

# **INTRODUCTION TO HEARING LOSS AND HEARING AIDS**



**CHS | SCO**

CANADIAN HEARING SOCIETY  
SOCIÉTÉ CANADIENNE DE L'OUÏE

# Canadian Hearing Society

- ▶ Founded in 1940, the Canadian Hearing Society (CHS) is the largest charitable agency of its kind in Canada employing approximately 425 people who deliver 17 programs through a network of 25 offices across Ontario.

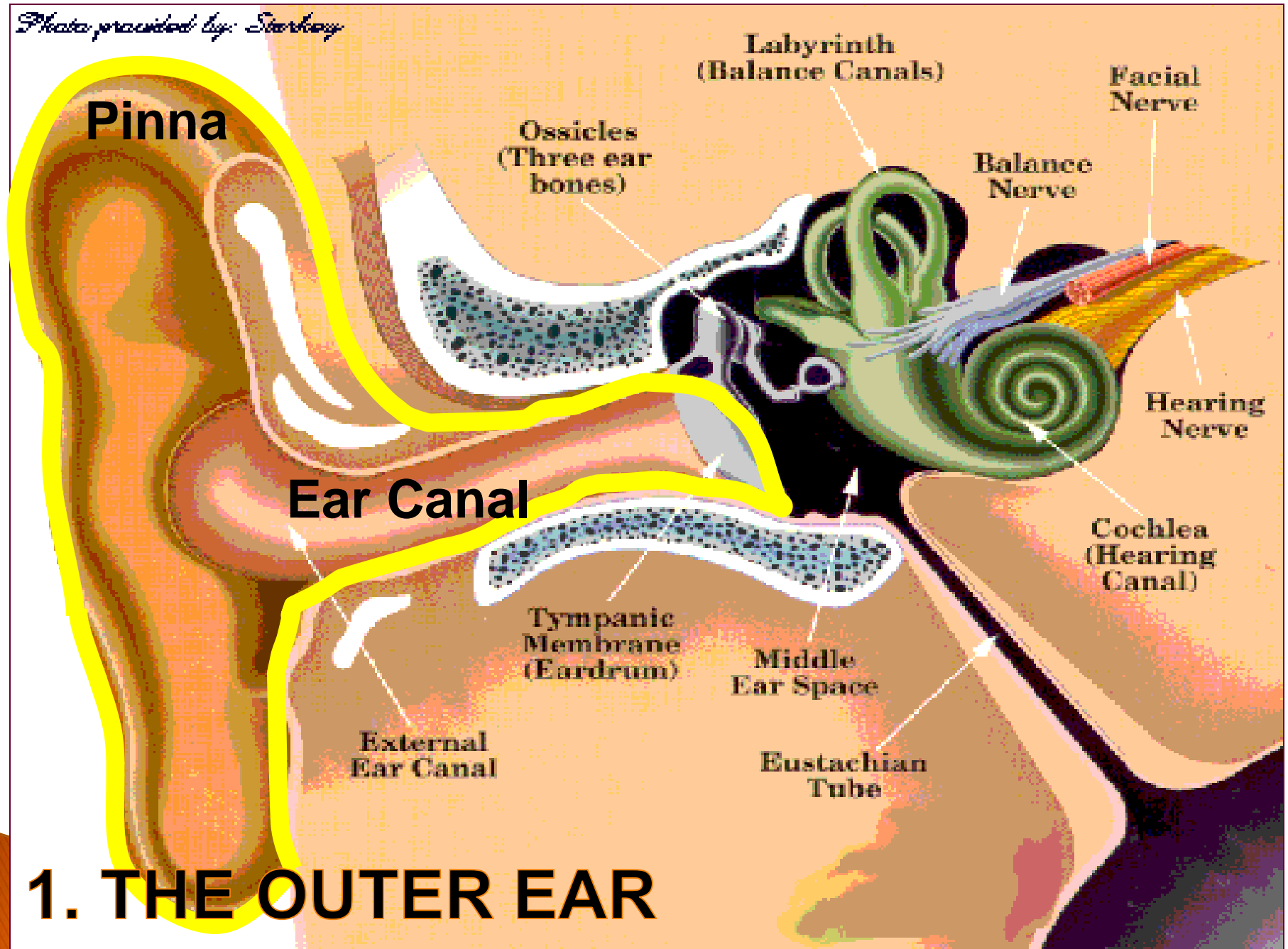
Some of our services that may be helpful to you...

- Audiology/Hearing Aids
- Communication Devices
- Counseling Services
- Employment Services
- American Sign Language Interpreting
- Real Time Captioning
- Sign Language Classes

