Approach to Hearing Loss

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Approach to Hearing Loss

Objectives

After this lesson, you must:

• Diagnose a patient with sudden sensorineural hearing loss
• Manage a patient with sudden sensorineural hearing loss
• Diagnose a patient with otosclerosis
• Diagnose a patient with noise-induced hearing loss
• Diagnose a patient with presbycusis
• Analyze a patient with sudden hearing loss
• Analyze a patient with non-sudden hearing loss
• Define hearing aids
Approach to Hearing Loss

Introduction
Introduction

**History**
- Age of onset
- Sudden or not
- Progression
- Unilateral or Bilateral
- Associated symptoms
- Trauma Hx (any type)
- Drug Hx

**Physical Exam**
- Ear canal
- Tympanic membrane
- Tuning forks

**Paraclinics**
- Audiometry (PTA, SRT, SDS)
- Tympanometry
- Acoustic reflex
Introduction

Pure Tone Audiometry

Conductive H.L.  Sensory Neural H.L.  Mixed H.L.
## Introduction

### Approach to Hearing Loss

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>250</th>
<th>500</th>
<th>1000</th>
<th>2000</th>
<th>4000</th>
<th>6000</th>
<th>8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Level</td>
<td>Normal</td>
<td></td>
<td></td>
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<tr>
<td>21 – 40 dB</td>
<td><strong>Mild</strong> Hearing Loss</td>
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<tr>
<td>41 – 60 dB</td>
<td><strong>Moderate</strong> Hearing Loss</td>
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<tr>
<td>61 – 90 dB</td>
<td><strong>Severe</strong> Hearing Loss</td>
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<tr>
<td>More than 90 dB</td>
<td><strong>Profound</strong> Hearing Loss</td>
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</tbody>
</table>
**Definition**

- SNHL in 3 consequent frequencies
- $\geq 30$ dB
- In $\leq 3$ days

- Most common on awakening
- Most common is unilateral
- Male = Female
- Most recovery within 2 weeks
- $1/3 - 2/3$ recovered Without Rx
Approach to Hearing Loss

**Sudden SNHL**

**it is a Syndrome, not Diagnosis**

**Needs Work up (?)**

**SSNHL is an otologic emergency**

- CBC-diff
- ESR
- Autoantibodies
- Thyroid Tests
- FTA-ABS
- HIV Antibody
- C.P. Angle MRI

**Poor prognostics**

- Extreme on Age
- Severe Hearing Loss
- High Frequencies involved
- Poor SDS in audiometry
- Presence of Vertigo
Approach to Hearing Loss

Sudden SNHL

Management

Etiology
Managing

Steroids

Antivirals
Sudden Hearing Loss

Yes: Begin SSNHL Treatment

No: Hx of Trauma (physical, acoustic, barotrauma)

Yes: Audiometry

No: Refer to ENT clinic

Cerumen Impaction

Yes: Begin SSNHL Treatment

No: Classic symptoms of SSNHL

Yes: Definite SSNHL

No: Remove Cerumen

Definite SSNHL

Yes: Work up for SSNHL etiology

No: Discontinue Treatment

Removing Cerumen

* : only Bone Conduction in cerumen

* : only Bone Conduction in cerumen
CHL

AbNL

TM

Canal

&

TM

PerforaMon

RetracMon

OpacificaMon

(fluid

or

mass)

Other

Ossicular

AbnormaliMes

AbNL

Ear Canal

Cerumen ImpacMon

Inflammation

Other Obstructions

R

No

Type of

Hearing

Loss

Sudden

Hearing

Loss

Yes

R:

refer to

ENT center

AbNL

Ear Canal

AbNL TM

NL Canal & TM

Perforation

Retraction

Opacification (fluid or mass)

Otosclerosis

Other Ossicular Abnormalities

AbNL middle ear structures

R
Otosclerosis

**General**
- Localized disease of otic capsule
- Female: twice male
- Commonly at 20 – 40 years old

**Pathology**
- Increased osteoblastic & osteoclastic activity
- Most common is around stapes footplate
- Can extend into inner ear structures
Otosclerosis

**Findings**

- Slowly progressive Hearing Loss
- Usually bilateral
- Tinnitus is common
- Normal Otoscopy (may see Schwatze sign)
- Tuning Forks: Commonly CHL
Findings

- **Audiometry**: CHL
  - Low frequencies involve at early
  - All frequencies later (flat type)
  - Carhart notch (in bone conduction)

- **Tympanometry**: Type As

- **Acoustic Reflex**: absent
Approach to Hearing Loss

Otosclerosis

Management

Observation

Nonsurgical
- Sodium Floride
- Bisphosphoate
- Hearing Aids

Surgery
Sudden Hearing Loss

No

Type of Hearing Loss

CHL

SNHL

Progressive

Fluctuating

(Young) Congenital Inner Ear D.

(A Adult) Meniere disease

Gradual

Presbycusis

Noise Induced Hearing Loss

Drug Induced Hearing Loss

(A Adult) Autoimmune Inner Ear D.

Acoustic Neuroma

R: refer to ENT center
Noise-induced Hearing Loss

**Approach to Hearing Loss**

### Noise: Undesirable sound
- Continuous, intermittent, fluctuating, or impulsive
- Permissible noise level: continuous ≤ 85 dB for 8 Hrs

### Diagnostic Criteria:
- Gradually progressive persistent down slope SNHL
- History of exposure & stabilize with exposure off

**Management:** Prevention
Presbycusis

- **Definition**: age related gradual hearing loss
- **Otoscopy**: Normal
- **Audiometry**: Down slope Symmetric SNHL
- **Tympanometry**: Normal

**Management**: Rehabilitation
Sudden Hearing Loss

Yes

No

Type of Hearing Loss

- CHL
- SNHL
- MHL

One etiology

- Middle Ear disease (COM, Tumor)
- Temporal bone Trauma
- Inner Ear Malformations

Two etiologies

- Hx of CHL with secondary SNHL
- Hx of SNHL with secondary CHL

R: refer to ENT center
Approach to Hearing Loss

Hearing Rehabilitation

- Hearing Aids
- Hearing Education (lip reading)
- Hearing Assistive Technologies
# Approach to Hearing Loss

## Hearing Aids

### Nonsurgical

- **Air conducting**
  - Behind The Ear
  - In The Ear
  - In The Canal
  - Complete In Canal

- **Bone Conducting**
  - Eyeglasses
  - Headbands

### Problems

- Insufficient Amplify
- Feedback
- Canal occlusion
- Sound distortion
- Appearance

### Surgical

- **Air conducting**
  - Middle ear implants

- **Bone conducting**
  - BAHA

- **Nerve Conducting**
  - Cochlear Implant

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*Image credit: [Source]*
Thanks for your attention