1. This document was created to support maximum accessibility for all learners. If you would like to print a hard copy of this document, please follow the general instructions below to print multiple slides on a single page or in black and white.
2. This handout is for reference only. Non-essential images have been removed for your convenience. 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.
3. Copyright: Images used in this course are used in compliance with copyright laws and where required, permission has been secured to use the images in this course. All use of these images outside of this course may be in violation of copyright laws and is strictly prohibited.
4. Social Workers: For additional information regarding standards and indicators for cultural competence, please review the NASW resource: Standards and Indicators for Cultural Competence in Social Work Practice
5. Need Help? Select the "Help" option in the member dashboard to access FAQs or contact us.

How to Print Handouts

- On a Mac
  - Open PDF in Preview
  - Click File
  - Click Print
  - Click dropdown menu on the right "preview"
  - Click layout
  - Choose # of pages per sheet from dropdown menu
  - Checkmark Black & White if wanted.
- On a PC
  - Open PDF
  - Click Print
  - Choose # of pages per sheet from dropdown menu
  - Choose Black and White from "Color" dropdown

AMERICAN COCHLEAR IMPLANT ALLIANCE

Cochlear Implants as an Option for Children with Single-Sided Deafness

In partnership with American Cochlear Implant Alliance

Lisa Park, AuD, CCC-A
University of North Carolina at Chapel Hill

Cochlear Implant Best Practices for Adults and Children with Single-Sided Deafness: A Two-Part Series

Donna L. Sorkin, MA

Why another organization in hearing health?

- Membership organization focused on cochlear implantation and access to care
- Members are audiologists, physicians, speech pathologists, educators and others on CI teams + consumers/parents, advocates, hearing aid specialists
- Website designed for those in and out of CI
- Highly collaborative with other organizations

Welcome your involvement!

www.acialliance.org

https://www.facebook.com/ACIALLIANCE.ORG/

Twitter@acialliance

American Cochlear Implant Alliance

- Mission: Advance access to the gift of hearing provided by cochlear implantation through research, advocacy and awareness
- Address factors contributing to underutilization of cochlear implants
- Improve awareness regarding candidacy and outcomes

Why this topic is critical now

- **Perspectives about Unilateral Deafness have changed**
  - Measurable impacts on access to sound and quality of life
  - Many hearing health professionals are unaware of when and whether to refer
- **Insurance coverage for CI in SSD expanding**
- **Greater knowledge on outcomes**

American Cochlear Implant Alliance Task Force Guidelines for Clinical Assessment and Management of Cochlear Implantation in Adults With Single-Sided Deafness (SSD)

- *CI for SSD offers significant benefit for sound localization, tinnitus mitigation, and quality of life*
- *With sudden hearing loss, CI should not occur earlier than 3-6 month to allow time for medical workup*
- *Discuss and trial non-surgical options*
- *Long duration of deafness not a contraindication but may impact outcomes*
- *Advanced age not a contraindication*
- *Wear time associated with better outcomes (at least 8 hours a day)*
- *Auditory training during initial months*

www.acialliance.org/page/DeterminingCICandidacy

AMERICAN COCHLEAR IMPLANT ALLIANCE

ACI Alliance Task Force Guidelines for Clinical Assessment of Cochlear Implants (CI) in Children with Single-Sided Deafness (SSD)

- *At risk for hearing loss progression in better ear*
- *Dx bacterial meningitis*
- *Advantage of younger CI*
- *Developmental disadvantages of SSD due to difficulties with localization, hearing in noise, listening fatigue*
- *Auditory therapy strongly recommended*

www.acialliance.org/page/DeterminingCICandidacy

ACI ALLIANCE®
AMERICAN COCHLEAR IMPLANT ALLIANCE

AMERICAN COCHLEAR IMPLANT ALLIANCE

Cochlear Implants as an Option for Children with Single-Sided Deafness

In partnership with American Cochlear Implant Alliance

Lisa Park, AuD, CCC-A
University of North Carolina at Chapel Hill

Lisa Park, AuD, CCC-A

Dr. Park is an Associate Professor and Division Chief of the Children's Cochlear Implant Center at the University of North Carolina at Chapel Hill. She holds a Master of Science in Speech and Hearing from Washington University in St. Louis and a Doctorate in Audiology from The University of Florida. Her clinical research focuses on expanding cochlear implant indications for children who are deaf or hard of hearing and optimizing outcomes for non-traditional pediatric cochlear implant recipients.

Disclosures

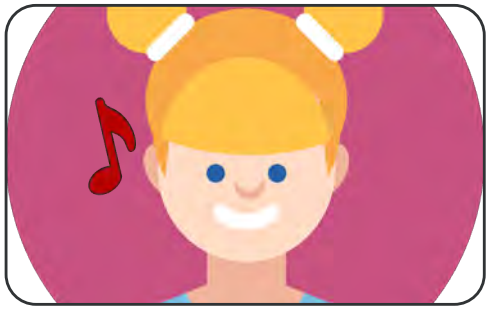
- **Presenter Disclosure:** Financial: Lisa Park is an Assistant Professor in the Department of Otolaryngology/Head and Neck Surgery at the University of North Carolina at Chapel Hill. Dr. Park is supported by a research grant from MED-EL Corporation. She received an honorarium for this presentation. Non-financial: Lisa Park has no relevant non-financial relationships to disclose.
- **Content Disclosure**: This learning event does not focus exclusively on any specific product or service.
- **Sponsor Disclosure:** This course is presented by AudiologyOnline in partnership with the American Cochlear Implant Alliance.

Learning Outcomes

After this course, participants will be able to:

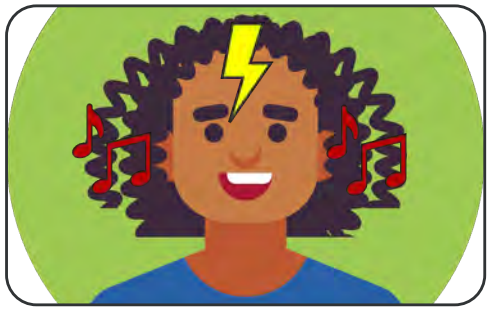
- Identify children with SSD who should be referred for a cochlear implant evaluation.
- Discuss expected benefits of cochlear implantation with parents of children who have SSD.
- Document strategies for requesting insurance approval for cochlear implantation in children with SSD.

Types of Listening



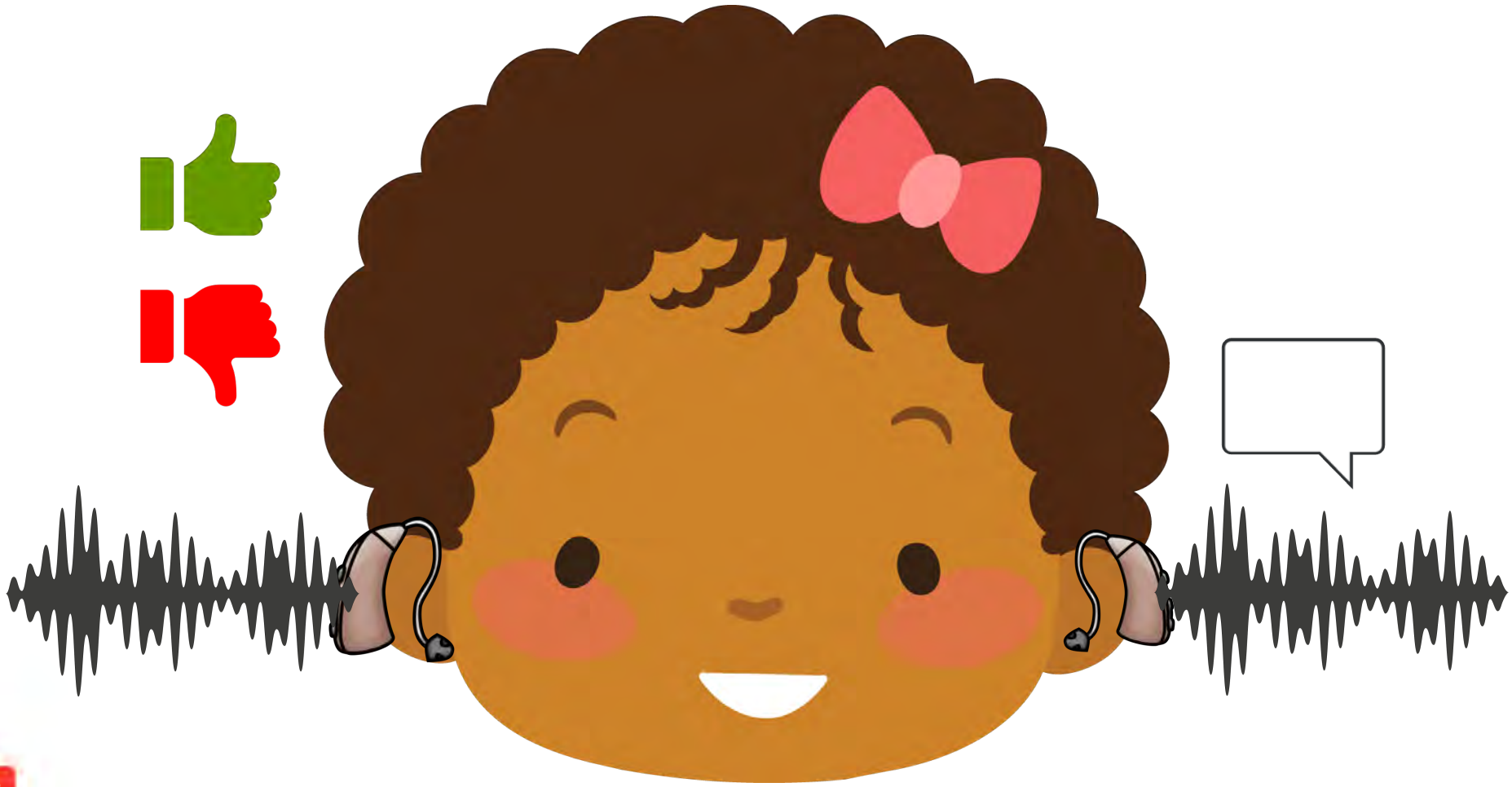
Monaural – one signal to one ear (SSD, wearing one earbud)

Bilateral – one signal to two ears (Streaming to bilateral CIs, same signal in each earbud)



