

Patient Safety in Hearing Healthcare Preventing Errors and Building Trust

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The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context; you should evaluate the course accordingly

As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations

The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors

The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations

Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs

Providers should always evaluate the limitations of diagnostic and screening tools, considering their potential for false results as well as any ethical implications

It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice



Risks and Benefits



Learner Outcomes

1

Define the four components of SOAP Notes

2

Identify primary red flags requiring medical referral

3

Identify tinnitus symptoms requiring emergency medical referral

Overview

This training is an overview of many ways to prevent medical errors from occurring in your office

Based on the nature and description of this training, it is assumed you are well versed in both the anatomy and disorders of the ear

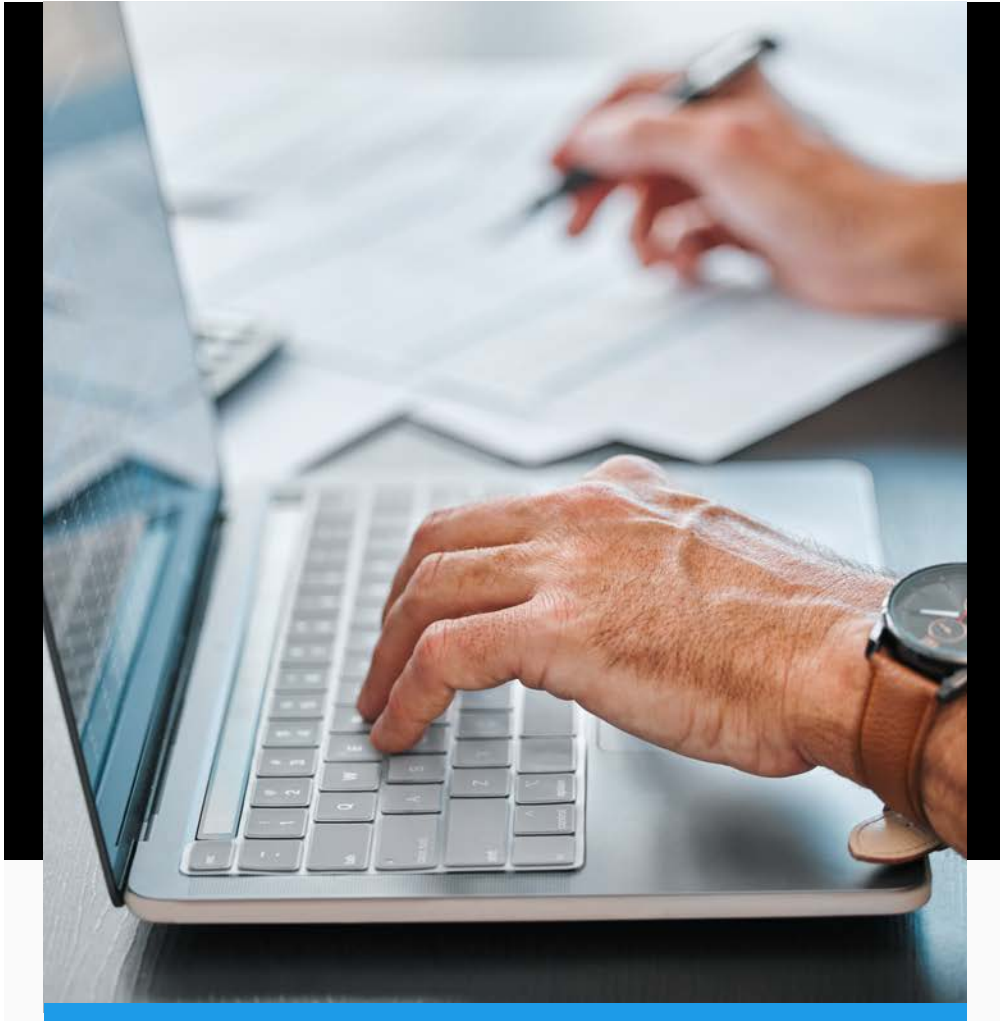
If you want more in-depth training on any of these topics, please follow up with your practice manager



Agenda

- 1 Clinical Documentation
- 2 Types of Hearing Loss
- 3 Importance of Otoscopy
- 4 Medical Referrals
- 5 Importance of Red Flags
- 6 Tinnitus
- 7 Ear Mold Impression Safety
- 8 Tympanometry
- 9 Follow Up Importance
- 10 Documentation/Acknowledgment





Clinical Documentation

Effective documentation reflects excellent care

- SOAP Notes are a great format for clinical notes

Be sure you **sign** and **date**

SOAP Notes

Subjective

Reason patient comes in or description of the problem

Objective

Observations or measurements completed to address the reason for the visit

Assessment

Analysis or interpretation of the data as they apply to the History

Plan

Statement of plan to address and resolve the presenting issue



S

"Mr. Jones reported that his hearing instruments were not working"

O

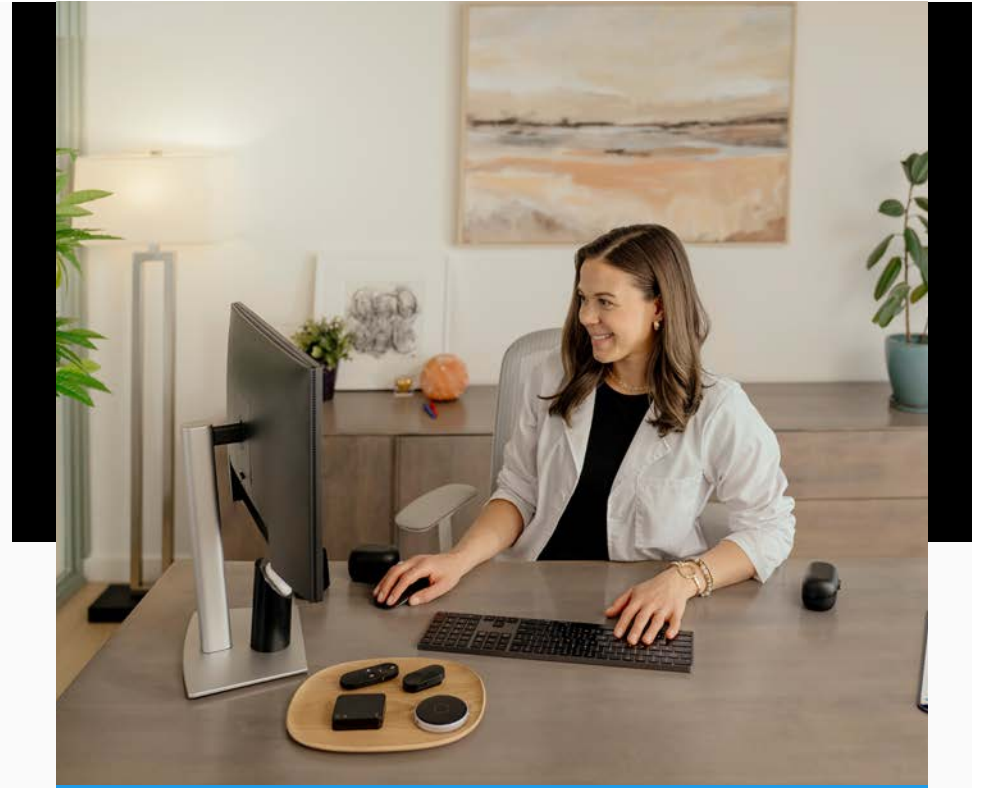
"Receivers plugged with wax. Wax removed. Analysis indicated HA's are working at specifications. Video otoscopy showed significant ear canal occlusion from cerumen bilaterally"

