



# PRONE POSITION FOR SEVERE ARDS

[https://www.ficm.ac.uk/sites/default/files/prone\\_position\\_in\\_adult\\_critical\\_care\\_2019.pdf](https://www.ficm.ac.uk/sites/default/files/prone_position_in_adult_critical_care_2019.pdf)

# Type of Staff Required for Prone

Category	Original Protocol	Modifications	Rational
Type of clinician used for proning events	<ul style="list-style-type: none"> <li>Only ICU trained staff (nurses, physicians, Respiratory therapists)</li> </ul>	<ul style="list-style-type: none"> <li><u>Eliminated</u>: the use of physicians and nurses in the turn position, line nurse, Physician and RN leader</li> <li><u>Added</u>: Trained core group of PT/OT staff to carry out prone turn with hands on training.</li> <li>Created an official "Prone Team".</li> </ul>	<ul style="list-style-type: none"> <li>Allowed ICU physicians and nurses to attend to medical management of patients.</li> <li>Freed critical care staff to attend to emergencies.</li> <li>Allowed for more proning and supining events to occur in succession leading to multiple proning events in one shift.</li> </ul>

# Equipment Modifications

Category	Original Protocol	Modifications	Rational
Pre- prone equipment/ patient preparation	<ul style="list-style-type: none"> <li>• Gel head positioner</li> <li>• Second glide/flat sheet</li> <li>• Chest roll x1</li> <li>• Hip roll x1</li> <li>• Second set of ECG leads with electrodes attached</li> <li>• Train of four (TO4) machine to assess paralysis</li> <li>• ETCO2 module/tubing</li> <li>• 10 Foam protective pads to be placed over all anterior bony prominences (anterior toes, knees, hips, shoulders, chest)</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Added:</u> Extra foam pads to place on anterior chest and face and under central venous and arterial access.</li> <li>• <u>Eliminated:</u> TO4 machine.</li> </ul>	<ul style="list-style-type: none"> <li>• Helped to mitigate increase development of pressure injuries with longer proning events and multiple prone events.</li> <li>• Not all patients required continuous paralysis, limited number of TO4 machines.</li> <li>• Paralysis when used was titrated for ventilator synchrony.</li> <li>• IVP doses of a paralytic were used when necessary to assist with prone turn *patient had to be adequately sedated</li> </ul>

# Number of Staff Required for Proning

Category	Original Policy	Modification	Rational
Required Staff	<p><u>9 ICU Clinicians:</u></p> <ul style="list-style-type: none"> <li>• 1 Physician Leader</li> <li>• 1 RN Leader</li> <li>• 2 RT (head of bed)</li> <li>• 4 Turn Nurses</li> <li>• 1 Line Nurse</li> </ul>	<p><u>Decrease staff to 5 Clinicians:</u></p> <ul style="list-style-type: none"> <li>• Eliminate: Physician &amp; RN leader, line RN 2 RT at head</li> <li>• 1 Physician or CRNA to secure airway and control head repositioning</li> <li>• Use 4 turn clinicians (replace RN's with PT/OT staff)</li> <li>• Same staffing requirements used with supine events</li> </ul>	<ul style="list-style-type: none"> <li>• Allowed for proning during crisis with limited staffing</li> <li>• Decreased unnecessary exposure of COVID-19 to large numbers of staff</li> </ul>

# Intravenous Tubing and Line Management

Category	Original Protocol	Modifications	Rational
IV tubing and line management	<ul style="list-style-type: none"> <li>All lines positioned above the waist were drawn up towards the head</li> <li>All lines positioned below the waist were drawn down to the feet</li> <li>All unnecessary drips were disconnected</li> <li>All anterior surface devices removed</li> <li>IV pumps positioned to avoid dislodgement</li> <li>Turn was initiated depending on placement of lines with tubing connected</li> </ul>	<ul style="list-style-type: none"> <li>All intravenous lines and arterial access were clamped and disconnected with team ONLY in the “ready” position.</li> <li>NIBP obtained just prior to turn.</li> <li>Total disconnection time allowed 10 seconds - just enough time to complete the turn.</li> <li>All HD and ECMO access remained attached.</li> <li>For external devices i.e. urinary catheters, rectal tubes - original protocol followed.</li> </ul>	<ul style="list-style-type: none"> <li>During COVID -19 each patient was on an extraordinary amount of drips.</li> <li>IV pumps were positioned outside of the rooms, which added multiple feet of extension tubing.</li> <li>Allowed for elimination of line nurse and mitigate the risk of vital access point dislodgement.</li> </ul>

