# Acute pain management in children

| | | |
|---|---|---|
| **Key Document code:** | WAHT-TP- 054 | |
| **Key Documents Owner:** | Dr Shinwari | Consultant Paediatrician |
| **Approved by:** | Paediatric Quality Improvement meeting | |
| **Date of Approval:** | 9th February 2024 | |
| **Date of review:**<br>**This is the most current version and should be used until a revised document is in place** | 9th February 2027 | |

## Key Amendments

| Date | Amendment | Approved by |
|---|---|---|
| 19th Nov 2020 | Document extended for 1 year | Dr J West/Paediatric QIM |
| 26th March 2021 | Approved with no amendments | Paediatric QIM |
| 9th February 2024 | FLACC score added with other minor amendments. Approved at Guideline Review Day | Paediatric QIM |

## Introduction & Staff Competencies

### Introduction

These guidelines aim to provide direction to medical and nursing staff on the safe and effective relief of acute pain and post-operative nausea and vomiting (PONV)
In addition they provide analgesic recipes, contact details and reference sources

### Staff Competencies Required To Use These Guidelines

These guidelines are intended for the use of all **trained** staff (medical and nursing). Any such member may use these for advice. However, specific measures will require further training. This will be identified in the relevant sections.

**All staff** making observations on paediatric post-operative patients **must** be able to assess the degree of pain, and measure pulse rate, respiratory rate and blood pressure by both machine and manual methods.

**The administration and adjustment of morphine infusions, PCAs and NCAs and the administration of IV boluses of opioids must only be performed by staff specifically trained to do so.**

Individual doctors remain responsible for any prescriptions that they write and the methods of pain relief that they prescribe.

For more information about drug dosage, side effects and contraindications consult the British National Formulary for Children

### Contact Details

The following people should be contacted in the event of needing further advice or assistance with the management of Acute Pain or Emesis

**Worcestershire Royal Hospital**

| Time | Designation | Contact |
|---|---|---|
| 0830-1500 Mon-Fri | Acute Pain Nurse | Bleep 238 |

| | | |
|---|---|---|
| Anytime | 3rd on Anaesthetist (ITU) | Bleep 702 |

**Alexandra Hospital**

| Time | Designation | Contact |
|---|---|---|
| 0730-1530 Mon-Fri | Acute Pain Nurse | Bleep 0271 |
| Anytime | 1st on Anaesthetist | Bleep 0907 |

## Contact /Communication

Situation, Background, Assessment, Recommendation SBAR should ideally be used as a structured method for communicating critical information regarding acute pain issues.

## Consent

The proposed method of analgesia and material risks associated with any technique should be discussed with the patient/parent/carer as appropriate e.g. weak legs following caudal anaesthesia.

A record of the above should be made on the anaesthetic chart/patient's notes.

## Assessment of Acute Pain

Pain is defined by the International Association for the Study of Pain as

*"An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage".*

There are long term psychological and physical consequences of inadequate pain control in all age groups.

Pain needs to be assessed taking into account several aspects of acute pain i.e.

| | |
|---|---|
| Cognitive | Physiological |
| Sensory | Behavioral |
| Affective | Sociocultural |
| Environmental | |

As such the following pain assessment tools form only a part of the assessment and are simply an aid in its assessment.

One of the following methods should be used and the method used should be documented on the chart used to record the child's pain.

**Suggested age range:**

| | | |
|---|---|---|
| Age | 2-7 yrs | FLACC (Face Legs Activity Cry Consolability) |
| Age | 4-16 yrs | FPS-R (Faces Pain Scale-Revised) |
| Age | 7-16 | Verbal (as per Adult Acute Pain Assessment) |

**Scores: out of 10**

| | |
|---|---|
| 0 | no pain |
| 1 - 3 | mild pain |
| 4 - 7 | moderate pain |

| | |
|---|---|
| 8 - 10 | severe pain |

## FLACC Score

The FLACC Score is the preferred pain assessment tool used on Riverbank, Children's day case, A&E (Alex and WRH), and theatres for children under 8 years of age (as per NPEWS observation chart), although it can be used to assess pain in the young person over 8 years of age. The FLACC Score is a behavioral tool, chosen because it is simple and consistent, and can be used to assess pain in infants/children/young people that are unable or reluctant to report their pain. Behavioral observation is the principal method in patients' with limited verbal and cognitive ability, therefore, the FLACC score is an ideal tool to use to assess pain in these patients (Voepel-Lewis; Zanotti; Dammeyer; Merkel, 2010).

