

Practicing the Best for the Best: How to Implement Evidence into Audiology Practice

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Evidence-Based Practice (EBP)

Best Current Evidence



EBP

Clinical Expertise

Patient Preference

EBP

- Clinical-decision making that uses a “show me the data” attitude
- Discourages clinical practice
 - Conjecture
 - Routine
 - Opinion



EBP is a Process

1. Ask a clinical question
2. Gather the evidence
3. Evaluate the evidence
4. Integrate evidence with patient preferences and clinical experience
5. Make and grade the recommendation

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1. Asking a Clinical Question

- Use a foreground rather than a background question
 - Background questions
 - who, what, where, how, when, why
 - Foreground questions
 - ask for specific information
 - PICO format



1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome

1. Asking a Clinical Question

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Who?			
“How would I describe a group of patients similar to mine?”			

1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome
	What?		
	"Which main intervention am I considering?"		

1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome
		Alternative Intervention?	
		“What is the main alternative to compare with the intervention?”	

1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome
			Outcomes
			“What can I hope to accomplish?” or “What could this exposure really affect?”

1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome
Who?	What?	Alternative Intervention?	Outcomes
“How would I describe a group of patients similar to mine?”	”Which main intervention am I considering?”	“What is the main alternative to compare with the intervention?”	“What can I hope to accomplish?” or “What could this exposure really affect?”

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Gathering the Evidence

- Books and non-peer reviewed journals
- Peer-reviewed, research articles
- Electronic bibliographic databases:
 - Pub Med/MEDLINE
 - CINAHL (Cumulative Index to Nursing and Allied Health Literature)
 - ComDisDome (Communication Sciences and Disorders DOME)
 - PsychINFO
 - Applied Social Science Index and Abstracts
 - National Rehabilitation Information Center



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Evaluating the Evidence

1. Is the study trustworthy (valid)?
2. How important are the findings (significance)?
3. How applicable is the evidence to your patient (relevance)?

Determining Validity of the Study

- Weighing study strengths and weakness
 - Research design
 - Randomization
 - Drop outs
 - Blinding
 - Number of participants
 - Adequacy of sampling



Levels of Evidence

Level	Description
1	Well-designed meta-analysis of >1 randomized controlled trial
2	Well-designed randomized control trial
3	Well-designed controlled study without randomization
4	Cohort studies, case control studies, cross-sectional surveys
5	Case reports
6	Expert opinion



Quality of the Evidence

Rating	Interpretation
++	Very low risk of bias. Weakness very unlikely to alter conclusions
+	Low risk of bias. Weaknesses identified or omitted information probably would not alter conclusions.
-	High risk of bias. Weaknesses identified or omitted information would likely alter conclusions.

Table 3. Quality Assessment of the 16 Studies Included in the Qualitative Analysis for This Systematic Review

Study	Level of Evidence	Control Group	Baseline Equivalence	Power Analysis	Inclusion Exclusion	HA Fit	Verification of HA Fit	Appropriate Statistics	Drop-outs Discussed
Abrams et al (1992)	2	Y	Y	N	Y	N	N	Y	N/A
Chmiel and Jerger (1996)	(2) 3	N	N/A	N	Y	Y	Y	Y	N/A
Dillon et al (1997)	(2) 3	N/A	N/A	N	N	Y	Y	Y	N/A
Humes et al (2001)	3	N	N/A	N	Y	Y	Y	Y	N/A
Jerger et al (1996)	(2) 3	N	N/A	N	Y	Y	Y	Y	N/A
Joore et al (2002)	3	N	N/A	N	Y	N	Y	Y	Y
Joore et al (2003)	3	N	N/A	N	Y	Y	Y	Y	Y
Malinoff and Weinstein (1989a)	3	N	N/A	N	N	N	N	Y	N/A
Mulrow et al (1990)	1	Y	Y	N	Y	N	N	Y	Y
Mulrow et al (1992a)	3	N	N/A	N	Y	N	N	Y	Y
Newman et al (1993)	3	N	N/A	N	N	Y	Y	Y	N
Newman and Weinstein (1988)	3	N	N/A	N	Y	N	N	Y	Y
Primesu (1997)	3	N	N/A	N	N	N	N	Y	N
Stark and Hickson (2004)	3	N	Y	Y	Y	Y	Y	Y	N
Taylor (1993)	3	N	N/A	N	Y	Y	N	Y	N
Yueh et al (2001)	1	Y	Y	N	Y	Y	Y	Y	N

