Mersey and West Lancashire Teaching Hospitals NHS Trust

Paediatric and Neonatal Clinical Guideline for the Assessment and Management of Pain in Infants, Children and Young People

Version No: 1

This guideline is for use at Whiston and St Helens Hospitals

Document Summary:
This guideline has been written to provide guidance to staff on how to assess and manage pain in infants, children and young people

Document status	Approved	
Document type	Guideline	**local**
Document number	PD0099	
Approving body	Drug and Therapeutic Committee – 12/03/2024 Paediatric Clinical Governance & Management Meeting – 17/04/2024	
Date approved	17/04/2024	
Date implemented	01/05/2024	
Review date	***3 years from approval date** **30/04/2027**	
Accountable Director	Medical Director	
Policy Author	Consultant Paediatrician, Consultant in Emergency Medicine, Paediatric Pharmacist	
Target audience	Clinical staff	

The intranet version of this document is the only version that is maintained. Any printed copies should therefore be viewed as "uncontrolled", as they may not contain the latest updates and amendments.

Document Control

Section 1 – Document Information		
Title	Paediatric and Neonatal Clinical Guideline for the Assessment and Management of Pain in Infants, Children and Young People	
Directorate	Paediatrics	
Brief Description of amendments		
Reviewed and updated. Section relating to Ketamine in Paediatric ED removed as ED have a guideline for this. ***This document supersedes the Paediatric Clinical Guideline for the Assessment and Management of Pain in Children and Young People – Version 2 (STHK)***		
Does the document follow the Trust agreed format?		Yes
Are all mandatory headings complete?		Yes
Does the document outline clearly the monitoring compliance and performance management?		Yes
Equality Analysis completed?		Yes
Data Protection Impact Analysis completed?		Yes

Section 2 – Consultation Information* *Please remember to consult with all services provided by the Trust, including Community & Primary Care			
Consultation Completed	☐ Trust wide ☐ Local ☑ Specific staff group		
Consultation start date	24/08/2022	**Consultation end date**	17/04/2024

Section 3 – Version Control		
Version	**Date Approved**	**Brief Summary of Changes**
1 (STHK)	18/4/2012	New Guideline
2 (STHK)	20/07/2016	Review and Update
1 (PD)	17/04/2024	Reviewed and updated. Section relating to Ketamine in Paediatric ED removed as ED have a guideline for this.

Section 4 – Approval – *To be completed by Document Control*			
Document Approved	☑ Approved ☐ Approved with minor amendments		
Assurance provided by Author & Chair	☑ Minutes of Meeting ☐ Email with Chairs approval		
Date approved	17/04/2024	**Review date**	30/04/2027

Section 5 – Withdrawal – *To be completed by Document Control*	
Reason for withdrawal	☐ No longer required ☐ Superseded
Assurance provided by Author & Chair	☐ Minutes of Meeting ☐ Email with Chairs approval
Date Withdrawn:	Click here to enter a date.

Contents

1. Scope

The purpose of this document is to inform and educate health care professionals specifically at Whiston and St Helens Hospitals how to effectively assess and manage paediatric pain using appropriate tools, analgesic treatments and non-pharmacological strategies.

2. Introduction

Paediatric pain management has long been recognised as underestimated, undertreated and inadequate (Beyer 1983, 1990, Mather & Mackie 1993, DOH 2003).

The consequences of leaving children in pain unnecessarily have been shown to have considerable side effects, which can be unpleasant and may progress to pain becoming established, severe and difficult to control, which in turn delays recovery (McQuay 1989, Cummings et al 1996, DOH 2003).

A contributing factor to the management of children's pain is that children often find difficulty expressing their pain to those caring for them in a way that is consistently recognised and clearly understood. Pain is also multi-dimensional which in turn makes pain difficult to manage objectively.

Paediatric pain management continues to be widely recognised as a complicated and challenging aspect of nursing.

Children may undergo procedures which potentially could be painful experiences; therefore effective pain management should be planned to avoid any distress. However, children are not miniature versions of adults and should be treated according to their cognitive and physical stages of development with the overall aim to provide a positive experience to help prevent any anxiety in adulthood.

Unrecognised pain can become established, severe and difficult to control.

3. Statement of Intent

The National Service Framework for children, young people and maternity services (DOH 2003) advocates thorough pain assessments as a prerequisite to optimal pain management.

According to the Royal College of Nursing, (RCN), (2009) "acknowledging pain makes pain visible and should be incorporated into routine observations as the fifth vital sign" (cited by RCN-Standards for assessing, measuring and monitoring vital signs in Infants, Children and Young People. (RCN 2013)

Pain is an inherently subjective multifactorial experience and should be treated and assessed as such. (American Academy of Pediatrics 20010) (Vol 108.No.3 pg. 793-797)

4. Definitions

Definition	Meaning
Acute Pain	Commonly associated with surgery or procedures and is considered to be pain which subsides as healing takes place e.g. it has a predictable end and is of brief duration (less than 3 months)
Procedural pain	Pain associated with procedures which for some children may be a frequent and distressing aspect of care. Management aims when undertaking procedural pain should be to minimise physiological discomfort and psychological effects. Multimodal treatment approaches are therefore recommended to meet the child's needs e.g. use of topical analgesic cream,

Definition	Meaning
	equinox, relaxation, distraction and play therapy. Children and parents should also receive appropriate information about what to expect and appropriate preparation about how to minimise distress.
BNFC	British National Formulary for Children

5. Duties, Accountabilities and Responsibilities

5.1 Chief Executive

The Chief Executive has overall responsibility for the strategic and operational management of the Trust including and ensuring that this guideline complies with all legal, statutory and good practice guidance requirements and is implemented effectively and efficiently.

5.2 Medical Director

The Medical Director is the accountable Director for this Guideline.

5.3 Clinical Directors in Paediatrics, Emergency Department, Surgical Care and Anaesthetics

It is the responsibility of the Clinical Directors, to ensure standards in all aspects of pain management are maintained in all healthcare settings where the care of children, young people and babies takes place.

5.4 Directorate Manager for Paediatrics

The Paediatric Directorate Manager is accountable to the Patient Safety Council for assuring compliance with this guideline ensuring that the guideline is reviewed and updated by the specified review dates.

5.5 Matrons, Ward Managers, Lead Nurses in Paediatrics, Emergency Department, Theatres, Surgery and Anaesthetics

Responsible for ensuring that all staff working in their clinical areas are fully aware of their responsibilities within this guideline and any specific pathways that are available.

5.6 Nurses and Medical Staff in Paediatrics, Emergency Department, Theatres, Surgery and Anaesthetics (Inclusive of bank staff)

All nurses and medical staff involved in the care of children and young people have a responsibility to ensure that any new and revised guidelines are referred to during the course of their practice. Staff are aware that clinical guidelines are available on the intranet and in shared paediatric folders T:/PAEDS.

6. The Assessment and Management of Pain in Children and Young People

6.1 Pain History

- Before implementing a pain strategy for children pre-procedure, post-operatively, or as a result of the disease process, it is fundamental to take a pain history from the child and their carers. The pain history allows children and families to document their child's past experience of pain and informs health care professionals how the child acts when in pain and how the child and family would like their pain to be managed.

- A Paediatric Pain History Tool has been used for all children admitted to this Trust for a procedure since 2007(**Appendix 1**). This information follows children to theatre and helps guide other health care professionals across the trust how to manage a children's pain taking into account their previous experiences of pain.

6.2 Pain Assessments

- Regular pain assessments are recommended for children in order to improve their pain management. Pain assessment should therefore incorporate a child centred approach involving the child, their parents and carers, and should utilise age and context appropriate pain measurement tools.

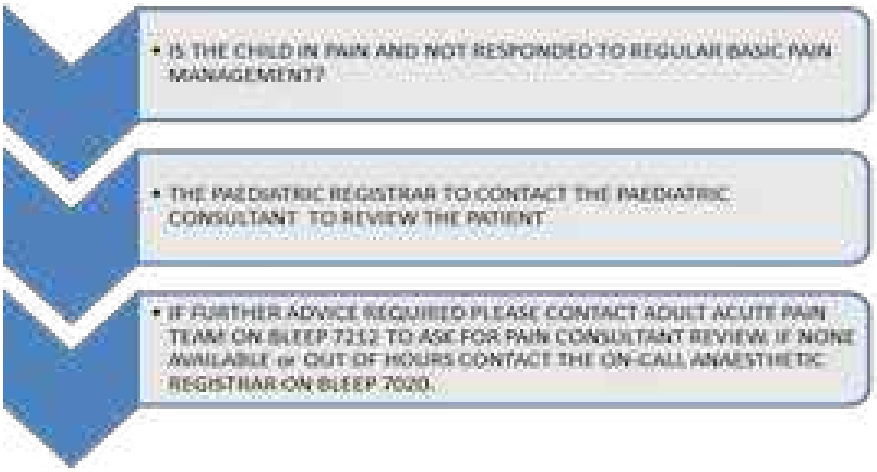
- A variety of pain assessment tools exist, many of which are not validated. As a consequence, the Royal College of Nursing (RCN 2009) undertook a systematic review and appraised the published evidence. The RCN went onto publish a quick reference guide identifying reliable valid pain assessment tools for preverbal infants and children. The Trust's Paediatric Pain Assessment Tool **(Appendix 1)** reflects the RCN recommendations and details different pain assessment tools available for use all of which have been validated. The RCN recommendations continue to be the benchmark guidance for paediatric pain assessment and management.

- When selecting a suitable pain assessment tool the child's age, development and clinical condition should be considered, and the different pain tools should be explained to the child and parents / careers on order to determine the most appropriate tool to use. Once a pain assessment tool has been chosen the tool of choice should be documented on the pain assessment chart in order that all staff are aware of which tool to use. The same tool should then be used throughout the child's hospital stay.

- The key to improving pain management for children is considered to be:
    - Accurate and timely pain assessments.
    - Undertaking a pain assessment as soon as possible after admission to hospital or when the child's condition allows is considered best practice.
    - Pain assessment should then become a routine integral part of every child's care, undertaken alongside routine observations and more frequently if pain is poorly controlled.
    - Pain assessment should therefore be a continuous process from admission through to discharge from hospital with health professionals remaining vigilant for indications of pain.

- The flow diagram below provides a way to refer for advice when needed from the Pain Consultant anaesthetist. It is a consultant to consultant review request.

<u>Referral process to the Acute Pain Team Consultant</u>



- If a paediatric patient is commenced on a PCA please refer patient via CareFlow to the Acute Pain Team

6.2.1 Rationale for Undertaking Pain Assessments

- Pain assessment will:
  - Determine the location, intensity, duration and type of pain.
  - Determine the need for pharmacological and / or non- pharmacological interventions.
  - Help observe for signs of deterioration / surgical complications.
  - Help in the diagnosis of certain conditions.
  - Act as a communication tool within the multidisciplinary team and provide a record of pain assessment and pain interventions.

6.2.2 Recommended Frequency of Pain Assessment

- On admission to hospital
- 4-6 hourly for infants and children taking oral analgesia.
- Frequency of pain assessments should be increased to hourly if the child' pain score equals 4 or above, as per RCEM guidance.
- Post operatively pain should be assessed hourly for the first 4 hours then as above.
- All episodes of pain should be documented
- Pain score should always be documented

- Upon completion of the pain assessment is important to:

PLAN **Is an analgesic / comfort intervention required?**

IMPLEMENT **Administer analgesia or comfort measures appropriate to the pain score.**

EVALUATE **Reassess the pain score after 30 minutes to assess the effectiveness of the analgesia / comfort intervention.**

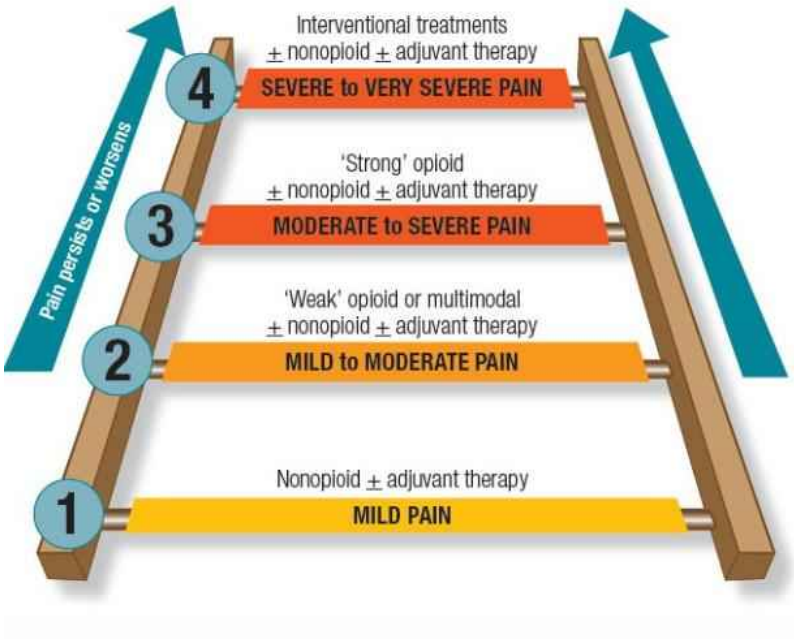
- It is essential that all interventions are clearly documented within the pain documentation.

6.3 Analgesic Ladder

- A stepwise approach to the treatment of pain is considered important. This method is known as the analgesic ladder.

- It is usual to start with simple analgesic methods which have few side effects progressing sequentially to analgesics that may have additional side effects. However, in cases of severe pain strong analgesia may be required initially which can then be stepped down as pain is controlled.

- In order to maximise effect each medication should be given regularly and should be assessed and alternated in accordance with the child's pain score.



6.3.1 Mild pain

Use a combination of oral or rectal paracetamol and/or oral ibuprofen (see section 10.2)

6.3.2 Moderate pain

Use a combination of oral or rectal paracetamol plus ibuprofen and/or oral morphine or codeine phosphate (depending on their age) see Section 10.2.

