

Intranasal Fentanyl in Paediatric Trauma

A Prehospital Retrospective Cross-Sectional Study on the Impact of Administration Routes on Pain Scores

Author, A. LE ROY

INTRODUCTION

Major trauma is reported in two-thirds of children hospitalised for accidental injury in Aotearoa New Zealand (AoNZ) (1). Assessing, treating and documenting pain in paediatric patients in the prehospital setting is often difficult due to lack of communication skills, patient distress and clinical ability (2). Without a formal pain assessment, children are less likely to receive appropriate and effective pain relief compared to adults (3).

In AoNZ, fentanyl is the primary opioid analgesia used and can be administered by Paramedics via the intravenous (IV), intranasal (IN) and intramuscular routes. Fentanyl is typically delivered intraneously; however, the lesser used IN route is a less invasive option with proven effectiveness in pain reduction in paediatric patients. Few studies have compared IN fentanyl to IV fentanyl, with IV morphine being the preferred opioid across different countries compared to AoNZ (3, 4).

METHOD

- > This **retrospective observational study** used collected Hato Hone St John (HHSJ) electronic patient report form data to assess the characteristics, treatment and outcome of paediatric patients.
- > All paediatric (≤ 15 yo) patients attended by prehospital emergency ambulances for trauma-related injuries who have been treated for pain with intravenous and intranasal fentanyl between 1 January 2023 to 30 September 2023.
- > Data was extracted from Aotearoa New Zealand, Paramedic Care Collection (ANZPaCC) dataset. Access to and use of the de-identified ANZPaCC dataset is co-governed by HHSJ. Approval for the use of this dataset will be sought via HHSJ data governance processes.
- > Descriptive analysis and proportions of variables were compared using Pearson's Chi- square goodness of fit test.

CONTACT INFORMATION

Analiese Le Roy analiese.leroy@stjohn.org.nz
Paramedic, Auckland

AIM

To determine whether the administration of IN fentanyl in paediatric (≤ 15 years old) patients leads to a greater reduction in pain than other administration routes in acute trauma in the prehospital setting.

CONCLUSIONS

Intranasal fentanyl is administered at lower rates overall compared to intravenous fentanyl in the AoNZ prehospital setting; however, IN fentanyl appears to be as effective as IV fentanyl in reducing pain scores.

There is poor adherence of pain score documentation from AoNZ Paramedics, requiring reflection on clinical practice. It is presumed through the lack of pain score documentation that AoNZ Paramedics do not complete full pain assessments on paediatric patients. This is important to improve as it is proven to affect whether patients receive the appropriate pain relief.

“With reflection on clinical practice, it is evident that IN fentanyl administration is a fast, effective and well-tolerated route of administration and *should* be used where indicated.”

ACKNOWLEDGEMENT

Supervisory team: Dr Verity Todd and Dr Graham Howie
HHSJ Clinical Audit and Research team for access to HHSJ data.

