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DOCUMENT CONTROL PAGE	
Title	**Title:** Analgesic doses for children **Version:** 6 **Reference Number:** MMC-G67
Supersedes	**Supersedes:** All previous versions **Significant Changes:** Addition of Ibuprofen doses and guidance, change of morphine sulphate oral solution doses and IV bolus doses to reflect BNFc, change of morphine bolus dose if patient is already on a continuous morphine infusion and further guidance regarding Naloxone. Harmonisation with Wythenshawe Hospital
Minor Amendment	**Date** **Notified To:** **Date:** **Summary of amendments:**
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1. Introduction

The following information is intended to guide your choice of analgesia. Please consult a senior colleague, the Children's Pain Team, on-call Anaesthetist or Pharmacy if you are unsure about what to prescribe.

2. Purpose

This document is intended to inform the decision making process when prescribing pain relief for children.

3. Background

Providing appropriate analgesia can often be difficult, but it is imperative that pain is well controlled. If severe pain is anticipated, early adequate pre-emptive treatment is better than attempting to control pain once it has started.

Opioids are respiratory depressants.
Monitoring of respiratory rate, level of sedation and oxygenation is important.
Beware of medicines interacting with other sedatives
(eg: benzodiazepines, chlorphenamine)

Seek guidance if you intend to prescribe opioids to an infant less than 6 months of age. This age group are particularly sensitive to the adverse effects of opioids. If in doubt contact the on-call Anaesthetist for advice.

When referring to the BNFc please use the BNFc App or https://bnfc.nice.org.uk/ for the most up to date information, including clarifications, corrections and updates.

4. Non- opioid analgesics

Paracetamol

- Please see 'Paracetamol Guidelines for Acute Pain Management in In-Patient Children'

5. Non- steroidal anti-inflammatory drugs (NSAIDs)

Children should not receive any (NSAIDs) if they fulfil any of the following criteria;

- History of bronchospasm, urticaria or angio-oedema after exposure to any NSAIDs
- A definite history of nasal polyps in association with wheezing or cough
- Children with definite aspirin sensitivity (this is very rare in children)
- Proven or suspected impairment of renal function or dehydration
- Platelets <100 cells/mm^3
- Haematology/oncology patients undergoing chemotherapy

Ibuprofen

- Dose: **5mg/kg QDS (6 hourly) or 10mg/kg TDS (8 hourly)**.
  Maximum 30mg/kg per day.

Younger children and those who have reduced oral intake would benefit from 5mg/kg QDS (6 hourly) as this has a better side effect profile (Henry et al 1996).

Older children, Sickle Cell patients and those who have undergone major surgery such as Orthopaedic, Spinal or Ravitch surgery may benefit from larger doses of 10mg/kg TDS.

If a child is NBM or has reduced oral intake then gastric protection (Omeprazole) can be commenced in order to allow Ibuprofen to be given for pain management.

Diclofenac

- Dose: As per BNFc

6. Weak opioids

Codeine Phosphate

Codeine must not be prescribed for children <12 years of age, or those children of any age who have had surgery for obstructive sleep apnoea or other airway issue.

- Dose: As per BNFc

7. Opioid analgesics

7.1 **Morphine Sulphate** for moderate to severe pain

Before commencing opioid analgesics please ensure simple analgesia has been optimised.

Oral preparations (immediate release / short acting):

- Morphine Sulphate oral solution 10mg/5mL

Age	Dose (oral)
< 1 month	seek advice from Consultant Anaesthetist
1-2months	50-100 micrograms/kg 4hrly
3-5 months	100-150 micrograms/kg 4hrly
6-11 months	200 micrograms/kg 4 hrly
1 year	Initially 200-300micrograms/kg every 4 hours, adjusted according to response
2-11 years	Initially 200-300micrograms/kg every 4 hours (max dose 10mg), adjusted according to response
12-17 years	Initially 5-10mg every 4 hours, adjusted according to response
Absolute Maximum Daily dose for Acute Pain	**90mg in 24 hours** (there is no evidence for doses of morphine above this level, exceeding 90mg per day may cause side effects without an increase in efficacy)

- **For complex & severe pain then a maximum single dose of 15mg can be given following discussion with Pain Team or Consultant Anaesthetist.**

- **Please refer to the Procedural Pain guidelines if higher doses of Morphine Sulphate oral solution are required prior to painful procedures.**
- **If standard 4 hourly dosing is inadequate then please contact the Pain Team or On Call Anaesthetist to discuss other analgesic techniques.**
- **Please note the above doses are for opiate naive patients. Higher doses will be required for those who have recent opioid use and may be tolerant.**

Breakthrough Pain Doses:

Morphine sulphate oral solution should be prescribed at one sixth of the total daily morphine dose for patients on sustained release preparations.
Solid oral dosage forms (e.g. Sevredol® tablets) should not be used for acute pain because onset of action is slower.

Modified Release / Sustained release preparations:

Patients will be converted to modified release/ sustained release formulations if they have required a lot of 'when required' immediate release morphine. To convert from immediate release morphine, calculate the total amount of immediate release morphine used in 24 hours and divide by 2 and give 12 hrly. For example, if a child received 4 doses of 10mg, they received 40mg of immediate release morphine in 24 hours which is converted to Morphine Sulphate Modified Release 20mg BD.

- Modified Release preparations available at RMCH:
  - Sustained Release Tablets (MST Continus® or Morphgesic® SR)
    - 5mg, 10mg, 30mg, 60mg, 100mg
  - Sustained Release Granules (MST Continus®)
    - 20mg, 30mg, 60mg, 100mg, 200mg
- Please note Wythenshawe use Sustained release capsules (Zomorph). Please can Wythenshawe staff contact Pharmacy or the Adult Pain Team for advice regarding Zomorph.

