MedStar Health Critical Care Proning Protocol
Updated 3/23/20: CC/EM Clinical Advisory Group

Rationale and Guidelines

Prolonged mechanical ventilation of patients in the supine position results in dependent atelectasis and contributes to the development of ventilator-induced lung injury in patients with ARDS. Change in positioning (ie proning) these patients leads to recruitment of these dependent, atelectatic areas, improves V/Q matching and oxygenation. A multicenter, randomized control trial in 2013 demonstrated both a statistical and clinically significant improvement in mortality at 28 and 90 days when patients with severe ARDS were proned. The following guidelines are best practice based on current available literature. Changes in the protocol will be on a case by case basis as determined necessary by the attending physician.

a. Inclusion criteria
    a. Patients intubated, ARDS <36 hours
    b. Severe ARDS (defined as PaO2:FiO2 ratio <150 on FiO2 0.6, PEEP 5, TV 6 cc/kg IBW)
b. Exclusion Criteria
    a. Open chest/abdomen
    b. Spinal instability
    c. Elevated ICP
    d. Massive hemoptysis
    e. Tracheostomy within the past 7 days
    f. Hemodynamic instability (ie norepinephrine > 20 mcg/min or norepinephrine 15 mcg/min + vasopressin)
    g. Pregnancy (relative)
    h. CRRT (relative)
    i. Cardiogenic shock (relative)
c. Pronation timing
    a. 16 hours prone
    b. 8 hours supine
d. Pharmacotherapy
    a. Recommend RASS -4, paralytic *if necessary, (not required)*
    b. Lacri-Lube/Ocular ointment applied q4 hr while supine
    c. Sedation vacation if indicated while supine only
e. Care Coordination
    a. Ensure all necessary procedures are completed while the patient is supine
        i. Invasive procedure (ie arterial line, CVL)
        ii. CXR
        iii. Lab draws
    b. Please note, tube feeds do not need to be held for this procedure
f. Required personnel and delineation of roles – *ensure nursing checklist is at the bedside and followed at this time*

    a. Physician or most experienced airway provider– head of bed, secure ETT, must be comfortable with emergency airway procedures
    b. Four other individuals, may be NP/PA, nurse, or tech. Two on either side of patient
        i. One person responsible for lines being tucked and secured
        ii. One person watching the monitor for significant instability
g. Ongoing ventilator management
    a. Reassess oxygenation and ventilator settings within one hour of change in position
h. Return to supine positioning when
    a. Pplat <25 cm H2O
    b. FiO2 < 0.5
    c. pH > 7.3
    d. PaO2:FiO2 >200

Potential Complications

a. ETT obstruction or dislodgement
b. Dislodgement of catheters/IVs or thoracostomy tubes
c. Peripheral nerve injury
d. Skin ulceration or breakdown at atypical pressure points
    a. Additional padding will be needed, as outlined in nursing protocol

Criteria for discontinuation of prone positioning

a. Clinical improvement as outlined above
b. Cardiac arrest or refractory hemodynamic instability
c. Unplanned extubation
d. Hemoptysis
e. Refractory SpO2 <85% on FiO2 of 1.0
f. PaO2:FiO2 drops by >20% relative to supine positioning

Guérin, C., Reignier, J., Richard, J. C., Beuret, P., Gacouin, A., Boulain, T., … Ayzac, L. (2013). Prone positioning in severe acute respiratory distress syndrome. *New England Journal of Medicine*. https://doi.org/10.1056/NEJMoa1214103

Manual Proning Order Set

All orders will be carried out unless there is a ☐. Orders with a ☐ must be checked to be carried out. Orders without a ☐ will be carried out unless crossed out and initialed. Information in [ ] is educational and is not an order.

Indications for Use

- Intubated with ARDS onset less than 36 hours
- Severe ARDS (defined as PaO2:FiO2 ratio <150 on FiO2 0.6, PEEP 5, TV 6cc/kg IBW)

Absolute Contraindications (Do Not Order if Any of the Following are Present)

- Open sternal/abdominal wound
- Unstable cervical, thoracic, lumbar, pelvic, skull or facial fractures; cervical or skeletal traction
- Extensive facial trauma
- Uncontrolled intracranial pressure (ICP)
- Pregnancy
- Massive hemoptysis
- Tracheostomy within the past 7 days

Relative Contraindications

- Hemodynamic instability (norepinephrine >20mcg/min or norepinephrine 15mcg/min + vasopressin)
- Cardiogenic shock
- CRRT
- Wound at risk of dehiscence while in prone position (unless clearance obtained by surgical attending)

Medications

[Sedation orders should be placed using the **CC Sedation for Agitation and Delirium** order set in MedConnect; all sedation orders need titration goals changed to RASS -4. Recommend continuous IV sedative and analgesic.]