The FLACC Score facilitates assessment and re-evaluation of pain, treatment and documentation, which in turn helps to improve patient outcome and experience (Macdonald and Simons, 2002).

The FLACC Score is an interval scale that measures pain by quantifying pain behaviors with scores ranging from 0-2. Pain scores are determined by a cumulative score based on 5 categories, (F) face, (L) legs, (A) activity, (C) cry and (C) consolability. The overall cumulative score ranges between 0-10, the higher the score indicates the severity of the pain the patient is experiencing (Merkel, 1997). Therefore, if the patients' overall cumulative pain score is 0 they are considered to be PAIN FREE. However, if their pain score is between 1-3 they are deemed to have MILD pain, a pain score of 4-7 is suggestive of MODERATE pain and a pain score between 8-10 indicates that the patient is experiencing SEVERE pain.

**FLACC SCALE – (Face, Legs, Activity, Cry, Consolability)**

Instructions: Rate patient in each of the five measurement categories. Add together to determine total pain score

| | 0 | 1 | 2 |
|---|---|---|---|
| FACE | No particular expression or smile, **eye contact and interest in surroundings** | Occasional grimace or frown, withdrawn, disinterested, **worried look to face, eyebrows lowered, eyes partially closed, cheeks raised, mouth pursed** | Frequent to constant frown, clenched jaw, quivering chin, **deep furrows on forehead, eyes closed, mouth opened, deep lines around nose/lips** |
| LEGS | Normal position or relaxed | Uneasy, restless, tense, **increased tone, rigidity, intermittent flexion/ extension of limbs** | Kicking or legs drawn up, **hypertonicity, exaggerated flexion/ extension of limbs, tremors** |
| ACTIVITY | Lying quietly, normal position, moves easily **and freely** | Squirming, shifting back and forth, tense, **hesitant to move, guarding, pressure on body part** | Arched, rigid, or jerking, **fixed position, rocking, side to side head movement, rubbing of body part** |
| CRY | No cry or **moan** (awake or asleep) | Moans or whimpers, **occasional cries, sighs,** occasional complaint | Crying steadily, screams, sobs, moans, **grunts**, frequent complaints |
| CONSOLABILITY | **Calm**, content, relaxed, does not require consoling | Reassured by occasional touching, hugging, or talking to, distractible | Difficult to console or comfort |

## Faces Pain Scale

This is used for younger children age 3yrs and older. The faces used are not the traditional "smiley" faces as children have been found to confuse the emotion of happiness and pain which although related are not the same and should be managed differently.

In the following instructions (as taken from the source document), say "hurt" or "pain, whichever seems right for a particular child.

"These faces show how much something can hurt. This face *[point to left-most face]* shows no pain. The faces show more and more pain *[point to each from left to right]* up to this one *[point to right-most face]* – it shows very much pain. Point to the face that shows how much you hurt [right now]."

Score the chosen face 0, 2, 4, 6, 8, 10, counting left to right, so '0' = 'no pain' and '10' = very much pain.' Do not use words like 'happy' and 'sad'. This scale is intended to measure how children feel inside, not how their face looks.


## Verbal

This is used for older children in exactly the same way as in adult patients

| Pain on movement | Score |
|---|---|
| None | 0 |
| Mild | 1 |
| Moderate | 2 |
| Severe | 3 |

It is important to follow these instructions. The score should be an even number. To ensure reliability of this assessment tool the numbers should be hidden from the child. Odd numbers will be picked up in audits and may be interpreted as a documentation error.

**Learning Disabilities and other Complex Needs**
The most appropriate pain scoring tool should be used in conjunction with available resources.
Online resources include -
The Hospital Communication Book
http://www.easyhealth.org.uk/listing/hospital-(leaflets)

Pain should be assessed regularly, recorded, appropriate intervention applied and then reassessed. If necessary, further intervention will be required.

