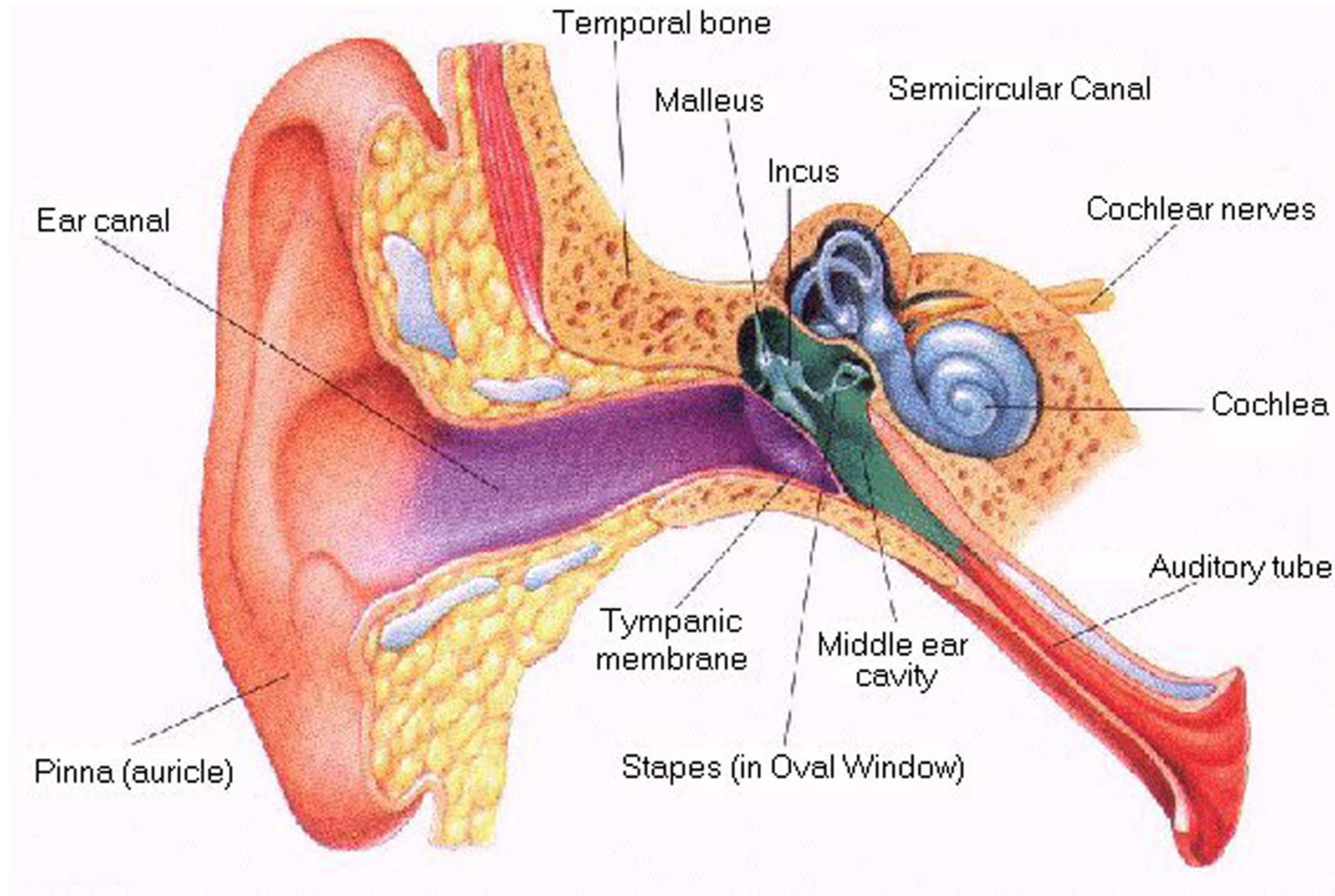


# The Ear and Hearing

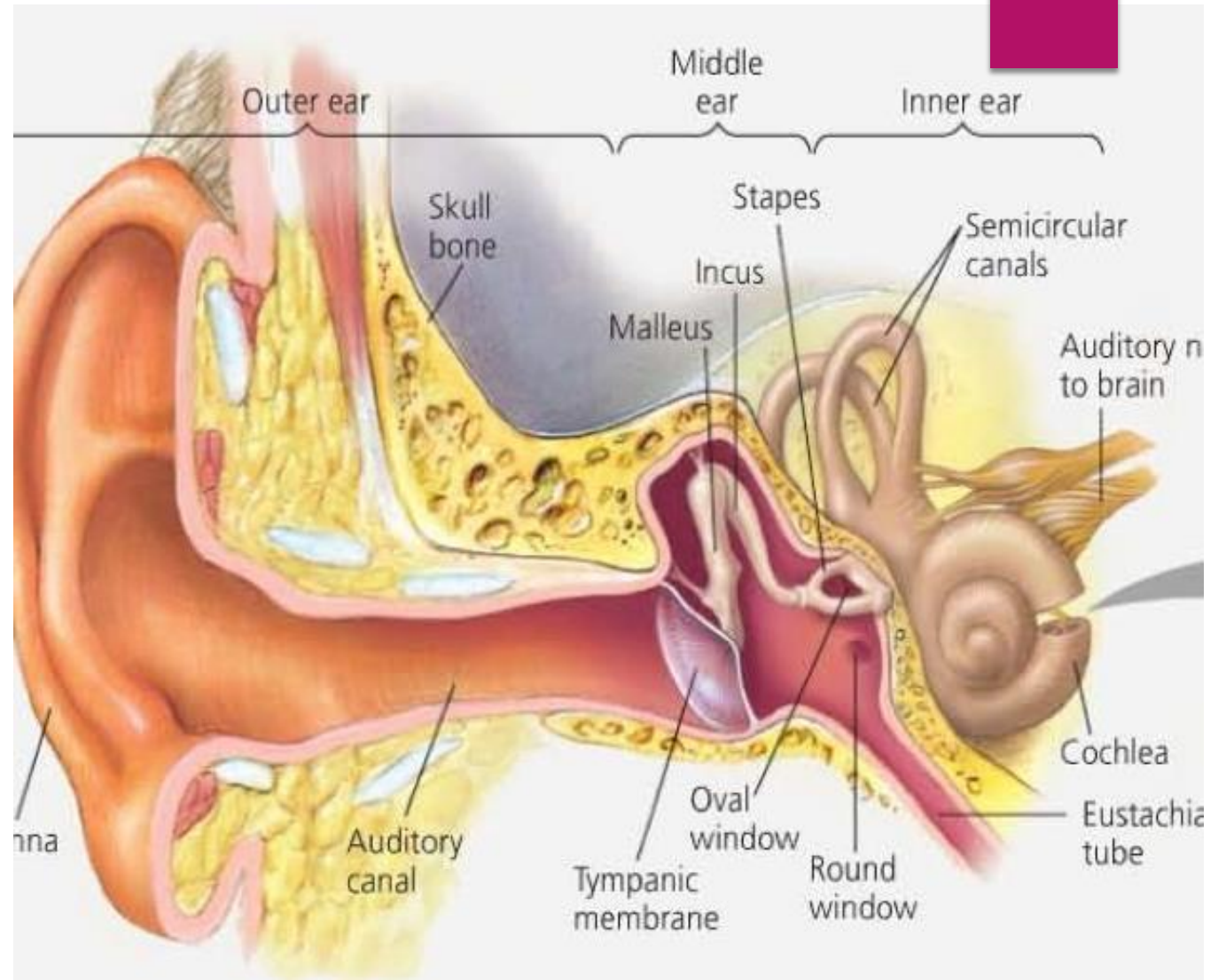
SUSAN KRUM, AU.D.



# Anatomy of the Ear

# 3 Sections of the Ear

- ▶ The ear is divided into 3 sections
  - ▶ Outer Ear
  - ▶ Middle Ear
  - ▶ Inner Ear.