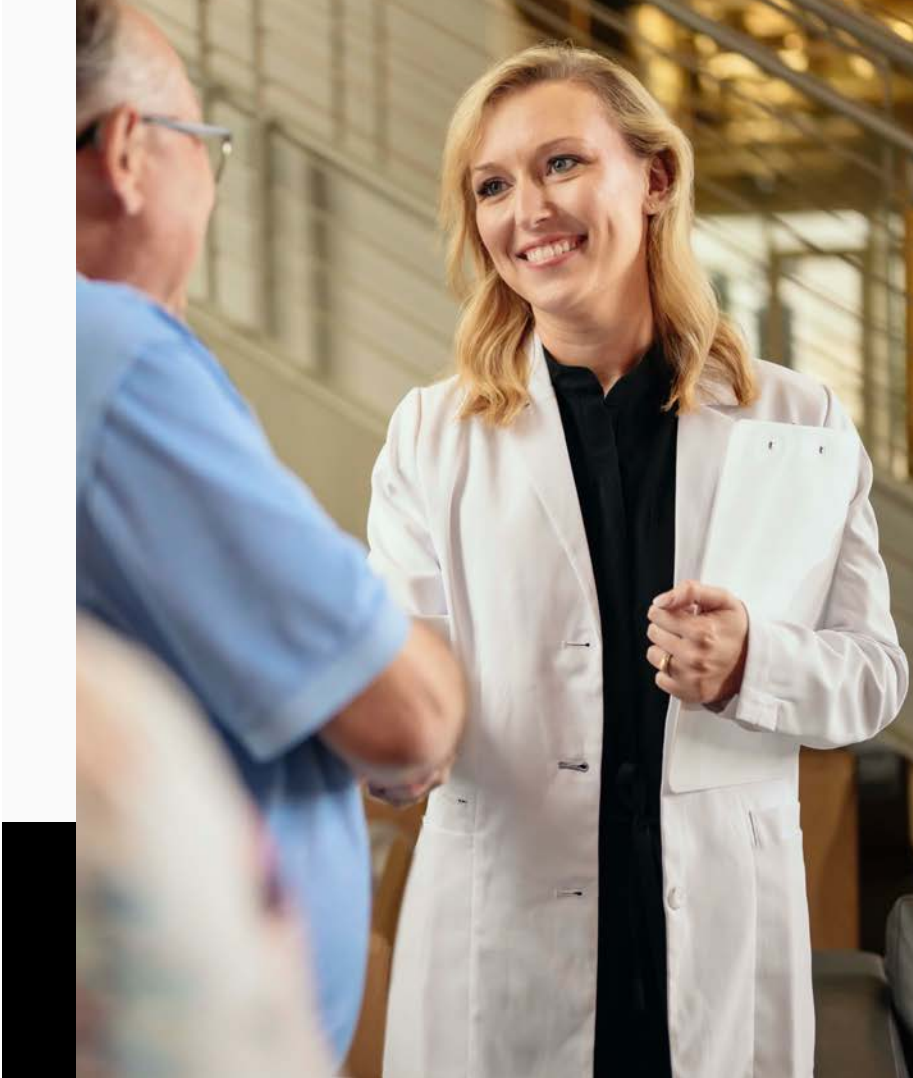
A

"Excessive cerumen caused hearing aid to malfunction"

P

"Referred to ENT for cerumen management. Reinstructed on changing wax filters, suggested this be done with every battery change, Scheduled 3-month appointment to clean, check and monitor. Instructed to call immediately should issues arise"





Professional Communication and Collaboration

Professional communication should be timely and accurately delivered

Clear, accurate, without jargon or ambiguous expression

All documentation should be completed to respect their rights, privacy, and their personal health identifiers in compliance with all laws and regulations

Examples of federal mandates in the US include Health Insurance Portability and Accountability Act

Types of Hearing Loss

Conductive

Sensorineural

Mixed

Central

Functional



Conductive Hearing Loss

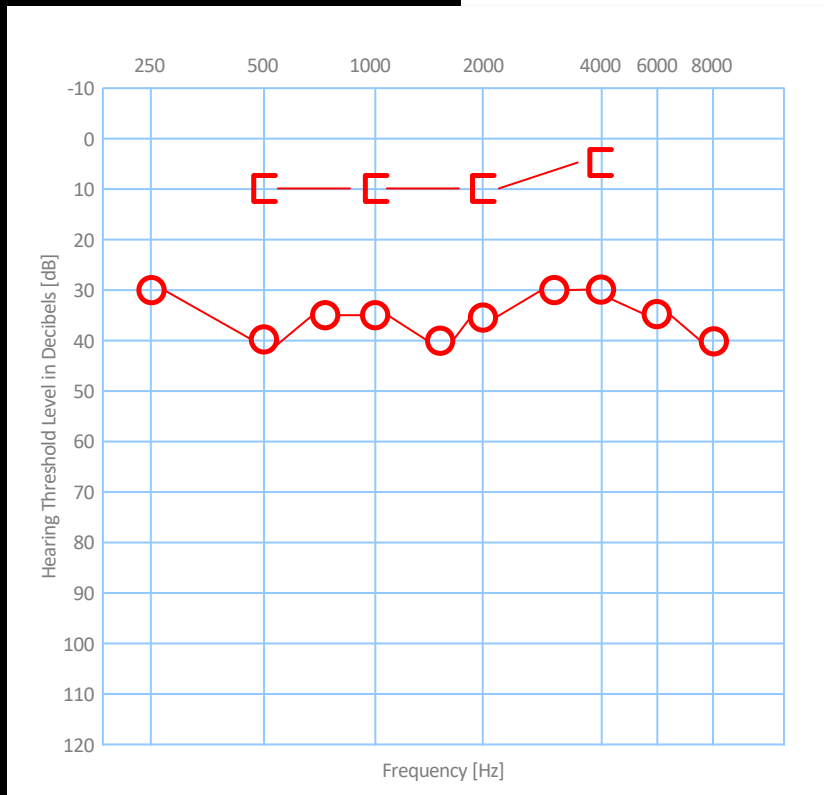
Conductive

Results from abnormalities of the external and/or middle ear

Sound is not readily transmitted or conducted through air, bone, or tissue because of abnormality

This loss has the potential to be treated by medical intervention





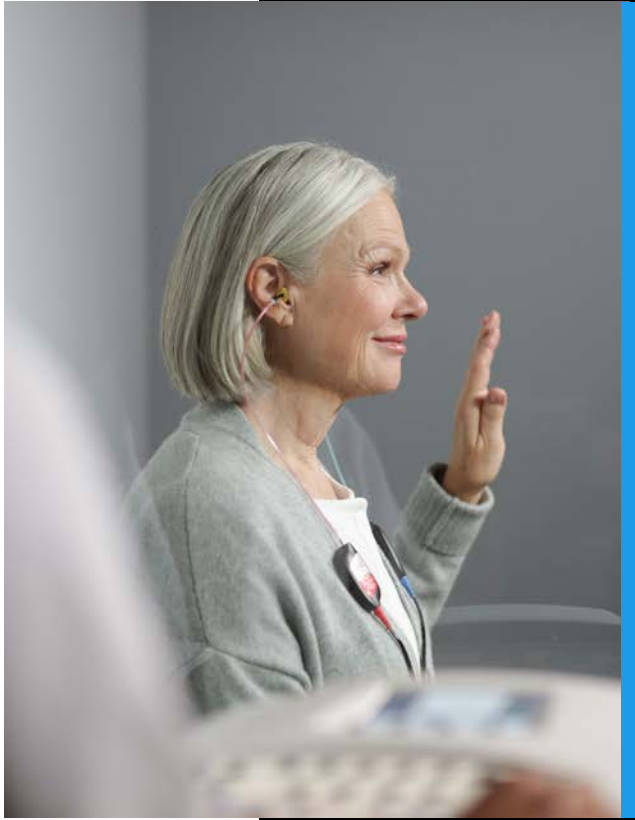
Conductive Hearing Loss

Occurs when the cochlea functions normal as tested by bone conduction, but the middle ear system is not working properly

Ear infection and effusion

Ossicular discontinuity

Otosclerosis



Sensorineural Hearing Loss

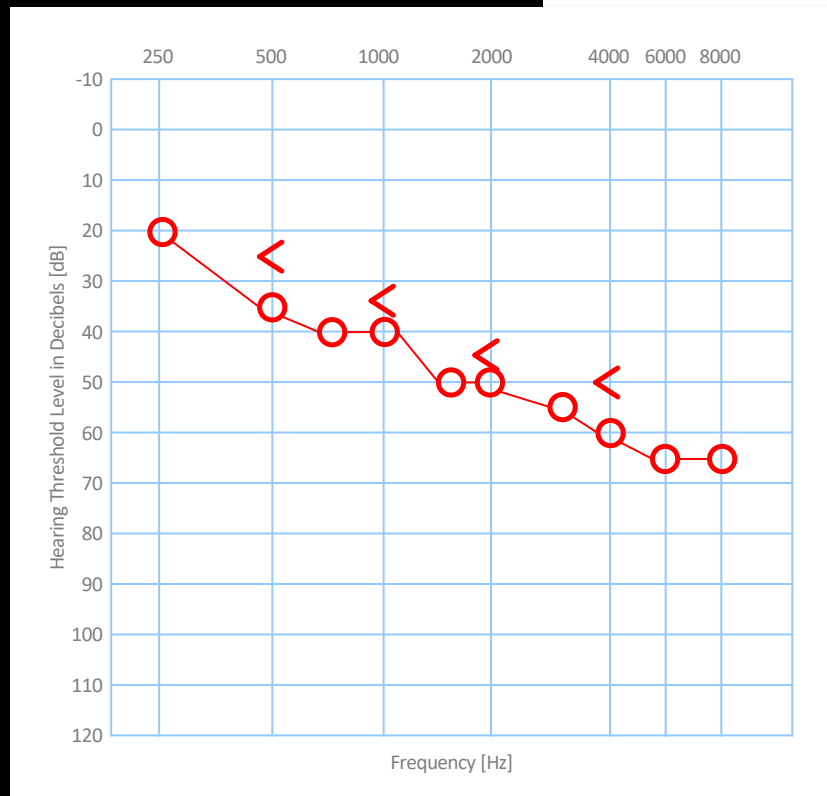
Sensorineural (SNHL)

Typically, SNHL is not treated medically, and hearing aids are the recommended intervention

This can be referred to as “nerve loss”

Sensory = Cochlea

Neural = Auditory Nerve



Sensorineural Hearing Loss

Both air and bone are beyond normal limits.
The air and bone scores should be within 10 dB

It is common to see a sloping configuration in SNHL, where thresholds in the high frequencies are worse than those in the low frequencies

People often say they can hear speech but can't understand it (consonants unclear)

Difficulty understanding speech in noise

Heredity

Presbycusis (hearing loss associated with aging)

