosteroid injections
   If your osteoarthritis is severe, treatment using painkillers may not be enough to control your pain.
   In this case, you may be able to have a type of treatment where medicine is injected into the joints affected by osteoarthritis. This is known as intra-articular injection.

> If you need intra-articular injections, it is likely that you will have injections of corticosteroid, a medicine that reduces swelling and pain.
> If you get a prolonged response to the injection, it may be repeated. Ideally, you should have no more than three corticosteroid injections a year, with at least a three-month gap between injections (NHS, 2015m).

Supportive treatments

In addition to lifestyle changes and medication, you may also benefit from a number of supportive treatments that can help reduce your pain and make everyday tasks easier (NHS, 2015m).

Transcutaneous electrical nerve stimulation (TENS) transcutaneous electrical nerve stimulation (TENS) uses a machine that sends electrical impulses through sticky patches, called electrodes, attached to the skin. This may help ease the pain caused by your osteoarthritis by numbing the nerve endings in your spinal cord which control pain.

Treatment with TENS is usually arranged by a physiotherapist, who can advise on the strength of the pulses and how long your treatment should last (NHS, 2015m).

Hot or cold packs Applying hot or cold packs (sometimes called thermotherapy or cryotherapy) to the joints can relieve the pain and symptoms of osteoarthritis in some people. A hot-water bottle filled with either hot or cold water and applied to the affected area can be very effective in reducing pain.

Special hot and cold packs that can either be cooled in the freezer or heated in a microwave are also available, and work in a similar way (NHS, 2015m).

Manual therapy Not using your joints can cause your muscles to waste and may increase stiffness caused by osteoarthritis. Manual therapy is a treatment provided by a physiotherapist. It uses stretching techniques to keep your joints supple and flexible (NHS, 2015m).

Assistive devices If your osteoarthritis causes mobility problems or difficulty performing everyday tasks, several devices could help. Your GP may refer you to a physiotherapist or an occupational therapist [50] for specialist help and advice.

If you have osteoarthritis in your lower limbs, such as your hips, knees or feet, your physiotherapist or occupational therapist may suggest special footwear or insoles for your shoes. Footwear with shock-absorbing soles can help relieve some of the pressure on the joints of your legs as you walk. Special insoles may help spread your weight more evenly. Leg braces and supports also work in the same way.

If you have osteoarthritis in your hip or knee that affects your mobility, you may need to use a walking aid, such as a walking stick. Hold it on the opposite side of your body to your affected leg so that it takes some of your weight.

A splint (a piece of rigid material used to provide support to a joint or bone) can also be useful if you need to rest a painful joint. Your physiotherapist can provide you with a splint and give you advice on how to use it correctly.

If your hands are affected by osteoarthritis, you may also need assistance with hand-operated tasks, such as turning on a tap. Special devices, such as tap turners, can make performing these tasks far more manageable. Your occupational therapist can give you help and advice about using assistive devices in your home or workplace (NHS, 2015m).

Surgery

Surgery for osteoarthritis is only needed in a small number of cases where other treatments have not been effective or where one of your joints is severely damaged.

If you may need surgery for osteoarthritis, your GP will refer you to an orthopaedic surgeon. Having surgery for osteoarthritis may greatly improve your symptoms, mobility and quality of life. However, surgery cannot be guaranteed to get rid of your symptoms altogether, and you may still experience pain and stiffness due to your condition.

There are several different types of surgery for osteoarthritis. Some of the main types of surgery carried out are described below (NHS, 2015m).

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[50] a person who provides support to people whose health prevents them doing the activities that matter to them

Arthroplasty

Joint replacement therapy, also known as an arthroplasty, is most commonly carried out to replace hip and knee joints.

During an arthroplasty, your surgeon will remove your affected joint and replace it with an artificial joint (prosthesis) made of special plastics and metal. An artificial joint can last for up to 20 years, although it may eventually need to be replaced.

There is also a newer type of joint replacement surgery called resurfacing. This uses only metal components and may be more suitable for younger patients. Your surgeon will discuss with you the type of surgery that would be best (NHS, 2015m).

Arthrodesis

If joint replacement is not suitable for you, your surgeon may suggest an operation known as an arthrodesis, which fuses your joint in a permanent position. This means that your joint will be stronger and much less painful, although you will no longer be able to move it (NHS, 2015m).

Osteotomy

If you have osteoarthritis in your knees but you are not suitable for knee replacement surgery, you may be able to have an operation called an osteotomy. This involves your surgeon adding or removing a small section of bone either above or below your knee joint.

This helps realign your knee so your weight is no longer focused on the damaged part of your knee. An osteotomy can relieve your symptoms of osteoarthritis, although you may still need knee replacement surgery eventually (NHS, 2015m).

Complementary and alternative therapies

Some people with osteoarthritis try complementary or alternative therapies - such as acupuncture and aromatherapy - and find them helpful, although there is often a lack of medical evidence to suggest they are effective and they generally aren't recommended by the National Institute for Health and Care Excellence (NICE) (NHS, 2015m).

Nutritional supplements

A number of nutritional supplements have also been used to treat osteoarthritis in the past, including chondroitin and glucosamine.

Glucosamine hydrochloride has not been shown to have any beneficial effects, but there is evidence that glucosamine sulphate and chondroitin sulphate may help symptoms to a small degree and do not cause many side-effects. However, these supplements can be expensive and NICE recommends that they shouldn't routinely be offered on the NHS (NHS, 2015m).

Rubefacients

Rubefacients are available as gels and creams that produce a warm, reddening effect on your skin when you rub them in. Several rubefacients have been used to treat joint pain caused by osteoarthritis.

However, research has shown that rubefacients have little effect in improving the symptoms of osteoarthritis and NICE therefore does not recommend their use (NHS, 2015m).

Living with osteoarthritis

With the right support, you can lead a healthy, active life with osteoarthritis. Osteoarthritis doesn't necessarily get worse and doesn't always lead to disability (NHS, 2015m).

Self-care

Self-care is an integral part of daily life. It means you take responsibility for your own health and wellbeing with support from those involved in your care. Self-care includes things you do each day to stay fit, maintain good physical and mental health, prevent illness or accidents, and effectively deal with minor ailments and long-term conditions.

People living with long-term conditions can benefit enormously if they receive support for self-care. They can live longer, have less pain, anxiety, depression and fatigue, have a better quality of life and are more active and independent (NHS, 2015m).

Living healthily

A good diet and regular exercise will help keep muscles strong and control your weight, which is good for osteoarthritis and also has other health benefits (NHS, 2015m).

Take your medication

It is important to take your medication as prescribed, even if you start to feel better. Continuous medication can sometimes help prevent pain, although if your medications have been prescribed 'as required', you may not need to take them in between painful episodes. If you have any questions or concerns about the medication you're taking or any side-effects you think you may be experiencing, talk to your healthcare team.

It may also be useful to read the information leaflet that comes with the medication, which will tell you about possible interactions with other drugs or supplements. Check with your healthcare team if you plan to take any over-the-counter remedies, such as painkillers, or any nutritional supplements, as these can sometimes interfere with your medication (NHS, 2015m).

Regular reviews

Because osteoarthritis is a long-term condition, you'll be in regular contact with your healthcare team. A good relationship with the team means that you can easily discuss your symptoms or concerns. The more the team knows, the more it can help you (NHS, 2015m).

Vaccinations

People with long-term conditions such as osteoarthritis are often encouraged to get an annual flu jab each autumn to protect against flu.

You may also be advised to get a pneumoccocal vaccination. This is a one-off injection that protects against a serious chest infection called pneumococcal pneumonia (NHS, 2015m).

Talk to others

Many people find it helpful to talk to other people who are in a similar position to them. You may find support from a group or by talking individually to someone who has osteoarthritis.

Patient organisations have local groups where you can meet other people with the same condition (NHS, 2015m).

Your feelings

A diagnosis of osteoarthritis can initially be confusing and overwhelming. Like many people with a long-term health condition, those who find out they have osteoarthritis may feel anxious or depressed. But there are people you can talk to who can help, including your GP or support groups (NHS, 2015m).

Work and money

If you have severe osteoarthritis and are still working, your symptoms may interfere with your working life and may affect your ability to do your job. Arthritis Care has useful advice on how you can make simple adjustments at work to make it easier to do your job (NHS, 2015m).

If you have to stop work or work part time because of your arthritis, you may find it hard to cope financially. You may be entitled to one or more of the following types of financial support -

- If you have a job but can't work because of your illness, you are entitled to Statutory Sick Pay from your employer.
- If you do not have a job and cannot work because of your illness, you may be entitled to Employment and Support Allowance.
- If you are aged 64 or under and need help with personal care or have walking difficulties, you may be eligible for the Personal Independence Payment.
- If you are aged 65 or over, you may be able to get Attendance Allowance.
- If you are caring for someone with rheumatoid arthritis, you may be entitled to Carer's Allowance (NHS, 2015m).

You may be eligible for other benefits if you have children living at home or if you have a low household income (NHS, 2015m).

Prevention

It is not possible to prevent osteoarthritis altogether. However, you may be able to minimise your risk of developing the condition by avoiding injury and staying as healthy as possible (NHS, 2015m).

Look after your joints

Exercising regularly can help keep your joints healthy, but take care not to put too much stress on your joints, particularly your hips, knees and the joints in your hands.

Avoid exercise that puts strain on your joints and forces them to bear an excessive load, such as running and weight training. Instead, try exercises such as swimming and cycling, where your joints are better supported and the strain on your joints is more controlled.

Try to maintain good posture at all times, and avoid staying in the same position for too long. If you work at a desk, make sure your chair is at the correct height, and take regular breaks to move around (NHS, 2015m).

Keep your muscles strong

Your muscles help support your joints, so having strong muscles may help your joints stay strong too.

Try to do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity (such as cycling or fast walking) every week to build up your muscle strength and keep yourself generally healthy.

Exercise should be fun, so do what you enjoy, but try not to put too much strain on your joints (NHS, 2015m).

Lose weight if you are overweight or obese

Being overweight or obese can increase the strain on your joints and increase your risk of developing osteoarthritis. Losing weight if you are overweight may therefore help lower your chances of developing the condition (NHS, 2015m).

Osteoporosis

Osteoporosis is a condition that weakens bones, making them fragile and more likely to break.

It's a fairly common condition that affects around three million people in the UK. More than 300,000 people receive hospital treatment for fragility fractures (fractures that occur from standing height or less) every year as a result of osteoporosis.

Wrist fractures, hip fractures and fractures of the vertebrae (bones in the spine) are the most common type of breaks that affect people with osteoporosis. However, they can also occur in other bones, such as in the arm, ribs or pelvis.

There are usually no warnings you've developed osteoporosis and it's often only diagnosed when a bone is fractured after even minor falls (NHS, 2014h).

Symptoms of osteoporosis

Osteoporosis develops slowly over several years.

There are often no warning signs or symptoms until a minor fall or a sudden impact causes a bone fracture.

Healthy bones should be able to withstand a fall from standing height, so a bone that breaks in these circumstances is known as a fragility fracture (NHS, 2014h).

The most common injuries in people with osteoporosis are -

- wrist fractures,
- hip fractures,
- fractures of the spinal bones (vertebrae) (NHS, 2014h).

Sometimes a cough or sneeze can cause a rib fracture or the partial collapse of one of the bones of the spine.

In older people, a fractured bone can be serious and result in long-term disability. For example, a hip fracture may lead to long-term mobility problems.

Although a fracture is the first sign of osteoporosis, some older people develop the characteristic stooping (bent forward). It happens when the bones in the spine have fractured, making it difficult to support the weight of the body (NHS, 2014h).

Is osteoporosis painful?

Osteoporosis isn't usually painful until it causes a fracture.

Although not always painful, spinal fractures are the most common cause of long-term (chronic) pain associated with osteoporosis (NHS, 2014h).

Causes of osteoporosis

Osteoporosis causes bones to become less dense and more fragile. Some people are more at risk than others.

Bones are at their thickest and strongest in your early adult life and their density increases until your late 20s. But you gradually start losing bone density from around the age of 35.

This happens to everyone, but some people develop osteoporosis and lose bone density much faster than normal. This means they are at greater risk of a fracture (NHS, 2014h).

Risk groups

Osteoporosis can affect men and women. It's more common in older people, but it can also affect younger people (NHS, 2014h).

Women Women are more at risk of developing osteoporosis than men because the hormone changes that occur in the menopause directly affect bone density.

The female hormone oestrogen is essential for healthy bones. After the menopause (when monthly periods stop), oestrogen levels fall. This can lead to a rapid decrease in bone density (NHS, 2014h).

Women are at even greater risk of developing osteoporosis if they have -

- an early menopause (before 45 years of age),
- a hysterectomy (removal of the womb) before the age of 45, particularly when the ovaries are also removed,
- absent periods for more than six months as a result of overexercising or too much dieting (NHS, 2014h).

Men In most cases, the cause of osteoporosis in men is unknown. However, there's a link to the male hormone testosterone, which helps keep the bones healthy.

Men continue producing testosterone into old age, but the risk of osteoporosis is increased in men with low levels of testosterone (NHS, 2014h).

In around half of men, the exact cause of low testosterone levels is unknown, but known causes include -

- the use of certain medications, such as oral glucocorticoids,
- alcohol misuse,
- hypogonadism (a condition that causes abnormally low testosterone levels) (NHS, 2014h).

Risk factors

Many hormones in the body can affect the process of bone turnover. If you have a condition of the hormone-producing glands, you may have a higher risk of developing osteoporosis (NHS, 2014h).

Hormone-related conditions that can trigger osteoporosis include -

- hyperthyroidism [51],
- disorders of the adrenal glands, such as Cushing's syndrome,
- reduced amounts of sex hormones (oestrogen and testosterone),
- disorders of the pituitary gland,
- hyperparathyroidism [52] (NHS, 2014h).

Other risk factors

Other factors thought to increase the risk of osteoporosis and broken bones include -

- a family history of osteoporosis,
- a parental history of hip fracture,
- a BMI of 19 or less,
- long-term use of high-dose oral corticosteroids (widely used for conditions such as arthritis and asthma), which can affect bone strength,
- having an eating disorder, such as anorexia or bulimia,
- heavy drinking and smoking,
- rheumatoid arthritis,
- malabsorption problems, as experienced in coeliac disease and Crohn's disease,

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[51] overactive thyroid gland

[52] overactivity of the parathyroid glands

- some medications used to treat breast cancer and prostate cancer which affect hormone levels,
- long periods of inactivity, such as long-term bed rest (NHS, 2014h).

Diagnosis

Osteoporosis is often diagnosed after weakened bones have led to a fracture.

If you're at risk of developing osteoporosis, your GP may refer you for a bone mineral density scan, known as a dual energy X-ray absorptiometry (DEXA, or DXA) scan.

Normal X-rays are a useful way of identifying fractures, but they aren't a reliable method of measuring bone density (NHS, 2014h).

DEXA (DXA) scan

A DEXA scan can be used to help diagnose osteoporosis. It's a quick, safe and painless procedure that usually takes about five minutes, depending on the part of the body being scanned.

The scan measures your bone mineral density and compares it to the bone mineral density of a healthy young adult and someone who's the same age and sex as you.

The difference between the density of your bones and that of a healthy young adult is calculated as a standard deviation (SD) and is called a T score (NHS, 2014h).

Standard deviation is a measure of variability based on an average or expected value. A T score of -

- above -1 SD is normal,
- between -1 and -2.5 SD is defined as decreased bone mineral density compared with peak bone mass,
- below -2.5 is defined as osteoporosis (NHS, 2014h).

Although a bone density scan can help diagnose osteoporosis, your bone mineral density result isn't the only factor that determines your risk of fracturing a bone.

Your age, sex and any previous injuries will need to be taken into consideration before deciding whether you need treatment for osteoporosis.

Your doctor can help you take positive steps to improve your bone health. If you need treatment, they can also suggest the safest and most effective treatment plan for you (NHS, 2014h).

The FRAX tool

The World Health Organization (WHO) has developed a 10-year Fracture Risk Assessment Tool to help predict a person's risk of fracture between the ages of 40 and 90.

The tool is based on bone mineral density and other relevant risk factors, such as age and sex.

The algorithms used give a 10-year probability of hip fracture and a 10-year probability of a major fracture in the spine, hip, shoulder or forearm (NHS, 2014h).

Treatment

Treating osteoporosis involves treating and preventing fractures and using medication to strengthen bones (NHS, 2014h).

Preventing falls and fractures

The Department of Health's National Service Framework (NSF) for Older People provides doctors and other healthcare professionals with guidance about caring for older people.

An important objective for health services across England is to try to prevent falls and fractures. This is of particular concern for people who've been diagnosed with osteoporosis and those with risk factors for osteoporosis (NHS, 2014h).

The key messages for older people and their family and carers are -

- falls are a risk as you get older, but aren't inevitable - there are measures you can take to prevent falls or reduce the harm that might be caused by falling,
- staying active and healthy - for example, through exercise and diet - is likely to keep you independent and reduce your risk of falling,
- if you're unsteady on your feet or fall, speak to your GP so possible causes of falls, such as poor eyesight, certain medications, and poor muscle strength and balance, can be identified and treated (NHS, 2014h).

Treatment overview

Although a diagnosis of osteoporosis is based on the results of your bone mineral density scan (DEXA or DXA scan), the decision about what treatment you need - if any - will also be based on a number of other factors. These include your -

- age,
- sex,
- risk of fracture,
- previous injury history (NHS, 2014h).

If you've been diagnosed with osteoporosis because you've had a fracture, you should still receive treatment to try to reduce your risk of further fractures.

You may not need or want to take medication to treat osteoporosis. However, you should ensure that you're maintaining sufficient levels of calcium and vitamin D. To achieve this, your healthcare team will ask you about your diet and may recommend making changes or taking supplements (NHS, 2014h).

NICE recommendations

The National Institute for Health and Care Excellence (NICE) has made some recommendations about who should be treated with medication for osteoporosis (NHS, 2014h).

A number of factors are taken into consideration before deciding which medication to use. These include your -

- age,
- bone mineral density (measured by your T score),
- risk factors for fracture (NHS, 2014h).

NICE has summarised its guidance for two groups of people -

- postmenopausal women with osteoporosis who haven't had a fracture (primary prevention),
- postmenopausal women with osteoporosis who've had a fracture (secondary prevention) (NHS, 2014h).

You can read the NICE guidance by clicking on the links below.

- NICE guidance - [[http://www.nice.org.uk/guidance/TA160][Alendronate, etidronate, risedronate, raloxifene and strontium ranelate for the

primary prevention of osteoporotic fragility fractures in postmenopausal women]]

- NICE guidance - Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women

Medication for osteoporosis

A number of different medications are used to treat osteoporosis. Your doctor will discuss the treatments available and make sure the medicines are right for you (NHS, 2014h).

Bisphosphonates

Bisphosphonates slow down the rate at which bone is broken down in your body. This maintains bone density and reduces the risk of fracture.

There are a number of different bisphosphonates, including alendronate, etidronate, ibandronate, risedronate and zolendronic acid. They're given as a tablet or injection.

You should always take bisphosphonates on an empty stomach with a full glass of water. Stand or sit upright for 30 minutes after taking them. You'll also need to wait between 30 minutes and two hours before eating food or drinking any other fluids.

Bisphosphonates usually take 6 to 12 months to work and you may need to take them for five years or longer. You may also be prescribed calcium and vitamin D supplements to take at a different time to the bisphosphonate (NHS, 2014h).

The main side-effects associated with bisphosphonates include -

- irritation to the oesophagus (the tube food passes through from the mouth to the stomach),
- swallowing problems (dysphagia),
- stomach pain (NHS, 2014h).

Not everyone will experience these side-effects.

Osteonecrosis of the jaw is a rare side-effect that's linked with the use of bisphosphonates, although most frequently with high-dose intravenous bisphosphonate treatment for cancer and not for osteoporosis.

In osteonecrosis, the cells in the jaw bone die, which can lead to problems with healing. If you have a history of dental problems, you may need a check-up before you start treatment with bisphosphonates. Speak to your doctor if you have any concerns (NHS, 2014h).

Strontium ranelate

Strontium ranelate appears to have an effect on both the cells that break down bone and the cells that create new bone (osteoblasts).

It can be used as an alternative treatment if bisphosphonates are unsuitable. Strontium ranelate is taken as a powder dissolved in water.

The main side-effects of strontium ranelate are nausea and diarrhoea. A few people have reported a rare severe allergic reaction to the treatment. If you develop a skin rash while taking strontium ralenate, stop taking it and speak to your doctor immediately (NHS, 2014h).

Selective oestrogen receptor modulators (SERMs)

Selective oestrogen receptor modulators (SERMs) are medications that have a similar effect on bone as the hormone oestrogen. They help maintain bone density and reduce the risk of fracture, particularly of the spine.

Raloxifene is the only type of SERM that's available for treating osteoporosis. It's taken as a tablet every day.

Side-effects associated with raloxifene include hot flushes, leg cramps and a potential increased risk of blood clots (NHS, 2014h).

Parathyroid hormone (teriparatide)

Parathyroid hormone is produced naturally in the body. It regulates the amount of calcium in bone.

Parathyroid hormone treatments (human recombinant parathyroid hormone or teriparatide) are used to stimulate cells that create new bone (osteoblasts). They're given by injection.

While other medication can only slow down the rate of bone thinning, parathyroid hormone can increase bone density. However, it's only used in a small number of people whose bone density is very low and when other treatments aren't working.

Nausea and vomiting are common side-effects of the treatment. Parathyroid hormone treatments should only be prescribed by a specialist (NHS, 2014h).

Calcium and vitamin D supplements

Calcium is the major mineral found in bone, and having enough calcium as part of a healthy, balanced diet is important for maintaining healthy bones.

For most healthy adults, the recommended amount of calcium is 700 milligrams (mg) of calcium a day, which most people should be able to get from a varied diet that contains good sources of calcium.

However, if you have osteoporosis you may need more calcium, which will usually be in the form of supplements. Ask your GP for advice about taking calcium supplements.

Vitamin D is needed to help the body absorb calcium. It's difficult to get enough vitamin D from your diet alone because few foods contain vitamin D. In the UK, most healthy adults obtain vitamin D from exposing the skin to summer sunlight.

However, for people at risk of not getting enough vitamin D, supplementation with 10 micrograms of vitamin D a day (400 international units (IU)) is recommended to prevent deficiency.

At risk groups include people over 65 years of age, and people who aren't exposed to much sunlight because they cover their skin for cultural reasons, are housebound, or who stay indoors for long periods. Staying indoors for long periods!Low vitamin D}

If you're found to lack vitamin D, your GP may prescribe supplements at a higher dose than the above recommendation to correct the deficiency (NHS, 2014h).

Hormone replacement therapy (HRT)

hormone replacement therapy (HRT) is sometimes recommended for women who are experiencing the menopause as it can help control symptoms.

HRT has also been shown to maintain bone density and reduce the risk of fracture during treatment.

However, HRT isn't specifically recommended for treating osteoporosis and it isn't often used for this purpose.

This is because HRT slightly increases the risk of developing certain conditions, such as breast cancer, endometrial cancer, ovarian cancer and stroke, more than it lowers the risk of osteoporosis (NHS, 2014h).

Testosterone treatment

In men, testosterone treatment can be useful when osteoporosis is caused by insufficient production of male sex hormones (hypogonadism) (NHS, 2014h).

Preventing osteoporosis

Your genes are responsible for determining your height and the strength of your skeleton, but lifestyle factors such as diet and exercise influence how healthy your bones are (NHS, 2014h).

Regular exercise

Regular exercise is essential. Adults aged 19 to 64 should do at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity, such as cycling or fast walking, every week.

Weight-bearing exercise and resistance exercise are particularly important for improving bone density and helping to prevent osteoporosis.

As well as aerobic exercise, adults aged 19 to 64 should also do muscle-strengthening activities on two or more days a week by working all the major muscle groups, including the legs, hips, back, abdomen, chest, shoulders and arms.

If you've been diagnosed with osteoporosis, it's a good idea to talk to your GP or health specialist before starting a new exercise programme to make sure it's right for you (NHS, 2014h).

