



EXECUTIVE SUMMARY

**Cochlear Implantation
in Children**




Treatment process in patients referred to a cochlear implant centre

Preoperative Assessment	Surgery and In-patient Care	Postoperative care
Medical	Multidisciplinary Team	Fitting + Tuning
Audiological	Clinical Facilities	Rehabilitation + Assessment
Hearing Aid Evaluation		Follow-up + Long Term Maintenance
Communication		
Psychological Status		
Information + Counselling		




Key points

- Pediatric cochlear implantation improves hearing abilities, the development of speech and language skills, academic attainment, employment opportunities, and quality of life (Vincenti et al., 2014)¹.
- Cochlear implantation is a safe and reliable treatment option for children with severe to profound hearing loss. (Sharma et al., 2020)².
- Early cochlear implantation under the age of 12 months ensures auditory stimulation in a sensitive period of a child's auditory development and thus enables early-implanted children to develop communication skills similar to their normal-hearing peers (Sbeih et al., 2022)³.
- Whenever possible, bilateral implantation should be considered. Children bilaterally fitted with a CI have better results in sound localization and speech perception in noise than unilaterally implanted children. Both sequential and simultaneous bilateral surgery are considered safe surgical options of pediatric cochlear implantation (Uecker et al., 2019)⁴.
- A multidisciplinary team should accompany the child and their family along the entire hearing journey from pre-operative assessment through rehabilitation and routine follow-up.



Selection criteria

- Children with pre-lingual or post-lingual severe-to-profound sensorineural hearing loss and adolescents with pre-lingual or post-lingual sudden or progressive hearing loss are considered to benefit from cochlear implantation.
- Thorough pre-operative counselling is required to both the families and caregivers AND the children depending on their age.
- Families and caregivers should have realistic expectations about the cochlear implantation process and the potential outcome.



Assessment Process

- The multi-disciplinary cochlear implant team will conduct a comprehensive assessment of the child's/adolescent's hearing abilities. The assessment covers medical, audiological, communicative, and psychological tests.
- Details should be collated about the environments in which each child or adolescent typically communicates and where they find the most difficulty.
- Children may have additional needs, which may or may not be evident at the time of assessment. These should be considered as part of the assessment and selection process.

Preoperative information and counselling for parents/caregivers

- The parents/caregivers will receive thorough information and counselling about the entire cochlear implant treatment according to a checklist in a language or medium that is appropriate to the family's preferred method of communication.
- The parents/caregivers should have a clear understanding of the benefits and limitations of implantation. Expectations must be managed to ensure a positive outcome throughout the entire hearing journey.
- Where a child is considered to be old enough to make an informed choice, their assent should be obtained, and their views and wishes should be respected and considered.



Treatment

- The surgeon is responsible for the overall medical care throughout the child's/adolescent's stay in hospital. After surgery, the surgeon will continue to monitor the child's/adolescent's progress during the postoperative period.
- An intra- and/or postoperative radiological examination to check the position of the device and the electrode array should be considered.
- The audio processor should be fitted and programmed by experienced clinical personnel once the wound has healed satisfactorily.
- Before initial programming, clinical personnel need to check external components, explain programming procedures and the use of the audio processor to the child/adolescent AND the parents/caregivers.
- Postoperative rehabilitation tailored to the recipient's individual needs should begin after initial fitting to facilitate acclimatization to the new sensation of sound and to outline the rehabilitation programme.
- The rehabilitation programme may include training in the detection of sound, including localization and spatial tests: auditory detection, discrimination, and recognition; voice quality; speech intelligibility; language development, comprehension, and expression; and social skills.
- Appropriate measures should be performed at regular intervals to monitor progress in audiological, speech perception, educational, and communicational outcomes.

Follow-up

- The child/adolescent and the family must have easy access to a CI centre (or a local partner-service) for programming and rehabilitation.
- Adequate spare parts and replacements of external equipment must be available. Audio processor batteries should be available to implant recipients either from the CI programme or from a local audiology department.

References

- ¹ Vincenti V, Bacciu A, Guida M, et al. Pediatric cochlear implantation: an update. Ital J Pediatr. 2014 Sep 2;40:72.
- ² Sharma SD, Cushing SL, Papsin BC, et al. Hearing and speech benefits of cochlear implantation in children: A review of the literature. Int J Pediatr Otorhinolaryngol . 2020 Jun;133:109984.
- ³ Sbeih F, Bouzaher MH, Appachi S, et al. Safety of Cochlear Implantation in Children 12 Months or Younger: Systematic Review and Meta-analysis. Otolaryngol Head Neck Surg. 2022 Dec;167(6):912-922.
- ⁴ Uecker C, Szczepek A, Olze H. Pediatric Bilateral Cochlear Implantation: Simultaneous Versus Sequential Surgery. Otol Neurotol. 2019 Apr;40(4):e454-e460.

Based on: [HEARRING Group. 2017. Quality standards for cochlear implantation in infants, children, and young adults. Based on: Martin J, Raine CH. 2013. Quality standards for cochlear implantation in children and young adults. Cochlear Implants Int. 14 Suppl 2:S13-20.](#)

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