# Intravenous and Arterial Access Points

Category	Original Protocol	Modifications	Rational
Required intravenous access	<ul style="list-style-type: none"><li>All patients to be proned must have a sutured central and A-line in place</li></ul>	<ul style="list-style-type: none"><li>The placement of A-lines and central lines was now required based on the patient's medical management.</li><li>May prone with two large bore working intravenous access points (20G/18G).</li></ul>	<ul style="list-style-type: none"><li>Allowed for more emergent proning of decompensating patients without waiting for line placement.</li></ul>

# Turning Procedure

Category	Original Protocol	Modification	Rational
Turning Procedure Steps	<ul style="list-style-type: none"> <li>• Second set of leads to be placed during the turn to the posterior chest with a slight pause while in the upright lateral position</li> <li>• Prone turn initiated based on head position and critical line placement (as not to drag tubing under the patient while during the prone event)</li> </ul>	<ul style="list-style-type: none"> <li>• ECG leads disconnected when all team members were in the ready position just prior to initiating the turn. Once patient in the prone position (total of 10 seconds) a second fresh set of ECG leads were placed to posterior chest.</li> <li>• Turning prone initiated based on what was easiest for clinicians not on IV and arterial access. In cases where this was not possible - original protocol was followed.</li> <li>• All supine events including but not limited to emergency turn back initiated based on “The Nose Knows”.</li> </ul>	<ul style="list-style-type: none"> <li>• Removal of original ECG wires just prior to the prone events eliminated the need to pause during the turn to place new leads.</li> <li>• Pre-prone discussion time eliminated delay allowing for prone events to be conducted more quickly.</li> <li>• No time to reposition multiple extension tubing - avoided dislodgement.</li> <li>• For supine events: “The Nose Knows)” and not having to manage multiple IV access points allowed for the patient to be turned more quickly in the direction that was safest for airway securement.</li> </ul>

# Head Repositioning

Category	Original Protocol	Modification	Rational
Head Repositioning	<ul style="list-style-type: none"><li>• Required every 2 hours with: RT/Physician, two RN's</li></ul>	<ul style="list-style-type: none"><li>• No head repositioning.</li><li>• Gel head positioner used as per original protocol.</li><li>• Primary RN/RT instructed to re-hollow anterior facial pressure points every time care was delivered.</li></ul>	<ul style="list-style-type: none"><li>• Due to limited staffing and multiple patients requiring prone and supine events - unable to gather necessary staff to safely turn the head and secure the airway.</li></ul>

