Treating Severe to Profound Hearing Loss in Adults: A Continuum of Care
Leigh Ann Monthey, AuD
Our mission

We help people hear and be heard.

We empower people to connect with others and live a full life.

We transform the way people understand and treat hearing loss.

We innovate and bring to market a range of implantable hearing solutions that deliver a lifetime of hearing outcomes.
Hearing Healthcare Professionals

- Diagnose, manage and treat hearing or balance problems for individuals from birth to adulthood
- Counsel and support patients emotionally
- Familiar with a wide range of treatment options and everchanging technology

“My HCP is a lifesaver”
Life SAVERS

See
Assess
advise
Engage
Refer
Support
**Life SAVERS**

**SEE**: Recognize when someone is a candidate for implantable technology

**ASSESS**: Testing to confirm benefit and candidacy

**ADVISE & ENGAGE**: Explain the benefit of implantable technology

**REFER**: Send to the right place at the right time

**SUPPORT**: Monitor and assist after referral
See

/sē/ verb
discern or deduce mentally after reflection or from information; understand
Dante: Introduction

• Longstanding hearing loss since childhood
• Deafness is in his family with many family members using American Sign Language
• Using high-powered hearing aids
• Daughter is getting married and he is afraid he won’t hear the music at her wedding
Dante: Audiogram

Otoscopy & Tympanometry:
Normal AU

Word Recognition Scores:
(W22 Recorded)
- Right: 20% at 90 dBHL
- Left: 20% at 90 dBHL

Hearing Aids:
Power BTEs; met targets as expected in the low frequencies but not able to meet targets in the highs
Dante: Discussion

- Have you seen patients with a similar history to Dante’s?
- What might hold someone back from recommending a cochlear implant for him?
- What could be the benefits of cochlear implantation for Dante?
- What are the chances he will do better with an implant than he does right now?
Hearing Loss

• **466 million people** in the world with disabling hearing loss¹

• Nearly **1 out of every 3 people** over 65 years are affected by disabling hearing loss¹

• Untreated hearing loss can lead to the acceleration of **cognitive decline** in the elderly²

• While users are generally satisfied with hearing aids, overall satisfaction is **significantly lower** for those with severe to profound hearing loss³

Effects of Disabling Hearing Loss


Reduced interpersonal communication
Decline in psychosocial well-being
Cognitive decline
Reduced quality of life
Reduced economic independence
Think of Your Patients…

Despite appropriately fit hearing aids…

- Do they struggle on the phone with unfamiliar speakers?
- Have they withdrawn from activities or social situations because they can’t hear?
- Does the hearing loss negatively impact their employment or job opportunities?
- Do they return frequently for hearing aid adjustments that just aren’t helpful?

Yes? Then you may have recognized a candidate…
Dante: Outcome

Left ear implanted July 2015

Speech Recognition: Left Ear

- Sentence (Quiet)
- Sentence (Noise)
- Word (quiet)

- Pre-op
- 3 month
- 3 year
Dante: Outcome

Left ear implanted July 2015
Right ear implanted April 2018

Speech Recognition: Right Ear

Sentence (Quiet)  Sentence (Noise)  Word (quiet)

- Pre-op
- 3 month
- 6 month
Video

https://youtu.be/USbNHru8T5Q
In their own words…

“I would have liked to have the choice presented to me 20 years ago…”

~Dante B
Assess

/əˈses/ verb

evaluate or estimate the nature, ability or quality of.
Sue: Introduction

- Meniere’s disease with a history of fluctuating and progressive hearing loss
- Father had significant untreated hearing loss for many years and she swore she wouldn’t do the same
- Had seen numerous Audiologists and ENT’s over the years
- Music is very important to her
Sue: Audiogram

Otoscopy & Tympanometry:
Normal AU

Word Recognition Scores:
(W22 Live Voice)
- Right: 68% at 110 dBHL
- Left: 89% at 105 dBHL

Hearing Aids:
Power BTEs; met NAL-RP targets as expected in the left ear, did not meet targets in the high frequencies in the right ear
Sue: Discussion

• Have you met patients like Sue?
• What might hold someone back from recommending a cochlear implant for her?
• How do you know Sue is “ready” for a cochlear implant evaluation? Are there other tests you feel are needed?
Hearing Aid Benefit

How do you measure hearing aid benefit?

