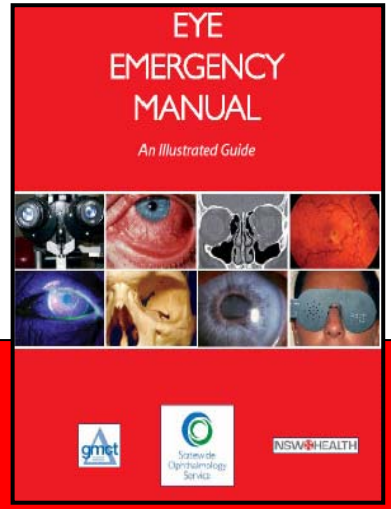
# Ocular Anatomy



# ACKNOWLEDGEMENTS

This education module, *Ocular Anatomy* was originally prepared by
Dr Con Petsoglou, Ophthalmologist, Sydney Hospital & Sydney Eye Hospital,
Save Sight Institute: University of Sydney.
It has been adapted with Dr Petsoglou's permission for
inclusion in the education modules, *Eye Education for Emergency Clinicians.*
These have been developed as an education resource
to compliment the consensus based guidelines published
in the *Eye Emergency Manual,* NSW Dept Health 2007.

Special thanks to:

Jillian Grasso, *Clinical Nurse Consultant Ophthalmology,*
Janet Long, *Clinical Nurse Consultant Community Liaison Ophthalmology,*
Joanna McCulloch, *Transitional Nurse Practitioner Ophthalmology,*
Cheryl Moore, *Nurse Educator Ophthalmology, and*
Carmel Smith*, Project Officer, Eye Emergency Manual Project.*
for editing the original presentation

***December 2008***

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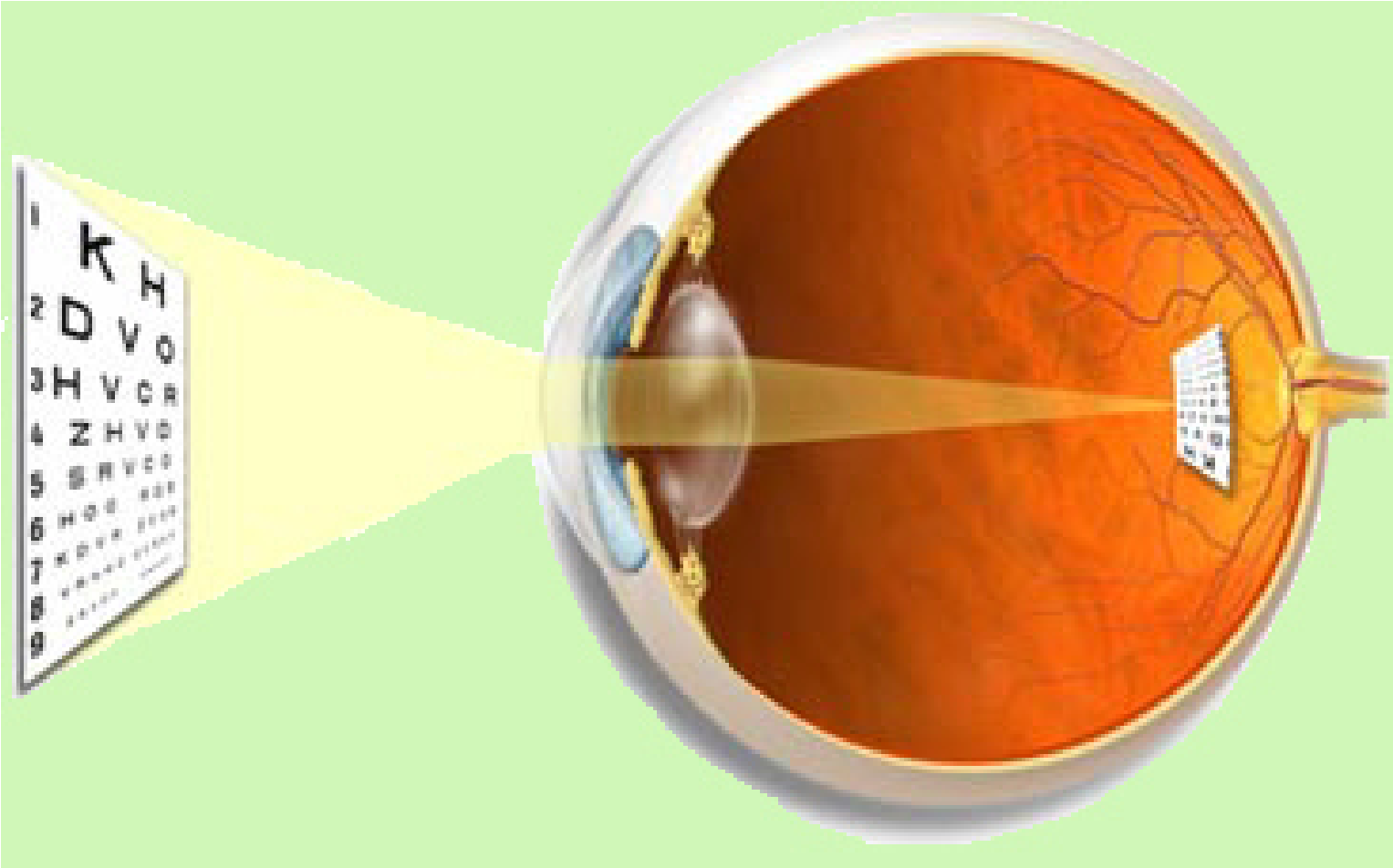
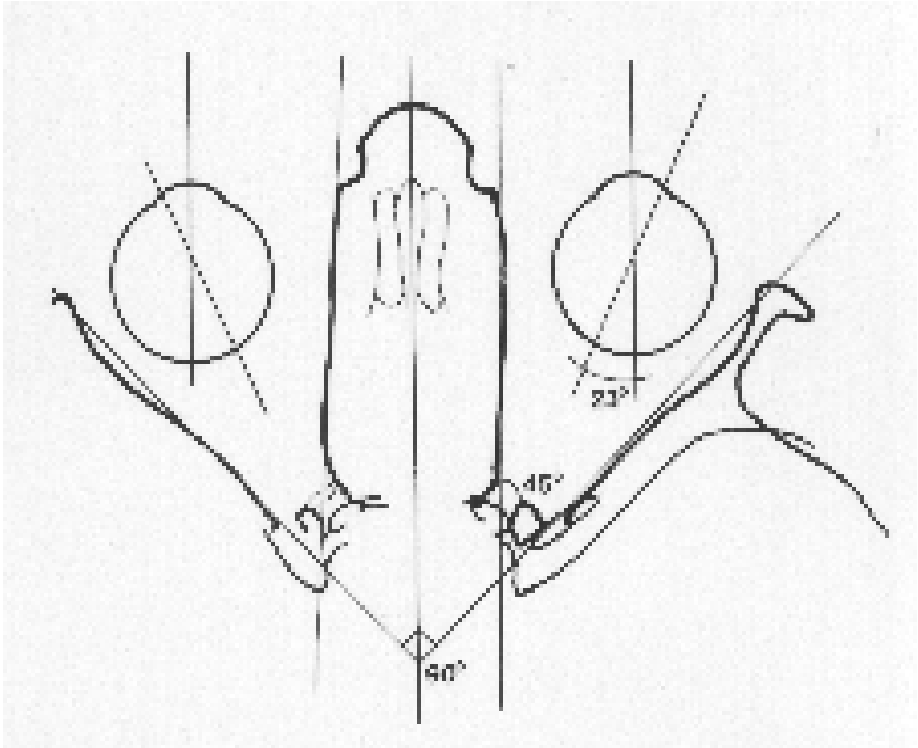
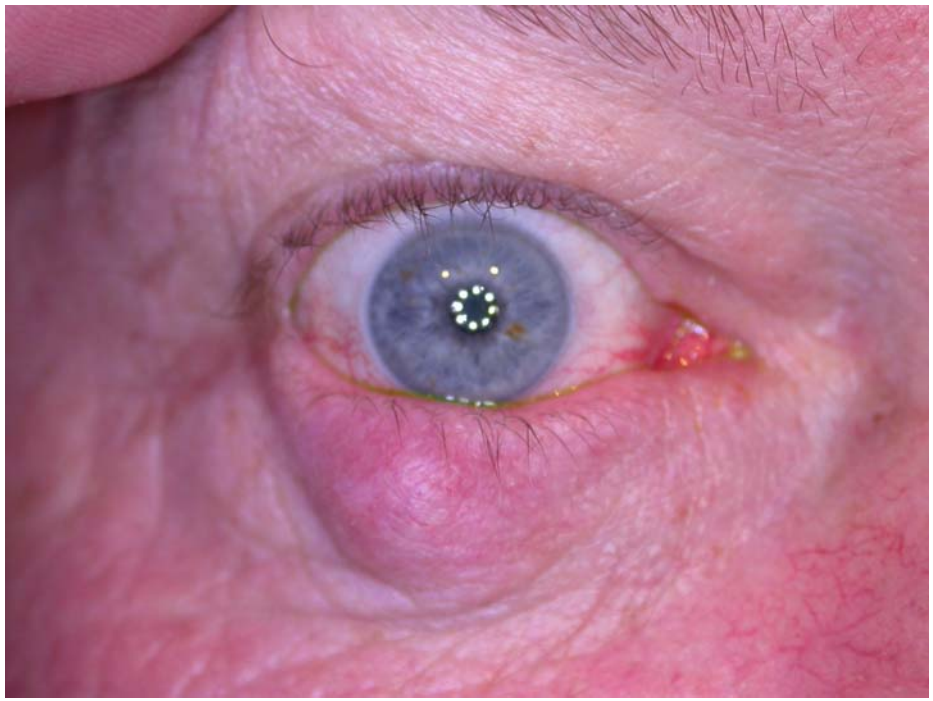


