

# Early Fitting of Amplification Best Practice Guidelines



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**BRITISH ACADEMY  
OF AUDIOLOGY**

Guy's and St Thomas'   
NHS Foundation Trust

Moeller,  
2000

- Significantly better language scores at age 5 are associated with early intervention

Sharma et  
al, 2002

- Auditory system maximally plastic in first 3.5 years. After age 7 plasticity is significantly reduced

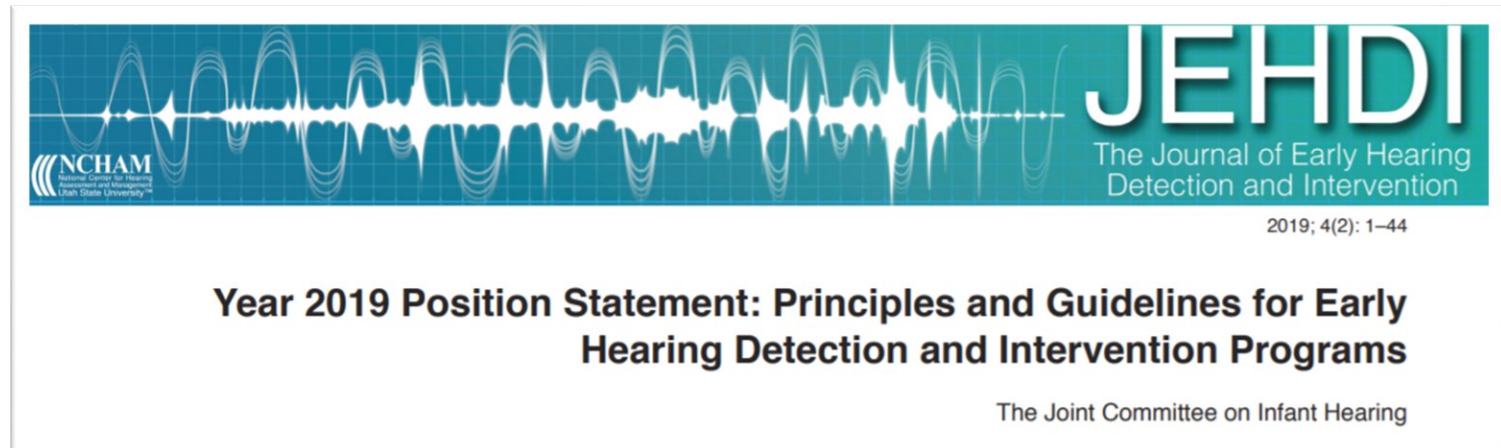
Tomblin et  
al, 2014

- Speech and language outcomes are improved when hearing aids are fitted early and fitted well – OCHL study

Ching et  
al, 2017

- Children with amplification introduced at 24 months had poorer language at age 5 than children with amplification introduced at 3 months – LOCHI study

# How early is early?



JCIH guidelines give a 1-3-6 benchmark

- Screening completed by 1 month
- Diagnosis by 3 months
- Early intervention by 6 months

Recommended programmes work towards 1-2-3 timeline

# How early is early?

Screening  
<1 week

Assessment  
started  
4-5 weeks

Assessment  
completed  
12-13 weeks

Hearing aid  
fitted  
16-17 weeks



# When to recommend hearing aids?

BSA early intervention guidelines:

*'Bilateral permanent hearing loss of  $\geq 40\text{dBHL}$ '*



So not mild or unilateral?

- Children with UHL demonstrate worse oral language scores than those with normal hearing (Lieu et al, 2010)
- Children with a mild hearing loss who use hearing aids full time score higher on grammar and vocabulary measures than non-users (Walker et al, 2015)
- Early hearing aid provision improves speech and language outcomes, including mild hearing loss (Tomblin et al, 2014)

