Clinical Guidance

Paediatric Critical Care:
Child Ventilated in Adult ITU

Summary
This guideline is for the use of when caring for children ventilated in adult ITU. STRS will always endeavor to place a child in a PICU, however this guideline can be used while waiting for STRS or if there was an epidemic. It discusses ventilation, cardiovascular considerations, antibiotic and line insertion as well as analgesia and feeding.

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This clinical guideline has been produced by the South Thames Retrieval Service (STRS) at Evelina London for nurses, doctors and ambulance staff to refer to in the emergency care of critically ill children.

This guideline represents the views of STRS and was produced after careful consideration of available evidence in conjunction with clinical expertise and experience. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.

Change History		
Date	Change details, since approval	Approved by

Paediatric Critical care

Child ventilated in adult ICU

Refer all children requiring intensive care to
South Thames Retrieval Service 0207 188 5000

Lines/ tubes

Use uncuffed ETT unless requiring high ventilator pressures (PIP>25cmH_20)
Always intubate orally in 1st instance
Convert to nasal ETT if skills available (nasal better tolerated)
Use 2x 'trousers' to secure – follow STRS ETT taping policy
Suction catheter = 2x size of ETT e.g.8Fr catheter fits 4 ETT

Note there is a higher complication rate of arterial and central lines in children
Indications for arterial line: FiO_2>60%, $ETCO_2$ >8KPa, >5 micrograms/kg/minute dopamine
Indication for central line: >5micrograms/kg/minute dopamine

Avoid urinary catheters unless urinary retention or shock - Weigh nappies and monitor urine output.

Ventilation

Always humidify circuit
<25kg – small (15mm) diameter ventilator circuit
Pressure control or pressure support ventilation preferred

Typical initial settings –
Rate 20bpm, PEEP 5cmH_20, Ti 0.8s
PIP- to move chest, aim tidal volume 6-8ml/kg
FiO_2 to achieve SaO_2>92%
Aim $ETCO_2$ 4-7KPa

Paediatric Acute Respiratory Distress Syndrome managed in similar way to adult ARDS

- Increase PEEP (7-12 cm H_20)
- Permissive hypercapnoea ($ETCO_2$ up to 10KPa)
- Aim TV 5ml/kg
- Tolerate SaO_2 down to 88%
- Consider muscle relaxant/ prone position

If ventilation improves, wean can often then be rapid (average paediatric ventilation 2-4 days)

Cardiovascular

Fluid boluses Hartmans or 0.9% sodium chloride:
-20ml/kg if sepsis, 5ml/kg aliquots if cardiac (must reassess)
-If > 60 ml/kg fluid, start inotropes or earlier if cardiac

1st line inotrope is Dopamine (5-10micrograms/kg/minute)
Dopamine can run via peripheral line at lower concentration – see emergency drug calculator
2nd line inotrope – warm shock= noradrenaline
cold shock = adrenaline
Call STRS and see sepsis guideline if ongoing septic shock

Analgesia and sedation

Standard sedation:
IV morphine 10 to 40 micrograms/kg/hour
(neonates 5 to 20micrograms/kg/hour)
Add IV Midazolam **ONLY** if over 5yrs at 0.5-2 micrograms/kg/minute
NG clonidine 3 to 5 micrograms/kg 8 hourly
Muscle relaxation as required with IV Rocuronium 1mg/kg

Feeding and maintenance fluids

All children require NG tube
Enteral (NG) feeding preferred
Fluid restrict all critically ill children
Monitor fluid balance (weigh nappies)

Fluid requirements (NB. resus fluid is extra to this)

- < 10kg 2ml/kg/hr total
- 10 to 40kg 1ml/kg/hr total
- > 40kg 40ml/hr total

(e.g 15kg patient receives 15ml/hr)
NG feed 2-4 hourly
If feed not tolerated use IV fluids at same rate
< 10 kg – 0.9% sodium chloride with 10% glucose
>10 kg – 0.9% sodium chloride with 5% glucose
Monitor blood glucose 6 hourly, aim glucose 4-8mmol/l

If ready-made bags of 0.9% sodium chloride and glucose are not available- please see website for recipe

Blood transfusion

Transfuse if Hb<70g/L or if requiring inotropes and Hb<100g/L
Avoid unnecessary blood sampling– significant blood loss

Antibiotics/ Antivirals

Admission blood culture, broncho-alveolar lavage, FBC, CRP, nasopharyngeal aspirate

Respiratory infection: co-amoxiclav

Neonatal Shock: cefotaxime +/-amoxicillin +/- Aciclovir

Septic shock: ceftriaxone +/- gentamicin

Suspected meningitis/ encephalitis: ceftriaxone (cefotaxime if <1m), aciclovir, macrolide

STRS will retrieve all ventilated children ASAP

Only in extreme circumstances will children remain at a DGH.

Update STRS:
Daily for ongoing support/ advice
PIP> 25cmH_20
Adrenaline or noradrenaline commenced
Air leak – pneumothorax or pneumomediastium
Clinician feels patient is deteriorating
Problems with sedation