# HOW WE HEAR



*Photo provided by: Starkey*

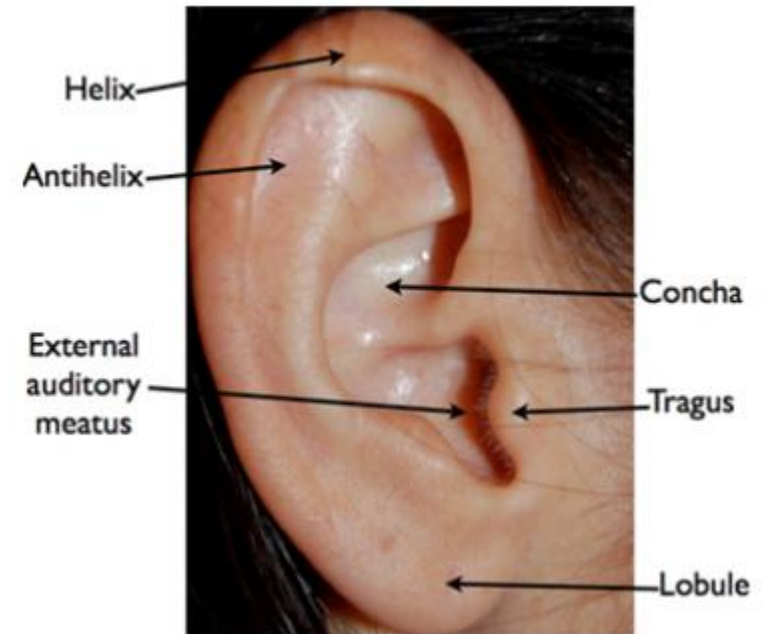


# 1. THE OUTER EAR

# PARTS OF THE OUTER EAR

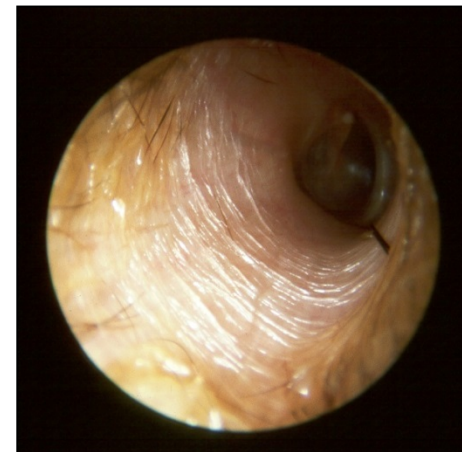
## PINNA

- collects sound

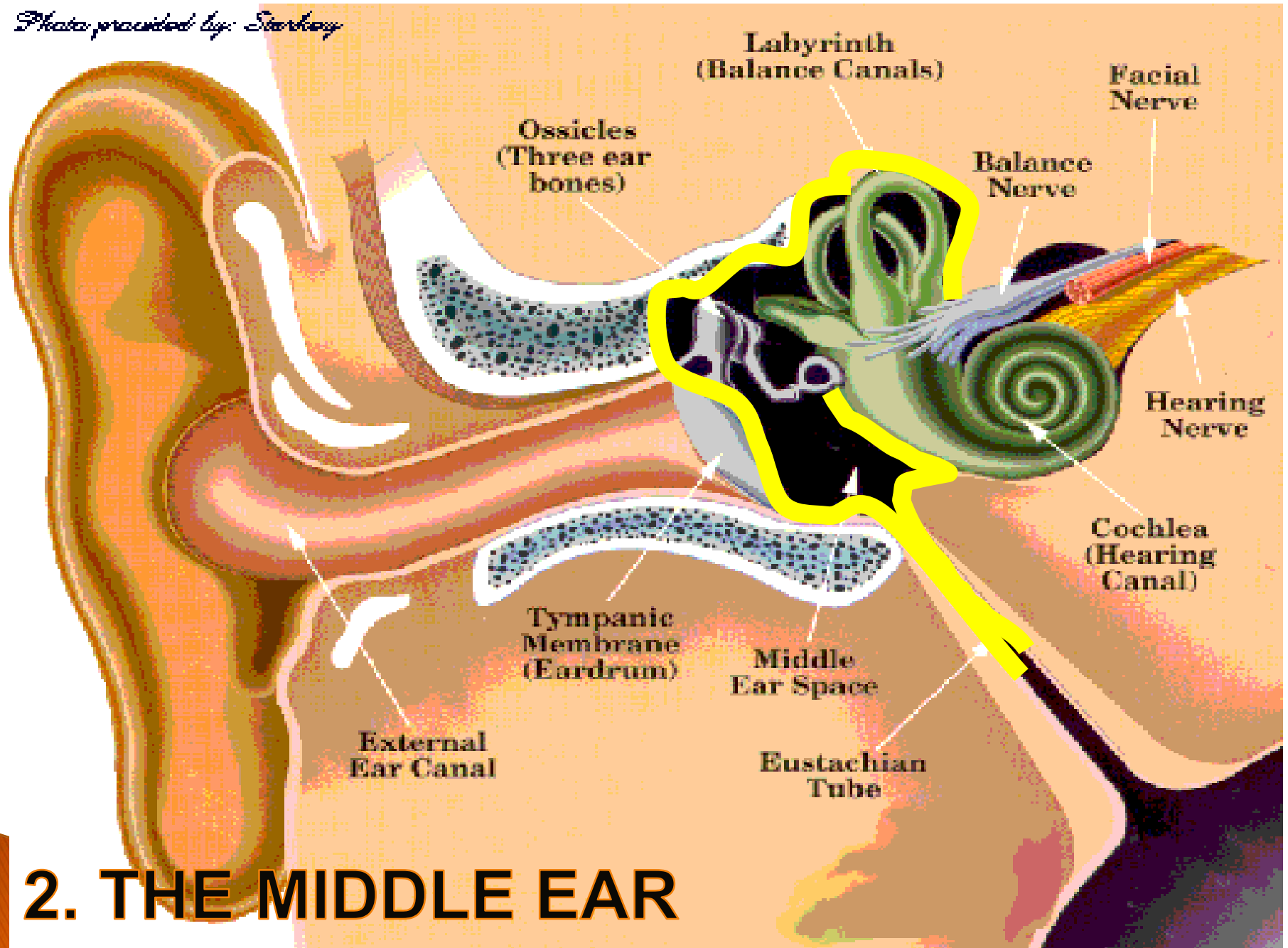


## EAR CANAL

- produces wax (is this good?)



*Photo provided by: Starkey*



## 2. THE MIDDLE EAR

# PARTS OF THE MIDDLE EAR

## Ear drum

- separates the Outer from the Middle ear
- picks up vibrations (sound)

## Middle ear cavity

- Space behind ear-drum which is filled with air.



