

Transporting Critically Ill Patients

Critically ill patients are transported within an institution or to other hospitals to obtain additional care that is not available at the current location, such as diagnostic studies, specialized care units, or clinical expertise. Transporting critically ill patients can be risky, and the potential benefits must outweigh the potential hazards. This pocket card provides tips to safely transport critically ill patients within a hospital (intrahospital) or to a different facility (interhospital).

The main goals during the transport of critically ill patients are to maintain safety and to provide the same level and quality of care as they would receive in the intensive care unit (ICU). Before transport, the patient's respiratory, circulatory, and neurologic status should be evaluated and stabilized. Non-urgent diagnostic testing or procedures should be delayed to allow for optimization of the patient's condition.

Intrahospital Transport (Warren et al., 2004)

The transport of critically ill patients from the emergency department or the ICU to other areas of a hospital should be organized and efficient and is ideally performed by specially trained staff. Consider the use of safety tools such as checklists. Policies and procedures should be in place to address the following:

- **Pre-transport coordination and communication**
 - Nurse-to-nurse and provider-to-provider communication are essential to preserving the continuity of patient care. Use Situation, Background, Assessment, Recommendation (SBAR) tool.
 - Transferring staff reviews the patient's clinical status and treatment plan.
 - Receiving location confirms it is ready to receive the patient.
 - Respiratory therapy is notified of the timing of the transport and what equipment will be needed.
 - Documentation includes indications for transport and patient status throughout the time away from the unit.
 - Secure all intravascular catheters and drains to prevent inadvertent dislodgement.
 - For non-intubated patients with hypoxia or desaturation episodes, strongly consider increasing non-invasive respiratory support or endotracheal intubation prior to leaving the ICU. Test the patient's tolerance to the supine position if the patient is to undergo a procedure requiring the patient to lie flat.
 - Treat agitation with medications if it poses a risk factor for safe transport.
- **Accompanying personnel**
 - A minimum of two individuals should accompany a critically ill patient off of the unit.
 - 1st should be a nurse who has completed a competency-based orientation and has met standards for critical care nurses.
 - 2nd should be either a respiratory therapist, registered nurse, or critical care technician. Some facilities have designated transport teams and a member of this team would accompany the patient as the 2nd person.

- If the patient is unstable, it is recommended that a health care provider (physician, physician assistant, advanced practice nurse) trained in airway management, advanced cardiac life support, and critical care accompany the patient.
- If the patient is leaving the unit for a test or procedure, patient care may be transferred to the procedural staff if they are appropriately trained; if care is not transferred, the transport personnel should remain with the patient until they return to the ICU.
- **Accompanying equipment**
 - Blood pressure monitor (or standard blood pressure cuff)
 - Pulse oximeter
 - Cardiac monitor/defibrillator
 - Memory-capable monitor that can store patient bedside data (if available)
 - Airway management equipment, sized for the patient
 - Oxygen source with ample supply and 30-minute reserve
 - Place the patient on supplemental oxygen as prescribed.
 - For mechanically ventilated patients, note the endotracheal tube (ETT) position, ensure it is secured before transport, and confirm adequate oxygenation and ventilation.
 - Portable ventilators should have alarms that indicate disconnection and excessively high airway pressure; a backup battery power supply is essential.
 - Basic resuscitation drugs
 - Epinephrine
 - Atropine
 - Antiarrhythmic agents
 - Sedatives and narcotic analgesics for specific cases (follow your facility policies and procedures for narcotic medication sign-out)
 - Intravenous (IV) fluids and continuous drip medications regulated on battery-operated infusion pumps, fully charged and functioning. Estimate fluid and vasopressor needs, factoring in the potential need for increased support during transport.
 - Note: if a health care provider is not accompanying the patient during transport, protocols should be in place, allowing the administration of medications and fluids by trained staff under emergency circumstances.
- **Monitoring during transport** – Critically ill patients require the same level of physiologic monitoring during transport as they have in the ICU.
 - Continuous electrocardiogram (ECG) monitoring
 - Continuous pulse oximetry
 - Vital signs per protocol: blood pressure (BP), heart rate (HR), and respiratory rate (RR)
 - Some patients may require capnography, continuous intra-arterial BP, pulmonary artery pressure, intracranial pressure (ICP) monitoring, or intermittent cardiac output (CO).

Interhospital Transport (Warren et al., 2004)

When a patient requires care that exceeds that available at the current hospital, that patient will be transferred to a facility with the appropriate technology and clinical expertise. The decision to transfer is

the responsibility of the attending health care provider at the referring institution. Resuscitation and stabilization should begin before the transfer to the degree possible.

