SESLHD PROCEDURE COVER SHEET

Health
South Eastern Sydney
Local Health District

NAME OF DOCUMENT	Paediatric (greater than one year) Pain Protocol for use in Post Anaesthetic Care Units (PACU)
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FUNCTIONAL GROUP(S)	Surgery, Perioperative and Anaesthetic
KEY TERMS	Pain Protocol, Paediatric Pain Protocol, PACU
SUMMARY	To ensure safe and effective pain protocol is delivered to paediatric patients greater than one year in the PACU (SGH, TSH and SSEH).

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Paediatric (greater than one year) Pain Protocol for use in Post Anaesthetic Care Units (PACU) – SGH,TSH and S/SEH

SESLHDPR/612

1. POLICY STATEMENT

The Paediatric Pain Protocol is a policy guideline for paediatric patients greater than one year of age who require administration of intravenous opioid analgesia by Registered Nurses in the postoperative period whilst within the Post Anaesthetic Care Unit (PACU).
If intravenous opioid is required for a patient less than one year old then this must be administered by an Anaesthetic Registrar, Fellow or Consultant.

2. BACKGROUND

Pain assessment is a prerequisite to optimal pain management in paediatric care and should involve a clinical interview with the child and/or their parent carer, physical assessment and use of an age and context appropriate pain intensity measurement tool. The research in paediatric pain in hospitalised children shows it is often assessed infrequently[1] and under-treatment of pain can result in many adverse effects[1,3]. Improvements in pain management and in patient staff satisfaction have been associated with regular assessment and measurement of pain[1].

This guideline describes:

- paediatric age appropriate pain assessment measurement tools[1]
- dosing schedule and delivery procedure
- intervals for assessment, monitoring and documentation requirements
- discharge criteria[16]
- staff educational requirements to ensure safe effective administration of Paediatric Pain Protocol within SESLHD PACU departments

3. DEFINITIONS

aliquot	Measured part of a whole volume
ANTT	Antiseptic Non Touch Technique
CBR	Clinical Business Rule
CERS	Clinical Emergency Response System
S8	Schedule 8 Drug
eMR	Electronic Medical Record
IV	Intravenous
IIMS+	Incident Information Management System
iVIEW	electronic patient care record and observation chart
KPI	Key Performance Indicator
MAR	Medication administration record (within eMR)
MO	Medical Officer
MoH	Ministry of Health
NIMC	National Inpatient Medication Chart
PACU	Post Anaesthetic Care Unit
PD	Policy Directive

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Pain Protocol	The intravenous incremental administration of analgesia (usually opioid) using a prescribed pathway of dose, administration intervals and observation in order to achieve adequate analgesia. It is most commonly used in PACU and Emergency Department settings by nursing staff who have received appropriate education. Pain protocol regimes are institution/area specific
SPOC	Standard Paediatric Observation Chart. There are five age specific Paediatric observation charts: under three months; three to 12 months; one to four years; five to 11 years and 12 years and older. Each chart details the yellow and red zone calling criteria.

4. RESPONSIBILITIES

PACU Staff:

Nurses working in the PACU will:

- attend pain assessments and safely administer opioids so that the paediatric patient's pain is controlled
- monitor the patient's observations as per the required intervals and if the patient's condition deteriorates activate the appropriate clinical review or rapid response call
- successfully complete the SESLHD Learning Package Acute Pain Management of Adults in the Post Anaesthetic Care Unit: IV Opioid Pain Protocol **and** the online HETI SKIP ELearning Pain Module
- complete additional education requirements as required by the individual facilities PACU management and education team e.g DETECT and DETECT Junior e-learning and/or DETECT Junior practical
- **all** PACU nurses competent to administer Pain Protocol must be familiar with the preparation and administration of naloxone

Education staff:

- ensure all nurses working in the PACU complete the educational requirements prior to administration of Paediatric Pain Protocol
- ensure appropriate support and education is provided to PACU nurses to develop and maintain required knowledge and skill associated with this procedure
- maintain records for evidence of education attended

Line Managers:

- ensure all nurses working in the PACU will receive appropriate training
- ensure there is adequate provision of nursing staff to provide paediatric high/close observation care within the PACU
- Review IIMS$^+$ data relevant to this procedure and investigate incidents as required.

