

DOCUMENT CONTROL PAGE	
Title	<p>Guideline for Management of Sepsis in Children The guideline is intended for use by any hospital team caring for infants and children across the Paediatric Critical Care Network in the North West & North Wales region. Version: 1 Reference Number: PCCN4</p>
Supersedes	<p>Supersedes: Nil Description of Amendment(s): New guideline – not applicable</p>
Minor Amendment	<p>Date: Notified To: Date: Summary of amendments:</p>
Author	<p>Originated By: Kate Parkins Designation: Clinical Lead, North West & North Wales Paediatric Transport Service (NWTS) Co-Authors: Christopher Walker, Clinical Nurse Specialist, NWTS Matthew Christopherson, Locum NWTS Consultant, NWTS Mark Entwistle, Staff Grade Anaesthetist, Arrowe Park Hospital</p> <p>NWTS is a regional Paediatric Intensive Care transport service for the North West & North Wales region, providing advice on patient management, in addition to clinical teams that stabilise and transport critically sick or injured children.</p>
Ratification	<p>Ratified by:</p> <ol style="list-style-type: none"> CMFT (Host Trust): <ul style="list-style-type: none"> - Paediatric Medicines Management Committee (MMC) on: 5th March 2014 - Divisional Children’s Clinical Effectiveness Committee on: 4th June 2014 AHFT: <ul style="list-style-type: none"> - CDEG (Clinical Development & Evaluation Group) on: 20th June 2014
Application	Children only
Circulation	<p>Issue Date: 9th September 2014 Circulated by: Clinical Lead, North West & North Wales Paediatric Critical Care Network Dissemination and Implementation: NWTS & PCCN Network circulation lists</p>
Review	<p>Review Date: 20th June 2016 Responsibility of: Clinical Lead, North West & North Wales Paediatric Transport Service (NWTS)</p>
Date placed on the Intranet: 9th September 2014	Please enter your EqIA Registration Number here: 36/13

1. Detail of Procedural Document

Guideline for Management of Sepsis in Children—for use by clinical teams managing infants and children in the North West & North Wales region.

2. Equality Impact Assessment

EqIA Registration Number: **36/13**

3. Consultation, Approval and Ratification Process

This guideline was developed with input from:

- North West and North Wales Paediatric Transport Service (NWTS) - medical & nursing
- Representatives from both Paediatric Intensive Care Units (Royal Manchester Children's Hospital and Alder Hey Children's Hospital) - medical, nursing and paediatric intensive care pharmacists.
- Representatives from microbiology and infectious diseases departments (Royal Manchester Children's Hospital and Alder Hey Children's Hospital)
- Representatives from the District General Hospitals within the PCCN - medical, nursing and AHP (paediatrics, anaesthetics, adult intensivists and emergency medicine teams)

These guidelines were circulated amongst the Consultants from both Paediatric Intensive Care Units (Central Manchester University Hospitals NHS Foundation Trust and Alder Hey NHS Foundation Trust) and the Consultants from the North West and North Wales Paediatric Transport Service (NWTS) for comments on the **4th February 2013**.

These guidelines were circulated amongst the North West and North Wales Paediatric Critical Care Network for comments on the **26th February 2013**.

The guidelines were also circulated for further comments amongst the relevant leads (microbiology, infectious diseases, pharmacy and paediatric intensive care) from both children's hospitals (Central Manchester University Hospitals NHS Foundation Trust and Alder Hey NHS Foundation Trust) on the **3rd June 2013 & 14th November 2013**.

All comments received have been reviewed and appropriate amendments incorporated.

These guidelines were signed off by the Network/NWTS Clinical Lead on **31st January 2014**.

For ratification process see appendix 1.

4. References and Bibliography

See guidelines.