RESULTS

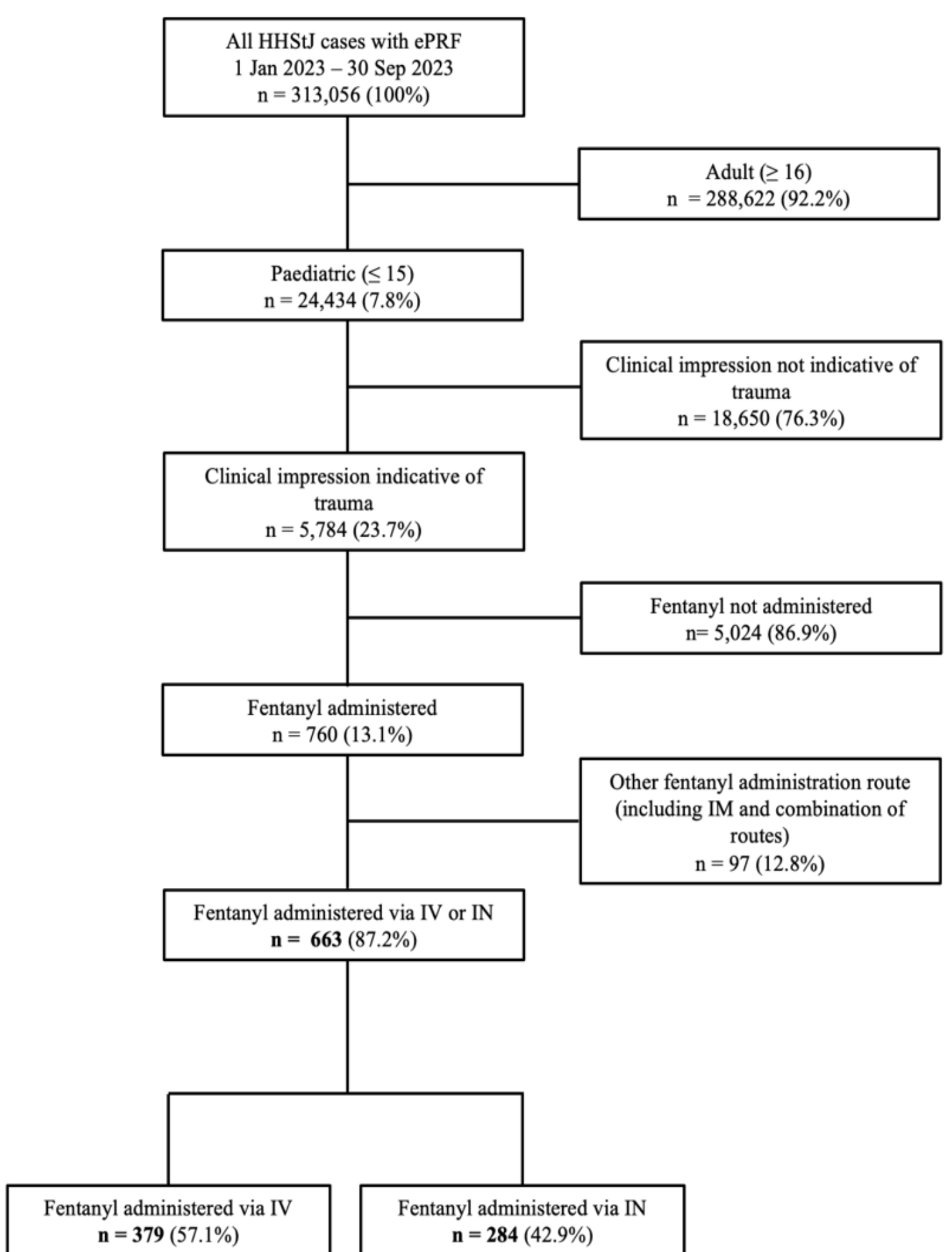
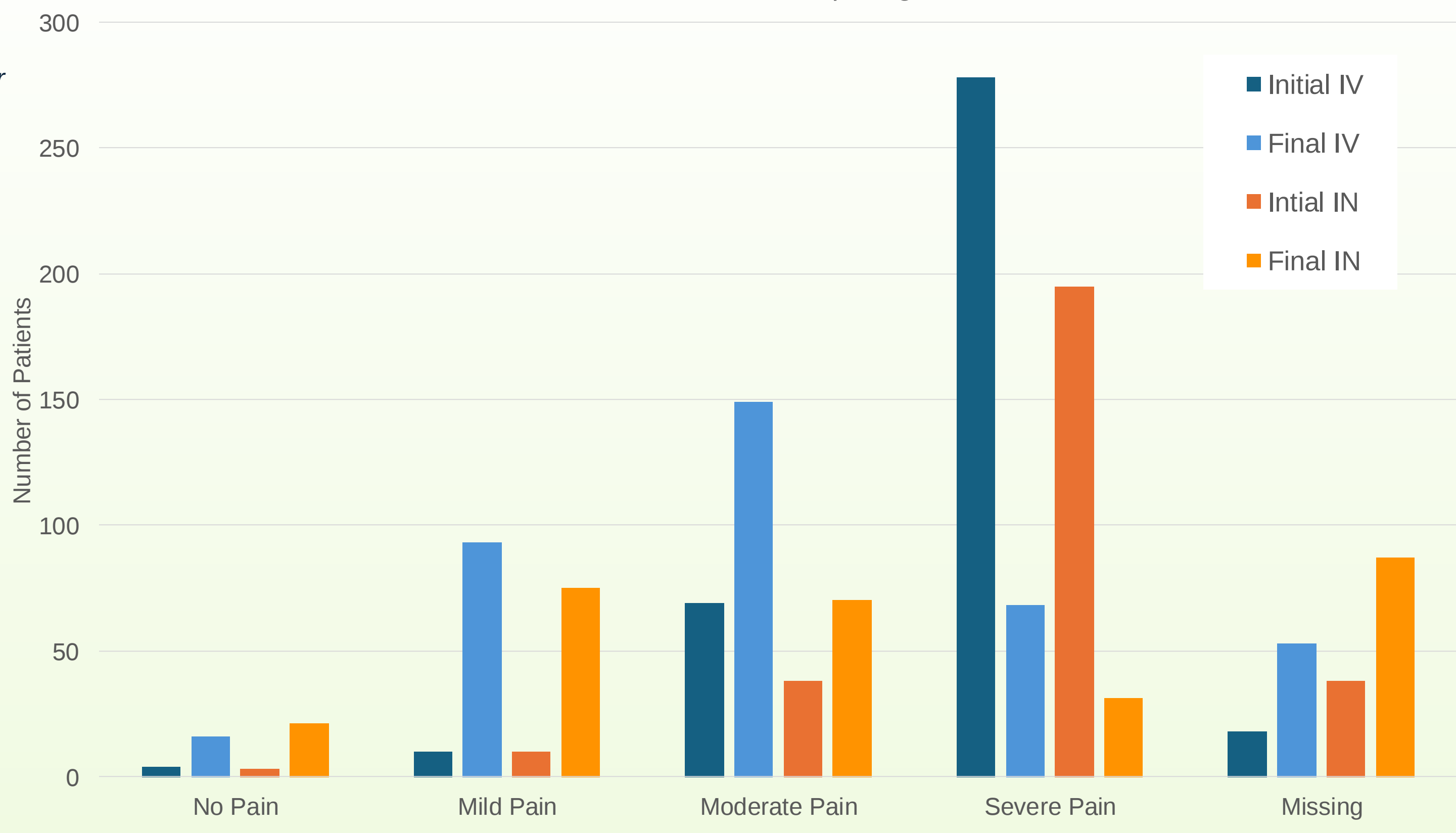


