

Adverse Event During Intrahospital Transport

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The Case

A 4-year-old boy underwent surgery under general anesthesia for correction of a congenital intestinal abnormality. The procedure was uneventful, and he was extubated in the operating room and brought to the postanesthesia care unit (PACU). The patient appeared stable in the PACU, but due to his age and length of the procedure, the PACU anesthesiologist ordered him to be placed on continuous pulse-oximetry monitoring for 24 hours.

The patient was deemed stable to leave the PACU and be transported to the regular floor. However, he was not placed on pulse oximetry during the transport itself, which took about 10 minutes. On arrival to the floor, the patient transporter brought the patient to the designated room and alerted nurses that he had placed a new patient from the PACU there. The transporter did not communicate any concerns about the patient to the nursing staff. The bedside nurse had received signout from the PACU that the procedure had been uncomplicated and the patient had done well, so she felt no urgency to assess the new arrival. A few minutes later, the nurse went to assess the patient. She placed him on pulse oximetry and immediately realized that he was markedly hypoxic. She immediately administered oxygen by face mask, but he quickly became bradycardic and hypotensive, and a Code Blue was called. The patient went into cardiac arrest. He was eventually resuscitated but was left with significant neurological injury as a result of hypoxic brain injury.

The hospital performed a root cause analysis of the case. The investigation found that the PACU staff understood the order for "continuous pulse oximetry for 24 hours" was to begin when the patient arrived on the ward. The patient's oxygen saturation had probably started to drop shortly before he left the PACU and had progressively worsened during transport, while he was not monitored. Had the patient been monitored during the transport, his deterioration might have been detected earlier. The transport staff member stated that he thought the patient might be experiencing breathing difficulty during the transport but did not voice his concern as he had been assured the boy was stable and he did not trust his own judgment.

The Commentary

This transfer from the postanesthesia care unit to the floor represents a type of intrahospital transfer, described as when patients are transported between units within the hospital. Several errors related to the intrahospital transfer process can be identified in this case. These include communication breakdowns, lack of assessment of patient pre- and post-intrahospital transfer, insufficient knowledge and skills in patient monitoring during intrahospital transfer, and failure to raise concerns about the patient's condition. The root cause analysis highlights important information on factors contributing to the errors. In this commentary, we address these issues and provide potential solutions for clinical practice.

The frequency of complications and adverse events associated with intrahospital transfers varies across studies.⁽¹⁾ Alarming, one prospective observational study that included patient-, staff-, and equipment-related adverse events reported an overall rate of 80% during intrahospital transfer.⁽²⁾ Contributing factors to adverse events can be related to several hazardous areas within the intrahospital transfer process and the severity of the patient's illness.⁽³⁾ Our observational study identified safety hazards during intrahospital transfers related to the transport team, transport-related tasks, tools and technologies used, and the environment and the organization in which intrahospital transfers were performed.⁽⁴⁾ One-third of all hazards were related to the tools and technologies used. However, the majority of detected hazards did not result in observable patient harm, suggesting that clinicians often intervene before hazards result in adverse patient outcomes.

A multifaceted approach is needed to enhance intrahospital transfer safety, including both redesign of systems to reduce hazards as well as assessment and training of technical and nontechnical skills of clinicians performing intrahospital transfers. Possible safety solutions include the use of checklists, specific training programs, and technical interventions.^(1,4) For example, one study reported a significant reduction of unexpected events after implementing a pretransport checklist in the emergency department.⁽⁵⁾ Guidelines are also available for transport of critically ill patients, such as those for the interhospital and intrahospital transport of critically ill patients, developed by the American College of Critical Care Medicine and the Society of Critical Care Medicine.⁽⁶⁾ The guidelines recommend careful planning, introduction of standardized procedures, and the use of qualified personnel.⁽⁶⁾ Checklists for the intrahospital transfer process may include pretransport assessment of the patient, use of appropriate transport equipment, and preparation of medications and fluids. During the intrahospital transfer, the checklist may include checking and recording the patient's vital signs, and documentation of medication or other treatments. After the intrahospital transfer, the checklist may include reassessment of patient condition, a reminder to document the intrahospital transfer in the patient's medical record, and rechecking monitoring and equipment used.⁽⁷⁾

In this case, the patient's deteriorating condition might have been detected earlier had (i) appropriately qualified and trained personnel accompanied the patient and (ii) equipment for surveillance (such as pulse oximeter) been used during the transfer. For critically ill patients, some suggest a minimum of two qualified staff members should accompany the patient.⁽⁷⁾ However, research on transfers of non-ICU patients is limited. We do know that most of these transports are performed by unlicensed personnel who lack the qualification, skills, and knowledge to safely monitor patients.⁽⁸⁾ Therefore, it is crucial to carefully assess the patient prior to the intrahospital transfer, preferably using standardized protocols (e.g., a triage protocol or other locally developed guidelines) to determine appropriate transfer personnel and surveillance. If the

patient's condition requires it, the intrahospital transfer should be performed by qualified and trained personnel.

The hospital's own root cause analysis identified that one factor contributing to the incident was that the transporter did not raise his concerns about the boy's breathing difficulties because he had been assured that the boy was stable and he didn't trust his own judgement. This fact highlights important issues about the hospital's safety climate, and specifically the ability of all personnel to speak up about safety concerns.⁽⁹⁾ Previous research has focused primarily on nurses and physicians, but failure to speak up is not limited to clinical professions. Rather, it occurs across professions and support staff within a setting.⁽¹⁰⁾ Barriers to speaking up might include the dominance of medicine in regards to decision-making, hierarchical structures, and lack of intrahospital transfer educational programs for nonmedical staff. Notably, most interventions that facilitate communication across hierarchies have not included health care support personnel such as transporters. Additionally, the extent to which nonmedical staff are considered members of health care teams is often unclear.⁽¹¹⁾ Improving safety climate among all health care providers might include interventions such as clarity of roles, communication, and education that supports decision making⁽¹¹⁾; however, evidence regarding its effect on health care support personnel is not available.

In this case, communication failures and breakdown in information transfer occurred along with discrepancies in how to interpret the physician's order of continuous monitoring. About 20 years ago, the Institute of Medicine highlighted communication failures as a contributing factor for errors and adverse events.⁽¹²⁾ Moreover, handover within and between units can result in critical gaps in the continuity of patient care. To improve communication and information transfer, communication strategies such as closed-loop communication and frameworks such as SBAR [Situation, Background, Assessment, Recommendation] can be used.⁽¹³⁾

In summary, intrahospital transfer is a potentially dangerous process for patients. Organizations should therefore identify and proactively manage transport-related safety hazards before they can cause patient harm. Clinicians should also be aware of potential errors, failures, and complications that might occur during the transfer. To enhance intrahospital transfer safety, we recommend: (i) assessment of the patient prior to the transport to determine the skill level required by the intrahospital transfer team; (ii) assessment of the patient after transport to determine any deterioration in condition; (iii) development and implementation of a locally adapted intrahospital transfer checklist; and (iv) use of standardized communication tools for information transfer. Furthermore, promoting a culture of safety—including the ability of staff to speak up about safety—is crucial for safe practice.

Take-Home Points

- Intrahospital transfers expose patients to an increased risk of complications.
- Clinical incidents that may or may not result in patient harm frequently occur during intrahospital transfer.
- Assessment of patient pre- and post-transfer might mitigate some patient risk.
- Safe transport requires trained personnel and appropriate level of monitoring.
- The use of transport checklists and communication tools for information transfer may enhance the quality and safety of intrahospital transfers.

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