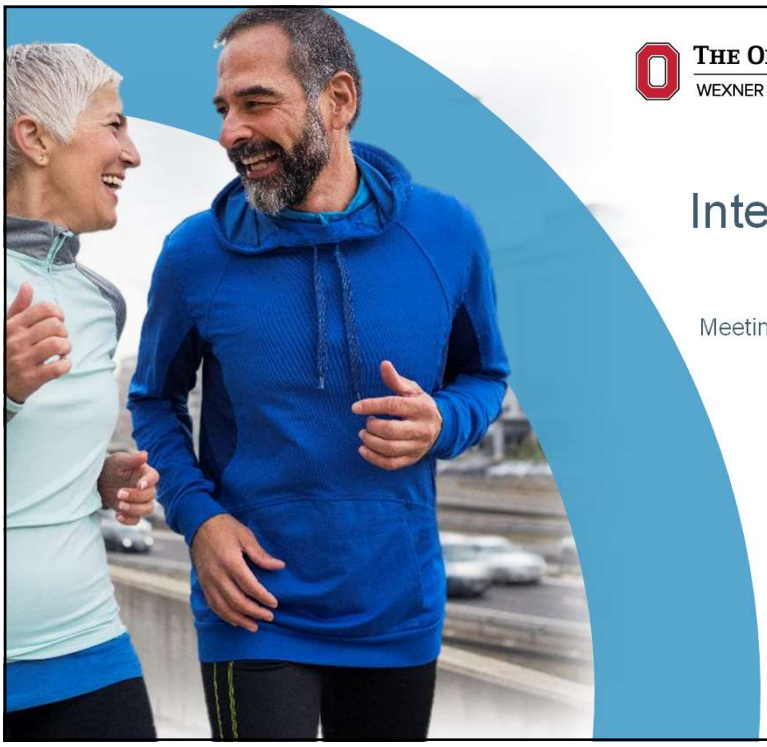

THE OHIO STATE UNIVERSITY
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ADVANCED BIONICS
POWERFUL CONNECTIONS

Interprofessional Auditory Rehabilitation

Meeting the Needs of Adults with Cochlear Implants

Adult AR Clinical Models:
Feasibility for Audiologists & Speech-Language Pathologists

Kara J. Vasil, AuD, CCC-A
Christy Ray, PhD, CCC-SLP

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This webinar is being recorded.

Outline

- What is Comprehensive AR?
- Barriers to Comprehensive AR
- Interprofessional Practice and Roles in AR
- Current AR Models Across Various Settings
- Where do we go from here?

Learner Outcomes

- After this course learners will be able to describe the similarities and differences of the current models of aural rehabilitation.
- After this course learners will be able to identify perceived and real barriers to aural rehabilitation that are present in various clinical settings, including feasibility, patient interest, and interprofessional collaborative communication.
- After this course learners will be able to summarize the value of key players in aural rehabilitation, specifically identifying the roles of SLPs and audiologists in patient-centered care.

Outline

- What is comprehensive AR?
- Barriers to Comprehensive AR
- Interprofessional Practice and Roles in AR
- Current AR Models Across Various Settings
- Problem Solving and Overcoming Obstacles

What is AR?

You tell us!

Use the chat box to tell us what AR looks like in your clinic

What is AR?

"any device, procedure, information, interaction, or therapy which lessens the communicative and psychosocial consequences of a hearing loss"

(Ross, 1997)

"...the reduction of **hearing-loss induced deficits** of function, activity, participation, and quality of life..."

(Boothroyd, 2007)

Real-life AR

- Clinicians providing AR services to adults are often lacking clear guidance as to a standard approach
- Adult CI patients are mainly relying on **clinician-recommended**, self-guided rehabilitation methods
- Adult CI users' motivation is high, but they often do not independently set benchmarks for success and overcoming obstacles

(Harris et al., 2016)

What is AR?

Defining Success

What is AR?

But AR *really* involves…

Comprehensive Auditory Rehabilitation

- Speech recognition
- Listening comprehension
- Motivation
- Device knowledge
- Psychosocial function
- Communication confidence
- Listening effort
- Self-efficacy
- Social participation/isolation
- Executive functioning and cognition
- Quality of life

What is AR?

"…the reduction of
hearing-loss induced deficits
of function, activity, participation, and quality of life…"
(Boothroyd, 2007)

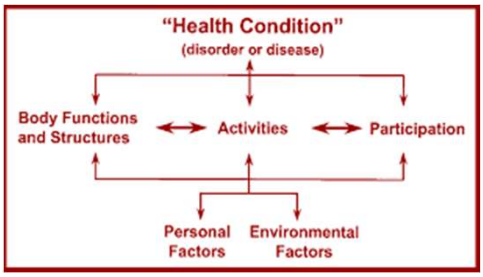
FUNCTION
- hearing capacity

ACTIVITY
- USE of capacity

PARTICIPATION
- activity in daily life

QUALITY OF LIFE
- perception of experiences and well-being

International Classification of Functioning
Disability and Health (ICF) Framework

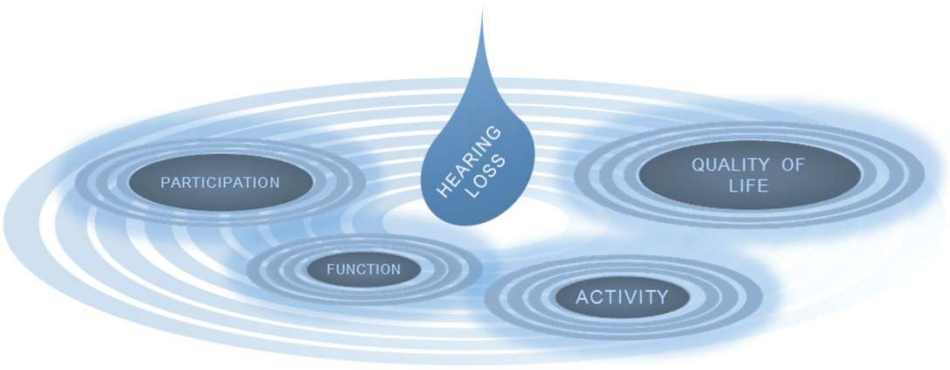


World Health Organization. International Classification of Functioning, Disability and Health, Geneva, World Health Organization; 2001.

