THE CORNEA AND SCLERA

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات البصريات

المرحلة الثانية

فسلجة العين

Lec 2
نظري

Lecture
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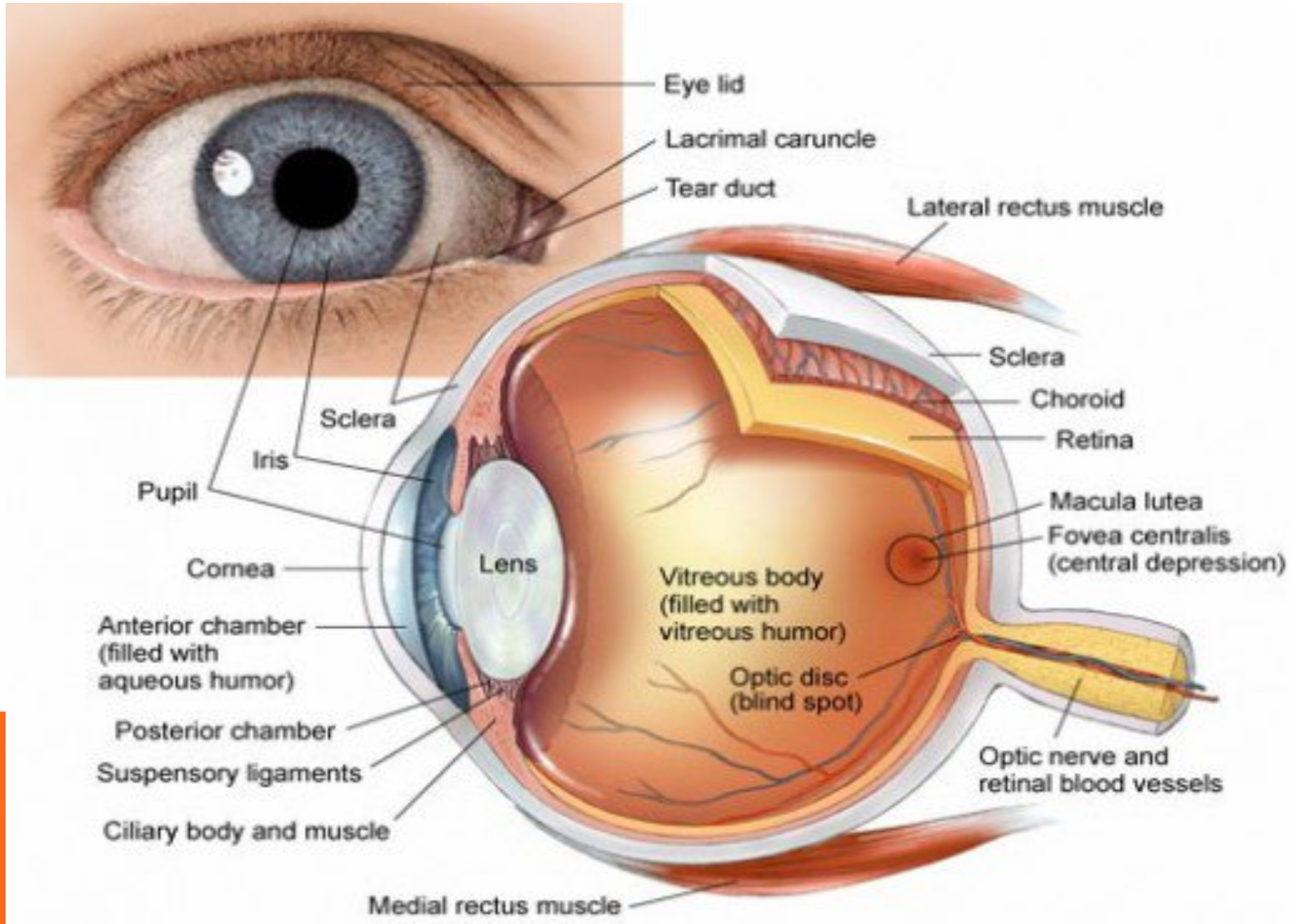

Eye lid
Lacrimal caruncle
Tear duct
Lateral rectus muscle
Sclera
Choroid
Retina
Macula lutea
Fovea centralis
(central depression)
Sclera
Iris
Pupil
Cornea
Lens
Vitreous body
(filled with
vitreous humor)
Anterior chamber
(filled with
aqueous humor)
Optic disc
(blind spot)
Posterior chamber
Suspensory ligaments
Optic nerve and
retinal blood vessels
Ciliary body and muscle
Medial rectus muscle