6.3.3 Severe pain

Consider Entonox as a holding measure then use intranasal fentanyl or diamorphine (section 11.4 & 11.5) or if intravenous access is required, give intravenous morphine (see section 10.6) supplemented by oral analgesia (see section 10.2).

6.4 Pain Leaflet

- A pain leaflet for parents / carers should be given to all parents in order to explain how their child's pain will be managed in hospital.

- The leaflet entitled 'Pain Relief for Children' provides explanations regarding, pain assessment, methods of pain relief, play therapy and distraction. Upon discharge home timings of last doses of analgesia should be documented in order that parents / carers know when they can next administer analgesia. Ward contact numbers are also included and advice to contact the wards should parents / carers have any concerns upon discharge.

7. Good Practice Guidance for Clinical Procedures

Effective preparation along with the use of local anaesthetic, sedation, analgesia and distraction techniques, have been proven to successfully reduce the need for undue immobilisation during clinical procedures.

7.1 Tips for success when undertaking clinical procedures.

- Decisions regarding clinical procedures should always be made with the agreement of parents and carers when possible.
- When planning clinical procedures consider what is in the child's best Interest along with the necessity and urgency of the procedure.
- Clear mechanisms should be available for parents / carers to be heard should they disagree with the clinical decision.
- Children should always be informed about planned treatments or procedures.
- Distraction therapy, play and coping skills should be used along with pain relief to prepare children for procedures.
- Establish if parents / carers wish to be present during the procedure. Clear explanations should be provided as to what the procedure entails and if the parents wish to assist in holding their child. During the procedure provide parental support to ensure that parents / carers remain happy continuing to assist.
- Ensure all necessary equipment is prepared prior to the procedure. Always utilise experienced staff to help facilitate the procedure and do not attempt to undertake a procedure single handed.
- Where possible use alternatives to clinical holding. Should holding be necessary, make use of skilled staff using minimum pressure immobilisation, and aim to manage the procedure as quickly as possible. Provide reassurance for child throughout explaining the need for holding.
- Aim to provide positive encouragement during the procedure, and debrief the child, parents and carers post procedure.
- Should the procedure be unsuccessful, step back, consider who should undertake further attempts. Ensure the child and family remain up to date with the plan of care.

8. Non-Pharmacological Pain Management

Non-pharmacological techniques such as psychological strategies: involving parents, cuddles, child-friendly environment, and explanation with reassurance all help build trust. Also, distraction with toys, blowing bubbles, reading, portable DVD players or story-telling can help to alleviate pain and non-pharmacological adjuncts such as limb immobilisation for fractures and dressings for burns should be used alongside pharmacological interventions.

8.1 Hot and Cold Packs

- Hot and Cold packs are intended to give patients and staff more choice around pain management and can be used alongside pain medications. Hot and cold packs are not intended to replace the need for analgesic medications.
- It is important prior to using hot and cold packs to explain to the patient and their carers how the packs work.

- **HEAT** - Thermotherapy. Increases blood flow to the area, this provides more nutrients and O_2 and gives muscles energy.

- **COLD** – Cryotherapy. Reduces blood flow to the area to help prevent bleeding and swelling.

- Before using the pack always check for evidence of tears or cracks. Do not use a pack unless it is intact.

- ***Preparation of Cold Packs***
  - Ideally two cold packs should be stored in a freezer so there is always one available for use.
  - **Do not apply the cold pack directly to the affected area**. Place the pack in a clean pillowcase before applying to the patient.

- ***Preparation of Hot Packs***
  - Hot packs take up to 60 seconds to heat in a microwave. To heat place on full power for 30 seconds, check the pack and then further heat in 10 second increments up to a total of 60 seconds. Check the pack after each 10 second.
  - **Always** check the heat of the pack before giving it to the patient.
  - **Do not apply the hot pack directly to the affected area**. Place the pack in a clean pillowcase before applying to the patient.

- ***Documentation***
  - Please remember to document that you have used a hot or cold pack when undertaking a pain assessment.

9. Pharmacological Pain Management

Any suspected adverse effects to medicines should be reported to the MHRA via the yellow card system at https://yellowcard.mhra.gov.uk/

9.1 Accessing BNF Children (BNFc) or MEDUSA

FOR DRUG DOSES AND ADMINISTRATION PLEASE REFER TO BNFc AND MEDUSA

- BNFc and MEDUSA can be accessed via the Trust Intranet Home Page. Please see how to reach the relevant resources as the screenshots below.. **The electronic databases are updated regularly and staff should check regularly for any changes. Use electronic databases where possible.**

- BNFc can be accessed by clicking on the logo below.

Then Click on 'drug dosing'
Then click on the British National Formulary 'BNF'

- Medusa is a National, NHS-run database of monographs to support reconstitution and administration of intravenous medicines which can be accessed by clicking on the logo below

- No login needed – automatic entry. If automatic entry is not working, login is:
- Username**: sthkstaff**
- Password**: tiger2**

- When the database opens there are two separate Intravenous sections
    - Intravenous Therapy
    - Paediatric Intravenous Therapy

When looking for a monograph search the Paediatric Intravenous Therapy section first.

If the drug is not listed then search the Intravenous Therapy Section.

9.2 Topical Spray

Topical spray (ethyl chloride) can be used as an alternative to topical analgesic cream for children with allergies, or for those who require topical anaesthetic for emergency procedures.

What is Ethyl Chloride Spray?

- Ethyl Chloride spray is a topical local anaesthetic which works by undercooling (freezing) the skin. Vapours are highly flammable and if inhaled can cause general anaesthesia.

Indications for Use

- Ethyl Chloride is a cold spray. It produces rapid, immediate, profound and surface anaesthesia of the skin which lasts for up to 10 seconds.
- Children should be made aware that the spray is noisy and feels very cold.

Preparation of the Child

- Children should be warned prior to application that the spray will feel very cold on their skin. Making the skin very cold numbs it.
- Be aware that in pre- or non-verbal children e.g. babies and children with complex needs, the application of the spray can be distressing and painful if no prior explanation can be given.

Contraindications

- Do not apply to the head as the intense cold would feel very unpleasant.
- Do not apply near the face as vapours must not be inhaled.

Application

- Clean the site with a suitable antiseptic.
- Wear gloves and spray Ethyl Chloride on the target area continuously for 3-7 seconds from a distance of at least 10-20cm.
- Spray until the skin just begins to turn white; do not frost the skin.
- Insert the cannula or needle within 10 seconds.
- The duration of effect lasts for about 30-45 seconds until the skin re-warms.
- Alternatively, drip contents by holding the can sideways and gently pressing the actuator. This is useful if the clinician wants to identify and secure the vein by maintaining skin traction prior to application of the coolant.
- It is important to have all procedural equipment ready prior to application of the spray, to minimise delay between onset of analgesia and insertion of cannula.
- An experienced practitioner is also beneficial as the duration of action is very short.
- Handy hint: Full cans provide more effective surface anaesthesia than nearly empty ones.

Storage

- Store at a temperature of 10-25C in a dry well-ventilated area.
- Do not refrigerate.
- Protect from sunlight.

Precautions

- Do not breathe vapours. Use in a well-ventilated area. Solvent vapours can cause rapid general anaesthesia if inhaled.
- Highly flammable. Do not allow solution to soak into dressings. Avoid any kind of ignition source. Do not use near heat sources e.g. trephine wires, diathermy.
- Do not allow the solution to pool. This can cause pain from excessive cooling and also increases the risk of ignition.
- Applying for longer than the advised time interval can cause frost bite. If unintentional freezing occurs, flood or soak with tepid water. Do not use hot water. Seek medical advice.
- Do not spray on open wounds.
- Avoid contact with eyes.
- Repeated exposure may cause skin dryness or cracking
- If the first attempt at cannulation fails, then choose a different site for a repeat application to avoid frost bite.

Possible Side Effects

- Allergic skin reactions
- Frostbite - with excessive spray applications.

- Redness of the skin for some patients with sensitive skin that may last for several hours/days.
- Report any adverse drug reactions which are serious, medically significant or result in harm should be reported to the MHRA via the Yellow Card reporting scheme https://yellowcard.mhra.gov.uk/ (Serious events are fatal, life-threatening, a congenital abnormality, disabling or incapacitating, or resulting in hospitalisation)

Disposal

- Empty aerosols should be disposed of in grey bags. Part used or full aerosols should be returned to Pharmacy for disposal.

Reference: Analgesic - ethyl chloride spray. Ennogen Healthcare Information Leaflets for Users 02/2015.

9.3 Topical Analgesic Cream

The following analgesic creams are currently used across the Children and Young People's Unit.

	Dose	Application instructions
Ametop Gel Tetracaine 4%	**Child 1 month – 18 years** Child 1 month – 5 years contents of up to 1 tube applied at separate sites at a single time. Child 5-18 years contents of up to 5 tubes applied at separate sites at a single time.	Apply contents of tube or appropriate proportion to site of venepuncture or venous cannulation and cover with occlusive dressing **Remove gel and dressing after 30 minutes for venepuncture and after 45 minutes for venous cannulation.** **Note - Ametop MUST be removed in the appropriate time scale. Failure to do so can cause redness and irritation of the skin**
EMLA Cream Used on Paediatric Ward if the child has an allergy to Ametop Lidocaine 2.5%, Prilocaine 2.5%,	Anaesthesia before minor skin procedures including venepuncture. **Neonate and up to 3 months old** Apply up to 1g. Max 1 dose in 24 hours **Child 3 to 12 months** Apply up to 2 g. Max 2 doses in 24 hours, separated by at least 12 hours **Child 1 to 17 years** Apply thick layer Max 2 doses in 24 hours	 Under occlusive dressing 1 hour before procedure. . Apply up to 2 g under occlusive dressing for max 4 hours before procedure. Under occlusive dressing 1 to 5 hours before procedure **Note – shorter time application is recommended for children with atopic dermatitis.**

9.4 Sucrose for Neonates and Infants less than 3 months of age

- The control of pain in neonates and children less than 3 months of age can prove difficult due to problems determining the exact level of pain present. The recognition and management of pain in neonates and babies less than three months of age can be challenging to nurses who are attempting to provide effective pain relief. Research suggests that neonates experience as much pain as older children, which if left untreated can lead to increased sensitivity to stimuli. This along with failure to recognise and treat pain can impact on individuals in later years.

- Sucrose may work by activating endogenous opioid systems within the body. Oral sucrose should therefore be considered as a method of pain relief for infants prior to venepuncture, heel pricks, lumbar puncture or any other procedure when the baby is not receiving opioids.

9.4.1 Indications for Use

Term and preterm babies up to 1 year of age undergoing painful procedures, such as:

- Heel prick blood sampling
- Vaccination
- Venepuncture blood sampling (venous cannulation – sucrose does not reduce pain scores though 'crying time' can be significantly reduced).
- Short distressing procedures, e.g. insertion oro-gastric tube

9.4.2 Contraindications for Use

- Do not use sucrose in newly delivered infants of diabetic mothers.
- Avoid in infants with birth asphyxia, risk of necrotising enterocolitis, cyanotic heart disease, oesophageal atresia, tracheal oesophageal fistula, medically paralysed infants, any baby whereby enteral feeds are contraindicated.
- Abnormal blood sugars are not a contraindication.

9.4.3 Prescribing Sucrose

- Sucrose is licensed as a food supplement. For the purpose of administration it is to be treated as a medicine and **must be prescribed as 24% SUCROSE solution on the medicine Kardex.**

- Sucrose can be prescribed for all babies who fulfil the criteria for administration. Verbal consent should be obtained from parents / carers prior to use.

9.4.4 Administration of Sucrose

- Sucrose is to be given orally.
- Sucrose can be given either directly dripped onto the tongue using an oral syringe or on a pacifier/dummy.
- Sucrose has a peak effect after 2 minutes and has a greater effect when used with a pacifier / dummy. Each dip of a pacifier is estimated to be 0.2ml.
- Administer:
  - 32-36 weeks of age – 1ml max per procedure
  - >37 weeks – max 2ml per procedure

- **Dose**
  - 0.5-1.5ml sucrose 24% is given orally with or without a dummy and should be administered 2 minutes prior to the procedure allowing the sucrose solution to reach peak effect.
  - The dose can be repeated up to 3 times if required.
  - A maximum dose of 10ml in any 24 hour period is suggested.

- **Administration/action**
  - Administration of Sucrose 24% should be documented in patient care record – paper or electronic.
  - Sucrose is only effective when given orally, as its analgesic effects are attained via an orally mediated increase in endogenous opioid. Administration via any other route, e.g. via naso-gastric tube, therefore, is ineffective.
  - Onset of action = 10 seconds
  - Peak action = 2 minutes
  - Duration of action = 5-10 minutes

9.4.5 Storage of Sucrose

- Store at room temperature
- Label each pot / vial for single use only and date and time when opened
- Discard each opened pot / vial after each procedure

9.5 Entonox Guidance

9.5.1 Introduction

- Entonox is an homogenous gas containing a mix of 50% oxygen and 50% nitrous oxide compressed into a cylinder.

Verbal consent must be obtained prior to administering Entonox and documented in the case notes. Consent can be obtained from parent(s), guardians or the patient if 16 years and older

- Entonox is a potent analgesic with properties comparable to that of strong opioids. It can provide short-term pain relief, sedation and reduce anxiety during a wide range of painful procedures such as pin site dressings and removal of drains.

- Nitrous Oxide is an anaesthetic gas; hence misuse of Entonox could potentially result in loss of consciousness.

- **In this trust Entonox may be supplied under the brand name of EQUINOX and this is the name found on the gas cylinders**

- Due to the potential risk Entonox should only be self-administered when used for procedural pain such as:
  - Wound and burn dressing, suturing and removal of sutures.
  - Changing or removing packs and drains
  - Invasive procedures such as catheterisation
  - Acute trauma
  - Physiotherapy procedures, particularly post-operative
  - Also suitable for children and young people undergoing venepuncture and injections that may experience anxiety surrounding these procedures.

- The child must be able to co-operate by demanding and inhaling the gas his or herself. If the patient is unable to do this, alternative analgesia should be given.