Figure 1. Numbers meeting inclusion criteria: paediatric patients aged 15 years or less who had a clinical impression indicative of trauma who received fentanyl either via the IV or IN route

- > The incident location influenced the type of injury and severity, with fentanyl administration route demonstrating significance.
- > Road traffic accidents were the least common mechanism of injury, yet demonstrated a significantly higher proportion of patients receiving IV compared to IN fentanyl.

- > IN fentanyl was administered at a **lower rate** than IV fentanyl (42.9% vs. 57.1%). Both IV and IN fentanyl administration demonstrated a clear reduction in pain scores between initial and final (Figure 2); however, IN administration showed more patients as having no or mild pain compared to IV fentanyl.
- > There was no significant association between initial pain score and route of fentanyl administration ($p < .05$)
- > Most patients experienced initial pain as severe
- > There was a statistically significant difference between final pain score and route of fentanyl administration.

Figure 2. Initial and Final Pain Score comparing IV and IN administration routes



REFERENCES

1. Montoya L, Kool, B., Dicker, B., Davie, G. New Zealand Medical Journal. 2022.
2. Karlsen AP, Pedersen DM, Trautner S. Ann Emerg Med. 2014;63(6):699-703.
3. Browne L, Studnek, J., Shah, M., Brousseau, D., Guse, C. & Lerner, B. Prehospital Emergency Care. 2016;20(1):59-65.
4. Lord B, Jennings PA, Smith K. Pediatric Emergency Care. 2019;35(11):749- 54.