# Stages of good early amplification

## Fitting

Audiogram  
Estimation

HA  
Selection

Prescription

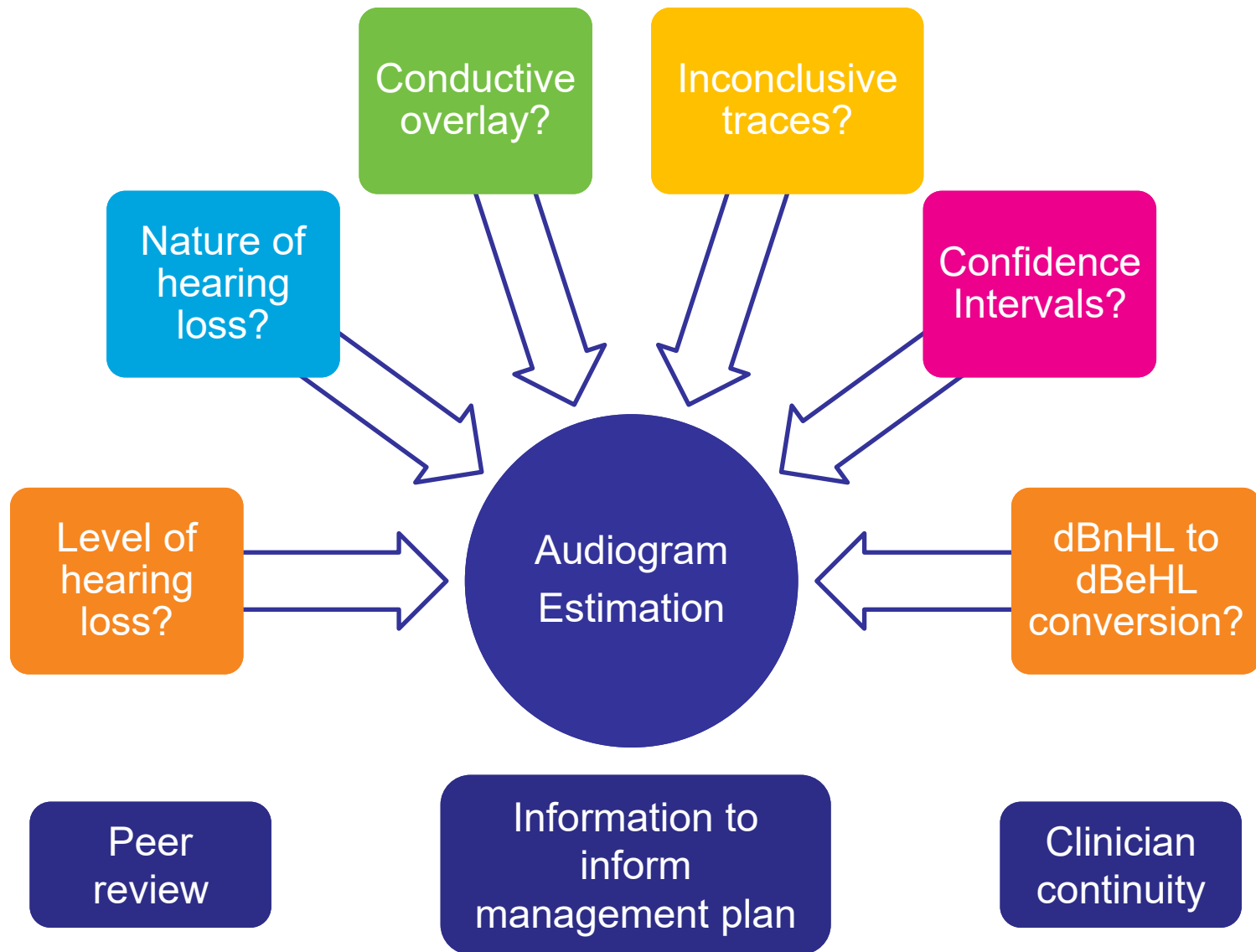
Verification



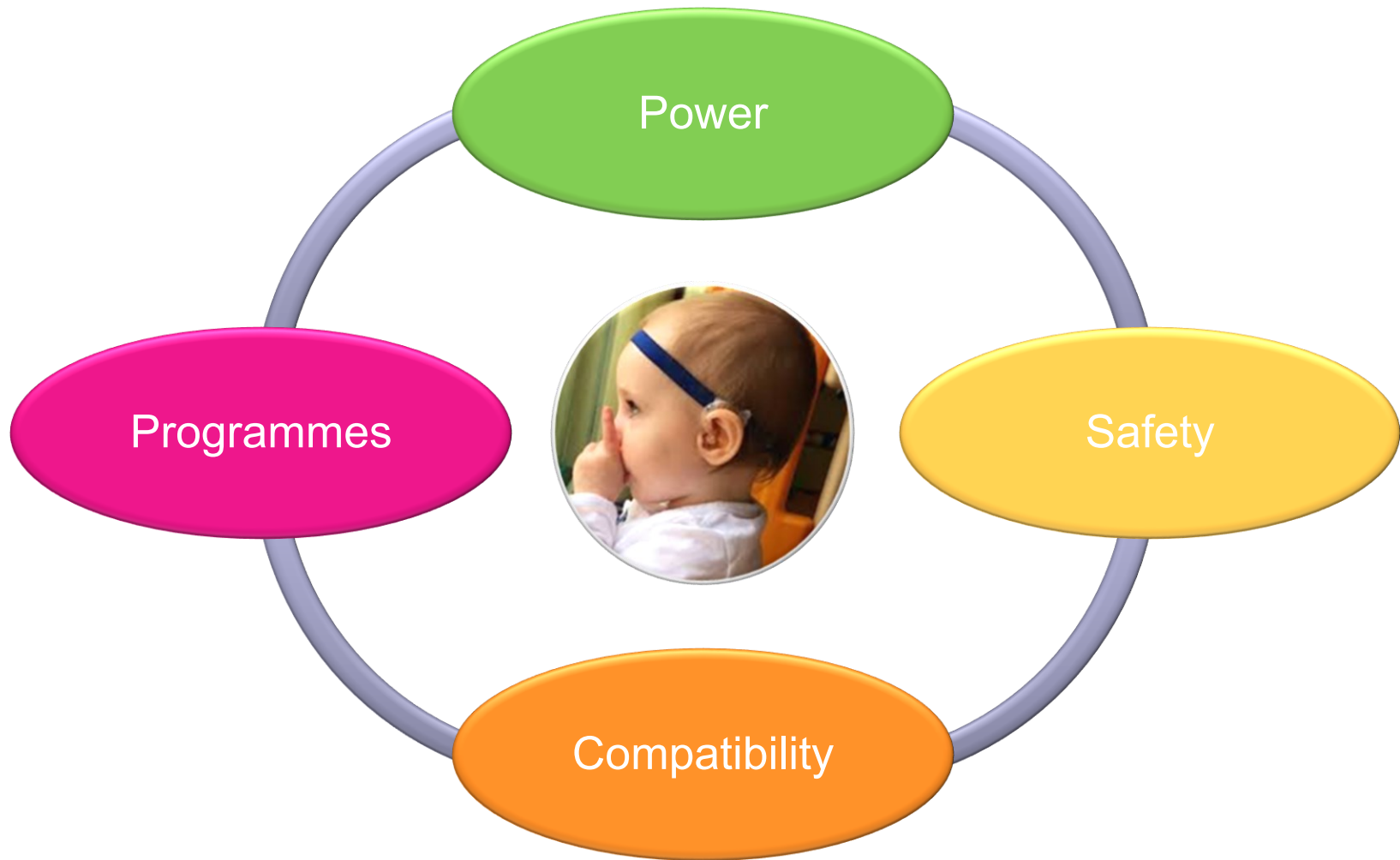
## Follow Up

Validation

Ongoing  
Review



# Which device do I consider?





# Why use a prescription formula?



Ensures consistent audibility and improvement in long term speech outcomes



Leads to more comfortable listening and improved speech quality and intelligibility



Recommended by NHSP 2014 and BSA 2018

# Which prescription do I use?

Most UK paediatric fittings will be to DSLv5

No significant difference in speech production, perception or language when compared to NAL-NL2

