Pathology Patterns
- Conductive Hearing Loss (CHL)
  - OM, OD, Otosclerosis, TM Perf, ETD, ME effusion
- Sensorineural Hearing loss (SNHL)
- Retrocochlear Pathologies
- Central Auditory Processing
- Functional Hearing Loss
- Stenger Test

Conductive Hearing Loss

- Air bone gaps with the bone line being in the normal hearing range (<12dB ABG)
- Mainly affects low frequencies
- Symptoms include aural fullness
- Varied ear canal volume
- Flat tymp, with no peak pressure point and low static admittance
- ARTs are absent when the probe is stimulating the affected ear (ipsi and contra)
- ARTs are elevated or absent when probe is stimulating the healthy ear (contra) – dependent on the severity of the HL or blockage.
- OAEs (TEOAE & DPOAE) will be absent
- SRT would corroborate with the PTA
- SRS would be excellent (90-100%)
- Pathologies include otitis media, otosclerosis (normal TPP -/+50), ossicular discontinuity (high static, never below 0.76), TM perforation or tubes (large ECV), ET dysfunction (negative pressure, normal static), cholesteatoma, impacted cerumen (small ECV)

Otitis Media

- Flat tymp (NP)
- Low static (0.1)
- Normal ECV (1.5)
- No Ipsi in affected ear (NR)
- Present Ipsi in nonaffected ear (85)
- Absent OAEs in affected ear

Otosclerosis

- Carhart notch at 2kHz in bone conduction
- Normal tymp (0)
- Low static (0.1)
- Normal ECV (1.5)
- No Ipsi (NR)

Ossicular Discontinuity

- High tymp peak exceeding graph but normal (0)
- High static, never below 0.76 (1.0)
- Normal ECV (1.5)
- No ipsi (NR)

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TM Perforation
- Flat Tymp (NP)
- Low or normal Static (0.1 or 0.5)
- Large ECV (5)
- Variable ipsi → depends on the size of the perf

ETD (with possible ME fluid)
- Flat or Negative Tymp (NP or -250)
- Low or normal Static (0.1 or 0.5)
- Present ipsi – (85)

Sensorineural Hearing Loss
- No ABGs, bone matches the air line
- Mainly affects the high frequencies
- Symptoms include tinnitus, trouble hearing in BGN,
- Otosclerosis has a SNHL component at 2kHz
- Noise induced SNHL is seen with a 3-6kHz notch on the audiogram
- Normal immittance values
- ARTs are dependent on the degree of HL
  - Normal to elevated reflexes up to a 50dB hearing loss
  - Elevated for mod-severe hearing loss
  - Absent for profound hearing loss
- 30% of people with mild HL also have present TEOAEs
- DPOAEs are absent in those who have a hearing loss greater than 50dB
- SRT would corroborate with PTA
- SRS scores varies from excellent – fair, if not (check DUBNO chart) → indicative of HL

Retrocochlear Pathologies (8th nerve problem)
- Bilateral HL, unilateral, asymmetrical HL
- SRS below on Dubno chart
- Rollover PIPB (performance intensity function for PB words)
- No ipsi in the affected ear (NR)
- Present ipsi in the nonaffected ear (85)
- Elevated contra stim affected ear (120)

- Normal contra stim non-affected ear (85)

Central Auditory Processing

- Hearing WNL
- Present IPSI bilateral
- Absent CONTRA bilaterally

Functional Hearing Loss

- No shadow curve in AC with those who has asymmetrical loss
- No SRT-PTA agreement (SRT is better than PTA)
- ARTs at or below the person's threshold of audibility
- Present OAEs
- Do STENGER TEST for a unilateral hearing loss, when the two ears differ by at least 40dB
    - Stenger phenomenon is binaural fusion and occurs when a sound is present to both ears, the listener is aware of its presence only in the ear with a higher SL.
    - Procedure:
        - 10dB SL presented to the better ear
          -10dB SL presented to the poorer ear
        - Because of binaural fusion in the Stenger phenomenon, an honest person will response to the tone in the better ear because it is a 10dB above the ear's threshold
        - A person who is faking a hearing loss will not admit to hearing in the poorer ear, so the tone is only audible in the ear with the a higher SL. Although the person can hear a tone in the poorer ear, he will refuse to response since it is 10dB below the exaggerated threshold

Pathology Patterns

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Silman & Gelfand (1981) 90th percentiles for the ARTs Tabular Form

TABLE 2-1. NINETIETH PERCENTILE LEVELS FOR ACOUSTIC REFLEX THRESHOLDS AS A FUNCTION OF HEARING LOSS

Hearing level	*500*	*1000*	*2000*
0–5	95	100	95
10–15	95	100	100
20–25	95	100	100
30–35	100	100	105
40–45	100	105	105
50–55	105	105	110
60–65	105	110	115
70–75	115	115	125
80–85		125	125
>85		125	125

Data from Silman, S., & Gelfand, S. A. (1981). The relationship between magnitude of hearing loss and acoustic reflex threshold levels. *Journal of Speech and Hearing Disorders, 46,* 312–316.

Olsen WO (1991). Special auditory tests: A historical perspective (pp. 19-52). In JT Jacobson, JL Northern JL (eds.), *Diagnostic Audiology*, Pro-Ed: Austin, TX