DETERIORATING NEONATE – RECOGNITION AND MANAGEMENT INSIDE NEWBORN CARE CENTRE

This Local Operating Procedure is developed to guide safe clinical practice in Newborn Care Centre (NCC) at The Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this Local Operating Procedure.
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1. AIM
- To facilitate the early recognition and management of the deteriorating neonate who is admitted within Newborn Care Centre (Intensive Care Unit and Special Care Nursery)

2. PATIENT
- Newborns

3. STAFF
- Medical and nursing staff

NOTE:
The Standard Neonatal Observation Chart (SNOC) is not used within NCC due to the wide range and differences in expected observation ranges across these patient groups (including preterm infants, term infants, surgical infants and infants requiring specialist care). Skilled nursing care and appropriate assessment are essential for detecting changes and deterioration in infants. This includes identifying changes in observations that fall outside of normal limits for that patient. In the event that a medical officer or nurse practitioner cannot be located within Newborn Care Centre during escalation, Clinical Emergency Response System (CERS) processes should be followed (call 2222 and state whether you require a Clinical Review, Rapid Response or CODE BLUE).

4. EQUIPMENT
- Cardiorespiratory monitor
- Massimo saturation monitor (infants not on cardiorespiratory monitor requiring saturation)
- Stethoscope
- Thermometer
- Appropriately fitted blood pressure cuff
- Neopuff or Ambu-Bag
- Neonatal resuscitation trolley

5. CLINICAL PRACTICE
Standard observation requirements

Patient	Observations required and interval
New admission	Systematic examination (eg. A-G* systematic assessment), HR, RR, SpO2, Cap Refill, BGL**, BP, work of breathing all to be completed on admission/arrival *Airway, Breathing, Circulation, Disability, Exposure, Fluids, Glucose

	**for newborn infant just delivered, BGL to be complete between 45 minutes – 1 hour of life to allow transition after birth
Infant nursed in Level 3 (NICU)	HR, RR, SpO2, skin temp probe (crib) and IAL (if applicable) – continuous monitoring and hourly documentation BP (cuff) and axilla temperature with cares (6-8 hourly [cares may be 12 hourly in special circumstances deemed appropriate by NCC team]) Twice daily BGL or more frequent as appropriate (until off intravenous fluids and BGLs stable)
Infant nursed in Level 2A (Special Care)	HR, RR, SpO2, skin temp probe (if nursed in crib) – continuous monitoring and hourly documentation BP (cuff) and axilla temperature with cares (6-8 hourly) Twice daily BGL or more frequent as appropriate (until off intravenous fluids and BGLs stable) Infants no longer requiring continuous monitoring are to be nursed as per Level 2B observations
Infant nursed in Level 2B (Transitional Care)	HR, RR and axilla temperature – 6 hourly Continuous HR, RR, SpO2 monitoring with hourly documentation for infants still receiving caffeine and to continue for 7 days after cessation of caffeine
Post-operative/Recovery infant	Systematic examination (eg. A-G* systematic assessment), HR, RR, SpO2, Cap Refill, BGL, BP, work of breathing all to be completed on admission/arrival HR, RR, SpO2 – continuous monitoring and hourly documentation BP every 15 minutes for first hour (cuff or IAL), BP every 30 minutes for next hour, hourly BP until 12 hours post-operative BGL – 6 hourly Other observations (bladder pressure monitoring, abdominal girth, gastric aspirates etc) as per surgical request *Airway, Breathing, Circulation, Disability, Exposure, Fluids, Glucose
Infants being transferred out (to theatres or to another hospital) or discharged home	Infants must have a full set of observations including HR, RR, SpO2, work of breathing, capillary refill, axilla temperature and BGL within 1 hour of being transferred/discharged

Clinical Review

- If an infant is found to have any of the following or has changes in observations that include:
  - Decreased SpO2
  - Increasing oxygen requirement
  - Increased desaturations