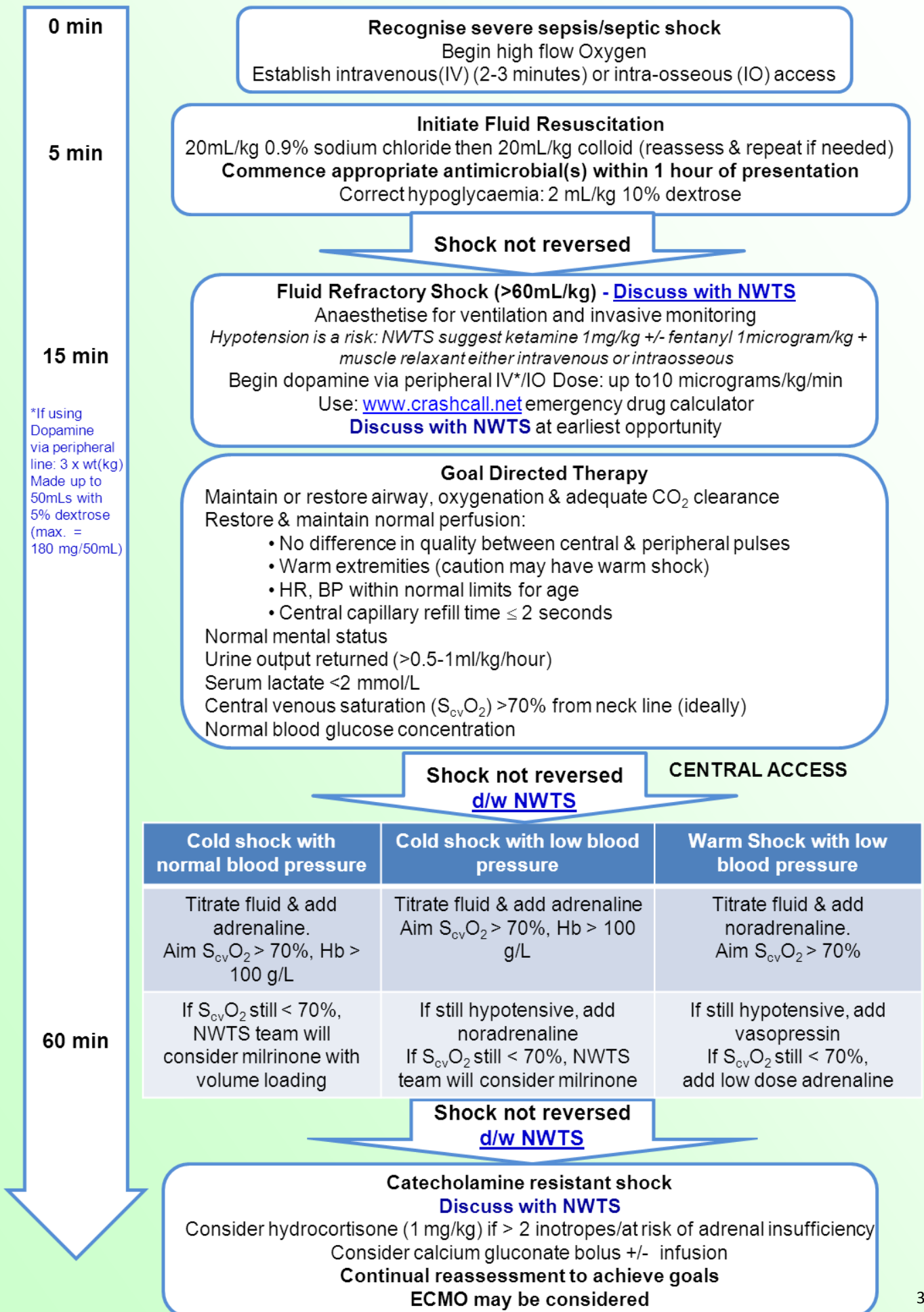
5. Disclaimer

These clinical guidelines represent the views of the North West and North Wales Paediatric Critical Care Network and North West and North Wales Paediatric Transport Service (NWTS), and were produced after careful consideration of available evidence in conjunction with clinical expertise and experience. It is intended that trusts within the Paediatric Critical Care Network will adopt this guideline and educational resource after review through their own clinical governance structures

The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.

Clinical advice is always available from NWTS on a case by case basis. Please feel free to contact NWTS (01925 853 550) regarding these documents if there are any queries.

Summary Guideline: Paediatric Sepsis – The First Hour



Summary Guideline: Beyond the First Hour Until Transfer

Airway

- Oral endotracheal tube – caution with nasal ETT as may be coagulopathic (epistaxis risk)
 - Consider cuffed ETT if any evidence of pulmonary oedema
- Endotracheal tube secured appropriately for transfer (see regional transport guidelines)
- Nasogastric tube placed to decompress the stomach
- Chest X-ray demonstrating position of endotracheal tube & nasogastric tube
- Inclusion of a heat moisture exchanger & end-tidal CO₂ monitoring within the circuit

Breathing

- Placed on ventilator with age appropriate settings aiming for tidal volume 5-8mL/kg.
- Positive end expiratory pressure (PEEP) maintained, use mechanical ventilator
 - High PEEP in pulmonary oedema (may need 10-12+)
 - Avoid furosemide to treat pulmonary oedema
- Monitor end-tidal CO₂ & SpO₂ (*Permissive hypercapnia to pH 7.25*)

Circulation

- At least one good peripheral venous cannula or intraosseous line
 - Intraosseous line can be treated as central access
- Multi-lumen central venous catheter (CVC) sited and secured (CXR if neck line)
- Measurement of the central venous pressure (CVP)
- Measurement of central venous saturation (S_{cv}O₂ if internal jugular line)
- Site arterial line; secure and transduce
 - If femoral: preferably use same side as CVC to keep other side free for renal support catheter
- Start Inotrope infusions via peripheral or intraosseous line, aim eventually via CVC
 - NB may not be possible initially until received adequate fluid resuscitation
- Urinary catheter

