

## **Aided cortical response, speech production, perception and functional performance of children using conventional amplification or nonlinear frequency compression**

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**Aim:** The aim of this study was to compare children's performance with conventional processing or nonlinear frequency compression in hearing aids.

**Methodology:** Sixty-four children aged between 2 and 7 years with bilateral hearing aids were recruited. Evaluations of cortical responses, speech production, speech perception and functional performance were completed with the children wearing their personal hearing aids with conventional processing. The children were then refitted with new hearing aids with NLFC. Following a 6 week trial, the subjects were evaluated again while using their hearing aids with NLFC activated.

**Results:** Comparing the pre- and post-fitting performance showed that the mean speech intelligibility rating and the number of cortical responses present for /s/ were significantly higher when children were amplified with NLFC technology than with conventional processing ( $p < 0.05$ ). Parents judged the children's functional real life performance with the NLFC hearing aids to be similar or better than that with the children's own hearing aids in both quiet and noisy situations. No other significant differences were found. An overall figure of merit (FOM), calculated by averaging the standardized difference scores between processing schemes for all measures revealed that, on average, an advantage for NLFC processing was associated with poorer hearing at 4 kHz.

**Conclusion:** Compared to conventional processing, the use of NLFC resulted in a higher number of cortical responses present for /s/ and higher parental ratings of children's real-life performance.

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