Binaural – Combining information from both ears to be processed by one brain

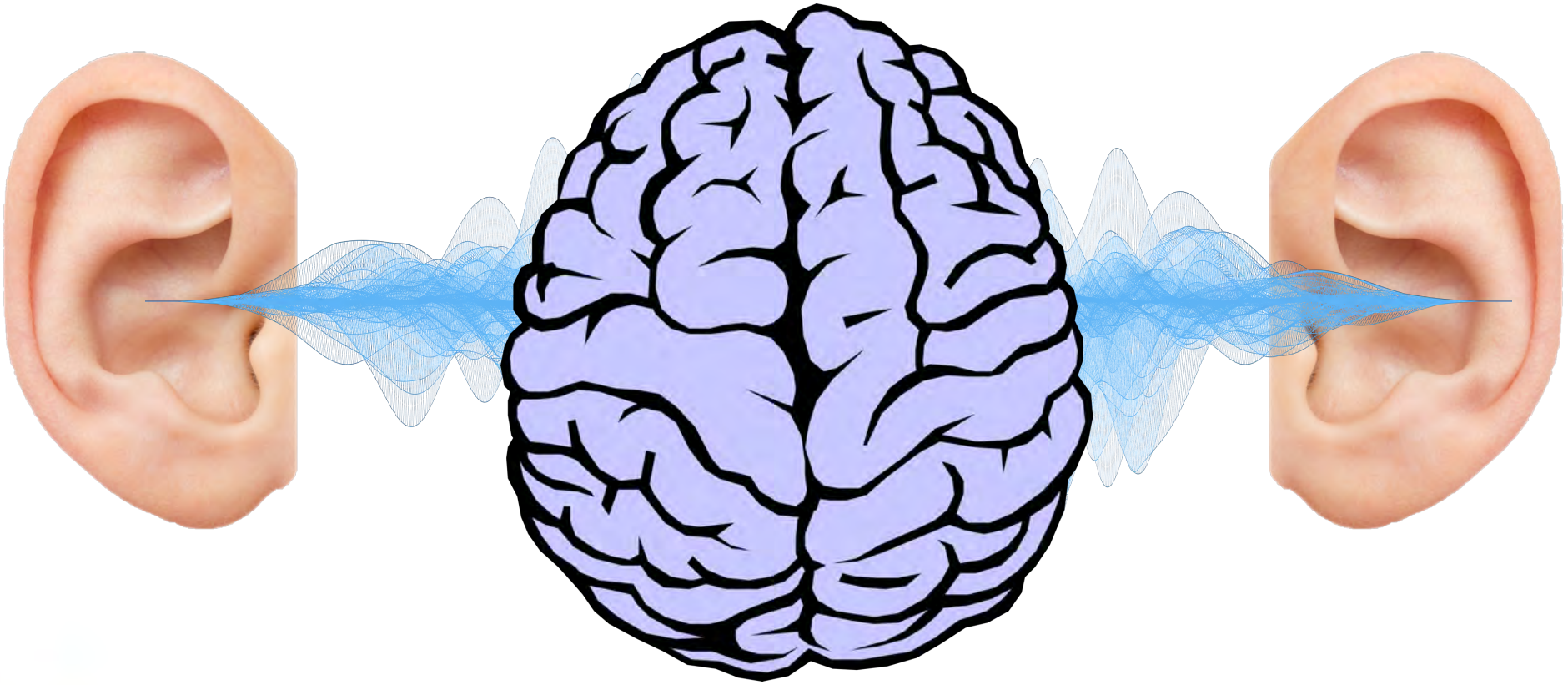
Contralateral Rerouting of the Signal (CROS)



Bone Conduction Device (BCD)

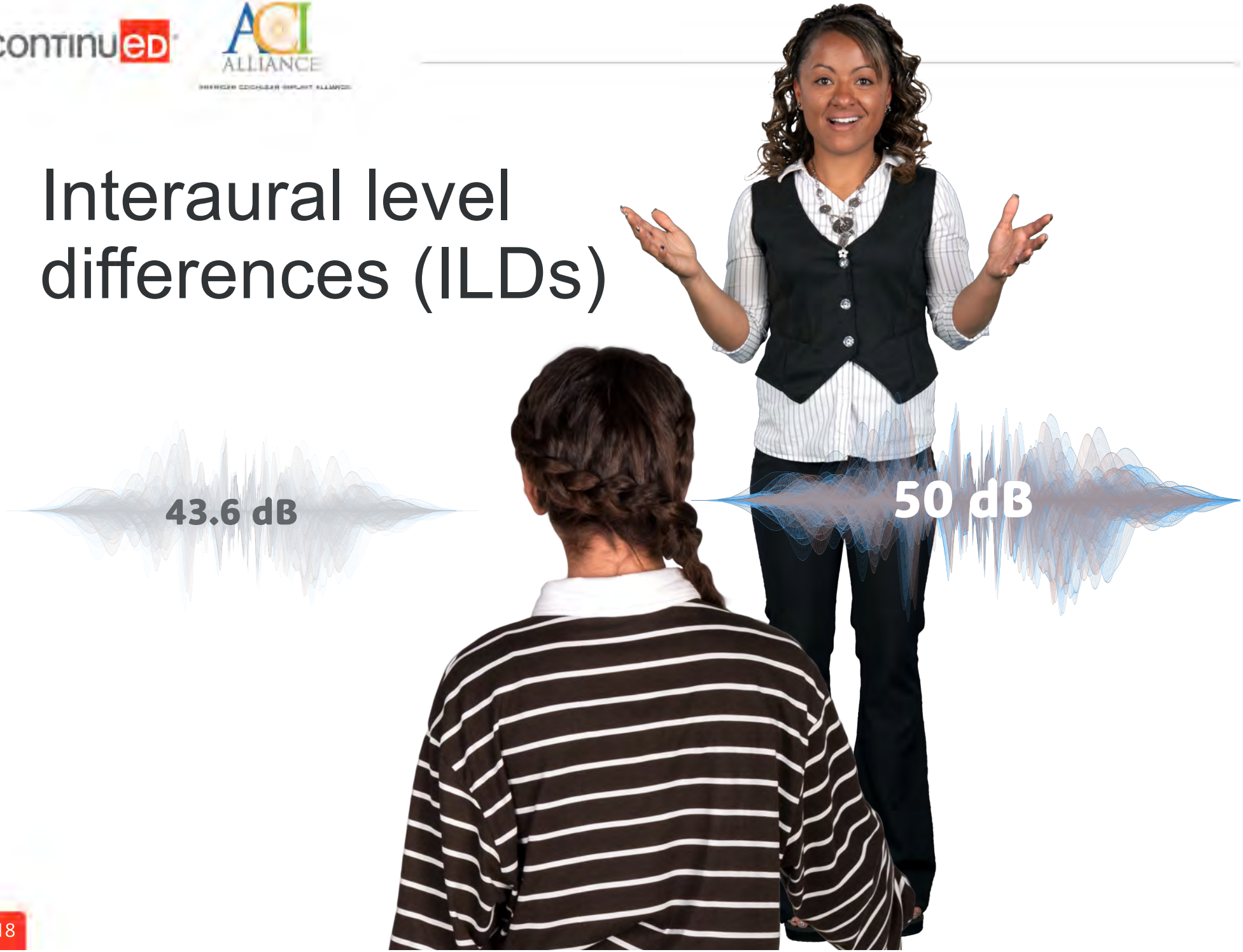
"We have two ears and one mouth so that we can listen twice as much as we speak"

Binaural Summation



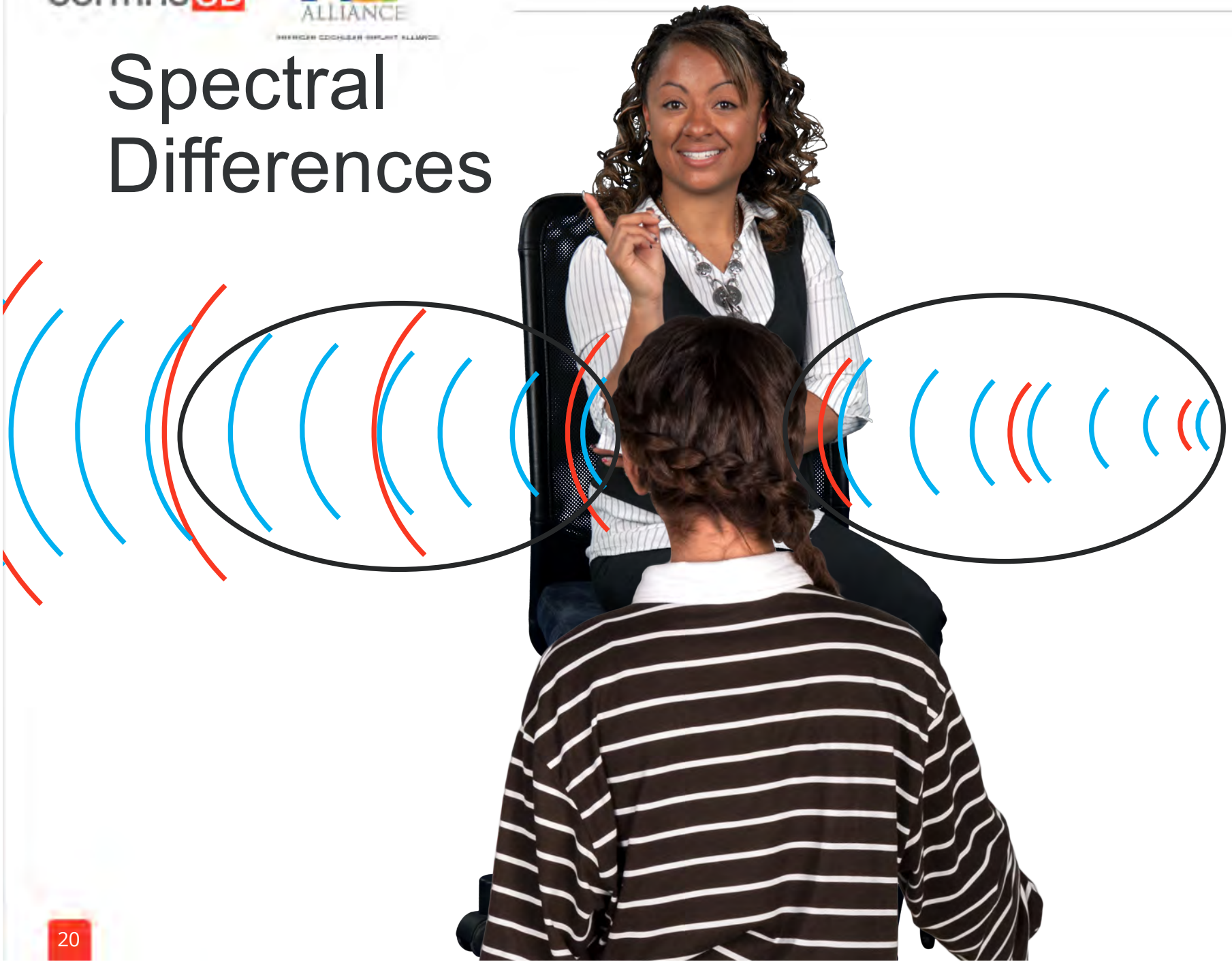
Head Shadow

Interaural level differences (ILDs)

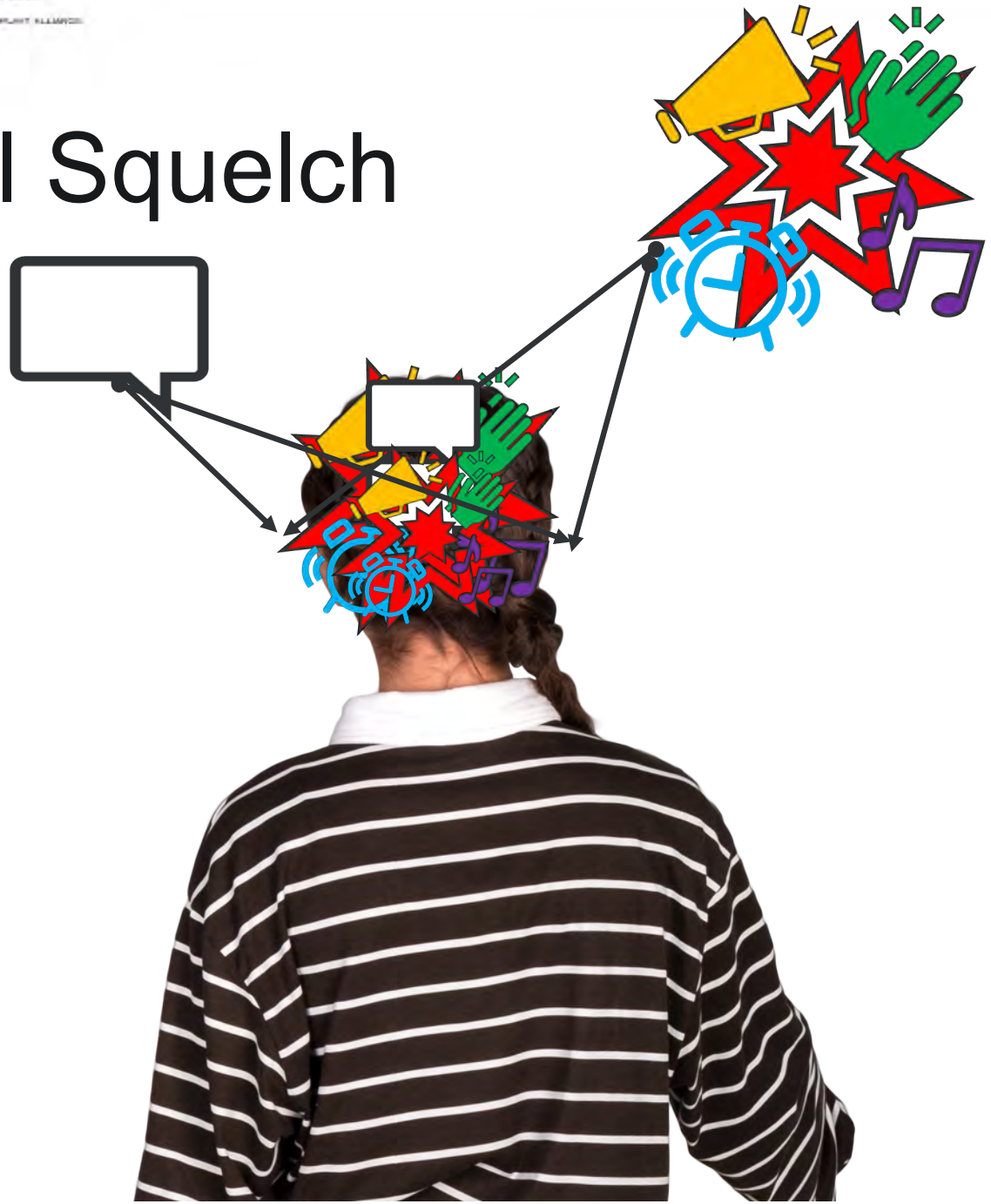


Interaural timing differences (ITDs)

