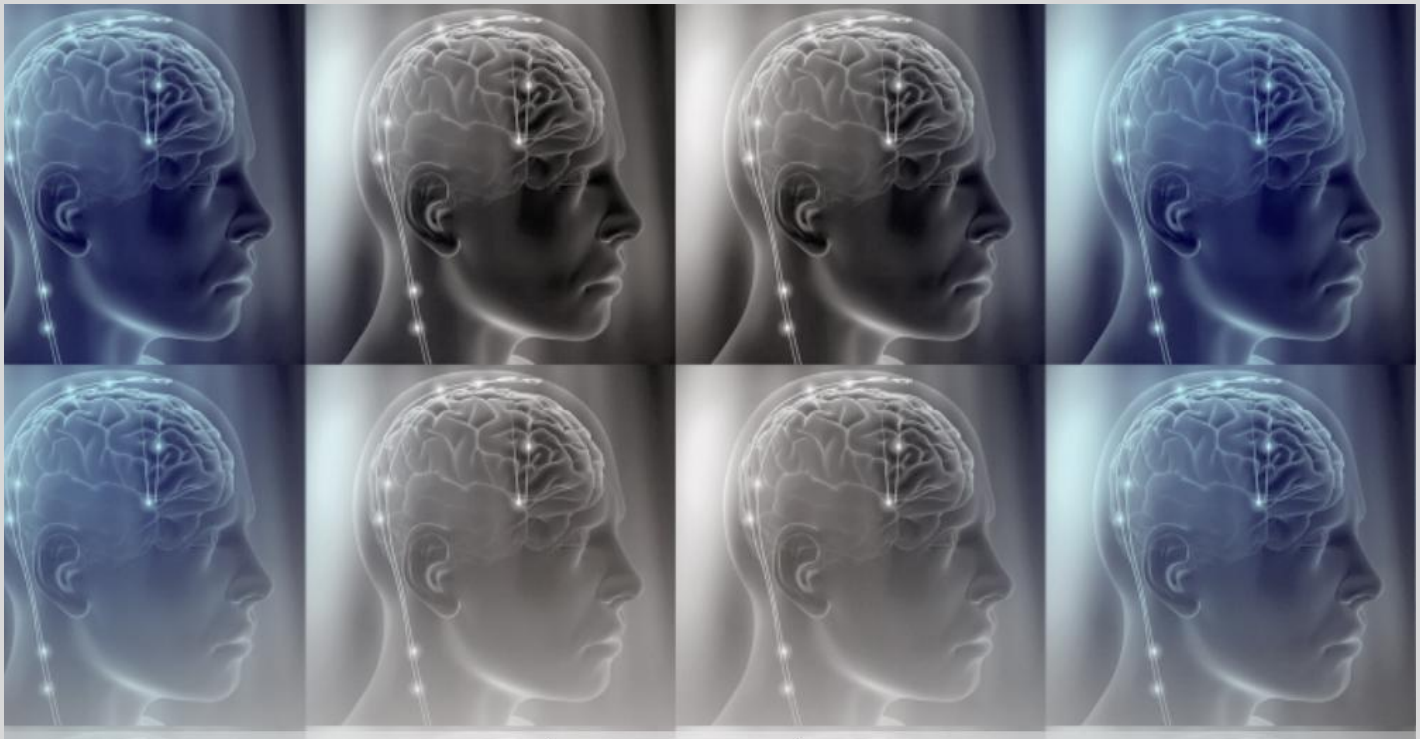

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CNS Central Nervous System

Block

Physiology Team

	Female Side	Male side
Done By :	Ghaida Al-Sugair	Mohammed Asiri
Revised By:	Sara Alanazy	

CNS Central Nervous System

Block

Slide No.(1)

Team Notes :

CNS central Nervous System

Block

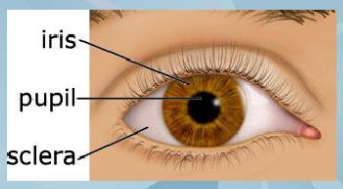
Slide No.(2)

- **Anatomy of the eye:**

1- Sclera (for protection- spherical appearance)-

-choroids inside sclera (BV to supply retina with blood)

- post 2/3 of choroid has retina innermost layer



Team Notes :

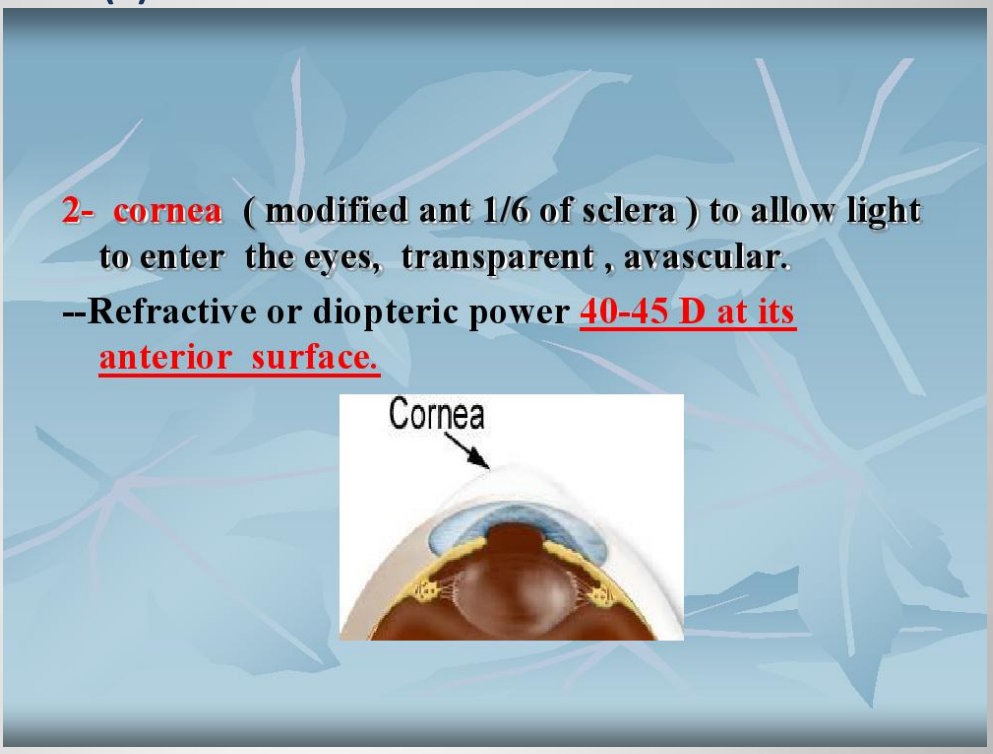
Choroid :

vascular layer of the eye, containing connective tissue, and lying **between the retina and the sclera.**

CNS Central Nervous System

Block

Slide No.(3)



Team Notes :

(Additional info) :

Cornea receives nutrients via diffusion from the tear fluid through the outside surface and the aqueous humour through the inside surface, and also from neurotrophins supplied by nerve fibers that innervate it.

