



Benefits and Disadvantages of Proning Patients

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April 2017

Aims and Objectives

- ☞ To discuss the indications for proning
- ☞ To increase awareness of the physiological effects proning has on patients
- ☞ To identify the contraindications to proning
- ☞ To be aware of the precautions needed to be undertaken prior to proning
- ☞ To discuss the turning procedure
- ☞ To identify the complications that can occur with proning
- ☞ To review the care and management of a patient in the prone position

Indications for Prone Position

- ☞ Bilateral basal collapse/consolidation
- ☞ Early acute respiratory distress syndrome
- ☞ Acute lung injury
- ☞ $\text{PaO}_2 > 9\text{KPa}$ despite an $\text{FiO}_2 > 0.6$
- ☞ $\text{PEEP} > 7\text{cmH}_2\text{O}$ +/- inverse ratio ventilation
- ☞ Moderate to severe acute respiratory failure

Indications for Prone Position

- ☞ Mobilisation of secretions
- ☞ Bilateral infiltrates on chest X ray
- ☞ No left ventricular failure
- ☞ Reduced lung compliance
- ☞ Reducing the risks of iatrogenic lung injury due to prolonged periods of mechanical ventilation

What effects does the Prone Position have ?

Increased oxygenation due to:-

- 📄 blood flow redistribution and improved V/Q match
- 📄 more consistent ventilation and equal distribution of lung stresses
- 📄 increase in basal expansion, and better alveolar recruitment
- 📄 increased functional residual volume

What effects does the Prone Position have ?

Increased oxygenation due to:-

- ☞ increased surface area for gas exchange
- ☞ enhanced drainage of pulmonary secretions
- ☞ movement of interstitial fluid
- ☞ increased tidal volumes and reduced work of breathing due to the displacement of abdominal and cardiac structures

What effects does the Prone Position have ?

Decrease in FiO_2

Decrease in PEEP

Helps to prevent further pulmonary injury caused by high PEEP, volutrauma and oxygen toxicity

Improvement in survival of ARDS patient's????????????????????????????????

Evidence base

- ☰ Gattinoni L et al (2001) proned for 6 or more hours per day for 10 days, results showed an improvement in oxygenation, but not in mortality
- ☰ Ball C et al (2001), proning guidelines recommend 20 hours a day in prone position
- ☰ Mancebo et al (2006) proned for 17 hours a day for 10 days identified a 15% absolute decrease in ICU mortality in proned group
- ☰ Rossetti et al (2006) proned for 3 hours a day, correlation between patients body weight and response to proning, the heavier the better
- ☰ Fernandez et al (2008) patients proned for more than 20 hours a day found a 15% absolute increase in 60 day survival rates and an improvement in PaO₂/FiO₂ ratio
- ☰ Romero et al (2009) found significant increases in PaO₂/FiO₂ ratio in patients proned for a total of 55 (\pm 7) hours

Evidence base

- ☞ Taccone P et al (2009), prone for 20 hours a day, no significant difference in mortality rates and increased risk of complications
- ☞ Gattinoni L et al (2010) prone for 7-9 hours to 17-18 hours, survival rate not altered, but was better in those with more severe hypoxaemia
- ☞ Arbroug F et al (2011), prone for 7-24 hours a day, concluded long intervals of prone therapy decreased mortality significantly in patients with ARDS
- ☞ Robak O et al (2011), prone for 4 hours oxygenation improved in 70% of patients, alternating prone upright position oxygenation improved in 85% of patients
- ☞ Guerin C et al (2013), prone positioning sessions of 16 hours, adhered to ARDSnet recommendations for tidal volumes and pressures, 28 day mortality 16% versus 32.8%, 90 day mortality 23.6% versus 41 % and no significant difference in incidence of complications

Contraindications for the Prone Position

- ☞ Chest wall abnormalities, kyphoscoliosis, advanced arthritis
- ☞ Chest drain with a persistent leak
- ☞ Facial trauma and surgery, including ophthalmic surgery
- ☞ Multiple trauma and fractures requiring stabilisation, such as pelvic, ribs, sternum
- ☞ Raised intra cranial pressure
- ☞ Elevated intra abdominal pressure

Contraindications for the Prone Position

- Seizures
- Shock or acute bleeding
- Pregnancy (2nd and 3rd Trimester)
- Unstable spinal fractures
- Tracheostomy less than 24 hours old
- Demonstration of previous poor tolerance of prone positioning

Contraindications for the Prone Position

- ☞ Cardiovascular instability/recent cardiac arrest
- ☞ Recent cardio thoracic surgery/ presence of intra aortic balloon pump
- ☞ Obese patients > 90Kg or girth > 50 inches
- ☞ Pain and/or agitation
- ☞ Grossly distended abdomen
- ☞ Bowel ischaemia /recent abdominal surgery
- ☞ Burns/open wounds