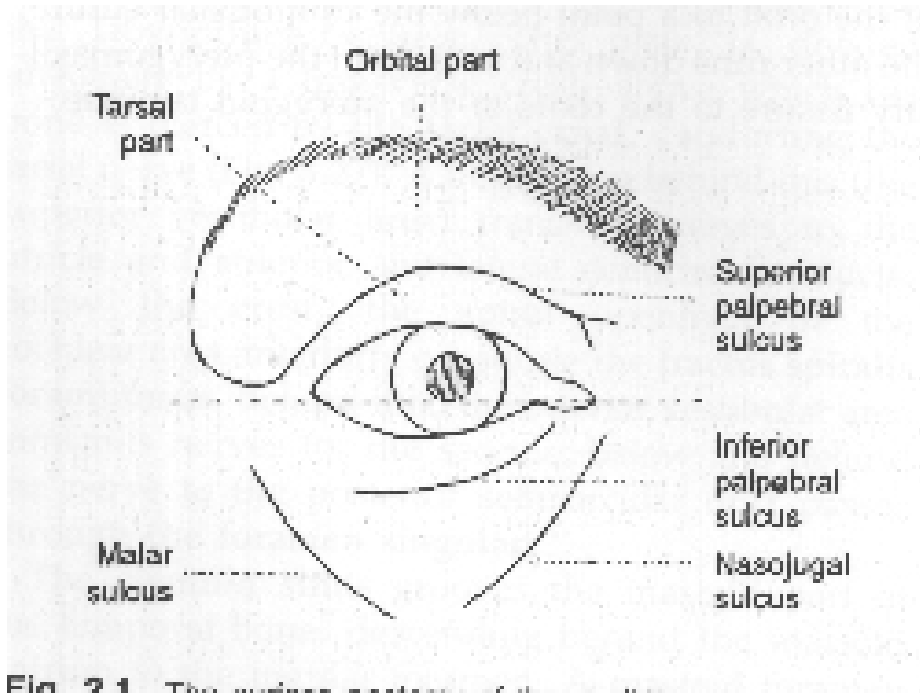
# General

- Eyes are parallel to enable binocular vision
- Protection from environment by:
  - Brow and Eyebrows
  - Eyelids: superior and inferior
  - Bony orbit
  - Soft fat around eye to cushion blows