What is AR?
Perspective

Biomedical Model	Biopsychosocial Model
Focus on Illness — As opposed to health	**Context of Disease and Illness** — Biological, psychological, & social roles
Single-Factor Causes — Looks for cause rather than contributing effects	**Multifactorial** — Many causes for health and illness, which produce many effects
Simple Explanation — Simplest possible process to explain illness.	**Integrated Explanation** — Whole-body contributions to overall health
External Locus — People not responsible for illness.	**Personal Factors** — Behavior is changeable and influences health.
Binary Outcomes — Absence of illness = health.	**Outcomes on Continuum** — Health and illness viewed on a continuum.

What is AR?
What does it aim to treat?



What is AR?

What does it aim to treat?

Function

- hearing capacity

Activity

- USE of capacity

Participation

- activity in daily life

QOL

- perception of experiences and well-being

Sensory Management
Optimize auditory function

Instruction
Use of technology and control of the listening environment

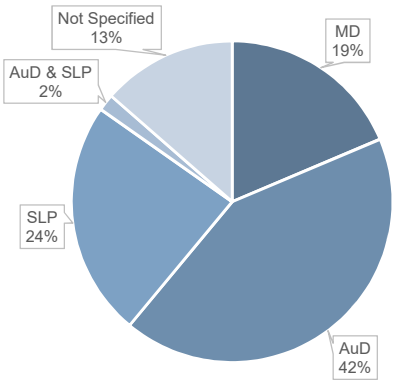
Perceptual Training
Improve speech perception and communication

Counseling
Enhance participation and deal with limitations

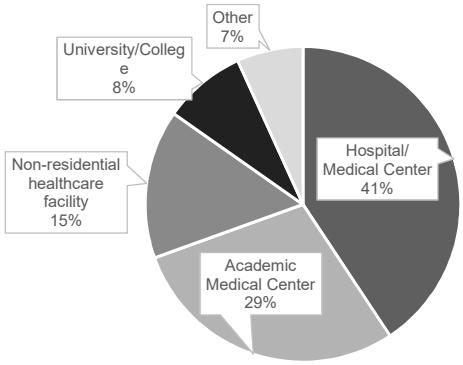
Boothroyd, 2007

What is AR?

PROFESSION



WORK SETTING



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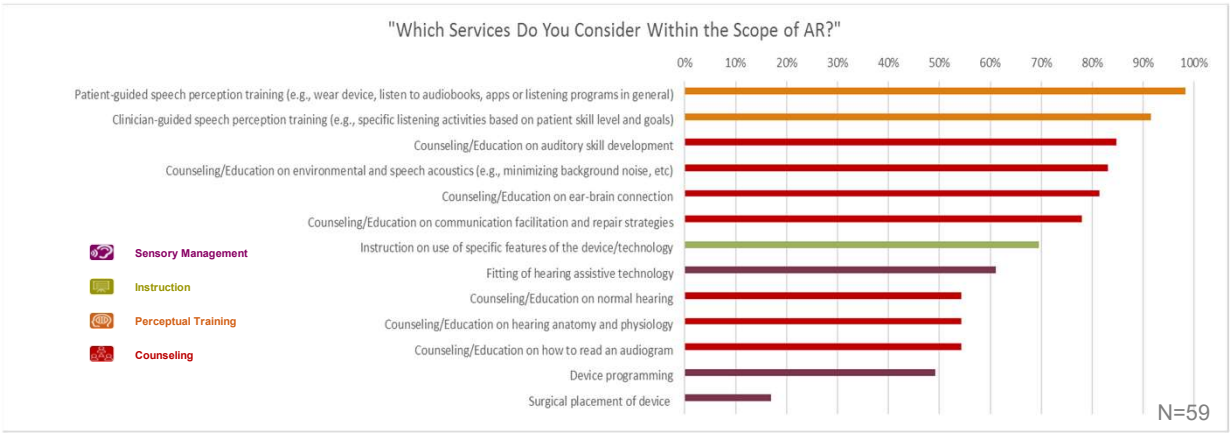
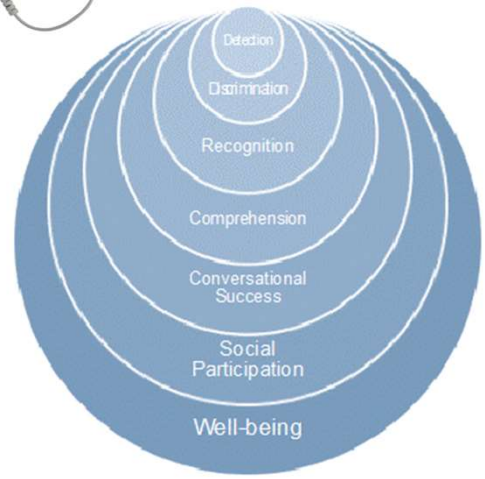
What is AR?



