



## eAPPENDIX      **Prone Positioning for ARDS patients – Tips and lessons from the COVID-19 pandemic**

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### **COVID-19 Low-Fidelity in Situ Simulation for Proning**

**Main Objectives:** This scenario was created in response to the COVID-19 pandemic by the Critical Care Strategic Clinical Network of Alberta, in collaboration with members of the provincial critical care community. The main objective of this simulation is to provide an easy guide for practicing prone positioning. This simulation can be led by any staff member, regardless of their formal training in simulation.

**It is important for ICU teams to become proficient in prone positioning to adequately prepare for a respiratory pandemic, during which ICU teams may be required to care for a large number of patients with ARDS.**

**Location:** Empty ICU bed, stretcher in a hallway or classroom.

**Staff required for Simulation:** 6-7 total. A minimum of 5 staff members are required to prone. One person will read the proning checklist (below) and one person will simulate the patient for repositioning. As teams become more comfortable, they may not require an additional person to read the checklist.

Staff requirements for proning:

- One respiratory therapist (RRT)– primary responsibility is management of the airway
- One ICU nurse (RN) – primary responsibilities are the other patient lines and attachments

- Three additional healthcare workers
  - Can be ICU or non-ICU
  - Can be MD/RRT/RN/health care aide (HCA)/allied health workers

Consider which support staff you have available at your site. They do not need to be clinical workers. Try to practice with any staff that may be involved in proning a patient to broadly increase comfort levels with this skill. The RN and RRT will be leaders for those participating that are not clinical. Everyone who may be involved must be trained and fit tested for appropriate personal protective equipment (PPE).

**Equipment:** Bed or stretcher, electrocardiogram (ECG) wires, simulation lines as available (intravenous lines [IVs], IV pole, foley, chest tube and waterseal container, drains), tape, proning checklist (see example checklist below), ventilator tubing, 3 pillows, 2 flat sheets, Duoderm (can simulate with tape), head positioning devices (gel pads, foam head rest), absorbent pad/sheet. Consider assembling a “Prone Sim” bucket with all supplies for ease of use.

**In an effort to preserve PPE, do not use PPE for simulation.**

**Preparation:**

- Lay one flat sheet on stretcher or bed.
- Have staff member lay down to simulate the patient.
- Tape lines to staff member to simulate patient attachments.
- Tape ECG leads to anterior chest.
- If possible, attach wires to a monitor to simulate connections as they will hang.
- Collect staff and other supplies.
- Explain the simulation and assign roles.

**SCENARIO**

A patient with suspected COVID-19 has been admitted to your ICU 8 hours ago. Their admission chest x-ray (CXR) demonstrates bilateral airspace disease suggestive of acute respiratory distress syndrome (ARDS), and they are intubated. The patient is adequately sedated and paralyzed, and you have been using appropriate lung protective strategies, but their PaO<sub>2</sub> has remained around 91 with a FiO<sub>2</sub> of 0.65 (PF 140) for the last 4 hours. The team decides to prone the patient. The attending physician provides the order for prone positioning (as required).

**SIMULATION**

**Do not use new PPE for this simulation and instead consider using reusable or expired PPE.**

**Team leader should conduct a pre-proning huddle to review roles and plan prior to donning PPE.**

**Be mindful of communication challenges that you might expect when proning in an isolation room. Practice speaking clearly and with enough volume. Use eye contact and closed loop communication styles.**

**Team leader to read proning checklist or procedure steps. Use the procedure you are most comfortable with or the checklists below. Staff to follow steps as they are read.**