Investigations

- Blood (peripheral + indwelling lines) cultures, PCR (Meningococcal, Pneumococcal & Herpes Simplex as appropriate)
- Sputum cultures for M, C & S, & NPA for respiratory viral screen
- Full blood count, coagulation studies & group & save (may need clotting or other blood products)
- Urea & Electrolytes, calcium, magnesium, lactate, C-reactive protein, LFTs
- Blood glucose
- Arterial blood gas including lactate, and intermittent S_{cv}O₂
- Urine dipstick & cultures, consider stool, throat swab (rapid Group A Strep testing),
- CSF cultures, including PCR & virology (**CAUTION:** Do NOT do LP if increased WOB, unstable BP or altered neurology)

Drugs

- Check all antimicrobials have been given within 1st hour presentation & document time administered
- Give steroids (dexamethasone) within 4 hours if signs of meningitis (& over 3 months old)
- Maintenance fluids containing dextrose to maintain normal blood glucose levels

Communication

- **Parents:** Outline diagnosis, management and prognosis
- **Maintain contact with NWTS for on-going advice**
 - History, current management, need for specialist equipment (e.g. iNO, HFOV, ECMO)
 - Copy notes, observation & drug charts; send X-rays/imaging via PACS

Age Group	Heart Rate			Respiratory Rate		Blood Pressure (normal values)	
	Normal	Tachycardia	Bradycardia	Normal	Tachypnoea	Systolic	Mean
0-4 months	110-160	>160	<110	30-40	>40	>60	≥45
4 mo-2 yrs	100-150	>150	<100	25-35	>35	>70	≥50
2yrs-5yrs	80-120	>120	<80	25-30	>30	>85	≥60
5yrs-12yrs	70-120	>120	<70	20-25	>30	>90	≥60
Over 12 yrs	65-110	>110	<65	15-20	>25	>100	≥65

RECOGNITION OF SEPTIC SHOCK¹ (International definition)	
Suspected Infection	
Hypo- or Hyperthermia (Temperature <36°C or >38.5°C)	
Tachycardia (or bradycardia in infants)	
Tachypnoea (or apnoea in infants)	
Altered or fluctuating or variable conscious level	
Decreased urine output (<1ml/kg/hour)	
Other end organ dysfunction e.g. abnormal clotting or liver function tests	
Signs of:	COLD SHOCK
	Capillary refill >3s
	Reduced peripheral pulses
	Cool & mottled extremities Core/peripheral temperature gap >3°C
	Narrow pulse pressure
OR	WARM SHOCK
	Flash capillary refill time
	Bounding peripheral pulses
	Warm to edges with flushed appearance
	Wide pulse pressure

HYPOTENSION = LATE SIGN IN PAEDIATRIC SEPSIS & not needed for diagnosis. If present, confirms severe septic shock.

RED FLAGS indicating severe sepsis (at presentation):

- Rapid deterioration in less than 6 hours
- Poor or no response to treatment
- WCC less than $2 \times 10^9/L$ and/or neutropenic OR WCC more than $30 \times 10^9/L$
- Platelets low (less than 50)
- Lactate > 2 mmol/L (arterial or venous or capillary)
- Hypoglycaemia
- Hypothermia
- Altered or variable conscious level (check with parents/carers)
 - ◊ Quiet submissive child (not usual self/behaviour)
 - ◊ Aggressive, combative child (not usual self/behaviour)
- Oliguria or anuria for 6-12 hours
- Deranged liver function
- Central venous saturation less than 70% (or 20-25% less than usual SpO₂ in cyanotic heart disease)

RISK FACTORS FOR SEVERE DISEASE²

- Male sex: severe sepsis is 15% more common in boys with an increased incidence in boys under 4 years
- Underlying disease/ Co-morbidities
 - ◊ Neonates: Gram negative sepsis especially in those with probable Galactosaemia; Grp B Strep; HSV
 - ◊ Infants with cardiovascular or respiratory disease
 - ◊ Older Child with Neuromuscular disease or Oncology diagnosis
 - ◊ Any age: Immunodeficiency
- Recent Illness
 - ◊ Concurrent/recent Chicken Pox (within last 6-8 weeks) – Invasive Grp A Strep & *Staph. aureus*
 - ◊ Post Influenza A or B – *Streptococcus pneumoniae*, *N. meningitidis*, Invasive Group A Streptococcus, *Staphylococcus aureus*
- Chronic Illness patients (NB may be carriers of: Pseudomonas or MRSA or other multi-resistant organisms)

EMPIRIC ANTIMICROBIALS IN SEPSIS ^{7,8,9} — **broad spectrum cover** (see formulary for drug doses)

