Original Investigation

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Evaluation of Extended Indications for Cochlear Implantation Beyond Conventional Criteria

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Abstract

Objective: This study evaluated the indications for cochlear implant (CI) that extend beyond the current criteria of the Health Implementation Communiqué (HIC) of the Turkish Social Security Institution.

Methods: A retrospective review was performed on 27 patients who underwent CI, even though they did not meet the HIC criteria. All cases were approved by the Scientific Advisory Board on Auditory Implants of the Ministry of Health. Demographic, clinical, and audiological data, including pre- and post-operative pure-tone averages (PTA) and speech discrimination scores (SDS), were analyzed.

Results: The cohort included 15 females and 12 males, with a median age of 17 years. Etiologies comprised congenital hearing loss (n=14), idiopathic sudden sensorineural hearing loss (n=3), post-meningitic hearing loss (n=2), Menière's disease (n=1), and other acquired causes. Exclusion from the HIC criteria was mainly due to age restrictions for bilateral CI, audiological thresholds outside defined limits, single-sided deafness, SDS above 30%, or a gap of more than four years between chronological and language age. Audiological outcomes from 22 patients revealed a median PTA with the CI alone of 35 dB hearing level and a median SDS of 58%, with significant improvement compared to baseline ($p<0.001$). While most patients demonstrated substantial benefit, 14.8% (cases 6, 17, 21, 25) exhibited poor performance (SDS <30%). Case analyses underscored the impact of etiology and duration of auditory deprivation on outcomes.

Conclusion: CI beyond conventional reimbursement criteria can provide meaningful functional gains. Individualized, evidence-based, multidisciplinary evaluation supports broader access to hearing rehabilitation and is consistent with global trends in personalized auditory care.

Keywords: Cochlear implant, hearing loss, single-sided deafness, social security, reimbursement incentive, cochlear implant candidacy, insurance coverage

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Introduction

Hearing loss profoundly affects communication, cognition, and quality of life (1). Cochlear implants (CI) improve outcomes, yet global utilization remains below 15%, with inequities in access (2). Initially restricted to post-lingually deafened adults with profound hearing loss [>100 dB hearing level (HL)], CI candidacy has expanded to children, bilateral implantation, residual hearing, and single-sided deafness (SSD) (3,4). While guidelines

generally align in this direction, reimbursement and socioeconomic factors vary considerably across countries (4-7). Demonstrating the benefits in patients excluded from coverage is essential to expand healthcare and reduce inequities.

In Türkiye, candidacy and reimbursement for CI are regulated by the Health Implementation Communiqué (HIC) of the Turkish Social Security Institution (SSI), which defines explicit audiological and clinical thresholds for eligibility. According to the latest update in 2024, CI is reimbursed for patients with bilateral severe-to-profound sensorineural hearing loss (SNHL) with no benefit from binaural hearing aids (8). From an audiometric standpoint, CI eligibility in children older than two years and in adults requires either a bilateral four-frequency pure-tone average (4PTA) of ≥80 dB HL or a better-ear 4PTA of ≥70 dB HL combined with a worse-ear 4PTA of ≥90 dB HL, accompanied by speech discrimination scores (SDS) below 30% when measurable. For children aged two years or younger, bilateral SNHL of ≥90 dB HL constitutes the audiological threshold for candidacy. Additionally, candidates are expected to have an expressive and/or receptive language age that does not differ by more than four years from their chronological age. In individuals older than four years, the SSI does not reimburse simultaneous or sequential bilateral CI unless the hearing loss is meningitis-related or accompanied by bilateral blindness (8).

While the HIC criteria provide standardized guidelines for reimbursement, they restrict CI to a narrow subset of patients and exclude several groups who may still derive substantial benefits. Among those potentially benefiting are individuals with SSD, candidates for tinnitus suppression, and those considered for bilateral CI beyond the regulatory age limits (9-15). In addition, there exists a "gray zone" of patients who fall at the margins of audiological criteria, such as those with borderline SDS, or discrepancies between chronological age and language age. Although these patients may not strictly meet the regulatory thresholds, they often represent a group in whom CI can provide meaningful functional and developmental gains.

