Management of a Vented Patient for Non-ICU RN’s

The module will provide the following education:
- Determining need for Mechanical Ventilation
  - Intubation
  - Ventilator Modes
  - Ventilator Alarms
  - Extubation
- Sedation Management
Appropriate for Mechanical Ventilation

Inadequate ventilation and/or oxygenation

- Acute Respiratory Failure (ARF)
  - ABG shows low oxygenation and/or abnormal CO2
- Airway Protection
  - Obstruction
  - Aspiration, Secretion Management
  - Altered mental status

Specifically with COVID19 patients, early intubation is key
Managing an Intubation of a Patient

Always have a plan prior to intubation

Think about what you need and be prepared for the before, during, and after intubation
Managing Intubation of the COVID-19 patient

What do you need at the bedside?

- The right people
- The right PPE for COVID-19 Intubation
- The right equipment - airway box outside room:
  - Bag-Valve Mask w/filter
  - Medications
  - Correct size ETT & Stylet

- Laryngoscope handle and blade
- 20cc syringe
- Sterile Lube
- ETAD/Securing Device
- Skin Prep
- Suction - Yankauer
- Oxygen at 15L flow rate
- Bedside monitoring equipment
- Ventilator
# Rapid Intubation Sequence Common Medications

## Sedatives

<table>
<thead>
<tr>
<th>Medications</th>
<th>Dose</th>
<th>Onset</th>
<th>Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etomidate</td>
<td>0.3 mg/kg</td>
<td>30-60 sec</td>
<td>5-10 min</td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>50 – 200 mcg</td>
<td>&lt; 1 min</td>
<td>30 – 60 min</td>
<td></td>
</tr>
<tr>
<td>Propofol</td>
<td>0.5 – 1.5 mg/kg</td>
<td>&lt; 1 min</td>
<td>3-10 min</td>
<td>May cause significant hypotension. Consider initial dose of 0.5 mg/kg in hemodynamically unstable patients.</td>
</tr>
<tr>
<td>Ketamine</td>
<td>0.5-2 mg/kg</td>
<td>~30 sec</td>
<td>10 – 20 min</td>
<td>May cause hypertension. Due to its bronchodilator properties, it is used more often in asthmatic patients.</td>
</tr>
</tbody>
</table>

## Paralytics

<table>
<thead>
<tr>
<th>Medications</th>
<th>Dose</th>
<th>Onset</th>
<th>Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocuronium</td>
<td>0.6-1.2 mg/kg</td>
<td>60 – 75 sec</td>
<td>30 – 60 min</td>
<td>Duration increases with higher doses</td>
</tr>
<tr>
<td>Succinylcholine</td>
<td>1 to 1.5 mg/kg</td>
<td>&lt; 1 min</td>
<td>5 – 10 min</td>
<td>Should be avoided in patients with:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Renal dysfunction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Burn/Crush Injuries</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Malignant Hyperthermia history</td>
</tr>
</tbody>
</table>

Always give sedative prior to paralytic.
PPE before ABC

- There is no emergency during a pandemic
- Protect yourself with the correct PPE before caring for your patient
- COVID-19 is Severe Respiratory Precautions

- PPE Guideline Link
  https://www.spectrumhealth.org/covid19/provider-resources
Overview of Vent Modes

Pressure Support Ventilation (PSV)
- Ventilator has a set pressure support level
- Patient breathes at own rate and depth
- Too much sedation may cause decreased respiratory rate
- Back-up setting on ventilator prevents apnea
Overview of Vent Modes

Assist Control Volume (A/C Volume)
- Ventilator is set with specified rate and tidal volume
  - Patient can breathe over the set rate
- Peak Inspiratory Pressure (PIP) will vary
  - Note baseline/average on vent and watch trend

Pressure Control Ventilation (PCV or P/C)
- Ventilatory is set with specified rate and peak inspiratory pressure
  - Patient can breathe over the set rate
- Tidal volume will vary
  - Note baseline/average on vent and watch trend
What is Positive End Expiratory Pressure (PEEP)

PEEP Setting used with every invasive ventilation mode
PEEP Keeps alveoli open at the end of expiration
PEEP Improves gas exchange

- Normal 5-8 cm
- Commonly seeing 12-20 used for patients with COVID-19
- Weaning of PEEP may indicate that lungs are improving
- Minimize breaking/opening the circuit- alveoli may take hours to recover in patients needing high PEEP
  - Aerosolization occurs when vent circuit is broken
- If break in circuit causes desaturation, reconnect the circuit and then call RT
# Frequent Ventilator Alarms

