

# Neonatal stabilisation for retrieval V6

Clinical Guideline Presentation



45 minutes

Towards CPD Hours

## References:

Queensland Clinical Guideline: Neonatal stabilisation for retrieval is the primary reference for this package.

## Recommended citation:

Queensland Clinical Guidelines. Neonatal stabilisation for retrieval clinical guideline education presentation E23.18-1-V6-R28. Queensland Health. 2023.

## Disclaimer:

This presentation is an implementation tool and should be used in conjunction with the published guideline. This information does not supersede or replace the guideline. Consult the guideline for further information and references.

## Feedback and contact details:

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# Objectives

- Outline the indications for neonatal transfer/retrieval
- Identify the principles of neonatal stabilisation and resuscitation
- Identify and manage deterioration
- Outline parental support recommendations

# Abbreviations

<b>BGL</b>	Blood glucose level	<b>PEEP</b>	Positive end expiratory pressure
<b>CPAP</b>	Continuous positive airway pressure	<b>PIP</b>	Peak inspiratory pressure
<b>ECG</b>	Electrocardiogram	<b>PIVC</b>	Peripheral intravenous access
<b>ETT</b>	Endotracheal tube	<b>RSI</b>	Rapid sequence induction
<b>FBC</b>	Full blood count	<b>RSQ</b>	Retrieval Services Queensland
<b>HIE</b>	Hypoxic ischaemic encephalopathy	<b>SpO<sub>2</sub></b>	Capillary peripheral oxygen saturation
<b>IPPV</b>	Intermittent positive pressure ventilation	<b>UVC</b>	Umbilical vein catheter
<b>IV</b>	Intravascular	<b>≤</b>	Less than or equal to
<b>LBW</b>	Low birth weight	<b>&lt;</b>	Less than
<b>NBM</b>	Nil by mouth	<b>&gt;</b>	Greater than

# Indications for transfer/retrieval

Transfer or retrieval may be indicated when the clinical care of the baby exceeds the capability of the local facility

## Antenatal considerations

### Fetal

- Congenital anomaly
- Multiple pregnancy
- Fetal growth restriction



### Maternal

- Preterm labour
- Antepartum haemorrhage
- Prelabour rupture of membranes

# Indications for transfer/retrieval

## Postnatal considerations:

- Apgar  $\leq 6$  at 5 mins of age
- Prematurity or low birth weight (LBW)
- Respiratory conditions
- Seizures
- Hypoxic ischaemic encephalopathy (HIE)
- Hypoglycaemia
- Sepsis
- Persistent hypothermia
- Conditions requiring specialty management

# Retrieval Services Queensland (RSQ)

Contact **RSQ** *early* to speak to the coordinating neonatologist (or obstetrician) for:

- **Advice** and/or
- **Retrieval/transfer of pregnant woman or baby**

*Note: Depending on the circumstance, the neonatal retrieval team may be activated prior to the baby's birth*

# Neonatal stabilisation principles





# Anticipate and plan

**Initial management is critical for long term outcomes**



**Identify risks and make a plan**



**Assess clinical service capability**



**Prepare for birth of preterm or unwell neonate**



**Call RSQ for advice and/or support early**

# Resuscitation



## Preparation is KEY



### Staff

- Skilled in neonatal resuscitation
- Familiar with equipment
- Roles allocated

### Equipment

- Checked, complete and operational
- Appropriately sized and readily available
- Refer to 'Neonatal resuscitation trolley checklist'

### Environment

- Free from clutter
- Preheated overhead radiant warmer—in a draft free position
- Warmed room—increase temperature if indicated (e.g. preterm baby)

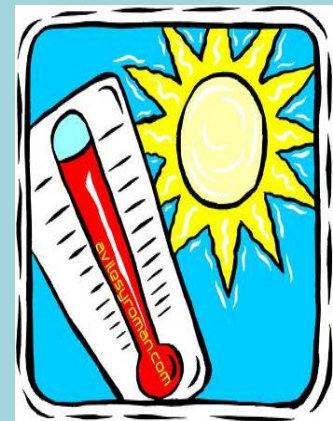
# Thermoregulation

Normal temperature 36.5 °C - 37.5 °C

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

## Considerations:

- *Prewarm environment and equipment*
  - Birth room (26 °C)
  - Radiant warmer
  - Blankets and hat
  - Polyethylene bag or sheet
  - Humidified respiratory support (if available)
- *Check baby's temperature to ensure remains normothermic*



# Signs of respiratory distress



## Increased work of breathing

- Tachypnoea
- Apnoeic episode/s
- Chest recession (sternal, intercostal or subcostal)
- Nasal flaring
- Audible expiratory grunt



## Oxygen requirement

- > 30% to maintain SpO<sub>2</sub>

**Respiratory distress is an indication that continuous positive airways pressure (CPAP) may be required**

# Commencing CPAP



Commence CPAP at 6–8 cm H<sub>2</sub>O



Set **flow** at lowest level to achieve pressure



Deliver warm humidified air/oxygen mix (37 °C)