In many high-volume CI centers, clinical decision-making increasingly extends beyond these conventional boundaries, guided by evidence-based, individualized assessments and multidisciplinary team discussions involving otolaryngologists, audiologists, and speech-language pathologists (15). In Türkiye, patients who do not meet the formal HIC criteria but are anticipated to benefit from auditory implantation are individually evaluated by the Scientific Advisory Board on Auditory Implants (SABAI), which assesses candidacy based on current evidence, patient-specific factors, and expected functional outcomes.

The presented study aims to evaluate whether patients excluded from national reimbursement criteria, yet approved through individualized scientific board evaluation, can achieve clinically meaningful audiological benefit consistent with internationally expanding candidacy standards. Examining these indications is essential to bridge the gap between regulatory frameworks and evidence-based practices highlighted in contemporary literature.

Methods

Study Design and Ethical Approval

This retrospective study was carried out in the Department of Otorhinolaryngology at the University of Health Sciences Türkiye, Ankara Etlik City Hospital, a tertiary referral center performing more than 80 CIs annually. Ethical approval was obtained from the University of Health Sciences Türkiye, Ankara Etlik City Hospital Scientific Research Ethics Committee (approval no: AEŞH-BADEK-2025-0269, date: 30.04.2025). The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from adult participants and from the legal guardians of pediatric patients.

Patient Selection

Medical records of patients evaluated for CI between November 2022 and December 2024 were retrospectively reviewed. The study included 27 patients who did not meet the current HIC reimbursement criteria but were considered suitable candidates by the institutional CI board and subsequently approved by the SABAI of the Ministry of Health.

Exclusion criteria were:

- Patients who met the standard HIC criteria for CI
- Patients evaluated by SABAI but not approved for CI
- Cases in which an alternative auditory implant (e.g., auditory brainstem implant or bone-anchored hearing aids) was recommended.

Data Collection

Demographic, clinical, and audiological data were retrospectively retrieved from the institutional electronic medical records. The extracted variables included:

- Age, sex, and occupation
- Etiology of hearing loss
- Duration of auditory deprivation, side, and degree of hearing loss
- Preoperative unaided 4PTA (500, 1000, 2000, and 4000 Hz), SDS, and auditory brainstem response (ABR) findings

• Preoperative assessment of language and speech development

• Intraoperative electrophysiological responses [neural response telemetry (NRT) measurements]

• Postoperative audiological performance during follow-up assessments.

All patients underwent standard audiological evaluations both preoperatively and postoperatively. Hearing and speech performance were assessed at a minimum of 6 months postoperatively using age-appropriate measures.

Statistical Analysis

Data were analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean±standard deviation or as median with interquartile range (IQR) and minimum-maximum values, depending on distribution. Improvement in paired SDS values (postoperative minus preoperative) was assessed using the Wilcoxon signed-rank test.

Results

A total of 27 patients comprised the study cohort, including 15 females and 12 males, with a median age of 17 years (IQR: 6-43; range: 2-61). Etiologies of hearing loss included congenital SNHL (n=14), idiopathic sudden SNHL (ISSNHL, n=3), chronic otitis media (n=1), post-meningitic hearing loss (n=2), progressive SNHL (n=1), Menière's disease (n=1), and other acquired conditions such as head trauma, labyrinthitis, and otosclerosis surgery (Table 1).

Criteria leading to exclusion from HIC reimbursement:

• Bilateral CI candidates older than four years (n=10),

• Audiological thresholds outside the defined limits (n=5),

• SSD (n=5),

• SDS greater than 30% (n=4),

• Gap between chronological and language age exceeding four years (n=3) (Table 1).

