

Explanatory notes for paediatric and weight-based paediatric patient or nurse-controlled analgesia pain assessment charts

These notes explain how to complete the paediatric patient or nurse-controlled analgesia (SMR130.026) and Weight-based paediatric PCA or NCA assessment charts (SMR130.031)

Local governance

Paediatric PCA or NCA is **only** to be used in facilities with local governance structures in place to ensure its safe and effective use in children. These must include a PCA or NCA guideline (including specific paediatric information), appropriate environment, staff training, supervision and support.

Local health district governance for paediatric PCA or NCA **must** include:

- An endorsed policy or guideline for PCA, including specific paediatric information
- A dedicated paediatric inpatient area, e.g. level 4 paediatric facilities
- Adequate provision of onsite 24/7 medical cover
- Escalation of care procedures
- Adequate provision of nursing staff to provide paediatric high and/or close observation care
- Appropriately trained staff in care of paediatric patients and PCA or NCA
- Specification of the range of procedures and criteria to be supported through PCA or NCA
- Selection criteria of patient suitable for paediatric PCA or NCA, e.g. cognitive ability of the child)
- Appropriate paediatric oxygen therapy
- Continuous oxygen saturation monitoring
- Accurate monitoring of fluid infusion rate and balance
- Accurate monitoring of intravenous lines for occlusion
- Background intravenous fluids to keep vein open running with paediatric PCA or NCA
- Administration of paediatric PCA using syringes and/or bags
- No other opioids or sedatives to be administered unless ordered by the acute pain service or equivalent medical officer
- Provision of naloxone
- Auditing of paediatric PCA or NCA charts
- Clinical incidence reviews
- Minimum of daily review of patients by the acute pain service or equivalent medical officer

Target patient group

- The paediatric PCA or NCA [SMR130.026] and weight based paediatric PCA or NCA [SMR130.031] pain assessment charts are for use in **non-tertiary** paediatric facilities.
- These charts are for use in **paediatric** patients, under 16 years of age receiving PCA or NCA for pain management
- These charts are **not** to be used for adult patients.
- The prescribing guides on both charts are **not suitable** for children weighing **less than 10kg**.
- The **weight based paediatric PCA or NCA form** [SMR130.031] is to be only used by those facilities who have weight-based software enabled in their PCA pumps. All other aspects of prescribing, administration and observations are the same for both charts.

Paediatric PCA or NCA chart [SMR130.026]

This chart is to be used in facilities where the opioid bag or syringe is prepared according to the weight of the child. This chart includes a prescribing guidance table to determine the amount of opioid which will be diluted in 0.9% sodium chloride.

Weight based paediatric PCA or NCA chart [SMR130.031]

The weight based paediatric PCA or NCA chart is to be only used in facilities where standardised opioid mixes and concentration are used **and** PCA pumps that have software with the capability of entering the child's weight at point of programming.

WEIGHT BASED PCA pumps determine the precise bolus dose based on the weight of the child.

This chart incorporates a prescribing guidance table using **standardised opioid mixes and concentration**. The prescribing guide is not suitable for children weighing less than 10 kg.

Target education group

- Medical officers and nurse practitioners who prescribe PCA or NCA for paediatric patients.
- Nursing and medical staff on paediatric wards and other paediatric inpatient areas where paediatric patients use PCA or NCA.
- Clinical pharmacists who review paediatric patient medications and medication charts.

Paediatric PCA or NCA management guide (page 1)

The management guide is on the front page of the chart. For detailed information regarding paediatric PCA/ NCA prescribing, administering and management refer to local hospital procedures. The safety of paediatric patients using PCA or NCA for pain management is paramount.

Paediatric PCA or NCA is **ONLY** to be used in facilities with local governance structures in place to ensure its safe and effective use in children. These **must** include a PCA or NCA guideline (including specific paediatric information), appropriate environment, staff training, supervision, and support.

Management guide summary

- **Environment** – Children **must** be cared for in a paediatric ward or paediatric in-patient area.
- **Observations** – Recorded **hourly** on the chart (pain and sedation) and the standard paediatric observation chart or electronic medical record (pain, sedation, respiratory rate and oxygen saturations).
- **Continuous pulse oximetry** – **Must** be used for paediatric patients receiving PCA or NCA.
- **Oxygen therapy** – As required to maintain oxygen saturations above 95%.
- **No other opioids or sedatives** – Unless ordered by the acute pain service or equivalent medical officer.
- **PCA pump settings** – **Must** be checked by two nurses.
- **Adverse effects** – Including pruritus, nausea and vomiting must be managed appropriately.
- **PCA button** – Only the patient (not the parent, carer or nurse) may use the button for PCA.
- **Nurse controlled analgesia** – Only the allocated registered nurse may use the button for NCA.
- **PCA giving set** – With anti-syphon and anti-reflux capabilities.

Escalation of care

Instructions on how to respond to paediatric patient clinical observations assessed in the Blue, Yellow or Red Zone are consistent with the 'Track and Trigger' principles of the Between the Flags Program¹. Between the Flags is a safety net in NSW public hospitals to reduce the risk of undetected clinical deterioration of patients and ensuring appropriate responses when needed.

