

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.

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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

BGL	Blood glucose level	PEEP	Positive end expiratory pressure
CPAP	Continuous positive airway pressure	PIP	Peak inspiratory pressure
ECG	Electrocardiogram	PIVC	Peripheral intravenous access
ETT	Endotracheal tube	RSI	Rapid sequence induction
FBC	Full blood count	RSQ	Retrieval Services Queensland
HIE	Hypoxic ischaemic encephalopathy	SpO₂	Capillary peripheral oxygen saturation
IPPV	Intermittent positive pressure ventilation	UVC	Umbilical vein catheter
IV	Intravascular	≤	Less than or equal to
LBW	Low birth weight	<	Less than
NBM	Nil by mouth	>	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 ≤ 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)

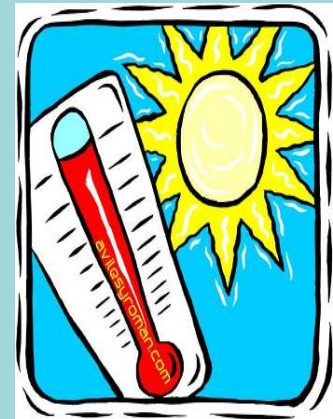
Thermoregulation

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 SpO₂

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

Commencing CPAP



Commence CPAP at 6–8 cm H₂O



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 H₂O)

Oxygen requirement > 40%

Poor gas exchange

Blood gas pH < 7.25 and/or PaCO₂ > 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 cmH₂O
- Positive end expiratory pressure (PEEP) 6–8 cmH₂O

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 ≤ 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 ≤ 28 weeks and/or ≤ 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)
 - o Leave on free drainage
 - o 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)

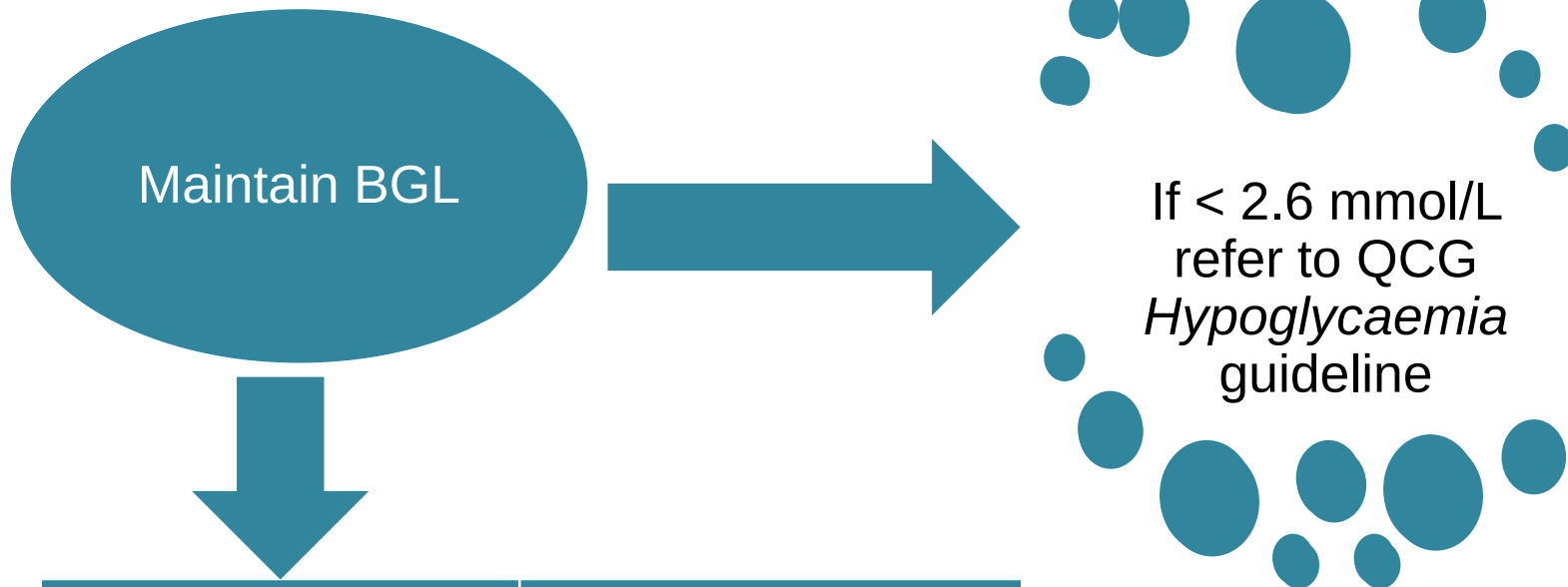


	Day 1	Day 2	Day 3	Day 4	> Day 5
Preterm mL/kg/day	80	100	120	120	120 maximum
Term mL/kg/day	60	80	100	120	120 maximum

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

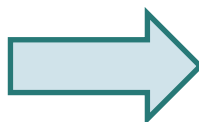
- Term: 92–98%
- Preterm: 90–95%

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
- ≥ 35 weeks
- ≥ 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:
 - o Social work service
 - o Interpreter service
 - o Indigenous Hospital Liaison Officer (IHLO)