1. Ocular lubricant (Lacri-Lube S.O.P. ophthalmic ointment), 1 appl applied q4h while supine
2. Paralytic, if necessary but not required
    a. Vecuronium bolus 0.1mg/kg = _____mg IV for Train of Four ≥ 3 (Max Dose of 10mg). Repeat q30 minutes until Train of Four is < 3, then continue Train of Four assessment q4hr. **Paralytics should not be administered before an analgesic and sedative have been started and titrated to RASS -4.**

Laboratory

1. ☐ ABG one hour after proning
2. ☐ ABG daily, in morning while supine

[May substitute pulse oximetry monitoring at the discretion of the provider]

Imaging/Diagnostics

1. "XR Chest 1 View Portable", ordered daily with morning care while supine [MedConnect order to be placed for each day]

Patient Care Prior to Proning

[Utilize Manual Proning Checklist]

1. Ensure completion of necessary invasive procedures by provider (central line placement, arterial line placement)
2. Place NG or OG tube for feeding [tube feeds should not be held for proning]
3. Ensure ETT is secured with appropriate device per RT (tape or Hollister)
4. Place patient on FiO2 1.0 and suction ETT, mouth and nose
5. Ensure patient's tongue is in mouth. If tongue protruding, insert bite block
6. Remove all EKG leads from the anterior chest and move to lateral aspects of upper limbs
7. Review fixation of invasive and curative devices
8. Place foam boarded dressings on forehead, cheeks (under Hollister device), chin, upper chest, anterior iliac crest, bilateral knees, and top of feet
9. Apply Lacri-lube and apply a cut-to-fit foam dressing over eyes
10. Tape eyelids shut with a horizontally placed piece of tape
11. Complete oral care, ostomy care, dressing changes
12. Empty drains and ostomies
13. Reposition invasive lines and tubing
14. Place chest tube drainage system on the post-pronating insertion site side
15. Place patient in midline position with HOB flat
16. Tuck patient's hands under each hip
17. Wrap the edge of the sheets as closely as possible to the patient's body
18. Max inflate ICU bed
19. Ensure patient is adequately sedated to the prescribed RASS
20. Place code cart and airway box outside of patient's room if supplies allow

Proning Procedure

1. Required Personnel
    a. Physician or most experienced airway provider at the head of bed
    b. Additional providers (NP/PA, nurse or tech)
    c. RT if available

    [See Manual Proning Checklist for personnel recommendations and assignments]

2. Verbal Countdown
    a. Team member at head of bed initiates the turning maneuver with a verbal countdown

   b. On the count of three, move the patient to the edge of the bed away from the ventilator and lift the patient onto their side, facing the ventilator
   c. On a second count of three, turn the patient into the prone position toward the ventilator
3. Once Patient is Prone
   a. Assess airway, invasive lines and tubes, and hemodynamic status
   b. Place EKG leads on the patient's back with black and red leads on the patient's left and white and green leads on the patient's right. The brown lead should be placed in the center.
   c. Position patient on prone pillow or in a position that limits pressure to face and enables visualization of ETT
   d. Place pillows under shins to keep toes elevated off mattress
   e. Return ICU bed to normal mattress setting and place patient in reverse Trendelenberg
   f. Document procedure in MedConnect

Proning Therapy/Parameters

1. Turning Schedule

   □ 16 hours prone, 8 hours supine

   □ _____hours prone, _____ hours supine

2. Reverse Trendelenberg: 10-20 degrees
3. Return to supine position if cardiac arrest occurs
4. Notify provider if
   a. Oxygen saturation goes below 88% while supine (return to prone position)
   b. Anxiety/agitation is uncontrollable

