Course Information

Limitations/Risks

- The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context; you should evaluate the course accordingly.
- As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations.
- The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors.
- The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations.
- Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs.
- Providers should always evaluate the limitations of diagnostic and screening tools, considering their potential for false results as well as any ethical implications.
- It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice.

Cochlear Care Consensus:

Expert Guided Care Recommendations

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Learning Objectives

After completing this course, participants will be able to:

- Describe how and why the Cochlear Care Consensus was developed.
- List at least three of the prioritized consensus statements.
- Describe the benefits of the Cochlear Care Consensus recommendations to clinical practice.

Speaker Disclosures

Financial disclosures and a disclaimer were presented at the beginning of this course. Please refer to the original course materials for complete disclosure information.

Evolution of Cochlear Implant Aftercare

Early Cochlear Implant Care: The 1980s

The clinical trial for the Mini 22 device in the 1980s established the first recommended protocols for programming, evaluation, and post-operative follow-up. Appointments were lengthy and frequent, as clinicians were developing care models from the ground up.

- First-year activation appointments lasted up to eight hours, with an additional four hours the following day.
- Patients were typically seen nine times during the first year, totaling approximately 26 hours of clinical contact.
- Follow-up schedule included: post-activation day, one week, and months 1, 2, 3, 6, 9, and 12.

Key Differences: Then vs. Now

Three major areas of change have allowed the care model to evolve significantly over the past four decades:

Area	Then (1980s) vs. Now
Programming	Bipolar stimulation required individual threshold and comfort level measurement for every electrode; processor erase took 20 minutes. Today: wireless programming, immediate downloads, monopolar stimulation, interpolation, and population mean mapping allow much faster individualized fitting.
Equipment	One program per processor with sensitivity dial only; patients returned to clinic for any change. Today: four programs available, patient-controlled app adjustments, and self-troubleshooting options reduce clinic visits.
Recipients	Patients presented with profound deafness and limited communication ability. Today: shorter durations of deafness and better residual hearing result in improved outcomes and easier communication from the outset.

Current Appointment Trends

A 2025 clinician survey tracked the evolution of post-operative appointment frequency:

- 1980s: Approximately 9 appointments in the first year
- 2014: Average of approximately 8 appointments
- 2025: Average reduced to approximately 6 appointments
- Clinicians now spend approximately 25% of their time with cochlear implant patients and 75% in other specialty areas, reflecting widespread multispecialty practice.

Q1

- The Cochlear Care Consensus was developed primarily to reduce variability in cochlear implant care and improve clinical efficiency.
- Key reasons include: increasing demand that outpaces available clinical capacity, multispecialty clinical settings, and the need for evidence-based guidance to standardize post-operative care.

Why a Cochlear Care Consensus?

Clinical Challenges Driving the Need

- Cumulative patient volume: existing patients continue to require long-term maintenance care, limiting capacity for new referrals.
- Utilization gap: adult hearing aid utilization averages approximately 20%; cochlear implant utilization is estimated between 2% and 12% of eligible adults.
- Access limitations: extended waitlists prevent many candidates from receiving timely care.
- Multispecialty practice: fewer clinic hours are dedicated exclusively to cochlear implant patients.
- Clinicians seek streamlined, evidence-based tools to support efficient, high-quality care.

Clinical Practice Guidelines vs. Clinical Consensus

These two frameworks are distinct and serve complementary purposes:

Clinical Practice Guideline	Clinical Consensus
Requires high-level evidence from peer-reviewed literature	Integrates expert clinical knowledge not yet fully represented in the literature
Typically sponsored or organized by a professional or regulatory body (e.g., AAA, ASHA, FDA)	Developed through structured expert deliberation and anonymous voting
Statements are bounded by available published evidence	Allows clinicians to address the research-to-practice gap (estimated average: 17 years)
Recommendations may be less definitive where evidence is limited	Provides more specific clinical guidance while the evidence base continues to develop

Example: A clinical practice guideline may recommend auditory training with variable options. A consensus statement can specify: home-based auditory training in the cochlear implant ear alone for approximately 30 to 60 minutes per day, with additional guided training recommended for specific populations such as single-sided deafness or sequential bilateral implantation.

Q2

- The consensus was achieved using a modified Delphi process — a structured methodology developed to ensure all expert voices carry equal weight through anonymous voting.
- Statements scoring greater than 7 on a 9-point Likert scale met consensus; scores of 6.5 to 7 were near consensus; below 6.5 did not meet consensus.