Weight-bearing exercises

Weight-bearing exercises are exercises where your feet and legs support your weight. High-impact weight-bearing exercises, such as running, skipping, dancing, aerobics, and even jumping up and down on the spot, are all useful ways to strengthen your muscles, ligaments and joints.

When exercising, wear footwear that provides your ankles and feet with adequate support, such as trainers or walking boots.

People over the age of 60 can also benefit from regular weight-bearing exercise. This can include brisk walking, keep-fit classes or a game of tennis. Swimming and cycling aren't weight-bearing exercises, however (NHS, 2014h).

Resistance exercises

Resistance exercises use muscle strength, where the action of the tendons pulling on the bones boosts bone strength. Examples include press-ups, weightlifting or using weight equipment at a gym.

If you've recently joined a gym or haven't been for a while, your gym will probably offer you an induction. This involves being shown how to use the equipment and having exercise techniques recommended to you.

Always ask an instructor for help if you're not sure how to use a piece of gym equipment or how to do a particular exercise (NHS, 2014h).

Healthy eating

Eating a healthy balanced diet is recommended for everyone. It can help prevent many serious health conditions, including heart disease, diabetes and many forms of cancer, as well as osteoporosis.

Calcium is important for maintaining strong bones. Adults need 700mg a day, which you should be able to get from your daily diet. Calcium-rich foods include leafy green vegetables, dried fruit, tofu and yoghurt.

Vitamin D is also important for healthy bones and teeth because it helps your body absorb calcium. Vitamin D can be found in eggs, milk and oily fish.

However, most vitamin D is made in the skin in response to sunlight. Short exposure to sunlight without wearing sunscreen (10 minutes twice a day) throughout the summer should provide you with enough vitamin D for the whole year (NHS, 2014h).

Certain groups of people may be at risk of not getting enough vitamin D. These include -

- people who are housebound or particularly frail,
- people with a poor diet,
- people who keep covered up in sunlight because they wear total sun block or adhere to a certain dress code,
- women who are pregnant or breastfeeding (NHS, 2014h).

If you're at risk of not getting enough vitamin D through your diet or lifestyle, you can take a vitamin D supplement. For adults, 10 micrograms a day of vitamin D is recommended (NHS, 2014h).

Other factors

Other lifestyle factors that can help prevent osteoporosis include -

- quitting smoking - smoking is associated with an increased risk of osteoporosis,
- limiting your alcohol intake - the NHS recommends not drinking more than 14 units of alcohol a week; it's also important to avoid binge drinking (NHS, 2014h).

Get some sun!

Between May and September, sunlight triggers the production of vitamin D, which helps your body absorb calcium.

This process helps strengthen teeth and bones, which in turn helps prevent conditions such as osteoporosis (NHS, 2014h).

Living with osteoporosis

Having osteoporosis doesn't mean you'll definitely have a fracture.

There are measures you can take to reduce your risk of a fall or break (NHS, 2014h).

Preventing falls

Making some simple changes at home can help reduce the risk of fracturing or breaking a bone in a fall.

Check your home for hazards you may trip over, such as trailing wires. Make sure rugs and carpets are secure, and keep rubber mats by the sink and in the bath to prevent slipping.

Have regular sight tests and hearing tests. Some older people may need to wear special protectors over their hips to cushion a fall. Your GP can offer help and advice about changes to your lifestyle (NHS, 2014h).

Healthy eating and exercise

Regular exercise and a healthy diet are important for everyone, not just people with osteoporosis. They can help prevent many serious conditions, including heart disease and many forms of cancer.

You should ensure you have a balanced diet that contains all the food groups to give your body the nutrition it needs. Exercising regularly can increase bone strength, relieve stress and reduce fatigue (NHS, 2014h).

Getting support

Your GP or nurse may be able to answer any questions you have about living with osteoporosis and can reassure you if you're worried.

You may also find it helpful to talk to a trained counsellor or psychologist, or to someone at a specialist helpline. Your GP surgery will have information about these.

Some people find it helpful to talk to others with osteoporosis, either at a local support group or in an internet chat room (NHS, 2014h).

Recovering from a broken bone

Broken bones usually take six to eight weeks to recover. Having osteoporosis doesn't affect how long this takes. Recovery depends on the type of fracture you have. Some fractures heal easily, but others may require more intervention.

If you have a complicated wrist fracture or hip fracture, you may need an operation to make sure the bone is set properly. Hip replacements are often needed after hip fractures, and some people may lose mobility as a result of weakened bones.

Osteoporosis can cause a loss of height as a result of fractures in the spinal column. This means the spine is no longer able to support your body's weight and causes a hunched posture.

This can be painful when it occurs, but it may also lead to long-term (chronic) pain. Your GP or nurse may be able to help with this.

During the healing process, you may need the help of a physiotherapist or occupational therapist so you can make as full a recovery as possible (NHS, 2014h).

Coping with pain

Everyone experiences pain differently, so what works for you may differ from what works for someone else (NHS, 2014h).

There are a number of different ways of managing pain, including -

- medication,
- heat treatment, such as warm baths or hot packs,
- cold treatment, such as cold packs,
- TENS - this is thought to reduce pain by stimulating the nerves,
- simple relaxation techniques, massage or hypnosis (NHS, 2014h).

You can use more than one of these techniques at the same time to manage your pain - for example, you could combine medication, a heat pack and relaxation techniques (NHS, 2014h).

Working and money

You should be able to continue to work if you have osteoporosis. It's very important that you remain physically active and have a fulfilled lifestyle.

This will help keep your bones healthy and stop you focusing too much on your potential health problems. However, if your work involves the risk of falling or breaking a bone, seek advice from your employer, GP and the National Osteoporosis Society about how to limit your risk of having an accident or injury that could lead to a bone break.

If you can't continue working, you may be eligible for disability benefits, such as the Personal Independence Payment (PIP). People over 65 who are severely disabled may qualify for a disability benefit called Attendance Allowance (NHS, 2014h).

Pneumonia

Pneumonia is swelling (inflammation) of the tissue in one or both lungs. It's usually caused by a bacterial infection.

At the end of the breathing tubes in your lungs are clusters of tiny air sacs. If you have pneumonia, these tiny sacs become inflamed and fill up with fluid (NHS, 2016e).

Symptoms

The symptoms of pneumonia can develop suddenly over 24 to 48 hours, or they may come on more slowly over several days (NHS, 2016e).

Common symptoms of pneumonia include -

- a cough - which may be dry, or produce thick yellow, green, brown or blood-stained mucus (phlegm),
- difficulty breathing - your breathing may be rapid and shallow, and you may feel breathless, even when resting,
- rapid heartbeat,
- fever,
- feeling generally unwell,
- sweating and shivering,
- loss of appetite,
- chest pain - which gets worse when breathing or coughing (NHS, 2016e).

Less common symptoms include -

- coughing up blood (haemoptysis),
- headaches,
- fatigue,
- nausea or vomiting,
- wheezing,
- joint and muscle pain,
- feeling confused and disorientated, particularly in elderly people (NHS, 2016e).

When to see your GP

See your GP if you feel unwell and you have typical symptoms of pneumonia.

Seek urgent medical attention if you're experiencing severe symptoms, such as rapid breathing, chest pain or confusion (NHS, 2016e).

Who's affected?

In the UK, pneumonia affects around 8 in 1,000 adults each year. It's more widespread in autumn and winter.

Pneumonia can affect people of any age, but it's more common - and can be more serious - in certain groups of people, such as the very young or the elderly.

People in these groups are more likely to need hospital treatment if they develop pneumonia (NHS, 2016e).

What causes pneumonia?

Pneumonia is usually the result of a pneumococcal infection, caused by bacteria called Streptococcus pneumoniae.

Many different types of bacteria, including Haemophilus influenzae and Staphylococcus aureus, can also cause pneumonia, as well as viruses and, more rarely, fungi (NHS, 2016e).

As well as bacterial pneumonia, other types include -

- **viral pneumonia** - most commonly caused by the respiratory syncytial virus (RSV) and sometimes influenza type A or B; viruses are a common cause of pneumonia in young children,
- **aspiration pneumonia** - caused by breathing in vomit, a foreign object, such as a peanut, or a harmful substance, such as smoke or a chemical,
- **fungal pneumonia** - rare in the UK and more likely to affect people with a weakened immune system,
- **hospital-acquired pneumonia** - pneumonia that develops in hospital while being treated for another condition or having an operation; people in intensive care on breathing machines are particularly at risk of developing ventilator-associated pneumonia (NHS, 2016e).

Risk groups

The following groups have an increased risk of developing pneumonia -

- babies and very young children,
- elderly people,
- people who smoke,
- people with other health conditions, such as asthma, cystic fibrosis, or a heart, kidney or liver condition,
- people with a weakened immune system - for example, as a result of a recent illness, such as flu, having HIV or AIDS, having chemotherapy, or taking medication following an organ transplant (NHS, 2016e).

Diagnosing pneumonia

Your GP may be able to diagnose pneumonia by asking about your symptoms and examining your chest. Further tests may be needed in some cases.

Pneumonia can be difficult to diagnose because it shares many symptoms with other conditions, such as the common cold, bronchitis and asthma (NHS, 2016e).

To help make a diagnosis, your GP may ask you -

- whether you feel breathless or you're breathing faster than usual,
- how long you've had your cough, and whether you're coughing up mucus and what colour it is,
- if the pain in your chest is worse when you breathe in or out (NHS, 2016e).

Your GP may also take your temperature and listen to your chest and back with a stethoscope to check for any crackling or rattling sounds.

They may also listen to your chest by tapping it. Lungs filled with fluid produce a different sound from normal healthy lungs.

If you have mild pneumonia, you probably won't need to have a chest X-ray or any other tests.

You may need a chest X-ray or other tests, such as a sputum (mucus) test or blood tests, if your symptoms haven't improved within 48 hours of starting treatment (NHS, 2016e).

Treatment

Mild pneumonia can usually be treated at home with rest, antibiotics and by drinking plenty of fluids. More severe cases may need hospital treatment.

Unless a healthcare professional tells you otherwise, you should always finish taking a prescribed course of antibiotics, even if you feel better.

If you stop taking an antibiotic part way through a course, the bacteria can become resistant to the antibiotic.

After starting treatment, your symptoms should steadily improve.

However, how quickly they improve will depend on how severe your pneumonia is (NHS, 2016e).

As a general guide, after -

- **one week** - fever should have resolved,
- **four weeks** - chest pain and mucus production should have substantially reduced,

- **six weeks** - cough and breathlessness should have substantially reduced,
- **three months** - most symptoms should have resolved, but you may still feel very tired (fatigue),
- **six months** - most people will feel back to normal (NHS, 2016e).

Treatment at home

Visit your GP if your symptoms don't improve within three days of starting antibiotics (NHS, 2016e).

Symptoms may not improve if -

- **the bacteria causing the infection is resistant to antibiotics** - your GP may prescribe a different antibiotic, or they may prescribe a second antibiotic for you to take with the first one,
- **a virus is causing the infection, rather than bacteria** - antibiotics have no effect on viruses, and your body's immune system will have to fight the viral infection by creating antibodies (NHS, 2016e).

Painkillers, such as paracetamol or ibuprofen, may help relieve pain and reduce fever (NHS, 2016e).

However, you shouldn't take ibuprofen if you -

- are allergic to aspirin or other NSAIDs,
- have asthma, kidney disease, a history of stomach ulcers or indigestion (NHS, 2016e).

Cough medicines aren't recommended as there's also little evidence they are effective. A warm honey and lemon drink can help relieve discomfort caused by coughing.

Your cough may persist for two to three weeks after you finish your course of antibiotics, and you may feel tired for even longer as your body continues to recover.

Drink plenty of fluids to avoid dehydration, and get plenty of rest to help your body recover.

If you smoke, it's more important than ever to stop, as smoking damages your lungs.

See your GP if, after following the above self-help measures, your condition is deteriorating or isn't improving as expected.

Pneumonia isn't usually passed from one person to another, so it's safe to be around others, including family members.

However, it's best for people with a weakened immune system to avoid close contact with a person with pneumonia until they start to get better (NHS, 2016e).

Follow-up

Your GP will probably arrange a follow-up appointment for you about six weeks after you start your course of antibiotics (NHS, 2016e).

In some cases, they may arrange follow-up tests, such as a chest X-ray, if -

- your symptoms haven't improved,
- your symptoms have come back,
- you smoke,
- you're over the age of 50 (NHS, 2016e).

Some people may be advised to have a flu vaccination or pneumococcal vaccination after recovering from pneumonia (NHS, 2016e).

Treatment in hospital

You may need treatment in hospital if your symptoms are severe. You'll be given antibiotics and fluids intravenously through a drip, and you may need oxygen to help breathing.

In very serious cases of pneumonia, breathing assistance through a ventilator in an intensive care unit (ICU) may be required (NHS, 2016e).

Aspiration pneumonia

If you've breathed in an object that's causing pneumonia, it may need to be removed.

To do this, an instrument called a bronchoscope may be used to look into your airways and lungs so that the object can be located and removed. This procedure is known as a bronchoscopy (NHS, 2016e).

Restless legs syndrome

Restless legs syndrome, also known as Willis-Ekbom disease, is a common condition of the nervous system that causes an overwhelming, irresistible urge to move the legs.

It can also cause an unpleasant crawling or creeping sensation in the feet, calves and thighs. The sensation is often worse in the evening or at night. Occasionally, the arms are affected too.

Restless legs syndrome is also associated with involuntary jerking of the legs and arms, known as periodic limb movements in sleep (PLMS).

Some people have the symptoms of restless legs syndrome occasionally, while others have them every day. The symptoms can vary from mild to severe. In severe cases, restless legs syndrome can be very distressing and disrupt a person's daily activities (NHS, 2015n).

Prevalence

As many as 1 in 10 people are affected by restless legs syndrome at some point in their life.

Women are twice as likely to develop restless legs syndrome than men. It's also more common in middle age, although the symptoms can develop at any age, including childhood (NHS, 2015n).

Symptoms

Restless legs syndrome typically causes an overwhelming urge to move your legs and an uncomfortable sensation in your legs (NHS, 2015n).

The sensation may also affect your arms, chest and face, too. It has been described as -

- tingling, burning, itching or throbbing,
- a ”creepy-crawly” feeling,
- feeling like fizzy water is inside the blood vessels in the legs,
- a painful, cramping sensation in the legs, particularly in the calves (NHS, 2015n).

These unpleasant sensations can range from mild to unbearable, and are usually worse in the evening and during the night. They can often be relieved by moving or rubbing your legs.

Some people experience symptoms occasionally, while others have them every day. You may find it difficult to sit for long periods of time - for example, on a long train journey.

Just over half of people with restless legs syndrome also experience episodes of lower back pain (NHS, 2015n).

Periodic limb movements in sleep (PLMS)

Up to 80% of people with restless legs syndrome also have PLMS.

If you have PLMS, your leg will jerk or twitch uncontrollably, usually at night while you're asleep. The movements are brief and repetitive, and usually occur every 10 to 60 seconds.

PLMS can be severe enough to wake up both you and your partner. The involuntary leg movements can also occur when you're awake and resting (NHS, 2015n).

Causes

In many cases, the exact cause of restless legs syndrome is unknown.

When no cause can be found, it's known as "idiopathic" or primary restless legs syndrome.

Research has identified specific genes related to restless legs syndrome, and it can run in families. In these cases, symptoms usually occur before the age of 40 (NHS, 2015n).

Dopamine

There's evidence to suggest restless legs syndrome is related to a problem with part of the brain called the basal ganglia. The basal ganglia uses a chemical (neurotransmitter) called dopamine to help control muscle activity and movement.

Dopamine acts as a messenger between the brain and nervous system to help the brain regulate and co-ordinate movement. If nerve cells become damaged, the amount of dopamine in the brain is reduced, which causes muscle spasms and involuntary movements.

Dopamine levels naturally fall towards the end of the day, which may explain why the symptoms of restless legs syndrome are often worse in the evening and during the night (NHS, 2015n).

Underlying health condition

Restless legs syndrome can sometimes occur as a complication of another health condition, or it can be the result of another health-related factor. This is known as secondary restless legs syndrome (NHS, 2015n).

You can develop secondary restless legs syndrome if you -

- **have iron deficiency anaemia** - low levels of iron in the blood can lead to a fall in dopamine, triggering restless legs syndrome,
- **have a long-term health condition** - such as chronic kidney disease, diabetes, Parkinson's disease, rheumatoid arthritis, an underactive thyroid gland, or fibromyalgia,
- **are pregnant** - particularly from week 27 until birth; in most cases the symptoms disappear within four weeks of giving birth (NHS, 2015n).

Triggers

There are a number of triggers that don't cause restless legs syndrome, but can make symptoms worse. These include medications such as -

- some antidepressants,
- antipsychotics,
- lithium - used in the treatment of bipolar disorder,
- calcium channel blockers - used in the treatment of high blood pressure,
- some antihistamines,
- metoclopramide - used to relieve nausea (NHS, 2015n).

Other possible triggers include -

- excessive smoking, caffeine or alcohol,
- being overweight or obese,
- stress,
- lack of exercise (NHS, 2015n).

Diagnosis

There's no single test for diagnosing restless legs syndrome.

A diagnosis will be based on your symptoms, your medical and family history, a physical examination, and your test results.

Your GP should be able to diagnose restless legs syndrome, but they may refer you to a neurologist if there's any uncertainty (NHS, 2015n).

There are four main criteria your GP or specialist will look for to confirm a diagnosis. These are -

- an overwhelming urge to move your legs, usually with an uncomfortable sensation such as itching or tingling,
- your symptoms occur or get worse when you're resting or inactive,

- your symptoms are relieved by moving your legs or rubbing them,
- your symptoms are worse during the evening or at night (NHS, 2015n).

Assessing your symptoms

Your GP or specialist will ask you about the pattern of your symptoms to help assess their severity. For example, they may ask you -

- how often you have symptoms,
- how unpleasant you find your symptoms,
- whether your symptoms cause significant distress,
- whether your sleep is disrupted, making you tired during the day (NHS, 2015n).

Keeping a sleep diary may help your doctor assess your symptoms. You can use the diary to record your daily sleeping habits, such as the time you go to bed, how long it takes you to fall asleep, how often you wake during the night, and episodes of tiredness during the day.

Mild symptoms of restless legs syndrome can usually be treated by making lifestyle changes - for example, establishing a regular sleeping pattern and avoiding stimulants, such as caffeine, alcohol or tobacco, in the evening.

If your symptoms are more severe, you may need medication to bring them under control (NHS, 2015n).

Blood tests

Your GP may refer you for blood tests to confirm or rule out possible underlying causes of restless legs syndrome. For example, you may have blood tests to rule out conditions such as anaemia, diabetes and kidney function problems.

It's particularly important to find out the levels of iron in your blood because low iron levels can sometimes cause secondary restless legs syndrome. Low iron levels can be treated with iron tablets (NHS, 2015n).

Sleep tests

If you have restless legs syndrome and your sleep is being severely disrupted, sleep tests - such as a suggested immobilisation test - may be recommended. The test involves lying on a bed for a set period of time without moving your legs while any involuntary leg movements are monitored.

Occasionally, polysomnography may be recommended. This is a test that measures your breathing rate, brain waves and heartbeat throughout the course of a night. The results will confirm whether you have PLMS (NHS, 2015n).

Treatment

Mild restless legs syndrome that isn't linked to an underlying health condition can be managed with just a few lifestyle changes.

If symptoms are more severe, medication may be needed.

Restless legs syndrome caused by an underlying health condition can often be cured by treating that condition.For example, iron deficiency anaemia can be treated by taking iron supplements.

If it's associated with pregnancy, it usually disappears on its own within four weeks of the birth (NHS, 2015n).

Lifestyle changes

A number of lifestyle changes may be enough to ease the symptoms of restless legs syndrome. These include -

- avoiding stimulants in the evening - such as caffeine, tobacco and alcohol,
- not smoking,
- taking regular daily exercise - but avoid exercising near bedtime,
- practising good sleep habits - for example, going to bed and getting up at the same time every day, not napping during the day, taking time to relax before going to bed, and avoiding caffeine close to bedtime,
- avoiding medicines that trigger the symptoms or make them worse - if you think medication is causing your symptoms, continue to take it and make an appointment to see your GP (NHS, 2015n).

During an episode of restless legs syndrome, the following measures may help relieve your symptoms -

- massaging your legs,
- taking a hot bath in the evening,
- applying a hot or cold compress to your leg muscles,
- doing activities that distract your mind, such as reading or watching television,
- relaxation exercises, such as yoga or tai chi,
- walking and stretching (NHS, 2015n).

A small medical trial carried out in 2011 found a type of osteopathic exercise technique called positional release manipulation could be of benefit to people with restless legs syndrome. It involves holding different parts of the body in positions found to reduce feelings of pain and discomfort (NHS, 2015n).

Medication

Dopamine agonists Dopamine agonists may be recommended if you're experiencing frequent symptoms of restless legs syndrome. They work by increasing dopamine levels, which are often low (NHS, 2015n).

Dopamine agonists that may be recommended include -

- ropinirole,
- pramipexole,
- rotigotine skin patch (NHS, 2015n).

These medications can occasionally make you feel sleepy, so you should be cautious when driving or using tools or machinery after taking them. Other possible side-effects can include nausea, dizziness and headaches.

If you experience nausea while taking a dopamine agonist, you may be given medication to help with this (antiemitic medication).

Impulse control disorder (ICD) is a less common side-effect sometimes associated with dopamine agonists.

People with ICD are unable to resist the urge to do something harmful to themselves or others. For example, this could be an addiction to alcohol, drugs, gambling, shopping, or sex (hypersexuality).

However, the urges associated with ICD will subside once treatment with the dopamine agonist is stopped (NHS, 2015n).

Painkillers A mild opiate-based painkiller, such as codeine or tramadol, may be prescribed to relieve pain associated with restless legs syndrome.

Gabapentin and pregabalin are also sometimes prescribed to help relieve painful symptoms of restless legs syndrome. Side-effects of these medications include dizziness, tiredness and headaches (NHS, 2015n).

Aiding sleep If restless legs syndrome is disrupting your sleep, a short-term course of medication may be recommended to help you sleep.

These types of medication are known as hypnotics, and include temazepam and loprazolam. Hypnotics are usually only recommended for short-term use (typically no longer than a week).

You may find you still feel sleepy or ”hungover” the morning after taking your medication (NHS, 2015n).

Levodopa Levodopa may be recommended if you only have occasional symptoms of restless legs syndrome. This is because if you took levodopa every day, there’s a high risk it would actually make your symptoms worse.

Levodopa is available in tablet or liquid form, and you should take it once you feel the symptoms of restless legs syndrome coming on.

The medication will make you feel very sleepy (often suddenly), so you should never drive or use tools or machinery after taking levodopa (NHS, 2015n).

Cardiovascular diseases

Recent research found people with restless legs syndrome may be up to twice as likely to develop cardiovascular disease, such as coronary heart disease or stroke, compared with people who do not have the syndrome.

This risk is thought to be greatest in people with frequent or severe symptoms of restless legs syndrome.

The exact reason for the increased risk is unclear, but it may be that the rapid leg movements are associated with an increased heart rate and blood pressure. Sleep problems have also been linked to cardiovascular disease.

To reduce this risk, you should exercise regularly, maintain a healthy weight, give up smoking if you smoke, and eat a healthy, balanced diet (NHS, 2015n).

Prognosis

The symptoms of restless legs syndrome will usually disappear if it’s possible to address an underlying cause.

However, if the cause is unknown, the symptoms can sometimes get worse with time and severely affect the person’s life. Restless legs syndrome isn’t life threatening, but severe cases can severely disrupt sleep (causing insomnia) and trigger anxiety and depression.

The charity Restless Leg Syndrome UK provides information and support for people affected by restless legs syndrome, and may be able to put you in touch with other people in your area affected by the condition (NHS, 2015n).

Rheumatoid arthritis

Rheumatoid arthritis is a long-term condition that causes pain, swelling and stiffness in the joints.

The hands, feet and wrists are commonly affected, but it can also cause problems in other parts of the body.

