OTOSCOPY & OPTHALMOSCOPY



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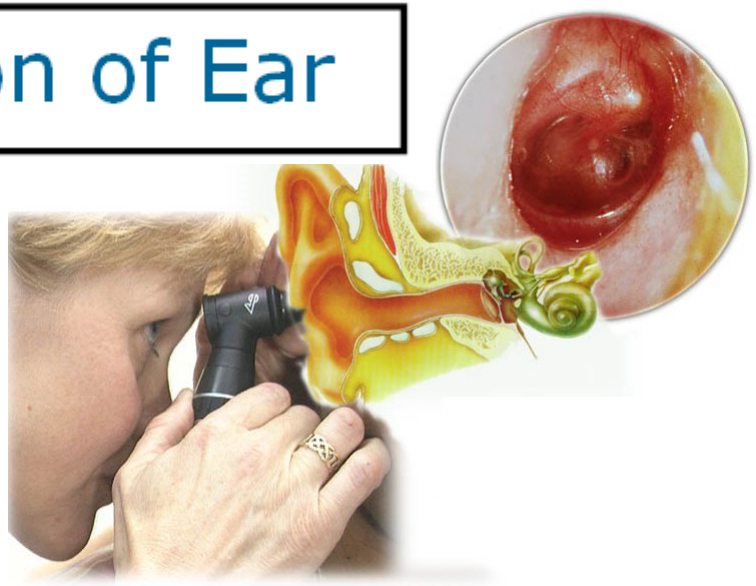
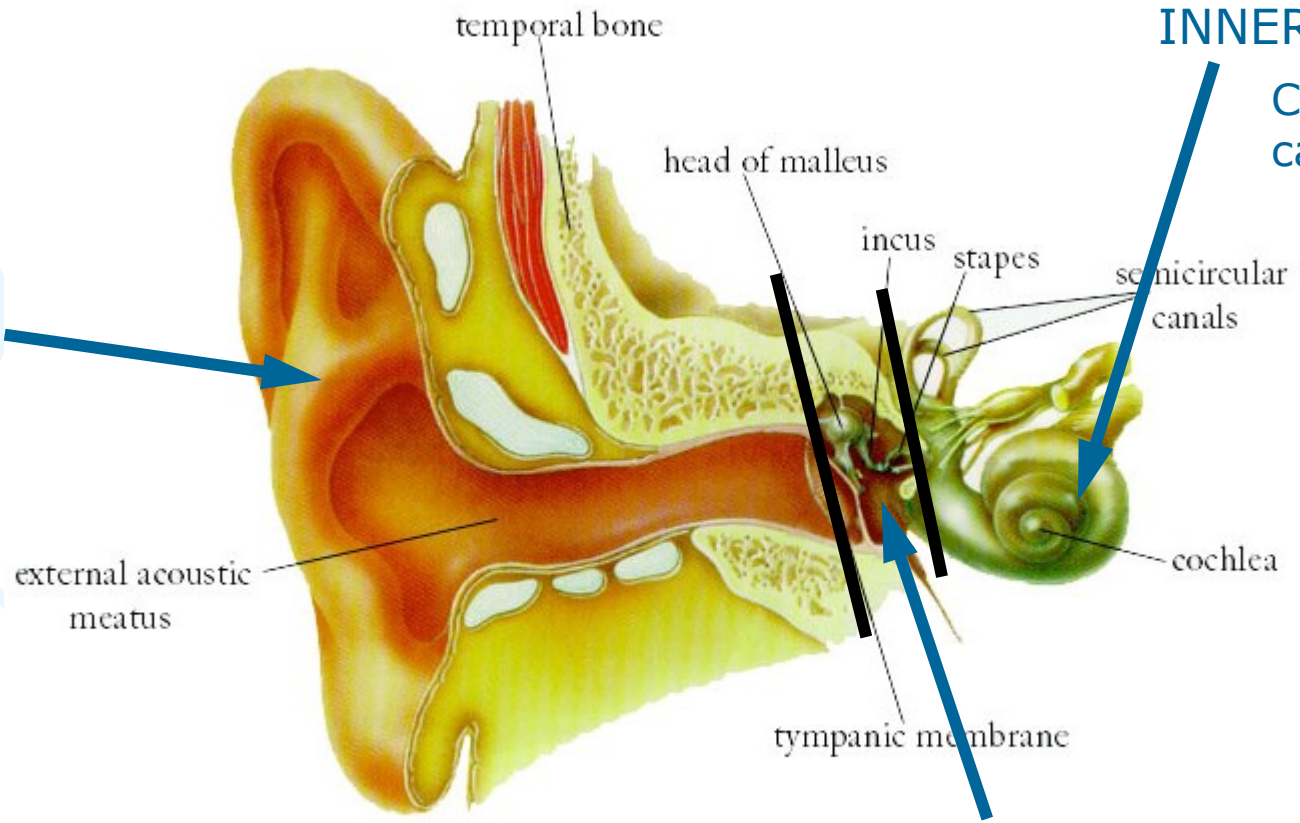
OTOSCOPY

