

# EAR - I



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# Lesson Plan

- Introduction
- External Ear

## **PINNA**

- Lateral Surface
- Applied aspects
- Nerve supply
- Arterial supply
- Venous & Lymphatic drainage

## **EXTERNAL AUDITORY MEATUS**

- Introduction
- Cartilaginous part
- Bony part
- Arterial supply
- Nerve supply

## **TYMPANIC MEMBRANE**

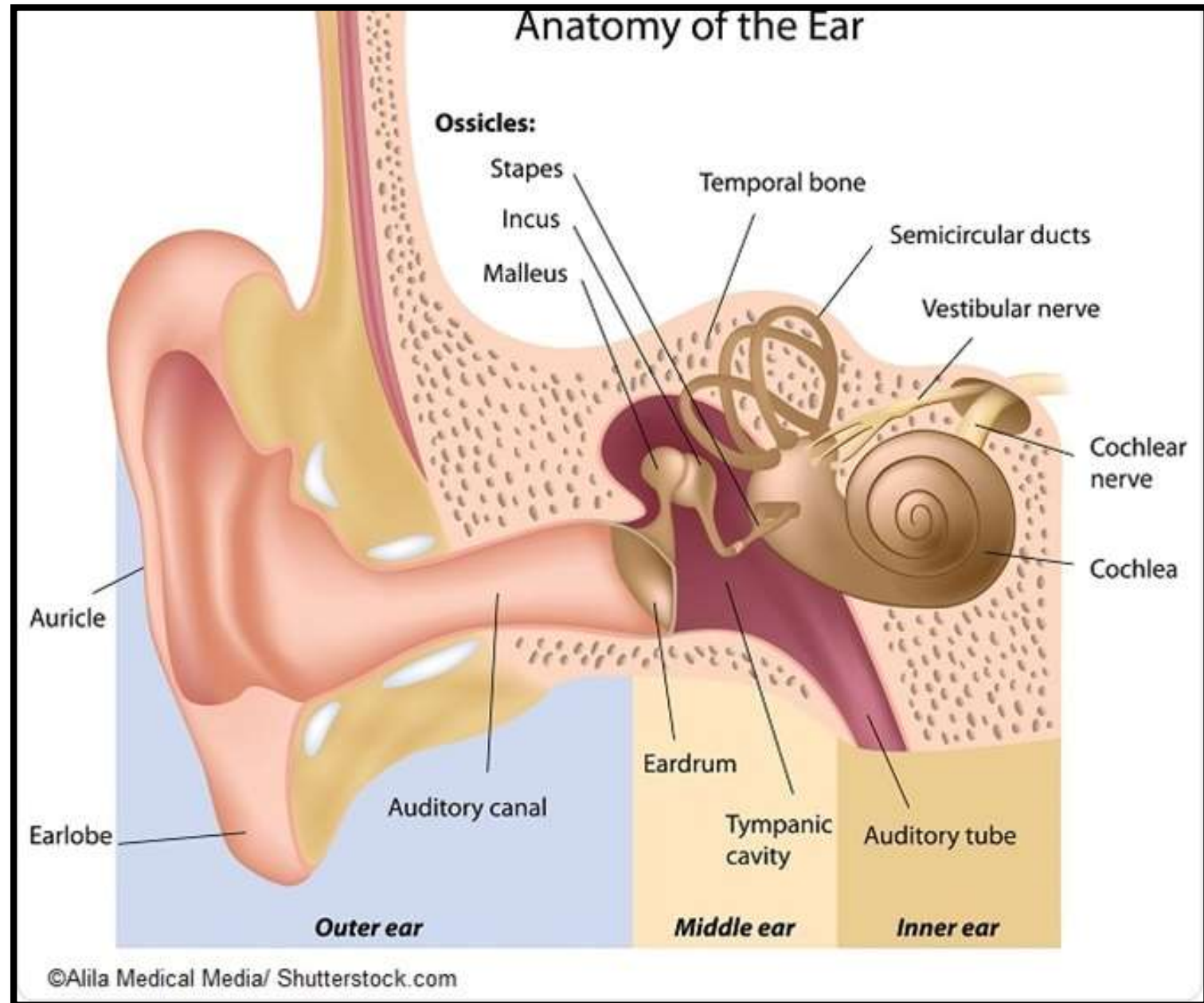
- Introduction
- Layers
- Parts
- Surfaces
- Arterial supply
- Venous drainage
- Nerve supply

# Introduction

- Ear is the organ for special sensation of **hearing**.
- It also plays important role in maintaining the **equilibrium** of the body.

## **PARTS- 3**

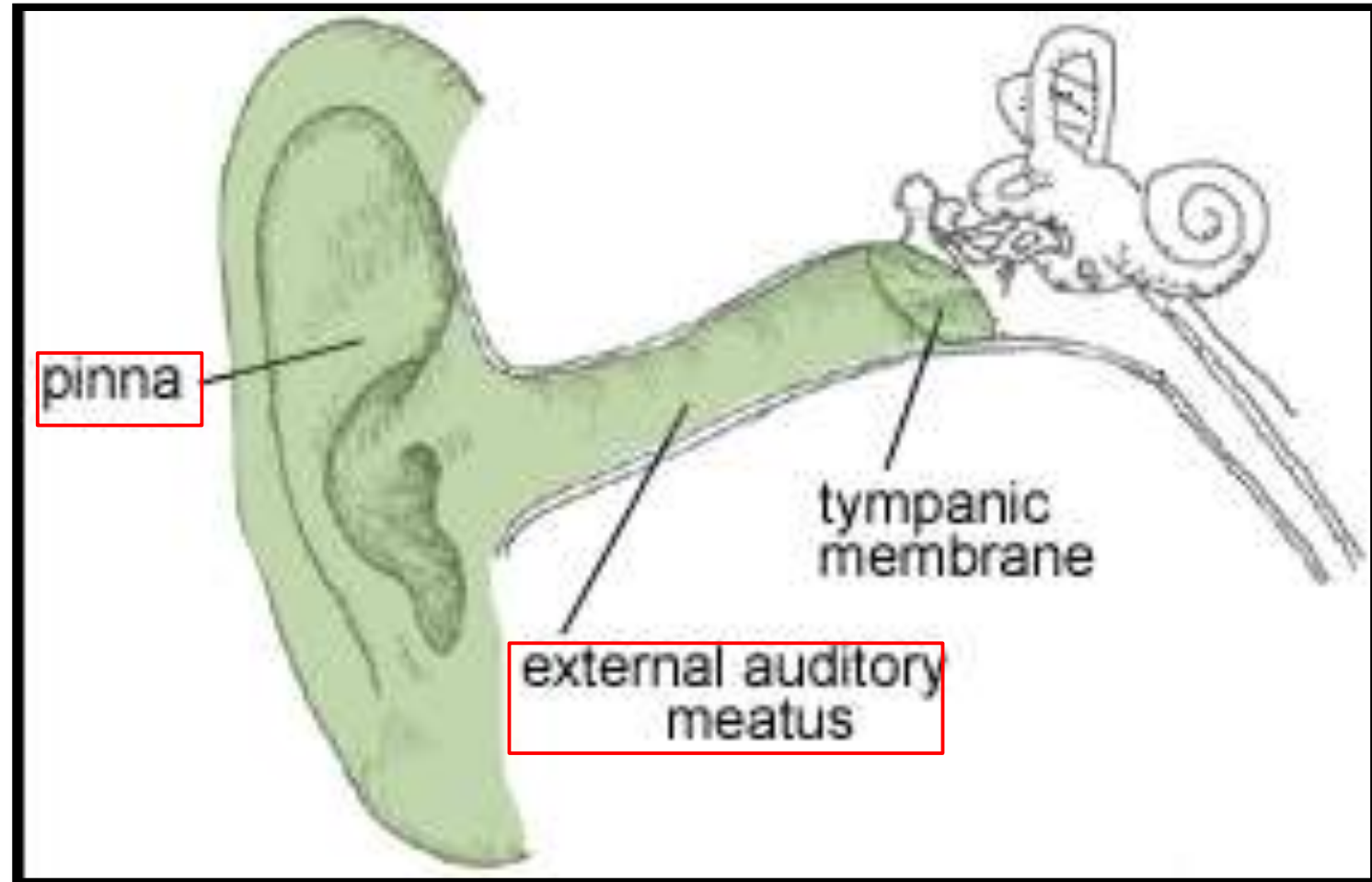
- External Ear.
- Middle Ear.
- Internal Ear.



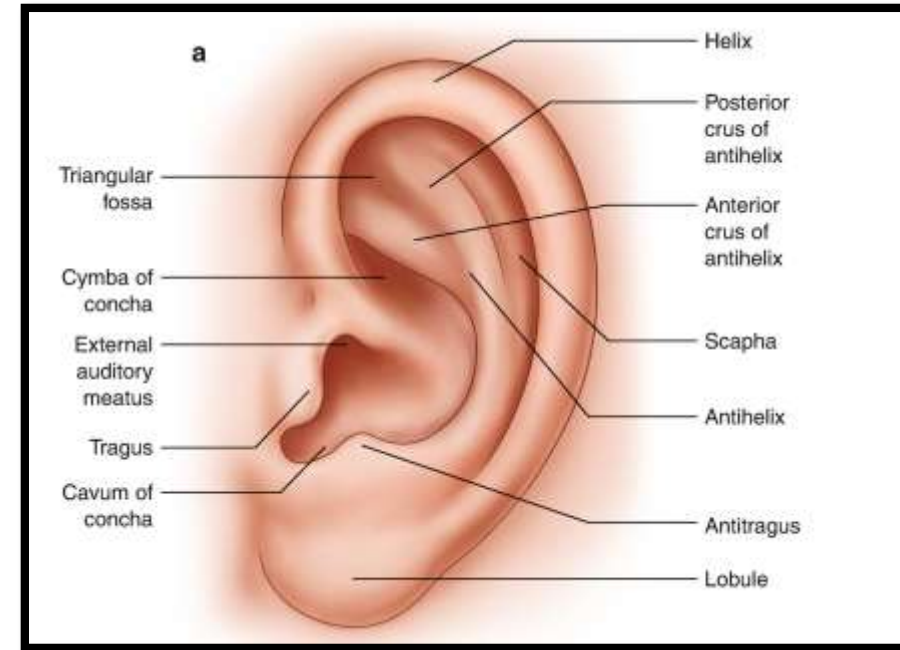
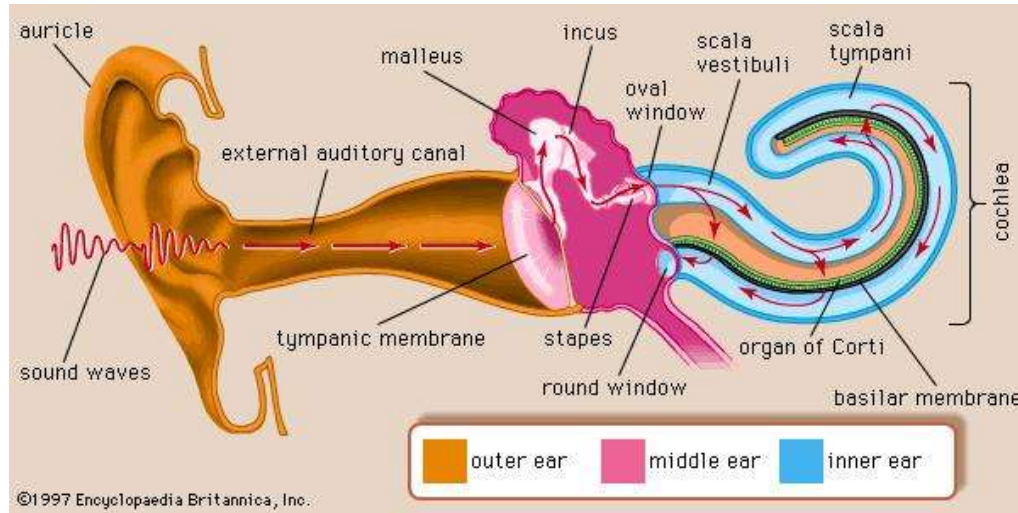
# External Ear