Note: Level 1 = randomized controlled trials; Level 2 = quasi-experimental; Level 3 = nonexperimental. When two study levels are shown, the one outside of the parenthesis was used for the analyses completed in this review. Y = yes; N = no; N/A = not applicable; HA = hearing aid.

How Important Are the Findings?

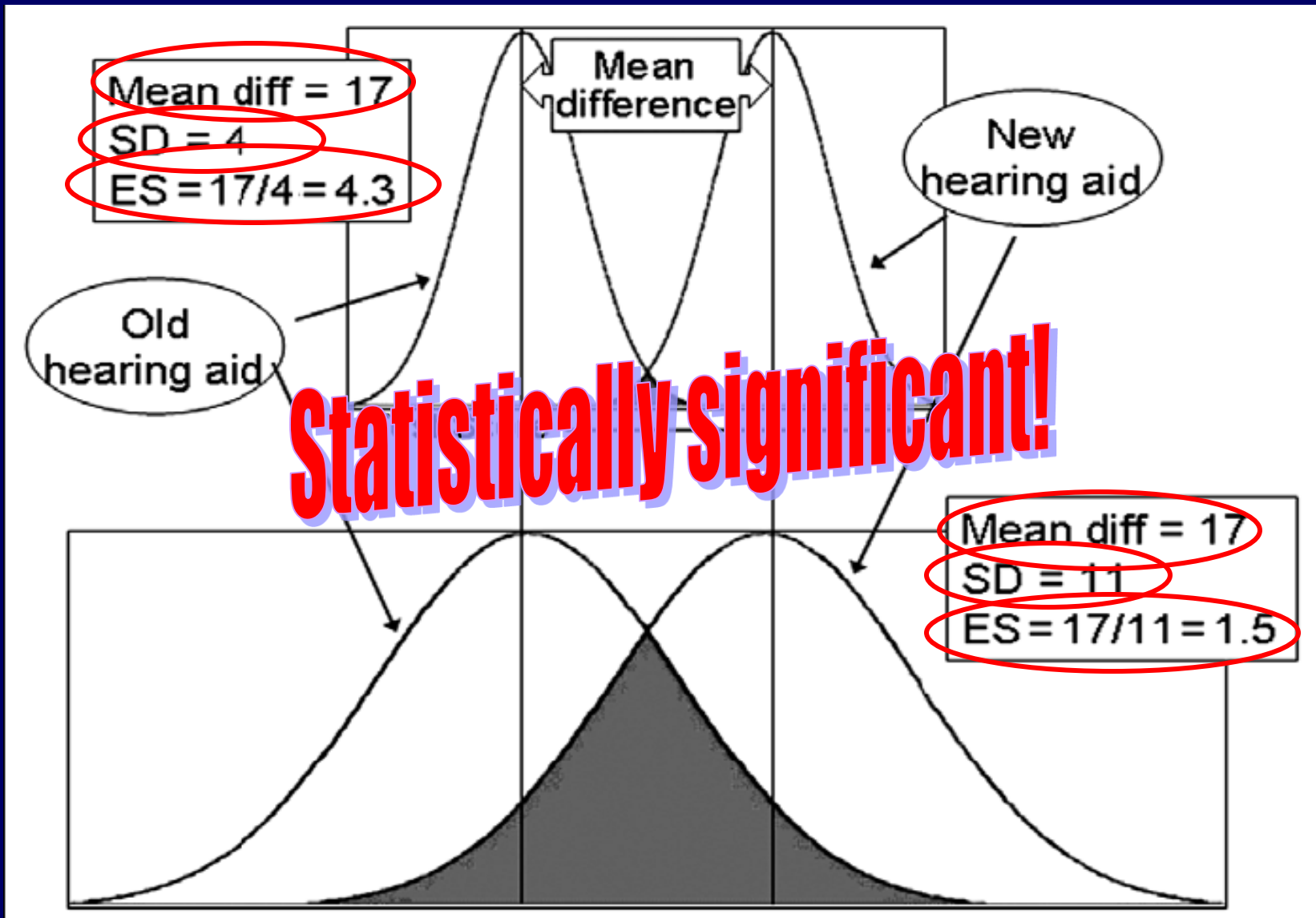
- Statistical significance
 - was the observed finding a chance occurrence
 - Largely effected by the research design and sample size
- Clinical/Practical significance
 - Magnitude of the result
 - Effect Size (e.g., Cohen's d)
 - Independent of the sample size