Spectral Differences



Binaural Squelch



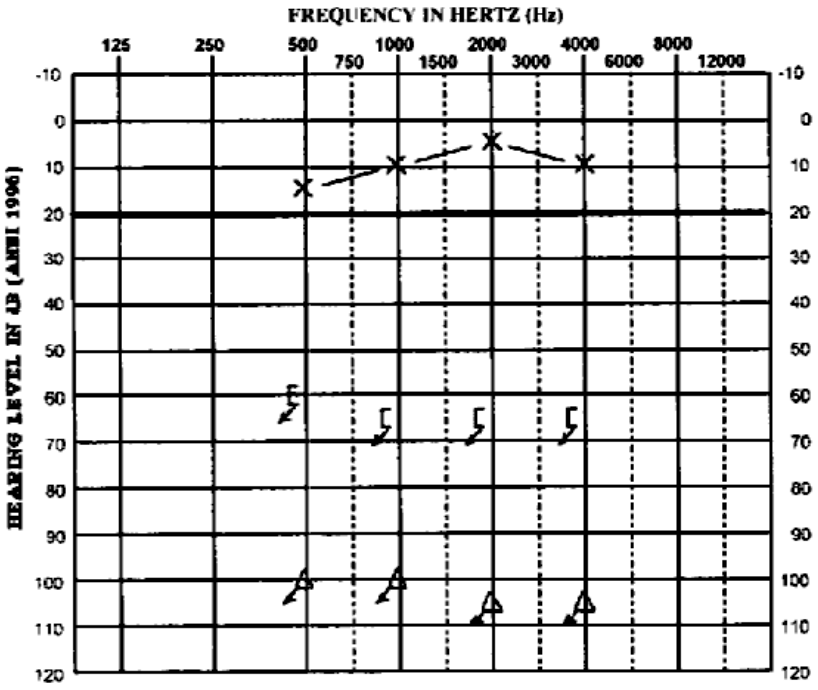
Localization vs Lateralization


Two ears are
better than
one.

Simon

Simon

- 6-year-old male, with a history of OME and tubes.
- Passed NBHS.
- Documented normal hearing at age 4.
- Persistent perf. Tried a myringoplasty.
- A tympanoplasty followed
  - Post op testing indicated severe-to-profound loss in the right ear with poor unaided word rec (12%)
- Fit with Ponto on soft band.
- Using FM at school.



Referral and Candidacy

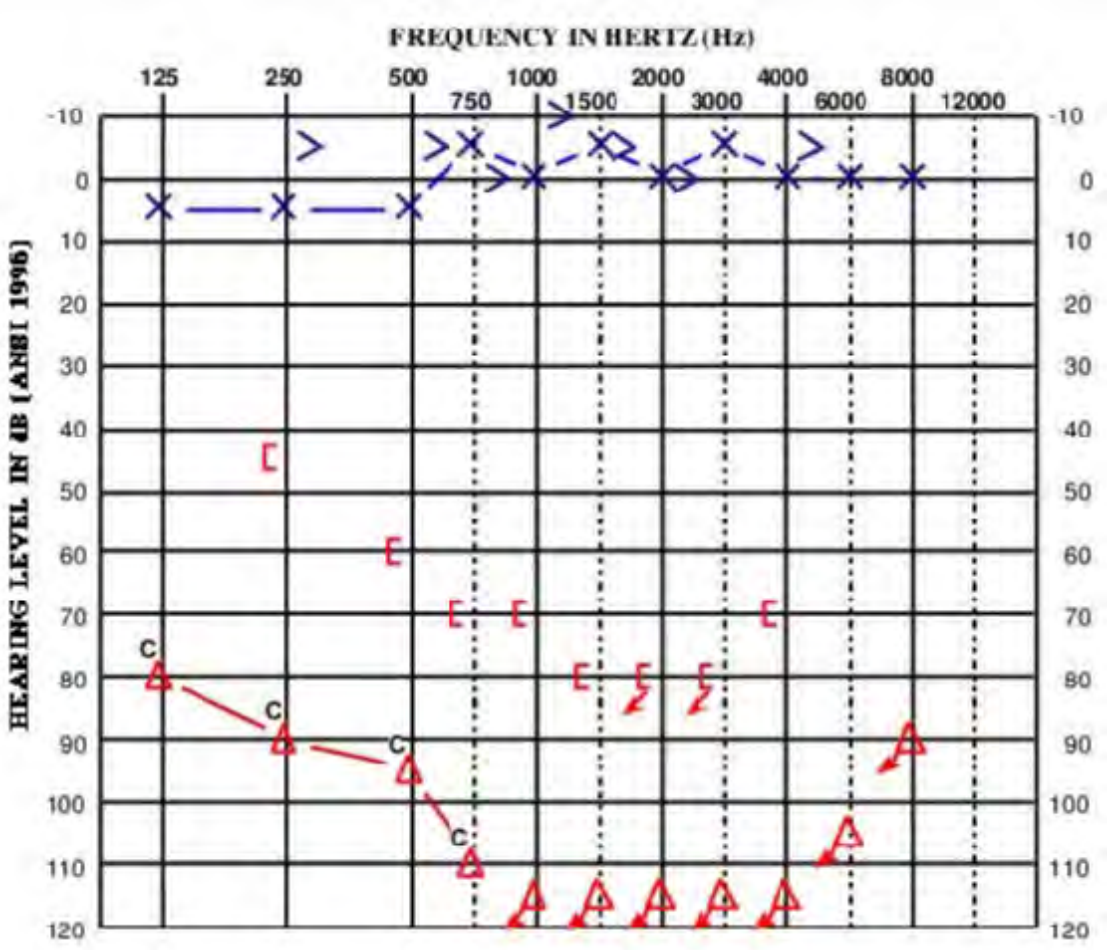
- Referral doesn't mean a child will receive an implant.
- Referring for an evaluation, not a surgery date.
- CI audiologists and surgeons can provide the best education about CIs – we do it all day every day!
- A CI is another technology option in the continuum of care.

Referral and Candidacy

- Is Simon too old?
  - He's 6 but hearing loss happened 2 years ago
- We are still learning about outcomes.
- Success is different for everyone.
- Will a 14-year-old with congenital SSD end up with 80% word recognition?
  - Probably not!
  - Maybe that isn't their goal.

Referral and Candidacy

Simon's Evaluation



Simon's Evaluation

- Gather all the data you can!
  - QoL & Subjective Data
    - Reports unable to localize and it is a safety issue
    - Very overwhelmed by noise. Has a "safe room" at school.
    - Napping during the school day

Simon's Evaluation

- Gather all the data you can!
  - Normal imaging
  - Wanted Aided Word Recognition
    - CNC Recorded, 60 dB SPL:
      - Left ear 94% (unaided)
      - Right ear 0% (left masked)
      - Pattern perception on ESP

Simon's Evaluation

- Gather all the data you can!
  - Speech and language:
    - Both are within normal limits
  - Localization
    - Very poor (106 degrees)
  - Sentence recognition in noise
    - Spatial release from masking
    - BKB-SIN SNR-50
      - 4.5 dB of benefit with noise to the poor ear
      - -0.5 dB of benefit with noise to the good ear

Simon's Evaluation

- Insurance denied
- Stated it was "experimental"

Insurance Thwarted!

- Knew this may happen (plan known to deny)
- Submitted anyway!
  - He was a candidate; insurance doesn't make decisions for us.
- A generic request for coverage had been sent.

Insurance tips

- Data data data!
  - Word recognition
  - Subjective
    - Vanderbilt Fatigue Scales
    - PEACH+
    - SSQ
  - Speech and language
  - Speech in noise
  - Localization

Insurance tips

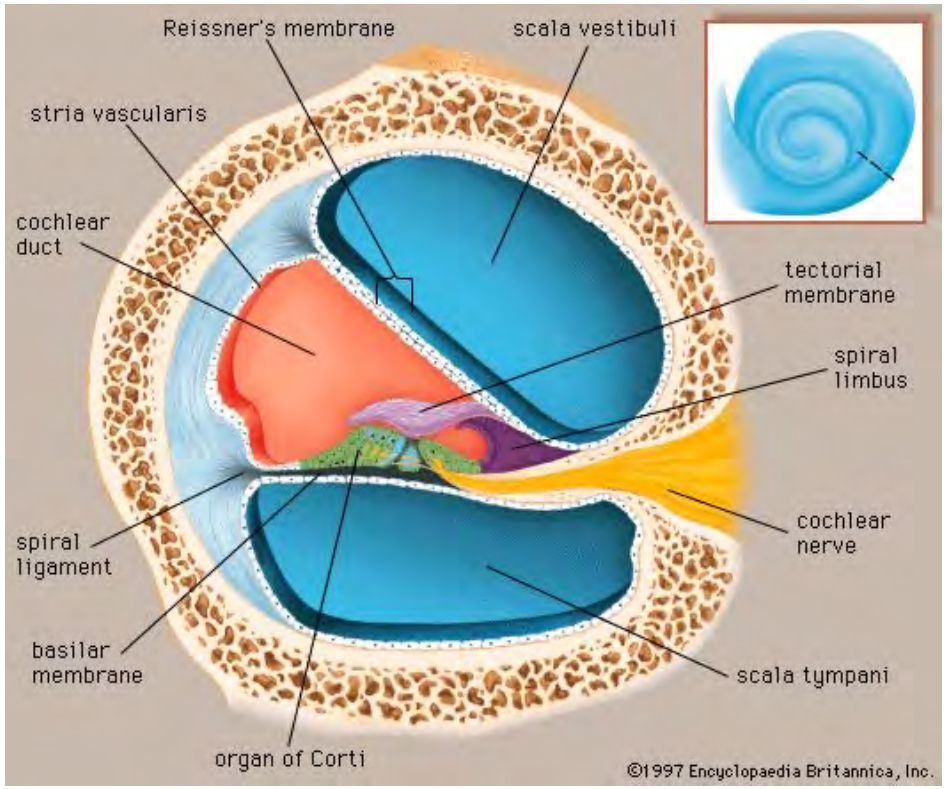
- References
  - Loads of them!
- Peer-to-peer
- State Ombudsman
- LMN template with PDFs

Surgery

- Received a Flex28 device in the right ear.
- Surprise ossification at the round window!