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Problem</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Pressure</strong></td>
<td>Coughing, Secretions, Mucous plug or worsening lung compliance</td>
<td>Suction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call RT if alarm continues</td>
</tr>
<tr>
<td></td>
<td>Biting the tube or ETT kinked or mal-positioned</td>
<td>Fix problem- check ETT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase sedation, consider bite block</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Call RT if alarm continues</td>
</tr>
<tr>
<td><strong>Circuit Disconnect</strong></td>
<td>Circuit disconnected</td>
<td>Look for disconnection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reconnect circuit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notify RT if disconnection results in desaturation</td>
</tr>
<tr>
<td><strong>High Rate, TV, or MV</strong></td>
<td>Pain, coughing, agitation, neuro breathing</td>
<td>Assess</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Treat: Suction or address pain/sedation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT may need to readjust alarms</td>
</tr>
<tr>
<td><strong>Low Rate, TV or MV</strong></td>
<td>Increased secretions, mucous plug, coughing or excessive change in sedation</td>
<td>Suction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess and address sedation/pain if RASS not at goal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call RT if no resolution</td>
</tr>
<tr>
<td><strong>Apnea</strong></td>
<td>Apnea, hypoventilation, excessive sedation</td>
<td>Assess and adjust level of sedation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Call RT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vent will continue using back-up rate (PSV)</td>
</tr>
</tbody>
</table>

When in doubt, bag and shout!
Sedation Management

- Vented patients often receive some sedation
- The goal is for the patient to be comfortable on the vent but still able to participate in care

Common Sedative Medications
- Fentanyl
- Versed
- Propofol
- Dexmedetomidine (Precedex)
Richmond Agitation Sedation Scale (RASS)

Used to assess patient’s level of agitation and sedation

Sedation medications are titrated to a RASS Goal (provider order) at least every 4 hours, as well as before and after each titration

Scoring Patient Steps

- Observe
  - Where are they before stimulation
- Provide minimal stimulation
- How do they react to stimulation
- Chart RASS
- Titrate sedation to RASS score
- In 15-30 min Reassess and Chart RASS Score
  - Titrate as needed

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
<td>Overtly combative or violent immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very Agitated</td>
<td>Pulls on removes tubes/catheter has aggressive behavior toward staff</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Freq. non-purposeful movement or Patient-Ventilator dyssynchrony</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious or apprehensive but movements not aggressive or vigorous</td>
</tr>
<tr>
<td>0</td>
<td>Alert/Calm</td>
<td></td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Not fully alert, but has sustained (&gt;10 sec) awakening, eye contact, to voice</td>
</tr>
<tr>
<td>-2</td>
<td>Light Sedation</td>
<td>Briefly (&lt;10 sec) awakens with eye contact to voice</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate Sedation</td>
<td>Any Movement to voice (no eye contact)</td>
</tr>
<tr>
<td>-4</td>
<td>Deep Sedation</td>
<td>No response to voice, but any movement to physical stimuli</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td>No response to voice or physical stimulation</td>
</tr>
</tbody>
</table>
Delirium

Delirium is defined as a disturbance in attention and awareness that is accompanied by a change in cognition that cannot be better accounted for by a preexisting or evolving neurocognitive disorder such as dementia.

Observed as a sudden, severe confusion due to rapid changes in brain function.

Delirium is devastating to patients and is undiagnosed approximately 70% of the time.

Confusion Assessment Method for ICU (CAM-ICU)
- An assessment tool that uses objective testing prespecified cutoffs to determine the presence of inattention and disorganized thinking.
  - See Epic for assessment details
  - Best time to assess for delirium is when sedative is turned off and patient is awake
  - Policy: Delirium Prevention and Management for Adult Critical Care Patients (Ref #: 20792)
Spontaneous Awakening Trial (SAT)

Patients on continuous sedation need a ‘sedation holiday’ or SAT each shift. Discuss with ICU RN if SAT is appropriate:

■ Turn off sedation completely
■ Assess patient
■ Assess:
  ■ Sedation level (RASS)
  ■ Delirium (CAM-ICU)
  ■ Neuro function
■ Policy: Spontaneous Awakening Trial (SAT) (Ref #: 19862)
Spontaneous Breathing Trial (SBT)

- Use daily, unless otherwise ordered, to determine readiness for extubation
- Coordinate SAT and SBT with RESPIRATORY THERAPY
- Successful SBT: stable vital signs, spontaneous breathing, no distress noted
- An order is required for extubation – RT will extubate patient
- Post extubation the RN will:
  - Assess mental status – ability to follow commands, cough, control secretions
  - Monitor oxygen needs and respiratory effort
  - Patients must have a swallow study order and diet order before they can have oral intake, including water
- Policy: Spontaneous Breathing Trial Interdisciplinary Protocol (Ref #: 10056)