

I. The Eye and Vision (pp. 548–569; Figs. 15.1–15.20)

A. Vision is our dominant sense; 70% of our body's sensory receptors are found in the eye (p. 548).
Two types of receptors are: general vs special

B. Accessory Structures of the Eye (pp. 548–551; Figs. 15.1– 15.3)

1. **Eyebrows** are short, coarse hairs overlying the supraorbital margins of the eye that shade the eyes and keep perspiration out.

2. **Eyelids** (palpebrae), eyelashes, and their associated glands help to protect the eye from physical danger as well as from drying out.

3. **Conjunctiva** is a transparent mucous membrane that lines the eyelids and the whites of the eyes. It produces a lubricating mucus that prevents the eye from drying out.

4. The **lacrimal gland**, which secretes a dilute saline solution that cleanses and protects the eye as it moistens it, and ducts that drain excess fluid into the nasolacrimal duct.

5. The movement of each eyeball is controlled by six **extrinsic eye muscles**

C. Structure of the Eyeball (pp. 551–556; Figs. 15.4–15.9) 1. Three layers form the wall of the eyeball.

a. **The fibrous tunic** is the outermost coat of the eye and is made of a dense avascular connective tissue with two regions: the sclera and the cornea.

b. **The vascular tunic** (uvea) is the middle layer and has three regions: the choroid, the ciliary body, and the iris.

c. **The inner layer** (retina) is the innermost layer made up of two layers: the outer pigmented layer absorbs light; the inner neural layer contains millions of photoreceptors (rods and cones) that transduce light energy.

*Photoreception is the process by which the eye detects light energy.

Photoreceptors are modified neurons that structurally resemble tall epithelial cells. **Rods** are highly sensitive and are best suited to **night vision**. Cones are less sensitive to light and are best adapted to bright light and color vision.

2. **Internal Chambers and Fluids** a. The posterior segment (cavity) is filled with a clear gel called **vitreous humor** that transmits light, supports the posterior surface of the lens, holds the retina firmly against the pigmented layer, and contributes to intraocular pressure.

b. The anterior segment (cavity) is filled with **aqueous humor** that supplies nutrients and oxygen to the lens and cornea while carrying away wastes.3. **The lens** is an avascular, biconcave, transparent, flexible structure that can change shape to allow precise focusing of light on the retina.

D. Light and Optics a. The **far point of vision is that distance beyond which no change in lens shape** is required (about

6 meters or **20 feet**). b. Focusing for close vision demands that the eye

make three adjustments: accommodation of the lens, constriction of the pupils, and convergence of the eyeballs.

c. **Myopia**, or nearsightedness, occurs when objects focus in front of the retina and results in seeing close objects without a problem but distant objects are blurred.

d. **Hyperopia**, or farsightedness, occurs when objects are focused behind the retina and results in seeing distant objects clearly but close objects are blurred.

Know the homeostatic imbalances for the accessory structures and parts of the eye

Focus more on the powerpoint presentation to succeed on the test