Paediatric Intensive Care Unit

Spontaneous Breathing Trial (SBT) in paediatric patients

Staff relevant to:	Medical, nursing and allied health professionals involved in the management of ventilated paediatric patients
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1. Introduction and Who Guideline applies to

The following guideline outlines the use of the Spontaneous Breathing Trial in paediatric patients within the East Midlands Congenital Heart Centre on PICU and within the Leicester Children's hospital on CICU. It can be used as an aid and learning tool by medical, nursing and allied health professionals involved in the management of ventilated paediatric patients

Background

Spontaneous breathing trials (SBT) are used to identify patients who are likely to struggle following extubation off a ventilator, and may require a further period of recovery on the ventilator. SBT is "the defacto litmus test for determining readiness to breathe without a ventilator".
Ideally, during an SBT we want to observe the patient under conditions that would simulate those following extubation.

2. Guideline information/procedures

Suitability for SBT

- Overnight postoperative care
- Procedural sedation
- Short-term intubation for airway protection and monitoring (e.g. seizures)
- Underlying reason for intubation has resolved/is resolving
- Spontaneous breathing & not under neuromuscular blockade
- Stable Fio2 ≤ 40% for 6 hours and on conventional ventilator modes
- Haemodynamically stable

Flowchart 1: SBT Procedure

- Hold enteral feeds.
- Set Fi02 at 50%
- Set PEEP at 5cm H2O.

Spo2 > 95%

No

- Return to pre-test ventilator settings.
- Restart feeds
- Consider re-test the following day.

Switch to PS with settings:
- **ETT3-3.5mm**-10cm H2O
- **ETT4**-4.5mm-8cm H2O
- **ETT>5mm**-6cm H2O

Failure

Patients on baseline NIV should **NOT** have PEEP and PS set lower than baseline settings

Ventilator settings

Spo2 (Fio2<0.5)	PEEP	VTe	RR
>95%	5cm H2O	5ml/kg IBW	-<6m: 20-60 -6m-2y: 15-45 -2y-5y: 15-40 ->5y: 10-35

Signs of unsuccessful SBT

- Increased FiO2>40% sustained for >2 hours.
- Tachypnea and/or tachycardia-if>20% increase after respiratory rate change sustained for >2 hours and unexplained by other factors
- Asynchrony with ventilator
- Increased work of breathing (nasal flaring/accessory muscle use/retractions)
- Increased EtCO2/paCO2 on ABG and/or decreased minute ventilation (MV)

Aim to extubate within the next 2-4 hours.
Consider if appropriate personnel present (e.g., in children with previous difficult airway)
Consider need for dexamethasone for extubation (See guideline)

Possible reasons for failure:

- Level of sedation - over-sedation may result in a patient not initiating their own spontaneous breaths. Consider adjustments to sedation.
- Hypotension/haemodynamic changes-Weaning may induce increased work of breathing, decreasing preload and manifesting as hypotension.
- Fluid Status-Consider diuresis.
- Fever-Consider new infection source.
- New pneumonia/VAP

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NB: Paper copies of this document may not be most recent version. The definitive version is held on InSite in the Policies and Guidelines Library

3. Education and Training

None

4. Monitoring Compliance

None

5. Supporting References

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6. Key Words

CICU, East Midlands Congenital Heart Centre, Extubation, PICU, Ventilator .

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

CONTACT AND REVIEW DETAILS			
Guideline Lead (Name and Title) Bedangshu Saikia - Consultant			**Executive Lead** Chief Medical Officer
Details of Changes made during review:			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
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