❖ It consists of:

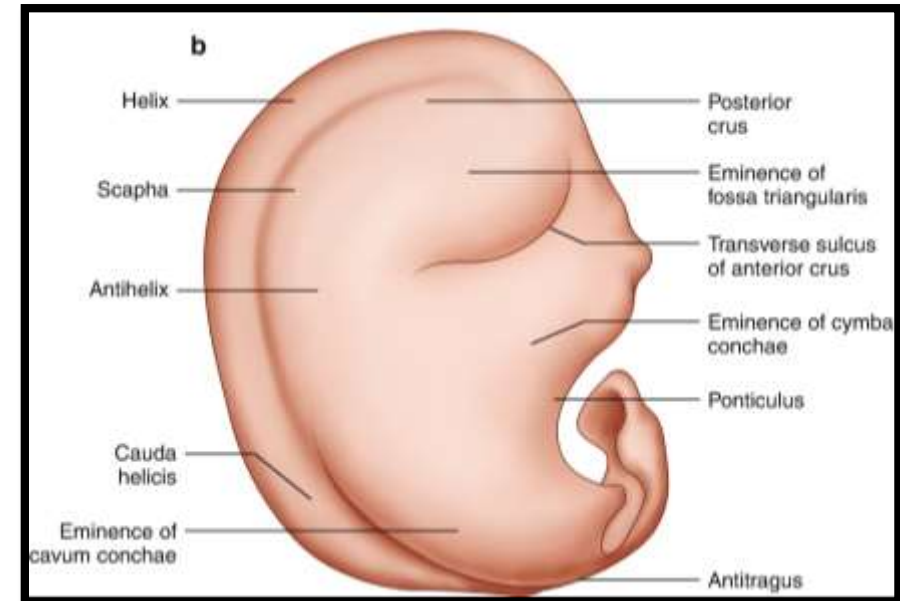
- Pinna (Auricle).
- External auditory meatus (External acoustic meatus).



# Pinna (Auricle)



Lateral (Facial surface)



Medial (Cranial surface)

- It collects and directs the sound waves to the external auditory meatus.
- It is made up of elastic cartilage covered with skin.
- Its cartilage is continuous with cartilage of External auditory meatus.

## Surfaces- 2

- Lateral (Facial surface)
- Medial (Cranial surface)

# Lateral Surface of Pinna

❖ It presents the following features:

## Concha-

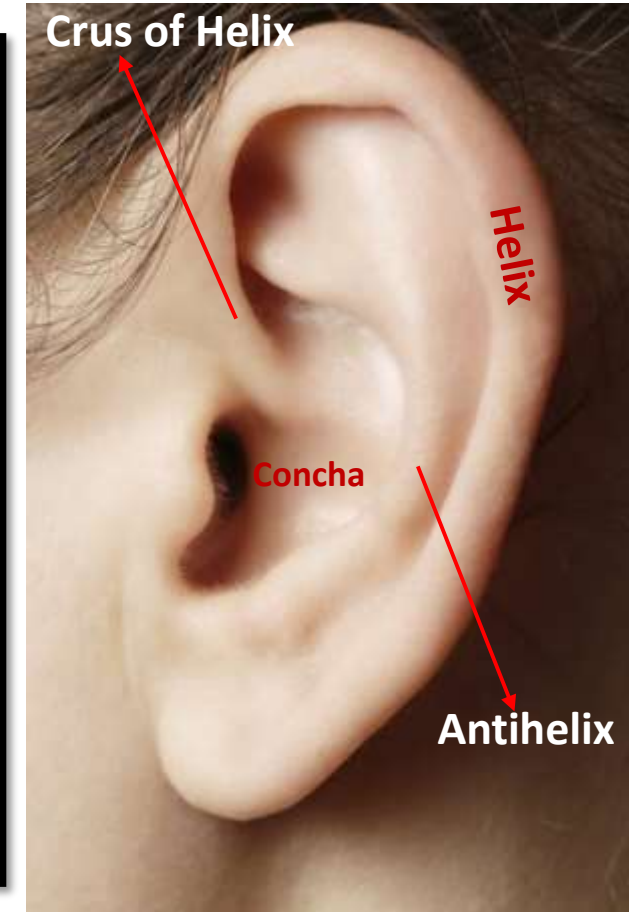
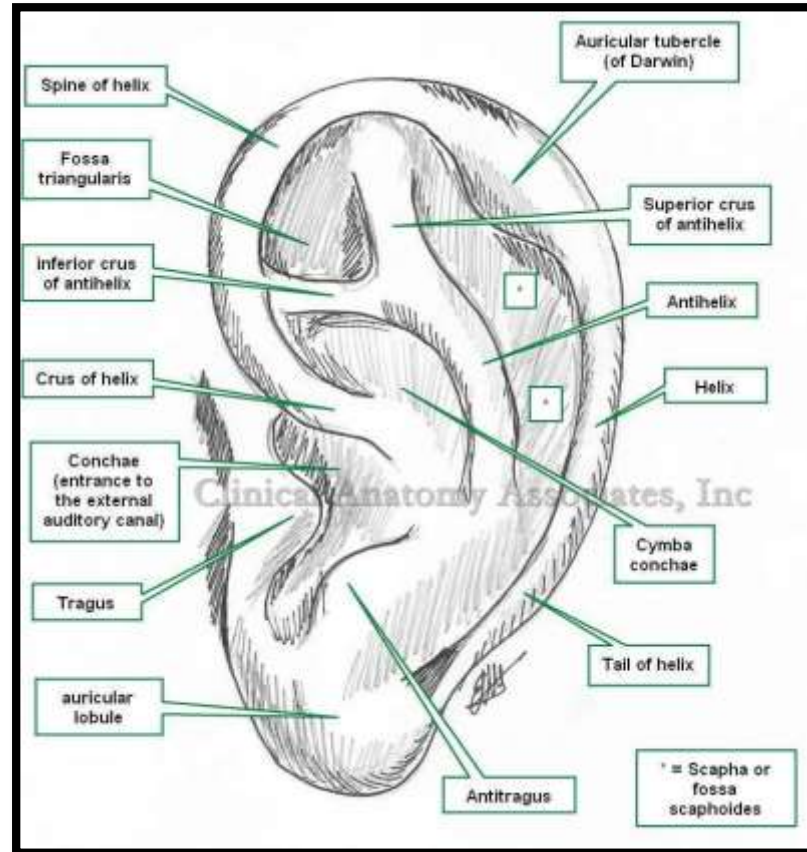
- A large depression that leads into external auditory meatus.

## Helix-

- Peripheral rim of pinna.
- It has two limbs: anterior and posterior.
- Its anterior limb ends as crus of helix.

## Antihelix-

- A prominent ridge in front and parallel to the posterior part of helix.



# Lateral Surface of Pinna contd...

## Tragus-

- A triangular flap of cartilage in front of concha.

## Antitragus-

- A small elevation opposite to the tragus.

## Cymba Concha-

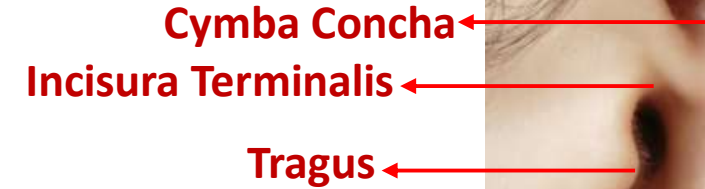
- It is small area of concha above the crus of helix.
- It corresponds to Suprameatal triangle (Mc Ewen's Triangle).

## Lobule-

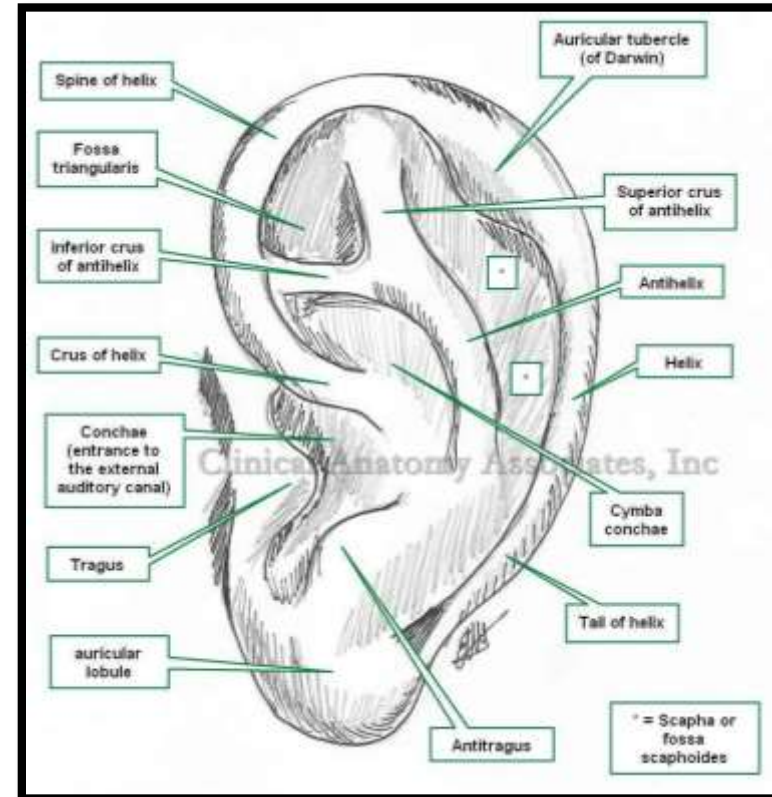
- It hangs below the antitragus.
- It is made up of fibrofatty tissue covered with skin.
- There is **no cartilage** in the lobule.

## Incisura Terminalis-

- It is a gap between tragus and crus of helix.
- There is **no cartilage** in this gap.



Antitragus



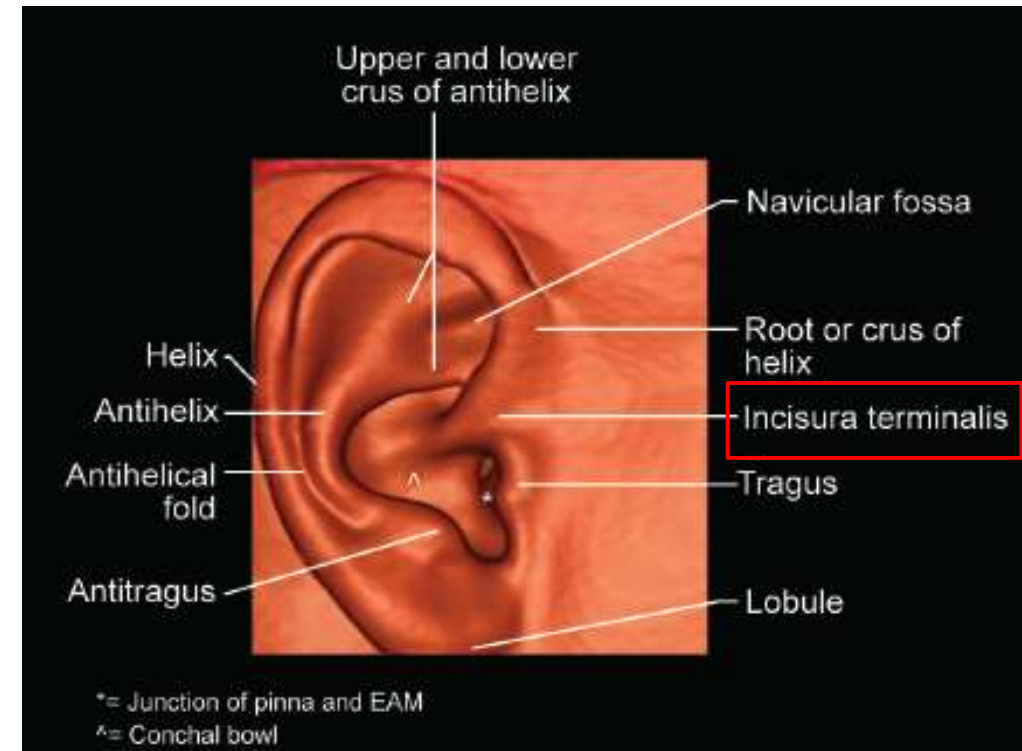
# Applied Aspects

## Pinna as a graft-

- Pinna is used as a graft material in several plastic surgeries.