Reassessment is performed regularly i.e.

| | |
|---|---|
| At least hourly | following major surgery |
| | If problems have been encountered |

If patient receiving IV opioids e.g. NCA/PCA or oral morphine

| | |
|---|---|
| 2-4 hourly | after intermediate or minor surgery |
| | And patient's initial pain score 3 or less |
| | And no opioids |

Involvement of surgeons may be warranted if there are deviations from anticipated pain symptoms

**Non-pharmacological treatment of pain**
The seven aspects of acute pain should be addressed i.e.

Cognitive, physiological, sensory, behavioral, affective, sociocultural, environmental

Therefore:

- Discuss pain management with patient and carer beforehand where possible.
- Impart information and answer questions: involvement of the Play Team can be useful.
- Give patient information leaflet.
- Positive emotional support.
- Proper positioning of the painful part, especially fractures which respond well to splinting.
- Relief of nausea and thirst.
- Keep the patient at a comfortable temperature.
- Make the surrounding environment as pleasant as possible.
- Allow the patient privacy and quiet if he/she/they want(s) it.

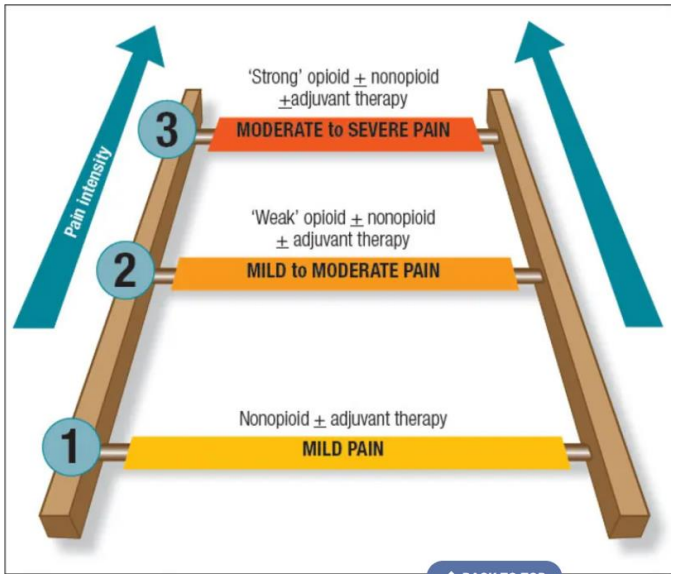
## Analgesia Ladder and principles of prescribing

The World Health Organisation Analgesia Ladder is a common framework used to prescribe analgesia in a logical stepwise approach.

***Start at the level most appropriate to the patient's level of pain and make sure that you have prescribed something from each "rung" of the ladder below.***

***Prescribe regular analgesics.***

Progress to the next rung if the pain is not controlled after an adequate trial period i.e. the length of time in which you would have expected the drug to have some effect.
There should be rescue analgesia prescribed for breakthrough pain.
Prescribe antidotes for common or worrisome side-effects e.g. nausea, respiratory depression.




Prescriptions should be reviewed every 24 hours to ensure maximum dosage limits are not exceeded and to assess the need to continue each drug in the light of the assessment of pain control and adverse effects.

## Choice of Technique

Principles are

1. use of simplest effective technique
2. multimodal approach
3. regular assessment and titration of analgesia for each individual child

There is no single correct analgesic technique for each procedure but the following recommendations may be useful

| Procedure | Possible Analgesic Technique |
|---|---|
| Herniotomy<br>Hydrocele repair<br>Orchidopexy | Simple analgesics plus<br>wound infiltration/ilioinguinal, iliohypogastric and genitofemoral nerve block/fascia iliaca block/caudal |
| Circumcision | Simple analgesics plus<br>penile block/caudal |
| Squint correction | Simple analgesics plus<br>topical/local anaesthesia<br>Prescribe opioid analgesics as rescue only |
| Adenoidectomy | Simple analgesics |
| Tonsillectomy | Simple analgesics<br>Dexamethasone<br>Codeine/oramoph rescue |
| Appendicectomy | Simple analgesics plus<br>wound infiltration/<br>Morphine boluses/<br>Morphine NCA/PCA |
| Laparotomy | Simple analgesics plus morphine NCA/PCA |
| Lower limb surgery | Simple analgesics<br>Caudal/PNB |

## Enteral Analgesia (oral/rectal)

Paracetamol, ibuprofen, diclofenac, codeine, Oramorph®.