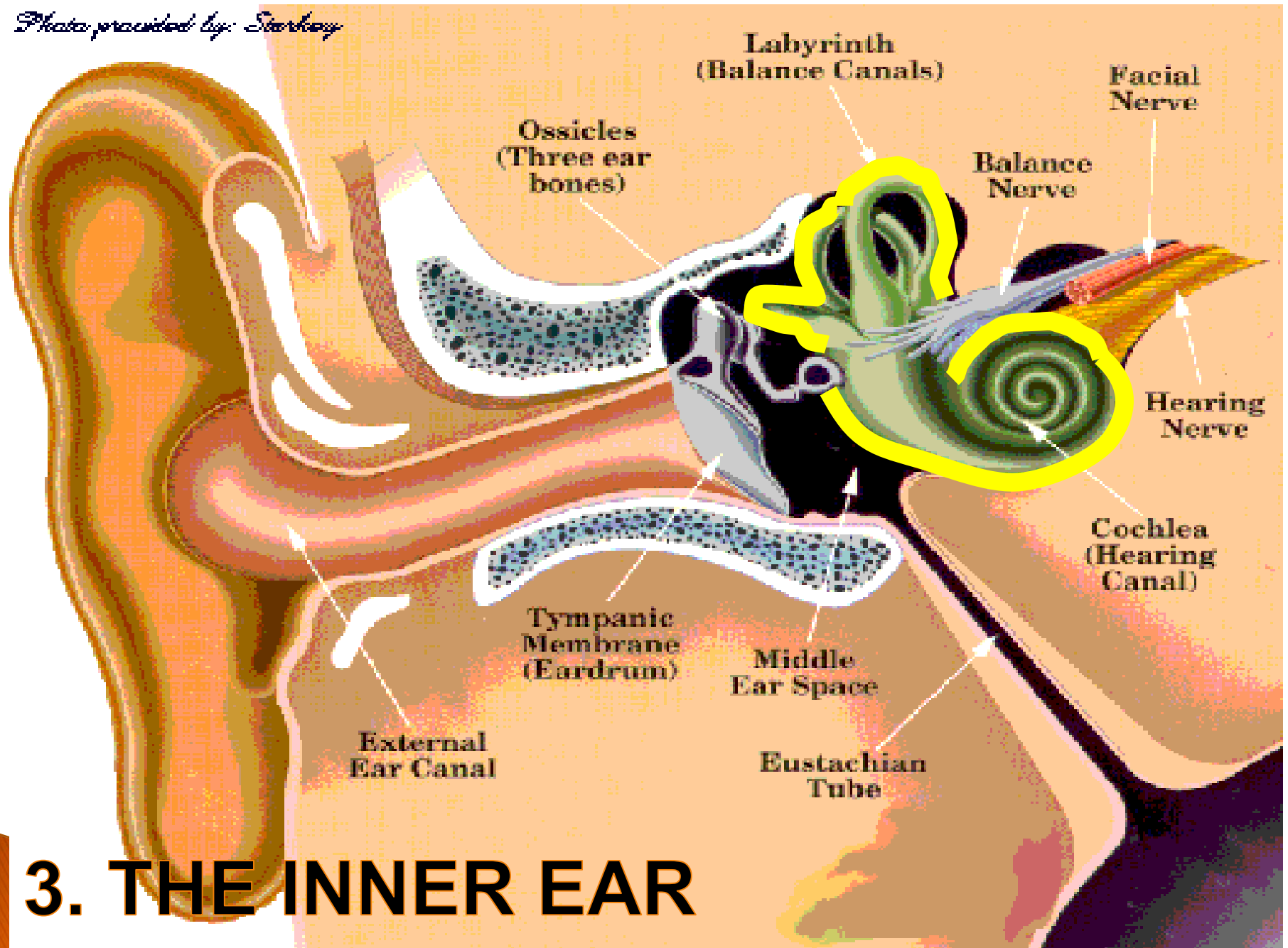
## THE THREE LITTLE MIDDLE EAR BONES

- hammer (malleus), anvil (incus), & stirrup (stapes).
- form a chain (when you move one, you move them all together).
- the stirrup (stapes) is the smallest bone in the entire body.





*Photo provided by: Starkey*



### **3. THE INNER EAR**

# PARTS OF THE INNER EAR

## Cochlea

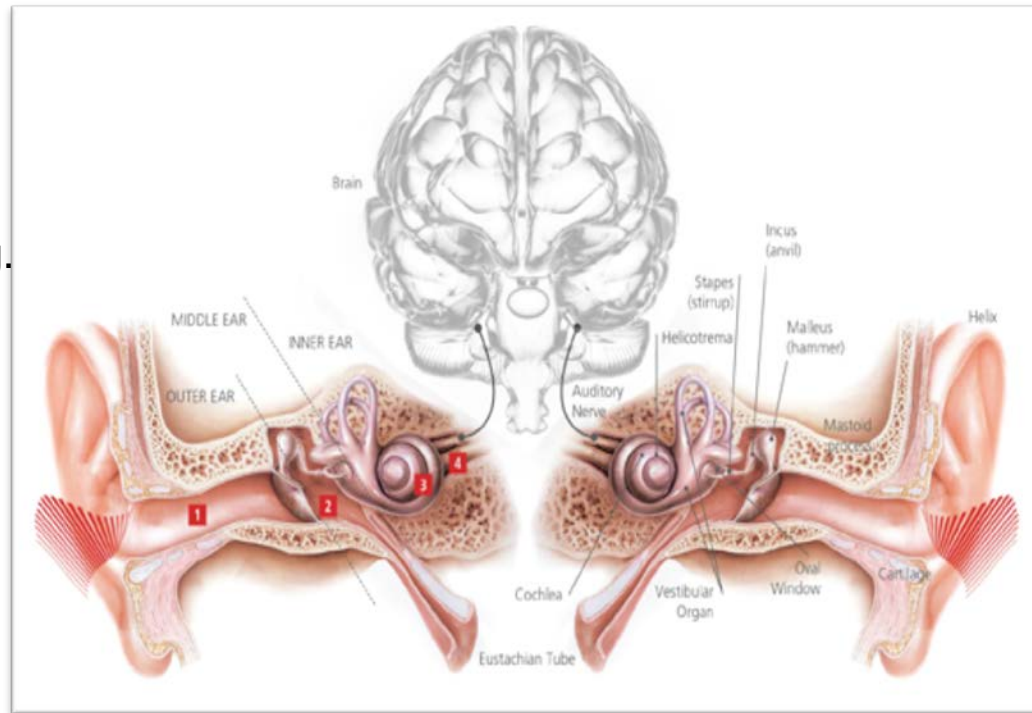
Organ of Hearing

- snail-shaped structure filled with fluid
- contains +/- 40,000 hair cells tuned for various pitches and various levels of loudness
- Hair cells will bend in response to the movement in the inner ear fluid, creating an electrical signal
- Electrical signal stimulates the auditory nerve
- Auditory nerve sends electrical signal to the brain (the auditory cortex) for processing