# External Anatomy

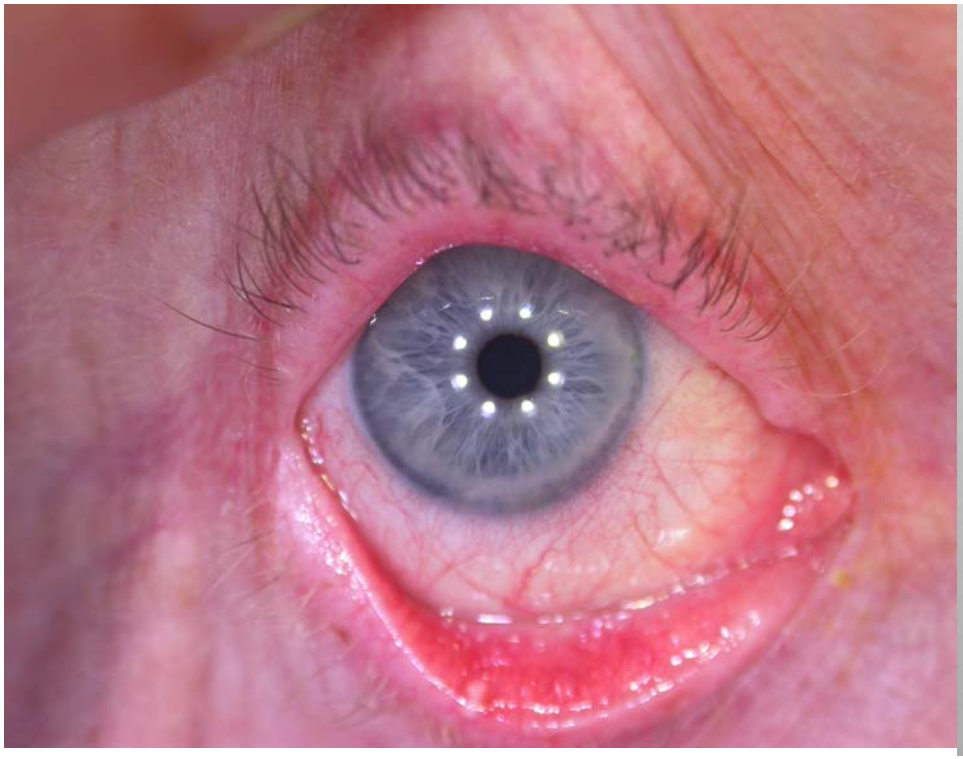


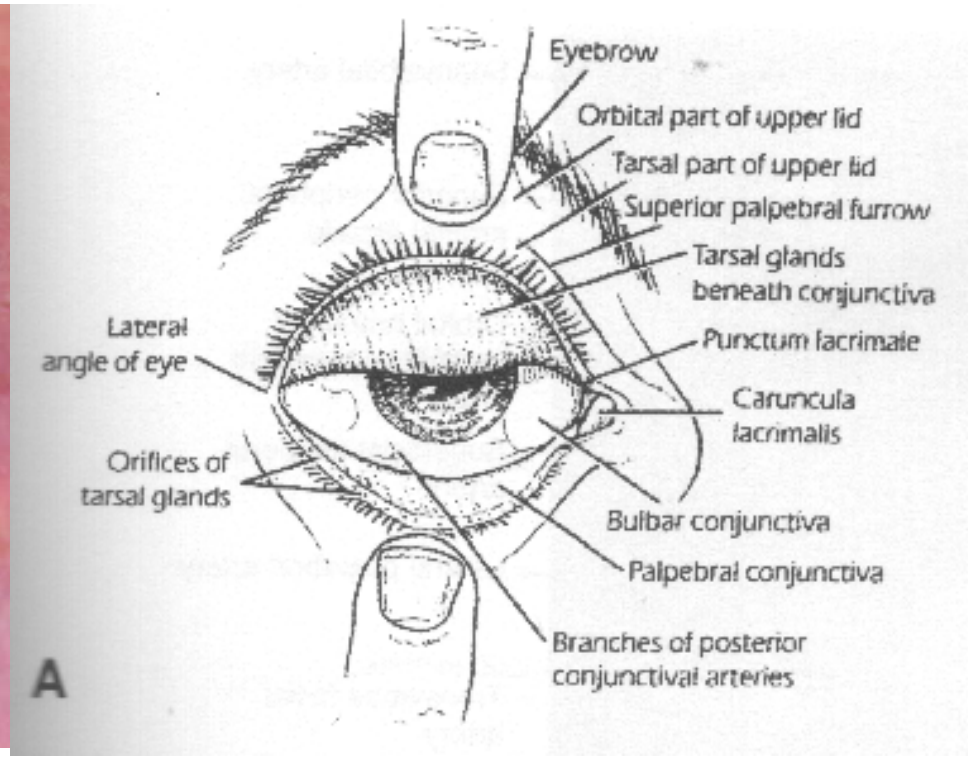


# Eyelids

- Palpebral fissure is elliptical
  - 30mm long and 15mm high
  - Upper lid covers cornea 1-2mm
  - Lower lid just below cornea
  - Lateral Canthus
    - 30-40º 5mm medial to orbital margin
  - Medial Canthus
    - More obtuse
    - Contains caruncle and semilunar fold

# Conjunctiva

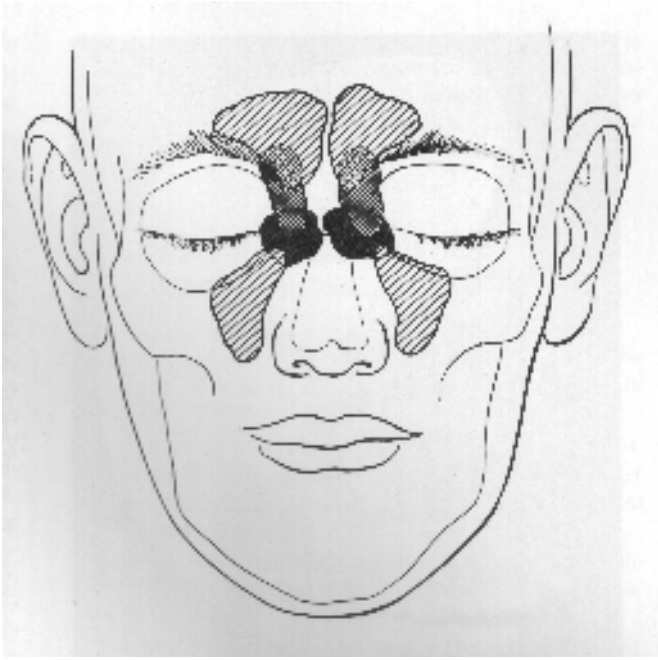


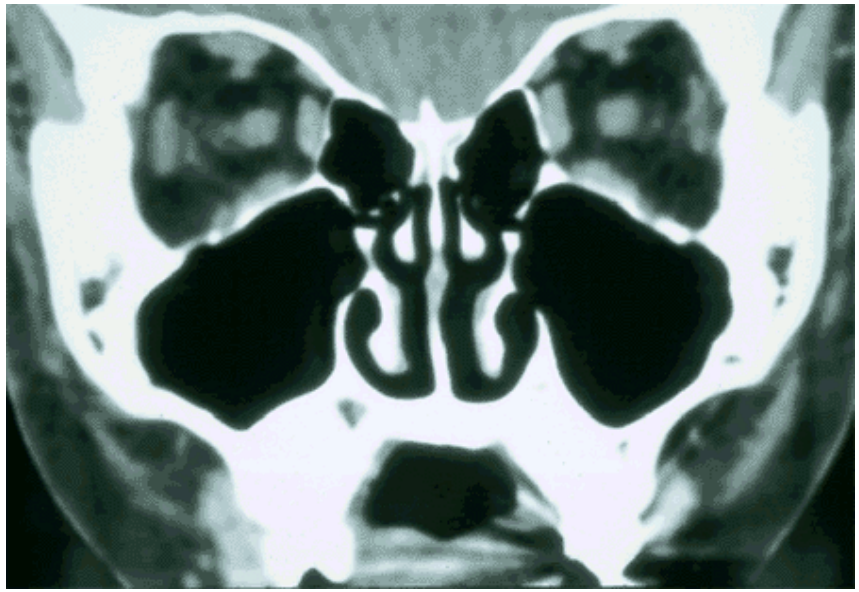


# Conjunctiva (cont)

- Mucosal surface to moisten and protect
- Barrier to infection
- Stretches from eyelids to limbus
- Attached firmly at limbus
- Open at limbus to expose globe

# Sinuses



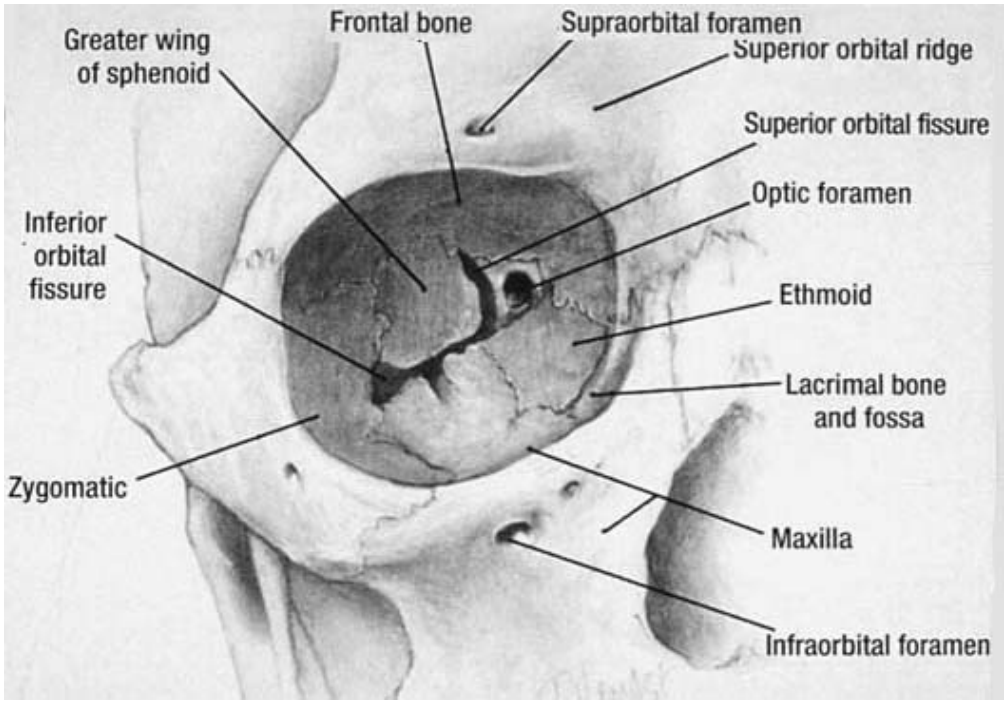


# Sinuses (cont)

- Eyes lie within 2 bony cavities–orbits
- Surrounded by air filled, mucus lined cavities called sinuses
- Complex relationship between the two
- 4 main sinuses in the facial skeleton
  - Maxillary sinus – cheek bone
  - Frontal sinus - brow
  - Ethmoidal sinus – upper nose
  - Sphenoidal sinus- central skull
- All are paired

