

## Joint Trust Guideline for the Management of Pain in Neonates, Infants, Children and Adolescents (Paediatric Patients)

### A Clinical Guideline

<b>For Use in:</b>	NNUH
<b>By:</b>	All clinical staff
<b>For:</b>	All children from birth to their 18 <sup>th</sup> birthday
<b>Key words:</b>	Acute Paediatric Pain, Paediatric Pain formulary
<b>Name and job title of document author:</b>	Dr Jasmine Kaur - Consultant Anaesthetist and College Tutor
<b>Name of document author's Line Manager:</b>	Michael Irvine
<b>Job title of author's Line Manager:</b>	Consultant Anaesthetist NNUH
<b>Supported by:</b>	Dr. Jonathan Payne Consultant Anaesthetist NNUH Dr. Kathy Wilkinson Consultant Anaesthetist NNUH Dr E Bentsi-Enchill Locum Consultant Paediatrician JPUH
<b>Assessed and approved by the:</b>	Clinical Guidelines Assessment Panel (CGAP)  Approved by committee Chair's Action <input checked="" type="checkbox"/>
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This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

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## Version and Document Control:

Version Number	Date of Update	Change Description	Author
3.2	20/10/2020	Document reviewed, no clinical changes	Dr Ajay Arora
3.3	26/05/2021	Two updated web links: Oral sucrose (NHS Scotland guideline as agreed with Dr Kaur) and intra nasal fentanyl	Dr Jasmine Kaur

## This is a Controlled Document

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## Objectives

To provide direction to clinical staff involved in the care of young people on the safe and effective management of pain.

To provide information on the management of common side effects of the drugs suggested.

Contact details for further advice are given within this guideline and will be updated as appropriate.

## Rationale

Many young people in hospital experience pain as result of disease, injury or following surgery. In many patients the pain is inadequately controlled. Failure to treat pain may have an adverse effect on the recovery and delay discharge. The exposure to severe or sustained pain during critical periods of development of the nervous system may inform the adult experience of pain.

Inadequate treatment of pain in young people is multi-factorial. Age appropriate assessment of pain with the use of validated assessment tools should be available. Clinical staff should be aware of available pain management strategies including non-pharmacological strategies and appropriate drug doses and regimes for the management of pain in hospital setting. Assessment tools and management of pain should be standardised throughout the trust in areas where young people are cared for.

The provision of discharge medications and clear directions to parents and primary care physicians will support good pain management post discharge.

This guideline has been produce as part of the East of England Children's Services initiative.

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## Broad recommendations

- The plan for managing a child's pain should be individual to the child and their family. Where possible it should be prepared in collaboration with them.
- The ability to control pain should not be overstated to the child or the parent as complete pain relief may not be achievable.
- Where it is anticipated that a patient will be in pain, all reasonable care should be taken to prevent the pain developing.
- When pain has developed the aim should be to produce a rapid onset of analgesia and medication regimes should be designed to prevent the return of pain.
- All pharmacological regimes suggested should take account of up to date available information.

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## Assessment of pain

- Regular and accurate assessment of pain is central to effective pain management.
- The assessment tools used differ depending on the age and maturity of the child.

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- The tools use different ranges which need to be converted to the NNUH pain score prior to documentation.
- Pain should be assessed by appropriately trained nurses.
- Pain should be assessed on admission and repeated at regular intervals appropriate to the child's condition and not less than twice a day.
- Pain should be assessed at rest and movement. Children's self-report of their pain is the preferred approach.
- Where the patient has special needs and communication may be compromised specialist tools for assessment of pain may be needed to direct effective pain management.

