

# PAIN ASSESSMENT AND MANAGEMENT

## INTRODUCTION

- Discomfort, pain or stress can be associated with routine care and invasive procedures. Babies are unable to report pain, use observational skills and clinical judgment

### Key recommendations

- Routine assessments to detect pain using a validated assessment tool
- Minimise number of painful procedures
- Prevent/reduce acute pain from invasive procedures using non-pharmacological and pharmacological methods
- Anticipate and treat post-operative pain

### Types of pain

Acute pain	Skin-breaking procedures or tissue injury caused by diagnostic or therapeutic interventions
Established pain	Occurs after surgery, localised inflammatory conditions, birth-related trauma
Prolonged/chronic pain	Results from severe diseases e.g. necrotising enterocolitis (NEC), meningitis. Pathological pain state persisting beyond normal tissue healing time

### Symptoms and signs

- Lack of behavioural responses does not exclude pain

Physiological changes	Behavioural changes	Anatomical changes	Body movements
<ul style="list-style-type: none"> <li>• Increase in:                             <ul style="list-style-type: none"> <li>• heart rate</li> <li>• blood pressure</li> <li>• respiratory rate</li> <li>• oxygen consumption</li> <li>• mean airway pressure</li> <li>• muscle tone</li> <li>• intracranial pressure</li> <li>• skin blood flow</li> </ul> </li> <li>• Decrease in:                             <ul style="list-style-type: none"> <li>• oxygen saturation and transcutaneous oxygen levels</li> <li>• Apnoea</li> <li>• shallow breathing</li> <li>• fixed heart rate</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Change in facial expression:                             <ul style="list-style-type: none"> <li>• grimace</li> <li>• brow bulge</li> <li>• eye squeeze</li> <li>• deepening naso-labial furrow</li> <li>• nasal flaring</li> <li>• tongue curving or quivering</li> </ul> </li> <li>• Crying</li> <li>• Whimpering</li> <li>• ‘Silent’ cry (intubated babies)</li> <li>• Decreased sleep</li> <li>• Heightened responses</li> </ul>	<ul style="list-style-type: none"> <li>• Dilated pupils</li> <li>• Sweating</li> <li>• Flushing</li> <li>• Pallor</li> </ul>	<ul style="list-style-type: none"> <li>• Fisting</li> <li>• Tremulousness</li> <li>• Thrashing limbs</li> <li>• Limb withdrawal</li> <li>• Writhing</li> <li>• Arching back</li> <li>• Head banging</li> <li>• Finger splaying</li> <li>• Cycling</li> </ul>

- Sudden pain and distress may indicate acute deterioration e.g. bowel perforation
- Physiological changes cannot be sustained long-term

## PAIN ASSESSMENT

- Assess within 1 hr of admission
- Frequency of further assessments will depend on baby’s clinical condition, underlying diagnosis and pain score (see **Frequency of assessment**)

### Pain assessment tools

- **Separate tools may be needed to assess acute and prolonged pain**
- Use validated pain assessment tools [Pain Assessment Tool (PAT) and Premature Infant Pain Profile (PIPP)]
- See **Abstinence syndrome** guideline for assessment of babies with neonatal abstinence syndrome

### Pain assessment not indicated/unsuitable

Not indicated	Unsuitable
<ul style="list-style-type: none"> <li>Pharmacologically paralysed babies; provide appropriate pain relief</li> </ul>	<ul style="list-style-type: none"> <li>Distress is expected but easily relieved (e.g. ventilated baby requiring suction)</li> <li>For simple, routine procedures e.g. capillary blood sampling</li> <li>second person (parent, nurse or healthcare practitioner to provide support and comfort baby)</li> </ul>

