MEDICAL POLICY

POLICY TITLE	**COCHLEAR IMPLANT**
POLICY NUMBER	**MP 1.023**

Clinical Benefit	**☐ Minimize safety risk or concern.** **☐ Minimize harmful or ineffective interventions.** **☐ Assure appropriate level of care.** **☐ Assure appropriate duration of service for interventions.** **☒ Assure that recommended medical prerequisites have been met.** **☐ Assure appropriate site of treatment or service.**
Effective Date:	**9/1/2024**

I. POLICY

Bilateral or Unilateral cochlear implantation of a U.S. Food and Drug Administration (FDA) approved cochlear implant device may be considered **medically necessary** in individuals who meet the following criteria:

- age 9 months and older with bilateral severe-to-profound pre-or post-lingual (sensorineural) hearing loss defined as a hearing threshold of pure-tone average of 70 dB (decibels) hearing loss or greater at 500 Hz (hertz), 1000 Hz, and 2,000 Hz.; **AND**
- have shown limited or no benefit from hearing aids.

Cochlear implantation as a treatment for individuals with unilateral hearing loss with or without tinnitus may be considered **medically necessary** in individuals who meet the following criteria:

- Age 5 years and above with single sided deafness (SSD) and asymmetric hearing loss (AHL) who has profound sensorineural hearing loss in one ear and normal hearing or mild sensorineural hearing loss in the other ear; **AND**
- Obtains limited benefit from an appropriately fitted unilateral hearing aid in the ear to be implanted; **AND**
- At least one-month experience wearing a contralateral routing of signal (CROS) hearing aid or other relevant non implantable device.

Replacement of internal and/or external components is considered **medically necessary** in individuals who have inadequate response to existing component(s) to the point of interfering with the individual's activities of daily living, or the component(s) is/are no longer functional and cannot be repaired.

POLICY TITLE	COCHLEAR IMPLANT
POLICY NUMBER	MP 1.023

Upgrades of an existing, functioning external system to achieve aesthetic improvement, such as smaller profile components, or a switch from a body-worn, external sound processor to a behind-the-ear (BTE) model are considered **investigational**.

Replacement of internal and/or external components solely for the purpose of upgrading to a system with advanced technology or to a next-generation device is considered **investigational.**

Cochlear implantation with a hybrid cochlear implant/hearing aid device that includes the hearing aid integrated into the external sound processor of the cochlear implant, including but not limited to the Nucleus® Hybrid™ L24 Cochlear Implant System, may be considered **medically necessary** for patients ages 18 years and older who meet all of the following criteria:

- Bilateral severe-to-profound high-frequency sensorineural hearing loss with residual low-frequency hearing sensitivity; **AND**
- Receive limited benefit from appropriately fit bilateral hearing aids; **AND**
- Have the following hearing thresholds:
  - Low-frequency hearing thresholds no poorer than 60 dB hearing level up to and including 500 Hz (averaged over 125, 250, and 500 Hz) in the ear selected for implantation; **AND**
  - Severe to profound mid-to-high frequency hearing loss (threshold average of 2000, 3000, and 4000 Hz ≥75 dB hearing level) in the ear to be implanted; **AND**
  - Moderately severe to profound mid-to-high frequency hearing loss (threshold average of 2000, 3000, and 4000 Hz ≥60 dB hearing level) in the contralateral ear; **AND**
  - Aided consonant-nucleus-consonant word recognition score from 10% to 60% in the ear to be implanted in the preoperative aided condition and in the contralateral ear will be equal to or better than that of the ear to be implanted but not more than 80% correct.

Cochlear implantation with a hybrid cochlear implant/hearing aid device that includes the hearing aid integrated into the external sound processor of the cochlear implant, including but not limited to the Nucleus® Hybrid™ L24 Cochlear Implant System, that does not meet the above criteria is considered **investigational**. There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Policy Guidelines

Bilateral cochlear implantation should be considered only when it has been determined that the alternative of unilateral cochlear implant plus hearing aid in the contralateral ear will not result in a binaural benefit; (i.e., in those patients with hearing loss of a magnitude where a hearing aid will not produce the required amplification).