# Outer Ear

Contains:

- ▶ Pinna (Auricle)
- ▶ Ear Canal

Purpose: Funnel Sound into the ear

Common Conditions include:

- ▶ Wax build up (NO Q-TIPS)
- ▶ Outer ear infections (swimmers ear)
- ▶ Collapsed canal
- ▶ Bony Growths





# Middle Ear

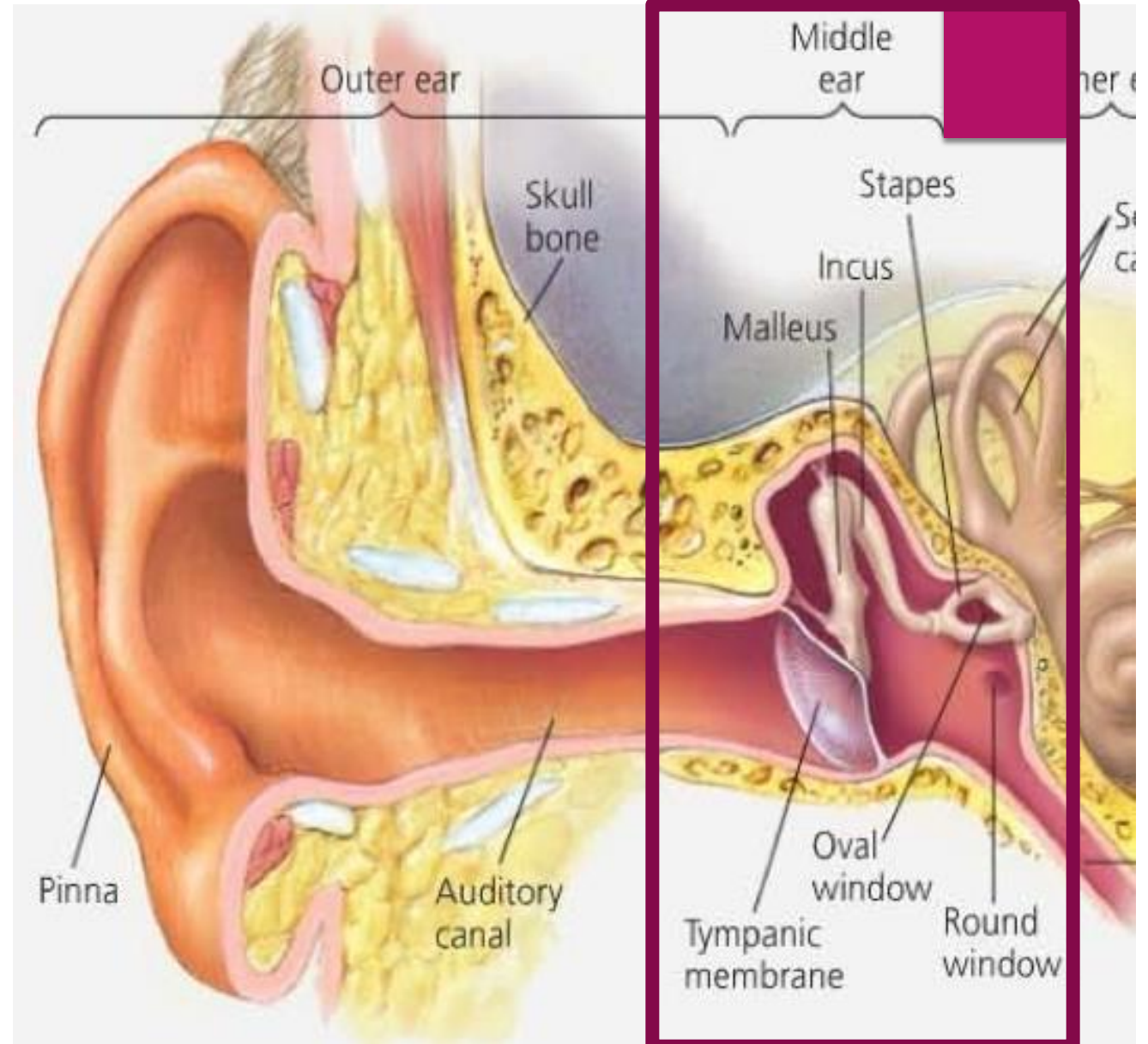
Contains:

- ▶ Tympanic Membrane (Ear Drum)
- ▶ 3 Ear bones
  - ▶ Malleus (Hammer)
  - ▶ Incus (Anvil)
  - ▶ Stapes (Stirrup)

Purpose: Mechanically transmits sound to the inner ear

Common Conditions:

- ▶ Middle Ear infections
- ▶ Tissue Growths
- ▶ Fixation of bones
- ▶ Eustachian Tube Dysfunction