All drugs must be given in accordance with the “Drugs Policy” See BNF for Children for prescribing information.

### Uses
Enteral administration is the mainstay of analgesia and should be used unless contraindicated.

Avoid oral NSAIDs in the absence of food or milk (single dose to fasting patient as premed acceptable). Consider PR as alternative

A parent's consent (and child's, if old enough) for the administration of rectal drugs should always be sought and documented prior to their use

## Parenteral Analgesia

## Morphine

### Uses
Parenteral administration is used when oral administration is unsuitable e.g.

Nil by mouth for surgical reasons e.g. delayed gastric emptying,

Significant nausea and vomiting

ESSENTIAL SAFETY PRECAUTIONS TO BE USED WITH ALL IV OPIOID INFUSIONS

**1.** No supplementary opioids to be prescribed unless ordered by Anaesthetist or member of Acute Pain Team.

**2.** Either an exclusive dedicated line for IV opioids should be used or else an antisiphon and antireflux device must be employed.

**3.** All pumps must be kept locked when in use on the ward.

**4.** Maintain IV access until 4 hours after discontinuation.

**5.** Record observations as per guideline (see later).

**6.** All personnel who care for patients receiving PCA or NCA analgesia must be trained and competent to do so.

**7.** PCA/NCA pumps must only be programmed by an anaesthetist or member of the Acute Pain Team.

### Areas
Theatres, Riverbank, Ward 1, A&E

**Monitoring** see later

## Drugs

### Morphine
Mode of action: binds to opioid receptors in the brain and spinal cord to produce

Analgesia

Sedation

Respiratory depression

Euphoria

Bradycardia

Pruritis
Miosis
Nausea and vomiting
Inhibition of gut motility

**Naloxone**
MUST always be prescribed and administered if respiratory depression suspected (see later)
4mcg/kg naloxone and repeat as required

## Definitions

**Patient Controlled Analgesia (PCA)**
A method of pain control which allows the PATIENT to press a button to self-administer a pre-programmed amount of IV opioid (the bolus dose) after a set period of time (the lock-out period). The patient may also receive a very small background infusion of the opioid.

**Nurse Controlled Analgesia (NCA)**
A technique by which the nurse may press a button to give the patient a pre-programmed amount of IV opioid (the bolus dose) after a set period of time (the lockout period).
With NCA the patient may be given a larger continuous infusion of the opioid compared with PCA and the pump will be programmed with a longer lockout period
It is essentially an IV infusion with the facility for the nurse to give a bolus of drug

**PCA & NCA**

**Assessment of patient for PCA/NCA**
Anaesthetist to consider:
1. suitability of PCA/NCA for each individual patient
2. the appropriateness of PCA/NCA for the type of surgery undertaken
3. Enteral opioids only to be used in designated areas i.e. WRH: Riverbank Ward, theatre recovery.

**For PCA** the patient must
Be able to press button on handset
Be able to understand the technique
Be 7 years old or older
Be willing to use it
Have parental consent

**For NCA**
Used in younger children and those unable to use PCA
Nurse needs to be trained in the use of NCA and know when to administer a bolus of drug
Parents must be educated NOT to press the button

## Preparation
Information (verbal and written) to child and parents
Explain pain assessment tools

## Setting up Infusion
The PCA/NCA pump must ONLY be programmed by an anaesthetist or member of Acute Pain Team

Use only standard pump programme and drug concentrations at all times

**Standard Concentration**

| Weight | | |
|---|---|---|
| <50kg | 1mg/kg morphine in 50ml N/saline or 5% Glucose | 1ml=20mcg/kg morphine |
| ≥50kg | 50mg morphine in 50ml N/saline or 5% Glucose | 1ml=1mg morphine |

**PCA < 50kg**

1mg/kg morphine in 50ml N/saline or 5% Glucose
1ml=20microg/kg

| | Initial | Range |
|---|---|---|
| Background infusion rate | 0.2ml/hr* | 0-0.2ml/hr* |
| Bolus dose | 1ml | 0.5-1ml |
| Lockout period | 5 mins | 5-15 mins |
| Max 4 hrly dose | 400mcg/kg | |