Deliver oxygen to maintain target oxygen saturations

# CPAP

## CPAP can be delivered by:

- Flow-inflating bag and mask
- T-piece device and mask
- Bi-nasal prongs
- Single nasopharyngeal tube
- Nasal mask
- Bubble CPAP device
- Ventilator



Refer to Queensland Clinical Guidelines - *Respiratory distress and CPAP*

# Indications for IPPV

No spontaneous respirations OR  
spontaneous respirations not sustained

Increased or worsening signs of respiratory  
distress  
(while on CPAP 8 cm H<sub>2</sub>O)

Oxygen requirement > 40%

Poor gas exchange

Blood gas pH < 7.25 and/or PaCO<sub>2</sub> > 60 mmHg

# Intubation and ventilation

Consider difficult airway plan

Consider rapid sequence induction (RSI)

Use appropriate size and depth of endotracheal tube (ETT)

Provide warmed humidified gases at 37 °C

Set pressures:

- Positive inspiratory pressure (PIP) 18–20 cmH<sub>2</sub>O
- Positive end expiratory pressure (PEEP) 6–8 cmH<sub>2</sub>O

Set inspiratory time 0.3–0.4 seconds

Adjust rate 40–60 breaths per minute

Deliver oxygen concentration to maintain target oxygen saturations

Adjust settings to achieve physiological chest movement



# Surfactant

- Consider if baby:
  - Has signs of respiratory distress requiring IPPV in the first 24 hours of life
  - Is  $\leq$  32 weeks gestation
  - Has respiratory distress syndrome
- Warm to room temperature prior to administration via ETT
- Continue to provide IPPV until retrieval team arrive

# Clinical support

## All babies requiring retrieval/transfer require:

### Intravascular access

- Skin preparation for babies  $\leq 28$  weeks and/or  $\leq 1000$  grams—use aqueous chlorhexidine 0.1% (if available)
- Commence IV maintenance fluids—glucose 10%

### Nil by mouth (as advised)

- Insert gastric tube size 6 or 8 Fr (orogastric if respiratory distress)
  - Leave on free drainage
  - Aspirate 4-6 hourly (unless otherwise indicated)

### Developmental care and comfort

- Consider developmental care—positioning, handling, environmental stimuli and encourage parental contact

# Fluid requirements

Commence IV maintenance infusion:

- Glucose 10%
- Total fluid intake to include all fluids infused (maintenance and support medicines)

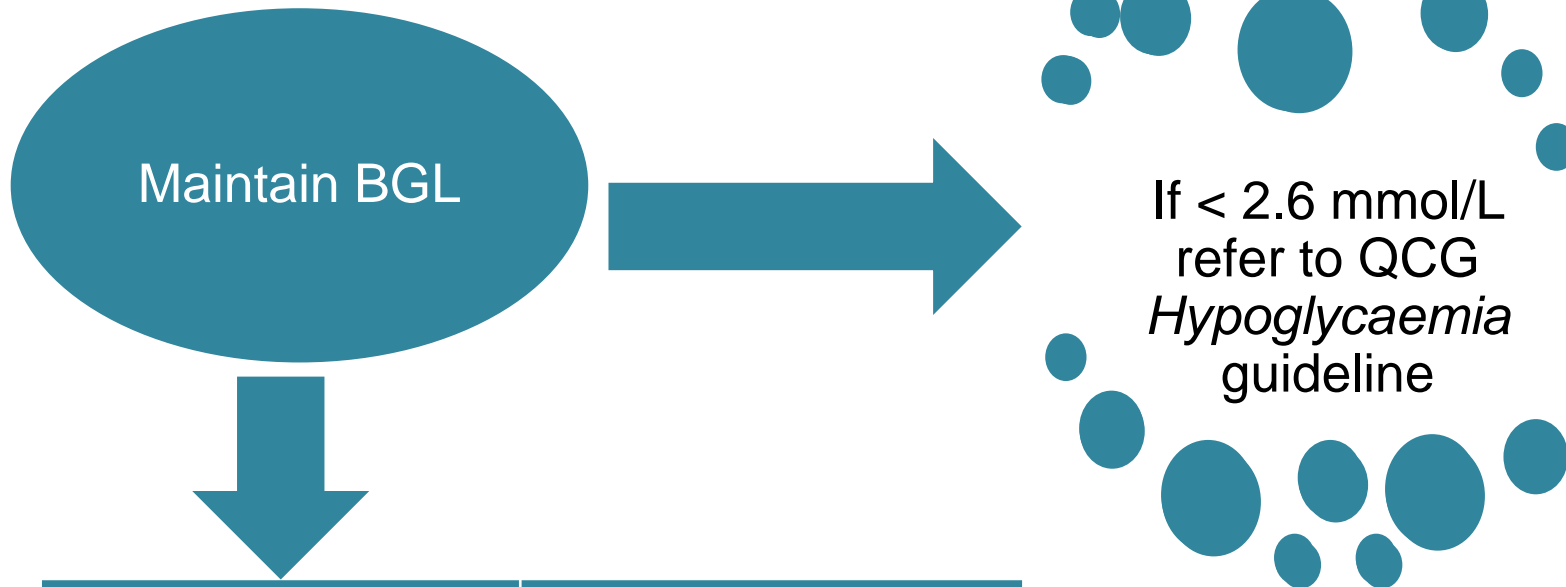


	Day 1	Day 2	Day 3	Day 4	> Day 5
<b>Preterm</b> mL/kg/day	80	100	120	120	120 maximum
<b>Term</b> mL/kg/day	60	80	100	120	120 maximum

