

Magnetic Resonance-Guided Focused Ultrasound Neurosurgery for Essential Tremor: OHTAC Recommendation

ONTARIO HEALTH TECHNOLOGY ADVISORY COMMITTEE RECOMMENDATION

- The Ontario Health Technology Advisory Committee recommends publicly funding magnetic resonance-guided focused ultrasound neurosurgery for people with moderate to severe, medication-refractory essential tremor

RATIONALE FOR THE RECOMMENDATION

The Ontario Health Technology Advisory Committee members accepted the conclusions of the health technology assessment conducted by Health Quality Ontario.¹

The Committee agreed that magnetic resonance-guided focused ultrasound neurosurgery provides clinical benefit and value for money, and is consistent with patient preferences and values with regard to the neurosurgical treatment options for moderate to severe, medication-refractory essential tremor.

Decision Determinants for Magnetic Resonance-Guided Focused Ultrasound Neurosurgery for Essential Tremor

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)?	In noncomparative studies, MRgFUS neurosurgery has been found to significantly improve tremor severity and quality of life and to significantly reduce functional disability in daily activities; MRgFUS neurosurgery has been found to be significantly more effective than a sham procedure. There is no evidence of significant differences in tremor severity, quality of life improvement, or in functional disability reduction conferred by MRgFUS neurosurgery compared with deep brain stimulation nor is there of a significant difference in tremor severity improvement conferred by MRgFUS neurosurgery compared with radiofrequency thalamotomy.
	Safety How safe is the health technology/intervention likely to be?	MRgFUS neurosurgery is associated with few complications and adverse effects, the vast majority of which are transient and resolve either entirely or to a point at which there is minimal interference with people's lives.
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/intervention?	Essential tremor is the most common movement disorder, affecting up to 4% of adults. When essential tremor is severe, it limits people's ability to engage in activities of daily living, such as eating, writing, walking, and self-care; it diminishes quality of life; and it may result in an inability to work or participate in social activities, yielding a loss of independence.
	Need How large is the need for this health technology/intervention?	The condition progressively worsens over time. Up to half of people with essential tremor do not have adequate response to or are unable to tolerate medication. The next treatment option is currently invasive neurosurgery, but only those who are able and willing to accept the risks associated with invasive surgery are able to pursue this option. MRgFUS neurosurgery may provide a treatment option for the subset of people who are ineligible for invasive surgery and for those who find the risks of invasive neurosurgery unacceptable. The Ontario target population of people with moderate to severe, medication-refractory essential tremor eligible for neurosurgery is estimated to be about 800.
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?	Providing a noninvasive neurosurgical treatment option for essential tremor is consistent with expected societal values.
	Ethical values How likely is adoption of the health technology/intervention to be congruent with expected ethical values?	Providing a noninvasive neurosurgical treatment option for essential tremor is consistent with expected ethical values.

Decision Criteria	Subcriteria	Decision Determinants Considerations
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?	In people with essential tremor who are ineligible for invasive neurosurgery, MRgFUS neurosurgery provides reasonable value for money compared with no surgery. In people who are eligible for invasive neurosurgery, MRgFUS neurosurgery is a reasonable option, from an economic perspective, along with radiofrequency thalamotomy and deep brain stimulation.
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? Organizational feasibility How organizationally feasible is it to implement the health technology/intervention?	Publicly funding MRgFUS neurosurgery at the current level of 48 cases per year would lead to a net budget impact of about \$1 million per year for the next 5 years. The MRgFUS system is currently available in two Ontario centres. Providing MRgFUS neurosurgery to people likely to benefit from it would appear to be feasible from an organizational perspective.

Abbreviations: GRADE, Grading of Recommendations Assessment, Development, and Evaluation; MRgFUS, magnetic resonance-guided focused ultrasound.

^aThe 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. Magnetic resonance-guided focused ultrasound neurosurgery for essential tremor: a health technology assessment. Ont Health Technol Assess Ser [Internet]. In Press.

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