There may be periods where your symptoms become worse, known as a flare-up or flare. A flare can be difficult to predict, but with treatment it is possible to decrease the number of flares and minimise or prevent long-term damage to the joints (NHS, 2014i).

Symptoms

Rheumatoid arthritis mainly affects the joints, although it can cause problems in other parts of the body too.

The symptoms of rheumatoid arthritis often develop gradually over several weeks, but some cases can progress quickly over a number of days.

The symptoms vary from person to person. They can come and go, and may change over time. You may occasionally experience flares when your condition deteriorates and your symptoms become more severe (NHS, 2014i).

Symptoms affecting the joints

Rheumatoid arthritis is primarily a condition that affects the joints. It can cause problems in any joint in the body, although the small joints in the hands and feet are often the first to be affected.

Rheumatoid arthritis typically affects the joints symmetrically (both sides of the body at the same time and to the same extent), but this is not always the case.

The main symptoms of rheumatoid arthritis affecting the joints are outlined below (NHS, 2014i).

Pain The joint pain associated with rheumatoid arthritis is usually a throbbing and aching pain. It is often worse in the mornings and after a period of inactivity (NHS, 2014i).

Stiffness Joints affected by rheumatoid arthritis can feel stiff. For example, if your hands are affected, you may not be able to fully bend your fingers or form a fist.

Like joint pain, the stiffness is often more severe in the morning or after a period of inactivity. Morning stiffness associated with another type of arthritis called osteoarthritis usually wears off within 30 minutes of getting up, but rheumatoid arthritis morning stiffness often lasts longer than this (NHS, 2014i).

Swelling, warmth and redness The lining of joints affected by rheumatoid arthritis become inflamed, which can cause the joints to swell, and become hot and tender to touch.

In some people, firm swellings called rheumatoid nodules can also develop under the skin around affected joints (NHS, 2014i).

Additional symptoms

As well as problems affecting the joints, some people with rheumatoid arthritis experience a range of more general symptoms, such as -

- tiredness and a lack of energy,
- a high temperature (fever),
- sweating,
- a poor appetite,
- weight loss (NHS, 2014i).

The inflammation associated with rheumatoid arthritis can also sometimes cause problems affecting other areas of the body, including dry eyes if the eyes are affected and chest pain if the heart or lungs are affected (NHS, 2014i).

When to seek medical advice

You should see your GP if you think you have symptoms of rheumatoid arthritis.

There are a number of conditions that can cause problems such as joint pain and stiffness, so it's important to get a proper diagnosis.

Diagnosing rheumatoid arthritis as soon as possible is particularly important because early treatment can help stop the condition getting worse and reduce the risk of further problems such as joint damage (NHS, 2014i).

Causes

Rheumatoid arthritis is an autoimmune condition, which means it is caused by the body's immune system attacking itself. However, it is not yet known what triggers this.

Normally, your immune system makes antibodies that attack bacteria and viruses, helping fight infection. But if you have rheumatoid arthritis, your immune system mistakenly sends antibodies to the lining of your joints, where they attack the tissue surrounding the joint.

This causes the thin layer of cells (synovium) covering your joints to become sore and inflamed (NHS, 2014i).

This inflammation in turn causes chemicals to be released that thicken the synovium and damage nearby -

- bones,
- cartilage - the stretchy connective tissue between bones,
- tendons - the tissue that connects bone to muscle,
- ligaments - the tissue that connects bone and cartilage (NHS, 2014i).

If the condition is not treated, these chemicals gradually cause the joint to lose its shape and alignment and, eventually, can destroy the joint completely.

Various theories of why the immune system starts to attack the joints have been suggested, including that an infection or virus may trigger this, but none of these theories has been proven (NHS, 2014i).

Possible risk factors

There are a number of things that may increase your risk of developing rheumatoid arthritis, including -

- **your genes** - there is some evidence that rheumatoid arthritis can run in families, although the risk of inheriting the condition is thought to be low as genes are only thought to play a small role in the condition,
- **hormones** - rheumatoid arthritis is more common in women than men, which may be due to the effects of a hormone called oestrogen that is found at higher levels in women, although this has not been conclusively proven,

- **smoking** - some evidence suggests that people who smoke are at an increased risk of developing rheumatoid arthritis (NHS, 2014i).

Diagnosis

Rheumatoid arthritis can be difficult to diagnose because many conditions cause joint stiffness and inflammation and there is no definitive test for the condition.

You should see your GP if you have these symptoms so they can try to determine the cause (NHS, 2014i).

Seeing your GP

Your GP will carry out a physical examination, checking your joints for any swelling and to assess how easily they move. Your GP will also ask you about your symptoms.

It is important to tell your GP about all your symptoms, not just ones you think are important, as this will help the doctor make the correct diagnosis.

If your GP thinks you have rheumatoid arthritis, they will refer you to a specialist (rheumatologist).

Your GP may arrange blood tests to help confirm the diagnosis after conducting a physical examination and consulting your medical history, or they may refer you at the same time as requesting tests (NHS, 2014i).

Blood tests

No blood test can definitively prove or rule out a diagnosis of rheumatoid arthritis, but a number of tests can show possible indications of the condition.

Some of the main tests used are outlined below (NHS, 2014i).

Erythrocyte sedimentation rate (ESR) In an ESR test, a sample of your red blood cells is placed into a test tube of liquid. The cells are then timed to see how fast they fall to the bottom of the tube (measured in millimetres per hour). If they are sinking faster than usual, you may have an inflammatory condition, such as rheumatoid arthritis (NHS, 2014i).

C-reactive protein (CRP) A C-reactive protein (CRP) test can indicate if there is inflammation anywhere in the body by checking how much CRP is present in your blood. CRP is produced by the liver. If there is more CRP than usual, there is inflammation in your body (NHS, 2014i).

Full blood count The full blood count will measure your red cells to rule out anaemia. Anaemia is a condition where the blood is unable to carry enough oxygen, due to a lack of blood cells.

Anaemia is common in people with rheumatoid arthritis, although the problem can have many causes, so having anaemia does not prove that you have rheumatoid arthritis (NHS, 2014i).

Rheumatoid factor and anti-CCP antibodies Specific blood tests can help to diagnosis rheumatoid arthritis, but are not accurate in every person. About half of all people with rheumatoid arthritis have a positive rheumatoid factor present in their blood when the disease starts, but about one in every 20 people without rheumatoid arthritis also tests positive for this.

Another antibody test known as anti-cyclic citrullinated peptide (anti-CCP) is also available. People who test positive for anti-CCP are very likely to develop rheumatoid arthritis, but not everybody found to have rheumatoid arthritis has this antibody.

Those who test positive for both rheumatoid factor and anti-CCP may be more likely to have severe rheumatoid arthritis requiring higher levels of treatment (NHS, 2014i).

Joint imaging

A number of different scans may also be carried out to check for joint inflammation and damage. These can help differentiate between different types of arthritis and can be used to monitor how your condition is progressing over time (NHS, 2014i).

Scans that may be carried out to diagnose and monitor rheumatoid arthritis include -

- X-rays - where radiation is passed through your body to examine your bones and joints,
- ultrasound scans - where high frequency sound waves are used to create an image of joints,
- MRI scans - where strong magnetic fields and radio waves are used to produce detailed images of your joints (NHS, 2014i).

Treatment

There is no cure for rheumatoid arthritis, but treatment can help reduce inflammation in the joints, relieve pain, prevent or slow joint damage, reduce disability and enable you to live as active a life as possible.

Early treatment and support - including lifestyle changes, medication, supportive treatments and surgery - can reduce the risk of joint damage and limit the impact of the condition.

Your treatment will usually involve care from your GP in addition to a number of different specialists.

The National Institute for Health and Care Excellence (NICE) has produced guidance on the management of rheumatoid arthritis in adults (NHS, 2014i).

Stopping the condition progressing

There are a number of medications available that can be used to help stop rheumatoid arthritis getting worse and reduce your risk of further problems.

These are often divided into two types of medication: ’disease-modifying anti-rheumatic drugs (DMARDs)’ and ’biological treatments’ (NHS, 2014i).

Disease-modifying anti-rheumatic drugs (DMARDs) If you have been diagnosed with rheumatoid arthritis, you will normally be offered a combination of Disease-modifying anti-rheumatic drugs (DMARD) tablets as part of your initial treatment, as these medications are particularly effective in easing symptoms of the condition and slowing down its progression.

DMARDs work by blocking the effects of the chemicals released when the immune system attacks the joints, which could otherwise cause further damage to nearby bones, tendons, ligaments and cartilage.

There are many different DMARDs that can be used, including methotrexate, leflunomide, hydroxychloroquine and sulfasalazine.

Methotrexate is normally the first medicine given for rheumatoid arthritis, often alongside another DMARD and a short-course of corticosteroids to relieve any pain (see below). It may also be combined with the biological treatments mentioned below.

Common side-effects of methotrexate include feeling sick, loss of appetite, a sore mouth, diarrhoea, headaches and hair loss. The medication can also sometimes have an effect on your blood count and your liver, so you will have regular blood tests to monitor this.

Less commonly, methotrexate can affect the lungs, so you will usually have a chest X-ray and possibly breathing tests when you start taking methotrexate, to provide a comparison if you develop shortness of breath or a persistent dry cough while taking it. However, most people tolerate methotrexate well.

It can take a few months to notice a DMARD working. It is important to keep taking the medication, even if you do not notice it working at first.

You may have to try two or three types of DMARD before you find the one that is most suitable for you. Once you and your doctor work out the most suitable DMARD, you will usually have to take the medicine in the long term (NHS, 2014i).

Biological treatments Biological treatments are a newer form of treatment for rheumatoid arthritis. They include etanercept, infliximab, adalimumab, certolizumab, golimumab, rituximab, abatacept and tocilizumab.

They are usually taken in combination with methotrexate or another DMARD and are normally only used if these medications alone have not been effective.

Biological medications are given by injection and they work by stopping particular chemicals in the blood from activating your immune system to attack your joints.

Side-effects from biological treatments are usually mild and include skin reactions at the site of the injections, infections, feeling sick, a high temperature (fever) and headaches.

Some people may also be at risk of getting more serious problems, including the reactivation of infections such as tuberculosis (TB) in people who have had them in the past (NHS, 2014i).

Relieving pain

In addition to the medications used to control the progression of rheumatoid arthritis, you may also need to take medication specifically to relieve pain. Some of the different medicines that may be used to relieve pain are outlined below (NHS, 2014i).

Painkillers In some cases, you may be advised to use painkillers such as paracetamol, or a combination of paracetamol and codeine (co-codamol) to relieve the pain associated with rheumatoid arthritis.

These medications don't help treat the underlying inflammation of your joints, but they can sometimes be helpful in relieving pain. For example, they may be recommended while you are waiting to see a specialist or during periods where your symptoms are particularly bad (flare-ups) (NHS, 2014i).

Non-steroidal anti-inflammatory drugs (NSAIDs) In addition to - or instead of - the painkillers mentioned above, your doctor may prescribe a NSAID.

This may be a traditional NSAID (such as ibuprofen, naproxen or diclofenac) or an alternative type called a COX-2 inhibitor (such as celecoxib or etoricoxib).

These medications can help relieve pain while also reducing inflammation in the joints, although they will not stop rheumatoid arthritis getting worse over time.

Your doctor will discuss with you what type of NSAID you should take and the benefits and risks associated with each of them.

Although uncommon, taking an NSAID tablet can increase the risk of serious stomach problems - such as internal bleeding - because the medications can break down the lining that protects the stomach against damage from stomach acids.

If you are prescribed an NSAID tablet, you will often have to take another medicine, such as a PPI, as well. Taking a PPI reduces the amount of acid in your stomach, which greatly reduces the risk of damage to your stomach lining (NHS, 2014i).

Corticosteroids Corticosteroids are powerful medications that can help reduce pain, stiffness and inflammation.

They can be used as a tablet (for example, prednisolone), as an injection directly into a painful joint, or as an injection into the muscle (to help lots of joints).

They are usually used to provide short-term pain relief - for example, while you are waiting for DMARD medication to take effect or during a flare-up.

Corticosteroids are normally only used in this way because long-term use of corticosteroids can have serious side effects, such as weight gain, osteoporosis (thinning of the bones), easy bruising, muscle weakness and thinning of the skin (NHS, 2014i).

Supportive treatments

Your doctor may also refer you to other services that might be able to help you with your rheumatoid arthritis symptoms (NHS, 2014i).

Physiotherapy A physiotherapist may help you improve your fitness and muscle strength, and make your joints more flexible.

They may also be able to help with pain relief using heat or ice packs, or TENS. A TENS machine applies a small pulse of electricity to the affected joint, which numbs the nerve endings and can help ease the pain of rheumatoid arthritis (NHS, 2014i).

Occupational therapy If rheumatoid arthritis causes you problems with everyday tasks, occupational therapy may help.

An occupational therapist can provide training and advice that will help you to protect your joints, both while you are at home and at work.

Some type of support for your joints, such as a splint, may also be recommended, or devices that can help open jars or turn on taps (NHS, 2014i).

Podiatry If you have problems with your feet, a podiatrist may be able to help. You may also be offered some type of support for your joints or shoe insoles that can ease pain (NHS, 2014i).

Surgery

Sometimes, despite medication, damage to your joints may occur. In such cases, you may need surgery to help restore your ability to use your joint.

Surgery may also be recommended to reduce pain or correct deformities (NHS, 2014i).

Finger, hand and wrist surgery There are different types of surgery to correct joint problems in the hand. Examples include -

- carpal tunnel release (cutting a ligament in the wrist to relieve pressure on a nerve),
- release of tendons in the fingers to treat abnormal bending,
- removal of inflamed tissue that lines the finger joints (NHS, 2014i).

Arthroscopy Arthroscopy is a procedure to remove inflamed joint tissue.

During the operation, a thin tube with a light source and camera (arthroscope) is inserted into the joint through a small cut in the skin so that the surgeon can see the affected joint.

Special surgical instruments are inserted through other small cuts in the skin to remove the damaged tissue. You usually do not have to stay overnight in hospital for this kind of surgery, but the joint will need to be rested at home for several days (NHS, 2014i).

Joint replacement Some people with rheumatoid arthritis will need surgery to replace part or all of a joint, such as the hip, knee or shoulder joint. This is known as a joint replacement or arthroplasty.

Replacement of these joints is a major operation that involves several days in hospital followed by months of rehabilitation.

The latest joints have a limited lifespan of 10–20 years. They are not perfect and some function may not be restored after the damaged joint is replaced by a new one (NHS, 2014i).

Complementary and alternative therapies

Many people with rheumatoid arthritis try complementary therapies, such as -

- massage,
- acupuncture,
- osteopathy,
- chiropractic (NHS, 2014i).

In most cases, there is little or no evidence these are effective in the long-term, although some people may experience a short-term benefit from them (NHS, 2014i).

Nutritional supplements and dietary changes

There is no strong evidence to suggest that specific dietary changes can help improve rheumatoid arthritis, although some people with rheumatoid arthritis feel that their symptoms get worse after they have eaten certain foods.

If you think this may be the case for you, it may be useful to try avoiding problematic foods for a few weeks to see if your symptoms improve. However, it is important to ensure your overall diet is still healthy and balanced.

There is also little evidence supporting the use of supplements in rheumatoid arthritis, although some can be useful in preventing side-effects of medications you may be taking. For example, calcium and vitamin D supplements may help prevent osteoporosis if you are taking steroids and folic acid supplements may help prevent some of the side-effects of methotrexate.

However, there is some evidence to suggest that taking fish oil supplements may help reduce joint pain and stiffness caused by rheumatoid arthritis (NHS, 2014i).

Living with rheumatoid arthritis

Rheumatoid arthritis can be life-changing. You may need long-term treatment to control your symptoms and reduce joint damage.

Depending on how much pain and stiffness you feel and how much joint damage you have, you may have to adapt the way you carry out simple daily tasks. They can become difficult or take longer to complete.

Here are some things you can do to help keep the condition under control (NHS, 2014i).

Self-care

Self-care is an integral part of daily life. It involves taking responsibility for your own health and wellbeing with support from those involved in your care.

Self-care includes what you do every day to stay fit and maintain good physical and mental health, prevent illness or accidents and care more effectively for minor ailments and long-term conditions.

People living with long-term conditions can benefit enormously from being supported to care for themselves. They can live longer, have a better quality of life and be more active and independent (NHS, 2014i).

Take your medication

It is important to take your medication as prescribed, even if you start to feel better, as medication can help prevent flare-ups and reduce the risk of further problems such as joint damage. If you have any questions or concerns about the medication you are taking or side-effects, talk to your healthcare team.

It may also be useful to read the information leaflet that comes with the medication about possible interactions with other drugs or supplements. Check with your healthcare team before taking any over-the-counter remedies, such as painkillers or nutritional supplements. These can sometimes interfere with your medication (NHS, 2014i).

Regular reviews

As rheumatoid arthritis is a long-term condition, you'll be in contact with your healthcare team regularly so they can check to ensure your condition is under good control and your treatment is right for you.

The more the team knows, the more they can help you, so discuss any concerns you have with them (NHS, 2014i).

Keeping well

If you have rheumatoid arthritis, you may be advised to have a yearly flu jab to protect against flu. You may also be advised to have a pneumococcal vaccination, a one-off injection that protects against a specific serious chest infection called pneumococcal pneumonia.

Get plenty of rest during a flare-up as this is when your joints can be particularly painful and inflamed. Putting further strain on very swollen and painful joints can often make the pain and inflammation worse (NHS, 2014i).

Healthy eating and exercise

Regular exercise and a healthy diet are recommended for everyone, not just people with rheumatoid arthritis. They can help prevent many conditions, including heart disease and many forms of cancer.

Exercising regularly can help relieve stress, help keep your joints mobile and strengthen the muscles supporting your joints. Exercise can also help you lose weight if you are overweight, which can put extra strain on your joints.

However, it's important to strike a balance between rest and exercise. Rest will make inflamed joints feel more comfortable, but without movement your joints will stiffen and your muscles will become weaker. You need to find out the best activities and the right balance for you.

When starting exercise it is always best to increase the amount of exercise you do gradually and if a particular activity causes your joints to become warm and swollen or if it causes severe pain then stop and rest. If not, you should be fine to continue.

If a particular activity always causes a flare-up then it's probably best to avoid it and find an alternative. In general, exercises involving high impact such as step exercises or contact sports such as rugby and football are more likely to cause problems. Forms of exercise that put less strain on your joints include swimming, cycling, walking and aqua- aerobics.

If you need further help, your physiotherapist is a good person to help advise on appropriate exercises for you (NHS, 2014i).

Self-management

Taking control of rheumatoid arthritis will help you cope with its impact on your lifestyle.

Arthritis Care offers self-management training courses to teach techniques for living positively with arthritis. Techniques include relaxation and breathing exercises to help pain control, goal-setting exercises and positive thinking to help give you some control over your condition.

A self-management programme specifically for people with rheumatoid arthritis has been developed by the National Rheumatoid Arthritis Society (NRAS). The course helps people learn more about their condition and provides practical tips on how to manage everyday life (NHS, 2014i).

Talk to others

Many people find it helpful to talk to others in a similar position, and you may find support from an individual or group of people with rheumatoid arthritis. Patient organisations have local support groups where you can meet others diagnosed with the same condition (NHS, 2014i).

Your feelings

It can be hard to deal with the unpredictable nature of rheumatoid arthritis. Some days, the pain and stiffness will be much worse than others, and there is no way of knowing when a flare-up will occur.

The difficult nature of rheumatoid arthritis can mean that some people develop depression or feelings of stress and anxiety. Sometimes, these feelings can be related to poorly controlled pain or fatigue. Living with any long-term condition makes you more likely to have a range of emotions such as frustration, fear, pain, anger and resentment.

Speak to your healthcare team if you are struggling to deal with your condition emotionally. They may be able to offer medication or psychological interventions to help (NHS, 2014i).

Starting and raising a family

If you are taking medicines for rheumatoid arthritis, let your healthcare team know if you want to start a family or if you are worried about becoming pregnant while on medication.

Some medications, such as methotrexate, leflunomide and biological treatments, should not be taken by men or women while they are trying for a baby. The doctors and nurses will work with you to ensure your rheumatoid arthritis is controlled while you are trying to get pregnant.

Babies and young children are physically and mentally demanding for any parent, but particularly so if you have rheumatoid arthritis. If you are struggling to cope, it may help to talk to other people in the same situation as you. You may also be able to get additional support from your health visitor or occupational therapist to help you manage your young family (NHS, 2014i).

Sex and relationships

Pain, discomfort and changes in the way you feel can affect your sex life. Your self-esteem or thoughts about how you look may affect your confidence.

Although many people find it difficult to talk about such private issues, there are resources that might help you. Talking to your partner or GP about the impact of rheumatoid arthritis on your sexuality and sexual relationships may help (NHS, 2014i).

Money and benefits

If you have to stop work or work part time because of your rheumatoid arthritis, you may find it hard to cope financially (NHS, 2014i).

You may be entitled to one or more of the following types of financial support -

- If you have a job, but cannot work because of your illness, you are entitled to Statutory Sick Pay from your employer.
- If you do not have a job and cannot work because of your illness, you may be entitled to Employment and Support Allowance.

- If you are aged 64 or under and need help with personal care or have walking difficulties, you may be eligible for a Personal Independence Payment.
- If you are aged 65 or over, you may be able to get Attendance Allowance.
- If you are caring for someone with rheumatoid arthritis, you may be entitled to Carer's Allowance (NHS, 2014i).

You may also be eligible for other benefits if you have children living at home or if you have a low household income (NHS, 2014i).

Paying for your medications If you have rheumatoid arthritis, you are likely to need repeat prescriptions of medication to keep your condition under control.

Rheumatoid arthritis is not listed as a medical condition that entitles a person to free prescriptions in England, although you may sometimes be able to get your medication for free if your condition falls under the category of: 'a continuing physical disability which means the person cannot go out without the help of another person'.

You are also entitled to free prescriptions if you are 60 or over, or if you receive Income Support, income-based Jobseeker's Allowance, or income-related Employment and Support Allowance.

If you aren't entitled to free prescriptions, you may find it cheaper to buy a prescription prepayment certificate (PPC). This is effectively a prescription 'season ticket' that covers all your prescriptions over a three or 12 month period.

Read more about help with prescription costs to see if you are entitled to free prescriptions (NHS, 2014i).

Complications

Having rheumatoid arthritis can put you at a higher risk of developing other conditions, particularly if it is not well controlled.

Some of these conditions are described below (NHS, 2014i).

Carpal tunnel syndrome

Carpal tunnel syndrome is a common condition in people with rheumatoid arthritis.

It is the result of compression of the nerve that controls sensation and movement in the hands (median nerve) and can cause symptoms such as aching, numbness and tingling in your thumb, fingers and part of the hand.

Symptoms of carpal tunnel syndrome can sometimes be controlled with wrist splints or corticosteroid injections, although surgery to release the pressure on the median nerve may be needed in severe cases (NHS, 2014i).

Widespread inflammation

As rheumatoid arthritis is an inflammatory condition, it can cause inflammation to develop in other parts of your body, such as the -

- **Lungs** - inflammation of the lungs or lung lining can lead to pleurisy or pulmonary fibrosis, which can cause chest pain, a persistent cough and shortness of breath.
- **Heart** - inflammation of the tissue around the heart can lead to pericarditis, which causes chest pain.
- **Eyes** - inflammation of the eyes can lead to scleritis or Sjogren's syndrome. Scleritis can cause eye redness and pain, whereas Sjogren's syndrome can cause dry eyes.
- **Blood vessels** - inflammation of the blood vessels is known as vasculitis. This can lead to the thickening, weakening, narrowing and scarring of blood vessel walls. In serious cases, it can affect blood flow to your body's organs and tissues and can be life-threatening (NHS, 2014i).

However, thanks to early treatment, inflammation due to rheumatoid arthritis affecting other parts of the body is becoming less common (NHS, 2014i).

Joint damage

If rheumatoid arthritis is not treated early or is not well controlled, the inflammation in your joints could lead to significant and permanent damage (NHS, 2014i).