The Modified Delphi Consensus Process

Overview and Background

The modified Delphi method was originally developed by the RAND Corporation during the Cold War era to synthesize expert knowledge through structured, anonymous deliberation. The Cochlear Care Consensus adapted this methodology to develop evidence-based guidance statements for adult cochlear implant care.

Key Tenets of the Modified Delphi

- Anonymity in voting prevents the influence of any single voice or 'bandwagon' effect.
- Opportunity for anonymous comments after each voting round.
- Comments are incorporated into subsequent review iterations.
- Predetermined scoring criteria are established and disclosed to all participants before voting begins.

Consensus Process: Structure and Scope

- Six structured meetings were conducted.
- Five content expert groups were formed, each led by experienced clinicians.
- Literature reviews were completed and draft protocols developed for each content area.
- Likert statements were written, voted upon anonymously, and revised over two structured rounds.
- Similar statements were consolidated to avoid redundancy.

Scoring Criteria

Score Range	Interpretation
Greater than 7.0	Consensus met
6.5 to 7.0	Near consensus — reviewed by consensus chairs for final determination
Less than 6.5	Consensus not met

Outlier management: votes more than two points from the mean were considered outliers and excluded from the final score calculation.

Final Outcomes

- Round 1: 69 Likert statements submitted; 64 met consensus, 3 were near consensus, 2 did not meet consensus.
- Round 2: 61 statements reviewed; 60 met consensus, 1 near consensus (excluded).
- Final output: 56 consensus statements across five content areas.

Content Expert Groups and Leadership

Expert Group Structure

- **Programming and Objective Measures — Jordan Holder, AuD; Allison Bieber, AuD**
- **Evaluation and Validation of Performance — Meredith Holcomb, AuD; Mary Rose Goldstein, AuD**
- **Contralateral Ear Considerations — Susan Rathgob, AuD; Bill Shapiro, AuD**
- **Patient Management Considerations — Kristen Lewis, AuD; Kerry Richter, AuD**
- **Cochlear Services and Tools — Molly Smeal, AuD; Rebecca Lewis, AuD**

Q3

- A consensus statement represents an agreed-upon recommendation based on a combination of peer-reviewed literature and structured expert input.
- It is distinct from both a clinical practice guideline (which requires high-level published evidence) and an individual clinical opinion (which lacks structured validation).

Key Consensus Statements

Programming and Objective Measures

These statements were ranked among the highest priority by the consensus group.

Key Statement: Upper Stimulation Levels

- Upper stimulation levels should be guided by electrically evoked stapedial reflex (ESRT) measurement by the first follow-up visit when possible.
  - Probe tone: 678 Hz
  - Measurement site: contralateral ear (when an unimplanted contralateral ear is present)
  - ESRT findings used as initial setup for upper stimulation level guidance

Key Statement: Population Mean Mapping at Activation

- It is recommended that clinicians use the population mean mapping at activation.
  - T and C levels are increased simultaneously and globally to a level the patient reports as very loud.
  - Over approximately 15 minutes of conversation with the patient, upper stimulation levels are adjusted globally until the patient is comfortable.
  - Population mean mapping has been shown to be an effective and efficient starting point for individualized fitting.

Key Statement: Lower Stimulation Level Verification

- Lower stimulation levels should be verified using aided detection thresholds (ADIT) with frequency-modulated warbled pure tones or fresh noise.
- Optimal range for cochlear implant aided thresholds: 20 to 25 dB HL from 250 Hz through 6000 Hz.
- If aided thresholds fall within this range, adjustment to T levels is likely unnecessary.
  - Thresholds outside this range (poorer or better than 20 to 25 dB HL) should prompt consideration of T level adjustments.
  - Clinical judgment should be applied, particularly for long-term stable patients.

Q4

- Cochlear implant programming is a key topic area addressed in the consensus statements.
- Major programming recommendations include: ESRT-guided upper stimulation levels, population mean mapping at activation, and ADIT verification of lower stimulation levels targeting 20 to 25 dB HL.

Evaluation and Validation of Performance

Key Statement: Minimum Speech Test Battery Version 3 (MSTB3)

- Clinicians are recommended to follow the Minimum Speech Test Battery Version 3 (MSTB3) when assessing adult cochlear implant performance post-operatively.
- The MSTB3 was revised in recent years and is supported by published evidence.
- This recommendation was itself achieved through a modified Delphi process.
- Use of the MSTB3 supports standardization of performance assessment across clinical settings.

