



# Case Study:

## Team Helps Patient Regain Hearing, Balance, and Autonomy After Cochlear Implant

SIG 7: Aural Rehabilitation and Its Instrumentation

### Summary

After recovering from meningitis, 72-year-old Jon continued to suffer from hearing loss, severe dizziness, and imbalance. Struggling with daily activities, he sought information from a team of professionals about a cochlear implant (CI) and help improving his daily life. After the implant surgery, the interprofessional practice team helped Jon navigate life with the CI and regain his balance.

### Patient Info



**JON**  
72-YEAR OLD

**Current Diagnosis:**  
Sensorineural hearing loss

### Meet The Team



Audiologist



Neurologist  
(team facilitator)



Physical  
therapist (PT)



SLP



Social worker  
(added later)



Patient

Continue for more

## Background

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Jon, a 72-year-old man, suffered sudden bilateral hearing loss and dizziness after contracting meningitis approximately 6 months ago. His hearing loss has caused him to lose his job as a store clerk, has strained his personal relationships, and has made it difficult to schedule appointments and get medical information over the phone. His dizziness has resulted in multiple falls and makes daily tasks—such as walking, bathing, cooking, and driving—difficult. Jon is single and gets little support at home. His initial post-meningitis audiogram revealed undetectable pure-tone audiometric air conduction thresholds bilaterally across frequencies. He sought information regarding CI candidacy and help improving his daily life.

## How They Collaborated

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The initial team of the neurotologist (team facilitator), audiologist, SLP, and PT met to review Jon's history and concerns. The team decided to add a social worker to address issues related to loss of income and lack of at-home support. The team members also decided that when unanimous agreement isn't possible, they would go with the majority opinion.

The team members developed a plan to assess Jon's needs. They would each evaluate Jon in accordance with their specialties. Also, the social worker would determine Jon's Medicaid eligibility, provide the necessary paperwork, and review the need for assisted living.

Following the conclusion of their assessments, the entire team met and discussed their findings. The audiologist reported that Jon has profound sensorineural hearing loss. Following an MRI, the neurotologist decided to pursue cochlear implantation in Jon's left ear but to preserve Jon's right ear. The neurotologist planned the surgery soon after the assessment. Both the audiologist and the PT found issues with Jon's balance. The SLP reported normal scores on cognitive linguistic tests and thought that Jon could communicate by writing until his surgery.

After discussing the evaluation results, the team agreed upon a treatment plan. The social worker would help identify an assisted living facility for Jon. Afterward, the neurotologist would perform the CI surgery, and the audiologist would handle the implant's activation, programming, and testing. The SLP would follow up by setting listening goals and auditory training for Jon. Also following the CI surgery, the PT would reassess Jon's gait and balance and would start a rehabilitation program.

## Outcome

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Three months after Jon's CI surgery, sound-field warble-tone thresholds improved from being undetectable to measuring at 30–35 dB HL in the left ear. On his hearing in noise test, Jon recognized 70% of words correctly.

Jon continued to attend weekly auditory training sessions and made improvements on phoneme, word, and sentence recognition. Jon was initially completing daily telephone practice and was experiencing increased success in using the telephone with familiar listeners. However, after a while, he stopped working on his home auditory training program. He also continued to participate in biweekly physical therapy and can now walk with limited assistance. Although improved, his balance and gait remained barriers to independence. In separate conversations with the team members, Jon expressed a desire to move home and out of assisted living.

The team discussed Jon's lack of follow-through with the home telephone practice. Jon mentioned to the PT that he is more focused on walking and does not see the value of the telephone practice. The team discussed how to reiterate the importance of all facets of his educational program. In particular, the SLP, audiologist, and PT thought of ways to reinforce the other team members and increase Jon's compliance.

## Ongoing Collaboration

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The team continued to check in every other week. They monitored Jon's response to treatment and reviewed his candidacy for CI in the right ear. Jon continued speech-language pathology and physical therapy services to address his listening, balance, and gait goals. Jon's goal continues to be a return to living independently at home.

# Case Rubric:

## Team Helps Patient Regain Hearing, Balance, and Autonomy After Cochlear Implant

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### Patient Info



**JON**  
72-YEAR OLD

**Current Diagnosis:**

Sensorineural hearing loss

### Meet The Team



**Audiologist**



**Neurologist**  
(team facilitator)



**Physical therapist (PT)**



**SLP**



**Social worker**  
(added later)



**Patient**

Continue for more

## History and Concerns

(Share key information gathered from team)

**Jon** is a 72-year-old male who suffered sudden bilateral sensorineural hearing loss and dizziness due to meningitis approximately 6 months ago. Following the recovery of his general central nervous system back to near baseline, his resulting hearing loss led to an inability to perform his job as a store clerk, strained personal relationships, loss of independence in scheduling appointments over the phone, and difficulty obtaining information from medical professionals. His dizziness results in multiple orthopedic injuries due to falls and loss of independence in mobility for tasks such as walking, bathing, dressing, cooking, and driving. **Jon** is single, with little reports of support from his home environment. His initial post-meningitis audiogram reveals undetectable pure-tone audiometric air conduction thresholds bilaterally across frequencies. He is seeking information regarding cochlear implant (CI) candidacy and recommendations for improved function, daily activity, and participation in activities of daily living.