### Use of pain assessment tool

- Note gestational age
- Observe baby's behaviour for 15–30 sec then gently touch baby's limb to determine muscle tone/tension (can be done during routine handling)
- Note:
  - physiological conditions that may influence score (in cyanotic heart disease, baby's colour may score normal unless there is a change in the intensity of the cyanosis or duskiness due to pain)
  - medications that may affect behaviour or physiological responses
  - environmental triggers (sudden bright lights, noise, activity) may cause a stress response. Document on chart or in notes at time of score
- When score is above tool's recommended thresholds, initiate comfort measures or analgesia

### Frequency of assessment

- All babies** to have pain assessment within 1 hr of admission; score generated will dictate frequency of assessment
- Intensive care:** hourly with observations
- High dependency:** 4-hrly or if signs of distress/discomfort
- Special care:** as condition dictates or subsequently if signs of distress/discomfort
- Post-operatively:** hourly for first 8 hr, then 4-hrly until 48 hr post-op (more frequently if signs of distress/discomfort)

## PAIN MANAGEMENT

### Indications

- Birth trauma
- Iatrogenic injury
- Before, during and after **any** painful procedure
- Severe illness e.g. NEC, meningitis
- To aid ventilation
- Preparation for transfer if ventilated
- Babies undergoing therapeutic hypothermia
- Post-operatively
- End-of-life care
- Formal assessment indicates pain
- If non-pharmacological techniques are ineffective or not appropriate, progress to pharmacological agents (e.g. post-surgery, severe illness, major injury, congenital malformations and palliative care)

### Non-pharmacological pain relief

- Gently repositioning baby
- Light swaddling (blanket/nest), prolonged restrictive swaddling may be associated with increased risk of developmental hip dysplasia
- Comfort/containment holding
- Reducing light, noise, and activity around baby
- Soothing voice
- Nappy change
- Non-nutritive sucking (NNS) (dummy or gloved finger) [see **Non-nutritive sucking (NNS)** guideline]
- Kangaroo care (see **Kangaroo care** guideline)
- Breastfeed (see **Breastfeeding** guideline)
- Sucrose
- Mother's expressed breast milk (MEBM) – no additives

**Reassess after 30 min**

- If pain score in upper range, institute comfort measures and administer prescribed analgesia/seek medical review
- If score continues to rise, consider increasing dose of analgesia and reassess after 30 min
- if clinical concerns – medical review
- If score constantly below baseline and analgesia maintained, reduce dosage
- Record effectiveness of pain management in care plan

**Sucrose**

- Sucrose 24% solution and breast milk provide a quick, short-term analgesic effect (given orally)
- NNS increases effectiveness
- Use in conjunction with environmental and behavioural measures to relieve pain (e.g. positioning, swaddling, containment holding, kangaroo care)
- may be given to ventilated babies with care