- Health Care professionals administering Entonox should be trained in its use and be familiar with the side effects and contra-indications.

- The clinical area used for administration of Entonox should be well ventilated to prevent the accumulation of nitrous oxide.

9.5.2 Entonox Related Side Effects

- Earache
- Dry mouth
- Dizziness
- Over sedation
- Nausea and vomiting.

9.5.3 Contraindications to the use of Entonox

Entonox gas must <u>not</u> be used in any of the following situations:

- Patient refusal.
- Head injury with impaired consciousness.
- Intoxicated/ sedated patients.
- Pneumothorax - artificial, traumatic or spontaneous.
- Intestinal obstruction.
- Severe bullous emphysema and severe chronic obstructive airways disease.
- Air embolism.
- Middle ear occlusion.
- Use during myringoplasty
- Patients who cannot hold mouthpiece and follow simple inhalation instructions,
- Maxilla-facial injuries.
- Decompression sickness.
- Within 48h of an underwater dive.
- Gross abdominal distension.
- Untreated B_{12}/folate deficiency e.g. pernicious anaemia (Entonox causes inactivation of vitamin B12)
- Known sensitivity or allergy to Entonox.
- Following air encephalography.
- Following recent intraocular injection of gas (such as SF6)

9.5.4 Use with caution

- Patients who use Entonox for longer than 24 hours or more frequently than every 4 days must have a full blood count, B12 and folate level checked routinely. Abnormalities in blood picture should be discussed with Consultant Haematologist

- Confirmed or possible early pregnancy

- In patients with poor nutritional status or vegans where B12 deficiency may exist

- Patients with known COPD-the high concentration of oxygen (50%) in Entonox may depress respiration in a small number of patients who have chronic raised CO_2 levels.

- In patients receiving other centrally acting sedative drugs such as opioids, anti-depressants, anti-psychotics and benzodiazepines(risk of pronounced sedation and depression of protecting reflexes)

- In patients receiving methotrexate (potentiates anti-folates effects)

- In patients receiving bleomycin, amiodarone, or nitrofurantoin (or similar antibiotics) due to increased risk of pulmonary toxicity, please use with caution and keep levels as low as possible.

- Smoking should be prohibited when using Entonox

- Oil based preparations should not be used on the hands, face or nasal passages when using Entonox: e.g moisturising products.
- Exposure to Nitrous Oxide depletes the body of vitamin B12 stores and could precipitate neurological complications.

- Staff should be aware that Entonox is a habit forming drug and has been subject to abuse. Although these cases are rare, addiction may result with long-term use and this can lead to myeloneuropathy and sub-acute combined degeneration of the spinal cord.

9.5.5 Entonox administration process

ACTION	RATIONALE
PREPARATION	
1. Ensure Entonox is prescribed. • The prescription should read 50% Nitrous Oxide, 50% Oxygen. (Entonox) • Identify correct patient with hospital number, name, D.O.B and allergy status. • *Baseline observations should be carried out prior to commencing procedure.*	To adhere to Trust policy.
2. Ensure verbal consent has been obtained and documented in the case notes.	• Consent to be obtained from parent(s), guardians or the patient if they are 16 years or older. • Where a patient over 16 years lacks capacity under the Mental Capacity Act to take part in discussions or make decisions regarding medication, there is a duty to consult with the patient's family/guardian(s).
3. The procedure must be carried out in a well-ventilated room to maintain the average occupational exposure level of the healthcare professional to less than 100ppm (parts per million) over an 8-hour period.	To prevent the accumulation of nitrous oxide. Departments using Entonox should contact the Trust Health and Safety Lead for advice about workplace Exposure monitoring in accordance with '' The HSE EH40/2005 Workplace exposure limit requirements.
4. Ensure you have the correct cylinder containing Entonox. Check the expiry date and batch number.	Gas cylinders have a shelf life of 2 years.
5. Check the cylinder is at least a quarter full. If less than a quarter full contact Medirest via the Maximo system to replace the cylinder If any of the following technical problems occur, they should be reported to porters immediately: • Equipment not delivering gas. • Leak at joint between regulator and cylinder valve. • demand valve leaks or does not shut cleanly.	To prevent running out of Entonox during the procedure

ACTION	RATIONALE
• Demand valve does not stop delivering gas after test button is released.	
6. Entonox gas breathing system with mouthpiece. Ensure the patient demand valve is clean and in-service date. Attach breathing system to the demand valve on the Entonox gas cylinder.	To prevent infection and to check the demand valve is operating by pressing the blue test button ensure you can hear the gas flowing. Check for leaks by listening closely. Blow a small amount of Entonox through the system to remove debris.
7. Staff who are pregnant or planning to conceive may wish to avoid the area whilst Entonox is administered. *The member of staff in charge of the ward or Department must ensure at the handovers and at the point of Entonox administration that staff in the first trimester of pregnancy, or actively planning to conceive, may wish to avoid the area whilst* Entonox *gas is being administered* for long periods and a risk-assessment should be completed. All trained staff who can administer Entonox will also be made aware of occupational exposure risks at the Entonox training sessions. Staff who administer Entonox have a duty of care to ensure that those in the immediate vicinity, including the child or young person, and family members where appropriate, are aware of this risk and have the opportunity to remove themselves from the immediate area discreetly if they choose to do so.	Exposure to high levels or prolonged exposure in inadequately ventilated environments to nitrous oxide may affect fertility or prove harmful to a foetus.
8. To prepare the patient: a. explain the procedure including how to administer Entonox and possible side effects. b. Reassure that if side effects occur, they will wear off quickly once inhalation stops.	To reduce anxiety and determine level of co-operation.
9. The child should not eat anything for an hour before the procedure and should drink minimal fluids.	To reduce the likelihood of nausea and vomiting.
10. Give supplementary analgesia as prescribed if required one hour before the procedure.	To provide additional pain relief.
11. Allow the child to practice using the Entonox before the procedure starts.	To ensure an effective technique is established.
ADMINISTRATION OF ENTONOX	
1. Explain to the child they should concentrate on breathing slow deep breaths	To establish an effective inhalation technique.
2. If the child has or is suspected to have any infectious disease/illness for example MRSA or pseudomonas or has an immune deficiency, use the disposable system.	To comply with the Trust Infection Control Policy.

ACTION	RATIONALE
3. If the child is using a face mask for administration. they should hold the mask over the mouth and nose, maintaining an airtight seal and breathe normally.	
4. If using a mouthpiece. the child should hold the mouthpiece between their teeth and breathe through the mouth.	
5. Inhalation should start at least 4 breaths before starting the procedure.	To ensure Entonox has taken affect before introduction of painful stimuli.
6. The patient should continue to use the Entonox as required throughout the procedure.	To provide effective analgesia with minimal side effects.
7. Observe the patient throughout the procedure to determine: a. Level of pain b. Any side- effects **c.** Whether Entonox is used effectively	To ensure that adequate pain relief is provided with minimal side-effects.
8. Oxygen saturation should be monitored throughout the procedure if patients have an underlying cardiac or respiratory condition.	To observe for post inhalation hypoxia
9. Monitoring should continue for 30 minutes after discontinuing Entonox to ensure that the side effects have completely worn off.	To maintain patient safety.
10. Entonox is intended only for short term use i.e. for procedural pain management. Entonox must in no circumstances be used continuously for patients.	Prolonged use (above 6 hours) can lead to vitamin B12 deficiency.
SIDE EFFECTS / COMPLICATIONS	
1. If the patient complains of earache, inhalation should be stopped, and alternative analgesia prescribed.	To prevent risk of perforation of the eardrum.
2. A dry mouth is a common side effect but is not usually distressing. The patient should be encouraged to continue inhaling the Entonox.	To provide effective analgesia.
3. If the patient feels dizzy or disorientated, they may cease inhalation until the sensation wears off. The patient may wish to continue to maintain effective pain relief.	To provide effective pain relief with minimal side effects.
4. If the patient complains of nausea, they should be encouraged to cease inhalation if they wish.	The side effect of Entonox wears off quickly once inhalation ceases.
5. Less commonly the patient may vomit: a. Remove the demand valve immediately. b. Reassure the patient and clear any obstruction. c. The patient may then recommence administration if they wish.	To prevent inhalation of vomit. The side effects wear off quickly once inhalation ceases.
COMPLETING THE PROCEDURE	
1. Check the cylinder gauge for contents. If less than quarter full ring Medirest and request the medical gas porter to replace the cylinder. If less than half full ensure a new cylinder has been ordered. Turn off the cylinder.	To ensure there is adequate supply of Entonox for the next patient.
2. Monitoring should continue for 30 minutes after discontinuing Entonox to ensure the effects have worn off.	To maintain patient safety.

ACTION	RATIONALE
3. Patients should not walk unaided until any dizziness or disorientation has subsided. If the child is an outpatient they should be supervised within the ward environment for at least 30 minutes post procedure.	To maintain patient safety.
CLEANING / DISPOSAL OF EQUIPMENT	
1. Depressurise the system.	To maintain a safe environment.
2. Masks and mouthpieces are single use and must be discarded. • The tubing should be cleaned pre and post patient use with Chlor-Clean solution as per Clinical Decontamination policy and if it is visibly contaminated it must be changed immediately. • The system should be depressurised before cleaning by turning the valve to close and depressing the test button. • A bacterial filter protects the tubing from internal contamination and should always be used when administering Entonox to a patient. • Administration devices, masks and mouthpieces are single patient use only. • If a patient is known to be colonized or infected with an alert organism, or has an acute infection then the tubing remains with the patient and must be disposed of after the patient completes their treatment. (See Infection Control Policy)	To minimise the risk of cross infection.
DOCUMENTATION	
1. Complete nursing documentation to state that Entonox was administered, for how long, how effective it was and any side effects experienced by the child.	To provide information for other staff as to the child's experience using Entonox.

9.6 Analgesia

Route can be orally, via IV or rectally, depending on circumstances
See BNFC for age banded dosage for Paracetamol, Non-steroidal anti-inflammatory drugs (Ibuprofen). For opioid analgesia please see table below.

Opioid analgesia – prescribe one drug only. DO NOT give with PCA/NCA or fentanyl epidurals		
Oral morphine	**See Section 10.4 below**	
Codeine	**Not for use in children under 12 years of age** **See section 10.3 below**	>12 years and >30kg 30mg PO/PR every 6 hours[d]
IV Morphine	**See Section 10.6 below**	

a Post menstrual age (PMA) in weeks is the gestational age plus the postnatal age (time elapsed after birth)
b doses based on weight or age may need to be reduced in obese or underweight patients respectively to avoid inadvertent overdose.
c Paracetamol. A higher dose of 20mg/kg oral/rectal paracetamol every 6 hours may be used when pain is not controlled with the standard dose (15mg/kg) where no contraindications exist. This dose should be reviewed every 24 hours. Loading doses are not recommended to minimise the potential for error
d Codeine use at the lowest effective dose for the shortest period. Duration of treatment should be limited to 3 days. Contraindicated in patients under 18 years with obstructive sleep apnoea. See MHRA advice https://www.gov.uk/drug-safety-update/codeine-restricted-use-as-analgesic-in-children-and-adolescents-after-european-safety-review

9.7 Oral codeine

Prescribers should be aware that the use of codeine for analgesia in children and adolescents under 18 years of age was restricted by the regulatory authorities following a European safety review. These local guidelines have been developed to reflect the recommendations of the regulatory authorities (Medicines and Healthcare Products Regulatory Agency - MHRA and European Medicines Agency - EMA), whilst taking account of the specialist needs of certain patient groups, where no suitable alternative treatments are available or appropriate.

- The MHRA, Pharmacovigilance Risk Assessment Committee (PRAC) of the European Medicines Agency (EMA) and the US regulator (FDA) have recommended restrictions on the use of codeine in children, following a review of reports of children in the USA who developed serious adverse effects or died after taking codeine for pain relief (1, 2). The MHRA issued their guidance in the June 2013 Drug Safety Update (3).
- Codeine is converted to morphine in the liver by the CYP2D6 enzyme. There are many genetic variations of CYP2D6 which affect the rate and extent of this conversion and which vary markedly with ethnicity. Most of the cases of serious adverse events or death occurred in children who had evidence of being “ultra-rapid metabolisers” of codeine. This can result in high levels of morphine in the blood and an increased risk of morphine toxicity such as respiratory depression.
- Codeine is now contra-indicated in:
    - ALL children aged 0-18 years old who undergo tonsillectomy or adenoidectomy (or both) for obstructive sleep apnoea
    - ALL patients of any age known to be CYP2D6 ultra-rapid metabolisers
    - 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.
    - Codeine should not be used by breastfeeding mothers because it can pass into breast milk.
- **Morphine is the preferred opioid analgesic for the treatment of moderate to severe pain**
- **Although the MHRA permit the short-term use (maximum 3 days) of codeine to relieve moderate acute pain in children older than 12 years, without the contra-indications described above, it is NOT recommended to use codeine except in the specific exclusions described below.**
- Rectal codeine is not used in this hospital.
- Patients who have been stabilised on long term treatment with codeine for the management of chronic pain conditions can continue to receive the drug on an in-patient and discharge/out-patient basis. There should be an entry in their case notes that they are known to tolerate codeine without adverse effects. Codeine liquid will no longer be available as ward stock and therefore named patient supplies will need to be made available to these patients.
- Where prescribers consider use of codeine may be justified outside these specific exclusions and in line with MHRA recommendations, they should ask about any history of previous treatment with codeine including: efficacy, side effects and family history of adverse events. Children should be over 12 years old. The lowest effective dose of codeine should be used for the shortest time. The starting dose of codeine should not exceed 0.5mg/kg/dose (max 30mg) every 6 hours. If this dose is ineffective treatment should be changed to oral morphine

9.8 Oral Morphine - Guidelines for Prescribing

CAUTION: Consider lean body weight when prescribing for obese patients

9.8.1 Inpatients

- Doses of simple analgesics (paracetamol and/or ibuprofen) should be optimised before considering other therapy.