# HOW DO WE HEAR?

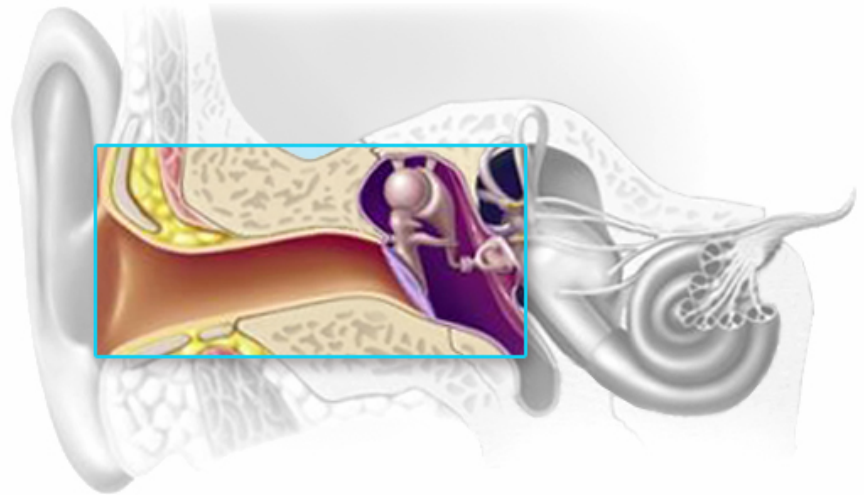
1. Sound waves travel in the air.
2. Outer Ear: they go down the ear canal.
3. Middle Ear: they hit the ear drum.
4. Middle Ear: the tiny bones start moving.
5. Inner Ear: a wave is created in the cochlea.
6. Inner Ear: the hair cells bend over.
7. Auditory Nerve: the message is sent.
8. Brain: "I hear something".



# TYPES OF HEARING LOSS

## Conductive

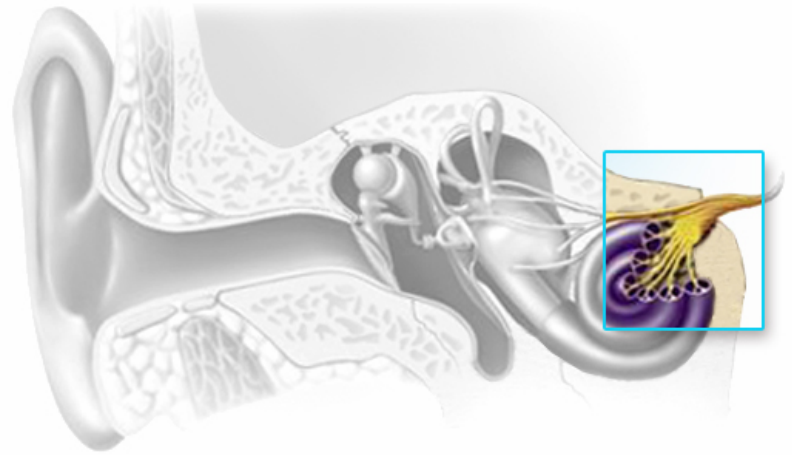
- means sound can't get through
- problem with the outer or middle ear e.g., wax, infection
- can sometimes be medically treated
- "I feel plugged"



# TYPES OF HEARING LOSS

## Sensorineural

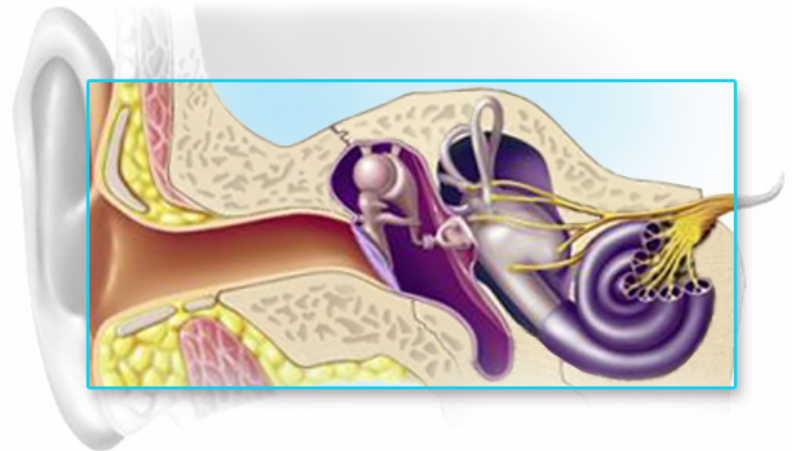
- means the auditory system is damaged
- damage to cochlea and/or auditory nerve
- permanent



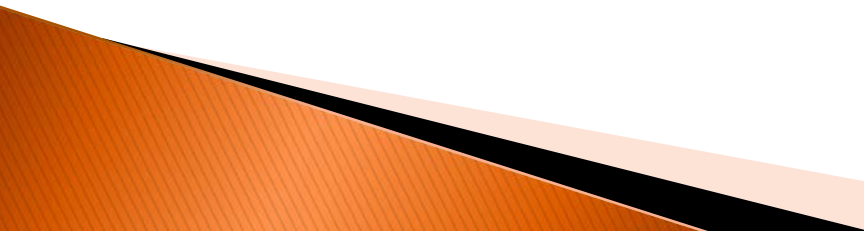
# TYPES OF HEARING LOSS

## Mixed


- combines a problem with the inner ear and the outer or middle ear.
- E.g., Presbycusis plus a hole in the eardrum



# HOW DOES A SENSORINEURAL LOSS AFFECT YOUR HEARING?

- High pitched sounds are harder to hear  
*E.g. consonants, children's and women's voices*
  - Speech is softer and it is not as **clear** as it normally would be. (*Does everybody really mumble?*)
  - Communication with others is more difficult
  - Sensorineural hearing loss is **permanent**
- 

# CAUSES OF SENSORINEURAL HEARING LOSS

- Age-related (Presbycusis)
  - Noise damage
  - Meniere's Disease
  - Hereditary/congenital
  - Trauma
  - Illness- meningitis, mumps
  - Ototoxicity
  - Acoustic neuroma (tumor on auditory nerve)
- 