Noise induced hearing loss

Acoustic Neuroma

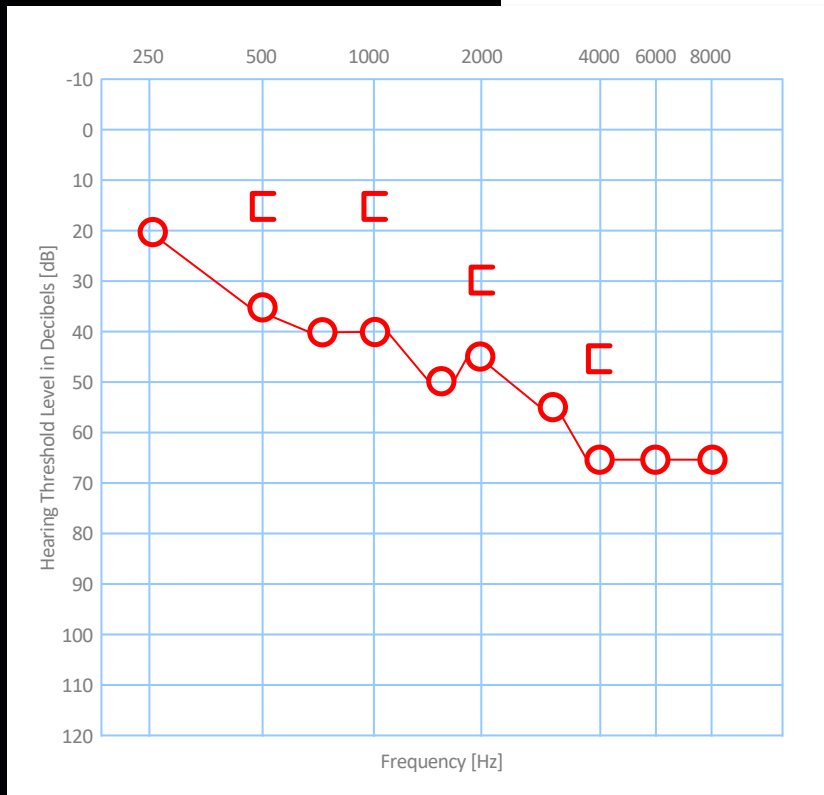
Meniere's Disease



Mixed Hearing Loss

Mixed

The combination of Conductive hearing loss and Sensorineural hearing loss in the same ear



Mixed Hearing Loss

For example, a patient may have a moderate, high frequency, SNHL from presbycusis **and** an ear infection that causes Otitis Media, creating a conductive component

Central Hearing Loss

Inability for the brain to process, recognize or understand sounds or speech accurately, with normal results on an audiogram

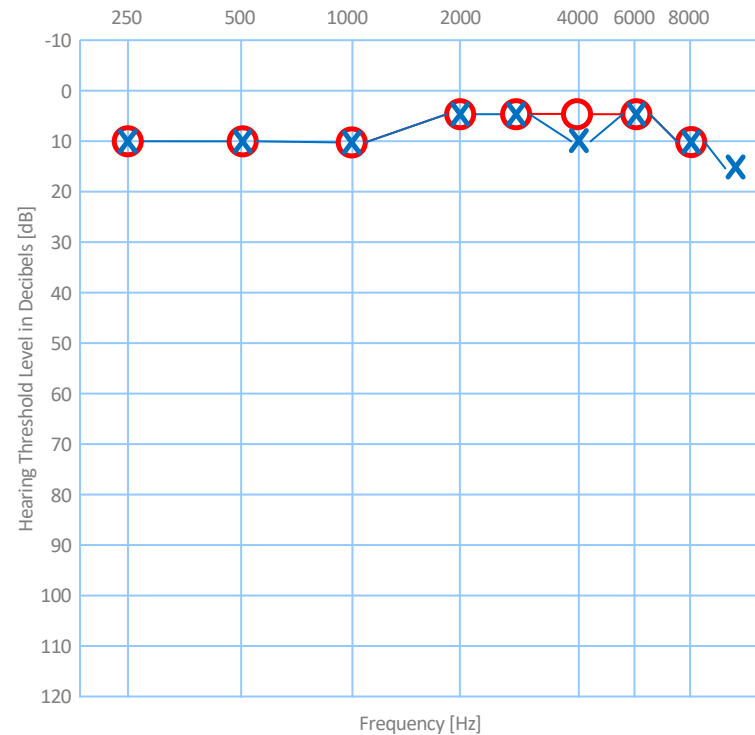
Types of central hearing loss include:

Pure word deafness (auditory agnosia)

Cortical deafness

Auditory hallucinations

Central Auditory Processing Disorder (this could also be acquired following traumatic brain injury)



PTA = 8.75 dB



Functional Hearing Loss

Functional Hearing Loss

A decrease in hearing that is unexplained by anatomic or physiologic abnormalities, or both

Another term for this is pseudohypacusis. It is evident when a person is not or cannot be truthful or accurate in their responses during audiologic evaluation

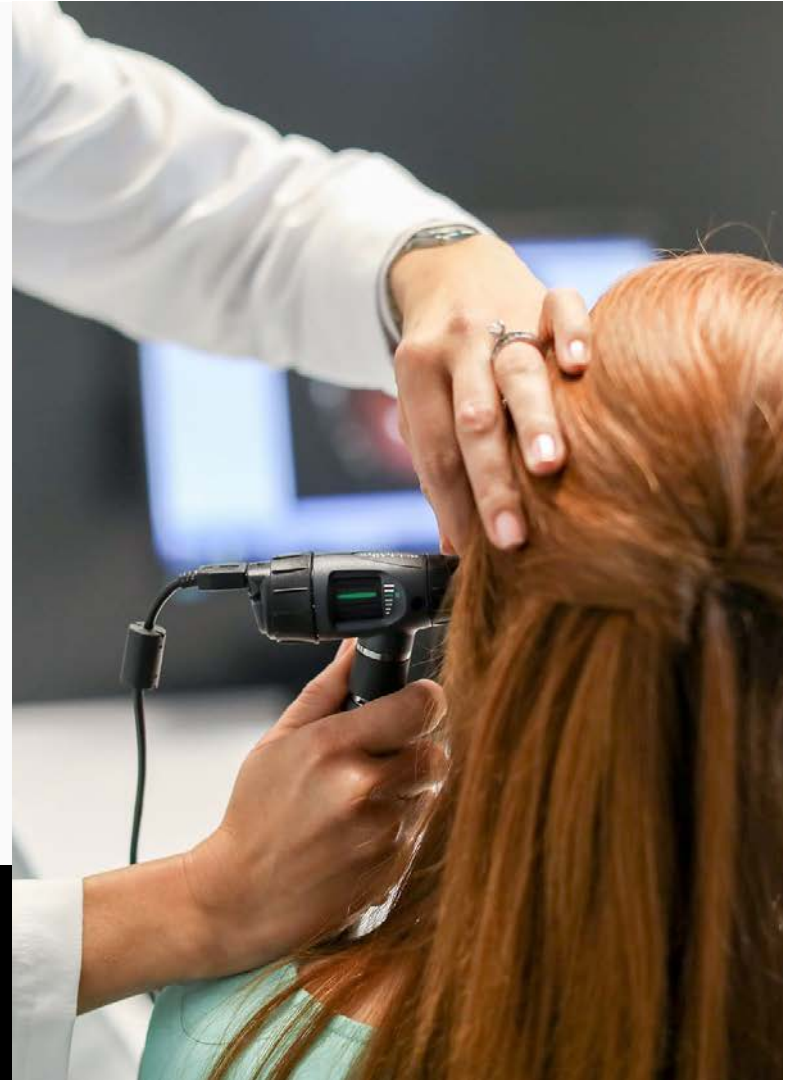
In these cases, there is nothing physically wrong with the person's peripheral or central auditory nervous system

Importance of Otoscopy

Foreign object identification

Shape of ear canal

Cone of light



Landmark of a Normal Ear Drum

The Cone of light

This visible light reflex phenomenon occurs during otoscopy

Shining light on the tympanic membrane causes a cone shaped reflection in the anterior inferior quadrant of the ear drum, this is a landmark of a “normal” ear drum!



Which ear drum is pictured based on the cone of light?

Left or Right?



