MORPHINE – STANDARD MORPHINE INTRAVENOUS PATIENT CONTROLLED ANALGESIA IN PAEDIATRICS POLICY

POLICY

Reference	CPG-PAIN-IVPCAPaed		
Approving Body	Anaesthetic Clinical Governance Group		
Date Approved	5th October 2021		
For publication to external SFH website	**Positive confirmation received from the approving body that the content does not risk the safety of patients or the public:**		
	YES	**NO**	**N/A**
	X		
Issue Date	7th October 2021		
Version	v2.0		
Summary of Changes from Previous Version	Additional information with regard to infusion line labelling (blue stickers) and guidance for out of hours PCA support		
Supersedes	v1.0, Issued 13th December 2017 to Review Date October 2021 (ext2)		
Document Category	• Clinical		
Consultation Undertaken	• Pain Team Nurse Specialists – email • Pain Team Anaesthetists - email • Lead Surgical Pharmacist – email • Recovery Sister (lead) – email • Paediatric Clinical Educator - email • Ward 25 Sister (lead) – email • Anaesthetics and Pain Management Service Director – email • Anaesthetic Governance Group – email & meeting • Consultant Paediatrician - email		
Date of Completion of Equality Impact Assessment	9th September 2021		
Date of Environmental Impact Assessment (if applicable)	N/A		
Legal and/or Accreditation Implications	N/A		
Target Audience	Registered practitioners for whom this policy is applicable to		
Review Date	October 2024		
Sponsor (Position)	Chief Nurse		
Author (Position & Name)	Clare Burton – Pain Management Nurse Consultant		
Lead Division/ Directorate	Surgery		
Lead Specialty/ Service/ Department	Anaesthetics Service Line/ Pain Management		
Position of Person able to provide Further Guidance/Information	Pain Nurse Consultant		

Associated Documents/ Information	**Date Associated Documents/ Information was reviewed**
1. CADD® Solis Quick Guide (hyperlinked to Pain Management Intranet Site)	2009
2. CADD® Solis Operator's Manual (hyperlinked to Pain Management Intranet Site)	2011
3. Paediatric Acute Pain Prescription Chart	December 2018
Template control	June 2020

CONTENTS

1.0 INTRODUCTION

IV PCA is an effective analgisia mainanence regimen for post-operative pain management and/or the management of pain caused by traumatic injury or acute flare of disease. PCA allows the child to have more control over their opioid analgesia and often avoids peaks and troughs in peak plasma concentration and injection discomfort which can occur with bolus SC administration.

IV PCA has been found to save on nursing time and empowers patients to self- manage pain: this inturn can lead to greater patient satisfaction. Caring for patients with IV PCA requires specialist knowledge and training of the bolus only infusion pumps and awareness of potential side effects and/ or complications.

“The complexities associated with prescribing, preparing and administrating injectable medicines mean that there are greater potential risks for patients than for other routes of administration. Weak operating systems increase the potential risk of harm and a safe system of work is needed to minimise these risks.”
(NPSA, 2008)

2.0 POLICY STATEMENT

This policy aims to establish standards of safe practice for children using IV morphine PCA and identifies which members of staff can prescribe an IV PCA and use the associated equipment. In addition the policy specifies the level of training the practitioner must complete: its place is to ensure the highest standard of care delivery to patients. Failure to comply with this policy may be regarded as misconduct and dealt with in accordance with the Trust’s disciplinary procedures and potentially the practitioner’s regulatory body.

All registered healthcare professionals as defined in this policy can check IV opioids in accordance with their professional registration, but they are prevented from administering this medication unless they have received the Trust’s IV medicines administration training relevant to their area of practice (RD04/RD04.4/RD05).

This clinical document applies to:

Staff group(s)

- Appropriately trained adult registered nurses
- Appropriately trained paediatric registered nurses
- HCPC registered operating department practitioners
- Anaesthetists

Clinical area(s)

- Theatres/Theatre Recovery (Kings Mill only)
- Ward 25

Patient group(s)

- Patients under the age of 16 years following major surgery, or surgery that has resulted in severe symptoms of pain.
- Patients under the age of 16 years with severe acute pain following traumatic injury or disease.

Exclusions

- Patients over the age of 16 years.
- Patients who lack the mental and/or physical capacity required to use the equipment (self-administration button).
- Patients with a known sensitivity to morphine.

