Cochlear Implant Rehabilitation for Adults

Naama Tsach, PhD
Speech & Language Pathologist
Educational Audiologist

Learning Outcomes

After this course, participants will be able to:

- Designate rehabilitation goals.
- Refer to all aspects that should be included in a rehabilitation plan.
- Explain how to implement a rehabilitation process that is effective outside of the clinic in the patients' daily lives.
Spontaneous auditory learning is not trivial, it is influenced by:

- Auditory attentiveness
- The ability to perform several tasks at the same time
- The opportunities for auditory learning as part of a daily routine
- Linguistic skills
- The ability to cope with errors and misunderstandings
- The amount of learning required
- Subgroups
- Exceptions
- Heterogenic groups

Variables impacting rehabilitation and results of adult CI users

- Prelingual/peri-lingual/post lingual deafness
- Duration of hearing loss
- Sudden/progressive/fluctuating/stable/hearing loss
- Pre-implantation functional hearing of the implanted ear and non-implanted ear
Variables impacting rehabilitation and results of adult CI users

- Communication modality, auditory orientation, speech intelligibility, linguistic skills
- Acculturation Deaf/hearing
- Education
- Occupation
- Age
- Additional Disabilities

Variables impacting rehabilitation and results of adult CI users

- Technological competence
- Personality & attitudes
- Accessibility to rehab services
- Support of family and friends
What do adult CI recipients have in common?

- Differences between expectations and reality
- The need to get answers to questions arising over time about the technology and the process they are going through
- (May experience) feelings of disappointment, loneliness, lack of patience, and frustration
- The need for support and encouragement
- The desire to hear better
- The desire to progress faster

What do adult CI recipients have in common?

- The desire to get the most out of their CI
- Speech perception tests may fail to represent their functioning in real life
- The challenge to implement their new hearing skills in everyday life
Adult patients are different than pediatric patients!

- They have their own agenda
- Expectations, hopes and dreams
- Difficulties in adapting to changes
- They have something to lose
- Emotional reactions: fears, worries, disappointment, frustration, “stubbornness”
- Less family involvement/support
The Clinician needs to:

- Constantly learn from the patients about their life as deaf/hard-of-hearing
- Knowledge about speech perception and speech understanding
- Adjust the rehab goals to the patient’s needs
- Identify the patients’ strengths, skills and interests.
- Feel comfortable with uncertainty.

“Think and wonder, wonder and think” (Dr. Seuss)

The Clinician needs to:

- Be caring while maintaining authority
- Constantly reflect on the processes of change and progress with the patient and demonstrate achievements: auditory learning is a multi-dimensional and complex process
- Break down long-term goals into short term goals
- Help the patient navigate the hearing world
Goals

Improvement of quality of life, based on the reasoning and goals that lead the patient’s decision to go through cochlear implantation:

- ease of communication
- participation
- feelings of independence, involvement, belonging, orientation, confidence, higher self esteem, etc.

A patient’s wish list:
To communicate more easily
To understand those who speak fast
Participate in discussions at work
Talk on the phone
Go out with friends
Get better position at work
Learn a second language
Rehab should include:

- Optimal use of the implant
- Bilateral hearing
- Speech perception
- Speech understanding
- Communication in challenging conditions
- Improving listening skills
- Greater involvement and better functioning in listening related activities

Optimal use of the implant

- Optimal use of the implant during the entire day allows the patient to apply their new auditory abilities in a variety of ways in their daily lives
- Maintenance habits
- Enjoyment of hearing
Bilateral hearing

- Hearing aid that is best fitted and adjusted to the non-implanted ear or a second CI

Speech Perception

Improving and establishing the ability to:

- Discriminate between speech sounds
- Identify (most) speech sounds
- Identify speech sounds by their acoustic features and know which sound alike
- Use these skills to understand speech
Speech Understanding

Improvement of the ability to:

- Hold a conversation
- Understand short/long stories, instructions, etc.
- (Understand of lyrics, conversations between two other people, speech via the telephone or radio etc.)

Speech Understanding

- Combinations of different materials, in different tasks and different presentation modes
Speech Understanding

Materials:
- Should be relevant to the patient
- Should represent as broadly as possible everyday life
- Should be varied in linguistic complexity, length, amount of redundancy/clues (semantic, syntactic, familiar/unfamiliar)

Examples of materials:
- Word lists: numbers, letters, places, names of athletes, foods, words from a foreign language, etc.
- Minimal pairs
- A set of speech sounds that the patient can clearly identify in a closed set, that grows with time and can be used to create monosyllabic words
Examples of materials:

- **Word lists:** Numbers, letters, places, names of athletes, foods, words from foreign language, etc.
- **Minimal pairs**
- A set of *speech sounds* that the patient can clearly identifies in a closed set, that grows with time and serve as a base to create monosyllabic words

- **The Hebrew words:** shuk, kad, sim

Examples of materials:

- Different kinds of *sentences:* varying lengths and linguistic levels, sentences with semantic/syntactic and even phonemic errors, incomplete sentences, quotes, idioms, headlines, expressions
- **Trivia, quizzes, crossword puzzles**
- **Texts:** short stories, informational pieces, recipes, dialogues, jokes, poems, articles, (excerpts from) novels
- **Recorded materials:** songs, news, audio-books
Speech Understanding

Tasks:
- Different levels of auditory perception (detection / discrimination /identification /comprehension)
- Tasks that involve understanding, expression, thinking and linguistic-awareness.
- Understanding, expressing and thinking rather than repeating, pointing and imitating.