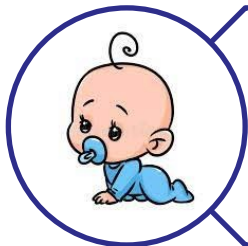
# Verification



Device centric measure of performance



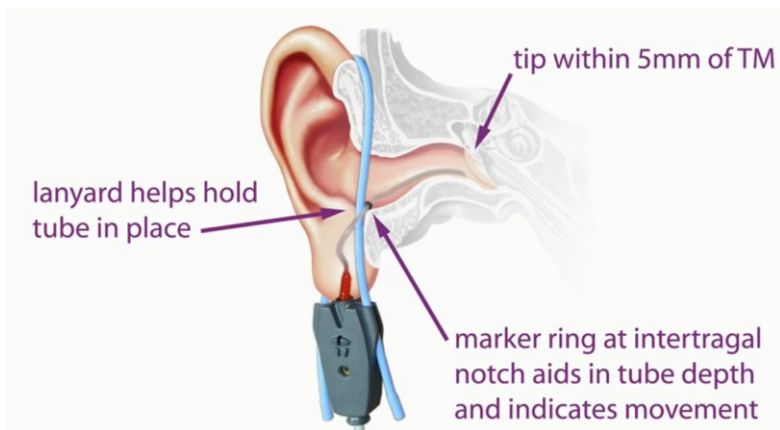
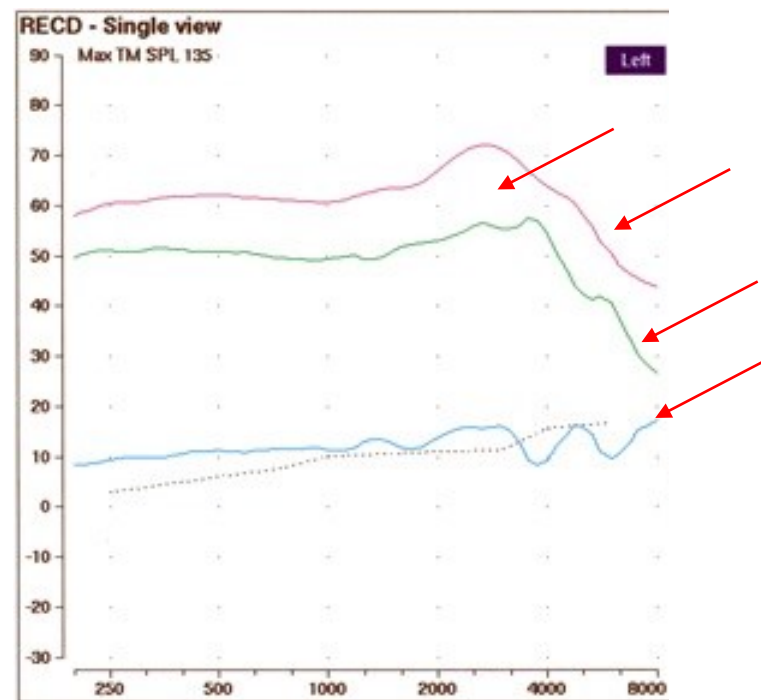
Performed in 2cc coupler in infants



