

Applied Anatomy of the Ear

A Professor Dr Haider Alsarhan

THE EXTERNAL EAR

(A) The Auricle: helix, crus of helix, tragus, lobule, antihelix, triangular fossa, antitragus, concha, External auditory Canal opening

(B) The External Auditory Canal (EAC): 2.5 cm

1-Outer 1/3: Cartilaginous: hair follicles, sebaceous glands, cerumen glands

The wax: is hydrophobic, acidic & with antibacterial properties,
the epithelium of the EAC has the capacity to migrate.

2- Inner 2/3: Bony



THE TYMPANIC MEMBRANE (TM)

Three Layers;

- 1. outer : epithelial**
- 2. middle : fibrous**
- 3. inner: mucosal**

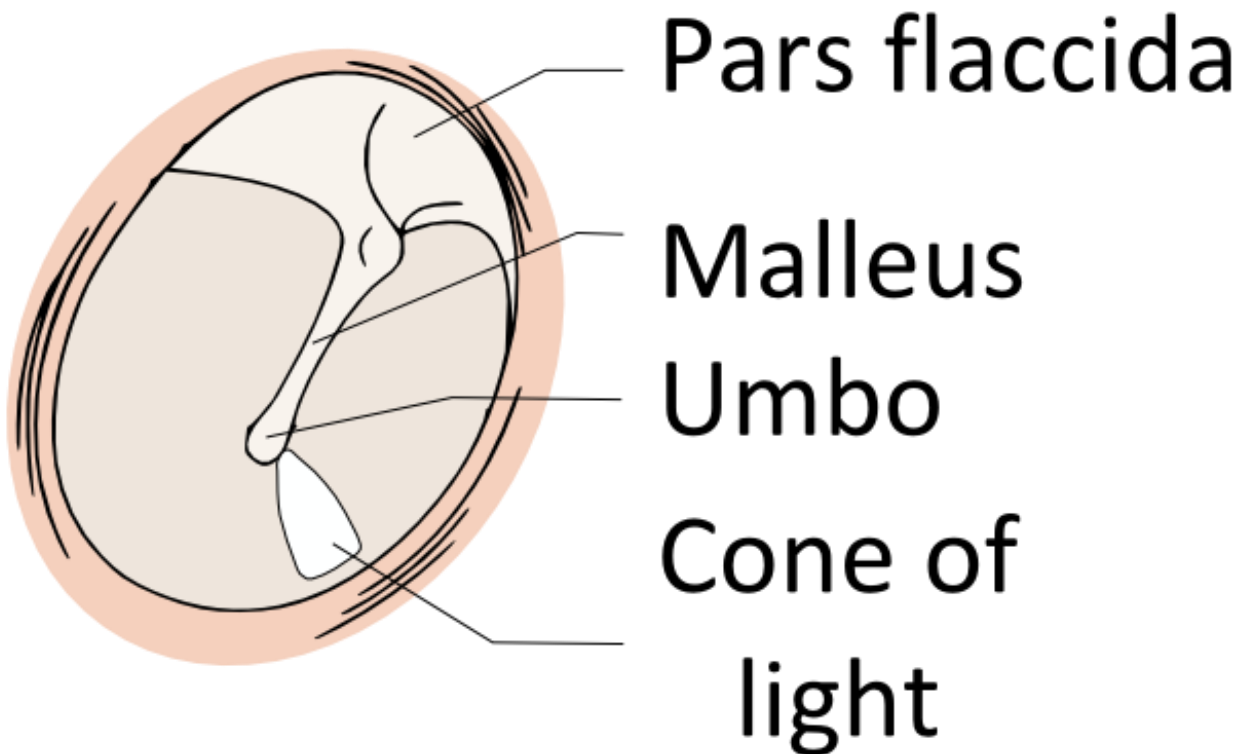
The tympanic membrane is attached to the temporal bone by the Annulus fibrousus

The Tympanic Membrane is divided into two parts:

- 1. Pars Tensa (which consist of the 3 layers)**
- 2. Pars Faccida (in which the mille fibrous layer is deficient)**

Landmarks of the TM:

Handle of Malleus (manubrium), Lateral Process of Malleus, Anterior & Posterior Malleolar Folds, Light Reflex (cone of light).



