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Effect of amplification on the intelligibility of speech in hearing impaired children with and without dead regions in the cochlea

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Adults with high-frequency (HF) sensorineural hearing impairment with and without dead regions (DRs) in the cochlea differ in benefit from amplification of speech presented in quiet [Vickers et al., *J. Acoust. Soc. Am.* 110, 1164-1175 (2001)]. Subjects with HF DRs showed no improvement in speech intelligibility when spectral components of the speech above about 1.7 times the edge frequency of the DR were amplified according to a hearing-aid prescription formula while performance of those without DRs showed improvement with addition of amplified frequency components up to 7.5 kHz. In the present study we tested a group of six children (8-12 years old) who were experienced hearing-aid users with moderate-to-severe sensorineural hearing impairment. The presence of DRs was diagnosed using the TEN(HL) test and "fast" psychophysical tuning curves. Four children showed evidence for DRs (two unilateral and two bilateral). The vowel-consonant-vowel stimuli (65-dB SPL) were subjected to the frequency-gain characteristic prescribed by the DSL prescription formula then low-pass filtered with various cutoff frequencies and presented via headphones. The results showed that in ears with or without DRs the performance improved with increasing cutoff frequency up to 7.5 kHz.