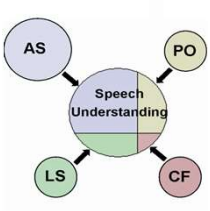
Sensory Management

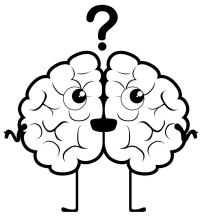


Fitting of hearing assistive technology	61%
Device programming	49%
Surgical placement of device	17%

Perceptual Training

How can we use information about a patient's ability to process speech?





Patient-guided speech perception training (e.g., wear device, listen to audiobooks, apps or listening programs in general)	98%
Clinician-guided speech perception training (e.g., specific listening activities based on patient skill level and goals)	92%

BOTTOM-UP AUDITORY TRAINING		
Task	**Target Skills**	**Examples**
Phoneme Discrimination	Acoustic cues: Manner of articulation Placement of articulation Voicing	"fish" vs. "dish" "shale" vs. "fail" "made" vs. "mate"
Suprasegmental Identification	Syllable/word stress Syllable/word length	"OBject" vs. "obJECT" "man" vs. "manage" vs. "manageable"
Text Following	Familiarity and association of sounds to known words	Matching auditory and text input
TOP-DOWN AUDITORY TRAINING		
Task	**Target Skills**	**Examples**
Preceding Word Identification; Sentence Completion	Verbal working memory Selective attention Vocabulary and Retrieval	"The students gathered in the hall." (Target: "students") "I didn't know what ____ it was." (Target: "time")
Picture/Object Identification; Answering Questions	Comprehension Verbal working memory Long-term memory Vocabulary and Retrieval	"It is round and hangs on the wall." "Is a feather heavier than a brick?"
Following Directions	Comprehension Verbal working memory Short-term memory	"Write the following appointments on your calendar: Haircut onTuesday the 15th at noon and a meeting with Joe at 3:30 the following Monday"

Counseling

- Expectations
- Motivation, Compliance
- Informed decision making: self-efficacy

Counseling/Education on auditory skill development	85%
Counseling/Education on environmental and speech acoustics (e.g., minimizing background noise, etc)	83%
Counseling/Education on ear-brain connection	81%
Counseling/Education on communication facilitation and repair strategies	78%
Counseling/Education on normal hearing	54%
Counseling/Education on hearing anatomy and physiology	54%
Counseling/Education on how to read an audiogram	54%

Taylor, et al., 2014

Instruction

- Device & Accessories
- Use & Knowledge
- To optimize auditory sensitivity and sensory management

Instruction on use of specific features of the device/technology	69%

Who would benefit from comprehensive AR?

Who wouldn't benefit from comprehensive AR?

Outline

- What is Comprehensive AR?
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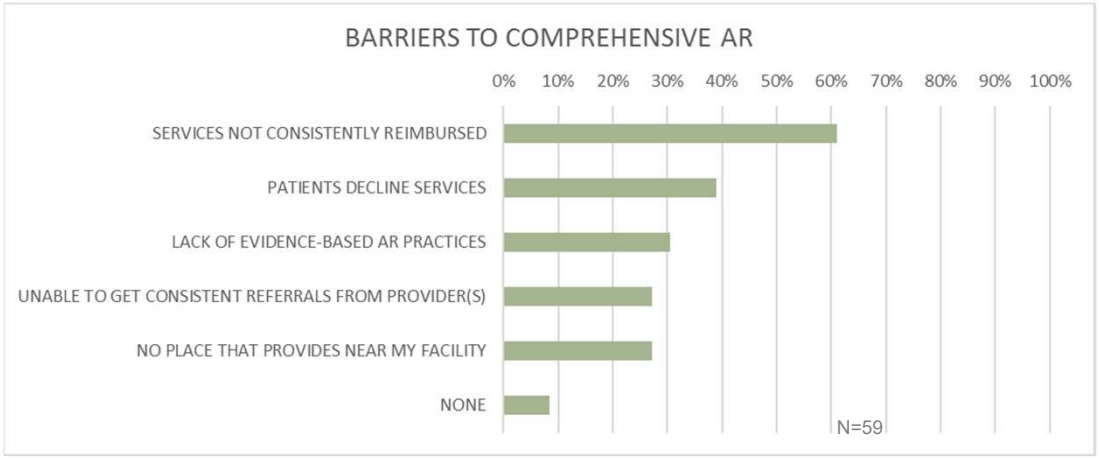
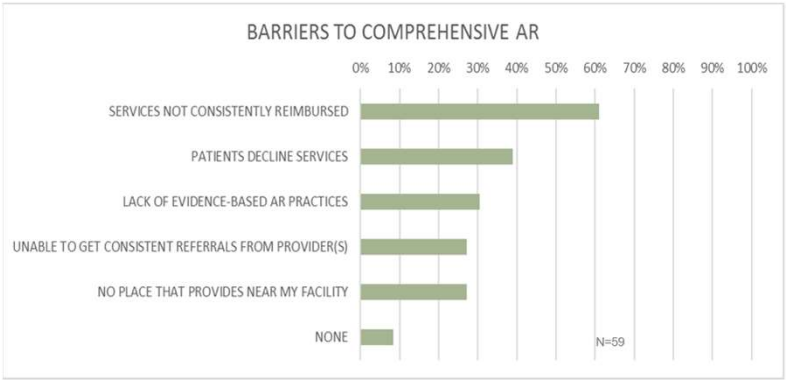
BARRIERS

