CUSP 4 MVP – VAP

Spontaneous Awakening (SAT) and Spontaneous Breathing Trial (SBT) Protocol

Introduction
Reducing the number of days a patient is on mechanical ventilation has been shown to reduce the risk of VAP. (Ely 1996, Brook 1999, Kress 2000) Strategies for weaning patients off of mechanical ventilation are often not handled well as the spontaneous awakening (SAT) and spontaneous breathing trials (SBT) are viewed separately. A wake up and breathe protocol using both the SAT and SBT can significantly reduce the number of days patients are on mechanical ventilation. Girard et. al. showed that paired, the SAT and SBT reduced the number of days patients were on mechanical ventilation (3.1 day mean difference, 95% CI 0.7-5.6; p=0.02), with a concomitant reduction in the length of hospital stay (4 day difference) when compared to SBT alone. This same technique, often called a readiness-to-wean or sedation protocol, has been used in other institutions with much success. (Kress 2000, Blackwood 2011, Quenot 2007) We are using the model Girard et. al. developed in 2008 for this project.

Spontaneous Awakening Trial (SAT)
A patient is considered to have passed the SAT if already awake, defined by Kress et. al. 2000 as “They can do three out of four simple tasks on request: open their eyes, look at their caregiver, squeeze the hand or put out their tongue.”

The SAT consists of two parts, a safety screen and the trial. (Please see flow diagram below.) The safety screen checks for contraindications. A patient passes the screen unless the following factors are present:

- Receiving a sedative infusion for active seizures or alcohol withdrawal
- Receiving escalating doses of sedative for agitation
- Receiving neuromuscular blockers
- Evidence of active myocardial ischemia in prior 24 hours
- Evidence of increased intracranial pressure

If the patient passes the safety screen, all sedatives and analgesics used for sedation are stopped. Analgesics used for pain are continued. The goal is that the patient can do three out of four simple tasks on request: open their eyes, look at their caregiver, squeeze the hand or put out their tongue (Kress 2000) or can go without sedation for 4 hours or more without the following:

- Sustained anxiety
- Agitation
- Pain
- Respiratory rate of 35 breaths/minute for ≥ 5 minutes
- SpO₂ of less than 88% for ≥ 5 minutes
- Acute cardiac dysrhythmia
- Two or more signs of respiratory distress
If a patient fails the SAT, sedatives are started at one half the prior dosage and titrated up as needed.

### Spontaneous Breathing Trials

If a patient passes the SAT, the patient is assessed for the SBT safety screen. A patient passes if the following conditions are achieved:

- Adequate oxygenation (SpO$_2$ $\geq$ 88% or an F$_1$O$_2$ of $\leq$ 50% and a PEEP $\leq$ 8 cm H$_2$O)
- Any spontaneous inspiratory effort in a 5-minute period
- No agitation
- No significant use of vasopressors or inotropes
- No evidence of increased intracranial pressure

If a patient fails the safety screen, he is reassessed for SAT the following day. If the patient passes the safety screen, they undergo the SBT. Ventilatory support is removed. Patient is allowed to breathe through either a T-tube circuit of a ventilatory circuit with CPAP of 5cm H$_2$O or pressure support ventilation of less than 7cm H$_2$O. A patient passes the trial if they avoid developing any of the following failure criteria within 120 minutes:

- Respiratory rate of either $<$ 8 breaths per minute (bpm) or $>$ 35 bpm for 5 min or longer
- Hypoxemia (SpO$_2$ $<$ 88% for $\geq$ 5 min)
- Abrupt change in mental status
- Acute cardiac arrhythmia
- Two or more signs of respiratory distress
  - Tachycardia
  - Bradycardia
  - Use of accessory muscles
  - Abdominal paradox
  - Diaphoresis
  - Marked dyspnea

If a patient fails the SBT, he is reassessed for SAT the following day. If a patient passes the SBT, the patient’s physicians are notified for possible extubation.
Start

Is the patient responsive to verbal stimuli?
- Yes
  - Evaluate every 24 hrs
  - Patients receiving full vent support or patients being weaned are eligible and should be screened daily.
- No

SAT Safety Screen
Does the patient meet any of the following criteria?
- Is receiving sedative for active seizures or alcohol withdrawal
- Is receiving sedative for agitation
- Is receiving neuromuscular blockers
- Has evidence of myocardial ischemia in prior 24 hours
- Has evidence of intracranial pressure

Can they go without sedation for 4 hrs or more without any of the following:
- Anxiety
- Agitation
- Pain
- Respiratory Rate of 35 breaths/minute for >= 5 minutes
- SpO2 of less than 88% for >=5 minutes
- Acute cardiac arrhythmia
- Two or more signs of respiratory distress
  - Tachycardia
  - Hypoxemia
  - Use of accessory muscles
  - Abdominal paradox
  - Diaphoresis
  - Marked dyspnea

Yes
- • Return to Start
- • Rescreen tomorrow
No
- • Restart Sedation at Half Dosage
- • Titrate for Pain/Sedation
- • Return to Start

SBT Safety Screen
Does the patient meet the following criteria?
- Has adequate oxygenation (SpO2 ≥ 88% on an FIO2 of <=50% and a PEEP 28 cm H2O)
- Any spontaneous inspiratory effort in a 5-min period
- No agitation
- No myocardial ischemia
- No vasopressor or inotropes
- No increased intracranial pressure

Yes
- • Return to Start
No
- • Return to Start

Patient is allowed to breathe through a T-tube circuit or ventilatory circuit with CPAP of 5cm H2O or pressure support ventilation of <7cm H2O. Does patient develop any of the following failure criteria?
- Respiratory rate of more than 35 or less that 8 breaths per min for 5 min or longer
- Hypoxemia (SpO2 < 88% for >=5 min)
- Abrupt change in mental status
- An acute cardiac arrhythmia
- Two or more signs of respiratory distress
  - Tachycardia
  - Bradycardia
  - Use of accessory muscles
  - Abdominal paradox
  - Diaphoresis
  - Marked dyspnea

Yes
- • Return to Start
No
- Notify Physician to Consider Extubation

Adapted from Girard at al. The Lancet, 2008