**Contraindications to sucrose**

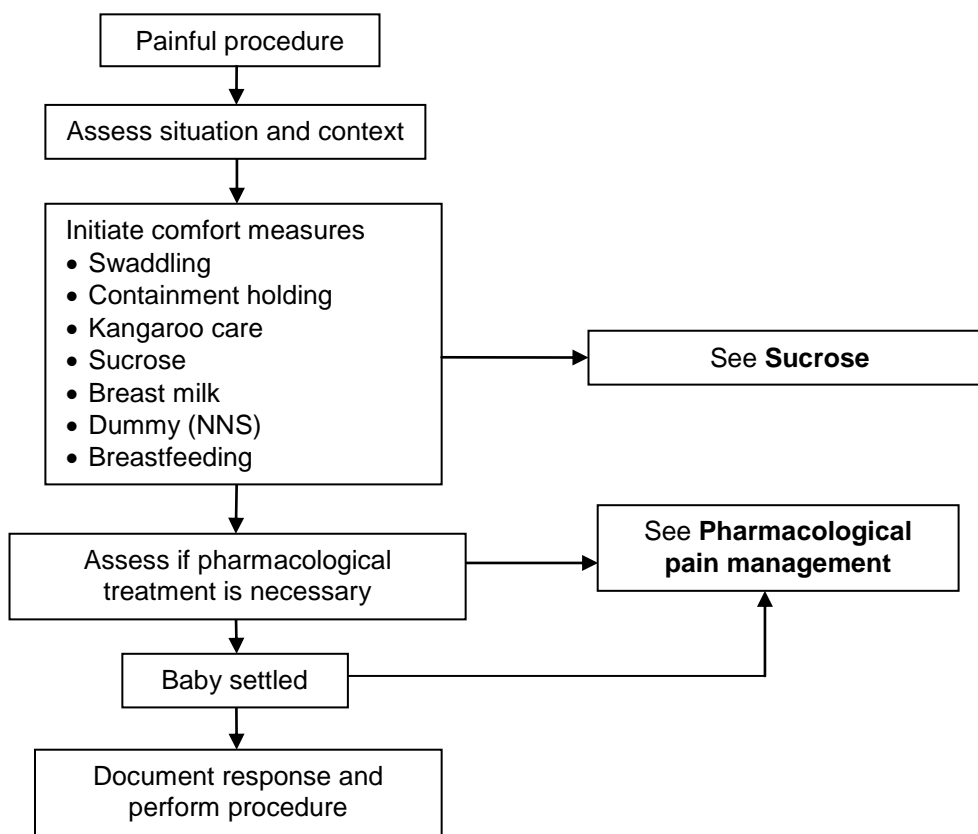
Do not use	May not be effective
<ul style="list-style-type: none"> <li>• &lt;28 weeks' gestation – use MEBM</li> <li>• High risk of NEC – use MEBM</li> <li>• Nil-by-mouth (if due to surgical problem, sucrose may be appropriate, discuss with surgeon)</li> <li>• Sedated or on other pain medications</li> <li>• Diabetic mother (until blood glucose stabilised)</li> <li>• Known carbohydrate malabsorption or enzyme deficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Baby with neonatal abstinence syndrome</li> <li>• Baby just been fed</li> <li>• Exposed to chronic in-utero stress</li> <li>• &gt;6 months</li> </ul>

**Administration**

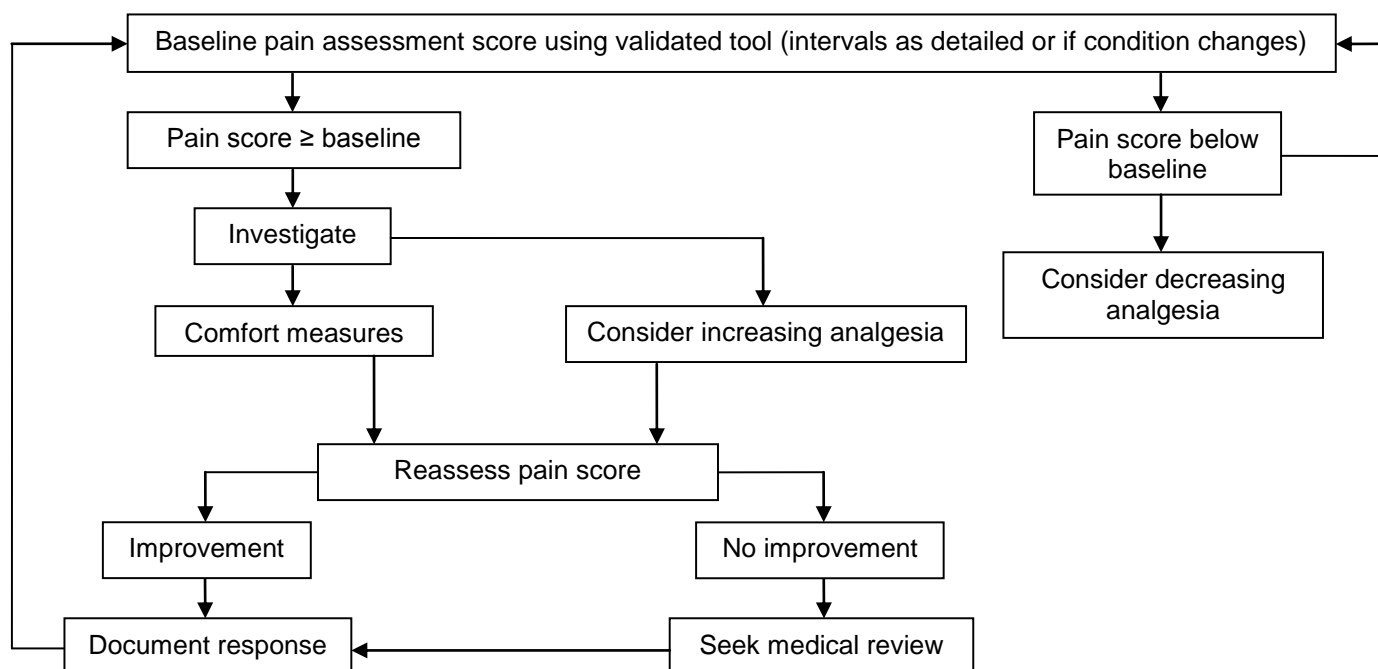
- Use commercially available sucrose 24% solution and follow manufacturer's guidelines regarding storage and use
- Maximum 8 doses in 24 hr
- Avoid risk of choking/aspiration – ensure baby is awake
- Drop dose onto tongue, buccal membrane, or dummy and **wait 2 min** before starting procedure
- For procedures lasting >5 min, repeat dose (maximum 2 further doses)
- Continue environmental and behavioural management strategies during procedure
- Observe baby's cues and allow 'time-out' to recover
- Document administration of sucrose as per local policy

