CLINICAL PRACTICE GUIDELINE
Guideline coverage includes NICU KEMH, NICU PCH and NETS WA

Recognising and Responding to Clinical Deterioration

This document should be read in conjunction with the Disclaimer

Aim

To enhance outcomes of neonatal patients through improved recognition of abnormal vital signs and associated with a potential clinical deterioration, and to establish a response plan enabling appropriate interventions when observations fall consistently outside the normal range.

Background

Research indicates that signs of clinical and physiological instability often precede a cardio-respiratory arrest. In many cases these events may be prevented if the early signs of deterioration are recognised and acted upon before the patient deteriorates beyond the point of reversibility.

The early signs of deterioration include changes in respiratory rate, oxygen saturation, blood pressure, heart rate, temperature and conscious/mental status which may go unrecognised. A ‘track and trigger’ system that ‘tracks’ the measurement of vital signs and ‘triggers’ a predetermined response of intervention/review has been shown to mitigate deterioration.

Consider

Infants who are ventilated, or on CPAP, or receiving HHF may trigger the escalation process but may not require an escalation plan. These infants will require a documented plan in the patient medical records.

Recording Vital Signs and Recognising Deterioration

Observations must be attended on all neonatal patients as per the monitoring and observation frequency guideline, and documented on the Neonatal Observation Chart and Nursing Assessment - MR489 or 491.

The six core physiological (and the minimum) vital signs to be recorded are respiratory rate, oxygen saturations, blood pressure, heart rate, temperature, and level of consciousness. Urine output and pain should also be assessed regularly. Blood glucose level and blood gas levels may/could be considered either as a vital sign or be performed as a result of deteriorating core vital signs.

How to Recognise and Respond to a Deteriorating Neonate

Use the guidelines/tables below to identify clinical deterioration and obtain the appropriate action or review. If you or the infant’s family have clinical concern, do not hesitate to raise the concerns with the rest of the team.

Code Blue Paediatric Emergency Call

Response Criteria	Actions Required
• Airway obstruction causing cyanosis/bradycardia • Respiratory or cardiac arrest • Sudden fall in level of consciousness • New drop in SaO_2 requiring bag and mask ventilation • Seizure, obstruction causing cyanosis/bradycardia • You (or a family member/carer) think that the infant needs immediate review but they do not meet the above criteria	• Initiate neonatal resuscitation • Call immediately for medical and nurse assistance • If medical staff not present in NICU, place Code Blue Paediatric Emergency Call (via 55)

Medical Review

Response Criteria	Actions Required
• New or worsening increased work of breathing • Increased rate of apnoea/ bradycardia/desaturation episodes • New drop in SaO_2 consistently <85% • New increase in FiO_2 by >10% • Mean blood pressure dropping by >10mmHg • Any seizures • Abnormal blood gas (≤ pH 7.25) • PGL <2.6 and symptomatic (lethargic or jittery) • You (or a family member/carer) think that the infant requires medical review but they do not meet the above criteria	• Page registrar with infant's name, location and contact number, requesting review within 15 minutes • Commence continuous monitoring and record observations • If medical review not attended within 15 minutes, escalate to SR or Consultant • If ongoing deterioration initiate Code Blue Paediatric Emergency Call • Report immediately and repeat any abnormal blood gas with pH≤7.25mmol/L within 30 minutes

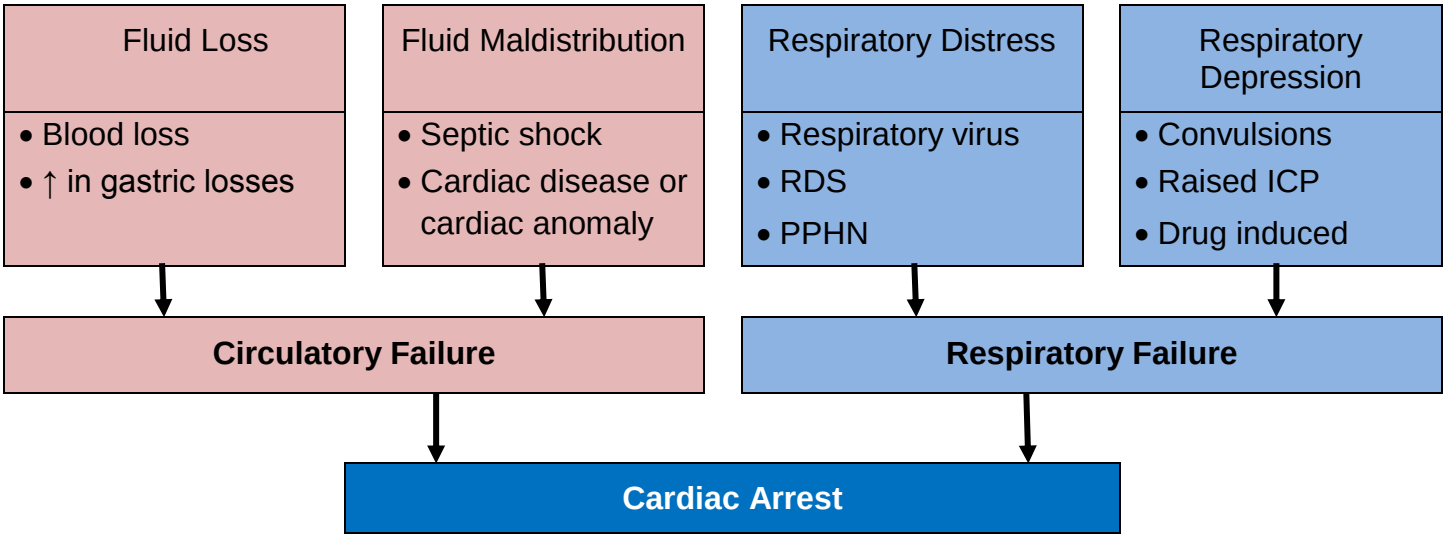
Shift Coordinator Review

Response Criteria	Actions Required
• Instability characterised by rising FiO_2, more significant apnoea/bradycardic/desaturation episodes, rising or falling blood pressure, temperature instability (increased or decreased), lethargy or irritability • You (or a family member/carer) are worried about the infant but they do not meet the above criteria	• Shift Coordinator must review patient • Record observations at least every hour • Repeat blood gas • Monitor oxygen requirement • Manage fever, pain, fluids, distress • If deterioration continues immediately escalate to medical review

