Health Quality Ontario

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Bilateral Cochlear Implantation: Health Quality Ontario Recommendation

FINAL RECOMMENDATION

- Health Quality Ontario, under the guidance of the Ontario Health Technology Advisory Committee, recommends publicly funding bilateral cochlear implantation for adults and children with bilateral severe to profound sensorineural hearing loss

RATIONALE FOR THE RECOMMENDATION

The Ontario Health Technology Advisory Committee has reviewed the findings of the health technology assessment[1] and determined that bilateral cochlear implantation improves aspects of hearing that are important to patients and is reasonable value for money.

Public Comment: Held April 3 to 24, 2018.

Ontario
Health Quality Ontario

Decision Determinants for Bilateral Cochlear Implantation in Adults

Decision Criteria	Subcriteria	Decision Determinants Considerations
Overall clinical benefit How likely is the health technology/intervention to result in high, moderate, or low overall benefit?	**Effectiveness** How effective is the health technology/ intervention likely to be (taking into account any variability)?	Compared with unilateral cochlear implantation, bilateral cochlear implantation improved sound localization (GRADE: high), speech perception in noise (GRADE: moderate), and subjective benefits of hearing (GRADE: moderate). There was no difference for speech perception in quiet (GRADE: moderate). The findings for tinnitus and quality of life were inconclusive.
	Safety How safe is the health technology/ intervention likely to be?	The cochlear implantation procedure is generally safe. Existing evidence showed an overall complication rate of 16% to 20%; approximately 5% of major complications required surgical revision.
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/ intervention?	The funding level for unilateral cochlear implantation in adults was 270 devices in the 2017/18 fiscal year. According to the Ontario Cochlear Implant Program, an additional 10% of the current volume for unilateral cochlear implantation (i.e., 27 devices) would be needed for bilateral cochlear implantation (absolute or relative indications).
	Need How large is the need for this health technology/intervention?	At present, bilateral cochlear implantation is not funded for adults. There are significant unmet needs in adults with severe to profound sensorineural hearing loss, and there are inequities based on age because bilateral cochlear implantation is funded for children.
Consistency with expected societal and ethical values[a] How likely is adoption of the health technology/ intervention to be congruent with societal and ethical values?	**Societal values** How likely is adoption of the health technology/intervention to be congruent with expected societal values?	Participants reported a desire for increased access to bilateral cochlear implants for people with severe to profound sensorineural hearing loss. They reported feeling that bilateral cochlear implants would provide increased health gains and be consistent with the societal values of independence and fairness.
	Ethical values How likely is adoption of the health technology/intervention to be congruent with expected ethical values?	Participants' desire for increased access to bilateral cochlear implants is consistent with ethical values, including autonomy, justice, fairness, and beneficence.
Value for money How efficient is the health technology/intervention likely to be?	**Economic evaluation** How efficient is the health technology/intervention likely to be?	On average, compared to unilateral cochlear implantation, sequential bilateral cochlear implantation is cost-effective for adults with sensorineural hearing loss ($48,978/QALY). The probability that bilateral cochlear implantation would be cost-effective was 51% and 57% at willingness-to-pay thresholds of $50,000/QALY and $100,000/QALY, respectively.
Feasibility of adoption into health system How feasible is it to adopt the health technology/ intervention into the Ontario health care system?	**Economic feasibility** How economically feasible is the health technology/intervention?	We estimated that publicly funding bilateral cochlear implantation in adults would lead to additional costs of between $510,000 and $780,000 per year over the next 5 years.
	Organizational feasibility How organizationally feasible is it to implement the health technology/ intervention?	Infrastructure is in place to make implementation feasible.

Abbreviations: GRADE, Grading of Recommendations Assessment, Development, and Evaluation; QALY, quality-adjusted life-year.
[a]The anticipated or assumed common ethical and societal values held in regard to the target condition, target population, and/or treatment options. Unless there is evidence from scientific sources to corroborate the true nature of the ethical and societal values, the expected values are considered.

Decision Determinants for Bilateral Cochlear Implantation in Children

Decision Criteria	Subcriteria	Decision Determinants Considerations
Overall clinical benefit How likely is the health technology/intervention to result in high, moderate, or low overall benefit?	**Effectiveness** How effective is the health technology/ intervention likely to be (taking into account any variability)?	Compared with unilateral cochlear implantation, bilateral cochlear implantation improved sound localization (GRADE: moderate), speech perception in quiet (GRADE: moderate), speech perception in noise (GRADE: moderate), language development (GRADE: moderate), preverbal communication (GRADE: moderate), and subjective benefits of hearing (GRADE: moderate). The findings for quality of life were inconclusive (GRADE: low).
	Safety How safe is the health technology/ intervention likely to be?	The cochlear implantation procedure is generally safe. Existing evidence showed an overall complication rate of 16% to 20%; approximately 5% of major complications required surgical revision.
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/ intervention?	In the 2017/18 fiscal year, 146 cochlear implant devices were funded in children.
	Need How large is the need for this health technology/intervention?	The current funding volume is sufficient to meet target wait times of 6 weeks; however, the official funding policy of the Ministry of Health and Long-Term Care is for unilateral cochlear implantation only. If bilateral cochlear implantation is officially funded, the volume would remain unchanged.
Consistency with expected societal and ethical values[a] How likely is adoption of the health technology/ intervention to be congruent with societal and ethical values?	**Societal values** How likely is adoption of the health technology/intervention to be congruent with expected societal values?	Participants reported a desire for increased access to bilateral cochlear implants for people with severe to profound sensorineural hearing loss. They reported feeling that bilateral cochlear implants would provide increased health gains and be consistent with the societal values of independence and fairness.
	Ethical values How likely is adoption of the health technology/intervention to be congruent with expected ethical values?	Participants' desire for increased access to bilateral cochlear implants is consistent with ethical values, including autonomy, justice, fairness, and beneficence.
Value for money How efficient is the health technology/intervention likely to be?	**Economic evaluation** How efficient is the health technology/ intervention likely to be?	On average, compared to unilateral cochlear implantation, simultaneous bilateral cochlear implantation is cost-effective for children with prelingual sensorineural hearing loss ($27,427/QALY), and sequential bilateral cochlear implantation is cost-effective for children with postlingual sensorineural hearing loss ($30,386/QALY). The probability that simultaneous/sequential bilateral cochlear implantation would be cost-effective was 64%/62% and 69%/68% at willingness-to-pay thresholds of $50,000/QALY and $100,000/QALY, respectively.
Feasibility of adoption into health system How feasible is it to adopt the health technology/ intervention into the Ontario health care system?	**Economic feasibility** How economically feasible is the health technology/intervention?	Bilateral cochlear implantation is already the standard of care for children in Ontario. Publicly funding bilateral cochlear implantation is not expected to lead to additional costs.
	Organizational feasibility How organizationally feasible is it to implement the health technology/ intervention?	Infrastructure is in place to make implementation feasible.

Abbreviations: GRADE, Grading of Recommendations Assessment, Development, and Evaluation; QALY, quality-adjusted life-year.

[a]The anticipated or assumed common ethical and societal values held in regard to the target condition, target population, and/or treatment options. Unless there is evidence from scientific sources to corroborate the true nature of the ethical and societal values, the expected values are considered.

REFERENCE

(1) Health Quality Ontario. Bilateral cochlear implantation: a health technology assessment. Ont Health Technol Assess Ser [Internet]. 2018 Oct;18(6):1–139. Available from: http://www.hqontario.ca/evidence-to-improve-care/journal-ontario-health-technology-assessment-series

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About the Ontario Health Technology Advisory Committee

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