

## Rating scale used

| RATING | WORD           | DESCRIPTION  |
|--------|----------------|--|
| 1      | Essential      | without this element the effective functioning of the protocol would be severely impaired              |
| 2      | Very important | without this element the protocol would be less effective, but not severely impaired                   |
| 3      | Important      | this element desirable, but its absence would not make the protocol noticeably less effective for most |
| 4      | Unimportant    | absence of this element would have little impact on effectiveness                                      |
| 5      | Undesirable    | presence of this element would have a detrimental effect on effectiveness                              |

## Clinical algorithm for the management of intubated patients presenting with ALI or ARDS

Steps rated as **ESSENTIAL** reaching CONSENSUS SIQR < 0.5

| CLINICAL ALGORITHM STEP   | SUBJECT AREA                                     | SIQR | RANGE | AGREEMENT | ALTERNATIVE RATING BY PANELLISTS | MEDIAN RATING        |
|---|--|------|-------|-----------|----------------------------------|----------------------|
| The oxygenation status for ARDS as PaO <sub>2</sub> : FiO <sub>2</sub> <27 KPa/ 200mmHg   | CRITERIA USED TO IDENTIFY PATIENTS WITH ARDS/ALI | 0    | 1-2   | 4/5       | 2                                | <b>ESSENTIAL (1)</b> |
| The oxygenation status of ALI as PaO <sub>2</sub> : FiO <sub>2</sub> >27 KPa/ 200mmHg < 40kPa / 300mmHg   | CRITERIA USED TO IDENTIFY PATIENTS WITH ARDS/ALI | 0    | 1-2   | 4/5       | 2                                | <b>ESSENTIAL (1)</b> |
| Exclude pulmonary edema<br>Bilateral infiltrates are non cardiogenic<br>PAWP<18   | CRITERIA USED TO IDENTIFY PATIENTS WITH ARDS/ALI | 0    | 1-3   | 4/5       | 3                                | <b>ESSENTIAL (1)</b> |
| Patient size: Weight >135 kg; Pregnancy (2nd/3rd trimester)   | CONTRA INDICATIONS FOR PRONE POSITIONING         | 0    | 1-2   | 4/5       | 2                                | <b>ESSENTIAL (1)</b> |
| Unstable: Do not resuscitate order; patients experiencing seizures; acute bleeding; massive hemoptysis; recent cardiopulmonary arrest; MAP<65mmHg with or without vasopressors resuscitation or inotropes; pacemaker inserted for fewer than 2 days; cerebral perfusion pressure of less than 60 mm Hg. | CONTRA INDICATIONS FOR PRONE POSITIONING         | 0    | 1     | 5/5       | -                                | <b>ESSENTIAL (1)</b> |
| Orthopedic, neurological conditions or co morbidities: kyphoscoliosis; recent pelvic or chest fractures; multiple trauma, external pelvic fixation; spinal injury requiring spinal precautions, spinal instability, osteoporosis; head injury –   | CONTRA INDICATIONS FOR PRONE POSITIONING         | 0    | 1     | 5/5       |                                  | <b>ESSENTIAL (1)</b> |