Table 1. Demographic, etiological, and audiological characteristics of cochlear implant candidates outside HIC eligibility criteria

Case	Age (years)	Sex	Etiology	Side of hearing loss	Duration of auditory deprivation	PTA-AC (dB), PTA-BC (dB), SDS (%), or ABR results	Reason for HIC criteria non-compliance
Case 1	34	M	ISSNHL	Right	6 months	R: 109/72/12 L: 35/35/92	Outside the defined audiological threshold levels
Case 2	<2	F	Congenital	Bilateral	6 months	R: 100 dB, ABR wave V(+) L: 85 dB, ABR wave V(+)	Outside the defined audiological threshold levels
Case 3	51	F	Chronic otitis media	Bilateral	10 years	R: 99/68/16 L: 85/49/52	Outside the defined SDS levels
Case 4	43	M	Head trauma	Left	5 months	R: 6/6/100 L: 120/76/0	Single-sided deafness
Case 5	61	F	Progressive SNHL	Bilateral	10 years	R: 100/56/36 L: 85/52/76	Outside the defined SDS levels
Case 6	30	F	Microvascular decompression surgery for trigeminal neuralgia	Right	24 months	R: 117/77/0 L: 9/9/100	Single-sided deafness
Case 7	5	F	Congenital	Bilateral	5 years (left CI+)	R: 100 dB, ABR wave V(-) L: 85 dB, ABR wave V(-)	Bilateral CI after age 4 (right ear)
Case 8	45	M	ISSNHL	Left	6 months	R: 21/21/96 L: 114/73/20	Single-sided deafness
Case 9	7	M	Congenital	Bilateral	7 years (right CI+)	R: 116/73/0 L: 99/73/0	Bilateral CI after age 4 (left ear)/ language-chronological age gap >4 years
Case 10	24	F	Post-meningitic SNHL	Bilateral	22 years (right CI+)	R: 118/78/0 L: 113/78/0	Bilateral CI after age 4 (left ear)

Table 1. continued

Case	Age (years)	Sex	Etiology	Side of hearing loss	Duration of auditory deprivation	PTA-AC (dB), PTA-BC (dB), SDS (%), or ABR results	Reason for HIC criteria non-compliance
Case 11	<2	M	Congenital	Bilateral	2 years	R: 70 dB, ABR wave V(+) L: 100 dB, ABR wave V(-)	Outside the defined audiological threshold levels
Case 12	36	F	Post-AOM labyrinthitis	Bilateral	4 months	R: 120/71/0 L: 119/71/0	Bilateral CI after age 4 (simultaneously)
Case 13	7	M	Congenital	Bilateral	7 years (right CI+)	R: 100 dB, ABR wave V(-) L: 100 dB, ABR wave V(-)	Bilateral CI after age 4 (left ear)
Case 14	11	F	Post-meningitic left-ear SNHL, progressive right-ear SNHL	Bilateral	3 years (left CI+)	R: 110/73/0 L: 118/73/0	Bilateral CI after age 4 (right ear)
Case 15	9	F	Congenital	Bilateral	2 years	R: 111/71/0 L: 116/71/0	Language-chronological age gap >4 years (expressive language age: 2 years 3 months)
Case 16	6	F	Congenital	Bilateral	6 years	R: 111/73/0 L: 108/73/0	Language-chronological age gap >4 years (expressive language age: 1 year 3 months)
Case 17	5.5	M	Congenital	Bilateral	5 years	R: 113/77/0 L: 115/77/0	Language-chronological age gap >4 years (expressive language age: 1 year)
Case 18	5	F	Congenital	Bilateral	5 years (left CI+)	R: 100 dB, ABR wave V(-) L: 100 dB, ABR wave V(-)	Bilateral CI after age 4 (right ear)
Case 19	45	M	Menière's disease	Bilateral	2 years	R: 99/73/0 L: 48/42/76	Outside the defined audiological threshold levels
Case 20	51	F	Otosclerosis surgery	Left	18 months	R: 36/18/92 L: 120/70/0	Outside the defined audiological threshold levels
Case 21	8	F	Congenital	Right	8 years	R: 104/77/0 L: 7/7/100	Single-sided deafness
Case 22	17	F	Congenital	Bilateral	17 years (right CI+)	R: 120/72/0 L: 105/72/0	Bilateral CI after age 4 (left ear)
Case 23	51	F	Otosclerosis surgery (bilateral)	Bilateral	18 months	R: 103/45/28 L: 90/45/76	Outside the defined SDS levels
Case 24	18	M	Congenital	Bilateral	18 years	R: 91/72/8 L: 79/68/52	Outside the defined SDS levels
Case 25	12	F	Congenital	Right	11 years	R: 10/7/100 L: 120/77/0	Single-sided deafness
Case 26	34	F	ISSNHL (left at 17, right at 26)	Bilateral	Left 10 years (CI+ 7 years ago), right 8 years	R: 88/72/0 L: 103/72/0	Bilateral CI after age 4 (right ear)
Case 27	6	F	Congenital	Bilateral	1 year (right CI+)	R: 119/77/0 L: 109/77/0	Bilateral CI after age 4 (left ear)