  - Bradycardias
  - Apnoeas
  - Increased HR above normal range (>180 bpm)
  - Increased RR above normal range (>60 breaths/minute)
  - BGL <2.6 mmol/L or > 10 mmol/L
  - Increased work of breathing
  - Low BP (mean arterial pressure < gestational age of infant)
  - Change in tone, alertness/arousal or activity
  - Pale/mottled appearance
  - Blood gas parameters outside of acceptable range
  - Temperature instability (<36.3 or >37.4)
  - New or increasing pain
  - Increasing vomiting or feed intolerance
  - Increasing abdominal distention
  - Weight loss >10% of birth weight
  - Infants who appear jaundiced

- Escalate to medical officer or nurse practitioner on the unit for review of infant within 30 minutes.
- If a medical officer or nurse practitioner is not present on the unit, call a Clinical Review on 2222 and request for neonatal clinical review NCC.
- Inform nursing team leader of review and continue to monitor and observe infant.
- Increased frequency or addition of extra observations may be requested as part of Clinical Review including blood gas, increased monitoring of BP, or commencement of SpO2 or HR monitoring (if not already monitored).
- If infant further deteriorates whilst waiting for 30 minute review, escalate to medical officer or nurse practitioner on the unit for a review within 5 minutes.
- If no medical officer or nurse practitioner present on the unit, call 2222 and request a Neonatal Rapid Response

Rapid Response

- If an infant is found to have any of the following or has changes in observation that include:
  - Profound, prolonged or frequent desaturations
  - Prolonged apnoea
  - Profound bradycardia (<60 bpm)
  - Tachycardia (>200 bpm unrelated to infant arousal)
  - BSL <2.0 mmol/L
  - Moderate to severe work of breathing
  - Sudden drop in BP (mean arterial pressure >5 mmHg below gestational age)
  - Any suspected seizure activity (abnormal repetitive movements, desaturations/bradycardias)
  - Clinical suspicion of sepsis
  - White extremity
  - Significant bleeding
  - Significant blood gas alterations (eg. pH <7.2, pCO2 >65, lactate >2.5)
  - Discoloured gastric aspirates or vomits (bilious, coffee ground or blood)
  - Abdominal distention with colour change of abdomen (dusky/grey abdomen)
  - Fresh blood in stools
  - Fresh blood in ETT aspirates/suctioning consistent with pulmonary haemorrhage
  - Suspicion of subgaleal haemorrhage as identified through scalp observations
- Stay with infant and immediately request another staff member to escalate to unit medical officer or nurse practitioner for review within 5 minutes.
- Inform nursing team leader of need for review.
- If medical officer or nurse practitioner not present on the unit, call 2222 and request a Neonatal Rapid Review.
- Provide support to infant (blow over oxygen, PEEP or IPPV, suctioning) as required.
- If infant deteriorates further whilst waiting for review:
  - Commence Basic Life Support
  - Escalate to a CODE BLUE to unit medical officer or nurse practitioner
  - Request a staff member to get the red Neonatal Resuscitation trolley
  - If medical officer or nurse practitioner not present on the unit, call 2222 and request a Neonatal CODE BLUE.

CODE BLUE

- Any infant experiencing any of the following should be treated as an emergency:

  - Floppy and unresponsive
  - Profound seizure activity
  - No respiratory effort or profound apnoea prolonged for >1 minute and not responsive to stimulation
  - Prolonged and profound bradycardia (<60 bpm)
  - Cyanosis
  - Suspected accidental extubation
- Stay with infant and commence Basic Life Support using Neonatal Basic Life Support Algorithm (Appendix 1).
- Second staff member to immediately escalate to unit medical officer or nurse practitioner as a CODE BLUE requiring immediate action.
- Request staff member to get red Neonatal Resuscitation Trolley.
- If medical officer or nurse practitioner not present on the unit, call 2222 and state:
  - Neonatal CODE BLUE
  - Your location (Newborn Care Centre, Royal Hospital for Women, bed number)
- Commence documentation on the Neonatal Resuscitation Chart.

