SANDWICH Intervention Package

The SANDWICH intervention is a care bundle with four interrelated and interdependent components. Each component part is essential to the overall intervention, therefore delivering each component is equally important.

This intervention can be delivered alongside your PICU's usual sedation and ventilation weaning practices. If your PICU has a sedation weaning or ventilation weaning protocol, please continue to use these as you did before. The bottom line is that the four component parts of the SANDWICH STUDY are delivered in addition to any usual practice.

The components of the care bundle are:

- Regular sedation assessment using the COMFORT original/Comfort B score
- Twice daily assessment of readiness for a Spontaneous Breathing Trial (SBT)
- Conducting a Spontaneous Breathing Trial (if criteria met)
- Multidisciplinary ward round daily to discuss
    - Child's sedation score and sedation requirements
    - Set COMFORT original/ COMFORT B target for the shift
    - Result of the readiness for an SBT screen +/- outcome of SBT

1. There should be at least one daily multidisciplinary ward round.

WHO IS INVOLVED? This should include at least the nursing and medical disciplines, but may include other disciplines such as physiotherapy, pharmacy and dieticians according to usual practice in your PICU. Daily sedation and ventilation targets must be fed back to the child's bedside nurse and recorded on the daily bedside record (see Appendix 1 explained further in section 3).

WHERE SHOULD IT TAKE PLACE? The round may be conducted at the bedside or a meeting room according to usual practice in your PICU. If conducted in a meeting room without the bedside nurse, then a subsequent face to face discussion should take place at the child's bedside with the bedside nurse.

WHAT IS REVIEWED REGARDING SEDATION? The round must discuss sedation management for the child which should include reviewing:

- the current trends in COMFORT/B scores and the preceding 24 hours;
- the prescribed sedative regimen and number of additional boluses required to be administered;
- Setting the target COMFORT Original/COMFORT B score range in accordance with the child's condition and ventilation plans (see COMFORT original and COMFORT B target range and Titration guideline in Appendix 2).

WHAT IS REVIEWED REGARDING VENTILATION? The round must discuss ventilation management which should include reviewing:

- the result of the readiness for SBT screen criteria and the child's ventilation status;
- Ventilation targets or weaning goals for the next 12-24 hours.

Please **tick the ward round checklist** to indicate these have been reviewed (Appendix 3). Please **keep a copy** of the Ward Round checklist in the dedicated SANDWICH folder to allow the research nurse to retrospectively record these discussions were performed. The research nurse will destroy the checklists after entering the data into the electronic case report form.

2. Minimum 6-hourly measurement of sedation using COMFORT/B.

The child's bedside nurse should undertake sedation assessment using either the COMFORT Original (Appendix 4) or COMFORT B tool (Appendix 5). Scores should be documented according to usual practice in the PICU. Units not already using COMFORT as a sedation tool will receive education and training on the COMFORT Behavioural score.

The bedside nurse should **actively** titrate the sedation infusions and/or prescribed PRN sedation medications in accordance with usual PICU policy. This means both **increasing and decreasing** intravenous or enteral sedation **to achieve the COMFORT target range set on the daily ward round.**

3. Twice daily assessment of criteria for readiness to perform a Spontaneous Breathing Trial (SBT)

WHO DOES THIS? Bedside nurses should undertake daily assessment of five criteria that indicate potential readiness to undertake an SBT. Results should be discussed at daily ward rounds, but can also be fed back to senior staff at any time.

WHEN IS THIS ASSESSED? A minimum of twice per day (end of night shift and early afternoon).

- Screen towards the end of the night shift. If the patient passes the SBT screen, discuss with senior staff to consider commencing the SBT prior to the morning handover. This will enable early discussion of the SBT outcome and extubation if the SBT is successful.
- Screen in the early afternoon to allow sufficient time to proceed to an SBT and possible extubation before the evening handover.
- A minimum of two screens per day should be completed, but readiness for an SBT status can be screened multiple times according to the child's condition.

WHAT ARE THE CRITERIA?

- $FiO2 \leq 0.45$
- $SpO2 \geq 95\%$ (or as appropriate to underlying condition)
- $PEEP \leq 8$
- $PIP \leq 22$
- Cough present

These should be ticked on the bedside record sheet (Appendix 1).