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District Managers/Service Managers:

- review existing procedure annually
- present audit results and IIMS data relevant to this procedure to the SESLHD Surgical Stream Committee and Anaesthetic Directors Committee

Medical / Anaesthetic staff will:

- Retain responsibility for the paediatric patients analgesic requirements and related clinical reviews until discharge from the PACU
- Prescribe 'Pain Protocol' Medication Administration record (MAR) in the Electronic Medical Record (eMR) as per the requirements of Ministry of Health Policy Directive PD2013_043 - Medication Handling in NSW Public Health facilities
- Include the opioid of choice that is available within each facility e.g. fentanyl, oxycodone or morphine
- Include the maximum dose and number of doses to be administered
- Include any variation to the Paediatric Pain Protocol aliquot prescription

5. PROCEDURE

5.1 Patient assessment

As per the Paediatric Pain Protocol Flow Chart, pain assessment must occur immediately prior to any administered dose and no more than five minutes after each administered dose. The best method of assessing the severity of pain is by observing and communicating with the child[3]. Age appropriate pain tools have been developed for assessing pain severity in neonates, infants, children and adolescents. This procedure recommends the following four major pain tools to be used to assess paediatric pain prior to the administration of Paediatric Pain Protocol[9] and that the same pain assessment tool is used for consistency of pain scores.

5.2 PAEDIATRIC PAIN SCALES[11, 20] - see APPENDIX 2

5.2.1 Face, Legs, Activity, Cry, Consolability (FLACC) Scale for ages two months to seven years

A number of observational tools have been developed that are based on behaviours known to be associated with pain because pre-verbal children cannot self-report it. The FLACC pain scale is based solely on observed behaviours of children ranging in age from two months to seven years. A score is given from zero to two for each of the five categories, allowing severity of pain to be determined. A pain score can be calculated after a relatively short observation period by an unfamiliar clinician and there is no reliance on the measurement of vital signs.

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5.2.2 FACES pain scale – revised (FPS-R) for ages greater than four years

The FACES Pain Scale – revised is an Australian self-reporting tool that has been validated for use in children over the age of four years. The revised version uses a six face scale to give a score ranging from zero to 10.

There are specific instructions that accompany this tool, in order to ensure that the feelings of pain are being measured, and not the emotional status of the child, e.g. feeling 'happy' or 'sad' emotions that do not cause confusion in the reporting of pain.

5.2.3 Visual Analogue Scale (VAS) for ages seven to 18 years

VAS pain scales, also known as visual analogue pain scales, have been used for three decades in the assessment of children's pain. They have often been used in the validation of other pain scales, such as the Faces Pain Scale. VAS pain scales are a self-report tool used for children aged seven years up to eighteen years. These scales use numbers from zero to 10 along a line. Zero equals no pain and 10 equals severe pain. When administering this tool (see Appendix 4), ask the child to point along the scale, indicating their severity of pain. Do not ask them to verbalise a number for their pain severity rating, because many children want to receive a score of 10 out of 10.

5.2.4 Revised FLACC (r-FLACC) Pain Scale for paediatric patients with cognitive impairment

Children with cognitive impairment have historically not been evaluated well for pain and clinicians have subsequently provided insufficient analgesia. Children with cognitive impairment display individual but generally predictable and observable behaviours to pain and contrary to previous belief are not insensitive or indifferent to pain. Observer-rated behavioural assessment tools have been devised for children with cognitive impairment and include input from their parent.

5.3 NON PHARMOLOGICAL (PLAY and PHYSICAL) and PHARMACOLOGICAL OPTIONS

To assist with the management of paediatric acute pain relief and anxiety the following strategies are recommended:[9]

- use of multimodal analgesic options
- involve parents, cuddles, child friendly environment, age appropriate explanation with reassurance, provide distraction with books, ice blocks, toys
- physical strategies such as positioning, quiet area, deep breathing

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5.4 DOSING OF PAIN PROTOCOL[1]

Sedation levels, pain score, respiratory rate/effort and heart rate must be taken at commencement and prior to each administration of IV Pain Protocol.

A review of the paediatric patient's intraoperative analgesia must be attended to assess baseline analgesia loading[20].