### **NPASS: Neonatal Pain, Agitation and Sedation Scale**

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Assessment Criteria	Sedation		Sedation/Pain	Pain/Agitation	
	-2	-1	0	1	2
Crying Irritability	No cry with painful stimuli	Moans or cries minimally with painful stimuli	No sedation/ No pain signs	Irritable or crying at intervals Consolable	High-pitched or silent continuous cry Inconsolable
Behaviour state	No arousal to any stimuli No spontaneous movement	Arouses minimally to stimuli Little spontaneous movement	No sedation/ No pain sign	Restless, Squirming Awakens frequently	Arching, kicking Constantly awake or arouses minimally / no movement (not sedated)
Facial expression	Mouth is lax No expression	Minimal expression with stimuli	No sedation/ No pain sign	Any pain expression intermittent	Any pain expression continual
Extremities tone	No grasp reflex Flaccid tone	Weak grasp reflex Reduced muscle tone	No sedation/ No pain sign	Intermittent clenched toes, fists or finger splay Body is not tense	Continual clenched toes. Fists or finger splay Body is tense
Vital signs HR, RR BP, SaO <sub>2</sub>	No variability with stimuli Hypoventilation or apnoea	<10% variability from baseline with stimuli	No sedation/ No pain sign	10-20% variability SaO <sub>2</sub> 76-85% with stimulation - quick recovery	>20% variability SaO <sub>2</sub> <75% with stimulation – slow recovery Out of sync with ventilation

### FLACC - Suggested age group 2months to 7 years

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## Face, Legs, Arms, Cry, Consolability (FLACC)

Observer rated pain assessment tool suitable for age 0 – 16 years

Category	Scoring		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten

0 = No Pain (0)

1-3 = Mild Pain (1)

4-7 = Moderate Pain (2)

8-10 = Severe Pain (3)

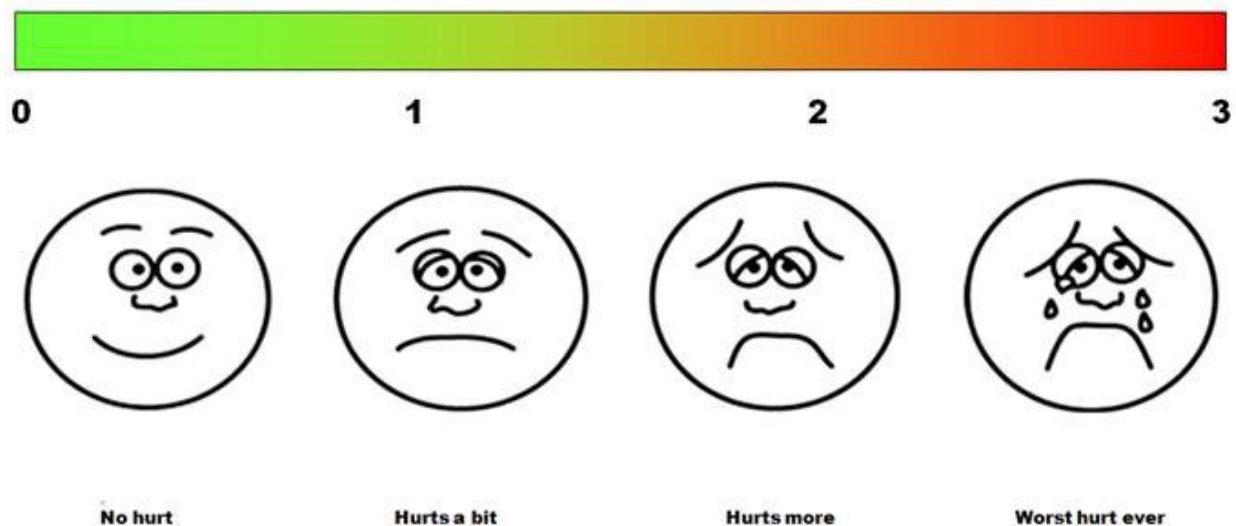
Each of the five categories is scored from 0-2 which results in a total score between 0 and 10 (Merkel et al, 1997)

Self reporting tools suitable for children aged 3 year and above.

**Modified Wong and Baker - Suggested age group 3 to 7 years**

**Numerical Rating Scale (or VAS) – In children over 7 years of age**

Self-report tools suitable for 4 – 16 years



Available on Trustdocs – click here [Pain Assessment Tool for ages 0-16 Trustdocs ID: 14450](#)

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The scoring must be converted to the NNUH score for documentation and determining the appropriate intervention.

