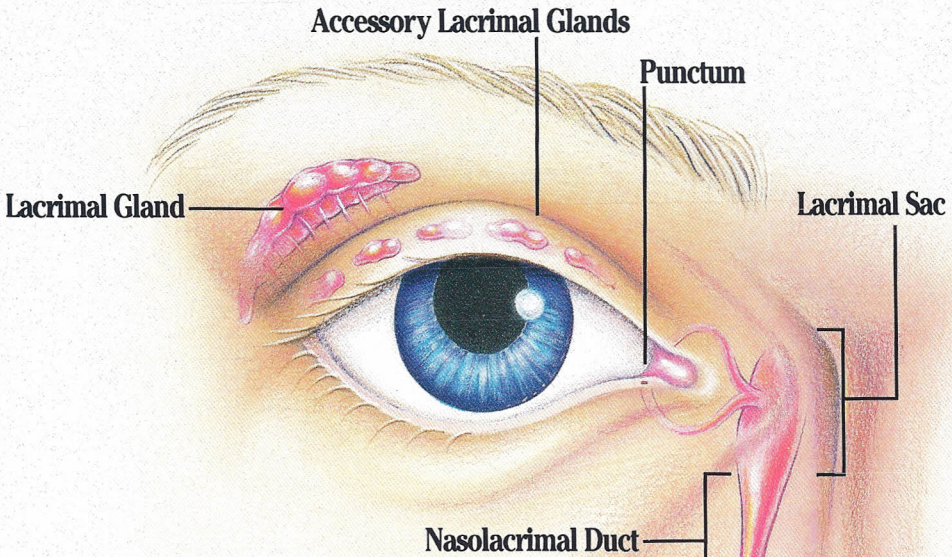
THE ANATOMY OF DRY EYE

A Look at the Factors that Cause Dry Eye



HOW TEAR FLOW WORKS

The following terms are important in understanding how tear flow works.

A. **The Large Lacrimal Gland** is situated above the outer rim of the eye. This gland produces "reflex tears," which represent the eye's response to emotion, injury, or irritation.

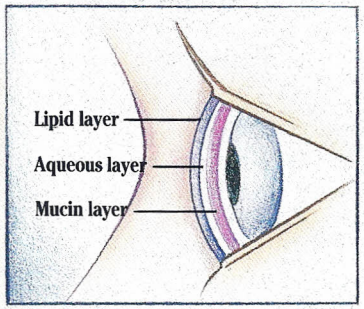
B. **The Accessory Lacrimal Glands** are located along the upper lid of the eye. They secrete high-quality "constant tears" containing an antibacterial agent called lysozyme. In addition to warding off infection, constant tears cool, comfort, and lubricate the eye.

C. **The Punctum** is a small external orifice in the corner of the eye that serves as a "drain" for tears. While there are puncta on both the upper and lower eyelids, the majority of tears flow through the lower punctum.

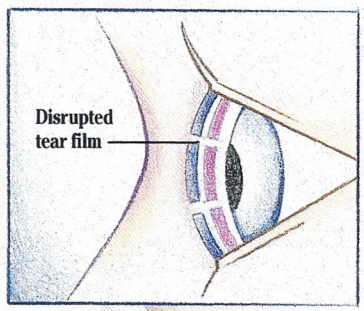
D. **The Lacrimal Sac** is an enlarged area within the "drainage system" through which tears flow from the eye into the nose. Tears flowing into the punctum are processed in the lacrimal sac before passing into the nasolacrimal duct.

E. **The Nasolacrimal Duct** is the downward continuation of the lacrimal sac into the nose.

NORMAL EYE



DRY EYE



Three exceedingly thin layers make up the healthy tear film that coats and protects the eye.

- The outer, or lipid, layer provides an oil-based surface that retards evaporation of tears. If this layer did not exist, tears would evaporate 10 to 20 times faster than they do.
- The middle, or aqueous, layer includes salt and protein in a base that is 98% water.
- The inner mucin layer coats the surface of the eye, allowing the other layers to form a film. Without this layer the tears would "bead up," much like rain on a waxed car.

When tears lack the important components shown above, or when too few tears are produced, the tear film can break down. This breakdown produces dry spots on the cornea, causing the symptoms associated with dry eye – a feeling of itchiness, grittiness, a burning sensation, and general discomfort.

Aside from the wearing of contact lenses, perhaps the most important cause of dry eye is the natural aging process. At age 65, the eye produces about 60% fewer tears than it did at age 18. **But dry eye can also result from disruption of the blinking reflex, medications such as antihistamines, decongestants, and heart medications, vitamin A deficiency, and environmental factors** (sun, wind, smoke, and air conditioners). Even low humidity or high atmospheric pressures can produce dry eye in some individuals.

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