# Inner Ear

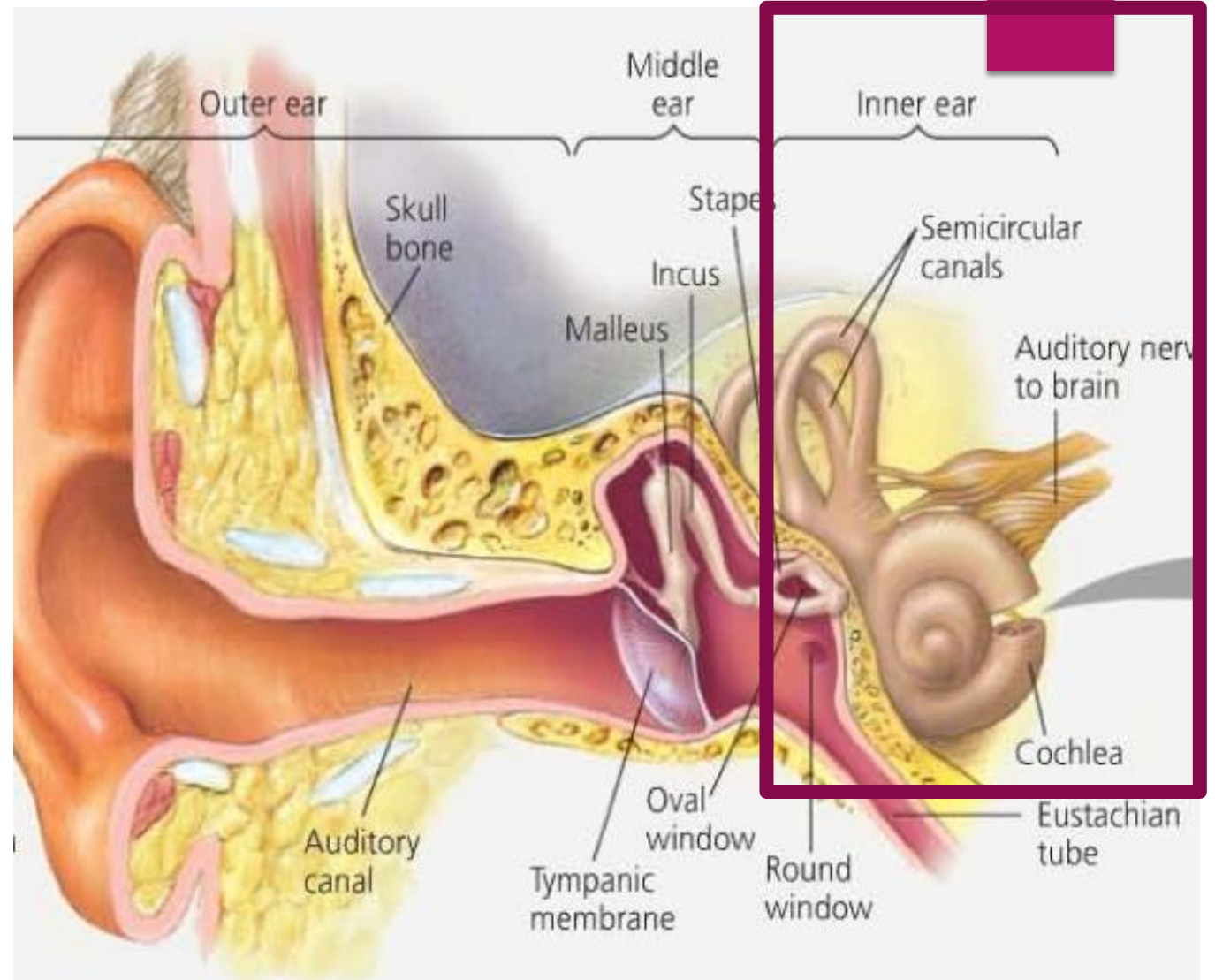
## Contains:

- ▶ Oval Window & Round Window
- ▶ Cochlea
- ▶ Auditory Nerve
- ▶ Semicircular Canals (Vestibular system)

Purpose: Transforms mechanical sound into electrical pulse to transmit information to the brain