NNUH score	Pain	NPASS score	FLACC score
0	None	0	0
1	Mild	1 – 3	1 – 3
2	Moderate	4 – 6	4 – 7
3	Severe	7 – 10	8 – 10

## Principles of pain management in the 'acute' setting.

- Attempts should be made to anticipate and prevent pain rather than to relieve it when it is established.
- The effective and safe relief of pain in young people is based on the principle of multimodal or balanced analgesia.
  - The patient should be cared for in a quiet, calm and child orientated environment.
  - Age appropriate distraction strategies should be employed. Play specialists can advise and support this.
  - In the case of the patient having previous experience of pain, acknowledgement of rituals and previous successful strategies should be acknowledged and incorporated.
  - Clear explanations and reassurance should be given to both parents and child. Where possible this should be supported by information leaflets. Further information can be found on the Jenny Lind web site.

## Analgesic strategies

### Local anaesthetics

- Local anaesthetics are also useful for providing surface analgesia. Ametop is licensed for use in neonates. EMLA can be used in children over 1 year of age.
- Lidocaine impregnated plasters are available ('Versatis') but not on hospital formulary. These can only be prescribed on the direct advice of a Pain Specialist.
- Local anaesthetic techniques should be used whenever possible. It allows site-specific analgesia and reduces the need for systemic analgesics. These may be single shot techniques such as caudal analgesia and peripheral nerve blocks or local anaesthetic infusion techniques.

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- Where specialist techniques, such as epidural infusions, are employed please refer to appendix for further guidance on nursing care and monitoring requirements. Changes to regime should be authorised by Acute Pain team (Bleep –\*\*\*\*\*or Ext \*\*\*\*\*) or senior anaesthetist.
- Awareness of safe dose limits when using local anaesthetic strategies is advised.

### Local Anaesthetics -

#### **Maximum recommended doses for use in children over 1 month of age (single dose)**

Agent	Maximum recommended doses	Maximum recommended doses with vasoconstrictor
Lidocaine ( Lignocaine)	3 mg/kg	6 mg/kg
Prilocaine	6 mg/kg	8 mg/kg
Bupivacaine	2 mg/kg	2 mg/kg
Levobupivacaine	2.5 mg/kg (insufficient data)	
Ropivacaine	3 mg /kg (insufficient data)	
Cocaine	3 mg/kg	

### Procedural pain

- Consider sucrose in neonates (see appendix 5).
- Nitrous oxide may be appropriate for short duration procedures such as dressing changes (see appendix 4).
- Fentanyl lozenges and lollipops may be used in appropriate patients on advice of Specialist in Pain Medicine.

### Analgesic regime

- A stepwise approach is useful. Start with simple analgesics, which have the fewest side effects and add additional drugs as appropriate.
- Choice of medication should be directed by the pain score and expectation and experience of the clinical situation.
- The route of administration and drug choice should take into account requirement for speed of onset of pain relief, co morbidity, patient preference and the availability of skilled staff to monitor the patient.
- Using more than one drug reduces the consequence of inter-individual variability in drug pharmacodynamics.

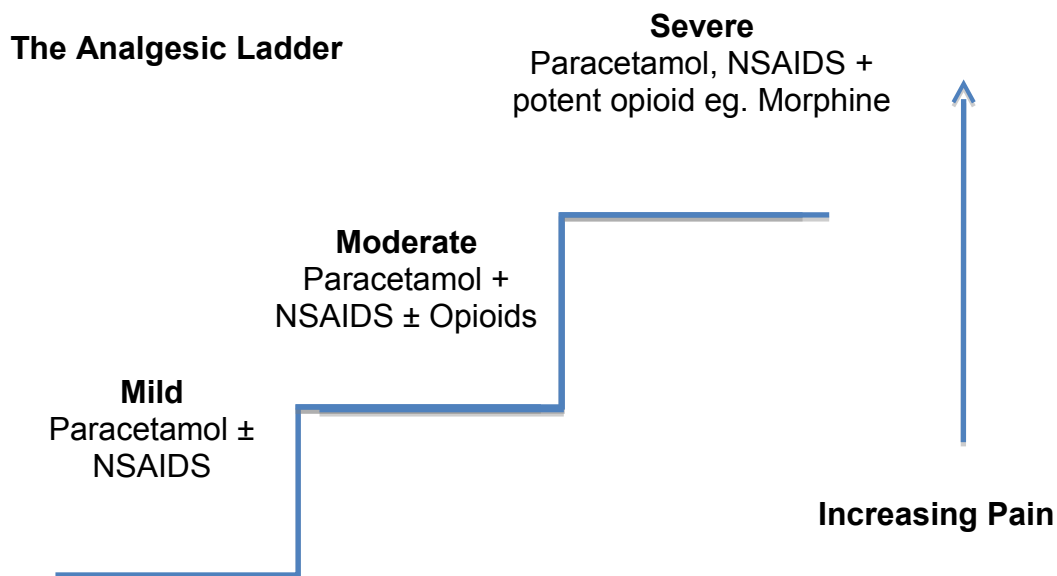
*Note that codeine is a pro drug and therefore there is a wide variation in response to this drug. The metabolism of the drug may be related to racial origin. Patients with far eastern heritage are unlikely to convert the drug into the active form, whereas patients of Middle Eastern and African/Ethiopian are more likely to be ultra-fast*