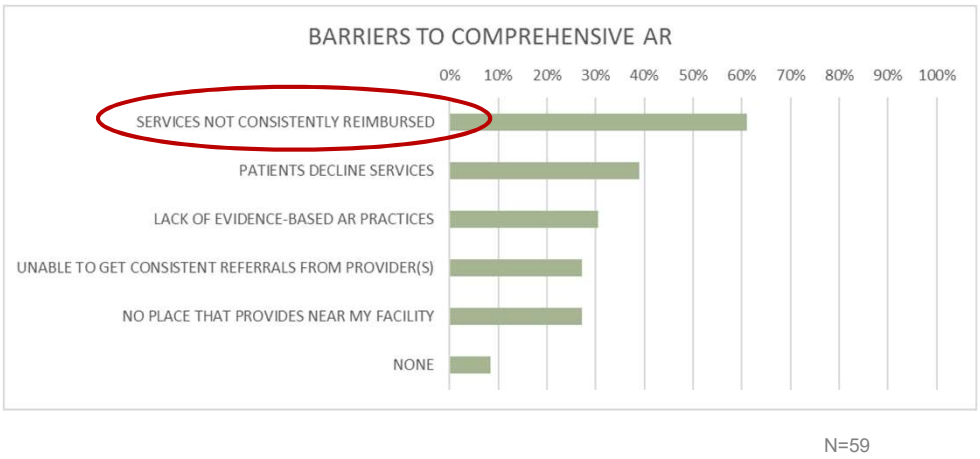


BARRIERS

- COST EFFICIENCY
- PATIENT ACCESSIBILITY
- EVIDENCE/ CLEAR STANDARD
- PROFESSIONAL AWARENESS & TRAINING



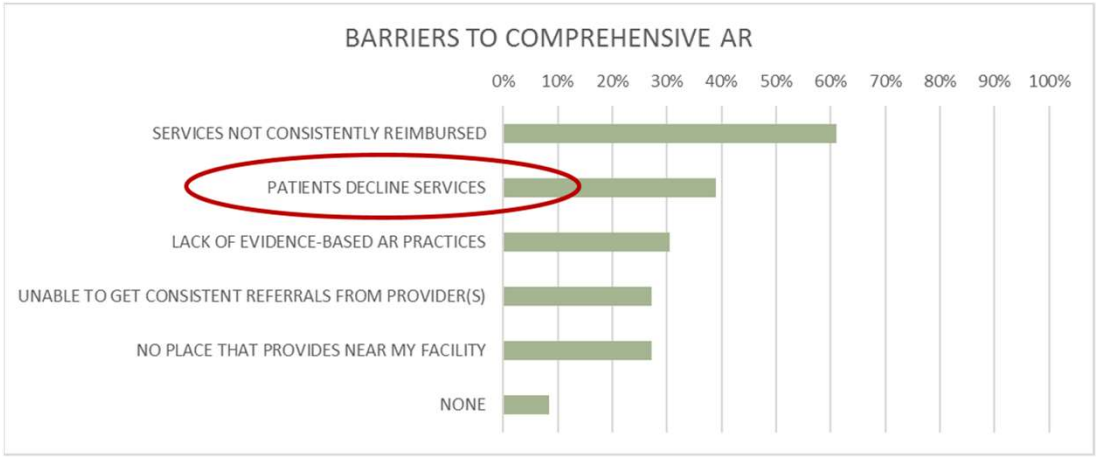
BARRIERS



BARRIERS
Cost Efficiency

CPT Code	Descriptor	2020 National Fee	Notes
92522	Evaluation of speech sound production (eg, articulation, phonological process, apraxia, dysarthria);	$94.55	Do not bill 92522 in conjunction with 92523.
92523	with evaluation of language comprehension and expression (eg, receptive and expressive language)	$198.49	Do not bill 92523 in conjunction with 92522.
92507	Treatment of speech, language, voice, communication, and/or auditory processing disorder; individual	$81.20	**Not covered** for audiologists. Medicare coverage is limited to diagnostic testing.
92508	group, 2 or more individuals	$24.54	
92626	Evaluation of auditory function for surgically implanted device(s) candidacy or postoperative device(s); first hour	$92.39	**Revised in 2020.** This code may be used by SLPs to report an evaluation of auditory function related to pre- implant candidacy or post-implant status evaluation. See also: New and Updated CPT Codes for 202(
92627	each additional 15 minutes (List separately in addition to code for primary procedure)	$22.01	This is an add-on code for 92626.
92630	Auditory rehabilitation; prelingual hearing loss	$0.00	This code will not be paid for. CMS instructs SLPs to use 92507 for auditory rehabilitation.
92633	postlingual hearing loss	$0.00	CMS instructs SLPs to use 92507 for auditory rehabilitation.

BARRIERS
Patient Accessibility



"What influences people's decision to get/not get a cochlear implant?"

