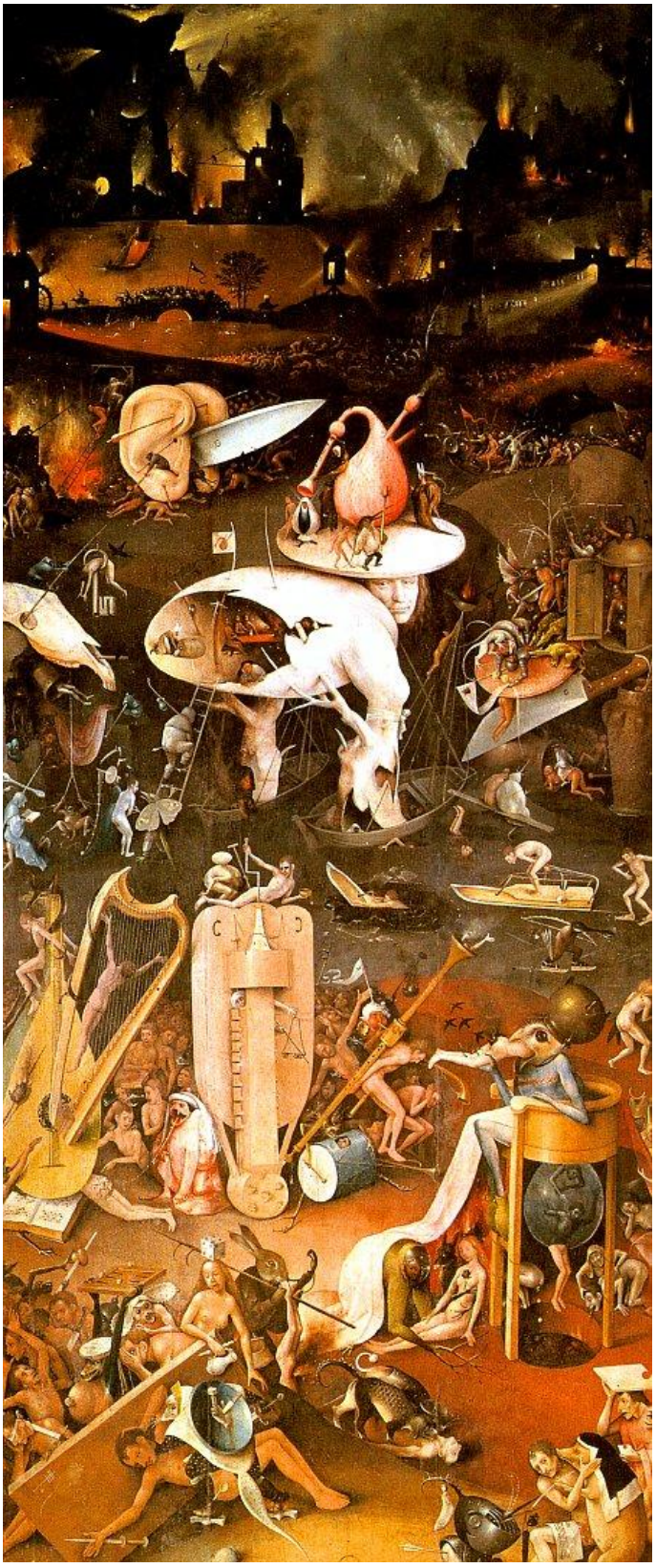
THE NORTHERN HOSPITAL

PARENTAL ANALGESIA IN THE EMERGENCY DEPARTMENT



"The Garden of Earthly Delights", Hieronymus Bosch c. 1504, Right panel: Triptych plus shutters. Oil on panel, Museo del Prado, Madrid

"...through me the way to the city of woe, through me the way to eternal pain, through me the way among the lost…before me nothing was but things eternal, and I endure eternally, abandon all hope you who enter here…".

Dante Aligheri, The Inferno, ***(1306-1317)***

This is Hieronymus Bosch's terrifying medieval depiction of Hell, part of his famous "Triptych" depicting the progression of sin in the world. Beginning on the left hand panel, with the creation of the world, the story progresses from Adam and Eve and original sin to the Garden of Earthly Delights (from which the work takes its name) in the centre panel illustrating a world deeply engaged in sinful pleasures. Finally on the right hand panel, (shown opposite) the torments of hell are depicted, a dark, fiery and nightmarish vision where punishments for sin are dispensed to the dammed for all eternity.