NB ANTIMICROBIALS SHOULD BE PRESCRIBED & ADMINISTERED WITHIN FIRST HOUR OF PRESENTATION OF SEPSIS

BIRTH-3 MONTHS : Cefotaxime + amoxicillin +/- gentamicin +/- aciclovir

Over 3 MONTHS : Cefotaxime or ceftriaxone (avoid ceftriaxone if likely to need calcium bolus)

GENERAL POINTS RELATING TO BOTH AGE GROUPS

- ◆ Consider clindamycin to treat invasive Grp A Strep. or Staph. aureus (Toxic shock or necrotising fasciitis)
- ◆ Consider aciclovir (Herpes Simplex) especially if low GCS/abnormal neurology +/- abnormal LFTs
- ◆ Consider macrolide (clarithromycin or erythromycin) to treat Mycoplasma or Pertussis
- ◆ Consider adding metronidazole if surgical cause suspected
- ◆ Immunosuppression/Febrile neutropenic sepsis → local oncology team guidelines (discuss with NWTS team)
- ◆ Pseudomonas carriers: appropriate anti-Pseudomonal antibiotics (e.g. ceftazidime or ciprofloxacin)
- ◆ If recently overseas or prolonged or multiple antibiotic exposure within 3 months consider adding vancomycin or teicoplanin
- ◆ MRSA carriers – follow local guidelines
- ◆ Patients with permanent access devices in situ add vancomycin or teicoplanin (eg VP shunts, Broviac or Hickman lines, Portacaths etc)
- ◆ For patients with suspected Gram negative sepsis (eg UTI, abdominal sepsis, Galactosaemia) consider gentamicin
- ◆ For patients with multi-drug resistant organism (e.g. ESBL, CRE, VRE) seek early advice from ID/microbiology

FLUID BOLUSES: Reassess after each bolus

Check: effect of sustained direct upwards (towards head) pressure on the liver (hepato-jugular response)

- ✦ If BP improves +/- pulse rate falls – patient still fluid responsive, therefore give more fluid
- ✦ If BP doesn't improve or worsens start an inotrope

Check for signs of volume overload/cardiac failure: i.e. gallop rhythm, or hepatomegaly, or, on examination of chest, evidence of pulmonary oedema (crepitations or crackles) with or without hypotension — **start inotropes**

Consider blood products if $\geq 60\text{mL/kg}$ fluid bolus used: FFP 15-20mL/kg; Platelets (10 mL/kg) if $<50 \times 10^9/\text{L}$; Packed cells (10-20 mL/kg) if Hb $< 100 \text{ g/L}$; Cryoprecipitate (5-10 mL/kg) if fibrinogen $<0.75\text{g/L}$

BICARBONATE USE (see drug formulary)

- Not recommended for treatment of hypoperfusion-induced lactic acidaemia with $\text{pH} \geq 7.15$
- However, may be considered if $\text{pH} < 7$ despite continued fluid resuscitation & inotropes

CORRECT HYPOGLYCAEMIA & HYPOCALCAEMIA (see drug formulary)

10% dextrose & don't forget to start dextrose containing maintenance fluids

10% calcium gluconate bolus +/- infusion as per ionised calcium

CORTICOSTEROIDS (see formulary)

Low-dose Hydrocortisone: consider adding when not stabilising on 2 inotropes (send blood for cortisol level first)

If meningitis present (& more than 3 months old), give dexamethasone (within 4 hours but not more than 12 hours of starting antibiotics)

TRIGGERS FOR INTUBATION / ANAESTHETIC REVIEW

- Decreased conscious level (i.e. $\text{GCS} \leq 8$, $\text{AVPU} \leq \text{P}$) OR fluctuating conscious level
- Increasing respiratory failure, signs of exhaustion
- Impending cardiovascular collapse
- Fluid refractory shock
 - ◇ 40-60 mL/kg resuscitation fluid given within the 1st hour without reversal of shock
 - ◇ Increasing size of liver
 - ◇ Requirement for inotrope infusions

PROPHYLAXIS Ideally to be arranged by local team for parents and siblings in addition to informing HPA (Consultant on call for Communicable Disease Control (CCDC))

- Meningococcal: Index case will also need prophylaxis unless already treated with ceftriaxone
- Consider prophylaxis for the team if pulmonary oedema is aerosolised during intubation or ETT suction

OUTCOMES FOR PAEDIATRIC SEPSIS are improved when best practice guidelines are followed^{3,4,5}.