- **Infants and children older than 12 weeks of age, who require additional analgesia for the management of moderate to severe pain should be given oral morphine**

- **Note**: Morphine oral solution is available in two strengths
  - 2mg/ml (= 10mg/5ml), which should be used to deliver all doses greater than 500 microgram
  - 100 microgram/ml, which should be used to deliver doses of 500 microgram or less.

- All inpatients receiving opioid analgesics (including codeine and morphine) should be closely monitored via the PEWS scoring system. If patients are unusually sleepy, confused or display difficult or noisy breathing they should be reviewed **immediately** by a doctor, as these are signs of toxicity. No further doses of opioid should be administered. Naloxone (see BNFC and section 9.11) may be indicated. Other signs of toxicity include respiratory depression, pin-point pupils, lack of appetite, constipation or nausea and vomiting.

9.8.2 Discharging patients on Oral Morphine

- Consider whether simple analgesics (paracetamol and/or ibuprofen) will provide sufficient pain relief.
- It is unlikely that infants younger than 12 weeks of age will require opioid analgesia on discharge.
- Infants and children older than 12 weeks of age who require additional analgesia should be provided with oral morphine solution up to a maximum of 7 day's supply, usually. There may be special circumstances where longer durations of treatment are indicated (e.g. in oncology, palliative care, chronic patients); GPs can be requested to supply continuing treatment.
- Ensure the correct strength of oral morphine solution is provided (see above).
- A Patient Information Leaflet on oral morphine should be provided to all patients on discharge.

9.8.3 Outpatients

- Consider whether simple analgesics (paracetamol and/or ibuprofen) will provide sufficient pain relief.
- It is unlikely that infants younger than 12 weeks of age will require opioid analgesia as out-patients.
- Infants older than 12 weeks of age who require analgesia for the treatment of moderate to severe pain should be given oral morphine solution.
- Ensure the correct strength of oral morphine solution is provided (see above).
- A Patient Information Leaflet on oral morphine should be provided to all out-patients by the Pharmacy Department.

9.8.4 Oral morphine doses

Age range	Oral morphine dose	Reduced dose**	Dose interval
Oral morphine doses for inpatients			
Birth – 3 months*	50 microgram/kg	30 microgram/kg	6 hourly Neonates – 8 hourly
3-6 months	100 – 150 microgram/kg	70-100 microgram/kg	4-6 hourly Maximum **6 doses** in 24 hours
6-12 months	200 microgram/kg	150 microgram/kg	
From 1 year to 50kg	200-300 microgram/kg	150-200 microgram/kg	
Over 50kg	15mg	10mg	
Oral morphine doses for discharge medication (maximum 7 days' supply)			
3-6 months	50 microgram/kg	30 microgram/kg	4-6 hourly Maximum 6 doses in 24 hours
6-12 months	100 microgram/kg	70 microgram/kg	
From 1 year to 50kg	150-200 microgram/kg	100-150 microgram/kg	
Over 15 years + 50-74 kg	10mg	7.5mg	
0ver 15 years + 75 kg or more	10-15mg (total daily dose = 60 mg)	7.5mg	

* It is unusual for a neonate to receive oral morphine (except in management of neonatal abstinence syndrome) as absorption is erratic and much more reliable pain control is achieved using NCA infusion. Please check with a senior member of staff before proceeding.

** Morphine doses should be reduced in patients whose breathing may be compromised by existing conditions or post-operatively e.g. OSA, following tonsillectomy, adenoidectomy, severe respiratory/cardiac conditions

NB: Patients on long-term morphine may be discharged on their inpatient dose

9.9 Morphine Administration by Intravenous Bolus

FOR DRUG DOSES AND ADMINISTRATION PLEASE REFER TO BNFc AND MEDUSA

9.9.1 Indications

- The treatment of severe pain in children is assessed on a standard pain tool. The majority of these patients will be post-operative.
- Consideration to alternative / additional forms of analgesia should be given according to the WHO analgesic ladder.
- Pain unresponsive to strong analgesia may be an indication for referral to the surgical team, e.g. compartment syndrome in a fractured limb.

9.9.2 Cautions

- The dose prescribed should be suitable for the patient's age, weight, maturity and clinical condition.
- **Prescribing a Morphine Bolus**
  - Ensure that the dose prescribed is appropriate for the weight, age, maturity and clinical condition of the patient. Use BNFC as your reference text but also note below:
    - Until approximately 13 weeks of age the ability to metabolise morphine gradually matures and smaller doses are generally required.
    - It is very important to note that the dose for infants in particular also depends on gestational age, postnatal age and previous exposure to morphine. For example, a full-term neonate might require 50 microgram/kg in the first few days whilst a baby born before 37 weeks gestation would

usually require only 25 microgram/kg. A full-term newborn of 3 kg might receive 50 microgram/kg but a 4-month-old weighing 3 kg having had previous surgery might require 100 microgram/kg for adequate pain relief.
        - The tables attached show doses and volumes which MAY be appropriate for different weights, and all must be checked as appropriate for your patient. If other doses are used, they must be checked very carefully and IF IN DOUBT, contact the original prescriber.
    - The patient should be nursed and monitored in an appropriate environment, by appropriately trained staff. Give consideration to admission to the High Dependency Unit if the patient's needs are complex in terms of analgesia or co morbidity.

9.9.3 Formulation

- Intravenous morphine sulphate is available in ampoules of ten milligrams in one millilitre (10mg/ml)
- It can be diluted in sodium chloride 0.9% or glucose 5% solutions.

9.9.4 Monitoring

- Oxygen should be available at the bedside, with a suitably sized face mask.
- Full resuscitation equipment should be available within the clinical area or ward, and checked in accordance with local policy.
- **Pulse oximetry** should be applied before the bolus is given. Monitoring should remain in place for the next 30 minutes.
- **Heart rate (HR)** record before administration then at 5, 10, 15 and 30 minutes.
- **Respiratory rate (RR)** record before administration then at 5, 10, 15 and 30 minutes.
- **Sedation Score** record before administration then at 5, 10, 15 and 30 minutes.

9.9.5 Intravenous Cannula

- Injections should be given according to local guidance on intravenous administration of drugs and using ANTT (aseptic no touch technique) principles.
- In particular, the intravenous cannula must be flushed before and after the morphine bolus, and the site observed for signs of redness or irritation using the VIP score.

9.9.6 Dosage guidelines

Start with the lowest appropriate dose and titrate to effect whilst patient is being fully monitored.

9.9.7 Morphine bolus injection – dose and volume checker

Please refer to BNFC for dose and Medusa for administration.

9.10 Patient Controlled analgesia

Please refer to Standard Operating Procedure for Patient Controlled Analgesia (PCA) in the paediatric patient aged 8 years and over and weighing ≥ 20kg in acute pain situations Version No: 2. STHK 1188

Any paediatric patient commenced on a PCA should be referred to the Acute Pain Team via CareFlow.

9.11 Naloxone

FOR DRUG DOSES AND ADMINISTRATION PLEASE REFER TO BNFc AND MEDUSA

- The specific antagonist to morphine is naloxone. It **MUST** be prescribed for each patient who is to receive intravenous morphine.
- If a child requires naloxone they **MUST** be reviewed immediately by a doctor.
- Naloxone is a short acting drug, repeated doses or an infusion may be required.

9.12 Intravenous Paracetamol

FOR DRUG DOSES AND ADMINISTRATION PLEASE REFER TO BNFc AND MEDUSA

9.12.1 Preparation

- Intravenous paracetamol is available as an infusion containing paracetamol at a concentration of 10mg in ml. It is licensed for use in all ages from term new-borns to adults.
- It is obtained in 2 different pack sizes:
  - **500mgs in 50mls** (licensed for use in term new-born infants, infants, toddlers and children weighing less than 33kg)
  - **1 gram in 100mls** (licensed for use in adults, adolescents and children weighing more than 33kg)
- Please note that post-op dosing may be different. Ensure the correct dosing has been prescribed based on the clinical nature of the patient.

9.12.2 Dosage guidance

Please refer to BNFC

9.12.3 Indications for Use

- Paracetamol infusion may be used in all groups of patients from term neonates onwards:

  a. As an alternative to oral or rectal paracetamol to treat pain or pyrexia
  b. To supplement other IV analgesia in patients with severe pain
  c. As the sole analgesia for patients where pain is moderate in nature and opioid drugs or NSAIDS need to be avoided.

- The analgesic efficacy of intravenous paracetamol is greater than that of oral or rectal paracetamol.
- Intravenous paracetamol has the same side effects and cautions as for oral and rectal paracetamol.

9.12.4 Cautions

- Impaired liver function
  - Maximum daily dose should be decreased

- Impaired renal function
  - If creatinine clearance is ≤ 30ml/minute the interval between doses should be increased to six hours

9.12.5 Side Effects

- Side effects are rare, but skin rashes and blood disorders including thrombocytopenia, leucopenia and neutropenia are reported. Hypotension is also reported on infusion of paracetamol.

- Metoclopramide can increase the absorption of paracetamol.

- Cholestyramine can reduce the absorption of paracetamol.

- Prolonged regular use of paracetamol may enhance the anticoagulant effect of Warfarin and other coumarins.

- Carbamazepine, Phenytoin and other antiepileptic drugs can increase the metabolism of paracetamol.

9.12.6 Pharmacokinetics

- In adults a therapeutically consistent plasma concentration is achieved within 40 minutes of administration, as opposed to the large unpredictable variation in plasma concentration seen after oral and rectal administration. Neonates and young infants show a lower clearance and longer half-life of the drug

- **Onset of action for pain relief** is between 5-10 minutes with peak analgesic effect after 1hour. Duration of action is 4-6 hours.

- **Onset of action as an antipyretic** is 30 minutes. Duration of action is ≥6 hours.

9.12.7 Efficacy

- There is evidence in both adults and children to show that intravenous paracetamol is as effective as an intravenously administered NSAID in the management of pain. There is also evidence that intravenous paracetamol reduces morphine requirements after surgery, whereas oral or rectally administered Paracetamol has little demonstrable effect.
- Intravenous paracetamol is also effective, as an antipyretic in patients where the enteral route is unavailable.

9.12.8 Administration

Administer over 15 minutes via intravenous infusion via an infusion pump.

- Correctly identify the patient as per hospital policy
- Administration of intravenous paracetamol is a two nurse check procedure and should be administered by a nurse who has undergone intravenous therapy training.
- Firstly, check no other paracetamol preparations are being administered as these must be discontinued.
- Select the appropriate dosage bottle. (500mg in 50ml or 1gram in 100ml)
- Calculate the dosage in millilitres to be administered
- Draw the paracetamol dose from the vial into a syringe.

- Label the syringe with a drug administration label.
- Attach the syringe to an intravenous administration set.
- Calculate the infusion rate for infusion over a 15 minute period and set pump accordingly.
- Flush the line afterwards to ensure the whole dose is received.

10. Emergency Department Protocols

The Royal College of Emergency Medicine (RCEM) set standards for the management of pain in children and young people attending the Paediatric Emergency Department in 2017. The standards are assessed in national Royal College of Emergency Medicine audits as part of Quality improvement.

The standards are graded as below:

Standard	Standard type
1) Pain is assessed within 15 minutes of arrival	Fundamental
2) Patients in severe pain (pain score 7 to 10) should receive appropriate analgesia, according to local guidelines (unless documented reasons not to)	
a. 50% within 20 mins of arrival or triage whichever is the earliest.	Aspirational
b. 75% within 30 mins of arrival or triage whichever is the earliest.	Developmental
c. 100% within 60 mins of arrival or triage whichever is the earliest.	Fundamental
3) Patients with moderate pain (pain score 4 to 6) should be offered or receive analgesia, according to local guidelines (unless documented reasons not to)	
a. 50% within 20 mins of arrival or triage whichever is the earliest.	Aspirational
b. 100% within 60 mins of arrival or triage whichever is the earliest.	Developmental
4) 90% of patients with severe or moderate pain should have documented evidence of re-evaluation and action within 60 minutes of receiving the first dose of analgesic	Developmental
5) If analgesia is not prescribed and the patient has moderate or severe pain the reason should be documented in the notes	Developmental

10.1 Pain assessment

The experience of the triage nurse that is used to gauge the severity of a child's pain, based on their observation and feedback from the parents. Dependent on the child's age the child will be asked to gauge the severity of their pain based on the FACES pain assessment tool:

10.2 Pain Management

Pain will be managed according to the severity of pain using a stepwise approach (section 6.3).

Nonpharmacological techniques such as psychological strategies: involving parents, cuddles, child-friendly environment, and explanation with reassurance all help build trust. Also, distraction with toys, blowing bubbles, reading, portable DVD players or story-telling can help to alleviate pain and non-pharmacological adjuncts such as limb immobilisation for fractures and dressings for burns should be used alongside pharmacological interventions.

10.2.1 Management of pain in special circumstances

10.2.1.1 Nerve blocks

In certain circumstances a regional nerve block may be indicated, for example a facia iliaca compartment block should be performed on children with femoral shaft fractures. (see appendix 2 and 3)

10.2.1.2 Painful procedures

Where a painful procedure is being completed a combination of pain relief may be considered. This should be discussed with a senior doctor in the Emergency Department. Example regimen include:

- Entonox with intra-nasal fentanyl for fracture manipulation
- Entonox with local anaesthetic infiltration or local anaesthetic solution (section 11.3) may be considered.
- It may be considered necessary to formally sedate the child but this would be at the discretion of the Emergency Department Consultant.