* Review background infusion after 24 hrs? Stop

**PCA > 50kg**

50mg morphine in 50ml N/saline or 5% dextrose

| | Initial | Range |
|---|---|---|
| Background infusion rate | Nil | Nil |
| Bolus dose | 1ml | Discuss with Acute Pain Team |
| Lockout period | 5 mins | Discuss with Acute Pain Team |

**NCA**

1mg/kg morphine in 50ml N/saline or 5% dextrose
1 ml=20microg/kg

| | Initial | Range |
|---|---|---|
| Background infusion rate | 0.5 ml/hr | 0-0.5ml/hr |
| Bolus dose | 1ml | 0.5-1ml |
| Lockout period | 30mins | |
| Max 1 hrly dose | 2.5 ml | |
| Max 4 hrly dose | 10ml | |

## Equipment

- 50ml Luer lock syringe
- PCA/NCA pump
- Dedicated line or y-connector with anti-syphon and antireflux connections

## Ward requirements

- Staffing
- Equipment

Resus facilities

## Charts and observations

Prescription Chart to include naloxone

Pain Observation Chart to include hourly recording of
SpO2 (constant monitoring required)
Respiratory rate
Sedation score
Pain score
Nausea score
Total dose since reset
Number presses
Vol left in syringe

4-hourly recording of
pruritus
Urinary retention
Inspection of IV site

## Monitoring

Monitoring should be as that charted (see above). All children receiving opioids should have **constant** monitoring of SaO2, with appropriate alarm settings. However, there can be significant respiratory depression despite adequate SaO2 readings. If there are ANY concerns regarding respiratory rate or sedation, the child MUST be nursed in an HDU bed.

## Drug Administration

Initial: -

Anaesthetist may consider initial loading dose of morphine 50-100 mcg/kg

On-going administration

**1.** All patients to be reviewed by Acute Pain Team/On call anaesthetic registrar at least once daily.

**2.** Background infusions usually reduced before NCA stopped.

**3.** Only a member of the Acute Pain Team or anaesthetist may adjust pump programming if the patient is in pain or has significant side effects.

**4.** IV morphine syringes and administration sets must be changed every 24 hours.

## General Care of Patient

Core care plan to be followed.

Paracetamol and NSAID to be given regularly where possible (consider rectal route where possible and consent/parental consent obtained).

Record observations hourly on observation chart and for 4 hours after discontinuation

Keep IV access for at least 4 hours after discontinuation.

## Management of side effects

i.e. Pain
Sedation
Respiratory Depression
Pruritis
Constipation
Nausea and Vomiting

**Pain**

| | | | |
|---|---|---|---|
| NB Pain score | 0 | = | no pain |
| | 1-3 | = | mild pain |
| | 4-7 | = | moderate pain |
| | 8-10 | = | severe pain |

Aim for a pain score of 3 or less
Type and location of pain should be ascertained whenever possible

If patient is in pain i.e. pain score >3:

Check pump switched on and running.

Check infusion site - ensure IVI has not tissued.

For PCA:

Encourage patient to self-administer bolus and evaluate effectiveness after 10-15 mins.

For NCA :

Administer bolus (see NCA note) and evaluate effectiveness after 10-15mins.

Ensure simple analgesics prescribed and administered where possible e.g. paracetamol, NSAID.

If pain seems anxiety-related involve parents, play therapists etc to try to distract and reassure.

If pain scores greater than 3 for more than one hour please call acute pain team/anaesthetist.

Always consider possible complications as cause of pain and call surgeons if concerned.

Consider co-analgesics e.g. antispasmodics.

**Sedation**

Sedation is a common side-effect of morphine.

However, the patient should ALWAYS be rousable.

Increasing sedation may be an early sign of respiratory depression.

Level of sedation must be observed and recorded on the observations chart and appropriate action taken accordingly.

Sedation score must be recorded hourly while PCA/NCA in progress and for 4 hours after discontinuation. Sedation score should also be recorded hourly for 4 hours after oral morphine.

| | | |
|---|---|---|
| Sedation scores | 0. | awake |
| | 1. | drowsy, wakes when approached |
| | 2. | sleeping/needs to be roused |

3. difficult to rouse/unrousable

If sedation score 2 or 3 stop the infusion
Contact Acute Pain Team or anaesthetist
Infusion can be recommenced once reviewed by APT/anaesthetist AND sedation level 1.
Record this in the notes.