## Surgery of external auditory meatus-

- For this, incision is given in the region of **incisura terminalis**.





# Nerve Supply

## Motor supply-

- Facial nerve.

## Sensory supply-

### Lateral Surface-

Lower 1/3<sup>rd</sup> – Great Auricular Nerve (C2, C3)/

Upper 2/3<sup>rd</sup>- Auriculotemporal nerve.

Concha- by Auricular branch of Vagus (**Alderman's Nerve/Arnold's Nerve**)

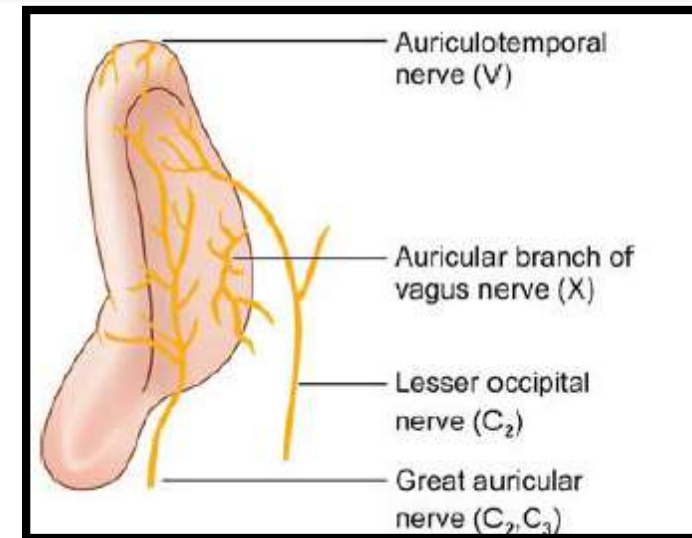
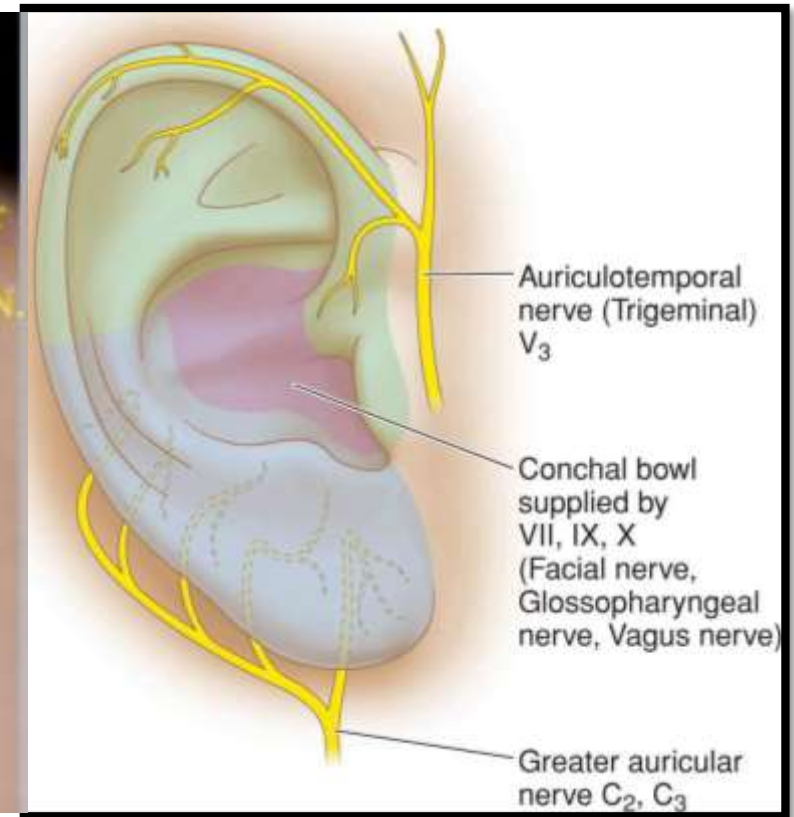
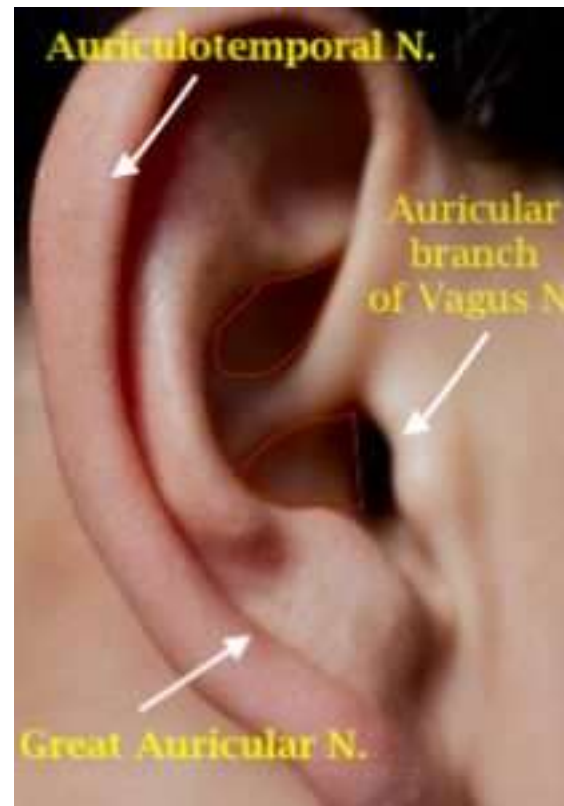
)

### Medial Surface-

Lower 1/3<sup>rd</sup> – Great Auricular Nerve (C2, C3)

Upper 2/3<sup>rd</sup>- Lesser Occipital Nerve.

Eminentia Concha- by Auricular branch of Vagus (**Alderman's nerve/Arnold's Nerve**)



# Arterial Supply

## Posterior Auricular Artery-

- It is a branch of external carotid artery.

### It supplies:

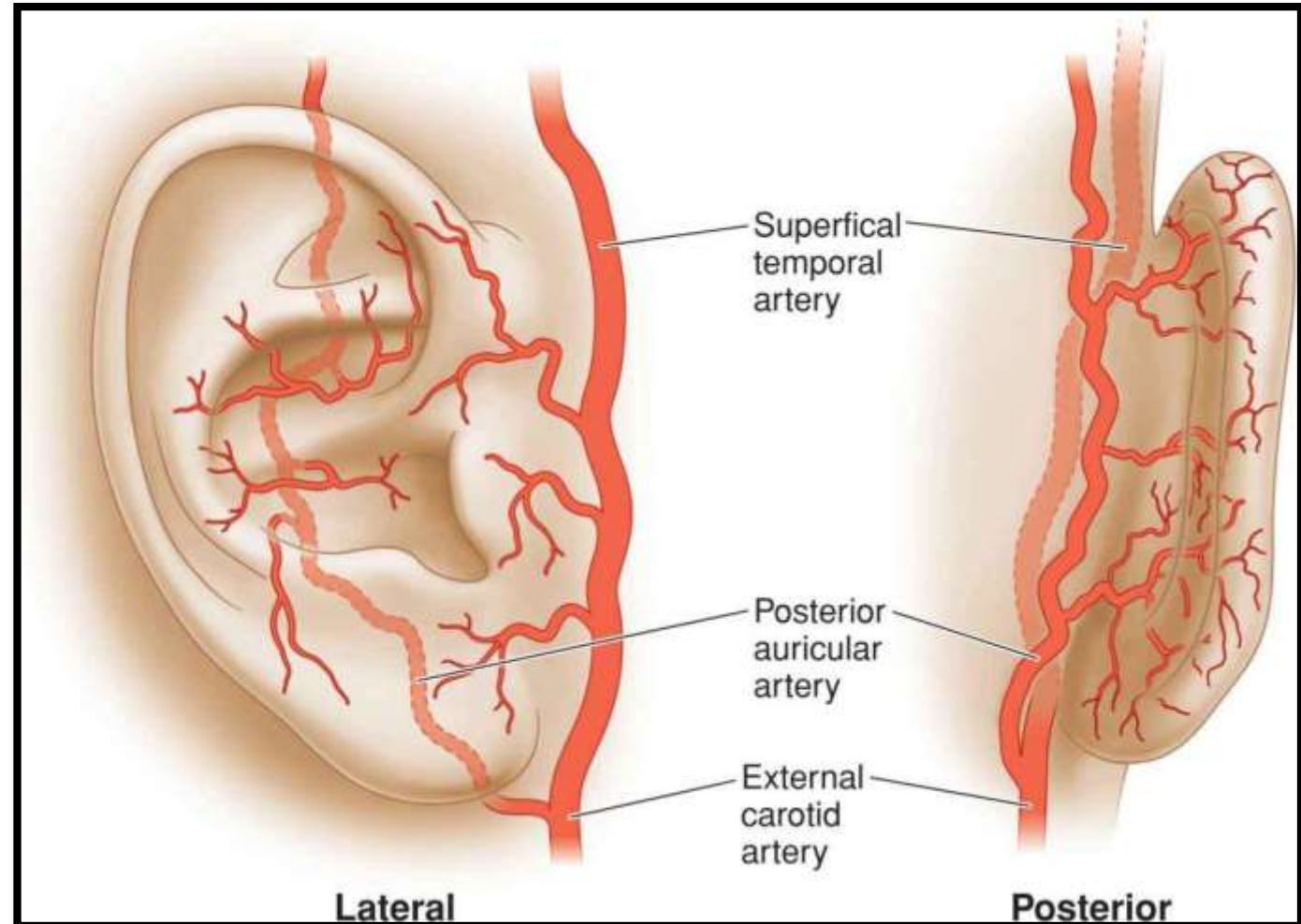
- Medial surface &
- Posterior part of lateral surface

## Superficial Temporal Artery-

- It is one of the terminal branches of External Carotid Artery.