10.2.1.3 Local Anaesthetic (LAT) Solution Protocol for wound management

10.2.1.3.1 Indications for Use

- Children 1 year of age and older
- Laceration that is likely to require suturing in the ED
- Consider in wounds requiring exploration, cleaning or debridement
- **Is the wound:**
  - In digit, pinna, nasal alae or penis Y / N
  - Greater than 8 hours old Y / N
  - Bite, crush or flap wound Y / N

- Wound in or near mucosal surface including eye, nose or mouth Y / N
- **Does patient have a history of:**
  - Previous reaction to local anaesthetic Y / N
  - History of cholinesterase deficiency Y / N

If you answer YES to any of the above, DO NOT apply LAT Solution

If you can answer **NO to all of the above questions**, and judge that the wound may need suturing in the ED or that topical anaesthesia may be of benefit in wound inspection or toilet, then apply LAT solution according to the procedure below:

10.2.1.3.2 Procedure

- Complete a LAT Solution Record (**Appendix 4)** and file this document in the Emergency Department notes plus a copy of this record must be kept for audit purposes.
- Always wear gloves when handling topical anaesthetic
- Draw up amount of solution to be used in syringe according to age and wound size:
  - Use 1ml of solution per cm of wound length up to maximum allowed
  - Maximum amount depends on age:
    - Age 1-3 years 2 ml
    - Age greater than 3 years 3 ml
- Apply no more than half of solution to edges of wound by dropping from syringe or using cotton applicator
- Cut swab to appropriate size to cover wound. Soak swab piece with remainder of solution and apply to wound secured firmly with bandage or occlusive dressing
- Instruct parent/guardian to ensure child does not put dressing into mouth or eyes and to inform Minor Injuries staff immediately if dressing becomes loose
- Inform patient/parents of time for removal (*30 minutes after application*) and advise them to contact nursing staff if they have not been seen by this time.
- Complete procedure (use additional Lidocaine 1% if needed)

10.3 Administration of Intra-Nasal Diamorphine in Children Using 5mg Ampoules

FOR DRUG DOSES AND ADMINISTRATION PLEASE REFER TO BNFc AND MEDUSA

10.3.1 Indications

- Intranasal diamorphine is used for the relief of acute, severe pain (pain score 7-10) in children. It may be used as an alternative to intravenous opiates where a rapid response to analgesia is desirable, e.g. forearm fractures, burns. It's time to onset of action is similar to intravenous diamorphine.

10.3.2 Contra-Indications

- Children less than 1 year old
- Children weighing less than 10kg
- Head injury
- Blocked nose / upper respiratory tract infection
- Concomitant use of other opiates or sedatives e.g. midazolam

10.3.3 Dose

- **The dose MUST be administered by a SENIOR doctor and should be given ONCE ONLY.**

10.3.4 Administration

- **The child should be nursed ONLY in paediatric resuscitation or in an area with monitoring and resuscitation facilities readily available.**

1. Weigh the child. NB Round weight down (see table below).
2. Determine the volume of water to be added to 5mg diamorphine powder.
3. Add the water to 5mg diamorphine powder using a 1ml syringe.
4. Draw 0.2ml of this solution into the syringe. (Discard remaining solution as per CD procedures).
5. Remove the mucosal atomisation device (kept in CD cupboard) from the packet and attach firmly to the syringe.
6. Gently tip the child's head back and place the tip of the mucosal atomisation device into the nostril.
7. Gently depress the plunger on the syringe, asking the child to sniff if possible.
8. **Complete intra nasal diamorphine/fentanyl sheet (kept in the paediatric resuscitation area in Paeds ED) See Appendix 5**
9. **Dispose of diamorphine not used immediately**

- **ALL CHILDREN RECEIVE 0.2ml**

- **THE SMALLER THE CHILD, THE GREATER THE VOLUME OF WATER USED TO DISSOLVE 5mg DIAMORPHINE**

WEIGHT (kg)	Volume of sterile water (mls) added to 5mg diamorphine ampoule	Amount of diamorphine to be given in 0.2mls
10	1.00ml	1mg
12	0.85ml	1.18mg
14	0.7ml	1.43mg
16	0.6ml	1.67mg
18	0.55ml	1.82mg
20	0.5ml	2.0mg
25	0.4ml	2.5mg
30	0.35ml	2.86mg

35	0.3ml	3.33mg
40	0.25ml	4.0mg
45	0.2ml	5.0mg

10.3.5 Monitoring

- Monitor respiratory rate, pulse, oxygen saturations using the Emergency Department Analgesia record for intranasal diamorphine **(Appendix 5)**
  - Record the pain score (numerical or smiley faces)
  - The child should be monitored for 20 minutes after administration (or longer if necessary)

10.3.6 Adverse Effects

- Nausea/vomiting (the child should not routinely receive an anti-emetic)
- Drowsiness
- Respiratory depression

10.3.7 Other Considerations

- Supplementary oral analgesia should also be given, e.g. paracetamol and/or ibuprofen

- Don't forget non-pharmacological methods of pain relief, e.g.
  - splint and support fractured limbs
  - apply dressings to wounds, especially burns
  - distraction and play therapy

- Consider the need for future intravenous access and apply topical local anaesthetic as required.

10.4 Intranasal fentanyl in the Paediatric Emergency Department

10.4.1 Indications:

- Acute moderate to severe pain in children over 1 year old who do not have intravenous access.
- Injuries with moderate to severe pain
- Clinically suspected displaced or long limb fractures
- Painful and distressing burns
- Significant finger injuries
- No intravenous access already obtained.

10.4.2 Contraindications

- Child less than 7 kg weight or greater than 70kg (max dose 100micrograms)
- Child less than 1 year of age
- Concomitant use of other opiates or sedatives (midazolam, ketamine)
- Known fentanyl or other opiate hypersensitivity.
- Reduced conscious level secondary to trauma or other medical condition.
- Bilateral blocked nasal passages from URTI or trauma
- Epistaxis
- Clinical evidence of hypovolaemia

10.4.3 Side Effects

- Respiratory depression
- Hypotension
- Nausea and vomiting
- Pruritus
- Nasal irritation

10.4.4 Dose

- For patents aged 1 to 18 years:
  - Use the fentanyl 100microgram/2mL (50 microgram/ml) injection intranasally which is normally intended for intravenous use
  - **First dose: 1.5 microgram/kg dose (max 100 microgram/dose)**
  - **A second dose may be administered 10 minutes after the first in order to provide adequate analgesia: 0.75 – 1.5 microgram/kg.**
  - After a second dose, if further analgesia is required, review and consider alternative modality.
  - The onset time of fentanyl via the intranasal route is approximately the same as if given by the intravenous route.
  - Dose equivalence: 17 microgram intranasal fentanyl ≡ 1 mg intravenous morphine
  - The half-life of fentanyl is approximately 6 minutes. Length of analgesic duration approximately 60 minutes

10.4.5 Preparation

- Weigh the child in kg (or if not possible, use updated APLS formulae to gain an estimate)
- Use the table below to determine dose and volume

10.4.6 Administration Technique

- Explain the procedure to the child and family.
- Use a MAD (mucosal atomisation device) atomiser if available. Attach it to the 1 ml syringe with the drawn up volume of fentanyl as per the dosage table at the end of this guideline.
  - ***If a MAD atomiser is being used, an extra 0.1 ml fentanyl needs to be drawn up to account for the dead space.***
  - ***This does NOT need to be done for the top up dose if the same device is being used.***
- With the child sitting at approximately 45 degrees or with their head to one side, insert the syringe loosely into one of the nostrils.
- If compliant, ask the child to sniff hard whilst quickly depressing the plunger of the syringe.
- If an atomiser is being used, hold it in place for a further 5 seconds after administration to prevent egress out of the nostril
- If the volume is >1ml, split the dose equally between the 2 nostrils.

10.4.7 Monitoring

- Remember that children vary in their response to opiates
- A **PEWS** chart should be completed pre-administration documenting baseline observations (pulse, BP, respiratory rate, oxygen saturations, and AVPU/GCS)
- **Pain score and level of sedation** should also be included with the observations
- Further observations should be taken at **5, 10, 15, 30 and 60 minutes** post administration of the last dose

- Increase observations/monitoring to every 5 minutes and alert a doctor if there is any evidence of over-sedation, respiratory depression or other adverse effects. Then revert to above once observations are normal.

10.4.8 Discharge

- The patient can be discharged home from the PED if:
  - their underlying condition has been treated
  - they have returned to their baseline cognitive state, and
  - their observations have been stable for at least 2 hours after administration of the last dose of intranasal fentanyl.

10.4.9 Treatment of Overdose (including respiratory depression)

- **CALL FOR HELP**
- Oxygen
- Support airway +/- assisted ventilation
- Consider naloxone as a reversal agent for respiratory depression (this is available in "Resus")'
  - 4 – 10 microgram/kg IV as an initial dose. This is due to the negative effects of full reversal of opiate when being used for analgesia.
  - If respiratory improvement is not achieved, a larger dose of 100 microgram/kg (maximum 2 mg) may be administered.

10.4.10 First Dose Intranasal Fentanyl Dosage Chart

Weight of child (kg)	Initial dose (1.5 microgram/kg)	Volume of Initial dose (ml) (50micrograms/mL)	Volume of Initial dose with dead space volume (ml)*
7 – 9.9	10 microgram	0.2 ml	0.3 ml

Weight (Kg)	Dose in microgram (1.5microgram/kg)	Volume (mL)	Final volume (including dead space)
10-11	15	0.3	0.4
12-14	20	0.4	0.5
15-18	25	0.5	0.6
19-21	30	0.6	0.7
22-24	35	0.7	0.8
25-28	40	0.8	0.9
29-32	45	0.9	1.0
33-34	50	1.0	1.1
35-38	55	1.1	1.2
39-41	60	1.2	1.3
42-44	65	1.3	1.4
45-48	70	1.4	1.5
49-51	75	1.5	1.6
52-54	80	1.6	1.7
55-58	85	1.7	1.8
59-61	90	1.8	1.9
62-64	95	1.9	2
65-69	100	2	2.1

NB doses have been rounded to 0.05ml

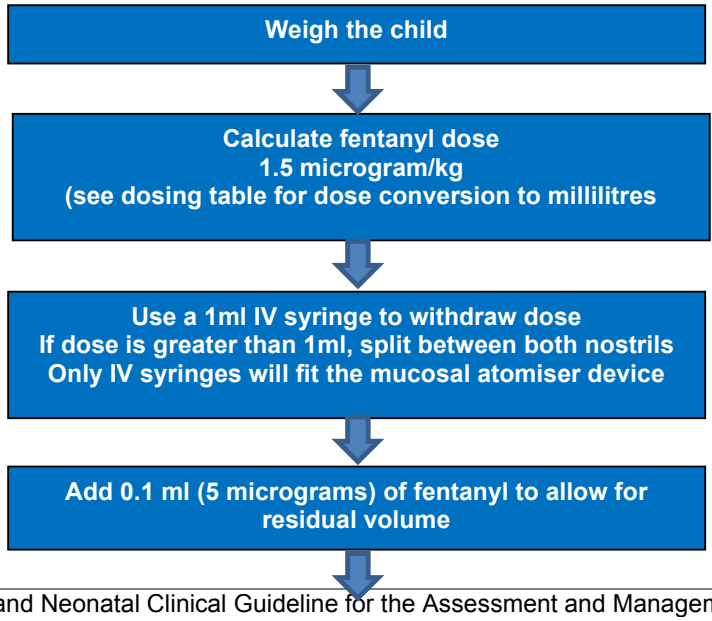
10.4.11 Second Dose Intranasal Fentanyl Dosage Chart

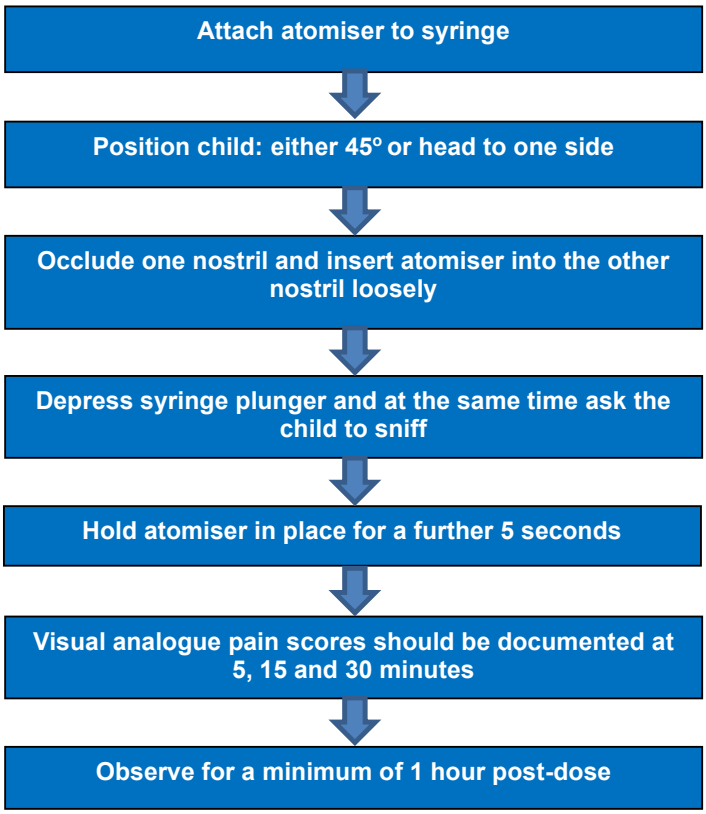
Weight of child (kg)	Top Up Dose (0.75 – 1.5 microgram/kg)	Volume of Top Up Dose (ml) (50 micrograms/mL)
7 – 9.9	5 microgram	0.1 ml

Weight (Kg)	Dose in microgram (0.75- 1.5microgram/kg)	Volume (mL)
10-11	7.5 - 15 microgram	0.15 - 0.3mL
12-14	10 - 20 microgram	0.2 - 0.4 mL
15-18	12.5 - 25 microgram	0.25 - 0.5 mL
19-21	15 - 30 microgram	0.3 - 0.6 mL
22-24	17.5 - 35 microgram	0.35 - 0.7 mL
25-28	20 - 40 microgram	0.4 - 0.8 mL
29-32	22.5 - 45 microgram	0.45 - 0.9 mL
33-34	25 - 50 microgram	0.5 - 1.0 mL
35-38	27.5 - 55 microgram	0.55 - 1.1 mL
39-41	30 - 60 microgram	0.6 - 1.2 mL
42-44	32.5 - 65 microgram	0.65 - 1.3 mL
45-48	35 - 70 microgram	0.7 - 1.4 mL
49-51	37.5 - 75 microgram	0.75 - 1.5 mL
52-54	40 - 80 microgram	0.8 - 1.6 mL
55-58	42.5 - 85 microgram	0.85 - 1.7 mL
59-61	45 - 90 microgram	0.9 - 1.8 mL
62-64	47.5 - 95 microgram	0.95 - 1.9 mL
65-69	50 - 100 microgram	1 - 2 mL

NB: volumes have been rounded to the nearest 0.05ml

10.4.12 Administration of intranasal fentanyl





11. Suggested Analgesic Regime for Paediatric patients post Tonsillectomy

Drug	Dose	Side effects/ Cautions
Paracetamol	2-3 yr 180mg QDS 4-5 yr 240mg QDS 6-7 yr 240-250mg QDS 8-9 yr 360-375mg QDS 10-11 yr 480-500mg QDS 12-15 yr 480-750mg QDS 16-17 yr 500mg - 1G QDS	Maximum 4 doses in 24hrs. Minimum 4 hours apart. Caution in liver failure.
Ibuprofen	1-3 yr 100mg TDS 4-6 yr 150mg TDS 7-9 yr 200mg TDS 10-11 yr 300mg TDS 12-17 yr 300-400mg TDS	Every 6-8 hours, minimum 4 hours apart. Maximum **daily** dose 30mg/kg Caution: Asthma, sensitivity to NSAIDS, renal dysfunction or bleeding diathesis
Morphine Sulphate	1-11 years -200 – 3000 micrograms/kg every 4 hours micrograms/ (maximum 10mg per dose) for 7 days 12-17 years 5-10mg 4 hourly.	Adjust according to response. Maximum of 4 doses in 24hours. Caution with other opiates. For maximum effect take half an hour before meals.