If sedation score repeatedly 2 or 3, patient must be reviewed by APT and nursed in HDU environment with continuous SaO2 monitoring.

**Respiratory Depression**
Respiratory rate must be recorded hourly while PCA/NCA in progress, for 4 hours after discontinuation and also for 4 hours after each dose of oral morphine.

Respiratory rate must be recorded more frequently if patient is excessively sedated or condition deteriorates.

The minimum acceptable respiratory rate must be stated on the observation chart by the prescribing anaesthetist this is for guidance only. Staff must be alert to the possibility of respiratory depression if shallow respirations, poor respiratory effort, excessive sedation level.

If in doubt, treat as 'respiratory depression' - see below.

**Normal Respiratory Rate by age at rest**

| Age (years) | Respiratory Rate (breaths/min) |
|---|---|
| <1 | 30-40 |
| 1-2 | 25-35 |
| 2-5 | 25-30 |
| 5-12 | 20-25 |
| >12 | 15-20 |

**Treatment of respiratory depression**
Stop infusion
Give oxygen via facemask
Naloxone 4mcg/kg IV stat (to be prescribed at initiation of PCA/NCA by prescribing anaesthetist) Repeat if necessary
If no IV access, can be given IM/SC
Dose may need repeating as short half-life (30 mins)
Contact APT/anaesthetist IMMEDIATELY
Document in notes

**Treatment of respiratory arrest**
Stop infusion
Call for help
BLS
2222

Naloxone
Contact APT once patient's condition stable.

**Pruritus**
Consider other causes e.g. jaundice, contact dermatitis.
Consider:

| | |
|---|---|
| Chlorphenamine | Age 2-6 years 1mg 4-6 hrly.<br>Max 6mg/day<br>Age 6-12 years 2mg 4-6 hrly<br>Max 12 mg/day<br>Age 12-16 years 4mg 4-6 hrly<br>Max 24mg/day |
| Naloxone | 0.5microg/kg |

