



Spectrum Health

Nursing Clinical Education Resources
Nancy Bekken
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COVID-19 Ventilator Management
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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	Medications	Dose	Onset	Duration	Notes
	Etomidate	0.3 mg/kg	30-60 sec	5-10 min	
	Fentanyl	50 – 200 mcg	< 1 min	30 – 60 min	
	Propofol	0.5 – 1.5 mg/kg	< 1 min	3-10 min	May cause significant hypotension. Consider initial dose of 0.5 mg/kg in hemodynamically unstable patients.
	Ketamine	0.5-2 mg/kg	~30 sec	10 – 20 min	May cause hypertension. Due to its bronchodilator properties, it is used more often in asthmatic patients.

Always give sedative prior to paralytic

Paralytics	Medications	Dose	Onset	Duration	Notes
	Rocuronium	0.6-1.2 mg/kg	60 – 75 sec	30 – 60 min	Duration increases with higher doses
Succinylcholine	1 to 1.5 mg/kg	< 1 min	5 – 10 min	Should be avoided in patients with: <ul style="list-style-type: none"> •Renal dysfunction •Burn/Crush Injuries •Malignant Hyperthermia history 	

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

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

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 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

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

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)



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