

# No more tears? Understanding dry eye

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## Introduction

The eye needs tears to stay healthy and ensure clear vision. Tears are produced by the lacrimal gland, situated above the eyeball, and are released every time the eye blinks. The purpose of tears is to keep the surface of the eye (the cornea) moist and to wash away dust or foreign matter, thereby protecting the eye from infection. Of the many eye conditions treated daily, dry eye is one of the most common seen in the community pharmacy.

## What is dry eye?

Dry eye, also known as dry eye syndrome or keratoconjunctivitis sicca (KCS), occurs when the eyes do not produce enough tears or when the consistency of tears is inadequate and the tears evaporate faster than normal. In patients who experience dry eye, the surface of the eye may become inflamed, which, if left untreated, may lead to pain, ulcers and possibly some loss of vision. However, permanent loss of vision from dry eye is uncommon. Dry eye can affect tasks such as using a computer or reading for long periods of time.

Dry eye may be a result of the following:

- *Inadequate production of tears:* This may be caused by advancing age, certain medical conditions or certain medications that decrease the amount of tears produced.
- *Evaporation of tears:* To protect and nourish the cornea, tears consist of three layers, namely an oily layer, a watery layer and a mucous layer. The oily layer helps to prevent the evaporation of the watery layer, while the mucous layer lets the tears spread evenly over the surface of the eye. Dry eye symptoms can develop if the tears evaporate too fast or do not spread evenly over the cornea because of deficiencies with any of the three tear layers. In addition,

environmental factors such as wind and dry weather may cause increased tear evaporation, which reduces the tear volume.

## Symptoms of dry eye

People with dry eyes may experience any of the following symptoms:

- stinging or burning of the eye
- a gritty feeling in the eye, as if something irritates the eye
- pain and redness of the eye
- episodes of blurred vision
- eyelids feeling heavy
- decreased tolerance to long periods of reading, working at the computer, or any activity that requires sustained visual attention
- eye fatigue.

In addition, episodes of excessive tear production followed by very dry eyes may be experienced. This is because the eyes produce a large amount of tears at once to attain optimal moisture. As tear ducts can handle only a limited amount of tears at any one time, the excess tears pour down the cheeks.

## Causes of dry eye

There are many factors that contribute to dry eye, of which some are described here:

- *Age:* Dry eyes can develop as part of the aging process and may be experienced in the majority of people over 65 years of age.
- *Gender:* Owing to hormonal changes caused by pregnancy, the use of oral contraceptives or menopause, women are more susceptible to dry eyes than men.

- **Medicines:** Certain medicines, including (but not limited to) antihistamines, decongestants, blood pressure medications and antidepressants, can affect tear production.
- **Medical conditions:** People with medical conditions such as rheumatoid arthritis, diabetes and thyroid problems are more likely to have symptoms of dry eyes.
- **Environmental conditions:** Dry, windy weather and smoke exposure can increase the evaporation of tears, resulting in dry eye symptoms. Working in front of the computer screen for long periods reduces regular blinking, which may contribute to symptoms of dry eye.
- **Other factors:** Long-term use of contact lenses can be a factor in the development of dry eyes. Eye surgery, such as LASIK, can decrease tear production and contribute to dry eyes.

## Treatment

Treatments aim to restore or maintain the normal amount of tears in the eye to minimise dryness and discomfort, thereby maintaining eye health. In addition, taking a supplement containing omega-3 fatty acids may help to alleviate dry eye symptoms by reducing inflammation and maintaining a healthy tear film and eye surface.

The exact treatment for dry eye syndrome depends on whether symptoms are due to decreased production of tears, fast evaporation of tears or another underlying condition. If

dry eye syndrome is caused by an underlying condition, the patient should be referred to their doctor for treatment or referral to an appropriate specialist.

Over-the-counter treatments are regarded as the first-line treatment for dry eye. Lubricant eye preparations, also known as artificial tears, are key treatment options for dry eyes.

- **Eye drops (with or without preservatives):** Eye drops that contain preservatives prevent the growth of bacteria in the medicine bottle. If symptoms of dry eye require eye drops to be used frequently (i.e. more than six times a day), it is preferable to use preservative-free eye drops. This is because preservatives used in large quantities or over a prolonged period of time (months or years) may damage the delicate cells on the surface of the eye or cause inflammation. Preservative-free preparations are also recommended for people who wear soft contact lenses, as preservatives may attach to the contact lens and damage the eye. This type of eye drops may be more expensive than those containing preservatives.
- **'Oily' tear eye preparations** are particularly useful if dry eye is caused by tears evaporating too fast, as these products replenish the oily part of the tear film and so retard evaporation from the surface of the eye.
- **Eye ointments** can also be used to help lubricate the eyes. This treatment is recommended for overnight use because they tend to cause blurry vision.

Examples of artificial tear products and their active ingredients are outlined in Table 1.

**Table 1:** Artificial tear preparations available for alleviating dry eye symptoms

| Preparation type               | Active ingredient                                   | Examples available   |
|--------------------------------|---|--|
| Eye drops (with preservatives) | Carboxymethylcellulose                              | Refresh Tears®   |
|                                | Hydroxypropylmethylcellulose                        | Artelac® Moisture<br>Bausch & Lomb Moisture Drops®<br>Spersatear®<br>Tears Naturale II |
|                                | Propylene glycol<br>Polyethylene glycol 400         | Systane® Ultra<br>Systane® Balance   |
| Eye drops (preservative-free)  | Carboxymethylcellulose                              | Cellufresh®<br>Celluvisc®  |
|                                | Hyaluronic Acid + Polyethylene Glycol + Vitamin B12 | Artelac® Intense Rebalance (preservative free in the eye)                              |
|                                | Hyaluronic Acid                                     | Artelac® Splash  |
|                                | Hydroxypropylmethylcellulose                        | Tears Naturale® Preservative Free  |
|                                | Hypromellose  | Artelac® Moisture  |
|                                | Polyethylene glycol 400                             | Systane® Ultra unit dose   |
| Eye gel (with preservative)    | Polyethylene glycol 400                             | Systane® Gel drops   |
|                                | Triglycerides + Carbomer                            | Artelac® Advanced Eye Gel<br>Liposic Eye Gel®  |
| 'Oily' eye drops               | Triglycerides + Carbomer                            | Artelac® Advanced  |
| Eye ointment                   | Anhydrous liquid lanolin                            | Duratears®   |

## Relieving dry eye

Living with dry eye can be a challenge, but the following simple interventions may help to relieve some of the symptoms:

- Avoid too much air movement. Fans, wind and hair-dryers can further dry out the eyes, so exposure should be limited. Sunglasses should be worn outdoors to reduce exposure to drying winds and the sun.
- Use a humidifier in winter. Use of heaters in winter often dries the air out, so a humidifier may be used to add moisture back into the air.
- Rest the eyes. Prolonged focused use of the eyes when reading, watching television or looking at a computer screen may lead to dryness of the eyes. Resting the eyes and more frequent blinking may help to regain moisture in the eye.
- Avoid cigarette smoke. Smoking can increase the risk of developing dry eye. Furthermore, exposure to cigarette smoke can cause eye irritation.

- A warm compress applied to the eyes may provide relief of symptoms.

Dry eye can become a chronic condition, often posing a challenge to daily activities. Should symptoms persist after treatment as outlined in Table 1, patients should be referred to their doctor for further evaluation.

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