Pain protocol is delivered according to the paediatric patient's weight - which should be consistent with documentation in eMR. The prescribed IV Pain Protocol opioid is made up to 10mL with sodium chloride 0.9% so that the concentration is as listed in the Paediatric Pain Protocol Opioid Dosage Schedule in Appendix 1.

Paediatric patients may receive a maximum of **five aliquot doses of 1mL.**
The anaesthetist should be consulted to review the paediatric patient prior to further dosing.

5.5 MEDICATION REQUIREMENTS

All medication must be prepared, handled and administered in accordance with NSW Ministry of Health Policy Directives:

- PD2013_043: Medication Handling in NSW Public Health Facilities
- PD2017_013: Infection Prevention and Control
- PD2016_058: User Applied Labelling of Injectable Medicines, Fluids and Lines.

5.6 MEDICATION ADMINISTRATION

All checks for each aliquot are to be checked by two registered nurses who must:

- confirm prescription order
- check paediatric patients identification
- check for allergies
- check patients weight and drug dosage with the prescription order according to Paediatric Pain Protocol Flow chart - Opioid Dosage schedule- Appendix 1
- the prescribed opioid is made up to 10 (ten) mL of sodium chloride 0.9% and labelled as per the PD2016_058: User Applied Labelling of Injectable Medicines, Fluids and Lines
- confirm patency of IV cannula[16]
- ensure compatibility of fluid in progress with opioid medication to be administered
- swab needleless IV access port with alcohol swab[16]
- temporarily occlude flow of fluid in tubing above level of access port
- the IV Paediatric Pain Protocol (**1 mL aliquot**) is to be administered via the closest injection site to the paediatric patient or a three way tap attached to the IV line – except in the

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case of a Clinician Initiated Bolus, when the bolus doses are administered via the PCA pump

- inject **1 mL aliquot** of Pain Protocol as a slow push over at least 30 seconds
- re-establish patency of IV fluid flow
- ensure administration of an appropriate volume to flush the medication following each administration
- replace blunt drawing up needle on syringe end placing in a clean receptacle to maintain ANTT between doses[14]
- observe IV site and paediatric patient, attend observations as per observations and monitoring requirements and observe for adverse reactions[16]

It is the responsibility of the accredited PACU RN for safe storage of the remaining S8 medication between each aliquot. It must be stored in a clean receptacle, at the patient's bedside and must remain in full view of the administering PACU RN.

5.7 OBSERVATIONS and MONITORING

Supervision and monitoring of the paediatric patient during the administration of IV Paediatric Pain Protocol is essential, to monitor for adverse effects (see Adverse Effects of Pain Protocol- **Section 5.9**) of analgesia or ineffective treatment[9]. Adequate numbers of PACU staff are to be allocated to enable close observation - see Line Managers responsibility.

Patients given IV Paediatric Pain Protocol require close and continuous observation because toxicity manifests as sedation, respiratory depression, hypoxia and bradycardia[8, 20].

Monitoring with pulse oximetry must be in place continuously to monitor oxygen saturation and pulse rate. Oxygen should be administered as required by Hudson mask if oxygen saturation falls below 95%.

Take blood pressure (where appropriate) at commencement of pain protocol.

All observations are to be maintained within the normal zones of the age specific Standard Paediatric Observations chart (SPOC) in iVIEW/eMR[18].

Sedation levels, pain score, respiratory rate/effort and heart rate must be assessed and documented prior to each administration of IV Pain Protocol.

Sedation levels, pain score, respiratory rate and effort and heart rate must be assessed and documented three minutes after the administration of each IV Pain Protocol dosage.

At all other times sedation levels, pain score, respiratory rate and effort and oxygen saturations are taken and documented every fifteen minutes.

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5.8 SEDATION SCORING[12]

A sedation score is the most sensitive indicator for clinical deterioration associated with the administration of opioid. Respiratory depression is almost always preceded by increasing sedation. The Paediatric Pain protocol flowchart incorporates the validated paediatric tool, the University of Michigan Sedation Score (UMSS) which describes the following levels of sedation:

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

Observations for sedation scores are documented in iVIEW/eMR under pain assessment so that trends can be monitored and tracked.

All sedation observations are to be maintained within the normal zones of the age specific Standard Paediatric Observations chart (SPOC) in iVIEW/eMR. If a patient's observations enter the blue, yellow or red zones, the appropriate local/emergency response must be followed/activated.