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*metabolisers and produce increased levels of morphine. MHRA have restricted use in children due to reports of toxicity. Codeine should only be used to relieve acute moderate pain in children older than 12 years. It is contraindicated in all children (<18yr) undergoing removal of tonsils and/or adenoids for the treatment of obstructive sleep apnoea and in any patient known to be an ultra-rapid metaboliser of codeine. Codeine is also not recommended for use in children whose breathing may be compromised. We have substituted its use with low dose oral morphine (100 – 150mcg/kg)*

- Due to immaturity of organ systems, drug doses and frequency of administration, is different in neonates.
- Where pain is potentially as a result of direct nerve damage (neuropathic pain), anti- neuropathic agents should be prescribed in conjunction with base line analgesics. Prescription of this category of drugs may reduce the need for high doses of strong analgesics, with a consequent reduction in side effects. Addition of these drugs to an established opioid regime may lead to a short term risk of respiratory depression.



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### Formulary for children > 1 month old corrected gestational age.

Analgesics	Route	Dose	Maximum	Frequency
Paracetamol	Oral NGT PEG	20-30mg/kg loading dose, then 15-20mg/kg	75mg/kg/24 h to a max of 4g/24 h	4 - 6 hourly
Paracetamol	Rectal	30mg/kg loading dose 15-20mg/kg maintenance	75mg/kg/24 h to a max of 4g/24 h	4 - 6 hourly
Paracetamol  *post-op pain, consultant only, Max 60mg/kg/24h For 2 days max.	IV <10 kg  10-50 kg  >50 kg	7.5 - 10 mg/kg *(15mg/kg) 15 mg/kg  1 g	40 mg/kg/24 h  60 mg/kg/24h  4 g/24h	4 - 6 hourly  4 – 6 hourly  4 – 6 hourly
Ibuprofen (age > 3 month)	Oral	5 – 10 mg/kg	30 mg/kg/24h not to exceed 400mg/dose	8 hourly
Diclofenac (age > 6 months)	Oral and Rectal	1 mg/kg	3 mg/kg/24 h not to exceed 150mg/24 h	8 hourly
Morphine sulphate (Oramorph)	Oral 6 months – 1 yr  > 1yr	0.1-0.2 mg/kg  0.1 – 0.4 mg/kg	0.4 mg/kg	4 hourly / as required
Morphine sulphate	SC	0.15 mg/kg		4 hourly / as required
Morphine sulphate	IV loading dose IV or SC infusion	0.05 – 0.1 mg/kg loading 10 – 40 mcg/kg/h		Titrated to response over at least 5 min. Can repeat iv dose
Diamorphine Child > 10 kg	Intranasal	0.1 mg/kg		Usually one dose <i>See protocol appendix</i>
Codeine MHRA restricted use: in <12yr, contraindicated all children with OSA &/or rapid metabolisers	Oral (age 12-18yr)  ( should NOT be given IV )	1mg/kg	Max dose 60mg Max 240mg/day	6 hourly <i>For no longer than 3 days</i>