# Presbycusis

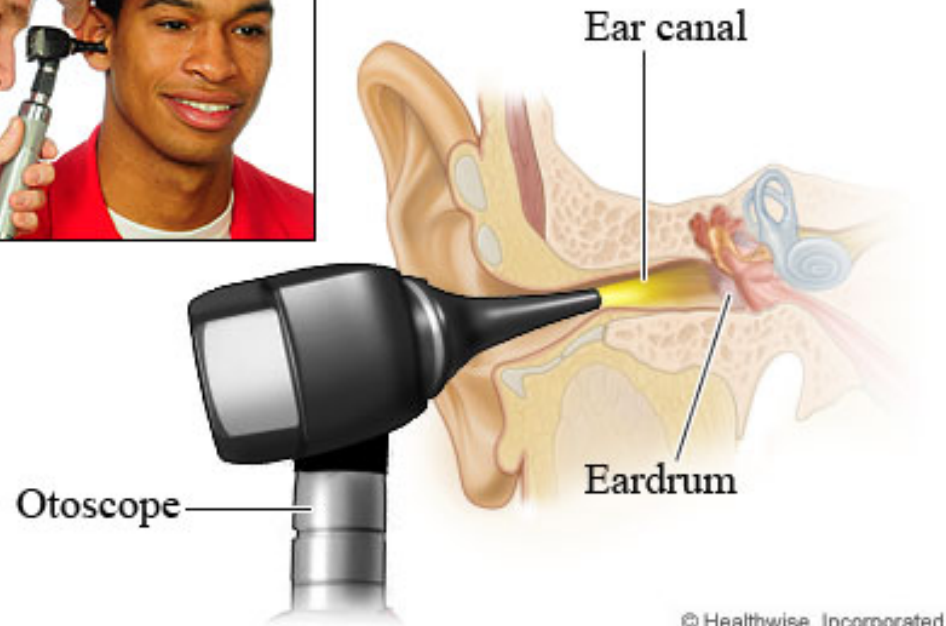
## Hearing loss related to aging

- Sensorineural
- generally causes problems hearing high-pitched sounds
- consonants like /“s”, “ch”, “th”, “f”/
- speech seems *mumbled & unclear*:
- ***“I can hear you but I don’t understand what you’re saying”.***



# HEARING TESTS

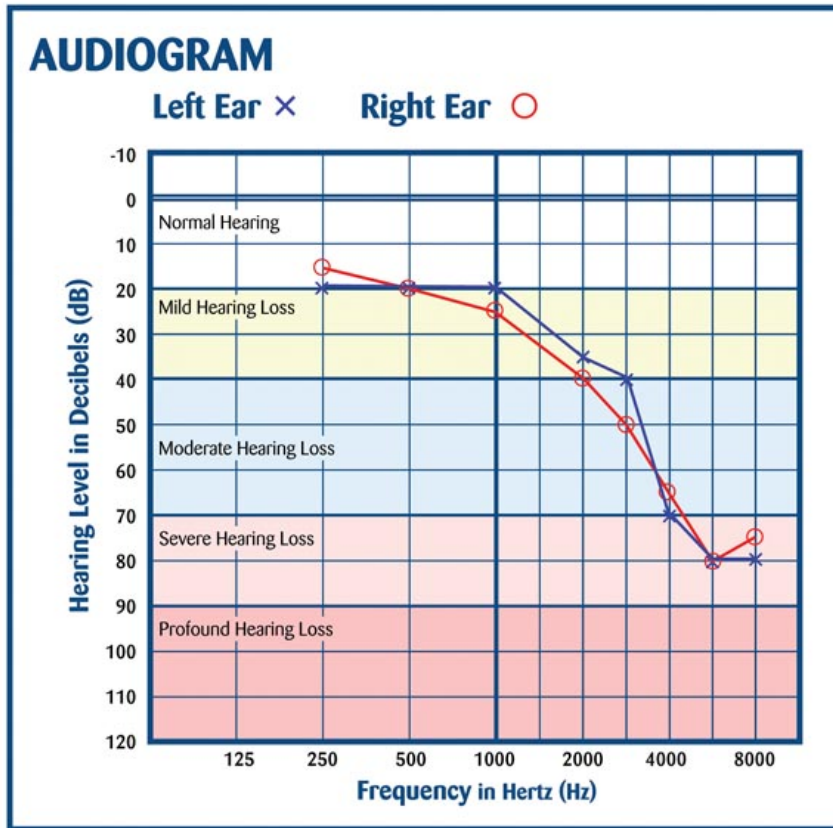
# STEP 1: OTOSCOPY



© Healthwise, Incorporated

# STEP 2

## The Hearing Test



Hearing Tests tell you the following:

- Amount of Hearing Loss
- Type of Hearing Loss
- Shape of Hearing Loss
- Word Recognition



\* An example presbycusis (sloping high-frequency hearing loss) synonymous with the ageing process.

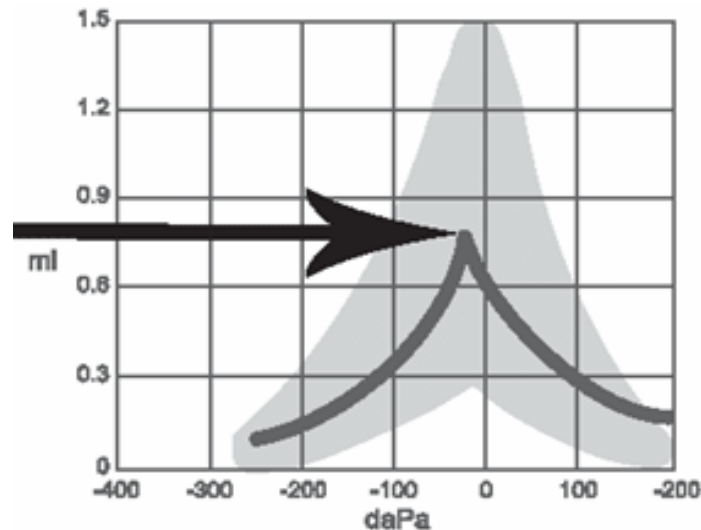
# **STEP 3 SPEECH TESTS:**

## **Word Recognition Scores(WRS)**

- Reflects your ability to hear single syllable words.
- Expressed as a percentage on the audiogram
- Administered with no visual cues
- This indicates your “clarity”
- Speech Discrimination ability usually declines with sensorineural hearing losses

# STEP 4: THE TYMPANOGRAM

Tympanometry is a test that lets the audiologist know if the eardrum and middle ear are functioning normally



