

Nursing aspects of prone positioning on an Air-Fluidised Therapy bed

Introduction

Among the various treatment options in the Intensive Care unit, the prone positioning has become a standard of care. When the recommendation for the prone position is given, it is preferable to lay the patient on an Air-Fluidised Therapy (AFT) bed.

The interface pressure for this system is very low which allows for the patient to 'float'. This floating effect is the result of soda-lime glass beads with silicone coating circulated together with filtered air to mimic the fluid.

The filter sheet is porous. Exudates and bodily fluids are absorbed and encapsulated by the beads. Pathogens cannot survive or reproduce in the medium because the airflow is extremely dry. Warm filtered air which is continuously circulating around the patient creates a clean, dry environment. The therapy system can be set to different temperatures.

Nursing aspects

Provided the right technique is used, our experience has been that it is easier to turn the patient on an AFT than on a low-flow bed or mattress. No pillows are needed to position the patient, thereby preventing the pinching of blood vessels or peripheral nerve injury.

It is essential to have a large enough filter sheet to facilitate turning and to position the patient properly. If the filter sheet is too small, a 'hammock' effect will occur, resulting in pressure sores.

Patients to be placed in a prone position always require capnography and continuous capillary O₂ saturation measurements monitoring. The patients are sedated.

A closed suction system is used before turning the patient. This requires tube fixation. Measures are taken to prevent pressure sores on the ears due to the tube fixation. Eyes are rinsed, lubricated with ointment and covered with eye pads. The patient's mouth is cared for according to the protocol, making sure that no liquid remains in the mouth and that the mouth is covered with gauze impregnated with Vaseline.

To prevent pressure sores on the nose and mouth, as little gauze as possible is used and it is secured with a plaster without stretching it to prevent skin peeling.

Care must be taken to ensure that the tongue lies properly in the month, i.e. not between the molars or teeth. The stomach tube is drained. A stomach tube via the mouth is preferable. If a nose tube is used, it is guided along the stomach tube to prevent pressure sores on the nose.

Other preparations:

- Feeding through the stomach tube is stopped, as a prone position is an indication for a duodenum tube.
- Drains and catheters are guided downwards between the legs.
- Central lines, stomach tubes, etc. are guided upwards along the head.
- Any IVs on extremities are disconnected.
- New ECG patches are laid out ready for use.

The patient is turned by at least three persons, one of whom is a physician.