Examination of Ear



http://medweb.cf.ac.uk/otoscopy/index.htm

ANATOMY OF EAR



INNER

Cochlea, SC canals,vestibule

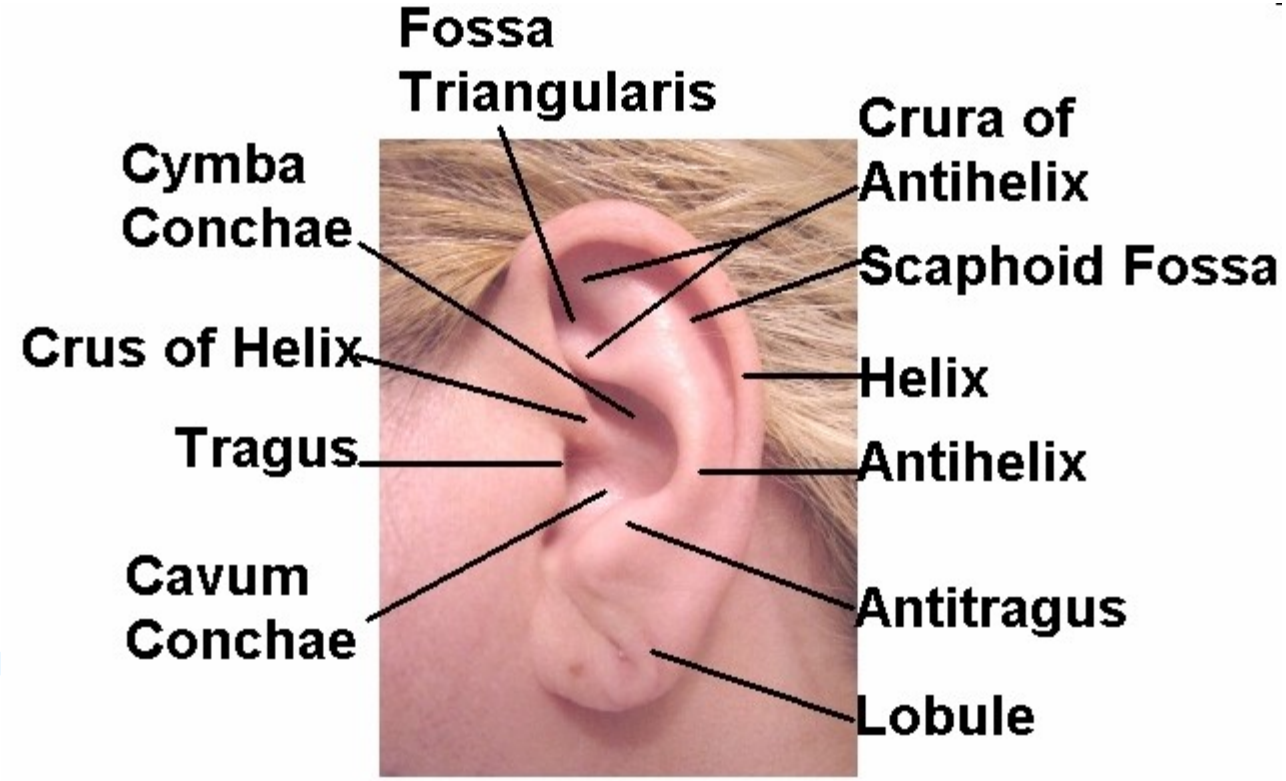
EXTERNAL

Outer ear & canal until TM

MIDDLE

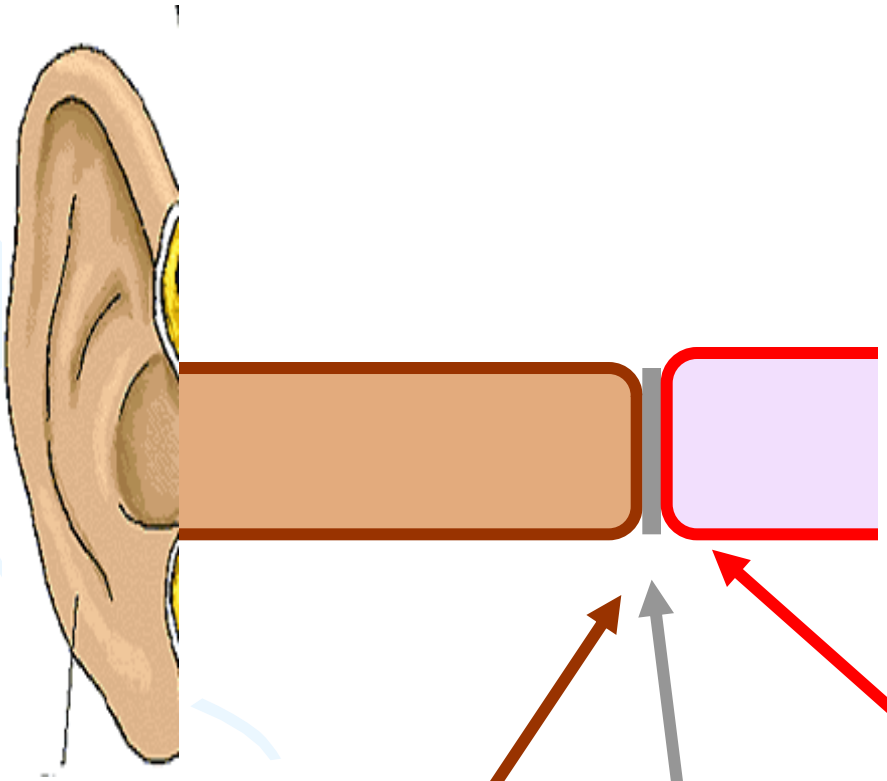
TM + air filled area behind, including ossicles

ANATOMY OF EXTERNAL EAR



Anatomy of the Pinna

LAYERS OF TYMPANIC CAVITY



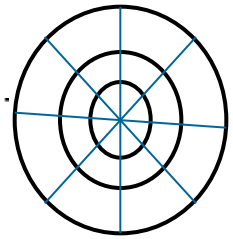
SKIN OF EXT. CANAL

FIBROUS LAYER

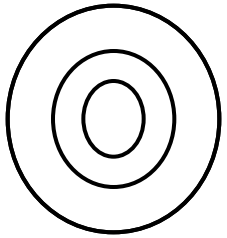
MUCOSA

FIBROUS LAYER:

Pars Tensa: circular and radial fibres



Pars Flaccida: only circular fibres



Safety & Communication

- Explain to patient what you are going to do.
  - May be some discomfort, but should be no pain.

- Clean & Disinfect speculum, and wash hands between patients

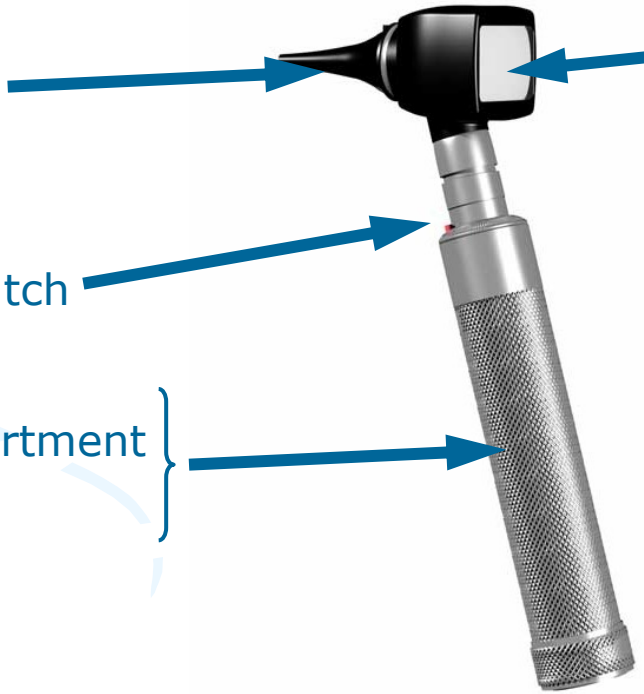
To Start...

