

Best Evidence Statement (BEST)

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Topic: Effects of Amplification on Quality of Life Among School Age Children with Single Sided Deafness

Clinical Question

- P:** Among school age children with single sided deafness
I: does amplification bone conduction hearing aids
C: versus no amplification
O: improve quality of life (QoL)

Definitions:

Amplification:

For the purpose of this study, amplification is defined as: Contralateral routing of Signal (CROS), bone anchored hearing aid (BAHA), bone conduction hearing aids (Transcranial aid).

Quality of Life:

For the purpose of this project, QoL is defined as the core dimensions of); physical functioning, emotional functioning, social functioning, and school functioning.

Other important indicators of QoL in the pediatric population with SSD include hearing in noise, localization, ease of listening and communicating, communication intent and behavior, nature of interpersonal relationships and involvement in recreational activities.

Target Population

- School age children (ages 7-18 years) with single sided deafness.
- Children with additional learning disabilities are excluded.

Recommendation

It is recommended that for children with single sided deafness (SSD) amplification be offered (*Hol, 2010 [3b], Christensen, 2010 [4a], House 2010 [3a]*).

Note 1: Selected educational and family outcomes are important to monitor when amplification is used or if a decision is made not to provide amplification (*McKay 2010 [5a]*).

Note 2: Utilize Quality of Life measurements with any child identified with SSD and their families (*Borton 2010 [3a]*).

Note 3: Educate parents/families and the child on the impact of single sided deafness regarding the potential effects of the hearing loss, current amplification options, costs, and realistic expectations about the devices may increase their ability to make informed an decision regarding interventions (*Borton, 2010 [3a], McKay 2010 [5a]*).

Discussion/summary of evidence

A review of the current literature suggests that amplification versus no amplification improves quality of life and therefore offered as a part of care (House, 2010 [4b], Hol, 2009 [3b], Yuen, 2009 [3a], Linstrom 2009 [3a], Christensen, 2010, [4a]). Two of the most commonly reported challenges for patients with SSD are the ability to localize sound and speech understanding in noise (Bess, 1986 [5a]). Therefore, most research studies have been designed to measure benefit with amplification in these two conditions, and failed to consistently show improvement in both (Hol, 2009 [3b], Hol, 2005 [3a], Linstrom, 2009 [3a]). Quality of life measures for adults, however, have consistently shown benefit in the following conditions: listening in background noise, ease of communication and listening in reverberant conditions (House, 2010 [4b], Hol, 2009 [3b], Yuen, 2009 [3a], Newman, 2008 [3b], Linstrom, 2009 [3a]). The studies evaluating children with SSD (Christensen, 2010 [4a], Christensen, 2008, [4b]) as well as studies involving children with unilateral hearing loss (UHL), (Borton, 2008 [3a], Wendorf, 2010, [3a]) suggest that functional outcome measures such as the CHILD, LIFE and a questionnaire by McKay (2002), indicate improvement in quality of life with amplification. These findings suggest that more consistent test protocols utilizing quality of life measures are necessary to gather information on the effects of amplification for children with SSD.

Health Benefits, Side Effects and Risks

The primary risk of amplification is dependent upon the amplification device chosen. Amplification options are divided into surgical and nonsurgical options.

The most common surgical option is the Bone Anchored Hearing Aid (BAHA) which includes the general risks involved in surgical procedures, such as anesthesia and infection as well as the potential failure of the device to integrate with the bone. Another consideration is the high cost of the surgical procedure compared to the outcome benefits. The appearance of the device has also been a concern reported by some patients.

The nonsurgical options include cross routing of signal hearing aids (CROS aids) and bone conduction hearing aids (the TransEar and Transcranial CROS in-the-ear hearing aids). The cost of the device is a consideration as most hearing aids are not covered by insurance companies. The appearance of these devices has also been expressed as a concern by some patients and their parents.

Common to all amplification devices is the time and effort to manage the hearing devices and the possibility that some children may have difficulty appropriately managing their devices, depending on their dexterity and developmental skills.

References (evidence grade in []; see Table of Evidence Levels following references)

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Note: Full tables of evidence grading system available in separate document:

- [Grading a Body of Evidence to Answer a Clinical Question](#)
- [Judging the Strength of a Recommendation](#) (abbreviated table below)

Table of Evidence Levels (see note above)

<i>Quality level</i>	<i>Definition</i>
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5 or 5a or 5b	Other: General review, expert opinion, case report, consensus report, or guideline

†a = good quality study; b = lesser quality study

Table of Recommendation Strength (see note above)

Strength	Definition
“Strongly recommended”	There is consensus that benefits clearly outweigh risks and burdens (or visa-versa for negative recommendations).
“Recommended”	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is lack of consensus to direct development of a recommendation.
<p>Dimensions: In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.</p> <ol style="list-style-type: none"> 1. Grade of the Body of Evidence (see note above) 2. Safety / Harm 3. Health benefit to patient (<i>direct benefit</i>) 4. Burden to patient of adherence to recommendation (<i>cost, hassle, discomfort, pain, motivation, ability to adhere, time</i>) 5. Cost-effectiveness to healthcare system (<i>balance of cost / savings of resources, staff time, and supplies based on published studies or onsite analysis</i>) 6. Directness (<i>the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome]</i>) 7. Impact on morbidity/mortality or quality of life 	

Background Information

Children identified with single sided deafness (SSD) are frequently not offered amplification due to limited treatment options and unknown benefits (*Kiese-Himmel, C., 2002[4a], McKay 2008 [4a]*). The difficulties children experience with unilateral hearing loss (UHL) are described in the literature but there is limited evidence to support the benefit of amplification for SSD, especially with the pediatric population. Current amplification options are inconsistently offered by audiologists (*McKay, 2008 [5a], McKay 2010 [5a]*). This project was developed to discover the evidence around the quality of life benefits for children with SSD fit with amplification.

Supporting information

Group/team members

Team Leader: Lori Garland, M.S, Pediatric Audiologist II, Division of Audiology, Cincinnati Children’s Hospital Medical Center

Support Personnel: Barbara K. Giambra, MS, RN, CPNP, Center for Professional Excellence/Research and Evidence-based Practice, Cincinnati Children’s Hospital Medical Center

Search strategy

Databases: Ovid Medline, PubMed, Google Scholar and hand search.

Keywords: single sided deafness, unilateral hearing loss, unilateral deafness, amplification, quality of life, treatment, outcomes, guidelines

Limits: English language, all dates included

Retrieved: July 29, 2010 – November 22, 2010

Copies of this Best Evidence Statement (BEST) are available online and may be distributed by any organization for the global purpose of improving child health outcomes. Website address: <http://www.cincinnatichildrens.org/svc/alpha/h/health-policy/ev-based/default.htm>
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Note

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

Reviewed against quality criteria by two independent reviewers