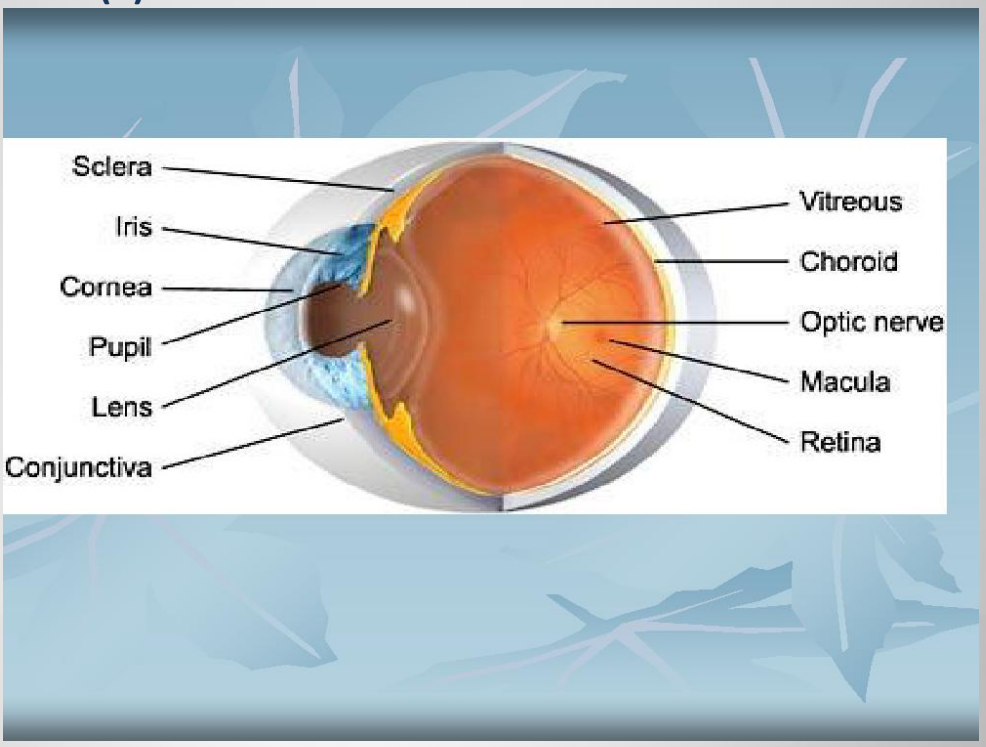
diopteric power 40-45 D

Diopter, is a unit of measurement of the optical power of a lens
(or) the refractive (light bending) capacity of a lens.

CNS central Nervous System

Block

Slide No.(4)



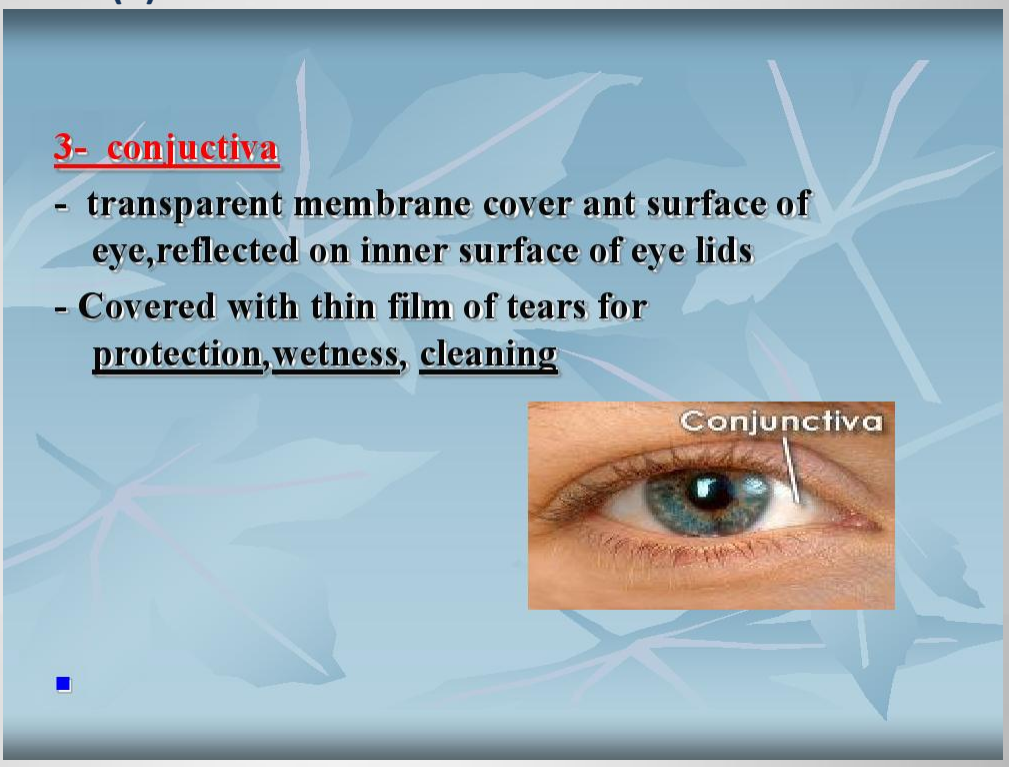
Team Notes :

Nothing else was mentioned about this slide

CNS Central Nervous System

Block

Slide No.(5)



Team Notes :

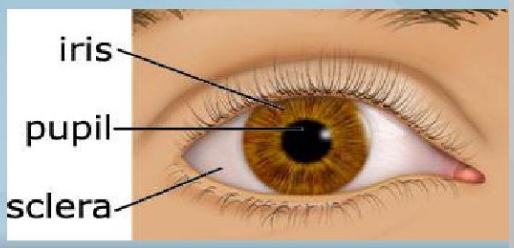
Conjunctiva helps lubricate the eye by producing mucus and tears, although a smaller volume of tears than the lacrimal gland. It also contributes to immune system and helps to prevent the entrance of microbes into the eye

CNS Central Nervous System

Block

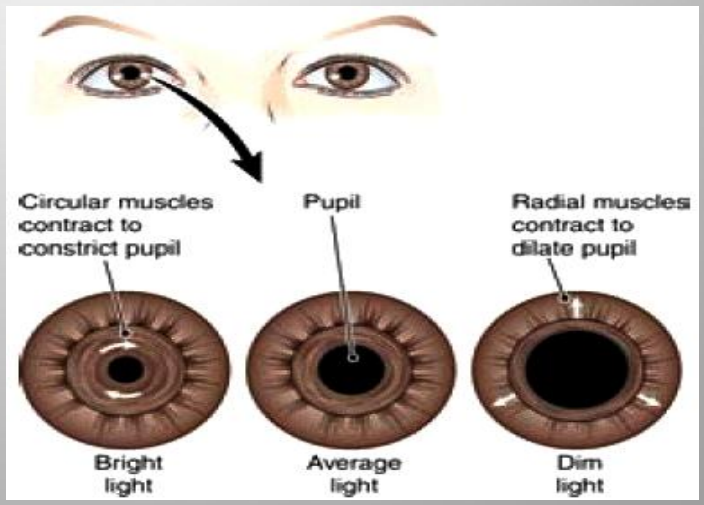
Slide No.(6)

- 4- pupil / behind center of cornea, allow light to enter the eye
- 5- Iris colored part (radial muscle dilates the pupil (by sympathetic) + circular muscles constrict the pupil (by parasympathetic).



