Intrathecal Drug Delivery Systems for Cancer Pain and Noncancer Pain: OHTAC Recommendation

ONTARIO HEALTH TECHNOLOGY ADVISORY COMMITTEE RECOMMENDATIONS

- OHTAC recommends against the expansion of public funding for intrathecal drug delivery systems for patients with chronic pain due to advanced cancer
- OHTAC recommends against the expansion of public funding for intrathecal drug delivery systems for patients with chronic non-malignant back pain

BACKGROUND

Cancer is the leading cause of death in Canada: it was associated with an estimated 76,600 deaths in 2014. About two thirds of patients with incurable cancer experience pain. At the end of life, about 10% to 30% of cancer patients receiving conventional pain therapies have pain that is refractory (difficult to manage) or persistent. Currently available options include opioid rotation, parenteral infusions, neuraxial analgesia, nerve blocks, and surgery. Refractory pain and concerns about side effects drive the search for alternative pain management options in cancer patients.

Reliable estimates of the prevalence of refractory noncancer chronic pain are difficult to find. Options available to treat refractory pain include non-opioid analgesic medications, opioid analgesics, neuraxial analgesia, nerve blocks, and surgery, as well as multidisciplinary rehabilitation programs.

Intrathecal drug delivery systems provide pain relief by direct infusion of medication into the cerebrospinal fluid. To see how effective intrathecal drug delivery systems are, we looked at studies comparing them with routine pain management, or with routine pain management plus a rehabilitation program.
SUMMARY OF FINDINGS

The health technology assessment completed by Health Quality Ontario and its research partners is available in two separate reports. Completed decision determinants frameworks are included in this report.

These were the key findings of the health technology assessment:

- Very low quality evidence suggests that intrathecal drug delivery systems results in fewer drug-related side effects, with no difference in cancer pain, compared with comprehensive pain management.
- Very low quality evidence suggests that intrathecal drug delivery systems improve noncancer pain, but not quality of life, compared with conventional medical management.
- Cost-effectiveness could not be established owing to the poor quality of evidence.
- The estimated budget impact for implementation in Ontario is $100,000 in the first year to $500,000 in fifth year for cancer pain, and $1.5 million in the first year to $5.0 million in fifth year for noncancer pain.

OHTAC DELIBERATIONS

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

OHTAC members acknowledged that some patients may benefit from intrathecal drug delivery systems. However, given the very low quality of evidence, OHTAC members felt that they could not support widespread adoption of the technology beyond the current status in Ontario. OHTAC members also felt that the evidence was not sufficiently conclusive to definitively recommend against public funding.
## Decision Determinants for Intrathecal Drug Delivery Systems for Cancer Pain

<table>
<thead>
<tr>
<th>Decision Criteria</th>
<th>Subcriteria</th>
<th>Decision Determinants Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall clinical benefit</td>
<td>Effectiveness</td>
<td>How effective is the health technology/intervention likely to be (taking into account any variability)?</td>
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<tr>
<td></td>
<td>Safety</td>
<td>How safe is the health technology/intervention likely to be?</td>
</tr>
<tr>
<td></td>
<td>Burden of illness</td>
<td>What is the likely size of the burden of illness pertaining to this health technology/intervention?</td>
</tr>
<tr>
<td></td>
<td>Need</td>
<td>How large is the need for this health technology/intervention?</td>
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<tr>
<td>Consistency with expected societal and ethical values</td>
<td>Societal values</td>
<td>How likely is the adoption of the health technology/intervention to be congruent with expected societal values?</td>
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<tr>
<td></td>
<td>Ethical values</td>
<td>How likely is the adoption of the health technology/intervention to be congruent with expected ethical values?</td>
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<tr>
<td>Value for money</td>
<td>Economic evaluation</td>
<td>How efficient is the health technology/intervention likely to be?</td>
</tr>
<tr>
<td>Feasibility of adoption into health system</td>
<td>Economic feasibility</td>
<td>How economically feasible is the health technology/intervention?</td>
</tr>
<tr>
<td></td>
<td>Organizational feasibility</td>
<td>How organizationally feasible is it to implement the health technology/intervention?</td>
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</table>

- **Effectiveness**: We found very low quality evidence that intrathecal drug delivery systems added to comprehensive pain management reduce overall drug toxicity; no significant reduction in pain scores was observed.
- **Safety**: The risk of serious procedure- or equipment-related harms over a 4-week period may be as low as 14% or as high as 38%.
- **Burden of illness**: According to expert opinion, the number of surgeries that can be performed per year is 5 and could increase to 30 in 5 years (Dr. Catherine Smyth, personal communication, September 2, 2015).
- **Need**: There is an unmet need for this technology for a subgroup of cancer patients with persistent severe pain or serious drug toxicity (about 1,600 patients annually).

### Notes
- **Consistency with expected societal and ethical values**: Very likely
- **Ethical values**: Very likely
- **Value for money**: Unclear; evidence is insufficient and of inadequate quality to address this question
- **Feasibility of adoption into health system**: Adoption of technology appears to be feasible, resulting in a budget impact of between $100,000 and $500,000 per year for the first 5 years.
- **Organizational feasibility**: Neuraxial analgesia requires ongoing monitoring and committed resources. Intrathecal drug delivery care teams should consist of interventional pain physicians, nurses, palliative care physicians, pharmacists, and primary care providers.

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*Derived from the closest available statistics: 26,076 people died of cancer in Ontario in 2009; 64% of advanced cancer patients experience some pain, of which 10% may be refractory; 26,076 x 0.64 x 0.1 = 1,669.1,6,7

*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 Intrathecal Drug Delivery Systems for Noncancer Pain

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<tr>
<td>Overall clinical benefit</td>
<td>Effectiveness</td>
<td>Very low quality of comparative observational evidence showed internally inconsistent results. Reduction in pain with intrathecal drug delivery systems did not translate into global treatment satisfaction or improved quality of life and well-being.</td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td>The incidence of serious adverse events requiring surgical treatment owing to device-related issues (e.g., catheter migration, catheter obstruction, pump failure) varied from 10% to 33% (across six case series).</td>
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<td>Burden of illness</td>
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<td>According to expert opinion, the number of surgeries that can be performed per year is 30–50 (Dr. Anuj Bhatia, personal communication, September 3, 2015) and could increase to 100–200 in 5–10 years.</td>
</tr>
<tr>
<td>Need</td>
<td></td>
<td>Reliable estimates of the prevalence of refractory noncancer chronic pain were unclear.</td>
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<tr>
<td>Consistency with expected societal and ethical values&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Societal values</td>
<td>Unclear</td>
</tr>
<tr>
<td></td>
<td>Ethical values</td>
<td>No major concerns; quite likely</td>
</tr>
<tr>
<td>Value for money</td>
<td>Economic evaluation</td>
<td>The cost-effectiveness evidence was of insufficient quality to allow any assessment of the appropriateness of funding the procedure in this population.</td>
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<tr>
<td>Feasibility of adoption into health system</td>
<td>Economic feasibility</td>
<td>Unclear. The budget impact is estimated to be $1.5 million in the first year and to increase to $5.0 million per year in the fifth year.</td>
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<td>Organizational feasibility</td>
<td>Neuraxial analgesia requires ongoing monitoring and committed resources. Intrathecal drug delivery care teams should consist of interventional pain physicians, nurses, palliative care physicians, pharmacists, and primary care providers.</td>
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REFERENCES


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