|  |   |   |     |     |   |                      |
|--|---|---|-----|-----|---|----------------------|
| Intracranial pressure of more than 30mmHg; deep venous thrombosis; severe facial trauma or recent ophthalmic surgery; increased intraocular pressure; asthma; advanced osteoarthritis, rheumatoid arthritis  |   |   |     |     |   |                      |
| Recent surgery (Last 15 days): Maxillofacial surgery; new tracheotomy (< 24 hours); cardiothoracic surgery/unstable mediastinum; abdominal surgery, stoma formation, open abdomen, large abdomen; broncho-pleural fistula  | CONTRA INDICATIONS FOR PRONE POSITIONING                                    | 0 | 1   | 5/5 |   | <b>ESSENTIAL (1)</b> |
| If unsure discuss possible benefits compared to potential danger of identified contra indications with interdisciplinary team members  | CONTRA INDICATIONS FOR PRONE POSITIONING                                    | 0 | 1   | 5/5 |   | <b>ESSENTIAL (1)</b> |
| Pressure area risk calculated and assessment made for the use of specialist mattress, as per ICU standard  | PRACTICAL CONSIDERATIONS BEFORE THE IMPLEMENTATION OF THE PRONING PROCEDURE | 0 | 1-2 | 4/5 | 2 | <b>ESSENTIAL (1)</b> |
| Ensure that there are sufficient number of staff available to turn patient (initiate and after 6 hours). This includes at least 5 staffmembers (McCormick et al 2001) and an anaesthetist to manage patient airway and coordinate the move (Rowe et al 2004).  | PRACTICAL CONSIDERATIONS BEFORE THE IMPLEMENTATION OF THE PRONING PROCEDURE | 0 | 1   | 5/5 | - | <b>ESSENTIAL (1)</b> |
| Based on the assessment of the patient's sedation/pain status, sedation/analgesia must be administered to optimize sedation; prevent pain; minimize discomfort and avoid agitation during the turn. Should interference with ventilation occur despite adequate sedation; pharmacological muscle relaxants should be considered to prevent interference thereby optimizing oxygenation and stability (Rowe et al 2004).    | PRACTICAL CONSIDERATIONS BEFORE THE IMPLEMENTATION OF THE PRONING PROCEDURE | 0 | 1   | 5/5 | - | <b>ESSENTIAL (1)</b> |
| Patient protection: eye care – as per ICU standard: importantly, clean and lubricate with simple eye ointment. Maintain eye closure using geliperm or tape to avoid corneal abrasion; if available position a sliding sheet in situ; warn patient before initiating procedure; ensure all wound dressings have been completed  | PREPARATIONS MADE BEFORE PRONING THE PATIENT                                | 0 | 1-2 | 4/5 | 2 | <b>ESSENTIAL (1)</b> |
| Ensure safety of all external lines: aspirate nasogastric (NG) feed. Stop NG feed for the duration of the turn, check placement of tube before recommencing feed; disconnect infusion lines, naso-gastric feeds and ECG pads; Lines / tubes deemed essential by its continued presence must be adequately secured and flexible enough to accommodate all aspects of the turn; direct the lines towards the patients' head. | PREPARATIONS MADE BEFORE PRONING THE PATIENT                                | 0 | 1   | 5/5 | - | <b>ESSENTIAL (1)</b> |
| Protect the airway: Make sure appropriate intubation equipment is immediately available; suction patient (if available place closed suction system in place); secure the endotracheal/tracheostomy tube; document  | PREPARATIONS MADE BEFORE PRONING THE PATIENT                                | 0 | 1   | 5/5 | - | <b>ESSENTIAL (1)</b> |

|   |  |   |     |     |   |               |
|---|--|---|-----|-----|---|---------------|
| grade of intubation and length of ETT in cm, at teeth; document ABG's to use as reference in identification of non responders   |  |   |     |     |   |               |
| Monitoring: check PERLA (pupils equal and reacting to light accommodation); have at least a pulse oximeter with an effective pulsatile trace (visible or audible at all times) in situ during the process of turning to monitor heart rate and oxygen saturation  | PREPARATIONS MADE BEFORE PRONING THE PATIENT   | 0 | 1   | 5/5 | - | ESSENTIAL (1) |
| After procedure: Position head facing towards the ventilator; reconnect the equipment   | PRONING OF THE PATIENT   | 0 | 1-2 | 4/5 | 2 | ESSENTIAL (1) |
| Pulmonary instability: unplanned extubation, endotracheal tube obstruction, transcutaneous oxygen saturation [SpO2] <85% for more than 5 minutes. <b>POSTED COMMENT:</b> vital so that practitioners are aware of when patients may need to be returned to their original position.   | POSSIBLE ADVERSE REACTIONS TO TURNING PRONE  | 0 | 1-3 |     | 3 | ESSENTIAL (1) |
| Hemodynamic instability: cardiac arrest; heart rate <30/min for more than 1 minute; arterial systolic blood pressure <60 mm Hg for more than 5 minutes. <b>POSTED COMMENT:</b> vital so that practitioners are aware of when patients may need to be returned to their original position  | POSSIBLE ADVERSE REACTIONS TO TURNING PRONE  | 0 | 1-3 |     | 3 | ESSENTIAL (1) |
| Develop a patient specific mobility plan in consultation with interdisciplinary team members (refer to mobilization algorithm)  | REHABILITATION   | 0 | 1-2 | 4/5 | 2 | ESSENTIAL (1) |
| After 6 hours check ABG's. If PaO2:FiO2 has increased by at least 20mmHg patient is regarded as a RESPONDER and the prone position is continued   | IDENTIFICATION AND MANAGEMENT OF NON-RESPONDERS  | 0 | 1   | 5/5 | - | ESSENTIAL (1) |
| Before initiation of a RM discuss the potential benefits compared to the risks with interdisciplinary team members  | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0 | 1   | 5/5 | - | ESSENTIAL (1) |
| Monitor patient closely and only suction when clinically indicated coarse breath sounds; noisy breathing; increased or decreased pulse; increased or decreased respiration; increased or decreased blood pressure; prolonged expiratory breath sounds; increase in airway pressure; desaturation and clinically apparent increased work of breathing (refer to best practice suction algorithm) | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0 | 1   | 5/5 | - | ESSENTIAL (1) |

