PAIN-K

Pre-hospital Analgesia with Intra-Nasal Ketamine

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BCEHS | BC Emergency Health Services

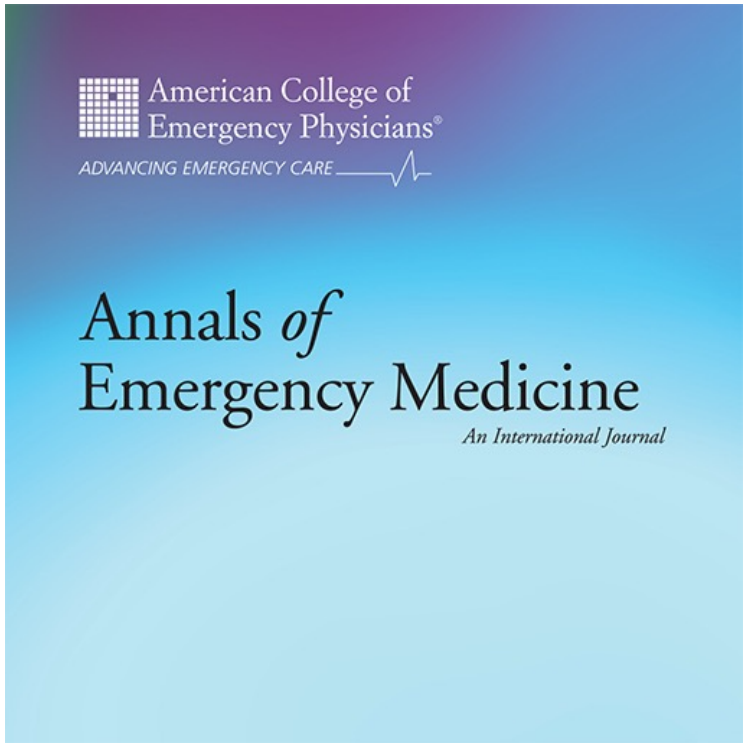
DISCLOSURES

I have no actual or potential conflict of interest in relation to this presentation.

I am **not** a author of the research, but I am presenting it on their behalf!

AUTHOR TEAM

- Gary Andolfatto
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@gandolfattoNV