In certain situations, implantation may be considered before 12 months of age. One scenario is post-meningitis when cochlear ossification may preclude implantation. Another is in cases with a strong family history, since establishing a precise diagnosis is less uncertain.

Hearing loss is rated on a scale based on the threshold of hearing. Severe hearing loss is defined as a bilateral hearing threshold of 70 to 90 dB, and profound hearing loss is defined as a bilateral hearing threshold of 90 dB and above.

In adults, limited benefit from hearing aids is defined as scores 50% correct or less in the ear to be implanted on tape-recorded sets of open-set sentence recognition. In children, limited benefit is defined as failure to develop basic auditory skills, and in older children, 30% or less correct on open–set tests.

A post-cochlear implant rehabilitation program is necessary to achieve benefit from the cochlear implant. The rehabilitation program consists of 6 to 10 sessions that last approximately 2.5 hours each. The rehabilitation program includes development of skills in understanding running speech, recognition of consonants and vowels, and tests of speech perception ability.

Contraindications to cochlear implantation may include deafness due to lesions of the eighth cranial (acoustic) nerve, central auditory pathway, or brain stem, active or chronic infections of the external or middle ear and mastoid cavity or tympanic membrane perforation. Cochlear ossification may prevent electrode insertion, and the absence of cochlear development as demonstrated on computed tomography scans remains an absolute contraindication.

Cross-reference:

MP 1.019 Implantable Bone-Conduction and Bone-Anchored Hearing Prosthetic Devices
MP 1.130 Semi-Implantable and Fully Implantable Middle Ear Hearing Aid
MP 2.038 Treatment of Tinnitus

II. PRODUCT VARIATIONS

TOP

This policy is only applicable to certain programs and products administered by Capital Blue Cross. Please see additional information below, and subject to benefit variations as discussed in Section VI below.

FEP PPO - Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at: https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies .

III. DESCRIPTION/BACKGROUND

TOP

The basic structure of a cochlear implant includes both external and internal components. The external components include a microphone, an external sound processor, and an external transmitter. The internal components are implanted surgically and include an internal receiver implanted within the temporal bone and an electrode array that extends from the receiver into the cochlea through a surgically created opening in the round window of the middle ear.

Sounds picked up by the microphone are carried to the external sound processor, which transforms sound into coded signals that are then transmitted transcutaneously to the implanted internal receiver. The receiver converts the incoming signals to electrical impulses

that are then conveyed to the electrode array, ultimately resulting in stimulation of the auditory nerve.

Regulatory Status

Several cochlear implants are commercially available in the United States and are manufactured by Cochlear Americas, Advanced Bionics, and the MED-EL Corp. Over time, subsequent generations of the various components of the devices have been approved by the U.S. Food and Drug Administration (FDA), focusing on improved electrode design and speech-processing capabilities. Furthermore, smaller devices and the accumulating experience in children have resulted in broadening of the selection criteria to include children as young as 12 months. The labeled indications from FDA for currently marketed implant devices are summarized in Table 1. FDA product code: MCM.

Table 1. Cochlear Implant Systems[a] Approved by the Food and Drug Administration

Variables	Manufacturer and Currently Marketed Cochlear Implants		
	Advanced Bionics® HiResolution® Bionic Ear System (HiRes 90K)	**Cochlear® Nucleus 22 and 24**	**Med El® Maestro Combi 40+**
PMA	P960058	P840024, P970051	P000025
Predicate devices	Clarion Multi-Strategy or HiFocus CII Bionic Ear (P940022)	Freedom with Contour	
Indications			
Adults ≥18 y	• Postlingual onset of severe-to-profound bilateral SNHL (≥70 dB) • Limited benefit from appropriately fitted hearing aids, defined as scoring ≤50% on a test of open-set HINT sentence recognition	• Pre-, peri-, or postlingual onset of bilateral SNHL, usually characterized by: o Moderate-to-profound HL in low frequencies; and o Profound (≥90 dB) HL in mid-to-high speech frequencies • Limited benefit from binaural hearing aids (≤50% sentence recognition in ear to be implanted)	• Severe-to-profound bilateral SNHL (≥70 dB) • ≤40% correct HINT sentences with best-sided listening condition • SSD (≥90 dB) or AHL (Δ15 dB PTA) o Limited benefit from unilateral amplification, defined by test scores of 5% or less on monosyllabic CNC words in quiet when tested in the ear to be implanted alone.