Team Notes :

Iris Muscles:



Circular muscles → contract to constrict pupil **(by parasympathetic)** → **Miosis**

Radial muscles → contract to enlarge pupil **(by sympathetic)** → **Mydriasis**

CNS central Nervous System

Block

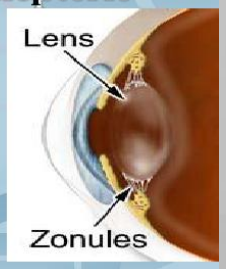
Slide No.(7)

6-cilliary muscles (body)
thick ant part of choroid to which attached suspensory ligaments (zonule)

7- lens (transparent, biconvex, semisolid, diopteric power 15-20 D, held in place by zonule (lens ligament) attached to ant part of cilliary body (choroid)

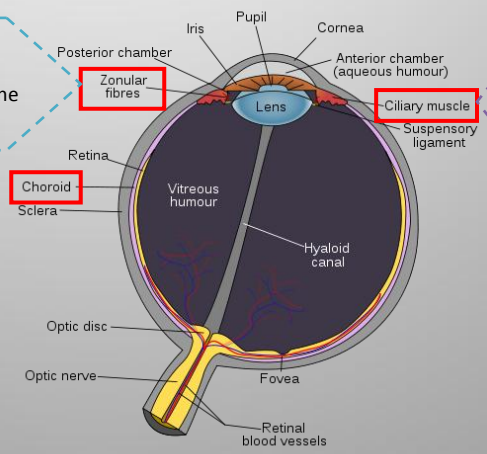
Q.what is cataract?

8- Uvea = choroid + iris + cilliary muscles



Team Notes :

Ring of fibrous strands connecting the ciliary body with the crystalline lens of the eye.

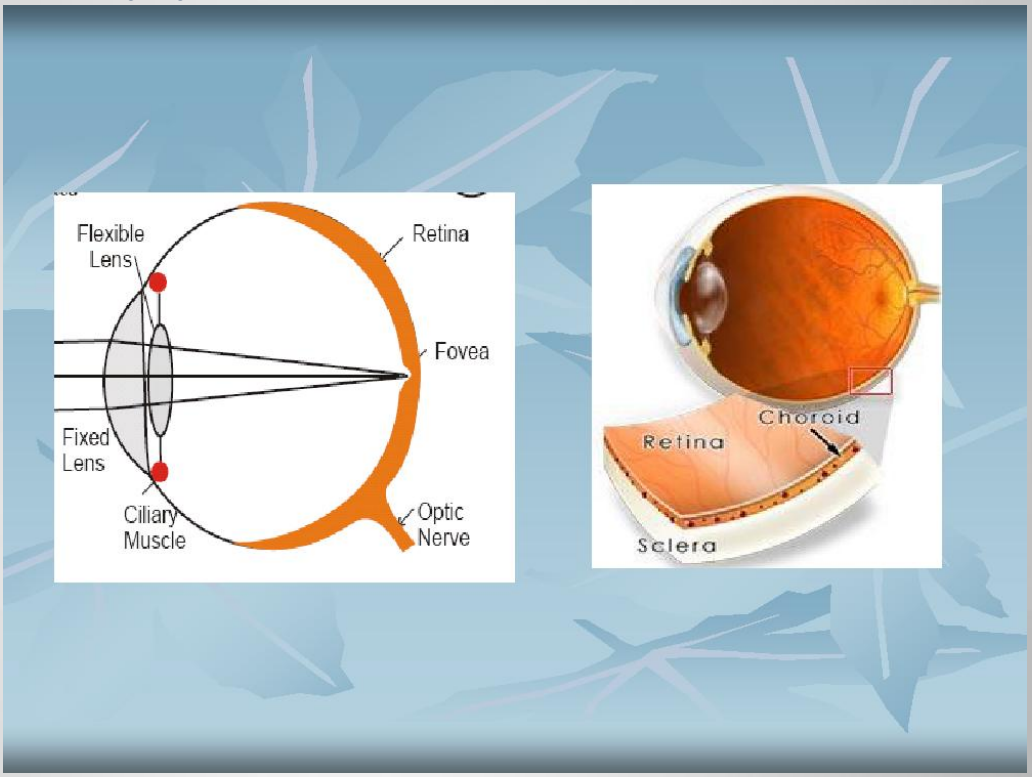


controls accommodation for viewing objects by changing the shape of the **lens**, and regulates the flow of aqueous humour.

CNS Central Nervous System

Block

Slide No.(8)



Team Notes :

A **cataract** is a clouding that develops in the crystalline lens of the eye or in its envelope (lens capsule).

Several factors can promote the formation of cataracts, including long-term exposure to ultraviolet light, exposure to ionizing radiation, secondary effects of diseases such as diabetes, hypertension and advanced age, or trauma (possibly much earlier); they are usually a result of denaturation of lens protein.

CNS Central Nervous System

Block

Slide No.(9)

-Anterior chamber of the eye /

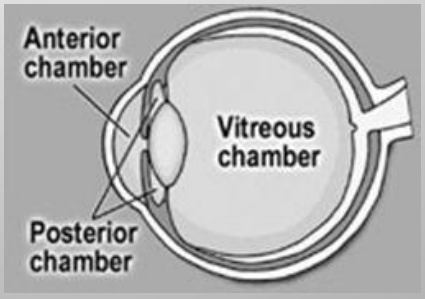
…between iris & cornea.

-posterior chamber of the eye /

….between iris & cilliary muscles

- Iris between both

Team Notes :



CNS Central Nervous System

Block

Slide No.(10)

Refractive media of the eye:-

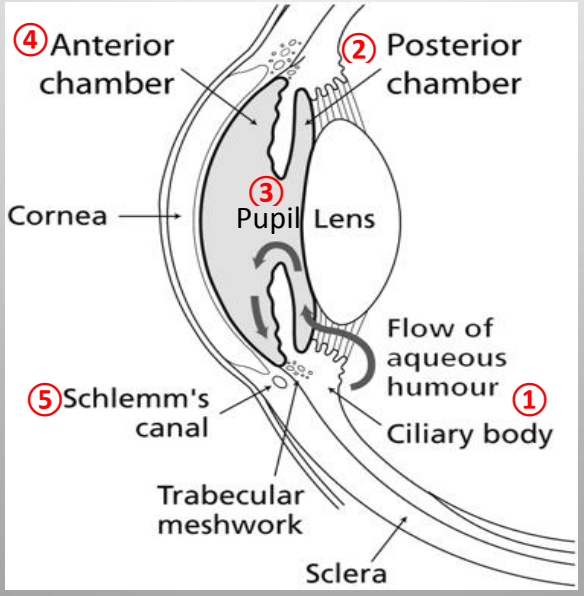
1-Cornea (greatest refraction of light)
-diopteric power 40-45 D at ant surface
-(2/3 refractive power of eye)

2-Aquous humour

--(fluid produced by cilliary body ---to post chamber-----to pupil---to ant chamber----to canal of schlemm at angle of ant chamber---to veins

- **Function//**
- **-nourishing retina & other eye structures**
- **-causes intraocular pressure 10-20mm Hg**

Team Notes :