- Clinical examination of the ear should begin with a general examination of the external ear, and of the lymph nodes of the head.

- Following this, we can use an otoscope to look inside the ear.

OTOSCOPE / AURISCOPE

- In primary care we use otoscope aka auroscope
  - Clean speculum & functioning batteries (BRIGHT light is important!!)



Speculum size should be the

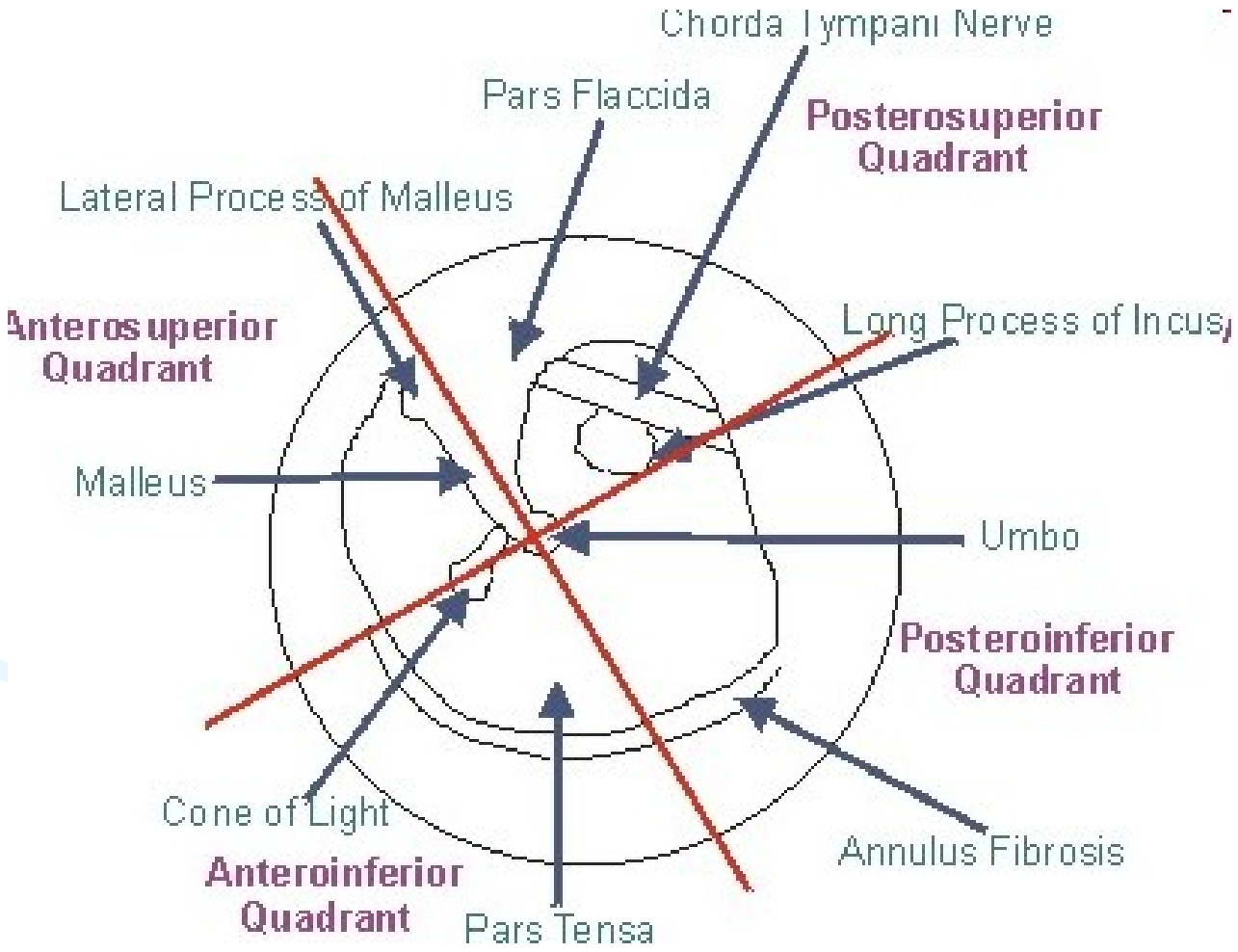
LARGEST THAT CAN FIT WITHOUT CAUSING PAIN

- Hold close to eyepiece for more control
  - Pencil (or hammer grip)
  - Right hand right ear, left hand left ear

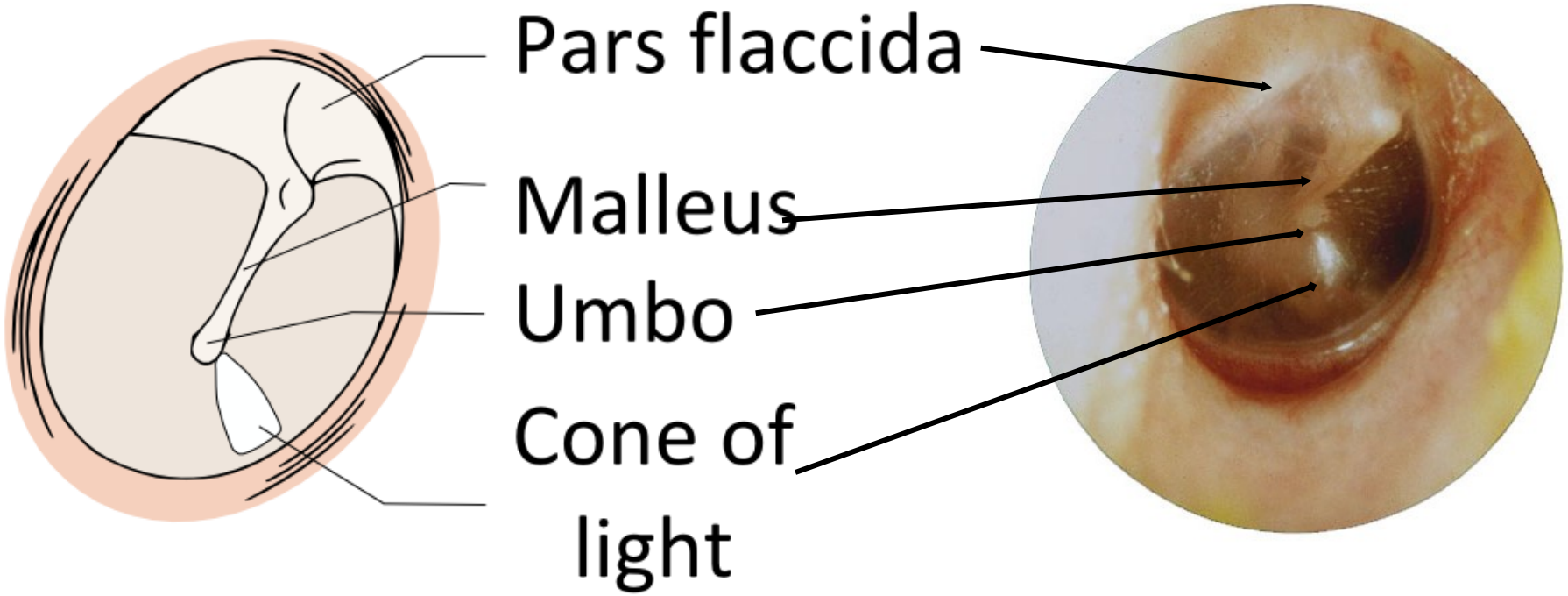
- Pull pinna back and up to straighten ear canal
  - To make speculum insertion easier