### Pre Prone Checklist

<b>Collect Supplies</b>	
	3 pillows (if the patient is large, considering using more pillows)
	2 flat sheets
	Head positioning device (gel pads, foam head rest, or alternative tool)
	Absorbent pads, skin protection dressings (duoderm, mefix, etc.)
<b>Preparation for Prone Position</b>	
	Hold enteral feeding to prevent aspiration
	Clear room of non-essential equipment
	Explain the purpose of prone positioning to the patient/family
<b>RRT Assessment</b>	
	Endotracheal tube (ETT) is secure and positioned to the far side of the mouth, opposite to the ventilator. Ensure ventilator tubing is firmly connected to prevent disconnection.
	Pre-oxygenate the patient
	Patient's face is turned towards the ventilator
	Mouth and ETT have been suctioned
	Evac suction tubing has been disconnected
	Oxygen saturation monitor is on
	Ensure that suction is available and functioning at the HOB
	Intubation / emergency equipment is nearby, including bag-valve-mask
	Determine if the airway is difficult. If difficult, notify team and prepare other emergency equipment as needed on standby.
	Check ETT location on CXR and note position at the teeth
<b>RN Assessment</b>	
	Lubricate patient's eyes and remove any earrings, body piercings, and jewelry
	Due to the direction of insertion, chest tubes can be draped along the patient's side and the containers placed at the foot of the bed
	All non-essential IV lines are discontinued
	Naso/orogastric tubes are disconnected and placed upwards beside the patient's face
	Other tubes and lines originating from above the waist are moved to the head of the bed
	Tubes and lines from below the waist are moved to foot of the bed
	ECG electrodes are repositioned (or removed with physician order) to avoid excessive pressure points

	Ensure suction is disconnected
	Maximally inflate the bed, ensure brakes are applied
	Ensure patient is adequately sedated, medications available as needed
	If indicated, perform baseline train of 4 and administer paralytics
	Develop plan with most responsible healthcare provider (MRHP) for hemodynamic instability and have appropriate medications and fluid ready
	Perform baseline comprehensive assessment and note cardiopulmonary parameters to assess patient's tolerance to prone positioning
<b>Preparation for the Turn (once above checklist complete)</b>	
	Place three pillows on the patient <ul style="list-style-type: none"> <li>- One on the torso below the clavicles</li> <li>- One on the hips</li> <li>- One over the lower legs (can be placed after proning)</li> </ul>
	Place absorbent pads under the pillows (facing the patient) in high drainage areas
	Consider placing protective dressings (e.g., duoderm) on prominent bony areas (e.g. knees)
	Tuck the patient's arm closest to the ventilator under their hip
	Cross the patient's ankles
	Place flat sheet over the pillows and fold down from head of the bed so that the patient's head is exposed
	You are now ready to start the turn. Call for required help.

### **Prone Positioning Procedure**

#### **Designate**

- Leader: Experienced member of the team.
- Airway management: Minimum 1 RRT at the head of the bed.
- Turners: 4 members, 2 on either side of the patient. Minimum 1 ICU RN.
- MRHP on unit: To provide direction if medical intervention is required.
- MINIMIZE PEOPLE IN ROOM (limit exposure, preserve PPE).

#### **Confirmation**

- RRT: Confirm the location for ETT and verbalize to the team.
- Team: Confirm all lines are positioned and unnecessary lines are removed.

#### **Leader will call out the following process in order:**

#### **Cocoon**

- Turners: Clench the bottom sheet and the top sheet. Roll them together creating a tight roll.
- The tighter the roll, the easier the turn.

#### **Prepare**

- First move will be horizontal. Patient's face must be toward ventilator.

- We will move the patient across the mattress AWAY from the ventilator.
- RRT: Is the ETT secure and are you ready for the move?

### **Horizontal**

- Team: Are you ready?
- RRT: Please count and on the RRT count of 3 we will move the patient horizontal away from the ventilator.

## **COMPLETE THE HORIZONTAL MOVE**

### **Turn Check**

- RRT: Is the ETT secure?
- Team: Do you see any issues with the lines?
- Team: We will prepare for the lateral turn.

### **Lateral Turn**

- The lateral turn is a 90 degree turn and the patient will lie on their side. The turners on the side opposite the ventilator will pull upwards on the sheet roll. The turners on the side of the ventilator will push the sheet roll under the patient.
- Team: Are you ready?
- RRT: Please count and on the RRT count of 3 we will turn the patient laterally.