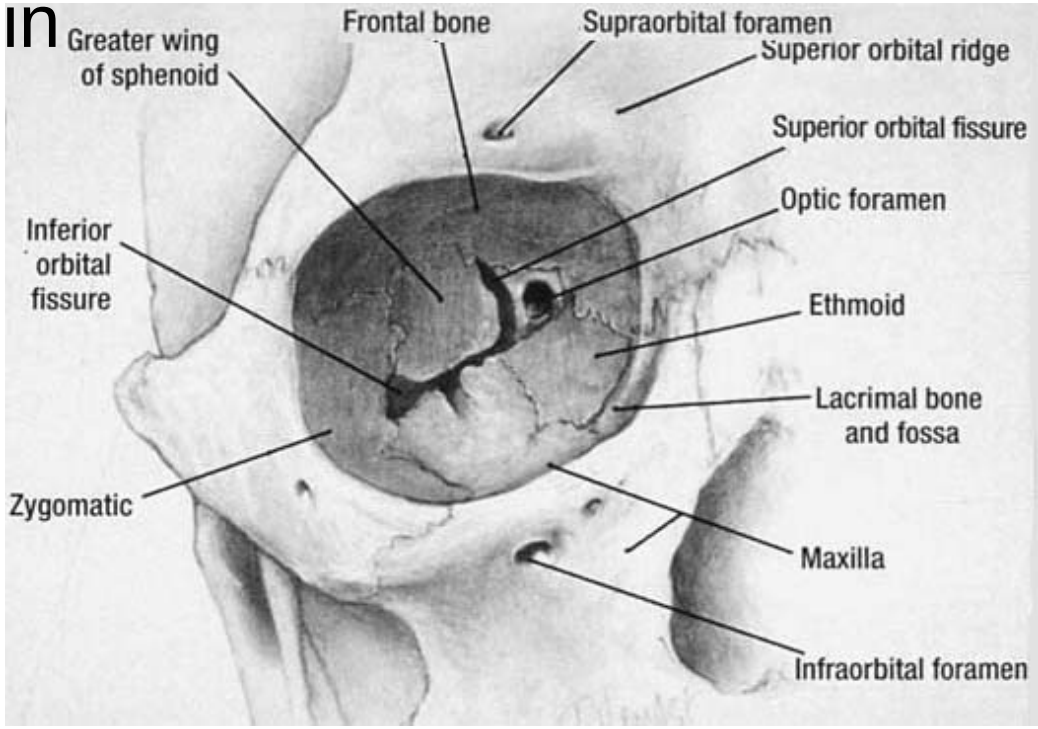
# Bony Orbit

- Pear shaped cavity with optic nerve stem
- Medial walls parallel
- Lateral walls 45º
- Volume 30cc
- Opening
  - Height 35mm
  - Width 45mm
  - Depth 45mm



# Intra Orbit

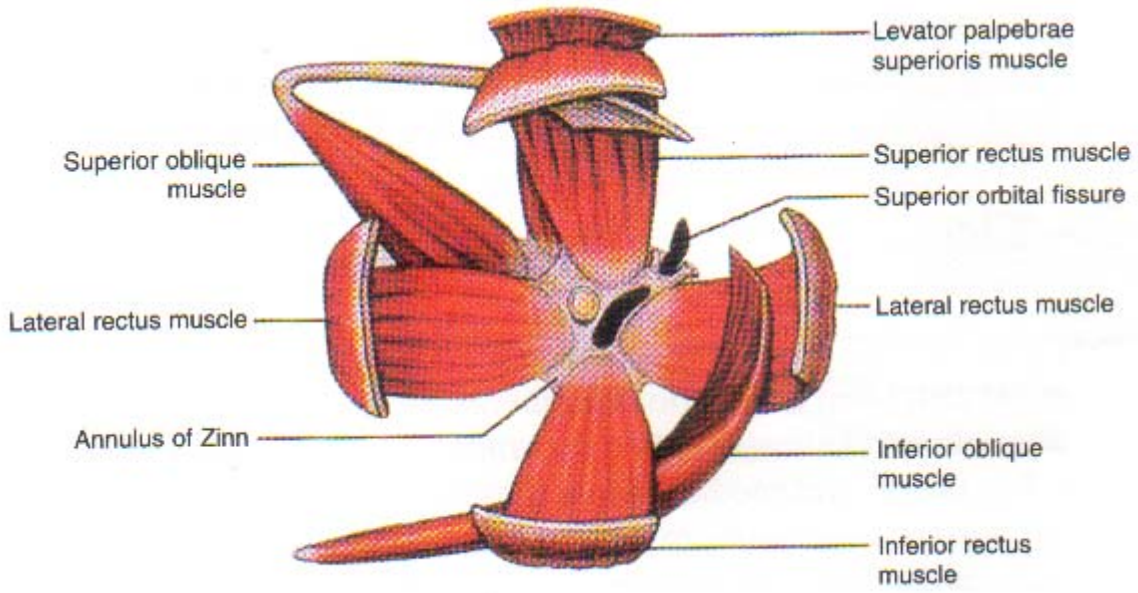
- Orbital Canal
- Strong, unforgiving in lesser wing of sphenoid
- Conducts
  - Optic Nerve
  - Ophthalmic Artery
  - Sympathetic fibres



# Orbital contents

- Eyeballs take up 70% of orbital volume
- Surround the eyes is a complicated network of
  - Soft Orbital Fat
  - Fibrous tissue
  - Extraocular Muscles
  - Vessels + Nerves