Variables	Manufacturer and Currently Marketed Cochlear Implants		
			o Patients must have at least 1 month experience wearing a CROS hearing aid or other relevant device and not show any subjective benefit.
Children	**12 mo to 17 y of age** • Profound bilateral SNHL (>90 dB) • Use of appropriately fitted hearing aids for at least 6 mo in children 2-17 y or at least 3 mo in children 12-23 mo • Lack of benefit in children <4 y defined as a failure to reach developmentally appropriate auditory milestones (eg, spontaneous response to name in quiet or to environmental sounds) measured using IT-MAIS or MAIS or <20% correct on a simple open-set word recognition test (MLNT) administered using monitored live voice (70 dB SPL) • Lack of hearing aid benefit in children >4 y defined as scoring <12% on a difficult open-set word recognition test (PBK test) or <30% on an open-set sentence	**25 mo to 17 y 11 mo** • Severe-to-profound bilateral SNHL • MLNT scores ≤30% in best-aided condition in children • LNT scores ≤30% in best-aided condition in children **9 to 24 mo** • Profound SNHL bilaterally • Limited benefit from appropriate binaural hearing aids	**12 mo to 18 y** • Profound sensorineural HL (≥90 dB) o In younger children, little or no benefit is defined by lack of progress in the development of simple auditory skills with hearing aids over 3 to 6 mo o In older children, lack of aided benefit is defined as <20% correct on the MLNT or LNT, depending on child's cognitive ability and linguistic skills. o A 3- to 6-mo trial with hearing aids is required if not previously experienced. **5 y to 18 y** • SSD (≥90 dB) or AHL (Δ15 dB PTA)

Variables	Manufacturer and Currently Marketed Cochlear Implants		
	test (HINT for Children) administered using recorded materials in the sound field (70 dB SPL)		o Insufficient functional access to sound in the ear to be implanted must be determined by aided speech perception test scores of 5% or less on developmentally appropriate monosyllabic word lists when tested in the ear to be implanted. o Patients must have at least 1 month experience wearing a CROS hearing aid or other relevant device and not show any subjective benefit

AHL: asymmetric hearing loss; CNC: consonant-nucleus-consonant; CROS: contralateral routing of signal; HINT: Hearing in Noise Test; HL: hearing loss; IT-MAIS: Infant-Toddler Meaningful Auditory Integration Scale; LNT: Lexical Neighborhood Test; MAIS: Meaningful Auditory Integration Scale; MLNT: Multisyllabic Lexical Neighborhood Test; PBK: Phonetically Balanced-Kindergarten; PTA: pure tone average; SNHL: sensorineural hearing loss; SPL: sound pressure level; SSD: single-sided deafness.

In 2014, the Nucleus® Hybrid™ L24 Cochlear Implant System (Cochlear Americas) was approved by FDA through the premarket approval process. This system is a hybrid cochlear implant and hearing aid, with the hearing aid integrated into the external sound processor of the cochlear implant. It is indicated for unilateral use in patients ages 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 an appropriately fit bilateral hearing aid. The electrode array inserted into the cochlea is shorter than conventional cochlear implants. According to FDA's premarket approval notification, labeled indications for the device include:

- Preoperative hearing in the range from "normal to moderate hearing loss [HL] in the low frequencies (thresholds no poorer than 60 dB HL up to and including 500 Hz)"

- Preoperative hearing with “severe to profound mid to high frequency hearing loss (threshold average of 2000, 3000, and 4000 Hz ≥75 dB HL) in the ear to be implanted”
- Preoperative hearing with “moderately severe to profound mid to high frequency hearing loss (threshold average of 2000, 3000, and 4000 Hz ≥60 dB HL) in the contralateral ear”
- “The CNC [Consonant-Nucleus-Consonant] word recognition score will be between 10% and 60%, inclusively, in the ear to be implanted in the preoperative aided condition and in the contralateral ear equal to or better than that of the ear to be implanted but not more than 80% correct.”

