

PROTOCOL FOR: Prone Positioning

POLICY: Prone positioning may be used in the Intensive Care Unit in an attempt to improve arterial oxygenation and pulmonary mechanics in patients with acute lung injury or acute respiratory distress syndrome (ARDS). Proning may be performed manually, as outlined in this policy, or with the Rotoprone Therapy System bed, which may be ordered by an ICU MD/APRN.

A. Candidates for prone positioning:

1. Patients who meet the operational definition for acute lung injury and ARDS as developed by the American-European Consensus Conference on ARDS. Criteria include:
 - a. acute onset of respiratory signs and symptoms.
 - b. hypoxemia, specifically a PaO₂/FiO₂ ratio of 300 or less for acute lung injury and PaO₂/FiO₂ ratio of 200 or less for ARDS.
 - c. radiologic evidence of diffuse pulmonary infiltrate.
2. Patients whose PaO₂ is marginal or inadequate despite optimal ventilator therapy.
3. Patients for whom postural drainage of dorsal lung regions is indicated.

B. Relative contraindications to prone positioning:

1. Increased intracranial pressure
2. Hemodynamic instability
3. Spinal instability
4. Unstable bone fractures
5. Abdominal surgery
6. Abdominal compartment syndrome
7. Active intra-abdominal process
8. Pregnancy

DESIRED PATIENT OUTCOMES:

The primary goal of positioning a patient prone is to improve gas exchange by making ventilation more uniform and improving ventilation in previously dependent lung regions. Indications of a positive response to proning include:

1. an increase in SpO₂
2. return of SvO₂ to baseline within 5 minutes of the turn, and eventual increase in SvO₂
3. heart rate and blood pressure return to baseline
4. respiratory rate < 30/min or return to baseline
5. ABGs: increase in PaO₂ and SaO₂ within minutes of the position change; no change in PaCO₂.

CLINICAL ASSESSMENT and CARE CONSIDERATIONS:

1. Time Prone: Unless otherwise specified, a 6 hour protocol will be followed. The patient will remain prone for 6 hours, then turned supine with lateral rotation. The patient should remain supine until the gain of improved SaO₂, SvO₂, and ABGs declines, but no longer than

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6 hours. Care activities such as bathing, oral care, skin assessment, endotracheal tube retaping, central line dressing changes, ROM, chest x-ray, etc. should occur while the patient is supine. Any test requiring patient transport should be done while the patient is supine.

2. Skin integrity: In addition to standard skin care protocols, interventions to preserve skin integrity include use of a protective barrier cream to the face, avoiding pressure on the eyes, repositioning the head, using pads to cushion bony prominences, and use of a pressure reduction surface. While prone, the patient may still be tipped slightly side to side to examine anterior skin surfaces. A thorough skin assessment will be done when the patient is supine.
3. Positioning and physical therapy: Recommended positioning is: arms above the patient's head, or one arm up and one arm alongside the body with the head turned toward the upper arm. Head and arm position should be altered every 2 hours. The head of the bed (head gatch) should not be elevated when the patient is prone. A 30 degree reverse trendelenberg position can be used for patients receiving enteral nutrition. This will also aid in decreasing facial edema. Physical therapy should be provided within limits of ROM when prone. Physical therapy can be maximized when the patient is supine.
4. Nutrition: Prone positioning is not a contraindication to enteral feeding, however, it is a recommendation to hold the tube feeding one hour prior to the turn, as the risk for aspiration is highest at that time. The patient's head may be elevated during feeding as described above. Gastric residual should be assessed every 4 hours. The importance of nutrition in the critically ill patient with ARDS cannot be overemphasized, and dietary consultation is appropriate to evaluate nutritional needs.
5. Pulmonary care: Airway maintenance is of primary concern, especially during position changes. Security of the airway must be assessed frequently. Nursing and respiratory staff will assist in airway maintenance, pulmonary care and suctioning. Degree of lateral rotation and tolerance will be assessed daily.
6. Emergency care: If the patient exhibits signs of intolerance to proning (i.e. a dramatic decrease in oxygen saturation, hypotension, or cardiac arrhythmias) the patient will be turned supine (using appropriate number of staff and methods), and the physician will be notified. Staff must be on the alert that a rapid team response is required to turn the patient supine in event of cardiac arrest.

CLINICAL ASSESSMENT/ACTIONS:

Rationale/comments

1. Perform a baseline physical assessment and record. Note condition of patient's skin, incisions, tubes, catheters. Document VS, hemodynamic parameters and ventilator settings. Baseline data is needed to evaluate patient response. Patient's front cannot be visualized when prone.
2. Obtain needed supplies:
Moisture barrier cream for face
Cushion to support head(Gentletouch 7" headrest pillow available from OR)
(2) Bath blankets for rolls
Eye patch/tape or eye lubricant
Rotoprone bed will have its own cushions and sling supports.

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- (MD order needed for lubricant)
Clean linen including absorbent pad/towel.
3. Check that airway is secure and that in-line suction is attached. Note position of endotracheal tube for future reference. ETT must be secure to prevent dislodgment with turning and with increased secretions when prone.
 4. Apply moisture barrier cream to patient's face. Protects skin from expelled oral and nasal secretions.
 5. Secure tubes, IV lines, and catheters. Protects against accidental dislodgment with position change.
 6. If manually proning, use bath blankets to create rolls to support the chest and pelvis. Rolls will support the weight of patient's torso and allow abdomen to protrude when prone.
 7. Administer pain med, sedation, or paralytics as ordered and indicated. Pain and anxiety must be controlled for position change to be tolerated. Paralytic may be needed with pressure control ventilation.
 8. Gather catheters/tubing head to waist at the top of the bed. Gather catheters/tubing waist down at the foot of the bed. Helps to prevent catheter/tubing dislodgement during the turn.
 9. Assemble team (3-5 persons) and delegate responsibilities. Person at head will guard the airway. Minimally, 1 person will stand on each side. Primary nurse directs position change, assist with turn, guards catheters/tubing.