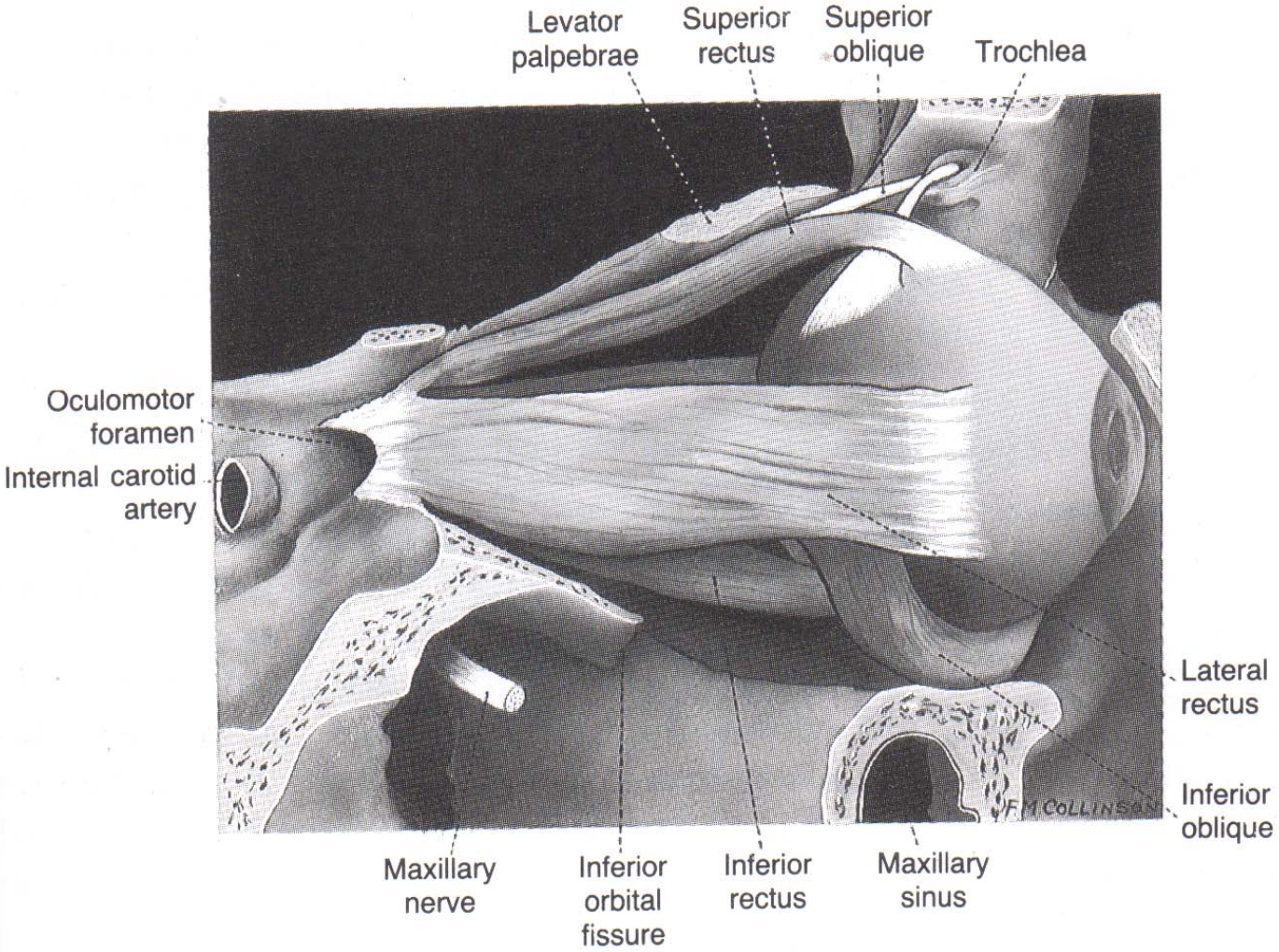
# Extraocular muscles (EOM)



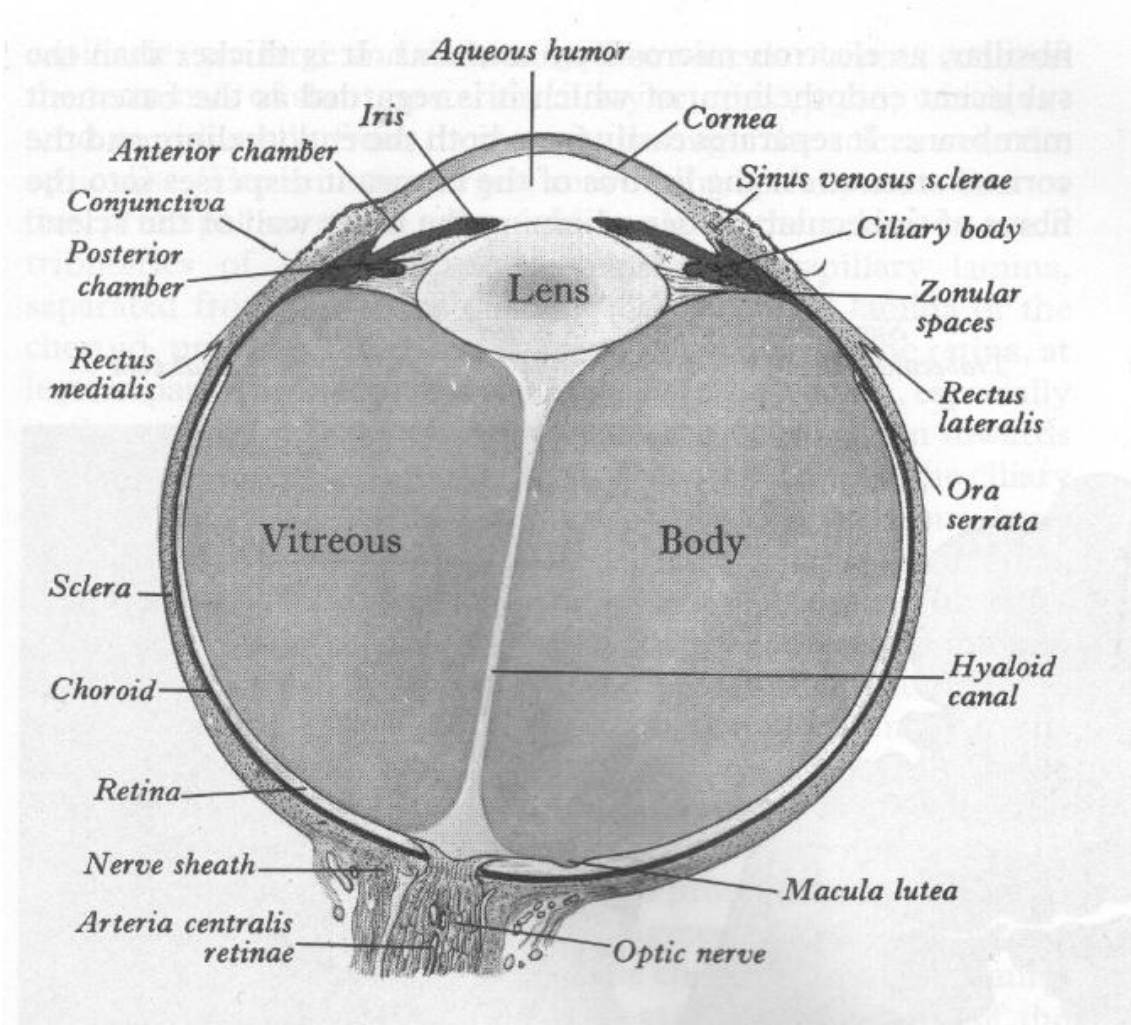
# Extraocular muscles (cont)

- There are 6 EOMs
  - 4 Recti and 2 Obliques
- Each has a unique action
- 3 axes of motion:
  - Horizontal
    - Towards nose = a***d***duction
    - Towards temple = a***b***duction
  - Vertical : Elevation and Depression
  - Tortional:
    - Intorsion: 12 o'clock of cornea turns in
    - Extorsion: 12 o'clock of cornea turns out

