

PAIN AND STRESS

RECOGNITION AND ASSESSMENT

Symptoms and signs

Distinguish signs of pain and stress from signs of life-threatening conditions, such as hypoxia, seizures or CO₂ retention, which require other forms of management

A lack of behavioural responses (e.g. crying and movement) does not necessarily indicate a lack of pain

Behavioural

- Crying, whimpering
- Facial expressions:
 - brow bulge
 - eye squeeze
 - deepening of nasolabial folds
- Active movement and attempts to withdraw from the painful stimulus:
 - thrashing
 - tremulousness
 - limb withdrawal, flexion
 - cycling movements
 - arching
- Flexor reflexes; leg withdrawal
- Exaggerated reactivity
- Decreased sleep periods

Physiological

- Changes in heart rate and variability
- Respiratory rate and quality
- Fluctuations in blood pressure – up or down
- Decreased transcutaneous oxygen and carbon dioxide levels
- Oxygen desaturation
- Palmar sweat
- Pallor
- Flushing

Indications for pain management

- Before painful procedures:
 - insertion of long lines
 - intubation and IPPV
 - LP
 - insertion of chest drain
 - venous sampling/access
- In response to behavioural changes
- To aid ventilation:
 - respirations out of synchrony with the ventilator
 - pulmonary hypertension
- In infants with raised ICP

NON-PHARMACOLOGICAL PAIN MANAGEMENT

- Non-nutritive sucking
- Swaddling
- Distraction
- Dummy
- Calming
- Tactile stimulation
- Rocking

- Expressed breast milk
- Skin-to-skin care

PRINCIPLES OF ANALGESIA

- Prophylactic or symptomatic
- Use stepwise approach with agents of increasing potency

ANALGESIA FOR NON-VENTILATED INFANTS

Sucrose

Activates opioid systems that provide natural analgesia and is recognised as an appropriate analgesia for newborn babies during some painful procedures

Contraindicated in unstable babies

Indications

- Heel pricks for blood sampling
- Cannulation and venous sampling
- Ventricular tap

Use

- Use sucrose in conjunction with other non pharmacological methods such as:
 - dummy
 - hands-on comforting
 - swaddling
 - performing procedure in a quiet environment
- Use sucrose solution (e.g. Sweet-Ease 24% or Hypostop 40%)
 - preterm baby – 0.1-0.5 mL repeated as necessary
 - term baby – 2 mL in repeated doses as necessary at 5 min intervals to a maximum of 3 doses per procedure
- Give first dose 2 min before procedure by one of following methods:
 - dip cotton bud into solution and wipe around baby's mouth
 - dip dummy into solution and give to baby
 - via syringe

Topical pain relief

- Lidocaine (plain, not with adrenaline) 1% 0.3 mL/kg maximum per dose effective as a topical anaesthesia

Avoid EMLA cream – evidence of efficacy in neonate is inconsistent

Paracetamol

- Orally or rectally – absorbed more quickly if given via oral route
- oral dosage

Gestation	Loading dose	Maintenance	Max daily dose
>32 weeks	24 mg/kg	12 mg/kg 4 hrly	60 mg/kg
<32 weeks	24 mg/kg	12 mg/kg 8 hrly	30 mg/kg

- rectal dosage

Loading dose	Maintenance
36 mg/kg	24 mg/kg 8 hrly

- Whichever route is used, treatment is for maximum of 3 days. Total daily dose not to exceed 60 mg/kg

Oramorph

- Particularly useful for chronic pain relief and for terminal care

- Large doses such as 100 micrograms/kg 4 hrly can cause hypotension and respiratory depression

ANALGESIA FOR VENTILATED INFANTS

Either diamorphine or morphine may be used in addition to agents used for **non-ventilated Infants**

Diamorphine

- Loading dose 50 microgram/kg IV
- Maintenance 15 microgram/kg/hour IVI
- Larger doses than this are no more effective but are associated with more adverse effects
- Effects can be reversed by naloxone 10 microgram/kg IV as a bolus

Morphine

- Loading dose 50 microgram/kg IV
- Maintenance 5 microgram/kg/hour IV
- Can cause hypotension, bradycardia and respiratory depression
- Half life between 1 and 6 hr – increases with decreasing gestational age
- Effects can be reversed by naloxone 10 microgram/kg IV as a bolus

SEDATION

Sedation has no analgesic effect. Always use in conjunction with appropriate analgesia

Chloral hydrate

- Can be useful in irritable fatigued child/cerebral irritation
- Has long half life and can accumulate, leading to hypotension and respiratory depression
- single dose treatment – 45 mg/kg (75 mg/kg for term infants) oral
- sustained sedation – 30 mg/kg 6 hrly oral

PAIN RELIEF DURING SPECIFIC PROCEDURES

Heel prick

- Dip a dummy in sucrose solution
- Breastfeeding during procedures – caution in poor feeders; try to avoid association between feeding and pain
- Control and swaddling to restrict physical movements (by parent or nurse)

Chest drain insertion

- Secure local anaesthesia using lidocaine ± systemic analgesia