The nature of listening environments during cochlear implant use varies with children’s ages

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Disclosures

- Dr. BC Papsin is a speaker for Cochlear Corporation
Ease of understanding speech and listening fatigue are largely dependent on environment acoustics

Children with hearing loss experience higher levels of fatigue

(Bess & Hornsby, 2014; Hornsby et al., 2014; Gustafson et al., 2013)

http://www.ndcs.org.uk/family_support/education_for_deaf_children/education_during_school_years/tiredness.html
Objectives

- Investigate environment acoustics of children during their all-day CI use
- Evaluate how environment acoustics vary with age
SCAN (datalogging): monitor listening environments during all-day CI use
SCAN (datalogging): monitor intensity levels in the environment

Example of a 10-year-old child

Intensity (dB A)

- >80
- <40
- 40-49
- 60-69
- 70-79
- 50-59
SCAN (datalogging): monitor sound types in the environment

Example of a 10-year-old child

Sound type

- “Noise”
- “Wind”
- “Music”
- “Speech-in-Noise”
- “Quiet”
- “Speech”
Hypothesis

- Environment acoustics will vary with age
Study sample

146 children

One CI
- Unilateral (n=5)
- Bimodal (n=40)

Two CIs
- Simultaneously implanted (n=77)
- Sequentially implanted (n=24)
Consistent CI use is observed in many children

Average daily CI use = 9.9 ± 3.4 hours/day (range: 0.2 - 16.7)

93 of 146 (~64%) of children used their CIs for >9 hours/day
Most environments are at moderate intensity levels

Easwar et al., accepted
Types of sound exposure vary by age

Easwar et al., accepted
Exposure to speech varies by age

Easwar et al., accepted
Children listen to speech in a noisy environment most often

Easwar et al., accepted
Summary & Conclusions:

- Children are exposed to moderately loud sounds throughout the day and types of sounds vary by age.
- Children are most often listening to speech in a noisy environment.
- Emphasizes the need for improved access to speech in noise beyond the classroom.
- SCAN (datalogging) is a clinically useful tool to quantify environmental factors affecting CI performance on an individual basis.
Thank you to all of our participants
References:


