

## Cochlear Implantation in Young Children with Single Sided Deafness: Characteristics and Early Data

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**Introduction:** Treating children with substantial unilateral hearing loss (UHL) is typically limited to rerouting of signals to the better hearing ear. An ongoing clinical trial is evaluating whether young children with UHL experience an improvement in speech perception, localization, and quality of life (QOL) with cochlear implant (CI) use. The present report will review pre-operative findings and early outcome data.

**Methods:** Children between 3.5-6.5 years with moderate to profound UHL were enrolled. The pre-operative test battery included pediatric and parental QOL questionnaires, speech perception, and localization assessment. These measures were repeated post-activation and localization testing was carried out with and without the CI.

**Results:** Pre-operatively, subjects reported greater cognitive and general fatigue than their parents reported perceiving. Improvements in speech perception, localization, and QOL were demonstrated as early as 3 months post-activation.

**Conclusion:** Children with UHL tend to perceive greater difficulty with fatigue than their parents' rankings would suggest. Early data suggests that CI use in children with substantial UHL provides improvements in speech perception, localization, and QOL, even within the early months of device use.

**Disclosure:** Cochlear implantation in children with single sided deafness is not approved by the FDA. Dr. Kevin Brown has received an Investigative Device Exemption (IDE) for this study. This study is supported by MED-EL Corporation.

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## References:

Anne S, Lieu JEC, Cohen MS (2017). Speech and Language Consequences of Unilateral Hearing Loss: A Systematic Review. *Otolaryngol Head Neck Surg*, 157(4): 572-579.

Bess FH, Tharpe AM (1988). Performance and management of children with unilateral sensorineural hearing loss. *Scand Audiol Suppl*, 30: 75-9

Bess FH, Tharpe AM, Gibler AM (1986). Auditory performance of children with unilateral sensorineural hearing loss. *Ear Hear*, 7(1): 20-6.

Bosman AJ, Hol MK, Snik AF, Mylanus EA, Cremers CW (2003). Bone-anchored hearing aids in unilateral inner ear deafness. *Acta Otolaryngol*, 123(2): 258-260.

Hol MK, Kunst SJ, Snik AF, Cremers CW. Pilot study on the effectiveness of the conventional CROS, the transcranial CROS and the BAHA transcranial CROS in adults with unilateral inner ear deafness (2009). *Eur Arch Otorhinolaryngol*, 267(6): 889-896.

Kunst SJ, Leijendeckers JM, Mylanus EA, Hol MK, Snik AF, Cremers CW (2008). Bone-anchored hearing aid system application for unilateral congenital conductive hearing impairment: audiometric results. *Otol Neurotol*, 29(1): 2-7.

Lieu JE, Tye-Murray N, Karzon RK, Piccirillo JF (2010). Unilateral hearing loss is associated with worse speech-language scores in children. *Pediatrics*, 125(6): 2009-2448.

Lieu JE (2013). Unilateral hearing loss in children: speech-language and school performance. *B-ENT, Suppl 21*: 107-115.

Reeder RM, Cadieux J, Firszt JB (2015). Quantification of speech-in-noise and sound localisation abilities in children with unilateral hearing loss and comparison to normal hearing peers. *Audiol Neurotol*, 20 Suppl 1: 31-37.

Sangen A, Royackers L, Desloovere C, Wouters J, van Wieringen A (2017). Single-sided deafness affects language and auditory development - a case-control study. *Clin Otolaryngol*. 42(5): 979-987.

Van Deun L, van Wieringen A, Van den Bogaert T, Scherf F, Offeciers FE, Van de Heyning PH, Desloovere C, Dhooge IJ, Deggouj N, De Raeve L, Wouters J (2009). Sound localization, sound lateralization, and binaural masking level differences in young children with normal hearing. *Ear Hear*, 30(2): 178-190.

Wazen JJ, Ghossaini SN, Spitzer JB, Kuller M (2005). Localization by unilateral BAHA users. *Otolaryngol Head Neck Surg*, 132(6): 928-932.