The Process to get a HA

1) Select candidates
2) Select a hearing aid that fits patient’s needs
3) Order HAs
4) Dispense HAs
5) Verify best fit
6) Assess/Adjust the performance of HAs and Follow-up
1. Select Candidates

- Case history
- Otoscopy
- Tympanometry
- Pure tone audiogram
- Speech testing: SRT, Word discrimination score, Most comfortable levels (MCL) and Uncomfortable loudness level (UCL), Speech-in-Noise tests
- OAE’s
- Medical clearance or waiver
1. Select Candidates

Need to consider:

- Degree of hearing loss
- Degree of communication difficulties due to hearing loss
- The patient’s motivation
The Patient’s Motivation for Having a HA

- Patient’s motivation is associated with:
  - Level of hearing loss
  - Working environment
  - Life style
  - Whether the patient truly accepts his/her hearing loss
  - Patient’s expectations
When to Fit

- Patient is:
  - Audiometrically appropriate
  - Motivated
  - Accepting of the cosmetics and cost
  - Properly counseled about expectations for sound quality and background noise
2. HA Selection

- Selecting a hearing aid style depends on:
  - Client preference
    - Cosmetic concern
    - Cost
  - Degree of hearing loss
  - Physical status of the patient - manual dexterity
  - Outer and middle ear conditions
  - Age
2. HA Selection

- Types of microphones
- Speech processing functions
- Noise reduction functions
- Acoustic feedback reduction
- The number of channels in signal processing
- Connectivity functions
- Multiple memory functions

Entry level → Middle level → Advanced level

- Enable presetting desirable parameters for different listening conditions
Other Options

- T-Coil/phone options
- Volume control
- On/off switch
- Wax guard
- Earmold options
- Remote controls
- Color
Binaural vs. Monaural Fitting

- Benefits of binaural fitting:
  - Hear from both sides
  - Improve S/N ratio
  - Improve sound localization
  - Prevent an “auditory deprivation” effect
  - More natural sound
  - Two ear summation (3 dB)
Binaural vs. Monaural Fitting

- Common reasons not to use binaural HAs:
  - Cost
  - More difficulties in handling the HAs
  - Very poor hearing and word discrimination in one ear
Two Special Conditions in Binaural HA Fitting

- If a patient has one dead ear:
  - **CROS** (contralateral routing of signal)
    - For the patient having good hearing in the other ear
    - Fit a HA to the dead ear and use wire or FM to deliver sounds to the good ear
  - **BICROS** (bilateral contralateral routing of signal)
    - Used in one dead ear and one with hearing loss
    - Dead ear: the device contains only a mic
    - The ear with hearing loss: a complete HA
3. Order HAs & 4. Dispense HAs

- Depends on features needed
- Many reputable manufacturers:
  - Widex, Oticon, Starkey, GN Resound, Phonak, Siemens, Unitron, and others
Making Ear Impression

- Used as a template for making the shells of ITE, ITC and CIC, as well as the earmold for BTE
- Check the ear canal and the ear drum first
5. HA Fitting

- Use Noah Platform to enter audiometric data
- Program the HA/perform necessary measurements
- Make sure:
  - Proper Gain
  - Proper maximal output
  - Good sound quality
5. HA Fitting

- Check HA fit to ensure:
  - Physical comfort
  - Absence of feedback
  - Ease of insertion and removal
  - Security of fit
Provide Initial Counseling

- Aims of the initial counseling:
  - Determine the hearing difficulties (COSI)
  - Determine the impacts of hearing loss
  - Provide information on HA and establish a realistic expectation:
    - Cosmetic concerns
    - Physical comfort
    - Speech quality: improved, but not perfect,
    - More benefit in quiet than in noise
Provide Initial Counseling

At the fitting, it’s important to remember HIO BASICS:

- **H**earing expectations
- **I**nstrument operation
- **O**cclusion effect
- **B**atteries
- **A**coustic feedback
- **S**ystem troubleshooting: cleaning, maintenance, service, warranty, and repairs
Fitting Orientation

- Practice insertion and removal of the aid and replacing the battery
- Provide information on:
  - The function of each part of the HA
  - Daily maintenance
  - Acclimatization (brain plasticity)
  - The details of the warranty
Trial Period