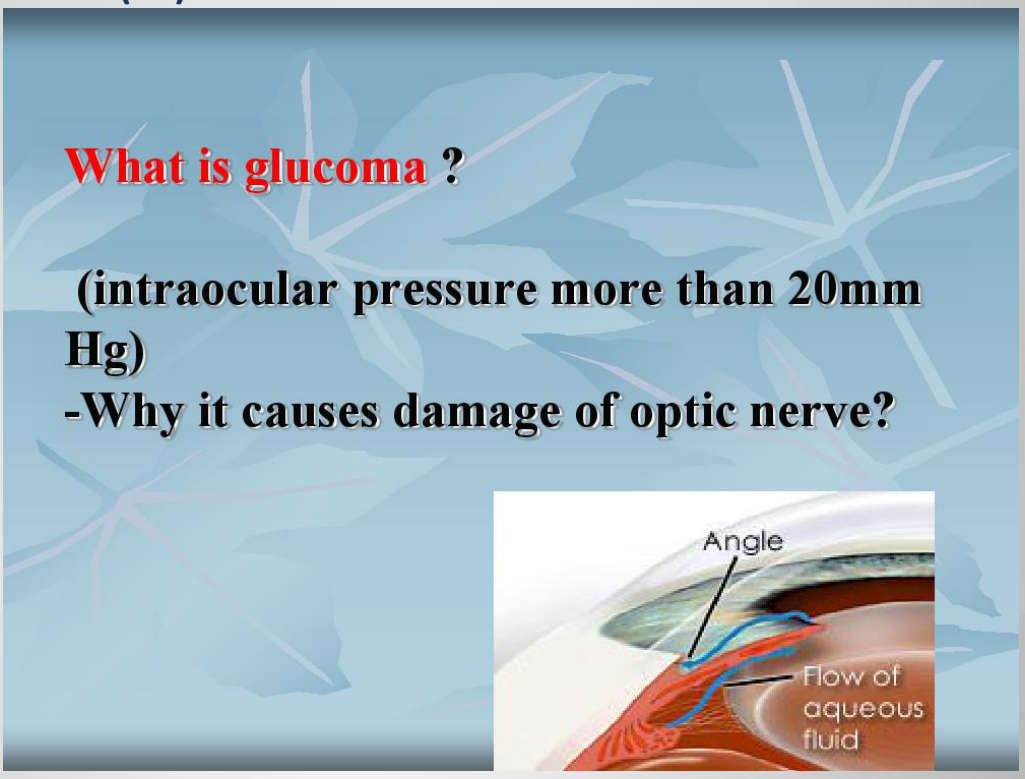


Aqueous Humour Circulation

CNS Central Nervous System

Block

Slide No.(11)



Team Notes :

Elevated intraocular pressure could result from either an excessive production of aqueous humor from the ciliary body or an obstruction of aqueous humor outflow through the chamber angle (trabecular meshwork).

A change in IOP is related to a change in the eye wall stress. Additionally, at the scleral canal the relative stress is concentrated. Therefore, an elevation of IOP could compress the tissues of the optic nerve.

CNS central Nervous System

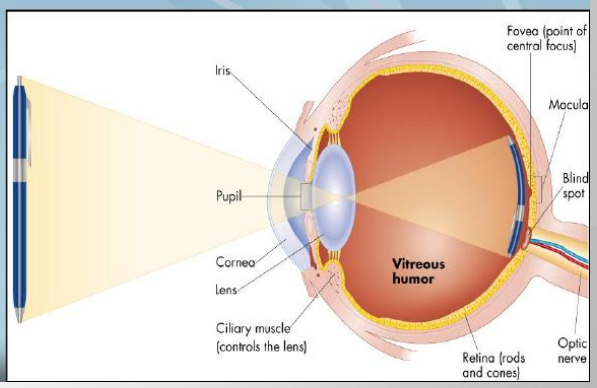
Block

Slide No.(12)

3-lens:- diopteric power 15-20 D

-(1/3 refractive power of eye) , more important than cornea. why?

4-Vitrous humour (between retina & lens for nourishing retina & keep spheroid shape of the eye)



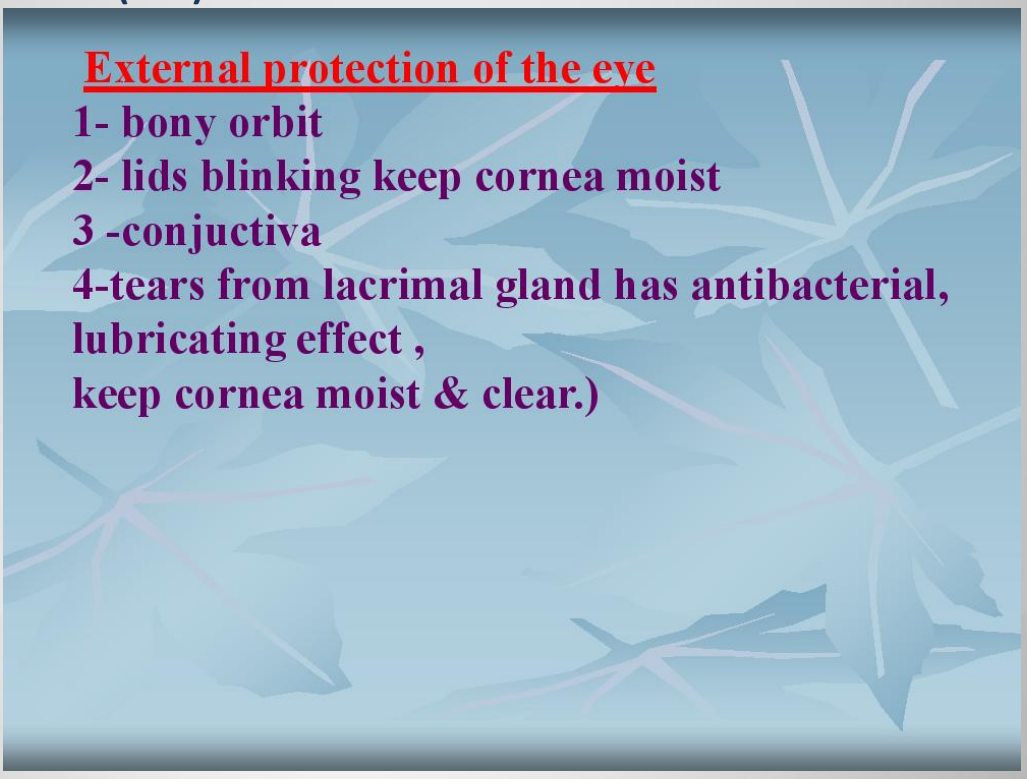
Team Notes :

Dioptric power of lens more important than cornea because lens is flexible and able to change its dioptric power (it could reach 40- 45 D) by changing its curvature which controlled by ciliary muscles through the zonules (accommodation).

CNS Central Nervous System

Block

Slide No.(13)



Team Notes :

(additional info.) :

Mainly tears are composed of Water, Salts, Antibodies, & **lysozyme.**

Emotional tears are composed of more protein based hormones, such as prolactin, andrenocorticotropic, and leucine enkephalin (a natural pain killer), which is why crying from emotion often makes you feel better.

CNS Central Nervous System

Block

Slide No.(14)

RETINA

1-Photoreceptors (RODS + CONES)

2-OPTIC DISC (blind spot. Why?)

- 3mm medial & above post pole of eye
- optic nerve leave & retinal bld vessles enter + no photoreceptors)

3-FOVEA CENTRALIS :-depression in macula lutea - yellow pigmented spot at post pole of eye + only cones + high visual acuity + for colors vision & details detection

Team Notes :

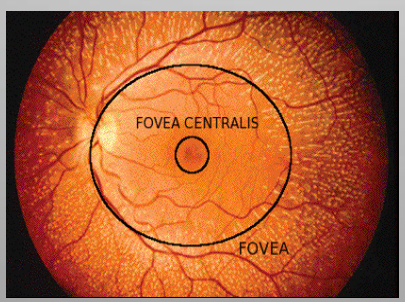
Types of Photoreceptors:

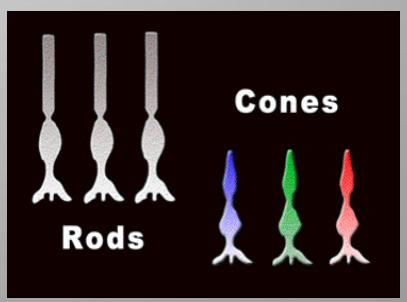
1. Rods

Rods are responsible of the **peripheral vision** and are outside the central part of the retina.

