# Intrathecal Drug Delivery Systems for Cancer Pain

## Recommendation

JANUARY 2024

Ontario Health

# Final Recommendation

Ontario Health, based on guidance from the Ontario Health Technology Advisory Committee, recommends publicly funding intrathecal drug delivery systems for cancer pain.

# Rationale for the Recommendation

The Ontario Health Technology Advisory Committee made the above recommendation after considering the clinical, economic, patient preferences and values, and ethical evidence reported in the health technology assessment.[1]

For patients with cancer pain who have a life expectancy greater than 6 months, the clinical evidence showed that compared with other methods of delivering pain medication (e.g., by mouth or through injection), intrathecal drug delivery likely reduces the intensity of pain experienced, likely decreases the use of systemic opioid pain medication (taken by mouth or through injection), and may improve functional outcomes and health-related quality of life.

The primary economic evaluation showed that intrathecal drug delivery is a cost-effective treatment for managing cancer pain. The total 5-year budget impact of publicly funding intrathecal drug delivery systems (IDDSs) is reasonable, estimated at $1.34 million, because of the small number of people expected to receive this treatment each year. Moreover, with improved pain management, the costs of IDDSs may be partially offset by savings associated with reduced pain-related health care resource use.

Patients and caregivers interviewed to obtain lived-experience evidence described IDDSs as reducing patients' cancer pain and improving patients' quality of life. However, they considered it an option of last resort after exhausting other pain management options because of the invasive nature of the surgical procedure needed to implant the drug infusion device (a pump) and insert a catheter (a thin tube) into the intrathecal space (a fluid-filled space around the spinal cord).

The ethics evidence review considered the impact of limitations in the geographic location of IDDS programs and providers on equity of access and early awareness of IDDSs as a pain management option. Additionally, to support patient autonomy in decision-making, informed consent procedures for IDDS pain management should include information about uncertainties in the clinical evidence regarding potential benefits and risks. Early access to information may improve patients' awareness of IDDSs as a pain management option and their understanding of the benefits and risks of IDDS pain management.

Ontario Health Technology Advisory Committee members commented on the inequities related to geographic access to IDDSs. They noted that although device implantation will likely be offered primarily at teaching hospitals, follow-up care, including medication refills for the drug infusion device, could be made available locally to minimize the need for patients to travel for this care. There was committee consensus that the evidence supports intrathecal drug delivery as an effective, reasonably safe, and cost-effective method of managing cancer pain, which aligned with patient preferences and values for care.

The committee also noted that intrathecal drug delivery may also be appropriate for patients with a life expectancy of less than 6 months or an uncertain life expectancy if undergoing IDDS implantation aligns with patients' goals of care.

This recommendation replaces the 2016 recommendation of the Ontario Health Technology Advisory Committee for IDDSs for cancer pain.

# Decision Determinants for Intrathecal Drug Delivery Systems for Cancer Pain

## Overall Clinical Benefit

### Effectiveness

*How effective is the health technology/intervention likely to be (taking into account any variability)?*

Compared with nonintrathecal methods of drug delivery in adults with cancer pain who have a life expectancy greater than 6 months, intrathecal drug delivery likely reduces pain intensity (Grading of Recommendations, Assessment, Development and Evaluations [GRADE]: Moderate to Low), likely decreases the use of systemic opioids (GRADE: Moderate to Low), may improve health-related quality of life (GRADE: Low), may improve functional outcomes (GRADE: Low), and may improve survival (GRADE: Low to Very low).

Compared with nonintrathecal methods of drug delivery in children with cancer pain, intrathecal drug delivery may reduce pain intensity, improve functional outcomes, and improve survival; however, the evidence is very uncertain (all GRADEs: Very low).

### Safety

*How safe is the health technology/intervention likely to be?*

The procedure to implant the intrathecal drug delivery device is associated with certain rarely occurring risks related to mechanical errors, drug-related side effects, and surgical complications (GRADE: Moderate to Low for adults, Very low for children).

### Burden of Illness

*What is the likely size of the burden of illness pertaining to this health technology/intervention?*

Cancer pain is undertreated in approximately 40% of patients.[2] IDDSs may provide adequate pain relief for appropriately selected patients with refractory cancer pain (pain not responsive to other pain treatment options).

