

The 9th International Forum *on* Pediatric Pain

Pain in the Emergency Department
- Tips and Tricks from the Trenches

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- **Challenges in pain management in the ED setting**
- **Recent changes that improved pain management**
- **Discuss what every one of us can do
“its all about the people”**



One-Week Survey of Pain Intensity on Admission to and Discharge from the Emergency Department: A Pilot Study¹

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Received 18 December 1996; received in revised form 23 May 1997; accepted 18 June 1997.

Abstract

[Full Text](#)

[PDF](#)

[Images](#)

[References](#)

Abstract

The purpose of this pilot study was to determine the incidence and severity of pain intensity in patients 4 years of age and older presenting to the noncritical ward of the emergency department (ED). All patients presenting to the ED of two university hospitals (one general, one pediatric) who were triaged to the noncritical ward during 12 h/day for 1 week were asked to report their pain intensity on admission and again asked just prior to discharge home. The chromatic analogue scale with a range of 0–10 was used as the measure of pain intensity. Pain reports were obtained from half of all patients (58% of adults, 47% of children) admitted during the study week. Approximately one-third (29% of adults and 31% of children) reported no pain on admission, but half of both age groups (52% of adults, 48% of children) reported pain 4/10 or higher. On discharge, one-third of

1998

- 4 years of age and older
- Two university hospitals in Montreal
- Pain of 0–10 when coming and when disposition determined
- Half (48%) of children reported pain 4/10 or higher on admission
- A third of children reported pain 4/10 or higher on discharge
- Children accompanied by their mothers - poorer pain improvement than with fathers alone or both parents

2005

- Half of 533 children presenting were experiencing pain due to musculoskeletal injury
- Mean pain intensity on admission was 5+ (SD 2.3) and
- Mean pain intensity on discharge was 4+ (SD 2.7)
- On admission, 13% reported pain intensity 8/10 or more
- 22% had worsening of pain and for 26% the pain remained the same
- 23% reported distress levels 8/10 or more

2013

- Edmonton, Alberta
- 4 months data
- Reviewed 468 medical records
- Fracture, dislocation, strain, sprain

- Pain scores were recorded for 6%.
- The average time from triage to first analgesic in the ED was 121 ± 84 min.

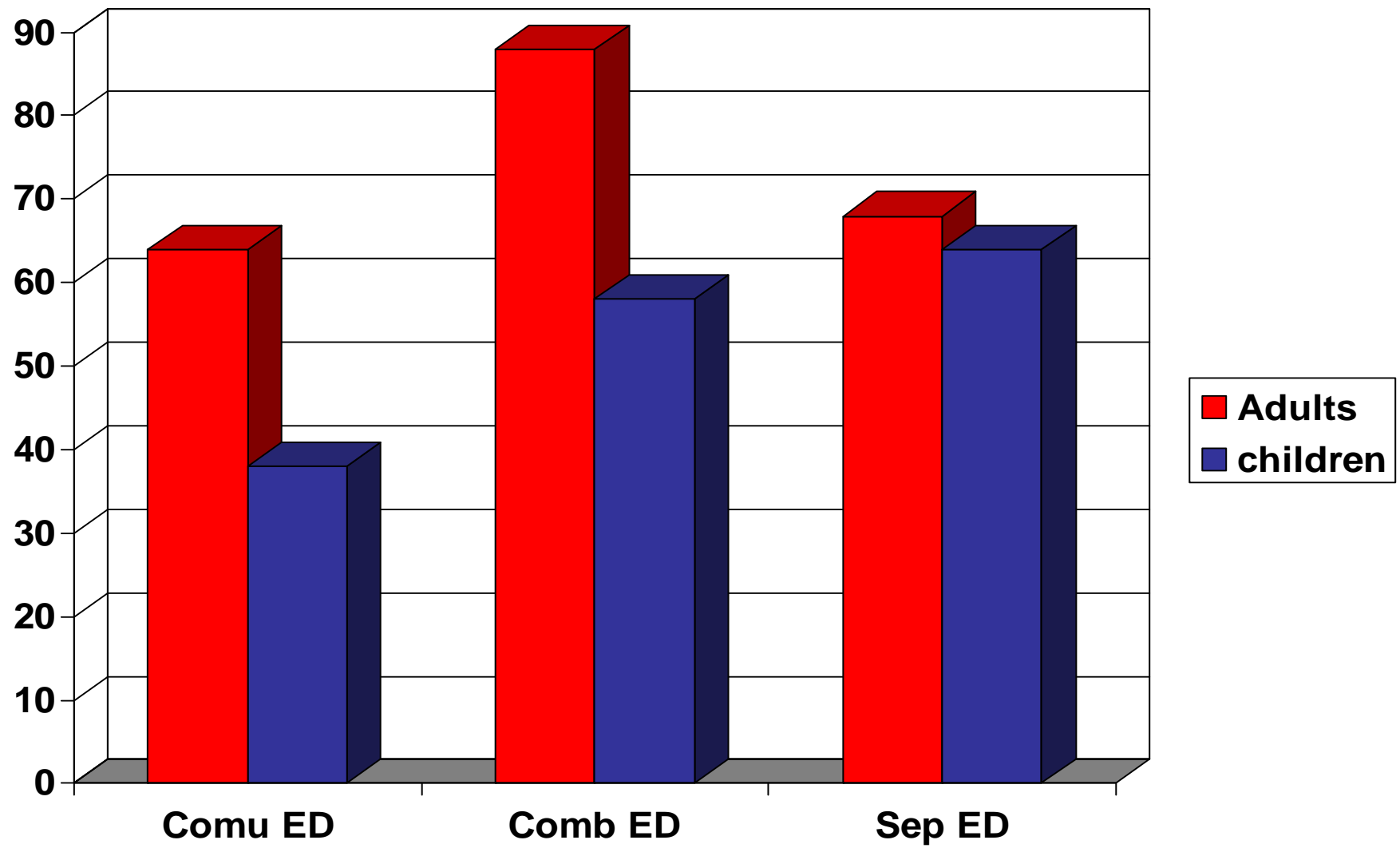
- 19% prehospital analgesics,
- 34% analgesics,
- 13% procedural sedation,
- 24% discharge analgesia advice