11.1 Advice for analgesia for after tonsillectomy

11.1.1 Information to be included in the discharge letter

- Give painkillers regularly for the first 24-48 hours even if child is not complaining of pain.
- Encourage your child to eat normal diet as well as they are able.
- If eating is sore, encourage cold drinks, avoiding acidic drinks like fresh orange juice.
- It can help to give painkillers half an hour before meals, so they are working when your child is eating.
- If your child has been given Morphine Sulphate and they develop any of the following symptoms, seek medical advice and do not give anymore:
    - Unusually sleepy and unable to wake up.
    - Finding it difficult to breathe
    - Feeling faint or dizzy

11.1.2 Information to be given to parents after tonsillectomy

- Take painkillers regularly for the first 24-48 hours even if not complaining of pain.
- Painkillers half an hour before meals to help with eating, but don't take more than recommended dose.
- Pain can get worse 3-5 days after the operation.
- Expect child to complain of a sore throat for about a week.
- Expect child to complain of ear pain or ache, this is actually caused by the sore throat but may not seem like it
- Child may have bad breath.
- Regular teeth brushing may be painful but will help to prevent infection around the area where the tonsils were removed.
- Child should avoid crowds and school for 10-14 days to prevent them catching a cold from other people.

When to seek further advice

- Temperature of >38 degrees not resolved with paracetamol or ibuprofen
- Child is in a lot of pain and it is not resolving with pain killers
- Vomiting blood or red or brown vomit
- Child not taking any oral fluids
- Large amount of bleeding from tonsillar area (back of the throat)

You can contact your GP or NHS 111 advice line. If you need more help:

Widnes Healthcare Resource Centre Caldwell Rd WA8 7GD: 0151 495 5000 (call before visiting)

Halton General Hospital, Hospital Way, Runcorn WA7 2DA: 01928 714567 (Walk in centre)

In an emergency: Whiston Hospital A&E Dept, Warrington Rd, Prescot L35 5DR: 0151 426 1600

12. Training

- Trust Staff who undertake pain assessments and manage pain relief for Children and Young People across the Trust require the following training and updates:

- Pain updates relating to paediatric pain management, including current practice and new evidence based practice
- Feedback from audits
- Learning from serious untoward incidents/adverse incident reporting

- For all staff, training should be discussed at annual appraisal

- Paediatric nursing staff record of pain management training to be maintained by the Children's Nurse Educator.

What aspect/s of this policy will require staff training?	Which staff groups require this training?	Is this training covered in the Trust's Statutory & Mandatory Training Policy?	If no, how will the training be delivered?	Who will deliver the training?	How often will staff require training	Who will ensure and monitor that staff have this training
Pain updates related to paediatric pain management. Feedback from audits. Learning from serious untoward/ adverse incident reporting	Staff who undertake pain assessment and manage pain relief for children and young people	No	Team meetings, governance meetings and via group e-mails	Nurse educators in Paediatrics and ED	At induction and when guidance is updated	Nurse Educator

13. Monitoring Compliance

13.1 Key Performance Indicators (KPIs) of the Policy

No	Key Performance Indicators (KPIs) Expected Outcomes
1	Compliance with the guideline monitored via audit
2	Untoward incidents or complaints regarding pain management are investigated immediately as per Trust policies
3	Datix Incident Reporting
4	Reporting of staff training

13.2 Performance Management of the Policy

Minimum Requirement to be Monitored	Lead(s)	Tool	Frequency	Reporting Arrangements	Lead(s) for acting on Recommendations
Untoward incidents or complaints regarding pain management are investigated immediately as per Trust policies	Clinical Directors for Paediatrics, ED, Surgery or Anaesthetics	Root Cause Analysis/ SIRI	As required	Paediatric and ED Clinical Governance Meetings. Trust Children's Surgical Meeting. Departmental meetings within	Clinical Directors for Paediatrics, ED, Surgery or Anaesthetics

Minimum Requirement to be Monitored	Lead(s)	Tool	Frequency	Reporting Arrangements	Lead(s) for acting on Recommendations
				Paediatrics, ED, Surgery and Anaesthetics	
Datix Incident Reporting	Matron, Paediatrics	Review of Datix Reports	Monthly	Quarterly report to Paediatric Clinical Governance Meeting and Trust Children's Surgical Meeting.	Clinical Directors/ Directorate Managers/ Matrons for Paediatrics, ED, Surgery or Anaesthetics
Reporting of staff training	Clinical Educators for Paediatrics, ED, Surgery or Anaesthetics	Report	Quarterly	Trust Children's Surgical Meeting, Paediatric Clinical Governance Meetings, Departmental meetings within Paediatrics, ED, Surgery and Anaesthetics	Matrons/Lead Nurses for Paediatrics, ED, Surgery or Anaesthetics

14. References/Bibliography/Relevant Legislation/National Guidelines

No	Reference
1	RCN Standards for assessing, measuring and monitoring vital signs in Infants, Children and Young People. (RCN 2017) https://www.rcn.org.uk/Professional-Development/publications/pub-005942 (Link checked 1.2.24)
2	American Academy of Pediatrics 2010) (Vol 108.No.3 pg. 793-797)
3	Beyer, J.E. McGrath, P.J. & Berde, C.B. (1990). Discordance between self-report and behavioural pain measures in children aged 3-7 years after surgery. Journal of Pain and Symptom Management; 5: 350-356
4	Cummings, E.A., Reid, G.J., Finley, G.A., McGrath, P.J., Richie, J.A. Prevalence and source of pain in pediatric inpatients. Pain. 1996; 68(1):25-31.
5	Howard, R. F. (2003) Current status of pain management in children. JAMA; 290:2464-69
6	Mather, L., Mackie. J. (1983) The incidence of postoperative pain in children. Pain; 15: 271-282
7	Mcquay, H. (1989) Opioids in chronic pain. British Journal of anaesthesia; 63: 213-226
8	McCaffery, M. (1994). Using Opioids with non-opioids. Nursing; 24(4):336-369
9	Murat .I. Gall. O, Tourniaire, B. (2003). Procedural Pain in children: evidence-based best practice and guidelines. Reg Anesth Pain Med; 28:561-72
10	McArthur, E. Cuncliffe, M. (1998). Pain Assessment and Documentation – Making a Difference. Journal of Health Care 2(4): 164-9
11	McGrath, P.J. (1995) Aspects of pain in children and adolescents. Journal of Clinical Psychology and Psychiatry 36 (5): 713-906
12	RCN (2009) Royal College of Nursing Recognition and assessment of acute pain in children. Available at: https://www.euroespa.com/wp-content/uploads/2014/10/003542.pdf (link checked 1.2.24)
13	Schechter, NL et al (1993) 'Pain in infants, children and adolescents – An Overview' in Schechter, NL: (1993) Pain in Infants, children and adolescents: Baltimore: MD: Williams and Wilkins 1993: 3 – 9
14	Treadwell, M. Frank, L and Vichinsky, E. (2002) Using Quality Improvement Strategies to Enhance Paediatric Pain Assessment. *Journal of Quality in Healthcare;* 14(1):39-47
15	The Pharmaceutical Journal. 21/28 June 2014

No	Reference
16	Pain relief using Entonox: GOS Hospital https://www.gosh.nhs.uk/conditions-and-treatments/procedures-and-treatments/pain-relief-using-entonox/ (link checked 1.2.24)
17	Cunliffe M (2005) Guidelines for the use of Intravenous Paracetamol (Perfalgan®), Royal Liverpool Children's Hospital
18	BNF for Children https://bnfc.nice.org.uk/ (link checked 1.2.24)
19	Summary of product characteristics for Paracetamol Infusion Fresenius Kabi 10/2010
20	Guidelines of the Royal Liverpool Children's NHS Trust Alder Hey
22	Association of Paediatric Anaesthetists Good Practice in Postoperative and Procedural Pain published *2008*
23	Journal of Neonatal Nursing Dec 2014, vol 20, Issue 6, pg. 274-282 Campbell et al.)
24	BMJ2001; 322; 261-265 (3 February)
25	Banga, S., Datta, V., Rehan, H.S. & Bhakhri B.K. (2016) Effect of sucrose analgesia, for repeated painful procedures, on short-term neurobehavioral outcome of pre-term infants: A randomised controlled trial. Journal of tropical Pediatrics 62,(2),101-106
26	Desjardins, M., Gaucher, N., Curtis, S. et al (2014) A randomized double-blind trial comparing the effects on pain of an oral sucrose solution versus placebo in children one to three months old needing venepuncture. Paediatrics and Child Health (Canada) 19(6)
27	Despriee, A.W. & Langeland, E. (2016) The effect of sucrose as pain relief / comfort during immunization of 15-month old children in health care centres: a randomized controlled trial. Journal of Clinical Nursing 25(3)372-380
28	Gaspardo, C.M.; Miyase, C. I.; Chimello, J. T. et al (2008) Is pain relief equally efficacious and free of side effects with repeated doses of oral sucrose in preterm neonates. Pain 137(1)16-25
29	Gao, H., Du, S., Zhang, H et al (2016) Efficacy and safety of repeated oral sucrose for repeated procedural pain in neonates: A systematic review. International Journal of Nursing Studies 62 p118-125
30	Gouin,S., Gaucher, N., Desjardins, M.P., & Lebel, D. (2018) A randomised double-blinded trial comparing the effect on pain of an oral sucrose solution vs placebo in children 1-3 months old undergoing simple venipunture. Journal of Emergency Medicine 54(1)33-39
31	Harrison,D., Reszel, J. Beuno, M. et al (2016) Breastfeeding for procedural pain in infants beyond the neonatal period. Cochrane Database of Systematic Reviews Oct 2016 No. 10 Harrison, J.W., Logan, S., Howell, C et al (2012) Effective analgesia using physical interventions for infant immunizations. Pediatrics 129(5)815-822
32	Linhares, M.B.M., Gaspardo, C.M., Souza, L.O. et al (2014) Examining the side effects of sucrose for pain relief in preterm neonates: a case control study. Brazilian Journal of Medical and Biological Research 47(6)527-532
33	Lotito, A., Glatard, A., Detavernier, M et al (2013) Use of sucrose 24% during venepuncture on a premature newborn child: a comparison with glucose 30%. International Journal of Clinical Pharmacy 35(5)887-888
34	Milbrandt, T., Kryscio, R. & Muchow, R. (2016) Oral sucrose for pain relief during clubfoot casting: A double-blinded randomized controlled trial. Journal of Pediatric Orthopaedics Sept 2016
35	Pandey, M., Datta, V. & Rehan, H.S. (2012) Role of sucrose in reducing painful response to orogastric tube insertion in preterm neonates. Indian Journal of Pediatrics 80(6)476-482
36	Shah, V., Taddio, A. & Riddell, R.P. (2015) Pharmacological and combined interventions to reduce vaccine injection pain in children and adults: systematic review and meta-analysis. Clinical Journal of Pain 31 (Suppl 10)S38-S63
37	Wente, S.J.K. (2013) Nonpharmacologic pediatric pain management in emergency departments: a systematic review of the literature. Journal of Emergency Nursing 39(2)140-150
38	Yilmaz, G., Pguz, M., Karacan, C.D. & Caylan, N. (2014) Oral sucrose administration to reduce pain response during immunization in 16-19 month infants: a randomized, placebo controlled trial. European Journal of Pediatrics 173(11)1527-153
39	Kings College Hospital NHS Foundation Trust; Intranasal fentanyl guideline May 2020
40	Warrington and Halton Hospitals NHS Foundation Trust; Intranasal fentanyl for acute severe pain in the paediatric emergency department October 2018
41	Leicester Children's Emergency Department 2016 Intranasal Fentanyl

No	Reference
42	Adelgais et al. Intranasal Fentanyl and Quality of Pediatric Acute Care. J Emerg Med, 53 (5), 607-615, 2017
43	Setlur A, Friedland H. Treatment of Pain With Intranasal Fentanyl in Pediatric Patients in an Acute Care Setting: A Systematic Review. Pain Mang, 8 (5), 341-352, 2018
44	The Royal Melbourne Children's Hospital; Clinical Practice Guidelines; Intranasal Fentanyl; https://www.rch.org.au/clinicalguide/guideline_index/Intranasal_fentanyl/
46	The Royal College of Emergency Medicine Best Practice Guideline: Management of Pain in Children July 2017 https://rcem.ac.uk/wp-content/uploads/2021/10/RCEM_Pain_in_Children_Best_Practice_Guidance_REV_Jul2017.pdf (link checked 1.2.24)

15. Related Trust Documents

No	Related Document
1	Trust Children's Surgery Policy
2	Trust Medicines Policy
3	Management of Controlled Drugs
4	Infection Control Policy – Chapter 45 Aseptic Non-touch Technique
5	Standard Operational Procedure (SOP) for the administration of Entonox gas in adult patients for the management of acute pain during procedures, except obstetrics and endoscopy. Version 2. April 2019
6	Standard Operating Procedure for Patient Controlled Analgesia (PCA) in the paediatric patient aged 8 years and over and weighing ≥ 20kg in acute pain situations Version No: 2 https://intranet.sthk.nhs.uk/plugins/extranet/widgets/policies/uploads/2021-61c465951b32b5.12529466.pdf [Accessed February 2024]
7	Neonatal Clinical Guideline for Newborn Resuscitation and Perinatal Management of Extremely Preterm Birth before 27wks of Gestation

16. Equality Analysis Screening Tool

The EIA screening must be carried out on all policies, procedures, organisational changes, service changes, cost improvement programmes and transformation projects at the earliest stage in the planning process. Where the screening identifies that a full EIA needs to be completed, please use the full EIA template.