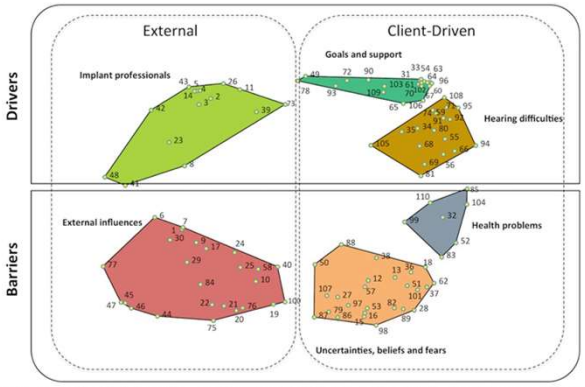
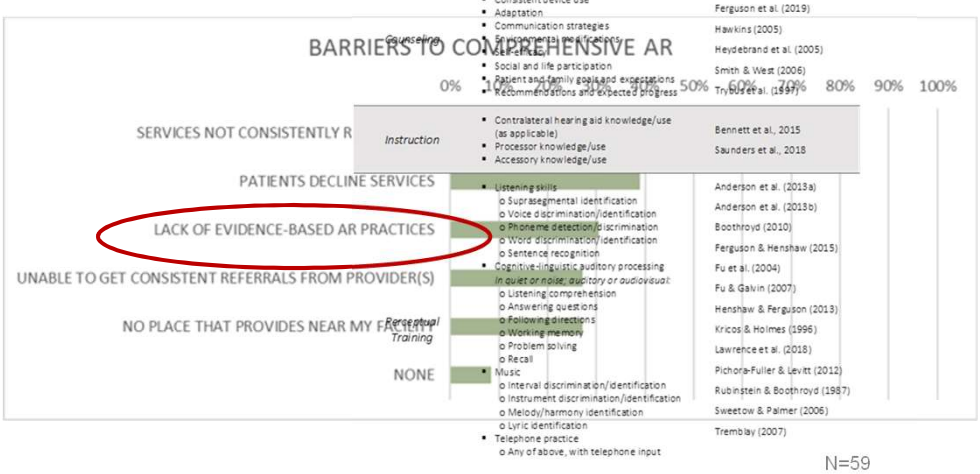


Fig. 1. Concept map, showing the 110 statements or underlying factors influencing the uptake of a CI clustered into six concepts, and conceptualized into two overarching domains- external and client-driven. Barrier and driver concepts were identified by the mean rating scores of each concept. Each point and the adjacent number show a brainstormed statement.

(Ebrahimi-Madiseh, et al., 2020)

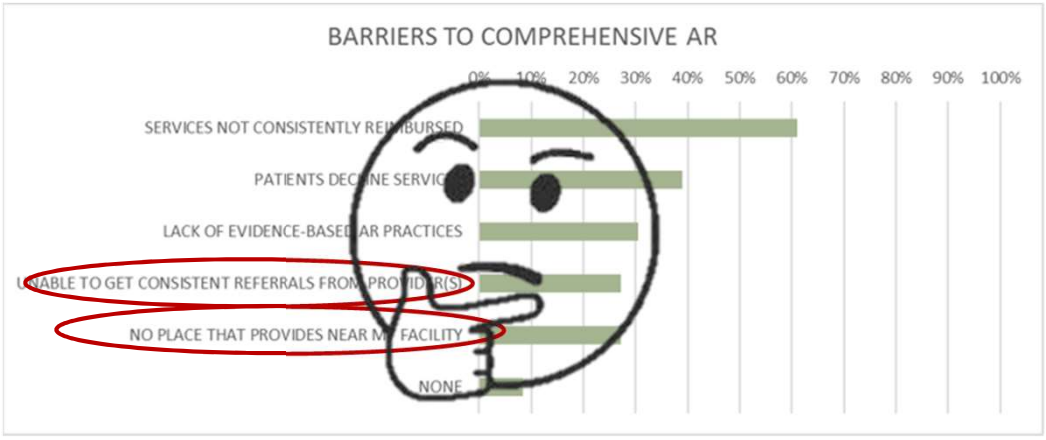
BARRIERS

Evidence & Clear Standard



Component	Potential Facets	Useful References
Sensory Management	▪ Implantation ▪ Activation ▪ Processor programming ▪ Device Troubleshooting	AAA (2019) Shapiro & Bradham (2012)
Counseling	▪ Device options ▪ Consistent device use ▪ Adaptation ▪ Communication strategies ▪ Environmental adjustments ▪ Social and life participation ▪ Patient and family goals and expectations ▪ Recommendations and expected progress	Chisholm et al. (2013) Ferguson et al. (2019) Hawkins (2005) Heydebrand et al. (2005) Smith & West (2006) Tryde et al. (1997)
Instruction	▪ Contralateral hearing aid knowledge/use (as applicable) ▪ Processor knowledge/use ▪ Accessory knowledge/use	Bennett et al., 2015 Saunders et al., 2018
Perceptual Training	▪ Listening skills o Suprasegmental identification o Voice discrimination/identification o Phoneme detection/discrimination o Word discrimination/identification o Sentence recognition ▪ Cognitive-linguistic auditory processing *In quiet or noise, auditory or audiovisual* o Listening comprehension o Answering questions o Following directions o Working memory o Problem solving o Recall ▪ Music o Interval discrimination/identification o Instrument discrimination/identification o Melody/harmony identification o Lyric identification ▪ Telephone practice o Any of above, with telephone input	Anderson et al. (2013a) Anderson et al. (2013b) Boothroyd (2010) Ferguson & Henshaw (2015) Fu et al. (2004) Fu & Galvin (2007) Henshaw & Ferguson (2013) Kricos & Holmes (1996) Lawrence et al. (2018) Pichora-Fuller & Levitt (2012) Rubinstein & Boothroyd (1987) Sweetow & Palmer (2006) Tremblay (2007)

BARRIERS
Provider Awareness & Training



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BARRIERS
Provider Awareness & Training