- 438 children with acute abdominal pain
- 26% received analgesia
- 14% under dosing of drugs
- Most under dosed morphine (24%)
- More analgesia if physician gave high probability of appendicitis

Comparison of pediatric and adult centers

- Doctors are less likely to order analgesics for children
- Children are less likely to receive analgesics, even when ordered
- Children more likely to receive non-narcotic agents
- Administration of analgesics are delayed, under-dosed
- Home medications and instructions are inadequate

Hauswald et al. *Pediatr Emerg Care* 13:263, 1996
Jacob et al. *J Pain Symptom Manage* 20:59-67, 2000
Friedland et al. *Ped Emerg Care* 13:103-106, 1997
Pena et al. *Ann Emerg Med* 34:483-491, 1999
Selbst et al. *Ann Emerg Med* 19:1010-1013, 1990



Petrack EM. Peds 1997

<i>percent</i>	6m – 24 m	6 y – 10 y
Fractures	29	51
Displaced #	45	78
Burns	50	75
2 nd Deg Burns	57	67

Pain in the Emergency Department

- *Unexpected, unprepared*
- *Rapid pace*
- *Pain or anxiety ?*

NEW

Pain Paradigm of the Emergency Department

- 1. It is all about the people***
- 2. New routes for analgesia***
- 3. New meds introduced***
- 4. The magic sauce***

What is better for a child ?

PASSIVE or ACTIVE

Distraction Techniques for Children Undergoing Procedures: A Critical Review of Pediatric Research

[Donna Koller, PhD](#) , [Ran D. Goldman, MD](#)

published online 14 October 2011.

Abstract

[Full Text](#)

[PDF](#)

[References](#)

Pediatric patients are often subjected to procedures that can cause pain and anxiety. Although pharmacologic interventions can be used, distraction is a simple and effective technique that directs children's attention away from noxious stimuli. However, there is a multitude of techniques and technologies associated with distraction. Given the range of distraction techniques, the purpose of this article was to provide a critical assessment of the evidence-based literature that can inform clinical practice and future research. Recommendations include greater attention to child preferences and temperament as a means of optimizing outcomes and heightening awareness around child participation in health care decision making.

Key words: [Pediatrics](#), [Distraction](#), [Pain](#), [Nonpharmacologic pain management](#), [Child life](#), [Medical procedures](#)

Child Life

- Greater attention to child preferences
- Attention to temperament
- Awareness around child participation
- Participation in decision making.