*Note: If the baby is older than 24 hours—consider sodium levels and weight gain/loss*

# BGL monitoring

**Measure** when IV access obtained



Hours of age	Target BGL (mmol/L)
0–48 hours	2.6 or more
After 48 hours to 96 hours	3.0 or more
After 96 hours	3.5 or more

**Refer to Queensland Clinical Guideline *Hypoglycaemia—newborn***

# Investigations

## Suspect *sepsis* in all unwell babies

- Collect:
  - Blood culture (1 mL if possible)
  - Full blood count
- Commence antibiotics as soon as possible
  - If sepsis is clinically suspected and unable to gain IV/UVC access, consider administering antibiotics by intramuscular (IM) injection
- Chest X-ray
- Other investigations as indicated
  - Blood gas analysis



Note: If unable to collect blood culture or FBC, do not delay administration of antibiotics

# Observations and monitoring



## **Monitor continuously:**

Heart rate, respirations, oxygen saturations



## **Document vital signs:**

Hourly (or more frequently if clinically indicated)



## **Blood pressure:**

Baseline (and as clinically indicated)



## **Temperature:**

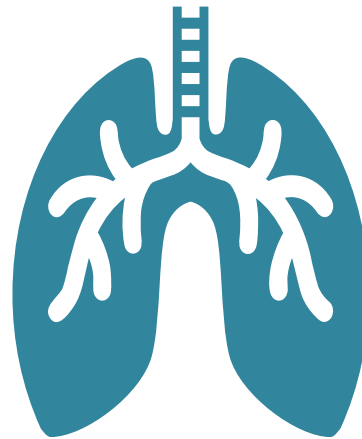
Skin—continuous (if available)

Per axilla—at least 4 hourly (if within normal limits)

# Oxygen saturations



**Preductal** oxygen saturation sensor (right hand or arm)



**Monitor** oxygen requirements



**Target** oxygen saturations

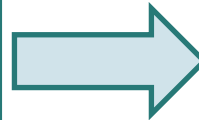
- Term: 92–98%
- Preterm: 90–95%

# Cardiovascular compromise

Management will vary according to underlying pathophysiology

## Clinical signs

- Hypotension (if mean arterial BP < gestational age in weeks)
- Pallor/mottled skin
- Tachycardia
- Central capillary refill > 2 seconds
- Metabolic acidosis
- Blood loss
- Decreased urine output



## Treatment

- Volume expander
  - 0.9% sodium chloride 10 mL/kg IV or UVC
- If required, discuss repeat dose/s with neonatologist
- Continue maintenance fluids

## Blood loss

- Use CMV negative, irradiated, cross matched blood
  - If unavailable, use emergency O Rh negative blood

**⚠ Caution:** Avoid rapid infusion in preterm baby

If hypotension persists, **contact RSQ** for advice from a neonatologist. Inotropic support may be required.



# Hypoxic-ischemic encephalopathy (HIE)

HIE often presents as an abnormal neurological assessment

- Reduced level of consciousness
- Seizures
- Difficulty in initiating and maintaining respiration
- Depression of tone and reflexes

If HIE is suspected

- Contact RSQ immediately to speak with a neonatologist for advice
- Commence hourly SARNAT scoring as soon as possible after birth until 6 hours of age

Criteria for therapeutic cooling

- Evidence of perinatal/intrapartum hypoxia
- $\geq 35$  weeks
- $\geq 1800$  grams
- $< 6$  hours of age

**Improved outcome if treatment includes therapeutic hypothermia**



# Pain management

**Aim:** To minimise pain during procedures and to assist baby 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
- Local anaesthetic

# While waiting for the retrieval team

## Clinical

- IV access
- Commence IV fluids
- NBM
- Gastric tube
  - Free drainage
  - Aspirate 4–6 hourly

## Developmental

- Position baby to provide:
  - Flexion
  - Containment
  - Midline alignment
- Reduce noise and light
- Encourage parental contact

## Hygiene and comfort

- Perform 4–6 hourly:
  - Nappy change
  - Mouth care
  - Position change
  - Oxygen saturation sensor repositioning

# 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
- EBM-labelled and packed in esky
- Amenities +/- refreshments



# Parents



- Encourage early contact with baby
- Communication—keep informed, provide brochures
- Photographs
- Accommodation—assist with arrangements
- Refer to:
  - Social work service
  - Interpreter service
  - Indigenous Hospital Liaison Officer (IHLO)