RECD to account for small ECV

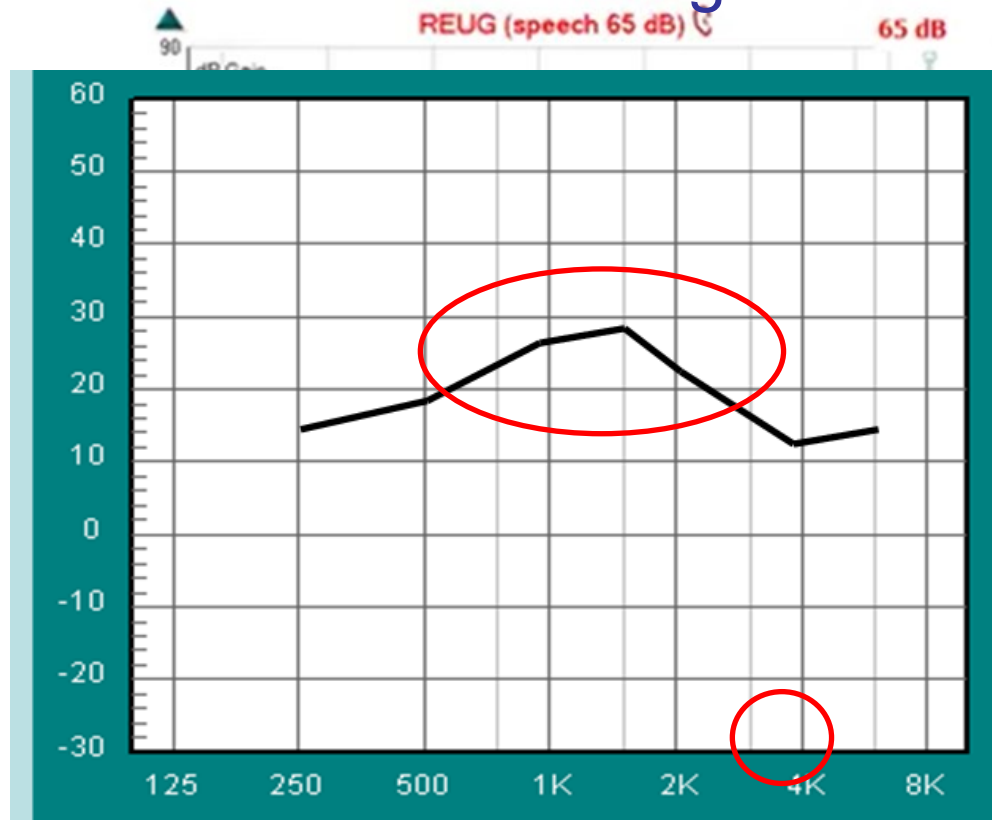


# RECD



# RECD

## Middle Ear Effusion



# Verification of frequency lowering



Ensure detection and discrimination of high frequency sounds /s/ and /sh/

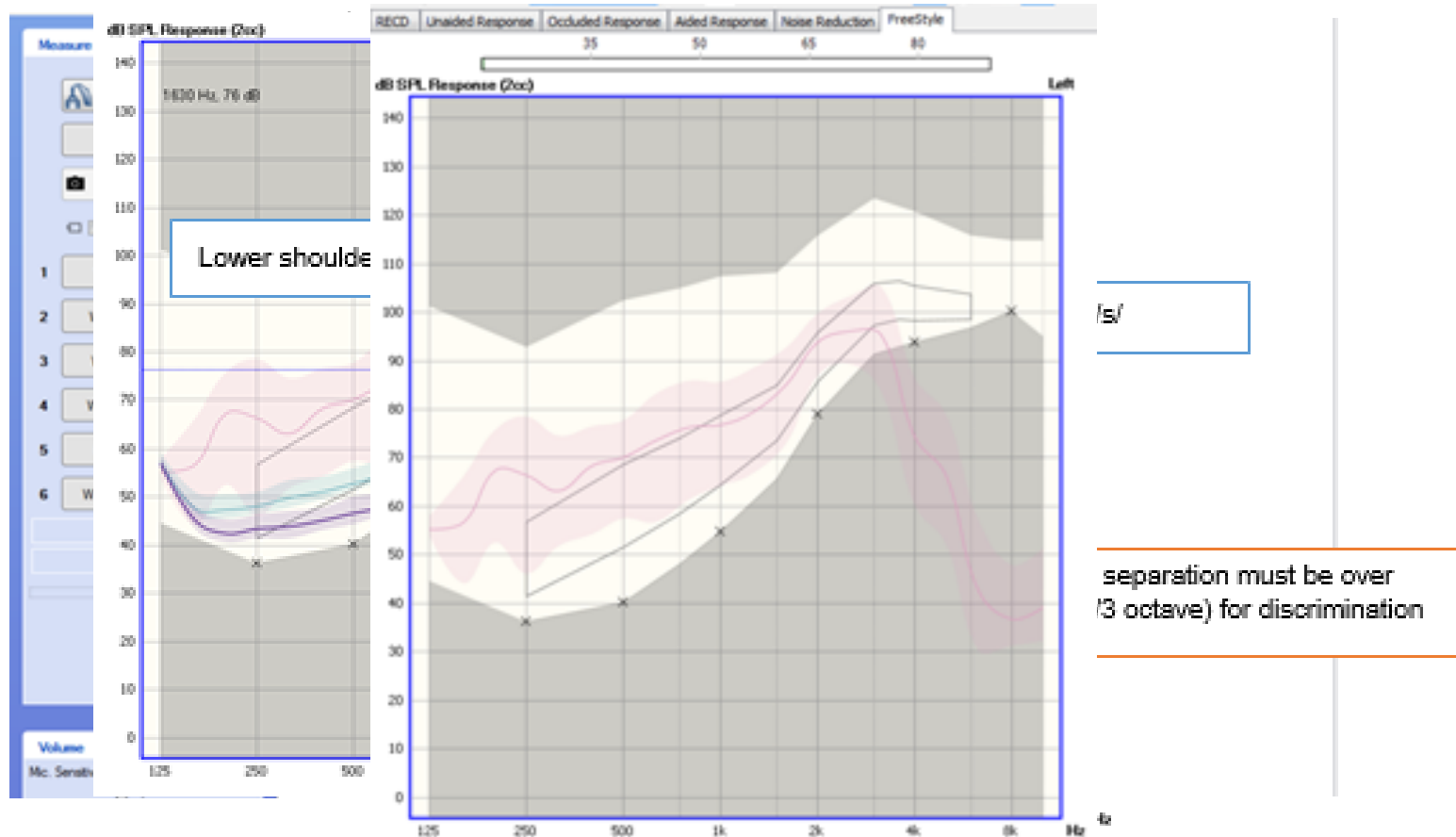


Higher frequencies are presented into a lower frequency region to become audible



UWO published speech stimuli to accurately assess now included in BSA practice guidance (2018)