Although the PCA or NCA observation chart incorporates a decision support tool, it should not replace clinical judgement. Clinicians must assess a patient's condition and escalate to the appropriate level, using the chart as a guide. For example, if a clinician considers that a patient requires urgent medical attention, based on their clinical judgement, even though the patient's observations remain in the White Zone, then they should initiate a Rapid Response call.

Blue Zone highlights criteria that require increased frequency of observations by nursing staff responsible for the care of patients using PCA:

- Sedation Score 1 Minimal Sedation., may appear tired or sleepy, responds to verbal conversation and/or sound)
- Respiratory rate in Blue Zone on standard paediatric observation charts (SPOC) or Between the Flags (BTF).

Yellow Zone highlights the following criteria that require clinical review by the Acute Pain Service or the equivalent medical officer responsible for the care of patients using PCA:

- Sedation Score 2 (somnolent or /sleeping, easily roused with light tactile stimulation or simple verbal command)
- A pain score between 7 and 10, out of 10.
- Respiratory rate in Yellow Zone on SPOC or BTF.

Red Zone highlights the following criteria that require an immediate Rapid Response following the local Clinical Emergency Response System (CERS) protocol Sedation scores 3 or 4 (unroutable, deep sleep or rousable only with deep or significant physical stimuli).

- Respiratory rate in Red Zone on SPOC or BTF.

The Acute Pain Service or the equivalent medical officer responsible for the care of patients using PCA must also be contacted.

Contact details to be completed at bottom of page 1 with relevant contact details for the clinicians responsible for the management of the patient receiving PCA during business hours and after hours.

Prescribing guidance tables for paediatric PCA or NCA prescription (page 2)

- Prescribing guidance tables on both charts are **NOT suitable for children less than 10 kg**.
- **Guidance categories:**
 - Opioid dilution
 - Bolus dose
 - Lockout
 - Background infusion
- Guidance categories are displayed for children 10 to 50 kg and children more than 50 kg.

Paediatric PCA or NCA prescription (page 2)

The prescription section for chart SMR130.026 or SMR130.31 is to be completed by a prescriber in accordance with the NSW Health Policy Directive Medication Handling in NSW Public Health Facilities PD2022_032.²

- The PCA prescription is valid for a maximum of 48 hours unless ceased earlier.
- Prescriber is to complete the patient allergy and adverse drug reaction section in full.
- Patient identification details to be either handwritten or a patient label affixed (first prescriber to check patient label is correct).

PCA prescription

If the child is over the 95th percentile for weight, then use 50th percentile weight as the dosing weight.

Background infusions are generally for NCA as rarely required for PCA

Background infusions require local guidelines support as they are associated with increased risk.

- **Refer to prescription guide** displayed at top of page 2 for opioid selection, opioid dilution, PCA or NCA bolus dose, lockout time for PCA and NCA, background infusion amount per hour.
- Complete route, drug, amount (in mg or microgram), total volume, drug concentration (mg or microgram per mL)
- Complete date, prescriber's signature, printed name and contact.
- Space allowed for pharmacy annotation
- Note: If changing from one opioid to another, a new PCA chart must be used.

PCA Program: Parameters for programming the PCA pump.

- Dosing weight (if the child is over the 95th percentile for weight, then use 50th percentile weight as the dosing weight)
- Date, time
- PCA bolus dose: refer to prescribing table at top of page 2
- Lockout interval (minutes)
- Background infusion: refer to prescribing table at top of page 2
- Prescriber's signature and printed name
- A second row is provided for a subsequent change to the PCA program.

Naloxone

- The prescription includes a recommendation of dose and frequency for administration of naloxone where sedation score are 3 or 4 OR a respiratory rate in the Red Zone.
- Date, route, dose, frequency, max PRN dose/24hrs, space for pharmacy annotation, dose calculation, Prescriber's signature, printed name, Contact/pager.
- This section is **not** considered a standing order for naloxone and completion of the prescription is required prior to administration. (See frequently asked questions, p.8)

Oxygen therapy

- Provide oxygen therapy as required to maintain oxygen saturations above 95%.

PCA to be ceased

- Refers users to the medical record for guidance on how and when the PCA is to be ceased. Completion of this section may be optional in your facility.

Record of opioid syringes/bags administered; remaining drug discarded (page 3):

Opioid solutions for PCA are prepared in a syringe or a bag depending on the type of PCA pump used. In the space required, date, time and two signatures are legally required for the administration of PCA opioid, and the total amount discarded in mL.

Record of naloxone administered

Four rows are provided for the administration of naloxone according to the prescription or standing order sticker on the front prescription page of the chart.