3.0 DEFINITIONS/ ABBREVIATIONS

Trust	Sherwood Forest Hospitals NHS Foundation Trust
Staff	All employers of the Trust including those managed by a third party on behalf of the Trust
RN	Registered nurse
mL	Millilitres
mg	milligrams
mcg	micrograms
TDS	Three times a day
QDS	Four times a day
PRN	As required
IV	Intravenous
PO	Per oral
NSAID	Non-steroidal anti-inflammatory drug
IV PCA	Intravenous patient controlled analgesia
PEWS	Paediatric Early Warning Score
PAPPC	Paediatric Acute Pain Prescription Chart
VIP	Visual inflammatory phlebitis
EIA	Equality Impact Assessment
SOC	Specialist Observation Chart (Anaesthetics / Theatre Recovery)
NC	Nerve Centre
AVPU	Alert, Voice, Pain, Unconscious

4.0 ROLES AND RESPONSIBILITIES

4.1 RESPONSIBILITIES OF THE ANAESTHETIST:

- To be conversant with this policy and access informal pump training if required via the Pain Team, Theatre Recovery Team or medical equipment training facilitator; ensuring competent use of the **grey** CADD Solis IV PCA pump and associated equipment.
- To discuss the IV PCA with the patient and parent(s) / carer(s) to establish patient compliance, physical and mental capacity to use the system and any sensitivity to the prescribed opioid (morphine).
- To prescribe the morphine PCA on the Trust PAPPC.
- To ensure awareness of the patients post-operative progress.
- The 1st on-call anaesthetist will support clinical areas with setting up PCA infusions and troubleshooting during unsocial hours.
- To ensure that the IV saline flush section on the Medicines Chart is signed and dated.

4.2 RESPONSIBILITIES FOR THE REGISTERED NURSE/ODP:

- To be conversant with this policy.
- Access formal/ cascaded training and be assessed as competent in the use of the **grey** CADD Solis IV PCA pump and associated equipment.
- To ensure that mandatory patient observations are undertaken, documented and reviewed as dictated in the policy.
- Appropriately respond to and escalate untoward events.
- To ensure that the correct preparation of opioid medicine is running as per prescription.
- To observe and maintain patency of peripheral IV access.

4.3 RESPONSIBILITIES FOR WARD SISTER/CHARGE NURSES:

- To act as excellent role models and be responsible and accountable for the policy implementation within their clinical areas.
- To monitor standards of best practice associated with this policy.
- To ensure that all registered practitioners within the sphere of their responsibility has access to and promptly attends the required formal training in order to develop skills and competence in caring for patients with IV PCA. This will include ensuring completion of associated training packages and medical equipment competency documents.
- To ensure that all registered practitioners accountable to them are aware of this policy and adhere to its statement.

4.4 RESPONSIBILITY OF PHARMACISTS:

- To monitor prescribing and oversee the administration of medicinal therapies.
- To alert prescribers and other health care professionals to potential or actual problems.

4.5 RESPONSIBILITY OF ALL ABOVE:

- To report incidents or near misses relating to IV medicines using the Trust incident reporting system (Datix).
- To gain valid consent. Patients have a legal and ethical right to determine what happens to them. Valid consent to treatment is essential and paramount when considering invasive techniques. Obtaining consent is also a matter of common courtesy between the health care professional and recipient.

5.0 APPROVAL

This policy has been approved by the Trust's Anaesthetics Clinical Governance Group on 5th October 2021.

6.0 DOCUMENT REQUIREMENTS (POLICY NARRATIVE)

When considering the use of an opioid PCA it is imperative to recognise that this should only be used as maintenance (PRN) analgesia following a sufficient analgesic pre-load and concomitant regular analgesia. For example - the use of a morphine PCA in the absence of a small but effective morphine pre-load / loading dose will not allow a peak plasma level of morphine owing to the nature of small incremental bolus's delivered via PCA versus the time it takes morphine to reach a peak plasma level (around 8 hrs.).

IV PCA is an electronically controlled pump that delivers a specified amount of IV morphine when the patient presses the bolus button. It is programmed to deliver a dose at set intervals. In paediatrics the dose is set according to the child's weight.