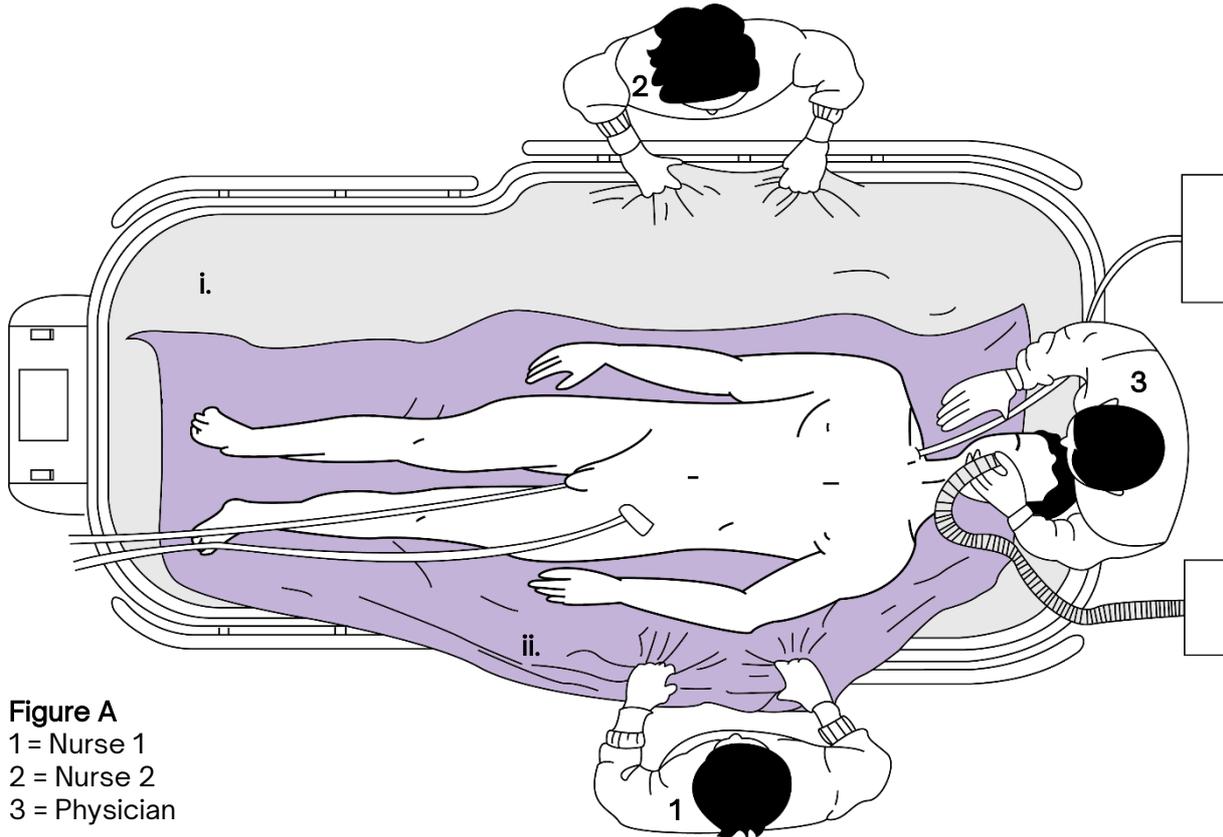


Figure A

1 = Nurse 1

2 = Nurse 2

3 = Physician

i.= Polyester filter sheet

ii.= Regular sheet

iii.= Clean sheet

Instructions

- The physician (3) stands at the head end and is responsible for the tube.
- The nurses stand on the left and right side of the bed, respectively. If the tube is on the left corner of the mouth, the patient is turned onto his or her right side. If the tube is on the right side, the patient is turned onto his or her left side. This prevents torsion between the feeding tube and the breathing tubes.
- The patient is pre-oxygenated with 100% FiO₂.
- Right before turning, the ECG patches and leads are removed and any arterial line disconnected. This means that, for a few moments, the only monitoring possible is the pressure curve of the pulmonary arterial catheter.
- The polyester filter sheet (i.) is pulled by nurse 2 as much as possible on the side to which the patient is being turned. At the same time, nurse 1 pulls the patient towards him or her on the other side of the regular sheet (ii.) (Figure A).