Altered Calling Criteria

- For any infant who is likely to experience frequent or chronic changes to their observation limits secondary to an illness/disease process, alterations can be made for escalation of their care based on these findings. These must be documented in the infant's eMR notes by a Neonatal Consultant or a Neonatal Fellow (in conjunction with the Consultant). These should be reviewed daily on medical rounds to ensure these alterations remain appropriate for the infant's clinical state.

REACH program

- If a parent/carer feels there has been a clinical deterioration in their infant or is concerned about their infant, they can escalate their concerns through the REACH program. In hours, parents should call or contact the Nurse Unit Manager (NUM). Outside normal working hours, parents should contact the After Hours Nurse Manager/Supervisor (AHNM) with concerns. Both NUM and AHNM can be contacted through the admission office (internal call 9 or 26061).

6. DOCUMENTATION

- eMR nursing notes
- Daily Care Plan
- Neonatal Observation Chart
- Neonatal Resuscitation Chart

7. RELATED POLICIES/PROCEDURES/CLINICAL PRACTICE LOP

- NSW Health Policy Directive PD2020_018 – Recognition and management of patients who are deteriorating. 12 June 2020.
- RHW LOP – REACH Recognise, Engage, Act, Call, Help is on the way.
- RHW LOP – Admission of a neonate to Newborn Care Centre
- RHW LOP – Resuscitation of the Neonate - Neonatal Resuscitation Guidelines at Delivery

8. RISK RATING

- Medium

9. NATIONAL STANDARD

- Standard 1 Clinical Governance
- Standard 5 Comprehensive Care
- Standard 6 Communicating for Safety
- Standard 8 Recognising and Responding to Acute Deterioration

10. ABBREVIATIONS AND DEFINITIONS OF TERMS

NCC	Newborn Care Centre	IAL	Invasive Arterial Line
SNOC	Standard Neonatal Observation Chart	ETT	Endotracheal tube
CERS	Clinical Emergency Response System	PEEP	Positive End Expiratory Pressure
HR	Heart Rate	IPPV	Intermittent Positive Pressure Ventilation
RR	Respiratory Rate	REACH	Recognise, Engage, Act, Call, Help
SpO2	Oxygen Saturation	NUM	Nurse Unit Manager

BGL	Blood Glucose Level	AHNM	After Hours Nurse Manager/Supervisor
BP	Blood Pressure		

11. AUTHORS

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APPENDIX 1

Newborn Life Support

At all stages ask: do you need help?

1 minute

Term gestation?
Breathing or crying?
Good tone?

YES — Stay with Mother → Maintain normal temperature, Ongoing evaluation

NO ↓

Maintain normal temperature,
Ensure open airway,
Stimulate

↓

HR below 100?
Gasping or apnoea?

NO → Laboured breathing or persistent cyanosis?
- NO → Maintain normal temperature, Ongoing evaluation
- YES → Ensure open airway, SpO_2 monitoring, Consider CPAP

YES ↓

Positive pressure ventilation
SpO_2 monitoring

↓

HR below 100?

NO → Post-resuscitation care

YES ↓

Ensure open airway
Reduce leaks
Consider:
Increase pressure & oxygen
Intubation or laryngeal mask

↓

HR below 60?

YES ↓

Three chest compressions to each breath
100% oxygen
Intubation or laryngeal mask
Venous access

↓

HR below 60?

YES ↓

IV Adrenaline
Consider volume expansion

Targeted pre-ductal SpO_2 after birth

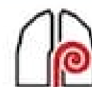
1 min	60-70%
2 min	65-85%
3 min	70-90%
4 min	75-90%
5 min	80-90%
10 min	85-90%

IV Adrenaline 1:10,000 solution

Gestation (weeks)	Dose
23-26	0.1 mL
27-37	0.25 mL
38-43	0.5 mL

10-30 microg/kg (0.1-0.3 mL/kg)

January 2016



NEW ZEALAND Resuscitation Council
WHAKAHAUORA AOTEAROA

APPENDIX 2

CERS Escalation Pathway