Issues Requiring Medical Referral

There are certain conditions that may be discovered during proper case history, otoscopy, and the audiometric evaluation

These are called **RED FLAGS**

When one or more is revealed, medical referral must be considered

Medical referral should be made if these conditions exist and is unknown to the patient, has not had recent medical attention of a physician or if you have any hesitation to move forward



8 Primary Red Flags

- 1 Visible congenital or traumatic deformity of the ear
- 2 Active drainage from the ear in the past 90 days
- 3 Sudden hearing loss within the past 90 days
- 4 Reported acute or chronic dizziness
- 5 Unilateral hearing loss of sudden or recent onset within 90 days
- 6 Air-bone gap greater than 15 dB at 500 Hz, 1 & 2 kHz
- 7 Reported pain or discomfort
- 8 Excessive cerumen or foreign body in the ear

1

Visible congenital or traumatic deformity of the ear

Whenever we see an ear that is deformed, whether it is congenital, (*present at/from birth*), or acquired (*occurred since birth or from trauma*) we must:

Identify through observation

Question the patient

Refer the patient on to a physician for medical clearance



Congenital Deformities

Atresia

A congenital absence or complete closure of the ear canal or absence of the external auditory meatus



Microtia

Abnormally small ears



This may be accompanied by undeveloped or under-developed middle ear ossicles

Acquired Deformities

Exostosis

Bony growths arising from the surface of the bone within the bony portion of the ear canal

This results from prolonged exposure to cold water

This can result in the narrowing or closure of the canal near the tympanic membrane

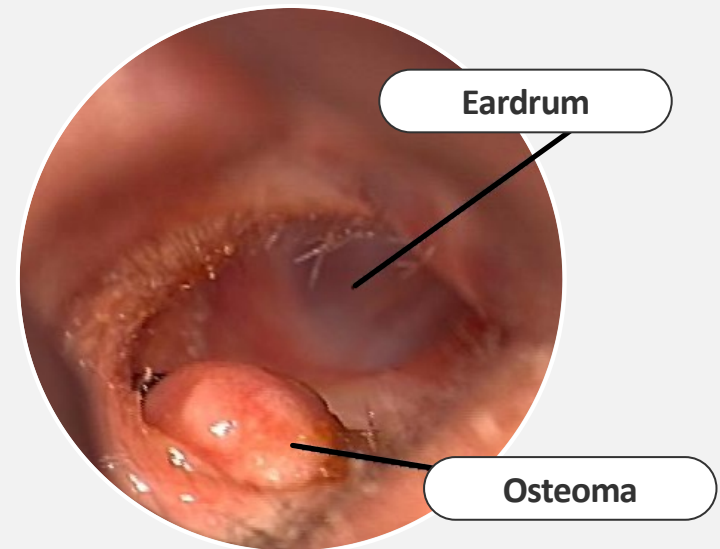


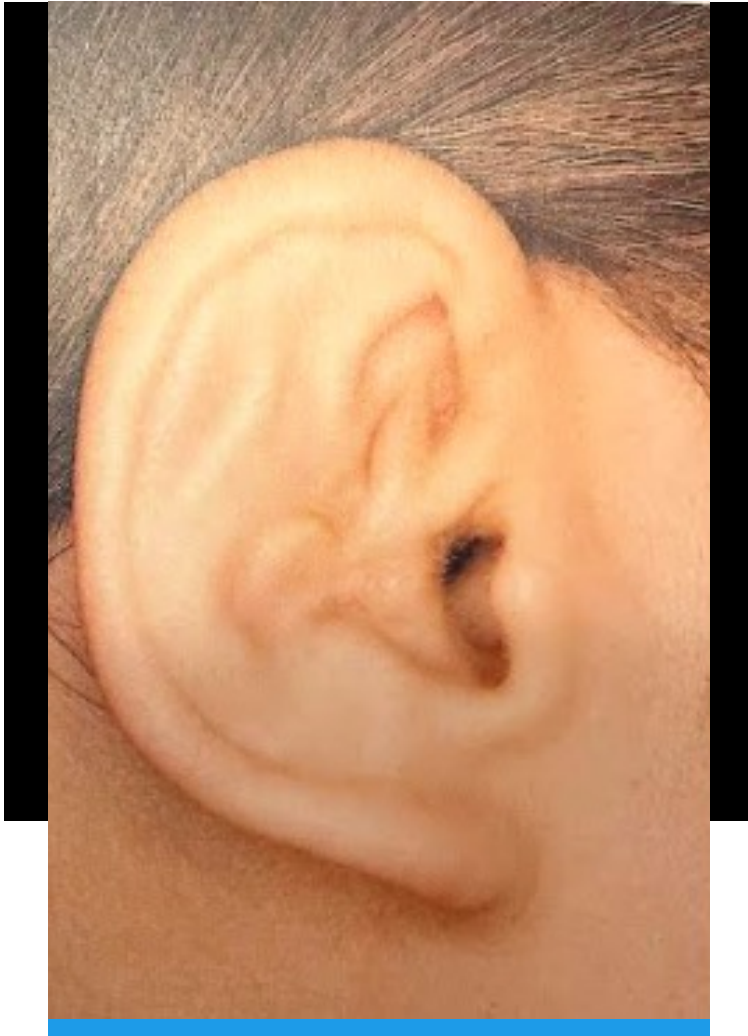
Acquired Deformities

Osteoma

This is a single benign tumor resembling cortical bone occurring at the tympanomastoid structure line that tends to have a narrow base

Again, this can result in the narrowing or closure of the canal near the tympanic membrane





Acquired Deformities

Traumatic Deformity

More likely to see traumatic deformities in the veteran population

Cauliflower ear

Cauliflower ear is a deformity of the ear caused by trauma, which occurs when blood pools in the pinna

Acquired Deformities

Disease induced deformities may include:

Melanoma

External or middle ear cholesteatoma
(pictured to right)

Immediate referral for a Cholesteatoma is crucial



2

Active drainage from the ear in the past 90 days

Suppurative Otitis Media

An acute or chronic Otitis Media with infected fluid and inflammation of the middle ear with infected fluid



Sudden loss within the past 90 days

Any reported sudden or rapidly progressive hearing loss should set that little red flag waving in the back of our minds

The causes of a sudden loss may be from trauma

Infection

Disease

Acoustic Neuroma

Ototoxicity

Allergies





Sudden loss within the past 90 days

Trauma

Head injuries resulting in

Temporal bone fracture

Concussion

Direct injuries to middle or inner ear

Barotrauma (drastic air pressure changes)

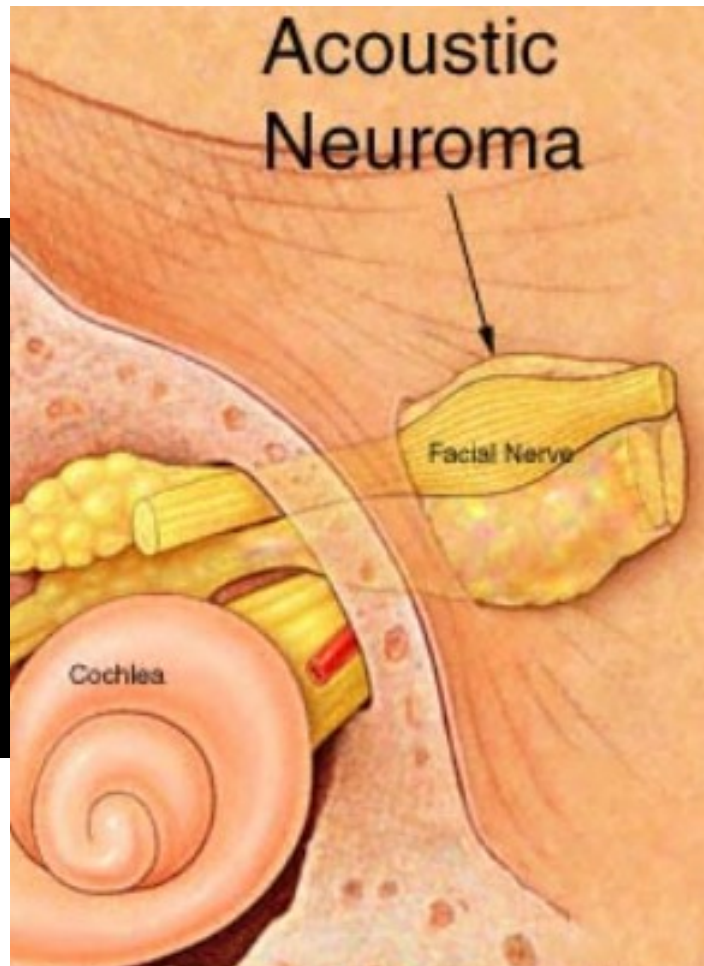
These are common with water skiing and scuba diving accidents

Sudden loss within
the past 90 days

Aminoglycosides

Amikacin	Netilmycin
Gentamycin	Sisomycin
Kanamycin	Streptomycin
Livodomycin	Tobramycin
Neomycin	





