

In adults with bilaterally symmetrical sensorineural hearing loss (SNHL), is one hearing aid better than two for speech understanding in noise as determined by dichotic digit and speech in noise testing?

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# Search Strategy

- Databases:
  - PubMed
  - USF Libraries Metasearch - *Medicine/Nursing*
    - PubMed, Health reference center-academic, MEDLINE (CSA), CINAHL, Annual Reviews
- Inclusion Criteria:
  - adults 18+ years old, any sex, bilateral sensorineural hearing loss, hearing aid users
- Exclusion Criteria:
  - children, cochlear implants, BAHA

# Search Strategy

- Search Terms:
  - (hearing aids or amplification) and (bilateral and unilateral) or binaural advantage and dichotic and (speech or speech perception or speech recognition or speech understanding)

# Summary of Search Results

- 26 unique results found
- 2 journal articles and 1 poster directly answered the question

# Search Results

- Walden & Walden (2005)
  - Subjects:
    - $n = 28$
    - Mean age: 75.1 yrs (Range: 50-90)
    - Symmetric mild to severe SNHL
    - 23 exp'd users; 5 new users
  - Test Setup:
    - Speech: 0 degrees
    - Noise: 0 degrees

# Search Results

- Walden & Walden (2005)
  - Key Findings:
    - 78.5% of subjects performed better in right ear than left on QuickSIN
    - Poorer performance (greater SNR loss) with bilateral amplification than performance in either ear alone
    - 82.1% of subjects performed better with “better ear” vs. bilateral amplification
    - Tendency for subjects to demonstrate better directed recall in the ear with the better QuickSIN score ( $p = .07$ )

# Search Results

- Henkin, Waldman, & Kishon-Rabin (2007)
  - Subjects:
    - $n = 28$
    - Mean age: 72.8 yrs (Range: 62-86)
    - Symmetric mild to severe SNHL
  - Test Setup:
    - Speech: 0 degrees
    - Noise: 180 degrees

# Search Results

- Henkin, Waldman, & Kishon-Rabin (2007)
  - Key Findings:
    - Comparable mean group performance: unilateral vs. bilateral
    - 71% of subjects performed better on SIN test with better ear vs. bilateral amplification
    - No correlation between DD and unilateral vs. bilateral aids
    - Decreased performance on DD and QuickSIN with increasing age

# Search Results

- Shaughnessy, Cox, & Goshorn (2008)
  - Subjects:
    - $n = 37$
    - Mean age: 70 yrs (Range: 57-81)
    - Exp'd users with symmetric mild to severe SNHL
  - Test Setup:
    - Speech: 0 degrees
    - Noise: 0 degrees

# Search Results

- Shaughnessy, Cox, & Goshorn (2008)
  - Key Findings:
    - 78.4% of subjects performed better on SIN test with better ear vs. bilateral amplification
    - At 70 dB HL: Poorer ear scores not significantly different from bilateral condition
    - At 50 dB HL: Better ear scores not significantly different from bilateral condition
    - At 70 dB HL: Greater tendency for better ear score to exceed bilateral score with increasing age (No correlation @ 50 dB HL input)

# Clinical Bottom Line

- In aging adults, one hearing aid may provide more benefit than two in certain listening conditions.
- Bilaterally-fit adults with continued difficulty hearing in noise should be counseled to try removing one hearing aid in difficult listening situations to determine benefit.

# Additional Comments

- Despite the suggestion that unilateral amplification may be useful in some situations, bilateral amplification provides both objective and subjective listening benefit and should continue to be the standard fitting practice for treating people with aidable bilateral SNHL.
- Decreased binaural advantage and increased binaural interference are associated with increasing age. The cause is believed to be a decrease in auditory processing function and/or efficiency.

# Additional Comments (cont'd.)

- Not all subjects showed right ear advantages, so a patient should be encouraged to experiment with individual right and left hearing aid removal to determine greatest benefit. Additionally, ear dominance is often stimuli-dependent; therefore the listener's target may influence his/her temporary amplification strategy.

# Conclusion

- In aging adults, one hearing aid may provide more benefit than two in certain listening conditions.
- Bilaterally-fit adults with continued difficulty hearing in noise should be counseled to try removing one hearing aid in difficult listening situations to determine benefit.

# References

- Henkin, Y., Waldman, A., & Kishon-Rabin L. (2007). The benefits of bilateral versus unilateral amplification for the elderly: are two always better than one? *Journal of Basic Clinical Physiological Pharmacology*, 18, 201 – 216.
- Shaughnessy, K.L., Cox, R, & Goshorn, J. (2008). Unilateral and Bilateral Speech Recognition and Preference for Bilateral Fitting. *Poster presented at the American Auditory Society Convention, Scottsdale, AZ, March 2008.*
- Walden, T.C., & Walden, B.E. (2005). Unilateral versus bilateral amplification for adults with impaired hearing. *Journal of the American Academy of Audiology*, 16, 574 – 584.