

R N I B

Understanding

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Dry Eye



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Contents

- 6** What is dry eye?
- 8** What are the symptoms of dry eye?
- 10** Why have I developed dry eye?
- 15** What are the causes of dry eye?
- 23** How is dry eye diagnosed?
- 24** What is the treatment for dry eye?
- 31** Is there anything I can do to help with dry eye?
- 34** Lid Hygiene for MGD and Blepharitis
- 36** RNIB Helpline
- 38** RNIB Booklet Series
- 42** Information sources

RNIB's Understanding series

The Understanding series is designed to help you, your friends and family understand a little bit more about your eye condition.

The series covers a range of eye conditions, and is available in audio, print and braille formats.

Contact us

We're here to answer any questions you have about your eye condition or treatment. If you need further information about dry eye or on coping with changes in your vision, then our Helpline is here for you.

RNIB Helpline

0303 123 9999

helpline@rnib.org.uk

Or say, **"Alexa, call RNIB Helpline"** to an Alexa-enabled device.



What is dry eye?

Dry eye is a common eye condition that can affect anyone, at any age. It's caused by a problem with our tears. Medically, dry eye is also known as keratoconjunctivitis sicca.

Dry eye can be divided into two main types:

- **Evaporative dry eye** is where the tears evaporate too quickly. This can be caused by problems with your eyelid, blinking, abnormalities in the oil secreting glands medically known as meibomian gland dysfunction (MGD), blepharitis, contact lens use, allergy and health conditions such as eczema and rosacea that affect the eyelid margin.
- **Aqueous deficient dry eye** is where there are not enough watery tears being produced. This often occurs because of conditions that affect your lacrimal glands. These are the small glands located underneath your upper eyelid that produce most of your tears. Conditions that can affect the lacrimal gland include obstructions, infections, medications and medical conditions such as Sjögren's syndrome.

Most cases of dry eye are evaporative, but both forms of dry eye can occur together.

There are many factors that can contribute to dry eye. It can lead to a variety of visual symptoms which can affect your quality of life. However, there are many things that can be done to help you cope with dry eyes.

What are the symptoms of dry eye?

Dry eye can make your eye look red and feel uncomfortable, scratchy and irritated. Often dry eye can make it feel like you've got something in your eye such as an eyelash or a piece of grit, even when there is nothing there.

Despite the name, having dry eye can also make your eyes watery, so your eyes may water more than usual. More information about watery eyes can be found in the next section.

Dry eye does not usually cause a permanent change in your vision. It can make your eyesight blurry for short periods of time, but the blurriness goes away on its own or improves when you blink.

Normally, dry eye affects both eyes. Sometimes one eye is affected more than the other.

Although dry eye doesn't usually cause long-term problems with your eyesight, it's important to let your general practitioner (GP) or optometrist (optician) know if your eyes are feeling uncomfortable, gritty or sore for long periods of time. Your optometrist or GP may be able to help by recommending eye drops which act as replacement tears. They may also recommend

that you have your eyes examined by an ophthalmologist (also known as a hospital eye doctor) if your dry eye is severe.

Most of the time, dry eye just causes discomfort and can be well controlled with the use of eye drops. Once you have dry eye, you tend to always be prone to it, but you will probably find that there are times when it is better than others.

Rarely, in severe cases, dry eye can be very painful, and the dryness can cause permanent damage to the front of your eye. The severity of these problems depends on the cause.

A rare condition called corneal neuropathic pain has the symptoms of dry eye along with extreme eye pain and light sensitivity but no signs of dry eye. When the doctor examines your eye, they are not able to see any, or little, evidence of dry eye despite you having all the symptoms. This form of painful dry eye does not respond to eye drops and is managed with pain killers.

Why have I developed dry eye?

Dry eye is caused by a problem with your tears. You can develop dry eye if:

- you don't produce enough tears, or
- the tears aren't of the right quality or
- if they don't spread across the front surface of your eye properly.

Dry eye is usually more common as people get older. As we age, our eyelids aren't as good at spreading tears each time we blink. The various glands in our eyes that produce tears may also become less effective. Dry eye occurs when the quality of your tear film gets worse.

What is the tear film?