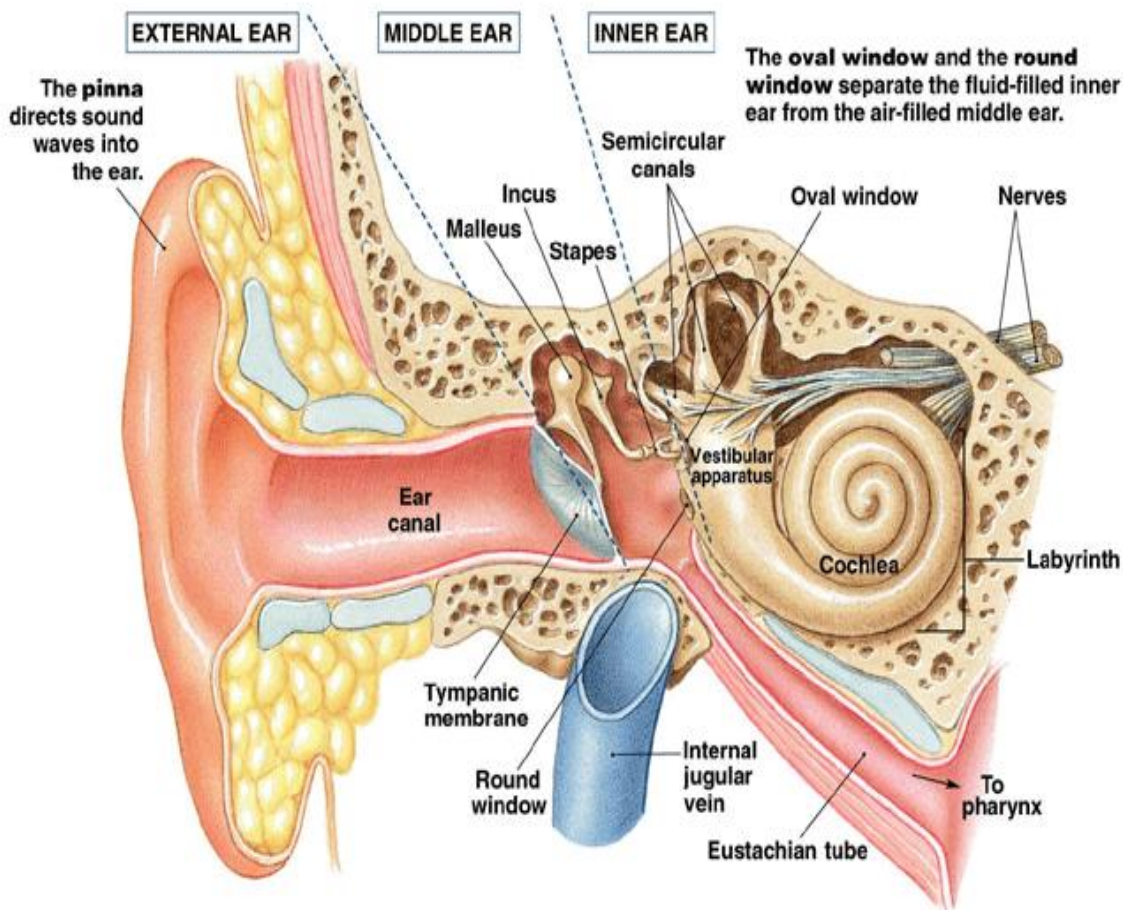
NERVE SUPPLY OF EXTERNAL EAR:

1. Auriculo-temporal nerve (V3)
2. Greater Auricular (C2, 3)
3. Lesser Occipital (C2)
4. Arnold`s nerve (X)
5. Facial nerve (sensory twigs)

BLOOD SUPPLY OF EXTERNAL EAR: branches of external carotid artery

Venous drainage: to posterior auricular & superficial temporal veins

Lymphatic drainage: to pre-auricular, infra-auricular & mastoid lymph nodes.



THE MIDDLE EAR CLEFT

Comprises of:

1. Middle Ear Proper
2. Aditus & Mastoid Antrum and Mastoid air cells
3. Eustachian Tube

Upper 1/3: Bony

Lower 2/3: Cartilaginous

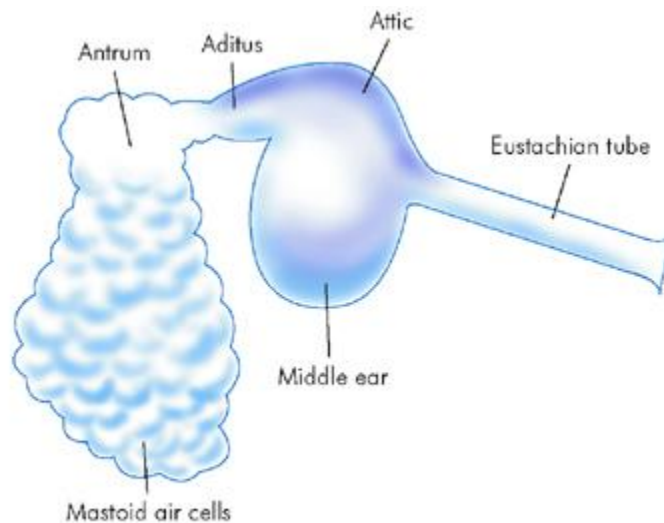


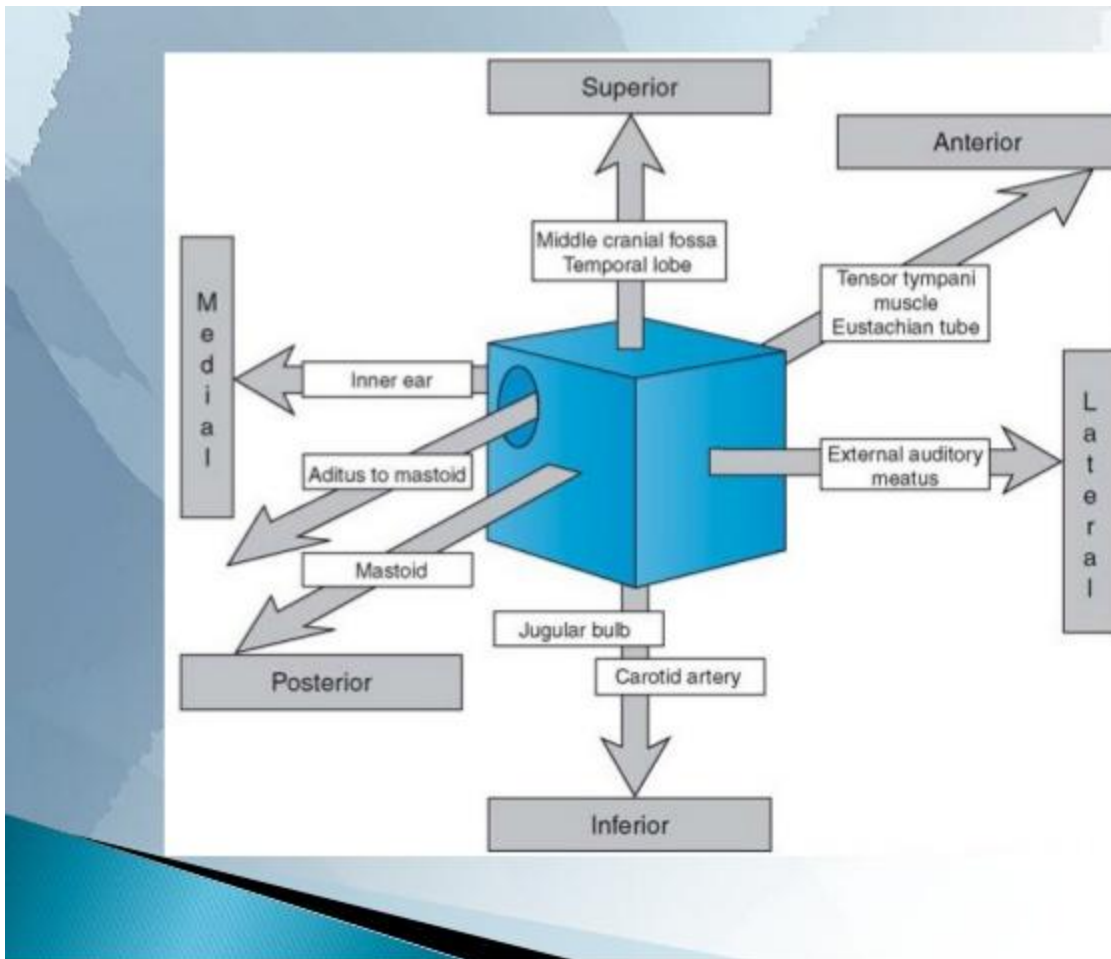
Fig. 1.4 Middle ear cleft.

THE MIDDLE EAR PROPER:

A box of 6 walls is an air-containing space with bony walls except laterally by TM.

Boundaries:

1. Lateral wall: TM
2. Medial wall: lateral semicircular canal (scc), oval window, promontory, and round window.
3. Anterior wall: Eustachian tube & canal for tensor tympani muscle
4. Posterior wall: Aditus, pyramid
5. Superior (roof): separate from dura of the middle cranial fossa
6. Inferior (floor): separate from jugular bulb



Contents of the Middle Ear:

1. Ossicles: Malleus, Incus and Stapes
2. Middle Ear Muscles: Stapedius(supplied by VII) and Tensor tympani muscles(supplied by V)
3. Chorda Tympani Nerve