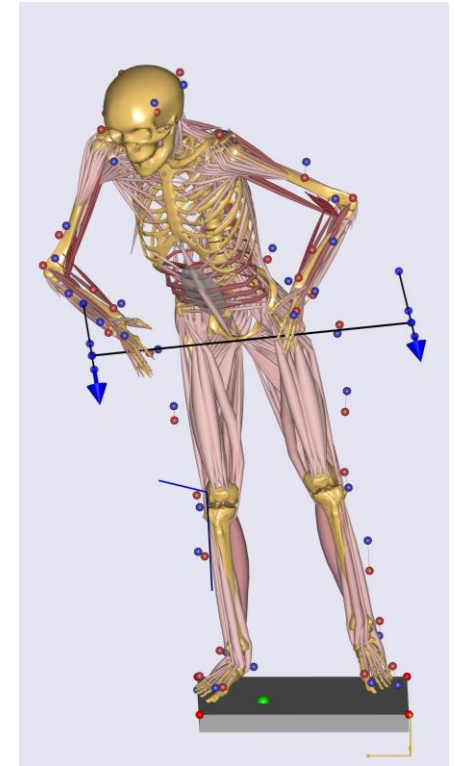


# Proning Patients in the ICU: Review of Methods and a New Approach

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# Neal Wiggermann, PhD



# Why isn't proning more common?



<https://youtu.be/ECdxhNFLwVo>



<https://youtu.be/qx2z26lL6g8>



## Proning Patients With COVID-19: A Review of Equipment and Methods

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**Objective:** To identify and critically evaluate methods for proning patients with COVID-19 in the intensive care unit (ICU).

**Background:** Acute respiratory distress syndrome (ARDS) is common in hospitalized patients with COVID-19. Proning improves blood oxygenation and survival rates in these patients but is not commonly performed due to the difficulty of the procedure.

**Methods:** An academic literature review, internet video search, and consultation with five subject-matter experts was performed to identify known methods for proning. Evaluation of each method considered the number of healthcare workers required, physical stresses on staff, risk of adverse events to patients, and equipment cost and availability.

**Results:** Several variations of manual techniques and lift-assisted techniques were identified in addition to a specialized proning bed. Manual methods require more healthcare workers, higher physical stresses, and greater risk of adverse events than lift-assisted methods on the proning bed.

### INTRODUCTION

“Proning,” or moving a patient from lying on the back to lying face down, is a therapy used to increase the likelihood of survival in patients with coronavirus disease 2019 (COVID-19). Proning was first described as a treatment for acute respiratory distress syndrome (ARDS) in the medical literature over 40 years ago. The procedure was initially used as a last resort when all other treatments failed, but recent findings suggest the use of prone positioning should be included as a part of the early management of severe ARDS (Koulouras et al., 2016; Mitchell & Seckel, 2018).

### Proning to Treat ARDS

ARDS was first recognized during the

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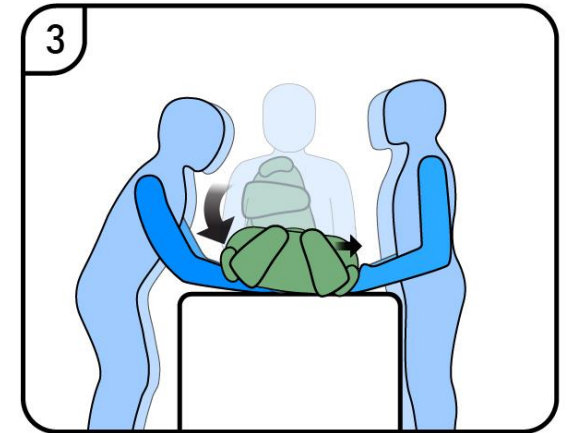
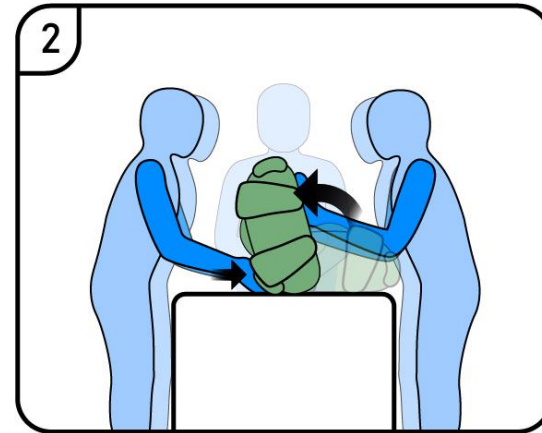
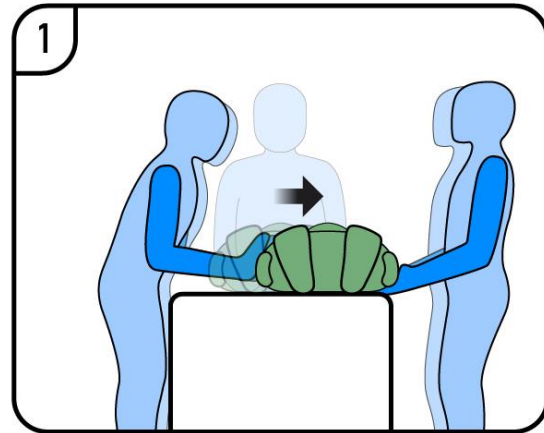
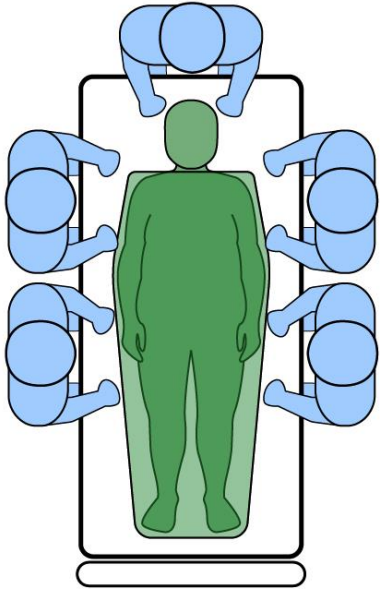
# Methods of Review