Factors independently associated with increased mortality^{4,5,6}:

- Failure to be looked after by senior paediatrician and failure of sufficient supervision of junior staff
- Persistent evidence of shock (2-fold increase in mortality per hour)
- Failure to administer adequate inotropes or resuscitation volume (even if inotropes started)

DRUG FORMULARY (www.crashcall.net for emergency drugs)

ACICLOVIR Indication: Herpes simplex encephalitis/sepsis. Via intravenous (IV) or intraosseous (IO) route. Dilute to 5mg/ml or less & infuse over 1 hour (AVOID concentrations between 5-25 mg/ml as may precipitate)
< 3 months: 10-20 mg/kg/dose 8 hourly
3 months-12 years: 500 mg/m²/dose 8 hourly
> 12 years: 10 mg/kg/dose 8 hourly

ADRENALINE INFUSION—Indication: Hypotension—standard central IV/IO infusion as per www.crashcall.com 0.3 mg/kg made up to 50 ml with 5% dextrose. Using this concentration 1 ml/hour = 0.1 microgram/kg/min
Dose: 0.1-1.5 micrograms/kg/min—start at minimum dose & titrate dose according to response

AMOXICILLIN Indication: Listeria meningitis (in combination with cefotaxime); Group B Strep, Enterococcal endocarditis.

IV/IO intermittent infusion given over 30-60 mins

Neonate: < 7 days: 50 mg/kg/dose 12 hourly; 7-28 days: 50 mg/kg/dose 8 hourly

1 month—18 years: 50 mg/kg/dose every 4-6 hours (maximum 2 g every 4 hours)

CALCIUM GLUCONATE 10% Indication: Treatment of hypocalcaemia: 0.3-0.5 ml/kg as a single dose IV/IO

CEFOTAXIME Indication: severe infection/meningitis given via IV/IO

Neonate: < 7 days: 50 mg/kg/dose 12 hourly; 7-21 days: 50 mg/kg/dose 8 hourly;

>21 days 50 mg/kg/dose 6-8 hourly

1 month-18 years: 50 mg/kg/dose 6 hourly (maximum: 3 g per dose)

CEFTAZIDIME Indication: Anti-Pseudomonas given via IV/IO

Neonate: < 7 days: 50 mg/kg/dose every 24 hours; 7-21 days: 50 mg/kg every 12 hours;

21-28 days: 50 mg/kg every 8 hours

1 month—18 years: 50 mg/kg 8 hourly (max. 6 g daily)

CEFTRIAXONE Indication: severe infection/meningitis via IV/IO

Full term neonate: 50 mg/kg as single daily dose, given via infusion over 60 mins

NB contraindicated in those needing calcium containing solutions (including TPN) due to the risk of precipitation as ceftriaxone-calcium salt.

1 month-12 years: Severe infection: 80 mg/kg as single daily dose (max 4 g/dose) as an infusion over 30 mins

> 12 –18 years: Severe infections 2-4 g/dose as single daily dose as an infusion over 30 mins

1 month—18 years: do **NOT** mix with **calcium** containing iv solutions & must NOT be given at the same time as calcium containing solutions even via different lines due to the risk of precipitation as ceftriaxone-calcium salt.

CIPROFLOXACIN Indication: severe respiratory infection (anti-Pseudomonas)

Given via IV/IO intermittent infusion over 60 mins

Neonate: 10 mg/kg/dose every 12 hours for respiratory infections (6 mg/kg/dose every 12 hours for UTI)

1 month-18 years: 10 mg/kg/dose every 8 hours. Max 400 mg/dose

CLARITHROMYCIN Indication: to treat Pertussis or Mycoplasma

Given via IV/IO intermittent infusion (concentration 2mg/ml) over 60 mins

1 month –12 years: 7.5 mg/kg/dose every 12 hours (max dose: 500 mg)

> 12 years: 500 mg/dose every 12 hours

CLINDAMYCIN Indication: to treat invasive Grp A Strep. or Staph. aureus or aspiration pneumonia via IV/IO

Given via IV/IO intermittent infusion (concentration 6mg/ml) over 10-60 mins)

Neonate: 5 mg/kg/dose 8 hourly

1 month—12 years: 10 mg/kg/dose 6 hourly

> 12 years: 675 mg—1.2 g per dose 6 hourly

DEXAMETHASONE PHOSPHATE Indication: Meningitis

> 3 months: 0.15 mg/kg/dose 6 hourly for 2-4 days. Ideally given within 4 - 12 hours of starting antibiotics

10% DEXTROSE Indication: treatment of hypoglycaemia Dose: 2 ml/kg as an IV/IO bolus

NB don't forget to start a **maintenance infusion** including dextrose & to recheck blood glucose after bolus

DOPAMINE Indication: Hypotension—standard central IV/IO infusions (monitoring BP essential) - as per www.crashcall.net

Dose: birth-18 years: 2-15 micrograms/kg/min

Central concentration: 15 mg/kg made up to 50 ml with 5% dextrose. 1 ml/hour = 5 micrograms/kg/min