Setting Goals

Patient-centered hearing care

• Ask questions:
  – What are some of the biggest challenges of your hearing loss?
  – Is there anything you’ve had to give up because of your hearing loss?
  – What could you do in your life differently if you could hear better?

• Set goals for hearing treatment
• Evaluate progress on those goals

If the patient doesn’t meet their goals with the best possible hearing aid fitting – what next?

Adult Candidacy: Nucleus® Cochlear Implant

Nucleus Cochlear Implants are intended for use in adults who have bilateral sensorineural hearing impairment and obtain limited benefit from appropriately fit binaural hearing aids.

- Moderate to Profound hearing thresholds
  ≥ 90 dBHL in the mid to high frequency range

- Limited benefit from amplification
  50% or less in the ear to be implanted (60% or less in the best-aided condition) on recorded sentence measures
Adult Candidacy: Hybrid™ L24 Implant*

The Nucleus Hybrid L24 cochlear implant system is indicated for unilateral use in patients aged 18 years and older who have residual low-frequency hearing sensitivity and severe to profound high-frequency sensorineural hearing loss and who obtain limited benefit from appropriately fit bilateral hearing aids.

- Severe to profound high frequency hearing loss
  - \( \geq 75 \text{ dBHL PTA for } 2, 3 \text{ & } 4 \text{ kHz} \)
- Limited benefit from amplification
  - 10-60% aided word score in the ear to be implanted and up to 80% aided word score in the opposite ear

*The Acoustic Component should only be used when behavioral audiometric thresholds can be obtained and the recipient can provide feedback regarding sound quality. Hybrid L24 implant is approved for use in adults ages 18 and older.
Nucleus Cochlear Implants are intended for use in children 12-24 months of age who have bilateral profound sensorineural deafness and children two years of age or older who have severe to profound hearing loss bilaterally who demonstrate limited benefit from hearing aids.

- Young Children: lack of progress in the development of simple auditory skills when appropriately aided
- Older Children: ≤30% correct on open set word recognition tests
When to Consider Cochlear Implant Evaluation

Cochlear’s Clinical Based Recommendation:¹⁻⁴

*PTA defined as .5, 1 & 2 kHz

4 - Clinical Evaluation of the Cochlear Nucleus CI532 Cochlear Implants in Adults Investigator Meeting. 2019 Apr
Sue: Outcome

Right ear implanted March 2017

Speech Perception Testing

- Sentence (Quiet)
- Word (Quiet)
- Sentence (Noise)

Pre-op vs 6 month
Video

https://youtu.be/jkqzBNwL_xk
In their own words…

“Ask the patient directly what they feel about...their hearing loss. Often it’s easier to talk to a health professional than loved ones who are also deeply impacted.”

~Sue Y
Advise & Engage

/ədˈvɪz/ verb  
offer suggestions about the best course of action to someone.

/enˈɡeɪj/ verb  
To occupy oneself; become involved.

Hear now. And always.
Gay: Introduction

- Loving grandmother with a sudden hearing loss in both ears in her 50’s
- Referred to a neurotologist after having an allergic reaction to prednisone
- Has not tried hearing aids
Gay: Audiogram

**Otoscopy & Tympanometry:**
Normal AU

**Word Recognition Scores:**
Did not test

**Hearing Aids:**
Not currently using
Gay: Discussion

• What do you think about Gay’s candidacy – would you refer her for consideration of an implant?
• Do you think she should have a hearing aid trial first? Why or why not?
• What if she was reluctant to have surgery? What would you tell her?
Counseling for a Referral

- How a cochlear implant works
- How a cochlear implant is different from hearing aids
- Expected outcomes
- Information about current technology
- Address other concerns
  - Cost
  - Surgery
  - Residual hearing
Two main components:

An **internal implant** placed just under the skin, behind the ear

An external **sound processor** that sits behind the ear
Video

https://youtu.be/Vm0nZH9RahE
Counseling for a Referral

- How a cochlear implant works
- How a cochlear implant is different from hearing aids
- Expected outcomes
- Information about current technology
- Address other concerns
  - Cost
  - Surgery
  - Residual hearing
Physiological Limitations: Cochlear Dead Regions

Cochlear dead regions are prevalent when thresholds ≥ 70 dB HL (~60%)\(^1\)

Why Cochlear Implantation?