AUDITORY VERBAL (AVT) SLP	ADULT OUTPATIENT SLP	AUDIOLOGIST
• Anatomy and physiology of hearing and disorders	• Cognitive-linguistic function for communication in adults	• Anatomy and physiology of hearing and balance disorders
• Auditory skill & language development	• Communication & disorders in aging	• Diagnostic evaluation of hearing and balance disorders across a range of patient populations
• Hearing technology, troubleshooting, communication strategies	• Acquired communication disorders across a range of patient populations	• Hearing technology, troubleshooting, communication strategies
• Importance of collaboration with parents/family to create buy-in & optimize outcomes	• Importance of collaboration with patients/family to create buy-in & optimize outcomes	• Importance of collaboration with patients/family to create buy-in & optimize outcomes
• Patient-centered goal setting: SMART Goals	• Patient-centered goal setting: SMART Goals	• Patient-centered goal setting
• Facilitation of learning & scaffolding	• Facilitation of learning & scaffolding	• Hearing preservation
• Multidisciplinary patient care (e.g., ENT, audiologist, school, etc)	• Multidisciplinary patient care (e.g., ENT, neurologist, PT/OT, etc.)	• Multidisciplinary patient care (e.g., ENT, neurologist, PT/OT, etc.)

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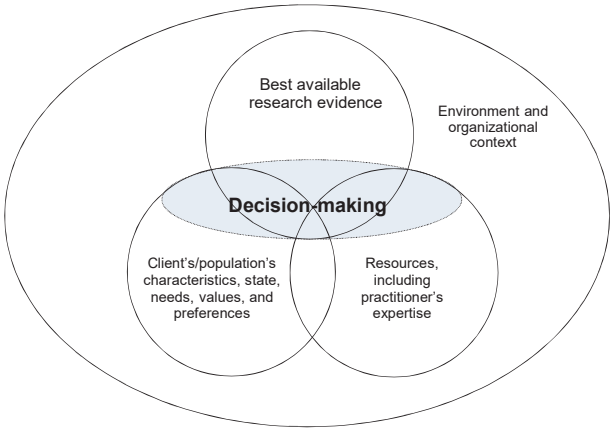
BARRIERS



Satterfield, J. M., Spring, B., Brownson, R. C., Mullen, E. J., Newhouse, R. P., Walker, B. B., & Whitlock, E. P. (2009). Toward a transdisciplinary model of evidence-based practice. *The Milbank quarterly*, *87*(2), 368–390. https://doi.org/10.1111/j.1468-0009.2009.00561.x

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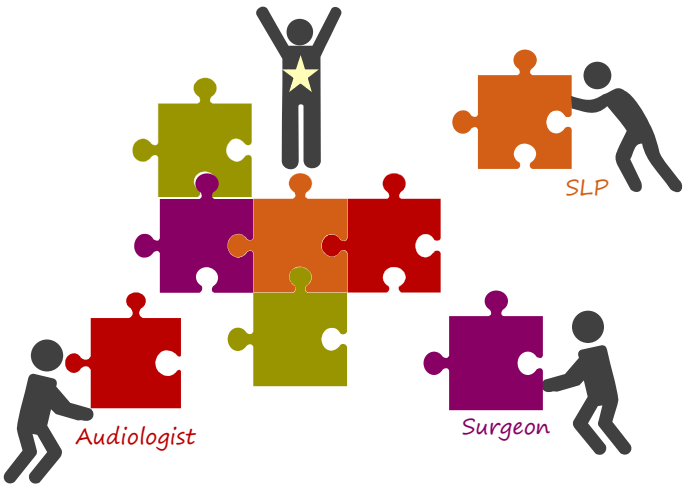
Interprofessional Practice and Roles

	AUD	SLP	BOTH	REFER OUT	N/A
Surgical placement of device	0%	0%	0%	0%	0%
Device programming	97%	0%	0%	3%	0%
Fitting of hearing assistive technology	88%	0%	5%	7%	0%
Instruction on use of specific features of device/technology	71%	0%	25%	3%	0%
Clinician-guided speech perception training *(e.g., specific listening activities based on patient skill/goals)*	14%	34%	29%	20%	3%
Patient-guided speech perception training *(e.g., audiobooks, apps or listening programs in general)*	39%	12%	44%	3%	2%
Counseling/Education on auditory skill development	36%	14%	44%	3%	3%
Counseling/Education on ear-brain connection	42%	10%	44%	0%	3%
Counseling/Education on normal hearing	52%	3%	40%	0%	5%
Counseling/Education on hearing anatomy and physiology	60%	2%	35%	2%	2%
Counseling/Education on communication strategies	41%	14%	42%	3%	0%
Counseling/Education on environmental and speech acoustics *(e.g., minimizing background noise, etc)*	47%	9%	43%	2%	0%
Counseling/Education on how to read an audiogram	58%	3%	34%	0%	5%

Sensory Management	Surgeon	Audiologist	SLP
· Device implantation	✓		
· Device programming		✓	
Instruction	**Surgeon**	**Audiologist**	**SLP**
· Device use	✓	✓	✓
· Device skill and knowledge	✓	✓	✓
Perceptual Training	**Surgeon**	**Audiologist**	**SLP**
· Clinician-guided auditory therapy			✓
Counseling	**Surgeon**	**Audiologist**	**SLP**
· Needs and goals	✓	✓	✓
· Realistic expectations	✓	✓	✓
· Communication strategies		✓	✓

