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Intravenous Fentanyl Patient Controlled Analgesia for Patients in Labour: Clinical Effectiveness and Guidelines

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.

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Questions or requests for information about this report can be directed to **requests@cadth.ca**

Research Questions

1. What is the comparative clinical effectiveness of intravenous fentanyl delivered via patient-controlled analgesia versus administration by health care provider for patients in labour?
2. What are the evidence-based guidelines regarding intravenous fentanyl delivered via patient-controlled analgesia for patients in labour?

Key Findings

No relevant literature was identified regarding the comparative clinical effectiveness of intravenous fentanyl delivered via patient-controlled analgesia versus administration by health care provider for patients in labour. Additionally, no relevant evidence-based guidelines were identified regarding intravenous fentanyl delivered via patient-controlled analgesia for patients in labour.

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were patient-controlled fentanyl and labour (childbirth). No filters were applied to limit the results by study type. The search was also limited to English language documents published between January 1, 2010 and September 8, 2020. Internet links are provided, where available.

Selection Criteria

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available.

Table 1: Selection Criteria

Population	Patients, of any age and at any gestation, in labour
Intervention	Intravenous fentanyl delivered via patient-controlled analgesia
Comparator	Q1: Intravenous fentanyl administered by health care provider Q2: Not applicable
Outcomes	Q1: Clinical effectiveness (e.g., maternal pain score, level of sedation, neonatal Apgar score) Safety (e.g., maternal and neonatal adverse events, such as respiratory depression, changes in heart rate and oxygen saturation; need for neonatal resuscitation and/or naloxone at delivery) Q2: Recommendations regarding the use of intravenous fentanyl delivered via patient-controlled analgesia in labour; recommendations regarding the use of pre-printed orders for intravenous fentanyl delivered via patient-controlled analgesia in labour
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, evidence-based guidelines

Results

No relevant health technology assessments, systematic reviews, randomized controlled trials or non-randomized studies were identified regarding the the comparative clinical effectiveness of intravenous fentanyl delivered via patient-controlled analgesia versus administration by health care provider for patients in labour. Furthermore, no relevant evidence-based guidelines were identified regarding intravenous fentanyl delivered via patient-controlled analgesia for patients in labour.

References of potential interest that did not meet the inclusion criteria are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

No literature identified.

Guidelines and Recommendations

No literature identified.

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Appendix — Further Information

Previous CADTH Report

1. Use of Fentanyl and continuous electronic fetal monitoring in labour and delivery: a review of clinical effectiveness, safety, and clinical practice guidelines [*CADTH rapid response report: summary with critical appraisal*]. Ottawa (ON): CADTH; 2011 Jan: https://cadth.ca/sites/default/files/pdf/htis/jan-2011/L2039_Fentanyl_draft_final.pdf Accessed 2020 Sep 11.

Systematic Reviews & Meta-Analyses – Unclear Comparator

2. Smith LA, Burns E, Cuthbert A. Parenteral opioids for maternal pain management in labour. *Cochrane Database Syst Rev*. 2018 Jun 5;6(6):Cd007396. PubMed: PM29870574

Randomized Controlled Studies – Alternative Comparator

3. Smith RL, Siddiqui N, Henderson T, Teresi J, Downey K, Carvalho JC. Analgesia for medically induced second trimester termination of pregnancy: a randomized trial. *J Obstet Gynaecol Can*. 2016 Feb;38(2):147-153. PubMed: PM27032739

4. Douma MR, Verwey RA, Kam-Endtz CE, van der Linden PD, Stienstra R. Obstetric analgesia: a comparison of patient-controlled meperidine, remifentanil, and fentanyl in labour. *Br J Anaesth*. 2010 Feb;104(2):209-215. PubMed: PM20008859

Non-Randomized Studies – Alternative Comparator

5. Miyakoshi K, Tanaka M, Morisaki H, et al. Perinatal outcomes: intravenous patient-controlled fentanyl versus no analgesia in labor. *J Obstet Gynaecol Res*. 2013 Apr;39(4):783-789. PubMed: PM23167696

6. Hosokawa Y, Morisaki H, Nakatsuka I, et al. Retrospective evaluation of intravenous fentanyl patient-controlled analgesia during labor. *J Anesth*. 2012 Apr;26(2):219-224. PubMed: PM22120170

7. Marwah R, Hassan S, Carvalho JC, Balki M. Remifentanil versus fentanyl for intravenous patient-controlled labour analgesia: an observational study. *Can J Anaesth*. 2012 Mar;59(3):246-254. PubMed: PM22057875

Review Article

8. Phillips SN, Fernando R, Girard T. Parenteral opioid analgesia: does it still have a role? *Best Pract Res Clin Anaesthesiol*. 2017 Mar;31(1):3-14. PubMed: PM28625303