Increased Surveillance

Response Criteria	Actions Required
• Changing observations not described above • You (or a family member / carer) are worried about the infant but they do not meet the above criteria	• Inform Shift Coordinator • Carry out appropriate interventions as prescribed • Record observations at least every 2 hours • Consider blood gas • Monitor oxygen requirement • Manage fever, pain, fluids, distress • If no improvement escalate to shift coordinator

Pathways Leading to Cardiac Arrest



Neonatal Resuscitation within the NICU

Basic Life Support

D	Danger?
R	Responsive?
S	Send for help
A	Open Airway
B	Normal Breathing? Give 2 breaths
C	If Heart rate <60 bpm after 30-60 seconds of IPPV Commence cardiac compressions. Ratio 3:1
D	Consider Adrenaline 1:10,000 (1ml if >34wks gestation; 0.5ml if <34wks). Manual defibrillator if ventricular fibrillation or tachycardia is present. Ensure help is coming.
Continue CPR until responsiveness or normal breathing return	

Roles in Resuscitation

First Responder

1. Check for Danger to self, patient or other people.
2. Assess responsiveness
3. If unresponsive:
    - Call for assistance. Activate emergency assistance button/ ask someone to call a Doctor and the Coordinator. Do not leave patient.
    - Note the time of patient collapse. Turn on timer on monitor.
    - Commence basic life support. Maintain airway until Doctor arrives, then assist with intubation.

Second Responder

1. Collect resuscitation trolley, set up for intubation and end tidal CO_2 monitoring.
2. Assist with resuscitation, commence cardiac compressions if required (turn off pressure mattress if in use). Support First Responder.
3. Allocate Nurse to record events on Resuscitation Record (MR 488.1).

Third Responder

1. If Medical staff are not present or need assistance Dial 55; State 'Code Blue emergency. Identify the exact site and state your name. Following this, call the on call Neonatologist if not present.
2. Collect Medication cart
3. Commence drawing up and labelling:
    - Adrenaline **1:10,000**
    - 0.9% sodium chloride for flushes and bolus.
    - Other drugs and infusions i.e. sedation and inotropes as required
4. Prepare for IV insertion (or if appropriate consider Umbilical or intraosseous routes).

Other staff

1. Support Third responder to check medications and set up for lines.
2. Remove excess furniture from the immediate area to facilitate access.
3. Ensure privacy and support is provided for family members who may be present. Inform family if they are not present. Where available a support person is to be allocated to stay with the family during this time and is to provide frequent and accurate updates using plain language.
4. Ensure the care of other infants within the unit continues.
5. If at NICU PMH/PCH - Following the arrival of the PICU team
    - Inform Code Blue team of situation
    - Allocate a Resus Lead (This should be the senior most doctor present either NICU or PICU).
    - Ward staff should continue to assist in the resuscitation as directed by the resuscitation leader.
6. Set up Ventilators and consider need for other equipment, i.e. Nitric, Sensomedic, JET.

Role of the Coordinator:

To ensure staff are aware of their roles and provide support. Facilitate coordination of the resus roles, teams and equipment. Facilitate handover to PICU team if required.

Consider:

The need for consultation with other treating Specialties, i.e.PICU Consultant for ECMO considerations.

Clinical Handover

Refer to Clinical Handover guideline.

Good handover is essential to recognising and responding to clinical deterioration.

All health practitioners are to handover the deteriorating patient using **i S o B A R** to assist the communication process when accountability and responsibility for patient care is transferred.

- **i**dentify.
- **S**ituation.
- **o**bservations.
- **B**ackground.
- **A**gree on a plan.
- **R**ead back.

References

1. Manual of Neonatal Care (7th Ed. 2012). Cloherty et al. (Eds).
2. National Safety and Quality Health Service Standards, Australian Commission on Safety and Quality in Healthcare, September 2011
3. Paediatric Nursing Practice Manual, Princess Margaret Hospital for Children, Section 3.1.9 Children's Early Warning Tool. Clinical Deterioration Steering Committee, Princess Margaret Hospital. Feb 2014
4. Retrospective Evaluation of a New Neonatal Trigger Score, Holme H, Bhatt R, Koumettou, Griffin MAS, Winckworth LC. Pediatrics, March 2013: 131(3) e837-842

Related WNHS policies, procedures and guidelines

Neonatal Clinical Guideline - Monitoring and Observation Frequency
- Clinical Handover
- Resuscitation Medications and Fluids
- Resuscitation Algorithm for the Newborn

Document owner:	Neonatal Directorate Management Committee		
Author / Reviewer:	Neonatal Directorate Management Committee		
Date first issued:	July 2014		
Last reviewed:	18th January 2018	Next review date:	18th January 2021
Endorsed by:	Neonatal Directorate Management Committee	Date endorsed:	23rd January 2018
Standards Applicable:	NSQHS Standards: 1 Governance 6 Clinical Handover, 9 Clinical Deterioration		
Printed or personally saved electronic copies of this document are considered uncontrolled. Access the current version from the WNHS website.			