- Academic Literature Review
- Internet Video Search
- Expert Review of Findings
  - Registered nurses (3), Physical therapist, Occupational therapist
  - All specialized experience in safe patient handling
- Considerations
  - Patient Safety
  - Staff required
  - Injury risk
  - Equipment required, patient weight limit

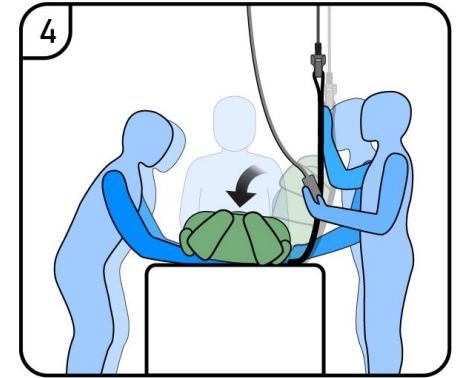
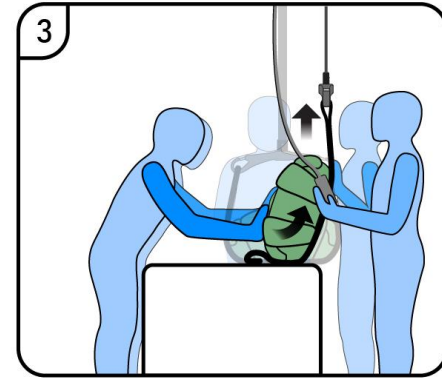
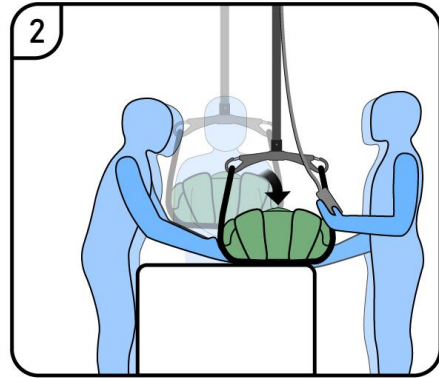
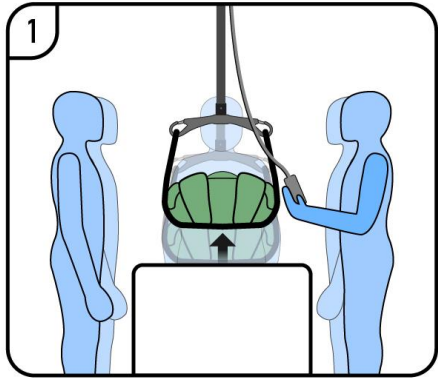
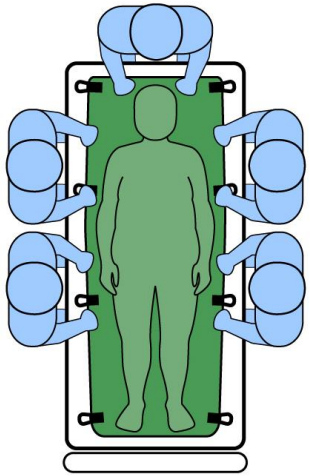
# Methods Identified