## Common Conditions:

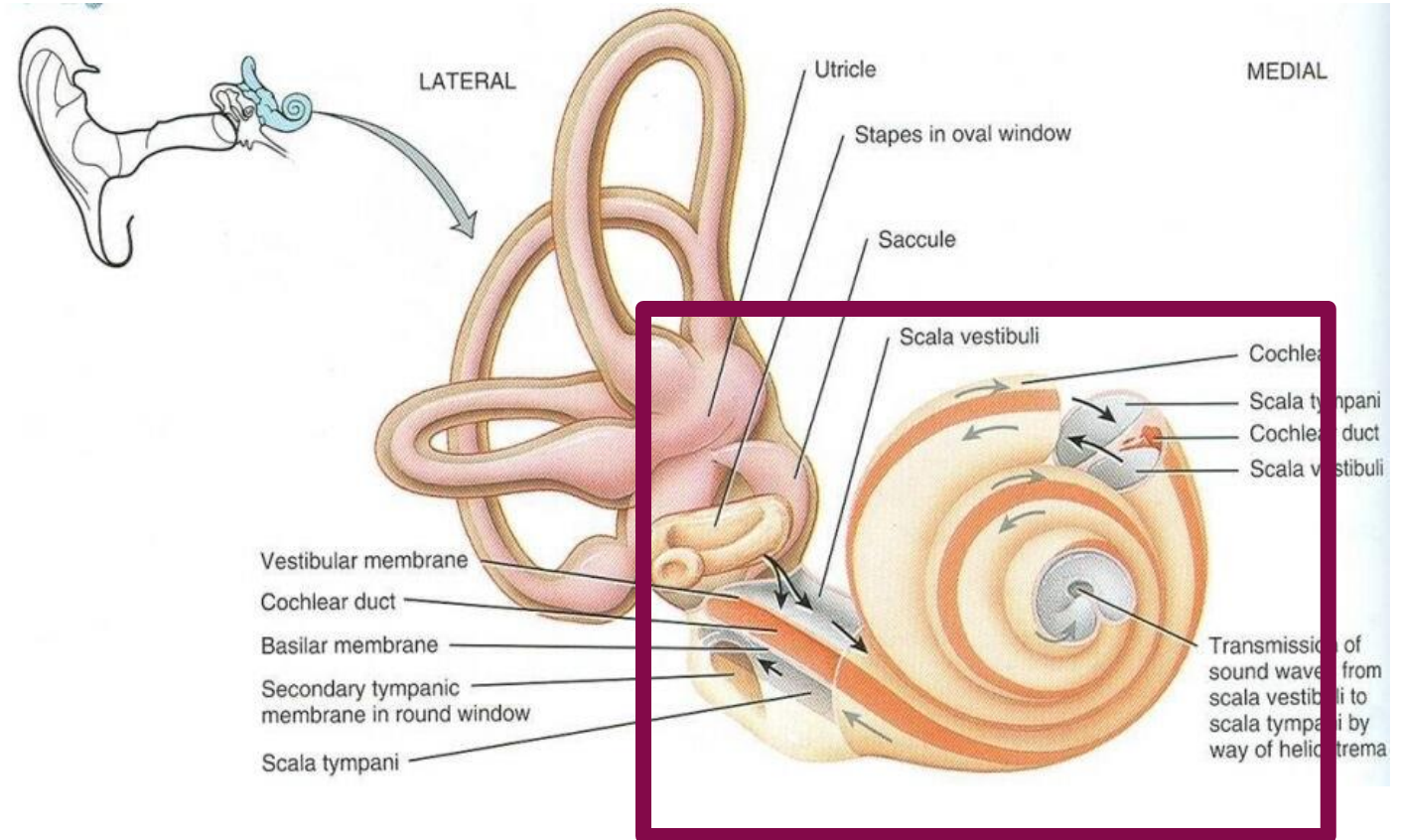
- ▶ Nerve Damage (Sensorineural Hearing loss)
- ▶ Fistula (fluid leakage)
- ▶ Acoustic Neuroma



# The Cochlea

## 5 Facts:

- ▶ Complicated system that turns “sound” into “electrical energy” for the brain to decipher into “Hearing”
- ▶ The Cochlea is the size of a pea
- ▶ There Are Over 20,000 Nerve Cells in the Average Cochlea
- ▶ Different Nerve Cells Cause Different Sounds to be Heard
- ▶ Fluid Inside the Cochlea Makes Waves