## Assessment Plan

(Determine roles/responsibilities for evaluation)

The initial team of the neurotologist (team facilitator), audiologist, speech-language pathologist (SLP), and physical therapist (PT) meet to review his history and concerns. The team decides to include a social worker to address issues related to loss of income and at-home support. Team members agree to consider all viewpoints, and use majority agreement when 100% agreement did not occur. **Together, the team members develop a comprehensive assessment plan, with the following assigned areas:**



**Audiologist** - Conduct audiometric and vestibular assessments



**SLP** - Conduct cognitive-linguistic assessment; establish alternative communication



**PT** - Conduct balance and gait assessments



**Social Worker** - Assess benefits and level of at-home support



**Neurotologist** - Conduct a medical assessment for operative candidacy and anatomical suitability for CI

## Assessment Results

(Summarize key diagnostic results)

Following the conclusion of the assessment, the entire team meet, share, and discuss the findings:



**Audiologist** – Reports profound sensorineural hearing loss bilaterally; they perform aided speech recognition testing, which reveal 0% recognition for Hearing in Noise Test (HINT) sentence materials in right, left, and binaural best-aided conditions. Results of the vestibular assessment reveal bilateral caloric weakness, with no response to warm irrigation on the left and a very weak response on the right (5 deg/sec right-beating). A video head impulse test demonstrates highly reduced gain for all semicircular canals, suggesting a diffuse bilateral vestibular hypofunction. The audiologist administers a baseline Dizziness Handicap Inventory (DHI), and Jon scored 76 of 100 total points, indicating a severe handicap.



**SLP** – Reports normal scores on the Cognitive-Linguistic Quick Test, which the SLP modifies using written instructions and visual-only stimuli. In addition, informal measures of reading and writing indicate adequate performance for use of a paper-and-pencil communication mode until CI could take place.



**PT** – Completes an initial assessment of balance and gait that indicates poor balance, decreased step length, and need for assistance by another individual or a two-wheeled walker. Jon's Functional Gait Assessment (FGA) score is 15 of a high score of 30.



**Social Worker** – Determines Jon's Medicaid eligibility and provides the necessary paperwork. In addition, she determines a need for assisted living, which would promote safety, facilitate activities of daily living, and reduce fall risk.



**Neurotologist** – Obtains an MRI with intravenous gadolinium of the temporal bones and internal auditory canals, which demonstrates fluid signal within the bilateral cochleae. These findings suggest the feasibility of placing a CI electrode array into either cochlea. The neurotologist elects to pursue cochlear implantation in the left ear; the right ear was worth preserving based on the presence of bilateral vestibular hypofunction with a small degree of caloric response. The neurotologist plans surgery to occur very soon after the assessment. Expedient surgery will promote a full CI electrode array insertion before substantial labyrinthine fibrosis could occur.

### IPP Treatment Plan

(Discuss, reflect, and modify recommendations to develop a coordinated plan)

The IPP team members share and discuss the evaluation results at a group meeting. **Together, they agree upon the following recommendations:**



**Audiologist** – Follow up by performing CI activation, programming, and audiometric testing.



**SLP** – Follow up by setting listening goals and initiating post-CI auditory training.



**PT** – Follow up by reassessing gait and balance, and initiating vestibular rehabilitation post-CI.



**Neurologist** – Perform left CI following identification of assisted living facility.



**Social Worker** – Follow up by reassessing appropriate support post-CI.

### Treatment Outcomes

(Discuss results of treatment)

At 3-months post CI, sound-field warble-tone thresholds improve from being undetectable to measuring at 30 dB to 35dB HL in the left ear. Additionally, speech recognition scores are 70% words correct in HINT sentences in quiet. Jon attends weekly auditory training sessions, making improvements on phoneme, word, and sentence recognition tasks; he was initially completing daily telephone practice at home and finding increased success using the phone with familiar listeners. However, he stopped working on his home auditory training program. He participates in biweekly physical therapy appointments focusing on neuromuscular re-education and functional mobility exercises. As a result, his FGA score increased from 15 to 22, and his DHI score decreased from 76 to 58, indicating improvement. He ambulated with limited assistance. Although improved, his balance and gait remain barriers to independence. In separate conversations with all professionals on the IPP team, Jon expresses a desire to return home to an independent living situation.

The team discusses Jon's lack of follow-through with the home telephone practice. Jon mentions to the PT that he is more focused on gait and doesn't see as much value to the

**Treatment Outcomes**

(Discuss results of treatment)

telephone practice. The team discusses how they could each reiterate to Jon the importance of all facets of his educational program. In particular, the SLP, audiologist, and PT each find ways to reinforce what other team members are addressing in intervention across disciplines to increase Jon’s compliance.

**Team Follow-Up**

(Determine meetings & communication plan)

For follow-up, the team communicates biweekly to confirm an appropriate response to treatment. Speech-language pathology and physical therapy services remain ongoing to address continued listening, balance, and gait goals. The team monitor’s Jon’s continued response to treatment for his eventual safe return to living independently at home and for consideration of future CI candidacy in the right ear.

**Acknowledgement**

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- Christin Ray, PhD, CCC-SLP
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- Aaron C. Moberly, MD
- Special Interest Group 7 (SIG 7): Aural Rehabilitation and Its Instrumentation

**Citations**

American Speech-Language-Hearing Association. (n.d.). Team helps patient regain hearing, balance, and autonomy after cochlear implant. <https://www.asha.org/practice/ipe-ipp/case-studies/case-study-8/>

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