6.1 The PRESCRIPTION

Morphine IV PCA Prescribing Regimen

Child's weight	Bolus dose in mg	Bolus dose in ml	Bolus dose in mcg
15-20kg	0.3mg	0.3ml	300 micrograms
20-25kg	0.4mg	0.4ml	400 micrograms
25-30kg	0.5mg	0.5ml	500micrograms
30-35kg	0.6mg	0.6ml	600micrograms
35-40kg	0.7mg	0.7ml	700micrograms
40-45kg	0.8mg	0.8ml	800micrograms
45-50kg	0.9mg	0.9ml	900micrograms
>50kg	1mg	1ml	1000micrograms

- The initial prescribed dose will be determined by the prescribing anaesthetist or senior paediatrician.
- Morphine bolus doses to be prescribed using the regimen above (doses equate to 20 micrograms/kg) with a 5 minute lockout interval - no background infusion.
- Changes from the initial prescription **must** be agreed by the Pain Team or 1st on-call anaesthetist and the reason for the change documented in the patient's medical notes. Any changes to the original prescription must be documented and prescribed on the PAPPC chart by a doctor**.**
- Infusion bags are pre- filled with 100mg morphine in 100mL sodium chloride (1mg/mL).

6.2 SETTING UP THE PCA SYSTEM (see hyperlink on page 2 for full guidance)

6.2.1 Regimen set up during non-unsociable hours (Mon- Fri 8am- 5pm):

- Immediate post-op patients:
    - IV PCA's will be set up in Theatre Recovery by two registered practitioners.

- Ward based patients (Ward 25):
    - IV PCA will be set up on Ward 25 (if required) by the pain nurse specialists.

6.2.2 Regimen set up during un-sociable hours (evenings / weekends):

- Immediate post-op patients:
  - As per section 5.3.1.

- Ward based patients (Ward 25):
  - IV PCA will be set up on Ward 25 by a Theatre Recovery registered practitioner (if available) supported by a registered ward nurse or the 1st on-call anesthetist supported by a ward nurse.

6.2.3 Setting up the IV PCA

- Controlled medicines should not be transferred between departments unless the required opioid is unavailable. Please check the morphine ward stock availability prior to setting up the PCA.
- Select the dedicated **grey** CADD Solis pump with a lock box marked for *'intravenous use only'* and specifically configured for IV PCA.
- Dedicated CADD Solis giving sets/infusion lines have an anti-syphon and anti-reflux valves and "Y"- extension. In the rare event that a single lumen giving set is used (without the Y connector) a double lumen anti-reflux needle free device can be attached to the end of the CADD Solis giving set / infusion line. Once primed with normal saline, the extension connector will allow a fluid management infusion to run alongside the PCA infusion into a single cannula.
- **The PCA infusion line must be labelled with a blue IV PCA sticker**.
- Non-NRFit yellow epidural CADD Solis giving sets/infusion lines must never be used for IV PCA infusions as in terms of patient safety the yellow line denotes 'epidural use only.'
- The pump program and morphine infusion bag must be checked by two registered practitioners who are appropriately trained as per Medicines Policy.
- The process for priming the line and preparing the pump is described in the quick guide for the CADD Solis and the CADD Solis Operator's Manual (hyperlinked on page 2).
- Ensure the prescribed opioid' programme is selected (morphine).
- The pump is automatically programmed to the standard prescribed dose with a 5-minute lockout on set up, but this programme may need to be changed to a lower prescribed dose based on depending on the child's body weight.
- The pump will only allow for bolus delivery and will not allow a background infusion.

6.3 SUPPORTIVE ANALGESIA

These are an essential part of PCA management. The requirement for opioids and severity of side effects can be effectively minimised with additional analgesia.

- Paracetamol PO - 18.75mg/kg 4-6 hourly, max QDS (reduce to 15mg/kg QDS on discharge).

- Ibuprofen PO - 5mg/kg 4- 6hourly, max QDS (review after 72 hours) increasing to 30mg/kg a day for severe pain.

6.4 ANTI-EMETICS

Follow post-operative nausea and vomiting protocol:

- First line: Ondansetron - 100micrograms/kg (max per dose 4mg)
- Second line: Cyclizine - < 5yrs 0.5-1mg/kg (max per dose 25mg)
  6-11yrs 25mg TDS
  12-17yrs 50mg TDS

6.5 PATIENT MONITORING

Ensure the child is monitored as stipulated below as morphine has a significant side effect profile. The child must be nursed in an area where they can be easily observed.

