If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. It may not include content identical to the powerpoint. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.
Pediatric Case Studies, Hearing Assistive Technology:
The Role of the Audiologist after the Fitting

JESSICA J. MESSERSMITH, PH.D.
LINDSEY E. JORGENSEN, AU.D. PH.D.

Disclosure and Author contact information

The authors have no relevant financial or nonfinancial relationships related to the content of this presentation.

The views and opinions expressed here are that of the authors and do not represent the US government, the Department of Veterans Affairs, the University of South Dakota, or the South Dakota Board of Regents

Contact: Jessica.Messersmith@usd.edu; Lindsey.Jorgensen@usd.edu
Learning Outcomes

After this course, participants will be able to:

- Describe approaches for verifying hearing aid and cochlear implant settings.
- Describe the impact of underfitting hearing technology on the user of the hearing aid/cochlear implant
- Define patient-provider communication and means for improving patient-provider communication in the audiology clinic.

Overview

Introduction
Case 1
Case 2
Case 3
Case 4
Case 5
Tying the cases together
Types of cases considered

5 cases

Typical cases (not absurdly unique)
- Some may seem extreme but
  - There are aspects of each case that the typical audiologist may actually encounter

Cases that challenged us to think creatively to find a solution
USD Speech and Hearing Clinic

Case 1

- Boy – 8 YOA
  - Normal gestation, full term
  - Referred NBHS, doesn’t remember f/u
  - Wasn’t talking – enrolled B-3
  - Genetics – no known cause
  - ABR at 3 YOA – moderate HL, first set of aids
    - Had 4 sets since then
    - Old old aids with limited bandwidth – because he “loses them”
  - 1 grade level behind (should be 3rd, in 2nd) still behind
    - Service: SLP, Reading, Math, OT (writing)

- SIGNIFICANT behavior concerns

- Teacher reported more behavior problems with FM use – he reported it being too loud
Case 1- The problem

8 years old – what type of testing?

Used VRA - questionable results
- moderate dropping to severe
- SRT = 30 dB HL???
- Recorded and MLV

Attempted ESP (early speech perception test) – poor cooperation

Hearing aid technology – old aids as punishment??
- Limited bandwidth

Problem: What to do?? How to fit the hearing aids???

1) use old results from younger
2) use new results that are inconsistent
3) use something in-between

Case 1- What did we do?

Got new aids with broad bandwidth – discussed with child/parent/teacher
- Do we do a “check out” system?

ABR to confirm thresholds – moderate results
Fit to ABR (verified) BUT fit to comfort (validation)
Fit using RECD – the aids were SEVERELY over fit (very small ears)

How much is enough benefit? How much do you listen to a kid?

Behavior – the problem or the cause?
Referred to behavioral psychologist
Work with the school
Case 1- Outcomes

School supposed to fill out a journal to identify his “behaviors”; they have not been complaint

Psychologist – No other diagnosis
We “listened to him” – he now trusts us, better consistency (but not great)
We fit using RECD – appropriate dB HL to dB SPL conversion
   ◦ Ex: 60 dB HL = 67 dB SPL vs 60 dB HL is really 80 dB SPL

Some better “behavior” – better hearing? older age?
Good at reporting when FM/HA are not working

Case 1- Insights gained

Age/cognition not always drives the method of evaluation
Age of input – “it is too loud”
Issues of bandwidth – need to hear all sounds to be able to produce them
Fit using RECD – you could really hurt the kiddo
Importance of establishing rapport
Try to work with the school – be the spearhead
Case 2

Background:
- HL Dx moderate to moderately-severe SNHL Au @ 2 yoa
  - Fit w/ HA Au
- Profound SNHL Au @ 3 yoa
- CI As @ 3.5 yoa

Entrance to USD clinic:
- 16 yoa

Observations:
- Spoken language user but articulation errors consistent w/ a great severity of hearing loss
  - Absence of /s/ and /sh/, restricted consonant range, prolonged and nasal vowels
  - Parents report that pt struggles in school, doesn’t use phone, or interact with others (e.g. doesn’t eat w/ family at table)
  - Parents report that he has consistently worn her CI since receiving it.
Case 2

- CI is under-fit!
- Impact:
  - Poorer outcomes
  - Limited auditory access
  - Speech and language
  - Literacy
  - Social isolation
Case 2- What did we do?

- Created progressive MAPs to gradually increase M-levels (move pt toward ESRT levels)
  - GRADUAL!
    - Over 1 year period
    - Did not correlate w/ behavioral M-levels initially
- Monitored pt performance and acceptance of changes regularly
  - w/ under-fit MAP:
    - HINT in quite- 46%
    - Thresholds: 45-30 dB HL
  - ESRT levels (1.5 years after starting ↑ M level)
    - AzBio in quite – 85%, CNC in quite – 52%
    - Thresholds – 20-30 dB HL

Case 2- Outcomes

- Pt rejected/didn’t like MAP with ↑ M-levels initially
- W/ support and encouragement recognized benefit gained
- 1.5 years after ↑ M-levels:
  - Parents report ↑ engagement
    - She eats dinner with them!
    - Has phone conversations
    - 1st time her mom heard her have a conversation with her little sister
  - Pt reports much greater satisfaction
    - ↑ grades
    - Was accepted to college
    - ↑ confidence
Case 2 - Insights gained