**Constipation**
Ensure patient is well hydrated.
Treat early with lactulose 0.5ml/kg bd.

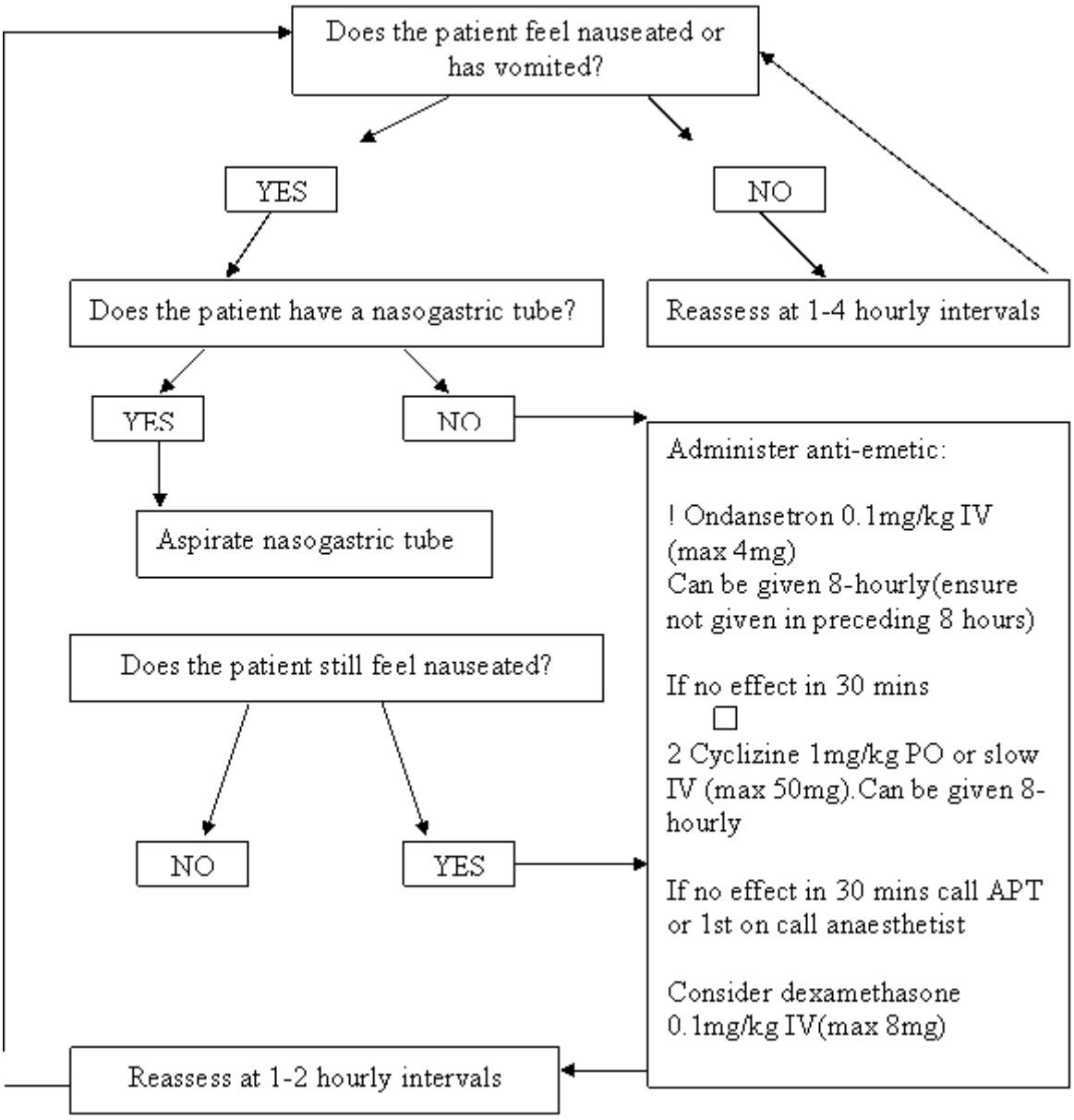
**Nausea and vomiting**
Observe for nausea and vomiting at least 4 hourly. If symptomatic, increase to hourly obs.
Document on chart.

**Post-Operative Nausea and Vomiting**
**PONV**

| Causes | Consequences |
|---|---|
| Opioids | patient distress |
| Anaesthetic agents | dehydration |
| Type surgery | electrolyte imbalance |
| Extended preop fast | delayed discharge |

Treat the cause where possible e.g. pain, movement, dehydration, opioids, forced oral intake, full stomach

Treat pain, avoiding opioids wherever possible, reduce patient movement, optimize surrounding environment i.e. quiet calm atmosphere with minimal surrounding activity, aspirate NG tube, consider IV fluids if dehydrated.




## Intranasal Diamorphine

### Indications
Initiation of analgesia in A&E. Particularly useful for pain caused by burns, fractures

### Contraindications
Child < 10kg
Concomitant use of other opioid or midazolam

### Designated Areas of Use
A and E

### Dose and preparation

**1.** Weigh child.

**2.** Prescribe diamorphine via intranasal route.

Dose=100mcg/kg

**3.** Add the volume of saline below to a **5mg** vial of diamorphine.

**4.** Use **0.2ml** intranasally. (Use a 1ml syringe) Gently tilt back the child's head. Place a few drops at a time into each nostril until all 0.2 ml given. Ask the child to sniff.

**5.** Monitor: vital signs (SaO2, resp rate, sedation score, HR) every 5 mins for one hour.

**6.** NB: Ensure naloxone prescribed.

| Weight (kg) | vol saline (ml)* | dose (mg) ** |
|---|---|---|
| 15 | 0.65 | 1.54 |
| 20 | 0.5 | 2.0 |
| 25 | 0.4 | 2.5 |
| 30 | 0.35 | 2.96 |
| 35 | 0.3 | 3.33 |
| 40 | 0.25 | 4.0 |