Teamwork Makes the Dream Feasible



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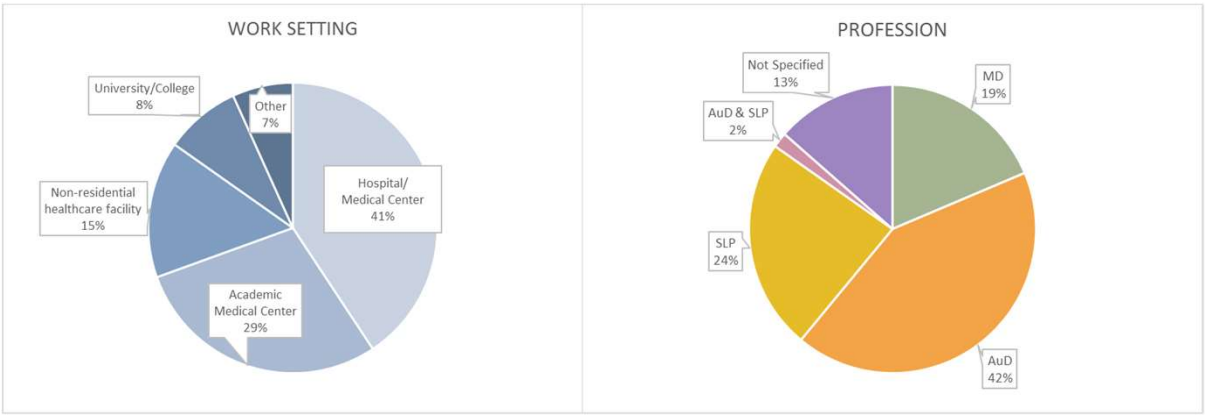
Some Models of Adult AR

Adult CI
AR Focus Group

Site	Location	Setting	AR Team	Referral Source	New Adult AR Patients (2019) Audiology	SLP
East Carolina University	Greenville, NC	University Clinic	Audiologist SLP Community ENT	Outside/community	Individual: 15 Group: 12	
University of Arkansas	Fayetteville, AR	University Clinic	Audiologist SLP	University-associated Outside/community	Individual: 40 Group: 20	Individual: 20
University of Tennessee Health Science Center	Knoxville, TN	University Clinic	Audiologist SLP	Outside/community	Individual: 50 Group: N/A	Individual: 20
Ohio State University	Columbus, OH	University Hospital	Audiologist SLP In-house ENT	In-house Outside/community	Individual: 65 Group: N/A	
Oregon Health & Science University	Portland, OR	University Hospital	Audiologist SLP In-house ENT	In-house	Individual: 70 Group: N/A	
Atlanta Veteran's Affairs Medical Center	Decatur, GA	VA	Audiologist In-house ENT	In-house	Individual: 20 Group: N/A	N/A
Gulf Coast Veteran's Affairs Health Care System	Biloxi, MS	VA	Audiologist SLP In-house ENT	In-house	Individual: 50 Group: Variable	
Phoenix Veteran's Affairs Health Care System	Phoenix, AZ	VA	Audiologist SLP	In-house	Individual: 15 Group: N/A	Individual: 1
Tibor Rubin Veteran's Affairs Medical Center	Long Beach, CA	VA	Audiologist In-house ENT	In-house Outside VA	Unknown	N/A

AR for Adults with CIs



Survey Respondents
N = 59

Models for Adult AR

	PRE-CI		POST-CI		POST-ACTIVATION					
	VISIT 1	VISIT 2	1-2 WEEKS	2-4 WEEKS	2 WEEKS	1 MONTH	2 MONTHS	3 MONTHS	6 MONTHS	1 YEAR
SURGEON	Medical Exam		Post-op Exam		*as needed*					
AUDIOLOGIST	CI Eval	Device Selection	Activation	Programming, etc	Programming, etc	Programming, etc	Programming, etc	Programming, etc	Programming, etc	Programming, etc
SLP		Communication Eval				AR Eval	AR Tx		Post-AR Eval	*as needed*

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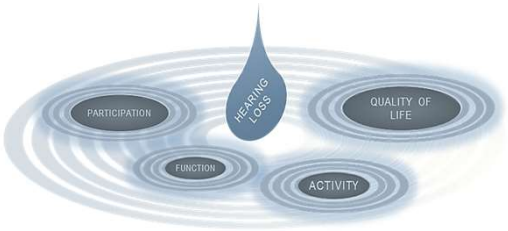
Shifting the Narrative

► Terminology and narrative need to reflect our broad objectives
- ➢ Improve stakeholder understanding, buy-in
- ➢ Shift toward standard (vs. exception or add-on)

WHAT ARE WE TREATING?
Communication…?
(Broader impairment beyond "hearing")



Sweetow, 2007

- Suggested change of terminology:
  - "hearing aid evaluation" → "functional communication assessment"
  - take the focus <u>off the product</u> → place it <u>on the end goal of improving communication</u>

Shifting the Narrative

"Hearing aids may (or may not) be one component of an overall rehabilitation plan, but a rehabilitation plan is not a component of a hearing aid fitting.

"…the current tendency to supplement hearing aid fittings with additional therapy is misguided…

…Instead, hearing aids should supplement the global plan of communication treatment."

VIEW POINT

Robert W. Sweetow

Instead of a hearing aid evaluation, let's assess functional communication ability

By Robert W. Sweetow

Periodically, governments, businesses, and professions must reassess their mission and goals in order to sustain their competence and maintain their relevance. The objective of this paper is to propose a variation in our profession's direction and to provide a general road map toward rendering this change viable.

Specifically, I am advocating that the generic "hearing aid evaluation" be replaced by a "Functional Communication Assessment" designed to yield results that will lead to an "Individualized Communication Enhancement Plan" (ICEP) for every patient.

This Functional Communication Assessment would be a battery of objective and subjective measures intended to assess residual auditory function beyond what can be determined by pure-tone and monosyllabic word-recognition-in-quiet testing. From these data, an ICEP would be constructed that would contain any or all of the following: education and counseling, communication strategies, individualized auditory training, hearing aids, assistive listening devices, and group education and therapy.