Other hybrid hearing devices have been developed. The Med-El EAS System received expanded premarket approval by the FDA in 2016 (PMA P000025/S084). FDA product code: PGQ

Although cochlear implants have typically been used unilaterally, interest in bilateral cochlear implantation has arisen in recent years. The proposed benefits of bilateral cochlear implants are to improve understanding of speech occurring in noisy environments and localization of sounds. Improvements in speech intelligibility with bilateral cochlear implants may occur through binaural summation (i.e., signal processing of sound input from 2 sides may provide a better representation of sound and allow the individual to separate noise from speech). Speech intelligibility and localization of sound or spatial hearing may also be improved with head shadow and squelch effects (i.e., the ear that is closest to the noise will receive it at a different frequency and with different intensity, allowing the individual to sort out the noise and identify the direction of sound). Bilateral cochlear implantation may be performed independently with separate implants and speech processors in each ear, or a single processor may be used. However, no single processor for bilateral cochlear implantation has been approved by FDA for use in the United States. Also, single processors do not provide binaural benefit and may impair sound localization and increase the signal-to-noise ratio received by the cochlear implant.

IV. RATIONALE

TOP

Summary of Evidence

A cochlear implant is a device for treatment of severe-to-profound hearing loss in individuals who only receive limited benefit from amplification with hearing aids. A cochlear implant provides direct electrical stimulation to the auditory nerve, bypassing the usual transducer cells that are absent or nonfunctional in deaf cochlea.

For individuals who have bilateral sensorineural hearing loss who receive cochlear implant(s), the evidence includes randomized controlled trials (RCTs) and multiple systematic reviews and technology assessments. Relevant outcomes are symptoms, functional outcomes, and treatment-related mortality and morbidity. The available studies have reported improvements in speech reception and quality-of-life measures. Although the available RCTs and other studies measured heterogeneous outcomes and included varying patient populations, the findings are consistent across multiple studies and settings. In addition to consistent improvement in speech reception (especially in noise), studies showed improvements in sound localization with bilateral devices. Studies have also suggested that earlier implantation may be preferred. The evidence

is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have unilateral sensorineural hearing loss who receive cochlear implant(s), the evidence includes prospective and retrospective studies reporting within-subjects comparisons and systematic reviews of observational studies. Relevant outcomes are symptoms, functional outcomes, and treatment-related mortality and morbidity. Given the natural history of hearing loss, pre- and post-implantation comparisons may be appropriate for objectively measured outcomes. However, the available evidence for the use of cochlear implants in improving outcomes for patients with unilateral hearing loss, with or without tinnitus, is limited by small sample sizes and heterogeneity in evaluation protocols and outcome measurements. A small feasibility study in adults with single-sided deafness or asymmetric hearing loss demonstrated improvements in sound perception, sound localization, and subjective measures of quality of life compared to baseline conditions. However, studies assessing outcomes compared to best-aided hearing controls across multiple time points are lacking. An ongoing post-marketing study in adults and children may further elucidate outcomes.

For individuals who have high-frequency sensorineural hearing loss with preserved low-frequency hearing who receive a hybrid cochlear implant that includes a hearing aid integrated into the external sound processor of the cochlear implant, the evidence includes prospective and retrospective studies using single-arm, within-subjects comparison pre- and post-intervention and systematic reviews. Relevant outcomes are symptoms, functional outcomes, and treatment-related mortality and morbidity. The available evidence has suggested that a hybrid cochlear implant system is associated with improvements in hearing of speech in quiet and noise. The available evidence has also suggested that a hybrid cochlear implant improves speech recognition better than a hearing aid alone. Some studies have suggested that a shorter cochlear implant insertion depth may be associated with preserved residual low-frequency hearing, although there is uncertainty about the potential need for reoperation after a hybrid cochlear implantation if there is loss of residual hearing. Studies reporting on long-term outcomes and results of re-implantation are lacking. The evidence is insufficient to determine the effects of the technology on health outcomes.

V. DEFINITIONS

AUDITORY pertains to the sense of hearing and the hearing organs.

BASIC ACTIVITIES OF DAILY LIVING include and are limited to walking in the home, eating, bathing, dressing, and homemaking.

DECIBEL refers to a unit of measure of the intensity of sound.

NEUROFIBROMA is a tumor of the connective tissue of the nerve.

NEUROFIBROMATOSIS is a group of genetic disorders that affects the cell growth of neural tissues.