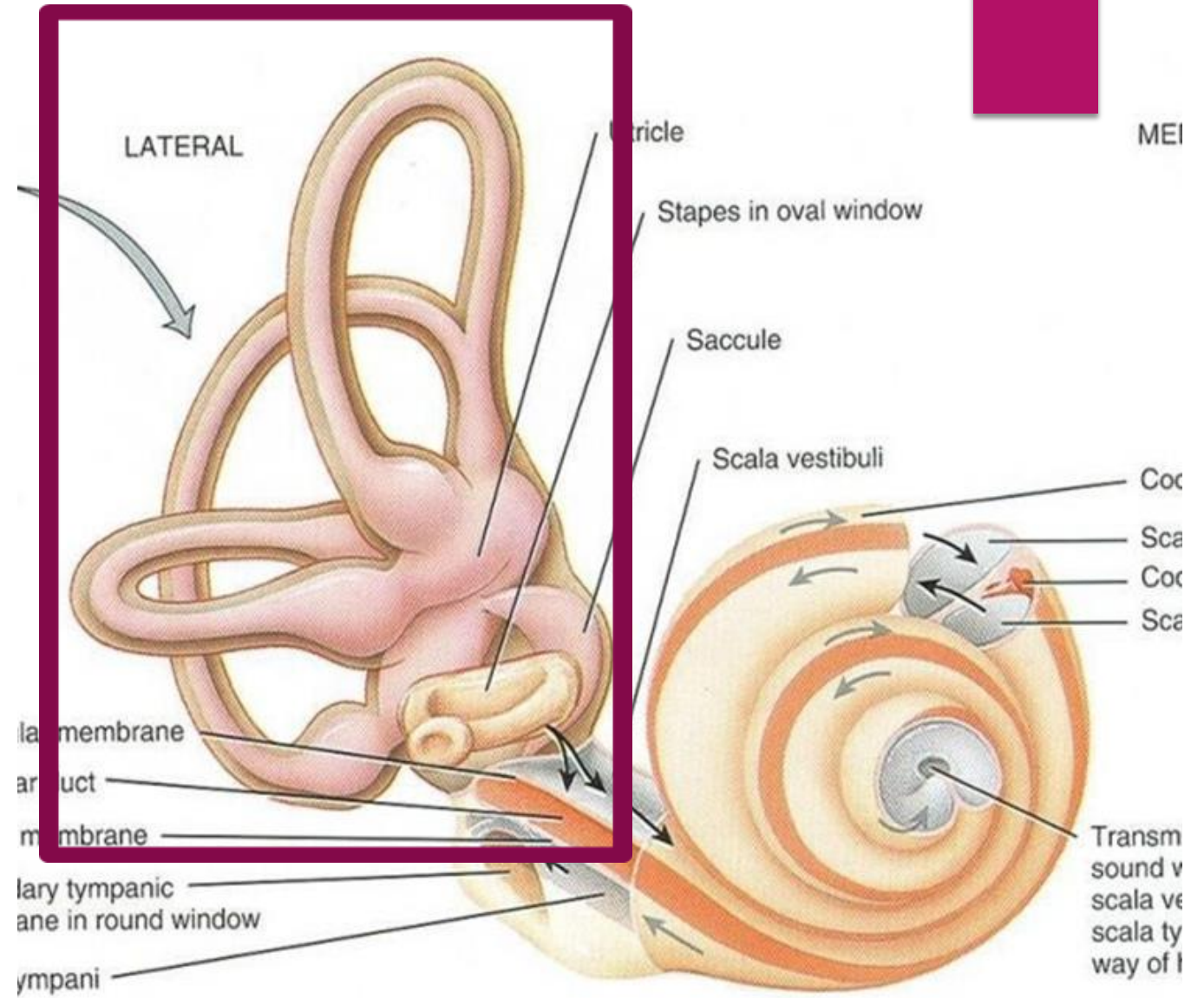
# Semicircular Canals

# The Vestibular System or better known as the System of Balance

Purpose: Allows the brain to know the positioning of the body in relation to its surroundings

## Common Conditions:

- ▶ Endolymphatic Hydrops
- ▶ Vestibular neuritis
- ▶ Benign Paroxysmal Positional Vertigo (BPPV)