Sudden loss within
the past 90 days

Tumors of the Middle and Inner Ear

Glomus tumor
Osteoma
Middle ear carcinoma
Acoustic neuroma

Reported acute or chronic dizziness

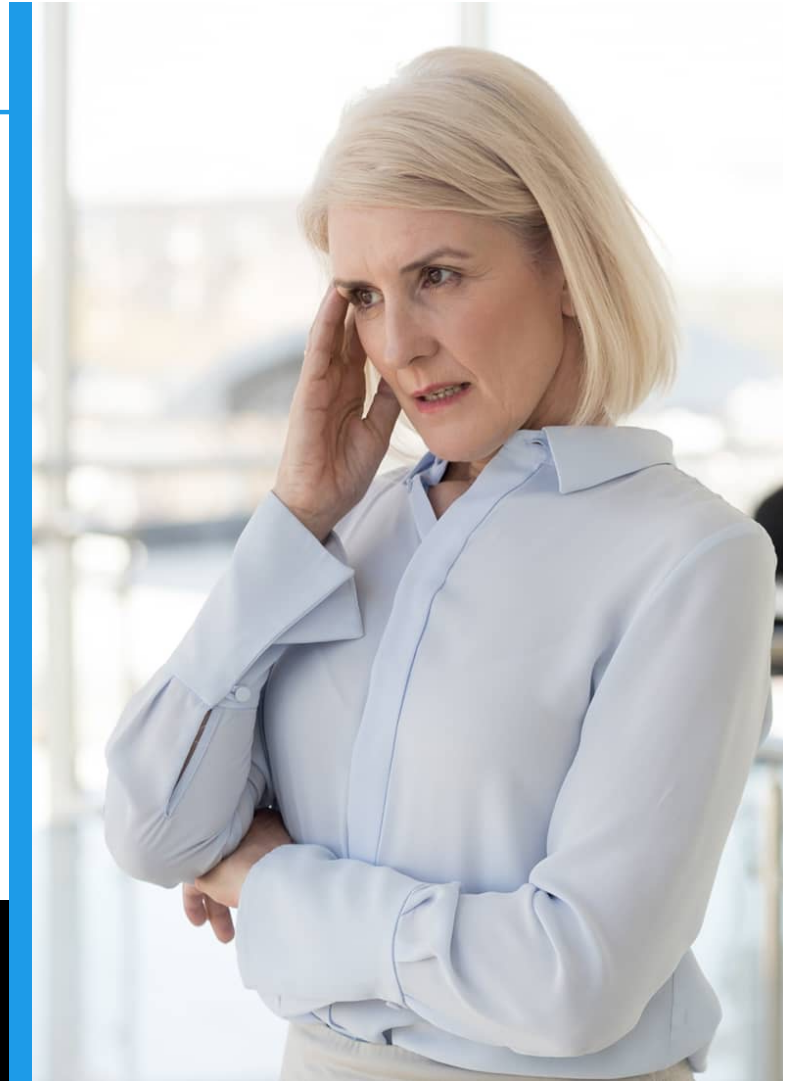
Dizziness is a general term referring to an inability to maintain normal balance and may be described as/with:

Nausea

Hyperventilation

Faintness

Light-headedness due to circulatory problems or the sensation of spinning



Vertigo Refresher

Vertigo is the feeling of spinning or feeling like the room is spinning around you

Physical therapy can help if the cause is an inner-ear dysfunction, however it is vitally important that you refer patients for medical help immediately if they have any other symptoms that could be related to the brain or heart

Numbness

Weakness especially down one side of the body

Facial drooping

Racing heart rate

Photosensitivity

Pain down your arm



Reported acute or chronic dizziness

Vertigo is a vestibular symptom in which the patient may report a sensation of spinning or their environment spinning



Reported acute or chronic dizziness

The causes might be the result of

- Medication
- Serious oto-pathological illness
- Vestibular dysfunction
- Acoustic neuroma
- Meniere's Disease



Reported acute or chronic dizziness

Meniere's Disease a.k.a. Endolymphatic Hydrops

This pathology affects the inner ear and results in sensorineural hearing loss, tinnitus, vertigo, and a sensation of aural fullness

These symptoms may appear separately or simultaneously

The hearing loss can fluctuate usually affecting the lower frequencies at first and spreading to all frequencies as time elapses

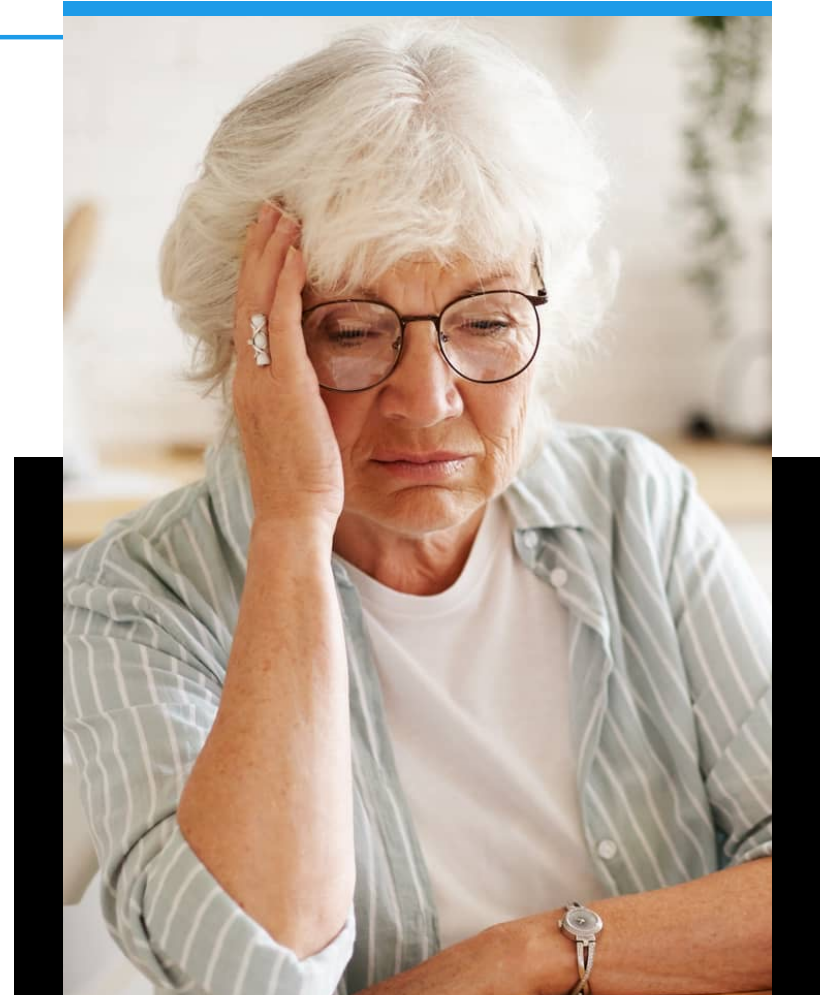


Unilateral hearing loss of sudden or recent onset within 90 days

Trauma and disease are generally unilateral in nature and should be referred to a physician prior to proceeding with auditory rehabilitation

Some of the causes can include:

Meniere's disease	Perforation of the tympanic membrane
Acoustic neuroma	
Trauma	Cholesteatoma
Autoimmune disease	Otitis media





Air-bone gap greater than 15 dB at 500 Hz, 1 kHz & 2 kHz

An air-bone gap of 15 dB or greater at 500 Hz, 1,000 Hz and 2,000 Hz, it indicates there is a potentially significant medically treatable condition



Air-bone gap greater than 15 dB at 500, 1 kHz & 2 kHz

Some causes of an air-bone gap in the outer ear and canal:

Closure of the tragus

Collapsed canal

Atresia of the external ear

Obstructions in the external auditory canal

Accumulated cerumen or other debris

Foreign object

External otitis

Fungus

Pre - and cancerous growths

Air-bone gap greater than 15 dB at 500, 1 kHz & 2 kHz

Some causes of an air-bone gap at the tympanic membrane

Perforation

Post-infection or surgical scar tissue

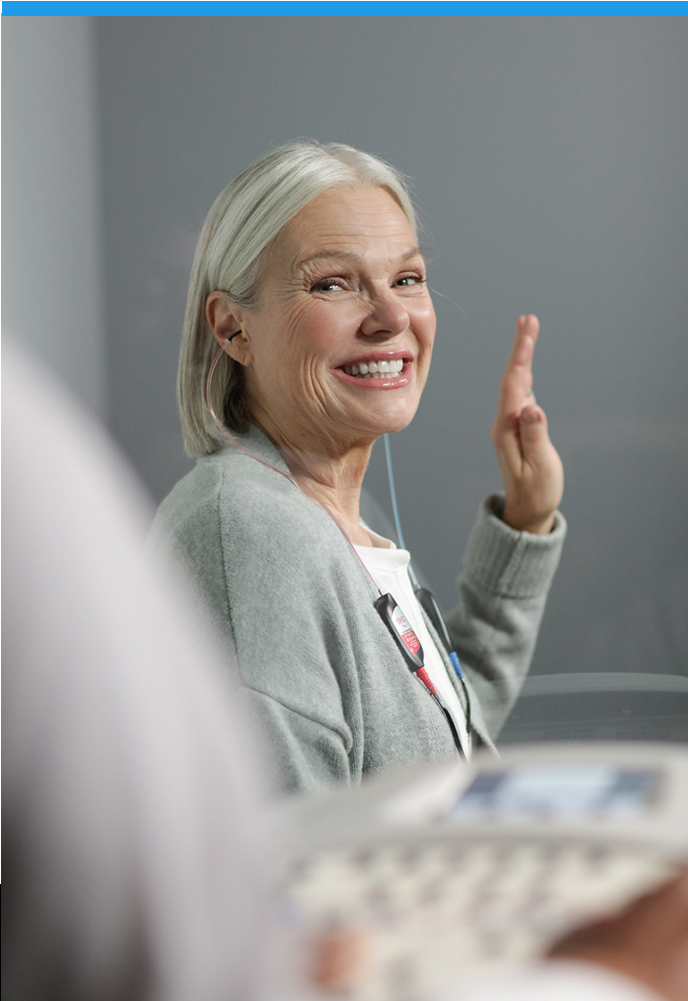
Thickening of the tympanic membrane from tympanosclerosis

Extreme flaccidness

Fluid

Cholesteatoma

Glomus tumor



Air-bone gap greater than 15 dB at 500, 1 kHz & 2 kHz

Some causes of an air-bone gap within the middle ear:

- Otosclerosis
- Disarticulation
- Otitis media
- Mastoiditis
- Cholesteatoma

AUDIOGRAM

DATE _____ NAME _____

RIGHT EAR

	250	500	1000	1500	2000	3000	4000	6000
AIR CONDUCTION								
BONE CONDUCTION								
SRT								

TESTED BY _____ dB _____

DISCRIM _____

LEFT EAR

	250	500	1000	1500	2000	3000	4000	6000	2000
AIR CONDUCTION									
BONE CONDUCTION									
SRT									

TESTED BY _____ dB _____

DISCRIM _____



Reported pain or discomfort

The patient may report having pain in and around the ear which may be related to the ear, or it may be a result of

Temporomandibular joint (TMJ) disorder

Orthodontic abnormalities

Dental hypersensitivity

Sinus problems

Reported pain or discomfort

With visual assessment we should be able to determine the presence of swelling, the absence of the cone of light on the tympanic membrane, redness or drainage in the ear canal

Serious ear disease, trauma, or acquired abnormalities may also be the cause



Excessive cerumen or foreign body in the ear

Impacted cerumen may result in

Obstruction of the ear canal and tympanic membrane

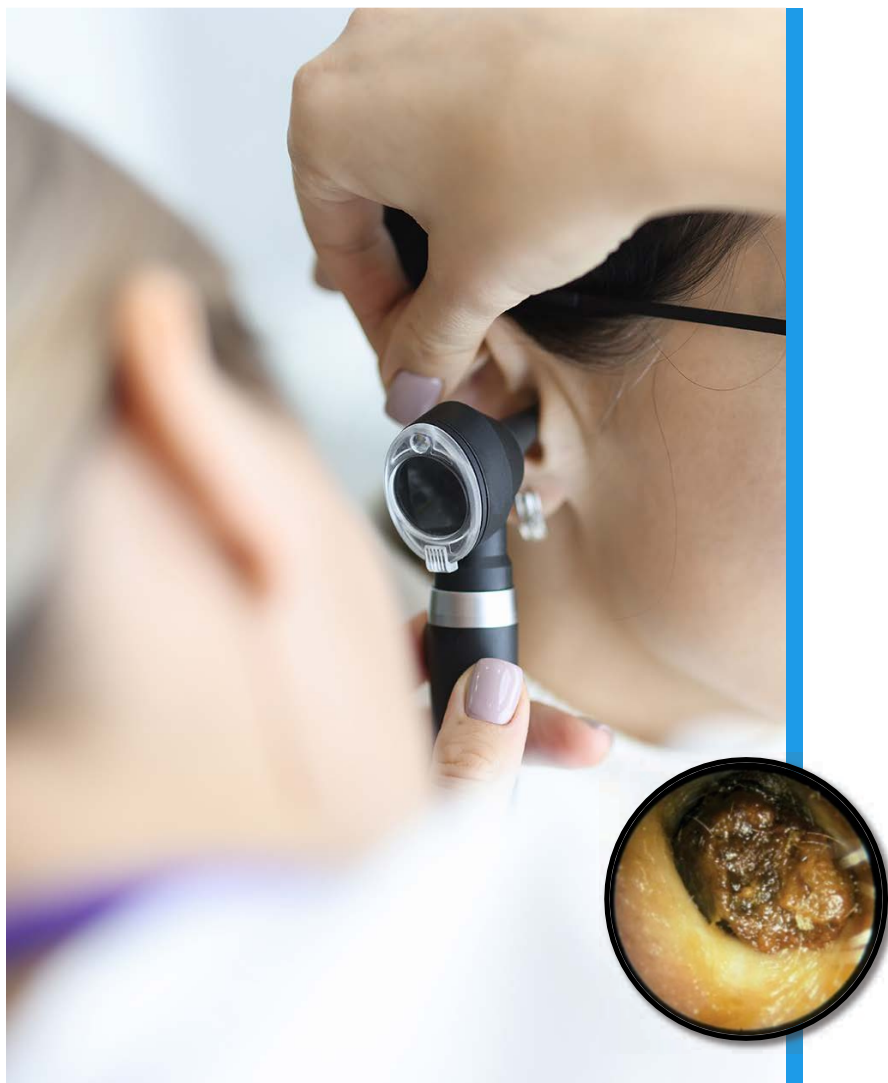
Inability to perform impedance testing, including acoustic reflexes

Inaccurate audiometric test results

Inability to perform probe mic measurement

Inability to take accurate earmold impression

The use of a hearing aid may cause excessive feedback or reduced gain



tin·ni·tus

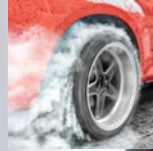
[“*TIN-it-us*”, “*tin-NITE-us*”]

noun Pathology

A constant or intermittent sound heard in the ears and/or head that does not have an outside source, often described as ringing, humming, or buzzing

Tinnitus

SCREECHING



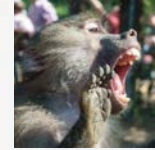
CRICKETS



WHISTLING



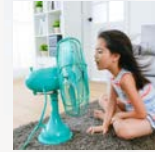
SCREAMING



ROARING



HUMMING



RINGING



BUZZING

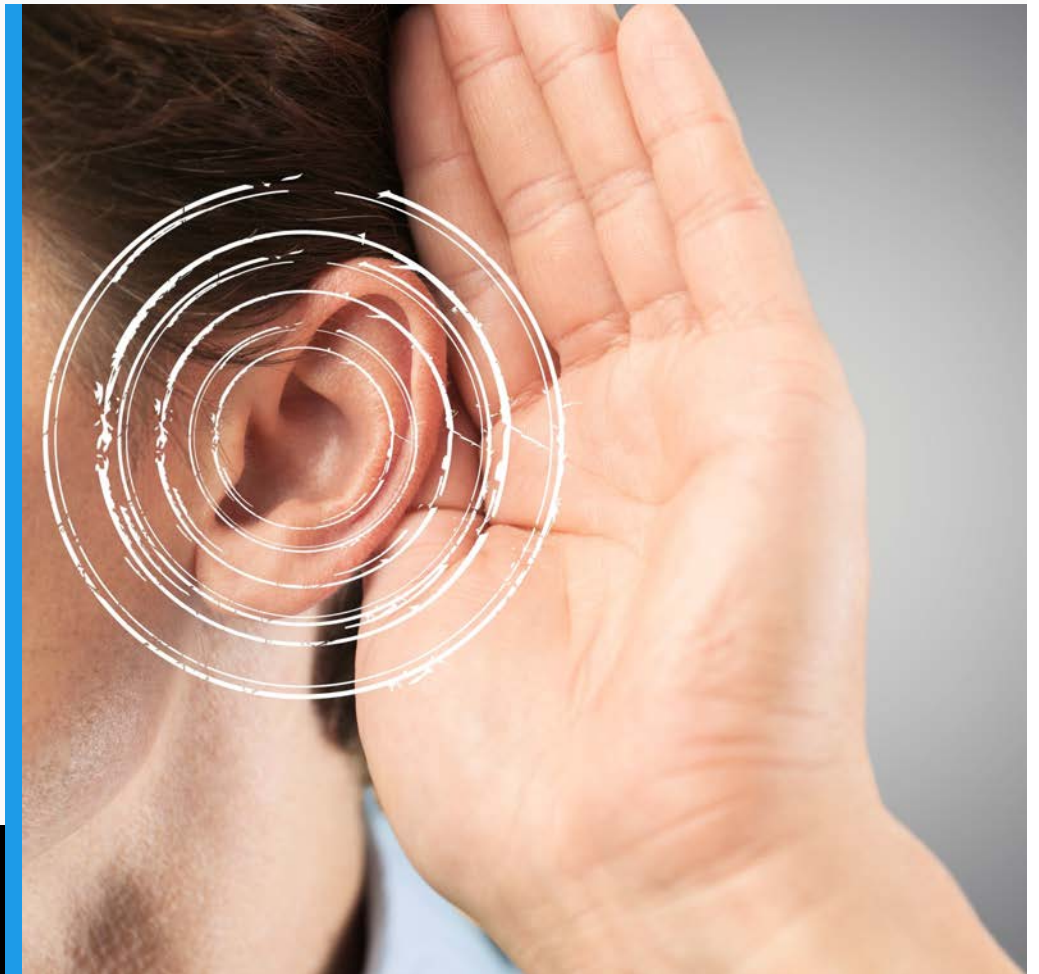


Tinnitus

NOT imagined

NOT a disease

A SYMPTOM of an underlying health condition



Tinnitus Assessment

How long have you had your tinnitus?

What does your tinnitus sound like?

When did you first experience your tinnitus?

Tinnitus
Assessment



Patient Name: _____ Date: ____/____/____

Patient's Assessment of Tinnitus

Which option best describes the head noise you are hearing?
☐ High Pitched ☐ Low Pitched ☐ Crickets ☐ Locust ☐ Other: _____

Describe the loudness of your tinnitus: ☐ Very Loud ☐ Loud ☐ Moderate ☐ Faint ☐ Very Faint

Is your tinnitus: ☐ Continuous ☐ Intermittent

When did the tinnitus start? _____

Do you hear your heart beating in your ears?..... ☐ Yes ☐ No

Does your tinnitus pulsate with your heart beat?..... ☐ Yes ☐ No

Do you have recurring dizziness?..... ☐ Yes ☐ No

Have you been exposed to loud sharp sounds or prolonged noise in the past?
(such as gunshots, machinery, motorcycles or recreational vehicles, etc.)..... ☐ Yes ☐ No

Does your tinnitus cause you to have problems understanding speech?..... ☐ Yes ☐ No
If yes, when? _____

Do you currently take, or have you ever taken any of the following drugs?
☐ Arthritis Medication ☐ Antibiotics ☐ Antidepressants ☐ Antihistamines ☐ Cardiac Medication
☐ High Blood Pressure Medication ☐ Chemotherapy Drugs ☐ Diuretics ☐ High Doses of Aspirin
You may want to ask your pharmacist or physician if any of your medications can affect your hearing.