NEUROFIBROMATOSIS TYPE II (NF-2) is an autosomal dominant disease affecting 1 in 50,000 persons and which causes intracranial and spinal tumors.

PROFOUND HEARING LOSS is defined as a bilateral hearing threshold of 90 dB and above.

SEVERE HEARING LOSS is defined as a bilateral hearing threshold of 70–90 dB.

VI. BENEFIT VARIATIONS

TOP

The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits, and which require preauthorization. There are different benefit plan designs in each product administered by Capital Blue Cross. Members and providers should consult the member's health benefit plan for information or contact Capital Blue Cross for benefit information.

VII. DISCLAIMER

TOP

Capital Blue Cross' medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital Blue Cross' Provider Services or Member Services. Capital Blue Cross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION

TOP

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Covered when medically necessary:

Procedure Codes							
69930	92507	92601	92602	92603	92604	92607	92608
L8614	L8615	L8616	L8617	L8618	L8619	L8621	L8622
L8623	L8624	L8625	L8627	L8628	L8629		

ICD-10-CM Diagnosis Codes	Description
H90.3	Sensorineural hearing loss, bilateral
H90.4	Sensorineural hearing loss, unilateral with unrestricted hearing on the contralateral side
H90.5	Unspecified sensorineural hearing loss
H90.6	Mixed conductive and sensorineural hearing loss, bilateral
H90.7	Mixed conductive and sensorineural hearing loss, unilateral with unrestricted hearing on the contralateral side
H90.8	Mixed conductive and sensorineural hearing loss, unspecified

IX. REFERENCES

TOP

1. *Cochlear Implants in Adults and Children. NIH Consens Statement Online. 1995;13(2):1-30*
2. *Bond M, Mealing S, Anderson R, et al. The effectiveness and cost-effectiveness of cochlear implants for severe to profound deafness in children and adults: a systematic review and economic model. Health Technol Assess. Sep 2009; 13(44): 1-330. PMID 19799825*
3. *Gaylor JM, Raman G, Chung M, et al. Cochlear implantation in adults: a systematic review and meta-analysis. JAMA Otolaryngol Head Neck Surg. Mar 2013; 139(3): 265-72. PMID 23429927*
4. *McRackan TR, Bauschard M, Hatch JL, et al. Meta-analysis of quality-of-life improvement after cochlear implantation and associations with speech recognition abilities. Laryngoscope. Apr 2018; 128(4): 982-990. PMID 28731538*
5. *McRackan TR, Bauschard M, Hatch JL, et al. Meta-analysis of Cochlear Implantation Outcomes Evaluated With General Health-related Patient-reported Outcome Measures. Otol Neurotol. Jan 2018; 39(1): 29-36. PMID 29227446*
6. *Crathorne L, Bond M, Cooper C, et al. A systematic review of the effectiveness and cost-effectiveness of bilateral multichannel cochlear implants in adults with severe-to-profound hearing loss. Clin Otolaryngol. Oct 2012; 37(5): 342-54. PMID 22928754*
7. *Choi JS, Betz J, Li L, et al. Association of Using Hearing Aids or Cochlear Implants With Changes in Depressive Symptoms in Older Adults. JAMA Otolaryngol Head Neck Surg. Jul 01 2016; 142(7): 652-7. PMID 27258813*
8. *van Zon A, Smulders YE, Ramakers GG, et al. Effect of unilateral and simultaneous bilateral cochlear implantation on tinnitus: A Prospective Study. Laryngoscope. Apr 2016; 126(4): 956-61. PMID 26255618*