Immediate release morphine should NOT be administered within 2 hours of a modified release being given.

Intravenous Morphine

Morphine sulphate IV Bolus for severe pain:

- Administration by medical staff only at RMCH. Senior Nurses are permitted to allow Morphine boluses at Wythenshawe only.
- Monitor Oxygen saturations in all patients.
- Use with care in patients with renal and liver disease.
- Preparations available:
  - 1mg/mL ampoules (RMCH only), 10 mg/mL ampoules, 60 mg/2mL ampoules
  - If patient weighs less than 10kg then 1mg/ml strength should be used to reduce the risk of error if available.
  - Opiate medicines are associated with a high risk of medication errors and the risk of harm to a patient if an error occurs is more likely when high strengths are used. To minimise the risk of error, high strength opiates, including morphine 60mg/2ml injection, should be stored separately from other CDs (e.g. inner CD cupboard, separate shelf of the CD cupboard etc.)

Age	Morphine Dose (IV bolus)
< 1 month	seek advice from consultant anaesthetist
1 to 5 months	100 micrograms/kg every 6 hours, adjusted according to response, dose to be administered over at least 5 minutes
6 months -11 years	100 micrograms/kg every 4 hours, adjusted according to response, dose to be administered over at least 5 minutes.
12-17 years	5mg every 4 hours, adjusted according to response, dose to be administered over at least 5 minutes.
For complex & severe pain then a maximum IV dose of 10mg can be given 4hrly - Slowly Titrate to Effect	
If standard 4 hourly dosing is inadequate then please contact the Pain Team or On Call Anaesthetist to discuss other analgesic techniques.	

Caution- If the patient is on a morphine infusion or receiving regular opiates then the following is recommended:

- Start with a 20 microgram/kg bolus then wait for 5 minutes
- Give a further 50 microgram/kg bolus every 5 minutes until the patient is comfortable
- Remain with patient for 20 minutes.

- **Morphine sulphate IV Infusion or Patient Controlled Analgesia (PCA) for acute and post-operative pain relief**:
- Please refer to 'Continuous morphine and fentanyl infusion guideline (Children) ' and 'Patient and nurse controlled analgesia guideline (children)'

7.2 Oxycodone Hydrochloride for moderate to severe pain

- Widely used throughout the UK as an alternative to morphine. Can be used in children with difficult pain management issues, intolerance to morphine or where morphine is contraindicated.

Oral preparations (immediate release / short acting)

- Errors often occur. There is a significant risk of overdose when an immediate release product is used in error for a modified release product.

- Immediate Release
  - Liquid usually prescribed for as required administration for the immediate relief of pain
  - Immediate release Oral Solution 5 mg in 5ml
  - Dose: As per BNFc
- Modified Release - longer acting and prescribed to be administered regularly (twice daily) to provide continuous pain relief
  - Oral Sustained Release Tablets
  - Oxycodone MR preparations need to be prescribed by brand name e.g. Oxylan to avoid confusion between formulations with different durations of action
  - Preparations available: 5mg, 10mg, 20mg, 40mg, 80mg
  - Dose: As per BNFc

Immediate release oxycodone should NOT be administered within 2 hours of a modified release being given.

- IV Infusion or Patient Controlled Analgesia (PCA) alternatives for acute and post-operative pain relief (not currently available at Wythenshawe):
  - Please refer to 'Oxycodone continuous infusion protocol for use in children' and 'Patient and nurse controlled analgesia guideline (children)'

7.3 Fentanyl IV Infusion or Patient Controlled Analgesia (PCA) alternatives for acute and post-operative pain relief (not currently available at Wythenshawe):

- Please refer to 'Continuous morphine and fentanyl infusion guideline (Children)' and 'Patient and nurse controlled analgesia guideline (children)'

8. Naloxone

Naloxone is an opioid antagonist, and will reverse the effect of opioid induced respiratory depression.

- Use with caution in patients dependant on opioids or with cardiac problems.
- Preparations available: IV Injection 400 microgram/mL

8.1 Naloxone for Respiratory Depression:

Patients should have at least two of the following criteria before naloxone is administered:

- Pinpoint pupils
- ManChEWS2 score of 4 for Respiratory Rate
- ManChEWS2 score of 4 for Conscious Level

For reversal of respiratory depression caused by medicinal use of opioids (those patients on opioid infusions/PCA/NCAs or those receiving regular opiates)

  - IV Bolus. 1st dose 5 micrograms/kg (as per Naloxone pre-printed sticker)
  - Titrate the prescribed naloxone until the patient is responsive
  - If repeated dose is required use 5 micrograms/kg
  - A higher dose of 100micrograms/kg (max 2mg) can be given to completely reverse the drug if overdose/poisoning suspected.
- Reverses the effects of morphine - including analgesia therefore **titration is important so as not to precipitate pain or opioid withdrawal**
- Naloxone has a shorter duration of action than ALL opiates; therefore a continuous infusion may be required. **A doctor should assess the need to further administer naloxone by continuous infusion**.

Side Effects of Naloxone:

There are possible side effects with the use of naloxone. The most common side effects include: dizziness, headache, hypertension, hypotension, nausea, vomiting, tachycardia, cardiac arrhythmia.

9. Nurse Controlled Analgesia

See: Nurse Controlled Protocol

10. Equality, Diversity and Human Rights Impact Assessment

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