For patients who meet candidacy criteria:

- High likelihood of significantly better speech understanding in both quiet and noise\(^1,2\)
- Improvement in quality of life\(^3\)
- Reduced anxiety and depression and improved overall health\(^4\)
- May slow age-related cognitive decline\(^5\)

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Counseling for a Referral

✓ How a cochlear implant works
✓ How a cochlear implant is different from hearing aids
✓ Expected outcomes
✓ Information about current technology
✓ Address other concerns
  – Cost
  – Surgery
  – Residual hearing
Outcomes

Large clinical trials in the US demonstrate post-operative speech perception scores dramatically higher than pre-operative scores\(^1,2\)

- On average, test scores for single words improve by 50 or more percentage points\(^1,2\)

A meta-analysis of 42 clinical studies revealed that unilateral cochlear implants provide improved hearing and significantly improved quality of life and improvements in sound localization for bilateral cochlear implants\(^1\)

- Of the 19 clinical studies that measured quality of life for adults after cochlear implantation, ALL reported a significant improvement

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Outcomes

• For patients with severe to profound hearing loss, cochlear implantation results in reduced anxiety and depression and improved overall health¹

• Cochlear implants may slow age-related cognitive decline with improvements seen in verbal and memory domains after surgery²

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Discuss Current Performance

In order to know how someone will do; need to know how they are doing today

• Formal tools
  – Client-oriented Scale of Improvement (COSI)
  – Abbreviated Profile of Hearing Aid Benefit (APHAB)

• Informal tools
  – “What do you avoid because of your hearing loss?”
  – “What would you do differently if you could hear better?”
Will I Do Better?

How do YOU answer the question:
“Will a cochlear implant work for me?”
Counseling for a Referral

- How a cochlear implant works
- How a cochlear implant is different from hearing aids
- Expected outcomes
- Information about current technology
- Address other concerns
  - Cost
  - Surgery
  - Residual hearing
Nucleus Cochlear Implants

**Most Implanted**
Over 379,000 registered Nucleus Cochlear implants worldwide

**Reliable Track-Record**
#1 in Implant reliability today and over time

**Improved Performance**
With improved technology of the implant, patients do better with each implant generation.

**Perimodiolar Advantage**
Cochlear delivers electrodes that are the closest to the hearing nerve to provide focused stimulation to maximize hearing performance.

**20+ Years of MRI Access**
Removable magnets were first introduced in Nucleus implants in 1997 for access to MRI – today, the Profile™ Plus allows access to MRI scans at 1.5T and 3.0T with the magnet in place

**Natural and Low-Profile Design**
Introduced slim implants that reduce the need for drilling

With over 30 years of innovations, Cochlear has continued to deliver exceptional products to ensure our recipients can **Hear Now. And Always**

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4. MRI Guidelines D774756
5. Data on File: Internal Specifications
6. CAM-MKTP-673: CI532- A New Benchmark in Hearing Performance
Dedication to Implant Reliability

Built on the unrivalled reliability record of the Profile Series Implant and of the entire Cochlear Nucleus implant portfolio with a longstanding track record of reliable implants.