PCA observations (pages 4-8):

The observations component of the paediatric PCA or NCA chart have been developed in consultation with the Clinical Excellence Commission (CEC) to incorporate the track and trigger principles of the Between the Flags Program.¹ This promotes early recognition of the deteriorating patient associated with opioid administration. These charts are intended for concurrent use with the SPOC and / electronic

medical record. The frequency of observations for paediatric patients receiving a PCA or NCA is a minimum of hourly for both the PCA or NCA charts and SPOC observations.

The observations included in the PCA or NCA chart are those that are relevant to the needs of patients receiving PCA or NCA. Observations are presented in the same order in which an assessment of the patient with a PCA or NCA should occur.

Pain score

A pain score should be assessed with the patient at rest and with relevant movement (such as deep breathing and coughing for a patient post laparotomy) using the most appropriate paediatric pain assessment tool either the:

- Face, legs, activity, cry and consolability (FLACC) or revised scale (FLACC-R)
- Face Pain Scale
- Visual Analogue Scale
- Pain score at rest to be recorded with the letter 'R'
- Pain score with movement to be recorded with the letter 'M'

Identify the pain assessment scale used with the first set of observations. Use the same scale for all subsequent pain assessments for the patient.

Sedation

Assessment of sedation is a more reliable way of detecting early opioid-induced ventilatory impairment than a decreased respiratory rate.³ Track and trigger colour codes have been incorporated to help staff recognise increasing sedation and to prompt appropriate clinical management of the patient. The paediatric PCA or NCA chart incorporates the validated paediatric tool, the University of Michigan Sedation Score (UMSS):

- **4 - Unroutable**
- **3 - Deep sedation** (deep sleep, rousable only with deep or significant physical stimuli)
- **2 - Moderately sedated** (somnolent or sleeping, easily roused with light tactile stimulation or simple verbal command)
- **1 - Minimally sedated** (may appear tired or sleepy, responds to verbal conversation and/or sound)
- **0 - Awake and alert**
- **S - Asleep (rousable)**

Observations for sedation scores are to be recorded graphically so that trends can be monitored (tracked). If a patient's observations enter the Blue, Yellow or Red Zones, the instructions on the front page explain the required appropriate response from clinicians.

PCA or NCA delivery observations

Delivery observations are to be recorded hourly with values recorded for the following:

- Total primary PCA dose
- Background infusion rate per hour

- Total demands, successful demands
- Adverse reactions - pruritus, nausea or vomiting. Record these with a yes or no response
- Comments or actions
- Assessor's initial

Two initials are required for change of PCA or NCA program, clinical handover, transfer of care or administration of syringe or bag.

Frequently asked questions

Are these charts mandatory for all paediatric patients receiving a PCA or NCA?

The paediatric PCA or NCA charts [SMR130.026 and SMR130.031] have been endorsed by the CEC Medication Safety Expert Advisory Committee and the NSW State Forms Management Committee. They are mandated for use in NSW public hospitals. Specialist Children's Hospitals in NSW are exempt from using these charts.

Why is there no space to prescribe an 'hourly or four hourly limit'?

Available evidence states that no benefit can be attributed to dose limits for PCA. The setting of a limit can give staff a false sense of security, where they may believe that the patient cannot receive an excessive dose of a drug. The setting of a dose limit cannot compensate for any shortcomings in monitoring. Hourly or four hourly limits are also not present on all machines.^{3, 4}

Why can't naloxone be a standing order?

A naloxone standing order requires each hospital using PCA, to write a protocol covering all issues surrounding the naloxone order and administration, implementation and accreditation. A standing order requires annual review by the appropriate network/area drug and therapeutics committee. This process was considered labour intensive in contrast to a prescription that can be completed for individual patients. Facilities may have a 'Naloxone Standing Order' refer to your local PCA policy or procedure to confirm.

Why is there no space to record respiratory rate or oxygen saturations on the paediatric PCA chart?

All observations, including respiratory rate and oxygen saturations, are to be recorded on the SPOC for the appropriate age of the child. The SPOC has correct parameters to ensure signs of deterioration are alerted for children of different ages.

Relevant policy directives and references

1. NSW Ministry of Health. [Recognition and management of patients who are deteriorating \(PD 2020_018\)](#). Sydney: NSW Ministry of Health; 2020.
2. NSW Ministry of Health. [Medication handling \(PD2022_032\)](#). Sydney: NSW Ministry of Health; 2022.
3. Macintyre PE, Schug SA, Scott DA, et al. Acute pain management: scientific evidence. 5th ed. Melbourne: Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine; 2020.
4. Macintyre PE, Schug SA. Acute pain management: a practical guide. 5th ed. Abingdon, UK: CRC Press; 2021.

Fact sheet

[A fact sheet on PCA and NCA](#) for children, parents and guardians is available from Sydney Children's Hospital Network.

Further information

For further information about the NSW Paediatric PCA and NCA charts [SMR130.026 and SMR130.031] contact:

- the clinical nurse consultant, specialist or registered nurse from your paediatric ward or education department
- the Acute Pain Service or anaesthetic department who manage paediatric patients with PCA or NCA
- Agency for Clinical Innovation Pain Management Network ACI-PainManagement@health.nsw.gov.au

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