2. Cons:

Cones provide the **eye's visual acuity and Color sensitivity** and they are much more concentrated in the central yellow spot known as the macula.

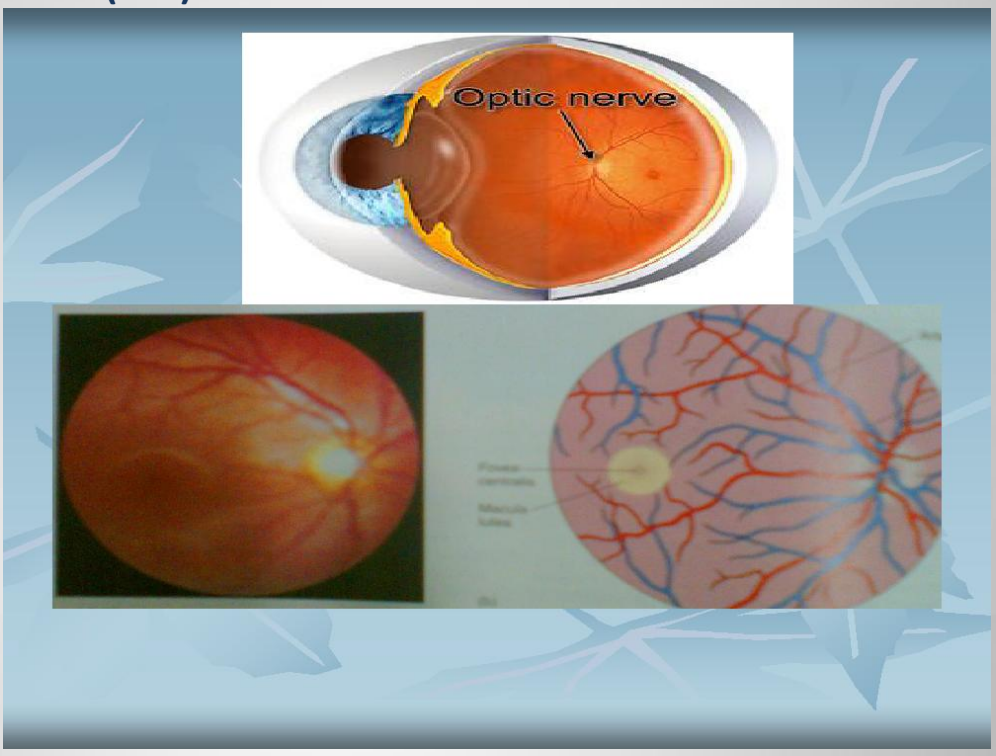




CNS central Nervous System

Block

Slide No.(15)



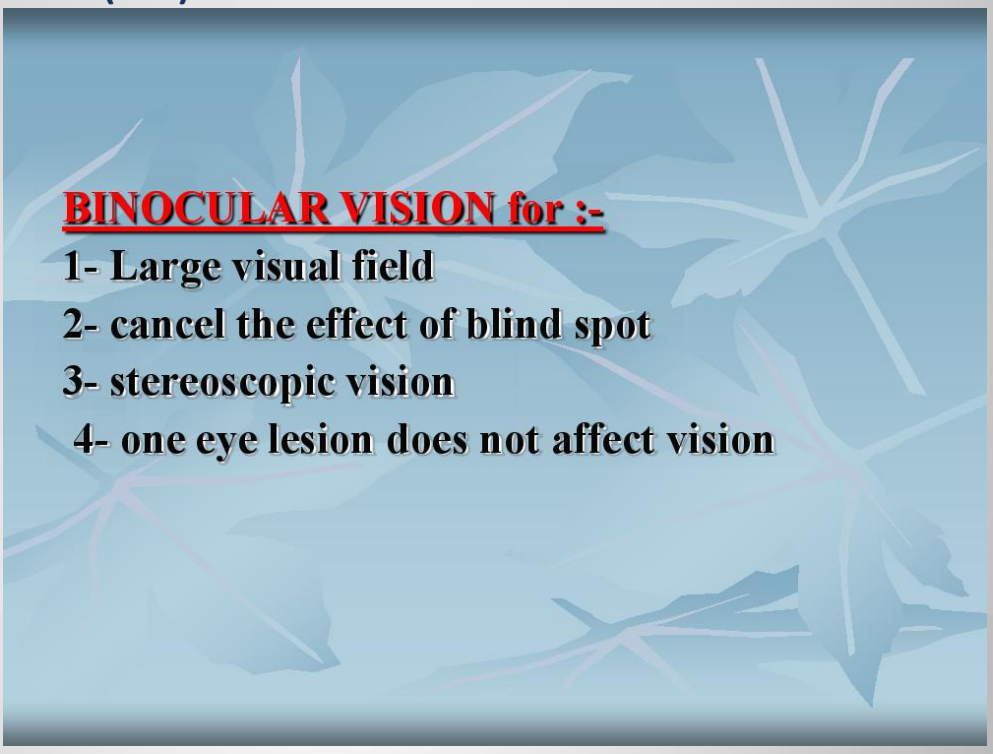
Team Notes :

Diabetic retinopathy is an eye condition that affects people with diabetes who have high blood sugar over a prolonged period of time. Too much blood sugar can destroy the blood vessels in the back of the eye, causing damage to the retina. Without the retina, the eye cannot communicate with the brain, making vision impossible. In the early stages of diabetic retinopathy these blood vessels leak fluid and distort sight. In the more advanced stage of diabetic retinopathy fragile new blood vessels grow around the retina. If left untreated, these blood vessels may bleed, clouding vision or scar detaching the retina.

CNS Central Nervous System

Block

Slide No.(16)



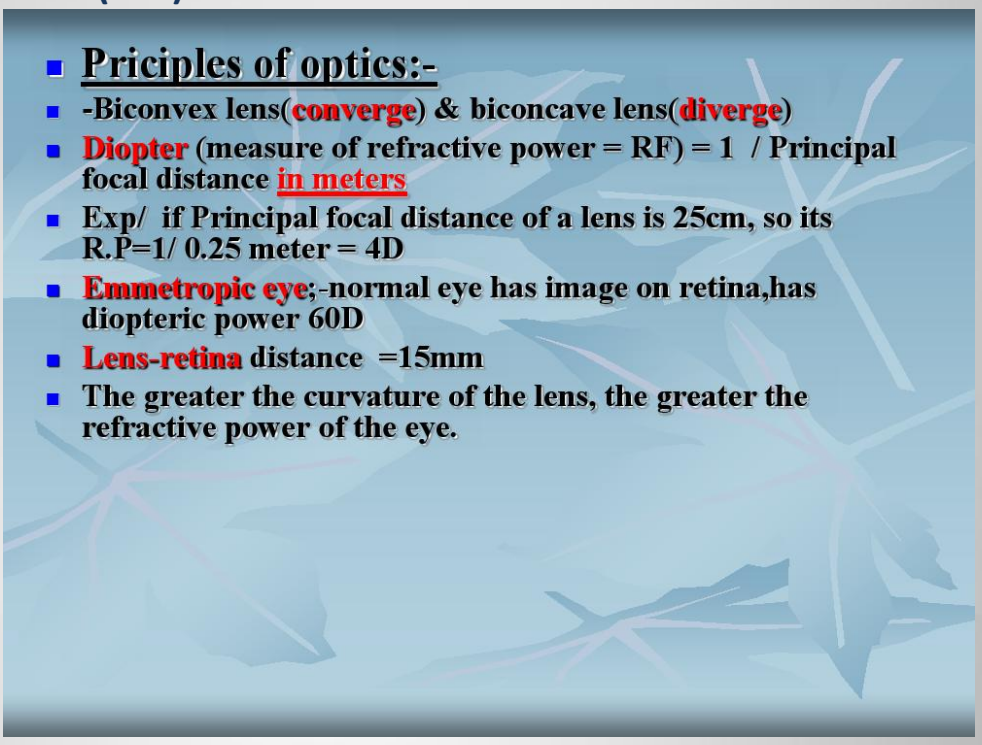
Team Notes :

Stereoscopic vision: seeing an object with two eyes at the same time, with both eyes set in the same plane.

