Group of Guidelines Consensus and Education in Ophthalmology®

Dry Eye Syndrome

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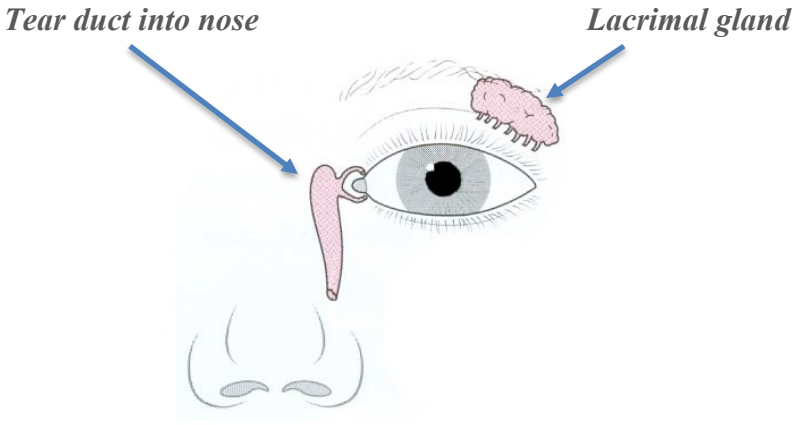
This booklet has been designed to help answer some of the questions you and your family or friends may have about Dry eye syndrome, to explain what is involved and what the possible risks are. If you have any questions and concerns, please do not hesitate to speak to a doctor or nurse caring for you.

What is dry eye syndrome?

Dry eye syndrome (also called keratoconjunctivitis sicca) is a condition in which the amount of aqueous (the watery component of tears) produced by the lacrimal gland is insufficient. You may also experience symptoms of dry eye syndrome if other components of the tears (mucus and lipid) are insufficient. This may occur if you have an eyelid or conjunctival disease, such as blepharitis (inflammation of the eyelids), or when normal blinking is disrupted by neurological or eyelid abnormalities.

We tend to notice tears when something is very funny, or very sad. However, if your eyes are healthy, glands in your eye are making tiny amounts of the same liquid all of the time. This is known as the ‘tear layer’. The tear layer helps to protect your eye and allows you to see clearly. It is made up of three main ingredients:

- **Aqueous (water)**: This is produced by the lacrimal gland, which is located above your eye, underneath your eyelid. Water is required to moisten the eye, wash away debris and provide a smooth corneal surface to help your eye focus. The lacrimal gland also secretes antibodies and antibacterial elements to protect the eye. Tears are mostly made of water.
- **An oily outer layer**: The oily, outer layer is produced mainly by glands within your eyelids (the meibomian glands). This layer lubricates your eye, which helps you blink. The oil also stops your tears from evaporating too quickly.



- **An inner mucus layer**: This layer is produced by glands within the conjunctiva (the clear layer that covers the white part of your eye and the inside of your eyelids). The mucus layer helps to spread tears over the surface of your eye.

What causes dry eyes?

It is estimated up to one in every three people over the age of 65 experiences problems with dry eyes.

- **Age:** Dry eyes occur as a part of the natural aging process, in particular women after the menopause
- **Medication:** The following drugs can reduce your lacrimal gland secretions:
  - Some varieties of antihistamines and decongestants
  - Certain antidepressants
  - Some blood pressure drugs (including Beta-blockers and diuretics)
  - Medications for Parkinson's disease
  - Contraceptive pills
  - Opiate-based pain relief (such as morphine)
  - Isotretinoin-type drugs.

- **Laser eye surgery (LASIK):** Some people who have had certain types of laser eye surgery find they have dry eyes in the weeks after surgery. This is usually a result of damage to the corneal nerves. The nerves usually regenerate and dryness typically improves. Occasionally, it can cause permanent problems, and individuals with significant existing dry eye syndrome should not undergo LASIK treatment.

- **Humid environment:** Central heating or air conditioning.

- **Medical conditions:** These include:
  - **Blepharitis** (a condition that causes inflammation of the eyelids) and other such conditions may cause meibomian gland dysfunction, which impairs the secretion of the other components of tears (lipid and mucous), making the eyes dry.
  - **Neurological problems, including stroke and Bell's palsy**, can affect your ability to blink/close your eyelids. This prevents the spread of tears over the eye and allows excessive tear evaporation.
  - Some medical conditions can cause inflammation or destruction of the lacrimal gland, resulting in impaired aqueous production
    - **Sjogren's syndrome**, which may occur on its own or alongside other rheumatological diseases, such as rheumatoid arthritis and systemic lupus erythematosis.
    - Other conditions, such as **ocular cicatricial pemphigoid or Stevens-Johnson syndrome** can cause conjunctival scarring, which causes dry eyes by blocking the lacrimal gland ducts. Conjunctival scarring can also occur as a result of chemical burns.

