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**Minimum Standards for Intrahospital Transport of  
Critically Ill Patients**

**INTRODUCTION**

Critically ill patients may have absent or small physiological reserves. Adverse physiological changes in these patients during intrahospital transport are common and can be life-threatening. Ventilator-dependent and haemodynamically unstable patients are at particular risk. Careful planning is required to move these patients between hospital facilities such as operating theatres, ICU, Emergency Department, imaging rooms, and wards. Such intrahospital transport is usually elective, but a need for urgency must also be anticipated (such as moving the patient to the operating theatres after a diagnostic procedure).

**1. PROTOCOL**

- 1.1 Relevant staff should formulate their hospital's protocol of intrahospital transport of critically ill patients. The protocol should be made widely known and available.

- 1.2 The transport itself must be justified. Whatever benefits of proposed interventions must outweigh the risks of moving the critically ill patient and those posed by the interventions themselves.

## **2. EQUIPMENT**

- 2.1 Equipment must be dedicated to intrahospital transport.
- 2.2 The equipment should be durable, and trolley-linked devices must be able to enter lifts and pass through all doorways en route.
- 2.3 All equipment must be able to function in the specific intervention area (e.g. a magnetic resonance imaging room) and facilities for remote patient monitoring should be available where required. Gas, suction, and electrical supplies at the destination must be present and compatible.
- 2.4 No equipment should be placed on the patient; specially designed receptacles or transport trolleys are useful.
- 2.5 Basic monitoring of ECG, heart rate, blood pressure (by invasive or an automated non-invasive monitor), and oxygen saturation by pulse oximetry must be used for all patients. A capnometer must be used to monitor all patients receiving mechanical ventilation.
- 2.6 A defibrillator and a suctioning device must be available.
- 2.7 A portable ventilator with a disconnect alarm is required for ventilator-dependent patients. Nonetheless, a manual resuscitator bag must always be available. Facilities to deliver PEEP and different modes of ventilation are necessary for some patients.
- 2.8 Infusion pumps are highly recommended for accurate administration of drug infusions. They should have alarms set appropriately.
- 2.9 Appropriate fully charged, spare battery packs for electrically driven devices must be available.
- 2.10 Equipment to secure the airway, and emergency drugs, analgesics, sedatives, and muscle relaxants must be available.
- 2.11 A procedure must be implemented to ensure that all intrahospital transport equipment is readily accessible and regularly checked.

## **3. STAFFING**

- 3.1 Key personnel for each transport event should be identified. The transport team should consist at least of an appropriately qualified nurse, an orderly, and an appropriately trained doctor.

- 3.2 Each team must be familiar with the equipment and be sufficiently experienced with securing airways, ventilation of the lungs, resuscitation, and other anticipated emergency procedures.

#### **4. PRE-DEPARTURE PROCEDURES**

- 4.1 The transport team must be freed from other duties.
- 4.2 The receiving person or staff at the destination must be notified, and the arrival time must be clearly understood.
- 4.3 All pieces of equipment must be checked, and notes and imaging films gathered. An example of a checklist is listed below. Individual responsibilities for checking equipment must be defined.
  - 4.3.1 The monitors function properly and the alarm limits are set appropriately.
  - 4.3.2 The manual resuscitator bag functions properly.
  - 4.3.3 The ventilator (if used) functions properly; respiratory variables and alarms are set appropriately.
  - 4.3.4 The suction device functions properly.
  - 4.3.5 Oxygen ( $\pm$  air) cylinders are full.
  - 4.3.6 A spare oxygen cylinder is available.
  - 4.3.7 Airway and intubation equipment are all available and working.
  - 4.3.8 Emergency drugs, analgesics, sedatives, and muscle relaxants are all available.
  - 4.3.9 Additional drugs are made available if indicated.
  - 4.3.10 Spare IV fluids, inotropic solutions, or blood are available if needed.
  - 4.3.11 Spare batteries are available for all battery-powered equipment.
  - 4.3.12 Chest tube clamps (if an underwater chest drain is present) are available.
  - 4.3.13 Patient notes, imaging films, and necessary forms (especially the informed consent form) are available.

#### **5. PATIENT STATUS**

- 5.1 Final preparation of the patient should be made before the actual move, with conscious anticipation of clinical needs. Examples include giving appropriate doses of muscle relaxants or sedatives, replacing near-empty inotropic and other IV solutions with fresh bags, and emptying drainage bags.
- 5.2 The patient must be reassessed before transport begins, especially after being placed on monitoring equipment and the transport ventilator (if used). Transport preparations must not overshadow or neglect the patient's fundamental care. An example of a brief check on the patient is listed below.
  - 5.2.1 Airway is secured and patent.

- 5.2.2 Ventilation is adequate; respiratory variables are appropriate.
- 5.2.3 All equipment alarms are switched on.
- 5.2.4 Patient is haemodynamically stable.
- 5.2.5 Vital signs are displayed on transport monitors and are clearly visible to transport staff.
- 5.2.6 PEEP/CPAP (if set) and FIO<sub>2</sub> levels are correct.
- 5.2.7 All drains (urinary, wound, or underwater seal) are functioning and secured.
- 5.2.8 Underwater seal drain is not clamped.
- 5.2.9 Venous access is adequate and patent.
- 5.2.10 IV drips and infusion pumps are functioning properly.
- 5.2.11 Patient is safely secured on trolley.

## **6. IN-TRANSIT PROCEDURES**

- 6.1 A best route should be planned. Lifts should be secured or reserved beforehand.
- 6.2 Adequate communication facilities during transit and at the destination must be available.
- 6.3 The status of the patient must be checked at intervals, especially if the journey takes considerable time. Any change in the patient's condition, unexpected event, or critical incident, must be acted upon immediately.

## **7. ARRIVAL PROCEDURES**

- 7.1 On arrival at the destination, the receiving monitoring, ventilation, gas, suction, and power facilities are checked if the patient is to be transferred from the transport facilities.
- 7.2 The patient must be assessed when the new monitors, ventilators (if used), gas and power supplies are established.
- 7.3 If another team assumes responsibility of care, a complete hand over is given to the team leader. The transport staff must remain with the patient until the receiving team is fully ready to take over care.

## **8. DOCUMENTATION**

The clinical record should document the patient's clinical status during transport until handover occurs at the destination.

## **9. QUALITY ASSURANCE**

The process of intrahospital transport of patients should be continually evaluated to identify system problems and recommend improvements.

These guidelines should be interpreted in conjunction with the following professional document:

PS52 *Minimum Standards for Transport of Critically Ill Patients.*

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