- Manual Proning
  - Draw Sheet
  - Sliding sheets
  - Air Assisted Devices
- Lift Assisted
- Specialized Automated Proning Bed

# Current Manual Technique

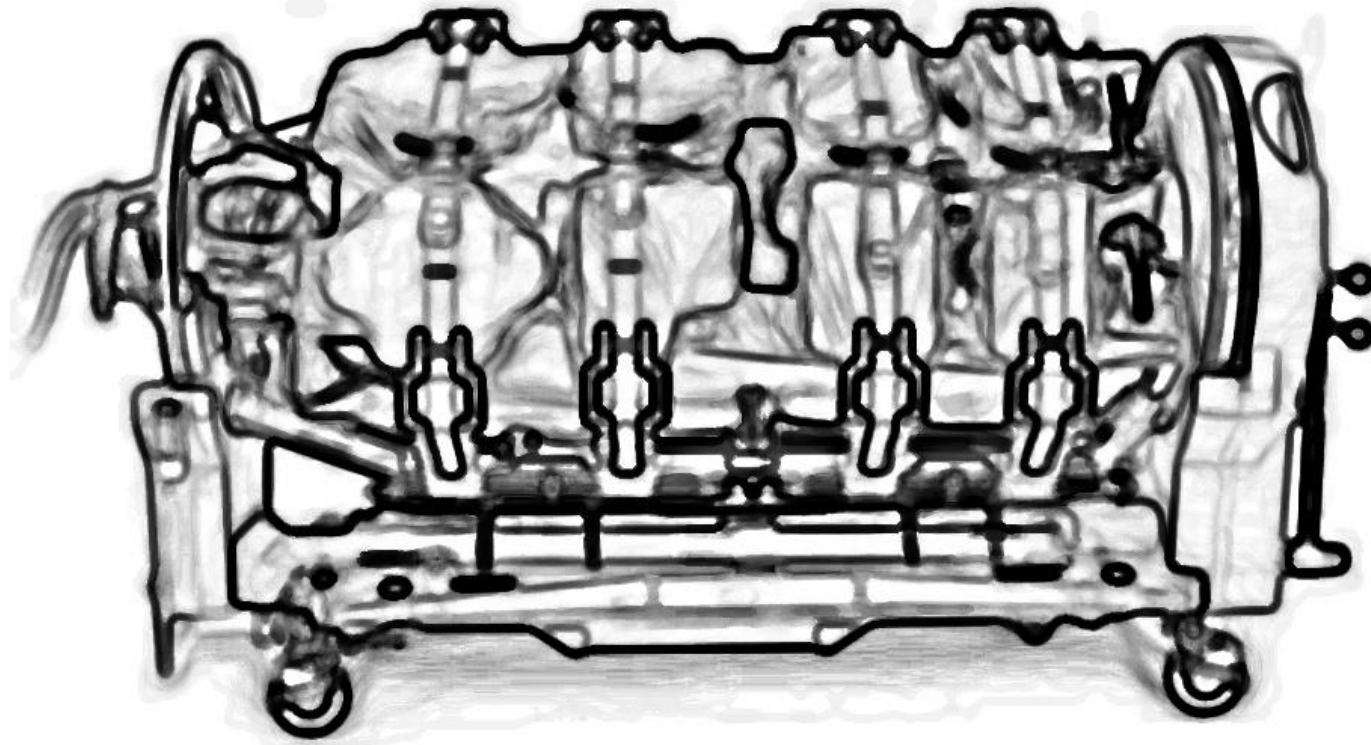


# Lift Assisted Technique – Repositioning Sheet





# Automated Proning Bed



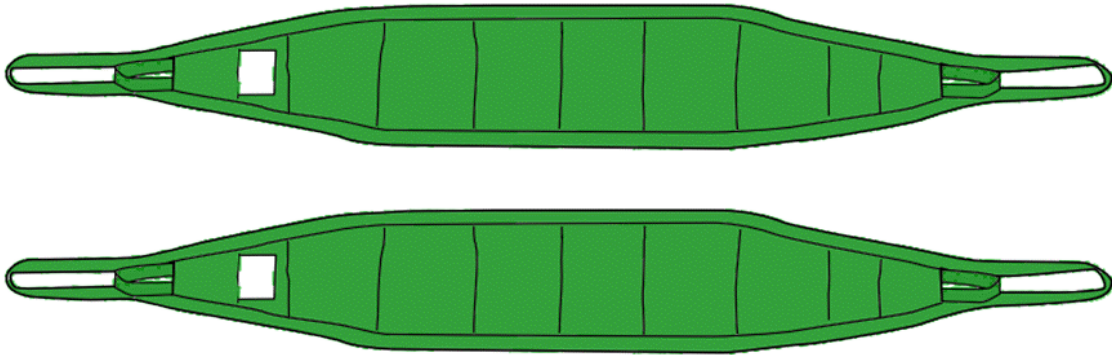
# Limitations of Current Methods

- Manual or Lift Assisted Methods
  - Manual patient lowering
  - Risk of injury remains, particularly lowering patient
  - Too many staff required
  - Weight limit - ???
- Automated Proning Bed
  - Availability & Cost
  - Weight limit – 350 lbs
  - Pressure Injury