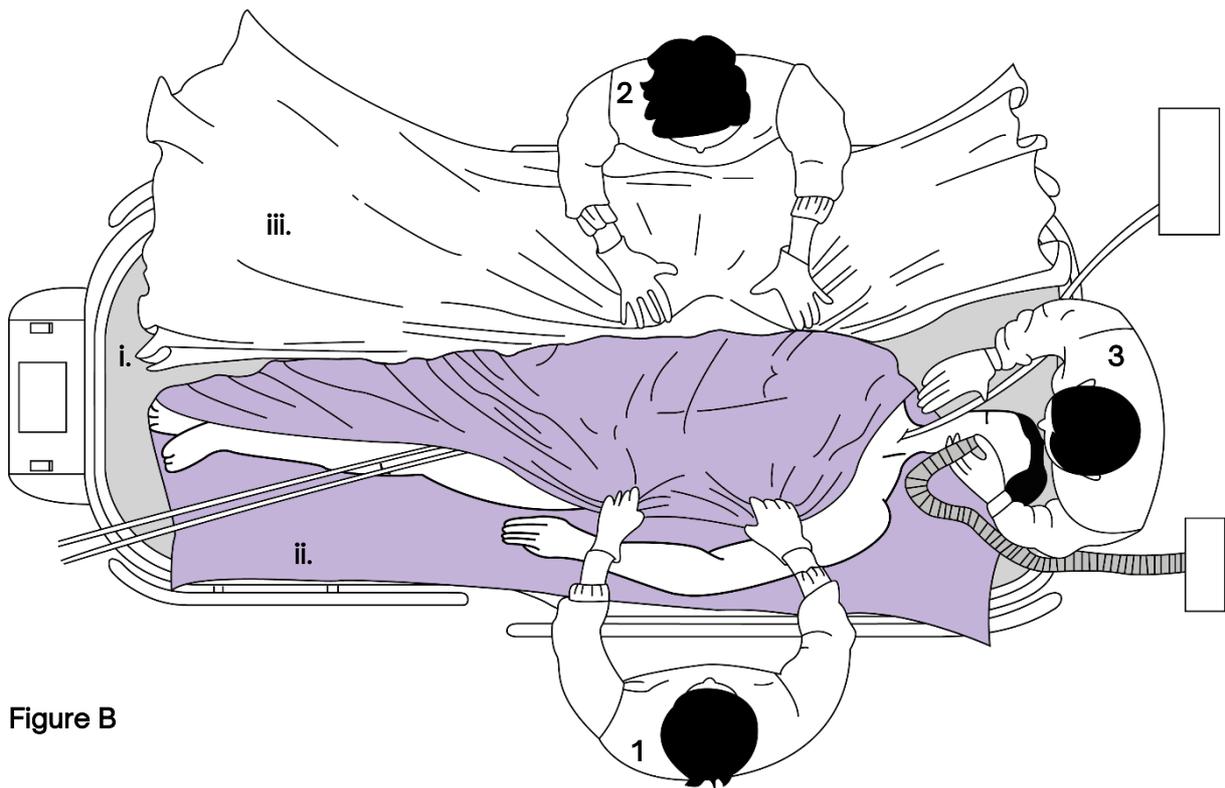


Figure B

- A clean sheet (iii.) is placed on the side to which the patient is being turned (over the large polyester filter sheet (i.). One-fourth of the clean sheet is slid under the dirty sheet (ii.) (Figure B). The rest of the sheet is slid under the patient later on when turning.
- The arm over which the patient is being turned is placed alongside the body.

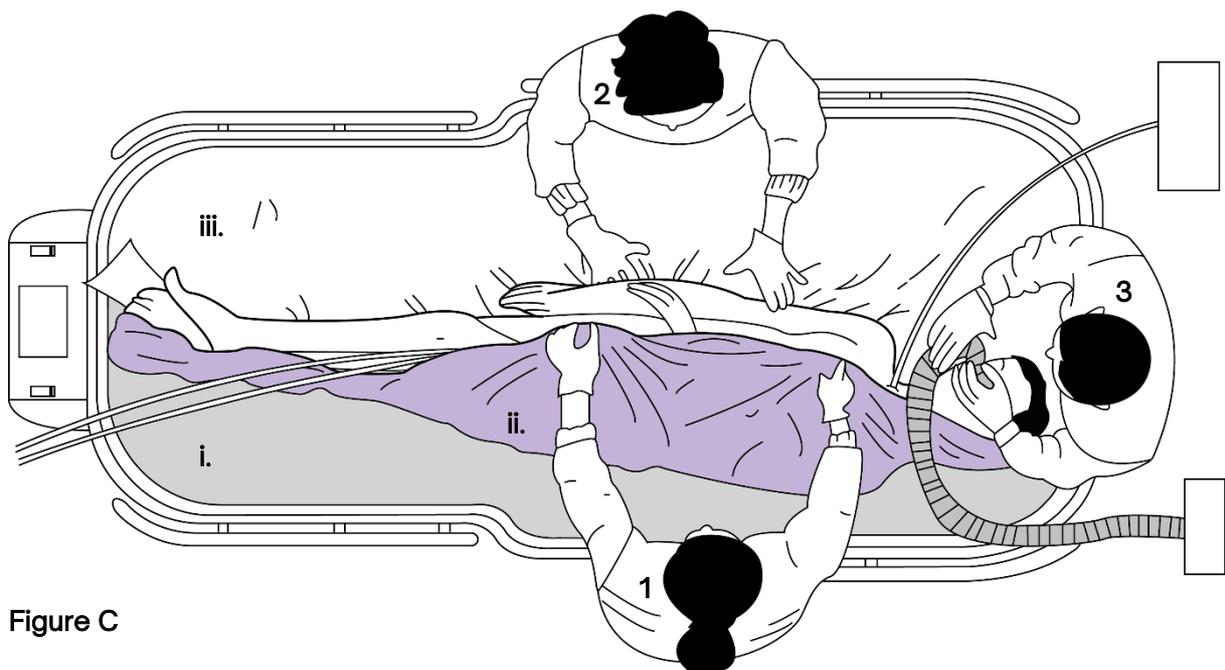


Figure C

When pulling away the dirty sheet, the patient is being turned gently into a partly prone position. This requires little to no effort on the part of the nurse (Figure C).