Peripheral concentration: 3 mg/kg made up to 50 ml with 5% dextrose. 1 ml/hr = 1 microgram/kg/min (max peripheral concentration 180 mg/50 mL)

ERYTHROMYCIN Indication: to treat Pertussis or Mycoplasma IV/IO infusion over 20-60 minutes

Neonate: 10-15 mg/kg/dose 8 hourly

1 month-18 years: 12.5 –25 mg/kg/dose 6 hourly

GENTAMICIN Indication: suspected Gram negative sepsis e.g. UTI, abdominal sepsis, Galactosaemia

Neonates i.e. < 44 weeks corrected gestational age (CGA) - Therapeutic drug monitoring required at 3rd dose

CGA < 32 weeks: 4-5 mg/kg every 36 hours. IV/IO bolus over 3-5 minutes

CGA > 32 weeks: 4-5 mg/kg every 24 hours. IV/IO bolus over 3-5 minutes

Children \geq 44 weeks CGA: 7 mg/kg every 24 hours (maximum dose 420 mg) by infusion over 20 mins.

Trough levels should be measured 18-24 hours after first dose

RENAL IMPAIRMENT: Use multiple daily dosing regimen (see BNFc) but consider giving 12 hourly or once daily depending on degree of renal impairment. Check that trough level is below the level indicated **before** each dose is given.

HYDROCORTISONE Indication: Fluid & inotropic resistant hypotension

Neonate: Initially 2.5 mg/kg repeated if necessary after 4 hours then 2.5 mg/kg every 6 hours

1 month-18 years: 1 mg/kg (max 100 mg) every 6 hours or 25mg/m²/dose 6 hourly

For 48 hours or until BP recovers, then dose reduced gradually over 24-48 hours

METRONIDAZOLE Indication: surgical cause for sepsis; IV/IO infusion at suggested rate of 5ml (25 mg) per minute

Neonate—2 months: 7.5 mg/kg/dose every 12 hours

2 months-18 years: 7.5 mg/kg/dose every 8 hours (maximum dose 500 mg)

MILRINONE Indication: inotrope with vasodilator properties, peripheral or central IV/IO infusion as per www.crashcall.net

Dose: 0.5-0.75 micrograms/kg/minute

Concentration: 0.75 mg/kg made up to 50 ml with 5% dextrose. 1 ml/hour = 0.25 micrograms/kg/min

NORADRENALINE INFUSION—Indication: Hypotension—standard central IV/IO infusion as per www.crashcall.net

Concentration: 0.3 mg/kg made up to 50 ml with 5% dextrose. Using this concentration 1 ml/hour = 0.1 microgram/kg/min

Dose: 0.1-1 micrograms/kg/min—start at minimum dose & titrate dose according to response

SODIUM BICARBONATE Indication: only consider if pH < 7 despite continued fluid resuscitation & inotropes

Half correction Sodium Bicarbonate (mmol) = (Base excess x weight (kg)) ÷ 6

TEICOPLANIN Indication: Antibacterial for use in those with indwelling devices. Can be given IV or IO

Neonate: IV **LOADING** dose 16 mg/kg as a single dose then give IV **MAINTENANCE** dose: 8mg/kg once daily.

All neonatal doses should be given as a 30 minute infusion.

1 month-18 years: IV **LOADING** dose: 10mg/kg/dose (max 400 mg) 12 hourly for **3** doses then give

IV **MAINTENANCE** dose: 6-10 mg/kg (max 400 mg) once daily

VANCOMYCIN Indication: Antibacterial, if recently overseas, in those with indwelling devices, or prolonged or multiple antibiotic exposure within last 3 months. Given IV/IO as intermittent infusion over 60 mins

Neonate: CGA < 28 weeks: 15 mg/kg/dose once daily; CGA 29-35 weeks: 15 mg/kg/dose 12 hourly;

CGA > 35 weeks: 15 mg/kg/dose 8 hourly

1 month– 18 years: 15 mg/kg/dose 8 hourly (maximum single dose 650 mg)

Therapeutic drug monitoring required

VASOPRESSIN (ARGIPRESSIN) Indication: management of hypotension unresponsive to usual inotropes

Central IV/IO infusion: all ages: 0.0003—0.002 units/kg/min (equivalent to 0.018-0.12 units/kg/hour)

Dose calculation (www.crashcall.net): 0.9 units/kg made up to 50 ml with 5% dextrose or 0.9% sodium chloride

Using this concentration: 1ml/hour = 0.0003 units/kg/min

For duration of antimicrobial agents: please seek advice from local guidelines or microbiology/ID teams.

