TINNITUS

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Objectives

- Tinnitus Definition
- Classifications
- Variability
- Anatomy and Physiology of the Ear
- Possible Causes
- COVID-19 Correlation
- Prevalence
- Treatment Options

Tinnitus Definition

Tinnitus is an internal sound that an individual perceives without an external source

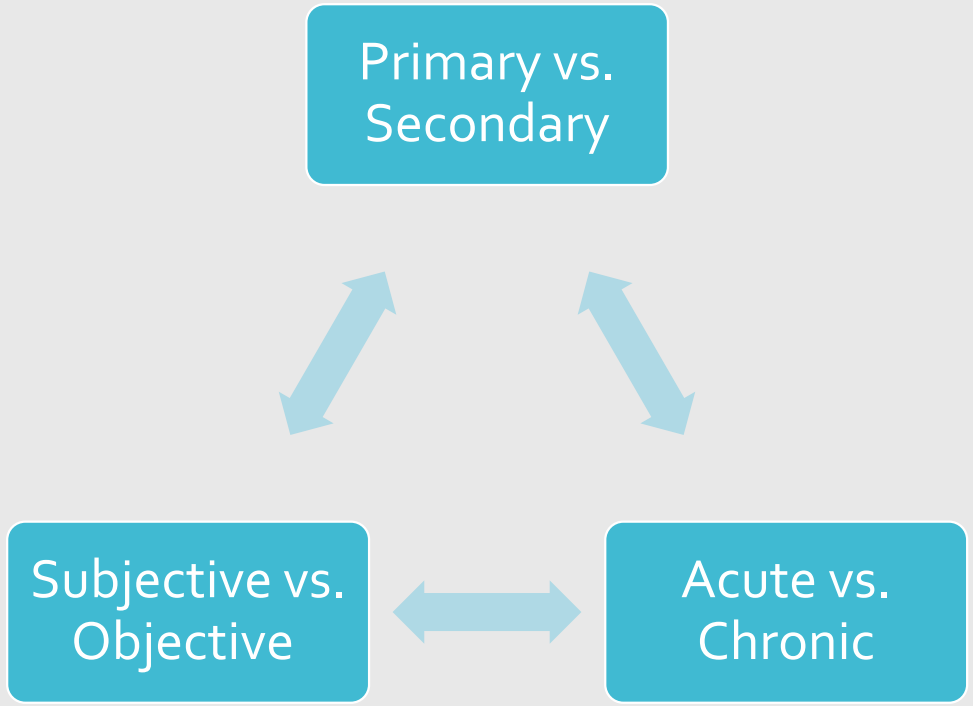
Described as buzzing, clicking, hissing, pulsating, ringing, roaring, or whooshing sound

Is not a disease, but is a symptom associated with multiple causes and cofactors that exacerbate it

Has been described as a “phantom perception of sound”

Tinnitus label comes from the Latin term "tinniere" which means to ring

Tinnitus Classifications



Classifications

Primary Tinnitus

- Idiopathic
- May or may not be associated with sensorineural hearing loss (SNHL)

Secondary Tinnitus

- Associated with a specific underlying cause (other than SNHL)
- Symptom of a range of auditory and nonauditory system disorders

Classifications

Acute Tinnitus

- Sudden
- Tends to last less than 3 months
- Associated with practically every known otologic disorder
- Often treatable

Chronic Tinnitus

- Long-term
- Condition worsens and consumes one's life
- Tends to last longer than 3 months

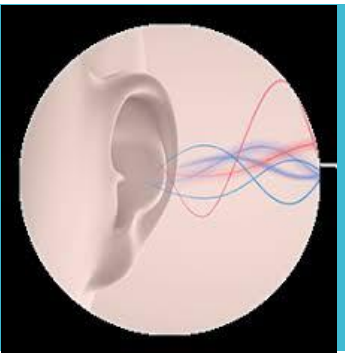
Classifications

Subjective Tinnitus

- Noise that is audible only to the patient
- Tends to result from auditory and neurological reactions to hearing loss
- More than 99% of cases are subjective

