CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Intramuscular versus Intravenous Administration of Analgesics and Sedatives: Comparative Clinical Effectiveness and Guidelines
SUMMARY OF ABSTRACTS


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Acknowledgments:

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Research Questions
1. What is the comparative clinical effectiveness of administering analgesics or sedatives intramuscularly versus intravenously for patients in acute care?
2. What is the comparative clinical effectiveness of administering analgesics or sedatives intramuscularly versus intravenously for patients in acute care with an existing intravenous access?
3. What are the evidence-based guidelines regarding the route of administration for analgesics and sedatives for patients in acute care?

Key Findings
Four randomized controlled trials, two non-randomized studies, and one evidence-based guideline were identified regarding the route of administration for analgesics and sedatives for patients in acute care.

Methods
A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2017, Issue 2), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. For questions 1 and 2 no filters were applied to limit the retrieval by study type. For question 3 methodological filters were applied to limit retrieval to guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2012 and February 21, 2017. Internet links were provided, where available.

Selection Criteria
One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

| Population                        | Q1 & Q3: Acute care patients in hospital requiring analgesics or sedatives  
|                                  | Q2 & Q3: Acute care patients in hospital requiring analgesics or sedatives who have an existing intravenous access |
| Intervention                      | Administering analgesics (e.g., opioids [e.g., fentanyl, morphine], NSAIDs) and/or sedatives (e.g., midazolam) via intramuscular (IM) route |
| Comparator                        | Administering analgesics (e.g., opioids [e.g., fentanyl, morphine], NSAIDs) and/or sedatives (e.g., midazolam) via intravenous (IV) |
| Outcomes                          | Q1 & Q2: Clinical benefits and harms (e.g., pain relief, time to pain relief, adverse events, patient satisfaction), impact on administration time  
|                                  | Q3: Recommendations for analgesic route of administration, including for patients with an existing IV access |
| Study Designs                     | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines |
Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Four randomized controlled trials, two non-randomized studies, and one evidence-based guideline were identified regarding the route of administration for analgesics and sedatives for patients in acute care. No relevant health technology assessments, systematic reviews, or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Four randomized controlled trials (RCT)\textsuperscript{1-4} and two non-randomized studies (NRS)\textsuperscript{5-6} were identified regarding the comparative clinical effectiveness of administering analgesics or sedatives intramuscularly (IM) versus intravenously (IV) for patients in acute care. One RCT\textsuperscript{1} compared IV and IM ketamine in children in acute care. The authors of the study observed that the sedative and analgesic effects of IM and IV ketamine were not significantly different; however, duration of effect and onset of action were better in the IV group for suturing, fracture reduction, and foreign body removal. One RCT\textsuperscript{2} examined IM and IV ketamine in patients with major depression. The study concluded that IM was as safe and effective as IV ketamine.\textsuperscript{2} Another RCT\textsuperscript{3} compared IV and IM ketamine in children in acute care and found that there were no significant differences in complications and level of sedation; however, sedation was longer in the IM group, making IV the more desirable approach for orthopedic procedures in sedating children. The authors of one RCT\textsuperscript{4} examined IM and IV morphine in pediatric patients undergoing bilateral myringotomy. They concluded that there was no difference in the efficacy of IM and IV morphine in controlling postoperative pain and emergency delirium.\textsuperscript{4} One NRS\textsuperscript{5} compared IM and IV midazolam in pediatric patients and observed no significant difference between IM and IV midazolam, but IM form of midazolam may be used in patients with limited IV access. The authors of another NRS\textsuperscript{6} examined IM and IV polyethylene-glycolated-asparaginase (PEG-ASP). The study concluded that IV PEG-ASP was well tolerated and did not result in a significant increase in hypersensitive reactions.\textsuperscript{6}

One evidence-based guideline\textsuperscript{7} was identified regarding the route of administration for analgesics and sedatives for older patients in acute care. The guideline recommends the use of IV analgesics for postoperative pain and to avoid IM injections.

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.
Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations

Appendix — Further Information
Randomized Controlled Trials – Comparison of Two Different Sedatives


Review Article

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