

Predicting high-frequency hearing loss with click-evoked otoacoustic emissions.

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While clinical click-evoked otoacoustic emission (CEOAE) test procedures are limited to about 5 kHz, an alternative CEOAE procedure with reduced artifact allows measurement up to 16 kHz in young adults (Goodman et al., ARO, 2006). The current study assessed test performance in predicting the presence or absence of hearing loss in 385 ears (14-85 yrs.). CEOAEs from 0.5 to 16 kHz were measured using an Etymotic ER10B+ probe and custom software. Behavioral threshold was determined using a yes-no task based on maximum-likelihood adaptive procedures. Hearing status at each frequency was predicted using the CEOAE signal-to-noise ratio (SNR) in a third octave centered at the same frequency. Test performance using the nonparametric area under the receiver operating characteristic curve (AROC) was assessed at 0.5-4 kHz octaves, and 4-16 kHz third octaves. For frequencies between 2-8 kHz, AROC was at least 0.90. The AROC was 0.87 at 1 kHz and 0.86 at 10.1 kHz, with poorer performance at 0.5, 12.7 and 16 kHz. Research continues on using alternative time windows to improve the CEOAE SNR, and on assessing test-retest repeatability of CEOAE and audiometry measurements. Results have potential clinical significance in predicting hearing status from 1-10 kHz using a single CEOAE test.

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