CNS central Nervous System

Block

Slide No.(17)



Team Notes :

Meters = ***centimeter(s)/100***

Cornea ……40-45 D

Lens …… 15-20 D

Accomodation …. +14 D (according to age)

CNS Central Nervous System

Block

Slide No.(18)

- **Errors of refraction:-**
- **1-Hypermetropia (hyperopia = farsightedness)**
- **(small eyeball, focus behind retina,**
- **Headache & blurred vision**
- **-continuous accomodation to bring image on retina —muscular effort--- cause headache, prolonged covergence by accomodation-----squint**
- **correction by biconvex lens**
- **2-Myopia(nearsightedness)**
- **(genetic, large eye ball, long anteroposterior diameter, or extensive close work as in studying---- -cause focus in front of retina**
- **correction by biconcave lens to diverge rays before strike lens**

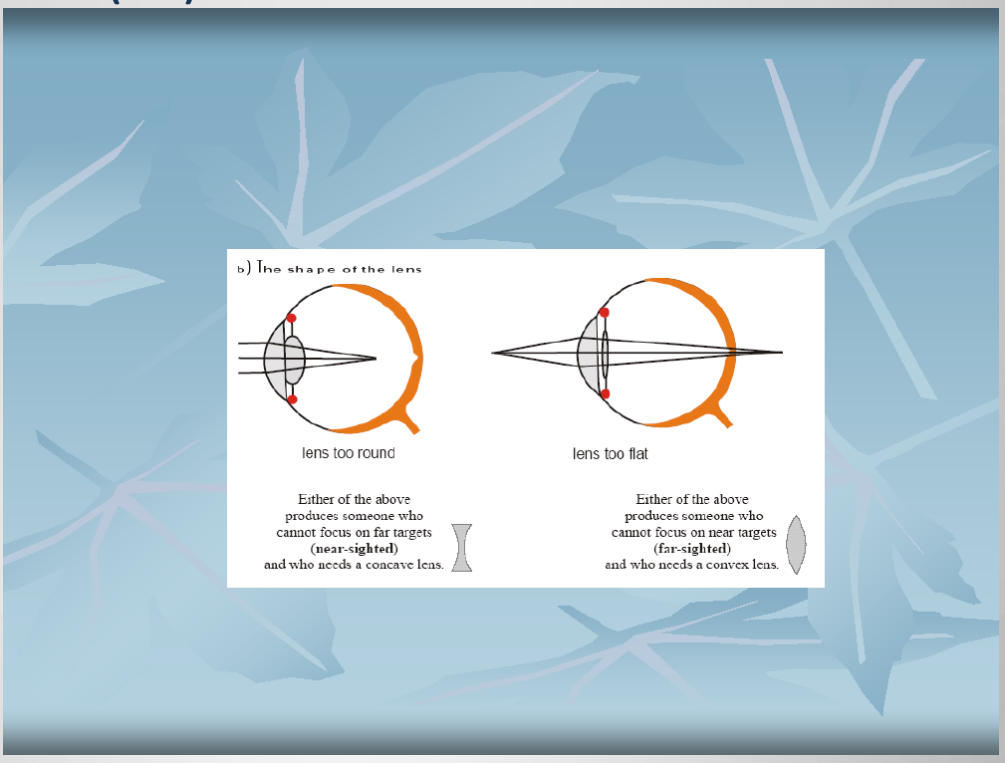
Team Notes :

Nothing else was mentioned about this slide

CNS Central Nervous System

Block

Slide No.(19)



Team Notes :

Nothing else was mentioned about this slide

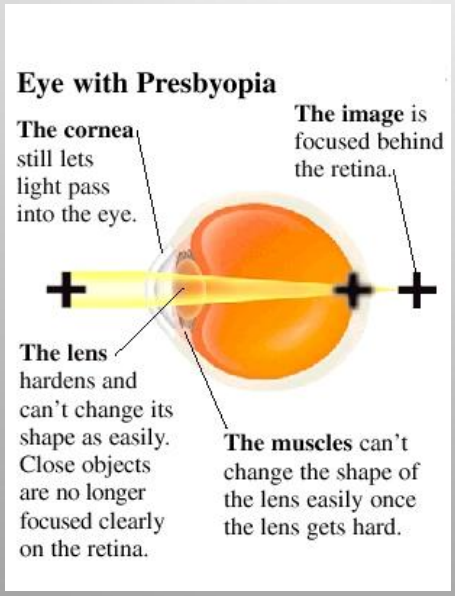
CNS Central Nervous System

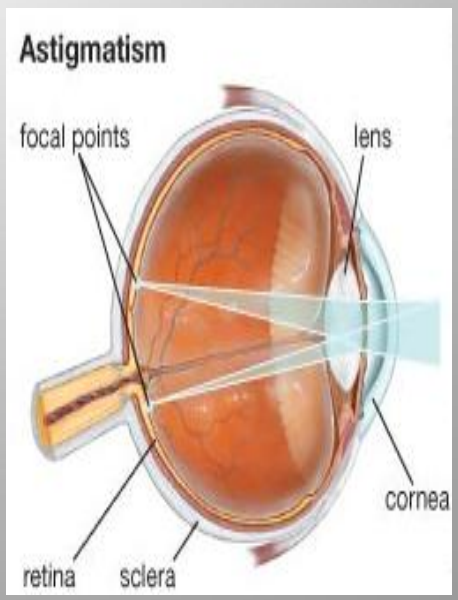
Block

Slide No.(20)

- **3-Presbyopia** (eye near point receeds by age due to loss of accomodation
- - correction by biconvex lens
- **4-Astigmatism** (uneven & ununiform corneal curvature
- -rays refracted to different focus>>>>>>> blurred vision
- -correction by cylindrical lens

Team Notes :





CNS Central Nervous System

Block

Slide No.(21)

Team Notes :

Nothing else was mentioned about this slide

CNS Central Nervous System

Block

Slide No.(22)

- **LAYERS OF RETINA (10 layers), the most important are :-**
- **1-pigment cell layer (vit A) (outermost layer) .what is its value?**
- **(absorb light &prevent its reflection back)**
- **2- rodes & cones (their outer& inner segments), but not cell bodies(rodes 120 million & cones 6 million) - describe their distribution.)**

Team Notes :

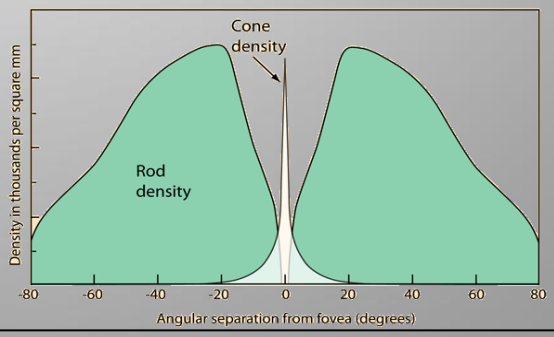
(additional info.)