Objective Tinnitus

- Noise that is audible to an observer (via a stethoscope or close proximity)
- Usually associated with vascular or muscular disorders (pulsatile tinnitus is related to heartbeat)
- Less than 1% of cases are objective

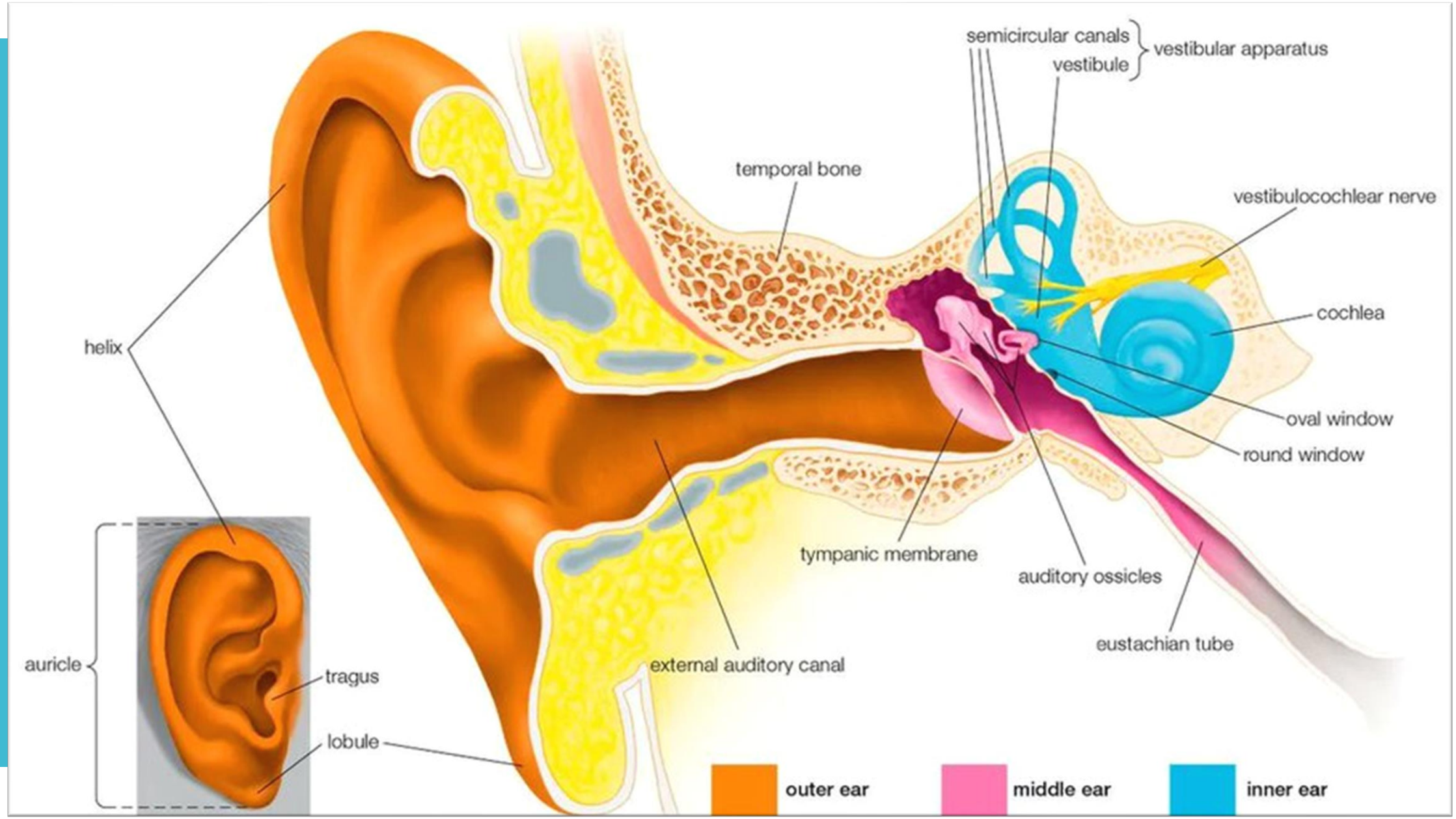


Variability

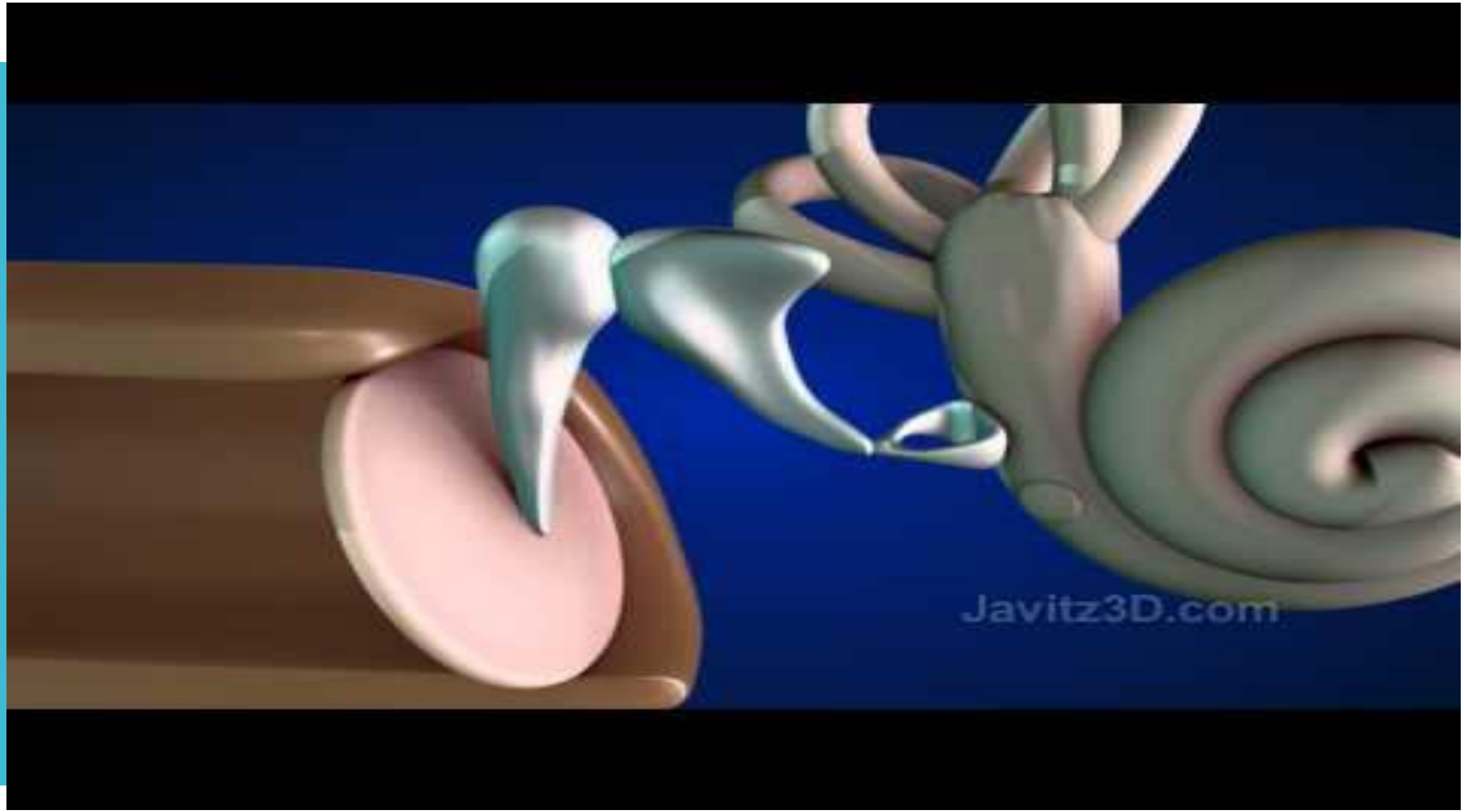
Can range in each individual and within each episode