References

¹Glodstein B, Giroir B, Randolph A *et al.* International pediatric sepsis consensus conference: Definitions for sepsis and organ dysfunction in pediatrics. *Pediatr Crit Care Med.* 2005; 6(1):2-8

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⁴Han YY, Carcillo JA, Dragotta MA, Bills DM, Watson RS, Westerman ME, Orr RA. Early reversal of pediatric-neonatal septic shock by community physicians is associated with improved outcome. *Pediatrics.* 2003;112:793-799

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⁶Inwald DP, Tasker RC, Peters MJ, *et al.* Emergency management of children with severe sepsis in the United Kingdom: the results of the Paediatric Intensive Care Society sepsis audit. *Arch Dis Child.* 2009;94:348-353

⁷National Institute for Health and Clinical Excellence (NICE) (2013) *Feverish illness in children: assessment and initial management in children younger than 5 yrs.* (CG160) London: National Institute for Health and Care Excellence

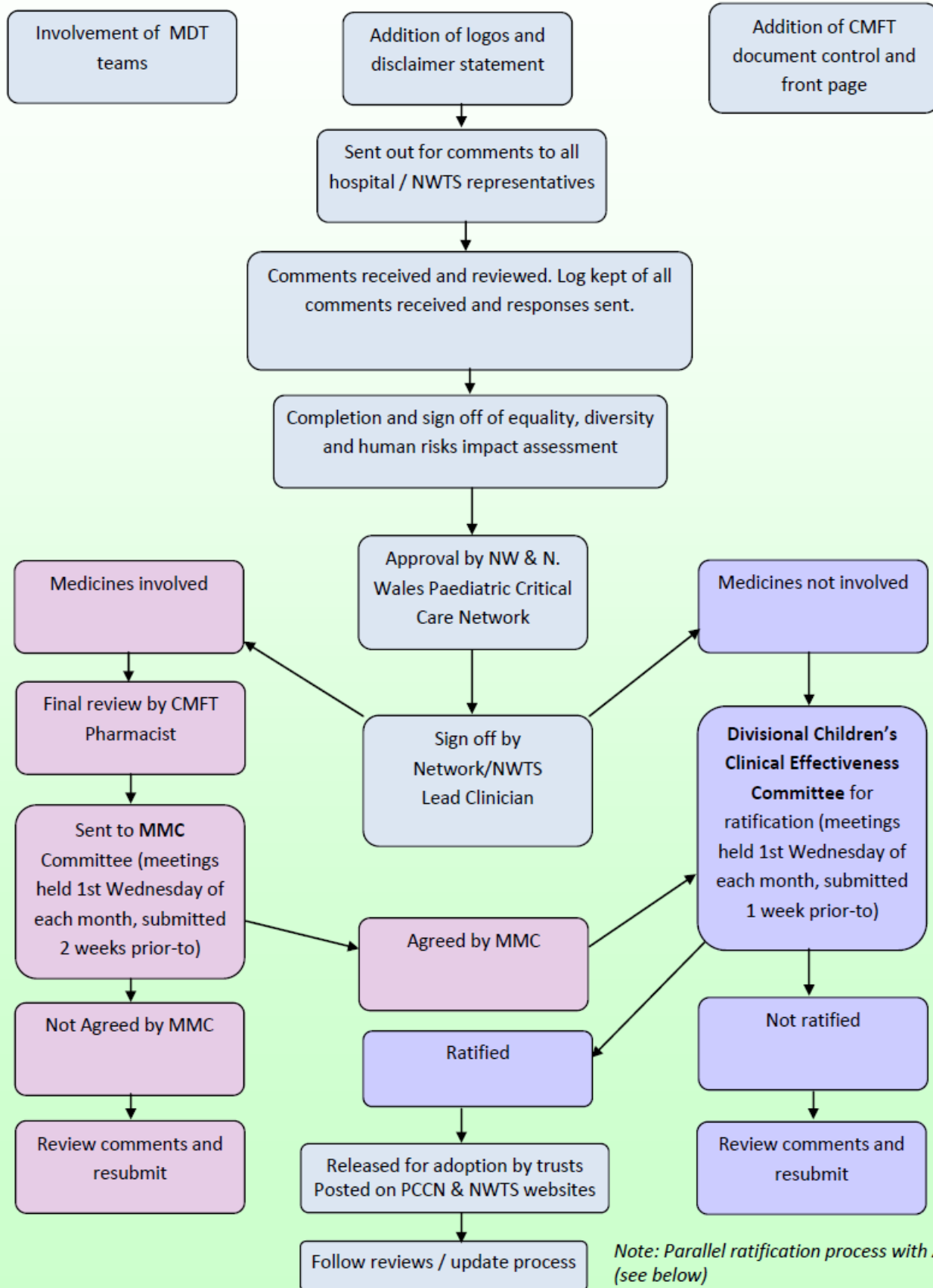
⁸NICE clinical guideline 102: Bacterial meningitis and meningococcal septicaemia