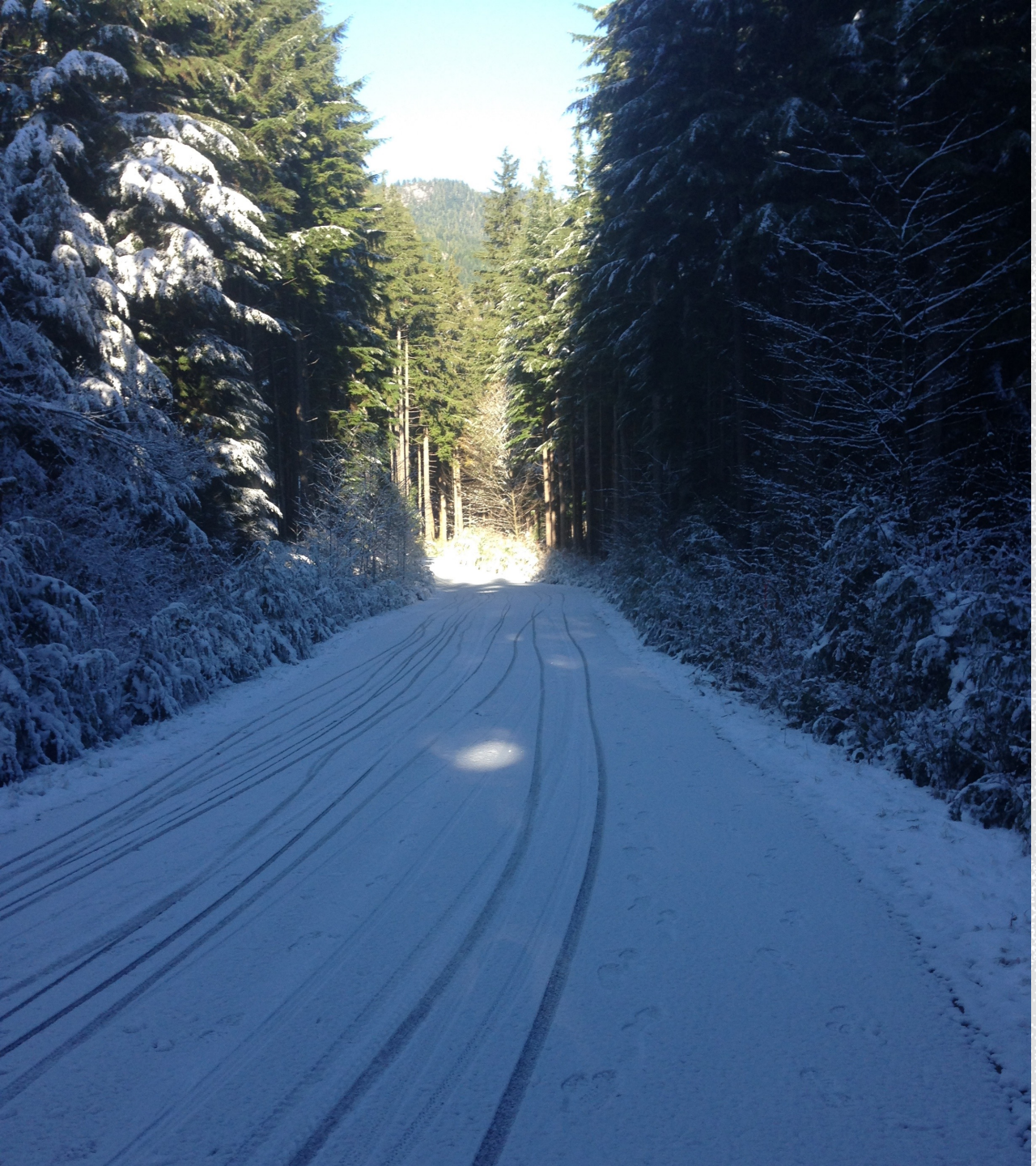
@AckerJoe



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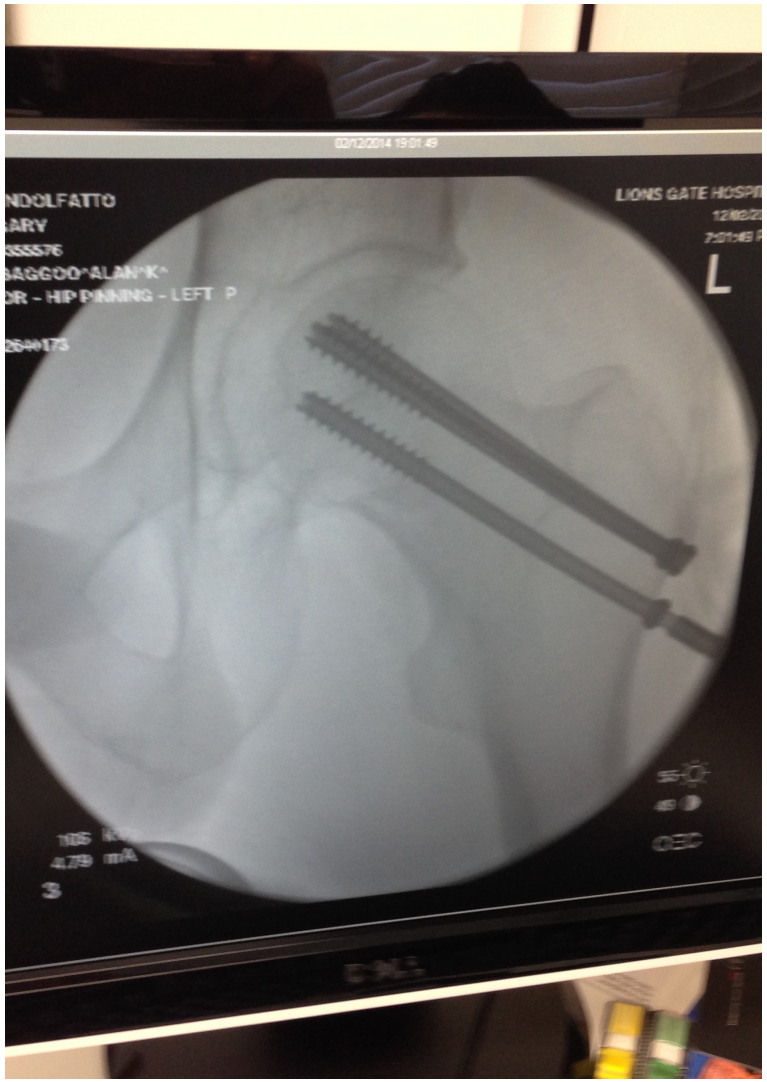
SETTING