A. Pitch
B. Onset
C. Loudness
D. Duration
E. Location
F. Severity

Peripheral Auditory Pathway

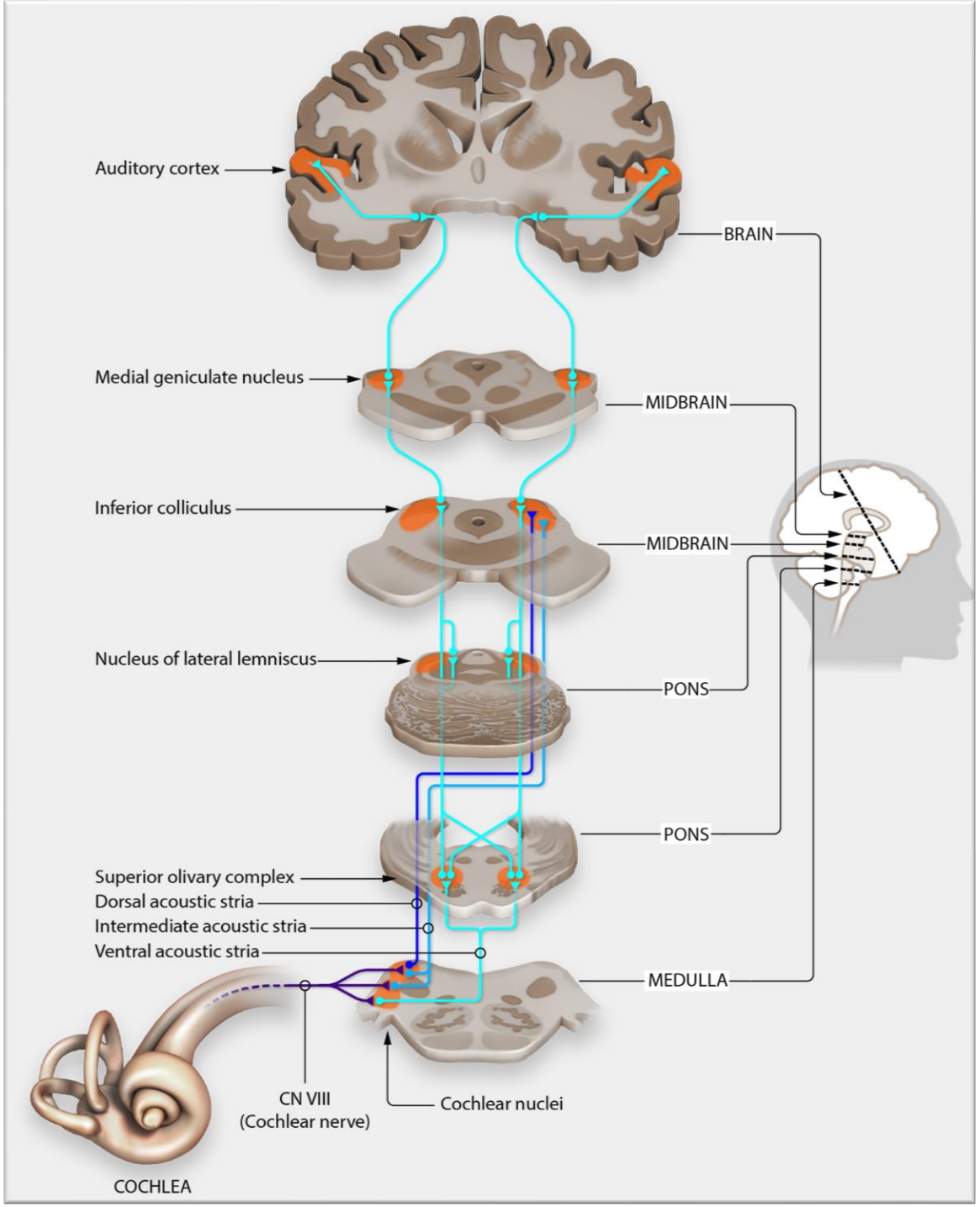


Video of the Anatomy and Physiology of the Ear



https://www.youtube.com/watch?v=qgdqp-oPb1Q&t=7s

Ascending Auditory Pathway

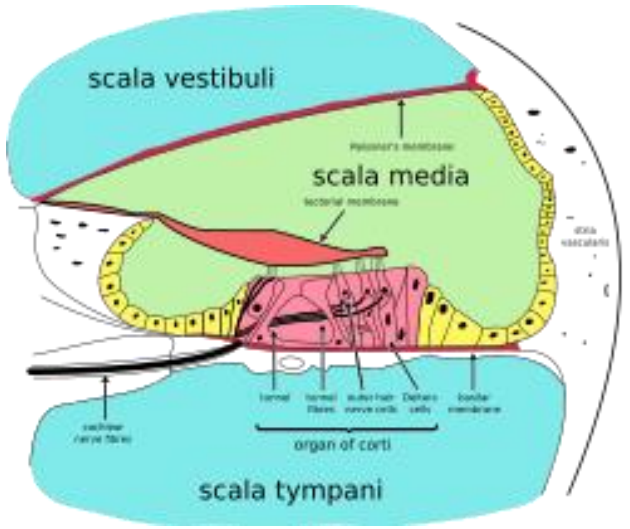


Etiology of Tinnitus

Etiology is unknown

Suspected to be due to:

- Abnormal neuronal discharges in the auditory nervous system
- Decoupling of outer hair cells from the tectorial membrane in the cochlea
- Hyperactivity of neural firing between hair cells in the cochlear and the auditory nerve
- Hypoactivity of neural firing between hair cells in the cochlear and the auditory nerve
- Abnormal functioning of the olivocochlear bundle



Possible Causes

- Medical issue involving the peripheral and/or central auditory system
- Noise exposure
- Ototoxicity
- Head trauma
- Sudden change in hearing
- Tumor (vascular tumor or vestibular schwannoma)
- Seizure Disorder
- Viral Infection (i.e., rubella, cytomegalovirus, measles)

COVID-19 and Tinnitus

- It is known that a viral infection could result in hearing loss and tinnitus. Therefore, COVID-19 **could** impact the auditory and vestibular system resulting in hearing loss, tinnitus, and balance issues
- A review of 26 studies of the correlation b/t COVID-19 and audio-vestibular symptoms, revealed the incidence of tinnitus to be 14.8% (Almufarrij & Munro, 2021)