# Verification of frequency lowering



# How long is long enough?

Wearing hearing aids more than 10 hours per day results in greater language growth (Tomblin et al, 2015)

Full-time HA users demonstrated significantly higher scores on vocabulary and grammar measures compared with nonusers (Walker et al, 2015)





# Validation

Person centric measure of success



Subjective

- Questionnaires
- Parental/ Professional reporting

Objective

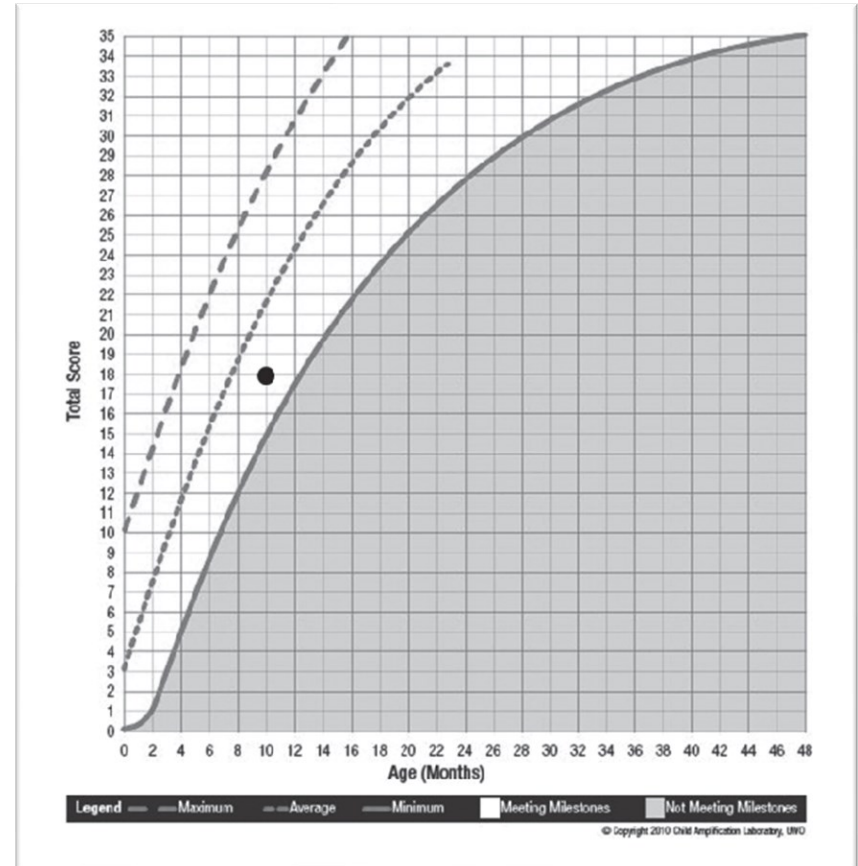
- SII
- Behavioural aided testing
- Aided auditory cortical testing

