Clinical Guideline

WATCh – MANAGEMENT OF THE CHILD WITH SEPSIS

SETTING	Wales and West Acute Transport for Children (WATCh)
FOR STAFF	WATCh Team, South West and Wales District General Hospital medical and nursing teams.
PATIENTS	Children requiring emergent treatment for known or suspected sepsis

GUIDANCE

This guidance offers advice for the WATCh team and DGH staff treating children with known or suspected sepsis. The following groups of children and young people are more vulnerable to sepsis:

- Children < 1 years
- Children who have had recent (within the last 6 weeks) trauma / surgery / invasive procedures
- Children with impaired immunity due to chronic illness or drugs
- Children with indwelling lines / catheters / any breach of skin integrity
- Infants born to mothers who are positive for group B streptococcus during pregnancy or are febrile / unwell during delivery.

A summary guideline is on page 2 and is available on the WATCh website (www.watch.nhs.uk).

GLOSSARY	PVC Peripheral Venous Cannula ETT Endotracheal Tube CVL Central Venous Line
RELATED DOCUMENTS	NICE guideline [NG51] Sepsis: recognition, diagnosis and early management. https://www.nice.org.uk/guidance/ng51?unlid=280104107201611917351 PICU Septic Shock in Children
AUTHORISING BODY	WATCh Governance group
SAFETY	Call the WATCh team for advice and support.
QUERIES	0300 0300 789

MANAGEMENT OF THE CHILD WITH SEPSIS

SIGNS AND SYMPTOMS	RED FLAG FINDINGS
• Toxic or ill appearance • Signs of dehydration • Rigors • Decreased tone in neonates / infants • Seizures / Meningism • Respiratory depression or failure • Decreased breath sounds • Macula erythema (toxic shock), purpura • Distended, tender abdomen • Warm, erythematous, swollen joint(s) • Consider alternative diagnosis e.g. cardiomyopathy	• Presence of fever (>38 degrees) • Hypothermia (core temperature <36 degrees) • Tachycardia • Tachypnoea • Abnormal pulse (diminished, weak or bounding) • Abnormal CRT • Hypotension • Abnormal mental state • Purpura • Macular erythema with mucosal changes, suggestive of toxic shock.

IMMEDIATE TREATMENT IN THE 1ST HOUR – SEEK IMMEDIATE SENIOR SUPPORT

- **100% oxygen via non rebreathe mask** to increase oxygen delivery to the tissues – support airway if required
- **IV / IO**
  - 2 wide bore cannula
  - DO NOT delay inserting an IO if PVC is difficult
- **Blood Cultures**
- **Broad spectrum antibiotics as per local guidelines e.g.**
  - <28days – Cefotaxime and Amoxicillin, add Aciclovir if suspicion of HSV
  - >28 days – Cefotaxime or Ceftriaxone
  - Check previous culture results for children with chronic illness or recent hospitalization to ensure appropriate cover
- **Serum lactate**
  - **Rapid Fluid Resuscitation - 10-20 mL/kg** (calculated on ideal body weight) isotonic crystalloid
  - Assess for signs of inadequate tissue perfusion / fluid overload after each bolus – assess liver size
- **Vasoactive agents** if shock persists after 40 mL/kg – peripheral strength Adrenaline infusion at 0.1 microgram/kg/min (see WATCh drug sheet – note concentrations and infusion rates are different for under vs over 40kg children)

RECOGNITION OF SEPTIC SHOCK	LABORATORY INVESTIGATIONS
• Sepsis with cardiovascular dysfunction despite ≥40ml/kg in the 1st Hour • Hypotension: SBP <50mmHg in <12months SBP <60mmHg aged 1-5years SBP <70mmHg in >5years • Reliance on vasoactive drugs to maintain SBP • ≥ signs of inadequate tissue perfusion (prolonged CRT, oliguria, metabolic acidosis, elevated lactate)	• Rapid blood glucose • Arterial or venous blood gas with ionized calcium • Complete blood count with differential • Blood lactate • Serum electrolytes, renal function, liver function, ferritin and inflammatory markers • Clotting, fibrinogen and d-dimer • Urinalysis

ONGOING MANAGEMENT

Airway and Breathing	CPAP or BiPAP support may be indicated in children responding to therapy but with evidence of respiratory distress. RSI for children with fluid-refractory septic shock – risk of circulatory collapse on induction.
RSI **AVOID** Propofol or gas inductions	Airway competent practitioner – intubation checklist completed Cuffed ETT to be used – do not cut CXR and NG tube following intubation Ketamine 1mg/kg, Fentanyl 1microgram/kg and Rocuronium 1mg/kg Prepare resus doses of adrenaline x2 and resuscitation fluid 20mL/kg Prepare dilute adrenaline (0.1mls/kg 1:10,000 diluted up to 10ml with 0.9% NaCl) Adrenaline (peripheral strength) infusion running pre-intubation (infusion on the WATCh drug sheet)
Circulation	Maintain blood pressure with vasoactive agents - Adrenaline / Noradrenaline infusions as first line Central strength Adrenaline and Noradrenaline infusions can be given via IO or CVL CVL / Arterial Line and urinary catheter for all intubated children as soon as practicable Treat hypocalcaemia (ionized <1.1) – Calcium Gluconate 10% 0.5ml/kg Blood transfusion if Hb <7g/dL
Disability	Treat hypoglycaemia – 2mL/kg 10% dextrose until reversed and increase glucose infusion rate. Check and observe pupils and fontanelle (where applicable) Dexamethasone 150 micrograms/kg (max 10mg per dose) QDS for 4 days in suspected meningitis Sedate and muscle relax with infusions of Morphine, Midazolam and Rocuronium. Consider loading dose(s) of morphine (50 microgram/kg) and Rocuronium (1mg/kg) at start of infusion.
Exposure	Observe for evolving rash, compartment syndrome, tissue necrosis Active management of pyrexia / hypothermia