

Abstracts – MEMRO 2006, Zurich July 27–30, 2006

4th International Symposium on Middle Ear Mechanics in Research and Otology

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Bone conduction and air conduction hearing comparison

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Purpose: Many subjects who wear a BAHA or use bone conduction describe the sound as being tinny. This could be due to filtering of the skull or the BAHA transducer. The fine frequency response of BAHA bone conduction and air conduction have not been compared in the same subjects. Methods: A fine frequency audiogram in 100 Hz steps was performed in 5 subjects, from 200 to 8kHz using headphones. This was then repeated using a BAHA headband. The fine frequency response of these subjects for the two modalities was compared after normalizing for force output of the transducer and the earphones. Test-retest experiments were performed on two subjects to ensure stability of responses. Results: The bone conduction transducer (BAHA) had a poor low frequency response compared to the headphones. Once corrected for, the fine frequency responses of air and bone conduction were very similar, with no signs of narrow resonance peaks in either. Conclusions: The tinny sound quality experienced by BAHA users is probably due to the poor low frequency response of bone conduction with this device. Otherwise, air conduction and bone conduction have similar fine frequency hearing responses.