Problems that can affect the joints include -

- damage to nearby bone and cartilage (a tough, flexible tissue that covers the surface of joints),
- damage to nearby tendons (flexible tissue that attach muscle to bone), which could cause them to break (rupture),
- joint deformities (NHS, 2014i).

These problems will sometimes need to be treated with surgery to prevent loss of function in the affected joints (NHS, 2014i).

Cardiovascular disease

If you have rheumatoid arthritis, you are at a higher risk of developing cardiovascular disease (CVD) than the population at large.

CVD is a general term that describes conditions affecting the heart or blood vessels, and it includes life-threatening problems such as heart attacks and strokes.

It's not clear exactly why people with rheumatoid arthritis are at an increased risk of these problems, but you can reduce your risk by ensuring your arthritis is well controlled and by reducing the impact of other factors that contribute to CVD, such as by stopping smoking, eating healthily and exercising regularly (NHS, 2014i).

Cervical myelopathy

If you have had rheumatoid arthritis for some time, you are at increased risk of developing cervical myelopathy and you may need a special assessment of your neck before any operation where you are put to sleep.

This condition is caused by dislocation of joints at the top of the spine, which put pressure on the spinal cord. Although relatively uncommon, it is a serious condition that can greatly affect your mobility and can lead to permanent spinal cord damage if not treated promptly with surgery (NHS, 2014i).

Scabies

I have included this section because scabies is a very real problem in nursing homes, and although it is classified as a STI [53] I am ignoring that aspect of it.

Scabies is a contagious skin condition caused by tiny mites that burrow into the skin.

The main symptom of scabies is intense itching that's worse at night. It also causes a skin rash on areas where the mites have burrowed (NHS, 2014j).

Scabies mites

Scabies mites are called Sarcoptes scabiei. They feed using their mouths and front legs to burrow into the outer layer of skin (epidermis), where they lay eggs.

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[53] Sexually transmitted infections

After three to four days, the baby mites (larvae) hatch and move to the surface of the skin, where they mature into adults.

Scabies like warm places, such as skin folds, between the fingers, under fingernails, or around the buttock or breast creases. They can also hide under watch straps, bracelets or rings (NHS, 2014j).

How scabies is spread

Scabies is usually spread through prolonged periods of skin-to-skin contact with an infected person, or through sexual contact.

It's also possible - but rare - for scabies to be passed on by sharing clothing, towels and bedding with someone who's infected.

It can take up to eight weeks for the symptoms of scabies to appear after the initial infection. This is known as the incubation period (NHS, 2014j).

Symptoms

The main symptoms of scabies are intense itching and a rash in areas of the body where the mites have burrowed.

The itching is often worse at night, when your skin is warmer. It may take four to six weeks before the itching starts because this is how long it takes for the body to react to mite droppings.

Symptoms will start within one to two days if you've had a scabies infection in the past. This is because your immune system will have learned to respond to a scabies infection (NHS, 2014j).

- **Itching, mainly at night** - Itching is the most common symptom. The itch can be so intense that it keeps a person awake at night,
- **Rash** - Many people get the scabies rash. This rash causes little bumps that often form a line. The bumps can look like hives, tiny bites, knots under the skin, or pimples. Some people develop scaly patches that look like eczema,
- **Sores** - Scratching the itchy rash can cause sores. An infection can develop in the sores,
- **Thick crusts on the skin** - Crusts form when a person develops a severe type of scabies called crusted scabies. Another name for crusted scabies is Norwegian scabies. These crusts house 100s to 1,000s of mites and the mites' eggs. With so many mites burrowing in the skin, the rash and itch become severe (AAD.ORG, 2016).

The rash

The scabies rash consists of tiny red spots. Scratching the rash may cause crusty sores to develop.

Burrow marks can be found anywhere on the body. They're short (1cm or less), wavy, silver-coloured lines on the skin, with a black dot at one end that can be seen with a magnifying glass (NHS, 2014j).

In adults, burrow marks often appear in the following areas -

- the folds of skin between fingers and toes,
- the palms of the hands,
- the soles and sides of the feet,
- the wrists,
- the elbows,
- around the nipples (in women),
- around the genital area (in men) (NHS, 2014j).

The rash usually affects the whole body, apart from the head. The following areas can be particularly affected -

- the underarm area,
- around the waist,
- the inside of the elbow,
- the lower buttocks,
- the lower legs,
- the soles of the feet,
- the knees,
- the shoulder blades,
- the female genital area,
- the groin,
- around the ankles (NHS, 2014j).

Elderly people, young children and those with a low immune system (immunocompromised) may also develop a rash on their head and neck.

Men usually have one or more very itchy, lumpy, 3 to 10mm spots on the skin of the genitals (on the penis and scrotum) (NHS, 2014j).

Causes

Scabies is a skin condition caused by the parasite Sarcoptes scabiei.

The intense itching associated with scabies is thought to be caused by the immune system reacting to the mites and their saliva, eggs and faeces (NHS, 2014j).

The scabies mite life cycle

A scabies infestation starts when a female mite burrows into your skin.

Male mites move between different burrow sites looking to mate. After mating, the male mite dies and the female begins to lay eggs, which hatch around three to four days later.

After hatching, the young mites move to the surface of the skin, where they mature into adults after 10–15 days. Male mites stay on the surface of the skin, while female mites burrow back into the skin to create a new burrow. The life cycle is then repeated. Without effective treatment, the life cycle of the scabies mite can continue indefinitely. Scabies mites are resistant to soap and hot water and can't be scrubbed out of the skin (NHS, 2014j).

How scabies is spread Scabies mites can't fly or jump, which means they can only move from one human body to another if two people have direct and prolonged physical contact (NHS, 2014j).

For example, scabies mites can be transmitted by -

- holding hands with an infected person for a prolonged period of time,
- having sex with an infected person,
- sharing clothing, towels and bedding with an infected person (although this is rare) (NHS, 2014j).

It's unlikely that scabies will be transmitted through brief physical contact, such as shaking hands or hugging.

Scabies mites can survive outside the human body for 24–36 hours, making infection by coming into contact with contaminated clothes, towels or bed linen a possibility. However, it's rare for someone to be infected in this way.

Scabies infestations can spread quickly because people are usually unaware they have the condition until two to three weeks after the initial infection.

There's an increased risk of catching scabies in confined environments, such as schools and nursing homes, where people are in close proximity to one another (NHS, 2014j).

Diagnosis

Your GP should be able to diagnose scabies from the appearance of your skin, and by looking for the burrow marks of the Sarcoptes scabiei mite.

However, as scabies is spread very easily, it's often possible to make a confident diagnosis if more than one family member has the same symptoms.

Your GP will also want to rule out other skin conditions that may be causing your symptoms, such as eczema or impetigo (a highly contagious bacterial skin infection) (NHS, 2014j).

Ink test

The burrows of scabies mites can be identified by using an ink test. Ink is rubbed around an area of itchy skin before being wiped off with an alcohol pad.

If scabies burrows are present, some of the ink will remain and will have tracked into the burrows, showing up as a dark line.

To confirm the diagnosis, a skin sample may be gently scraped from the affected area so it can be examined under a microscope for evidence of scabies mites, their eggs and faeces (NHS, 2014j).

Treatment

See your GP immediately if you have scabies and you haven't had a previous infection. Delaying treatment places other people at risk.

As other more serious skin conditions can sometimes cause similar symptoms to the symptoms of scabies, your GP will need to rule these out.

If you have scabies, your partner will also need to be treated regardless of whether or not they have any symptoms. This is because it's highly likely that scabies will have been transmitted through close bodily contact, such as during sex.

To reduce the risk of reinfection, avoid having sex and other forms of prolonged close bodily contact, such as holding hands, until both you and your partner have completed the full course of treatment (NHS, 2014j).

Lotions and creams

Lotions and creams are commonly used to treat scabies. Your GP, pharmacist or nurse will be able to advise you about which treatment to use (NHS, 2014j).

Applying the cream or lotion To prevent reinfection, all members of your household and any close contacts, including recent sexual partners (see diagnosing scabies for further details), should be treated at the same time as you, even if they don't have any symptoms.

The cream or lotion should be applied to the skin of all of your body, except your head. Before you apply it, make sure your skin is cool and dry. Don't apply it after having a hot bath.

If you apply it when your body is hot, it will quickly be absorbed into your skin and won't remain on the area where the scabies burrows are (NHS, 2014j).

You should also follow the advice outlined below.

- Read the patient leaflet that comes with the cream or lotion for details of where to apply it. Some products need to be applied to the whole body, including the scalp and face, whereas others must only be applied from the neck down,
- Pay particular attention to difficult-to-reach areas, such as your back, the soles of your feet, in between your fingers and toes, under fingernails, and on your genitals,
- Use a cotton bud or old toothbrush to apply the treatment under fingernails and toenails. Put the cotton bud or toothbrush in a bag and throw it away afterwards,
- Leave the treatment on your skin for 8 to 24 hours (depending on the preparation used) before washing it off thoroughly. Follow the manufacturer's instructions regarding how long to leave the cream or lotion on for,
- Reapply the cream or lotion immediately to any areas of skin that are washed during the period of application,
- Wash bed linen, nightwear and towels after the first application,
- Repeat the treatment process seven days after the first application to ensure it's successful. The second application will ensure any mites hatched from existing eggs are killed (NHS, 2014j).

Contact your GP if the itching hasn't improved after two weeks of treatment and you notice new burrows on your skin.

It can take a month after treatment for the general itching to subside completely, and longer for the lumpy genital lesions to resolve. Your GP may recommend repeating the treatment or they may prescribe a different lotion.

You should also speak to your GP or pharmacist if you experience any persistent side-effects (NHS, 2014j).

Infection control

On the day you first apply the cream or lotion, you should wash all bed linen, nightwear and towels at a temperature above 50'C (122'F).

If you're unable to wash certain items, place them in a plastic bag for at least 72 hours. After this time, the scabies mites will have died.

In cases of crusted scabies, you should clean the floors in your house and thoroughly vacuum your carpets and furniture, including the armchairs and sofa.

If you've been diagnosed with scabies, avoid close and prolonged physical contact with others until you've applied the cream or lotion. You should also avoid close contact with other members of your household until their treatment has been completed.

Children and adults can return to school or work after the first treatment has been completed (NHS, 2014j).

Itchiness

Your GP should be able to prescribe treatments, such as a mild steroid cream, to reduce the itchiness. Menthol cream or gel, available from pharmacies without a prescription, may also help relieve itchy skin.

Oral sedative antihistamines are also available from your local pharmacy and can be used to control itching and help you get a better night's sleep.

As this type of antihistamine can cause drowsiness, you should avoid driving or operating heavy machinery if you're affected in this way.

Non-sedating antihistamines don't help relieve the itching of scabies. Check with your GP or pharmacist if you're unsure.

You may continue to experience itchiness for a couple of weeks after your treatment has been completed. This is because your immune system will still be reacting to the presence of dead mites and their droppings.

Visit your GP if you're still experiencing itchiness six weeks after completing your treatment (NHS, 2014j).

Complications

A secondary infection and crusted scabies are two possible complications of scabies (NHS, 2014j).

Secondary infection

Repeatedly scratching itchy skin caused by scabies may break the skin's surface. This will make you more vulnerable to developing a bacterial skin infection, such as impetigo.

Antibiotics may be recommended to control a secondary infection.

Scabies has been known to make some pre-existing skin conditions, such as eczema, worse. However, other skin conditions should settle down after the scabies infection has been successfully treated (NHS, 2014j).

Crusted scabies

Crusted scabies, also known as Norwegian scabies, is a more severe form of scabies where thousands or even millions of scabies mites are present.

Normal scabies can develop into crusted scabies after a skin reaction. The condition affects all parts of the body, including your head, neck, nails and scalp. However, unlike normal scabies, the rash associated with crusted scabies usually doesn't itch.

In crusted scabies, the increase in the number of mites causes thick, warty crusts to develop on the skin. It's often mistaken for psoriasis (a skin condition that causes red, flaky, crusty patches of skin covered with silvery scales) (NHS, 2014j).

Crusted scabies affects people with a weakened immune system (the body's natural defence against infection and illness). This includes -

- the very young,
- people with brain disorders (neurological disorders, such as Parkinson's disease),
- people with Down's syndrome,
- pregnant women,
- elderly people,

- people with a condition that affects their immune system, such as HIV or AIDS,
- people who are taking steroids to treat other medical conditions,
- people who are having chemotherapy treatment (NHS, 2014j).

Research has found a healthy immune system appears to interrupt the reproductive cycle of the scabies mite. For example, most people with scabies will only have 5 to 15 mites on their body at any one time.

However, if you have a weakened immune system, the number of scabies mites can increase significantly. People with crusted scabies can have thousands or millions of scabies mites on their body at any one time.

Because of the high number of scabies mites, crusted scabies is highly contagious. Even minimal physical contact with a person with crusted scabies, or with their bed linen or clothes, can lead to infection.

However, contact with someone with crusted scabies will only lead to the normal type of scabies in people with a healthy immune system.

Crusted scabies can be treated using insecticide creams or a medicine called ivermectin, which is taken by swallowing a tablet. Ivermectin kills the mites by stopping their nervous system working (NHS, 2014j).

Tips for dealing with scabies

The mite that causes scabies is hardy. These tips can help you get rid of the mites (NHS, 2014j).

- If you think you have scabies, don't be embarrassed to see your GP. Some people do not seek medical help because they feel this reflects poorly on them. This is not true. People who are very clean and neat can get scabies. People of all ages, races, and income levels get scabies.
- Everyone with whom you had close contact needs treatment. Scabies is very contagious. If you get treatment and people with whom you live or have close contact do not get treatment, you can get the mites again. People do not have to have signs and symptoms of scabies to have mites on their skin. Someone who has never had scabies may not have any symptoms for 2 to 6 weeks.
- If your GP prescribes a medicine that you apply to your skin, be sure to take a bath or shower before you apply the medicine. You should then massage the medicine onto clean, dry skin. The medicine must remain on the skin for 8 to 14 hours. You will then wash off the medicine. For this

reason, most people apply the medicine at bedtime and wash it off in the morning.

- Apply the medicine from your neck to your toes. This includes all skin between your neck and toes - the skin around your nails, the crease between your buttocks, and the skin between your toes. Infants, children, and the elderly often need to treat their scalp, temples, and forehead. You should never apply medicine to the nose, lips, eyelids, nor around the eyes or mouth.
- If you wash your hands after applying the medicine, be sure to reapply the medicine to your hands. Mites like to burrow in the hands, so it is important to treat the hands. Be sure to apply the medicine to the skin between your fingers.
- The day you start treatment, wash your clothes, bedding, towels, and washcloths. Mites can survive for a few days without human skin. If a mite survives, you can get scabies again. To prevent this, you must wash clothes, sheets, comforters, blankets, towels, and other items. Be sure to follow these instructions when washing: -
  - Wash all items in a washing machine, using the hottest water possible.
  - After washing, dry everything in a dryer, using the hot setting.
  - If you cannot wash something in a washing machine and then dry it in a dryer, take it to a dry cleaner or seal it in plastic bag for at least 1 week.
  - Items that have not touched your skin for more than 1 week generally do not need washing. If you are not sure whether you wore clothing or used an item within the past week, be sure to wash and dry it.
- Vacuum your entire home on the day you start treatment. Vacuum carpeting, area rugs, and all upholstered furniture.
- Do not treat your pets. The human itch mite cannot survive on animals. Pets do not need treatment (AAD.ORG, 2016).

Shingles

Shingles, also known as herpes zoster, is a painful skin rash caused by the reactivation of the chickenpox virus (varicella-zoster virus) in people who have previously had chickenpox.

It begins with a burning sensation in the skin, followed by a rash of very painful fluid-filled blisters that can then burst and turn into sores before healing. Often an area on just one side of the body is affected, usually the chest but sometimes the head, face and eye (NHS, 2015o).

The main symptom is a painful rash that develops into itchy blisters that contain particles of the virus.

An episode of shingles typically lasts around two to four weeks, although around one in five people go on to develop nerve pain called postherpetic neuralgia in the affected area of skin (NHS, 2014k).

Who is affected?

Around 9 in every 10 adults in the UK have had chickenpox previously and are potentially at risk of developing shingles.

Shingles can occur at any age, but is most common in people who are over the age of 70. It is much less common in children.

It's estimated that around one in every four people will have at least one episode of shingles during their life (NHS, 2014k).

Symptoms

An episode of shingles typically lasts around two to four weeks. The main symptoms are pain, followed by a rash.

Any part of your body can be affected, including your face and eyes, although the chest and abdomen (tummy) are the most common areas where shingles develops (NHS, 2014k).

Early symptoms

In some cases, shingles may cause some early (prodromal) symptoms that develop a few days before the painful rash first appears. These early symptoms can include -

- a headache,
- burning, tingling, numbness or itchiness of the skin in the affected area,
- a feeling of being generally unwell,
- a high temperature (fever) (NHS, 2014k).

Not everyone will experience these prodromal symptoms. A high temperature is particularly uncommon (NHS, 2014k).

Pain

Eventually, most people with shingles experience a localised ”band” of pain in the affected area.

The pain can be a constant, dull or burning sensation and its intensity can vary from mild to severe. You may have sharp stabbing pains from time to time, and the affected area of skin will usually be tender.

Pain is less common in young healthy people and is rare in children. It usually starts a few days before the rash appears and can remain for a few days or weeks after the rash has healed (NHS, 2014k).

Rash

The shingles rash usually appears on one side of your body and develops on the area of skin related to the affected nerve.

Initially, the shingles rash appears as red blotches on your skin before developing into itchy blisters similar in appearance to chickenpox.

New blisters may appear for up to a week, but a few days after appearing they become yellowish in colour, flatten and dry out.

Scabs then form where the blisters were, which may leave some slight scarring. It usually takes two to four weeks for the rash to heal completely (NHS, 2014k).

When to seek medical advice

Shingles is not usually serious, but you should see your GP as soon as possible if you recognise the symptoms. Early treatment may help reduce the severity of your symptoms and the risk of developing complications.

You should also see your GP if you are pregnant or have a weakened immune system (the body’s natural defence system) and you think you have been exposed to someone with chickenpox or shingles and haven’t had chickenpox before (NHS, 2014k).

Ophthalmic shingles

Some cases of shingles can affect one of the eyes and are known as ophthalmic shingles. This occurs when the virus is reactivated in part of the trigeminal nerve, a nerve that controls sensation and movement in your face (NHS, 2014k).

Symptoms can include -

- a rash over your forehead, nose and around your eye,
- conjunctivitis - inflammation of your eye that causes it to become red and watery with a sticky coating on your eyelashes,
- a red eye,
- problems with your vision (NHS, 2014k).

Causes

Shingles is caused by the reactivation of the varicella-zoster virus, which is the virus that causes chickenpox.

After you have had chickenpox, the varicella-zoster virus lies dormant (inactive) inside your body. It can become reactivated at a later stage and cause shingles.

It is not known exactly why the virus is reactivated, but it is linked to having lowered immunity (protection against infection and diseases) (NHS, 2014k).

Your immunity to illness and infection can become lowered if there is a problem with your immune system (the body's natural defence system). This can happen as a result of -

- **old age** - as you age, your immunity may decrease, and shingles most commonly occurs in people over 70 years old,
- **physical and emotional stress** - the chemicals released by your body when you are stressed can prevent your immune system working properly,
- **HIV and AIDS** - people with HIV are much more likely to get shingles than the rest of the population because their immune system is weak,
- **recently having a bone marrow transplant** - the conditioning you require before the transplant will weaken your immune system,
- **recently having an organ transplant** - you may need to take medication to suppress your immune system so your body accepts the donated organ,
- **chemotherapy** - chemotherapy medication, often used to treat cancer, can temporarily weaken your immune system (NHS, 2014k).

However, young people who appear otherwise healthy can also sometimes develop shingles. (NHS, 2014k).

Is shingles contagious?

It is not possible to catch shingles from someone else with the condition, or from someone with chickenpox.

However, it is possible for someone who has never had chickenpox to catch it from someone with shingles, as the shingles blisters contains the live virus.

In the UK, chickenpox is so common during childhood that 9 out of 10 adults have already had it and will not be at risk from someone with shingles (NHS, 2014k).

Catching chickenpox

The blisters that develop as a result of shingles contain virus particles. If you have not had chickenpox before, you can catch it from direct contact with the fluid from the blisters of someone who has shingles, or from something that has the fluid on it, such as bed sheets or a towel.

If you have shingles, you are contagious until the last blister has scabbed over. This will usually occur after about 10 to 14 days (NHS, 2014k).

Preventing the virus spreading

If you have the shingles rash, do not share towels or flannels, go swimming, or play contact sports. This will help prevent the virus being passed on to someone who has not had chickenpox.

You should also avoid work or school if your rash is weeping (oozing fluid) and cannot be covered (NHS, 2014k).

Chickenpox can be particularly dangerous for certain groups of people. If you have shingles, avoid -

- women who are pregnant and have not had chickenpox before as they could catch it from you, which may harm their unborn baby,
- people who have a weak immune system, such as someone with HIV or AIDS,
- babies less than one month old, unless it is your own baby, in which case your baby should have antibodies (proteins that fight infection) to protect them from the virus (NHS, 2014k).

Once your blisters have dried and scabbed over, you are no longer contagious and will not need to avoid anyone (NHS, 2014k).

Diagnosis

Your GP will normally be able to diagnose shingles from your symptoms and the appearance of your rash. Testing is not usually necessary (NHS, 2014k).

Referral

It is uncommon for someone with shingles to be referred to a specialist for further assessment and treatment, but your GP may consider seeking specialist advice or referring you if -

- they think you may have a complication of shingles, such as meningitis or encephalitis,
- shingles is affecting one of your eyes - there is a risk you could develop permanent vision problems if the condition is not treated quickly,
- you have a weakened immune system - particularly in severe cases or cases affecting children,
- you are pregnant,
- a diagnosis is not certain (NHS, 2014k).

You may also be referred to a specialist if you have an unusually persistent case of suspected shingles that is not responding to treatment, or if you have been diagnosed with the condition more than twice (NHS, 2014k).

Who might I see?

Who you are referred to will depend on your circumstances. It could be -

- a paediatrician (a specialist in the care of babies and children) if your child is affected,
- an ophthalmologist (a doctor who specialises in treating eye conditions) if shingles is affecting one of your eyes,
- your own consultant (a specialist in a particular area of medicine) if you have one for an existing medical condition such as HIV or AIDS (NHS, 2014k).

Treatment

There is no cure for shingles, but treatment can help ease your symptoms until the condition improves. In many cases, shingles gets better within around two to four weeks.

However, it's still important to see your GP as soon as possible if you recognise the symptoms of shingles, as early treatment may help reduce the severity of the condition and the risk of potential complications (NHS, 2014k).

Self-care

If you develop the shingles rash, there are a number of things you can do to help relieve your symptoms, such as -

- keeping the rash as clean and dry as possible - this will reduce the risk of the rash becoming infected with bacteria,
- wearing loose-fitting clothing - this may help you feel more comfortable,
- not using topical (rub-on) antibiotics or adhesive dressings such as plasters - this can slow down the healing process,
- using a non-adherent dressing [54] if you need to cover the blisters - this avoids passing the virus to anyone else (NHS, 2014k).

Calamine lotion has a soothing, cooling effect on the skin and can be used to relieve the itching.

If you have any weeping blisters, you can use a cool compress (a cloth or a flannel cooled with tap water) several times a day to help soothe the skin and keep blisters clean.

It's important to only use the compress for around 20 minutes at a time and stop using them once the blisters stop oozing. Don't share any cloths, towels or flannels if you have the shingles rash (NHS, 2014k).

Antiviral medication

As well as painkilling medication, some people with shingles may also be prescribed a course of antiviral tablets lasting 7 to 10 days. Commonly prescribed antiviral medicines include aciclovir, valaciclovir and famciclovir (NHS, 2014k).

These medications cannot kill the shingles virus, but can help stop it multiplying. This may -

- reduce the severity of your shingles,
- reduce how long your shingles lasts,
- prevent complications of shingles, such as postherpetic neuralgia (although the evidence for this is uncertain) (NHS, 2014k).