Most reliable today:
Cochlear Nucleus Profile Series¹-³

Most reliable over time:
Cochlear Nucleus CI24RE Series¹-³

Most reliable for children:
Cochlear Nucleus Profile Series¹-³

99.82% within 5 years
99.00% within 14 years
99.75% within 5 years

Surgery

- Outpatient procedure using general anesthesia
- Small incision with minimal (to no) hair removal
- Cochlear Nucleus implants are designed to help preserve delicate cochlear structures
- Refined surgical techniques are used
- Intra-operative implant testing may be completed to ensure device integrity
Video

https://youtu.be/qO9HuQJ9Kfk
Hear Your Way

Cochlear’s sound processors and wireless accessories allow recipients to hear their way with products that are small, smart and simple.
**Hear Your Way**

**Proven Hearing Performance**

- **Smart Sound iQ with SCAN***
  - Automatically adjusts to the hearing situation
  - Industry’s first scene classifier
  - Background Noise Reduction*
  - Wind noise reduction*

- **Hybrid™ Hearing Advantage**
  - **Hybrid Hearing with Nucleus 7**
    - All Nucleus 7 sound processors are Hybrid ready
    - Amplify low frequency residual hearing and provide electrical stimulation with a single device

- **Uncompromised Hearing Performance**
  - **Kanso® Sound Processor**
    - Smart Sound iQ with SCAN
    - Off-the-ear sound processor with the same hearing experience as a behind-the-ear sound processor in quiet and noise¹

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*SNR-NR and WNR are approved for use with any recipient ages 6 years and older, who is able to 1) complete objective speech perception testing in quiet and in noise in order to determine and document performance 2) report a preference for different program settings. SCAN is FDA approved for use with any recipient age 6 years old and older, to be used at the discretion of the recipient/parent/caregiver.

* The Acoustic Component should only be used when behavioral audiometric thresholds can be obtained and the recipient can provide feedback regarding sound quality.
Wear Your Way

Discreet and Comfortable

Industry’s Smallest Sound Processors

- Nucleus 7 is 25% smaller and 24% lighter than previous processors
- Kanso is the smallest off-the-ear solution on the market

Fits Any Lifestyle

Range of wearing options

- Retention options for extra security when needed
- Six color choices for the Nucleus 7 and 8 colors for the Kanso

Swim With Your Processor

Kanso and Nucleus 7 Aqua+

- Nucleus 7 is water resistant with rechargeable batteries (IP57)
- Kanso and Nucleus 7 are water proof with the Aqua+ accessory (IP68)

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*1. The Nucleus Aqua+ accessory is IP68 rated and is approved for use with rechargeable batteries and is not approved for use with the acoustic component. The Nucleus 7 Sound Processor is water-resistant without the Nucleus Aqua+ accessory to level of IP57 of the International Standard IEC60529 when used with rechargeable batteries.
2. The Kanso Sound Processor with the Aqua+ is water resistant to level IP68 of the International Standard IEC60529. This water protection rating means that the sound processor with the Aqua+ can be continuously submerged under water to a depth of 3 meters (9 feet and 9 inches) for up to 2 hours. This water protection only applies when you use the Aqua+ and LR44 alkaline or nickel metal hydride disposable batteries.
Connect Your Way

**Direct-to-Device Streaming**

- Stream phone calls, music and more directly from compatible iOS and Android devices*
- Bimodal patients with compatible ReSound hearing aids** can stream directly to both ears

**Nucleus Smart App**

- Fine tune settings, access personalized data-logging and easily locate a missing sound processor
- Available for iPhone®, Apple Watch® and Android phones

**Wireless Accessories**

- Robust 2.4 GHz streaming technology
- Bimodal patients with compatible ReSound hearing aids can stream to both ears

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**Made for iPhone. Made for Android™.**

- Stream phone calls, music and more directly from compatible iOS and Android devices*
- Bimodal patients with compatible ReSound hearing aids** can stream directly to both ears

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*The Cochlear Nucleus 7 Sound Processor is compatible with Apple and Android devices. For compatibility information visit [www.cochlear.com/compatibility](http://www.cochlear.com/compatibility). Compatible Android devices that enable streaming are anticipated soon.