- It is not fully known if COVID-19 exacerbated any pre-existing tinnitus due to stress or if the tinnitus was a direct result of the virus (Almufarrij & Munro, 2021)
- Medication taken to treat COVID may have exacerbated pre-existing tinnitus
- Long-term effect of the COVID-19 virus on the auditory system is unknown (www.audiology.org/practice-management/covid-19-resources)
- Determine if the auditory symptoms are new or have been exacerbated
- Conduct an evaluation to gain objective information

Prevalence

Information retrieved from www.ata.org unless otherwise stated

Approximately

- 50% of patients with hearing loss also report tinnitus
- 80-90% of individuals who report tinnitus also have hearing loss
- 60% report tinnitus to be bilateral
- 30% report tinnitus to be unilateral
- 10% report tinnitus to be perceived in the head
- 20% of individuals seek treatment
- Men are 3 times more likely to seek treatment than women
- 50% of pediatric patients with hearing loss also report tinnitus (Baguley & McFerran, 2016)
- 25% of pediatric patients with hearing loss and tinnitus report it to be bothersome (Savastano, Marioni, & De Fillippi, 2009), but other research found that 3-10% of pediatric patients with hearing loss and tinnitus report it to be bothersome (Sheyte & Kennedy, 2010)
- 6-34% of pediatric patients with normal hearing report tinnitus (Savastano, Marioni, & De Fillippi, 2009)

