PHARYNGO-TYMPANIC TUBE
[Eustachian Tube/Auditory Tube]
Introduction

• An osseo-cartilaginous tube.
• Connects the nasopharynx with the tympanic cavity.
• Maintains the equilibrium of air pressure on either side of tympanic membrane.

Length-
• ~36 mm

Direction (from tympanic end)-
• Downwards, Forwards and Medially.
2 parts:
- **Bony (Osseous) part.**
- **Cartilaginous part.**

**Bony (Osseous) part**
- Posterolateral part.

**Length** ~12mm (1/3rd of total length).
- Lies between tympanic and petrous part of temporal bone.
- Opens into anterior wall of middle ear cavity (tympanic cavity).
- **Tympanic end** is small.
(c) Right temporal bone, inferior view
Cartilaginous Part

- **Anteromedial** part.
  Length - ~24mm (2/3rd of total length).

- Lies between petrous part of temporal bone and posterior border of greater wing of sphenoid bone.

- Opens into lateral wall of nasopharynx.

- **Pharyngeal end** is in the form of a vertical slit, and it is the widest part of the tube.

- Medial wall, roof and upper part of lateral wall of cartilaginous part is formed by elastic cartilage.

- Rest of the lateral wall is formed by fibrous membrane.
Parts contd...

- Both parts meet at isthmus (narrowest part).
### Differences between the Eustachian Tube of an Infant and an Adult

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Infant</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>18 mm</td>
<td>36 mm</td>
</tr>
<tr>
<td>Direction</td>
<td>More or less horizontal (makes an angle of 10° with horizontal plane)</td>
<td>Oblique, directed downwards, forwards and medially from tympanic end (makes an angle of 45° with horizontal plane)</td>
</tr>
<tr>
<td>Angulation of Isthmus</td>
<td>No angulation</td>
<td>Angulation present</td>
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</tbody>
</table>

**Applied Aspects**

- **Middle ear infections are more common in infants and young children** than in adults, since the eustachian tube is shorter, **wider** and more horizontal and infections from nasopharynx can easily reach the middle ear.
Figure 1: Comparison of Eustachian tubes of adult and child. The Eustachian tube of the human child is shorter, narrower, and more horizontal than that of the adult human.

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Functions of Eustachian Tube

- At rest, Eustachian tube remains closed.
- Eustachian tube is reflexly opened during swallowing, yawning and sneezing.
- It maintains equilibrium of air pressure on either side of tympanic membrane.
- It protects the middle ear by preventing the transmission of high air pressure from nasopharynx to middle ear.
- Movement of cilia present in epithelium of tube, clears the secretions from middle ear.
Applied Aspects

Blockage of Eustachian Tube- (blockage may be due to inflammation of tubal tonsil)
- Residual air in middle ear is absorbed into the blood vessels of its mucous membrane.
- Air pressure falls in tympanic cavity.
- Tympanic membrane retracts (bulges towards middle ear cavity).

Clinical Features-
- Hearing disturbance.
- Severe headache.

Treatment-
Periodic introduction of air within the middle ear by Eustachian catheter.
Thank you