Gestation	Dose of sucrose 24%
28 <sup>+0</sup> –30 <sup>+6</sup> weeks	0.1 mL (max 0.3 mL per procedure)
≥31 <sup>+0</sup> weeks and 1000–2000 g	0.2 mL (max 0.6 mL per procedure)
>2000 g	0.5 mL (max 1.5 mL per procedure)

### Management of procedural pain



### Management of prolonged or chronic pain



### Pharmacological pain management

- Give medication in conjunction with non-pharmacological measures
- The following drugs may be useful:
  - diamorphine
  - fentanyl
  - morphine
  - paracetamol
- Details of these drugs can be found in the **Neonatal Formulary**

**Suggested medication for procedures**

***Specific situations***

<b>Non-urgent endotracheal intubation</b>	<b>Mechanical ventilation</b>	<b>Chest drain insertion</b>	<b>CT/MR imaging</b>	<b>Laser therapy for ROP</b>	<b>Therapeutic hypothermia</b>
<ul style="list-style-type: none"> <li>• Fentanyl</li> <li>• Atropine</li> <li>• Suxamethonium</li> </ul>	<ul style="list-style-type: none"> <li>• Morphine/diamorphine continuous infusion</li> </ul>	<ul style="list-style-type: none"> <li>• Morphine/diamorphine IV</li> <li>• Lidocaine SC</li> </ul>	<ul style="list-style-type: none"> <li>• Sedation may be unnecessary if baby fed and swaddled</li> <li>• Chloral hydrate</li> <li>• Midazolam IV/buccal/intranasal</li> </ul>	<ul style="list-style-type: none"> <li>• Morphine/diamorphine continuous infusion</li> </ul>	

***Simple surgical procedures***

<b>Abdominal drain insertion</b>	<b>Broviac line removal</b>	<b>Wound dressing/drain removal</b>	<b>Application of silo bag for gastroschisis</b>
<ul style="list-style-type: none"> <li>• Morphine/diamorphine continuous infusion</li> <li>• Lidocaine SC</li> </ul>	<ul style="list-style-type: none"> <li>• Paracetamol oral/rectal</li> <li>• Lidocaine SC</li> <li>• Sucrose</li> </ul>	<ul style="list-style-type: none"> <li>• Paracetamol oral/rectal</li> <li>• Sucrose</li> </ul>	<ul style="list-style-type: none"> <li>• Paracetamol rectal</li> </ul>