9. *Bond M, Elston J, Mealing S, et al. Effectiveness of multi-channel unilateral cochlear implants for profoundly deaf children: a systematic review. Clin Otolaryngol. Jun 2009; 34(3): 199-211. PMID 19531168*
10. *Baron S, Blanchard M, Parodi M. Sequential bilateral cochlear implants in children and adolescents: Outcomes and prognostic factors. Eur Ann Otorhinolaryngol Head Neck Dis. Apr 2019; 136(2): 69-73. PMID 30314876*
11. *Food and Drug Administration. Summary of Safety and Effectiveness Data (SSED): Nucleus 24 Cochlear Implant System (P970051/S172). 2020*
12. *Lyu J, Kong Y, Xu TQ, et al. Long-term follow-up of auditory performance and speech perception and effects of age on cochlear implantation in children with pre-lingual deafness. Chin Med J (Engl). Aug 20 2019; 132(16): 1925-1934. PMID 31365431*
13. *Karltorp E, Eklöf M, Östlund E, et al. Cochlear implants before 9 months of age led to more natural spoken language development without increased surgical risks. Acta Paediatr. Feb 2020; 109(2): 332-341. PMID 31350923*
14. *Sharma A, Dorman MF. Central auditory development in children with cochlear implants: clinical implications. Adv Otorhinolaryngol. 2006; 64: 66-88. PMID 16891837*
15. *Forli F, Arslan E, Bellelli S, et al. Systematic review of the literature on the clinical effectiveness of the cochlear implant procedure in paediatric patients. Acta Otorhinolaryngol Ital. Oct 2011; 31(5): 281-98. PMID 22287820*
16. *Sterkers F, Merklen F, Piron JP, et al. Outcomes after cochlear reimplantation in children. Int J Pediatr Otorhinolaryngol. Jun 2015; 79(6): 840-843. PMID 25843784*
17. *Black J, Hickson L, Black B, et al. Prognostic indicators in paediatric cochlear implant surgery: a systematic literature review. Cochlear Implants Int. May 2011; 12(2): 67-93. PMID 21756501*
18. *Pakdaman MN, Herrmann BS, Curtin HD, et al. Cochlear implantation in children with anomalous cochleovestibular anatomy: a systematic review. Otolaryngol Head Neck Surg. Feb 2012; 146(2): 180-90. PMID 22140206*
19. *Fernandes NF, Morettin M, Yamaguti EH, et al. Performance of hearing skills in children with auditory neuropathy spectrum disorder using cochlear implant: a systematic review. Braz J Otorhinolaryngol. Jan-Feb 2015; 81(1): 85-96. PMID 25458263*
20. *Vlastarakos PV, Proikas K, Papacharalampous G, et al. Cochlear implantation under the first year of age--the outcomes. A critical systematic review and meta-analysis. Int J Pediatr Otorhinolaryngol. Feb 2010; 74(2): 119-26. PMID 19896223*
21. *Ching TY, Dillon H, Day J, et al. Early language outcomes of children with cochlear implants: interim findings of the NAL study on longitudinal outcomes of children with hearing impairment. Cochlear Implants Int. 2009; 10 Suppl 1: 28-32. PMID 19067433*
22. *Colletti L, Mandala M, Zoccante L, et al. Infants versus older children fitted with cochlear implants: performance over 10 years. Int J Pediatr Otorhinolaryngol. Apr 2011; 75(4): 504-9. PMID 21277638*
23. *Guerzoni L, Murri A, Fabrizi E, et al. Social conversational skills development in early implanted children. Laryngoscope. Sep 2016; 126(9): 2098-105. PMID 26649815*
24. *Lammers MJ, van der Heijden GJ, Pourier VE, et al. Bilateral cochlear implantation in children: a systematic review and best-evidence synthesis. Laryngoscope. Jul 2014; 124(7): 1694-9. PMID 24390811*