Vitamin A :

is a vitamin that is needed by the retina of the eye in the form of a specific metabolite, the light-absorbing molecule retinal, that is necessary for both low-light and color vision. Vitamin A also functions in a very different role as an irreversibly oxidized form of retinol known as retinoic acid, which is an important hormone-like growth factor for epithelial and other cells.

Cones are concentrated in the fovea centralis.

Rods are absent there but dense elsewhere.



CNS Central Nervous System

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Slide No.(23)

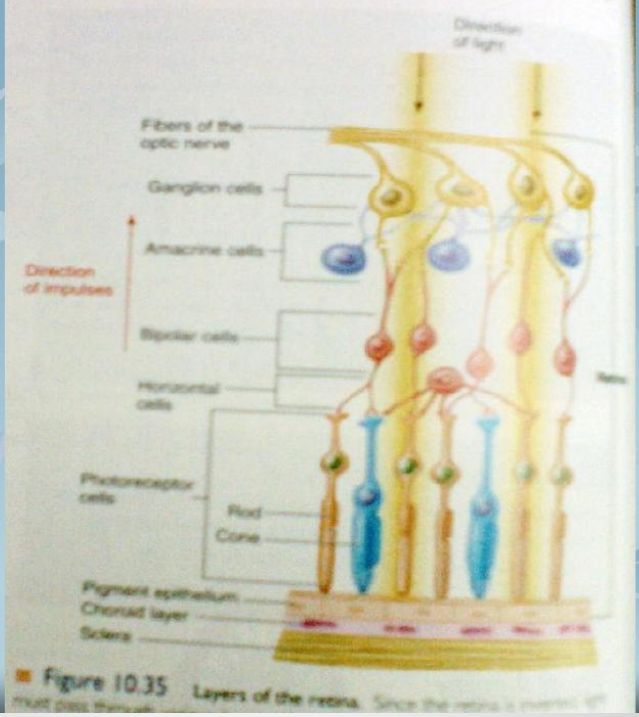
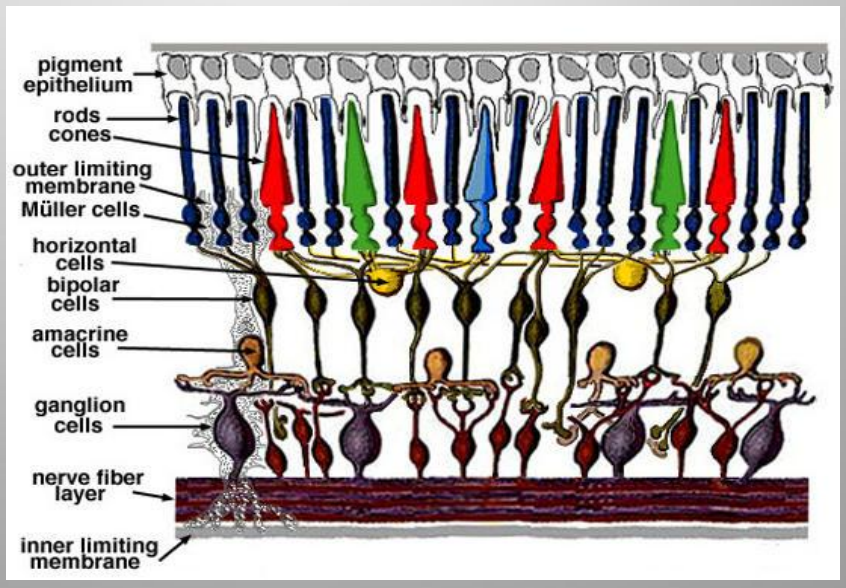


Figure 10.35 Layers of the retina.

Team Notes :



CNS Central Nervous System

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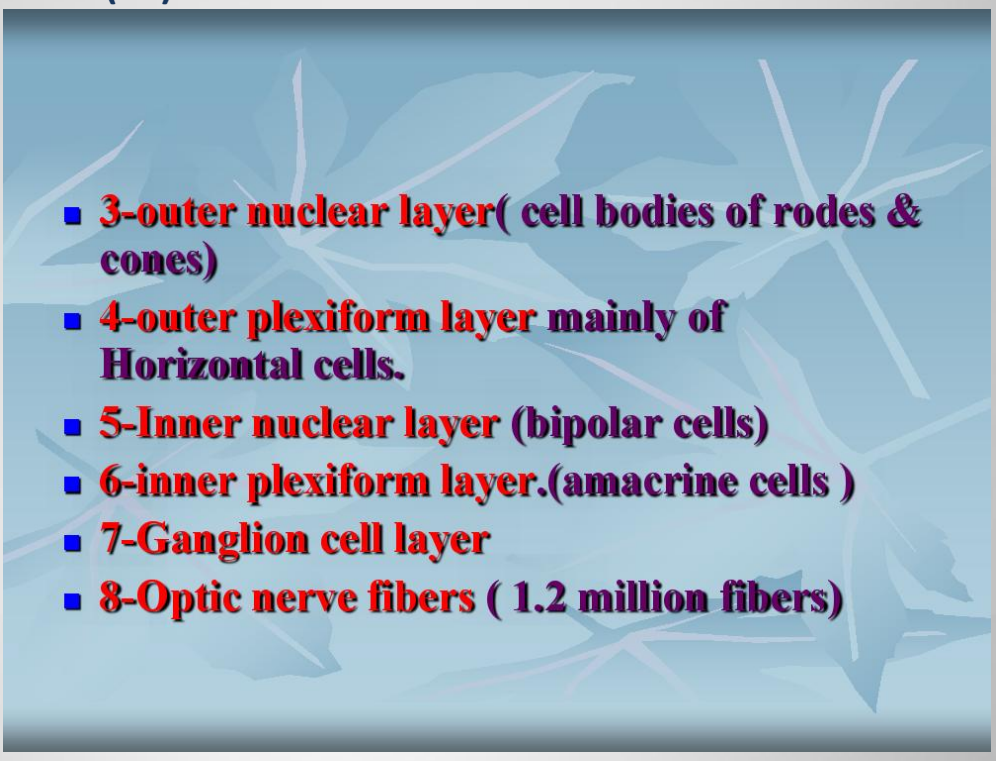
Slide No.(24)



Team Notes :

Nothing else was mentioned about this slide

CNS central Nervous System

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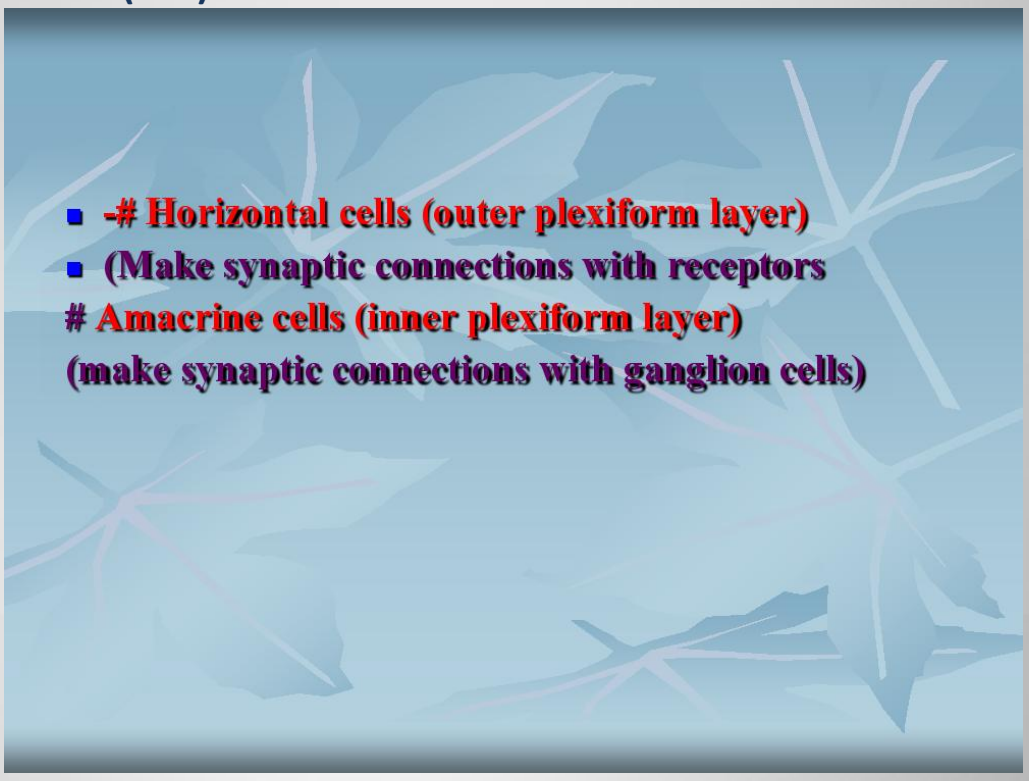
Slide No.(25)