We want to improve communication skills.

Speech Understanding

Presentation mode
- Amount of provided visual cues
- Use of acoustic high-lightening
- Speaking pace
- Number of repetitions
- The continuum between closed set to an open set
- Natural or recorded speech
Speech Understanding

Presentation mode
- Quiet or noisy conditions
- Familiar or unfamiliar speaker
- Man/woman/child speaker
- Single speaker versus several speakers
- Telephone
- Dual tasking: understanding speech while being occupied with other activities

Three Dimensions of Auditory Training Assignment

Material
Presentation Mode
Task
Speech Understanding

- Expanding capacity of auditory memory to help in coping with longer speech expressions
- Raising awareness of different strategies that can help to understand speaking based on incomplete speech perception
- Strategies to deal with misunderstandings

Communication in challenging acoustic conditions

- Encourage the patient to experiment and use additional technologies, including assistive listening devices (ALDs)
- Bilateral hearing
- Thoroughly explain the destructive effect of noise:
  - Patient should be able to explain this to people who are part of their everyday environment
  - Patient should be able to seek accommodations in everyday environments (home, work, restaurants, etc)
Improving Listening Skills

- Be attentive/address environmental sounds
- Listen to speech that is not directed at you
- Listen while being busy with other activities
- Listen to messages from public announcement systems
- Listen to discussions being held near you

https://www.acialliance.org/blogpost/1334356/323077/The-Challenge-for-Adults-of-Learning-to-Listen

Greater involvement and better functioning in listening related activities

- Using the telephone
- Listening to songs/music
- Video chatting
- Watching TV
- Social activities that were not possible before the implantation

Activities should become part of their everyday lives
Rehab should include:

- Optimal use of the implant
- Bilateral hearing
- Speech perception
- Speech understanding
- Communication in challenging conditions
- Improving listening skills
- Greater involvement and better functioning in listening related activities

Final tips

- Ask patient about their real-life experiences with their new hearing
- Be specific with your feedback
- When testing your patient, explain the meaning of the results
- Do not mix learning and testing. Don’t give your patient the experience of being tested continuously
- Make connections between what is done during the sessions to real life situations
Training at home :

- [https://newsineasyenglish.com/](https://newsineasyenglish.com/) options of slow or fast pace, can be used with or without the written text.
- Audio books – mind the linguistic level, speaking pace, speech clarity, background music
- Videos with subtitles – chose them carefully
- Practice at home with a friend or a family member

Self training at home :

- [https://www.cochlear.com](https://www.cochlear.com)
- [https://advancedbionics.com](https://advancedbionics.com)
- [https://www.medel.com](https://www.medel.com)

Environmental sounds
Speech sounds
Words
Sentences
Music
Telephone
Self training at home:

- http://angelsound.tigerspeech.com
- https://www.games4hearoes.com/

What makes our job totally worth it?

Three Patients

- Congenital deafness
- Studied in mainstream educational setting
- Good preimplantation speech intelligibility
- Implanted at an older age (25, 37, 56)
- Main mode of communication – spoken language
- Duration of rehabilitation program: 10-12 months
Yesterday I noticed that I was hearing without even trying.
I was cooking dinner without my sound processor. Suddenly it bothered me that I couldn’t tell what is happening inside the pot because the lid was covered it.
I can sometimes understand the PA on the bus. I need to stand close enough to the loudspeaker.

This week, for the first time ever, I picked up the phone at the office, and it wasn’t so bad – I even managed to understand most of it! I asked the woman who called me to email me just in case.
I started going to Pilates classes this week. It’s still difficult but I can understand most of what the instructor says. Regardless, I still need to find an assistive device that will help me hear better.
- My family told me that I no longer get up from the table once I’m done eating. I sit and stay with them to talk.
- I can sit at my desk at work and still know what’s happening in the hallway without even looking. It’s an amazing experience. I feel like I have eyes in the back of my head.

- I didn’t know that people argue on the radio!
- My mom was listening to the radio and she was amazed that I asked her a question about what they were talking about. She didn’t know I was even able to understand the radio dialogue.
- I didn’t know music could be so fun!
- I really like listening to jazz, this is an interesting music, it sounds like humming to me and I love it!
Other Rehab Resources

- Three Adult Rehab Blogs from ACI Alliance
  https://www.acialliance.org/page/ACIABlog
  - Adult Rehabilitation
  - Young Adult’s Perspective
  - Octogenarian’s Journey

- Stories (adults of all ages + veterans)
  https://www.acialliance.org/page/Stories

- Occasional ACI Alliance In-Person Workshops
  - Orlando / March 21:

Thank You

naama@acialliance.org