# Extraocular muscles (cont)



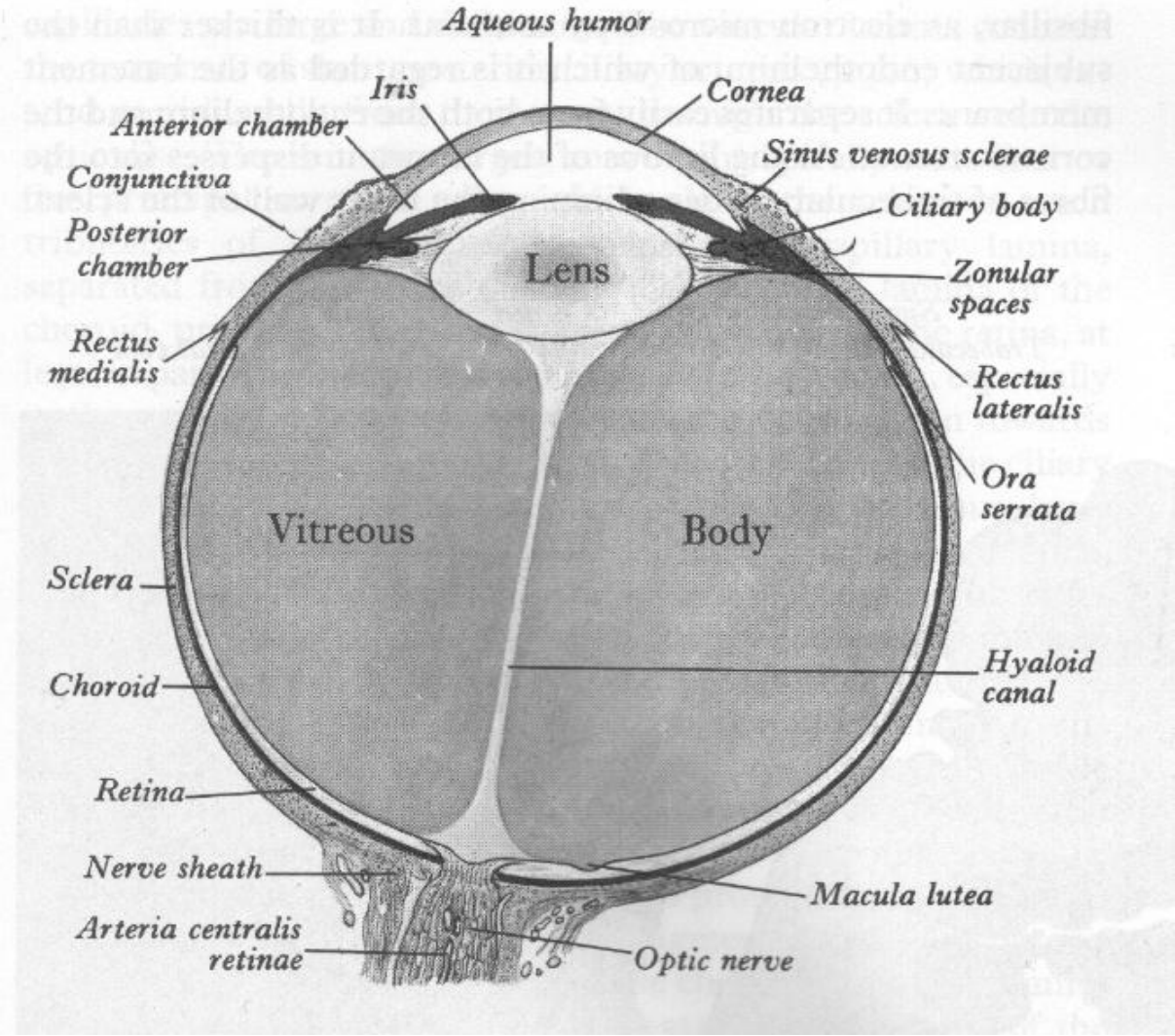
# Globe


Aqueous humor
Iris
Cornea
Anterior chamber
Sinus venosus sclerae
Conjunctiva
Ciliary body
Posterior chamber
Lens
Zonular spaces
Rectus medialis
Rectus lateralis
Ora serrata
Vitreous
Body
Sclera
Hyaloid canal
Choroid
Retina
Nerve sheath
Macula lutea
Arteria centralis retinae
Optic nerve

# Layers of the Eye

- Fibrous layer
  - Cornea (clear) and Sclera (white)
- Vascular layer: Uveal tract
  - Iris, Ciliary Body, Choroid
- Nervous layer
  - Retina
- Refractive media
  - Aqueous, Lens, Vitreous

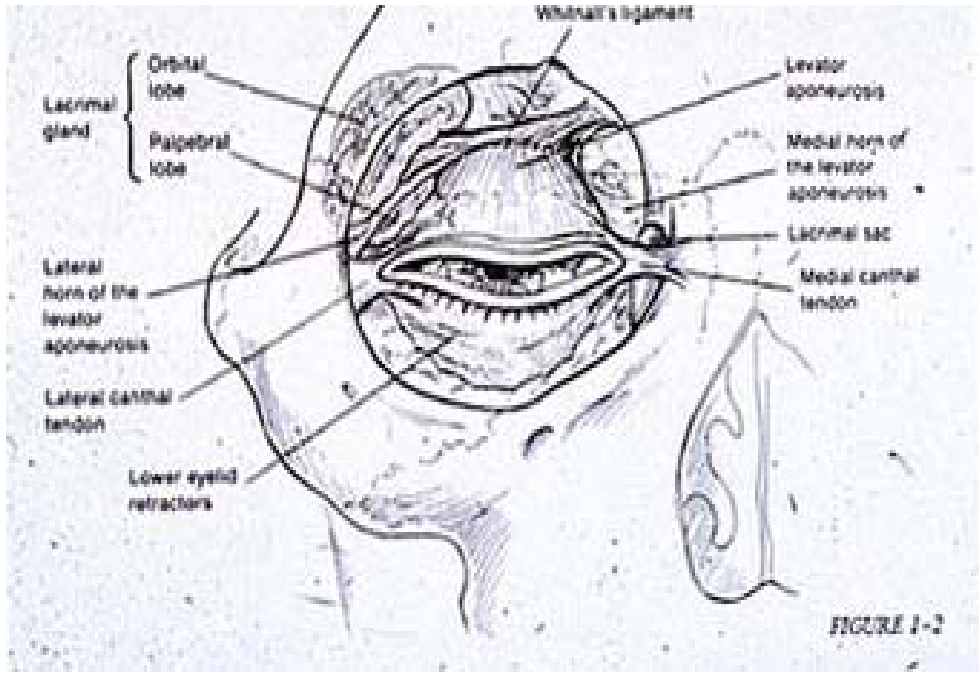
# Layers of the Eye (cont)