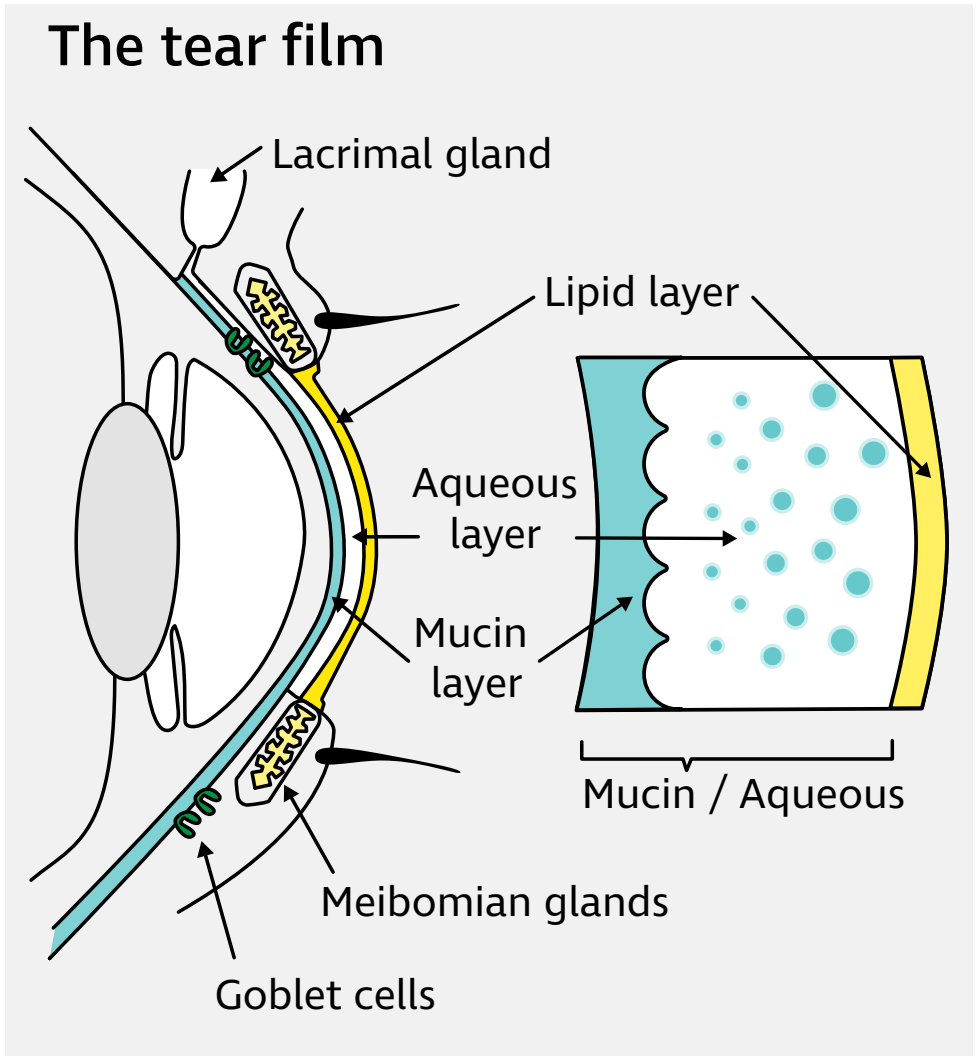
When you blink, you spread a thin layer of liquid over the front surface of your eye. This is called the tear film. The tear film keeps the front surface of your eye healthy. It also helps the eye focus properly, giving you clear vision.

The tear film is made up of three main layers:

- the mucin (mucus layer)
- the aqueous (watery) layer and
- the lipid (oily) layer.

Each layer is needed to keep your tear film healthy.

The illustration below is of the tear film and structures of the eye labelled with the following: lacrimal gland, goblet cells, meibomian glands, mucin layer, aqueous layer and lipid layer.



Mucin layer

The inner layer of the tear film is called the mucin layer. It is the layer which is closest to the surface of your eye. It forms a thin coating on the front surface of the eye. The mucin layer is like a foundation for the other tear layers. It helps the watery layer of tears to spread across the surface of the eye and remain in the right shape and place. The mucin layer is produced by goblet cells found scattered across the conjunctiva – named because their appearance resembles empty goblets after they have discharged mucus onto the surface of the eye.

Aqueous layer

The middle layer of the tears film is called the aqueous layer. This layer of tears provides moisture, oxygen and other nutrients to the front surface of the eye. The aqueous layer helps to wash away anything that gets into the eye such as dirt or an eyelash. It makes sure that the front of your eye is smooth, which helps your eye to see or focus properly. This layer is produced by lacrimal glands, named after the Latin word for tear, lacrima.

