Neonatal stabilisation for retrieval

Clinical Guideline Presentation

45 minutes  
Towards CPD Hours
Objectives

- Describe the indications for transfer/retrieval
- Identify principles of resuscitation and stabilisation
- Outline deterioration prevention
- Outline parental support requirements
Indications for retrieval

**Antenatal**
- Congenital abnormality, multiple birth, fetal growth restriction, preterm labour, prolonged rupture of membranes

**Postnatal**
- Low birth weight, respiratory conditions, seizures, HIE, hypoglycaemia, sepsis, conditions requiring specialty management
Contact

• Retrieval Services early for:
  ◦ Advice and/or
  ◦ Retrieval

• Retrieval team may be activated prior to the baby’s birth
Stabilisation principles

- Identify baby’s immediate needs
- Establish and maintain communication with parents
- Identify and initiate diagnostic investigations
- Stabilise and prevent deterioration
Anticipate and plan

1. Identify risks
2. Assess clinical service capabilities
3. Contact RSQ early
4. Prepare for possible arrival of preterm delivery
Initial resuscitation and stabilisation

Critical for preterm baby’s long term outcomes

Risk of mortality and morbidity:
• Increases with decreasing gestational age
• Higher amongst babies born outside of a perinatal tertiary centre
Resuscitation

Be prepared for all births

- Staff-skilled in neonatal resuscitation, familiar with equipment
- Equipment—complete, operational and available for all births
- Environment—increased room temperature if preterm, preheated overhead radiant warmer, blankets and hat, plastic wrap
Thermoregulation

Normal temperature 36.5 to 37.5°C

Preterm babies (especially < 28 weeks) require additional measures to prevent heat loss

- Prewarm environment and equipment:
  - Birth room (26°C)
  - Radiant warmer in draft free position
  - Hat and sheets/blankets
  - Use polyethylene bag/plastic wrap
Signs of respiratory distress

- Tachypnoea
- Chest recession
  - Sternal, intercostal or subcostal
- Nasal flaring
- Audible expiratory grunt
- Oxygen requirement > 30%
Respiratory support

Delivered by

- Bag and mask
- T-piece device
- Self-inflating bag
- Flow-inflating bag with manometer
- Bubble
- Ventilator
Continuous positive airway pressure (CPAP)

Indications to commence:
- Spontaneous respirations
- Signs of respiratory distress
- Oxygen requirement > 30%
When CPAP is commenced

- Commence at 6–8 cm H$_2$O
- Set flow at lowest level to achieve pressure
- Deliver warm humidified air/oxygen mix (37°C)
- Deliver oxygen to maintain target oxygen saturations
Intermittent positive pressure ventilation

**Signs of requiring IPPV**
- No or sustained spontaneous respirations
- Signs of respiratory distress increasing
- Requiring CPAP of 8 cm H20
- Oxygen requirement > 50%
- Gas exchange poor
- Blood gas:
  - pH < 7.25 and
  - PaCO2 > 60 mmHg

**Intubate baby and commence IPPV**
- Pressures:
  - PIP 18–20 cm H20
  - PEEP 6–8 cm H20
  - Inspiratory time 0.3–0.4 seconds
  - Rate 40–60 breaths per minute
  - Oxygen concentration to maintain target oxygen saturations
- Settings may require adjustment
  - To achieve physiological chest

**Surfactant**
- Consider if baby has:
  - Respiratory distress requiring IPPV in first 24 hours of life
  - ≤ 32 weeks gestation
  - Has hyaline membrane disease
  - Warm to room temperature prior to administration via ETT
  - Continue to provide IPPV until retrieval team arrives
Clinical support

All babies requiring transfer/retrieval require:

- Intravascular access
  - Commence glucose 10% IV maintenance fluids
  - $\leq 28$ weeks skin preparation—aqueous chlorhexidine 0.1%
- Nil by mouth
  - Gastric tube–free drainage and aspirate 4 hourly
Fluid requirements

Infusion:
- Glucose 10% IV
- Include all fluids infused (maintenance and support medicines)