Steps rated as **VERY IMPORTANT** reaching CONSENSUS (SIQR <0.5)

| CLINICAL ALGORITHM STEP   | SUBJECT AREA                                     | SIQR | RAN<br>GE | AGREE<br>MENT | ALTERNA<br>TIVE<br>RATING<br>BY<br>PANELLI<br>STS | MEDIAN<br>RATING   |
|---|--|------|-----------|---------------|---|--------------------|
| Bilateral infiltrates visible on CxR evaluation as a criteria for the identification of a patient with ARDS   | CRITERIA USED TO IDENTIFY PATIENTS WITH ARDS/ALI | 0    | 1-2       | 4/5           | 1   | VERY IMPORTANT (2) |
| Turning without a sliding sheet: the patient is moved to the side of the bed (NB at least 3 people needed on the patient side of the bed - head & neck, chest, pelvis and legs) , pillows placed on the mattress and in line with the patient's chest, pelvis and knees, doctor checks airway and vital IV lines, patient is rolled slowly prone onto the pillows with at least 3 people on the other side of the bed - doctor taking care of airway & lines. | PRONING OF THE PATIENT                           | 0    | 2-3       | 4/5           | 3   | VERY IMPORTANT (2) |
| After 6 hours check ABG's. If PaO2:FiO2 has NOT increased by at least 20mmHg patient is regarded as a NON RESPONDER and returned to the supine position   | IDENTIFICATION AND MANAGEMENT OF NON-RESPONDERS  | 0    | 1-2       | 4/5           | 1   | VERY IMPORTANT (2) |
| In responders continue the prone position for at least eight hours a day  | DURATION OF THE PRONE POSITION IN RESPONDERS     | 0    | 2         | 5/5           | -   | VERY IMPORTANT (2) |
| In RESPONDERS remain in the prone position for a maximum of 20 hours per day  | DURATION OF THE PRONE POSITION IN RESPONDERS     | 0    | 2         | 5/5           | -   | VERY IMPORTANT (2) |

Steps rated as **DESIRABLE** reaching CONSENSUS (SIQR < 0.5)

| CLINICAL ALGORITHM STEP   | SUBJECT AREA   | SIQR | RAN<br>GE | AGREE<br>MENT | ALTERNA<br>TIVE<br>RATING<br>BY<br>PANELLI<br>STS | MEDIAN<br>RATING |
|---|--|------|-----------|---------------|---|------------------|
| Once established in the prone position, while monitoring and ensuring hemodynamic stability the bed could be placed in a reverse Trendelenburg's position, i.e. tilted foot down 30–45°   | POSITIONING OF THE PATIENT IN PRONE  | 0    | 2-3       | 4/5           | 2   | IMPORTANT (3)    |
| In the early stages of ARDS (within the first 27 hours of diagnosis) a electronic sigh RM (eSigh) can be performed on a patient ventilated on volume-controlled ventilation to improve oxygenation and volume. The eSigh RM is described as increasing PEEP | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0    | 1-3       | 4/5           | 1   | IMPORTANT (3)    |