- Examine good ear first

QUADRANTS


Chorda Tympani Nerve
Pars Flaccida
Posterosuperior Quadrant
Lateral Process of Malleus
Anterosuperior Quadrant
Long Process of Incus
Malleus
Umbo
Posteroinferior Quadrant
Cone of Light
Annulus Fibrosis
Anteroinferior Quadrant
Pars Tensa

NORMAL TYMPANIC MEMBRANE



WHAT TO LOOK FOR

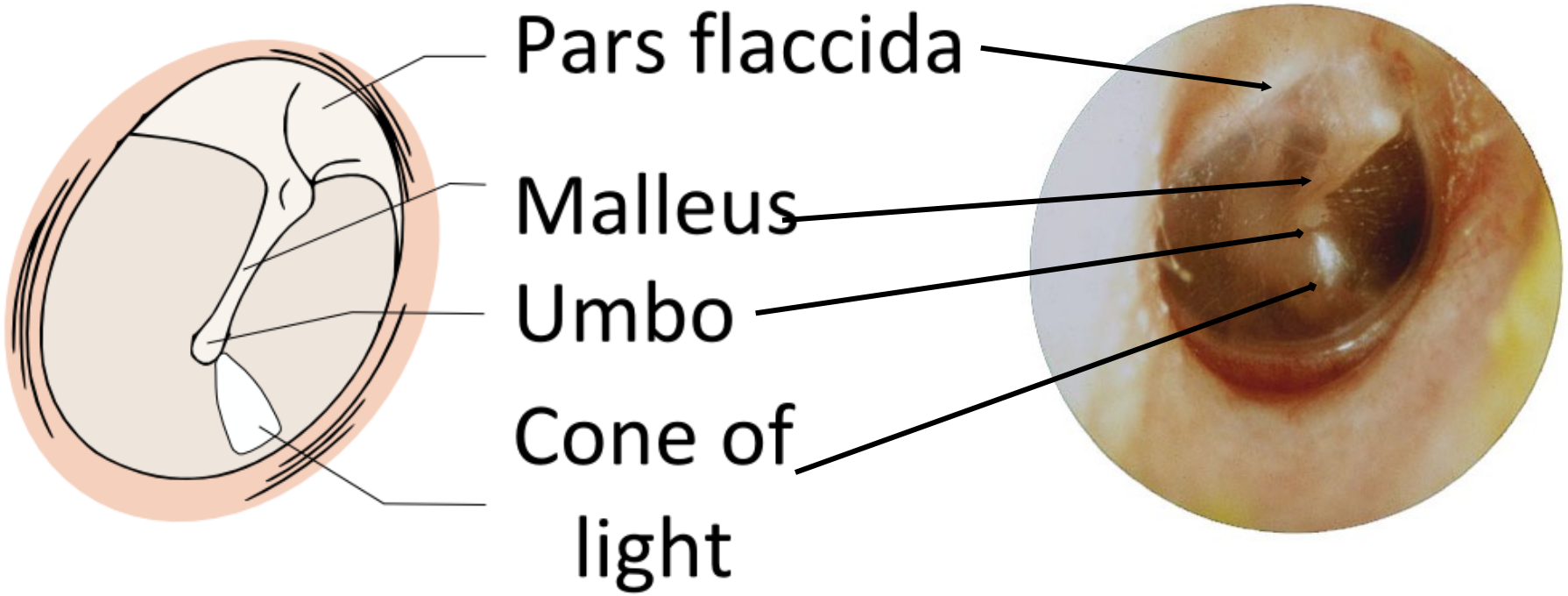
- External canal Wall
  - Skin (normal, inflammed?)
  - Debris?
- **Malleus HANDLE** (or lateral process)
- **UMBO** (malleus stria)
- **CONE OF LIGHT** (triangle shape, with apex at umbo))
- Inspect Pars Tensa, starting in Posterior-Superior quadrant, clockwise
- Inspect Pars Flaccida
- Identify as many structures as you can

HUC

Ask Yourself

- *Can I see **all** the external auditory canal?*
  - stenosis, foreign body, edema, blood, debris
- *Can I see the TM, or the handle of malleus, or both?*
- *Is the TM **intact**?*
  - retraction, perforation, blood vessels, clues about middle ear problems
- *Is the TM correct **colour and transparency**?*
  - Gold/blue/dull = fluid/blood in middle ear
  - White patches = tympanosclerosis (post-surgical?)
  - Pearly grey = Normal