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[54] a dressing that will not stick to the rash

Antiviral medicines are most effective when taken within 72 hours of your rash appearing, although they may be started up to a week after your rash appears if you are at risk of severe shingles or developing complications (NHS, 2014k).

Side-effects of antiviral medication are very uncommon, but can include -

- feeling sick,
- vomiting,
- diarrhoea,
- abdominal (tummy) pain,
- headaches,
- dizziness (NHS, 2014k).

Who may be prescribed antiviral medication? If you are over 50 years of age and have symptoms of shingles, it is likely you will be prescribed an antiviral medication (NHS, 2014k).

You may also be prescribed antiviral medication if you have -

- shingles that affects one of your eyes,
- a weakened immune system,
- moderate to severe pain,
- a moderate to severe rash (NHS, 2014k).

Pregnancy and antiviral medication If you are pregnant and have shingles, it is likely your GP will discuss your case with a specialist to decide whether the benefits of antiviral medication significantly outweigh any possible risks.

Shingles will not harm your unborn baby.

If you are under 50 years of age, you are at less risk of developing complications from shingles anyway, so you may not need antiviral medication (NHS, 2014k).

Painkilling medication

To ease the pain caused by shingles, your GP may recommend painkilling medication. Some of the main medications used to relieve pain associated with shingles are described below (NHS, 2014k).

Paracetamol The most commonly used painkiller is paracetamol, which is available without a prescription. Always read the manufacturer's instructions to make sure the medicine is suitable and you are taking the correct dose (NHS, 2014k).

Non-steroidal anti-inflammatory drugs (NSAIDs) NSAIDs, such as ibuprofen, are an alternative type of painkilling medicine also available without a prescription (NHS, 2014k).

However, NSAIDs may not be suitable if you -

- have stomach, liver or kidney problems, such as a stomach ulcer, or had them in the past,
- have asthma,
- are pregnant or breastfeeding (NHS, 2014k).

Ask your GP or pharmacist if you are unsure about whether you should take NSAIDs (NHS, 2014k).

Opioids For more severe pain, your GP may prescribe an opioid, such as codeine. This is a stronger type of painkiller sometimes prescribed alongside paracetamol.

Occasionally, your GP may consider seeking specialist advice before prescribing an even stronger opioid, such as morphine (NHS, 2014k).

Antidepressants If you have severe pain as a result of shingles, you may be prescribed an antidepressant medicine. These medications are commonly used to treat depression, but they have also proven to be useful in relieving nerve pain, such as the pain associated with shingles.

The antidepressants most often used to treat shingles pain are known as tricyclic antidepressants (TCAS). Examples of TCAS most commonly prescribed for people with shingles are amitriptyline, imipramine and nortriptyline (NHS, 2014k).

Side-effects of TCAS can include -

- constipation,
- difficulty urinating,
- blurred vision,
- dry mouth,
- weight gain,
- drowsiness (NHS, 2014k).

If you have shingles, you will usually be prescribed a much lower dose of TCAS than if you were being treated for depression. This will usually be a tablet to take at night. Your dose may be increased until your pain settles down.

It may take several weeks before you start to feel the antidepressants working, although this is not always the case (NHS, 2014k).

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Anticonvulsants Anticonvulsants are most commonly used to control seizures (fits) caused by epilepsy, but they are also useful in relieving nerve pain.

Gabapentin and pregabalin are the most commonly prescribed anticonvulsants for shingles pain (NHS, 2014k).

Side-effects of these medications can include -

- dizziness,
- drowsiness,
- increased appetite,
- weight gain,
- feeling sick,
- vomiting (NHS, 2014k).

As with antidepressants, you may need to take anticonvulsants for several weeks before you notice it working.

If your pain does not improve, your dose may be gradually increased until your symptoms are effectively managed (NHS, 2014k).

Shingles vaccination

A vaccine to prevent shingles, a common, painful skin disease is available on the NHS to certain people in their 70s.

The shingles vaccine is given as a single injection into the upper arm. Unlike the flu jab, you'll only need to have the vaccination once and you can have it at any time of the year.

The shingles vaccine is expected to reduce your risk of getting shingles. If you are unlucky enough to go on to have the disease, your symptoms may be milder and the illness shorter.

Shingles can be very painful and uncomfortable. Some people are left with pain lasting for years after the initial rash has healed. And shingles is fatal for around 1 in 1,000 over-70s who develop it.

It's fine to have the shingles vaccine if you've already had shingles. The shingles vaccine works very well in people who have had shingles before and it will boost your immunity against further shingles attacks (NHS, 2015o).

Who can have the shingles vaccination? From September 1 2015 the shingles vaccine is routinely available to people aged 70 and 78. You become eligible for the vaccine on the first day of September 2015 after you've turned 70 or 78 and remain so until the last day of August 2016.

In addition, anyone who was eligible for immunisation in the previous two years of the programme but missed out on their vaccinations remains eligible until their 80th birthday (NHS, 2015o).

This includes -

- people aged 71 and 72 on 1 September 2015,
- people aged 79 (NHS, 2015o).

Anyone aged 80 and over is unsuitable to have the shingles vaccination on the NHS because it seems to be less effective in this age group (NHS, 2015p).

You can have the shingles vaccination at any time of year, though many people will find it convenient to have it at the same time as their annual flu vaccination (NHS, 2015o).

Is there anyone who should not have the shingles vaccination? You should not have the shingles vaccine if you -

- have a weakened immune system (for example, because of cancer treatment, if you take steroid tablets or if you've had an organ transplant - your doctor will advise whether this applies to you),
- you've had a serious allergic reaction (including an anaphylactic reaction) to a previous dose of any of the substances in the vaccine, such as neomycin and gelatin - again, your GP can advise you if this applies to you,
- you've had a serious allergic reaction (including an anaphylactic reaction) to a previous dose of the chickenpox vaccine,
- have an untreated TB infection (NHS, 2015s).

How do I get the shingles vaccine? You don't need to do anything. Your doctor will invite you to the surgery for the vaccine when you become eligible. If you can't go to the appointment you're offered, contact your GP practice to rearrange it. It's important that you don't leave it too late to have the vaccination, as your GP may only be able to give it to you before 31 August 2016 (NHS, 2015o).

What is the brand name of the shingles vaccine? The brand name of the shingles vaccine given in the UK is Zostavax. It can be given at any time of the year (NHS, 2015o).

How does the shingles vaccine work? The vaccine contains a weakened chickenpox virus (varicella-zoster virus). It's similar, but not identical to, the chickenpox vaccine.

Very occasionally, people have developed a chickenpox-like illness following shingles vaccination (fewer than 1 in 10,000 individuals) (NHS, 2015o).

How long will the shingles vaccine protect me for? It's difficult to be precise, but research suggests the shingles vaccine will protect you for at least five years, probably longer (NHS, 2015o).

How safe is the shingles vaccine? There is lots of evidence showing that the shingles vaccine is very safe. It's already been used in several countries, including the US and Canada, and no safety concerns have been raised. The vaccine also has few side-effects (NHS, 2015o).

How is shingles spread? You don't "catch" shingles - it comes on when there's a reawakening of chickenpox virus that's already in your body. The virus can be reactivated because of advancing age, medication, illness or stress and so on.

Anyone who has had chickenpox can get shingles. It's estimated that around one in five people who have had chickenpox go on to develop shingles (NHS, 2015o).

Who's most at risk of shingles? People tend to get shingles more often as they get older, especially over the age of 70. And the older you are, the worse it can be. The shingles rash can be extremely painful, such that sufferers can't even bear the feeling of their clothes touching the affected skin.

The pain of shingles can also linger long after the rash has disappeared, even for many years. This lingering pain is called postherpetic neuralgia (PHN) (NHS, 2015o).

Can I get the shingles vaccine privately? The shingles jab is available privately for anyone over the age of 50. It's expensive and in very short supply, though. Expect to pay between £100 and £200. Your GP can advise on whether it's safe for you to have, but you may need to visit a private clinic to arrange this (NHS, 2015p).

Staying off work or school

If you or your child has shingles, you only need to stay away from work or keep your child off school while -

- the rash is weeping (oozing fluid) and cannot be covered,
- you or your child are feeling unwell (NHS, 2014k).

If the rash is only on your body and can be covered by clothing, there is little risk of passing the infection on to others (NHS, 2014k).

Complications

Complications can sometimes occur as a result of shingles. They are more likely if you have a weakened immune system (the body's natural defence system) or are elderly.

Some of the main complications associated with shingles are described below (NHS, 2014k).

Postherpetic neuralgia

Postherpetic neuralgia is the most common complication of shingles. It's not clear exactly how many people are affected, but some estimates suggest that as many as one in five people over 50 could develop postherpetic neuralgia as the result of shingles.

Postherpetic neuralgia can cause severe nerve pain (neuralgia) and intense itching that persists after the rash and any other symptoms of shingles have gone (NHS, 2014k).

Types of pain experienced by people with postherpetic neuralgia include -

- constant or intermittent burning, aching, throbbing, stabbing, or shooting pain,
- allodynia - where you feel pain from something that should not be painful, such as changes in temperature or the wind,
- hyperalgesia - where you are very sensitive to pain (NHS, 2014k).

Postherpetic neuralgia sometimes resolves after around three to six months, although it can last for years and some cases can be permanent. It can be treated with a number of different painkilling medicines (NHS, 2014k).

Eye problems

If one of your eyes is affected by shingles (ophthalmic shingles), there is a risk you could develop further problems in the affected eye, such as -

- ulceration (sores) and permanent scarring of the surface of your eye (cornea),
- inflammation of the eye and optic nerve (the nerve that transmits signals from the eye to the brain),
- glaucoma - where pressure builds up inside the eye (NHS, 2014k).

If not treated promptly, there is a risk that ophthalmic shingles could cause a degree of permanent vision loss (NHS, 2014k).

Ramsay Hunt syndrome

Ramsay Hunt syndrome is a complication that can occur if shingles affects certain nerves in your head.

In the US, Ramsay Hunt syndrome is estimated to affect 5 in 100,000 people every year and it may affect a similar number of people in the UK (NHS, 2014k).

Ramsay Hunt syndrome can cause -

- earache,
- hearing loss,
- dizziness,
- vertigo (the sensation that you or the environment around you is moving or spinning),
- tinnitus (hearing sounds coming from inside your body, rather than an outside source),
- a rash around the ear,
- loss of taste,
- paralysis (weakness) of your face (NHS, 2014k).

Ramsay Hunt syndrome is usually treated with antiviral medication and corticosteroids.

The earlier treatment is started, the better the outcome. Around three-quarters of people given antiviral medication within 72 hours of the start of their symptoms usually make a complete recovery.

If treatment is delayed, only about half of those treated will recover completely.

Those who don’t make a full recovery may be left with permanent problems, such as a degree of permanent facial paralysis or hearing loss (NHS, 2014k).

Other complications

A number of other possible problems can also sometimes develop as a result of shingles, including -

- the rash becoming infected with bacteria - see your GP if you develop a high temperature, as this could be a sign of a bacterial infection,
- white patches (a loss of pigment) or scarring in the area of the rash,
- inflammation of the lungs (pneumonia), liver (hepatitis), brain (encephalitis), spinal cord (transverse myelitis), or protective membranes that surround the brain and spinal cord (meningitis) - these complications are rare, however (NHS, 2014k).

Shingles is rarely life threatening, but complications such as those mentioned above mean that around 1 in every 1,000 cases in adults over the age of 70 is fatal (NHS, 2014k).

Stroke

A stroke is a serious, life-threatening medical condition that occurs when the blood supply to part of the brain is cut off.

Strokes are a medical emergency and urgent treatment is essential because the sooner a person receives treatment for a stroke, the less damage is likely to happen.

If you suspect that you or someone else is having a stroke, phone 999 immediately and ask for an ambulance (NHS, 2015q).

Symptoms and signs of stroke

If you suspect that you or someone else is having a stroke, phone 999 immediately and ask for an ambulance.

Even if the symptoms of a stroke disappear while you are waiting for the ambulance to arrive, you or the person having the stroke should still go to hospital for an assessment.

Symptoms that disappear quickly (and in less than 24 hours) may mean you have had a transient ischaemic attack (TIA) and you could be at risk of having a full stroke in the near future.

After an initial assessment, you may need to be admitted to hospital to receive a more in-depth assessment and, if necessary, for specialist treatment to begin (NHS, 2015q).

Recognising the signs of a stroke

The signs and symptoms of a stroke vary from person to person but usually begin suddenly. As different parts of your brain control different parts of your body, your symptoms will depend on the part of your brain affected and the extent of the damage.

The main stroke symptoms can be remembered with the word **FAST**: Face-Arms-Speech-Time (NHS, 2015q).

- **Face** - the face may have dropped on one side, the person may not be able to smile or their mouth or eye may have drooped,
- **Arms** - the person with suspected stroke may not be able to lift both arms and keep them there because of arm weakness or numbness in one arm,
- **Speech** - their speech may be slurred or garbled, or the person may not be able to talk at all despite appearing to be awake,
- **Time** - it is time to dial 999 immediately if you notice any of these signs or symptoms (NHS, 2015q).

It is important for everyone to be aware of these signs and symptoms. If you live with or care for somebody in a high-risk group, such as someone who is elderly or has diabetes or high blood pressure, being aware of the symptoms is even more important (NHS, 2015q).

Other possible symptoms

Symptoms in the FAST test identify most strokes, but occasionally a stroke can cause different symptoms (NHS, 2015q).

Other symptoms and signs may include -

- complete paralysis of one side of the body,
- sudden loss or blurring of vision,
- dizziness,
- confusion,
- difficulty understanding what others are saying,
- problems with balance and co-ordination,
- dysphagia,

- a sudden and very severe headache resulting in a blinding pain unlike anything experienced before,
- loss of consciousness (NHS, 2015q).

However, there are usually other causes for these symptoms (NHS, 2015q).

’Mini-stroke’ or transient ischaemic attack (TIA)

The symptoms of a TIA are the same as a stroke, but they tend to only last between a few minutes and a few hours before disappearing completely.

Although the symptoms do improve, a TIA should never be ignored as it is a serious warning sign there is a problem with the blood supply to your brain and means you are at an increased risk of having a stroke in the near future.

If you have had a TIA, you should contact your GP, local hospital or out-of-hours service, as soon as possible (NHS, 2015q).

Causes of stroke

There are two main types of stroke - ischaemic strokes and haemorrhagic strokes - which affect the brain in different ways and can have different causes (NHS, 2015q).

Ischaemic strokes

Ischaemic strokes are the most common type of stroke. They occur when a blood clot blocks the flow of blood and oxygen to the brain.

These blood clots typically form in areas where the arteries have been narrowed or blocked over time by fatty deposits known as plaques. This process is known as atherosclerosis (NHS, 2015q).

As you get older, the arteries can naturally narrow, but certain things can dangerously accelerate the process. These include -

- smoking,
- high blood pressure (hypertension),
- obesity,
- high cholesterol levels,
- diabetes,
- an excessive alcohol intake (NHS, 2015q).

Another possible cause of ischaemic stroke is a type of irregular heartbeat called atrial fibrillation, which can cause blood clots in the heart that break up and escape from the heart and become lodged in the blood vessels supplying the brain.

Atrial fibrillation can have a number of different causes, including lung disease, heart valve disease, excessive alcohol intake, coronary heart disease, and an overactive thyroid gland (hyperthyroidism) (NHS, 2015q).

Haemorrhagic strokes

Haemorrhagic strokes (also known as cerebral haemorrhages or intracranial haemorrhages) are less common than ischaemic strokes. They occur when a blood vessel within the skull bursts and bleeds into and around the brain.

The main cause of haemorrhagic stroke is high blood pressure, which can weaken the arteries in the brain and make them prone to split or rupture (NHS, 2015q).

Things that increase the risk of high blood pressure include -

- being overweight or obese,
- drinking excessive amounts of alcohol,
- smoking,
- a lack of exercise,
- stress, which may cause a temporary rise in blood pressure (NHS, 2015q).

Haemorrhagic strokes can also occur as the result of the rupture of a balloon-like expansion of a blood vessel (brain aneurysm) and badly-formed blood vessels in the brain (NHS, 2015q).

Can I reduce my risk?

It's not possible to completely prevent strokes because some things that increase your risk of the condition cannot be changed, including -

- **age** - you are more likely to have a stroke if you are over 65 years old, although about a quarter of strokes happen in younger people,
- **family history** - if a close relative (parent, grandparent, brother or sister) has had a stroke, your risk is likely to be higher,
- **ethnicity** - if you are south Asian, African or Caribbean, your risk of stroke is higher, partly because rates of diabetes and high blood pressure are higher in these groups,
- **your medical history** - if you have previously had a stroke, TIA or heart attack, your risk of stroke is higher (NHS, 2015q).

However, in most cases it is possible to significantly reduce your risk of having a stroke by making lifestyle changes to avoid problems such as atherosclerosis and high blood pressure. This includes things such as having a healthy diet, exercising regularly, stopping smoking if you smoke and cutting down on the amount of alcohol you drink.

As atrial fibrillation can also significantly increase your risk of having a stroke, it is also important to seek medical advice if you think you may have an irregular heartbeat. If you are diagnosed with the condition, you should talk to your doctor about the option of taking anticoagulant medications to lower your stroke risk (NHS, 2015q).

Diagnosis

Strokes are usually diagnosed by carrying out physical tests and studying images of the brain produced during a scan.

When you first arrive at hospital with a suspected stroke, a doctor will usually want to find out as much as they can about your symptoms.

A number of tests can then be carried out to help confirm the diagnosis and determine the cause of the stroke.

This may include blood tests to determine your cholesterol and blood sugar levels, checking your pulse for an irregular heartbeat and taking a blood pressure measurement (NHS, 2015q).

Brain scans

Even if the physical symptoms of a stroke are obvious, brain scans should also be carried out to determine -

- if the stroke has been caused by a blocked artery (ischaemic stroke) or burst blood vessel (haemorrhagic stroke),
- which part of the brain has been affected,
- how severe the stroke is (NHS, 2015q).

Different treatment is required for the different types of stroke, so a rapid diagnosis will make treatment more straightforward.

Everyone with suspected stroke should receive a brain scan within 24-hours and some people should be scanned within an hour of the onset of symptoms, especially those who -

- might benefit from clot-busting drugs (thrombolysis) such as alteplase or early anticoagulant treatment,
- are already on anticoagulant treatments,
- have a lower level of consciousness (NHS, 2015q).

This is why a stroke is a medical emergency and why 999 should be dialled when a stroke is suspected - there isn't time to wait for a GP appointment.

The two main types of scan used to assess the brain in people who have had a suspected stroke are a CT scan and a MRI scan. The type of scan you may have largely depends on your symptoms (NHS, 2015q).

CT scans - A CT scan is like an X-ray, but uses multiple images to build up a more detailed, three-dimensional picture of your brain to help your doctor identify any problem areas.

During the scan, you may be given an injection of a special dye into one of the veins in your arm to help improve the clarity of the CT image and look at the blood vessels that supply the brain.

If it is suspected you are experiencing a major stroke, a CT scan is usually able to show whether you have had an ischaemic stroke or a haemorrhagic stroke. It's generally quicker than an MRI scan and can mean you are able to receive appropriate treatment sooner (NHS, 2015q).

MRI scans - An MRI scan uses a strong magnetic field and radio waves to produce a detailed picture of the inside of your body.

For people with more complex symptoms, where the extent or location of the damage is unknown - and in people who have recovered from a transient ischaemic attack TIA - an MRI scan is more appropriate. This will provide greater detail of brain tissue, allowing smaller, or more unusually located areas affected by a stroke to be identified.

As with a CT scan, special dye can be used to improve MRI scan images (NHS, 2015q).

Swallow tests

A swallow test is essential for anybody who has had a stroke, as swallowing ability is commonly affected early after a stroke.

When a person cannot swallow properly, there is a risk that food and drink may get into the windpipe and then into the lungs (called aspiration), which can lead to chest infections such as pneumonia.

The test is simple. The person is given a few teaspoons of water to drink. If they can swallow this without choking and coughing they will be asked to swallow half a glass of water.

If they have any difficulty swallowing, they will be referred to the SLT for a more detailed assessment.

They will usually not be allowed to eat or drink normally until they have seen the therapist and may therefore need to have fluids or food given directly into an arm vein (intravenously) or through a tube inserted into their stomach via their nose (NHS, 2015q).

Heart and blood vessel tests

Further tests on the heart and blood vessels might be carried out later to confirm what caused your stroke. Some of the tests that may be carried out are described below (NHS, 2015q).

Carotid ultrasound - A carotid ultrasound scan can help show if there is any narrowing or blockages in the neck arteries leading to your brain.

An ultrasound scan involves using a small probe (transducer) to send high-frequency sound waves into your body. When these sound waves bounce back, they can be used to create an image of the inside of your body.

When carotid ultrasonography is needed, it should happen within 48 hours (NHS, 2015q).

Echocardiography - In some cases another type of ultrasound scan called an echocardiogram may be carried out to produce images of your heart and check for any problem with it that could be related to your stroke.

This will normally involve using an ultrasound probe moved across your chest (transthoracic echocardiogram).

In some cases, an alternative type of echocardiogram called transoesophageal echocardiography (TOE) may also be used.

This involves passing an ultrasound probe down your gullet (oesophagus), usually under sedation. As this allows the probe to be placed directly behind the heart, it produces a clear image of blood clots and other abnormalities that may not get picked up by a transthoracic echocardiogram.

Brain imaging is often used to identify which part of the brain has been affected by stroke and how severe it is (NHS, 2015q).

Treatment

Effective treatment of stroke can prevent long-term disability and save lives.

The specific treatments recommended depend on whether a stroke is caused by a blood clot obstructing the flow of blood to the brain (ischaemic stroke) or by bleeding in or around the brain (haemorrhagic stroke).

Treatment will usually involve taking one or more different medications, although some people may also need surgery.

The main treatment strategies for the two types of stroke are outlined below (NHS, 2015q).

Treating ischaemic strokes

If you have had an ischaemic stroke, a combination of medications to treat the condition and prevent it from happening again will usually be recommended.

Some of these medications will need to be taken immediately and only for a short time, while others may only be started once the stroke has been treated and may need to be taken in the long-term (NHS, 2015q).

Thrombolysis - Ischaemic strokes can often be treated using injections of a medication called alteplase that dissolves blood clots and restores the flow of blood to the brain. This use of "clot-busting" medication is known as thrombolysis.

Alteplase is most effective if started as soon as possible after the stroke occurs and is not generally recommended if more than four-and-a-half hours have passed, because it's not clear how beneficial it is when used after this time.

However, before alteplase can be used, it is very important that a brain scan to confirm a diagnosis of an ischaemic stroke is carried out because the medication can make the bleeding that occurs in haemorrhagic strokes worse (NHS, 2015q).

Antiplatelets - Most people will also be offered a regular dose of aspirin which - as well as being a painkiller - makes the cells in your blood called platelets less sticky, reducing the chances of another clot forming.

In addition to aspirin, other antiplatelet medicines such as clopidogrel and dipyridamole are also available (NHS, 2015q).

Anticoagulants - Some people may also be offered an additional medication called an anticoagulant to help reduce their risk of developing further blood clots in the future.

Anticoagulants prevent blood clots by changing the chemical composition of the blood in a way that prevents clots from occurring. Warfarin, rivaroxaban, dabigatran and apixaban are examples of anticoagulants for long term use. There are also a number of anticoagulants called heparins that can only be given by injection and are used in the short term (NHS, 2015q).

Anticoagulants may be offered if you -

- have a type of irregular heartbeat called atrial fibrillation that can cause blood clots,
- have a history of blood clots,
- are at risk of developing clots in your leg veins - known as DVT - because a stroke has left you unable to move one of your legs (NHS, 2015q).

Antihypertensives - If your blood pressure is too high, you may be offered medicines to lower it. Medicines that are commonly used include -

- thiazide diuretics,
- angiotensin-converting enzyme (ACE) inhibitors,
- calcium channel blockers,
- beta-blockers,
- alpha-blockers (NHS, 2015q).

Statins - If the level of cholesterol in your blood is too high, you will be advised to take a medicine known as a statin. Statins reduce the level of cholesterol in your blood by blocking an enzyme (chemical) in the liver that produces cholesterol.

