

CRITICALLY-APPRAISED TOPIC:
BILATERAL VS. UNILATERAL
BAHA USE

Jennie M. Brand

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PICO Question

- In adults with bilateral conductive hearing loss, is there a difference between unilateral and bilateral BAHA use as measured by sound localization and speech recognition scores in quiet?
 - Population: Adults with bilateral conductive HL
 - Intervention: Bilateral BAHA fitting
 - Comparison: Unilateral BAHA fitting
 - Outcomes: Sound localization & speech recognition scores in quiet

Search Strategies

- Databases searched (all accessed September 15, 2008):
 - PubMed
 - Health reference center-academic
 - MEDLINE (CSA)
 - CINAHL
- Inclusion criteria:
 - Conductive hearing loss, unilateral BAHA use, bilateral BAHA use, adults
- Exclusion criteria:
 - Children, published in a foreign language

Search Strategies (cont.)

- Search terms:
 - “bilateral BAHA”
 - 111 hits
 - 5 relevant articles
 - “bilateral BAHA adults”
 - 40 hits
 - Many of the same from “bilateral BAHA”
 - 1 additional useful article
 - “binaural BAHA”
 - 14 hits
 - Many of the same from “bilateral BAHA”
 - 3 pertinent articles, all found in previous searches
 - “binaural BAHA adults”
 - 3 hits
 - None relevant

Search Results

□ Studies included:

□ 2 controlled trials (both level 2)

- Bosman, A., Snik, A., van der Pouw, C., Mylanus, E., and Cremers, C. (2001). Audiometric evaluation of bilaterally fitted bone-anchored hearing aids. *Audiology*, 40(3), 158 – 167.
- Priwin, C., Stenfelt, S., Granström, G., Tjellström, A., and Håkansson, B. (2004). Bilateral bone-anchored hearing aids (BAHAs): An audiometric evaluation. *The Laryngoscope*, 114, 77 – 84.

□ Excluded studies (reasons):

- Children (1)
- Non-English (1)

Findings

First Author and Year of Publication	Location	Comparison	Control Patients	Number of Participants	Outcomes
Bosman, 2001	The Netherlands	Unilateral BAHA fitting (first implanted ear)	Concurrent	25	Localization, speech in quiet, speech in noise, binaural masking level difference
Priwin, 2004	Sweden	Unilateral BAHA fitting (best, usually first, implanted ear)	Concurrent	12	Soundfield thresholds, localization, speech in quiet, speech in noise, binaural masking level difference

Findings (cont.)

- Methodologies
 - Neither study randomized
 - Both studies used the same subjects as controls for a unilateral BAHA fit condition
 - Priwin et al. (2004) included patients with SNHL, while Bosman et al. (2001) did not (included patients with conductive HL only)
 - Both studies show advantages to bilateral vs. unilateral BAHA fitting

Findings (cont.)

First Author and Year of Publication	Soundfield Thresholds	Localization	Speech in Quiet	Speech in Noise	Binaural Masking Level Difference
Bosman, 2001	N/A	Significant improvement for bilateral vs. unilateral BAHA fit	Avg. 4-dB improvement for bilateral vs. unilateral BAHA fit	Marked improvement for bilateral vs. unilateral BAHA fit; no significant difference between sides	6.6-dB release from masking at 500 Hz, attributed to true binaural hearing
Priwin, 2004	Avg. improvement of 2 – 7 dB for bilateral fitting when sound presented at 0°, 180°, and best side	Significantly better with bilateral vs. unilateral BAHA fit; unilateral close to chance level	Avg. 5.4-dB improvement for bilateral vs. unilateral BAHA fit	~3 dB SNR improvement for bilateral vs. unilateral BAHA fit, with noise at best side or diffuse noise; 1 dB worsening at shadow side	Release from masking with bilateral BAHA fitting, though less than through AC because of cross-over stimulation

Conclusion

- Results from both studies indicate that patients fit with bilateral BAHAs have better localization and speech recognition scores in quiet as compared to unilaterally-fit BAHAs.
- Improvement was also seen in speech in noise and binaural masking level difference performance.
- More research needs to be conducted in this area, as both studies include a small sample.

References

- Bosman, A., Snik, A., van der Pouw, C., Mylanus, E., and Cremers, C. (2001). Audiometric evaluation of bilaterally fitted bone-anchored hearing aids. *Audiology*, 40(3), 158 – 167.
- Priwin, C., Stenfelt, S., Granström, G., Tjellström, A., and Håkansson, B. (2004). Bilateral bone-anchored hearing aids (BAHAs): An audiometric evaluation. *The Laryngoscope*, 114, 77 – 84.