5.9 ADVERSE EFFECTS OF IV PAIN PROTOCOL

- over-sedation
- respiratory depression
- poor pain control
- nausea and vomiting
- urinary retention
- pruritis
- hypotension
- myoclonic jerks or 'startling'.

If adverse events occur manage as per postoperative orders or contact the Anesthetists for immediate patient review.

Should emergency procedures be required these will be activated via the emergency call

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button and managed under Operating Suite emergency response protocols.
Appropriate clinical care for paediatric patients with yellow and red zone observations is[17]:

- ensure oxygen therapy is in progress
- ensure the Anaesthetist is contacted and able to review the patient immediately
- consider intravenous naloxone.

5.10 NALOXONE – (See APPENDIX 3 for dosages)[19]

For moderate sedation with early respiratory depression[19], consider:

- naloxone (child less than 12 years) 1 microgram/kg IV, initially and titrate with further 1 microgram/kg increments every two minutes until the effects of excessive sedation or respiratory depression are reversed.

If the child is unrousable or apnoeic, or in the event of absolute opioid overdose due to medication error, use[19]:

- naloxone (child less than 12 years) five to 10 micrograms/kg IV, every two minutes until the effects of excessive sedation or respiratory depression are reversed. If no response after several doses, review diagnosis and escalate care. If naloxone is required, move the child to a high dependency or intensive care area.

5.11 PAIN MANAGEMENT AND DISCHARGE

Continue to administer IV Paediatric Pain Protocol as per Paediatric Pain Protocol flow chart until pain score is less than three or patient comfort is achieved. Escalation of care is required for assessment of ongoing pain, increased pain or uncontrolled pain.

A paediatric patient may be discharged from PACU after a further 20 minutes of observations is performed following the last administered dose. The patient must not be requiring further doses, exhibiting signs of adverse effects from the opioid and meeting all PACU discharge criteria per the modified Aldrete Discharge Scoring Criteria as referenced by the:

- SESLHDGL/049 - Post Anaesthetic Care Unit (PACU) Discharge Guidelines, Post-Operative Adult and Maternity Patients

5.12 MEDICATION DOCUMENTATION

Document administration of IV Paediatric Pain Protocol in the PRN section eMR/MAR.

Administration of and patient response to opioid must be documented as per the local facility's PACU documentation requirements within eMR.

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The witness to a Schedule 8 medication transaction must be a person who is fully familiar with Schedule 8 medication handling and recording procedures. This would include a Registered Nurse or Registered Midwife, an authorised prescriber, a registered pharmacist, and any other person authorised by the registered nurse/midwife in charge of the patient care area to complete this task, such as an Enrolled nurse[10].

Enrolled Nurses as per the SESLHDPD/160 Medication: Administration by Enrolled Nurses Medication who have been accredited may witness the administration and discarding of Schedule 8 medications.

Witnessing occurs and is documented at the following steps[10]:

- removal of the medication from the Schedule 8 medication storage unit and the recording in the Schedule 8 drug register
- preparation of the medication (as applicable), such as drawing up into a syringe, and labelling, transfer to the patient and first dose administration[10] and at every 1 mL aliquot administration
- discarding and rendering as unusable any unused portion of the medication and recording in the Schedule 8 drug register[10].

6 DOCUMENTATION[21]

In the interests of patient care it is critical that contemporaneous, accurate and complete documentation is maintained as per the NSW Ministry of Health Policy PD2012_069 Health Care Records - Documentation and Management during the course of patient management from arrival to discharge in the:

- SESLHD anaesthetic record
- administration record (MAR) and i V i e w within eMR
- NSW Health Standard Paediatric Observation eMR
- education and training document is recorded in HETI and in local education records.

7 AUDIT

- Schedule 8 Drug Register – monthly
- Medical Key Performance Indicators (KPRs) - monthly
- organisation mandatory training records – annually
- local facility compliance audits
- ims+ data.