Patient's Assessment of Tinnitus

CAUSES

Check for cerumen in canals. **Is impacted cerumen present?**..... ☐ Yes ☐ No

Considering the patient's age and tinnitus evaluation results,
Is presbycusis a consideration?..... ☐ Yes ☐ No

TONE MATCHING

Left Ear:	Frequency	1K	2K	3K	4K	6K	8K	Volume Level	_____
Right Ear:	Frequency	1K	2K	3K	4K	6K	8K	Volume Level	_____

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Tinnitus Handicap Inventory (THI)

Designed to find out what effects tinnitus has had on your lifestyle, general well-being, etc

Answer all questions by shading the circle under the answer that best reflects how your tinnitus has affected you over the past week

Tinnitus Handicap Inventory (THI)



Name: _____ Date: ____/____/____

INSTRUCTIONS

This questionnaire is designed to find out what effects tinnitus has had on your lifestyle, general well-being, etc. Some of the effects below may apply to you and some may not. Please answer all questions by shading the circle under the answer that best reflects how your tinnitus has affected you over the past week.

QUESTIONNAIRE	YES (4 points)	SOMETIMES (2 points)	NO (0 points)
1. Because of your tinnitus is it difficult for you to concentrate?			
2. Does the loudness of your tinnitus make it difficult for you to hear people?			
3. Does your tinnitus make you angry?			
4. Does your tinnitus make you confused?			
5. Because of your tinnitus, are you desperate?			
6. Do you complain to others about your tinnitus?			
7. Because of your tinnitus do you have trouble falling asleep at night?			
8. Do you feel as though you cannot escape from your tinnitus?			
9. Does your tinnitus interfere with your ability to enjoy social activities?			
10. Because of your tinnitus do you feel frustrated?			
11. Because of your tinnitus do you feel that you have a terrible disease?			
12. Does your tinnitus make it difficult to enjoy life?			
13. Does your tinnitus interfere with your job or household responsibilities?			
14. Because of your tinnitus do you find that you are irritable?			
15. Because of your tinnitus is it difficult for you to read?			
16. Does your tinnitus make you upset?			
17. Do you feel that your tinnitus has placed stress on your relationships with friends or family members?			
18. Do you find it difficult to focus your attention away from your tinnitus?			
19. Do you feel you have no control over your tinnitus?			
20. Because of your tinnitus do you feel tired?			
21. Because of your tinnitus do you feel depressed?			
22. Does your tinnitus make you feel anxious?			
23. Do you feel you can no longer cope with your tinnitus?			
24. Does your tinnitus get worse when you are under stress?			
25. Does your tinnitus make you feel insecure?			
TOTAL NUMBER OF POINTS: _____			

RESULTS

0-16	18-36	38-56	58-76	78-100
<i>Slight:</i> Only heard in quiet environments	<i>Mild:</i> Easily masked by environmental sounds and easily forgotten with activities	<i>Moderate:</i> Noticed in presence of background noise, daily activities can still be performed	<i>Severe:</i> Almost always heard, leads to disturbed sleep patterns and interferes with daily activities	<i>Catastrophic:</i> Always heard, disturbed sleep patterns, difficulty with any activities

Reference: McCombie, A., Bapstley, D., Colan, R., McKenna, L., McKinnon, C. and Windle-Taylor, P. (2001).
Guidelines for the Grading of Tinnitus Severity: Result of a working group commissioned by the British Association of Otolaryngologists, Head and Neck Surgeons, 1999, Clin Otolaryngol 24, 388-393.

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Tinnitus Referrals

Urgent Referral

Pulsatile tinnitus

Unilateral tinnitus

Ear pain and/or drainage

Symptoms related to head
or neck movement

Vestibular symptoms
(dizziness/ vertigo)

Emergency Referral

Physical trauma

Facial palsy

Sudden hearing loss

Suicidal ideation

If you are concerned about
the patient's well-being



Tinnitus Treatment Options

No FDA approved method

No medications have been shown to reliably reduce tinnitus perception

Tinnitus caused by a treatable medical condition may be eliminated or drastically reduced by addressing the underlying condition

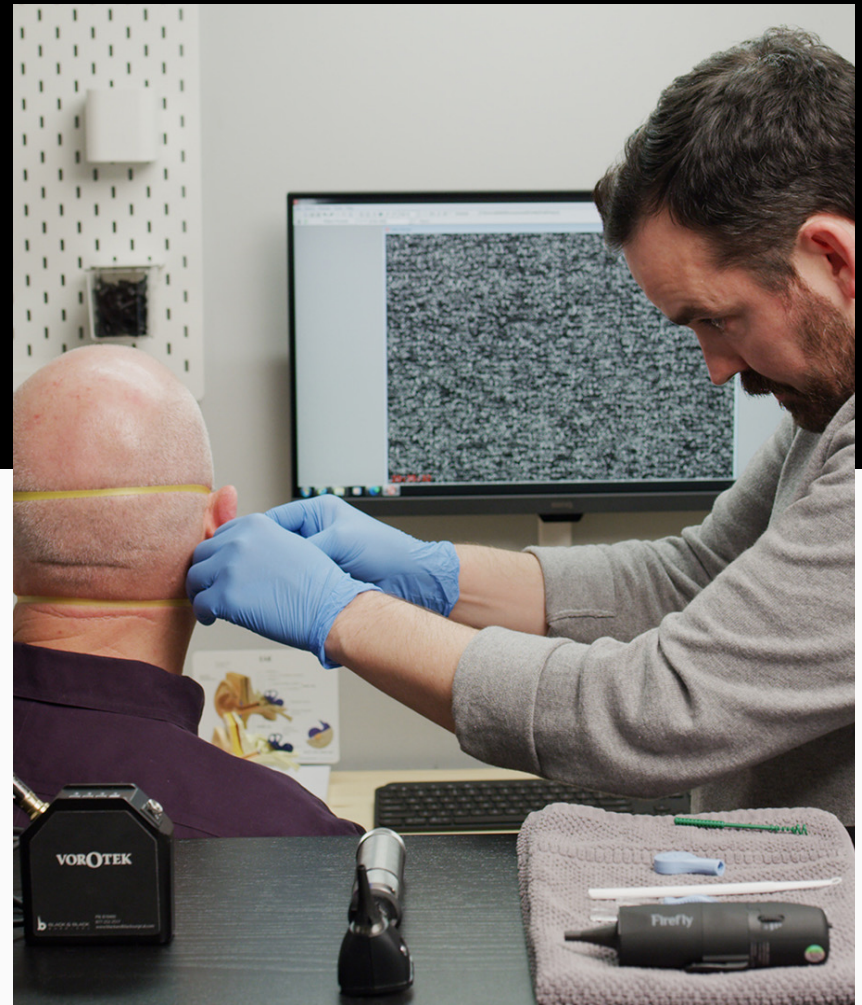
Noble, 2008; Langguth et al., 2009

Earmold Impression Safety Techniques

Otoscopy

Surgically modified ears

Bridge and Brace technique



Earmold Impression Safety Techniques

Bracing during **otoscopy** provides control and prevents potential trauma if the patient moves unexpectedly