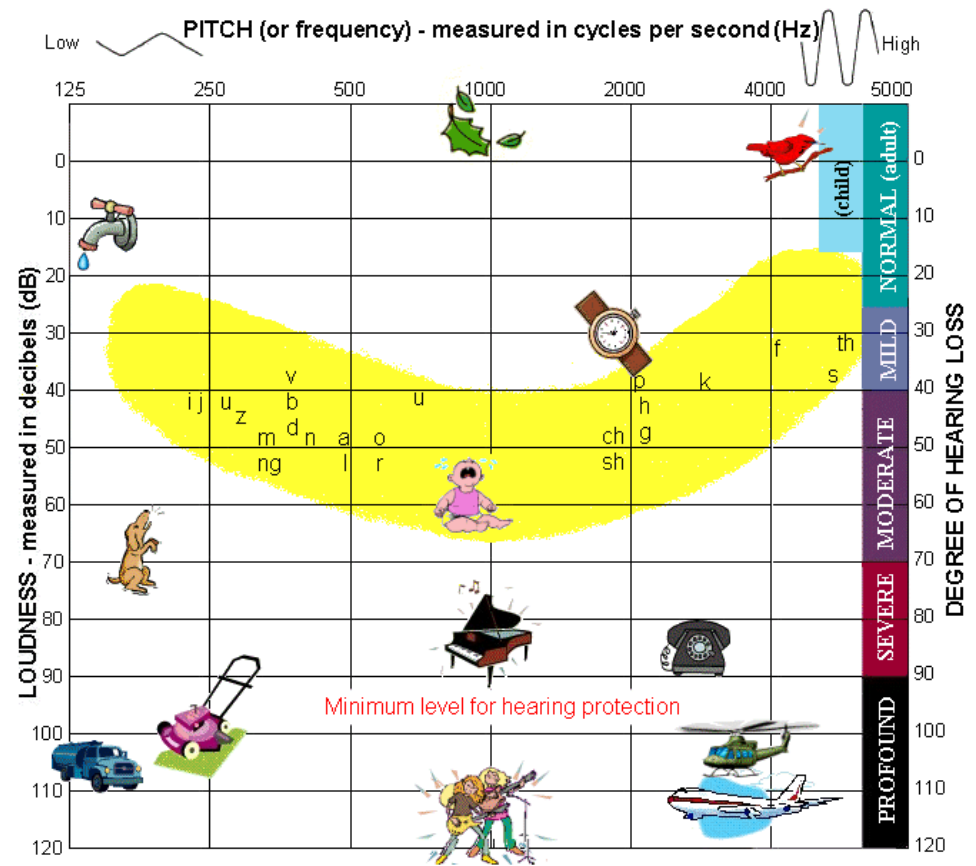
# IMPACT ON COMMUNICATION

## Mild Hearing Loss:

- Difficulty hearing soft speech; needs favorable seating.
- May benefit from a hearing aid

## Moderate Hearing Loss:

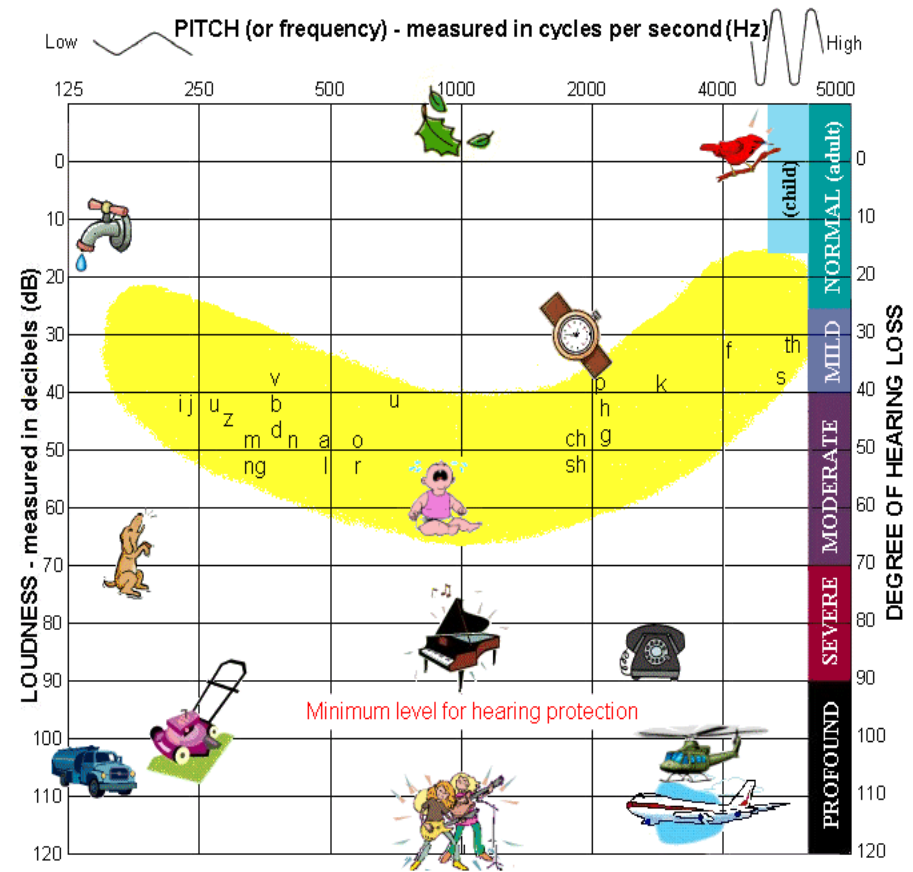
- Understanding speech is difficult, particularly where there is background noise
- Hearing aids are recommended



# IMPACT ON COMMUNICATION

## MODERATELY SEVERE LOSS:

- Conversation must be louder and nearby.
- Hearing Aids are strongly recommended, complemented by other devices and speechreading instruction.