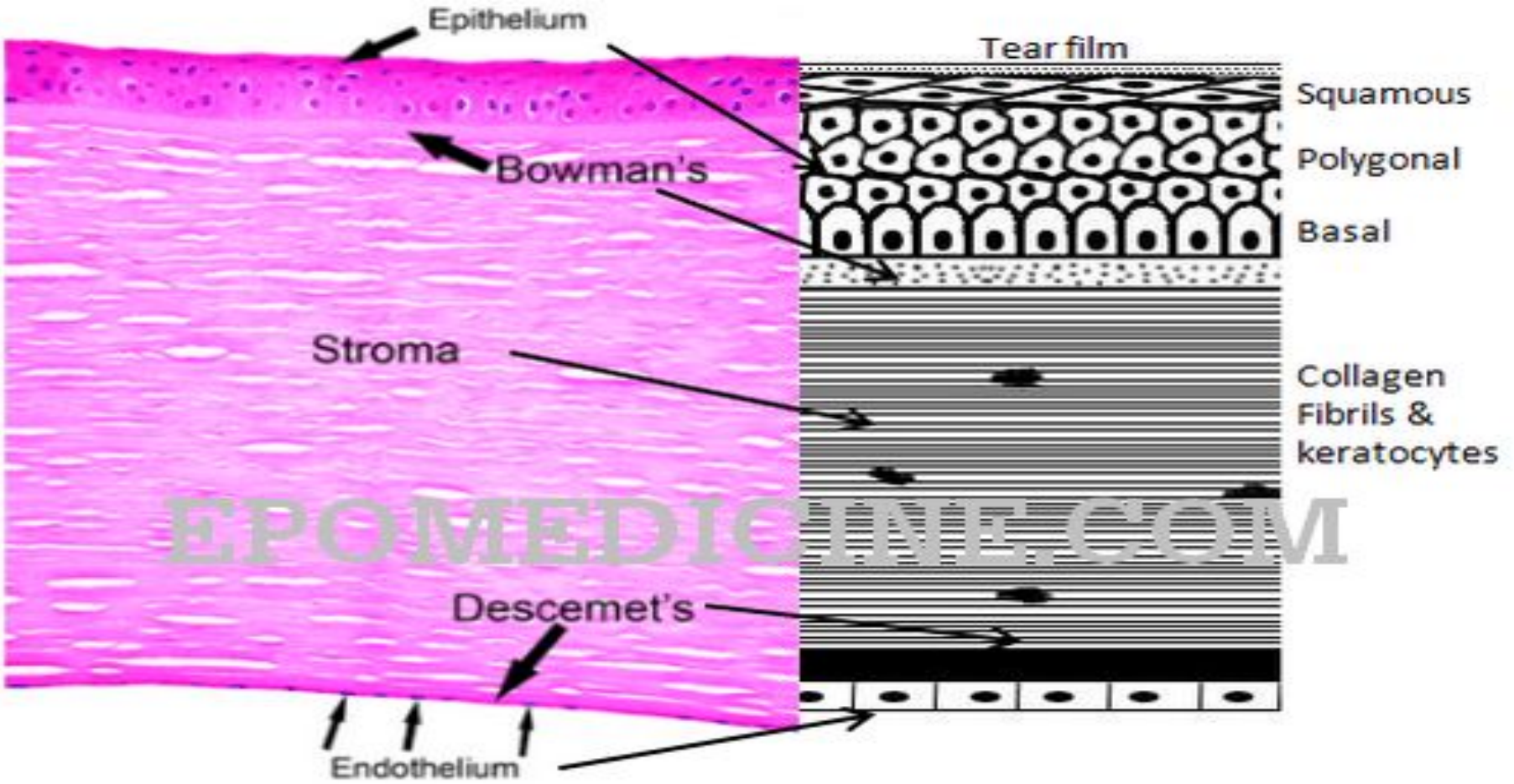
Cornea:

Anatomy and physiology

The cornea acts as a clear refractive surface and a protective barrier to infection and trauma. Its anterior surface is elliptical (11.7mm horizontally,10.6mm vertically), whereas its posterior surface is circular (11.7mm). It is **thinnest centrally** (around 535 microns)1 and **thickest in the periphery** (660 microns).

ANATOMY

The cornea has five layers:



The cornea has five layers:

1)Epithelium
2)Bowman’s membrane
3)Stroma
4)Descemet’s Membrane
5)Endothelium

1)Epithelium

The epithelium is the cornea's outermost layer. Its primary functions are to: block the passage into the eye of foreign material, such as dust, water, and bacteria and provide a smooth surface to absorb oxygen and nutrients from tears, which are then distributed to the other layers of the cornea. The epithelium is filled with thousands of tiny nerve endings.

2)Bowman’s membrane

The next layer behind the basement membrane of the epithelium is a transparent film of tissue called Bowman’s layer, composed of protein fibers called collagen provides structural support. If injured, Bowman’s layer can form a scar as it heals. If these scars are large and centrally located, they may cause vision loss.

3)Stroma

Behind Bowman's layer is the stroma, which is the thickest layer of the cornea. It is composed primarily of water and collagen. Collagen gives the cornea its strength, elasticity, and form. The unique shape, arrangement, and spacing of collagen proteins are essential in producing the cornea's light-conducting transparency.

4)Descemet's Membrane

Behind the stroma is Descemet's membrane, a thin but strong film of tissue that serves as a protective barrier against infection and injuries. Descemet's membrane is composed of collagen fibers that are different from those of the stroma, and are made by cells in the endothelial layer of the cornea (see above). Descemet's membrane repairs itself easily after injury.

5)Endothelium The endothelium is the thin, innermost layer of the cornea. Endothelial cells are important in keeping the cornea clear. Normally, fluid leaks slowly from inside the eye into the stroma.

The endothelium's primary task is to pump this excess fluid out of the stroma. Without this pumping action, the stroma would swell with water and become thick and opaque.

Q/Enumerate the layers of cornea? and mention the function of Descemet's Membrane

Important functions of cornea in the eye include

1. protecting the structures inside the eye .
2. contributing to the refractive power of the eye .
3. focusing light rays on the retina with minimum scatter and optical degradation

Q/Mention the functions of cornea in the eye?

summary

Layers of the Cornea (from outermost to innermost):

1. Epithelium:
The outermost layer; protects the eye and absorbs oxygen and nutrients.
2. Bowman's Layer:
A tough, acellular layer that provides structural support.

3. Stroma:
The thickest layer; made of collagen and gives the cornea its strength and transparency.
4. Descemet's Membrane:
A thin but strong layer that acts as the basement membrane for the endothelium.
5. Endothelium:
The innermost layer; maintains corneal dehydration to keep it clear by pumping excess fluid out

Thank you