NORMAL TYMPANIC MEMBRANE



NORMAL TYMPANIC MEMBRANE

- Thin
- Semi-transparent
- Pearly grey

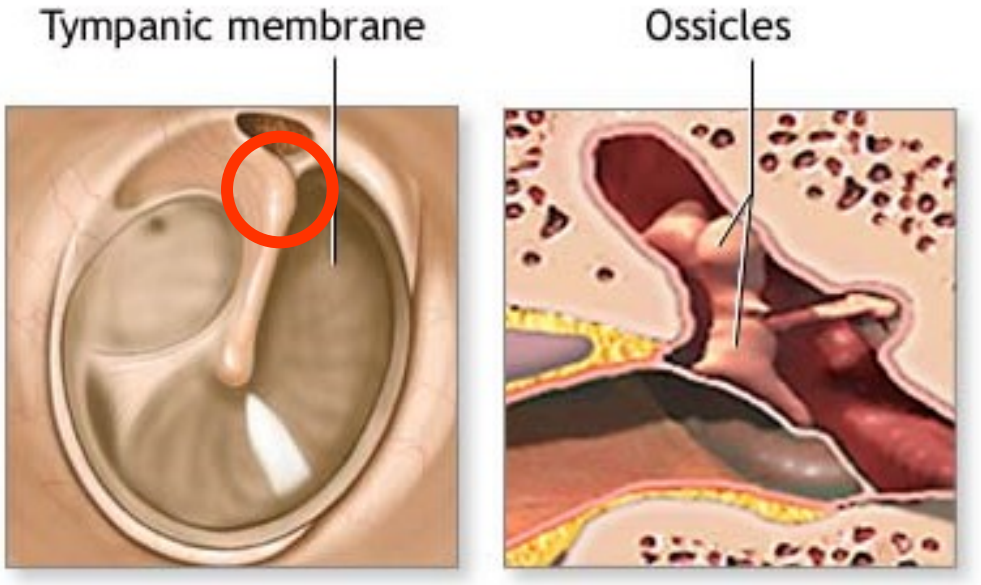
INSUFFLATION

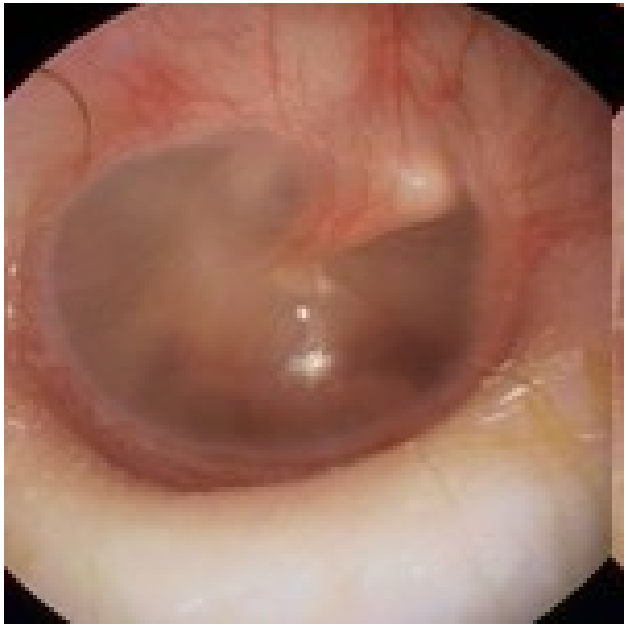
- Most otoscopes have a **small air vent connection** that allows the doctor to **puff air in to the canal**.

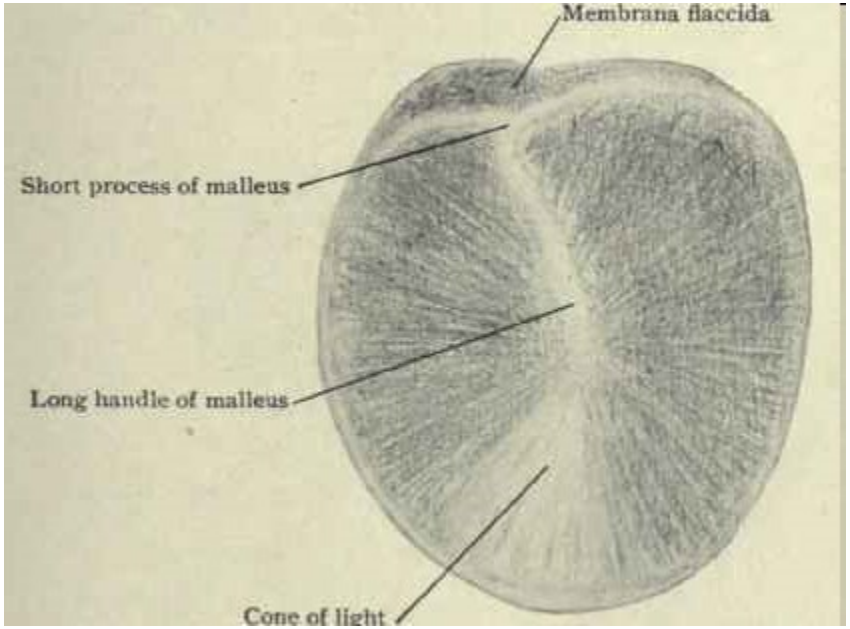
- Observing how much the eardrum moves with air pressure assesses its **mobility**, which **varies depending on the pressure within the middle ear.**

Can’t work out what’s what?

- Look for the **lateral process of malleus** for orientation.
- Even when most other part have been destroyed, this is usually still visible.

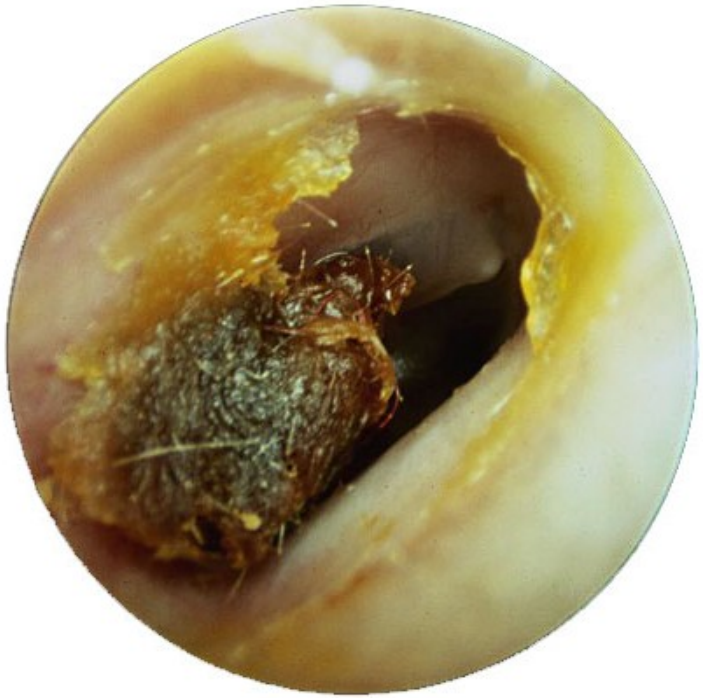





Membrana flaccida
Short process of malleus
Long handle of malleus
Cone of light

WAX / CERUMEN

- Normal secretion of outer meatus
- Initially **semi liquid and colourless**, **later oxidises** to **yellow-brown harder** substance which can block passage of sound.