Lipid layer

The outermost layer of the tears film that is furthest from your eye surface is an oily layer of tears called the lipid layer. The lipid layer seals in

the moisture of the aqueous layer so that it stays on the front of the eye for as long as it's needed. The lipid layer stops the tears from evaporating too quickly. Evaporation happens as liquids are lost to the air around them. This oily top layer also helps to make sure that the tears are spread over your eye in the right way. This layer is produced by meibomian glands found running in a row along the length of the eyelids. They are named after the doctor (Heinrich Meibom) who first described them.

In evaporative dry eye, a normal amount of tears are produced, but the tears evaporate too quickly. In aqueous deficient dry eye, the tears evaporate normally, but not enough tears are produced.

Anything that affects the structure and balance of your tear film – for example if you produce too little or too much of one of the layers, this will stop the tear film working properly and can cause dry eye.

Watery eyes

Some people are diagnosed with dry eye even though their eye appears to be watering constantly. Some people find that their dry eye streams with tears and feels very wet most of the time. This may be because your eye is being irritated by a problem

with one of the tear layers. Your eye tries to deal with it by producing more watery tears.

These watery tears don't help to correct the dryness in your eye and can cause short periods of blurred vision. People with a watery eye may be prescribed eye drops to help with the problem in the other layers of tears. This may stop your eyes from watering too much.

If your eyes water a lot, it can make the skin around the eye sore. This usually clears up on its own, but your GP may be able to give you some cream to soothe it. The area around your eyes is very delicate so you need to take care when using cream or using make-up, as it may cause irritation.

What are the causes of dry eye?

It is sometimes difficult to determine the exact cause of Dry eye. Dry eye is multifactorial which means that there can be many factors that contribute to the condition. Dry eye is common when you have other conditions such as thyroid eye disease, glaucoma, previous eye surgery or eye trauma. It can also be connected to other conditions affecting your body such as Sjögren's syndrome, diabetes and rheumatoid arthritis. The condition is common in both men and women as we get older, particularly in women, especially after the menopause. Changes in hormonal levels such as in pregnancy and menopause can contribute to dry eye.

Often the cause of dry eye is not known but the following can also affect your tear film and contribute to dry eye:

Blepharitis and meibomian gland dysfunction

Blepharitis and meibomian gland dysfunction (MGD) are the most common cause of dry eye.

Blepharitis is an inflammation of the eyelid margins and can sometimes be caused by a bacterial infection. It can be divided into two types based on the location:

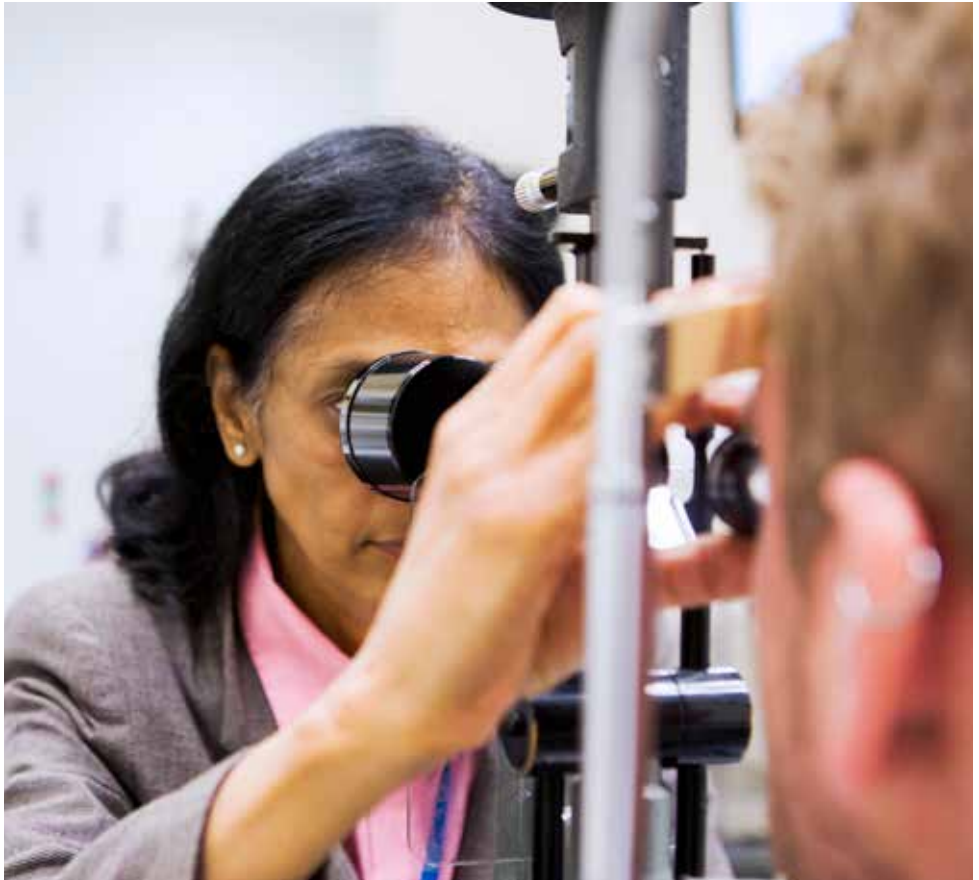
- **Anterior blepharitis** is when the inflammation is primarily around the eye lashes and in front of the lid margin.
- **Posterior blepharitis** is when there is inflammation present behind the eye lashes and is often caused by MGD.

