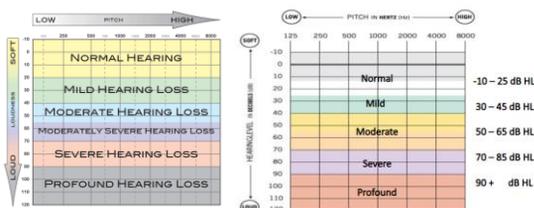


Revisiting Candidacy for Amplification for Children with Mild Hearing Loss

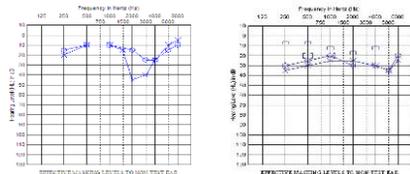
Merry Spratford, AuD, CCC-A
 NSLHA 2019 Fall Convention
 October 4, 2019

How do we define/categorize mild HL?

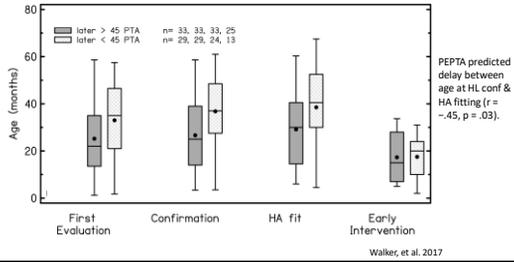


Do we need a definition/criterion?

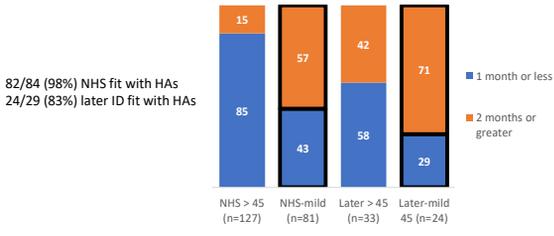
- Candidacy for devices
- Eligibility for early intervention
- Qualification for research studies, scholarships



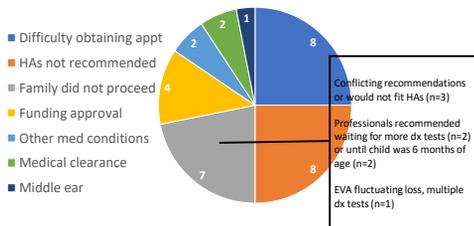
Without NHS referral, children with mild HL fit later



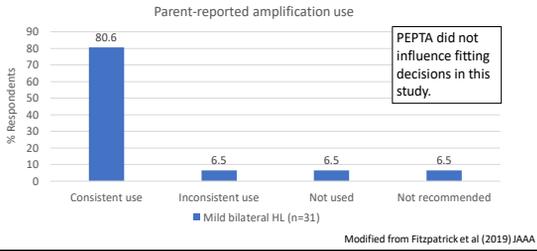
Children with mild HL experience delays between confirmation & HA fitting—why?



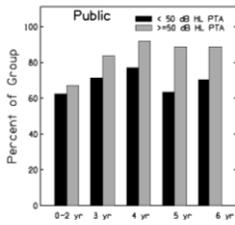
Delays due to ambivalence?



Ambivalence toward HAs is a widespread issue



Consistency of use lower for children with mild HL



Do you think hearing aids help your child hear better? "I don't know..."

- I don't know, we still have a hard time noticing she has a hearing loss.
- He does respond to quieter sounds with the aids on but he is alert with them off too. We need to get better at putting them on.
- I know it is necessary, but he is so young and he takes them off a lot. I think it helps and see the value in it.
- I don't know. I can't tell a big difference.
- I cannot say yes or no. It is hard to tell. She responds well without her aids.
- He does not always wear his aids. I doubt sometimes that he hears better with them on. He doesn't like his aids but I make him wear them.
- I can't imagine that they do. He is so young now to know.

Can we be more proactive?

Parents do not comprehend the impact that even a mild hearing impairment can have on speech and language development. We are using data logging to help encourage parents to have their child wear their devices more consistently. Often it is not until speech and language is measured as delayed that they buy into needing to use the devices all waking hours.

Need the evidence to support HAs for mild HL

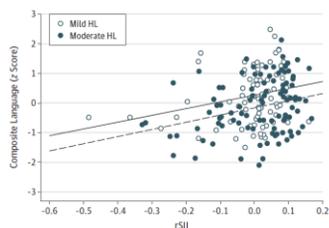
Child: care, health and development
Original Article

Mild, moderate, congenital hearing loss: cacar
Alternatively, mild hearing loss could represent 'overdiagnosis', defined as identification of a real condition for which treatment does not actually benefit an individual's outcomes (Coon *et al.* 2014). This would imply that these children's developmental deficits might not be attributable solely to their hearing acuity. If so, the decision to amplify mild losses early could represent not only overtreatment (i.e. treatment that cannot deliver benefit) but also active harm (costs, burden, stigmatization).

parents' outcomes and the complex outcomes between children identified via self-established (HL) and the general population.
Method: Linear regression adjusted for potential confounding factors was used throughout. Via a quasi-experimental design, language and psychosocial outcomes were compared across four population-based Australian systems of hearing loss detection: opportunistic detection from 1981-1995, n = 18; universal mid-freq referral from 2002-2005, n = 26; newly established HL from 2005-2005, n = 45; and self-established (HL) from 2007-2010, n = 27. In pooled analyses, see