# Subjective Feedback

## Questionnaires

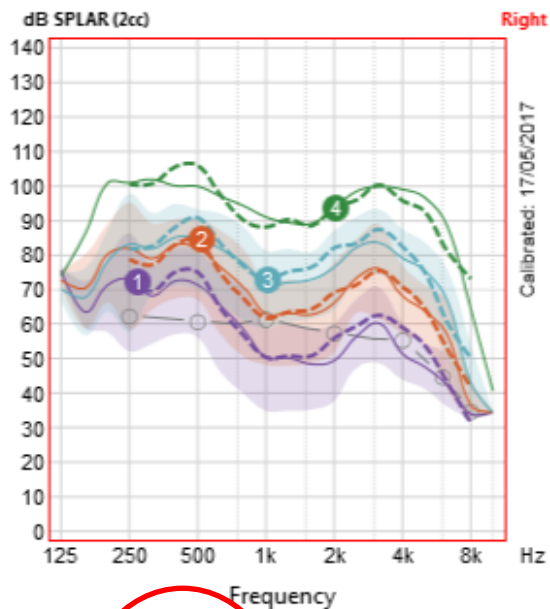
- LittleEARS
- PEACH
- TEACH

## Patient interview

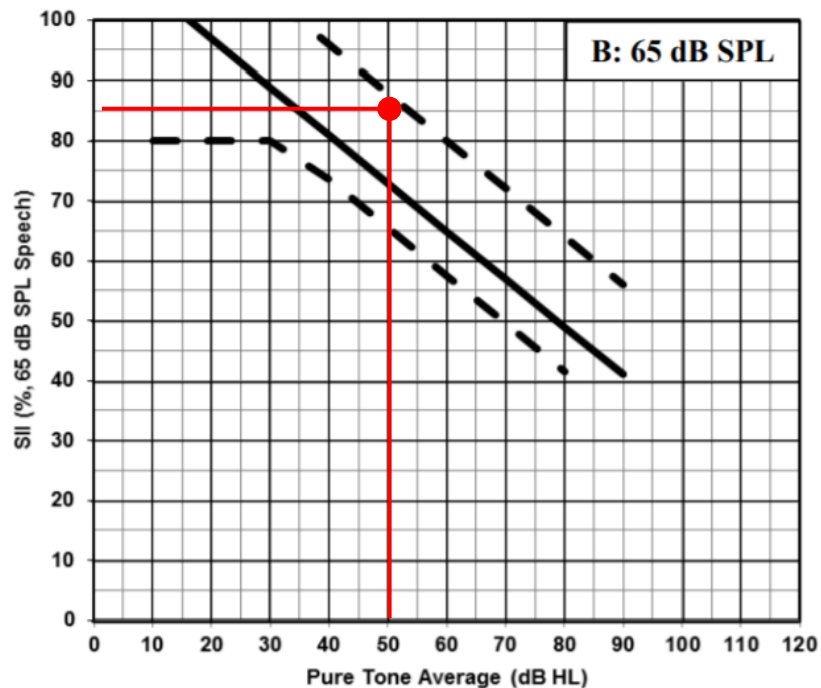


# Speech Intelligibility Index

RIGHT 15/06/2017 15:40



Legend, Right (2cc)		
1	SII: [55%]	DSL V5.0 - 50 (81) dB - ISTS Signal
2	SII: [85%]	DSL V5.0 - 65 (89) dB - ISTS Signal
3	SII: [83%]	DSL V5.0 - 80 (93) dB - ISTS Signal
4	SII: -	DSL V5.0 - 90 (N/A) dB - MPO Sign.
5		



# Aided testing

<7 months

- Behavioural Observation Audiometry
- CAEP

>7 months

- Aided VRA (NBN)
- LING detection
- LING discrimination

>24 months

- McCormick Toy Test
- Manchester Picture Test
- UWO Plurals
- Phoneme Perception Test

