

Intranasal fentanyl use in paediatric trauma in Aotearoa New Zealand



Analiese Le Roy^{1,2}, Lane Warner^{1,2}, Bridget Dicker^{1,2}, Sarah Maessen^{1,2}, Aroha Brett², Andy Swain^{1,3}, Graham Howie^{1,2}, Verity Todd^{1,2}

1 Paramedicine Department, School of Acute and Primary Health, Auckland University of Technology, Auckland, New Zealand

2 Hato Hone St John, Auckland, New Zealand

3 Wellington Free Ambulance, Wellington, New Zealand

Email: verity.todd@aut.ac.nz

INTRODUCTION

Major trauma is reported in two-thirds of children hospitalised for accidental injury in Aotearoa New Zealand (NZ) (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 NZ, fentanyl is the primary opioid analgesia used and can be administered by Paramedics via the **intravenous (IV)**, **intranasal (IN)** and intramuscular (IM) routes. Fentanyl is typically delivered IV; however, the lesser-used IN route is a potentially 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 internationally (3, 4).

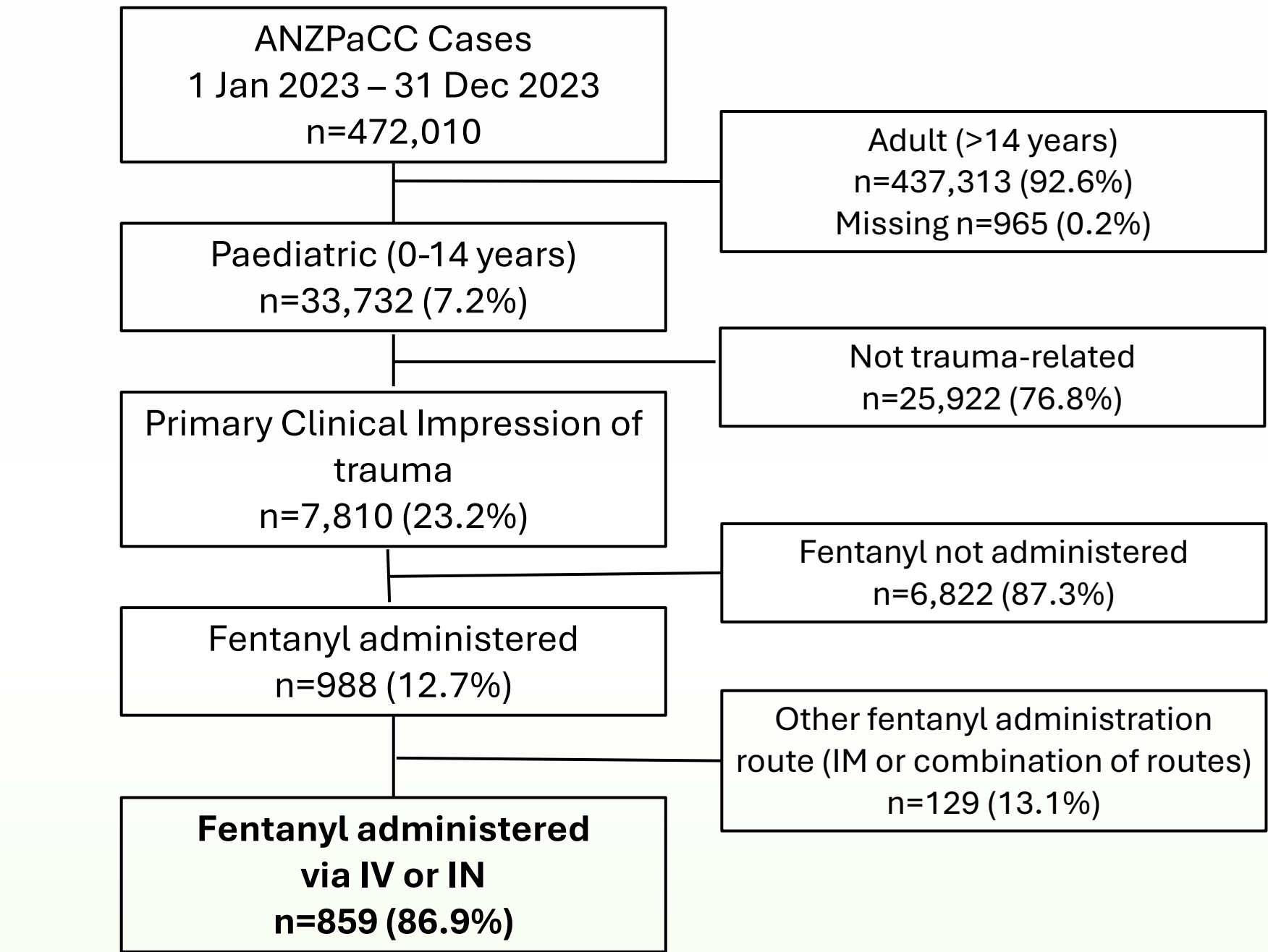
AIMS

1. **Determine the rate of intranasal (IN) administration in paediatric trauma cases receiving fentanyl**
2. **Evaluate whether IN fentanyl administration differs by patient demographic and clinical characteristics**
3. **Evaluate whether pain management with IN fentanyl is comparable to IV fentanyl**