**For compatible ReSound hearing aids visit: [www.cochlear.com/nucleus/compatibility](http://www.cochlear.com/nucleus/compatibility)**
24/7 Support for Recipients
- Personalized log-in for warranty information, user guides, rehabilitation and more
- Reduces the burden on cochlear implant clinics

Program Patients Naturally
- Patients can interact with clinicians in a more natural and comfortable way
- Allows for programming in more environments

Hear Now. And Always.
- Cochlear has a tradition of making our sound processors compatible with older internal devices
- Support for upgrades through Cochlear customer service
Counseling for a Referral

- How a cochlear implant works
- How a cochlear implant is different from hearing aids
- Expected outcomes
- Information about current technology

- Address other concerns
  - Cost
  - Surgery
  - Residual hearing
Addressing Concerns (Activity)

What are some common concerns patients have about moving forward with a cochlear implant?
Video

https://youtu.be/A5gTrolMmn4
Gay: Introduction (Reminder)

• Loving grandmother with a sudden hearing loss in both ears in her 50’s
• Referred to a neurotologist after having an allergic reaction to prednisone
• Has not tried hearing aids
Gay: Outcome

Left ear implanted May 2005

Speech Perception Testing

- Sentence (Quiet)
- Word (Quiet)
- Sentence (Noise)

Pre-op 6 month
Video

https://youtu.be/J0xnQiONDEw
In their own words...

“I would have the doctors and audiologists put themselves in the patient’s situation and explain to them how a cochlear implant would enhance their life”

~Gay M
Refer
/rəˈfər/ verb
pass a matter to (another body, typically one with more authority or expertise) for a decision; send or direct someone to a medical specialist
Bob T: Introduction

- Physician (Fertility specialist)
- Gradual hearing loss with tinnitus
- Now 87 years old and anxious to do anything possible to hear better
Bob T: Audiogram

**Otосcopy/Tympanometry:**
Normal AU

**Word Recognition Scores:**
RE: 18%
LE: 20%

**Hearing Aids:**
Frequency-lowering digital HA’s; fit to NAL targets
Bob T: Discussion

• Bob has some residual hearing – does this hold you back from suggesting a referral for him? Why or why not?

• How do you know when you have tried everything you can for him prior to referring for an implant?
When to Refer

Don’t Wait…
1. Correlation between duration of hearing loss and performance\(^1\)
2. Correlation between hearing loss and cognitive decline\(^2\)
3. Functional hearing can improve performance outcomes\(^1\)

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Once someone has decided to look into candidacy for a cochlear implant, what barriers may remain?
Referring Candidates

- Identify the clinical specialist in your area
- Request support materials for your patient
- Connect your patient to a cochlear implant recipient
- Schedule follow up
Cochlear Website Resources

- Request an information guide
- Find a cochlear implant specialist
- Support for candidates & recipients
- Professional resources
Connect with a Cochlear Concierge

Speak to a team of experts and audiologists, who include Nucleus® implant users, here to support and guide your patients through their hearing journey

- Discover the benefits of an implantable hearing solution
- Learn about the experiences of others using Cochlear Nucleus Implant, Cochlear Nucleus Hybrid or Baha® Systems
- Get answers to your questions

Email: Concierge@Cochlear.com

Call: 1 (800) 216-0228
Your Local Concierge
Bob T: Outcome

Right ear implanted during Hybrid trial, Jan 2006

Speech Perception Testing

Sentence (Quiet) | Word (Quiet)
---|---
Pre-op | 6 month
Bob T: Outcome (Cont.)

Post-op
Right
(unaided)
https://youtu.be/--gHXtX5KfU
In their own words...

“There is an ego problem, a fear that the patient will be lost to another physician, and perhaps [they] feel that their patient will feel that he or she is less of a physician if another physician can do things that they could not do.”

~Bob T
Support

/sə'pɔrt/ verb
give assistance to; enable to function or act; give approval, comfort or encouragement to

Hear now. And always
Susan H: Introduction

- Hearing is getting progressively worse
- Daughter is getting older and will be going off to college in a few years
- Purchased a very expensive pair of hearing aids that the dispenser thought would help but she is still not doing well enough to talk on the phone
- Discouraged from seeking an implant by previous audiologists and hearing aid dispensers and “horror stories” from internet groups
Susan H: Audiogram

Otoscopy & Tympanometry:
Normal AU

Word Recognition Scores:
- Right: 54% at 95 dBHL
- Left: 38% at 90 dBHL

Hearing Aids:
New digital aids with frequency-lowering technology; met targets as expected
Susan H: Discussion

• Susan has a progressive hearing loss – how do you know when/if the time is right for a cochlear implant evaluation?