ACUTE OTITIS MEDIA (w/ effusion)

- **Inflammation of middle ear (infection)**
- Upper half:
  - Prominent blood vessels, Bulging, malleus prominence obscured (fluid)
- Lower half:
  - Dull

NORM

ACUTE OTITIS MEDIA (w/no definition)

- **Inflammation of middle ear (infection)**
- **Bulging** TM, with Purulent fluid behind a tense TM
- Risk of perforation – need to drain!

NORM

TYMPANO-SCLEROSIS

- **Incomplete healing of OM**
- Inflammatory process > Scar Tissue = **Calcified plaques on TM**

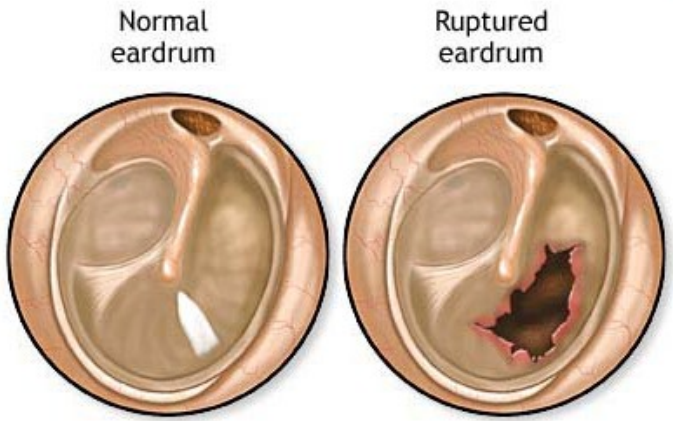
NORM

CENTRAL PERFORATION OF TM

- Causes include **Trauma to head**, Spontaneous perforation, Loud sounds, Middle ear fluid build up, kissing ear (negative pressure) etc

- Pressure related: circular

- Trauma related: cake shaped



OTHERS TO LOOK INTO

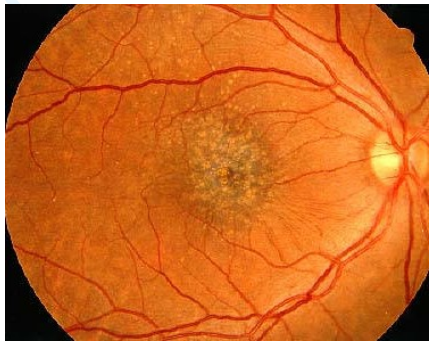
- Acute Otitis Media with effusion
- Secretory Otitis Media
- Fluid behind eardrum
- Resolution of Middle Ear Infection
- Serous Otitis Media
- Grommet / Tympanostomy tube
- Otitis Externa

FURTHER READING

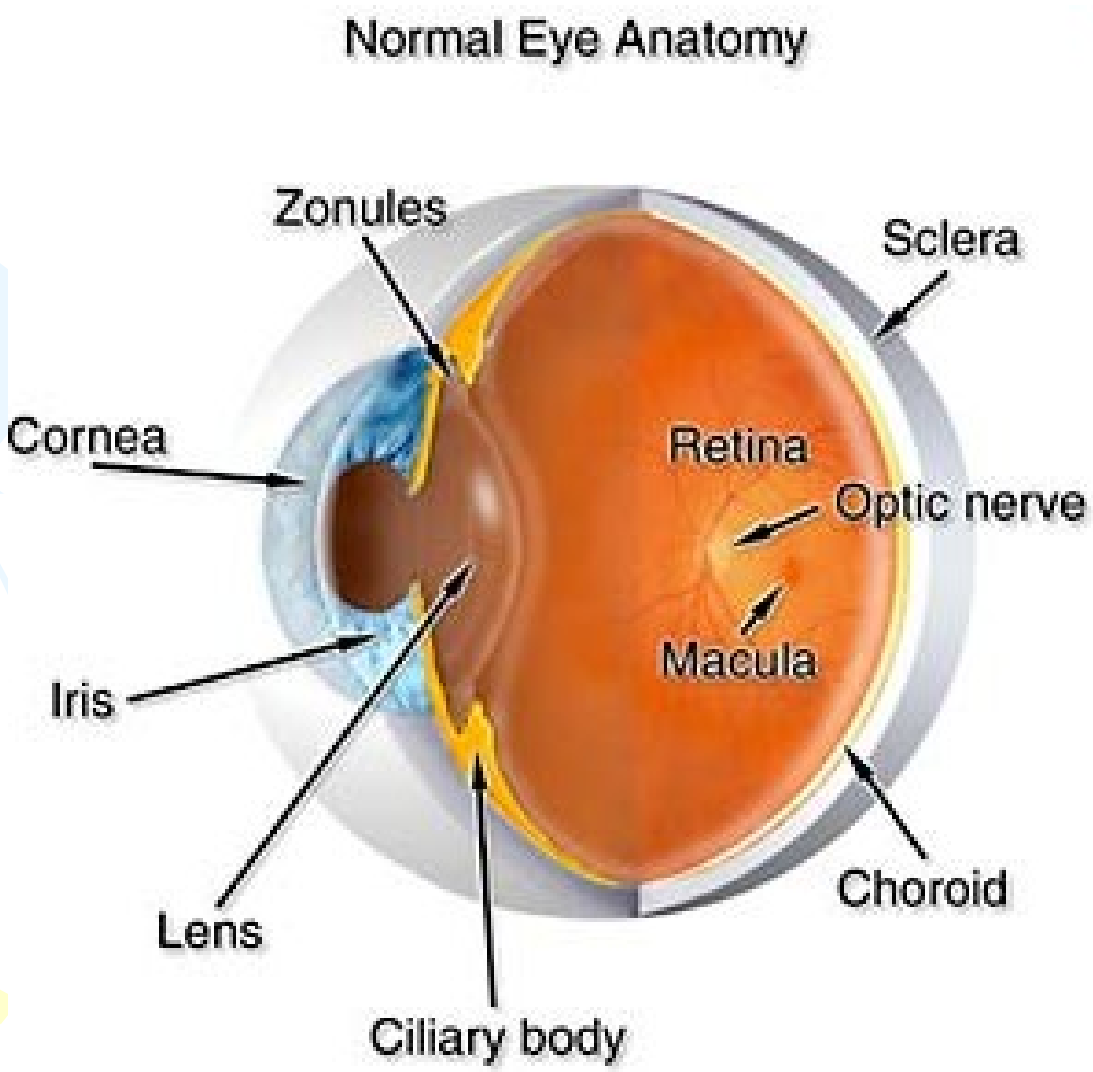
- Glue Ear (children)
- Myringotomy
- Retracted ear drum
- Cholesteatoma
- Grommets
- Tuning Fork tests – Rhines & Webers
- Tympanometry (jerger classification)
- Evoked Potentials
- Vestibulo-ocular relfex (VOR)
- Vestibulo-spinal reflec (VSR)
- Audiometry
- http://archive.student.bmj.com/back_issues/0795/7-otos.htm
- http://s818.photobucket.com/albums/zz101/bainiangudu168/video%20otoscope/?action=view&current=002-2.flv