PTA: Pure-tone average, AC: Air conduction, BC: Bone conduction, SDS: Speech discrimination score, ABR: Auditory brainstem response, HIC: Health Implementation Communiqué, SNHL: Sensorineural hearing loss, ISSNHL: Idiopathic sudden SNHL, CI: Cochlear implantation, M: Male, F: Female, R: Right, L: Left, AOM: Acute otitis media

The median duration of auditory deprivation among all patients was 60 months (IQR: 18-120). CI was performed in 15 patients in the right ear, 10 patients in the left ear, and two patients underwent simultaneous bilateral implantation. Intraoperative NRT was successfully obtained from all electrodes in 23 patients, whereas in one patient no response was recorded from any electrode (0/22; case 6). Intraoperative NRT responses and postoperative audiological outcomes are summarized in Table 2.

Preoperative mean 4PTA-air conduction in the ear selected for CI was 105.3±12.2 dB HL, and median 4PTA-bone conduction was 73.0 dB HL (IQR: 68-77), with a preoperative median SDS of 0% (IQR: 0-8). Audiological outcomes from 22 patients, evaluated at ≥6 months post-implantation (range, 6-24 months; mean: 14 months), revealed a median 4PTA with CI alone of 35 dB HL (IQR: 28-46). Postoperative median SDS of the implanted ear was 58% (IQR: 37-70). The median difference between paired SDS values (calculated as postoperative minus preoperative) was 50% ($p<0.001$, Wilcoxon signed-rank test). Overall, the cohort demonstrated substantial benefit from CI, although a subgroup exhibited limited outcomes. At present, there is no universally accepted definition of poor CI performance. In our study, poor performance was defined as a 12 month postoperative SDS in quiet of <30%, in accordance with Carlson (16). Overall, 14.8% of patients in our cohort—three pediatric cases (17, 21 and 25) and one adult case (6)—demonstrated suboptimal CI outcomes.

The adult case (case 6), a 30-year-old female with a history of microvascular decompression for trigeminal neuralgia, was diagnosed with SSD. Despite radiological evidence of nerve integrity and a positive promontory stimulation test (PST) preoperatively, postoperative assessments revealed no benefit, and the device was explanted 6 months after implantation. Two pediatric cases involved SSD with long durations of auditory deprivation (7 and 8 years). Although intraoperative NRT responses were present, both failed to achieve functional auditory benefit postoperatively. The third pediatric case (case 17), a 5.5-year-old male immigrant with congenital bilateral profound SNHL, had been using bilateral hearing aids for three years. Despite positive intraoperative NRT responses from all electrodes and a postoperative 4PTA of 35 dB HL at 1 year, his SDS remained 0%, with no observable listening behaviors.