MGD happens when the glands lining your upper and lower eye lids are blocked. You have about 30 of these small meibomian glands located just behind your lashes on each upper and lower lid. These glands secrete the oily layer onto the front of your tears. If the oil is of poor quality or there isn't enough oil being produced as the glands have become blocked, the tears tend to evaporate quickly. This leaves your eyes feeling dry and uncomfortable.

The three principles of using heat, cleaning and hydrating (with the use of drops) are the mainstay

of managing blepharitis or MGD. This is known as lid hygiene.

Lid hygiene can really help make your eyes feel more comfortable. You will need to do this twice a day for two to three weeks before you feel an improvement. You will need to continue practising lid hygiene in the long term to maintain control of blepharitis or MGD and keep your eyes feeling comfortable.



Lid hygiene for anterior blepharitis

Removing the crusts or debris from your lashes can be helpful if you have anterior blepharitis. Thorough hand washing is required before lid hygiene or applying eye drops. Follow these steps:

- Wash your hands thoroughly for 20 seconds.
- Prepare a cleaning solution of sodium bicarbonate (bicarbonate of soda) in cooled boiled water. To do this, boil the kettle and let the water cool to room temperature. Pour out one cup of water into a clean mug or glass and add a quarter teaspoon of sodium bicarbonate.
- Clean both the upper and lower lids using a clean tissue (folded several times) or a cotton bud. Dip the tissue or cotton bud in the prepared solution and wring out excess water. Wipe along the lid from the nose outwards; use a clean tissue/bud for every wipe. You will need several tissues/buds for each eye. Do not dip a used tissue or bud back into the solution – use a new one each time.
- Wash your hands again for 20 seconds.

Your optometrist or pharmacist may recommend pre-prepared lid wipes or cleaning solutions that you can purchase as an alternative to this which you may find more convenient to use.

Lid hygiene for posterior blepharitis or MGD

A warm compress is recommended for posterior blepharitis or MGD. The heat of the compress can help to unblock the meibomian glands. Along with gentle massage and lid cleansing, the compress will help to release any oil that may be trapped in your glands. Here are the steps to follow:

- Wash your hands for 20 seconds.
- Apply a warm compress over your eyes for five to 10 minutes – use a clean flannel rinsed in hot water, reheating regularly to keep it warm. You can also use a heat mask that is warmed up in the microwave or plugged into a USB socket.
- Use your finger or cotton bud to massage the skin towards your lashes. For your top lashes, you would be applying pressure downwards to the lashes and for the bottom lashes, you would move in an upwards direction.
- Follow the lid hygiene process for anterior blepharitis.
- Wash your hands for 20 seconds.

As an alternative, you can also buy commercially made lid warming devices that can be heated in the microwave or can be plugged into the electric mains. These tend to stay at the correct temperature for a longer time so may be more effective.

More information on blepharitis and MGD can be found on the Patient Info website at **bit.ly/InfoBlepharitis**.

Medication

Certain drugs, such as antihistamines, antidepressants, pain medications and oral contraceptives can also cause dry eye symptoms. Eye drops which contain preservatives may also contribute to dry eye, especially if you are using them frequently.

Contact lenses

Wearing contact lenses can cause you to develop dry eye. The length of time you wear your contact lenses along with other factors such as using computer screens, air pollution and wearing make-up can make the symptoms of dry eye worse. If wearing your contact lenses is making your dry eye symptoms worse, speak to your optician who will be able to give you advice about how to improve your symptoms or trying a different type of contact lens or cleaning solution.

You may be asked not to wear your contact lenses for a period to give your eyes a rest. You should follow the advice for wearing contact lenses issued by your optician in terms of replacement frequency, wearing time and cleaning regime.