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| 10 cm H <sub>2</sub> O above the LIP (lower inflection point of the pressure-volume curve) for 15 minutes, limiting the maximum peak airway pressure to 50 cm H <sub>2</sub> O. In case of severe arterial hypotension (systolic arterial pressure of less than 70 mm Hg) or severe hypoxemia (SpO <sub>2</sub> of less than 80%), the RM should be terminated (Constantin et al 2008) |  |  |  |  |  |  |
|--|--|--|--|--|--|--|

## Steps that did not reach consensus

| CLINICAL ALGORITHM STEP   | SUBJECT AREA  | SIQR | SD  | MEDIAN | ALTERNATIVE RATING BY PANEL |
|---|---|------|-----|--------|-----------------------------|
| Decreased oxygenation and bilateral infiltrates are of acute onset  | CRITERIA USED TO IDENTIFY PATIENTS WITH ARDS/ALI                            | 0.5  | 1-2 | 2      | 2;2;2;1;1                   |
| Have at least a pulse oximeter with an effective pulsatile trace (visible or audible at all times) in situ during the process of turning to monitor heart rate and oxygen saturation (Rowe et al 2004).   | PRACTICAL CONSIDERATIONS BEFORE THE IMPLEMENTATION OF THE PRONING PROCEDURE | 0.5  | 1-2 | 1      | 1;1;1;2;2                   |
| Procedure when using a sliding sheet: Ensure patients' arms are positioned close to their sides, with the palms facing inwards ; position pillows across pt chest, pelvis and knees; pull bottom sheet straight and taut and lay a second sheet across the patient, ensuring that all corners are matching, effectively cocooning the patient and pillows inside; move the patient towards one side of the bed; roll slowly onto flank and then onto abdomen in the direction of the ventilator. One staff member manages the head and tracheal tube and two members on either side of patient  | PRONING OF THE PATIENT  | 0.5  | 1-2 | 1      | 1;1;1;2;2                   |
| Pressure relief and protection: pay special attention to the following areas forehead, ear, nose tip, cheek or chin; breasts and genitalia  | POSITIONING OF THE PATIENT IN PRONE   | 0.5  | 1-3 | 1      | 1;1;1;2;3                   |
| Positioning: Upper pillow could support the patients' upper chest, allowing their shoulders to fall forwards slightly; the middle pillow might be positioned under the patients' pelvis, thus maintaining them in an abdomen-free position ;maintain the patient within the swimmers position, ensuring that their face looks towards the prominent arm, the opposite one being positioned carefully down by their side; shoulder position of the prominent arm might be maintained at 80° abduction, whilst the elbow is flexed to 90° In addition, a small-rolled pillowcase should be placed in the palm of the prominent hand to extend the wrist and allow flexion of the fingers. | POSITIONING OF THE PATIENT IN PRONE   | 0.5  | 1-3 | 1      | 1;1;1;2;3                   |

|  |  |     |     |   |           |
|--|--|-----|-----|---|-----------|
| In RESPONDERS continue the prone positioning for at least 7 days   | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0.5 | 2-3 | 3 | 3;3;3;2;2 |
| Choose a closed suction system to maintain oxygenation   | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0.5 | 1-2 | 2 | 2;2;2;1;1 |
| When using an open suction system include the use of VHI two hyperinflations using the CPAP function of the ventilator to an airway pressure of 45cmH2O for 20 s, with an interval of 1 min in between after suction procedure | INDICATION FOR SUCTION IN ARDS PATIENTS AND THE INCLUSION OF A RECRUITMENT MANOUVRE (RM) | 0   | 1-5 | 2 | 1;2;2;2;5 |
| Hemoptysis<br><b>POSTED COMMENT:</b> vital so that practitioners are aware of when patients may need to be returned to their original position.  | POSSIBLE ADVERSE REACTIONS TO TURNING PRONE  | 1   | 1-3 | 1 | 1;1;1;3;3 |