Table 2. Intraoperative NRT responses and pre- and postoperative audiological outcomes

Criteria leading to exclusion from HIC reimbursement	Case	Intraoperative NRT responses	Preoperative SDS in the ear selected for CI (%)	Postoperative SDS with CI (%)	Postoperative PTA (dB HL) with CI
Single-sided deafness	Case 4	12/12	0	48	34
	Case 6	**0/22**	**0**	**0**	**94**
	Case 8	12/12	20	60	25
	Case 21	**12/12**	**0**	**0**	**77**
	Case 25	**11/12**	**0**	**28**	**67**
Bilateral CI candidates older than four years	Case 7	22/22	N/A	40	45
	Case 9	22/22	0	40	58
	Case 10	22/22	0	56	35
	Case 12	22/22	0	92	30
	Case 13	12/12	0	64	10
	Case 18	12/12	N/A	52	35
	Case 22	22/22	0	52	29
	Case 26	22/22	0	80	25
	Case 27	22/22	0	88	52
Outside the defined audiological threshold levels	Case 1	22/22	12	68	25
	Case 2	12/12	N/A	60	25
	Case 11	22/22	N/A	44	40
	Case 19	12/12	0	68	35
SDS >30% in the contralateral ear	Case 3	12/12	16	40	32
	Case 23	10/12	28	76	45
	Case 24	22/22	8	64	30
Gap between chronological and language age exceeding four years	**Case 17**	**12/12**	**0**	**0**	**35**

HIC: Health Implementation Communiqué, NRT: Neural response telemetry, PTA: Pure-tone average, CI: Cochlear implant, SDS: Speech discrimination score, N/A: SDS test was not applicable due to the patient's age, bold values indicate patients with poor performance (SDS <30%), HL: Hearing level

Discussion

Growing evidence in recent literature indicates that patients beyond conventional indications may also achieve meaningful auditory and communicative benefits from CI (6,10-16). However, in Türkiye, many candidates fall outside of the current HIC criteria, while in other regions insurance restrictions continue to limit access. By contrast, countries such as Australia, Germany, and Italy provide comprehensive reimbursement, whereas Medicaid patients in the United States remain less likely to receive bilateral implants (4,17,18). These disparities underscore the importance of considering candidacy and coverage together. The presented study therefore evaluated extended indications and discussed their clinical rationale within the framework of current regulatory criteria.

CI for patients with SSD has been performed worldwide for several years. Randomized controlled trials and multicenter studies demonstrated that CI in patients with SSD significantly improves speech perception in noise, sound localization, and speech intelligibility (10,11,19). In our cohort, five patients underwent CI for SSD, comprising three adults and two children (aged 8 and 12 years). Notably, three of the four cases without functional auditory benefit belonged to this subgroup. In case 6, prior surgical trauma to the cochlear nerve likely contributed to poor outcomes. Successful CI requires sufficient cochlear nerve health, and anatomical integrity alone does not guarantee effective stimulation (20). Moreover, the utility of PST remains controversial, as positive responses do not ensure good CI performance, while negative responses do not necessarily exclude benefit (21). Of the adult patients, the other two presented with post-lingual SSD secondary to ISSNHL, and both achieved excellent postoperative outcomes. In accordance with current recommendations, these patients initially underwent standard treatment for ISSNHL, and CI was performed only after a minimum three-month waiting period following salvage therapy (19).

Duration of deafness is a strong predictor of CI outcomes in bilateral deafness, with early intervention linked to better results. In SSD, some studies report benefits even after long SSD durations, while others—especially in congenital SSD—show limited improvement (22,23). The metaanalysis by Benchetrit et al. (24) on CI outcomes in children with SSD showed that most children (79.6%) experienced improved speech perception in noise after CI, whereas 16.7% showed no improvement, attributed to prolonged durations of deafness (>4-7 years). In our cohort, two patients with congenital SSD likewise failed to benefit, likely due to extended auditory deprivation (7 and 8 years). The limited sample size precluded statistical analyses on the association between duration of deafness and CI outcomes. Nevertheless, these findings highlight the importance of considering auditory deprivation duration when selecting congenital SSD candidates for CI.