- NYS law mandates a minimum 45 day trial period

- Trial Period:
  - HA users need time to get used to how the HA sounds
Verification of the HA Fitting

- Real ear measurements/speech mapping
- Informal/subjective patient judgments of quality and intelligibility
- Aided speech understanding & hearing in the sound field
- Self-report measures (daily use time and satisfaction/benefit)
6. Assessment of the HA Performance

- Listening Check:
- Using a listening stethoscope, talk into the hearing aid.
6. Assessment of the HA Performance

- Electroacoustic analysis:
  - Tested in an acoustic measurement system
  - Turn the HA on (if a HA has a volume control, turn it to full on)
  - Check the gain-frequency response

Source: Dillon (2001): Hearing Aids
6. Assessment of the HA Performance

- Real-ear measures:
  - Use a probe microphone to monitor the sound pressure level in patient’s ear canal
  - To determine if the output falls at or around the desired level
6. Assessment of the HA Performance

- Functional gain measures:
  - Aided and unaided threshold testing and speech testing in patients
  - Self-assessment inventories
6. Follow-ups:

- Check data logs
- Adjustments
- Counseling
- Problem solving
HA Maintenance

Cleaning a HA:

- Use wax loop or dry cloth to remove any wax and/or dirt from all openings in the HA and/or the earmold.

- Hearing Aid: Wipe with a dry cloth
  - Never use cleaning solutions, alcohol or water on the hearing aid itself

- Earmold: if it can be detached from the hearing aid, soak in soapy water and leave separated from the hearing aid to dry.

- Change wax guard and dome
How to Change the Batteries
https://www.youtube.com/watch?v=LSG5j71Nxls
HA Maintenance

- Keep HA dry:
  - Prevent moisture & water exposure
  - Store HAs in a dry aid kit as needed
HA Troubleshooting

- Visual Inspection:
  - Battery check:
    - No corrosion, dirt or rust on battery or inside battery compartment
    - Use battery tester every morning to ensure sufficient battery strength
  - Earmold:
    - Check for wax in holes
    - Be sure it fits properly in the ear (no gaps)
    - No cracks
  - Tubing:
    - Not cracked, twisted, excessively hard or discolored
  - Hearing Aid:
    - No cracks in casing
    - Controls move easily
    - Be sure it is clean
HA Troubleshooting

- Weak or dead:
  - Obstruction by cerumen
  - Battery
  - On/off switch position
  - Circuit problem
HA Troubleshooting

Feedback:
- Check ear wax
- Check the earmold
- Check HA tubing
- Check the position
- Adjust HA output (levels and frequencies)
- Redo feedback test
HA Troubleshooting

- Occlusion effect: Due to augmentation of the low frequency (<500 Hz) in the ear canal.

- Solutions:
  - Use vent
  - Or reduce low frequency gain
HA Troubleshooting

- Problems associated with an improper size/shape of HAs
  - Loose fitting
  - Pain
  - Feedback
Other Important Tips

▶ Don’t take a bath or shower with hearing aids on. Do NOT get them wet!!

▶ Don’t wear them when you’re really sweaty.
  
  ▶ If it gets wet, let it air dry with the battery door open. Don’t use a blow dryer on it or put in a jar with rice.

▶ Don’t let anyone play with your hearing aids.

▶ Don’t let them get too hot or too cold.

▶ Don’t leave them where your dog can reach them.
Typical Outcomes of HA usage

- Excellent for conductive HL
- Not perfect for SNHL
- Poor in neuropathy/neural losses
Acclimatization/Adaptation

- Need time to adjust to new sound
- Must wear as much as possible
- Stepwise increase in gain
Perceptions About HAs

- Cosmetics are important for many patients
- Cost is often a major problem
- Handling a small HA is a concern for patients with limited dexterity
- Often have a bad reputation from friends/family
Pre-fitting test can only be partially completed

Hearing tests may provide only an estimation of hearing thresholds.

Wait for more testing results as they get older only if uncertain, otherwise use verification techniques

HA should have FM function

A child needs more follow up: check damage, adjust, new hearing testing.