Providence HEALTH CARE	Department: **Respiratory Services**	Date Originated: December 1997 Date Reviewed/Revised: **June 2011**
POLICY & PROTOCOL	Topic: Critical Care – Weaning Protocol for ICU/CICU (Respiratory Therapy) Number: B-00-13-12012	Related Links: B-00-13-12001

APPLICABLE SITES:

St. Paul's Hospital
Mount Saint Joseph Hospital

POLICY STATEMENT:

All ventilated patients in ICU and CICU will be screened daily for weaning readiness. All patients who meet the screening criteria will be assessed daily for weaning tolerance.

GENERAL INFORMATION:

Weaning from mechanical ventilation is an important clinical process and care must be taken to ensure that discontinuation of ventilatory support is neither delayed nor prematurely employed.

The purpose of the Weaning Protocol is to provide each patient with high quality ventilatory care with a smooth and timely transition towards liberation from mechanical ventilation.

Issues to consider in this process include:

- Understanding the reasons why the patient initially required mechanical ventilation
- Utilizing assessment techniques to identify those patients capable of tolerating ventilator discontinuation
- Trial(s) of spontaneous breathing to determine ability to formally discontinue ventilatory support
- After successful completion of a spontaneous breathing trial, assessment of airway patency and ability to protect airway (ie for consideration of extubation)

WEANING PROTOCOL:

The Weaning Protocol is comprised of 3 steps:

1. Daily Screening
2. Spontaneous Breathing Trial
3. Physician Notification

NOTE: *Each patient will be assessed daily for weaning tolerance until extubated.*

DAILY SCREENING:

Screening is to be performed every morning between the hours of 0600 – 0830. All of the following conditions must be met to proceed with a Spontaneous Breathing Trial, unless otherwise ordered by the ICU attending physician:

1. Adequate oxygenation
   - PaO_2/FiO_2 ratio greater than 150 on PEEP less than or equal to 8 cmH_2O
2. No significant respiratory acidosis
3. Hemodynamically stable
   - Minimal vasopressor agents (dopamine less than or equal to 5 µg/Kg/min acceptable)
   - Stable heart rate and rhythm
4. Adequate mentation
   - Minimal sedative agents (intermittent dosing acceptable)
   - Able to initiate spontaneous breaths
5. Rapid shallow breathing index (RSBI or f/Vt ratio) less than or equal to 105 (measured after 1 minute on CPAP = 0 and PS = 0) (note: evidence suggests that the RSBI may be influenced by ventilatory support such as CPAP or PS, but probably not by FiO_2)

SPONTANEOUS BREATHING TRIAL (SBT):

Once the screening criteria have been met, a Spontaneous Breathing Trial (SBT) of 30 – 120 minutes should be undertaken.

The SBT will be performed on PSV +5 cmH_2O (CPAP mode with PS) for 30 – 120 minutes.

NOTE: In CICU (or cardiac patients in ICU), a t-piece trial will be used for the spontaneous breathing trial (unless otherwise ordered by the ICU attending physician).

The SBT should be discontinued if the patient experiences 2 or more of the following conditions:

1. RR > 35 breaths/minute for 5 consecutive minutes or longer
2. SpO_2 < 90%
3. HR > 120 -140
4. Sustained change in HR of 20% or greater (increase or decrease)
5. Systolic BP > 180 or < 90 mmHg
6. Increased anxiety
7. Diaphoresis

If the trial is stopped PS will be increased in 5 cmH_2O increments (to a maximum of 25

cmH_2O) until the above-noted condition(s) have corrected. If the patient does not recover with higher levels of PS, return to the prior mode of maintenance ventilation (i.e. AC, PC).

PHYSICIAN NOTIFICATION:

The ICU attending physician will be notified if:

1. The spontaneous breathing trial is successful – extubation will be considered
2. The spontaneous breathing trial is *not* successful
3. The patient does not meet the criteria for initiating the Weaning Protocol

REFERENCES:

1. Patel KN, Ganatra KD, Bates JHT, Young MP. Variation in the rapid shallow breathing index associated with common measurement techniques and conditions. Respir Care 2009; 54 (11): 1462-1466.

2. El-Khatib MF, Zeineldine SM, Jamaleddine GW. Effect of pressure support ventilation and positive end expiratory pressure on the rapid shallow breathing index in intensive care unit patients. Intensive Care Med 2008; 34: 505-510.

3. AACP/AARC/SCCM Task Force. Evidence based guidelines for weaning and discontinuing mechanical ventilatory support. Chest 2001; 120 Suppl 6: 375S-484S.

4. Ely EW, Meade MO, Haponik EF, Kollef MH, Cook DJ. Mechanical ventilator weaning protocols driven by nonphysician health care professions: evidence-based clinical practice guidelines. Chest 2001; 120 Suppl 6: 454S-463S.

5. Yang KL, Tobin MJ. A prospective study of indexes predicting the outcome of trials of weaning from mechanical ventilation. NEJM 1991; 324(21): 1445-1450.