- Provincial provider of air & ground ambulance
- 950,000 sqkm
- 4,750 staff
- 756,000 responses in 2018
- 188 stations + 6 aircraft bases
- 3 dispatch centres
- 566 ambulances (450 PCP)
- EMR, PCP, ACP, ITT, CCP license levels



BACKGROUND

- Gary's back-country experience in Lynn Canyon
- Fall from bike
- 9km hike with fractured femur
- Problematic pre-hospital treatment of acute pain using N2O
- Reality check of analgesia limitations for PCPs


L


STAFF
ONLY

OBJECTIVES



Compare IN ketamine to IN placebo



Evaluate the proportion of patients with clinically significant pain reduction (VNRS of 2 or more) at 30 minutes after administration of IN ketamine



When added to usual paramedic care (NO)

Prehospital Analgesia With Intranasal Ketamine (PAIN-K): A Randomized Double-Blind Trial in Adults





Randomized Controlled Trial

120 adults with pre-hospital acute pain

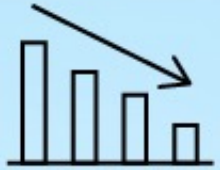
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Usual care (including nitrous oxide)

↓ ↓

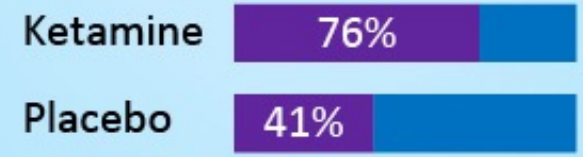
Intranasal ketamine 0.75 mg/kg

Intranasal saline



Results

Proportion of patients with ≥ 2 VNRS point pain reduction at 30 minutes





Summary

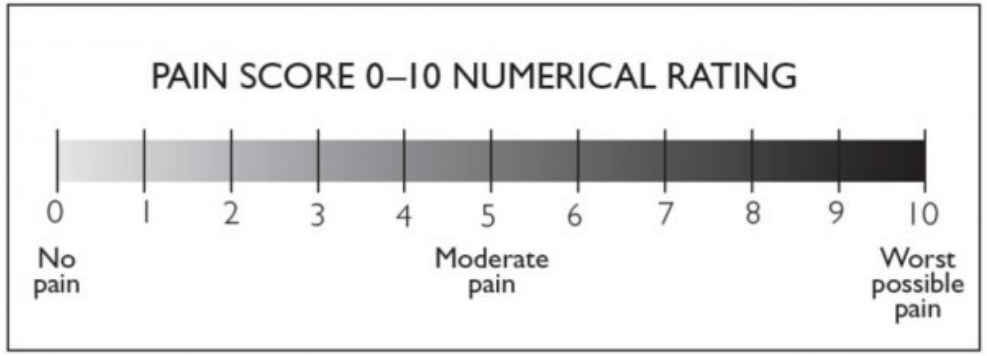
Intranasal ketamine at 0.75 mg/kg is an effective analgesic for out-of-hospital adults, with only minor adverse events.