⁹Dellinger RP, Levy MM, Rhodes A, Djillani A, *et al* including Paediatric subgroup. Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis & Septic Shock: 2012

www.crashcall.net for drug doses

Appendix 1

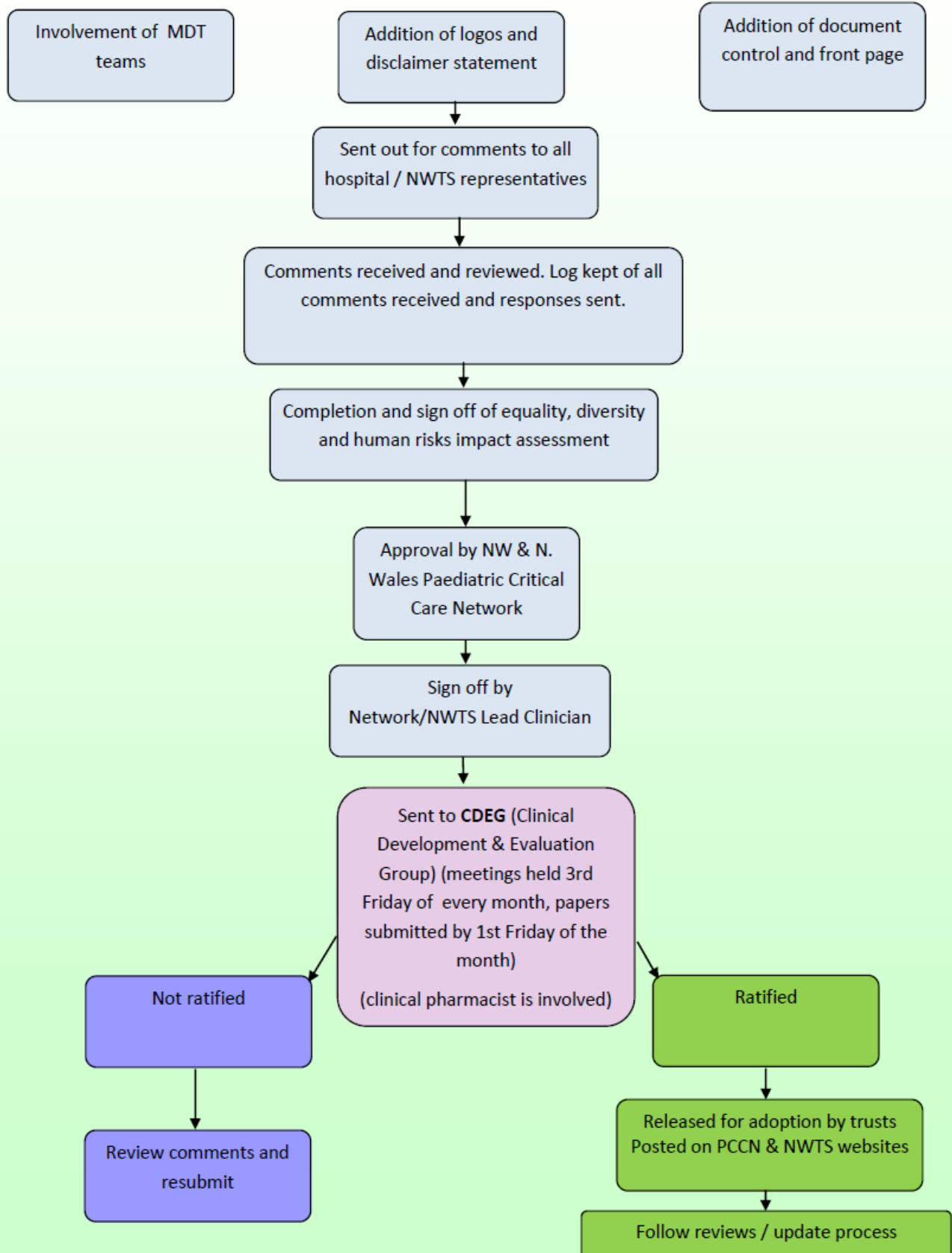
Ratification of Guidelines with Host Organisation (CMFT)



Note: Parallel ratification process with AHFT (see below)

Appendix 1 continued

Ratification of Guidelines with Alder Hey



Resources

www.crashcall.net - for intubation drugs / sedation regime / inotrope doses

Contact numbers:

NWTS (North West & North Wales Paediatric Transport Service) - 08000 84 83 82

Regional Paediatric Intensive Care Units:

Alder Hey Childrens Hospital - 0151 252 5241

Royal Manchester Childrens Hospital - 0161 701 8000

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Paediatric Pharmacists at both Alder Hey and Royal Manchester Children's Hospitals

Date of Approval: 20th June 2014

Date of Review: 20th June 2016

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Please visit NWTS website for the most up to date version of this guideline: www.nwts.nhs.uk