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Analgesics	Route	Dose	Maximum	Frequency
Buprenorphine patches	Transdermal <i>Use where oral route compromised</i>	Depending on previous opioid use		Weekly Seek pain team advice
Clonidine	Oral or IV Caudal	1-2 mcg/kg 1-2 mcg/kg + local anaesthetic		6-8 hourly
Ketamine	Oral Intravenous Caudal	0.5-1 mg/kg 0.1 mg/kg 0.25-1mg/kg + local anaesthetic		6 hourly 6 hourly use preservative free preparation for epidural route
<i>Gabapentin</i>	<i>oral</i>	<i>10 mg/kg</i>		<i>8 hourly Seek advice of Specialist in Pain Medicine</i>
<i>Sodium valproate</i>	<i>oral</i>			<i>BD Seek advice of Specialist in Pain Medicine</i>
<i>Amitriptyline</i>	<i>oral</i>	<i>1 mg/5 kg</i>	<i>Max 10 mg</i>	<i>At night. Seek advice of Specialist in Pain Medicine</i>
Antiemetics				
Ondansetron	IV or oral	0.1 mg/kg	4 mg	8 hourly
Cyclizine	Slow IV or PO	1 mg/kg	50 mg	8 hourly
Dexamethasone	IV	0.15 mg/kg	8 mg	8 hourly
Naloxone				
Respiratory depression	IV	4 mcg/kg		As required
Pruritis / Urinary retention	IV	0.5 mcg/kg		As required

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### Paracetamol doses for children < 1 month old corrected gestational age.

	Route	Dose	Maximum	Frequency
<b>Paracetamol</b>				
28 – 32 weeks old	PO	20mg/kg loading 10-15mg/kg maintenance	30mg/kg daily	8 hourly regularly
	PR	20mg/kg loading 15mg/kg maintenance	30mg/kg daily	12 hourly regularly
32 - 40 weeks old	PO	20mg/kg loading 15mg/kg maintenance	60mg/kg daily	6 hourly regularly
	PR	30mg/kg loading 20mg/kg maintenance	60mg/kg daily	8 hourly regularly
40 - 44 weeks old	IV	7.5 mg/kg	25mg/kg daily	8 hourly regularly
	PO	20mg/kg loading 15mg/kg maintenance	60mg/kg daily	6 hourly regularly
	PR	30mg/kg loading 20mg/kg maintenance	60mg/kg daily	8 hourly regularly
	IV	10mg/kg	30mg/kg daily	6 hourly regularly

### Discharge analgesics

- Patients should be discharged home with a supply of analgesics appropriate to the intensity and nature of their pain on discharge.
- Parents/carers should be given clear written instructions on dosage and frequency of analgesic medications. They should also be advised as to the likely duration of requirement for the analgesics supplied so that they are able to plan for repeat prescriptions.
- Parents can be given a copy of the information sheet on discharge medications. This identifies non-drug strategies that may be helpful in relieving discomfort.
- Parents should be encouraged to give analgesia regularly to prevent pain developing.
- If parents have a supply of appropriate drugs at home they should be advised on the use of these drugs. This will empower the family to use the readily available OTC drugs in the future.

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## Clinical audit standards

- 100% Awareness amongst junior staff paediatric department and anaesthetic department.
- 100% usage of pain assessment tools and documentation.
- 100% usage of information leaflets.
- A Patient/parent satisfaction survey will be conducted.

## Consultation process

The authors have drafted the guideline on behalf of the NNUH department of Anaesthesia and Pain Management. During the development of the guideline it has been circulated in draft form for comment to:

All Paediatric Anaesthetists, Paediatricians, Paediatric Surgeons, Paediatric Orthopaedics, A & E, Buxton Ward, CAU, NICU, Paediatric pain group (which includes representatives from the Clinical Psychology department, Buxton ward, Theatre recovery, Paediatric theatres), DPU and Paediatric palliative care.

## References

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## Appendix 1 – Great Ormond Street Hospital for Children NHS Trust Drug administration guidelines.

### Department of Anaesthesia

#### Please read before accessing Drug Administration Guidelines.

#### **Disclaimer**

These guidelines are written for use by the Department of Anaesthesia at Great Ormond Street Hospital for Children NHS Trust (GOSH). Use by any other institution or individual is on the understanding that the guidance contained therein is not intended to replace individual assessment and personalised treatment of the patient. Whilst every effort has been made to ensure accuracy of Drug doses in these guidelines it remains the responsibility of the prescribing Doctor to ensure the correct dose is prescribed and administered.

The authors have based these guidelines on best available evidence at the time of writing.

Any person intending to use the guidelines should assess the suitability of use. GOSH will not accept any responsibility for use by external agencies or individuals.

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