Other health conditions

There are some health conditions, particularly inflammatory conditions, which are associated with dry eye, such as rheumatoid arthritis and Sjögren's syndrome. Sjögren's syndrome is a condition that may cause you to have dry eye and a dry mouth.

For more information on Sjögren's syndrome, contact The British Sjögren's Syndrome Association (their details can be found at the end of this publication).

Surgery to the eye or injury to the eye surface

If you have surgery on your eye (for example laser eye surgery) or an accident which affects or scars your eye, you may develop dry eye. Your dry eye symptoms usually improve once the eye has healed, but this can take time.

Environment

There are environmental factors that may cause or make your dry eye symptoms worse. These include windy, dusty or smoky environments as well as heavily polluted areas or wearing make-up. Using air conditioners or heaters in the car and office may make your dry eye symptoms worse. Trying to identify and address these environmental factors can be a first step in helping to reduce your dry eye symptoms. Using air purifiers and humidifiers in your home might help.



How is dry eye diagnosed?

If your eyes feel uncomfortable and irritated, or you feel like there is something in your eye all the time, then you should tell your GP, optometrist or ophthalmologist.

Your GP or eye health professional may ask you about potential reasons for having dry eye, such as medication you are taking, your general health and any environmental factors which might be relevant (for example, whether you work in dusty places).

As well as examining the front of your eyes and the quality of your tears with a microscope called a slit lamp, your eye health professional may want to do further tests to work out if you have dry eye and if you do, how dry your eyes are. This can help them decide how to treat your eyes. The tests can check how much tears you produce and detect any areas on the front of your eye that don't have enough tears.

What is the treatment for dry eye?

There's no cure for dry eye but there are treatments that can help your eyes feel more comfortable and keep your symptoms at bay.

If your dry eye is caused by medication, then your GP may consider switching your medication to another. If your dry eye is caused by wearing contact lenses, then having a break from your lenses or asking your optician about trying a different type of contact lens may help the dry eye to improve.

Often dry eye is caused by getting older, which can't be helped, but there is treatment that can help with your symptoms. There are three main ways to help your dry eye:

- making the most of your natural tears
- using artificial tears (eye drops)
- reducing the draining away of the tears.

Making the most of your natural tears

There are things that you can do yourself which may help reduce the symptoms of dry eye. High temperatures and central heating can make tears evaporate more quickly, so sometimes lowering temperatures can help. Another option would be to use a humidifier (a small machine that helps to put water into the air), which may help slow down the evaporation of your tears and keep your eyes comfortable.

Many people find that their dry eye is worse when they're reading or using a computer. This is because you blink less when you are doing a task like this, giving the tears more chance to evaporate. You can try to blink more when you're doing these tasks. You can also use eye drops before you start reading, watching TV or using a computer, as this may help to keep your eyes comfortable.

Many people, particularly those with meibomian gland dysfunction (MGD), find that using warm compresses can help (see section on "What are the causes of dry eye?"). In turn this will improve the quality of your tears, making your eyes feel more comfortable.

There is some debate on whether diet helps with reducing the symptoms. Omega 3 and 6 as well

as flaxseed oil are thought to help with dry eye. However, there's no largescale evidence that taking these nutrients in the form of supplements will help you.

Using eye drops

Most people with dry eye need to use some form of eye drops, also known as artificial tears. Eye drops aim to supplement and replace your natural tears and help keep the surface of the eyes lubricated. This can make the eyes feel more comfortable. They can also prevent any damage to the front of your eye, which can happen if the eye is dry for a long time.

You should use your eye drops as advised. If you are having to use your drops very frequently, then you should let your ophthalmologist or optometrist know, as you may need a different type of drop or additional treatment to the drops you're using.

There are three main types of eye drops which your GP or eye health professional may recommend or prescribe:

Artificial tears

Artificial tears are made by many different companies. Some people find one brand works better for them than another, though the reasons

for this aren't clear. Different drops have different lubricating agents which may suit someone's dry eye better. Your eye health professional may suggest a selection of different brands for you to try. It is usually best to try one type for at least a month.

Most artificial tear drops can be bought over the counter from the pharmacist. Some people develop sensitivity to the preservative used in the drops, especially if they're using them a lot. This can make your eyes sore. You can ask for preservative-free eye drops if this is the case.

Gels

Some people may prefer to use thicker gel-like drops. The gels are made from different lubricating agents and may stay in the eye for longer. They do the same thing as ordinary drops, but you may not have to put them in as often.