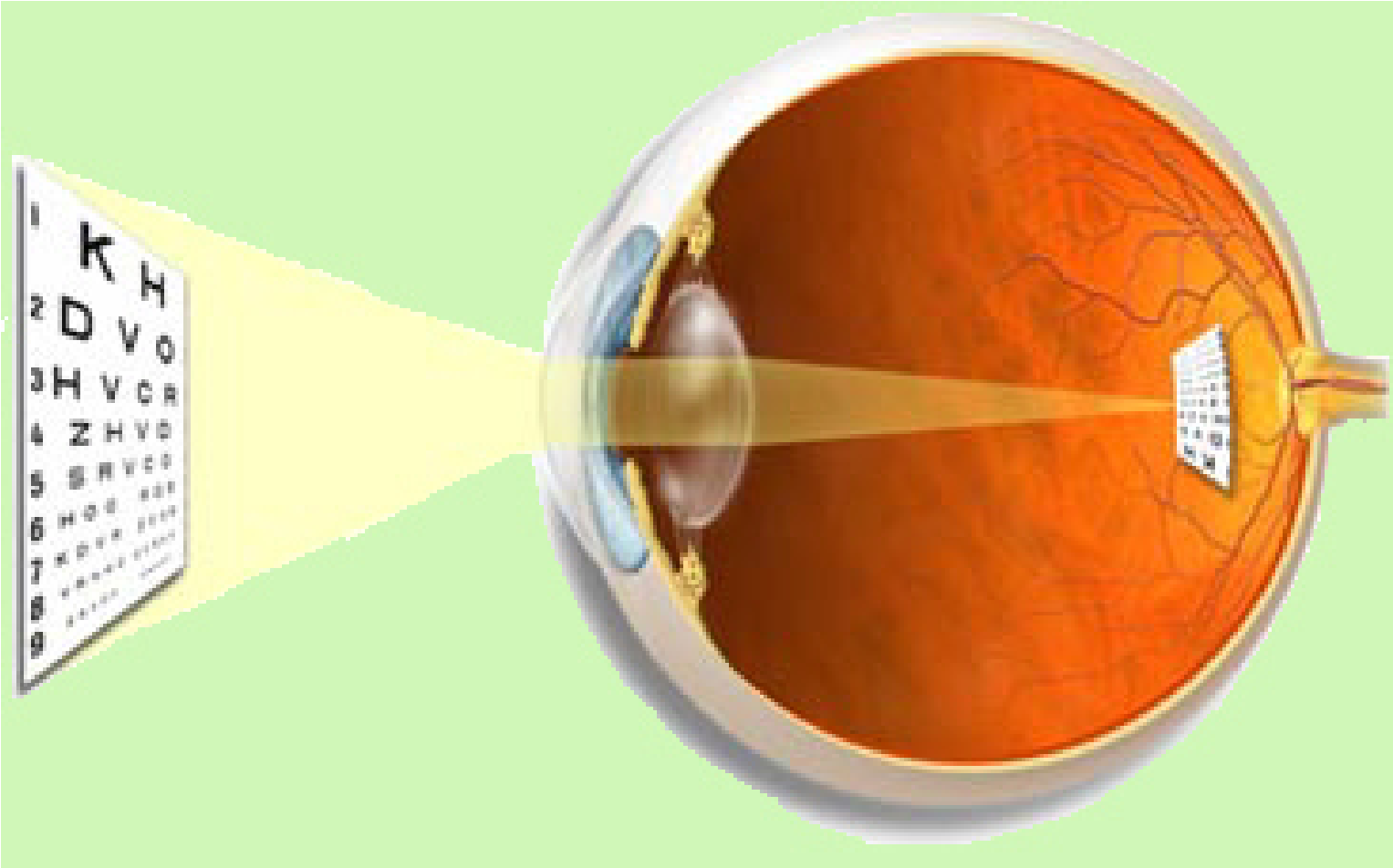
# Lacrimal System

- Exocrine gland producing tears and antibodies

- Tears coat eye and drain thru lacimal canaliculus to lacrimal sac and duct

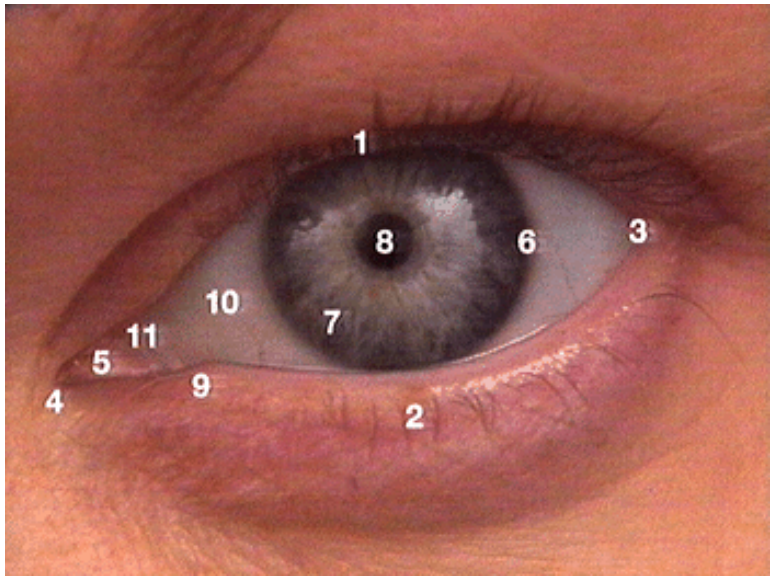


# Internal Eye



# Sclera (SKLE-ra)

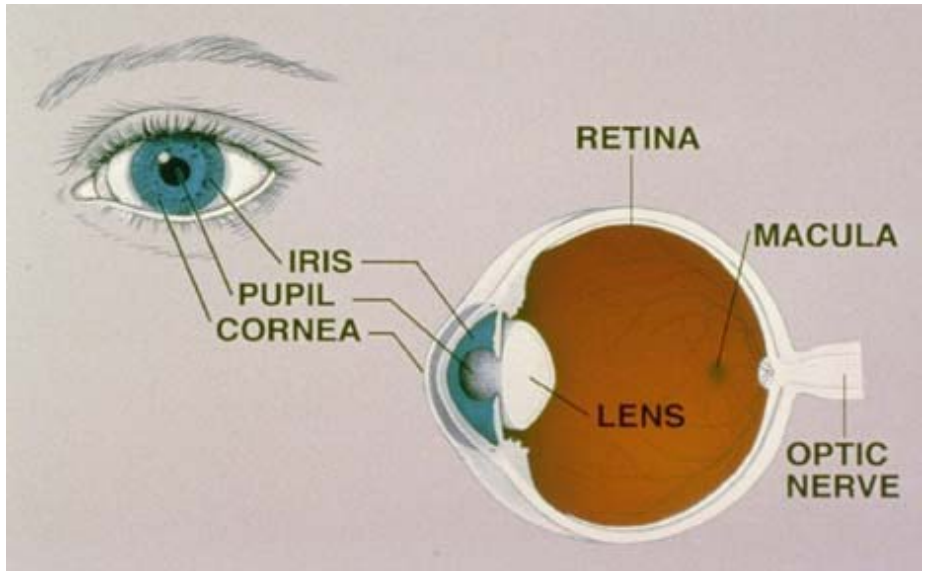
- Provides shape
- Protects the inner parts-covers whole of eye expect the cornea
- White, very tough connective tissue



# Cornea (KOR-ne-a)

- Admits and refracts (bends) light
- Avascular- transparent
- Curved
- 5 layers
- Central &.