Document via:	Observation	Half hourly for first:	Then hourly for next:	Then 2-4 hourly for: (child's condition determines)
NC / SOC	Blood pressure	2 hours	4 hours	Duration of IV PCA
NC / SOC	Pulse	2 hours	4 hours	Duration of IV PCA
NC / SOC	Respirations	2 hours	4 hours	Duration of IV PCA
NC / SOC	AVPU	2 hours	4 hours	Duration of IV PCA
NC / SOC	Oxygen saturations	2 hours	4 hours	Duration of IV PCA
NC / SOC	Temperature	2 hours	4 hours	Duration of IV PCA
NC / SOC	PEWS	2 hours	4 hours	Duration of IV PCA
NC / SOC & PAPPC	Pain Assessment	2 hours	4 hours	Duration of IV PCA
PAPPC	Itching	2 hours	4 hours	Duration of IV PCA
PAPPC	Nausea & Vomiting	2 hours	4 hours	Duration of IV PCA

The table above demonstrates standard requirements for child monitoring with IV PCA. Observations may be increased if a child's condition deteriorates as per Trust Observation and Escalation Policy for Newborns, Neonates, Infants, Children and Young People.

6.6 THE PUMP AND SYSTEM

- Pump settings MUST be checked against the prescription by performing a programme review:
    - On hand over from the theatre recovery staff to the ward staff nurse and documented on the PAPPC
    - At every shift change with two qualified nurses, one from either shift to ensure programming is correct.
- Ensure that the pump screen is displaying the morphine programme on a blue background.
- Document the PCA bolus dose, lockout period, PCA demands and quantity administered on the PAPCC at the observation times stated above.

6.7 CANNULA

- The cannula must be checked and deemed patent as per instruction set out in the Trusts VIP Protocol.
- Information with regard to cannula observations must be recorded on the appropriate Cannulation Observation Charts.

6.8 TROUBLE SHOOTING PROBLEMS

6.8.1 Unrelieved pain:

- Should be reviewed by a senior paediatrician to eliminate underlying causes.
- Inform the pain nurse specialists via Vocera (‘*call pain nurse’)* during non-unsociable hours or 1st on- call anaesthetist during unsociable hours.
- Check that the pump is functioning correctly.

6.8.2 De-functioning pump:

- Follow the quick guide for the CADD®-Solis (hyperlink page 2).
- Contact the pain nurse specialists via Vocera during non-unsociable hours or 1st on-call anaesthetist during unsociable hours.

6.8.3 Sedation and Respiratory Depression

If the child is drowsy or difficult to rouse (AVPU – P or U) and/or respiratory rate is less than 10 breaths /min:

- The handset MUST be taken away from the child and pump stopped
- Administer oxygen at 4L /min via face mask
- Prepare Naloxone IV (see PAPCC for guidance) – if naloxone is administered a Datix form must be completed post administration.
- Inform the 1st on- call anaesthetist during unsociable hours or the pain nurse specialist during non-unsociable hours and record event on the PAPPC

- The IV PCA must not be recommenced without prior advice from the on- call anaesthetist or pain nurse specialist.

6.9 CAUTIONS

- **Only the child must press the PCA button.**
- Ensure the bolus demand button is visible at all times.

6.10 DISCONTINUATION

- Ensure adequate step-down analgesia is prescribed prior to discontinuation of the IV PCA.
- The opioid bag and pump infusion line must be discarded into a blue medicines bin on immediate discontinuation of the regimen. Opioid medicines must never be left in the pump unattended when disconnected from the patient.
- Please wipe the pump using anti-microbial wipes and return the pump and power cable to Theatre Recovery promptly following discontinuation.

7.0 MONITORING COMPLIANCE AND EFFECTIVENESS

Monitoring of compliance and competencies will be achieved via the database on the register of training retained in the Training and Development Department.

Minimum Requirement to be Monitored **(WHAT – element of compliance or effectiveness within the document will be monitored)**	**Responsible Individual** **(WHO – is going to monitor this element)**	**Process for Monitoring e.g. Audit** **(HOW – will this element be monitored (method used))**	**Frequency of Monitoring** **(WHEN – will this element be monitored (frequency/ how often))**	**Responsible Individual or Committee/ Group for Review of Results** **(WHERE – Which individual/ committee or group will this be reported to, in what format (eg verbal, formal report etc) and by who)**
Department leaders / ward sisters / charge nurses	Competency packs are complete	Appraisals, Induction	On going	Department / Ward Leaders Group
Training and Development	Training pack completion	Register of Training	On going	Divisional Governance Forums
Reported incidents	Pain nurse consultant	Datix	Following each incident	Anaesthetic Governance Group Divisional Governance Forums / learning events Medicines Safety Group

8.0 TRAINING AND IMPLEMENTATION

8.1 FOR ANAESTHETISTS:

- Be conversant with this policy and access informal training available via Pain or Theatre Recovery Teams.
- Ensure competent to use the equipment.