The completed EIA screening form must be attached to all procedural documents prior to their submission to the appropriate approving body. A separate copy of the assessment must be forwarded to the Head of Patient Inclusion and Experience for monitoring purposes via the following email, cheryl.farmer@sthk.nhs.uk. If the assessment is related to workforce, a copy should be sent to the workforce Head of Equality, Diversity and Inclusion for workforce equality&diversity@sthk.nhs.uk

If this screening assessment indicates that discrimination could potentially be introduced, then seek advice from either the Head of Patient Inclusion and Experience or Head of Equality, Diversity (Workforce) and Inclusion.

A full equality impact assessment must be considered on any cost improvement schemes, organisational changes or service changes that could have an impact on patients or staff.

Title of function	Paediatric and Neonatal Clinical Guideline for the Assessment and Management of Pain in Infants, Children and Young People
Brief description of function to be assessed	Guideline to provide guidance to staff on how to assess and manage pain in infants, children and young people
Date of assessment	5.3.2024
Lead Executive Director	Medical Director
Name of assessor	
Job title of assessor	Consultant Paediatrician

Equality, Diversity & Inclusion

Does the policy/proposal:
1) Have the potential to or will in practice, discriminate against equality groups
2) Promote equality of opportunity, or foster good relations between equality groups?
3) Where there is potential unlawful discrimination, is this justifiable?

	Negative Impact	Positive Impact	Justification/ evidence and data source
Age	No	Yes	This guideline relates specifically to infants, children and young people
Disability	No	No	
Gender reassignment	No	No	
Pregnancy or maternity	No	No	
Race	No	No	
Religion or belief	No	No	
Sex	No	No	
Sexual orientation	No	No	

Human Rights

Is the policy/proposal infringing on the Human Rights of individuals or groups?

	Negative Impact	Positive Impact	Justification/ evidence and data source
Right to life	No	No	
Right to be free from inhumane or degrading treatment	No	No	
Right to Liberty/security	No	No	
Right to privacy/family life, home and correspondence	No	No	
Right to freedom of Thought/conscience	No	No	
Right to Freedom of expression	No	No	
Right to a fair trial	No	No	

Health Inequalities

Is the policy/proposal addressing health inequalities and are there potential or actual negative impact on health inequality groups, or positive impacts? Where there is potential unlawful impacts is this justifiable.

	Negative Impact	Positive Impact	Justification/ evidence and data source
Deprived Populations	No	No	
Inclusion health groups	No	No	
5 child clinical areas	No	No	
5 adult clinical areas	No	No	

Outcome

After completing all of the above sections, please review the responses and consider the outcome.

Is a full EIA required?	Yes ☐ No ☒ Please include rationale:

Sign off

Name of approving manager	Susan Thong
Job title of approving manager	Directorate Manager, Paediatrics
Date approved	5.3.2024

17. Data Protection Impact Assessment Screening Tool

If you answer **YES or UNSURE** to any of the questions below a full Data Protection Impact Assessment will need to be completed in line with Trust policy.

	Yes	No	Unsure	**Comments -** *Document initial comments on the issue and the privacy impacts or clarification why it is not an issue*
Is the information about individuals likely to raise privacy concerns or expectations e.g. health records, criminal records or other information people would consider particularly private?		No		
Will the procedural document lead to the collection of new information about individuals?		No		
Are you using information about individuals for a purpose it is not currently used for, or in a way it is not currently used?		No		
Will the implementation of the procedural document require you to contact individuals in ways which they may find intrusive?		No		
Will the information about individuals be disclosed to organisations or people who have not previously had routine access to the information?		No		
Does the procedural document involve you using new technology which might be perceived as being intrusive? e.g. biometrics or facial recognition		No		
Will the procedural document result in you making decisions or taking action against individuals in ways which can have a significant impact on them?		No		
Will the implementation of the procedural document compel individuals to provide information about themselves?		No		

Sign off if no requirement to continue with Data Protection Impact Assessment:
Confirmation that the responses to the above questions are all NO and therefore there is no requirement to continue with the Data Protection Impact Assessment

Policy author ___Clinical Director/Consultant Paediatrician__Date 05/03/2024

Appendix 1 Paediatric Pain Assessment Document

NHS
Mersey and West Lancashire Teaching Hospitals
NHS Trust

Patient Name
Unit Number
Date of Birth

PAEDIATRIC PAIN ASSESSMENT DOCUMENT

PAIN ASSESSMENT TOOLS

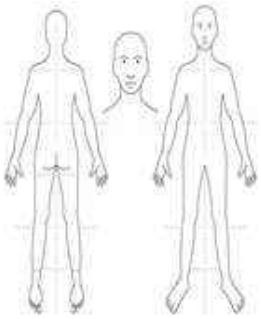
FLACC BEHAVIOURAL TOOL: Suggested age range 2months – 7 years

Each of the five categories are scored 0, 1, or 2
Resulting in a total score between 0-10

FLACC CATEGORIES	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 comfort or console

BODY CHART

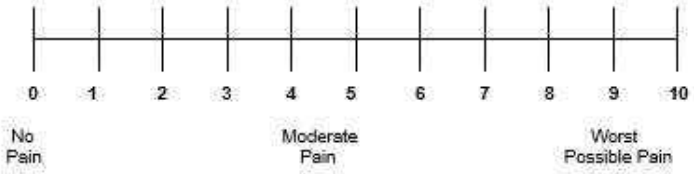
Point to where it hurts



Reference: S.Merkel et al The FLACC: A behavioural scale for scoring post operative pain in young children

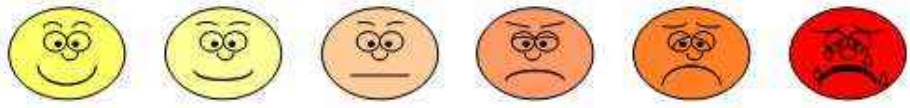
VISUAL ANALOGUE SCALE: Self Report tool. Suggested age range 4 years and over

Adapted from Wong and Baker (1988)



FACES PAIN ASSESSMENT TOOL: Suggested age range 4 years and over

Point to each face using the words to describe the pain intensity
Ask the child to choose the face that best describes their pain and record the appropriate number (Wong & Baker 1988)



0 No hurt
2 Hurts A little
4 Hurts a little more
6 Hurts even more
8 Hurts A lot
10 Worst hurt (You don't have to be crying to feel this bad)

Page Ref: PAI ROUP R 2024

GUIDELINES FOR HEALTH PROFESSIONALS

Undertake and document the child's pain history
Discuss the pain assessment tools with the child and family and select the most appropriate assessment scale

ASSESS the child's pain score

- On admission
- 4-6 hourly for infants and children taking oral analgesia. Increase the assessment frequency if the score is above 4
- Post operatively – hourly for the first 4 hours then as above
- Always document episodes of pain
- Always document the pain score

PLAN Is an analgesic / comfort intervention required
IMPLEMENT Administer analgesia or comfort measures appropriate to the pain score
EVALUATE Re-Score after 30 minutes to assess the effectiveness of the analgesia / comfort intervention

PAIN HISTORY

(For paediatric staff and families to complete) Can you tell us anything about your child and their experience of pain?
How do they normally act when in pain?
What particular words do they use?
Does the child or family have a history of painful experience?
How do you offer comfort or relief to your child at home? Do you give them a cuddle blanket, favourite toy etc?
Do you wish to be present at any planned clinical procedures that your child may undergo in hospital?
Any previous problems with operations or clinical procedures?
Any previous problems or side effects with drugs used, i.e. vomiting?
Please add any other information you consider relevant.

ANALGESIC INTERVENTIONS - Use the following to help identify how to respond to a child's pain score

Score 7-10 Severe Pain	Score 4-6 Moderate Pain	Score 1-3 Mild Pain
Paracetamol IV / orally / rectally regularly +/- NSAID +/- Morphine (Naloxone should always be prescribed with Morphine)	Paracetamol Orally / rectally regularly +/- NSAID (Non Steroidal Anti inflammatory drug E.g. ibuprofen, diclofenac)	Paracetamol Orally / rectally PRN

CHECK PAEDIATRIC BNF FOR CHILDREN FOR FULL PRESCRIBING DETAILS
N.B. Do not administer Codeine with Morphine or Fentanyl
N.B. See guidelines specifically for Intravenous Paracetamol

NB: Please circle which tool is being used for patient
1.FLACC 2.VAS 3.FACES

Date Time	Pain Score	Intervention / Analgesia Document all interventions e.g. Medication given, Hot/cold pack, Equanox, Sucrose offered, comforter etc.	Scored by: Patient, parent, nurse etc.	Re assess after 30 minutes State Pain Score	Signature

Date Time	Pain Score	Intervention / Analgesia Document all interventions e.g. medication given, hot/cold pack used, sucrose offered, comforter etc.	Scored by: Patient, Parent, nurse etc.	Re assess after 30 minutes State Pain Score	Signature

Discharge Analgesia:

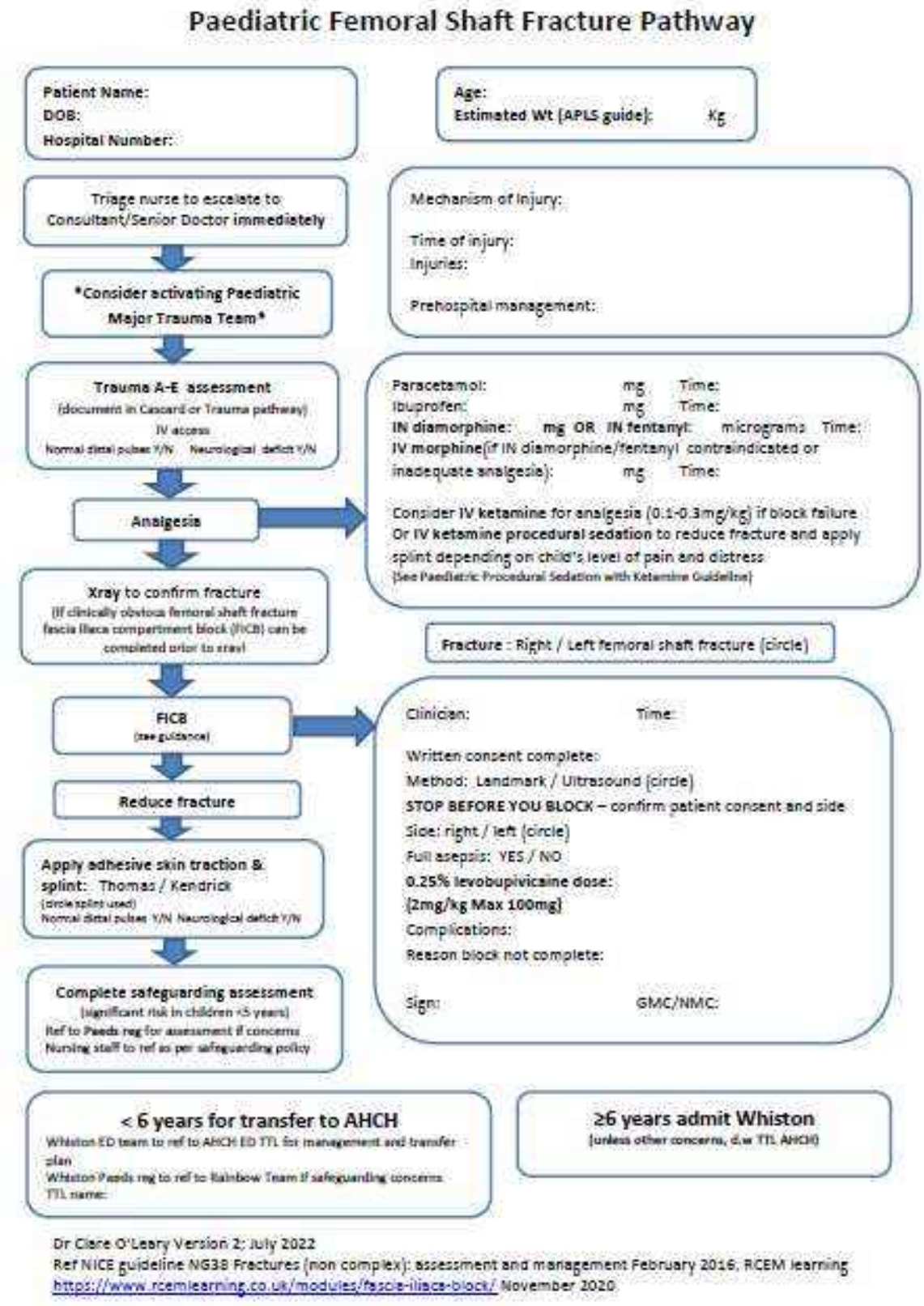
NB Prior to discharge please ensure patient has adequate pain relief if required, either prescribed before discharge or available at home, please document accordingly in notes and also please document if pain leaflet given.