Bilateral CI yields superior outcomes compared with unilateral use by restoring binaural summation, squelch, and head shadow effects, thereby improving listening comfort (25). According to the current HIC, bilateral CI is reimbursed primarily for children younger than four years with bilateral severe to profound SNHL. In our cohort, 10 patients who had previously received a unilateral CI underwent contralateral implantation. Of these, seven were younger than 18 years (median age 7), while three were adults. Despite wide variability in duration of deafness (four months to 22 years), all patients achieved satisfactory outcomes in terms of 4PTA and SDS with the newly implanted ear. In the pediatric group, this may be explained by the fact that all patients used hearing aids preoperatively in their impaired ear, which may have helped mitigate the effects of deprivation. Adult patients, despite not having contralateral amplification, also achieved favorable outcomes. Although data on sound localization, speech perception in noise, and quality of life were not available—representing a limitation of this study—growing evidence increasingly supports bilateral implantation not only in young children but also in older pediatric and adult populations, demonstrating long-term auditory, cognitive, and quality of life benefits (25). Van de Heyning et al. (4) examined CI candidacy criteria across 17 countries; all centers performed bilateral CI in children, and fourteen centers reported performing bilateral implantation in adults. Expanding candidacy criteria for bilateral implantation beyond current HIC restrictions would better align national policy with international recommendations.

Current HIC regulations define strict audiological thresholds for CI, primarily based on PTA and SDS. In clinical practice, however, borderline cases are frequently encountered that do not fully meet these numerical limits yet clearly exhibit functional hearing disability. For instance, one patient fulfilled the PTA criteria but demonstrated marked interaural asymmetry in SDS (36% vs. 76%). In another case, a two-year-old child presented with profound SNHL in one ear (L: 100 dB, ABR wave V–) and severe loss in the contralateral ear (R: 70 dB, ABR wave V+), technically outside the defined thresholds. In our cohort, CI was performed in five patients whose audiological thresholds were outside the previously defined HIC criteria and in four patients with SDS greater than 30%. All of these patients demonstrated clinically meaningful improvements in CI performance.

Candidacy has gradually expanded to include patients with greater residual acoustic hearing and higher aided speech recognition scores. However, recent data from the United States indicate that excessively stringent insurance and medicare requirements often delay implantation until binaural sentence scores deteriorate, resulting in

unnecessarily prolonged auditory deprivation in the poorer ear and worse postoperative outcomes (14). Zwolan et al. (26) conducted an analysis using audiometric data to predict adult CI candidacy, and the 60/60 guideline—defined as a PTA of ≥60 dB HL in the better ear and an unaided monosyllabic word score of ≤60%—yielded a sensitivity of 96%. In countries using monosyllabic scores in quiet (e.g., Austria, Belgium, Canada, Germany, Japan), candidacy thresholds for CI are typically set at ≤50%, while India and Switzerland apply ≤40% (4). In Türkiye, HIC criteria are more restrictive, requiring ≤30% SDS. Collectively, these findings underscore the need to revise candidacy and coverage criteria to prevent avoidable delays in implantation (14).

We also included an exceptional subgroup of patients outside the HIC language age criterion. Although technically outside the reimbursement criteria, borderline cases exist, for example, when the gap slightly exceeds four years (e.g., 4.5 years) or language age is just below the threshold (e.g., 3 years 9 months). Consistent with clinical evidence, CI may be justified when auditory verbal potential and rehabilitation progress are evident. This individualized approach, balancing neurodevelopmental potential and prognosis, reflects the ethical principle of maximizing benefit while minimizing unnecessary intervention. Literature supports this view, showing that carefully selected borderline candidates may achieve favorable outcomes when auditory verbal indicators are present, whereas results remain poor in cases of profound and prolonged deprivation (14,27). However, among the three patients in this subgroup, one did not benefit from CI. This patient, a 5.5-year-old immigrant with an expressive language age of one year, was unable to receive postoperative audiological rehabilitation in his native language, which may have contributed to the lack of benefit. In summary, we advocate flexible, evidence-based interpretation of candidacy criteria, particularly in borderline cases, to ensure timely auditory access and prevent further deprivation.