The goal of this proposal is to shift our focus from one that is product-oriented (i.e., centered around hearing aids) to one that is process-oriented (centered around enhancing communication).

The reason for this change is straightforward. Hearing aids are designed to provide access to acoustic information. However, communication, the ultimate objective for our patients, incorporates not only hearing, but also listening skills, cognitive-based interpretation, and communication strategies.[1,2]

Hearing aids may (or may not) be one component of an overall rehabilitation plan, but a rehabilitation plan is not a component of a hearing aid fitting. In other words, the current tendency to supplement hearing aid fittings with additional therapy is misguided. Instead, hearing aids should supplement the global plan of communication treatment.

Dispensing hearing aids is vital and it's a noble pursuit. In my counseling courses, I frequently quote the statement "selling is the transference of passion in the presence of need."[3] But when Dr. Raymond Carhart pioneered the field of audiology, he intended it to comprise both diagnostic and therapeutic functions.[4] When the primary focus is placed on hearing aids, it may inadvertently create an unnecessary restriction on our ability to provide comprehensive care, and this can send the wrong message to patients and other stakeholders.

NO EXCUSE FOR NOT OFFERING REHAB

Many professionals believe they are providing rehabilitation services merely by presenting instructions to accompany hearing aid fittings. Others argue that it is impractical to provide rehabilitation because such services take too much time and are not reimbursable.

I disagree with both contentions. There are numerous methods for providing rehabilitation services that do not require significant professional time. Hawkins presented an evidence-based review of the benefits gleaned from group-based AR.[5] Formal instruction in hearing aid and accessory management can lead to increased usage,[6] and, therefore, to enhanced function and activity when summed over time.[5,7]

> "…communication, the ultimate objective for our patients, incorporates not only hearing, but also listening skills, cognitive-based interpretation, and communication strategies.."

Group instruction can deliver both education and emotional support. There are abundant resources of content and material for group AR.[8-10] Evidence exists to support the efficacy of such programs in terms of reduced return-for-credit rates, increased usage, and greater initial patient satisfaction.[11,12]

Group-based aural rehabilitation may not always meet the needs of the individual patient. For this, it may be helpful to provide individual auditory training. Sweetow and Palmer conducted an evidence-based literature review that demonstrated the potential benefit of these services.[13]

Evidence is also emerging that clearly demonstrates that patients who complete individual auditory training (AT) such as LACE[14] have significantly lower return-for-credit (RFC) rates on new hearing aid purchases.[15-17] A recent issue of *Seminars in Hearing* offered a number of papers illustrating the plethora of new auditory training programs using computer technology.[18]

The argument that hearing healthcare professionals are not reimbursed for therapeutic services previously had merit, because, unfortunately, audiology has been assigned a Standard Occupational Classification (SOC) listing as a diagnostic rather than a therapeutic profession. However, last year, the Centers for Medicare and Medicaid Services (CMS) created new CPT codes (92626 and 92627) that implicitly recognized the need for an appraisal of residual auditory function beyond what the pure-tone audiogram provides.

Where do we go from here?

- Think beyond hearing loss
- Work collaboratively and creatively– to fill gaps and overcome barriers in a given setting
- Stay connected and supported
- Future research directions

COURSE 3: COMPONENTS OF ADULT AUDITORY REHABILITATION ASSESSMENT AND TREATMENT
Christy Ray, PhD, CCC-SLP; Erin Stefancin, MA, CCC-SLP; Kara Vasil, AuD, CCC-A • August 26, 12 – 1 EST

COURSE 4: OUTCOMES AND CASE STUDIES OF AUDITORY REHABILITATION FOR ADULTS WITH COCHLEAR IMPLANTS
Aaron Moberly, MD; Christy Ray, PhD, CCC-SLP; Kara Vasil, AuD, CCC-A; Erin Stefancin, MA, CCC-SLP September 23, 12 – 1 EST

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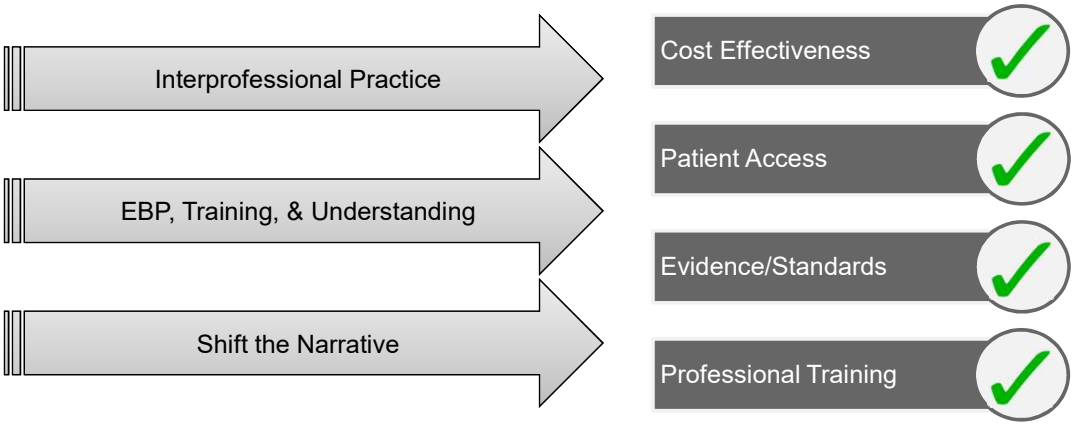
Barriers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