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12. NSW Ministry of Health Policy PD2020_018 - Recognition and Management of Patients who are Deteriorating.
13. NSW Ministry of Health Policy PD2017_036 – Infection Prevention and Control Policy.
14. NSW Ministry of Health Policy PD2020_045 – High-Risk Medicines Management.
15. NSW Ministry of Health Guideline PD2019_040 – Intravascular Access Devices (IVAD) Infection Prevention & Control.
16. National Standard for User-Applied Labelling of Injectable Medicines, Fluids and Lines.
17. SESLHDPR/284 - Management of the Deteriorating PAEDIATRIC Patient.
18. SESLHDGL/049 - Post Anaesthetic Care Unit (PACU) Discharge Guidelines, Post-Operative Adult and Maternity Patients.
19. eTG complete by Therapeutic Guidelines.
20. NSW Ministry of Health Guideline GL2018_11- Paediatric Procedural Sedation - Guide for Emergency Departments, Wards, Clinics and Imaging.

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21. NSW Ministry of Health Policy PD2012_069 - Health Care Records - Documentation and Management.

REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
November 2018	DRAFT	SESLHD Paediatric Pain Protocol Working party.
December 2018	DRAFT	Draft for Comment period.
January 2019	DRAFT	Processed by Executive Services prior to Quality Use of Medicines Committee approval.
June 2019	Draft	Approved by Quality use of Medicines Committee pending minor amendment to procedure to include use of procedure at SSEH.
July 2019	Draft	Procedure amended and endorsed by Executive Sponsors. Approved by Clinical and Quality Council. Procedure published.
September 2020	1	Minor review. Risk Rating amended from Extreme to High risk. Review Date amended to align with a High risk rating. Approved by Executive Sponsor.
September 2021	2	Minor review: formatting, hyperlinks and references updated. Approved by Executive Sponsor.
October 2021	3	Approved at Quality Use of Medicines Committee with minor amendments made.

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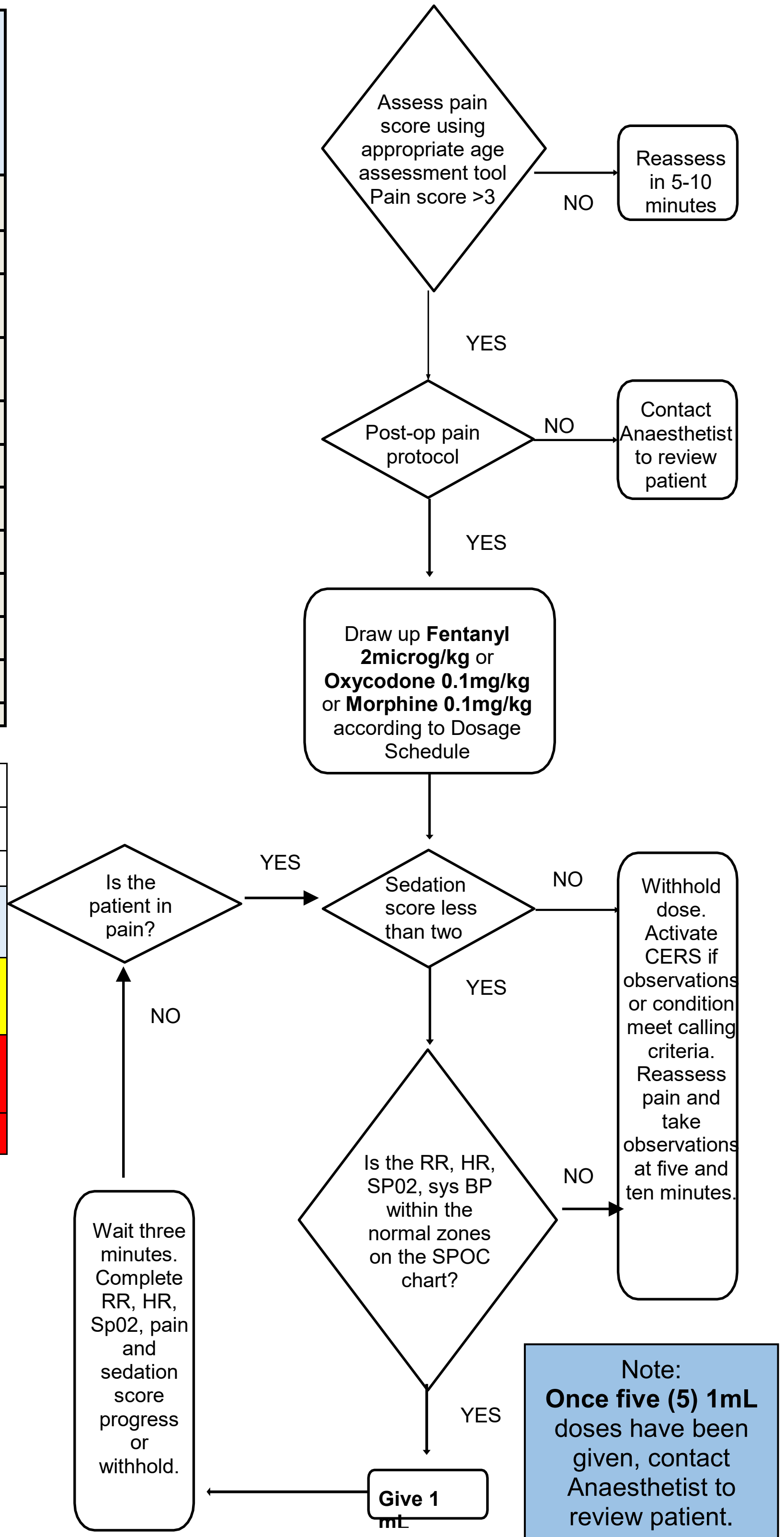
Appendix 1