Precautions to be taken prior to putting a patient in the prone position

- ☞ Inform the relatives if they are present
- ☞ 5 people must be present, one senior to take responsibility of the endotracheal tube
- ☞ Select one person to be responsible for directing the turning procedure
- ☞ Ensure the patient is well sedated and paralysed, if necessary
- ☞ Ensure a slide sheet is in position

Precautions to be taken prior to putting a patient in the prone position

☞ Ensure that the endotracheal tube is securely anchored

☞ Protect the patients eyes with ointment and eye pads

☞ Ensure that all equipment and medicine for potential resuscitation are within easy reach

Precautions to be taken prior to putting a patient in the prone position

- ✎ Disconnect and remove all equipment that the patient can do without, maintaining asepsis
- ✎ Adjust the remaining lines and monitor leads to prevent kinking and disconnection
- ✎ Empty ileostomy/colostomy drainage bags
- ✎ Reposition ECG electrodes just before turning

Turning Procedure

The direction of the first turn should be *towards* the ventilator, where possible, to minimise the risk of disconnection or extubation

Turning Procedure

- Place pillows over the patient's chest and pelvis to avoid abdominal pressure from the mattress
- Place a pillow over the shins to flex the knees and reduce stretching of the achilles tendon


Turning Procedure

- Place a sheet over the patient
- Loosen the bottom sheet and roll both sheets together along side the patient to make a sandwich
- Pull the patient to the edge of the bed and slowly turn him over onto the pillows
- The clean sheet is now underneath the patient

Youtube.com procedure links

 <https://www.youtube.com/watch?v=Hd5o41dp3c0>

 https://www.youtube.com/watch?v=Jb_WUNggwdM

 <http://www.nejm.org/doi/full/10.1056/NEJMoa1214103>

Potential Complications associated with the Prone Position

- ☞ Endotracheal /trachy tube displacement
- ☞ Difficulty in assessing the patients airway
- ☞ Increased oral/tracheal secretions
- ☞ Facial /periorbital oedema, increased intraocular pressure, corneal injury
- ☞ Difficulty performing eye, oral and facial care

Potential Complications associated with the Prone Position

- ☰ Displacement, compression or difficulty accessing IV lines, enteral feed line or invasive monitoring devices
- ☰ Breakdown of pressure areas or vulnerable areas such as face, cheeks, breasts, genitalia, knees, pelvic area
- ☰ Gastric regurgitation, intolerance of enteral feed

Potential Complications associated with the Prone Position

- ☞ Increased risk of bacterial translocation if the abdomen is restricted
- ☞ Joint stiffness or damage, nerve compression
- ☞ Cardiovascular instability
- ☞ Inadequate sedation or analgesia

Nursing Care of the Prone Patient

- ☞ Any specific care intervention, clinical procedure or sheet change should be completed prior to proning
- ☞ Eyelids should be closed using geliperm or paratulle to avoid corneal abrasions
- ☞ Place absorbent material under the dependent side of the face to absorb excess saliva

Nursing Care of the Prone Patient

- ☞ Perform regular oral suctioning
- ☞ Change ET tube tapes regularly
- ☞ Monitor for evidence of gastric regurgitation
- ☞ Nurse in the reverse Trendelenberg position to minimise gastric regurgitation and facial oedema
- ☞ Used closed suction systems to facilitate suction of the ET/Trachy tube

Nursing Care of the Prone Patient

- ☞ Use pressure relieving mattress and appropriate head support
- ☞ Laterally rotate the head 2-3 hourly, placing it away from the elevated arm(if possible) and avoiding neck extension
- ☞ Avoid pressure on the knees and stretching of the achilles tendon by pillow placement under the shins

Nursing Care of the Prone Patient

☰ Abduct the hips

☰ Reposition the upper limbs 2-3 hourly using the “swimmer’s position” (one arm parallel, the other shoulder abducted with elbow flexed) or both shoulders abducted with elbows flexed

☰ Avoid stretching of the brachial plexus and over distension of the shoulder

Nursing Care of the Prone Patient

- ☞ Nurse allocation should ensure an appropriately experienced nurse is available to care for the prone patient, whilst balancing the learning needs of the junior staff
- ☞ In an emergency situation such as cardiac arrest or loss of airway, return the patient to supine as soon as possible

Immediate Post Proning Checklist

Ensure all monitoring back on patient after turn

Thorough Top to Toe Approach

Two person check list

Person 1 calls out check. Person 2 performs check. Person 1 initials to confirm check undertaken.