The hoards of wretched souls depicted Bosch's Hell would be in urgent need of rapid administration of a powerful analgesic to help alleviate their torments.

PARENTERAL ANALGESIA IN THE EMERGENCY DEPARTMENT

Introduction

Pain is a major symptom requiring prompt attention in any ED.

Orally acting agents are frequently of insufficient efficacy or potency nor of sufficiently quick action for many conditions that present to the Emergency Department.

In consequence an array of potent analgesics for parental use are necessary.

Commonly used parenteral analgesic agents used in the ED include:

- Morphine.
- Fentanyl.
- Tramadol.
- Pethidine (in the past, though now out of favour in most EDs).
- Ketorolac.
- Ketamine.

All these agents, apart from ketorolac, can cause significant CNS depression and life threatening respiratory depression.

General Prescribing Considerations

For significant pain requiring prompt analgesia from an agent of high efficacy.

Dosages are titrated carefully to clinical effect under close physiological monitoring.

The principle adverse reactions which must be diligently observed for include:

- **CNS depression.**
- **Respiratory depression.**
- **Hypotension.**

Naloxone is the specific opioid antagonist.

Principles of quality analgesia

The 13 Principles of Quality Analgesia from the NHMRC Pain Management Initiative include:

1. Effective analgesia in the ED requires appropriate assessment and re-assessment, use of the appropriate drug(s) in appropriate doses, via the appropriate route within an acceptable time frame.

2. Pain is subjective and an individual's perception of pain may be influenced by culture, previous painful experiences, beliefs, mood and ability to cope.

   Clinical assessment of pain should include self-assessment by the patient

3. Pain management may be improved with regular reassessment of a patient's pain.

4. The use of pain scales is recommended.

5. The use of pethidine should be discouraged in favour of other opioids.

6. For acute, severe pain, titrated doses of IV opioids provides effective analgesia.

7. Paracetamol and non-steroidal anti-inflammatory drugs (NSAIDs) provide effective analgesia for acute pain.

   If used together, the quality of analgesia improves.

8. For acute pain not requiring IV opioids, the oral route is the preferred route of administration.

   Parenteral or rectal NSAIDs have no advantage over oral NSAIDs.

   Non-oral routes of administration are useful if patients are nauseated, vomiting or the oral route is not available.

9. Side-effects, adverse effects and contraindications of analgesics should always be considered.

   Dose adjustments may be required in the elderly or for those with diminished drug clearance (e.g. renal or liver dysfunction).

10. Effective pain management should be a key component in managing patients with substance abuse disorders, just as it is for patients without such disorders.

11. Subcutaneous morphine is not appropriate for initial acute pain management; however the subcutaneous route may be an option as a comfort maintenance strategy once IV opioids have controlled the initial intense episode.

12. When IV morphine is administered for acute pain, the overall incidence of nausea and vomiting is low, regardless of whether these patients are given prophylactic metoclopramide or not.

13. If opioids are required for home management of severe pain, patients should preferably be medically reviewed the next business day post discharge from the ED, or as soon as is otherwise possible.

    The quantity of discharge opioid medication should not exceed this period.

    Maximum Pharmaceutical Benefit Scheme quantities and pack sizes should not be prescribed if unlikely to be needed.

Non-pharmacological adjuncts

It is also important to remember non-pharmacological analgesic techniques such as:

1. Immobilisation of injured limbs or body parts.
2. Ice and elevation.
3. Explanation of the cause of pain and likely outcomes to allay anxiety.
4. Keeping the patient in as calm an environment as possible.
5. Psychological techniques such as distraction.

Specific Agents

Morphine

Introduction

Morphine is the original prototypical opioid and remains the best opioid narcotic analgesic agent for parenteral use in the ED.

Advantages

This agent of choice in those without significant opioid allergy.

It can be used for both acute and chronic pain syndromes.

Disadvantages

Those with documented allergic reactions.

Minor degrees of anaphylactoid reaction may be seen relatively commonly with IV use, but these generally do not preclude its use.