Team Notes :

Nothing else was mentioned about this slide

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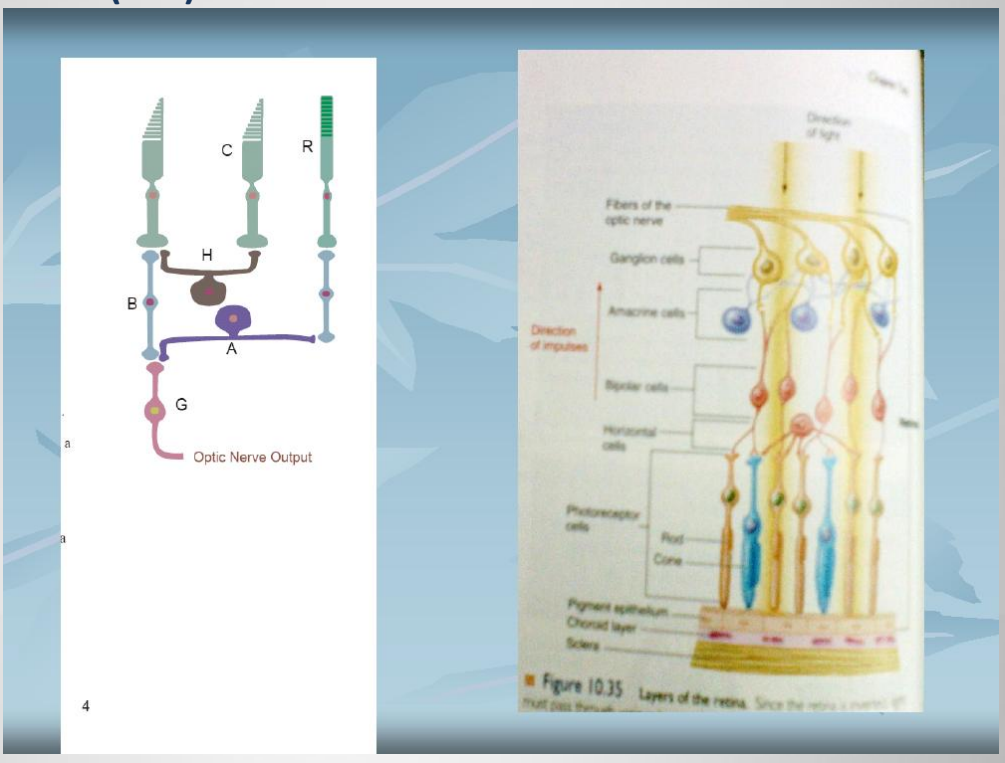

Team Notes :

Nothing else was mentioned about this slide

CNS Central Nervous System

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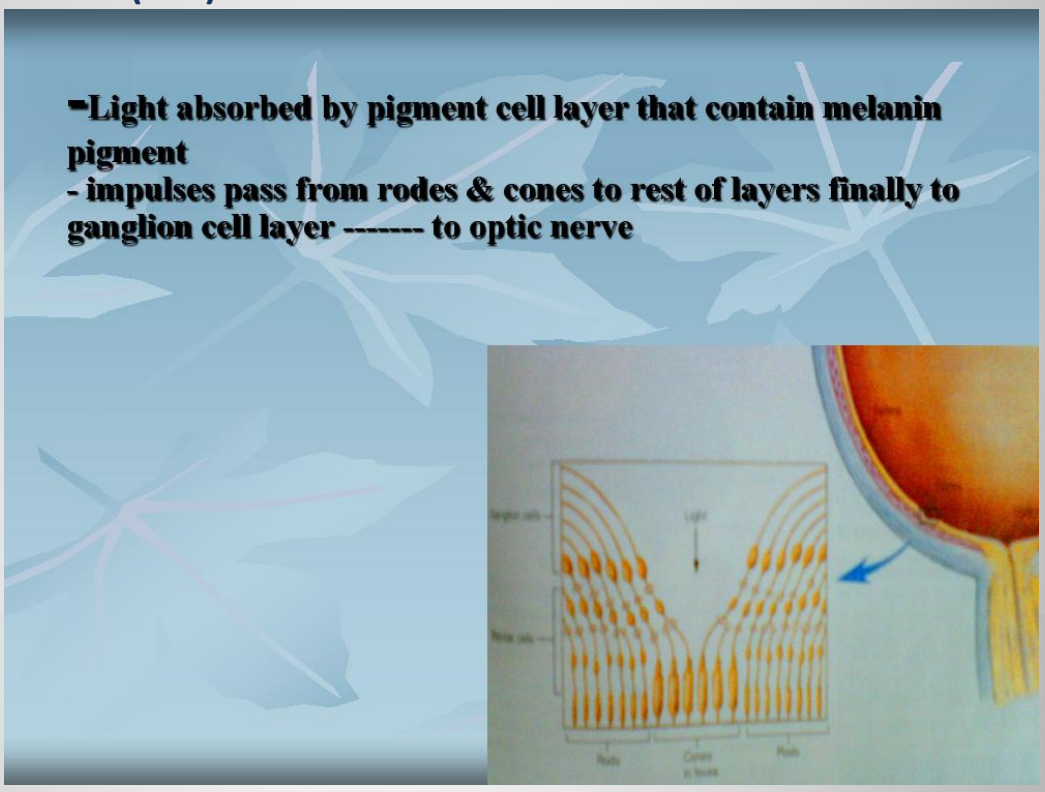

Team Notes :

Nothing else was mentioned about this slide

CNS Central Nervous System

Block

Questions:

1. Radial muscle of iris supplies by:
a. Sympathetic.
b. Parasympathetic.
c. Mixed.

2. Diopteric power of cornea =
a. 10-20 D
b. 0-10 D
c. 40-45 D

3.Calculate the refractive power of the lens if focal distance = 30 cm :
a. 4 D
b. 3.3 D
c. 6.2 D

4. All of the following structures are part of Uvea except:
a. Circular muscles.
b. Choroid.
c. Iris

5. Which retinal layer store vitamin A:
a. inner plexiform layer.
b. Rods and cones.
c. Pigment cell layer.

6. Myopia can be corrected by:
a. Biconcave lens.
b. Biconvex lens.
c. cylindrical lens.

Answers:

1= a
2= c
3= b
4= a
5= c
6= a