STEPS 10-16 OUTLINE THE METHOD TO MANUALLY PRONE THE PATIENT.

See Appendix for associated diagrams.

CLINICAL ASSESSMENT/ACTIONS (Cont):

Rationale/comments

10. Position patient's arms at his/her side. Protects patient from injury when turned.(See figure A.)
11. If linen change is desired cover patient with a clean sheet. Top sheet will become clean bottom sheet when patient placed prone.
12. Team members on both sides of bed slide roll top and bottom sheets in toward the patient. At leader's verbal cue, slide patient toward the side of bed. (See figure B.) It is best to patient away from the ventilator.
13. Tilt patient fully on his/her side such (See figure C.)

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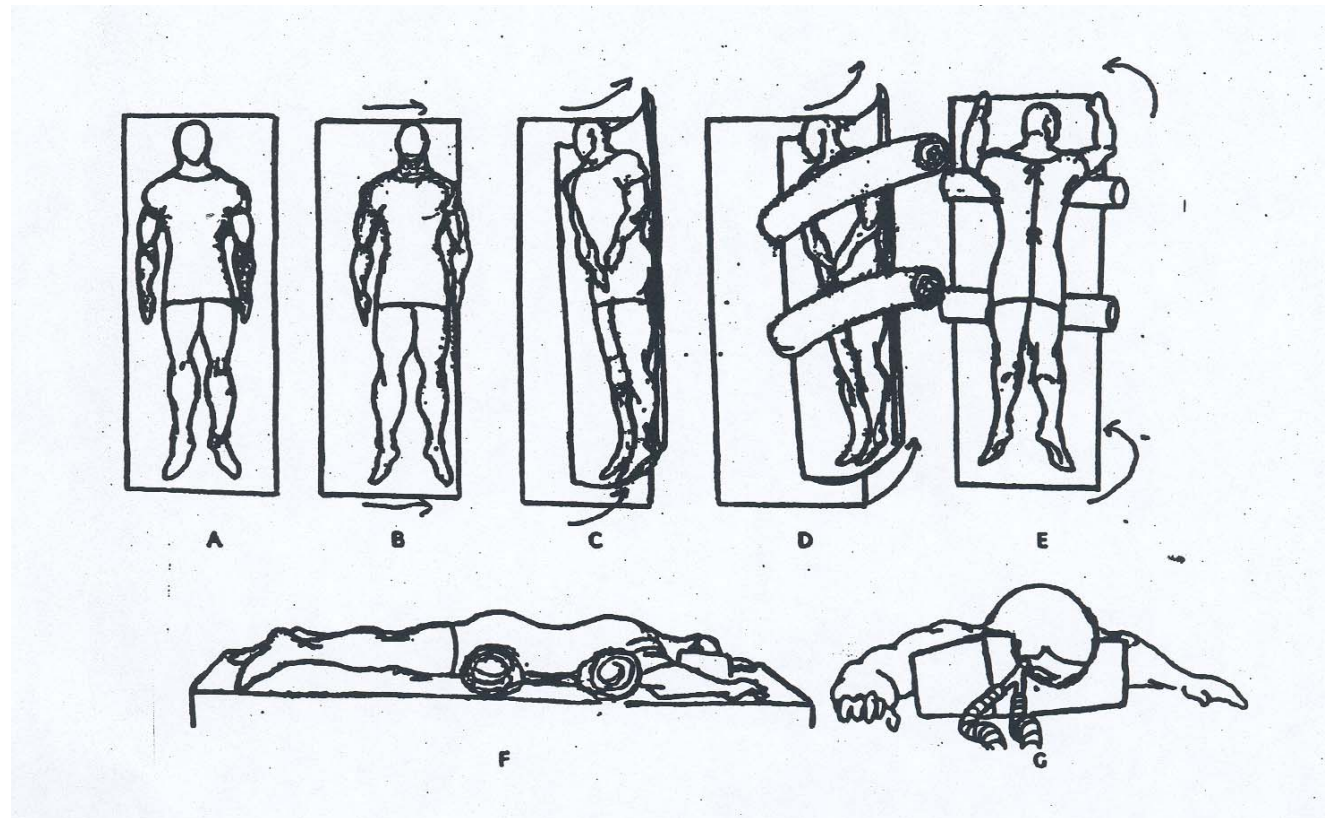
that the patient faces the ventilator.

14. Position blanket rolls at patient's chest and pelvis. (See figure D.)
15. Turn patient prone. Position patient's arms above his/her head and place head cushion with absorbent pad. (See figures E and G.)
16. Ensure proper body alignment and pad pressure points. Avoid hyperextension of the neck and extremities. (See figure F.) Patient should be on a bed with a pressure reduction Surface. Consult PT and consider use of hand and foot splints.
17. Record respiratory and hemodynamic profiles. Profiles are needed to evaluate response to treatment.
18. Continue pulmonary toileting as ordered and as tolerated by the patient. It is preferable to use a specialty bed that offers lateral rotation and percussion/vibration (for use when the patient is supine).

REFERENCES:

- Balas, M.C., 2000. Prone positioning of patients with acute respiratory distress syndrome: applying research to practice. Critical care nurse, 20 (1), pages 24-36.
- Curley, M.A., 1999. Prone positioning of patients with acute respiratory distress syndrome: a systematic review. American journal of critical care, 8 (6), pages 397-405.
- Vollman, K.M., 1997. Prone positioning for the ARDS patient. Dimensions of critical care nursing, 16 (4), pages 184-193.

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