Nurse Initiated Protocols



Original Research

Nurse-initiated analgesia pathway for paediatric patients in the emergency department: A clinical intervention trial

Simone E Taylor^{1,*}, David McD Taylor²,
Kathy Jao³, Shyan Goh⁴, Meagan Ward²

Article first published online: 21 JUL 2013



Abstract

Objective

The study aims to evaluate the impact of a nurse-initiated analgesia pathway (NIAP) intervention for paediatric patients in the ED.

Methods

We undertook a pre- and post-intervention trial in a large, tertiary referral, mixed ED. The intervention comprised development and implementation of a comprehensive NIA Standing Order. In addition to paracetamol, which nurses could initiate pre-intervention, they were authorised to administer ibuprofen, paracetamol/codeine combinations and topical local anaesthetics prior to a doctor assessing the patient. All nurses were trained and credentialed prior to administering the NIAP. Patients aged 5–17 years with a triage pain score of ≥ 4 (Wong–Baker or numerical rating scale) were eligible for enrolment. The primary outcome was time to analgesia. Secondary outcomes were the proportion of patients who received 'adequate analgesia' and parental satisfaction with ED pain management (measured 48 h post-discharge).

Aug 2013

- 5–17 years old
- pain score of ≥ 4 (/10)
- Standing Order set by nurses upon arrival to the ED
- Acetaminophen, ibuprofen, Acetaminophen /codeine combinations, topical anaesthetics

- Children received nurse-initiated analgesia
 - (3% vs 44%; $P < 0.001$)
- Time to analgesia reduced
 - (58 min vs 23 min; $P < 0.01$)
- More 'adequate analgesia'
 - (41% vs 73%; $P < 0.001$).

Physician initiated analgesia

If you don't ask, they don't tell !

PHASE 1:

Physician interview patient with pain scale

form on chart

PHASE 2:

Research Assistant interview patient –
no reminder form on chart

PHASE 3:

Repeat phase 1

PHASE 4:

Repeat phase 2

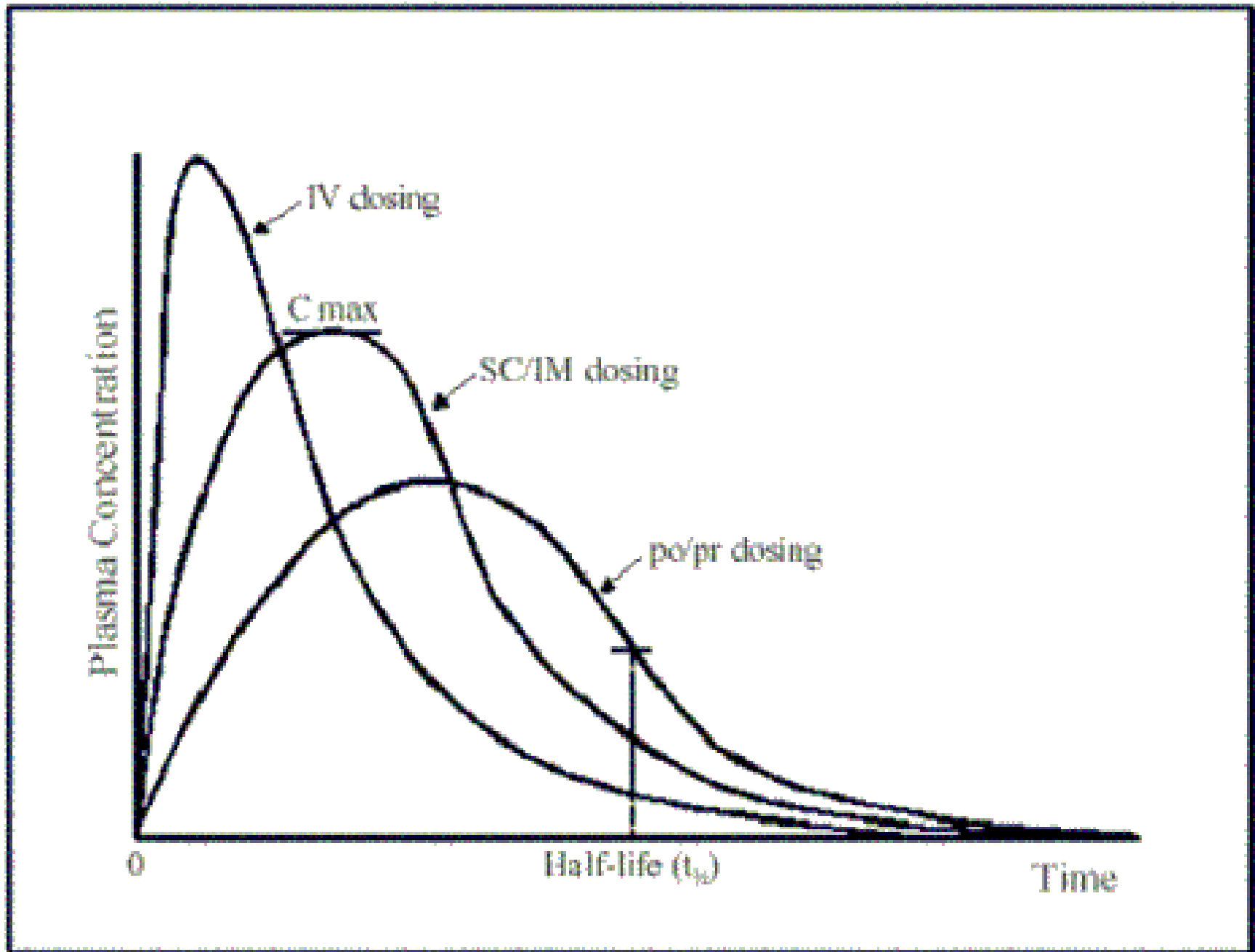
Parents as Providers

Children with limb injuries arriving the ED

- 28% pharmacological analgesics
- 44% non- pharmacological
- Age correlated with receiving medications
- Reason for not giving ?
- ‘it will interfere with assessment’
- ‘they will not see he is in pain’

Why look for other routes ?

- Reduce pain from injection
- IV access can be challenging
- Poking is time consuming
- Reduce safety hazards (peak concentration of medication)
- Reduce needle stick injuries
- Reduce cost



Routine oral dosing—immediate-release opioid preparations

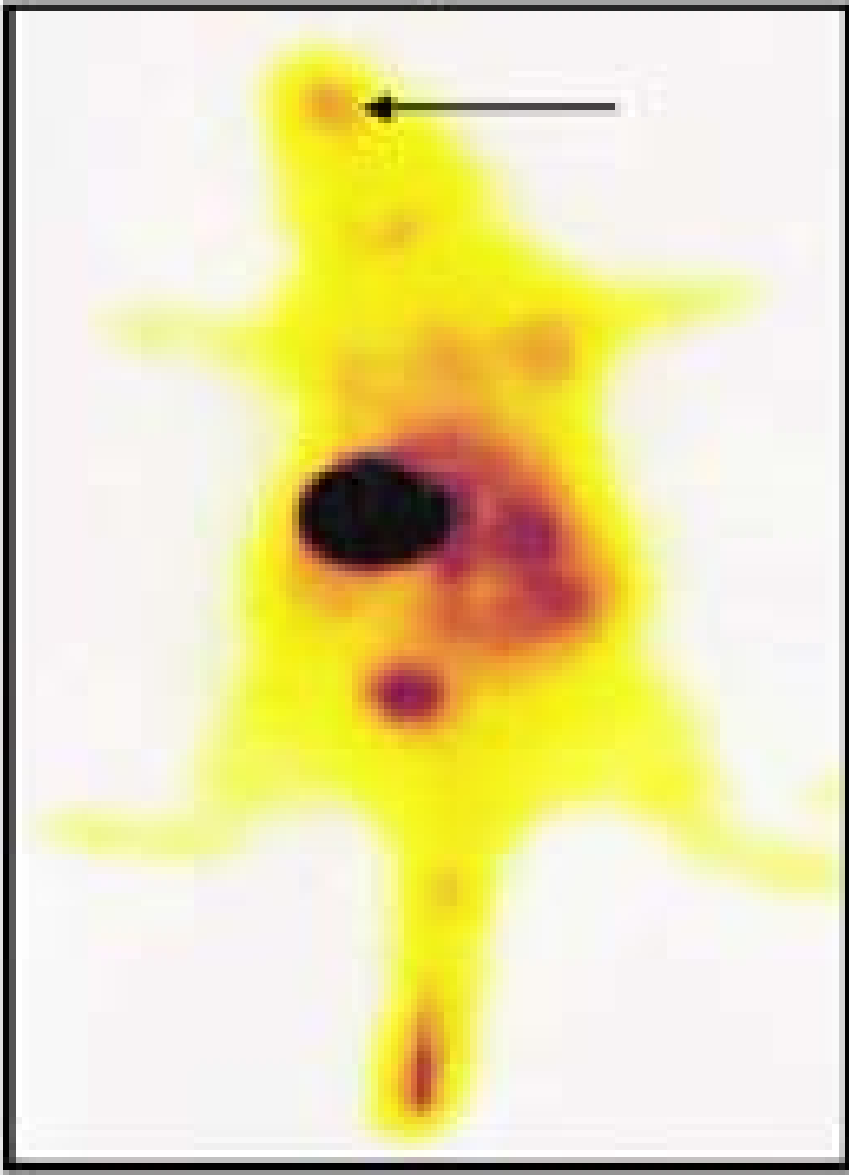
What Routes Should We Consider ?