| Area | Check Point | Checked. --Initial-- |
|---------------------|---|-------------------------|
| Head/Face | Airway not displaced (cm at lips= _____). | |
| | All connections between ETT + circuit secure. | |
| | Airway not kinked. | |
| | ETT pilot balloon visible. | |
| | ETT not compressing lips. | |
| | Eyes taped. No evidence of compression. | |
| Face Cushion | NG Tube secure + not displaced (cm at nose= _____). | |
| | Head fitted correctly in the face cushion, with eye brow line visible. | |
| | Face cushion supporting cheek bones but clear of the eyes. Chin not resting on face cushion. | |
| Neck | Neutral. Not extended. | |
| | Front of neck free from compression | |
| | Central Line Secure. | |
| Chest | Chest support cushion in place | |
| | Breasts correctly positioned + supported | |
| Abdomen | Abdomen free | |
| Pelvis | Pelvis support cushion in place | |
| | Male Genitalia positioned between legs | |
| | Catheter tubing is free and between legs | |
| Arms | Placed by side of patient | |
| | Shoulders not rotated | |
| | No compression over elbows | |
| | Wrists in neutral position | |
| | Hands free | |
| Legs | No peripheral IV lines under patient | |
| | Pillow positioned lengthways under right leg | |
| | Right foot hanging free | |
| Monitoring | Pulse oximeter wire not underneath patient | |
| | ECG Leads not underneath patient | |
| | Arterial Line tubing not underneath patient | |
| | Rectal Temperature probe inserted, wire not underneath patient | |

Carefully tilt bed to 30 degrees head up, while ensuring position of patient on bed remains unchanged.

Please sign below when checks completed.

Person 1 Signature _____

Person 2 Signature _____

PRONING SAFE SKIN CARE BUNDLE

KEY: Care / Action delivered

Y = Yes N = No (Document why not)

| | | |
|-------|-----|----------|
| NAME: | RXR | DATE / / |
|-------|-----|----------|

Frequency of care delivery should be hourly unless there is a valid reason which should be documented in the patient's notes

| | |
|--------------------------------------|------------------------|
| WATERLOW SCORE ON ADMISSION TO POCU: | TODAYS WATERLOW SCORE: |
|--------------------------------------|------------------------|

| | | | | | | | | | | | | |
|----------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| RECORD USING 24 HOUR CLOCK | | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM | HH:MM |
|----------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

SURFACE

| | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|
| BED: Type of Mattress: Nimbus 4 | | | | | | | | | | | | |
| All patient pressure relieving equipment working correctly | | | | | | | | | | | | |

MEDICAL DEVICES & PRESSURE SITES

| | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Check that face is visible in proning mask (1 hourly) | | | | | | | | | | | | |
| Check that eyes are taped shut (1 hourly) | | | | | | | | | | | | |
| Relieve pressure on face using hands down each side of patients face (1 hourly) | | | | | | | | | | | | |
| Alternate Oxygen saturation probe site (2 hourly) | | | | | | | | | | | | |
| Check NG Tube hanging free from mask (1 hourly) | | | | | | | | | | | | |
| Aspirate NG tube 2 hourly | | | | | | | | | | | | |
| Ensure urinary catheter tube is not under the patient (1 hourly) | | | | | | | | | | | | |
| If rectal or axilla temperature probe in situ check position (1 hourly) | | | | | | | | | | | | |

On returning to supine position

- Document all pressure ulcers of Grade 2 and above on ELHT wound care chart
- Complete IR1 for any Grade 2-4 pressure ulcers?
- Refer to Tissue Viability all Grade 2-4 pressure ulcers
- Photograph any Pressure Damage and store in notes

POSITIONAL CHANGE

| | | | | | | | | | | | | |
|----------------------------|--------------------------|--|--|--|--|--|--|--|--|--|--|--|
| (CHANGE POSITION 2 HOURLY) | Pillows under left side | | | | | | | | | | | |
| | Pillows under right side | | | | | | | | | | | |

INCONTINENCE

| | | | | | | | | | | | | |
|--------|-------------|--|--|--|--|--|--|--|--|--|--|--|
| | INCONTINENT | | | | | | | | | | | |
| BOWELS | STOMA | | | | | | | | | | | |
| | FLEXISEAL | | | | | | | | | | | |

NURSES INITIALS

Summary and Conclusions

- ☞ Discussed the indications for proning
- ☞ Increased awareness of the physiological effects proning has on patients, to be beneficial prone early and for longer and don't give up too soon
- ☞ Identified the contraindications to proning
- ☞ Increased awareness of the precautions needed to be undertaken prior to proning
- ☞ Discussed the practicalities involved in the turning procedure
- ☞ Identified the complications that can occur with proning
- ☞ Reviewed the care and management of a patient in the prone position

References

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