Andolfatto et al. *Ann Emerg Med.* August 2019

Annals *of* Emergency Medicine
An International Journal

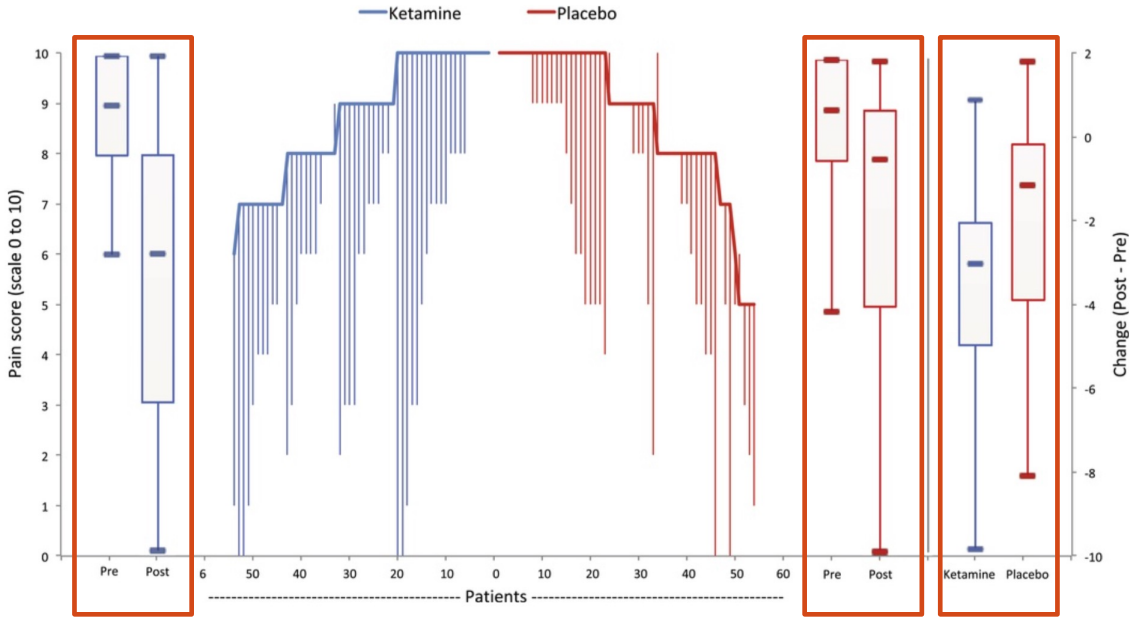
METHODS

- Double-blind randomized controlled trial
- Inclusion: Verbal Numeric Rating Scale (VNRS) ≥ 5
- Usual care including nitrous oxide
- Ketamine dose or Placebo
- VNRS q15 minutes



PRIMARY RESULTS

- 120 patients recruited
- Similar baseline characteristics
- Ketamine vs Placebo Group
  - 76% of ketamine group with ΔVNRS ≥2 (41% placebo)
  - Median reduction in VNRS of 3 (1 placebo)



SECONDARY RESULTS

- Ketamine had more AEs than placebo (62% vs 20%)
- AEs minor in nature (dizzy, unreality, nausea) – none serious, none required intervention
- Patient satisfaction (1-10 scale) – Median 5 ketamine, 2 placebo
- Paramedic satisfaction (1-10 scale) – Median 6 ketamine, 2 placebo



