ASSOCIATED POLICY LINK
Spontaneous Breathing Trial

SCOPE
Respiratory therapists will comply with this procedure.

DEFINITIONS
SBT – Spontaneous Breathing Trial
RT – Respiratory Therapist
RSBI – Rapid Shallow Breathing Index

SBT Readiness Indicators
1. Adequate oxygenation: PO2 > 60 mmHg on FiO2 < 50%; Peep < 8; PaO2/FiO2 > 120-300
2. Stable vital signs (HR and rhythm, B/P, temp)
3. Stable cardiovascular status
4. Acceptable SPO2/arterial blood gases
5. Adequate Hgb
6. Receiving reduced sedation or analgesics that may interfere with ventilatory drive
7. Resolution of acute phase; adequate cough

PROCEDURE
Upon confirmation of readiness indicators, the respiratory therapist will begin a Spontaneous Breathing Trial (SBT).

1. Transition to CPAP, and appropriate pressure support with respect to endotracheal tube diameter
   a. CPAP Mode:
      i. PSV 8 for # 6 endotracheal tube
      ii. PSV 7 for # 7 endotracheal tube
      iii. PSV 5 for # 8 endotracheal tube
   b. Maintain PEEP and FIO2 at current set level
2. Acceptable spontaneous parameters include:
   * NOTE: Zero Pressure support when obtaining respiratory parameters.
      a. RR 12-25
      b. VT > 5ml/kg (IBW)
      c. VE < 10 lpm
      d. VC 10ml/kg (IBW)
      e. NIF -25, or greater negative number
      f. RSBI of < 100.  * RSBI = RR/Vt (in liters)
3. RT will monitor patient tolerance during SBT.
   a. Arterial blood gas sample will be obtained per physician discretion.
PROCEDURE

P- Spontaneous Breathing Trial

If patient is not extubated within 60 minutes of spontaneous trial:
   a. RT will return patient to previous mode of ventilation.
      i. RT will obtain an RSBI at end of SBT (zero pressure support).

No patient will be extubated without a physician order.

The SBT shall end if any of the following conditions occur:
   a. Respiratory rate exceeds 35 breaths per minute for greater than five minutes.
   b. Arterial oxygen saturation falls below 90%.
   c. Heart rate exceeds 120 beats per minute or sustained changes in heart rate of 20% in either direction.
   d. Systolic blood pressure >180 mmHg or <90 mmHg.
   e. Increased anxiety
   f. Diaphoresis

“Tolerance Criteria” – how do we know if patient is failing/succeeding?
   a. Close direct observation during a “screening” phase of an SBT:
      i. If patients fail, they often fail early.
      ii. Patients must be watched for muscle fatigue, respiratory muscle paradox, hemodynamic instability, discomfort, and signs of worsening gas exchange

Satisfactory ABG results constitute:
   a. PH 7.35 - 7.42mmHg.
   b. PaCO2 31-45mmHg (non-CO2 retainers)
   c. For CO2 retainers: less than 10mmHg above their baseline (with ph > 7.35)
   d. PaO2 > 60mmHg with FIO2 < 50%

Additional SBT tolerance criteria for extubation:
   a. An acceptable amount of purulent or copious sputum.
   b. An adequate gag and cough.
   c. Positive cuff leak with deflated endotracheal tube balloon
   d. Ability of patient to lift head off pillow
   e. Level of alertness and neuro status appropriate per patient

Equipment needed for extubation includes:
   a. Gloves, mask, gown, and protective eyewear as indicated by Standard Precautions.
   b. Nasal cannula
   c. 10ml syringe
   d. Oral suction tip
   e. Towel or protective pad

Extubation Procedure:
   1. Difficult intubation ALERT:
      a. Anesthesia will be contacted for extubation when noted difficult intubation has been documented or suspected.
   2. Explain procedure/expectations to patient.
      a. Place protective cover over patient’s chest.
PROCEDURE

P- Spontaneous Breathing Trial

4. Assemble nasal cannula and ensure operation
5. Hyper-oxygenate patient.
7. Attach suction tip to suction and suction patient’s mouth.
8. Remove patient endo-securing device/material.
   a. Instruct patient to take a deep breath.
   b. At peak inspiration:
      i. Deflate balloon with suction activated.
      ii. Pull out endotrachael tube as patient exhales – suctioning throughout.
10. Encourage patient to cough.
11. Place patient on nasal cannula with appropriate flow to maintain SPO2 > 92%

Post Extubation Observation
1. Observe for stridor and respond collaboratively with physician:
   a. Immediate stridor – assess for re-intubation due to airway obstruction.
   b. Within two hours – suspect laryngeal edema.
      i. Obtain orders to treat.
   c. Within eight hours – problem solve:
      i. Airway secretions and/or subglottic edema.
2. Patient to remain NPO eight hours post extubation.

DOCUMENTATION
1. Document all ventilator setting changes within patient electronic medical record as appropriate.
2. SBT documentation shall include:
   a. Weaning parameters upon SBT initiation and RSBI at end of SBT.
   b. Patient tolerance of SBT.
      i. Patient extubation as applicable.

REFERENCES
FOCUS: Journal for Respiratory Care & Sleep Medicine: Evidence-based medicine for weaning & discontinuing ventilatory support-Wntr 2011 p30(2)