

Introduction

Although Part 4 is entitled *Anatomical Considerations*, it might just as easily be called *Potentially Adverse Effects of Contact Lens Wear*. In effect, this section will catalogue many of the potentially negative aspects of contact lens wear. However, with diligence on the part of the fitter and compliance on the part of the patient, many of these adverse effects can be greatly minimized if not virtually eliminated. Proper patient selection, well-fit lenses, and adequate follow-up will usually result in healthy corneas and satisfied patients. However, lack of concern, laziness, or simple negligence on the part of either the fitter or the patient can often cause the sort of problems we're about to study. Detecting many of these conditions will often require considerable clinical experience, and treating them should always be left to the prescribing practitioner.

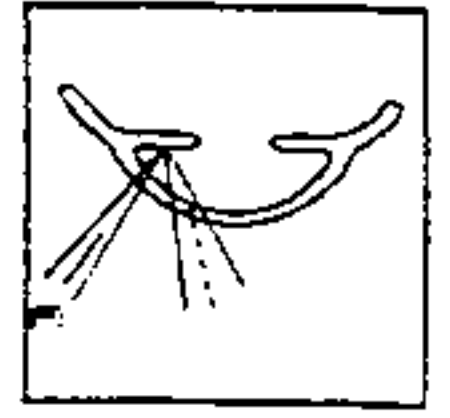
The section begins with a review of certain anatomical structures which effect the contact lens fitter. These include the tear film, eyelids, conjunctiva, cornea, and limbus. It is followed by a presentation of some of the potentially adverse effects of contact lens wear which include corneal edema, corneal striae, conjunctival and episcleral injection, giant papillary conjunctivitis, and corneal vascularization.

Flourescein, in addition to its value in helping to evaluate the fit of a contact lens, is also used to facilitate the precise delineation of specific corneal epithelial defects. It acts either by pooling in the area of the defect or by staining the underlying exposed basement membrane or Bowman's layer. Corneal epithelial staining patterns could possibly be caused by direct trauma or by defective distribution of the tear film. This section will illustrate staining patterns which might be caused by a poorly edged or damaged lens, or by improper insertion, removal and recentering techniques. We will also discuss staining which might be the result of defective tear distribution such as "three and nine-o-clock" staining, or limbal peripheral staining.

This section will conclude with a discussion of the biomicroscope or slit-lamp and will emphasize the importance of this instrument in contact lens fitting. The various illuminations are discussed, illustrated, and the uses of each are described.

The practice test consists of twenty-nine questions. As a reminder, be sure to study the material as thoroughly as possible before completing the test.

4: Anatomical Considerations



Anatomy Review



The taped discussion for Part 4 can be found on Tape 5, side 2. Simply follow along in the workbook as you listen to the tape for the first time. Then go over the material again to study it in more detail.

Anatomical & Physiological Considerations

Successful adaptation to any contact lens, either rigid or soft, is largely dependent upon the adequate wetting of both the lens and the cornea, and sufficient oxygen flow to the corneal epithelium. In addition, a stable and adequate tear film is required as well as some means of removing metabolic by products from the cornea. When there is an adequate tear volume, these requirements can be met with the eyelids.

The health of the anterior surface of the eye is largely dependent upon the balanced interaction of several of its components. These include the eyelids, cornea, conjunctiva, sclera, and tear film. A contact lens on the eye can impose additional burdens to this system. If any one of the components are in some way altered, it can interfere with successful contact lens wear.

Tear Film—Three Layers

Lipid Layer: A fatty material produced by the meibomian glands which forms a very thin layer over the entire surface of the tear film. It functions primarily to prevent rapid evaporation which would result in dry areas on the cornea and subsequent discomfort and corneal damage.

The Mucoid Layer functions to convert the hydrophobic epithelial layer of the cornea to a hydrophilic surface. It is the innermost layer of the tear film and located immediately against the corneal and conjunctival epithelial cells.

BUT or Break Up Time, indicates the amount of time it takes from a blink until the tear begins to break up or becomes discontinuous. BUT's shorter than 5-10 seconds are considered abnormal. Short BUTs may indicate a deficiency in the mucoid layer.

The Aqueous Layer is the middle layer of the tear film and consists of 98% water. However, it also contains ions, and other molecules such as sodium and potassium along with a concentration of protein.

A cornea is said to be *hypotonic* when more water flows in than out causing the cornea to swell. This occurs when normal evaporation is not allowed to occur. An isotonic cornea allows an equal amount of water to flow in as well as out allowing the cornea to maintain its normal thickness.