- Intranasal
- Sublingual
- Buccal
- Trans-dermal

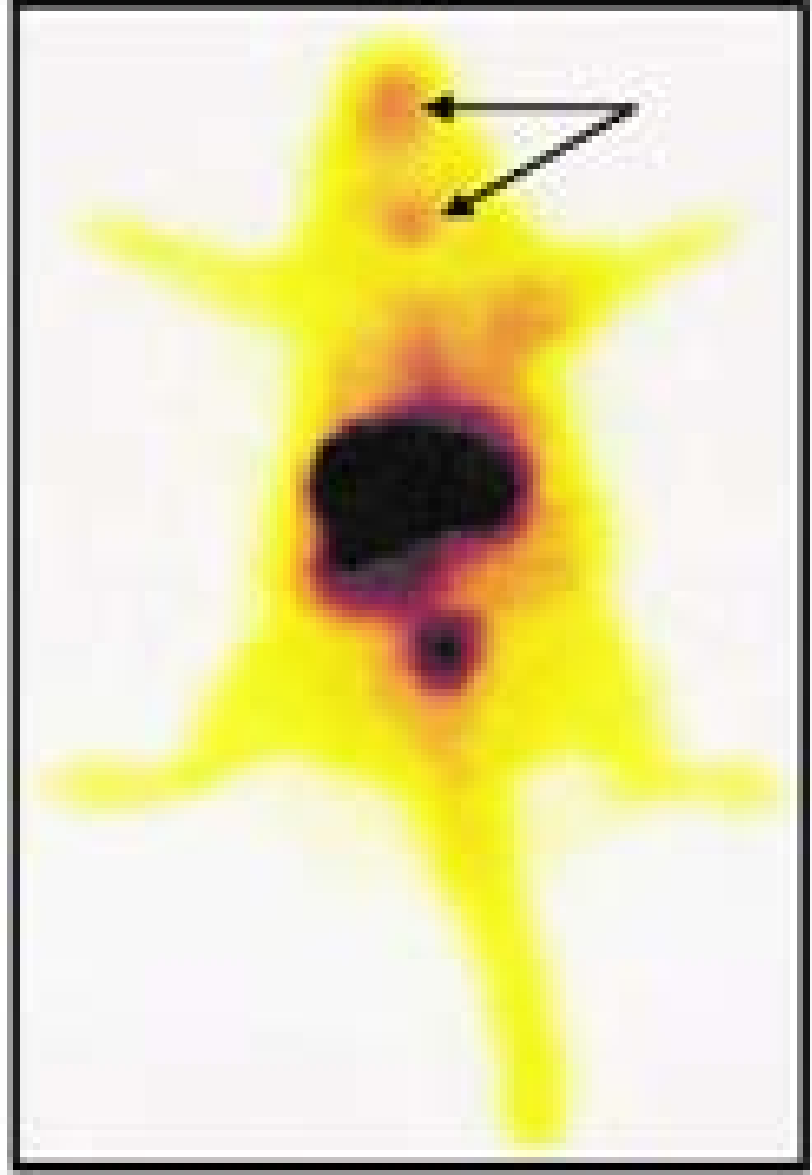
IN delivery – General principles

- No first pass metabolism
- Nose brain pathway
- Lipophilicity
- Bioavailability