METHODS

- Aotearoa NZ Paramedic Care Collection (ANZPaCC) contains data from all NZ road-based ambulance services (Hato Hone St John and Wellington Free Ambulance)
- **Inclusion criteria:**
 - Children (aged 0 to 14 years)
 - Attended in 2023 (1 January to 31 December)
 - Trauma (trauma-related primary clinical impression e.g. abrasion, bite, burn, fracture, traumatic brain injury, etc.)
 - Received fentanyl either intranasally (IN) or intravenously (IV)
- **Exclusion criteria:**
 - Intramuscular (IM) or mixed administration routes for fentanyl
- Descriptive analyses were used to examine patient demographics (age, sex, rurality, ethnicity, deprivation, location type) and clinical characteristics (acuity, numerical pain score)
- Chi-square analyses and binary logistic regression were undertaken using SPSS (version 30.0), with significance at $p < .05$
- This study was approved by the Northern B Health and Disability Ethics Committee (2022 FULL 13415), with locality approval from both ambulance services

COHORT



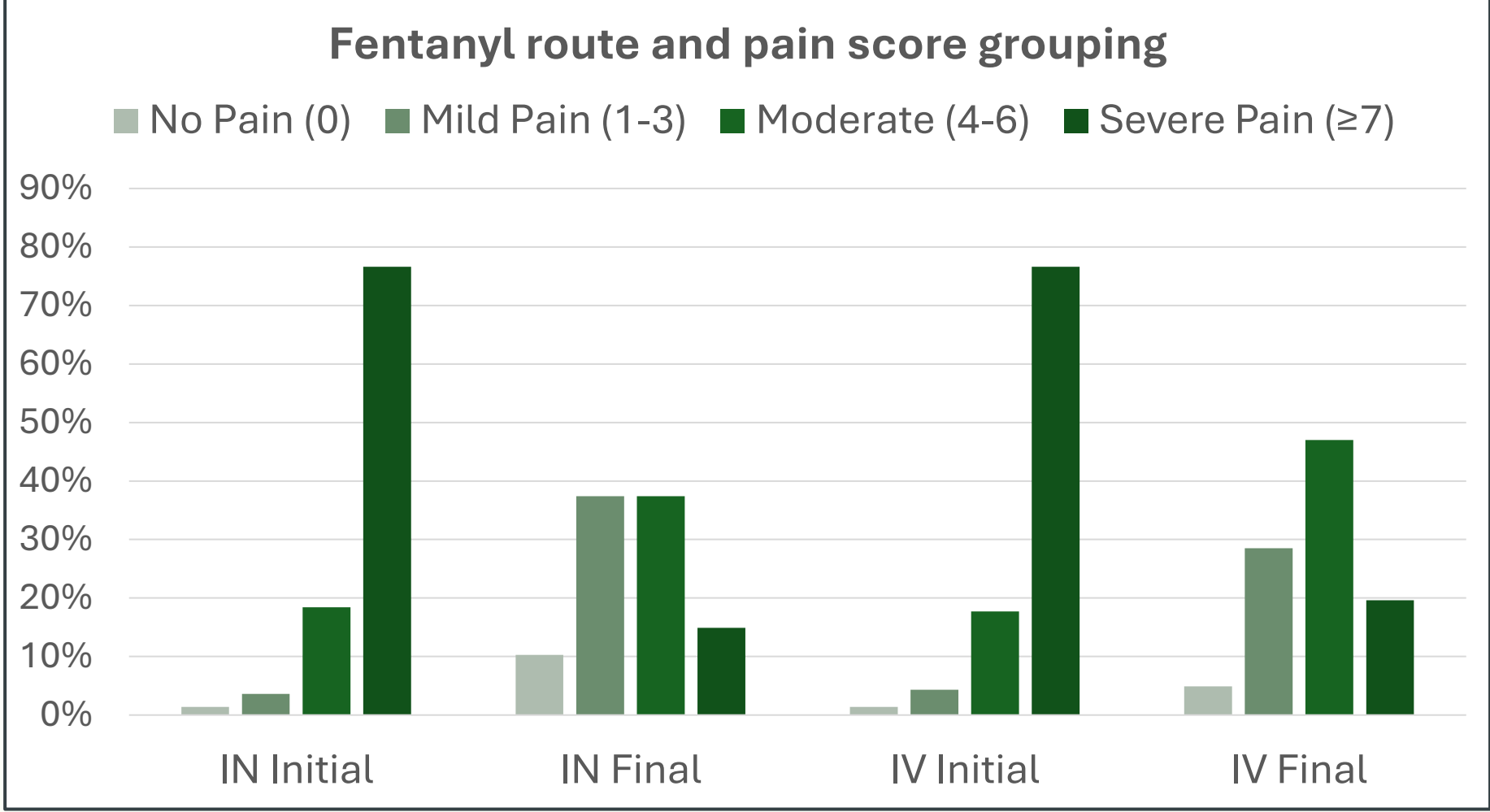
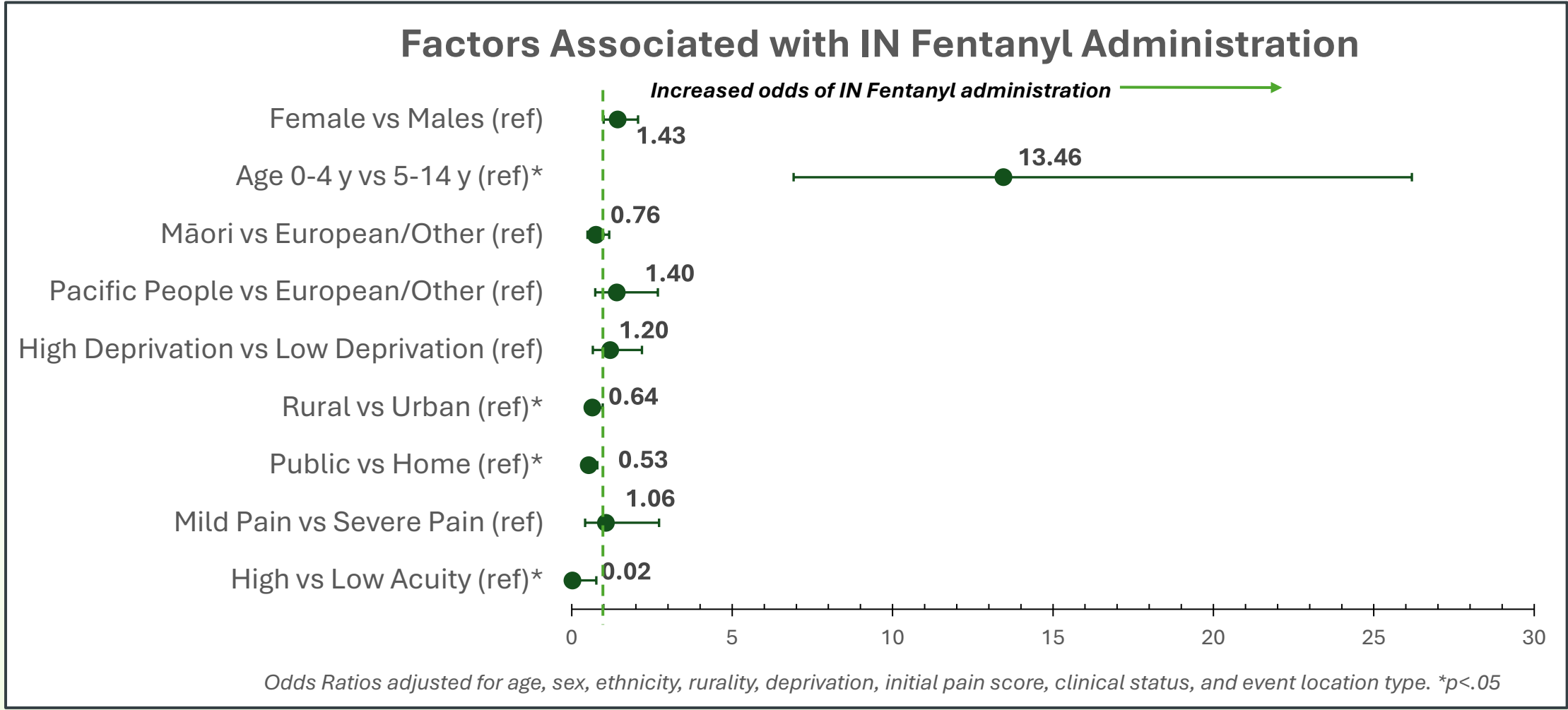
48%
of paediatric fentanyl
administrations were intranasal



RESULTS

Age is a large contributor to IN fentanyl administration — infants and preschoolers are 13 times more likely to receive IN fentanyl

Children in rural areas, those presenting in public locations, and those with high-acuity presentations are less likely to receive IN fentanyl



Both IN and IV fentanyl administration effectively reduced severe pain, with fewer than 20% of children remaining in the severe pain category. IN fentanyl demonstrated good analgesic efficacy, with 47.7% of patients achieving mild pain or complete relief compared to 33.4% with IV administration.

Pain scores were frequently missing (9.4% initial, 24.4% final)

CONCLUSIONS

- Intranasal fentanyl is administered at lower rates overall (48.2%) compared to intravenous fentanyl (51.8%) in NZ.
- Reduced intranasal fentanyl administration was associated with rural location, public settings, and high-acuity presentations. Further work is required to investigate potential inequities in IN administration.
- IN fentanyl appears to be as effective as IV fentanyl in reducing pain scores. However, there is poor pain score documentation adherence that falls below the expected standard and requires reflection on clinical practice. Documentation of pain scores after analgesia is an essential component of prehospital pain management.
- Our research suggests that IN delivery is an effective route of fentanyl administration and should be used where indicated in children.

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.