### It supplies:

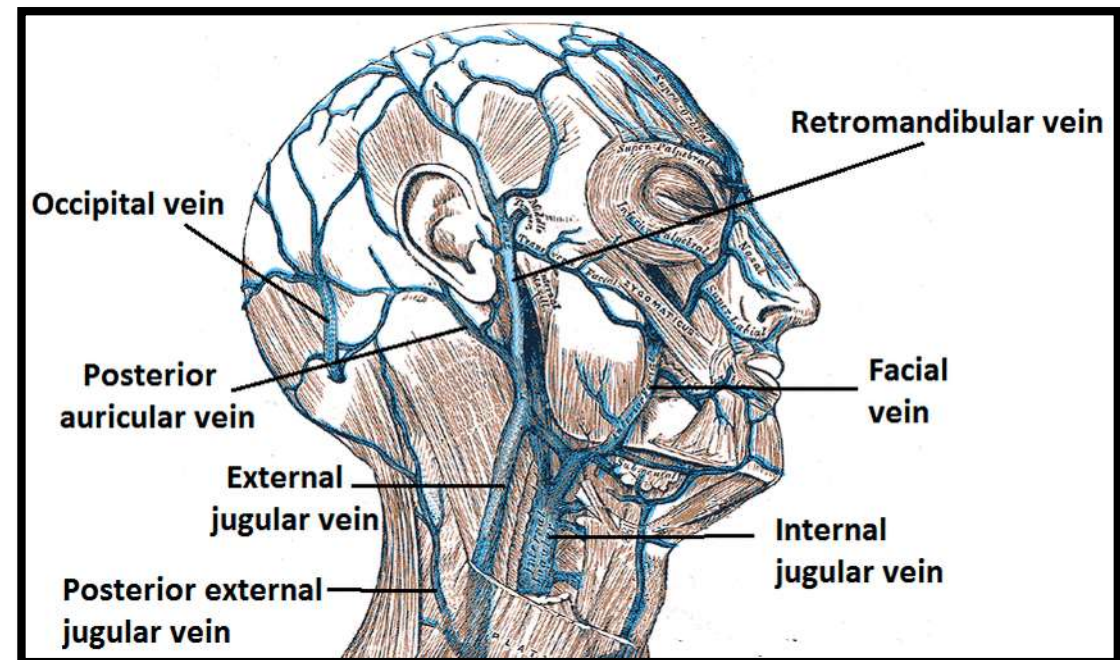
- Anterior part of lateral surface.
- Upper part of cranial surface is also supplied by few branches of Occipital artery.



# Venous & Lymphatic Drainage

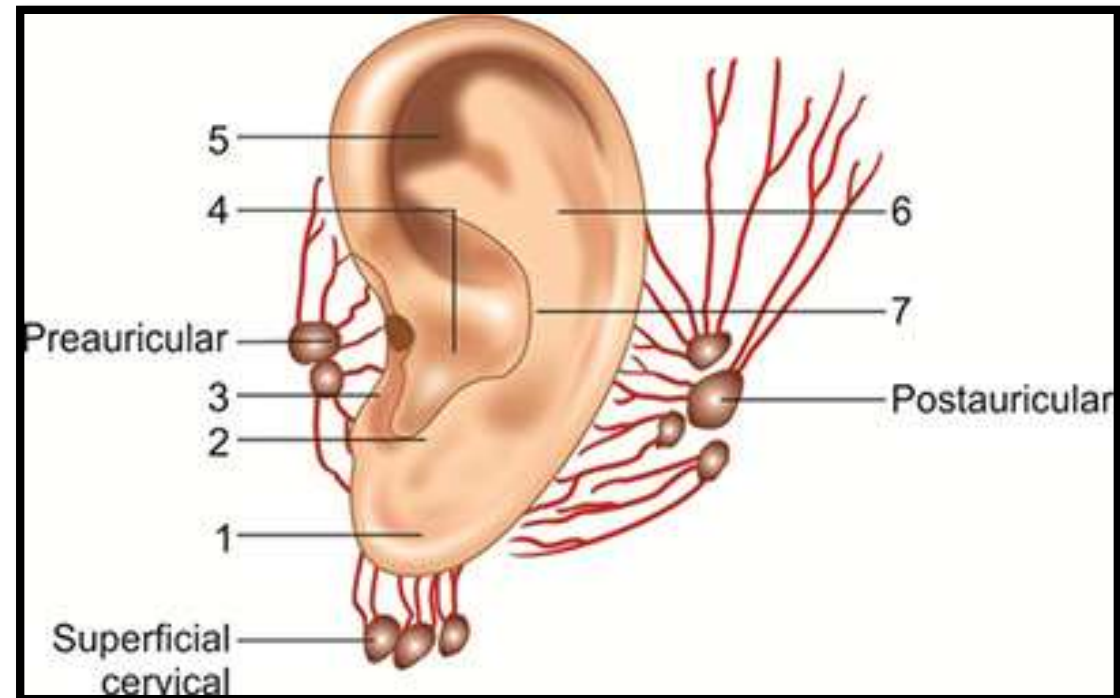
## Venous Drainage-

- Superficial Temporal vein &
- External Jugular Vein.

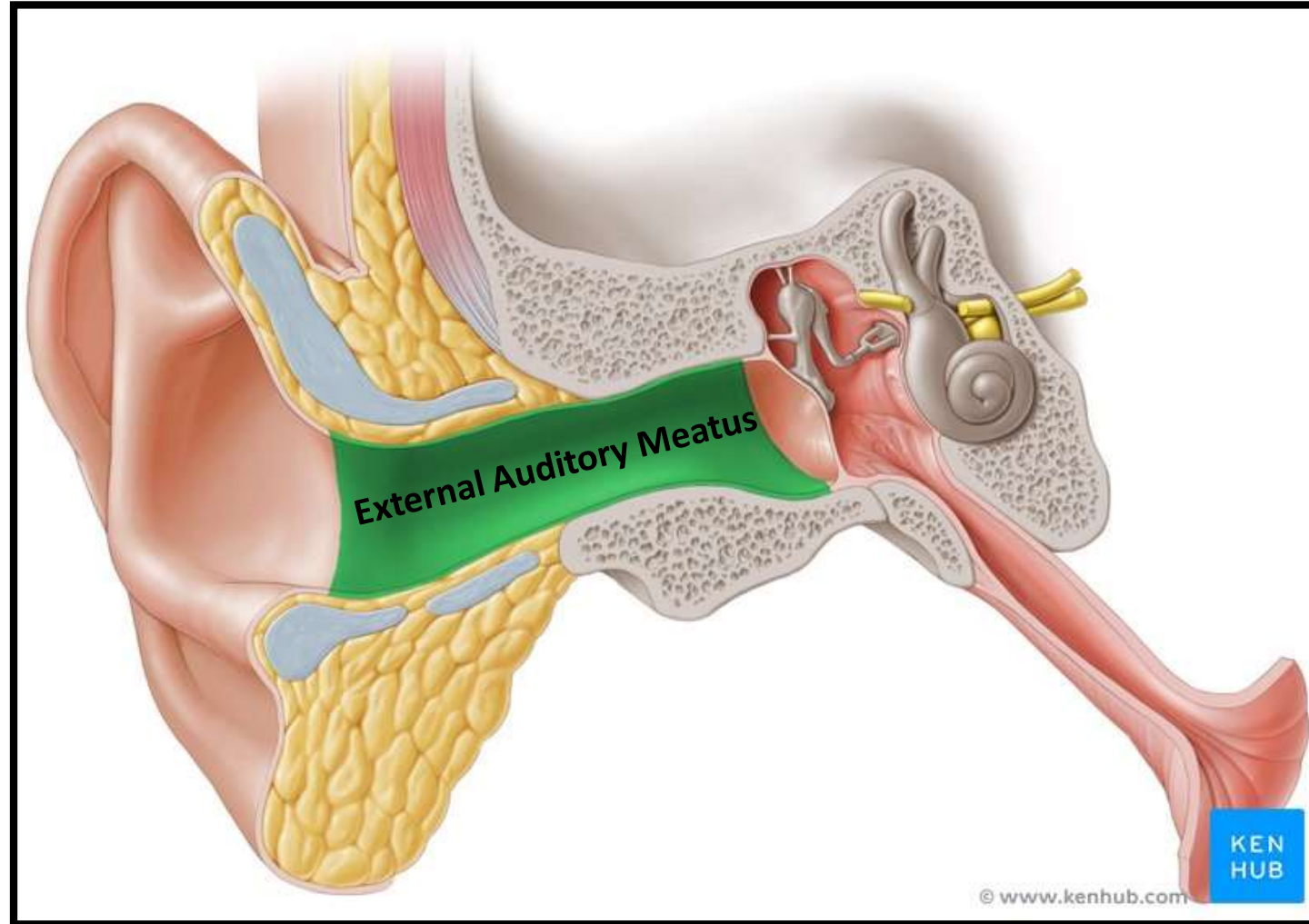


## Lymphatic Drainage-

- Preauricular lymph nodes.
- Postauricular (Mastoid) lymph nodes.
- Upper group of deep cervical lymph nodes.



# External Auditory Meatus [ External Acoustic Meatus]



# Introduction

- External auditory meatus is an osseocartilaginous canal.

## Extent-

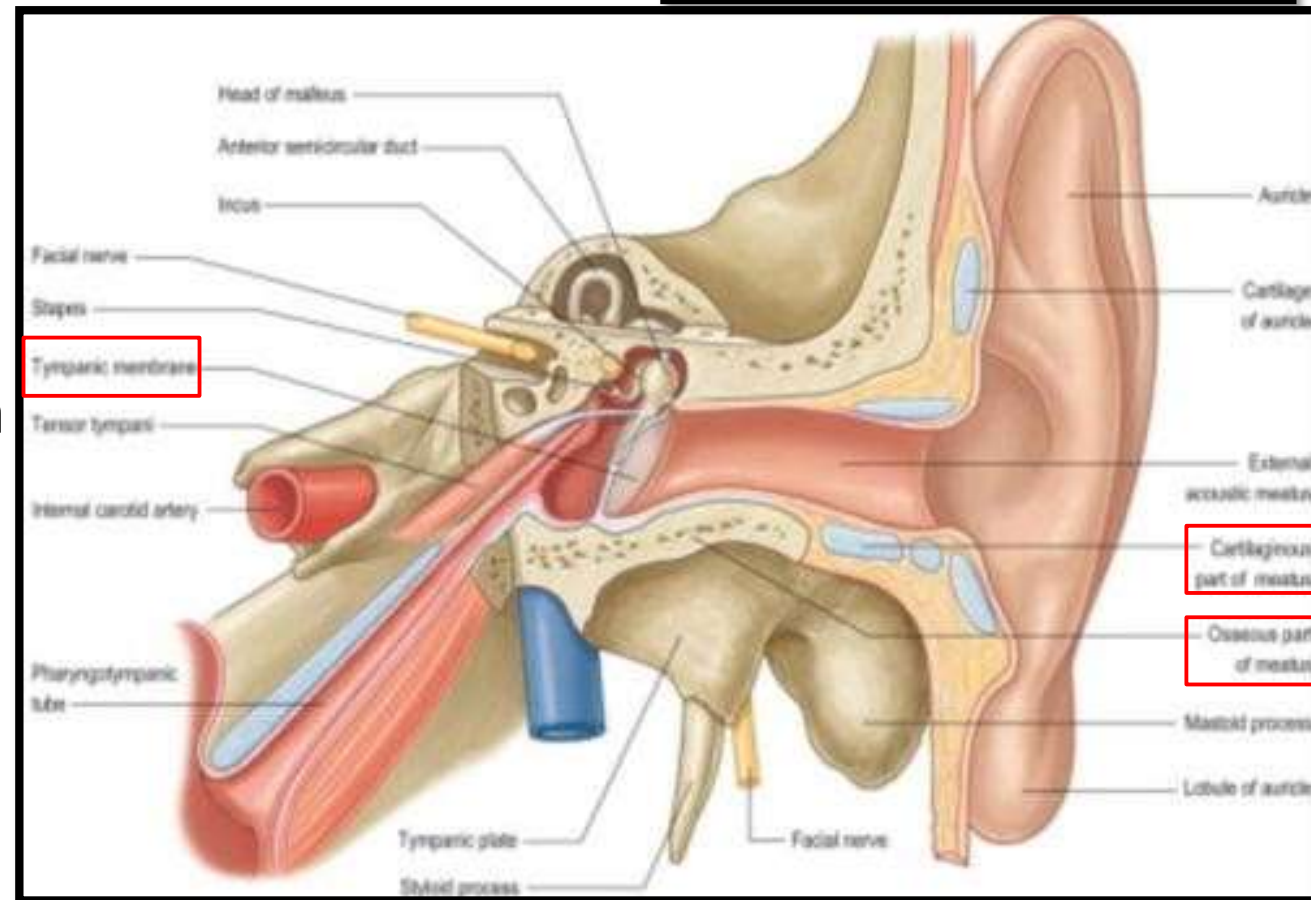
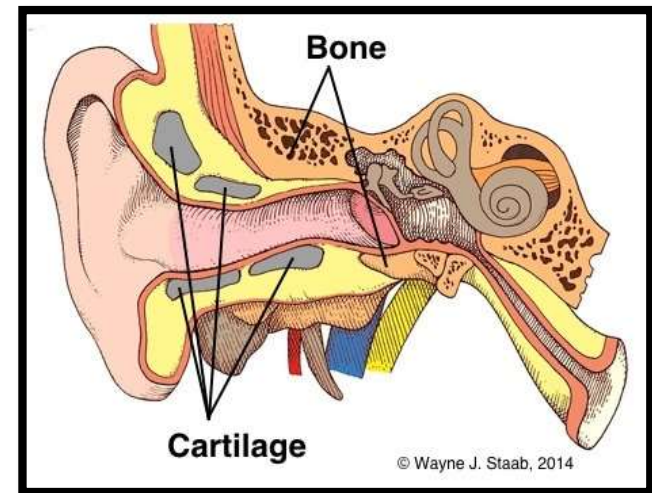
- From bottom of concha to the tympanic membrane.