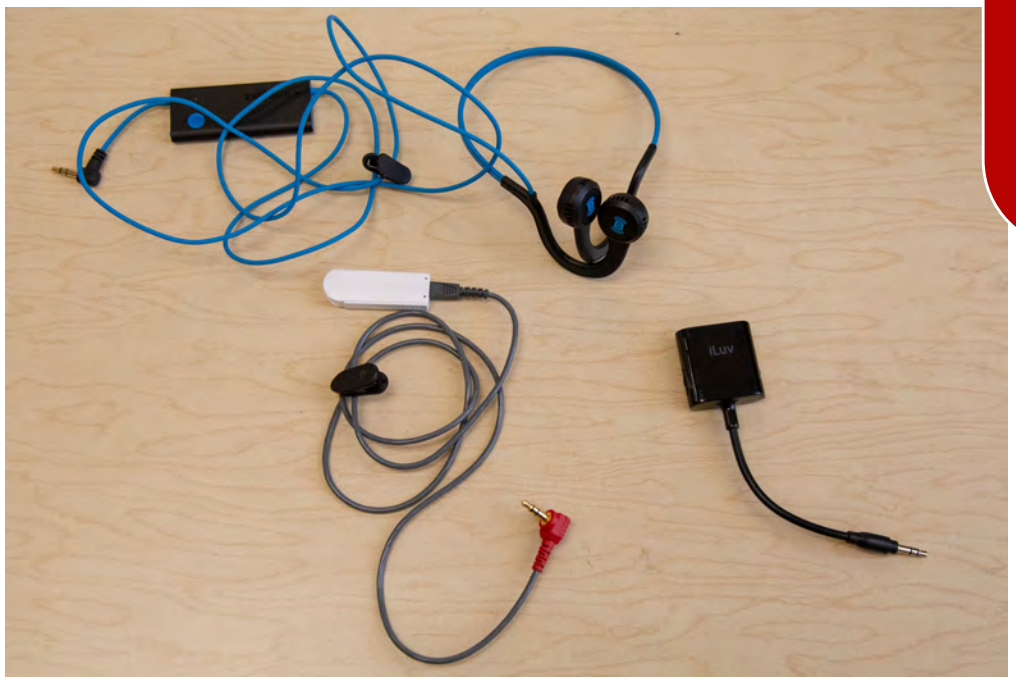
Surgery

- Needed to place in the scala vestibuli.
  - More chance of damage to cochlea
  - Poorer outcomes
    - Secondary to spiral ganglion damage and/or stimulation across turns



Therapy

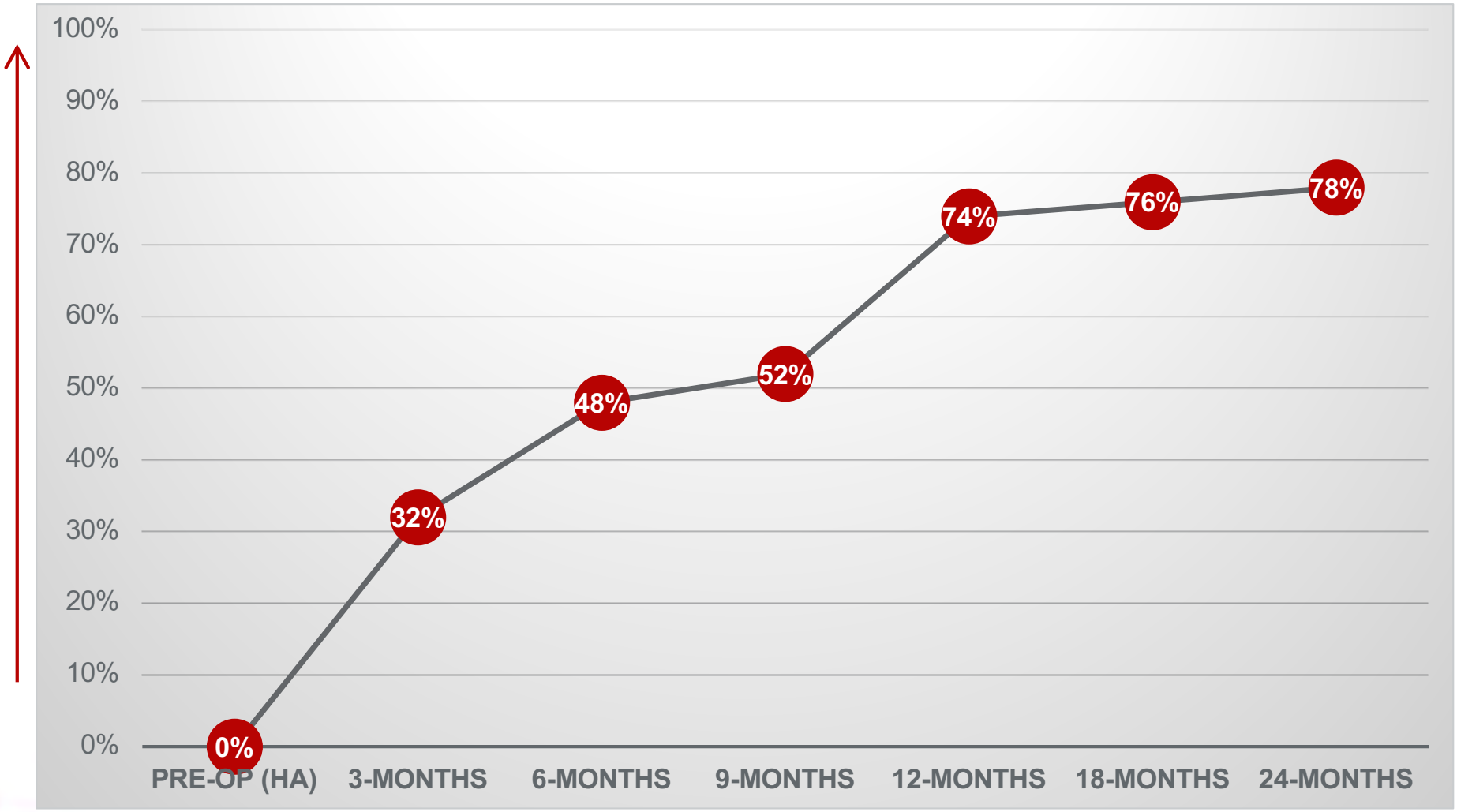
Receiving auditory therapy, direct connect to CI ear.



Simon's Evaluation

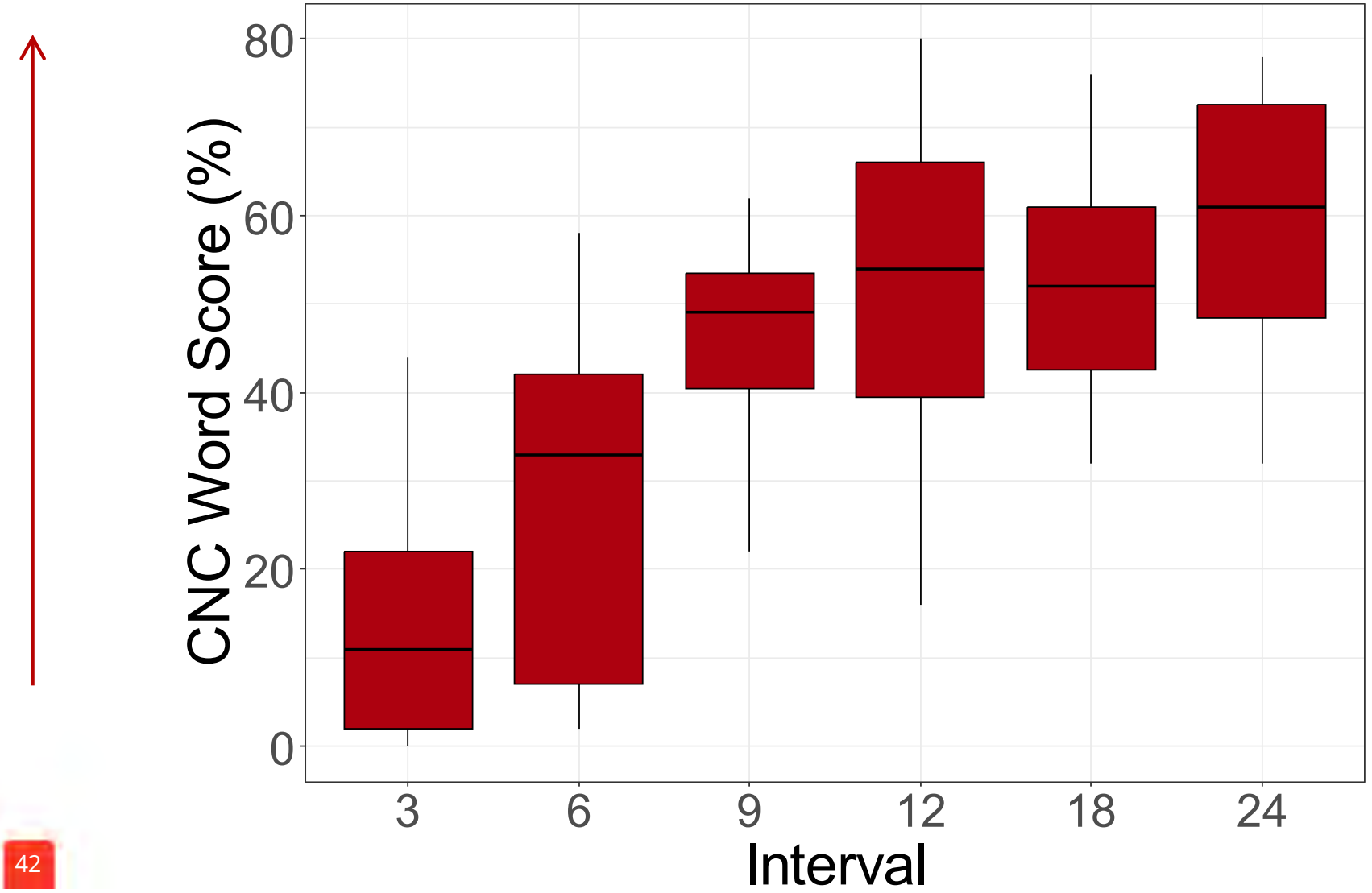
- CNC Recorded, 60 dB SPL:
  - Right ear 0% (left masked)
  - Pattern perception on ESP

CNC Word Scores

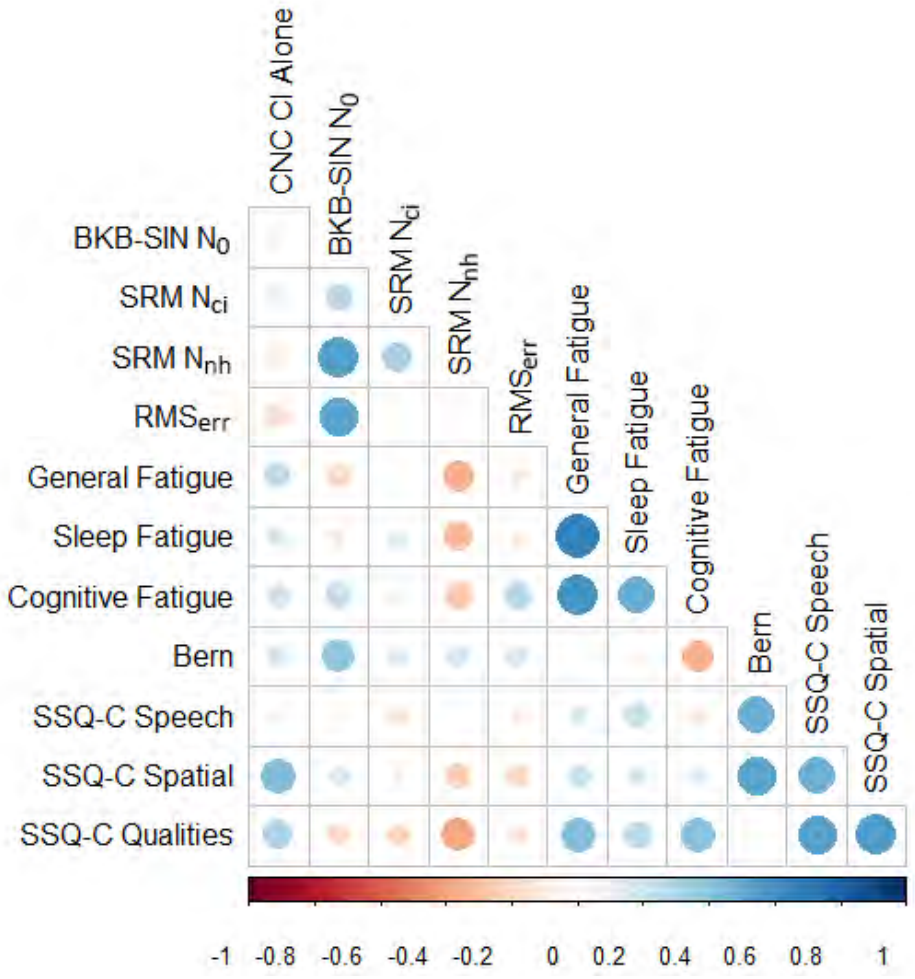


Park LR, Dillon MT, Buss E, Brown KD. Two-Year Outcomes of Cochlear Implant Use for Children With Unilateral Hearing Loss: Benefits and Comparison to Children With Normal Hearing. *Ear Hear*. March 7, 2023.