OPTHALMOSCOPY

Examination of eye



ANATOMY OF EYE



Sclera

Vascular **Choroid**

Photosensitive **Retina**

OPTHALMOSCOPE

Look through here

Change magnification

Magnification number

Depress and rotate green button to turn on

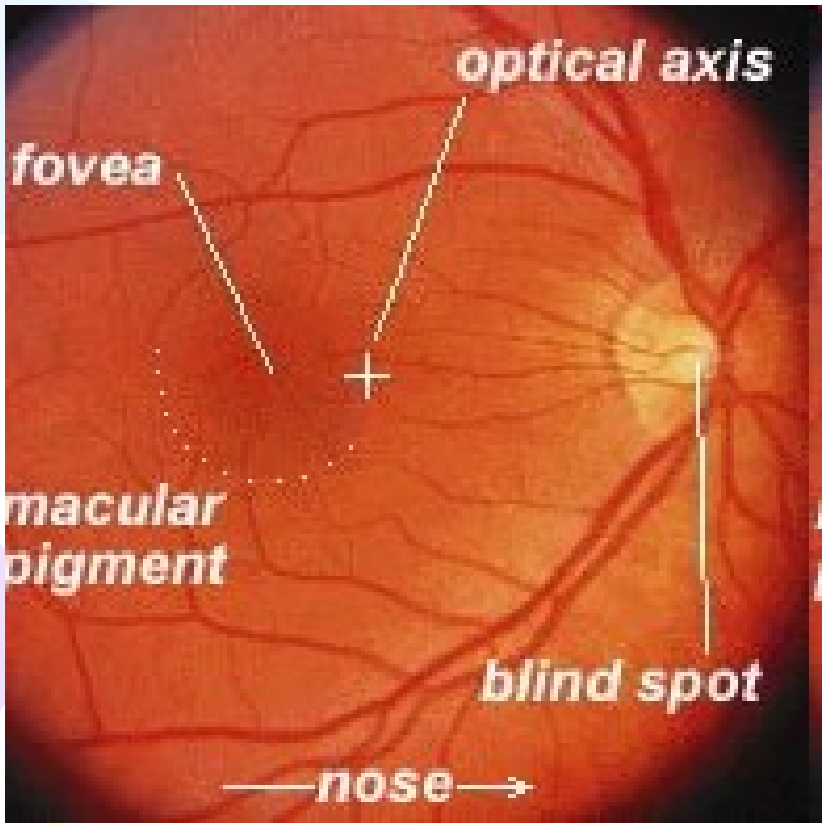
FACES EXAMINER

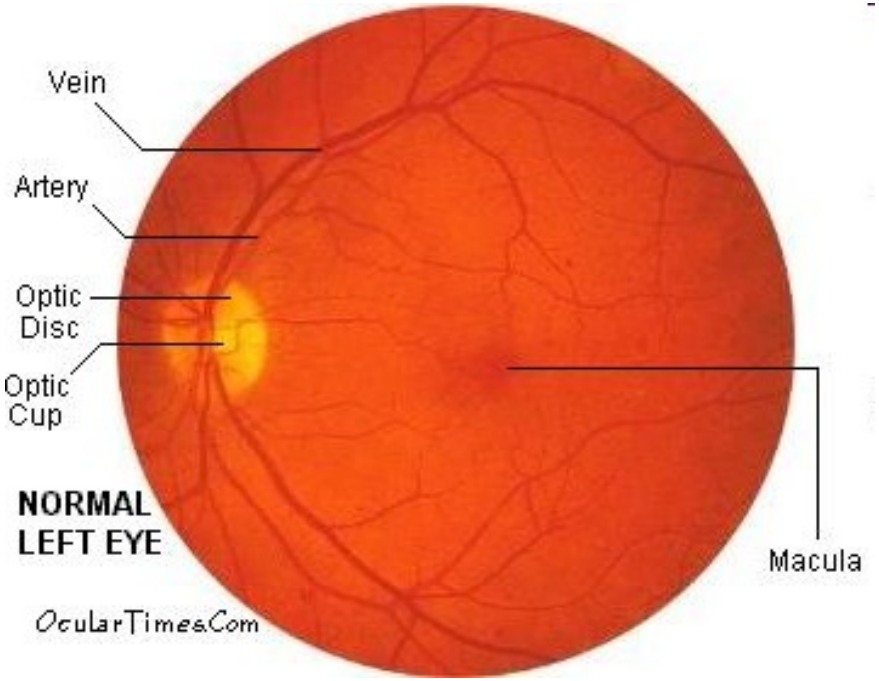
Lid

FACES PATIENTS EYE

OPTHALMOSCOPE

- Examine Fundus
  - Interior surface of the eye, opposite the lens, includes **retina, optic disc, macula** and **fovea**.





RETINA

- Innermost of 3 layers
  - Pars **optica** retina – **photoreceptive**
  - Pars **ceca** retina – **not photoreceptive**

- Review 11 histological layers of retina

- **Macula Lutea** : **flattened oval area in centre of retina**, slightly below optic disc.
  - In centre: Avascular **fovea centralis** : point of **sharpest visual acuity**; only cones, each with own nerve supply

RETINA: VASC SUPPLY

- Inner layers
  - **Central retinal arteries** (br. of opthalmic)
    - Occlusion > retinal infarction

- Outer layers
  - **No capillaries**
  - Nourished by diffusion from vascular choroid layer, which is supplied by retinal arteries

- Retinal Arteries:
  - **BRIGHT red**, **BRIGHT relfex**, **NO PULSE, Paler with age**,

- Retinal Veins:
  - **DARK red, NARROW reflex, SPONTANEOUS PULSE, 1.5x THICKER**

RETINA: NERVE SUPPLY

- No Sensory supply

- **Disorders of retina are painless!!**

METHOD

- Slightly **Dark** room (**dilated pupils** – can apply eye drops to help)
- Ask patient to keep looking straight ahead and **focus into distance**
- Check ophthalmoscope works and lid is open by **shining onto your hand**
- Hold ophthalmoscope **touching your eye**, **30cm from patient**. Put **spare hand on patients head**
- From **lateral** side (holding ophthalmoscope in **right hand for right eye**), look into the patients eye, through the pupil
- Observe **red reflex**
  - **reddish-orange reflection from the eye's retina**
  - No? – cataract, retinoblastoma??