**Length-** ~ 24 mm (along its posterior wall)

- Its anterior wall and floor are longer than the posterior wall and roof.

## Parts- 2

- Outer **Cartilaginous part**
- Inner **Bony part**



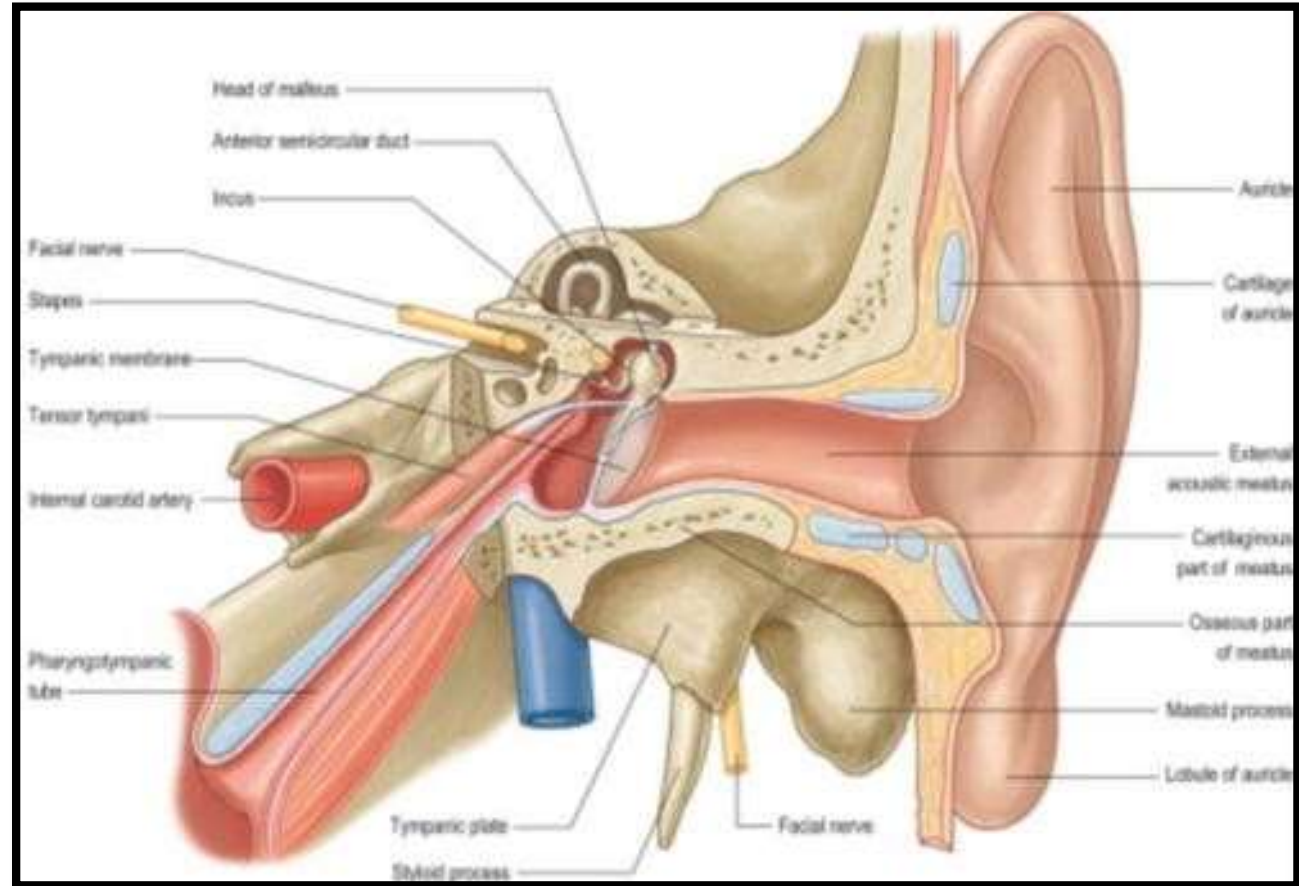
# Cartilaginous Part

- It is outer 1/3<sup>rd</sup> part.

**Length-** ~ 8mm

**Direction-** Upwards, Backwards and Medially  
(UBM)

- Its cartilage is the continuation of the cartilage of auricle.
- Its covering skin contains hair and ceruminous (pilosebaceous) glands.
- These glands secrete ear wax.



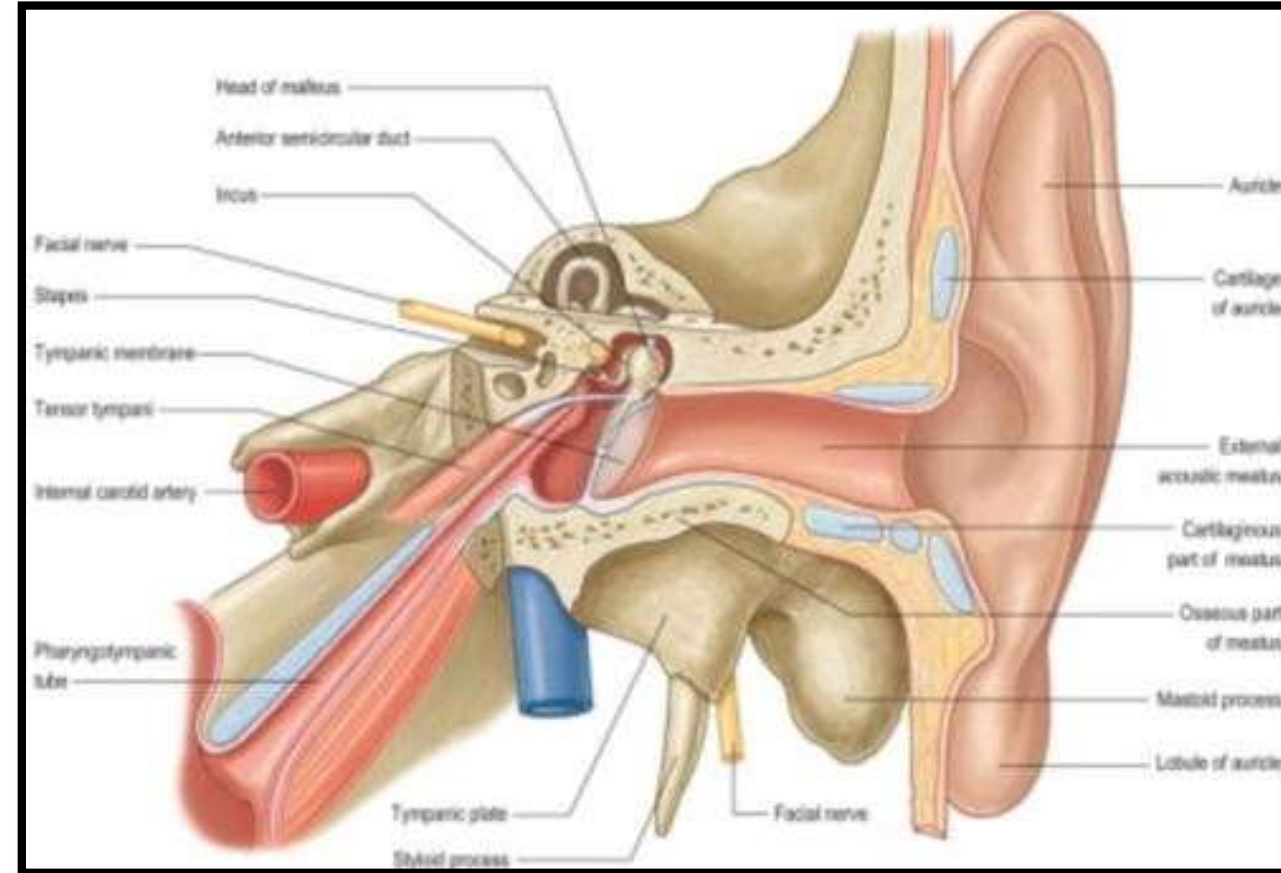
# Bony Part

- It forms the **inner 2/3<sup>rd</sup>**.

**Length-** ~ 16 mm

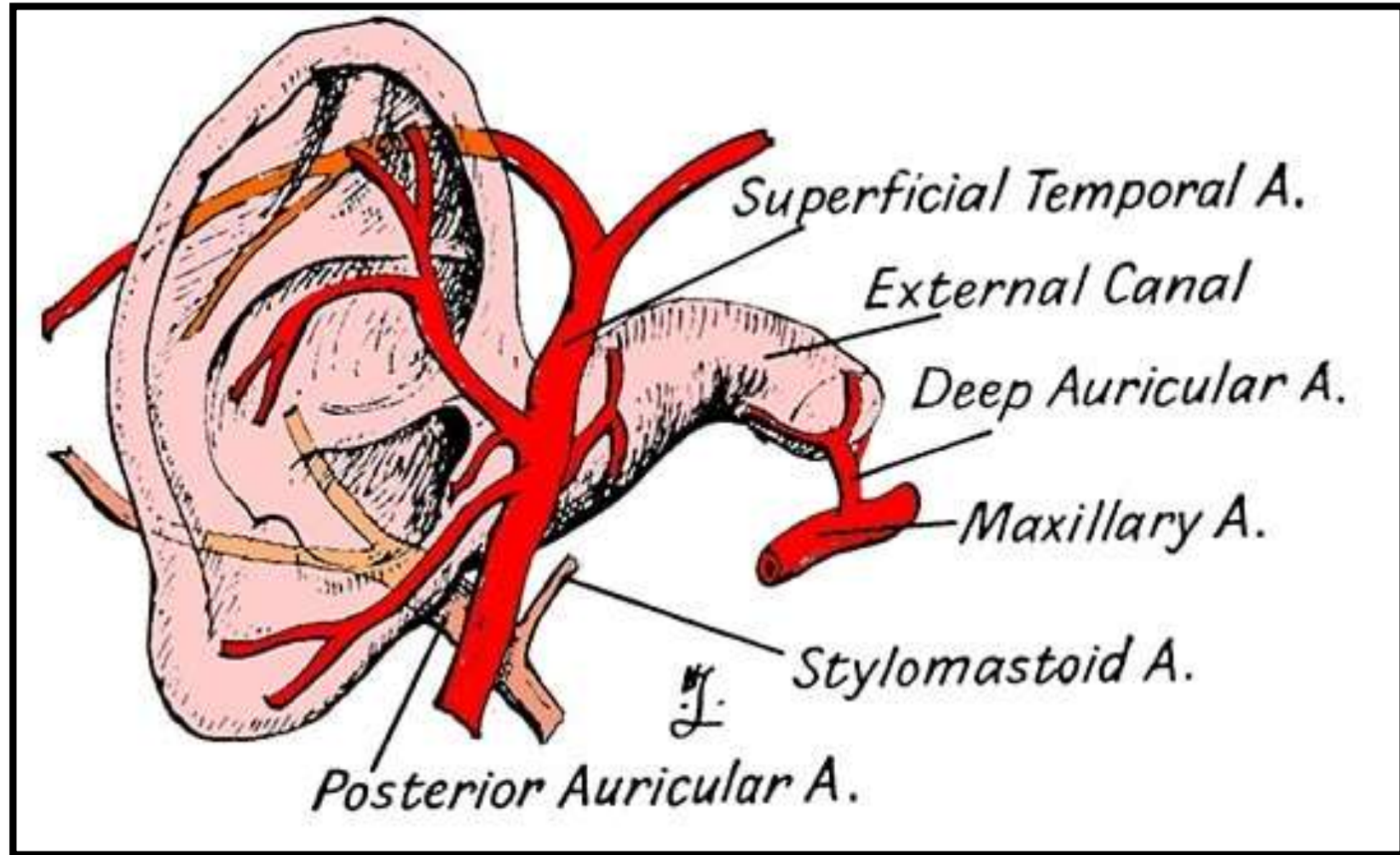
**Direction-** Downwards, Forwards and Medially  
(DFM)