You may be offered a statin, even if your cholesterol level is not particularly high, because a statin may help reduce your risk of stroke whatever your cholesterol level is (NHS, 2015q).

Carotid endarterectomy - Some ischaemic strokes are caused by narrowing of an artery in the neck called the carotid artery, which carries blood to the brain. The narrowing, known as carotid stenosis, is caused by a build-up of fatty plaques.

If the carotid stenosis is particularly severe, surgery may be offered to unblock the artery. This is done using a surgical technique called a carotid endarterectomy. It involves the surgeon making an incision in your neck to open up the carotid artery and remove the fatty deposits (NHS, 2015q).

Treating haemorrhagic strokes

As with ischaemic strokes, some people who have had a haemorrhagic stroke will also be offered medication, such as ACE inhibitors, to lower blood pressure and prevent further strokes from occurring.

If you were previously taking anticoagulant medicine before you had your stroke, you may also need treatment to reverse the effects of the medication and reduce your risk of further bleeding (NHS, 2015q).

Surgery - Occasionally, emergency surgery may be needed to remove any blood from the brain and repair any burst blood vessels. This is usually done using a surgical procedure known as a craniotomy.

During a craniotomy, a section of the skull is cut away to allow the surgeon access to the cause of the bleeding. The surgeon will repair any damaged blood vessels and ensure there are no blood clots present that may restrict the blood flow to the brain.

After the bleeding has been stopped, the piece of bone removed from the skull is replaced, often by an artificial metal plate (NHS, 2015q).

Surgery for hydrocephalus - Surgery can also be carried out to treat a complication of haemorrhagic strokes called hydrocephalus.

This is where damage resulting from a stroke causes cerebrospinal fluid to build up in the cavities (ventricles) of the brain, causing symptoms such as headaches, sickness, vomiting and loss of balance.

Hydrocephalus can be treated by surgically placing an artificial tube called a shunt into the brain to allow the fluid to drain properly (NHS, 2015q).

Supportive treatments

In addition to the treatments mentioned above, you may also need further short-term treatment to help manage some of the problems that can affect people who have had a stroke (NHS, 2015q).

For example, you may require -

- a feeding tube inserted into your stomach through your nose (nasogastric tube) to provide nutrition if you have dysphagia,
- nutritional supplements if you are malnourished,
- fluids given directly into a vein (intravenously) if you are at risk of dehydration,
- oxygen through a nasal tube or face mask if you have low levels of oxygen in your blood (NHS, 2015q).

What is good stroke care?

The National Stroke Strategy, published in December 2007, provides a guide to high-quality health and social care for those affected by stroke. Stroke experts have set out standards which define good stroke care, including -

- a rapid response to a 999 call for suspected stroke,
- prompt transfer to a hospital providing specialist care,
- an urgent brain scan - for example, CT scan or MRI scan undertaken as soon as possible,
- immediate access to a high-quality stroke unit,
- early multidisciplinary assessment, including swallowing screening,
- stroke specialised rehabilitation,
- planned transfer of care from hospital to community and longer-term support (NHS, 2015q).

The National Institute for Health and Care Excellence (NICE) has also produced guidelines on the diagnosis and management of stroke and a quality standard for stroke that describes the level of care the NHS is working towards.

If you are concerned about the standard of care provided, speak to your stroke specialist or a member of the stroke team (NHS, 2015q).

Recovering after a stroke

The injury to the brain caused by a stroke can lead to widespread and long-lasting problems.

Although some people may recover quite quickly, many people who have a stroke will need long-term support to help them manage any difficulties they have and regain as much independence as possible.

This process of rehabilitation will be specific to you, and will depend on your symptoms and their severity. It will often start while you are still in hospital and will continue at home or at a local clinic in your community once you are well enough to leave.

A team of specialists are available to help with your rehabilitation, including physiotherapists, psychologists, occupational therapists, speech therapists and specialist nurses and doctors.

You will be encouraged to actively participate in the rehabilitation process and will work with your care team to set goals you want to achieve during your recovery.

The different treatment and rehabilitation methods for some of the main problems caused by strokes are outlined below (NHS, 2015q).

Psychological impact

Two of the most common psychological problems that can affect people after a stroke are -

- depression - many people experience intense bouts of crying and feel hopeless and withdrawn from social activities,
- anxiety - where people experience general feelings of fear and anxiety, sometimes punctuated by intense, uncontrolled feelings of anxiety (anxiety attacks) (NHS, 2015q).

Feelings of anger, frustration and bewilderment are also common.

You will receive a psychological assessment from a member of your healthcare team soon after your stroke to check if you are experiencing any emotional problems.

Advice should be given to help deal with the psychological impact of stroke. This includes the impact on relationships with other family members and any sexual relationship. There should also be a regular review of any problems of depression and anxiety, and psychological and emotional symptoms generally.

These problems may settle down over time but if they are severe or last a long time, GPs can refer people for expert healthcare from a psychiatrist or clinical psychologist.

For some people, medicines and psychological therapies, such as counselling or CBT can help. CBT is a therapy that aims to change the way you think about things to produce a more positive state of mind (NHS, 2015q).

Cognitive impact

"Cognitive" is a term used by scientists to refer to the many processes and functions our brain uses to process information (NHS, 2015q).

One or more cognitive functions can be disrupted by a stroke, including -

- communication - both verbal and written,
- spatial awareness - having a natural awareness of where your body is in relation to your immediate environment,
- memory,
- concentration.
- executive function - the ability to plan, solve problems and reason about situations,
- praxis - the ability to carry out skilled physical activities, such as getting dressed or making a cup of tea (NHS, 2015q).

As part of your treatment, each one of your cognitive functions will be assessed, and a treatment and rehabilitation plan will be created.

You can be taught a wide range of techniques that can help you re-learn disrupted cognitive functions, such as recovering communication skills through speech therapy (see below).

There are also many methods to compensate for any loss of cognitive function, such as using memory aids, diaries and routines to help plan daily tasks.

Most cognitive functions will return after time and rehabilitation, but you may find they do not return to their former levels.

The damage that a stroke causes to your brain also increases the risk of developing vascular dementia. The dementia may happen immediately after a stroke or may develop some time after the stroke occurred (NHS, 2015q).

Movement problems

Strokes can cause weakness or paralysis in one side of the body and can result in problems with co-ordination and balance.

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Many people also experience extreme tiredness (fatigue) in the first few weeks after a stroke, and may also have difficulty sleeping, making them even more tired.

As part of your rehabilitation you should be seen by a physiotherapist, who will assess the extent of any physical disability before drawing up a treatment plan.

Physiotherapy will often involve several sessions a week, focusing on areas such as exercises to improve your muscle strength and overcome any walking difficulties.

The physiotherapist will work with you by setting goals. At first, these may be simple goals such as picking up an object. As your condition improves, more demanding long-term goals, such as standing or walking, will be set.

A careworker or carer, such as a member of your family, will be encouraged to become involved in your physiotherapy. The physiotherapist can teach you both simple exercises you can carry out at home.

If you have problems with movement, you may also receive help from an occupational therapist, who can assess your ability to carry out everyday tasks and find ways to manage any difficulties.

Occupational therapy may involve adapting your home or using equipment to make everyday activities easier, and finding alternative ways of carrying out tasks you have problems with (NHS, 2015q).

Communication problems

After having a stroke, many people experience problems with speaking and understanding, as well as reading and writing.

This is called aphasia, or dysphasia, when it is caused by injury to the parts of the brain responsible for language. If the problems are caused by muscles involved in speech being affected, this is known as Dysarthria.

You should see a SLT as soon as possible for an assessment, and to start therapy to help you with communication skills.

This may involve exercises to improve your control over your speech muscles, as well as using communication aids (such as letter charts and electronic aids) and alternative methods of communication (such as gestures or writing) (NHS, 2015q).

Swallowing problems

The damage caused by a stroke can interrupt your normal swallowing reflex, making it possible for small particles of food to enter your respiratory tract (windpipe).

Problems with swallowing are known as dysphagia. Dysphagia can lead to damage to your lungs, which can trigger a lung infection (pneumonia).

To prevent any complications from dysphagia, you may need to be fed using a feeding tube during the initial phases of your recovery. The tube is usually put into your nose and then passed into your stomach (nasogastric tube), but it may be directly connected to your stomach with a minor surgical procedure carried out using local anaesthetic (a percutaneous endoscopic gastrostomy, or PEG, tube).

In the long term, you will usually see a SLT several times a week for treatment to manage your swallowing problems. This may involve tips to make swallowing easier (such as taking smaller bites of food and advice on posture) and exercises to improve control of the muscles involved in swallowing (NHS, 2015q).

Visual problems

Stroke can sometimes damage the parts of the brain that receive, process and interpret information sent by the eyes. This can result in losing half of the field of vision - for example only being able to see the left or right hand side of what is in front of you.

Strokes can also affect the control of the movement of the eye muscles. This can cause double vision.

If you have any problems with your vision after a stroke, you will be referred to an eye specialist called an orthoptist who can assess your vision and suggest possible treatments.

For example, if you have lost part of your field of vision, you may be offered eye movement therapy. This involves exercises to help you look to the side with the reduced vision.

You may also be given advice about particular ways to perform tasks that can be difficult if your vision is reduced on one side, such as getting dressed (NHS, 2015q).

Bladder and bowel control

Some strokes damage the part of the brain that controls bladder and bowel movements. This can result in urinary incontinence and difficulty with bowel control.

Some people who have had a stroke may regain bladder and bowel control quite quickly, but if you still have problems after leaving hospital, help is available from the hospital, your GP and specialist continence advisors.

Don't be embarrassed - seek advice if you have a problem, as there are lots of treatments that can help. These include bladder retraining exercises, medications, pelvic floor exercises and the use of incontinence products (NHS, 2015q).

Sex after a stroke

Having sex will not put you at higher risk of having a stroke.

There's no guarantee you won't have another stroke, but there's no reason why it should happen while you are having sex.

Even if you have been left with a severe disability, you can experiment with different positions and find new ways of being intimate with your partner.

Be aware that some medications can reduce your sex drive (libido), so make sure your doctor knows if you have a problem, as there may be other medicines that can help.

Some men may experience erectile dysfunction after having a stroke. Speak to your GP or rehabilitation team if this is the case, as there are a number of treatments available that can help (NHS, 2015q).

Driving after a stroke

If you have had a stroke, you cannot drive for one month. Whether you can return to driving depends on what long-term disabilities you may have and the type of vehicle you drive.

It is often not the physical problems that can make driving dangerous (such as pressing the pedals or holding the steering wheel) but the problems with concentration, reaction time and awareness that can develop after a stroke.

Your GP can advise about whether you can start driving again a month after your stroke or whether you need further assessment at a mobility centre (NHS, 2015q).

Preventing further strokes

If you have had a stroke, your chances of having another one are significantly increased.

Some studies have shown that, without treatment, you have around a 25% chance of having another stroke within five years and a 40% chance of having one within 10 years.

Therefore, you will usually require long-term treatment with medications aimed at improving the underlying risk factors for your stroke.

For example, you may need long-term treatment with medication to help lower your blood pressure, with anticoagulants or antiplatelets to reduce your risk of blood clots, or with statins to lower your cholesterol levels.

You will also be encouraged to make lifestyle changes to improve your general health and lower your stroke risk, such as eating a healthy diet, exercising regularly, stopping smoking if you smoke and cutting down on the amount of alcohol you drink (NHS, 2015q).

Caring for someone who has had a stroke

There are many ways you can provide support to a friend or relative who has had a stroke to speed up their rehabilitation process. These include -

- helping to practice physiotherapy exercises in between their sessions with the physiotherapist,
- providing emotional support and reassurance their condition will improve with time,
- helping motivate the person to reach their long-term goals,
- adapting to any needs they may have, such as speaking slowly if they have communication problems (NHS, 2015q).

Caring for somebody after a stroke can be a frustrating and lonely experience. The advice outlined below may help (NHS, 2015q).

Be prepared for changed behaviour Someone who has had a stroke can often seem as though they have had a change in personality and appear to act irrationally at times. This is due to the psychological and cognitive impact of a stroke. They may become angry or resentful towards you. Upsetting as it may be, try not to take it personally.

It is important to remember that a person will often start to return to their old self as their rehabilitation and recovery progresses.

Try to remain patient and positive.

Rehabilitation can be a slow and frustrating process, and there will be periods of time when it appears little progress has been made.

Encouraging and praising any progress, no matter how small it may appear, can help motivate someone who has had a stroke to achieve their long-term goals (NHS, 2015q).

Make time for yourself If you are caring for someone who has had a stroke, it is important not to neglect your own physical and psychological wellbeing. Socialising with friends or pursuing leisure interests will help you cope better with the situation (NHS, 2015q).

Ask for help There are a wide range of support services and resources available for people recovering from strokes, and their families and carers. This ranges from equipment that can help with mobility, to psychological support for carers and families.

The hospital staff involved with the rehabilitation process can provide advice and relevant contact information (NHS, 2015q).

Preventing strokes

The best way to help prevent a stroke is to eat a healthy diet, exercise regularly and avoid smoking and drinking too much alcohol.

These lifestyle changes can reduce your risk of problems such as atherosclerosis (where arteries become clogged up by fatty substances), high blood pressure and high cholesterol levels, all of which are important risk factors for strokes.

If you have already had a stroke, making these changes can help reduce your risk of having another one in the future (NHS, 2015q).

Diet

An unhealthy diet can increase your chances of having a stroke because it may lead to an increase in your blood pressure and cholesterol levels.

Therefore, a low-fat, high-fibre diet is usually recommended, including plenty of fresh fruit and vegetables (five portions a day) and whole grains.

Ensuring a balance in your diet is important. Don't eat too much of any single food - particularly foods that are high in salt and processed foods.

You should limit the amount of salt you eat to no more than 6g (0.2oz) a day because too much salt will increase your blood pressure. Six grams of salt is about one teaspoonful (NHS, 2015q).

Exercise

Combining a healthy diet with regular exercise is the best way to maintain a healthy weight, and regular exercise can also help lower your cholesterol level and keep your blood pressure at a healthy level.

For most people, at least 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic activity, such as cycling or fast walking, every week is recommended.

If you are recovering from a stroke, you should discuss possible exercise plans with the members of your rehabilitation team. Regular exercise may not be possible in the first weeks or months following a stroke but you should be able to begin exercising once your rehabilitation has progressed (NHS, 2015q).

Stop smoking

Smoking significantly increases your risk of having a stroke. This is because it narrows your arteries and makes your blood more likely to clot.

If you stop smoking, you can reduce your risk of having a stroke. Not smoking will also improve your general health and reduce your risk of developing other serious conditions, such as lung cancer and heart disease (NHS, 2015q).

Cut down on alcohol

Excessive alcohol consumption can lead to high blood pressure and trigger irregular heartbeat (atrial fibrillation), both of which can increase your risk of having a stroke.

Because alcoholic drinks are high in calories they also cause weight gain. Heavy drinking multiplies the risk of stroke by more than three times (NHS, 2015q).

If you choose to drink alcohol and have fully recovered, you should aim not to exceed the recommended limits -

- men and women are advised not to regularly drink more than 14 units a week,
- spread your drinking over three days or more if you drink as much as 14 units a week (NHS, 2015q).

If you have not fully recovered from your stroke, you may find that you will have become particularly sensitive to alcohol and even the recommended safe limits as above for the general population may be too much for you (NHS, 2015q).

Managing underlying conditions

If you have been diagnosed with a condition known to increase your risk of stroke - such as high cholesterol, high blood pressure, atrial fibrillation, diabetes or a TIA - ensuring the condition is well controlled is also important in helping prevent strokes.

The lifestyle changes mentioned above can help control these conditions to a large degree, but you may also need to take regular medication (NHS, 2015q).

Urinary incontinence

Urinary incontinence is the unintentional passing of urine. It is a common problem and is thought to affect millions of people worldwide.

It's not clear exactly how many people are affected, but it's estimated that between 3 and 6 million people in the UK may have some degree of urinary incontinence.

Urinary incontinence affects both men and women, but it tends to be more common in women overall (NHS, 2014m).

Symptoms

Having urinary incontinence means you pass urine unintentionally.

When and how this happens varies depending on the type of urinary incontinence you have.

Although you may feel embarrassed about seeking help, it's a good idea to see your GP if you have any type of urinary incontinence.

Urinary incontinence is a common problem and seeing your GP can be the first step towards finding a way to effectively manage the problem (NHS, 2014m).

Common types of urinary incontinence

Around nine in every 10 people with urinary incontinence have either stress incontinence or urge incontinence (NHS, 2014m).

Stress incontinence Stress incontinence is when you leak urine when your bladder is put under extra sudden pressure, for example when you cough. It is not related to feeling stressed. Other activities that may cause urine to leak include: -

- sneezing,
- laughing,
- heavy lifting,
- exercise (NHS, 2014m).

The amount of urine passed is usually small, but stress incontinence can sometimes cause you to pass larger amounts, particularly if your bladder is very full (NHS, 2014m).

Urge incontinence Urge incontinence, or urgency incontinence, is when you feel a sudden and very intense need to pass urine and you are unable to delay going to the toilet. There is often only a few seconds between the need to urinate and the release of urine.

Your need to pass urine may be triggered by a sudden change of position, or even by the sound of running water. You may also pass urine during sex, particularly when you reach orgasm.

This type of incontinence often occurs as part of group of symptoms called overactive bladder syndrome (OAB), which is where the bladder muscle is more active than usual.

As well as sometimes causing urge incontinence, OAB can also mean you need to pass urine very frequently and you may need to get up several times during the night to urinate (NHS, 2014m).

Less common types of urinary incontinence

Mixed incontinence Mixed incontinence is when you have symptoms of both stress and urge incontinence. For example, you may leak urine if you cough or sneeze, and also experience very intense urges to pass urine (NHS, 2014m).

Overflow incontinence Overflow incontinence, also called chronic urinary retention, occurs when the bladder cannot completely empty when you pass urine. This causes the bladder to swell above its usual size.

If you have overflow incontinence, you may pass small trickles of urine very often. It may also feel as though your bladder is never fully empty and you cannot empty it even when you try (NHS, 2014m).

Total incontinence Urinary incontinence that is severe and continuous is sometimes known as total incontinence.

Total incontinence may cause you to constantly pass large amounts of urine, even at night. Alternatively, you may pass large amounts of urine only occasionally, and leak small amounts in between (NHS, 2014m).

Causes

Urinary incontinence occurs when the normal process of storing and passing urine is disrupted.

This can happen for a number of reasons, and certain factors may also increase your chance of developing urinary incontinence.

Some of the possible causes will lead to short-term urinary incontinence, while others may cause a long-term problem. If the cause can be treated, this may cure your incontinence (NHS, 2014m).

Causes of stress incontinence

Stress incontinence occurs when the pressure inside your bladder as it fills with urine becomes greater than the strength of your urethra to stay closed.

Any sudden extra pressure on your bladder, such as laughing or sneezing, can then cause urine to leak out of your urethra.

Your urethra may not be able to stay closed if the muscles in your pelvis (pelvic floor muscles) are weak or damaged, or your urethral sphincter (the ring of muscle that keeps the urethra closed) is damaged (NHS, 2014m).

These problems may be caused by -

- damage during childbirth, particularly if the child was born vaginally rather than by caesarean section,
- increased pressure on your tummy, for example because you are pregnant or obese,
- damage to the bladder or nearby area during surgery, such as the removal of the womb (hysterectomy) in women or removal of the prostate gland in men,
- neurological conditions, which affect the brain and spinal cord, such as Parkinson's disease or multiple sclerosis,
- certain connective tissue disorders, such as Ehlers-Danlos syndrome,
- certain medications (see below) (NHS, 2014m).

Causes of urge incontinence

The urgent and frequent need to pass urine can be caused by a problem with the detrusor muscles in the walls of the bladder. The detrusor muscles relax to allow the bladder to fill with urine, then contract when you go to the toilet to let the urine out (NHS, 2014m).

Sometimes the detrusor muscles contract too often, creating an urgent need to go to the toilet. This is known as having an 'overactive bladder'. The reason your detrusor muscles contract too often may not be clear, but possible causes include -

- drinking too much alcohol or caffeine,
- poor fluid intake - this can cause strong, concentrated urine to collect in your bladder, which can irritate your bladder and cause symptoms of overactivity,
- constipation,
- conditions affecting the lower urinary tract (urethra and bladder), such as urinary tract infection (UTI)'s or tumours in the bladder,
- neurological conditions,
- certain medications (see below) (NHS, 2014m).

Causes of overflow incontinence

Overflow incontinence, also called chronic urinary retention, is often caused by a blockage or obstruction to your bladder. Your bladder may fill up as usual, but as it is obstructed you will not be able to empty it completely, even when you try.

At the same time, pressure from the urine that is still in your bladder builds up behind the obstruction, causing frequent leaks (NHS, 2014m).

Your bladder can become obstructed as a result of -

- an enlarged prostate gland (in men),
- bladder stones,
- constipation (NHS, 2014m).

Overflow incontinence may also be caused by your detrusor muscles not fully contracting, which means that your bladder does not completely empty when you go to the toilet. As a result, the bladder becomes stretched. Your detrusor muscles may not fully contract if -

- there is damage to your nerves, for example as a result of surgery to part of your bowel or a spinal cord injury,
- you are taking certain medications (see below) (NHS, 2014m).

Causes of total incontinence

Total incontinence occurs when your bladder cannot store any urine at all. It can result in you either passing large amounts of urine constantly, or passing urine occasionally with frequent leaking (NHS, 2014m).

Total incontinence can be caused by -

- a problem with your bladder from birth,
- injury to your spinal cord, which can disrupt the nerve signals between your brain and your bladder,
- a bladder fistula, which is a small tunnel-like hole that can form between the bladder and a nearby area, such as the vagina, in women (NHS, 2014m).

Medications that may cause incontinence

Some medicines can disrupt the normal process of storing and passing urine, or increase the amount of urine you produce. These include -

- angiotensin-converting enzyme (ACE) inhibitors,
- diuretics,
- some antidepressants,
- HRT,
- sedatives (NHS, 2014m).

Stopping these medications, if advised to do so by a doctor, may help resolve your incontinence (NHS, 2014m).

Who is most at risk?

In addition to the causes mentioned above, there are some things that can increase your risk of developing urinary incontinence without directly being the cause of the problem. These are known as risk factors (NHS, 2014m).

Some of the main risk factors for urinary incontinence include -

- **family history** - there may be a genetic link to urinary incontinence, so you may be more at risk if other people in your family have experienced the problem,
- **increasing age** - urinary incontinence becomes more common as you reach middle age and is particularly common in people over 80,
- **having lower urinary tract symptoms (LUTS)** - a range of symptoms that affect the bladder and urethra (NHS, 2014m).

Diagnosis

If you experience urinary incontinence, see your GP so they can determine the type of condition you have.

Try not to be embarrassed to speak to your GP about your incontinence. Urinary incontinence is a common problem and it's likely your GP has seen many people with the condition (NHS, 2014m).

Your GP will ask you questions about your symptoms and medical history, including -

- whether the urinary incontinence occurs when you cough or laugh,
- whether you need the toilet frequently during the day or night,
- whether you have any difficulty passing urine when you go to the toilet,
- whether you are currently taking any medications,
- how much fluid, alcohol or caffeine you drink (NHS, 2014m).

Bladder diary

Your GP may suggest that you keep a diary of your bladder habits for at least three days, so you can give them as much information as possible about your condition. This should include details such as -

- how much fluid you drink,
- the types of fluid you drink,
- how often you need to pass urine,
- the amount of urine you pass,

- how many episodes of incontinence you experience,
- how many times you experience an urgent need to go to the toilet (NHS, 2014m).

Tests and examinations

You may also need to have some tests and examinations so that your GP can confirm or rule out things that may be causing your incontinence. Some of these are explained below (NHS, 2014m).

Physical examination Your GP may examine you to assess the health of your urinary system.

If you are female, your GP will carry out a pelvic examination, which usually involves undressing from the waist down. You may be asked to cough to see if any urine leaks out.

Your GP may also examine your vagina. In over half of women with stress incontinence, part of the bladder may bulge into the vagina.

