Dry eyes, a common eye problem, is caused by a lack of tear production. Tears normally keep the eyes moistened and lubricated. However, stinging, burning, dryness, and redness will result if enough tears are not produced to keep the eyes wet and comfortable. While discomfort is the primary result of dry eyes, infection and corneal scarring may occur if left untreated.

**What is tear film?**

Tear film, which constantly covers the eye, is made up of three layers. The oily outer layer reduces evaporation of the tears. The watery middle layer cleanses the eye and washes away foreign particles or irritants. The inner layer consists of mucus which coats the surface evenly and allows the tears to adhere to the surface of the eye.

**Tear Production**

Tears flow into the eye from two separate glands. The lacrimal glands, which are located above the eye, produce watery tears to moisten the eye. These tears also serve as "crying tears" which are released in response to injury and emotion. The tarsal glands, located in the eyelids, produce a tear film which constantly moistens and lubricates the eye.

The tear film is spread over the eye by blinking, keeping the surface of the eye smooth and optically clear. Tears also protect the eye from infection, since they contain a substance called lysozyme that acts as an antibacterial agent. Tears drain from the eye through two small openings called the upper and lower punctum. From the punctum, the tears drain through the tear sac and out into the nasal passages through the nasolacrimal duct.

**What are the symptoms of dry eyes?**

Patients with dry eyes often complain that their eyes feel gritty, itchy and dry. Other common symptoms include burning, stinging, redness, stringy mucus and sensitivity to light. Some patients may experience their eyelids sticking together in the morning. Patients with dry eyes may also have difficulty wearing contact lenses, which normally float on top of the tear film. If not enough tear film is produced, irritation and redness may result from the contact lens rubbing against the surface of the eye.

Surprisingly, watering of the eyes is also a symptom of dry eyes, as excess tears are produced in response to irritation. However, these excess tears are "crying tears" which consist mostly of water. The excess tears lack the oil necessary to keep them from evaporating and, therefore, do not function to lubricate the eye.

**What causes dry eyes?**

Normally, tear production decreases with age, leaving the delicate eye tissues exposed to the irritating effects of the environment and pollution. Dry eyes are more common with contact lens wearers and women, especially during change of life or pregnancy.

Dry eyes often occur in patients with arthritis. Medications and Vitamin A deficiency may also cause dry eyes by reducing tear secretion. In addition, environmental factors such as sun, wind, pollution, dry air from heating or air conditioning and smoke contribute to the occurrence of dry eyes. Finally, abnormal eyelid location may cause dry eyes.

**How are dry eyes diagnosed?**

Dry eyes are often diagnosed with a dye test or simple eye examination. The Schirmer Test, which measures tear production, may be used. In the Schirmer tear strip test, filtered paper strips are placed just inside the lower eyelid to measure the rate of tear production.

In some cases, temporary closure of the punctum may be performed to determine if eye discomfort is due to dry eyes. A tiny implant, about the size of a grain of rice, is painlessly placed in the tear drainage canals. The implants permit only a small percentage of tears to pass into the nasal passages, thus building up a layer of tears on the surface of the eye. The implants are absorbed by the body in a few days, giving the patient and doctor time to evaluate the
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![Tear Film Diagram](image)

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