- This part presents a narrowing called isthmus, about 20 mm deep to concha.
- This part is not fully developed in newborn and is represented by a ring of bone.
- Its covering skin is continuous with the outer layer (cuticular layer) of the tympanic membrane.
- This skin is devoid of hair and ceruminous glands.
- Anterior wall presents a foramen called **foramen of Huschke**.
- This foramen is normally present up to the age of 4 years.



# Arterial Supply

- Posterior Auricular Artery
- Deep Auricular Artery
- Anterior Auricular Artery





# Nerve Supply

## Auriculotemporal Nerve-

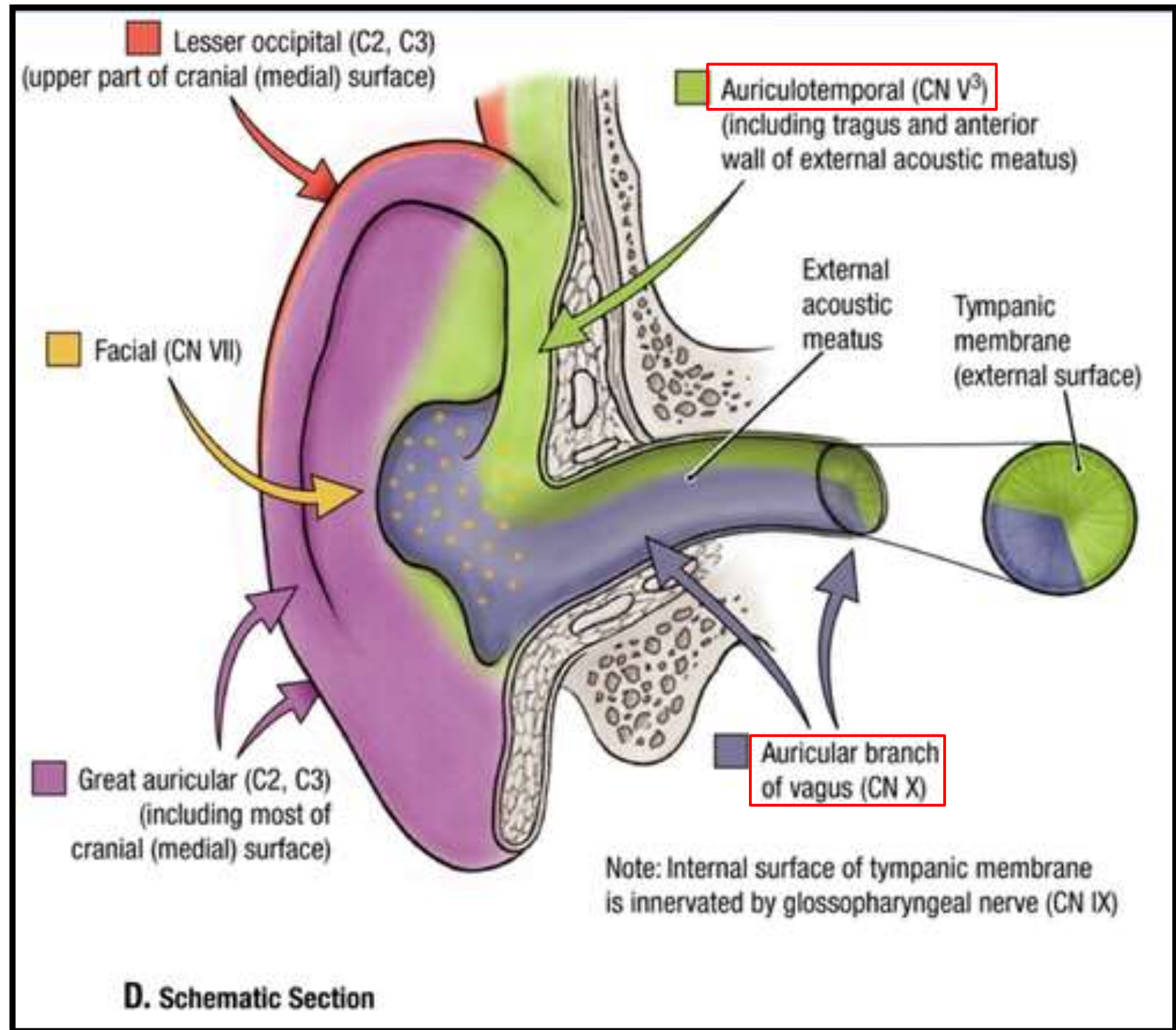
❖ Supplies:

- Anterior wall
- Roof

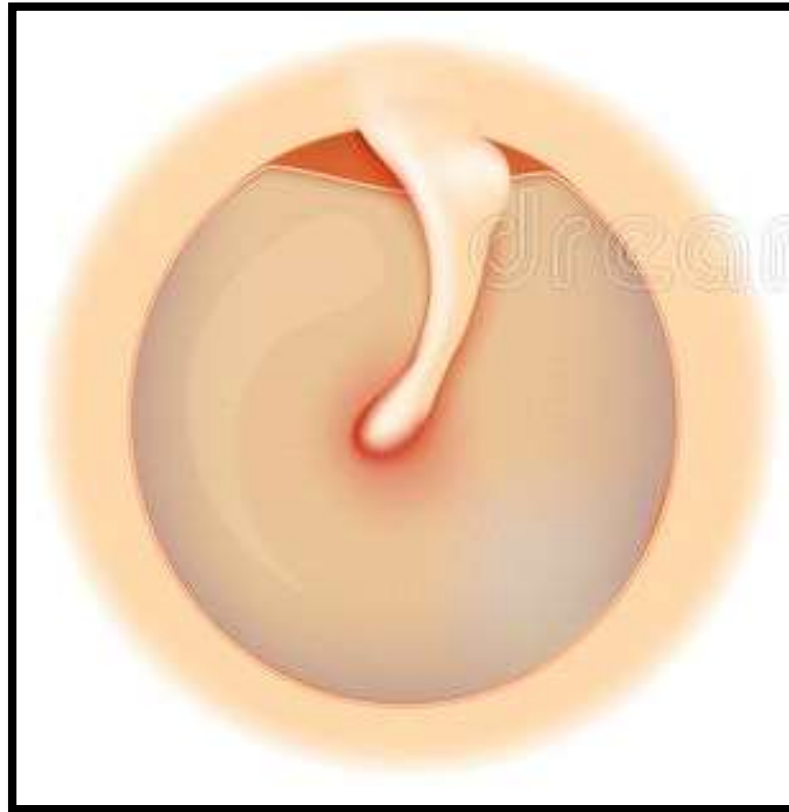
## Auricular branch of Vagus-

❖ Supplies:

- Posterior wall
- Floor



# Tympanic Membrane [Ear Drum]



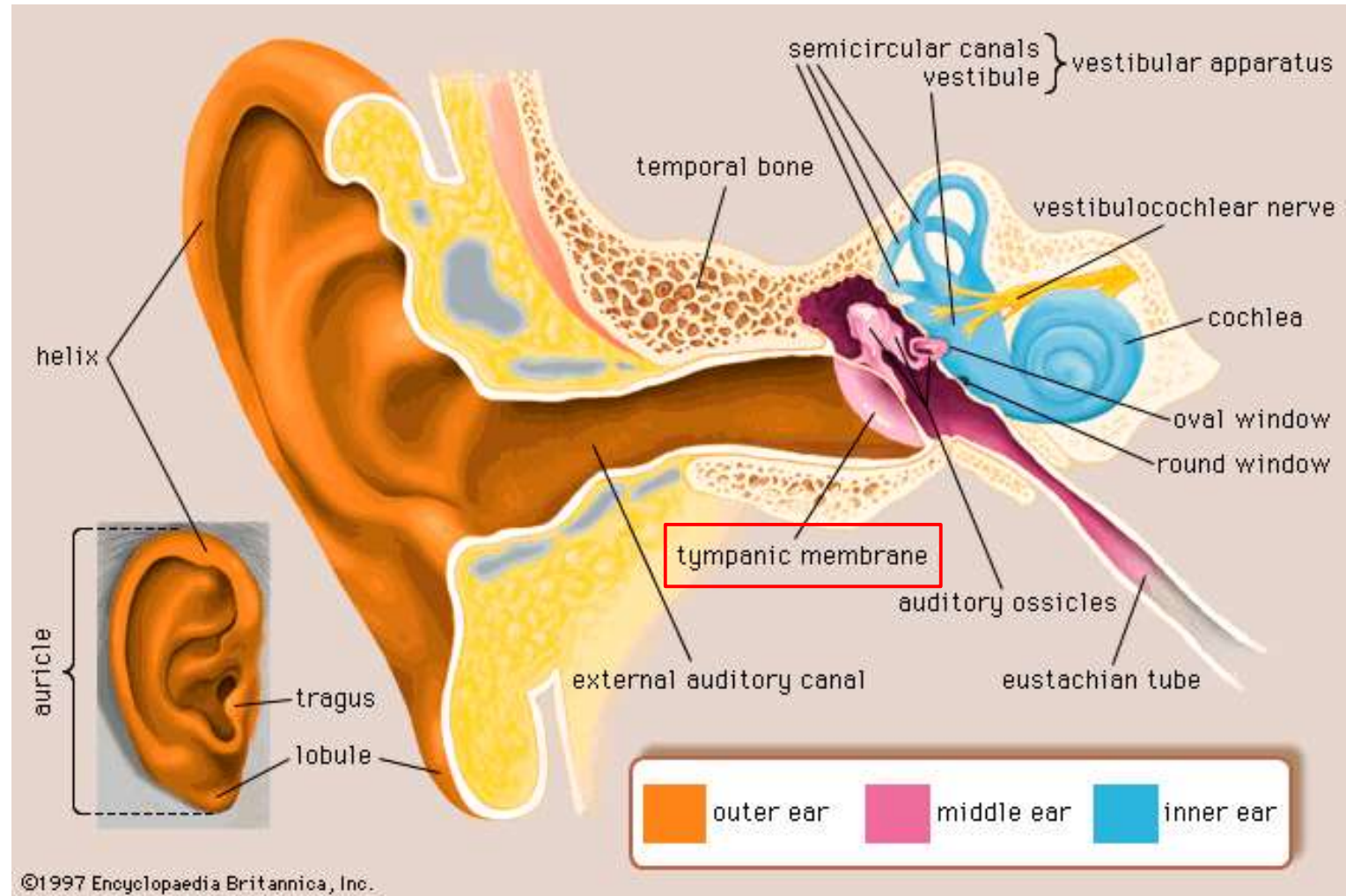
# Introduction

- It is a thin semi-transparent membrane which forms the partition between external auditory meatus and middle ear.