Thorough otoscopy is critical, especially if the patient has a surgical ear



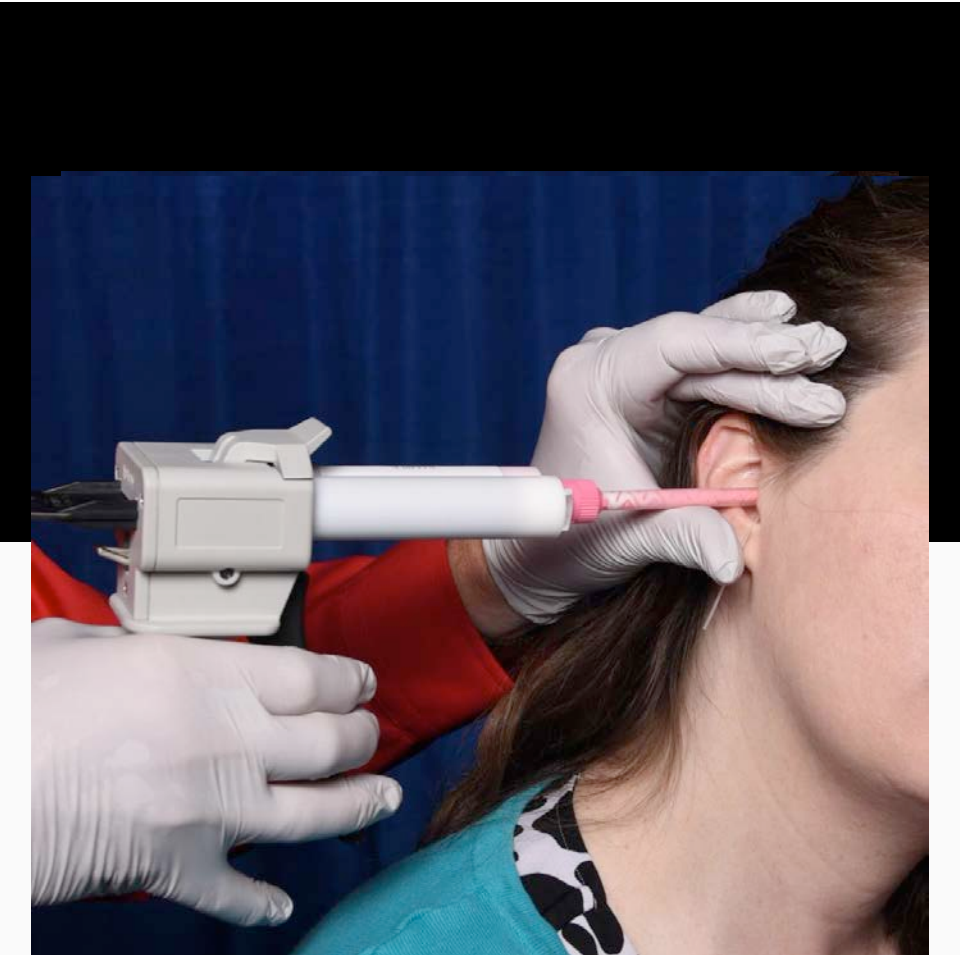
Bridge and Brace Technique

Both hands and instrument act together

One hand is the **bridge**

One hand holds the instrument and **braces** against the head or bridge hand

Prevents accidental injury or damage to the ear



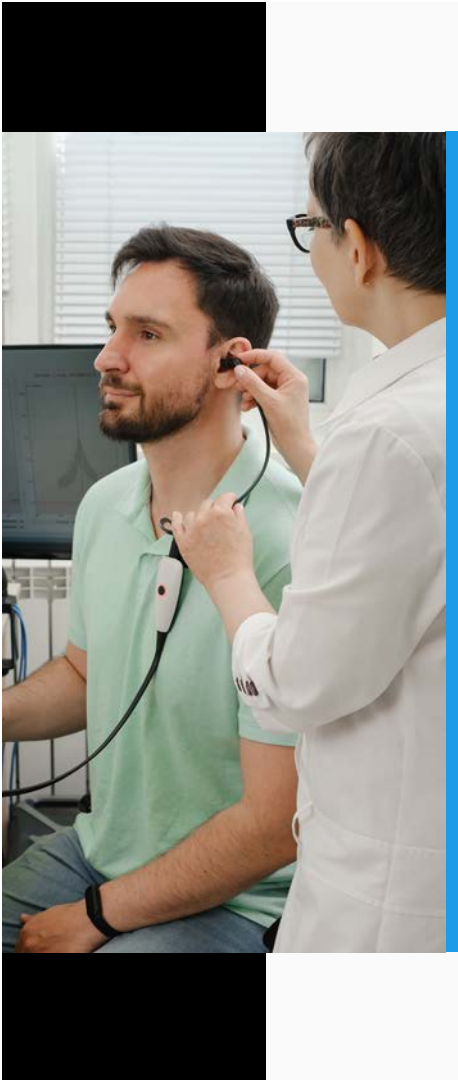
What is tympanometry?

Before the test, the patient's ear is examined to make sure the ear canal is not obstructed

Tympanometry is a **diagnostic procedure to examine the functionality of the eardrum, or tympanic membrane**

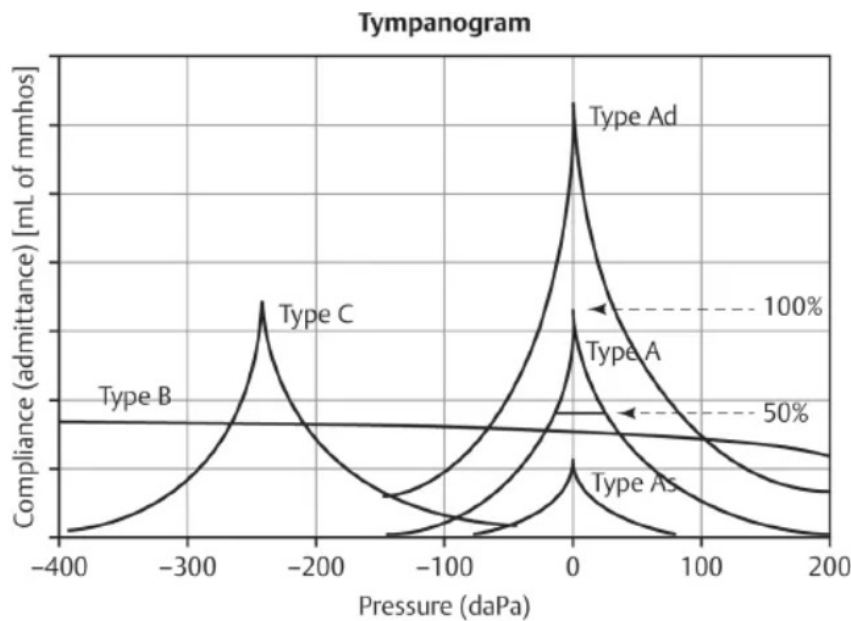
Tympanometry provides a way, along with a physical exam, for doctors to diagnose and monitor problems in the middle ear





How is tympanometry performed?

- 1 Otoscopy, checking for excessive **earwax** or a **foreign object** obstructing ear canal
- 2 Place a probe-type device in ear canal. The test changes the air pressure and causes the tympanic membrane to move back and forth
- 3 Measurements of the tympanic membrane movement are recorded in a tympanogram
- 4 Moving, speaking, or swallowing during the test may result in incorrect measurements
- 5 The test takes about two minutes
- 6 People of all ages can have tympanometry, though it can be more difficult for children who are too young to cooperate



Interpreting tympanometry

Tympanometry is designed to measure how the ear responds to varied air pressure in the middle ear

Normal Tympanometry Results

Normal Tymp Results Indicate:

There's no fluid in the middle ear

The tympanic membrane moves normally

There's normal pressure in the middle ear

There's normal movement of the ossicles
and the tympanic membrane

Normal pressure inside the middle ear can vary between
+50 to -200 decapascals (daPa) for both children and adults
(A daPa is a unit of air pressure)

Abnormal Tympanometry Results

Abnormal Tymp results may suggest:

- Fluid in the middle ear
- Perforation of the tympanic membrane
- Scarring of the tympanic membrane, which usually results from frequent **ear infections**
- Middle ear **pressure** beyond the normal range
- Growths in the middle ear
- Earwax **blocking** the tympanic membrane
- Lack of mobility or other problems with the ossicles of the middle ear

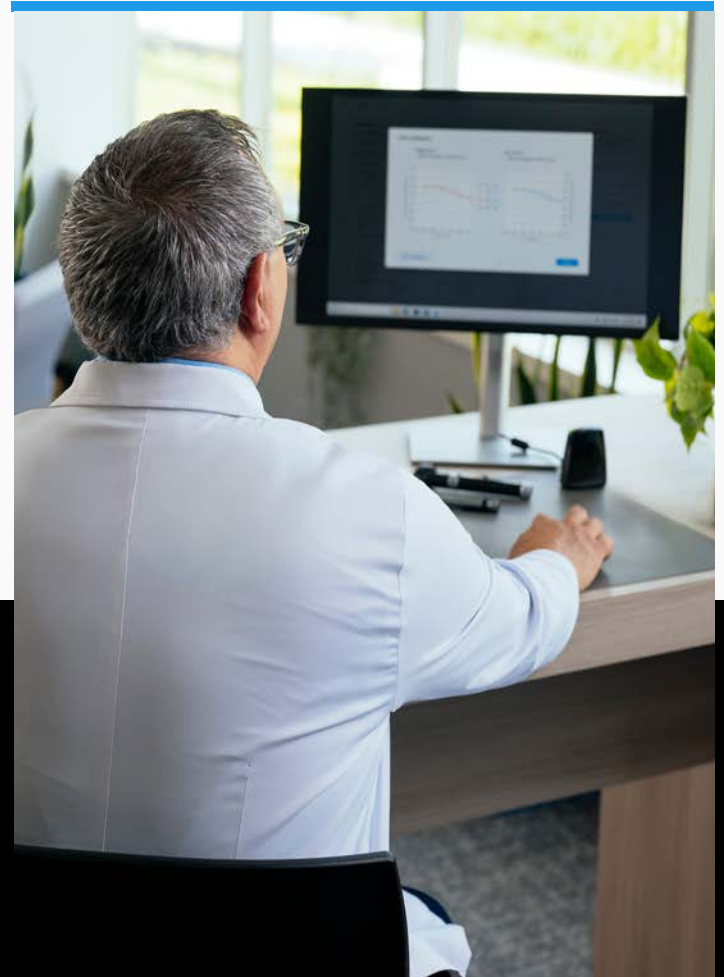
Follow Up/ Documentation

Always follow up with patients,
whether or not you make a referral

Ensure that an effective follow up
plan is in place

Always document appropriately

Patient safety comes **first**



Thank you