Effect Size (Cohen's d)

$$ES = \frac{\text{Mean Experimental Group} - \text{Mean Control Group}}{\text{Pooled Standard Deviation}}$$





How applicable is the
evidence to your patient
(relevance)?



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Evidence-Based Practice (EBP)

Best Current Evidence

EBP

Clinical Expertise

Patient Preference

Patient Preference

- Interests
- Needs/priorities goals
- Values regarding health and well-being
- Environment
- Culture



Evidence-Based Practice (EBP)

Best Current Evidence

EBP

Clinical Expertise

Patient Preference

Clinical Experience

“...proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice.”



Clinical Experience

- “External clinical evidence can inform, but never replace, individual clinical expertise, and it is this expertise that decides whether the external evidence applies to the individual patient at all and, if so, how it should be integrated into a clinical decision”

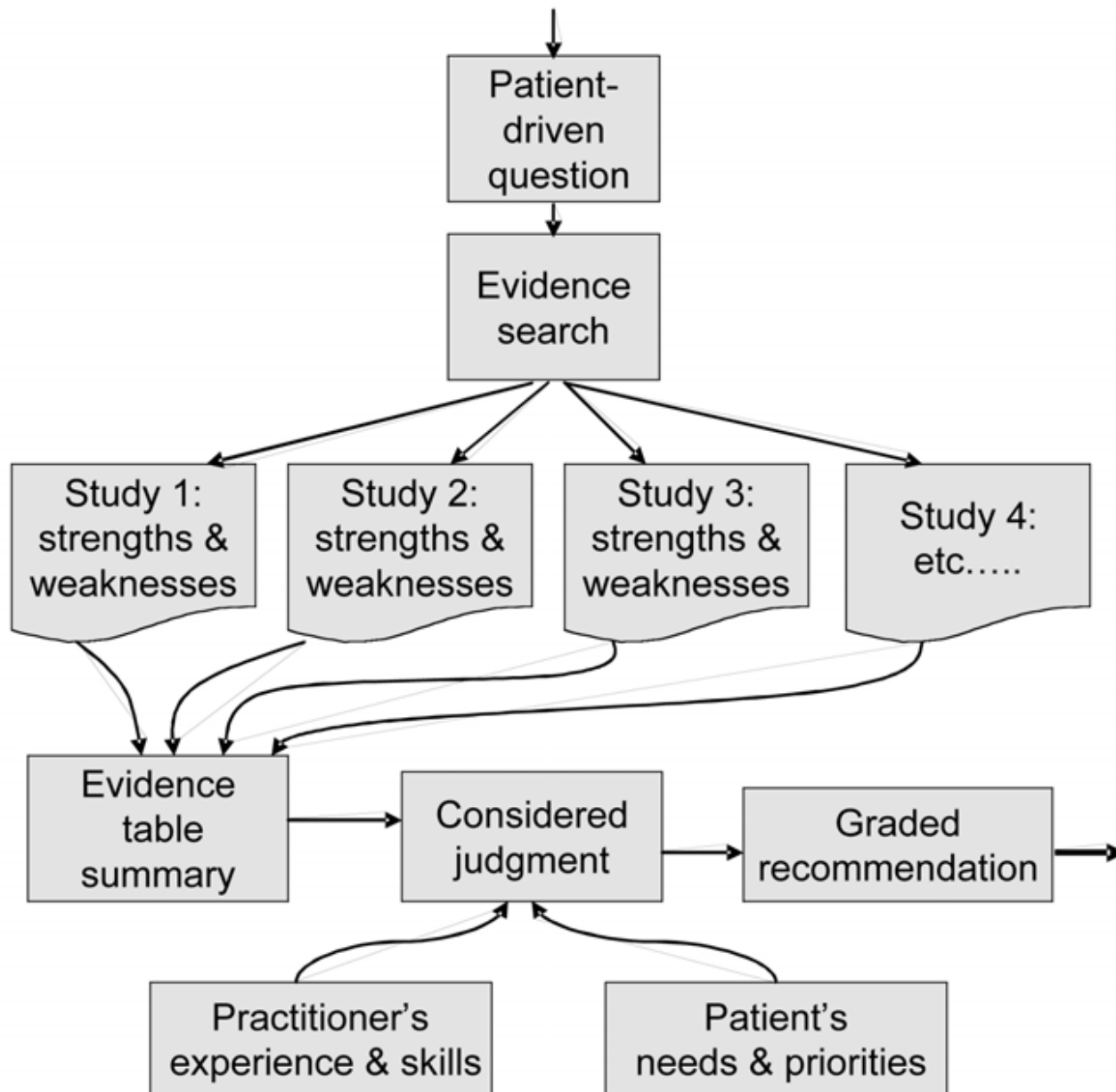


EBP is a Process

1. Ask a clinical question
2. Gather the evidence
3. Evaluate the evidence
4. Integrate evidence with patient preferences and clinical experience
5. **Make/grade the recommendation**

Making and Grading the Recommendation

Grade	Criteria
A	Level 1 or Level 2 studies with consistent conclusions
B	Level 3 or Level 4 studies with consistent conclusions
C	Level 5 studies
D	Level 6 studies, or inconsistent, inconclusive studies, high levels of risk or bias