Pain score on discharge

Pain leaflet given on discharge

Signature

Appendix 2 Paediatric Femoral Shaft Fracture Pathway



Dr Clare O'Leary Version 2; July 2022
Ref NICE guideline NG38 Fractures (non complex): assessment and management February 2016. RCEM learning https://www.rcemlearning.co.uk/modules/fascia-iliaca-block/ November 2020

Appendix 3 Guidance for Fascia Iliaca Compartment Block

Fascia Iliaca Compartment Block (FICB) for paediatric femoral shaft fractures

Nerve blocks should be administered by trained personnel. This could include nurse practitioners or paramedics in addition to physician practitioners (9, 10).

Absolute contraindications:

- Parent refusal/uncooperative child
- Allergy to local anaesthetic
- Infection over the proposed injection site

Relative contra-indications

- Significant swelling around fracture site (risk of masking compartment syndrome)
- Known peripheral neuropathy in the affected limb
- Recent failed block (repeat blockade could be considered by an alternative operator provided cumulative safe anaesthetic dosage is not exceeded)

Anticoagulation (this is no longer an absolute contraindication, and with training and ultrasound guidance, nerve blocks can be considered for all anticoagulated patients) (11)

The aim of the FICB block is to introduce a high volume of local anaesthetic to spread into the potential space under the fascia iliaca. It targets the 3 nerves which run in this area. These are the femoral nerve, the lateral femoral cutaneous nerve and the obturator nerve. In the FI compartment block the obturator nerve is usually only partially blocked.

The needle is inserted laterally and the structures pierced during passage are skin, subcutaneous tissue, fascia lata and then fascia iliaca. The landmark technique has been called the “two pop” technique as loss of resistance is felt as the needle passes through the 2 fascial layers.

The ultrasound approach is safer and more accurate as it allows visual confirmation that local anaesthetic is delivered to the correct fascial plane.

The sonographic anatomy is shown in the later section on performing the block.

Equipment for the procedure:

- Sterile gloves
- Chlorhexidine for skin cleaning
- Sterile drape for skin
- Sterile ultrasound cover
- Sterile ultrasound jelly
- Appropriate sized syringes for calculated volume of 0.25% levobupivicaine
- 5ml syringe for local anaesthetic
- orange needle for SC skin infiltration of lignocaine
- 16 or 18 Ultrasound nerve block needle
- 2 x Drawing up needle (for drawing up local anaesthetic)
- 0.25% levobupivicaine for block (see below re drug dose)
- 1% lignocaine (0.5-1ml) for SC skin infiltration
- Dressing

An assistant may be required if a two-person injection technique is required.

This is a volume dependent block. The effect is provided by spread of the local anaesthetic below the fascial layer, washing around the three targeted nerves. As a result, a low concentration and high volume of local anaesthetic is required.

LOCAL ANAESTHETIC for Fascia Iliaca Block

0.25% Levobupivicaine 2mg/kg maximum dose (use estimated body weight as per APLS guidelines)

0.25% levobupivicaine contains 2.5mg/ml

CONSENT

Gain written informed consent from parent/carer by discussing the risks and benefits. Include the following risks:

- Block failure (20%)
- Nerve damage
- Bleeding
- Infection
- LA toxicity, including the early signs of toxicity so the patient can report them immediately (see later)

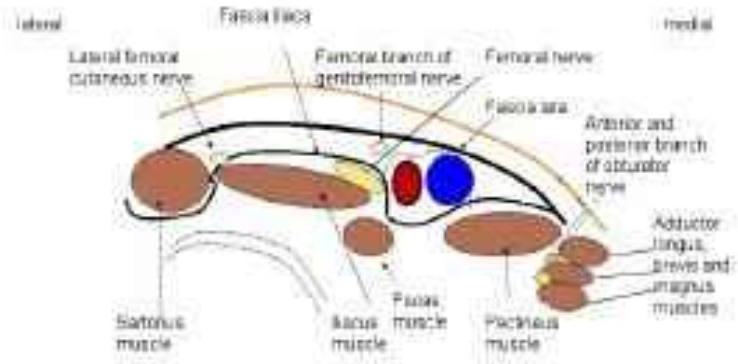
Talk them through the procedure and allow them to ask questions. Consent should be documented on the proforma.

TECHNIQUE

Position the patient flat on the bed (slight elevation of the head can be possible) with the leg slightly abducted and externally rotated (as pain allows).

Ensure there is a working IV cannula and the patient is connected to a cardiac monitor

The block can be performed either by landmark technique or using USS guidance.



LANDMARK TECHNIQUE:

1. Identify site for the block, cleanse skin with an antiseptic solution and drape with a sterile towel. Raise skin wheal with small amount of 1% lignocaine (0.5-1ml)
2. The landmarks for FICB are the anterior superior iliac spine (ASIS) and the pubic tubercle on the same side. Place one middle finger on the ASIS and the other middle finger of the pubic tubercle. Draw a line between these two points. Divide this line into thirds. Mark the point 1cm caudal from the junction of the lateral and middle third. This is the needle entry point.

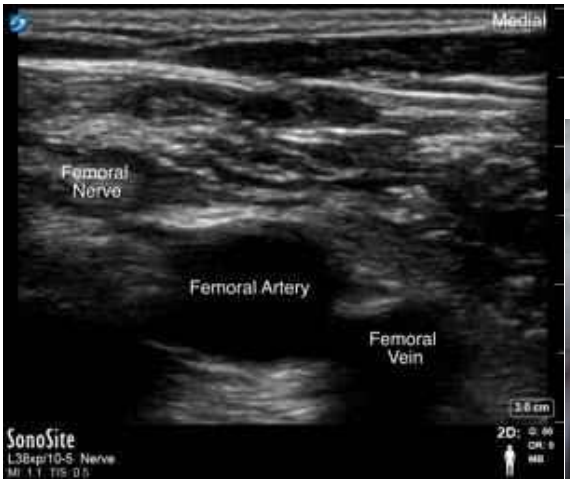
3. Palpate the ipsilateral femoral pulse at the level of your planned injections site. The pulse should be palpable 1.5 to 2 cm medial to the intended injection point to ensure a safe distance from the femoral nereve to avoid femoral nerve impalement.
4. Attach sideport of the hub of the Tuohy needle. Attach syringe filled with local anaesthetic solution. Prime tubing and needle with solution. Using Tuohy needle, pierce the skin at a right angle to its surface. Once thorough the skin adjust the needle angle to about 60 degrees directing the tip cranially.
5. Advance the needle through two distinct “pops” as it perforates first the fascia lata, then the fascia iliaca (the later gives a more subtle pop). Reduce the angle between the needle and skin surgace to about 30 degrees and advance the needle further 1-2mm
6. Aspirate before injection. If aspiration is negative, inject the levobupivicaine 0.25%. Pause after every 5mls and repeat aspiration. If aspiration is negative continue. There should be no resistance to injection. There should be no pain or paraesthesia on injection.

USS GUIDANCE TECHNIQUE:

Femoral artery identification and lateral scanning

Step 1:

With probe marker pointing towards ASIS (from the femoral artery and vein are identified. The nerve lies lateral to the artery. Probe depth should be set to 3cm, and a linear 5-11Hz probe selected.



Step 2:

The probe is moved lateral towards the ASIS, the iliacus muscle is identified with the fasia iliaca and fascia lata superiorly.

Fig. 50: Ultrasound-guided femoral block

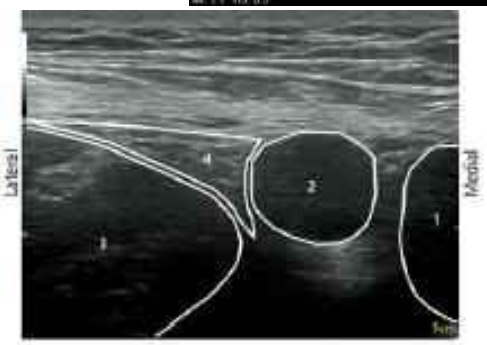


Fig. 51: Ultrasound image: ultrasonographic view of primary landmarks

1 Femoral vein
2 Femoral artery
3 Iliopsoas muscle
4 Femoral nerve

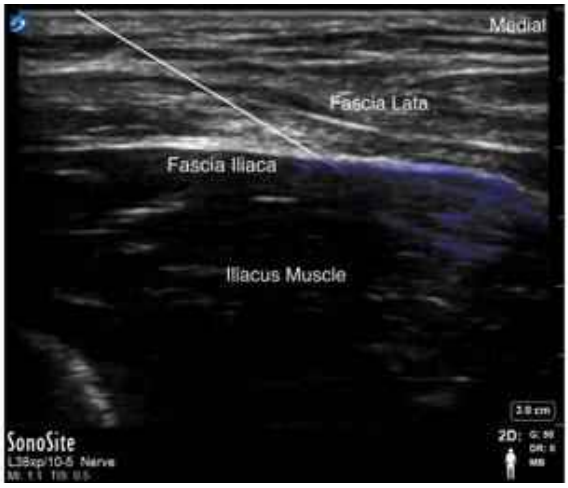
Step 3:

The needle is inserted and visualised in plane. A pop may be felt as it passes through the fascia lata and fascia iliaca. The needle should be placed under the fascia iliaca and the fascia hydro-dissected from the ilacus muscle.

The procedure can also be performed out of plane. The needle should be inserted as per the landmark technique and the needletip "chased" to be visualised entering the fascia iliac compartment.

The syringe should be aspirated prior to infiltration, and then a test dose of 1-2mls injected to confirm position. The probe can scan medially to confirm spread towards the femoral nerve.

(Local anaesthetic spread shown in blue.)



There should be no resistance to injection. The residual volume of the local anaesthetic can then be infiltrated. Ensure negative aspiration after every 5mls of local anaesthetic injected.

After infecting, carefully withdraw the needle, apply pressure for 30secs, then a dry dressing to the injection site.

Step 4:

Continue monitoring for 30mins

Document procedure on the proforma and ensure the levobupivicaine 0.25% is prescribed on the cascard.

Appendix 4 Emergency Department LAT Solution Record

Whiston Emergency Department
LAT solution protocol

Indications:
Children 1 year of age and older
Laceration that is likely to require suturing in the ED
Consider in wounds requiring exploration, cleaning or debridement

Is the wound:

- In digit, pinna, nasal alae or penis Y / N
- Greater than 8 hours old Y / N
- Bite, crush or flap wound Y / N
- Wound in or near mucosal surface including eye, nose or mouth Y / N

Does patient have a history of:

- Previous reaction to local anaesthetic Y / N
- History of cholinesterase deficiency Y / N

If you answer yes to any of the above, do not apply LAT solution

If you can answer no to all of the above questions, and judge that the wound may need suturing in the ED or that topical anaesthesia may be of benefit in wound inspection or toilet, then apply LAT solution according to the procedure below:

Procedure:

2. ***Always wear gloves when handling topical anaesthetic***
3. Draw up amount of solution to be used in syringe according to age and wound size:
    - Use 1ml of solution per cm of wound length up to maximum allowed
    - Maximum amount depends on age:

Age 1-3 years	2 ml
Age greater than 3 years	3 ml

4. Apply no more than half of solution to edges of wound by dropping from syringe or using cotton applicator
5. Cut swab to appropriate size to cover wound. Soak swab piece with remainder of solution and apply to wound secured firmly with bandage or occlusive dressing
6. Instruct parent/guardian to ensure child does not put dressing into mouth or eyes and to inform Minor Injuries staff immediately if dressing becomes loose
7. Inform patient/parents of time for removal (*30 minutes after application*) and advise them to contact nursing staff if they have not been seen by this time.
8. Complete procedure (use additional Lidocaine 1% if needed)

Whiston Emergency Department **LAT solution record**	
Name **DOB** **Hospital number**	**Date** **Time of injury**

Indication for use of LAT solution
- ☐ Wound inspection
- ☐ Wound cleaning
- ☐ Wound closure
- ☐ Other, (specify)

Wound type	Wound location	Wound length (cm)
☐ Incised wound ☐ Laceration ☐ Puncture wound ☐ Abrasion Other (specify)	☐ Face ☐ Scalp ☐ Torso ☐ Upper limb ☐ Lower limb Other (specify)	☐ Dirty ☐ Clean

Amount of LAT used: _____ ml
Time LAT applied: _____
Time LAT removed: _____ (30 minutes after application)

Procedure (e.g. sutures used)

Adverse events

Additional anaesthetic, analgesic or sedation required.

Drug	Dose	Time given

Please record feedback from patient (if age appropriate), parent/carer and staff regarding use of LAT solution and anaesthesia achieved.

PATIENT

unacceptable	barely acceptable	acceptable	good	excellent

Parent/carer

unacceptable	barely acceptable	acceptable	good	excellent

Staff

unacceptable	barely acceptable	acceptable	good	excellent

Put this document in the emergency department notes and a copy of this record must be kept for audit purposes.

Appendix 5 Emergency Department Analgesia Record for Intranasal Diamorphine & Fentanyl

Name **DOB** **Hospital number**	**Date** **Cause of pain**

Time	**Pre**	**10 min**	**30 min**	**60 min**
Pain Score **(0 – 10 or smiley faces)**				

Weight (kg)	**Dose administered**	**Second dose administered (IN fentanyl only)**	**Time of administration**

Observations	**O mins**	**5 mins**	**10 mins**	**15 mins**	**20 mins**
Resp rate					
Oxygen sats					
Pulse					
AVPU score					

Adverse events, including time of occurrence and any actions taken to manage these:

Additional analgesia required

Drug	**Dose**	**Time given**

Please record feedback from patient (if age appropriate), parent / carer and staff regarding intranasal diamorphine/fentanyl administration.

Patient

unacceptable	**barely acceptable**	**acceptable**	**good**	**Excellent**

Patient / carer

unacceptable	**barely acceptable**	**acceptable**	**good**	**Excellent**

Staff

unacceptable	**barely acceptable**	**acceptable**	**good**	**Excellent**

Put this document in the emergency department notes and a copy of the analgesia record must be kept for audit purposes