

Key Questions

Cochlear Implants: Bi- versus Unilateral

Introduction

Cochlear implants are designed to perform the function of cochlear hair cells in individuals where there has been a severe loss of cochlear hair cells. The implant devices convert sound into electrical impulses that stimulate the auditory nerve. Implantation may be performed unilaterally or bilaterally.

Policy Context

Cochlear implants may be implanted unilaterally (one ear) or bilaterally (both ears). Important questions center on the balance of benefits, potential harms, and costs of bilateral versus unilateral implantation as related to key health outcomes.

Scope of this HTA

Key questions guide the development of the evidence report. HTA seeks to identify the appropriate clinical topics (e.g., population, indications, comparators, outcomes) to address the statutory elements of evidence on safety, efficacy, and cost effectiveness relevant to coverage determinations.

Populations: Children, adolescents (20 years of age and younger), and adults with hearing loss

Interventions: Bilateral implantation of multichannel cochlear devices that use whole-speech processing coding strategies

Comparators: Unilateral CI only, unilateral CI plus acoustic hearing aid

Outcomes: *Primary:* Detection of sound (measured directly or measured indirectly by hearing aid use), neurocognitive development, perception and production of speech, functional status, quality of life (QOL), procedure- and device-related complications.
Secondary: Tinnitus, telephone usage, patient acceptance, employment or job performance, educational outcomes.

Key Questions

1. Compared with unilateral cochlear implantation or with unilateral cochlear implantation plus acoustic hearing aid, does bilateral cochlear implantation for hearing loss improve detection of sound, neurocognitive development, perception or production of speech, functional status, quality of life (QOL), or other patient-important outcomes?
2. Is bilateral cochlear implantation safe?

3. Does the effectiveness or safety of bilateral cochlear implantation vary according to age at implantation, prelingual versus postlingual onset of hearing loss, duration or degree of deafness, choice of implanted ear, time interval between implantations, specific device, or provider characteristics?
4. What are the cost implications, including cost-effectiveness, of bilateral cochlear implantation?

See *Key Question Public Comment and Response* document published separately.

[For additional information on key questions and public comments](#)