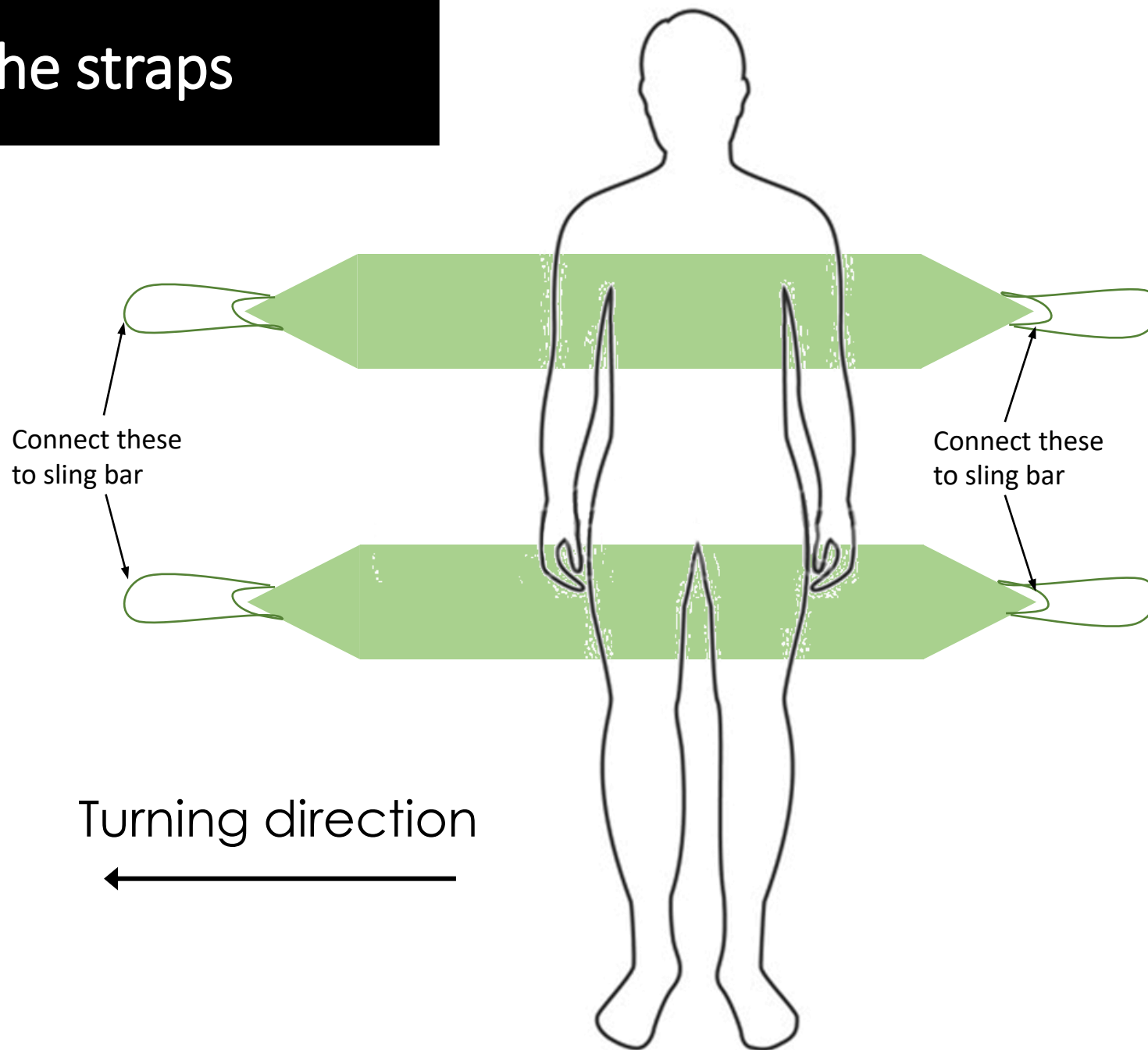


# New Lift Assisted Technique

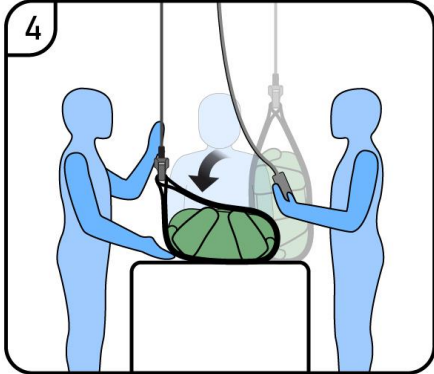
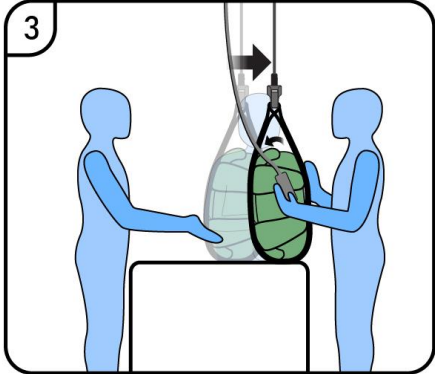
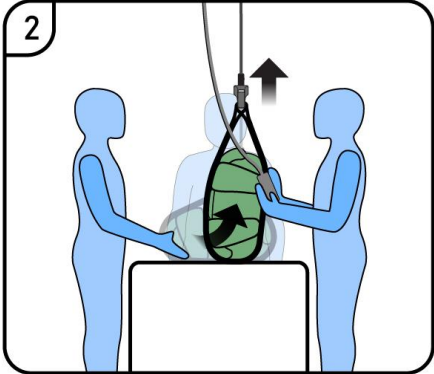
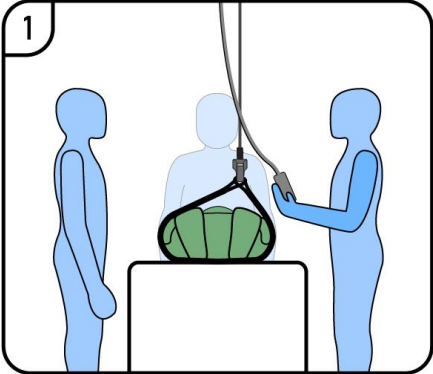
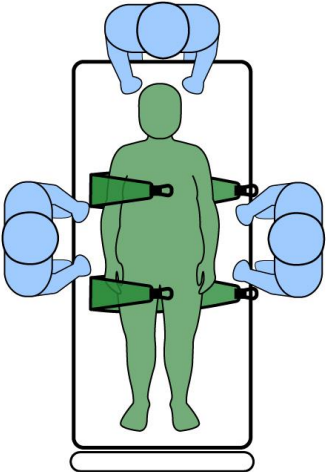
- Equipment required
  - Ceiling lift (ideal) or mobile lift
  - 2x MultiStraps™ (lift straps)



