Objectiveness and Effectiveness of CI AP Programs for Young Children Generated from eSRT’s.

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Objective fitting methods preferred for young CI users

– Unable to provide satisfactory feedback on loudness
– Often cannot perform or sustain performance to stimuli
– Clinician maybe dependent on BO – stilling, smiling, discomfort, aeropalpable reflex (APR)
– Objective measures are usually FAST and RELIABLE
– Collection of definitive data means fewer follow up fitting sessions are required
– CI clinics have heavy load – more CI users, BiCl’s
MCL’s can be objectively set at electrically elicited stapedius reflex threshold level (eSRT)

- Because of high correlation between eSRT and behavioural MCL ($r = 0.9$ [1])
- Because of high incidence of ESR in ped population 63 -83% (2)
- Threshold (THR) can be set at 10% of MCL
- eSR’s can be elicited to live voice once a program is activated to check ‘loudness’ of the generated program, small global MCL changes may ensue.

Objectives of study

1. Identify inter rater reliability between MCL set by 2 different audiologists based on eSRT measures

2. Outline the time required to measure eSRT’s on each active electrode

3. Describe the auditory performance of new CI users with eSRT based AP programs using cortical assessment.
Method

- **N** = 10

- **Inclusion criteria:**
  MED-EL CI before age 36 months
  Up to 4 months CI experience
  Routinely programmed using **eSRT fitting method**
  Routinely assessed using automated **cortical testing**

- **P1 responses to speech stimuli** /M/, /G/, /T/, presented at 55 dBSPL checked (access to quiet conversational speech)

  **Responses scored,** 1 point for a P1, further point for P1 within reference range. Total possible score = 6

Method continued....

- At one ‘early’ programming session MCL set at eSRT level by first audiologist then by 2nd ‘blinded’ audiologist
- Time taken to establish eSRT on each active electrode and perform ‘live voice’ eSRT recorded
- State of child during eSRT measures recorded
- Inter-rater reliability assessed by 2 way absolute agreement, average-measures, interclass correlation (ICC)
Results: Inter-rater reliability

- ICCs on each electrode all in excellent range (Cicchetti, 1994) .818 to .985
- Values indicate a high degree of agreement between testers.
Results: Time to measure eSRT and state of child

- Mean time to measure eSRT on each active electrode was **10.45 minutes**. Range 4-21 minutes
- **16/20** eSRT measures made while child was **awake and restful**
- **1/20** eSRT measures made during **natural sleep**
- **3/20** eSRT measures made while child **restless**
Results: Cortical responses to speech tokens /M/, /G/, /T/, presented at 55 dBSPL

- Usually CI users have a P1 to /G/ and /T/ after switch on with long latency
- Most children at 1-3 m post CI have P1’s to /G/ and /T/ within reference range
- Most CI users by 4m post CI have P1’s to /M/,/G/, /T/ latency of /M/ response sometimes remains long

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<th>Cl user</th>
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Changes in P1 responses over short time

EA: Cortical responses, 1 day post switch on 2 ACA points

EA: Cortical responses, 4 weeks post switch on 5 ACA points
Conclusions

- High inter-rater reliability demonstrates **objectivity** of eSR. MCL’s set by different clinicians are similar
- **Short time** required to measure eSRT’s makes this a viable measure for use in busy CI clinics
- eSRT based AP programs **access users to quiet conversational speech**
- eSRT based AP programs **allow for auditory maturity**, Demonstrated by shortening of P1 latencies within 1-4 m