Your GP may place their finger inside your vagina and ask you to squeeze it with your pelvic floor muscles. These are the muscles that surround your bladder and urethra. Damage to your pelvic floor muscles can lead to urinary incontinence.

If you are male, your GP may check whether your prostate gland is enlarged. The prostate gland is located between the penis and bladder, and surrounds the urethra. If it is enlarged, it can cause symptoms of urinary incontinence, such as a frequent need to urinate.

You may also need a digital rectal examination to check the health of your prostate gland. This will involve your GP inserting their finger into your bottom (NHS, 2014m).

Dipstick test If your GP thinks your symptoms may be caused by a UTI, a sample of your urine may be tested for bacteria. A small, chemically treated stick is dipped into your urine sample. It will change colour if bacteria are present. The dipstick test can also check the blood and protein levels in your urine (NHS, 2014m).

Residual urine test If your GP thinks you may have overflow incontinence, they may suggest a test called residual urine test to see how much urine is left in your bladder after you go for a wee.

This is usually done by carrying out an ultrasound scan of your bladder, although occasionally the amount of urine in your bladder may be measured after it has been drained using a catheter. This is a thin, flexible tube that is inserted into your urethra and passed through to your bladder (NHS, 2014m).

Further tests

Some further tests may be necessary if the cause of your urinary incontinence is not clear. Your GP will usually start treating you first and may suggest these tests if treatment is not effective (NHS, 2014m).

Cystoscopy A cystoscopy involves using a flexible viewing tube, known as an endoscope, to look inside your bladder and urinary system. This test can identify abnormalities that may be causing incontinence (NHS, 2014m).

Urodynamic tests These are a group of tests used to check the function of your bladder and urethra. This may include keeping a bladder diary for a few days (see above) and then attending an appointment at a hospital or clinic for tests such as -

- measuring the pressure in your bladder by inserting a catheter into your urethra,
- measuring the pressure in your abdomen (tummy) by inserting a catheter into your bottom,
- asking you to urinate into a special machine that measures the amount and flow of urine (NHS, 2014m).

Non-surgical treatments for urinary incontinence

The treatment you receive for urinary incontinence will depend on the type of incontinence you have and the severity of your symptoms.

If your incontinence is caused by an underlying condition, such as an enlarged prostate gland in men, you may receive treatment for this alongside your incontinence treatment (NHS, 2014m).

Conservative treatments, which do not involve medication or surgery, are tried first. These include -

- lifestyle changes,
- pelvic floor muscle training,

- bladder training (NHS, 2014m).

After this, medication or surgery may be considered.

The various non-surgical treatments for urinary incontinence are outlined below. You can also read a summary of the pros and cons of the non-surgical treatments for urinary incontinence, allowing you to compare your treatment options (NHS, 2014m).

Lifestyle changes

Your GP may suggest you make simple changes to your lifestyle to improve your symptoms. These changes can help improve your condition, regardless of the type of urinary incontinence you have (NHS, 2014m).

For example, your GP may recommend -

- reducing your caffeine intake - caffeine is found in tea, coffee and cola and can increase the amount of urine your body produces,
- altering how much fluid you drink a day - drinking too much or too little can make incontinence worse,
- losing weight if you are overweight or obese (NHS, 2014m).

Pelvic floor muscle training

Your pelvic floor muscles are the muscles you use to control the flow of urine as you urinate. They surround the bladder and urethra.

Weak or damaged pelvic floor muscles can cause urinary incontinence, so exercising these muscles is often recommended.

Your GP may refer you to a specialist to start a programme of pelvic floor muscle training.

Your specialist will assess whether you are able to squeeze (contract) your pelvic floor muscles and by how much. If you can contract your pelvic floor muscles, you will be given an individual exercise programme based on your assessment.

Your programme should include doing a minimum of eight muscle contractions at least three times a day and doing the recommended exercises for at least three months. If the exercises are helping after this time, you can keep on doing them.

Research suggests that women who complete pelvic floor muscle training experience fewer leaking episodes and report a better quality of life.

In men, some studies have shown that pelvic floor muscle training can reduce urinary incontinence - particularly after surgery to remove the prostate gland (NHS, 2014m).

The British Association of Urological Surgeons (BAUS) has more information on pelvic floor exercises in women and pelvic floor exercises in men.

Electrical stimulation If you are unable to contract your pelvic floor muscles, using a device that measures and stimulates the electrical signals in the muscles may be recommended. This is called electrical stimulation.

A small probe will be inserted into the vagina in women or the anus in men. An electrical current runs through the probe, which helps to strengthen your pelvic floor muscles while you exercise them.

You may find electrical stimulation difficult or unpleasant to use, but it may be beneficial if you are unable to complete pelvic floor muscle contractions without it (NHS, 2014m).

Biofeedback Biofeedback is a way to monitor how well you are doing the pelvic floor exercises by giving you feedback as you do them. There are several different methods of biofeedback -

- a small probe could be inserted into the vagina in women or the anus in men - this senses when the muscles are squeezed and sends the information to a computer screen,
- electrodes (sticky electrical patches) could be attached to the skin of your abdomen or around the anus - these sense when the muscles are squeezed and send the information to a computer screen (NHS, 2014m).

There isn't much good evidence to suggest biofeedback offers a significant benefit to people using pelvic floor muscle training for urinary incontinence, but the feedback may help motivate some people to carry out their exercises.

Speak to your specialist if you would like to try biofeedback (NHS, 2014m).

Vaginal cones Vaginal cones may be used by women to assist with pelvic floor muscle training. These are small weights that are inserted into the vagina. You hold the weights in place using your pelvic floor muscles. When you can, you progress to the next vaginal cone, which weighs more.

Some women find vaginal cones uncomfortable or unpleasant to use, but they may help with stress or mixed urinary incontinence (NHS, 2014m).

Bladder training

If you have been diagnosed with urge incontinence, one of the first treatments you may be offered is bladder training. Bladder training may also be combined with pelvic floor muscle training if you have mixed urinary incontinence.

Bladder training involves learning techniques to increase the length of time between feeling the need to urinate and passing urine. The course will usually last for at least six weeks (NHS, 2014m).

Incontinence products

While incontinence products are not a treatment for urinary incontinence, you might find them useful for managing your condition while you are waiting to be assessed or waiting for treatment to take effect (NHS, 2014m).

Incontinence products include -

- absorbent products, such as incontinence pants or pads,
- hand-held urinals (urine collection bottles),
- a catheter, a thin tube that is inserted into your bladder to drain urine,
- devices that are placed into the vagina or urethra to prevent urine leakage, for example while you exercise (NHS, 2014m).

Medication for stress incontinence

If stress incontinence does not significantly improve, surgery for urinary incontinence will often be recommended as the next step.

However, if you are unsuitable for surgery or you want to avoid having an operation, you may benefit from a medication called duloxetine. This can help increase the muscle tone of the urethra, which should help keep it closed.

You will need to take duloxetine by mouth twice a day and will be assessed after two to four weeks to see if the medicine is beneficial or if it is causing any side-effects (NHS, 2014m).

Possible side-effects of duloxetine can include -

- nausea,
- dry mouth,
- fatigue (extreme tiredness),
- constipation (NHS, 2014m).

Do not suddenly stop taking duloxetine as this can also cause unpleasant effects. Your GP will reduce your dose gradually.

Duloxetine is not suitable for everyone, however, so your GP will discuss any other medical conditions you have to determine if you can take it (NHS, 2014m).

Medication for urge incontinence

Antimuscarinics If bladder training is not an effective treatment for your urge incontinence, your GP may prescribe a type of medication called an antimuscarinic.

Antimuscarinics may also be prescribed if you have OAB, which is the frequent urge to urinate that can occur with or without urinary incontinence.

A number of different antimuscarinic medications that can be used to treat urge incontinence, but common ones include oxybutynin, tolterodine and darifenacin.

These are usually taken by mouth two or three times a day, although an oxybutynin patch that you place on your skin twice a week is also available.

Your GP will usually start you at a low dose to minimise any possible side-effects. The dose can then be increased until the medicine is effective (NHS, 2014m).

Possible side-effects of antimuscarinics include -

- dry mouth,
- constipation,
- blurred vision,
- fatigue (NHS, 2014m).

In rare cases, antimuscarinic medication can also lead to a type of glaucoma (a build-up of pressure within the eye) called angle-closure glaucoma.

You will be assessed after four weeks to see how you are getting on with the medication, and every six to 12 months thereafter if the medication continues to help.

Your GP will discuss any other medical conditions you have to determine which antimuscarinics are suitable for you (NHS, 2014m).

Mirabegron If antimuscarinics are unsuitable for you, or they have not helped your urge incontinence or have caused unpleasant side-effects, you may be offered an alternative medication called mirabegron.

Mirabegron causes the bladder muscle to relax, which helps the bladder fill up with and store urine. It is usually taken by mouth once a day (NHS, 2014m).

Side-effects of mirabegron can include -

- UTI's,
- a fast or irregular heartbeat,
- palpitations (suddenly noticeable heartbeats),
- a rash,
- itching (NHS, 2014m).

Your GP will discuss any other medical conditions you have to determine whether mirabegron is suitable for you (NHS, 2014m).

Medication for nocturia

A medication called desmopressin may be used to treat nocturia, which is the frequent need to get up during the night to urinate, by helping to reduce the amount of urine produced by the kidneys.

Another type of medication taken late in the afternoon, called a loop diuretic, may also prevent you from getting up in the night to pass urine. Diuretic medicine increases the production and flow of urine from your body. By removing excess fluid from your body in the afternoon, it may improve symptoms at night.

Desmopressin is licensed to treat bedwetting but is not licensed to treat nocturia. Loop diuretics are also not licensed to treat nocturia.

This means that the medication may not have undergone clinical trials (a type of research that tests one treatment against another) to see if it's effective and safe in the treatment of nocturia.

However, your GP or specialist may suggest an unlicensed medication if they think it's likely to be effective and the benefits of treatment outweigh any associated risk.

If your GP is considering prescribing desmopressin or a loop diuretic, they should tell you that it is unlicensed and will discuss the possible risks and benefits with you (NHS, 2014m).

NHS continence services

NHS continence services are centres staffed by specialist nurses, sometimes called continence advisers, and specialist physiotherapists. They should be able to diagnose your condition and start treating you.

You can usually book an appointment without a referral from a GP. You can find more information about local services on the Bladder & Bowel Foundation's website (NHS, 2014m).

Surgery and procedures for urinary incontinence

If other treatments for urinary incontinence are unsuccessful or unsuitable, surgery or other procedures may be recommended.

Before making a decision, discuss the risks and benefits with a specialist, as well as any possible alternative treatments.

If you are a woman and plan to have children, this will affect your decision, because the physical strain of pregnancy and childbirth can sometimes cause surgical treatments to fail. Therefore, you may wish to wait until you no longer want to have any more children before having surgery.

The various surgical treatments for urinary incontinence are outlined below (NHS, 2014m).

Surgery and procedures for stress incontinence

Tape procedures Tape procedures can be used for women with stress incontinence.

A piece of plastic tape is inserted through an incision inside the vagina and threaded behind the urethra. The middle part of the tape supports the urethra, and the two ends are threaded through two incisions in either the -

- tops of the inner thigh - this is called a transobturator tape procedure (TOT),
- abdomen (tummy) - this is called a retropubic tape procedure or tension-free vaginal tape procedure (TVT) (NHS, 2014m).

By holding the urethra up in the correct position, the piece of tape can help reduce the leaking of urine associated with stress incontinence.

The effectiveness of these tape procedures is similar, with around two in every three women not experiencing any leaking afterwards. Even those who still have some leaking after surgery often find this is less severe than it was before the operation.

However, it is not uncommon for women to need to go to the toilet more frequently and urgently after this procedure, and some find they are unable to completely empty their bladder when they go to the toilet.

In some cases, the tape can wear away or move over time and further surgery may be needed at a later stage to adjust it (for example, to make it looser) or to remove it.

The British Association of Urological Surgeons (BAUS) has more information on synthetic vaginal tapes for stress incontinence. You may also find it useful to read information from the Medicines and Healthcare products Regulatory Agency (MHRA) on vaginal tapes for stress urinary incontinence (NHS, 2014m).

Colposuspension Colposuspension involves making an incision in your lower abdomen, lifting up the neck of your bladder, and stitching it in this lifted position. This can help prevent involuntary leaks in women with stress incontinence (NHS, 2014m).

There are two types of colposuspension -

- **an open colposuspension** - where surgery is carried out through a large incision,
- **a laparoscopic ('keyhole') colposuspension** - where surgery is carried out through one or more small incisions using special, small surgical instruments (NHS, 2014m).

Both types of colposuspension offer effective, long-term treatment for stress incontinence, although laparoscopic colposuspension needs to be carried out by an experienced laparoscopic surgeon.

Problems that can occur after colposuspension include difficulty emptying the bladder fully when going to the toilet, recurrent UTI's and discomfort during sex.

BAUS has more information on bladder neck suspension (NHS, 2014m).

Sling procedures Sling procedures involve making an incision in your lower abdomen and vagina so a sling can be placed around the neck of the bladder to support it and prevent accidental urine leaks. The sling can be made of -

- a synthetic material,
- tissue taken from another part of your body (an autologous sling),
- tissue donated from another person (an allograft sling),
- tissue taken from an animal (a xenograft sling), such as cow or pig tissue (NHS, 2014m).

In many cases, an autologous sling will be used and will be made using part of the layer of tissue that covers the abdominal muscles (rectus fascia). These slings are generally preferred because more is known about their long-term safety and effectiveness.

The most commonly reported problem associated with the use of slings is difficulty emptying the bladder fully when going to the toilet. A small number of women who have the procedure also find that they develop urge incontinence afterwards (NHS, 2014m).

Urethral bulking agents An urethral bulking agent is a substance that can be injected into the walls of the urethra in women with stress incontinence. This increases the size of the urethral walls and allows the urethra to stay closed with more force.

A number of different bulking agents are available and there is no evidence that one is more beneficial than another.

This is less invasive than other surgical treatments for stress incontinence in women as it does not usually require any incisions. Instead, the substances are normally injected through a cystoscope (thin viewing tube) inserted directly into the urethra.

However, this procedure is generally less effective than the other options available. The effectiveness of the bulking agents will also reduce with time and you may need repeated injections.

Many women experience a slight burning sensation or bleeding when they pass urine for a short period after the bulking agents are injected.

BAUS has more information on urethral bulking injections (NHS, 2014m).

Artificial urinary sphincter The urinary sphincter is a ring of muscle that stays closed to prevent urine flowing from the bladder into your urethra. In some cases, it may be suggested that you have an artificial urinary sphincter fitted to relieve your incontinence.

This tends to be used more often as a treatment for men with stress incontinence and is only rarely used in women (NHS, 2014m).

An artificial sphincter consists of three parts -

- a circular cuff that is placed around the urethra - this can be filled with fluid when necessary to compress the urethra and prevent urine passing through it,
- a small pump placed in the scrotum (when used in men) that contains the mechanism for controlling the flow of fluid to and from the cuff,

- a small fluid-filled reservoir in the abdomen - the fluid passes between this reservoir and the cuff as the device is activated and de-activated (NHS, 2014m).

The procedure to fit an artificial urinary sphincter often causes short-term bleeding and a burning sensation when you pass urine. In the long-term, it is not uncommon for the device to eventually stop working, in which case further surgery may be needed to remove it.

BAUS has more information on the insertion of an artificial urinary sphincter in men (NHS, 2014m).

Surgery and procedures for urge incontinence

Botulinum toxin A injections Botulinum toxin A (Botox) can be injected into the sides of your bladder to treat urge incontinence and OAB.

This medication can sometimes help relieve these problems by relaxing your bladder. This effect can last for several months and the injections can be repeated if they help.

Although the symptoms of incontinence may improve after the injections, you may find it difficult to fully empty your bladder. If this happens, you will need to be taught how to insert a catheter (a thin, flexible tube) into your urethra to drain the urine from your bladder.

Botulinum toxin A is not currently licensed to treat urge incontinence or OAB, so you should be made aware of any risks before deciding to have the treatment. The long-term effects of this treatment are not yet known (NHS, 2014m).

Sacral nerve stimulation The sacral nerves are located at the bottom of your back. They carry signals from your brain to some of the muscles used when you go to the toilet, such as the detrusor muscle that surrounds the bladder.

If your urge incontinence is the result of your detrusor muscles contracting too often, sacral nerve stimulation - also known as sacral neuromodulation - may be recommended.

During this operation, a device is inserted near one of your sacral nerves, usually in one of your buttocks. An electrical current is sent from this device into the sacral nerve. This should improve the way signals are sent between your brain and your detrusor muscles, and so reduce your urges to urinate.

Sacral nerve stimulation can be painful and uncomfortable, but some people report a substantial improvement in their symptoms or the end of their incontinence completely.

BAUS has more information on sacral nerve stimulation (NHS, 2014m).

Posterior tibial nerve stimulation Your posterior tibial nerve runs down your leg to your ankle. It contains nerve fibres that start from the same place as nerves that run to your bladder and pelvic floor. It is thought that stimulating the tibial nerve will affect these other nerves and help control bladder symptoms, such as the urge to pass urine.

During the procedure, a very thin needle is inserted through the skin of your ankle and a mild electric current is sent through it, causing a tingling feeling and causing your foot to move. You may need 12 sessions of stimulation, each lasting around half an hour, one week apart.

Some studies have shown that this treatment can offer relief from OAB and urge incontinence for some people, although there is not yet enough evidence to recommend tibial nerve stimulation as a routine treatment.

Tibial nerve stimulation is only recommended in a few cases where urge incontinence has not improved with medication and you don't want to have botulinum toxin A injections or sacral nerve stimulation (NHS, 2014m).

Augmentation cystoplasty In rare cases, a procedure known as augmentation cystoplasty may be recommended to treat urge incontinence.

This procedure involves making your bladder bigger by adding a piece of tissue from your intestine (part of the digestive system) into the bladder wall.

After the procedure, you may not be able to pass urine normally and you may need to use a catheter. Due to this, augmentation cystoplasty will only be considered if you are willing to use a catheter.

The difficulties passing urine can also mean that people who have augmentation cystoplasty can experience recurrent urinary tract infections.

BAUS has more information on enlargement of the bladder using a segment of bowel (NHS, 2014m).

Urinary diversion Urinary diversion is a procedure where the ureters (the tubes that lead from your kidneys to your bladder) are redirected to the outside of your body. The urine is then collected directly without it flowing into your bladder.

Urinary diversion should only be carried out if other treatments have been unsuccessful or are not suitable.

Urinary diversion can cause a number of complications, such as a bladder infection, and sometimes further surgery is needed to correct any problems that occur (NHS, 2014m).

Catheterisation for overflow incontinence

Clean intermittent catheterisation Clean intermittent catheterisation (CIC) is a technique that can be used to empty the bladder at regular intervals and so reduce overflow incontinence (also known as chronic urinary retention).

A continence adviser will teach you how to place a catheter through your urethra and into the bladder. Your urine will flow out of your bladder, through the catheter and into the toilet.

Using a catheter can feel a bit painful or uncomfortable at first, but any discomfort should subside over time.

How often CIC will need to be carried out will depend on your individual circumstances. For example, you may only need CIC once a day, or you may need to use the technique several times a day.

Regular use of a catheter increases the risk of developing UTI's (NHS, 2014m).

Indwelling catheterisation If using a catheter every now and then is not enough to treat your overflow incontinence, you can have an indwelling catheter fitted instead. This is a catheter inserted in the same way as for CIC, but left in place. A bag is attached to the end of the catheter to collect the urine (NHS, 2014m).

Prevention

It is not always possible to prevent urinary incontinence, but a healthy lifestyle may reduce the chances of the condition developing (NHS, 2014m).

Healthy weight

Being obese can increase your risk of developing urinary incontinence. You may therefore be able to lower your risk by maintaining a healthy weight through regular exercise and healthy eating (NHS, 2014m).

Drinking habits

Depending on your particular bladder problem, your GP can advise you about the amount of fluids that you should drink.

If you have urinary incontinence, cut down on alcohol and drinks containing caffeine, such as tea, coffee and cola. These can cause your kidneys to produce more urine and irritate your bladder (NHS, 2014m).

The recommended daily limits for alcohol consumption are -

- three to four units a day for men,
- two to three units a day for women (NHS, 2014m).

A unit of alcohol is roughly half a pint of normal-strength lager or a single measure (25ml) of spirits.

If you have to urinate frequently during the night (nocturia), try drinking less in the hours before you go to bed. However, make sure you still drink enough fluids during the day (NHS, 2014m).

Pelvic floor exercises

Being pregnant and giving birth can weaken the muscles that control the flow of urine from your bladder. If you are pregnant, strengthening your pelvic floor muscles may help prevent urinary incontinence.

Men may also benefit from strengthening their pelvic floor muscles by doing pelvic floor exercises (NHS, 2014m).

Chapter 4

Miscellaneous

Quality of life

Quality of life is an internationally validated framework developed by Dr. Robert Schalock. This is represented by eight domains that provide an indication of an individual's quality of life in three broad areas -

- Independence,
- Social participation,
- Well-being (MEDICINENET, 2016).

The eight domains are -

- **emotional well-being** - contentment, self-concept, lack of stress,
- **interpersonal relations** - interactions, relationships, supports,
- **material well-being** - financial status, employment, housing,
- **personal development** - education, personal competence, performance,
- **physical well-being** - health and health care, activities of daily living, leisure,
- **self-determination** - autonomy / personal control, personal goals, choices,
- **social inclusion** - community integration and participation, roles, supports,
- **rights** - legal, human (respect, dignity, equality) (MEDICINENET, 2016).

The higher you score each item, the greater your quality of life score would be, and therefore the more satisfied and happy you are with your life at present.

