Health Quality Ontario

The provincial advisor on the quality of health care in Ontario

Vertebral Augmentation Involving Vertebroplasty or Kyphoplasty for Cancer-Related Vertebral Compression Fractures: OHTAC Recommendation

ONTARIO HEALTH TECHNOLOGY ADVISORY COMMITTEE RECOMMENDATIONS

- The Ontario Health Technology Advisory Committee recommends that vertebral augmentation (either vertebroplasty or kyphoplasty) be publicly funded and made accessible for appropriately selected cancer patients with vertebral compression fractures
- The Ontario Health Technology Advisory Committee recommends that Cancer Care Ontario provide the provincial oversight for vertebral augmentation services for cancer patients and work with clinical experts to determine the criteria needed for patient selection for kyphoplasty and vertebroplasty

BACKGROUND

With increasing survival among cancer patients, spinal lesions occur more frequently during disease progression. Cancers that metastasize to the spine, as well as other cancers such as multiple myeloma, can cause vertebral compression fractures or instability.

Conservative strategies including bed rest, bracing, and analgesics can be ineffective, leading to continued pain and progressive functional disability, limiting mobility and self-care. Surgery is usually not an option for cancer patients in advanced disease states owing to their poor medical or functional status and limited life expectancy. Vertebral augmentation—vertebroplasty and kyphoplasty—are minimally invasive treatment options for these cancer patients.

Health Quality Ontario conducted a health technology assessment to assess the safety and effectiveness of vertebroplasty or kyphoplasty as a treatment option for cancer patients with vertebral fractures. In addition, it commissioned the Ottawa Hospital Research Institute to evaluate the cost-effectiveness of vertebroplasty or kyphoplasty compared with the non-surgical management of cancer-related vertebral compression fractures and to conduct a budget impact analysis.

SUMMARY OF FINDINGS

The health technology assessment completed by Health Quality Ontario is available separately as a clinical evidence review[1] and an economic report.[2] A completed decision determinants framework for OHTAC is included in this report.

The key findings of the health technology assessment are listed below.

Clinical Findings

- Vertebral augmentation is associated with a clinically significant reduction in pain, with subsequent decreases in opioid use, improved physical functional disability scores, reduced disability, and improved quality of life.
- These improvements were reported for both vertebroplasty and kyphoplasty and for a diverse group of cancer patients with mixed primary spinal metastatic cancers, multiple myeloma, or hemangiomas.
- The most common adverse event after vertebral augmentation was bone cement leakage, which was usually asymptomatic. Major adverse events following vertebral augmentation rarely occurred.

Economic Findings

- The cost per case for kyphoplasty and vertebroplasty was $7,246 and $3,870, respectively. Compared with non-surgical management, kyphoplasty and vertebroplasty were associated with incremental cost-effectiveness ratios of $33,471 and $17,870, respectively, per quality-adjusted life-year.
- We estimated that the current use of vertebral augmentation procedures cost the Ministry of Health and Long-Term Care about $2.5 million in fiscal year 2014/15 and that more widespread use of these procedures would result in an incremental cost of approximately $67,302 to $913,386, depending on the scenario considered.

OHTAC DELIBERATIONS

The Ontario Health Technology Advisory Committee accepted the findings of the health technology assessment.

Given the substantial clinical benefit and the favourable incremental cost-effectiveness ratio OHTAC decided to recommend in favour of public funding.

Decision Determinants for Vertebral Augmentation Involving Vertebroplasty or Kyphoplasty for Cancer-Related Vertebral Compression Fractures

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)?	• Vertebral augmentation provides rapid, significant palliative pain control that results in a significant reduction in the need for analgesics, particularly opioids, and results in increased ambulation and decreased back pain–related disability
	Safety How safe is the health technology/intervention likely to be?	• Most risks are related to cement extrusion, and generally these are asymptomatic
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/intervention?	• With increasing survival in cancer patients, the occurrence of cancer-related spinal compression fractures is increasingly common. Unmanaged spinal fractures limit even basic activities of daily living, significantly impact patients' remaining quality of life, and impose a significant burden on caregivers
	Need How large is the need for this health technology/intervention?	• Cancer patients in advanced stages of their disease who have painful spinal metastases that are not adequately managed by medical therapy or palliative radiation, and who are ineligible for surgery owing to their medical condition and expected survival, have no option other than palliative sedation
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 the adoption of the health technology/intervention to be congruent with expected societal values?	• Patients with advanced cancer and limited life expectancy hope to be able to spend their remaining time comfortably at home with family and friends; inadequate pain management severely impacts their remaining quality of life
	Ethical values How likely is the adoption of the health technology/intervention to be congruent with expected ethical values?	• Pain palliation is a prime consideration in end-of-life care values
Value for money How efficient is the health technology likely to be?	**Economic evaluation** How efficient is the health technology/intervention likely to be?	• Vertebral augmentation is associated with cost-effectiveness estimates that fall within standard cost-effectiveness thresholds considered to represent reasonably good value for money

Decision Criteria	Subcriteria	Decision Determinants Considerations
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?	• Vertebral augmentation is likely associated with a net increase in costs to the healthcare system, but the budget impact is small • Vertebral augmentation interventions are provided by specialists, interventional radiologists, or surgeons, usually located at teaching hospitals. Referral pathways between oncologists and other physicians managing cancer patients need to be established

[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.

REFERENCES

(1) Health Quality Ontario. Vertebral augmentation involving vertebroplasty or kyphoplasty for cancer-related vertebral compression fractures: a systematic review. Ont Health Technol Assess Ser [Internet]. 2016 May;16(11):1–202. Available from: http://www.hqontario.ca/Evidence-to-Improve-Care/Journal-Ontario-Health-Technology-Assessment-Series.

(2) Health Quality Ontario and Ottawa Hospital Research Institute. Vertebral augmentation involving vertebroplasty or kyphoplasty for cancer-related vertebral compression fractures: an economic analysis. Ont Health Technol Assess Ser [Internet]. 2016 May;16(12):1–34. Available from: http://www.hqontario.ca/Evidence-to-Improve-Care/Journal-Ontario-Health-Technology-Assessment-Series.

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Health Quality Ontario
130 Bloor Street West, 10th Floor
Toronto, Ontario
M5S 1N5
Tel: 416-323-6868
Toll Free: 1-866-623-6868
Fax: 416-323-9261
Email: EvidenceInfo@hqontario.ca
www.hqontario.ca

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