**NB:**
* Vol saline=volume of saline added to 5mg ampoule of diamorphine.

**dose=resultant dose in mg of diamorphine in 0.2ml.

### Codeine

- Codeine should only be used to relieve acute moderate pain in children older than 12 years and only if it cannot be relieved by other painkillers such as paracetamol or ibuprofen
- Codeine is contraindicated in all children (ie, younger than 18 years) who undergo tonsillectomy or adenoidectomy (or both) for obstructive sleep apnoea
- Codeine is not recommended for use in children, whose breathing might be compromised, including those with: neuromuscular disorders; severe cardiac or respiratory conditions; upper respiratory or lung infections; multiple trauma; or extensive surgical procedures.
- In children age 12–18 years, the maximum daily dose should not exceed 240 mg. This may be taken in divided doses, up to four times a day at intervals of no less than 6 hours. It should be used at the lowest effective dose for the shortest period. Duration of treatment should be limited to 3 days and if no effective pain relief is achieved, treatment should be reviewed by a physician
- Information should be given to parents and caregivers on how to recognise the signs of morphine toxicity, and advice should be given to stop giving the child codeine and to seek medical attention immediately if their child is showing these signs or symptoms
- Symptoms of codeine toxicity include: reduced levels of consciousness; lack of appetite; somnolence; constipation; respiratory depression; 'pin-point' pupils; or nausea and vomiting
- Codeine is contraindicated in all patients of any age known to be CYP2D6 ultra-rapid metabolisers

### Inhalational

**Entonox** - a 50:50 mixture of oxygen and nitrous oxide.

**Uses**
May be used for the short term relief of pain in children aged 4 and over.eg venepuncture, suture of lacerations, change of dressings, removal of drains.

**Administration**
Entonox is delivered by specific on-demand equipment.

It is self-administered by the patient.

Inhalation should commence just prior to the noxious stimulating event.

Supervision essential throughout by trained member of staff.

**Contraindications**
Altered conscious level

Risk of pneumothorax

Intraabdominal obstruction

## Monitoring and Compliance

This section should identify how the Trusts plan to monitor compliance with and the effectiveness of this Treatment pathway. It should include auditable standards and/or key performance indicators (KPIs) and details on the methods for monitoring compliance.

| WHAT? | HOW? | WHO? | WHERE? | WHEN? |
|---|---|---|---|---|
| *These are the 'key' parts of the process that we are relying on to manage risk.* | *What are we going to do to make sure the key parts of the process we have identified are being followed?* | *Who is responsible for the check?* | *Who will receive the monitoring results?* | *Set achievable frequencies.* |
| | Central Records maintained on staff trained and competency assessments completed | Professional Development | | |
| No patient will be without fluid input (enteral or parenteral) for more than 10 hours | Care and comfort rounds | Nursing staff | Nurse manager | Daily |
| Essential regular medicines will not be omitted pre-operatively from surgical patients (unless there is a clinical reason to do so) | Audit | Pharmacy | Medicines Optimisation Committee | Annual |
| | Review of Medical Records | Critically ill child group/Paediatric Governance Committee | | |
| | Prospective Audit of case notes | Paediatric Clinical Governance Group | | |
| | By regular observations by ward nursing staff and samples of patient's by the acute pain team. All epidurals and PCA's should be monitored | The acute pain service | | |
| | Prospective notes audit via proforma in children's clinic | Children's clinic nursing staff, all exceptions to be included | | |
| | | Clinical Audit as directed by the Pharmacy Department and the NPSA | | |

## References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## Contribution List

### Key individuals involved in developing the document

| Name | Designation |
|---|---|
| Dr Tim Smith | Consultant Anaesthetist AH |
| Dr Michael McCabe | Consultant Anaesthetist WRH |

### Circulated to the following individuals/staff groups for comments

| Name | Designation |
|---|---|
| Acute Pain team | |
| Jo Marriot | Consultant anaesthetist |
| Dana Picken | Matron Paediatrics |
| Keith Hinton | Pharmacist |
| Sarah Scott | Pharmacist |

### Circulated to the following CD's/Heads of dept for comments from their directorates / departments

| Name | Directorate / Department |
|---|---|
| Dr A. Hudson | Paediatrics |

### Circulated to the chair of the following committee's / groups for comments

| Name | Committee / group |
|---|---|
| Alison Smith | Medicines Safety Committee |
| Dr S. Lindsay | Anaesthetic Clinical Governance Group |