PAEDIATRIC (greater than 1 year) PAIN PROTOCOL
OPIOID DOSAGE SCHEDULE
Draw up opioid and make up to 10ml with 0.9% sodium chloride.
Only give in 1ml aliquots.

WEIGHT (kg)	FENTANYL (microg)	OXYCODONE (mg)	MORPHINE (mg)
Greater than or equal to 7.5kg and less than 10kg	15	0.75	0.75
Greater than or equal to 10kg and less than 12.5kg	20	1	1
Greater than or equal to 12.5kg and less than 15kg	25	1.3	1.3
Great than or equal to 15kg and less than 20kg	30	1.5	1.5
Greater than or equal to 20kg and less than 25 kg	40	2	2
Greater than or equal to 25kg and less than 30kg	50	2.5	2.5
Great than or equal to 30kg and less than 35kg	60	3	3
Greater than or equal to 35kg and less than 40kg	70	3.5	3.5
Greater than or equal to 40kg and less than 45kg	80	4	4
Greater than or equal to 45kg and less than 50kg	90	4.5	4.5
Greater than 50kg	100	5	5

Table 2. University of Michigan Sedation Scale

Score	Descriptors
0	Awake and alert
1	Minimally sedated: tired/sleepy, appropriate response to verbal conversation and/or sound
2	Moderately sedated: somnolent/sleeping, easily aroused with light tactile stimulation or a simple verbal command
3	Deeply sedated: deep sleep, arousable only with significant physical stimulation
4	Unrousable



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Appendix 2

Choose a pain scoring tool appropriate to the age and the development of the infant or child.

1. **Face, Legs, Activity, Cry, Consolability (FLACC) Scale**

Use for infants or nonverbal children 3 months to 4 years (including cognitively impaired children).

FLACC-R Bold italics are descriptors validated in children with cognitive impairment

	Score 0	Score 1	Score 2
Face	No particular expression or smile	Occasional grimace/frown withdrawn or disinterested, ***appears sad or worried***	Frequent to constant frown, clenched jaw, quivering chin, ***distressed looking face: expression of fright or panic***
Legs	Normal position or relaxed	Uneasy, restless, tense, ***occasional tremors***	Kicking, legs drawn up, ***marked increase in spasticity, constant tremors or jerking***
Activity	Lying quietly, normal position, moves easily	Squirming Shifting back / forth / tense, ***mildly agitated (e.g. head back and forth, aggression), shallow splinting respirations, intermittent sighs***	Arched, rigid or jerking, ***severe agitation, head banging, shivering (not rigors), breath-holding, gasping or sharp intake of breath, severe splinting***
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaints, ***occasional verbal outburst or grunt***	Crying steadily, screams or sobs, frequent complaints, ***repeated outbursts, constant grunting***
Consolability	Content, relaxed	Reassured by occasional touching, hugging or talking to, distractible	Difficult to console or comfort, ***pushing away caregiver, resisting care or comfort measures***
FLACC interpretation – add the scores from each of the five assessments for a score of 0-10			

Merkel SI, Voepel-Lewis, T. Shayevitz, J R. Malviya, S. The FLACC: A behavioural scale for scoring postoperative pain in young children. *Pediatric Nursing*. 1997 May-June; 23(3):293-7.