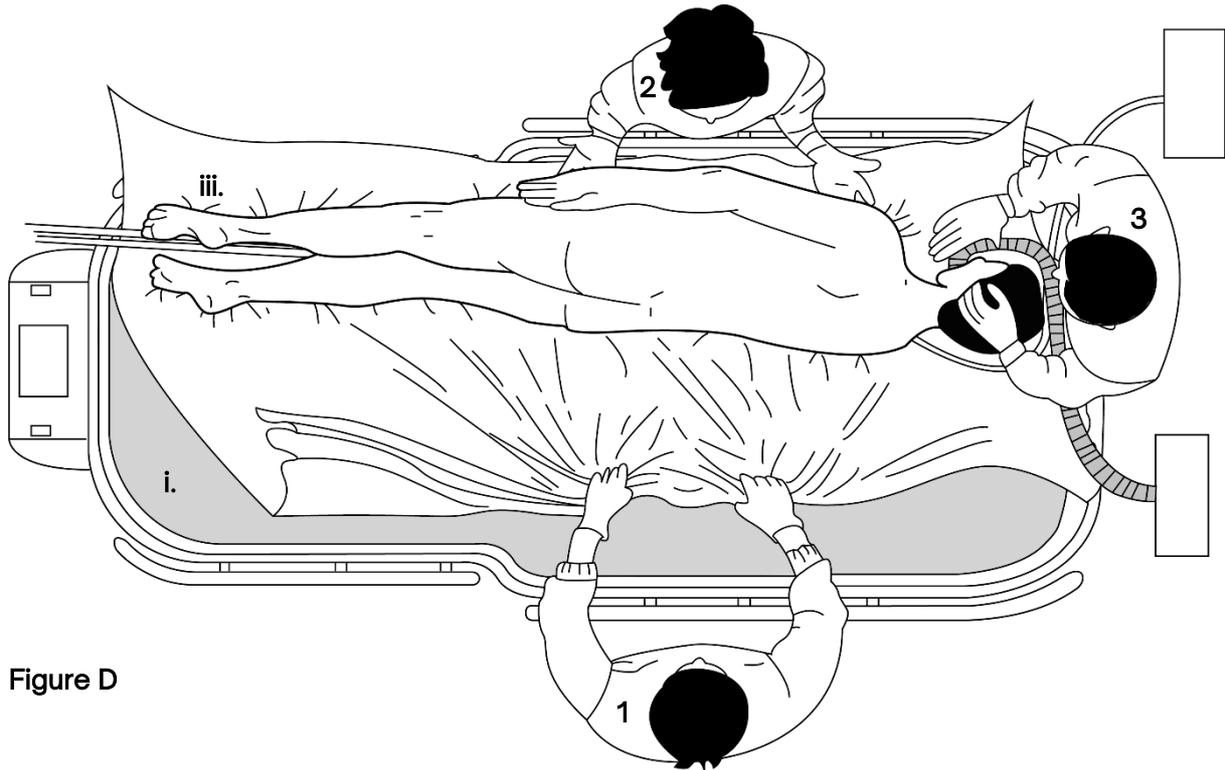
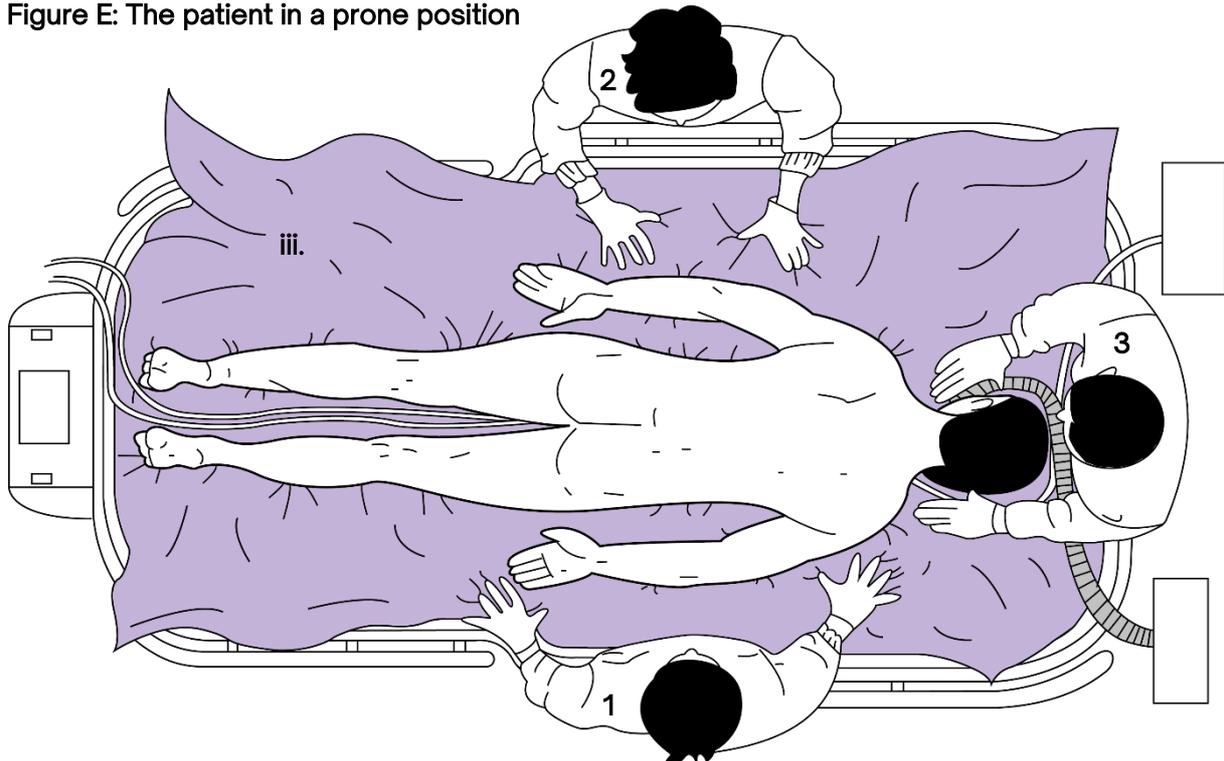