  Peripheral areas

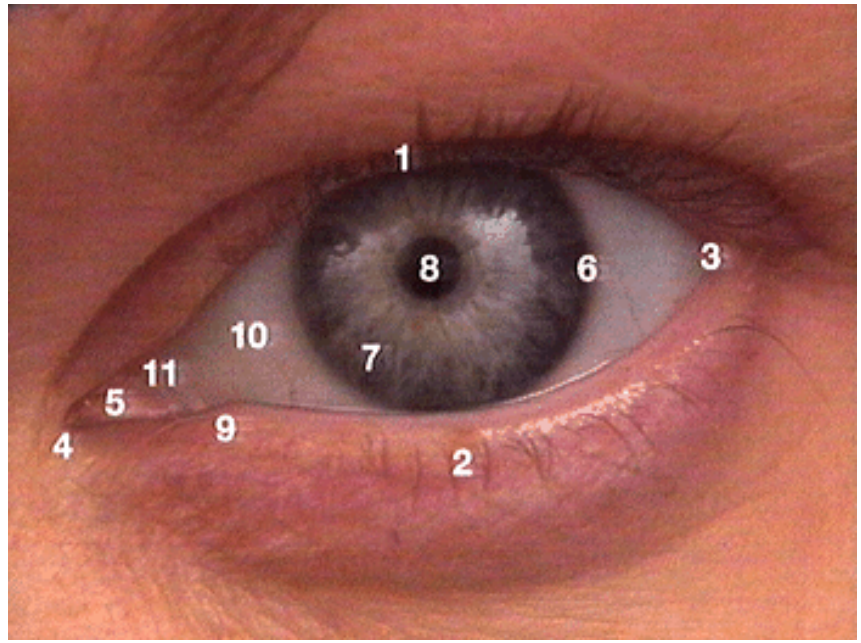


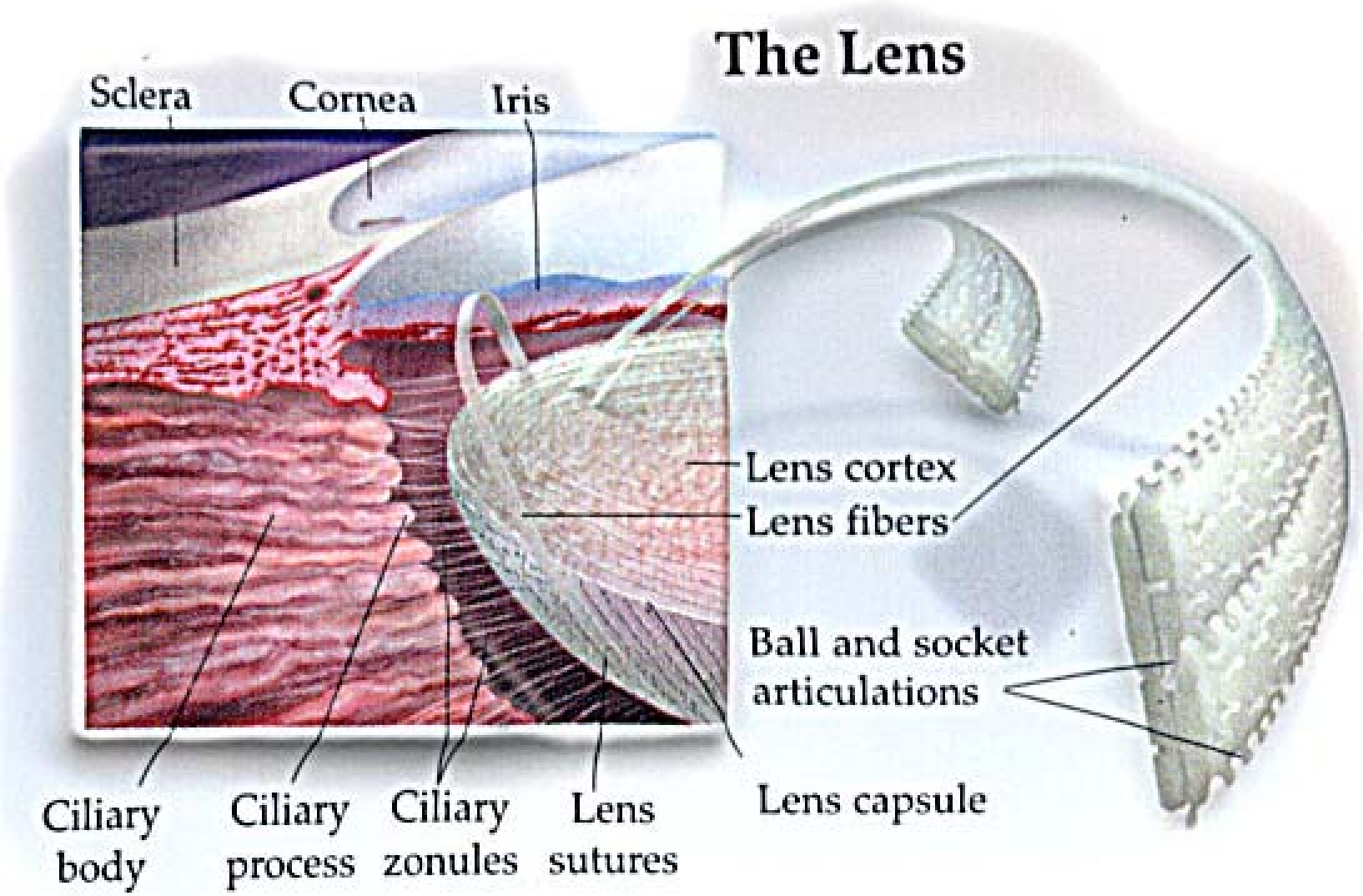
# Anterior Chamber

- Contains aqueous humour
- Helps maintain shape of eye
- Supplies oxygen and nutrients to lens and cornea

# Iris (I-ris)

- Coloured portion of eye
- Shaped like a donut
- Suspended between the cornea and lens
- Circular & radial smooth muscles
- Regulates light entering the eye through the pupil




The Lens
Sclera
Cornea
Iris
Lens cortex
Lens fibers
Ball and socket articulations
Lens capsule
Ciliary body
Ciliary process
Ciliary zonules
Lens sutures

# Lens (cont)

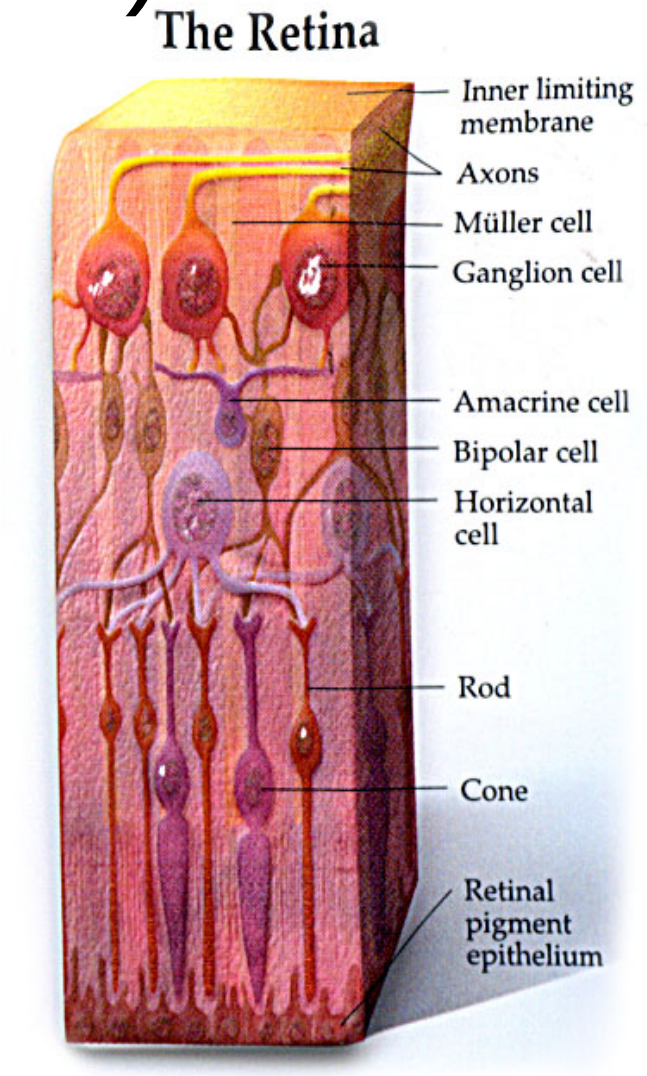
- Biconvex
- Measures 9mm by 4mm
- Transparent
- Avascular
- No nerve supply
- Located behind the iris, in front of the vitreous
- Seen through the pupil
- Supported by zonules or suspensory ligaments
- Function – focus light on the retina by accommodation
- A cataract is a opacity of the lens

# Posterior Chamber

- Largest cavity of the eye
- Contains vitreous body (formed in embryo)
- Maintains shape of eye
- Holds retina flush against the choroid
- Contains phagocytic cells

# Retina (Ret-in-ah)

- Inner most coat of the eye
- Non visual layer RPE and visual layer (nerve cells)
- 9-11 layers (main layers- ganglion layer, bipolar layer, photoreceptor layer)
- Beginning of visual pathway
- Central and peripheral vision
- Contains the optic nerve which is connected to visual area of brain



# Conclusion

- Anatomy complex
- Easy to be overwhelmed
- Principles important
- Consider in layers
- Terminology first
- Then function
- Then relations