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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

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◦ 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

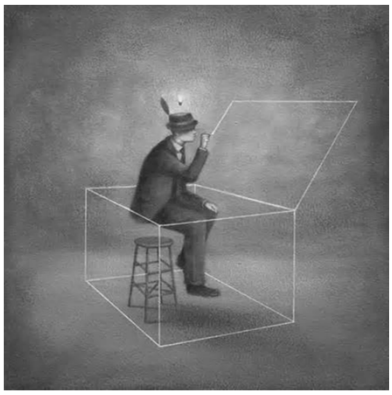
Case 3

Case 4

Case 5

Tying the cases together

Is good - good enough?



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 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

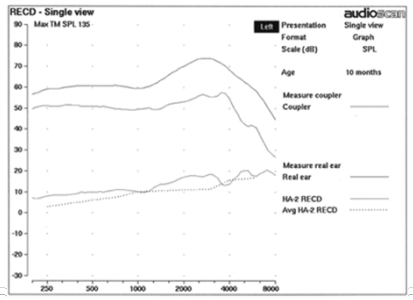
School supposed to fill out a journal to identify his "behaviors"; they have not been complaint

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

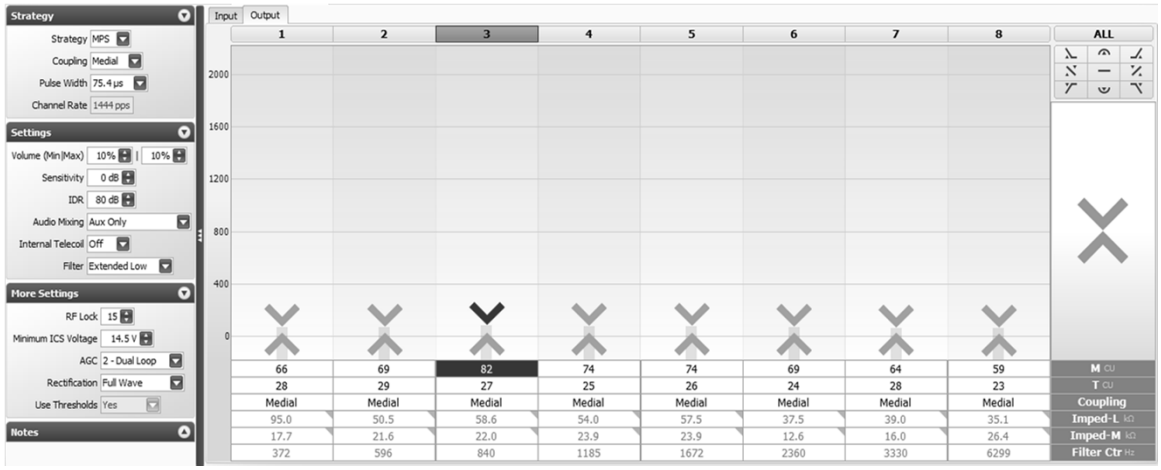
Importance of establishing rapport

Try to work with the school – be the spearhead

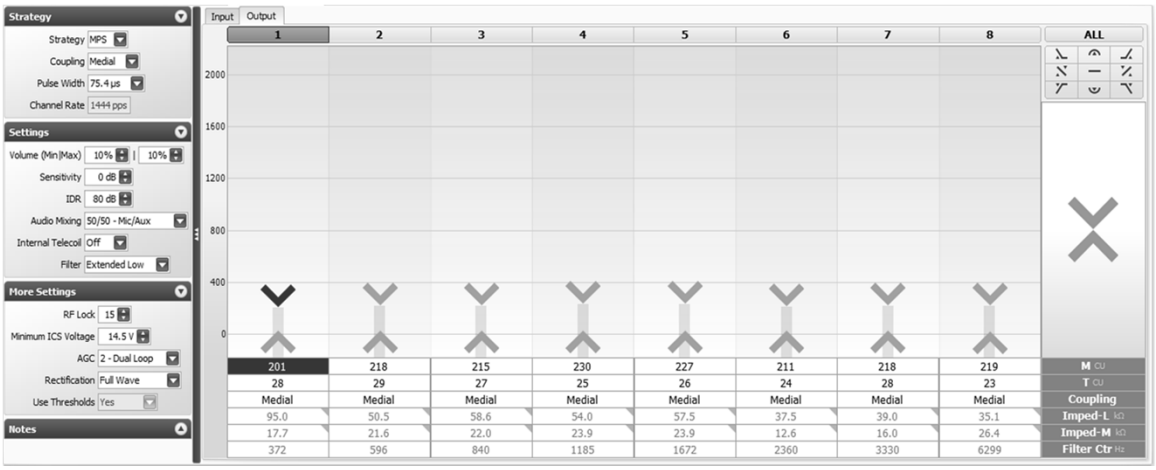
Case 2

- 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



Case 2



Case 2- The problem

- 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

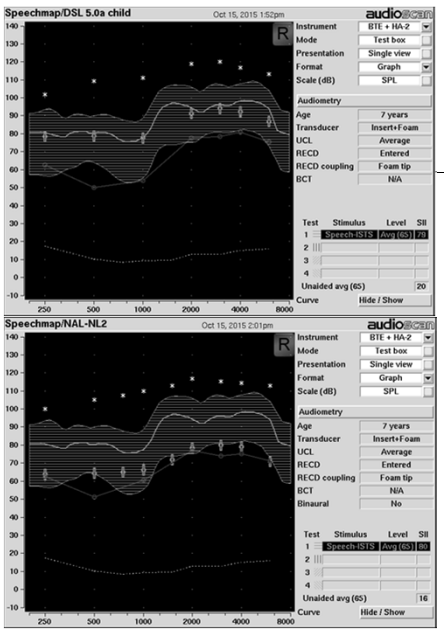
Discordance
- Grandmother 1 thinks her delay is cognitive
- Grandmother 2 thinks it is mom's fault
- Teacher says it is because she is shy
- Mom is not sure what to think

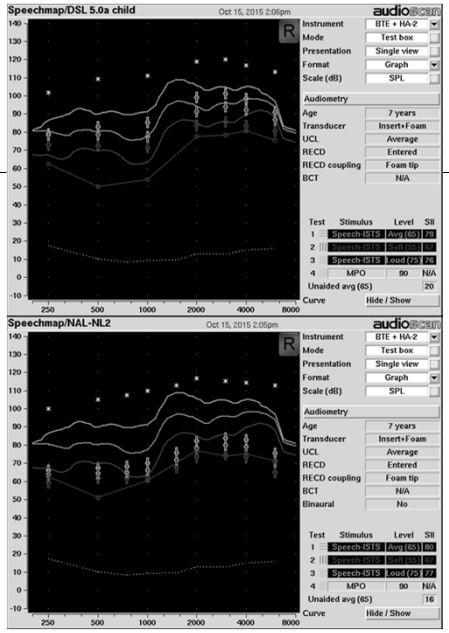
Case 3- The problem

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

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…