**Shape-** oval shaped

- It is placed obliquely making an angle of  $\sim 55^\circ$  with the floor of external auditory meatus.

- It faces **downwards, forwards** and **laterally (DFL)**



# Layers

- There are **3** layers in tympanic membrane (from lateral to medial):

1. Outer Cuticular layer
2. Middle Fibrous layer
3. Inner Mucosal layer

## Outer Cuticular Layer-

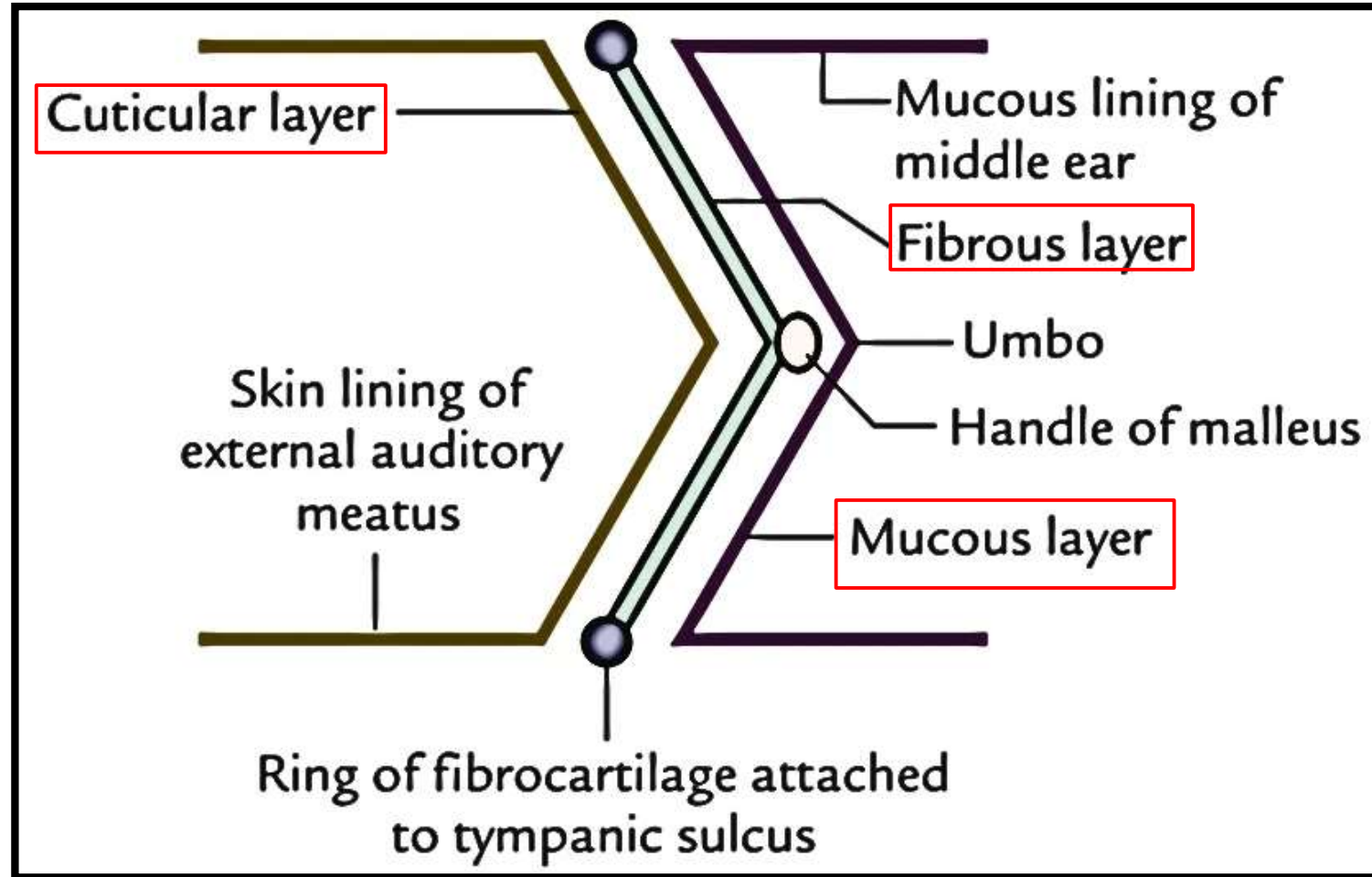
It consists of stratified squamous epithelium.

## Middle Fibrous Layer-

It encloses handle of Malleus

## Inner Mucosal Layer-

It consists of low columnar epithelium.



# Parts

❖2

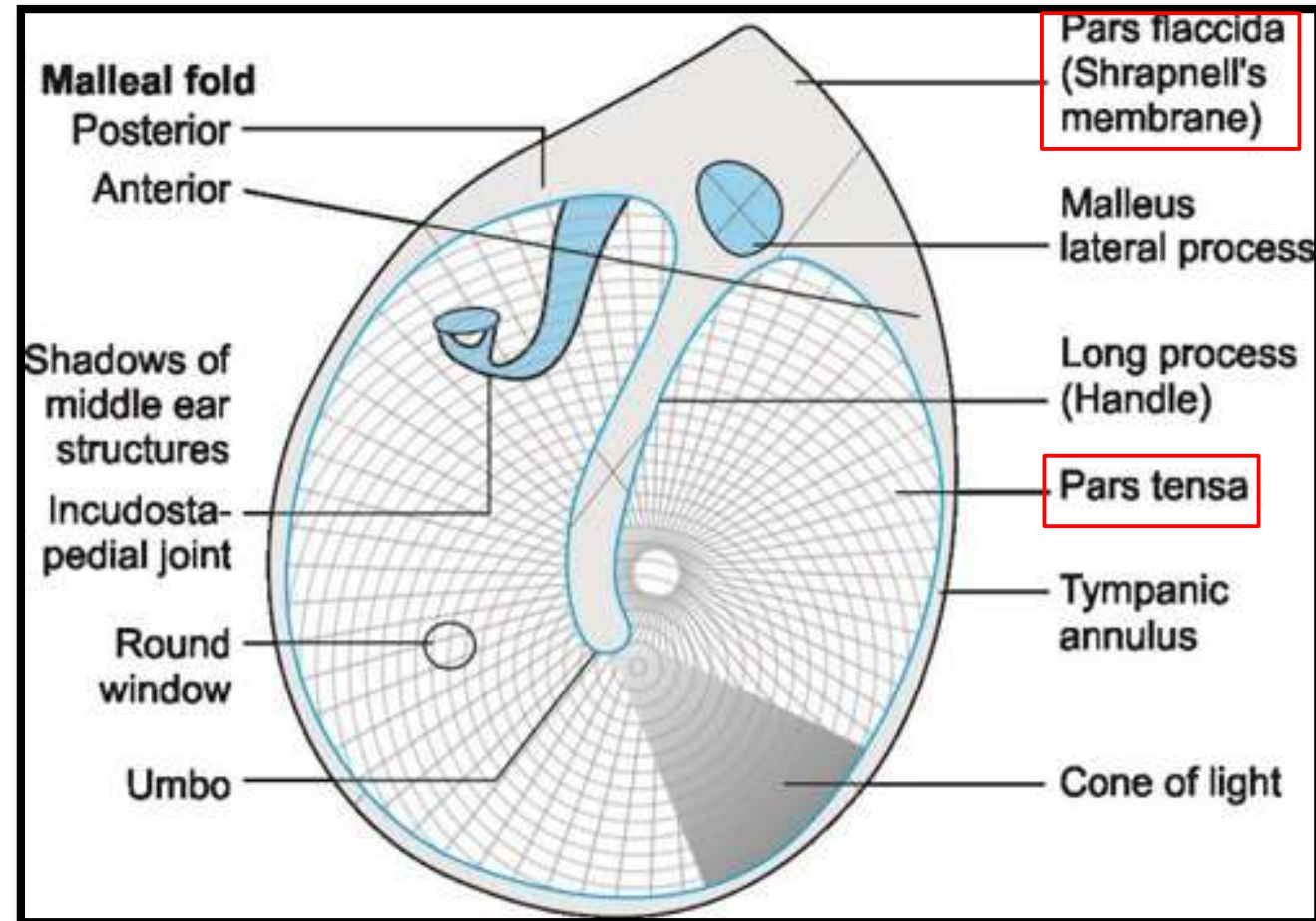
- Pars Tensa
- Pars Flaccida (Sharpnel's Membrane)

## Pars Tensa-

- It is the **large part** of tympanic membrane.
- Its inner surface has attachment of handle of Malleus.
- Its periphery is thickened to form fibrocartilaginous rim.
- Fibrocartilaginous rim presents a notch above.
- From the notch, anterior and posterior malleal folds pass to get attachment to the lateral process of Malleus.

## Pars Flaccida (Sharpnel's Membrane)-

- It is the **small part** of tympanic membrane, triangular in shape.
- It is above the lateral process of malleus between anterior and posterior malleal folds.