Complaints

- Bothersome
- Affects quality of life (QOL)
- Anxiety
- Depression
- Debilitating
- Extreme life changes
- Frequent mood swings
- Sleep disturbances
- Irritability or frustration
- Poor concentration
- Pain (associated with hyperacusis)
- Costly

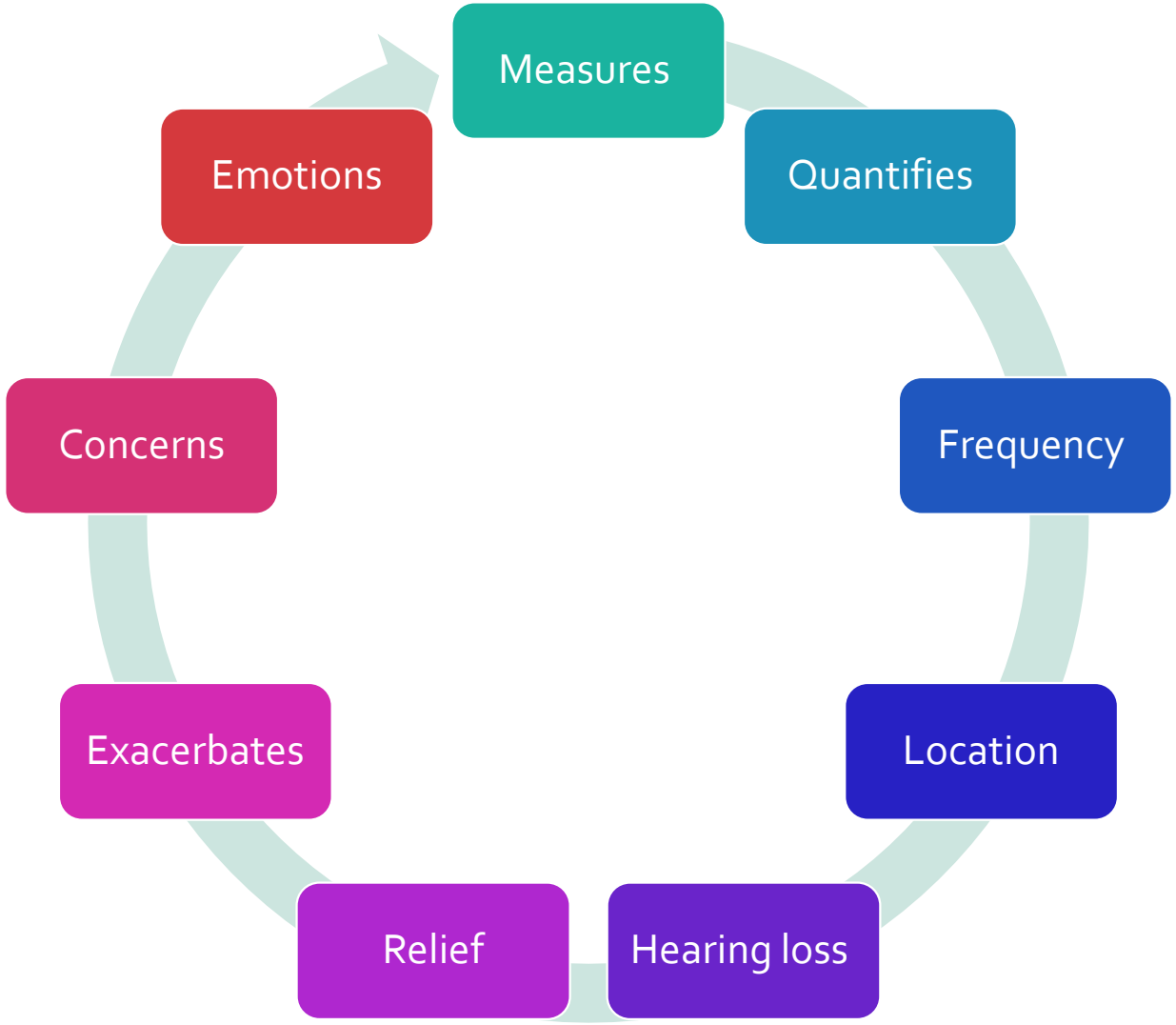
Diagnostics

- TINNITUS QUESTIONNAIRES
- HISTORY AND PHYSICAL EXAM
- AUDIOLOGIC EVALUATION
- IMAGING STUDIES

Case History Questions

- Family history of tinnitus
- Presence of Hearing loss
- Otitis media
- Rhinitis/hay fever
- Noise exposure
- Sound intolerance (misophonia or hyperacusis)
- Concussion/mild traumatic brain injury (mTBI)
- Medication
- Drug and alcohol use/abuse

Questionnaires



Questionnaires

Tinnitus Handicap Inventory (THI)

Tinnitus Functional Index (TFI)

Tinnitus Reaction Questionnaire (TRQ)

Iowa Tinnitus Handicap Questionnaire (THQ)

Tinnitus Severity Index (TSI)

Treatments

Recommended	Optional	Not Recommended
• Education • Counseling • Auditory therapies (hearing aids and specific forms of sound therapy) • Cognitive-behavioral therapy (CBT)	• Exercise • Dietary changes • Acupuncture • Yoga • Massage • Mindfulness practices	• Medications • Supplements

Main Goal

- Listen
- Offer compassion
- Express desire to help
- Offer hope
- Educate
- Eliminate fear that it is life threatening
- Help lower anxiety

Tips to Decrease Impact of Tinnitus

- Turn the volume down
- Avoid exposure to loud sounds
- Wear hearing protection
- Get adequate sleep to avoid fatigue
- Exercise often to improve circulation
- Manage your blood pressure
- Reduce your stress
- Learn methods to anticipate and manage stressful events
- Learn techniques to reduce awareness of tinnitus
- Avoid practitioners who tell you that there is nothing that you can do
- See an audiologist and ENT to rule out other medical diagnosis in order to eliminate the fear that something is seriously wrong