CNC Word Scores



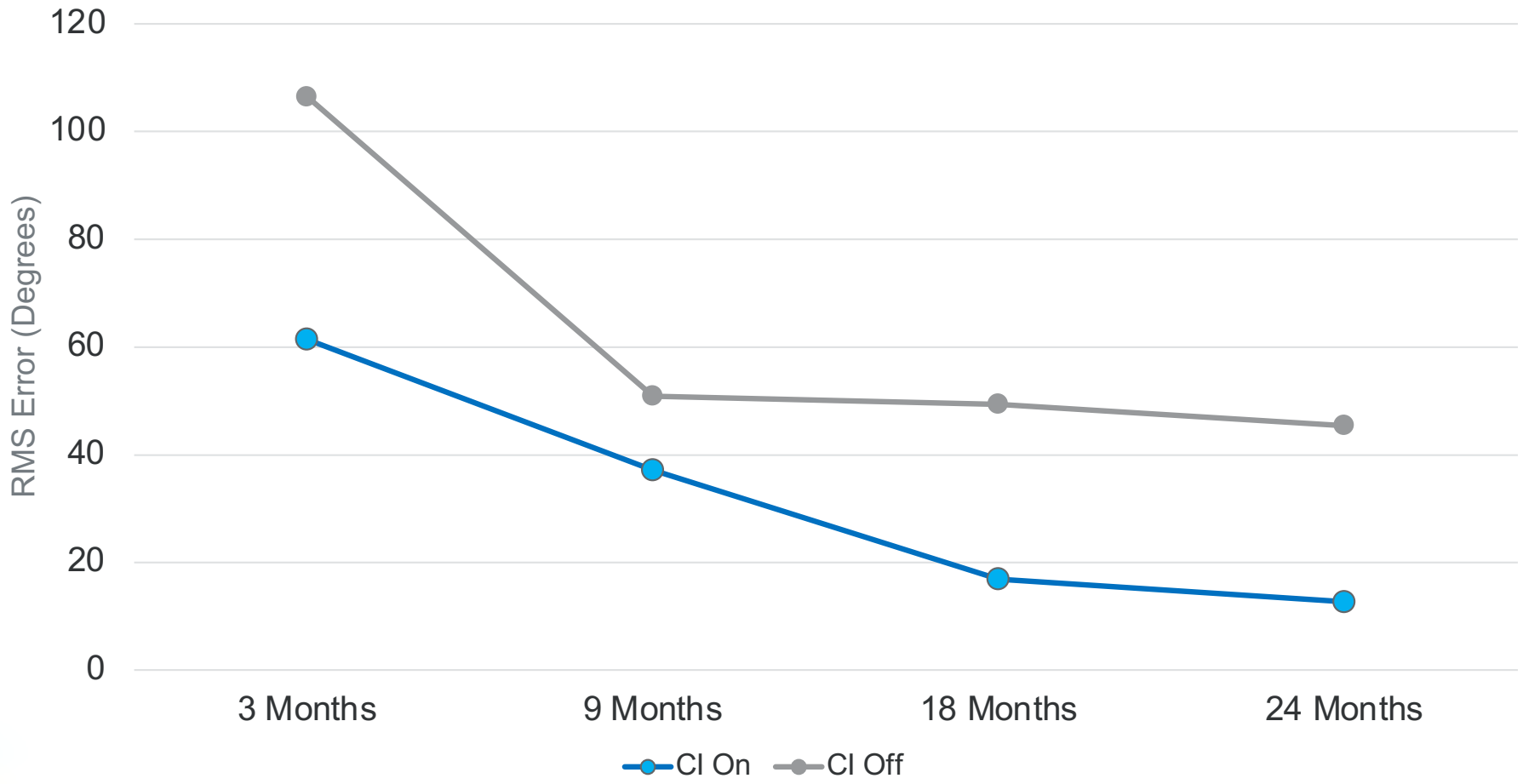
CNC Word Scores



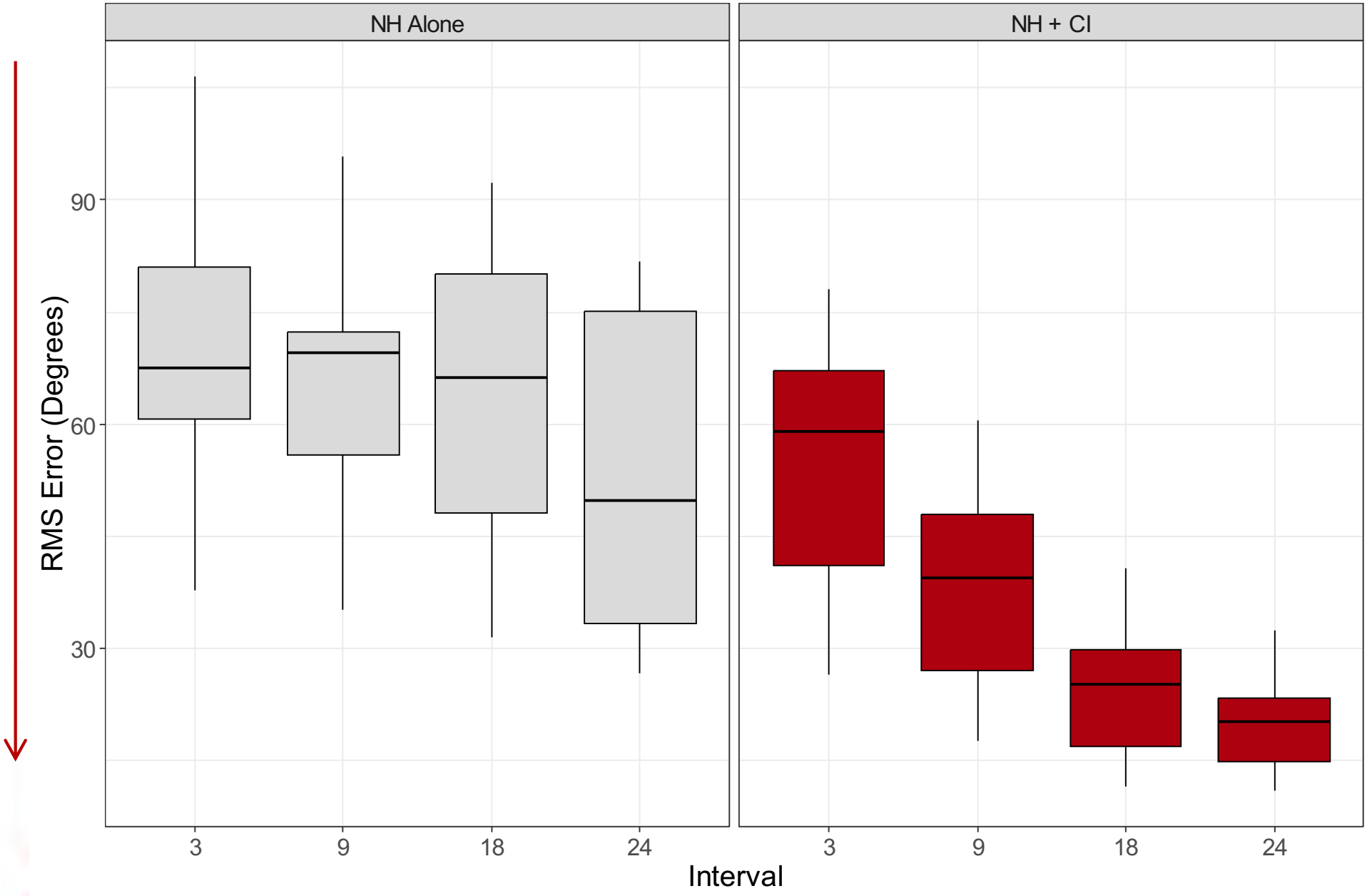
Localization Challenges

(Reeder, Cadieux, & Firszt, 2015)

