

Performance of non-surgical transcutaneous bone conduction hearing devices

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Objectives: This study aims to investigate:

- Within-subject comparison of thresholds using an audiometric bone oscillator and various bone conduction hearing devices (BCHD) that offer in-situ assessment;
- Non-surgical transcutaneous BCHD default force level output compared to recommended DSL BC targets; and
- The preferred listening levels of adults with simulated conductive hearing loss wearing non-surgical transcutaneous BCHDs.

Background: Bone conduction hearing devices (BCHD) on soft headbands are suitable for individuals who have conductive or mixed hearing losses and are often used with children who are too young to undergo surgical placement of a similar device. Unfortunately, evidence-based clinical protocols for fitting these devices is limited and only behavioural measures are used to verify the BCHDs.

Methods: An initial step is obtaining bone conduction hearing thresholds through in-situ and the audiometric bone oscillator. Twenty-five normal hearing young adults will be recruited and a bilateral conductive hearing loss will be simulated with earplugs. In-situ thresholds will be used to fit a variety of non-surgical transcutaneous BCHDs. Force level outputs will be measured using a clinical skull simulator and compared to Desired Sensation Level (DSL) BC targets. Suprathreshold measures will also be conducted. No conflicts of interest. Work supported by Western Faculty Research Development Fund.

Results: Measures of preference will be compared across devices and force-level outputs will be compared to DSL targets. Results will provide information about the suitability of using the current DSL BC targets with transcutaneous fittings as well as information about bandwidth and dynamic range of a variety of devices.

Conclusions: Given the evolution of clinical tools for objectively fitting BCHDs, this work will provide evidence for the development of fitting protocols for these devices. It is hoped that this work will highlight next steps for research with infants with hearing loss who wear non-surgical BCHDs.