• What are the consequences of waiting too long? Not waiting long enough?

• Is Susan a good candidate for bimodal use? Why or why not?
Ongoing Support

- Monitoring for candidacy if not a candidate today
- Managing the hearing aid on the opposite ear if a unilateral implant is received (ie, Bimodal recipient)
- Offering cochlear implant programming services
Talking about cochlear implants if the person is NOT a candidate but may be one in the future…

- When would you start talking about implants?
- How do you explain they are not yet a candidate?
- How do you know when to send them for an evaluation?
Hearing with Two Ears

- Recipients with residual hearing in the opposite ear will often continue to use a hearing aid with their cochlear implant.

- Considerations:
  - Deciding between Bilateral CI vs Bimodal
  - Type of hearing aid in the opposite ear
  - How to program the hearing aid
  - Many Bimodal recipients will continue to get care for their hearing aid from their local professional.
Benefits of Bimodal Hearing

Potential benefits:

- Better hearing performance in background noise\(^1\)
- Music appreciation\(^2\)

Up to 70% of CI users are bimodal\(^3\)

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### Hearing Satisfaction after Cochlear Implant

#### Bilateral Hearing Aids (pre-CI)
- **Satisfied or Very Satisfied**
  - Ability to understand what is said on TV: 13%
  - Ability to understand conversations in a small group: 8%
  - Hearing performance in background noise: 2%
  - Ability to listen to and appreciate music: 13%
  - Ability to understand people on the phone: 6%

#### Smart Bimodal* (after CI)
- **Satisfied or Very Satisfied**
  - Ability to understand what is said on TV: 76%
  - Ability to understand conversations in a small group: 79%
  - Hearing performance in background noise: 58%
  - Ability to listen to and appreciate music: 68%
  - Ability to understand people on the phone: 71%

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*To view smart bimodal hearing solution compatibility visit [http://www.cochlear.com/nucleus/compatibility](http://www.cochlear.com/nucleus/compatibility)
Cochlear’s partnership with ReSound offers the industry’s most comprehensive portfolio of Smart Bimodal Solutions to best meet patient’s needs

- Recipients can take advantage of made for iPhone technology and True Wireless™ accessories in both ears
- Centralized customer support for bimodal recipients
- Smart Hearing Alliance pricing available for recipients of Cochlear technology
- A complete list of compatible ReSound hearing aids is available at: www.cochlear.com
Fitting Bimodal Technology

- Bimodal fitting recommendations are available
- Recommendations given for directional microphone settings, mixing ratio and balancing gain
- Linking is done through cochlear implant software
Offer Cochlear Implant Programming

Cochlear Provider Network (CPN)

- Connects independent dispensing Audiologists with clinical specialists
- Enhance your clinic’s visibility with specialized offerings
- Become a “full hearing solutions” expert
- Industry-leading support from Cochlear

Learn More: (888) 257-6479 or CPN@Cochlear.com
Susan H: Outcome

Monitored for 3 years, implanted in 2017 (Right Ear) when Hybrid became available

Speech Perception

- Word (Quiet)
- Sentence (Noise)*

* Bimodal
Video

- [https://youtu.be/hXFgFx64oEY](https://youtu.be/hXFgFx64oEY)
In their own words…

“Get your patients in the booth periodically and keep a close eye on those word scores….I was not topping 40-45 [percent correct] and still no conversation about cochlear implants.”

~Susan H
Life SAVERS

See
Assess
Advise
Engage
Refer
Support
Life SAVERS

**SEE**: Recognize when someone is a candidate for implantable technology

**ASSESS**: Testing to confirm benefit and candidacy

**ADVISE & ENGAGE**: Explain the benefit of implantable technology

**REFER**: Send to the right place at the right time

**SUPPORT**: Monitor and assist after referral
Contact Us

www.cochlear.com/us
procare@cochlear.com
(877) 883-3101

Follow us on Twitter, Instagram and Facebook
Find videos for you or your patients on YouTube
Closing Video

https://youtu.be/DJLmleOEOvE