Simon's Localization



Q2

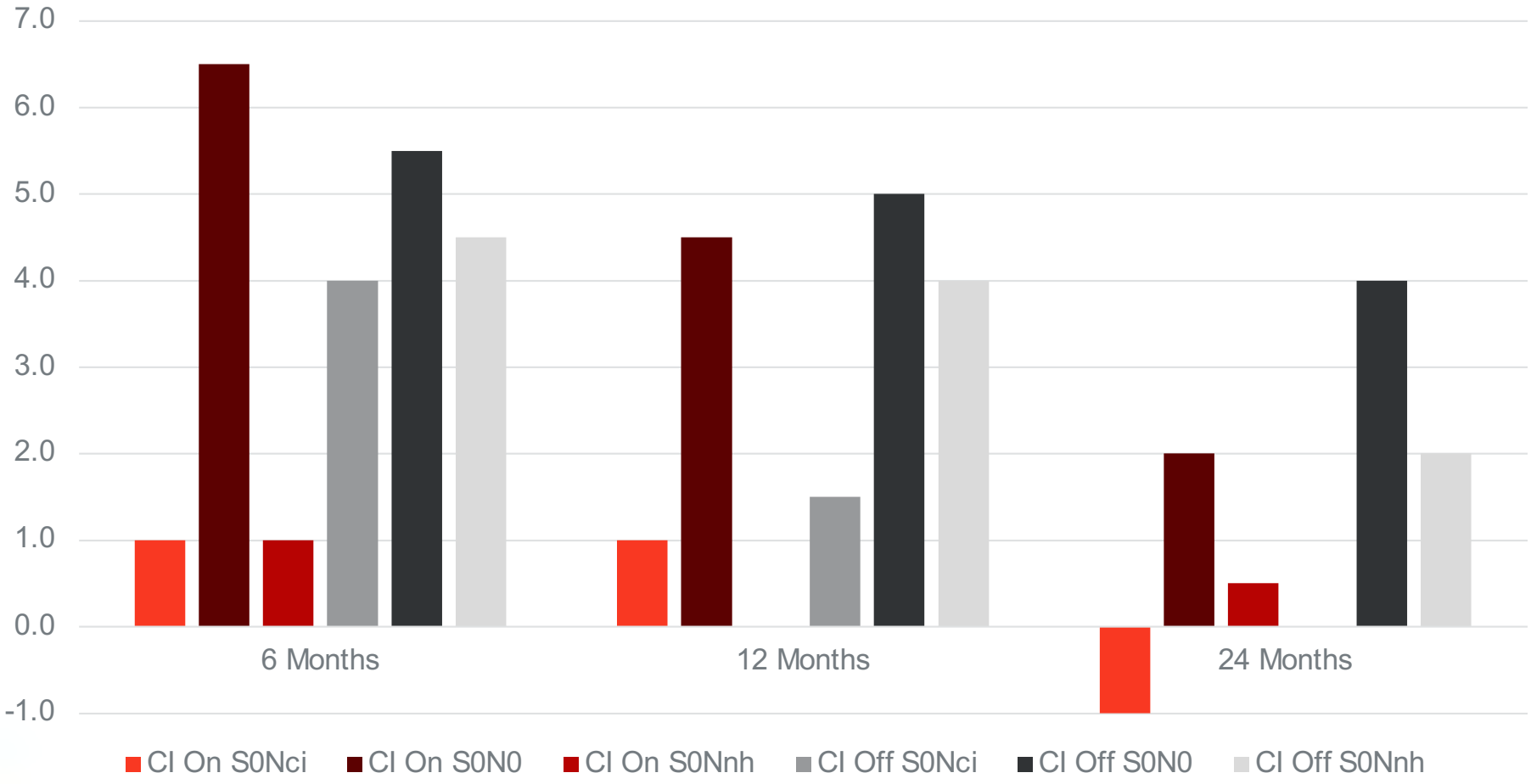


Communication Challenges

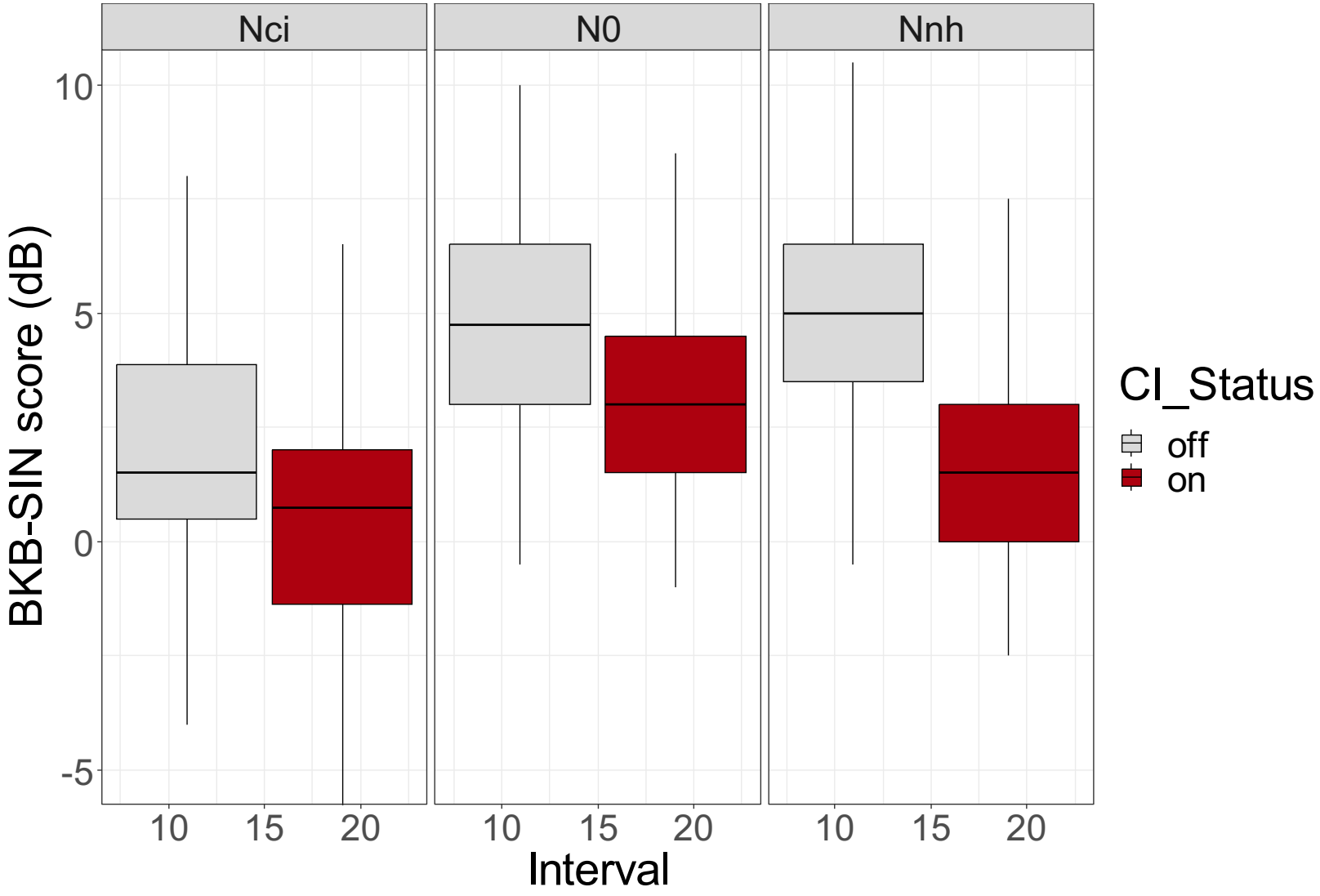
Communication Challenges

- Difficulty understanding speech in noise (Griffin, Poissant, & Freyman, 2018)

Simon's SRM


7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
6 Months
12 Months
24 Months
CI On S0Nci
CI On S0N0
CI On S0Nnh
CI Off S0Nci
CI Off S0N0
CI Off S0Nnh

Clinical Trial SRM



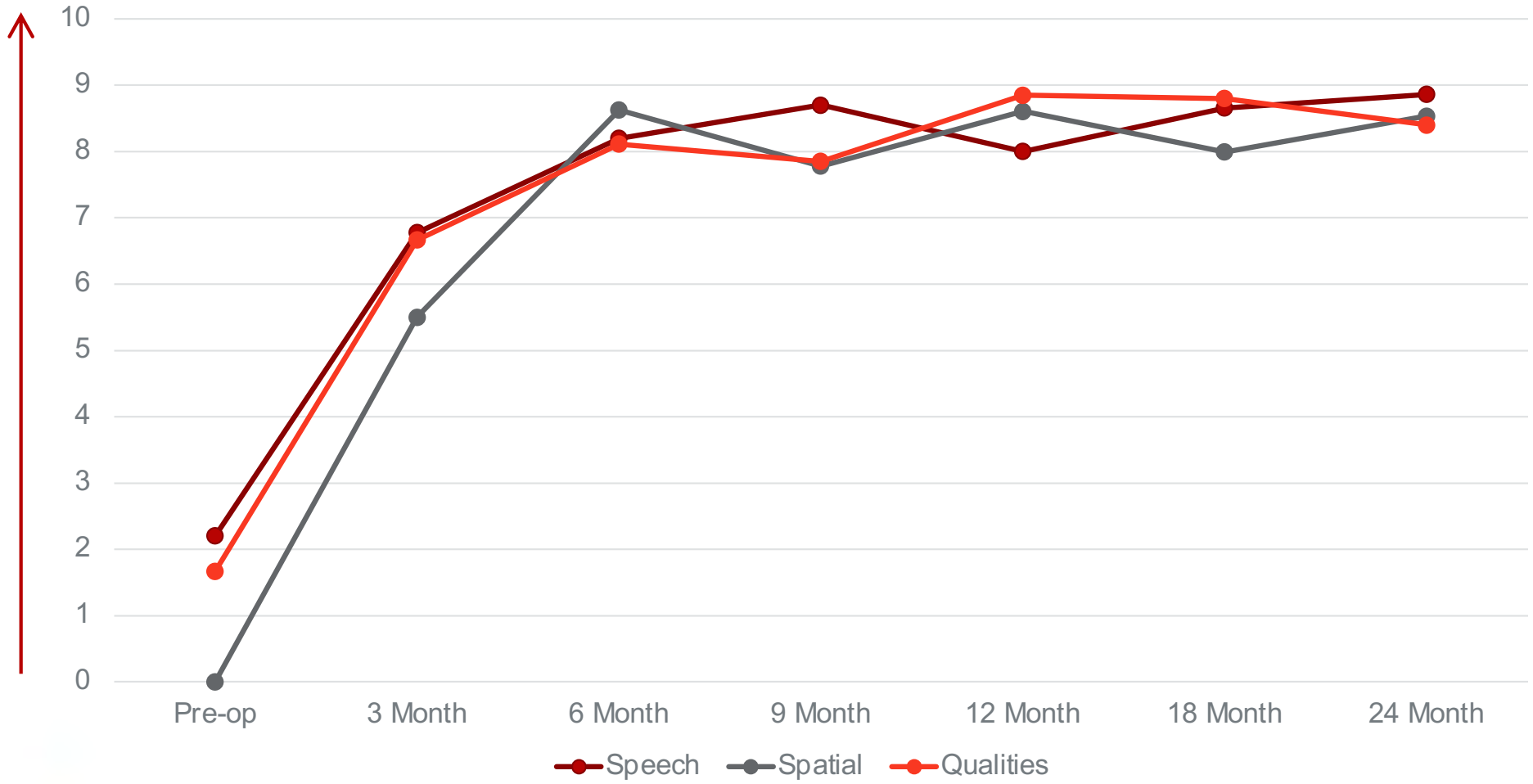
Quality of Life Challenges

- Quality of Life Challenges
  - Greater difficulties reported on QoL measures (Griffin, Poissant, & Freyman, 2018; Reeder et al 2015)

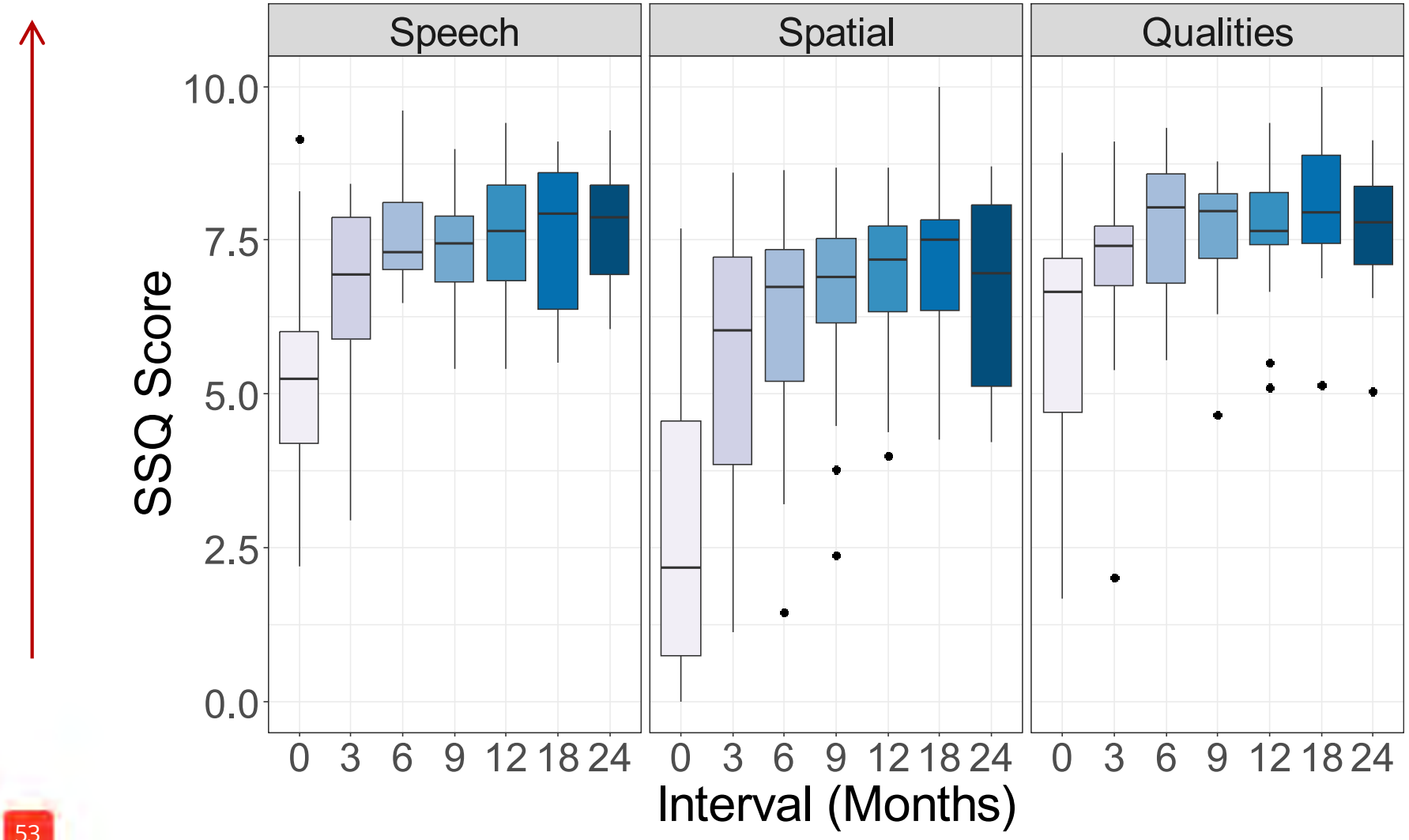
Simon's Evaluation

- Very overwhelmed by noise. Has a "safe room" at school.
- Napping during the school day