Figure D

- The clean sheet (iii.) is pulled under the patient (Figure D). The patient is now lying in a full prone position (Figure E). The ECG patches and leads are placed on the patient's back and the disconnected arterial line (if relevant) is connected again.
- The filter sheet (i.) is then spread evenly under the patient. This includes the head and foot ends. It is important that there is enough filter sheet around the patient's head to prevent a taut filter sheet and, consequently, too much pressure.
- The physician holds the patient's head, paying attention to the tube and other equipment.
- A nurse creates space in the glass beads for the patient's face and the tubes.
- The regular sheet is not to be pulled at this point, even if it is not smooth. Smoothing out the sheet can cause friction on the patient's skin, thereby damaging it.
- The patient's feet may not be placed on the edge of the bed. Special pillows are available for tall patients. Pes equinus is prevented by creating a space in the glass beads and placing the feet in it.
- The regular sheet should not be pulled taut here either to prevent friction on the skin.
- Peripheral lines are reconnected.
- IV valves should not be in contact with skin.

Figure E: The patient in a prone position



An agreement is made with the IC physician regarding the duration of the prone position each time.

When in the supine position, the patient's mouth and eyes are again treated and basic care given that is not possible in a prone position. Again, it is important that the regular sheet is not smoothed out, even if it appears messy. This prevents friction on the heels and resulting abrasion/blistering/heel pressure sore. It is also better not to place a pillow under the head to prevent a pressure sore on the back of the head.

When in the prone position, the patient's position is not to be altered. Family members are informed why the prone position is necessary and prepared for the fact that the patient's face cannot be seen. The view can raise emotions for the family to deal with.

If the situation allows it, arrangements are made with the family to visit the patient when in a different position.

Other aspects

Resuscitation has not been problematic. Defibrillation is possible in a prone position, but the patient must be turned onto his or her back for chest compressions.

If prone positioning is no longer indicated, the patient can once again be placed onto an Intensive Care bed (with low-air mattress).

The Adult Intensive Care Unit at the Amsterdam University Medical Centre (AMC) has had positive experiences with the prone positioning on an AFT over the course of four years. Complications such as undesired extubation and peripheral nerve damage have not occurred during this time period.

Pressure sores on the nose, mouth and teeth occasionally occur (less than 5%) and are always the result of an incorrect turning technique and position of the patient or because the sheet has been pulled taut.

Pressure sores on heels are still seen far too often, in spite of the use of the Air-Fluidised beds. Blistering and haemorrhagic blisters are the most common sores. These are the result of friction on the skin due to pulling the sheet without first lifting extremities. This automatic response is difficult to unlearn.

To prevent this, heels can be protected with a hydrocolloid or polyurethane bandage.

Transfer of the patient onto the AFT requires additional energy and effort on the part of the nursing staff. But the prevention of pressure ulcers and ease with which a patient can be turned into a prone position makes this worthwhile.

Literature:

1. Protocol buikligging; Protocolen Commissie Intensive Care Volwassenen AMC, Amsterdam 1996
2. Kesecioglu J., Prone position in therapy-refractory hypoxaemia. Adult Intensive Care Unit, AMC, Amsterdam. Current Opinion in Anaesthesiology 1997;1:92-100

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