- **Prior to transfer**
 - Obtain informed consent from a competent patient, a guardian, or a legally authorized representative of an incompetent patient.
 - This includes a discussion of the risks and benefits of transfer and is documented in the medical record.
 - Written informed consent should be obtained, if possible.
 - If in a life-threatening emergency, reasons for not obtaining consent should be documented in the medical record.
- **Pre-transport coordination and communication**
 - Referring providers should identify and contact the admitting provider at the receiving hospital to accept the patient and confirm that appropriate higher-level resources are available. Transferring/referring provider should:
 - Provide a full description of the patient's condition.
 - Provide treatment and stabilization of the patient.
 - Determine the mode of transportation in consultation with the receiving provider based on urgency and stability of the patient, time savings, weather conditions, medical interventions necessary for life support during transfer, and availability of personnel and resources.
 - Confirm transport services availability, prepare for anticipated patient needs during transport, and coordinate the transport timing.
 - The referring facility gives nurse-to-nurse report to the appropriate unit at the receiving hospital, or a transport team member can provide a report upon arrival.
 - Complete medical records, patient care summary, laboratory and radiographic studies should accompany the patient; preparation of records should not delay the transfer.
 - Critical information should be communicated verbally.
 - Policies should be established within each institution regarding the content of documentation and communication between personnel involved in the transfer.
- **Accompanying personnel**
 - A minimum of two people, in addition to the vehicle operator, should accompany critically ill patients during interhospital transport.
 - If the patient is unstable, the transport team leader should be a provider or nurse, preferably with additional training in transport medicine.
 - For critical but stable patients, the team leader may be a paramedic.
 - If a health care provider cannot accompany the patient, the transfer team should communicate with a command health care provider. If communication is not possible, standing orders should be written to authorize staff to perform lifesaving interventions.
- **Minimum equipment required**
 - A full list of equipment required for interhospital transfer can be found in the [Guidelines For The Inter- And Intrahospital Transport Of Critically Ill Patients](#). All necessary equipment is typically available within transport services (e.g., ambulance, transport helicopter).

- Supplies will focus on airway and oxygenation, vital signs monitoring, drugs needed for emergency resuscitation, stabilization, and maintenance of vital functions.
- All items should be checked for the expiration of sterility and/or potency.
- Equipment function should be verified regularly.
- **Monitoring during interhospital transport**
 - Continuous pulse oximetry
 - ECG monitoring, BP, and RR
 - Some patients may require monitoring of intra-arterial BP, central venous pressure (CVP), ICP, and/or capnography.
 - For mechanically ventilated patients, note the ETT position, and ensure it is secure, and the patient is receiving adequate oxygenation and ventilation.
 - Patient condition and management during transport are recorded in the patient medical record at the referring facility; copies are provided to the receiving facility.
- **Preparing a patient for interhospital transport**
 - Referring facilities will begin appropriate evaluation and stabilization prior to transport.
 - Delays may occur if the transport team must perform complex procedures to stabilize the patient.
 - Assess and secure the intubated patient's airway. Consider intubation prior to transport if the non-intubated patient's respiratory status is tenuous.
 - Avoid non-essential testing and procedures before transfer.
 - Secure intravenous (IV) access before transport; if peripheral IV access is not available, establish central venous access.
 - Initiate fluid resuscitation and inotropic support as needed. All IV fluids and medications should be in plastic (not glass) containers per facility protocol.
 - For trauma patients, spinal immobilization is maintained.
 - For patients with an ileus or intestinal obstruction or those that require mechanical ventilation, a nasogastric tube may be inserted.
 - Foley catheter is inserted for patients requiring strict fluid management, for extended transport, and patients receiving diuretics.
 - Soft wrist or leg restraints may be needed if the patient is agitated.
 - If the patient is combative or uncooperative, sedatives and/or neuromuscular blocking agents may be indicated.
 - Patient medical records and laboratory and radiographic studies are copied and sent to the receiving facility.

What to do in an emergency?

The incidence of adverse events (AEs) during intrahospital transport has been reported to occur between 30% to 60%. These include hypoxia, hypotension, accidental dislocation or thrombus of vascular access, chest tubes, bladder catheters, and endotracheal tubes (Ignatyeva et al., 2018). Nurses and other staff who are involved in the transport of critically ill patients should be trained on post-resuscitation management, airway management, and emergency medication administration (Ignatyeva et al., 2018). Orders for PRN medications and titration of vasoactive infusions should be obtained before transport. In the event of an emergency, follow your institution's specific policies for communication with or activation of the rapid response or code team.

References:

Ignatyeva, Y., Nguyen, A.P., Schmidt, U., Barak, R., Agarwal, R., & Davidson, J.E. (2018). Transport of Critically Ill Cardiovascular Patients. *Critical Care Nursing Quarterly*, 41(4), 413-425. <https://doi.org/10.1097/CNQ.0000000000000229>

Pannu, A., Walsh, D. (2022, August 30). Transport of Surgical Patients. *UpToDate*.
<https://www.uptodate.com/contents/transport-of-surgical-patients>

Salt, O., Akpınar, M., Sayhan, M. B., Örs, F. B., Durukan, P., Baykan, N., Kavalcı, C. (2020). Intrahospital critical patient transport from the emergency department. *Archives of Medical Science*, 16(2), 337-344. <https://doi.org/10.5114/aoms.2018.79598>

Warren, J., Fromm, R.E., Orr, R.A., Rotello, L.C., & Horst, H.M. (2004). American College of Critical Care Medicine Guidelines for the inter- and intrahospital transport of critically ill patients, *Critical Care Medicine*, 32(1), 256-262.
<https://doi.org/10.1097/01.CCM.0000104917.39204.0A>