- Move **closer** to eyes, **focusing** better using the focusing dial

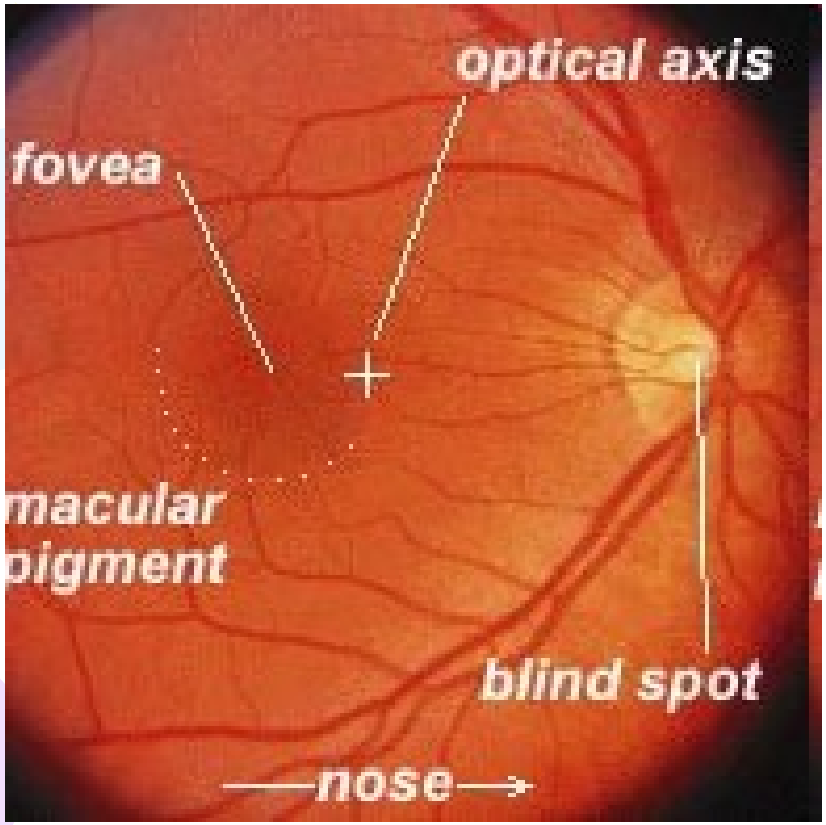
- Identify the **optic disc** (white circle / origin of all the blood vessels) and see the **fundus.**

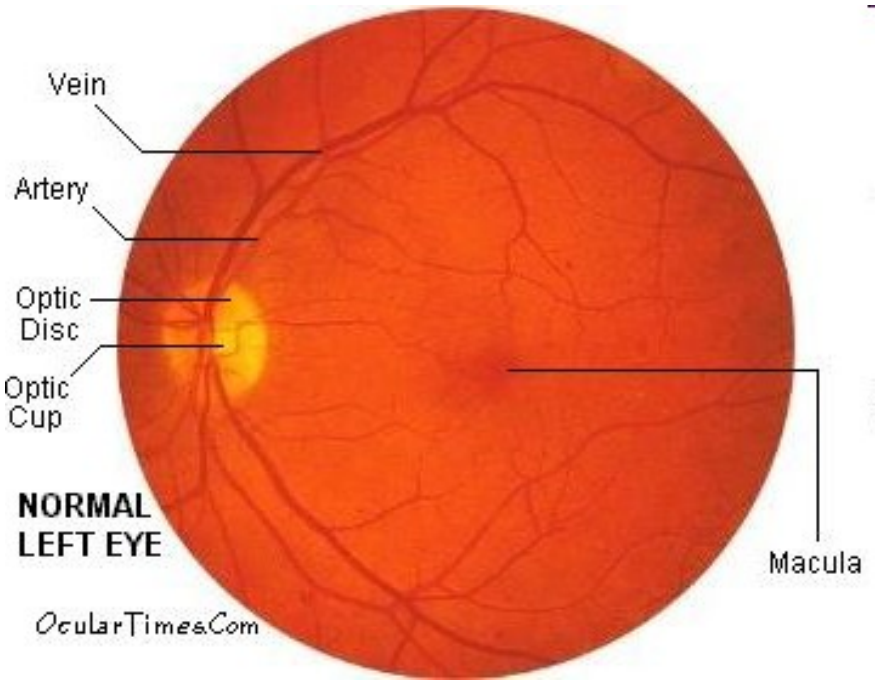
- Notice:
  - Colour size borders of **optic disc**
  - **Vessels** (of all quadrants)
  - **Macula**
    - Slightly darkened pigmented area, 2 optic disc widths from the optic disc
  - **Fovea**
    - Ask patient to looked directly into light, and you may see it
    - Do this last

NORMAL FUNDUS

- Completely **transparent retina**, with no intrinsic colour.
- **Uniform bright red coloration** from the choroid layer vessels
- Optic disc: sharply defined, **yellow-orange**
  - Younger people : pale pink optic disc
- Central Vein lies lateral to artery, **no crossing over**
- **Uniform diameter** of vessels
- Normal spontaneous **venous pulse**
- **NO arterial pulse**

NORMAL FUNDUS





AGE RELATED CHANGES

- **Optic disc** turns pale **yellow** (from pink)
- **Fundus** turns dull, and **non reflective**
- **Drusen** visible
  - tiny yellow or white accumulations of extracellular material that build up in Bruch's membrane
- **Thick vascular walls** > less elastic
- **Meandering of venules**
  - Sclerotic changes can compress vessels

ABNORMAL CHANGES

- Loss of transparency of retina
  - edema? – white/yellow
- Much more reading needed.

FURTHER READING

- Direct & indirect ophthalmoscope
- Ophthalmic history taking
- Tests or visual acuity (sharpness) : Snellens letter chart 20/20 / pictogram kids
- Ocular motility : 9 possible degrees of gaze
- Strabismus, paralysis of ocular muscles, gaze paresis
- Binocular alignment: cover test
- Eyelid and nasolacrimal duct examination
- Conjunctiva examination
- Cornea, and corneal sensitivity
- Examination of anterior chamber
- Lens examination : slit lamp, focused light
- Confrontational field testing
- Measure intraocular pressure
- Admin of eye drops, ointment, eye bandages