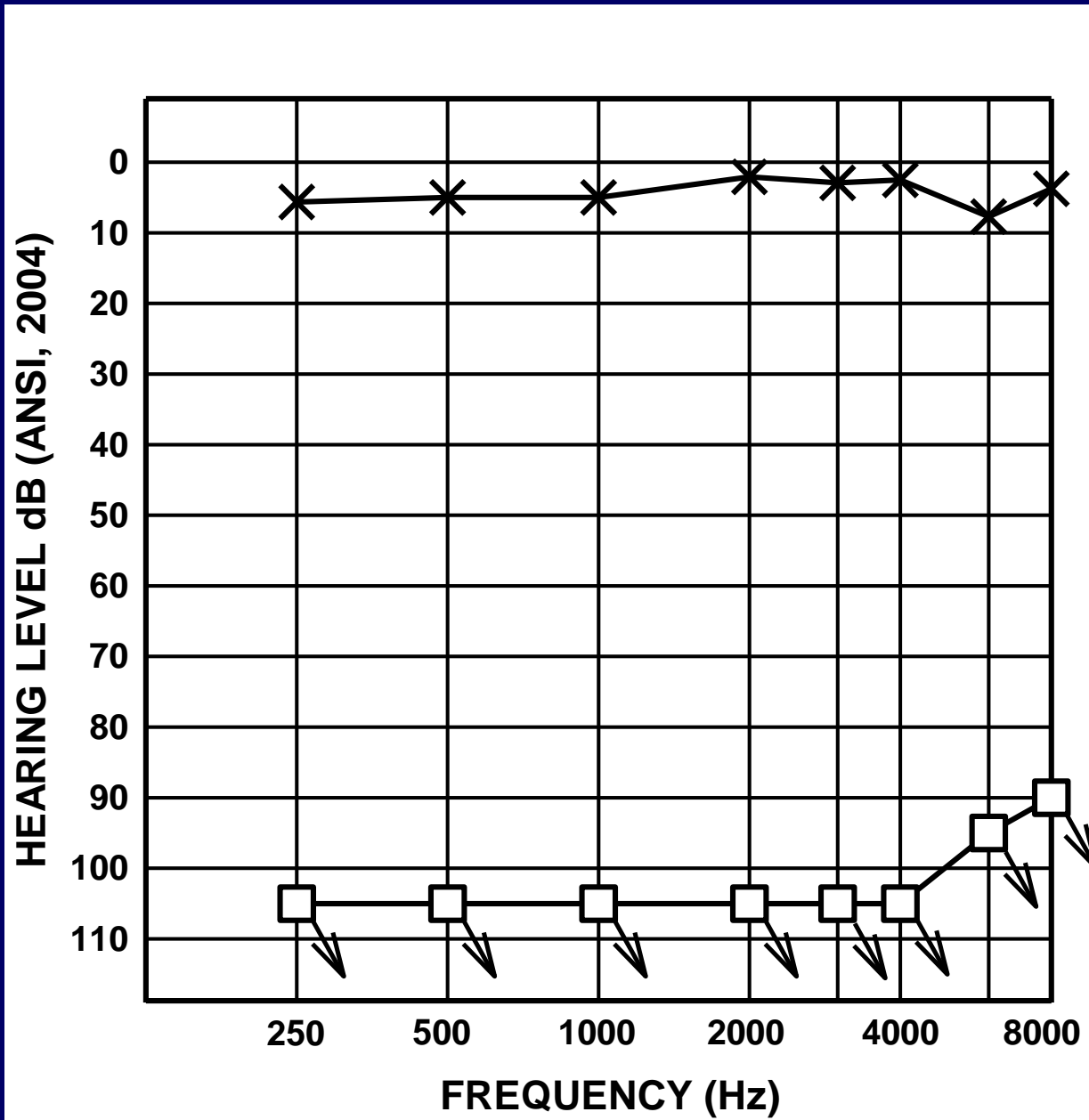
Example



My Fictitious Patient

- 45 y/o male Veteran
- Acoustic neuroma removed AD
- Comes to the clinic with c/o:
 - Speech-in-noise complaints
 - Car
 - Restaurants
 - Groups
 - Localization difficulties





Amplification Options

- Contralateral Routing of Signal Hearing Aid (CROS)
- Bone Anchored Hearing Aid (BAHA)
 - “Single-Sided Deafness”
 - BAHA on “dead” ear



1. Asking a Clinical Question

P patient	I intervention	C comparison	O outcome
Who?	What?	Alternative Intervention?	Outcomes
Adults with unilateral profound SNHL	BAHA	Air Conduction CROS	<ol style="list-style-type: none">1. Speech in Noise2. Subjective Outcomes3. Localization

2. Gather the Evidence

- Search Engines
 - Pub Med
 - Cumulative Index to Nursing and Allied Health Literature
 - National Rehabilitation Information Center
- Search Terms
 - CROS, BAHA, SSD, unilateral profound hearing loss, unilateral profound inner ear deafness



Search Results

- 10 articles
- 5 were rejected
 - Unilateral conductive or mixed losses
 - Better ear did not have normal thresholds
 - Subjects were reported in a follow-up study



3. Evaluating the Evidence

- Research Design/Level of Evidence
- Quality
 - Control group
 - Sample size
 - Power analysis
 - Drop outs
 - Statistical significance/appropriate stats