8.2 FOR REGISTERED NURSES/ MIDWIVES/ ODPs:

- To be conversant with this policy. This policy will be promoted by the pain nurse specialists during the Trust Induction Programme and Pain Management Study Day.
- To have completed the IV PCA training package and have been assessed as competent by a senior member of staff or a member of the Pain Team.

9.0 IMPACT ASSESSMENTS

- This document has been subject to an Equality Impact Assessment, see completed form at Appendix 1.
- This document is not subject to an Environmental Impact Assessment.

10.0 EVIDENCE BASE (Relevant Legislation/ National Guidance) AND RELATED SFHFT DOCUMENTS

10.1 EVIDENCE BASE:

- Australia and New Zealand College of Anaesthetists (ANZCA). Acute Pain Management: Scientific Evidence: 5th Edition. 2020: pp 402 - 429
- Royal College of Anaesthetists. Guidelines for the Provision of Anaesthesia Services (GAPS) Chapter 11: Guidance on the Provision of Anaesthesia Services for Inpatient Pain Management. 2019
- Smiths Medical. CADD®-Solis 2100, 2110 Ambulatory Infusion Pumps- Operator's Manual. 2011
- Smiths Medical. Quick Guide for the CADD®-Solis. 2009

10.2 RELATED SFHFT DOCUMENTS:

- Infection Prevention and Control Operating Policy
- IV Medication and Fluid Therapy Administration Through a Peripheral Venous Cannula Policy
- Observation and Escalation Policy for Newborns, Neonates, Infants, Children and Young People
- Medicines Policy
- Medical Equipment User Training Policy
- Medical Device Management Policy
- Policy for Consent to Examination, Treatment and Care

11.0 KEYWORDS

IV, PCA, pain management, medicines, pain relief, analgesia pumps, Cadd Solis, programming, grey, pump

12.0 APPENDICES

Appendix A – Equality Impact Assessment Form

APPENDIX A – EQUALITY IMPACT ASSESSMENT FORM (EQIA)

Name of service/policy/procedure being reviewed: MORPHINE – Standard Morphine Intravenous Patient Controlled Analgesia in Paediatrics Policy			
New or existing service/policy/procedure: Existing			
Date of Assessment: 9th September 2021			
For the service/policy/procedure and its implementation answer the questions a – c below against each characteristic (if relevant consider breaking the policy or implementation down into areas)			
Protected Characteristic	**a) Using data and supporting information, what issues, needs or barriers could the protected characteristic groups' experience? For example, are there any known health inequality or access issues to consider?**	**b) What is already in place in the policy or its implementation to address any inequalities or barriers to access including under representation at clinics, screening?**	**c) Please state any barriers that still need to be addressed and any proposed actions to eliminate inequality**
The area of policy or its implementation being assessed:			
Race and Ethnicity	None	None	None
Gender	None	None	None
Age	None	None	None
Religion	None	None	None
Disability	Patients with physical disabilities affecting use of hands will not be able to operate this equipment. Patients who lack the mental capacity to effectively uses this device will not be offered this analgesic technique.	Alternative analgesic techniques / plans will be available / prescribed for patients who cannot physically operate the self-administration (bolus) button or for patients who lack the mental capacity understand or use the device.	None
Sexuality	None	None	None
Pregnancy and Maternity	None	None	None

Gender Reassignment	None	None	None
Marriage and Civil Partnership	None	None	None
Socio-Economic Factors (i.e. living in a poorer neighbourhood / social deprivation)	None	None	None

What consultation with protected characteristic groups including patient groups have you carried out?

- None

What data or information did you use in support of this EqIA?

- None

As far as you are aware are there any Human Rights issues be taken into account such as arising from surveys, questionnaires, comments, concerns, complaints or compliments?

- No

Level of impact

From the information provided above and following EQIA guidance document Guidance on how to complete an EIA (click here), please indicate the perceived level of impact:

High Level of Impact/Medium Level of Impact/***Low Level of Impact*** *(Delete as appropriate)*

For high or medium levels of impact, please forward a copy of this form to the HR Secretaries for inclusion at the next Diversity and Inclusivity meeting.

Name of Responsible Person undertaking this assessment:

Signature:
Clare Burton

Date:
9/9/21