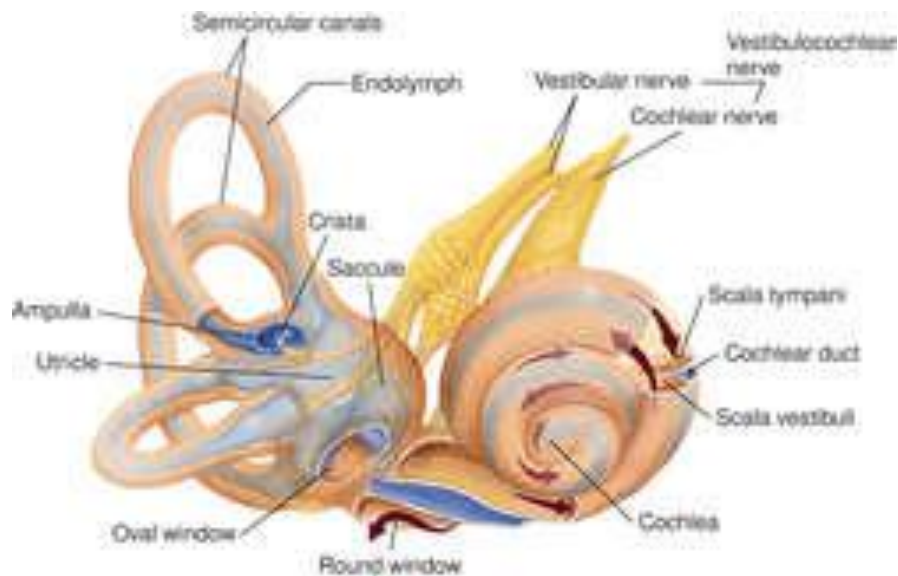
Sensory nerve supply of the middle ear: by Jacobson`s nerve, a branch of IX (Glossopharyngeal nerve).

Motor supply of middle ear muscles: by V & VII cranial nerves.

Arterial supply of middle ear: from branches of external & internal carotid arteries.

Venous drainage: to pterygoid plexus or superior petrosal sinus.

Lymphatics: Eustachian tube to retropharyngeal lymph node.



THE INNER EAR (LABYRINTH)

1. Bony Labyrinth (embedded in the Petrous Bone): comprises of

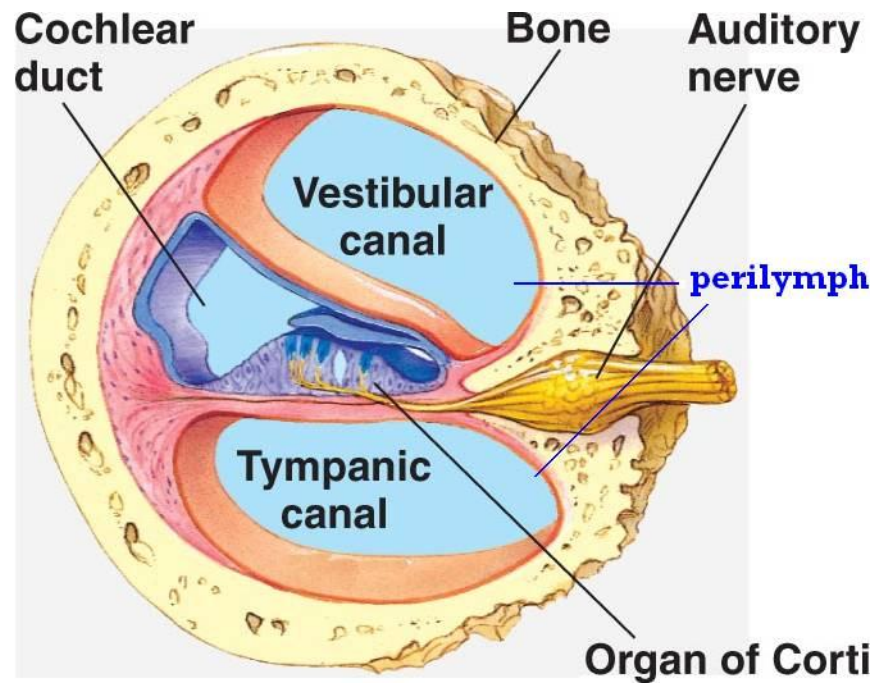
- A. Vestibule consist of 3 semicircular canals and the utricle and the saccule**
- B. Cochlea consist of 2 and a half turns**

2. Membranous Labyrinth: comprises of

- A. Membranous SCCs (Crista & Cupula)**
- B. Utricle & Saccule (Macula & Otolithic Membrane)**
- C. Cochlear Duct – triangular in cross section (Organ of Corti)**
- D. Y-shaped Endolymphatic Duct & Sac**
- E. Ductus Reuniens**

Blood Supply of inner ear: internal auditory artery, arise from anterior

Inferior cerebellar artery Branches of the internal carotid artery



INTERNAL AUDITORY CANAL (IAC) CONTENTS

1. Vestibulo-Cochlear Nerve:

Cochlear division and Vestibular division (superior and inferior branches)

2. Facial nerve.