- Audibility and dynamic range matter
- Persons w/ HL struggle with loudness judgements
  - Should behavioral loudness judgements be our sole source of information for setting eDR?
- How much benefit is enough?
  - Optimum vs. adequate

Case 3

6 year old girl
- Identified at 3 years of age – preschool screening
- Very shy, cries easily
- Mom – just agrees with whatever the professional says
- Hearing testing suggests moderate SNHL – very reliable

Still delays – speech/language AND falling behind in school

Discordance
- Grandmother 1 thinks her delay is cognitive
- Grandmother 2 thinks it is mom’s fault
- Teacher says it is because she is shy
- Mom is not sure what to think
Case 3- The problem

What is the current audiogram?
◦ Moderate SNHL (previously mild)
◦ Growth of the ear?
  ◦ Should we plot in dB SPL? Does it matter?
  ◦ How often should we be doing an audiogram?

How are the aids fit?
◦ RECD
◦ Appropriate fit
◦ What targets?

Problem: Aids are under fit
◦ Audibility
◦ The “target”???
  ◦ Don’t be a slave to the target – What does it mean?
Case 3- What did we do?

- Turned the aid up
  - Cried and cried and cried – silent heart wrenching tears
    - Why aid was under fit?
    - Turn up slowly???

- Pay attention to the target – BUT pay attention to audibility!

- Discussed with mom/family appropriateness of fitting
  - Tried not to put down the other clinician

Case 3- Outcomes

- Meeting audibility – now is good with the sound... and wants to hear more
  - Mom reports she is not as “shy” as she once was
  - Has friends
  - Not as withdrawn

- Better reports from SLP/teacher

- Summer – was able to “catch up”

- Discharged from special services

- NOT a cognitive delay
Case 3- Insights gained

Be okay with being the “bad guy” – a little bit

Push them a little

Okay with “uncomfortable” not okay with “pain”
  ◦ Push to the verge

Still need the rapport (mom and child)

Auditory delay can mask as cognitive delay

What is benefit?
  ◦ Optimal vs adequate
  ◦ When do we listen to the kiddo?

Case 4

- Background
  - HL
    - ANSD DX @ 8 months of age
  - HA
    - Appropriately identified with hearing loss; fit with HA
      - RECD completed during verification
    - Seen regularly for new earmolds – aids were NOT refit (problem 1)
    - Noted “progression of hearing loss”
      - Problem 2 – is it progression? Ear canal size?
      - Problem 3 – aids were not refit on regular basis
  - Every time get new information or earmolds – refit using RECD
Case 4- The problem

- He is progressing... but how much progress is enough?
  - Testing at 3 yoa:
    - PLS in average range
    - Ski-Hi Language Development Scale skills in 28-32 month range
    - But....
  - Parents described spoken language as “his own”
    - Real words used with a lot of jargon
    - Behavior and attention concerns

Case 4- What did we do?

- Strict monitoring of language and auditory development
- 3 months growth in 3 months time?
  - Ensure appropriate fit of HA Au
  - Ensure the intensive auditory-verbal therapy is being completed
  - Speech, language, and auditory evaluation
  - Repeat speech, language and auditory evaluation 3 months later
Case 4- Outcomes

- 1.8 months gain in 3 months time between testing
  - Different S&L assessments were used at each test session
- If maintained current HA fit w/ focus on spoken language only, pt would likely continue to fall behind peers
- Discussion of treatment options with parents
  - Wanted to maintain spoken language only
  - Pursue CI
- Received CI @ 3.8 yoa
  - Most recent testing w/ CI: 1 year post-CI
    - PLS:
    - S&L:

Case 4- Insights gained

- Continued monitoring of auditory, speech, and language development
- How much benefit is enough?
  - Optimum vs. adequate
- Empower vs. enable
  - Provide family time to process but keep moving forward
Case 5

- **Background:**
  - 6 yoa
  - CI Au @ 1 yoa
  - Consistent f/u

- **MAP:**
  - VRA/CPA T levels
  - ESRT, behavioral, performance based M levels

- **Star performer:**
  - Most recent thresholds w/ CI: 10-20dB HL
  - Most recent speech perception: PBK-50: 89% Ad, 68% As, 96% Au

---

Case 5- The problem

---

**continued**
Case 5- What did we do?

- Need to improve compliance and enhance PPC
- Developed visual schedule (VS) and video model (VM)
  - Dr. Liz Hanson, SLP, CCC-A
- Utilized VS and VM during CI prog. Appts
  - Allow child to view video as many times as desired

Case 5- Outcomes

- Increased compliance
  - Able to remove CI w/o resistance from pt
- Increased efficiency in appt
  - ↓ in time protesting = ↑ in # of procedures completed and ↓ appt duration
Case 5- Insights gained

- Remember what the goal is
  - Optimal pt outcomes provided effectively and efficiently
- Embrace your colleagues
- Small changes can = big pay off
  - Changes may be outside of “comfort zone”

Beyond the device

- Insights gained from each case apply across the clinic population
  - HA, assessment, CI, pediatric, adult, geriatric
- Is our job to provide adequate outcomes or optimal outcomes?
  - When do we listen to the kiddo and when do we push them?
Remember there is a child connected to those ears...