Ointments

You may be prescribed or recommended an ointment which you can apply before going to bed to keep your eyes moist overnight. Sometimes when you sleep, your eyes are not fully closed, so tears can evaporate, leaving your eyes very dry when you wake up. Ointments help stop the eyes drying out overnight so that they feel more

comfortable in the morning. Ointments are usually used just before bedtime because they are sticky and cause blurry vision, while eye drops are used during the day.

Specialist drops

In severe cases, dry eye can cause swelling or inflammation. You may be prescribed drops or ointments to help with this such as antibiotics, corticosteroids and ciclosporin which helps by increasing tear production. This would normally be prescribed by an ophthalmologist.

There are other specialist drops, known as serum eye drops, which are made from your own blood or donated blood. They are only prescribed for the very few cases that require them. They may be considered based on someone's individual circumstances.

These specialist drops are produced by the NHS Blood and Transplant Tissue Services. It is made by a process of separating the plasma from the red blood cells and diluting it with saline or a salt water solution to make eye drops. The serum eye drops have nutritional benefits as well as lubricating properties and are more closely matched to your own natural tears.

Reducing the draining away of tears

It's possible to help dry eye by blocking up the drainage holes called puncta, in your eyelids. Stopping the tears from draining away may help your tears stay in your eye for longer. The medical term for blocking the tear ducts is "punctal occlusion".

Usually, punctal occlusion is tried for a period of time to see if it helps. The small drainage channels are blocked by small devices called punctal plugs. If it helps you with the symptoms of dry eye, then the plugs are left in place. Occasionally, a permanent small surgical procedure can also be performed, if temporary blocking has been useful.

Often plugs or blocking the ducts is helpful at reducing the number of drops you need to use in the eyes every day. If you've had your tear ducts blocked you may still need to use drops, gels or ointments to protect your eyes and keep them as comfortable as possible.

Other treatments

Over the counter spray mists are available that you can use on your lids which help reduce evaporation and soothe the eyes. There are also treatments mainly being offered in private clinics for dry eye.

Some of these include moisture chamber spectacles or goggles which can help your eyes retain moisture. Another is the Lipiflow system which is a device that fits over your eye and directs heat and gentle massage to the eyelids specifically to help with blepharitis and MGD. Another possible treatment option includes Intense Pulse Light (IPL), a treatment which requires several sessions of light pulses being applied to the glands around your eyes to help unblock and clear the meibomian glands.

In addition to these, MGD can also be treated by probing the glands to help clear and unblock them as well as specialist tools to help clear the lids. Many of these treatments are available from private optometrists who specialise in dry eye and are currently not available on the NHS.

For some people with dry eye, multiple treatments are required to manage their dry eye condition and your eye health professional has to tailor treatment based on your individual circumstances. There are new treatments being explored all the time to help with dry eye symptoms.

Is there anything I can do to help with dry eye?

Having dry eyes can be difficult. Eyes that are red, uncomfortable and painful for long periods can be tiring. When your eyes first become dry, you may feel upset and worried. However, dry eye doesn't usually cause any damage to your eye and typically doesn't lead to permanent changes to your vision. There are many things that you can try to help you manage it better:

- Use your prescribed eye drops regularly. Finding eye drops that work for you can make a huge difference.
- Adjust your environment. Lowering temperature and using a humidifier may help, as central heating and air conditioning can worsen your symptoms.
- Avoid dusty, windy and smoky areas or use wrap-around glasses when you are exposed to these environments.
- Take rest periods and remember to blink often when you are using the computer, watching television or reading.



- Try to have a healthy balanced diet, with flax seed as well as foods containing omega 3 and 6, such as oily fish, nuts, seeds, eggs, green leafy vegetables, etc.
- Avoid using eye make-up when there's infection, inflammation present or when the eyes are sore.
- If you wear contact lenses, have regular follow-ups with your optometrist. You may need a break from wearing contact lenses if your eyes are dry or explore different types of lenses which may be more suitable for dry eye.

Finding the right eye drops to suit you and trying different things to help cope with the symptoms of dry eye can take some time and commitment. Although there is no cure for dry eye, most people will learn how to manage their dry eye so that it does not have too much impact on their everyday lives.

Lid Hygiene for MGD and Blepharitis

Step 1: Wash your hands thoroughly

Before touching your eyes, it's important you:

- Wash your hands thoroughly for 20 seconds.
- Dry your hands with clean towel or paper towels.