Glossary

A

alveoli air sacs in the lung, having the appearance of a bunch of grapes 207, 210

angina a dull, heavy or tight pain in the chest 134–136, 142, 144–147, 149, 153, 172, 187, 317

B

bilateral masectomy surgical removal of both breasts 246

C

cartilage the protective surface that allows your joints to move smoothly 314, 354, 357, 367

chemotherapy a type of cancer treatment, with medicine used to kill cancer cells 265, 281, 288, 341, 376, 380

chronic A health condition or disease that is persistent or otherwise long-lasting in its effects or a disease that comes with time 9–13, 104–108, 120, 129, 132, 137, 208, 210, 249, 251, 253, 254, 265, 275, 278, 288, 291, 327, 338, 347, 412, 413, 428

clinical trials these compare the effects - both wanted and unwanted - of two or more treatments 168, 310, 422

clitoroplasty construction of a clitoris with sensation 247

cornea the transparent layer of tissue at the front of the eye 109, 114, 120, 253, 390

D

dialysis treatment to replicate the functions of the kidneys 173, 188

dry AMD the most common form. In this type of macular degeneration, the delicate tissues of the macula become thinned and cease to function properly 22–24, 28, 29

dysphagia difficulty swallowing 197–206, 332, 392, 401, 405

E

ECG Electrocardiogram - a recording of the electrical conductivity of the heart 125, 143–145

F

facial feminisation surgery surgery to make your face a more feminine shape 247

fatigue extreme tiredness 100, 122, 130, 151, 161, 174, 322, 338, 340, 343, 364, 404, 420, 421

G

general anaesthetic a state of controlled unconsciousness caused by medications sending you to sleep in a controlled way 93, 219, 221, 258

H

hyperparathyroidism overactivity of the parathyroid glands 328

hyperthyroidism overactive thyroid gland 328, 394

hysterectomy removal of the womb 246

I

ibuprofen a NSAID used to treat mild to moderate pain, controlling a high temperature and easing inflammation and swelling 40, 107, 116, 218, 281, 284, 317, 343, 359, 385

L

local anaesthetic involves numbing an area of the body using a type of medication called a local anaesthetic 30, 32, 111, 114, 144, 185, 201, 219, 221, 258, 304, 405

lupus an incurable immune system illness, probably genetic in origin and mainly suffered by females 225

M

metoidioplasty involves cutting the surrounding labial tissues of the clitoris and suspensory ligament to ”free up” and relocate the clitoris in a more forward position, to more closely approximate the position of a penis 246

muscle wasting loss of muscle bulk 312

N

NHS The 'National Health Service' is the publicly funded national healthcare system in the UK. The organisation, funded primarily by taxation, provides free or low-cost healthcare to all legal residents of the UK. Medications are subsidised as well and prescriptions may be free when situations warrant 29, 30, 112, 115, 118, 126, 141, 143, 146, 155, 171, 185, 206, 245, 252, 269, 272, 283, 287–289, 305, 322, 337, 386, 387, 401, 422

non-adherent dressing a dressing that will not stick to the rash 383

O

occupational therapist a person who provides support to people whose health prevents them doing the activities that matter to them. 320, 338, 360, 365, 402, 404

oedema the medical term for fluid retention in the body. Oedema often causes swelling in the feet and ankles 167, 292, 296

oesophagus the tube that carries food from your mouth to the stomach 198–202, 204, 205, 332, 397

orchidectomy removal of the testes 247

P

palliative care is the active holistic care of patients with advanced progressive illness. Management of pain and other symptoms and provision of psychological, social and spiritual support is paramount. The goal of palliative care is achievement of the best quality of life for patients and their families. Many aspects of palliative care are also applicable earlier in the course of the illness in conjunction with other treatments 134

paracetamol a commonly used medicine that can help treat mild or moderate pain and reduce a high temperature. 107, 116, 218, 281, 284, 295, 317, 318, 343, 359, 384, 385

penectomy removal of the penis 247

peripheral vision vision to either side 21, 22, 249, 253

phalloplasty surgical construction of a penis 246

physiotherapist a person who helps to restore movement and function when someone is affected by injury, illness or disability. It can also help to reduce your risk of injury or illness in the future. 97, 130, 133, 308, 316, 319, 320, 338, 360, 364, 402, 404, 407, 422

podiatrist they are health care professionals who have been trained to prevent, diagnose, treat and rehabilitate abnormal conditions of the feet and lower limbs. They also prevent and correct deformity, keep people mobile and active, relieve pain and treat infections. They are also known as 'chiropodists' 216, 219, 223, 228, 229

Q

quality of life The individuals's ability to enjoy normal life activities. Quality of life is an important consideration in medical care. Some medical treatments can seriously impair quality of life without providing appreciable benefit, whereas others greatly enhance quality of life 8, 10–12, 28, 93, 98, 100, 130–132, 151, 174, 208, 212, 214, 215, 268, 320, 322, 362, 418, 430

R

radiotherapy a treatment involving the use of high-energy radiation. It's commonly used to treat cancer 32, 33, 199, 265

Raynaud's phenomenon a common condition that affects the blood supply to certain parts of the body - usually the fingers and toes 226

retina the nerve tissue that lines the back of your eye 23, 24, 26–28, 30, 32, 109, 120, 172, 187, 249, 251

retinal detachment Retinal detachment occurs when the thin lining at the back of your eye called the retina begins to pull away from the blood vessels that supply it with oxygen and nutrients. Without prompt treatment, it will lead to blindness in the affected eye 120

S

salpingo-oophorectomy removal of the fallopian tubes and ovaries 246

scrotoplasty construction of a scrotum 246

septic arthritis the inflammation of a joint caused by a bacterial infection. It is also known as infectious or bacterial arthritis 231

sinuses small air-filled cavities behind your cheekbones and forehead . 67, 286

T

tinnitus a ringing, roaring, or hissing sound in one or both ears 262–264, 299–303, 305, 307, 390

toxic Capable of causing injury or death, especially by chemical means; poisonous 65, 73, 80, 201

U

ultrasound scan this is sometimes called a sonogram, and is a procedure that uses high-frequency sound waves to create an image of part of the inside of the body 234

urethra the tube through which you urinate . 247, 412, 413, 415–418, 420, 423, 425, 426

V

vaginoplasty construction of a vagina 247

vertigo a feeling that the environment around you is spinning . . 264, 299–303, 305, 306, 308, 309, 311, 390

vulvoplasty construction of the vulva 247

W

wet AMD less common, but is typically more damaging. This is caused by the growth of abnormal blood vessels behind the macula. The abnormal blood vessels tend to haemorrhage or leak, with the result being the formation of scar tissue if left untreated 23, 24, 27–33

X

X-ray a quick and painless procedure commonly used to produce images of the inside of the body 124, 125, 143–145, 201, 205, 211, 212, 214, 216, 221, 234, 315, 329, 342, 344, 356, 358, 396

Acronyms

A

ABI auditory brainstem implant 273

AIDS acquired immune deficiency syndrome 275–280, 288, 376, 381, 382

AMD age-related macular degeneration 21–28, 30, 34, 35

anti-CCP anti-cyclic citrullinated peptide 356

B

BAHA Bone Anchored Hearing Aid 271

BMI body mass index 25, 124, 160, 164, 165, 202, 287, 328

BSL British Sign Language 273

BTE behind-the-ear 269, 270

BW Body-worn 270

C

CBT cognitive behavioural therapy 307, 403

CHD coronary heart disease 134, 135, 139, 142–144, 146, 147, 151, 154–156

CIC Completely in-the-canal 270

COPD Chronic obstructive pulmonary disease 11, 71, 87, 105, 106, 108, 120–128, 130–134, 199, 206, 207, 209, 211–215, 286, 288, 318

CRP C-reactive protein 355, 356

CT computerised tomography 125, 143, 145, 195, 396, 401

CVD cardiovascular disease 368

D

DMARD Disease-modifying anti-rheumatic drugs 357–359

DVLA Driver and Vehicle Licensing Agency 34, 261, 311

DVT deep vein thrombosis 222, 293, 294, 399

E

ENT ear, nose and throat 200, 266, 269, 303, 305, 310, 311

F

FEES fibreoptic endoscopic evaluation of swallowing 201

G

GIC gender identity clinic 243, 245

GP General Practitioner, a community-based doctor 22, 25, 28, 29, 34–36, 38, 42, 43, 45–48, 51–55, 57–60, 62, 67–69, 76–78, 83, 85–89, 95, 96, 98–100, 102–105, 107, 108, 121, 123, 127, 128, 132, 133, 135, 140, 141, 143, 146, 147, 151, 153, 155, 156, 166, 169, 170, 174–178, 180–183, 188–191, 193, 195, 197, 200, 209, 216, 218, 219, 222, 223, 225, 226, 229, 231, 233–239, 242, 245, 248, 250, 262, 265, 266, 268, 274, 281, 283–285, 287–289, 291–295, 298, 299, 303, 305–308, 311, 315–318, 320, 324, 329, 330, 334, 335, 337–340, 342–344, 347–349, 353, 355, 357, 365, 372–376, 379, 382–385, 387, 388, 391, 393, 396, 402, 406, 410, 411, 415–418, 421–423, 429

H

HDL high-density lipoprotein - known as the ”good” cholesterol 138

HIV human immunodeficiency virus 275–281, 288, 376, 380–382

HRT hormone replacement therapy 334, 414

I

ITC In-the-canal 270

ITE In-the-ear 270

L

LDL low-density lipoprotein - known as the ”bad” cholesterol 138, 147

LGBT lesbian, gay, bisexual and transgender 276, 280

M

MDT multidisciplinary team 202

MRI magentic resonance imaging 143, 145, 195, 304, 356, 396, 401

N

NIV non-invasive ventilation 129

NSAID non-steroidal anti-inflammatory drug 40, 235, 236, 317, 318, 343, 359, 385

O

OAB overactive bladder syndrome 411, 421, 426, 427

P

PCO posterior capsule opacification 119

PDT photodynamic therapy . . . 31, 32
PLMS periodic limb movements in sleep . . . 345, 346, 349
PPI proton pump inhibitor . . . 204, 235, 317, 359

R
RITE Receiver in-the ear . . . 270

S
SLT speech and language therapist . . . 194–196, 200, 202, 203, 397, 404, 405
STI Sexually transmitted infection . . . 278, 368

T
TCAS tricyclic antidepressants . . . 385
TENS transcutaneous electrical nerve stimulation . . . 319, 339, 360
TIA transient ischaemic attack . . . 391, 393, 394, 396, 410

U
ULT urate-lowering therapy . . . 236, 237
UTI urinary tract infection . . . 413, 416, 422, 424, 428

V
VOC volatile organic compound . . . 60–62
VRT vestibular rehabilitation . . . 308

W
WHO World Health Organization . . . 290
WSW women who have sex with women . . . 277

Bibliography

AAD.ORG (2016) *Scabies* URL: https://www.aad.org/public/diseases/contagious-skin-diseases/scabies (cit. on pp. 369, 377)

AGEUK (2016a) *Common foot problems* URL: http://www.ageuk.org.uk/health-wellbeing/conditions-illnesses/common-foot-problems/ (cit. on pp. 216, 228–229, 240)

— (2016b) *Coronary heart disease* URL: http://www.ageuk.org.uk/health-wellbeing/conditions-illnesses/coronary-heart-disease/ (cit. on pp. 134–135, 140–143, 145–146, 152–153)

ASTHMA.ORG (2015a) *Triggers - alcohol* URL: https://www.asthma.org.uk/advice/triggers/alcohol/ (cit. on pp. 43–44)

— (2015b) *Triggers - animals and pets* URL: https://www.asthma.org.uk/advice/triggers/animals-and-pets/ (cit. on pp. 44–47)

— (2015c) *Triggers - Colds and flu* URL: https://www.asthma.org.uk/advice/triggers/colds-and-flu/ (cit. on pp. 47–48)

— (2015d) *Triggers - emotions* URL: https://www.asthma.org.uk/advice/triggers/emotions/ (cit. on pp. 48–51)

— (2015e) *Triggers - exercise* URL: https://www.asthma.org.uk/advice/triggers/exercise/ (cit. on pp. 51–53)

— (2015f) *Triggers - female hormones* URL: https://www.asthma.org.uk/advice/triggers/hormones/ (cit. on pp. 56–57)

— (2015g) *Triggers - food* URL: https://www.asthma.org.uk/advice/triggers/food/ (cit. on pp. 53–54, 56)

— (2015h) *Triggers - house dust mites* URL: https://www.asthma.org.uk/advice/triggers/dust-mites/ (cit. on pp. 57–58)

— (2015i) *Triggers - indoor environment* URL: https://www.asthma.org.uk/advice/triggers/indoor-environment/ (cit. on pp. 59–63)

— (2015j) *Triggers - moulds and fungi* URL: https://www.asthma.org.uk/advice/triggers/moulds-and-fungi/ (cit. on pp. 63–66)

ASTHMA.ORG (2015k) *Triggers - pollen* URL: https://www.asthma.org.uk/advice/triggers/pollen/ (cit. on pp. 66–68, 70)

— (2015l) *Triggers - recreational drugs* URL: https://www.asthma.org.uk/advice/triggers/recreational-drugs/ (cit. on pp. 74–76)

— (2015m) *Triggers - sex* URL: https://www.asthma.org.uk/advice/triggers/sex/ (cit. on pp. 77–78)

— (2015n) *Triggers - smoking and second-hand smoke* URL: https://www.asthma.org.uk/advice/triggers/smoking/ (cit. on pp. 79–81)

— (2015o) *Triggers - stress and anxiety* URL: https://www.asthma.org.uk/advice/triggers/stress/ (cit. on pp. 81–84)

— (2015p) *Triggers - weather* URL: https://www.asthma.org.uk/advice/triggers/weather/ (cit. on pp. 84–86)

— (2016a) *Asthma triggers* URL: https://www.asthma.org.uk/advice/triggers/ (cit. on pp. 40–42)

— (2016b) *Triggers - pollution* URL: https://www.asthma.org.uk/advice/triggers/pollution/ (cit. on pp. 70–74)

CAHILL, S. et al. (2010) *Growing Older with the Epidemic: HIV and Aging* URL: http://www.gmhc.org/files/editor/file/a_pa_aging10_emb2.pdf (cit. on pp. 275, 277–278, 280)

CDC (2008) *HIV/AIDS Among Persons Aged 50 and Older* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services (cit. on pp. 275–276, 279)

— (2009a) *HIV Surveillance - Epidemiology of HIV Infection* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services URL: http://www.cdc.gov/hiv/topics/surveillance/resources/slides/general/index.htm (cit. on p. 278)

— (2009b) *HIV Surveillance in Injection Drug Users* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services (cit. on p. 278)

— (2010a) *HIV Among African Americans* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services URL: http://www.cdc.gov/hiv/topics/aa/pdf/aa.pdf (cit. on p. 278)

— (2010b) *HIV/AIDS among Hispanics/Latinos* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services URL: http://www.cdc.gov/hiv/hispanics/resources/factsheets/pdf/hispanic.pdf (cit. on p. 278)

— (2011a) *HIV among Women* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services (cit. on p. 276)

— (2011b) *HIV/AIDS among Transgender People* Centers for Disease Control and Prevention Atlanta, GA: U.S.: Department of Health and Human Services (cit. on p. 278) clevelandclinic (2010) *Presbycusis* url: https://my.clevelandclinic.org/health/diseases_conditions/hic_What_is_Presbycusis (cit. on pp. 263, 274–275)

Division, Civil Rights (2009) *Questions and Answers: The Americans with Disabilities Act and Persons with HIV/AIDS* U.S. Department of Justice url: www.ada.gov/qahivaids_license.htm (cit. on p. 279)

Doel, A. K. and A. Heath-Toby (2009) *HIV Risk for Lesbians, Bisexuals, and Other Women who have Sex with Women* New York url: http://www.gmhc.org/files/editor/file/GMHC_lap_whitepaper_0609.pdf (cit. on p. 277)

foot (2014) *Foot problems: a visual guide* url: http://www.nhs.uk/Tools/Documents/foot_problems_a_visual_guide.html (cit. on pp. 224, 240–241)

hivlawandpolicy (2010) *Positive Justice: HIV Criminalization Fact Sheet* The Center for HIV Law & Policy url: http://www.hivlawandpolicy.org/resources/view/560 (cit. on p. 280)

kaiser (2006) *Attitudes about Stigma and Discrimination Related to HIV/AIDS* Kaiser Family Foundation url: http://www.kff.org/spotlight/hivstigma/upload/Spotlight_Aug06_Stigma-pdf.pdf (cit. on p. 280)

— (2009) *2009 Survey of Americans on HIV/AIDS: Summary of Findings on the Domestic Epidemic* Kaiser Family Foundation url: http://www.kff.org/kaiserpolls/upload/7889.pdf (cit. on pp. 276–277, 280)

— (2011a) *Black Americans and HIV/AIDS* Kaiser Family Foundation url: http://www.kff.org/hivaids/upload/6089-09.pdf (cit. on p. 278)

— (2011b) *HIV/AIDS at 30: A Public Opinion Perspective* Kaiser Family Foundation url: http://www.kff.org/kaiserpolls/upload/8186.pdf (cit. on p. 280)

— (2011c) *Latinos and HIV/AIDS* Kaiser Family Foundation url: http://www.kff.org/hivaids/upload/6007-09.pdf (cit. on p. 278)

— (2011d) *Women and HIV/AIDS in the United States* Kaiser Family Foundation url: http://www.kff.org/hivaids/upload/6092-09.pdf (cit. on pp. 276–277)

Karpiak, S. E. and R. A. Shippy (2006) *Research on Older Adults with HIV* AIDS Community Research Initiative of America url: http://www.acria.org/files/ROAH20Final.pdf (cit. on pp. 277–278)

lgbtagingcenter (2016) *HIV/AIDS and older adults: fact versus fiction* url: http://www.lgbtagingcenter.org/resources/resource.cfm?r=322 (cit. on pp. 275–276)

Lindau, S. T. et al. (2007) "A Study of Sexuality and Health Among Older Adults in the United States" in: *New England Journal of Medicine* 357.8, pp. 762–774 doi: 10.1056/NEJMoa067423 (cit. on p. 276)

lookafteryoureyes (2016) *Cataracts* The College of Optometrists url: http://lookafteryoureyes.org/eye-conditions/cataracts/ (cit. on pp. 109, 112)

mayoclinic (2015) *Dysarthria* url: http://www.mayoclinic.org/diseases-conditions/dysarthria/basics/definition/con-20035008 (cit. on pp. 192–196)

MEDICINENET (2016) *Definition of Quality of life* URL: http://www.medicinenet.com/script/main/art.asp?articlekey=11815 (cit. on pp. 8, 430)

NCH (2009) *HIV/AIDS and Homelessness* National Coalition for the Homeless URL: http://www.nationalhomeless.org/factsheets/hiv.html (cit. on p. 278)

NHS (2014a) *Asthma* URL: http://www.nhs.uk/conditions/asthma/Pages/Introduction.aspx (cit. on pp. 36–37, 39–40, 86–102)

— (2014b) *Asthma attacks* URL: http://www.nhs.uk/Livewell/asthma/Pages/Asthmaattacks.aspx (cit. on pp. 37–38)

— (2014c) *Bronchitis* URL: http://www.nhs.uk/Conditions/Bronchitis/Pages/Introduction.aspx (cit. on pp. 103–108)

— (2014d) *Bunion* URL: http://www.nhs.uk/Conditions/Bunion/Pages/Introduction.aspx (cit. on pp. 216–223)

— (2014e) *Coronary heart disease* URL: http://www.nhs.uk/Conditions/Coronary-heart-disease/Pages/Introduction.aspx (cit. on pp. 134–140, 144–152, 154–156)

— (2014f) *Diabetes - type 2* URL: http://www.nhs.uk/Conditions/Diabetes-type2/Pages/Introduction.aspx (cit. on pp. 157, 160–162, 164–178)

— (2014g) *Dysarthria* URL: http://www.nhs.uk/conditions/dysarthria/Pages/Introduction.aspx (cit. on pp. 192–197)

— (2014h) *Osteoporosis* URL: http://www.nhs.uk/conditions/Osteoporosis/Pages/Introduction.aspx (cit. on pp. 326–339)

— (2014i) *Rheumatoid arthritis* URL: http://www.nhs.uk/conditions/rheumatoid-arthritis/Pages/Introduction.aspx (cit. on pp. 352–368)

— (2014j) *Scabies* URL: http://www.nhs.uk/Conditions/Scabies/Pages/Introduction.aspx (cit. on pp. 368–376)

— (2014k) *Shingles* URL: http://www.nhs.uk/Conditions/Shingles/Pages/Introduction.aspx (cit. on pp. 378–386, 389–391)

— (2014l) *Type 1 diabetes* URL: http://www.nhs.uk/Conditions/Diabetes-type1/ (cit. on pp. 178–192)

— (2014m) *Urinary incontinence* URL: http://www.nhs.uk/Conditions/Incontinence-urinary/Pages/Introduction.aspx (cit. on pp. 410–429)

— (2015a) *Asthma in cold weather* URL: http://www.nhs.uk/Livewell/asthma/Pages/asthma-cold-weather.aspx (cit. on pp. 102–103)

— (2015b) *Chilblains* URL: http://www.nhs.uk/conditions/chilblains/Pages/Introduction.aspx (cit. on pp. 224–228)

— (2015c) *Chronic obstructive pulmonary disease* URL: http://www.nhs.uk/Conditions/Chronic-obstructive-pulmonary-disease/Pages/Introduction.aspx (cit. on pp. 120–134)

— (2015d) *Dysphagia* URL: http://www.nhs.uk/conditions/Dysphagia/Pages/definition.aspx (cit. on pp. 197–206)

NHS (2015e) *Flu* URL: http://www.nhs.uk/Conditions/Flu/Pages/Introduction.aspx (cit. on pp. 280–287)
— (2015f) *Glaucoma* URL: http://www.nhs.uk/conditions/glaucoma/Pages/Introduction.aspx (cit. on pp. 249–261)
— (2015g) *Gout* URL: http://www.nhs.uk/Conditions/Gout/Pages/Introduction.aspx (cit. on pp. 230–239)
— (2015h) *Hearing impairment* URL: http://www.nhs.uk/Conditions/Hearing-impairment/ (cit. on pp. 269–273)
— (2015i) *Hearing Loss* URL: http://www.nhs.uk/conditions/Hearing-impairment/Pages/Introduction.aspx (cit. on pp. 261–269, 274)
— (2015j) *How flu vaccine works* URL: http://www.nhs.uk/Conditions/vaccinations/Pages/how-flu-vaccine-works.aspx (cit. on pp. 289–290)
— (2015k) *Macular degeneration* URL: http://www.nhs.uk/conditions/macular-degeneration/Pages/Introduction.aspx (cit. on pp. 21–35)
— (2015l) *Meniere's Disease* URL: http://www.nhs.uk/conditions/menieres-disease/Pages/Introduction.aspx (cit. on pp. 299–312)
— (2015m) *Osteoarthritis* URL: http://www.nhs.uk/Conditions/Osteoarthritis/Pages/Introduction.aspx (cit. on pp. 312–325)
— (2015n) *Restless legs syndrome* URL: http://www.nhs.uk/Conditions/Restless-leg-syndrome/Pages/Introduction.aspx (cit. on pp. 345–352)
— (2015o) *Shingles vaccination* URL: http://www.nhs.uk/Conditions/vaccinations/Pages/shingles-vaccination.aspx (cit. on pp. 378, 386–388)
— (2015p) *Shingles vaccine FAQs* URL: http://www.nhs.uk/Conditions/vaccinations/Pages/shingles-vaccine-questions-and-answers.aspx (cit. on pp. 387–388)
— (2015q) *Stroke* URL: http://www.nhs.uk/conditions/Stroke/Pages/Introduction.aspx (cit. on pp. 391–410)
— (2015r) *The flu jab* URL: http://www.nhs.uk/Conditions/vaccinations/Pages/who-should-have-flu-vaccine.aspx (cit. on pp. 287–289, 291)
— (2015s) *Who can have the shingles vaccine?* URL: http://www.nhs.uk/Conditions/vaccinations/Pages/who-can-have-the-shingles-vaccine.aspx (cit. on p. 387)
— (2016a) *Cataract surgery* URL: http://www.nhs.uk/Conditions/Cataract-surgery/Pages/Introduction.aspx (cit. on pp. 112–120)
— (2016b) *Cataracts - age-related* URL: http://www.nhs.uk/conditions/Cataracts-age-related/Pages/Introduction.aspx (cit. on pp. 109–112)
— (2016c) *Corns and calluses* URL: http://www.nhs.uk/conditions/CornsandCalluses/Pages/whatarecornsandcalluses.aspx (cit. on pp. 223–224, 228–229)
— (2016d) *Gender dysphoria* URL: http://www.nhs.uk/Conditions/Gender-dysphoria/Pages/Introduction.aspx (cit. on pp. 242–248)

NHS (2016e) *Pneumonia* URL: http://www.nhs.uk/conditions/pneumonia/Pages/Introduction.aspx (cit. on pp. 339–344)

— (2016f) *Venous leg ulcers* URL: http://www.nhs.uk/Conditions/Leg-ulcer-venous/Pages/Introduction.aspx (cit. on pp. 291–299)

NIA (2009) *Age Page: HIV, AIDS, and Older People* National Institute on Aging URL: http://www.nia.nih.gov/healthinformation/publications/hiv-aids.htm (cit. on pp. 276, 279–280)

PARENTGIVING (2016) *Common Chronic Conditions and Aging at Home* URL: http://www.parentgiving.com/elder-care/common-chronic-conditions-and-aging-at-home/ (cit. on p. 9)

SCHIFFMAN, G. and C. P. DAVIS (2016) *Emphysema* URL: http://www.emedicinehealth.com/emphysema/article_em.htm#emphysema_overview (cit. on pp. 207–212, 214–215)

SCPOD (2016) *Corns & Callus* URL: http://www.scpod.org/foot-health/common-foot-problems/corns-callus/ (cit. on p. 223)

VANN, M. R. (2015) *The 15 Most Common Health Concerns for Seniors* URL: http://www.everydayhealth.com/news/most-common-health-concerns-seniors/ (cit. on pp. 10–14)

WEBMD (2014) *Type 2 diabetes* URL: http://www.webmd.com/diabetes/type-2-diabetes-guide/ (cit. on pp. 158–164, 166)

WHO (1948) *WHO definition of Health* URL: http://www.who.int/about/definition/en/print.html (cit. on p. 7)

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