Feasibility of high frequency bone conduction thresholds for up to 16 kHz using the Westra KLH96 bone conduction transducer

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Background, Standard diagnostic audiometry tests include measurements of the hearing threshold for air conduction (AC) up to 8000 Hz, and bone conduction (BC) measurements up to 4 kHz. Thresholds for higher frequencies i.e. 8 kHz to 16 kHz, can be measured using air conduction; however possible (temporary) conductive hearing losses can influence these measurement results. This is unfortunate because the thresholds at high frequencies can be of special interest in certain specific hearing losses e.g. ototoxicity. **Material and Methods**, We have calibrated and characterized three different types of BC transducers; the standard B71 (Radioear), and for the high frequencies; the discontinued KH 70 (Präcitronic) and the KLH 96 (Westra) using an artificial mastoid (Bruel & Kjaer 4930). For these BC transducers the frequency response was measured. The distortion at all octave frequencies has been determined using at 5 dB loudness increments from 0 dB HL to the maximum output of the transducer. We will perform hearing threshold measurements on 60 ears of 30 healthy hearing subjects (aged 18 to 29 years). For each test subject pure tone thresholds are obtained from 125 Hz to 16 kHz using AC transducers (Sennheiser HDA200). The BC, pure tone thresholds are obtained from 250 Hz to 8 kHz for the B71 transducer, and from 250 Hz to 16 kHz for the KLH 96 and KH 70 transducers. The obtained thresholds are compared between AC and BC transducers, from 250 Hz to 16 kHz. Influence of the transducer placement is investigated by purposefully repositioning the transducer and comparing the pure tone thresholds. **Results**, The KLH 96 shows highest output characteristics for the high frequencies (from approximately 5 up to 16 kHz) and distortion measurements are not significantly different to the B71 and KH 70. Our preliminary test results with 22 subjects show that measurements at high frequencies (>4 kHz) are possible using the KLH96 and KH70 bone conductors with reasonable accuracy. Re-positioning the transducer increases the standard deviation of the measurements to approximately 5 dB above 10 kHz. **Conclusion**, Our preliminary results show that measurements at high frequencies (>4 kHz) are possible using the KLH96 and KH70 bone conductors. Technical comparison of the KH 70 and the KLH 96 shows a larger output in the frequencies above 5 kHz for the KLH 96.