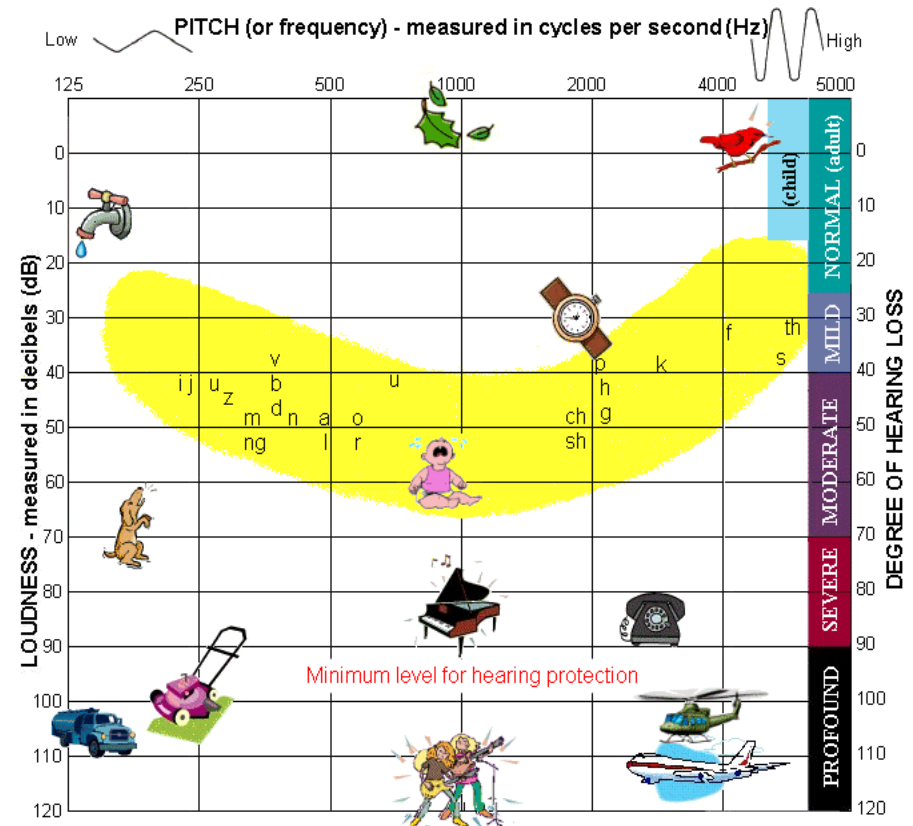




# IMPACT ON COMMUNICATION

## SEVERE LOSS:

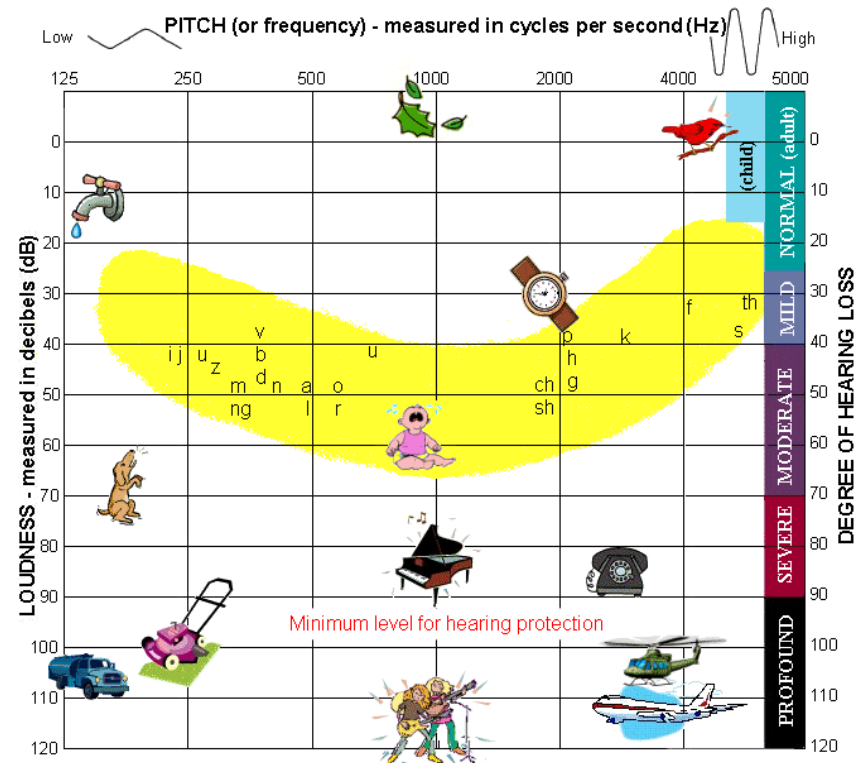
- May hear a loud voice at one foot from the ear, identify sounds in the environment, and distinguish vowels but not consonants.
- Cannot hear loud speech or understand speech on the telephone
- A comprehensive communication strategy of technology and Aural Rehabilitation is essential.



# IMPACT ON COMMUNICATION

## PROFOUND LOSS:

- Some very loud sounds may be heard or felt through vibration.
- This person adopts a comprehensive communication strategy, possibly including sign language instruction.



# IMPACT OF HEARING LOSS

- Hearing loss can have a profound affect on your well being
  - Social
  - Psychological
  - Physical
- This can occur whether
  - the symptoms remain unnoticed
  - you have been recently diagnosed
  - if you have been living with hearing loss your entire life



# **STEPS TO GETTING A HEARING AID**

# INITIAL CONSULTATION

- Case history to discuss your hearing.
- Review listening situations where you have difficulties.
- Examination/Otoscopy of each ear.
- Perform a hearing test



# HEARING AID PRESCRIPTION

## Takes into account:

- Your hearing test results.
- Your lifestyle & listening needs.
- Your hearing aid style and technology preferences.



# HEARING AID ORDER

## If you proceed with hearing aids:

- Impressions of the ears may be taken
- A fitting appointment will be scheduled within two weeks of the hearing aid order



# HEARING AID FITTING/ORIENTATION

- Check overall comfort and cosmetics.
- Set the aids to a comfortable volume and verify sound quality.
- Instruct on care and maintenance.
- Discuss a hearing aid use schedule.
- A follow-up appointment with the audiologist will be arranged.





# FOLLOW-UP APPOINTMENT

- Your experience with the hearing aids in different listening situations.
- Discuss whether objectives with aids have been met.
- Fine tune the hearing aids to improve the experience, if required.
- Future service will be provided as required to ensure the hearing aids continue to meet goals and objectives
- Provide additional education and counseling, if required.



# HEARING AIDS





# CUSTOM HEARING AIDS

Custom hearing aids are appropriate for mild to severe hearing loss. They fit entirely within the ear and are fitted individually based on an impression of the user's ear.



# BEHIND-THE-EAR (BTE)



- **Traditional BTE's** require a custom fit earmold to couple the hearing aid to the ear and direct the sound into the ear canal.
- This earmold helps to hold the hearing aid in place and can help provide the best acoustics depending on the hearing loss.
- The aids pick up sound, amplifies it and carries the amplified sound to an earmold that fits inside the ear canal.
- Is capable of more amplification than are other hearing aid styles





# OPEN FIT HEARING AIDS

- These are usually very small behind-the-ear-style devices, although larger BTE's devices can be modified for a more "open" fit.
- Sound travels from the instrument through a small tube or wire to a tiny dome in the ear canal.
- These aids leave the ear canal open, so they're best for mild to moderate high-frequency losses where low-frequency hearing is still normal or near normal.





# RECEIVER IN-THE-CANAL

- RIC hearing aids look similar to Open Fits.
- Receiver is at the end of the tube and is placed into the ear canal.
- External placement of the receiver allows the RIC to be as small as possible, making it extremely discreet and lightweight.



# HEARING AID ACCESSORIES

## Bluetooth Streamer



Smartphone Apps can control your hearing aids



Connect line by Oticon



TV link and Icom by Phonak



DEX by Widex

# Hearing Aid Technology Levels

## **Best**

Designed for active people that are in a variety of listening environments.

## **Advanced**

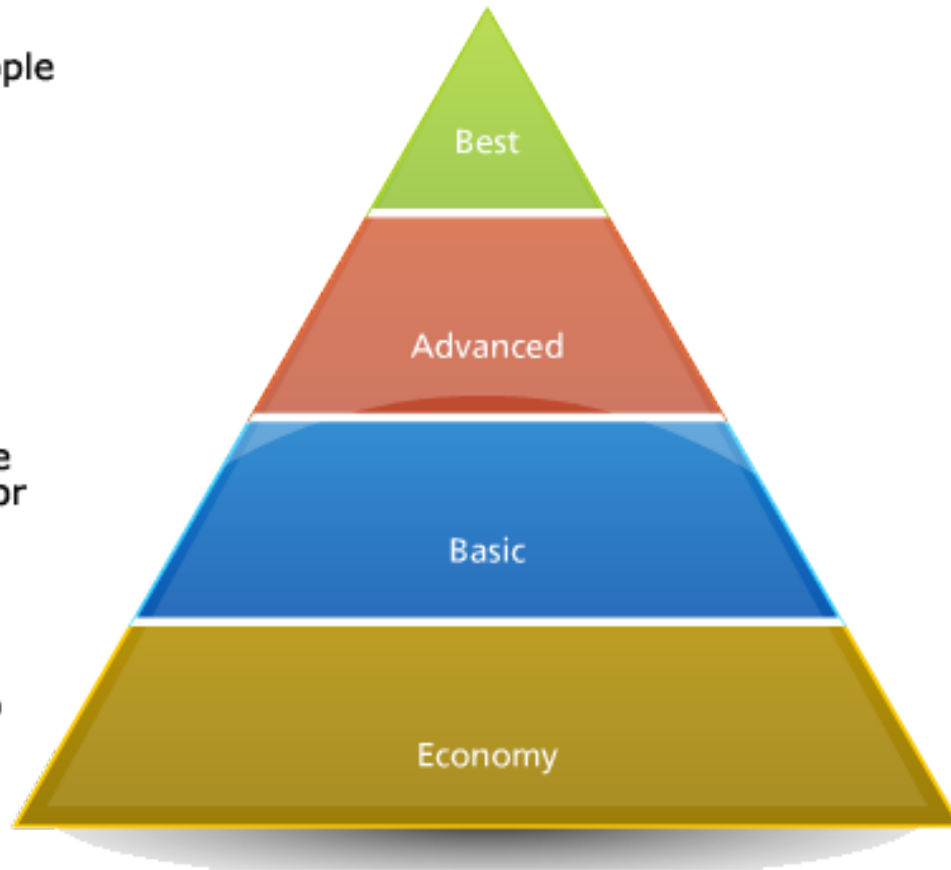
Designed to be used in relatively easy listening situations with some noise

## **Basic**

Designed to help people that aren't very active or spend the majority of time in quiet environments only.

## **Economy**

Designed for those who are budget conscious and just need basic amplification in quiet environments.

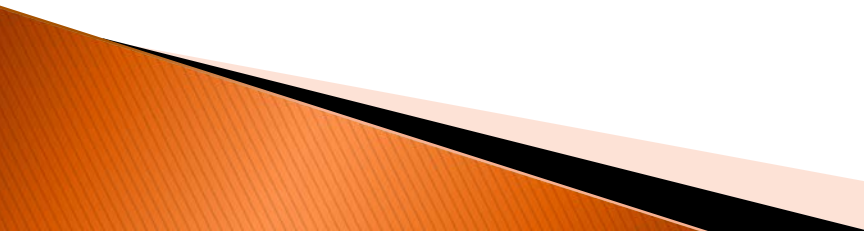




# REALISTIC EXPECTATIONS WITH HEARING AIDS

- Hearing in quiet should be improved.
- Hearing in moderate noise background should be improved.
- Hearing in noise will not be as good as hearing in quiet.
- Hearing in loud noise should be no worse than without hearing aids.
- Soft speech should be audible.
- Conversational speech should be comfortable.
- No whistling should occur if hearing aids are seated properly.
- Earmold should be comfortable.
- Own voice should be "acceptable."

# LIMITATIONS OF HEARING AIDS

- A hearing aid is an AID to hearing. It does not correct hearing or restore hearing to normal (typical).
  - It will amplify some background noise.
  - Hearing aids can make sounds louder, but cannot make them clearer.
  - They work best at a distance of 3 to 6 feet of the listener.
  - Users need to learn to derive maximum benefit from the aid; this occurs over time.
- 

# Communication/Assistive Listening Devices



Amplified Phone



Home Alerting System

Infrared TV Listening System



Doorbell Signaler



Audible Ring Signaler



Visual Fire Alarm



Tinnitus Sound Conditioner

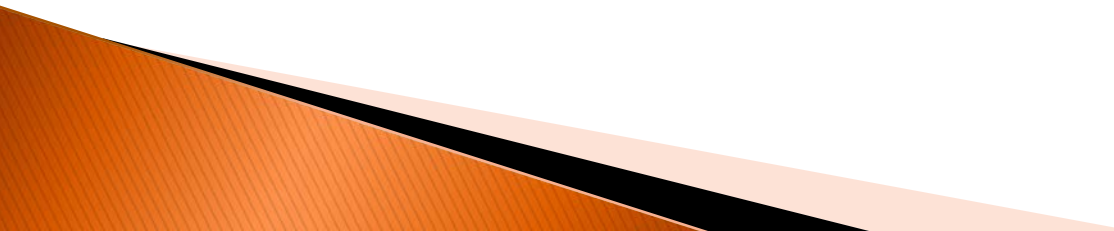


Vibrating Alarm Clock



Pocketalker

# TO BE SUCCESSFUL

- You have to be ready address and accept your hearing loss
  - Find an audiologist you are comfortable with and trust
  - Get a hearing aid that matches your lifestyle, listening needs and budget
- 

# **THANK YOU!**

**To Make an Appointment  
Contact Us at  
416-928-2502**