IF ALL CRITERIA ARE MET? Inform a senior member of staff (e.g. senior nurse, shift leader, nurse weaner, ICU registrar or consultant as appropriate in your unit) and ask if an SBT should be conducted. The criteria indicate potential readiness for undertaking an SBT, but the criteria do not capture the full picture. There may be valid reasons why an SBT should not be performed yet – if this is the case, ask senior staff to **explain why** as this will help with your learning process. Record the reasons why the child did not proceed to SBT on the bedside record sheet (Appendix 1).

4. Spontaneous Breathing Trial (SBT)

WHO DOES THIS? The SBT should be performed by an appropriately trained member of staff who is competent to do so in your PICU.

HOW IS THIS PERFORMED? The child's ventilator mode should be changed to provide a positive end expiratory pressure **(PEEP) of 5 cmH2O** and a **Pressure Support of 5 cmH2O (above PEEP).** The SBT can be conducted for up to two hours. During this time, observe the child for signs of tolerance.

In circumstances where it is planned for a patient to be maintained on non-invasive ventilation with a PEEP >5 cm H20 following extubation it would be ill-advised to decrease the level of PEEP pre-extubation to less than their usual or planned NIV settings. The SBT method for this category of patient will be to provide a patient specific **level of PEEP appropriate to their planned NIV PEEP setting** and a **Pressure Support of 5cm H20 (above PEEP).**

In sites where Drager ventilators are in use with the facility to activate Automatic Tube Compensation (ATC), please deactivate ATC on commencing the SBT for SANDWICH.

HOW DO I KNOW THE CHILD IS TOLERATING AN SBT? Monitor the child for signs of respiratory distress:

- Clinically significant increase in heart (above pre-SBT rates)
- Clinically significant increase in respiratory rate (above pre-SBT rates)
- Clinically significant increase in FiO2 requirement
- Signs of increased work of breathing
    - Use of accessory muscles- nasal flaring, tracheal tug, marked sternal/subcostal/ intercostal recession, head bobbing or asynchronous breathing
- Onset of sweating not in keeping with environmental conditions
- Apnoeic episodes
- Change to level of alertness

If the child shows signs of respiratory distress, request an immediate review by a senior member of staff. The child's ventilation settings should be increased to a level they feel will be tolerated. This may result in a return to the original pre-SBT settings, or may result in an increase of support that is still below the pre-SBT level. In this way speed of weaning is increased even in those who an SBT was not successful to the point of extubation. Once the child has stabilised record the result and duration of the SBT on the bedside record. A free text section is provided on the back of the checklist (Appendix 1) for relevant additional information you wish to record.

WHAT HAPPENS WHEN THE SBT IS TOLERATED? If the child is breathing spontaneously with no distress, inform a senior member of staff to discuss and consider a decision to extubate. There may be valid reasons why extubation should not be performed yet – if this is the case, ask senior staff to **explain why** as this will help with your learning process. Extubation should be performed according to usual PICU practice and policy. If extubation occurs, record the date and time on the bedside record. If extubation does not occur, record the reasons on the bedside record.

APPENDIX 1

Bedside Record Sheet- Double sided sheet with a free text section to the back. This will allow the 'other' category to be most accurately documented, and any additional notes the bedside nurse feels are appropriate in the decision making process but not reflected in the checklist.

APPENDIX 2

(**2a**) COMFORT Original Score titration guide (**2b**) COMFORT Behavioural Score titration guide

APPENDIX 3

Ward round generic checklist **OR** unit specific checklist adapted to include SANDWICH specific questions.

Most Units already utilise a ward round checklist or format. In this section we will ask permission to adapt their checklist to include two new criteria

1- **What is the target range for COMFORT/COMFORT B today?**
2- **Was the Spontaneous Breathing Trial (SBT) screen criteria reviewed and discussed?**

The Ward Round Checklist must be completed on every ward round for each ventilated patient enrolled in the trial. Once completed the checklist (generic or unit specific) should be stored in a dedicated folder for the Research Nurse. The research nurse will destroy the paper copy of the ward round checklist using an appropriate method once he/she has completed data collection for that day.

APPENDIX 4

COMFORT Original Score

Bedside Record Sheet- Double sided sheet with a free text section to the back. This will allow the bedside nurse the opportunity to comment on specific COMFORT scores calculated and actions taken as he/she feels necessary.

APPENDIX 5

COMFORT B Score

Bedside Record Sheet- Double sided sheet with a free text section to the back. This will allow the bedside nurse the opportunity to comment on specific COMFORT scores calculated and actions taken as he/she feels necessary.