Study	Level of Evidence	Control Group	Baseline Equivalence	Sample Size	Power Analysis	Drop Outs	Stats Sig
Hol et al., 2005	3	N	Y	29	N	Y	Y/N
Hol et al., 2010	3	N	Y	10	N	N	Y/N
Lin et al., 2006	3	N	Y	22	N	N	Y/N
Niparko et al, 2003	3	N	Y	10	N	N/A	Y/N
Wazen et al., 2003	3	N	Y	18	N	N	Y

Summary of Study Results

- Speech in Noise Testing (5/5)
 - BAHA better CROS
- Subjective Outcomes (5/5)
 - BAHA better CROS
- Localization (4/5)
 - 1 found BAHA better than CROS, not significant
 - 3 found CROS = BAHA = Chance



Summary of Study Results

- Long-term follow-up (2/5)
 - No difference in outcomes at short (e.g., 6-8 weeks) and long-term (e.g., 1-3 years) f/u
- Continued BAHA use (2/5)
 - 22/23 continued to use BAHA
 - All subjects continued to use BAHA



Study	Level of Evidence	Quality Rating
Hol et al., 2005	3	+
Hol et al., 2010	3	+/-
Lin et al., 2006	3	+
Niparko et al, 2003	3	+
Wazen et al., 2003	3	+

4. Integrate with Patient Preferences and Clinical Experiences



5. Grade/Make Recommendation

Grade	Criteria
A	Level 1 or Level 2 studies with consistent conclusions
B	Level 3 or Level 4 studies with consistent conclusions
C	Level 5 studies
D	Level 6 studies, or inconsistent, inconclusive studies, high levels of risk or bias

Benefits of EBP

- Identifies best clinical practices based on evidence to promote high-quality care
 - Foster the development of clinical practice guidelines
- Reduces unnecessary or inappropriate care
- Ever-evolving



Challenges of EBP

- Preference to use colleagues, texts, CEU seminars, and Google over EBP
- Lack of good evidence
- Skill/training for assessing best current evidence
 - Will people find it?
 - Will people read it?
 - Will people be able to evaluate it?
- Time
- Cookbook approach

(Sackett et al., 1996; Bernstein-Ratner, 2006; Louise-Hickson, 2009)



Solutions to Challenges of EBP

- Researchers and journals becoming more rigorous
- Continuing education regarding EBP
- Clinical Practice Guidelines
- Systematic Reviews



Systematic Reviews

- review of the literature for a specific question that tries to identify, appraise, select and synthesize all high quality research evidence relevant to that question
- Chisolm, T.H. & Portz, L.J. (2007). Making use of Systematic Reviews: EBP for the busy clinician. *Audiology Online*, (Full document access at: http://www.audiologyonline.com/articles/article_detail.asp?article_id=1783)



J Am Acad Audiol 16:485–493 (2005)

Effectiveness of Counseling-Based Adult Group Aural Rehabilitation Programs: A Systematic Review of the Evidence

David B. Hawkins*



J Am Acad Audiol 16:494–504 (2005)

Efficacy of Individual Auditory Training in Adults: A Systematic Review of the Evidence

Robert Sweetow*

Catherine V. Palmer†



J Am Acad Audiol 16:439–447 (2005)

Fitting Hearing Aids Using Clinical Prefitting Speech Measures: An Evidence-Based Review

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A Systematic Review of Health-Related Quality of Life and Hearing Aids: Final Report of the American Academy of Audiology Task Force on the Health-Related Quality of Life Benefits of Amplification in Adults

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Resources for EBP

- <http://www.libraries.psu.edu/psul/tutorials/ebpt.html>
- http://gollum.lib.uic.edu/applied_health/
- <http://www.biomed.lib.umn.edu/learn/ebp/>
- <http://www.ahrq.gov/browse/evidmed.htm>



Electronic Bibliographic Databases

- <http://www.ncbi.nlm.nih.gov/pubmed/>
- <http://www.apa.org/pubs/databases/psyinfo/index.aspx>
- <http://www.ebscohost.com/cinahl/>
- <http://www.csa.com/>
- <http://www.eric.ed.gov/>
- <http://www.naric.com/research/rehab/default.cfm>





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