Case Studies in Clinician-Directed Virtual Auditory Rehabilitation: A Story of Structure and Flexibility

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BACKGROUND

The Problems:

- More adults in the USA are seeking cochlear implants (CIs) than ever before (Nassiri et al., 2023).
- Age-related CI candidacy criteria have laxed in recent years; as the population of CI recipients changes & expands, rehabilitation practices must also adapt.
- Auditory rehabilitation (AR) improves speech perception, quality of life, & psychosocial function in adult CI recipients (Moberly et al., 2020; Bernstein et al., 2021), yet the uptake of clinician-directed AR in adult populations remains low.
- May clinicians opt out of adopting comprehensive AR practices (Ray et al., 2022), yielding few opportunities for student training.

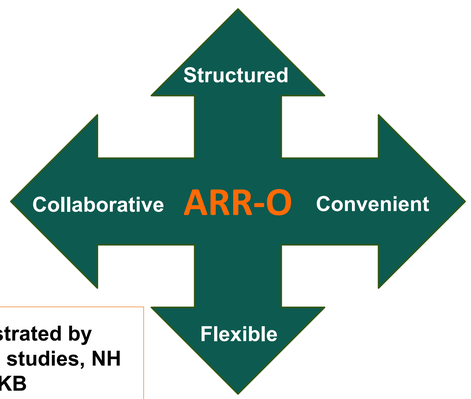
The Product:

Auditory Rehabilitation to Reconnect- Online version (ARR-O) may serve as a template for budding AR programs. ARR-O is a well-structured telehealth AR program which addresses barriers related to access, service provision, program quality, patient uptake, & student training.

ARR-O aims to:

- Increase access to clinician-directed AR for adults with CIs via telehealth
- Promote a standard of practice for AR in adult populations
- Cultivate competent AR clinicians via student training

KEY FEATURES



***Illustrated by case studies, NH and KB**

PROGRAM STRUCTURE & DEVELOPMENT OF INDIVIDUALIZED PLANS

ARR-O directly incorporates 3 of 4 pillars of AR (Boothroyd, 2007) while addressing each patient's individual needs.

Perceptual Training	Counseling	Education	Sensory Management
Systematic auditory training	Address psychosocial & emotional concerns	Discuss hearing loss, communication, & technologies	MAPping, audiometric assessment, device use

ARR-O audiologist & student clinicians implemented auditory training exercises, counseling, & education. Programming audiologist in community clinics maintained sensory management.

Individualized ARR-O plans were developed in 5 steps:

- Assess needs
- Brainstorm discussion topics
- Organize discussion topics
- Develop content
- Readminister baseline assessments

Session 1: Baseline	Sessions 2-5	Session 6: Final	
Goal setting & baseline measures	15 mins 15 mins 30 mins	Post-program assessments	Self-guided CI Aud

*Clinicians provided guidelines for independent auditory training (AT) exercises, which participants completed for 1 hour per day.

CASES

KB is a 59-year-old female and has a prelingual, bilateral sensorineural hearing loss, identified in adulthood. She wears a CI on her right ear & a hearing aid in the left. KB began ARR-O 10 mo post-activation. She is a student, lives alone, & attends weekly community meetings.

Client-Oriented Scale of Improvement (COSI):

- Better understand preacher using remote mic
- Improve sentence recognition in quiet by 10-15%
- Improve speech understanding for 1-on-1 conversations in noise
- Improve comfort with technology

PLAN:

- Self-advocacy
- Realistic expectations
- Factors affecting speech understanding
- Reframing perception of hearing loss
- ADA accommodations
- Communication repair strategies
- Types of noise; effects on speech perception
- ALD use

NH is a 49-year-old female who experienced a sudden unilateral sensorineural hearing loss of the right ear and uses a CI. NH began ARR-O 1 mo post-activation. She attended sessions during her lunch break, lives with her son, & enjoys family outings.

COSI:

- Identify words & environmental sounds without visual cues
- Reduce the need to ask to "repeat"
- Improve conversations in the workplace in noise
- Reduce physical adjustments during outings
- Reduce anxiety at restaurants

PLAN:

- Benefits of visual cues
- Self-advocacy
- Factors affecting speech understanding
- Living with single-sided deafness
- Preparing for difficult listening situations
- Unilateral CI outcomes
- Communication repair strategies
- Use of remote microphone & speech-to-text apps
- ADA accommodations
- Listening effort & anxiety

*ARR-O audiologist & 2 student clinicians administered synthetic & analytic AT exercises from Cochlear Rehabilitation Resources for Adults & developed additional exercises to meet specific goals. We employed a scaffolding technique to the adaptive AT plan.

OUTCOMES

The COSI was re-administered during the final session to assess **degree of change** over the course of the program & **final ability** with CI. Results were as follows:

Frequency of success: Hardly Ever 10% · Occasionally 25% · Half the Time 50% · Most of Time 75% · Almost Always 95%

KB	NH
No difference (N/A)	Better (75%)
Slightly better (75%)	No difference (50%)
Slightly better (75%)	Slightly better (25%)
Much better (95%)	No difference (25%)
	Slightly better (50%)

CONCLUSIONS & FUTURE DIRECTIONS

Conclusions:

- COSI indicates improvement in speech perception & psychosocial outcomes after completing ARR-O program
- Subjective reports from participants & programming audiologists indicate high value
- Student clinicians gained unique clinical experience

Future Directions:

- Collect data to assess program effectiveness
- Develop, validate, & implement pre/post-program assessment of speech perception & global outcomes
- Develop strategic plan for implementing auditory training exercises

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