A



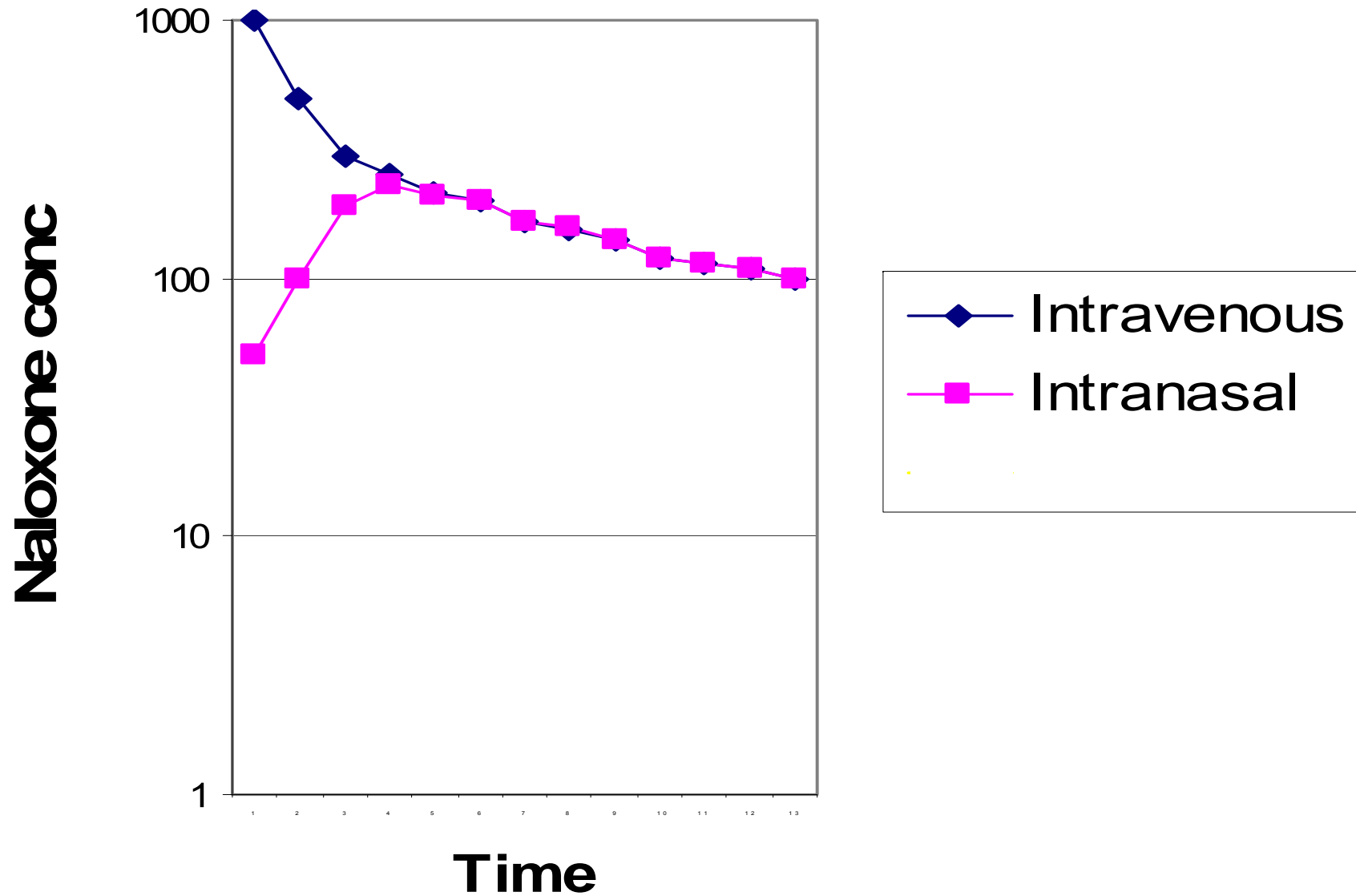
B



Bioavailability



Naloxone Serum Concentration



IN delivery - General principles

Factors affecting bioavailability:

- Medication characteristics
- Medication volume and concentration
- Nasal mucosal characteristics
- Delivery system characteristics
 - Mucosal surface area coverage
 - Medication particle size

Fitting Drugs and Conditions

- Pain control and Sedation-
opiates, benzodiazepines, ketamine
- Seizure Therapy –
Benzodiazepines
- Nasopharyngeal procedures and epistaxis-
anesthetics, vasoconstrictors
- Opiate overdose –
naloxone

Fitting drugs and conditions

Analgesia

- Diamorphine
- Fentanyl
- Sufentanil
- Meperidine

Sedation

- Midazolam
- Ketamine

Pain control and Sedation

IN sufentanil and midazolam Vs.