According to the HIC the lower age limit for CI is 12 months. Although our cohort did not include patients implanted before 12 months of age, several studies in literature have reported favorable outcomes in these expanding indication groups (28). CI has also been explored as a therapeutic option for severe, treatment-resistant tinnitus through mechanisms of auditory stimulation and cortical reorganization (13). These emerging indications, although not yet standard within the current HIC framework, merit consideration in future policy and clinical decision-making. Further national data and prospective evaluations are warranted before these indications can be integrated into routine clinical practice. The results of this study support the need to revise the current HIC criteria. Since these patients did not meet the existing criteria, CI would not have been possible without individual assessment and referral through SABAI. However, due to the small sample size and the heterogeneity of indication subgroups, these findings cannot be generalized. Nevertheless, we believe that each clinic should report its own outcomes and publish case experiences to strengthen the broader evidence base.

Study Limitations

This study has several limitations that should be acknowledged. First, its retrospective design and relatively small sample size may restrict the generalizability of the findings. Second, audiological outcomes were assessed at a minimum of six months, which may not fully capture long term performance trajectories. Third, heterogeneity in patient etiologies, age at implantation, and duration of auditory deprivation introduces variability that could influence outcomes. Finally, the absence of a control group meeting standard HIC criteria limit direct comparison between conventional and extended indications. Future prospective, multicenter studies with larger cohorts and longer follow-up are warranted to validate and expand upon these results.

Conclusion

CI is evolving beyond the conventional boundaries defined by the HIC of the SSI. While current criteria provide a framework for access and standardization, they do not fully reflect the diversity of clinical scenarios. Our findings show that patients outside reimbursement indications such as those with SSD, residual hearing, borderline cases, or bilateral implantation in selected adults may still achieve meaningful auditory benefits. Decisions regarding extended indications should be guided by individualized assessment, multidisciplinary consensus, and scientific evidence. Expanding candidacy and revising reimbursement criteria will support more inclusive rehabilitation. Accordingly, further prospective multicenter studies focusing on extended indications are needed to strengthen this approach.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the University of Health Sciences Türkiye, Ankara Etlik City Hospital Scientific Research Ethics Committee local committee (approval no: AEŞH-BADEK-2025-0269, date: 30.04.2025).

Informed Consent: Written informed consent was obtained from adult participants and from the legal guardians of pediatric patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.M.G., S.A.T., İ.A., S.E., D.S., M.M., M.D., Concept: M.M.G., S.A.T., İ.A., S.E., D.S., M.M., M.D., Design: M.M.G., S.A.T., İ.A., S.E., D.S., M.M.,

M.D., Data Collection and/or Processing: M.M.G., S.E., D.S., Analysis or Interpretation: M.M.G., S.A.T., İ.A., Literature Search: M.M.G., M.M., M.D., Writing: M.M.G.

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Main Points

- Cochlear implantation beyond conventional reimbursement limits provided substantial functional benefits in most patients.
- Extended indications included single-sided deafness (SSD), borderline audiological thresholds, bilateral cochlear implant (CI) age restrictions, and language-age discrepancies.
- Postoperative outcomes showed significant improvement: mean pure-tone averages 38.2 dB hearing level and median speech discrimination scores (SDS) 54% ($p<0.001$). Poor performance (SDS <30%) occurred in 14.8% of cases, mainly linked to congenital SSD and prolonged auditory deprivation.
- Individualized, evidence-based, multidisciplinary evaluation supports broader CI candidacy, aligning national practice with global trends in personalized auditory care.
- Findings demonstrate the importance of revising reimbursement coverage, as rigid limits fail to reflect clinical realities or contemporary evidence.

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