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>&gt;Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preterm</strong> mL/kg/day</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>120</td>
<td>120 maximum</td>
</tr>
<tr>
<td><strong>Term</strong> mL/kg/day</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>120 maximum</td>
</tr>
</tbody>
</table>
Glucose monitoring

Maintain blood glucose levels ≥ 2.6 mmol/L

Measure

When IV access obtained
If ≥ 2.6 mmol/L:
• Repeat at 2 and 4 hours of age
• Continue 4 hourly

If < 2.6 mmol/L refer to Guideline
Investigations

Suspect sepsis in all unwell babies

- Collect
  - Full blood count
  - Blood cultures
- Commence antibiotics
- Chest X-ray
- Other investigations as indicated
  - Blood gas analysis if requiring respiratory support
Observations and monitoring

- Monitor continuously—heart rate, respirations and oxygen saturations
- Document vital signs hourly—increase if abnormal
- Blood pressure—hourly
- Temperature
  - Skin—continuous (if available)
  - Per axilla—4 hourly if within normal limits
Oxygen saturations

• Position oxygen saturation sensor preductal—right hand or arm
• Target oxygen saturations
  o Term: 92–98%
  o Preterm: 90–95%
Cardiovascular compromise

Management will vary according to underlying pathophysiology

Clinical signs
- Hypotension
- Mean arterial blood pressure is < gestational age in weeks
- Pallor/mottled skin
- Tachycardia
- Capillary refill prolonged (> 2 seconds)—measure on sternum or head
- Metabolic acidosis
- Blood loss

Treatment
- Volume expander—0.9% sodium chloride 10 mL/kg IV or UVC
- May be repeated—discuss with retrieval medical coordinator

Blood loss
- If known
  - Use CMV negative, irradiated and cross matched blood
  - If unavailable use emergency O Rh negative blood

Caution
Avoid rapid infusion

If hypotension persists
Consider inotrope support
Hypoxic-ischemic encephalopathy

Improved outcome if treatment includes therapeutic hypothermia

Contact RSQ for advice when baby:

- Has abnormal neurological assessment
- ≥ 35 weeks
- ≥ 1800 grams
- < 6 hours of age
- Full care is planned
Pain management

**Aim:** To minimise pain during procedures and to assist baby to cope and recover

**Administer**
Analgesia, sedation and comfort measures appropriate to the intervention

**Nonpharmacological**
Breast milk, skin to skin contact, non-nutritive suck, swaddling/containment, noise and light reduction

**Pharmacological**
Oral sucrose, paracetamol, morphine, midazolam, local anaesthetic
## While waiting for the retrieval team

<table>
<thead>
<tr>
<th>Clinical</th>
<th>Developmental</th>
<th>Hygiene and comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IV access</td>
<td>• Position baby to provide:</td>
<td>• Perform 4 to 6 hourly:</td>
</tr>
<tr>
<td>• Commence IV fluids</td>
<td>- Flexion</td>
<td>- Nappy change</td>
</tr>
<tr>
<td>• NBM</td>
<td>- Containment</td>
<td>- Mouth care</td>
</tr>
<tr>
<td>• Gastric tube</td>
<td>- Midline alignment</td>
<td>- Position change</td>
</tr>
<tr>
<td>- Free drainage</td>
<td>• Reduce noise and light</td>
<td>- Oxygen saturation sensor repositioning</td>
</tr>
<tr>
<td>- Aspirate 4 to 6 hourly</td>
<td>• Encourage parental contact</td>
<td></td>
</tr>
</tbody>
</table>

Queensland Clinical Guidelines: Neonatal stabilisation for retrieval
Retrieval team

On arrival the retrieval team will require:

- Clinical handover
- Space and power points for retrieval cot
- Air and oxygen supply
- Procedure trolley
- Assistance until departure
- 2 copies of documentation
- Expressed breast milk-labelled and packed in esky
Parents

- Encourage early contact with baby
- Communication—keep informed, provide brochures
- Photographs
- Accommodation—assist with arrangements
- Refer to Social Worker