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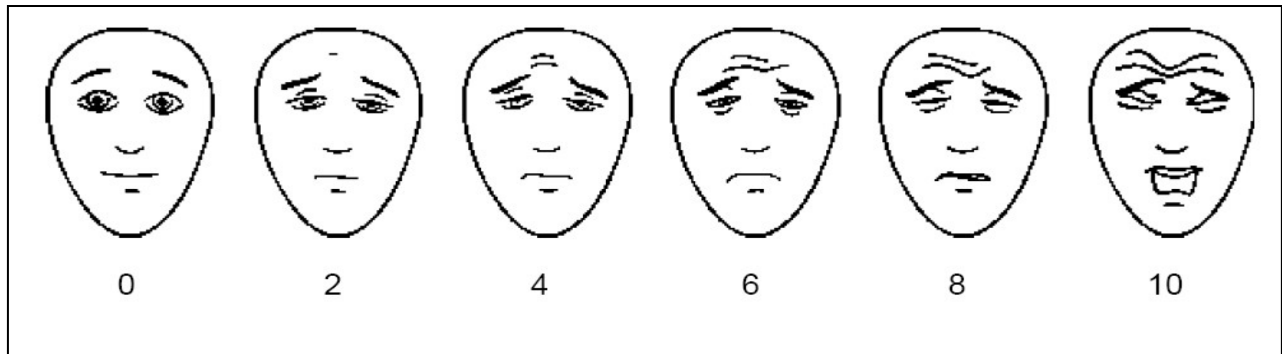
2. Face Pain Scale – Revised (FPS-R)

This score chart is used for non-verbal children > 4 years old.



Faces Pain Scale – Revised, ©2001, International Association for the Study of Pain [www.iasp-pain.org/FPSR]

Instructions:

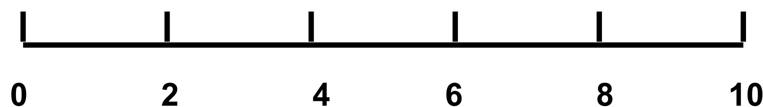
In the following instructions, use the terms "hurt" or "pain," whichever seems right for a particular child:

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

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

3. Visual Analogue Scale Linear Scale

This scale is used for children > 7 years old



0 2 4 6 8 10

Adapted from Scott DA and McDonald WM (2008) Assessment, Measurement and History. In: Textbook of Clinical Pain Management 2E edn. Macintyre PE, Rowbotham D and Walker S (eds). Acute Pain.

Tip: Ask the child to point along the line saying the “0” end is “No Pain” and the “10” end is “Worst Pain”. Don’t ask them “what is their score out of 10” because children want to get 10 out of 10, so just ask them to point at the line.

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APPENDIX 3- Paediatric Naloxone Protocol Dosage Schedule

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Appendix 3

PAEDIATRIC (greater than 1 year) RECOVERY NALOXONE PROTOCOL DOSAGE SCHEDULE Add Naloxone to 10mL with 0.9% sodium chloride. Give 1ml every 2 minutes until the effects of respiratory depression or sedation are reversed. IF APNOEIC OR UNROUSABLE CALL FOR A NAESTHETIC REVIEW IMMEDIATELY and consider immediate 5ml dose of the above.	
WEIGHT (kg)	**Naloxone (microg) in 10 ml NS**
Greater than or equal to 7.5kg and less than 10kg	75
Greater than or equal to 10kg and less than 12.5kg	100
Greater than or equal to 12.5kg and less than 15kg	130
Great than or equal to 15kg and less than 20kg	150
Greater than or equal to 20kg and less than 25 kg	200
Greater than or equal to 25kg and less than 30kg	250
Great than or equal to 30kg and less than 35kg	300
Greater than or equal to 35kg and less than 40kg	350
Greater than or equal to 40kg and less than 45kg	400
Greater than or equal to 45kg and less than 50kg	400
Greater than 50kg	400

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