Hypotension and bradycardia may be seen.

Respiratory depression is the most serious complication - but this can be readily reversed with naloxone

Dosing

2.5 to **5mg** IV as an initial dose, then titrated to effect every 5 to 10 minutes with further incremental doses of 2.5 to 5mg IV [1]

In elderly patients or those with cardiorespiratory compromise, an initial morphine dose of less than 2.5mg IV and incremental doses of 0.5 to 1mg should be considered. [1]

Patients should be reassessed continually to determine if the dose has been effective or if there are any adverse effects (especially sedation).

Pethidine

Introduction

Pethidine is a synthetic phenylpiperidine opioid agonist, structurally dissimilar to morphine.

It is no longer stocked in most Australian Emergency Departments, primarily because of its powerful potential for addiction.

There is **no** evidence that pethidine is better than morphine in the management of renal colic or obstetric pain.

Pethidine should only be used to treat acute pain for a short time, as a "once off", it has **no** role in chronic pain syndromes.

Advantages

It is a very potent analgesic agent.

May be a one off option in those with significant opioid allergy.

Disadvantages

Those with documented allergic reactions.

It has *significantly* greater potential to induce drug dependency when compared to other narcotic analgesics.

Prolonged use can lead to accumulation of the toxic metabolite **norpethidine.**

Should be avoided in patients with chronic pain syndromes, or in those that may become so (eg pancreatitis).

It some significant drug interactions, most notability with MAOIs where it can induce a life threatening serotonin toxicity.

Dosing

Usual starting doses are:

- 1 mg/kg IM.
- 0.25-0.5 mg /kg IV.

Fentanyl

Introduction

Fentanyl is a very potent synthetic opioid.

Advantages

It is s useful alternative for those with significant opioid allergy.

It is relatively short acting.

It is very cardiovascularly stable.

Disadvantages

Those with documented allergic reactions.

Dosing

- 25 to 50 micrograms IV as initial equivalent dosing. [1]
- 1 microgram/kg IM.

Tramadol

Introduction

Tramadol is a synthetic weak mu-opioid agonist that also enhances noradrenergic and serotonergic inhibition of central nociceptive transmission.

It has minimal respiratory depression and sedation but good analgesia.

Advantages

It is a useful alternative when there is significant opioid allergy.

It is less addictive than the opioids.

It is less constipating than the opioids.

Disadvantages

Those with documented allergic reactions.

Tramadol has limited analgesic activity, and if the doses are increased to try to get better analgesia, toxicity becomes likely. [2]

Tramadol is associated with potentially severe adverse reactions, including:

- **Seizures** and reduction of seizure threshold.
- **Serotonin syndrome**, especially when used in combination with other serotonergic agents.

Dosing

- 100 mg IM/IV [2]

Ketorolac

Introduction

Ketorolac is a potent NSAID.

It is the only currently available parental NSAID.

Advantages

Does not cause significant sedation.

Disadvantages

Those with documented allergic reactions.

It should be avoided in the elderly.

It should be avoided in those with renal failure including the those at risk of renal failure.

Dosing

- 30 mg IM 8 hourly, (maximum daily dose 90 mg)

Ketamine

Introduction

Ketamine is a powerful **anaesthetic agent**.

It also has significant analgesic effect.

Advantages

It is very useful for short painful procedures, where it is not only an analgesic agent, but also an effective anaesthetic agent.

It is useful as adjunctive treatment as low dose infusions, that can reduce the need for opioids.

Disadvantages

Those with documented allergic reactions.

Dosing

- Ketamine 0.5 to 1.5mg/kg IV initially, then titrated to effect with increments of 0.5mg/kg.
- Usual IM dose is 4 mg/kg

References

1. The Acute Pain Management Manual NHMRC, 2011.
2. eTG April 2012, and Analgesic Therapeutic Guidelines, 5th ed 2007.
3. Kaye K.I, Pethidine in Emergency Departments: promoting evidence based prescribing, MJA, vol 183 (3) 1 August, 2005, p. 129-133.
4. Molloy A, Does pethidine still have a place in therapy? Australian Prescriber, vol 25 (1), 2002, p.12-13.

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