IM meperidine, promethazine, and chlorpromazine

- Both methods equally effective in achieving sedation
- IN sufentanil and midazolam superior in:
 - Better tolerated by the patients
 - 13 min faster onset (20 vs 33 min)
 - 27 min faster discharge (54 vs 81 min)

Pain control and Sedation

IN fentanyl in the emergency department

45 Children in acute pain given IN Fentanyl

- Titration allowed q 5 minutes
- Results
 - Mean VAS score reductions of 18 mm (at 10 m)
 - No side effects (but sample small)

Pain control and Sedation

IN midazolam and ketamine for CT scan

- 30 children < 16 kg requiring CT
- Midazolam 0.6 mg/kg
- Ketamine 5 mg/kg
- **Results:**
 - 83% effective sedation
 - Rapid onset
 - No complications or desaturations

Intranasal Ketamine



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PAEDIATRIC EMERGENCY MEDICINE

Sub-dissociative dose intranasal ketamine for limb injury pain in children in the emergency department: A pilot study

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¹Southern Health Emergency Medicine Research Group, Southern Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, Victoria, Australia, and ²Paediatric Emergency Department, Department of Emergency Medicine, Monash Medical Centre, Southern Health, Clayton, Victoria, Australia

Abstract

Objective: The present study aims to conduct a pilot study examining the effectiveness of intranasal (IN) ketamine as an analgesic for children in the ED.

Methods: The present study used an observational study on a convenience sample of paediatric ED patients aged 3–13 years, with moderate to severe ($\geq 6/10$) pain from isolated limb injury. IN ketamine was administered at enrolment, with a supplementary dose after 15 min, if required. Primary outcome was change in median pain rating at 30 min. Secondary outcomes included change in median pain rating at 60 min, patient/parent satisfaction, need

Intranasal Ketamine for Limb Injury

- Pilot observational study
- Children 3-13 years
- Pediatric ED
- Isolated limb injury
- Pain $\geq 6/10$
- Given IN ketamine
- One more dose if needed in 15 min

Intranasal Ketamine for Limb Injury

- 28 children
- Median age 9 years
- 64% received 1 dose, (mean dose 0.84 mg/kg)
- 36% 2 dosages (mean second dose 0.54 mg/kg)
- Total mean dose 1.0 mg/kg

Intranasal Ketamine for Limb Injury

- Median pain rating decreased (at 30 min)
from 74.5 mm → 30 mm
- Median pain rating decreased (at 60 min)
→ 25 mm
- 1/3 needed additional opioid analgesia
- All adverse events were transient and mild

Other Intranasal

- IN lidocaine for cluster headaches ?
- IN antiemetics for Nausea/Vomiting, headaches?

'New' Meds

Ketamin

Propofol

Ketofol

out of the OR/ICU setting

Pediatric Emergency Care

Dedicated to the Care of the Ill or Injured Child

Pediatric Emergency Care:

December 2012 - Volume 28 - Issue 12 - p 1391–1395

doi: 10.1097/PEC.0b013e318276fde2

CME Review Article

Ketamine, Propofol, and Ketofol Use for Pediatric Sedation

Alletag, Michelle J. MD^{*}; Auerbach, Marc A. MD, MSc[†]; Baum, Carl R. MD, FAAP, FACMT[†]

CME

Abstract

Abstract: The use of a combination of ketamine and propofol (ketofol) for procedural sedation and analgesia in the emergency department setting shows promise as an agent that may minimize adverse effects of ketamine or propofol as single agents. This article provides a summary of current literature regarding ketofol. It also reviews the comparative pharmacokinetics, adverse effects, and dosing of ketamine, propofol, and ketofol as agents for procedural sedation and analgesia.