Key Statement: Daily Device Wear Time

- A minimum of 12 hours per day of device use is recommended.
- This recommendation is appropriate to communicate beginning at activation.
- Individualized consideration applies for patients with varying sleep duration.
- Processor wear time is a critical factor in outcomes; emerging evidence suggests increasing wear time in experienced users is associated with measurable performance improvement.

Key Statement: Avoiding Unnecessary Map Adjustments

- It is not necessary to continue adjusting T and C levels once a map is optimized.
- Optimization is indicated when: ESRT measurements guide upper stimulation levels, and ADIT results fall within the 20 to 25 dB HL range.
- Repeated minor adjustments over time can cumulatively deviate from the patient's optimal programming.
- Adjustments should be made when clinically warranted, not as a default at every appointment.

Contralateral Ear Considerations

Key Statement: Monitoring and Recommending for the Second Ear

- When a patient's contralateral ear meets candidacy criteria for cochlear implantation, the clinician should recommend that ear for implantation.
- Patients should be informed of bilateral candidacy both pre-operatively and throughout post-operative follow-up.
- With reduced appointment frequency, it is especially important to address contralateral ear status at each available visit.
- For bimodal patients, unaided audiometric thresholds in the contralateral ear should be monitored over time.

Key Statement: Hearing Aid Use in the Contralateral Ear

- Consistent use of a hearing aid in the contralateral ear is strongly encouraged for eligible bimodal patients.
- The timing and structure of bimodal stimulation following activation should be discussed with the individual patient.
- Best practices should be applied to both the cochlear implant ear and the hearing aid ear.
- Bimodal benefits are well-documented and significant.

Patient Management Considerations

Key Statement: Expected Performance Benchmarks (3 to 12 Months Post-Op)

- By three months post-operatively, most patients are expected to have achieved a clinically meaningful improvement in speech understanding compared to their pre-operative baseline.
- Expected monosyllabic word recognition scores (e.g., CNC words): approximately 55 to 65% by 3 to 12 months post-activation.
- Factors influencing performance trajectory include: processor wear time, optimization timing, underlying etiology, and participation in auditory rehabilitation.
  - Favorable etiology examples: Meniere's disease
  - Less favorable etiology examples: temporal bone fracture
- A reduced appointment schedule is appropriate for most patients, but tracking performance benchmarks ensures clinically significant concerns are not missed.
- Assessment at three months (per MSTB3) followed by assessment at 12 months is recommended.

Q5

- The consensus panel consisted of a diverse group of practicing audiologists with expertise spanning academic medical centers, private practice, non-profit clinics, and the Veterans Administration.
- The expert panel collectively represented over 200 years of cochlear implant clinical experience, with career-stage diversity ranging from early-career to pioneers in the field.

Cochlear Services and Tools

Key Statement: Remote Check

- Remote Check is recommended as a tool once the patient has reached expected performance milestones (approximately three months post-activation or later).
- Remote Check can be used as a baseline measure and for ongoing monitoring between in-person visits.
- Clinical data provided includes: aided detection levels, incision site appearance, impedances, and performance comparison to prior assessments.
- The tool reduces unnecessary urgent in-person visits and helps identify patients who require more frequent follow-up.
- Remote Check supports efficient, high-quality long-term care management.

Key Takeaways

Summary

- The Cochlear Care Consensus provides evidence-based guidance for optimized post-operative care of adult recipients of the Nucleus cochlear implant system.
- The consensus was developed through a systematic literature review combined with a structured modified Delphi expert panel process.
- All 56 consensus statements are grounded in peer-reviewed evidence and/or the collective clinical expertise of audiologists with over 200 years of combined cochlear implant experience.
- The consensus offers practical, implementable recommendations for everyday clinical practice, including programming, evaluation, contralateral ear management, and long-term care.
- Streamlining clinical practice through evidence-based guidance is essential to improving cochlear implant utilization and ensuring more patients access this life-changing technology.
- Clinicians are encouraged to review their current care protocols against the consensus recommendations and engage local cochlear implant representatives for support.

References

Messersmith, J. J., Johnsrude, I. S., & others. (2019). Clinical practice guideline: Cochlear implant referral and evaluation. American Journal of Audiology, 28(4), 735-747.

Notes

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