Step 2: Apply Heat and Gentle Massage

- Apply a warm compress over your eyes for five to 10 minutes – use a clean flannel rinsed in hot water, reheating regularly. Never apply a hot flannel to your eyes.
- Alternatively, you can also buy commercially made eye lid warming devices eye that can be heated in the microwave which retain the heat more effectively.
- Use your finger or cotton bud to massage the skin towards your lashes. For your top lashes, apply pressure downwards towards lashes and for the bottom lashes, massage in an upwards direction.

Step 3: Clean

- Either use freshly boiled and cooled water or prepare a cleaning solution of sodium bicarbonate in cooled boiled water. To do this, boil the kettle and let the water cool to room temperature. Pour out one cup of water into a clean mug or glass and use this for the next step or you can add a quarter teaspoon of sodium bicarbonate to the water.
- Your optometrist or pharmacist may recommend wipes or cleaning solutions that you can purchase as an alternative to this.
- Clean both the upper and lower lids using a clean tissue (folded several times) or a cotton bud. Dip the tissue or cotton bud in the prepared solution and wring out excess water. Wipe along the lid from the nose outwards; use a clean tissue/bud for every wipe. You will need several tissues/buds for each eye. Do not dip a used tissue or bud back into the solution – use a new one each time.

Step 4: Moisture

- Apply your lubricating eye drops and ointments

Step 5: Wash your hands thoroughly again

- Wash your hands again following step 1

RNIB Helpline

If you need someone who understands sight loss, call our Helpline on **0303 123 9999**, say "**Alexa, call RNIB Helpline**" to an Alexa-enabled device, or email **helpline@rnib.org.uk**. Our opening hours are Monday to Friday, 8am – 6pm.

You can also get in touch by post or by visiting our website: **rnib.org.uk**

**RNIB The Grimaldi Building
154A Pentonville Road
London N1 9JE**

Connect with others

Facebook groups

Join our helpful and welcoming community-led Facebook groups. Meet other people affected by sight loss, talk about the issues that matter to you, ask questions and share your story:
rnib.org.uk/facebook-groups

Make new friends

You can also sign up to an RNIB Talk and Support social group for a weekly chat by phone or online, for friendship and peer support. We also offer a range of special interest groups, where you can connect with like-minded people, as well as groups for people with Charles Bonnet syndrome to meet others in a similar situation and get support. Learn more: **rnib.org.uk/talk-and-support**

Sight Advice FAQ

Sight Advice FAQ answers questions about living with sight loss, eye health or being newly diagnosed with a sight condition. It is produced by RNIB in partnership with many other sight loss organisations. **sightadvicefaq.org.uk**

Other useful contacts

British Sjögren's Syndrome Association

PO Box 15040

Birmingham

B31 3DP

Helpline:

0121 478 1133

bssa.uk.net

RNIB Booklet Series

About the Starting Out series

Essential information about living with sight loss.

Titles include:

- Benefits, Concessions and Registration
- Emotional Support
- Help from Social Services
- Making the Most of Your Sight

About the Confident Living Series

Information to build confidence and independence. Titles include:

- Reading
- Shopping
- Technology
- Travel

About the Understanding Series

More about your eye condition. Titles include:

- Age Related Macular Degeneration
- Cataracts
- Dry Eye
- Diabetes Related Eye Conditions including Diabetic Retinopathy
- Glaucoma
- Nystagmus
- Retinal Detachment
- Inherited Retinal Dystrophies including Retinitis Pigmentosa
- Posterior Vitreous Detachment
- Visual Hallucinations – Charles Bonnet Syndrome

For audio, print or braille versions of these booklets please contact our Helpline or visit **shop.rnib.org.uk**.

For a list of information sources used in these titles and to provide feedback on the Starting Out and Confident Living Series, email **ckit@rnib.org.uk**.

We value your feedback

You can help us improve our information by letting us know what you think about it. Is this booklet useful, easy to read and understand?

- Is it detailed enough or is there anything missing?
- How could we improve it?

We would also like your views on the pictures and diagrams, are they appropriate, helpful and are there places where a diagram might have helped?

Send your comments to us by emailing **eyehealth@rnib.org.uk** or by writing to:

**Eye Health Information Service
RNIB
The Grimaldi Building
154A Pentonville Road
London N1 9JE**

About The Royal College of Ophthalmologists

The Royal College of Ophthalmologists champions excellence in the practice of ophthalmology and is the only professional membership body for medically qualified ophthalmologists.