25. *Broomfield SJ, Murphy J, Emmett S, et al. Results of a prospective surgical audit of bilateral paediatric cochlear implantation in the UK. Cochlear Implants Int. Nov 2013; 14 Suppl 4: S19-21. PMID 24533758*
26. *Sarant J, Harris D, Bennet L, et al. Bilateral versus unilateral cochlear implants in children: a study of spoken language outcomes. Ear Hear. Jul-Aug 2014; 35(4): 396-409. PMID 24557003*
27. *Escorihuela Garcia V, Pitarch Ribas MI, Llopez Carratala I, et al. Comparative study between unilateral and bilateral cochlear implantation in children of 1 and 2 years of age. Acta Otorrinolaringol Esp. May-Jun 2016; 67(3): 148-55. PMID 26632253*
28. *Friedmann DR, Green J, Fang Y, et al. Sequential bilateral cochlear implantation in the adolescent population. Laryngoscope. Aug 2015; 125(8): 1952-8. PMID 25946482*
29. *Illg A, Giourgas A, Kral A, et al. Speech comprehension in children and adolescents after sequential bilateral cochlear implantation with long interimplant interval. Otol Neurotol. Jun 2013; 34(4): 682-9. PMID 23640090*
30. *Oh SJ, Mavrommatis MA, Fan CJ, et al. Cochlear Implantation in Adults With Single-Sided Deafness: A Systematic Review and Meta-analysis. Otolaryngol Head Neck Surg. Mar 01 2022: 1945998221083283. PMID 35230924*
31. *Benchetrit L, Ronner EA, Anne S, et al. Cochlear Implantation in Children With Single-Sided Deafness: A Systematic Review and Meta-analysis. JAMA Otolaryngol Head Neck Surg. Jan 01 2021; 147(1): 58-69. PMID 33151295*
32. *Marx M, Mosnier I, Venail F, et al. Cochlear Implantation and Other Treatments in Single-Sided Deafness and Asymmetric Hearing Loss: Results of a National Multicenter Study Including a Randomized Controlled Trial. Audiol Neurootol. 2021; 26(6): 414-424. PMID 33789270*
33. *Peters JPM, van Heteren JAA, Wendrich AW, et al. Short-term outcomes of cochlear implantation for single-sided deafness compared to bone conduction devices and contralateral routing of sound hearing aids-Results of a Randomised controlled trial (CINGLE-trial). PLoS One. 2021; 16(10): e0257447. PMID 34644322*
34. *Buss E, Dillon MT, Rooth MA, et al. Effects of Cochlear Implantation on Binaural Hearing in Adults With Unilateral Hearing Loss. Trends Hear. Jan-Dec 2018; 22: 2331216518771173. PMID 29732951*
35. *Dillon MT, Buss E, O'Connell BP, et al. Low-Frequency Hearing Preservation With Long Electrode Arrays: Inclusion of Unaided Hearing Threshold Assessment in the Postoperative Test Battery. Am J Audiol. Mar 05 2020; 29(1): 1-5. PMID 31835906*
36. *Galvin JJ, Fu QJ, Wilkinson EP, et al. Benefits of Cochlear Implantation for Single-Sided Deafness: Data From the House Clinic-University of Southern California-University of California, Los Angeles Clinical Trial. Ear Hear. 2019; 40(4): 766-781. PMID 30358655*
37. *Peter N, Kleinjung T, Probst R, et al. Cochlear implants in single-sided deafness - clinical results of a Swiss multicentre study. Swiss Med Wkly. Dec 16 2019; 149: w20171. PMID 31880806*
38. *Poncet-Wallet C, Mamelle E, Godey B, et al. Prospective Multicentric Follow-up Study of Cochlear Implantation in Adults With Single-Sided Deafness: Tinnitus and Audiological Outcomes. Otol Neurotol. Dec 20 2019. PMID 31868784*