# Aided testing

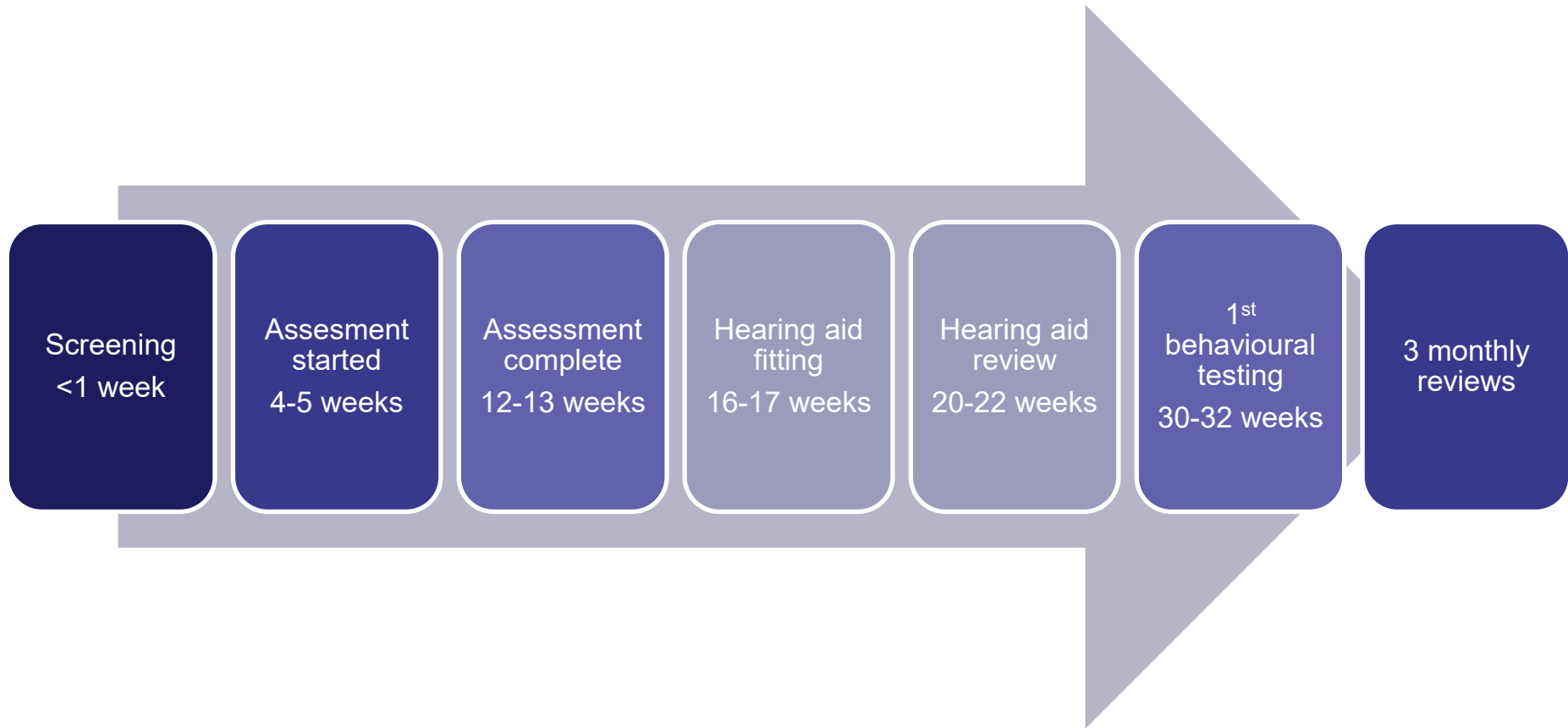


# Family centred care

Family-Centered Care is an approach to healthcare that recognizes the vital role that families play in audiological treatment and rehabilitation



# Beyond the first review



# References

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# Guidelines

BSA Guidelines for the early audiological assessment and management of babies referred from the Newborn Hearing Screening Programme: [https://www.thebsa.org.uk/wp-content/uploads/2014/08/NHSP\\_NeonateAssess\\_2014.pdf](https://www.thebsa.org.uk/wp-content/uploads/2014/08/NHSP_NeonateAssess_2014.pdf)

BSA Guidance on the verification of hearing devices using probe microphone measurements: <https://www.thebsa.org.uk/wp-content/uploads/2018/05/REMS-2018.pdf>

Newborn hearing screening programme standards valid for data collected from 1 April 2018: <https://www.gov.uk/government/publications/newborn-hearing-screening-programme-quality-standards/newborn-hearing-screening-programme-standards-2018-to-2019>

NHSP Guidelines for Fitting Hearing Aids to Young Infants: [http://www.wales.nhs.uk/sitesplus/documents/980/Infant%20HA%20Fitting%20guidelines%20v2%20FINAL\\_Feb%202014.pdf](http://www.wales.nhs.uk/sitesplus/documents/980/Infant%20HA%20Fitting%20guidelines%20v2%20FINAL_Feb%202014.pdf)

UWO Paediatric Audiology Monitoring Protocol: [https://www.dslio.com/?page\\_id=283](https://www.dslio.com/?page_id=283)

Thank you for listening

Any Questions?

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