# Surfaces

❖2

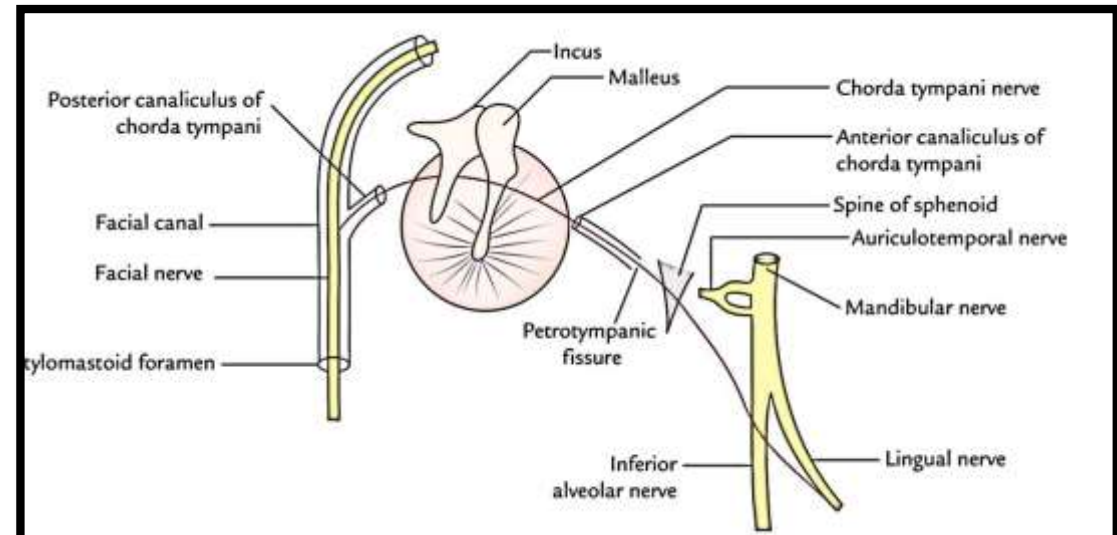
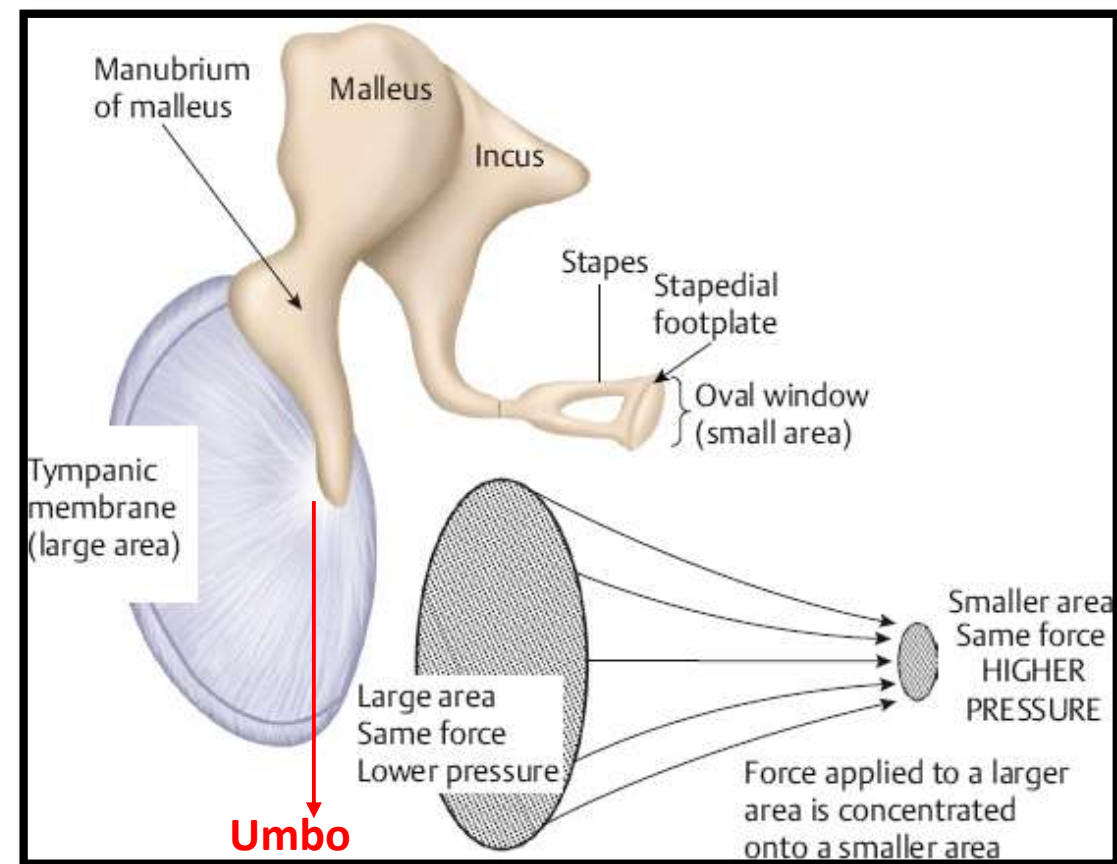
- Lateral surface
- Medial surface

## Lateral Surface-

- It is **concave**.
- It is directed **downwards, forwards and laterally (DFL)**.

## Medial Surface-

- It is **convex**.
- The point of maximum convexity is called '**Umbo**'.
- It has attachment of handle of Malleus up to the centre.
- Handle of Malleus is crossed medially by the Chorda Tympani Nerve.
- Chorda Tympani Nerve runs between the fibrous and mucosal layers at the junction of pars tensa and pars flaccida.



# Arterial Supply

## Lateral Surface-

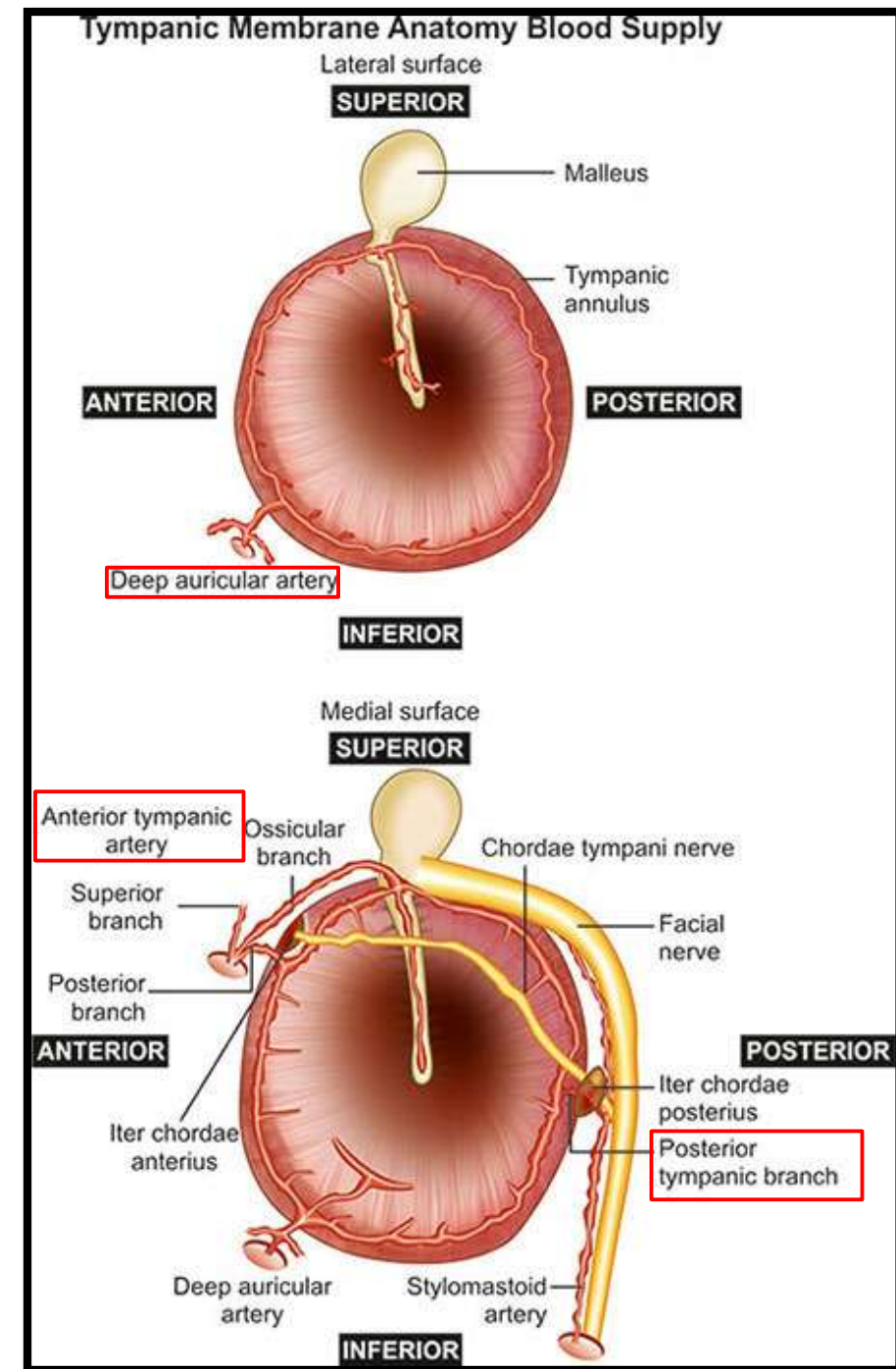
Supplied by:

- Deep Auricular Artery.

## Medial Surface-

Supplied by:

- Anterior Tympanic Artery
- Posterior Tympanic Artery



# Venous Drainage

## **Outer Surface-**

Drains into:

- External Jugular Vein.

## **Inner Surface-**

Drains into:

- Transverse Sinus and
- Pterygoid Venous Plexus.



# Nerve Supply

## Lateral Surface-

### Anterior ½-

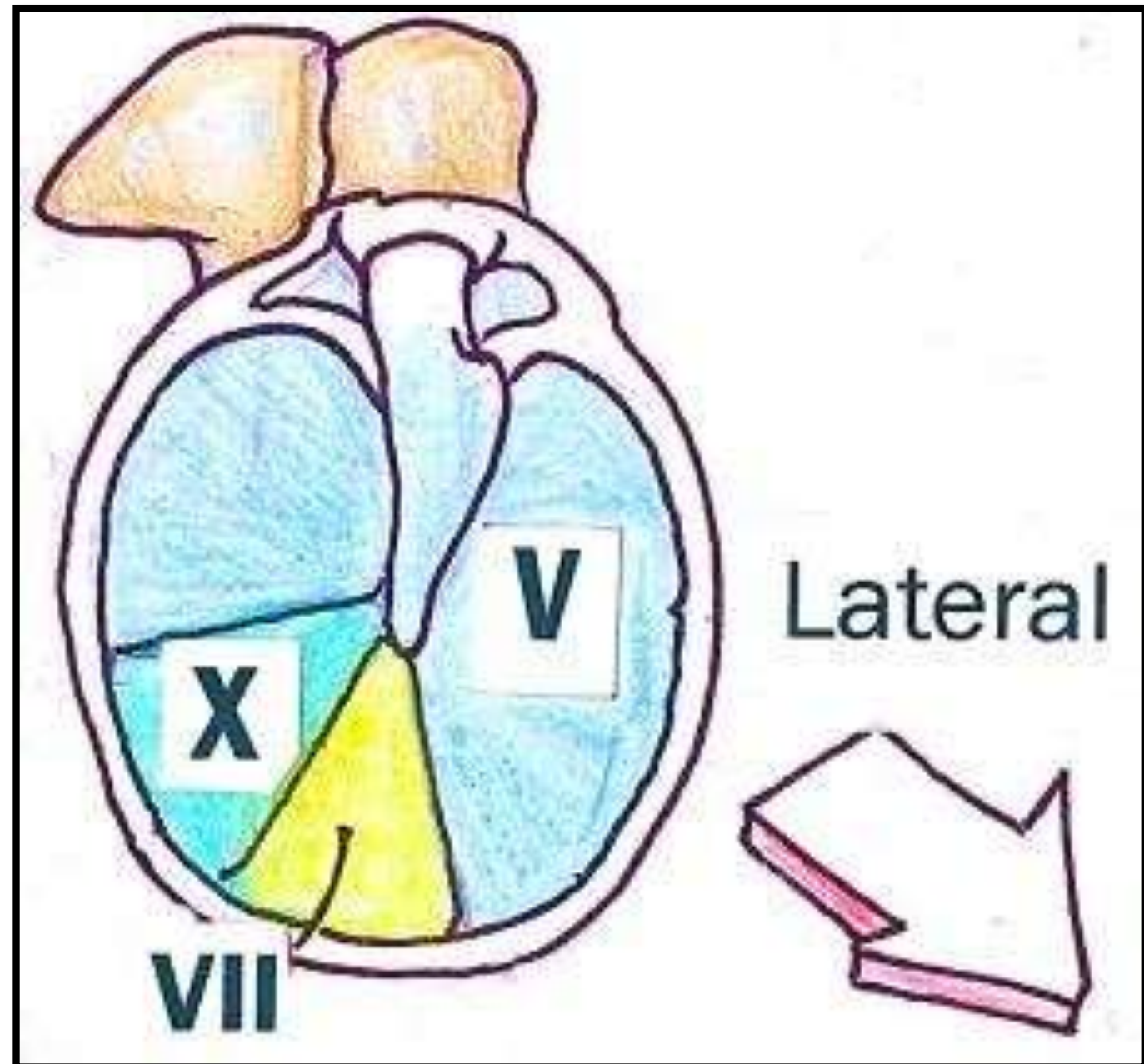
- Auriculotemporal Nerve.

### Posterior ½-

- Auricular branch of **Vagus**

## Medial Surface-

- Tympanic branch of **Glossopharyngeal** Nerve



thank  
you