# Placement of the straps



# New Lift Assisted Technique



# New Lift Assisted Technique



[https://youtu.be/72QO3X9\\_Lus](https://youtu.be/72QO3X9_Lus)

# Manual vs. Lift Assisted



# Considerations for Selecting Proning Methods

- **Patient Safety** – Mechanical vs. manual lowering
- **Staff required** – 3 to 7 (or 9)
- **Equipment required** – None, Lift equipment, straps, slide sheets
- **Patient weight limit** – 350 lbs, 440+ lbs, *Strength of team*
- **Injury risk**
  - Most caregiver musculoskeletal injuries are caused by manually handling patients (Nelson, 2006)
  - Caregivers can lift at most 35 lbs before exceeding guidelines for spine loading (Waters, 2007)



# Resources

Category	Method	Equipment Required	Staff Required	Patient Descent	Source
Manual	Manual technique - Draw sheet	Draw sheet and flat sheet	5 to 7	Manual	<a href="https://youtu.be/yb1ppe8Y-70">https://youtu.be/yb1ppe8Y-70</a> <a href="https://youtu.be/qx2z26IL6g8">https://youtu.be/qx2z26IL6g8</a>
	Manual technique - Friction reducing device	Friction reducing sheet and flat sheet	5 to 7	Manual	<a href="https://youtu.be/lcBPaHQUvXY">https://youtu.be/lcBPaHQUvXY</a> <a href="https://youtu.be/g9EDcOzuL7g">https://youtu.be/g9EDcOzuL7g</a>
	Manual technique - Air assisted lateral transfer device	Flat sheet and 2x Air assisted sheets	5 to 7	Manual	<a href="https://www.linkedin.com/feed/update/urn:li:activity:6651526505816031232/">https://www.linkedin.com/feed/update/urn:li:activity:6651526505816031232/</a>
	Vollman prone positioner	Vollman prone positioner	5 to 7	Manual	Vollman & Bander (1996). Int. care med., 22(10), 1105-1111
Lift assisted	Repositioning Sheet for Rotation	Mechanical Lift and 1x or 2x Sheets	5	Manual	<a href="https://youtu.be/0ksD7B64T7A">https://youtu.be/0ksD7B64T7A</a>
	Repositioning Sheet and positioning sling	Mechanical Lift, 2x Sheets, Positioning Sling	5	Manual	<a href="https://youtu.be/Gh9JDmETtyl">https://youtu.be/Gh9JDmETtyl</a>
	Lift Straps for Rotation	Mechanical Lift and 2x Straps	3	Mechanically controlled	<a href="https://youtu.be/gniNns_6C2Q">https://youtu.be/gniNns_6C2Q</a>
Specialized Bed	Automated Proning Bed	Proning Bed	2 to 3	Mechanically controlled	

Proning Methods Review Article: <https://bit.ly/3ifVcUe>

NPIAP – Pressure injury prevention tips for prone positioning: <https://bit.ly/2T1zUPt>

Treatment of ARDS Webinar: <https://bit.ly/3bqeTo5>

## Power Point References/Studies

- Bellani, G., Laffey, J. G., Pham, T., Fan, E., Brochard, L., Esteban, A., ... & Ranieri, M. (2016). Epidemiology, patterns of care, and mortality for patients with acute respiratory distress syndrome in intensive care units in 50 countries. *Jama*, *315*(8), 788-800.
- Chertoff, J. (2016). Why is prone positioning so unpopular?. *Journal of Intensive Care*, *4*.
- SGuérin, C., Reignier, J., Richard, J. C., Beuret, P., Gacouin, A., Boulain, T., ... & Clavel, M. (2013). Prone positioning in severe acute respiratory distress syndrome. *New England Journal of Medicine*, *368*(23), 2159-2168.