Results	Ketamine	Placebo	Difference, % (95% CI)
Adverse effects			
Subjects experiencing adverse effects, No. (%) [95% CI]	37 (62) [49 to 73]	12 (20) [12 to 32]	42 (24 to 56)
No. of adverse effects experienced*	52	14	
Adverse effects, No. (%) [95% CI]			
Feeling of unreality	16 (27) [17 to 39]	1 (2) [0.3 to 9]	25 (13 to 37)
Dizziness	12 (20) [12 to 32]	6 (10) [5 to 20]	10 (–3 to 23)
Nausea	10 (17) [9 to 28]	3 (5) [2 to 14]	12 (0.3 to 24)
Fatigue	6 (10) [5 to 20]	1 (2) [0.3 to 9]	8 (–1 to 19)
General discomfort	3 (5) [2 to 14]	3 (5) [2 to 14]	0 (–9 to 9)
Mood change	3 (5) [2 to 14]	1 (2) [0.3 to 9]	3 (–5 to 12)
Hallucination	1 (2) [0.3 to 9]	1 (2) [0.3 to 9]	0 (–7 to 7)
Change in hearing	1 (2) [0.3 to 9]	0	2 (–5 to 9)
Headache	0	1 (2) [0.3 to 9]	2 (–5 to 9)

*Some subjects experienced more than one adverse effect.



LIMITATIONS

- Single site
- Selection at discretion of paramedics
- Variable nitrous oxide use
- Unblinding likely



DISCUSSION

- IN route ideal for paramedics
- Ketamine safe
- ↑ satisfaction despite ↑AEs
- Role for further dose finding studies??

IN-Ketamine safe and effective in the hands of PCPs



TRANSLATION TO PRACTICE

- IN ketamine used by PCPs in Fort St John and Prince Rupert (PCP Air Bases)
- Plans to expand to select PCP communities in the near future
- Cost impact being determined
- Logistics & CTS impacts are substantial





Prehospital Analgesia With Intranasal Ketamine (PAIN-K): A Randomized Double-Blind Trial in Adults

Presented at the Canadian Association of Emergency Physicians *Scientific Assembly*, May 2018, Calgary, Canada.

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Open Access PlumX Metrics

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Article Info

Abstract | Full Text | Images | References | Supplemental Materials

Study objective

We compare intranasal ketamine with intranasal placebo in providing pain reduction at 30 minutes when added to usual paramedic care with nitrous oxide.

Methods

This was a randomized double-blind study of out-of-hospital patients with acute pain who reported a verbal numeric rating scale (VNRS) pain score greater than or equal to 5. Exclusion criteria were younger than 18 years, known ketamine intolerance, nontraumatic chest pain, altered mental status, pregnancy, and nasal occlusion. Patients received usual paramedic care and were randomized to receive either intranasal ketamine or intranasal saline solution at 0.75 mg/kg. The primary outcome was the proportion of patients with VNRS score reduction greater than or equal to 2 at 30 minutes. Secondary outcomes were pain reduction at 15 minutes, patient-reported comfort, satisfaction scores, nitrous oxide consumption, and incidence of adverse events.

Results

One hundred twenty subjects were enrolled. Seventy-six percent of intranasal ketamine patients versus 41% of placebo patients reported a greater than or equal to 2-point VNRS reduction at 30 minutes (difference 35%; 95% confidence interval 17% to 51%). Median VNRS reduction at 15 minutes was 2.0 and 1.0 and at 30 minutes was 3.0 and 1.0 for ketamine and placebo, respectively. Improved comfort at 15 and 30 minutes was reported for 75% versus 57% and 61% versus 46% of ketamine and placebo patients, respectively. Sixty-two percent of patients (95% confidence interval 49% to 73%) versus 20% (95% confidence interval 12% to 32%) reported adverse events with ketamine and placebo, respectively. Adverse events were minor, with no patients requiring physical or medical intervention.

Conclusion

Added to nitrous oxide, intranasal ketamine provides clinically significant pain reduction and improved comfort compared with intranasal placebo, with more minor adverse events.

READ THE ARTICLE!

Andolfatto, G., Innes, K., Dick, W., Jenneson, S., Willman, E., Stenstrom, R., … Benoit, G. (2019). Prehospital Analgesia With Intranasal Ketamine (PAIN-K): A Randomized Double-Blind Trial in Adults. *Annals of Emergency Medicine*. https://doi.org/10.1016/j.annemergmed.2019.01.048

https://www.annemergmed.com/article/S0196-0644(19)30102-7/abstract



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