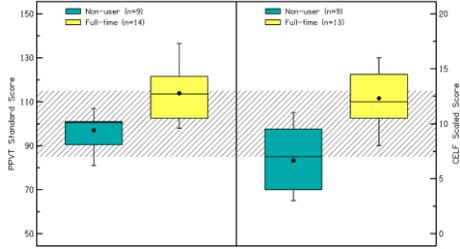
Carew *et al* 2017

Audibility has similar relationship with outcomes for children with mild & mod-severe HL



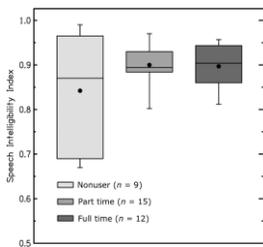
Tomblin *et al* 2014

Full-time HA users with mild HL have better vocabulary & morphology than non-users



Modified from Walker, et al., 2015

HA use provides consistent audibility, even when unaided audibility is high



He takes a break from his hearing aids on weekends and afterschool. ← Less benefit?

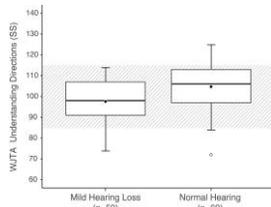
VS

The only time she takes them out is when it's too loud. ← More benefit?

Does Effective Audibility Index (dosage) explain outcomes?

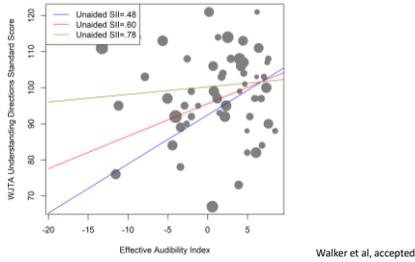
$$\text{AidedHrs}^{\text{AidedSII}} - \text{UnaidedHrs}^{\text{UnaidedSII}} = \text{EAI}$$

| Hours | Aided SII | Hours | Unaided SII | EAI |
|-------|-----------|-------|-------------|------|
| 16 | 0.75 | 8 | 0.25 | 6.32 |
| 12 | 0.75 | 12 | 0.25 | 4.59 |
| 8 | 0.75 | 16 | 0.25 | 2.76 |
| 4 | 0.75 | 20 | 0.25 | 0.71 |

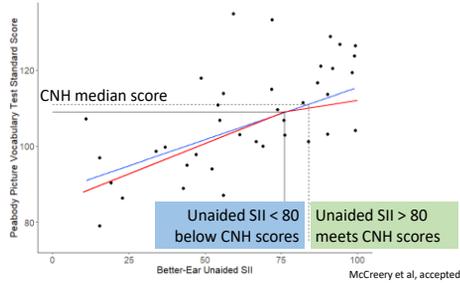


Walker et al, accepted

Yes! More benefit from HA use when unaided SII less than ~80



Language similar to NH when unaided SII >80



Conclusions

- Validation of unaided SII < or = 80
- Based on children who:
 - Were not fitted with hearing aids
 - Were fitted and did not use hearing aids
- BONUS!
 - Takes into account ear canal acoustics

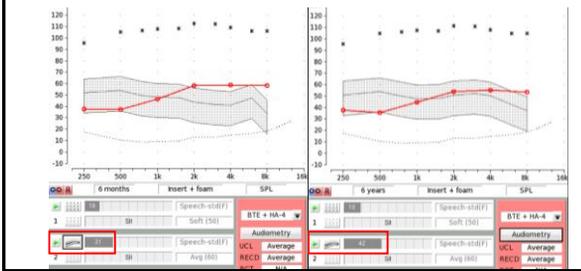
Why do we want to take into account ear canal acoustics for unaided audibility?



We know the RECD affects hearing aid measurements, but how do they affect thresholds??

- Inserts / ABR transducer calibrated referenced to a 2 cc coupler.
- Effective stimulus level will decrease as the ear canal volume increases.
- In dB HL, thresholds will appear to be worse over time as ear canal grows

Same HL - 6 months vs. 6 years



Hearing aid candidacy

- Unaided SII is a standard that incorporates
 - How hearing loss affects audibility
 - How ear canal acoustics change over time

How to implement the new SII criteria

1. Enter audiogram into Verifit
2. Measure/enter/average RECDs
3. Observe unaided SII value for average speech

Unaided SII < 80 fitting criterion

| | |
|---|--|
| <p>Old PTA-based criterion</p> <ul style="list-style-type: none"> • Did not reflect effects of ear-canal acoustics • Not based on language outcomes data • Not easy to quantify impact of hearing on audibility | <p>New unaided SII criterion</p> <ul style="list-style-type: none"> • Reflects effects of ear-canal acoustics on thresholds • Based on language outcomes data • Quantifies impact of hearing on audibility |
|---|--|

Term we use to describe loss = parent perception of disability

| Task | Simulation | Term |
|------------------------------|------------|------|
| Learning names of objects | 5.2 | 2.5 |
| Understanding Quiet speech | 6.5 | 3.5 |
| Learning to read | 5.0 | 2.5 |
| Hearing a fire alarm | 4.5 | 2.0 |
| Playing on a sports team | 4.8 | 2.2 |
| Playing a musical instrument | 4.8 | 2.8 |
| Understanding in noise | 6.2 | 3.2 |

Modified from Haggard & Primus 1999 AIA

How will using unaided SII change how you counsel families about "mild" HL?