### Need

*How large is the need for this health technology/intervention?*

Based on expert opinion, approximately 60 patients per year (about 10% of whom are estimated to be adolescents aged 12–17 years) with refractory cancer pain would be eligible to receive an IDDS in Ontario.

# Patient Preferences and Privacy

## Patient Preferences and Values

*Do patients have specific preferences, values, or needs related to the health condition, health technology/intervention, or life impact that are relevant to this assessment?*

Patients and caregivers interviewed described intrathecal drug delivery as effective in managing patients' pain and as having a positive impact on patients' quality of life. However, they considered intrathecal drug delivery an option of last resort after exhausting other pain management options because of the invasiveness of the surgical procedure required.

## Autonomy, Privacy, Confidentiality, and/or Other Relevant Ethical Principles as Applicable

*Are there concerns regarding accepted ethical or legal standards related to patient autonomy, privacy, confidentiality, or other ethical principles that are relevant to this assessment?*

To support patient autonomy in decision-making, informed consent procedures for IDDSs should include information about the uncertainties in the clinical evidence regarding potential benefits and risks. Early access to information may improve patients' awareness of intrathecal drug delivery as a pain management option and their understanding of any potential benefits and risks with IDDs treatment.

# Equity and Patient Care

## Equity of Access or Outcomes

*Are there disadvantaged populations or populations in need whose access to care or health outcomes might be improved or worsened that are relevant to this assessment?*

At the time of writing this recommendation, 1 teaching hospital in a large urban centre in Ontario provides an intrathecal drug delivery program for patients with cancer pain. People living far from this hospital may thus experience barriers in access to this pain management option. Increasing the number of teaching hospitals in Ontario that offer device implantation, as well as the local availability of follow-up care, may improve health outcomes and access to care for patients with cancer pain living in Ontario. Uncertainties in the pediatric clinical evidence, lack of pediatric health care facilities supporting device implantation in children, and lack of a pediatric-specific IDDSs may lead to inequitable outcomes for children with cancer pain compared with adults with cancer pain.

## Patient Care

*Are there challenges in the coordination of care for patients or other system-level aspects of patient care (e.g., timeliness of care, care setting) that might be improved or worsened that are relevant to this assessment?*

Limitations in the body of evidence for IDDSs for the management of cancer pain have implications for how benefits, harms, and costs have been evaluated and considered, which can lead to uncertainties about the benefit-and-risk trade-offs for individual patients and for the health care system.

# Cost-Effectiveness

## Economic Evaluation

*How efficient is the health technology/intervention likely to be?*

Compared with nonintrathecal methods of drug delivery to manage cancer pain, IDDSs are associated with an additional 0.08 quality-adjusted life-years (QALYs) gained and would cost an additional $4,482 in Ontario, resulting in an incremental cost-effectiveness ratio of $57,314 per QALY gained over a 1-year time horizon. The probability of IDDSs being cost-effective is 43.46% (i.e., uncertain if cost-effective) at a willingness-to-pay of $50,000 per QALY and 72.54% (i.e., moderately likely to be cost-effective) at a willingness-to-pay of $100,000 per QALY.

# Feasibility of Adoption Into Health System

## Economic Feasibility

*How economically feasible is the health technology/intervention?*

We estimate that publicly funding IDDSs for the management of cancer pain in Ontario would cost an additional $0.27 million annually, for a total of $1.34 million over the next 5 years.

## Organizational Feasibility

*How organizationally feasible is it to implement the health technology/intervention?*

Currently in Ontario, 1 teaching hospital offers an intrathecal drug delivery program for patients with cancer pain. Publicly funding IDDSs may increase the number of hospitals providing this treatment. While device implantation is likely to be performed primarily at teaching hospitals, follow-up care could be provided in local community health care settings if education and training are provided to local health care professionals. The ability to access follow-up care in local settings may increase access to this pain management option.

# References


1. Ontario Health. Intrathecal drug delivery systems for cancer pain: a health technology assessment. Ont Health Technol Assess Ser [Internet]. 2024 Jan;24(2):1–162. Available from: hqontario.ca/evidence-to-improve-care/health-technology-assessment/reviews-and-recommendations/intrathecal-drug-delivery-systems-for-cancer-pain
2. Roberto A, Greco MT, Uggeri S, Cavuto S, Deandrea S, Corli O, et al. Living systematic review to assess the analgesic undertreatment in cancer patients. Pain Pract. 2022;22(4):487-96.



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