Simon's SSQ Scores



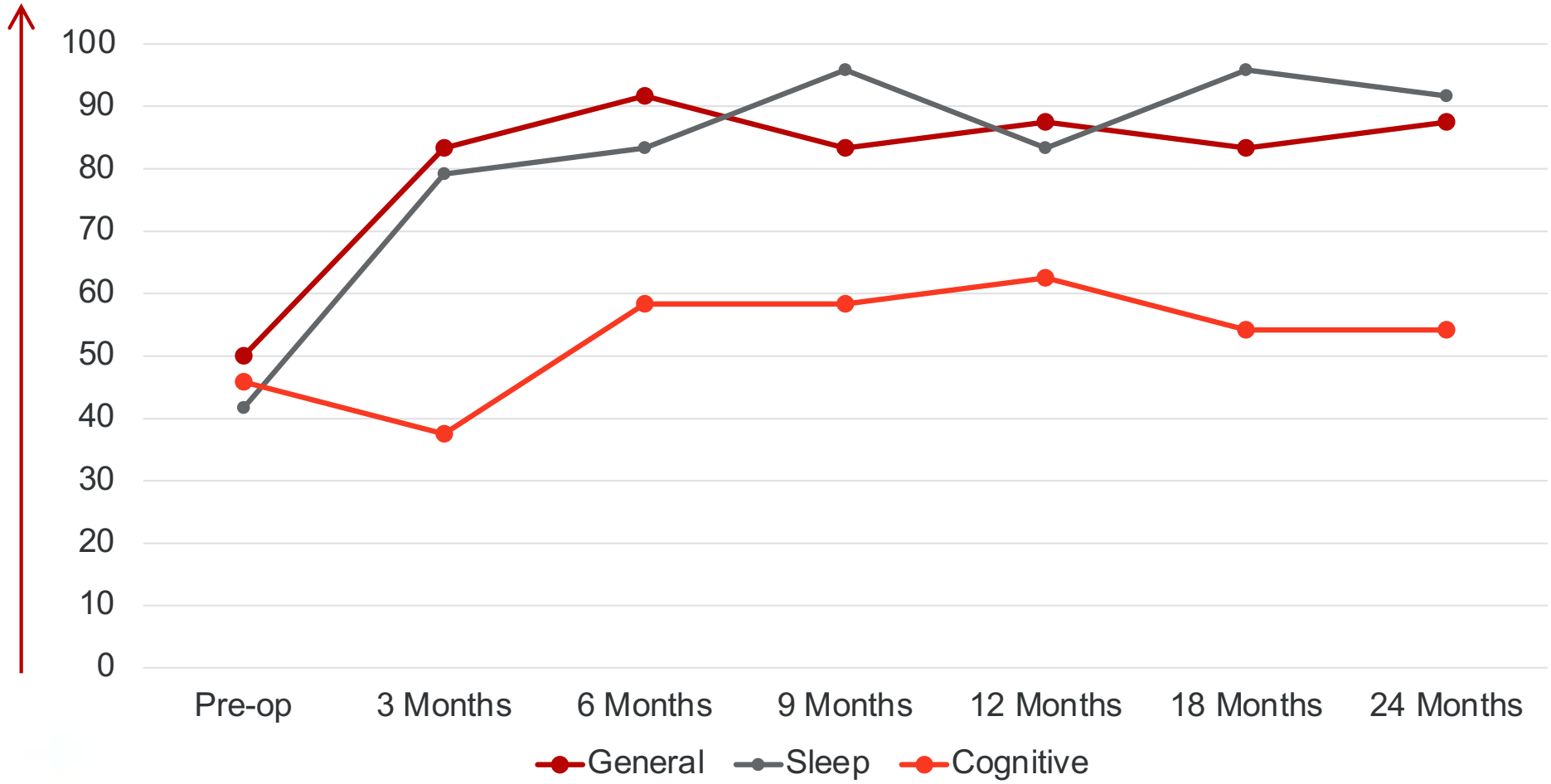
Clinical Trial SSQ



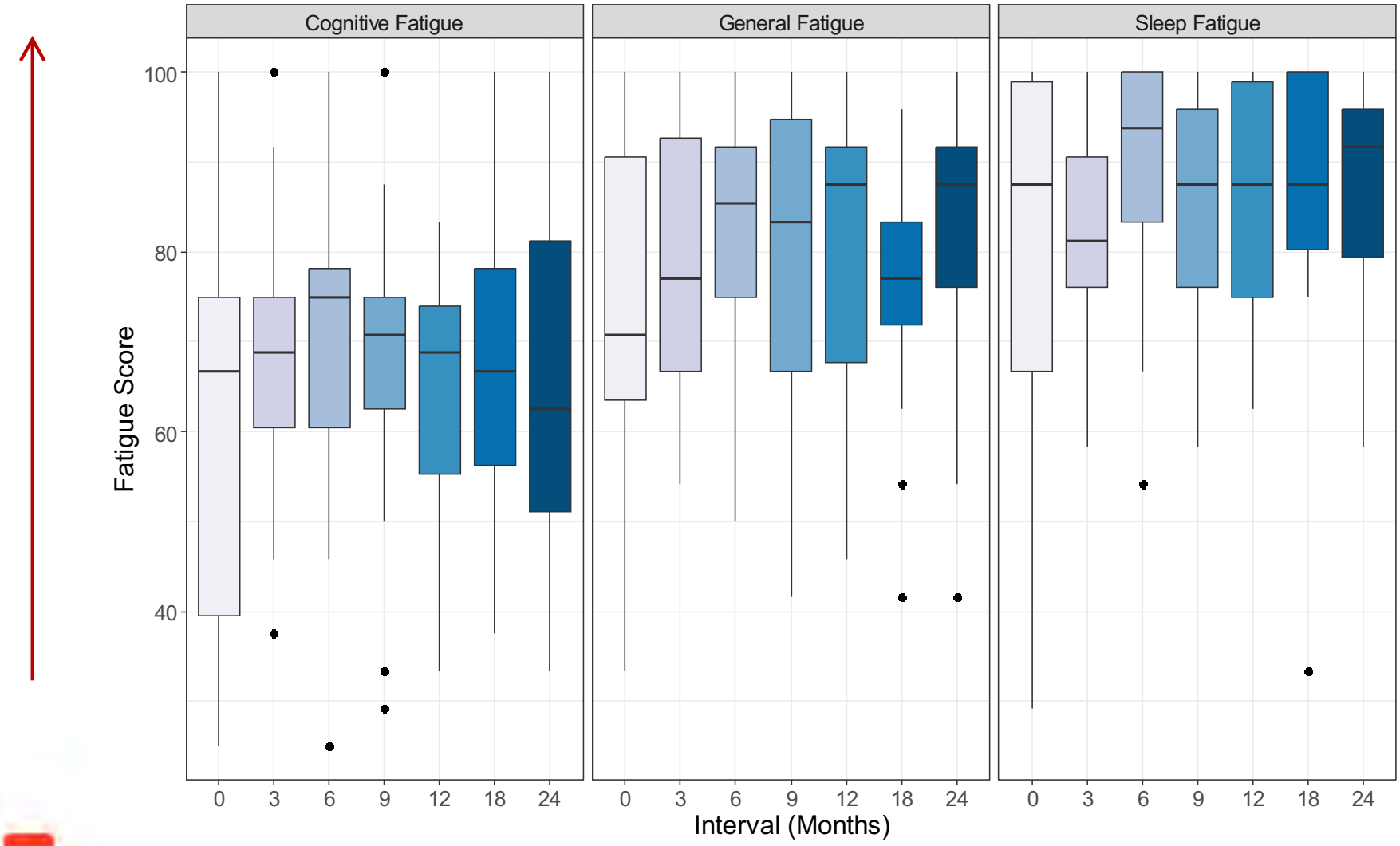
Quality of Life Challenges

- Quality of Life Challenges
  - Higher levels of fatigue (Hornsby et al, 2013).