What are the symptoms of dry eyes?

- Gritty irritation
- Itching, burning sensation and intermittent blurring of vision.
- Occasionally the eyes may compensate by watering to relieve the irritation by producing more tears.
- Stringy mucus in your eye
- eyelids that stick together when you wake up
- Sensitivity to light
- Red eyes
- Lack of tears when you cry

Your symptoms can be made worse by:

- wearing contact lenses

- Windy or hot weather
- Dusty and smoky environments

You can improve your symptoms by closing your eyes.

How is dry eye syndrome diagnosed?

Dry eye syndrome is diagnosed using a slit lamp. A slit lamp is a special microscope that eye doctors (ophthalmologists) use to give a magnified image of your eye. A slit lamp can enable us to see whether:

- The tear meniscus on the lower lid margin is reduced in size
- There are strands of mucus in the tear film
- There are abnormalities of the cornea, or loss and damage to the corneal epithelium (corneal skin cells)

These areas of damage can be highlighted using a special yellow dye called fluorescein.

You may also undergo some special tests to help us with our diagnosis. These include:

Tear break-up time test: This test helps your eye doctor to see whether you have a healthy tear layer. He or she will put droplets of yellow dye (fluorescein) into your eye, which makes the tear layer visible. Your doctor will then time how long it takes for the tear layer to break-up and dry-out. If this takes less than five seconds, your eyes are drying out too quickly.

Schirmer test: Your doctor will place one end of a thin strip of filter paper inside your lower eyelid. The other end will stick out of your eye. Your doctor will measure the amount of liquid the paper soaks up in five minutes. This test can also be done using special cotton threads.

Tear samples: Your doctor can further examine your tears by taking a sample. This can help if he or she wants to check your enzyme levels.

Special dye test: Your doctor may use a special dye to check for damaged cells on the surface of your eye.

What treatments are available for dry eye syndrome?

Dry eye syndrome is not usually a serious condition. There are three main ways to treat dry eyes:

1. Tear replacement

2. Preservation of existing tears
3. Reducing tear drainage

1. Tear replacement:

You will need to take tear replacement medicines regularly for them to work. They can reduce the symptoms of dry eye syndrome and prevent further damage to your eyes. Tear replacement is the main treatment for dry eye syndrome.

There are different types of artificial tears:

- **Eye drops** – There are many different brands for different types of dry eye. Most are available over the counter without prescription. Preservative-free drops are available in single doses if you become sensitive to preservatives. They are also advisable if you are using artificial tear drops more than four times a day. Eye drops need to be used often to work well, so make sure you follow your doctor's instructions.

- **Eye gels, such as Viscotears®:** These last longer than eye drops, so you will need to use them less frequently.

- **Eye ointments, such as Lacri-lube®:** These can be useful in lubricating the eye overnight. However, eye ointments are sticky and tend to blur vision. This means they have limited use in the daytime.

- **Mucolytic eye drops, such as acetylcysteine (ILube®):** These drops can be used to break up mucus in your tears.

Please remember:

- The manufacturer's leaflet will give advice on how to use and store your artificial tears. This can be found inside the packaging of your medicines.
- Throw away your artificial tears 28 days after opening the tube or bottle. Single-dose preservative-free drops should usually be discarded after use.
- Do not use artificial tears after their expiry date.

Side effects of tear replacement

The main side effects are an allergy/irritation to the drops, gels, ointments and other medicines used to treat your eyes. These side effects include:

- Worsening of: red, sore and itchy eyes.
- Mild stinging and blurred vision: which usually wears off a few minutes after use.

The side effects are similar to the symptoms of dry eye. So, if you feel your symptoms are getting worse, please contact the eye casualty department. See page 7 for contact details.

2. Preservation of existing tears:

By controlling your environment, you can help your tears work better and last longer. Below is a list of changes that you can make to help with dry eye syndrome:

- Slightly lowering room temperature will help to reduce tear evaporation. Remember, that temperature should not be reduced too much, especially if you are elderly.
- Avoid air conditioning (you could try using a humidifier instead).
- Avoid smoking.
- Avoid or reduce your reliance on contact lenses.
- Take regular breaks when reading, using a computer or watching TV. You blink less when doing these types of visual activities, so your eyes dry out more quickly.