39. *Dillon MT, Buss E, Rooth MA, et al. Cochlear Implantation in Cases of Asymmetric Hearing Loss: Subjective Benefit, Word Recognition, and Spatial Hearing. Trends Hear. 2020; 24: 2331216520945524. PMID 32808881*
40. *Food and Drug Administration. Summary of Safety and Effectiveness Data (SSED): MED-EL Cochlear Implant System (P000025/S104). 2019*
41. *Food and Drug Administration. Post-Approval Studies (PAS): MED-EL New Enrollment SSD/AHL Study. 2020*
42. *Food and Drug Administration. Summary of Safety and Effectiveness Data (SSED): Nucleus 24 Cochlear Implant System (P970051/S205). January 10, 2022*
43. *Vlastarakos PV, Nazos K, Tavoulari EF, et al. Cochlear implantation for single-sided deafness: the outcomes. An evidence-based approach. Eur Arch Otorhinolaryngol. Aug 2014; 271(8): 2119-26. PMID 24096818*
44. *Ramos Macias A, Falcon Gonzalez JC, Manrique M, et al. Cochlear implants as a treatment option for unilateral hearing loss, severe tinnitus and hyperacusis. Audiol Neurootol. 2015; 20 Suppl 1: 60-6. PMID 25997672*
45. *Tavora-Vieira D, Marino R, Krishnaswamy J, et al. Cochlear implantation for unilateral deafness with and without tinnitus: a case series. Laryngoscope. May 2013; 123(5): 1251-5. PMID 23553411*
46. *Brown KD, Dillon MT, Park LR. Benefits of Cochlear Implantation in Childhood Unilateral Hearing Loss (CUHL Trial). Laryngoscope. Mar 2022; 132 Suppl 6(Suppl 6): S1-S18. PMID 34542181*
47. *Pillsbury HC, Dillon MT, Buchman CA, et al. Multicenter US Clinical Trial With an Electric-Acoustic Stimulation (EAS) System in Adults: Final Outcomes. Otol Neurotol. Mar 2018; 39(3): 299-305. PMID 29342054*
48. *Food and Drug Administration. Approval Letter: Nucleus Hybrid L24 Cochlear Implant System (P130016). 2014*
49. *Roland JT, Gantz BJ, Waltzman SB, et al. United States multicenter clinical trial of the cochlear nucleus hybrid implant system. Laryngoscope. Jan 2016; 126(1): 175-81. PMID 26152811*
50. *Roland JT, Gantz BJ, Waltzman SB, et al. Long-term outcomes of cochlear implantation in patients with high-frequency hearing loss. Laryngoscope. Aug 2018; 128(8): 1939-1945. PMID 29330858*
51. *Lenarz T, James C, Cuda D, et al. European multi-centre study of the Nucleus Hybrid L24 cochlear implant. Int J Audiol. Dec 2013; 52(12): 838-48. PMID 23992489*
52. *Santa Maria PL, Gluth MB, Yuan Y, et al. Hearing preservation surgery for cochlear implantation: a meta-analysis. Otol Neurotol. Dec 2014; 35(10): e256-69. PMID 25233333*
53. *Causon A, Verschuur C, Newman TA. A Retrospective Analysis of the Contribution of Reported Factors in Cochlear Implantation on Hearing Preservation Outcomes. Otol Neurotol. Aug 2015; 36(7): 1137-45. PMID 25853614*
54. *Gantz BJ, Dunn C, Oleson J, et al. Multicenter clinical trial of the Nucleus Hybrid S8 cochlear implant: Final outcomes. Laryngoscope. Apr 2016; 126(4): 962-73. PMID 26756395*
55. *American Academy of Otolaryngology -- Head and Neck Surgery. Position Statement: Cochlear Implants. November 10, 2020*

56. *Raman G, Lee J, Chung MG, et al. Technology Assessment Report: Effectiveness of Cochlear Implants in Adults with Sensorineural Hearing Loss Rockville, MD: Agency for Healthcare Research and Quality; 2011*
57. *National Institute for Health and Care Excellence (NICE). Cochlear Implants for Children and Adults With Severe to Profound Deafness [TA566]. 2019*
Centers for Medicare & Medicaid. Cochlear Implantation. 2013
58. *American Academy of Otolaryngology -- Head and Neck Surgery. Position Statement: Cochlear Implantation for Single Sided Deafness in Adults. April 25, 2023*
59. *American Academy of Otolaryngology -- Head and Neck Surgery. Position Statement: Cochlear Implantation for Single Sided Deafness in Children. April 25, 2023*
60. *Blue Cross Blue Shield Association Medical Policy Reference Manual. 7.01.05. Cochlear Implant. March 2024*

X. POLICY HISTORY

TOP

MP 1.023	**11/15/2018 Consensus Review.** No change to policy statements. References updated.
	08/22/2019 Consensus Review. No change to policy statements. References updated.
	08/13/2020 Minor Review. Policy Statement changed to include the age of 9 months. Product variation statement updated. References reviewed, updated. Coding checked; codes added.
	08/31/2021 Consensus Review. No change to policy statement. Background, Rationale, and References updated. FEP language restructured.
	03/22/2022 Consensus Review. No change to policy statement. References reviewed and updated. Coding table's format updated.
	03/17/2023 Consensus Review. No change to policy statement. References updated. Coding reviewed.
	03/14/2024 Minor Review. Changed cochlear implant for unilateral hearing loss from INV to MN with criteria. Updated rationale, references. Removed code 92609 as it does not apply to cochlear implant. Removed codes 92605, 92606, and 92618.

Top