Simon's Fatigue Scores



Clinical Trial Fatigue Scores

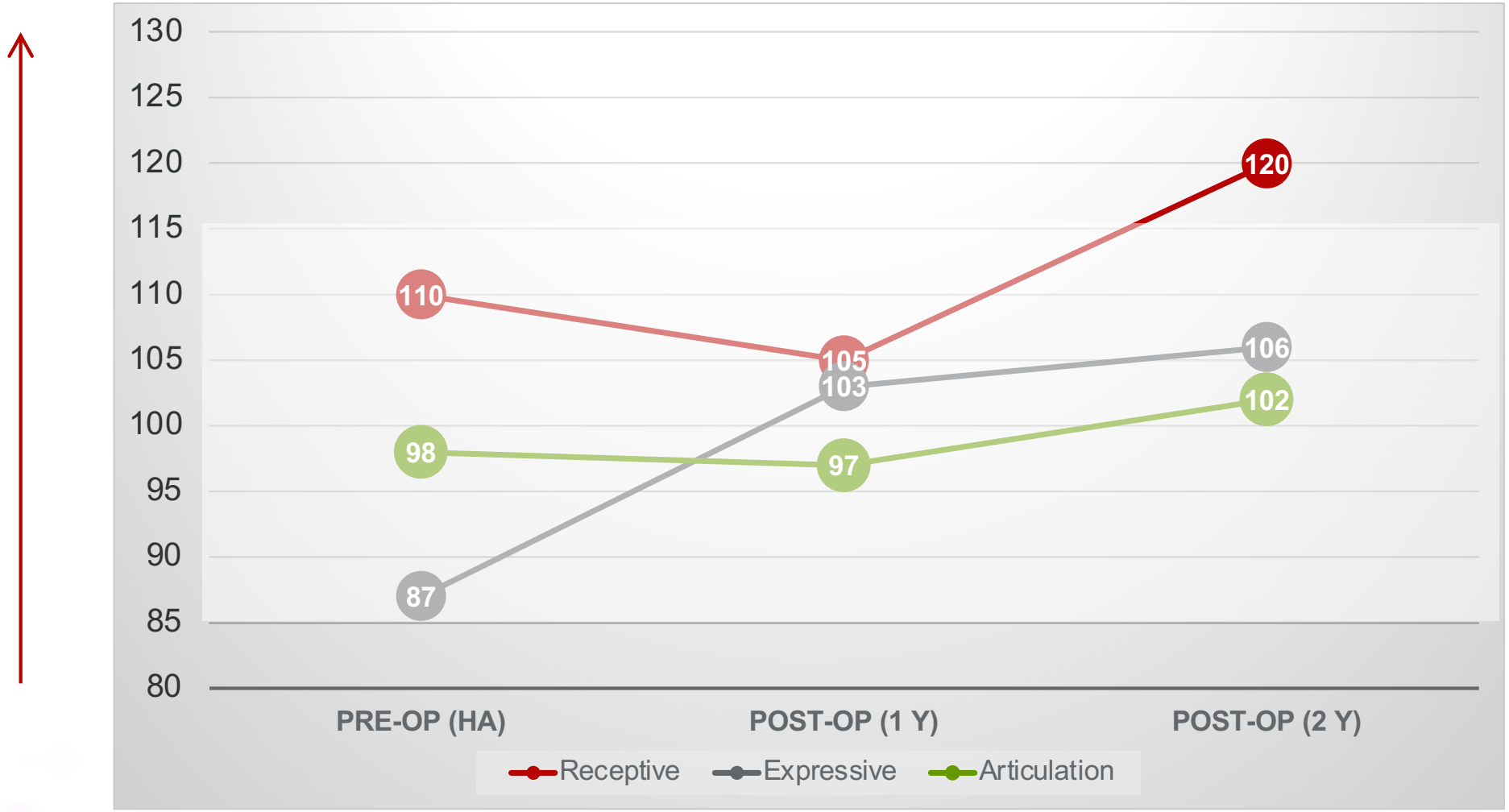


Communication Challenges

Communication Challenges

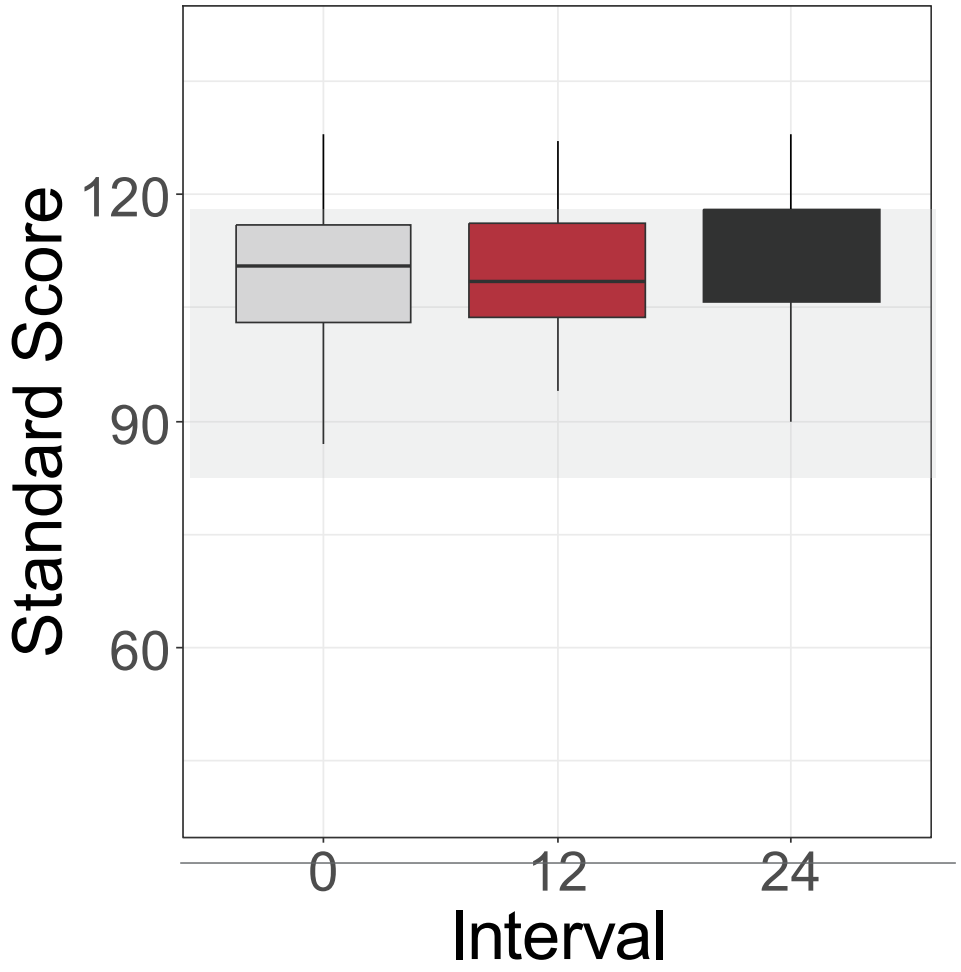
- Poorer language outcomes (Lieu, 2013; Lieu et al, 2010; Sangen, 2017)

Simon's Speech and Language



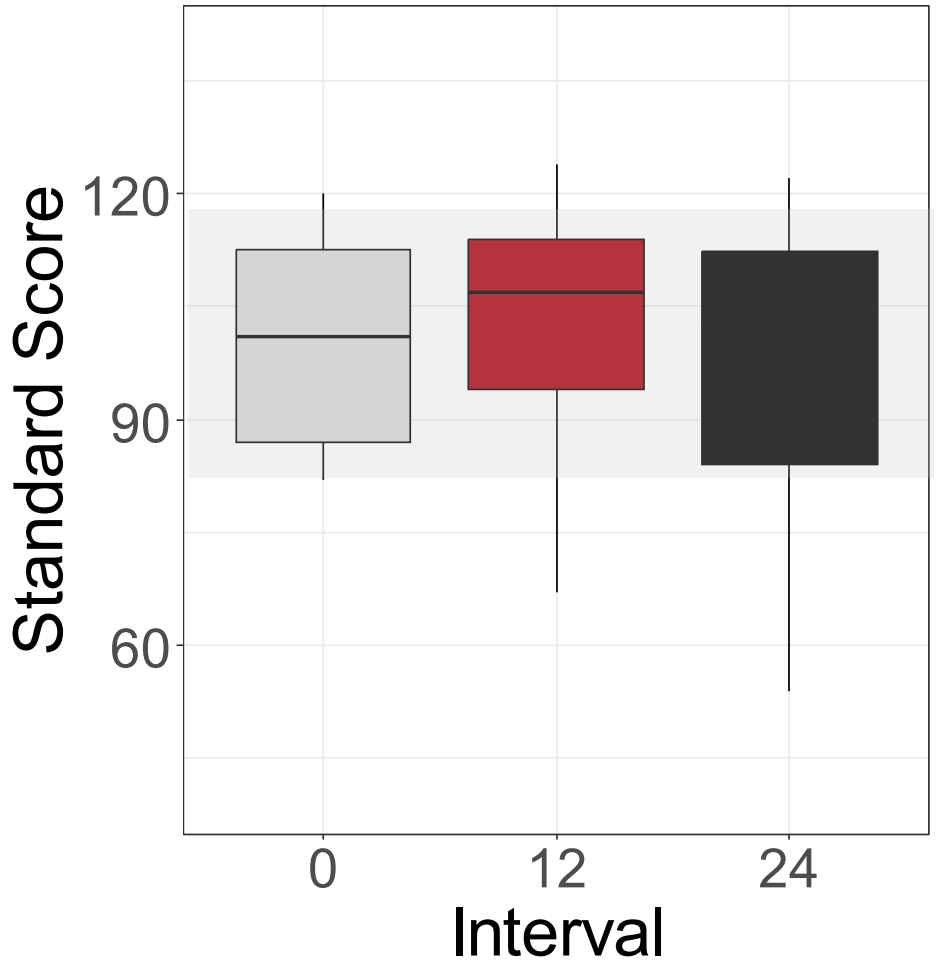
Clinical Trial Speech and Language

Expressive



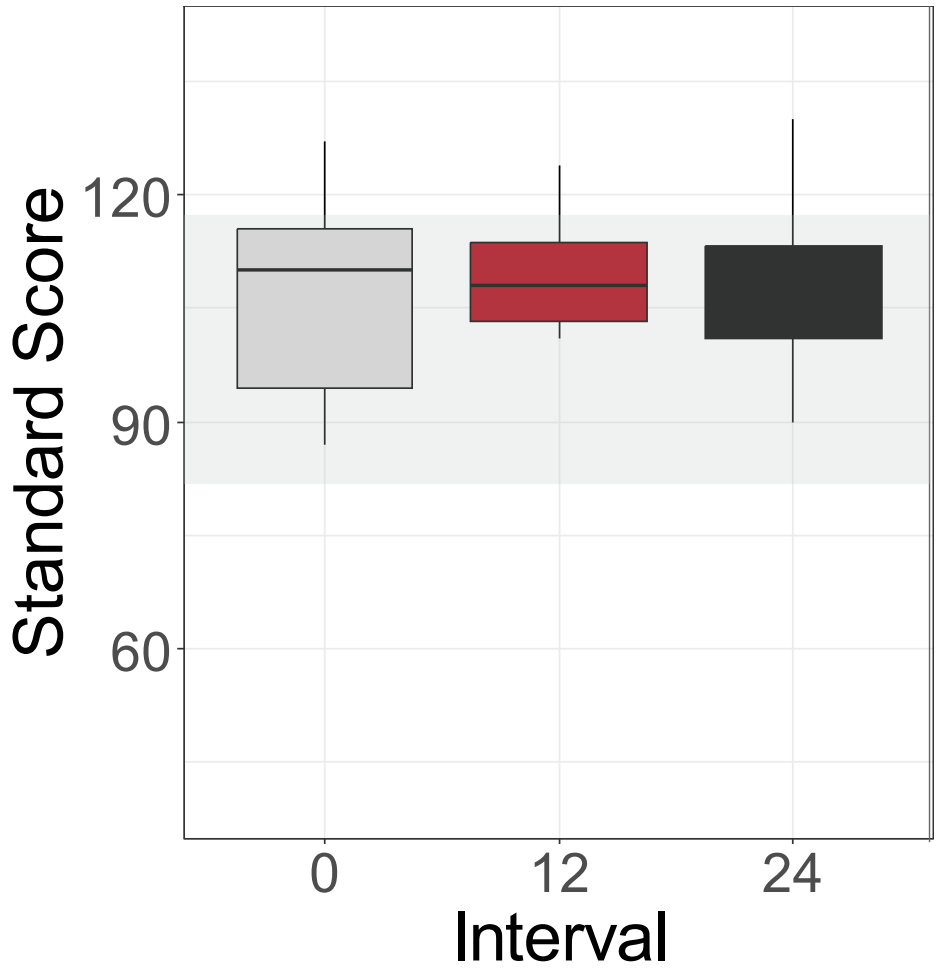
Clinical Trial Speech and Language

Receptive



Clinical Trial Speech and Language

Articulation



Quality of Life Challenges

- May impact higher level functions such as auditory attention, executive function, and sensory-motor control

- Cortical changes in children have been noted as a result of imbalanced auditory input

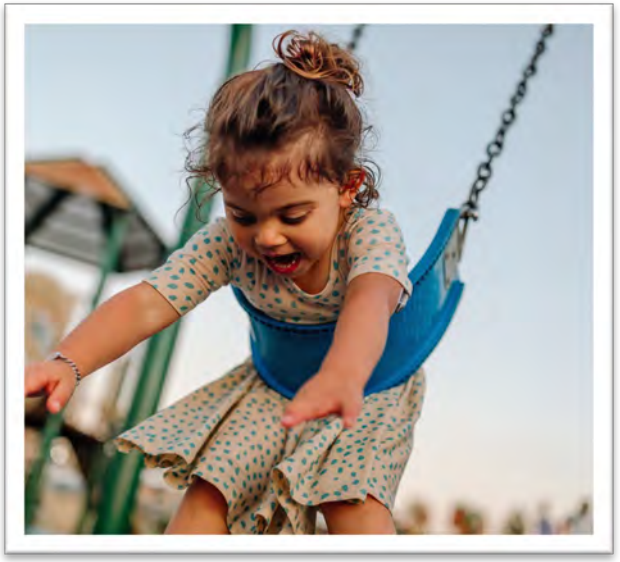
Educational Challenges

- Approximately 1/3 of children with UHL repeat a grade (Bess & Tharpe, 1984)
- 12-50% require additional educational support (Bess & Tharpe, 1984; Lieu et al, 2004; Lieu, 2018)

Educational Challenges

- Fare more poorly on cognitive measures (Fischer & Lieu, 2014; Lieu, 2013; Niedzielski, 2006; Purcell et al, 2016)
- Behavior concerns (Bess & Tharpe, 1984; Lieu, 2004; Tharpe, 2008)

- Etiology
- Cortical reorganization
- Treatable with a CI



Discussion and Questions?

Thank you for attending!

- Please remember to complete the exam after the event is over.
- The exam will be available 10-15 minutes after the conclusion of this event.
  - Log into your account
  - Go to pending courses
  - Choose take exam
  - For Live credit complete the exam within 7 days