Additional Patient Care Orders

1. Reposition head q4hr [See Manual Proning Checklist for procedure]
2. Reposition arms q4hr [See Manual Proning Checklist for procedure]
3. Turn the patient slightly lateral q4hr [See Manual Proning Checklist for procedure]
4. Ensure neck and back are not hyper-extended
5. Skin assessment with each supine cycle
6. Ice packs to face/eyes for edema when in supine position
7. If tongue swelling noted, place bite block to prevent breakdown
8. Insert fecal incontinence bag/bowel management system [ordered separately in MedConnect)

Discontinuing Therapy and Returning to Supine Position

1. Provider will notify nursing when proning therapy is no longer needed

Manual Proning Checklist for Nurses

Pre-proning care

- Check Physician Order (Proning Orderset)

- Ensure that patient is adequately sedated to prescribed RASS

- Place an Allevyn dressing on patient's cheeks under the Hollister ETT holding device to minimize onset of pressure injury while in the prone position.

- Consider alternative ETT holding devices if pressure injury noted. Alternatives include traditional ETT taping

- Review fixation of invasive and curative devices

- Apply Allevyn dressings to other areas of the body associated with pressure injury formation (forehead, chin, upper chest, anterior iliac crest, knees, top of feet)

- Apply lacrilube to the patient's eyes and apply a cut-to-fit foam/Allevyn dressing over the patient's eyes

- Ensure patient's tongue is in their mouth. If tongue is protruding or swelling is noted, insert bite block.

- Ensure oral care, ostomy care, dressings changed, and drain/ostomies are emptied prior to proning

- Remove all ECG leads/stickers from the anterior chest and place on the patient's back with Black & Red leads on the patient's Left, White & Green leads on the patient's Right, and the Brown lead in the middle

- Reposition invasive lines and tubing that are in the midline position. Re-assess fixation of invasive and curative devices, add IV tubing as needed. If there is a chest tube in place, place the chest tube on the side that the insertion site will be after pronation.

- Consider applying a rectal bag on the patient at minimum to manage stool. If stool is liquid in consistency, collaborate with physician/APP to insert an internal Fecal Management System (i.e. Flexi-Seal), unless contraindicated

- Place crash cart and airway box outside of patient's room

Proning Checklist

- Assemble your team (physician, optimally 4 other team members including bedside nurse and RT if available), ensuring there is an adequate number of staff members to safely turn the patient

- Place the patient on 100% FiO2 and suction ETT, mouth, and nose.

- Place patient into the midline position with HOB flat

- While patient is still in supine position, place a chux pad, a flat sheet, a pillow over both the chest and hip, and a flat sheet on top of the pillows

- Tuck patient's hand under each hip

- Wrap the edge of the sheets as closely as possible to the patient's body (like a burrito)

- Max inflate the ICU bed

- Ensure the team member at the head of the bed is responsible for initiating the turn maneuver via a verbal countdown, as well as securing the patients ETT and head throughout the maneuver

- On the count of three, initiated by the team member at the head of the bed, move the patient to the edge of the bed away from the ventilator and lift the patient on their side toward the ventilator.

- On the last count of three, turn the patient into the prone position toward the ventilator

- Assess airway, invasive lines and tubing, and hemodynamic status. Place limb electrodes and V lead on patient's back

- Position patient's head on prone pillow, or position patient's head in a manner that minimizes pressure to face and enables visualization of ETT.

- Place pillow under shins so toes are not touching mattress

- Return ICU bed to normal mattress setting and place patient in reverse Trendelenburg, at 10-20 degree angle.

- Document procedure in MedConnect

Maintenance

- Reposition head every two-four hours per physician order. Must be done with at least one other team member with the team member at the head of the bed initiating three count countdown and managing the airway and head movement. One a count of three, lift the patient's shoulders off the bed and rotate the head to the opposite side.

- Reposition the arms every two-four hours per physician order. Rotate the arm on the side of the ETT up, while the other rests by the patient's side (swimmer's position)

- Turn the patient slightly lateral position every two-four hours per physician order. Place pillows on the same side that the patient's head is turned to minimize torqueing of the neck.

- Ensure the neck and back are not hyper-extended

Expectations of documentation

- Document when patient starts proning, any reverse Trendelenburg positioning of the patient

- Document supination as well as the patient's response

- Document an integumentary assessment every time your patient returns to the supine position according to provider orders