## **COMPLETE THE LATERAL MOVE**

### **Turn Check**

- RRT: Is ETT secure?
- Team: Are there any concerns?
- Team: We will prepare to complete prone positioning.

### **Hand Change**

- Turners: Adjust your hands. If your hands are on top of the patient, switch with the person across from you so they are on the bottom underneath the patient. If your hands had been on the bottom, switch so you are holding the sheet roll on the top.
- Staff whose hands are on the bottom after this step will pull upward on the rolled up sheets, from under the patient.

### **Final Turn**

- RRT: Is the ETT secure?
- Team: We will turn patient onto their stomach.
- RRT: Please count and on RRT count of 3 we will turn the patient prone.

## **COMPLETE THE PRONE POSITION**

### **Final Turn Check**

- RRT: is the ETT secure

- TEAM: Do you see any concerns?
- Thanks team!

## PROCEED TO POST TURN CHECKLIST

### Post Turn Checklist and Maintenance of the Prone Patient

<b>RRT</b>	
	Confirm ETT depth and placement at the teeth. Ensure ventilator tubing is firmly connected.
	Manage ventilator settings
	Suction ETT and oral airway
	Consider arterial blood gas after 30 minutes of initial position change prone or unprone, and at regular intervals until stabilized
<b>RN</b>	
	Zero hemodynamic lines
	Place ECG leads on patient's back for continuous cardiac monitoring
	Assess hemodynamic status. If unstable seek medical assistance.
<b>Position Patient</b>	
	Ensure there are no pressure points under the patient (pull sheets tight, ensure knees and ankles are raised)
	Position the arms in 'swimmers position' (ensure that body mechanics look appropriate and the patient appears comfortable). Protect the shoulder joints during repositioning of arms. The patient's face should be towards the upward arm to promote arterial perfusion and venous drainage of the intracranial and extracranial vessels. The other arm will be at the patient's side.
	Place head support under the patient's head. Head support should rest on the forehead and cheek/mandible. The 'down' eye should not be resting on the support.
	Ensure the mouth is accessible for oral care
	Take care to avoid hyperflexion or hyperextension of the head and neck
	Ensure the ear is not folded over under the patient
	Place patient in reverse Trendelenburg at 30 degrees as tolerated
	Reconnect nasogastric and orogastric tubes to suction or enteral feeds. Notify physician or delegate if patient is not tolerating feeds. Motility agents may be added if necessary.
	Restart all IV infusions that were put on hold
<b>Patient Care</b>	
	Assess ETT q2h to ensure no cuts or breakdown to back of the neck and corners of the mouth or lips
	Lubricate and close the patient's eyes at a minimum of q2h to prevent corneal drying, abrasion, or infection.
<b>Patient Positioning</b>	
	Continue to mobilize the patient while maintaining good body alignment by making small incremental changes in the patient's position q2h while in prone position. Accomplish this by turning slightly to the right or left side lying position, using pillows, as tolerated by the patient. Reposition patient as necessary to minimize pressure points.

	For male patients ensure genitalia are not being compressed between the patient's legs or by the pelvic pad/pillow
	Consider using an absorbent pad under the patient, ensure to remove all wet linen to prevent skin breakdown
	Keep the bed in reverse Trendelenburg whenever possible
	Support the elbows to prevent ulnar nerve compression
	Change position of head and arms q2h to avoid neck or arm contractures (using alternating swimmer's position)
	Consult Physiotherapy if available

## DEBRIEF

Take a couple minutes to debrief the simulation with the team. Potential topics for discussion:

- **Communication:** Was it clear, concise and closed loop? Was there a clear team leader identified? Did staff communicate in a calm, respectful manner? How did the team in the isolation room communicate with the team outside the room?
- **Roles:** Was everyone clear what their role was? Were there any roles that were missing? Were there any roles that could have been filled from outside the room to help preserve PPE and minimize staff exposure?
- **Equipment/Tools:** Did you have all of the supplies that you needed? How would this be different on a real patient? What might be more challenging? What equipment needs to be in the room; what could stay outside? Were the checklists helpful?
- **Process:** What went well and what didn't? What would make this process easier?