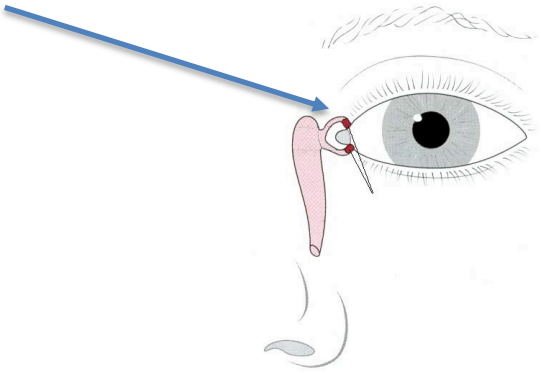
Aside from making changes to your environment, there are a number of other methods of preserving your existing tears. These include:

- **Lateral tarsorrhaphy:** If your eyelids do not close properly, you can have an operation called a lateral tarsorrhaphy. This involves sewing the outer edges of your eyelids together.
- **Medication to suppress your immune system:** If you have a condition that is inflaming your lacrimal gland, your doctor may give you medicines to suppress your immune system.
- **Cleaning and antibiotics:** If you have blepharitis (eyelid inflammation) you should clean your eyelids regularly. You may also be given a course of antibiotics.
- **Flaxseed oil/Omega III & VII supplements:** These have been shown to reduce the symptoms of dry eye by improving meibomian gland disease.

3. Reducing tear drainage:

You have drainage holes (called the lacrimal puncta) on the inside corner of your upper and lower eyelids. These can be blocked temporarily with punctal plugs made of silicone or collagen, or permanently with cauterisation (burning).
This will reduce or prevent tears from draining from the surface of your eye. Most of the drainage (about 70%) goes through the lower drainage hole. This is usually blocked first with a temporary plug.

Plugs in the opening of the tear ducts



You can have temporary plugs inserted as an outpatient. The process is easy, quick and painless.
Silicone plugs need to be removed but collagen plugs dissolve over the course of a few weeks. If your eyes water too much whilst the plug is in place, it may need to be removed.
If, while the plug is in place, your eyes are still too dry, your doctor may choose to block your upper drainage hole too.
Permanent closure of the puncta using cauterisation should only be done if temporary plugging has been successful. You can have this done as an outpatient. It is a simple operation, in which a doctor will inject a local anaesthetic into your eyelid.

How to apply your eye-drops or ointment

1. Always wash and dry your hands before putting in the drops to prevent infection.
2. Sit or lie with your head tilted backwards and support it on the back of a chair, or a pillow for comfort and safety. Look up at the ceiling.
3. If the eye is sticky, used cooled boiled water to gently clean the lids, taking care not to poke the eye.
4. When putting the eye drops into your eye do not allow the bottle tip to touch your eye.
5. Gently pull down the lower lid with one finger to create a pocket for ease of access.
6. Holding the drop bottle on the bridge of your nose or your forehead, squeeze one drop into the eye.
7. Squeeze a drop or a 1 cm ribbon of ointment into the pocket of the lower lid.
8. Close your eyes for a timed five minutes.
9. Remove any excess eye drops/ ointment gently with a clean tissue and wash your hands again.

Storage of eye drops and ointments

1. Never share your eye drops with anyone else
2. Store drops and ointments in a cool place out of reach of children (only store drops in the fridge if requested to do so)
3. Dispose of all opened eye drops and ointments after one month

Further questions

We hope this information is sufficient to help you decide whether to go ahead with the surgery. Please write down any questions not covered in this booklet and ask the doctor when you come to the hospital for your appointment. All our staff will always be ready and happy to give you the information you need.

This brochure is not intended as a substitute for professional medical care. Only your eye specialist can diagnose and treat eye problems.

If you have any further questions or concerns please contact your doctor.

Your comments

We are always interested to hear your views about our leaflets. If you have any comments, please contact us.

References

This leaflet was edited by specialist ophthalmologists from the GCEO Group® who are licensed in the EU and the Middle East. This leaflet was edited based and in accordance to the guidelines of the:

- The American Academy of Ophthalmology (USA) - Preferred Practice Pattern Guidelines:

https://www.aao.org/about-preferred-practice-patterns

- The Royal College of Ophthalmologists (UK):

https://www.rcophth.ac.uk/standards-publications-research/clinical-guidelines/

- National Institute for Health and Care Excellence (UK):

https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines

- The International Council of Ophthalmology:

http://www.icoph.org/enhancing_eyecare/international_clinical_guidelines.html

More resources:

The American Academy of Ophthalmology (USA) - Eye Health A-Z:

https://www.aao.org/eye-health/a-z