Auditory Therapies

Amplification (hearing aids and cochlear implants)

Tinnitus Masker

Sound Therapy Apps

Sound Therapy Systems (e.g., Sound Oasis Tinnitus Sound Therapy System - $85; Sound Oasis Sleep Therapy Pillow - $55; Acoustic Sheep Sleep Phones Headband - $50)

Cognitive Behavioral Therapy (CBT)

Focuses on patient's depression and anxiety which are symptoms and comorbid conditions of tinnitus

Helps patient find ways to destress

Assists patient to change their perspective on tinnitus

Support attempts to decrease the burden of tinnitus

93% of pediatric patients with disturbing tinnitus and normal hearing reported progress with CBT (Lee, Lee, & Kim, 2018)

83% of pediatric patients with disturbing tinnitus and moderate hearing loss reported progress with CBT (Lee, Lee, & Kim, 2018)

Coordinate Care

- Family
- Audiologist
- ENT
- Psychologist / LCSW
- Psychiatrist
- Massage /other therapists
- Nutritionist
- Acupuncturist

Prevention

Tinnitus may be on the rise due to increased exposure to noise, concussions, stress, viruses

World Health Organization (WHO) reports that approximately 1.1 billion youth are in danger of recreational noise-induced hearing loss

Research shows 1 in 5 Teenagers has signs of hearing loss (Doheny, K., 2021 form WebMD)

Educate about the damage of noise exposure (http://dangerousdecibels.org/)

Use noise app to receive alerts when volume rises to dangerous levels

Resources

- American Tinnitus Association (ATA), www.ATA.org
- Tinnitus Today Magazine
- American Academy of Audiology (AAA), www.AAA.org
- American Speech Language and Hearing Association (ASHA), www.ASHA.org
- Ida Institute, www.idainstitute.com

ATA's Free Resources

- Masking Sound Library
- "What is Tinnitus?" Flyer
- Progressive Tinnitus Management (PTM) Workbook
- Conversations in Tinnitus Podcasts

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