CLINICAL GUIDELINE	
Shock	
Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

This document should be read in conjunction with this DISCLAIMER

Shock is a complex syndrome resulting from failure of the circulatory system to meet the oxygen and nutrient needs of the tissues and to remove toxic metabolites.

Phases of Shock

Phase of Shock	Features	Clinical Signs
Compensated	Perfusion to vital organs preserved	Pallor, tachycardia cool skin, decreased capillary refill
Uncompensated	Compensatory mechanisms fail Anaerobic metabolism Lactic acidaemia	Very Pale, very slow capillary refill, tachycardia, acidotic breathing, reduced or absent urine output, depressed cerebral state
Irreversible	Extensive irreversible damage of vital organs	Death

Types of Shock and Aetiology

Type	Physiology	Examples
Cardiogenic	Defect of pump	Asphyxia, hypoxia, cardiomyopathy, arrhythmia
Hypovolemic	Inadequate blood volume	haemorrhage, dehydration
Distributive	Abnormal vascular beds	Sepsis/infection Vasodilators
Obstructive	Flow restriction	Pneumothorax, pericardial effusion
Dissociative	Inadequate oxygen capacity	Severe anaemia (acute blood loss)

Management

- Early recognition (anticipation), appropriate resuscitation (ABCD), aggressive stabilisation, treat underlying cause.
- Primary aim is to restore adequate perfusion to vital organs.
- Stabilisation involves optimising.
    - Oxygenation and ventilation ("Pink").
    - Perfusion ("Warm").
    - Energy substrates ("sweet").

Optimise Oxygenation and Ventilation:

- Intubation and ventilation may be required.
    - Supplemental oxygen as required to maintain SaO_2 > 92% (non-cardiac); discuss optimal SaO_2 for suspected cyanotic heart disease with NETSWA consultant and/or cardiologist.

Optimise Perfusion:

- UVC should be inserted if IV access is difficult; UAC is desirable if requiring inotropes, long transport (if transport will not be delayed significantly).
- Volume expansion:
    - Use normal saline 10-20ml/kg. Reassess after each bolus. If 40mL/kg has been given consider the need for other fluid (blood, FFP) or inotropic support.
    - **Avoid over-vigorous fluid resuscitation** can impede cardiac function, especially in cardiac failure/dysfunction such as asphyxia, Congenital heart disease, arrhythmias (e.g. SVT).
    - O-negative blood (if available) can be used in emergencies, where blood loss is evident (please take blood for pre-transfusion cross match if time permits).
- Inotrope support:
    - Controversial which (if any) agent to use.
    - Dobutamine: has α and β adrenergic effects. Dose: 5-15 mcg/kg/min.
    - Dopamine: has dose-dependent dopaminergic, α and β adrenergic effects. Dose: 2-15 mcg/kg/min.
    - Adrenaline: has α and β adrenergic effects. Intense vasoconstriction at high doses. Reserve when unresponsive to other inotropes (e.g. fulminant sepsis).
- In severe intractable arterial hypotension consider Hydrocortisone IV.
- Correct acidosis:
    - Optimise ventilation, perfusion and energy substrates first.
    - Consider sodium bicarbonate infusion.

Optimise Energy Substrates:

General guidelines for fluid management:

- Term babies: 60ml/kg/day IV (10% glucose).
- Preterm babies (<34 weeks): 70-80 ml/kg/day IV (7.5% glucose) .
- Very preterm (<27 weeks)/ low birth weight babies: 100 ml/kg/day IV (5% glucose).

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