The College is unable to offer direct advice to patients. If you're concerned about the health of your eyes, you should seek medical advice from your GP or ophthalmologist.

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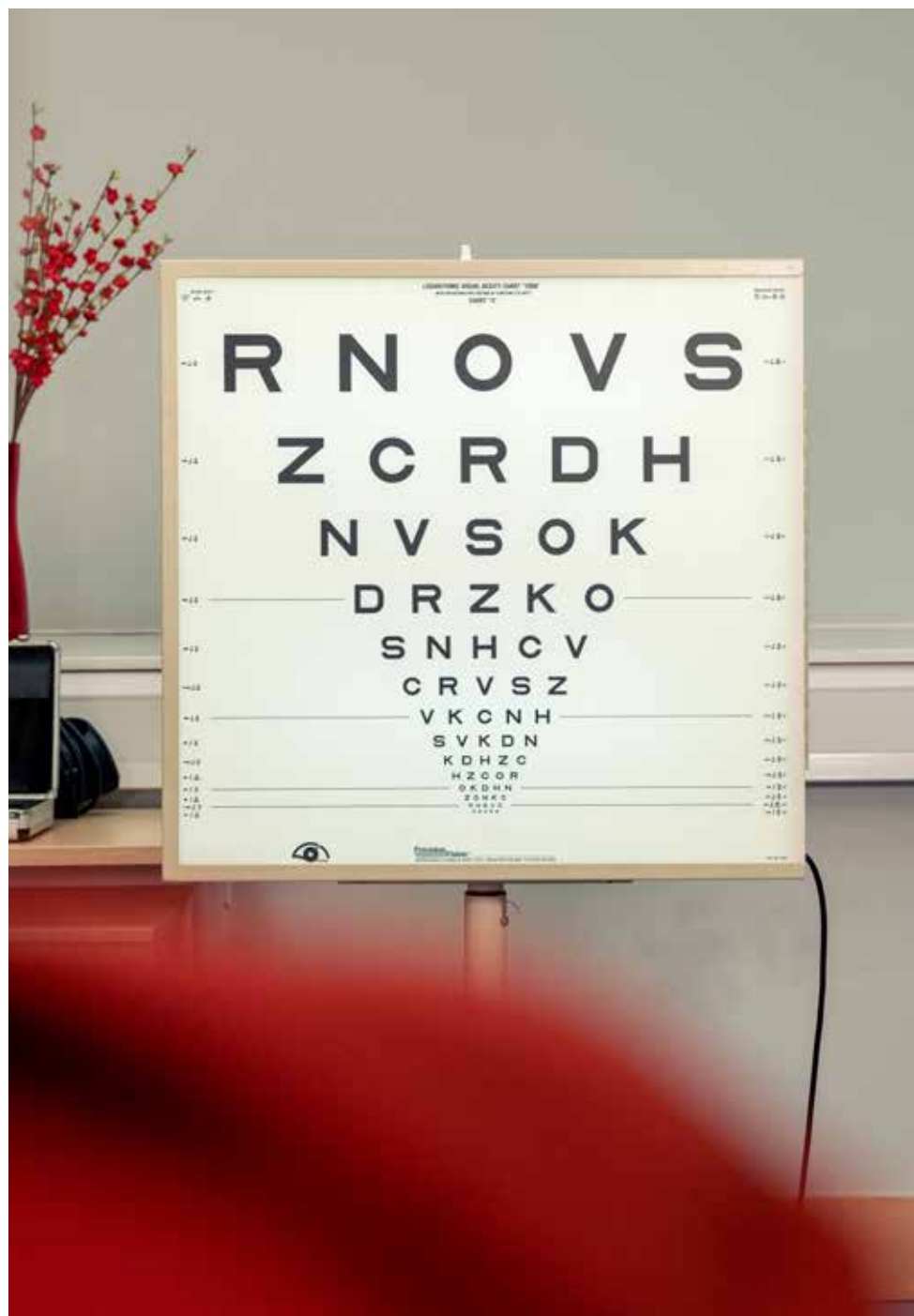
Information sources

RNIB and The Royal College of Ophthalmologists do all we can to ensure that the information we supply is accurate, up to date and in line with the latest research and expertise.

This publication uses information from:

- The Royal College of Ophthalmologists' guidelines for treatment
- clinical research and studies obtained through literature reviews
- specific support groups for individual conditions
- medical textbooks
- RNIB publications and research.

For a full list of references and information sources used in the compilation of this publication, email **eyehealth@rnib.org.uk**.



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to an Alexa enabled device.

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