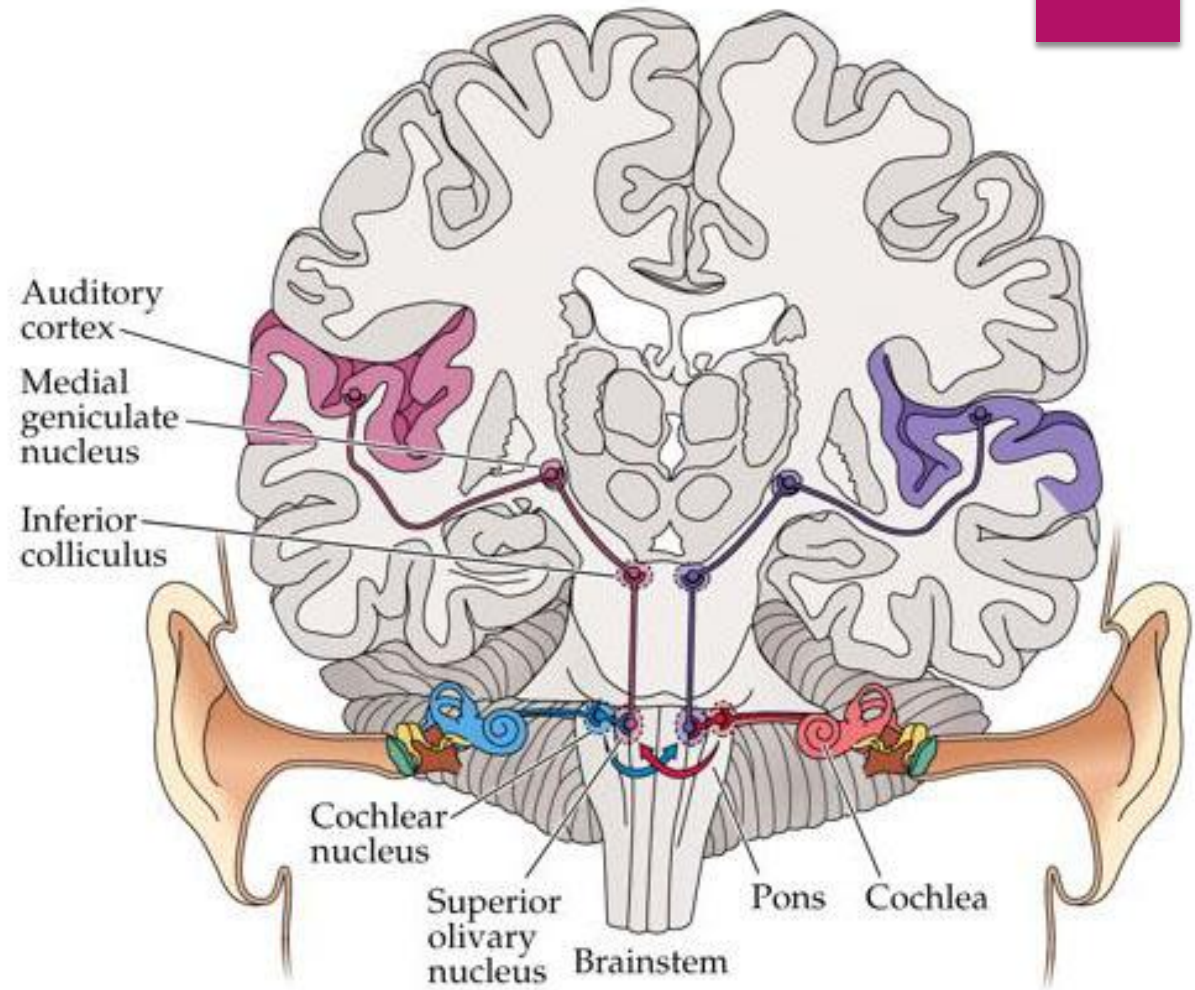


# Central Auditory Processing

Electrical impulses travel to the brain to be “translated” into functional information

The auditory cortex is involved in tasks such as identifying and segregating “auditory objects” and identifying the location of a sound in space.

“Ear” can be working fine and problem may exist in the brain.  
(5% of school age children have a CAPD)



# What to Do if I can't hear???

- ▶ Seek Medical Attention if your ear or hearing does not appear normal
- ▶ Get a baseline hearing test and repeat every three years if no perceived changes occur prior
- ▶ Determine if hearing loss is permanent or temporary
- ▶ Permanent hearing loss may be due to inner ear nerve damage which is remediated with hearing aids or cochlear implant
- ▶ Remember Auditory Processing Difficulty is different than inner ear nerve damage

Q and A

QUESTIONS??