

Moving Pains

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Case Objectives

- Appreciate the risk posed by intrahospital transport
- Identify key features of current transport practice and policies
- Propose interventions that might improve safety of intrahospital transport

Case & Commentary: Part 1

A 90-year-old woman, whose son was a prominent nonclinical member of the medical school faculty, was admitted to the acute care ward of the school's teaching hospital with a urinary tract infection and pneumonia. After developing hypoxemia, on hospital day 2, she was placed on 2 L/min oxygen by nasal cannula. On hospital day 3, her hypoxemia worsened, as did her mental status. A head CT was ordered. She was placed on a non-rebreather mask (NRM) at 15 L/min to maintain her oxygen saturations. This change in respiratory status occurred while the primary nurse was occupied by the critical needs of another patient, so another nurse and the respiratory therapist placed the patient on the NRM. The primary nurse completed the transport stability scale (TSS—a local instrument used to assess a patient's stability for transport and to determine the need for a nurse or physician to travel with the patient) at the nurses' station in preparing her patient for transport to the CT scanner. Because the nurse was unaware of the change in her patient's respiratory status, she recorded that the patient required only 2 L/min oxygen by nasal cannula. Accordingly, the TSS score did not signal a need for a nurse or physician to accompany the patient. Therefore, the patient was taken to the CT scanner by two transport personnel/escorts and her son, the physician-faculty member.

The increased risk of morbidity and mortality during intrahospital transport of critically ill patients is well described in the literature and has led to the publication of formal guidelines for such transports by the Society of Critical Care Medicine and the American College of Critical Care Medicine.⁽¹⁾ Despite the obvious risks (frequently due to sudden changes in clinical condition) of intrahospital transport for patients in acute medical wards, the issues surrounding patient safety for transport for non-ICU patients have not been well described. In fact, although we were able to find a few reports of "best practices" in abstract form

or shared via listserv communication, we could not find any standardized, endorsed guidelines for safe transport of this patient population, nor any peer-reviewed article on the subject.

Even in the absence of formal guidelines, most hospitals have recognized the risk of intrahospital transport and have developed their own policies to help manage the process. Unfortunately, our impression is that many of these policies lack some essential elements. First, many policies lack clear standards for patient assessment, including the elements of an assessment, its timing, and the responsible party. Second, many are silent on the levels of intervention required, nor do they outline contingency plans should a patient's status change during the course of transport. Many policies are vague as to who should transport the patient under a variety of circumstances. Finally, even hospitals with reasonably robust policies rarely have systems in place to ensure that the policies are actually followed "in the trenches."

In this case, the hospital did have a system for assessing and communicating the clinical stability of the patient, but the assessment recorded on the transport stability sticker did not reflect the patient's immediate pre-transport condition. Enforcing an acceptable timeframe for the pre-transport assessment is an essential element of a transport standard and policy. In part because of the timing of the assessment (before her deterioration), the patient was sent off the unit accompanied by two "transport personnel/escorts." In general, such transport personnel are unlicensed and have variable training and responsibilities. Currently, there is no requirement for basic training or certification for unlicensed staff who transport patients without a nurse or physician, despite the fact that such personnel may need to identify a patient's change in status or even serve as "first responders" from time to time.

Case & Commentary: Part 2

As the transporters prepared to leave the floor with the patient, one of them noticed that the patient had labored breathing. He suspected that a nurse should travel with them but did not question the nurse's assessment on the transport stability form. During transport, the patient continued breathing through her NRM, which was connected to an oxygen tank.

Once the patient arrived in radiology, the CT technician noticed that NRM bag was deflated and the oxygen tank had a regulator that limited oxygen delivery to 4 L/min. The technician connected the NRM to the wall oxygen source at 15 L/min for the study and located an appropriate tank (that would allow higher-flow oxygen) for the trip back to the unit. After the study, the patient was switched to this new tank at 15 L/min and awaited transport. The tank was noted to have 1000 lbs of pressure by the CT technician. The two transporters arrived, and the patient left radiology to return to her room.

In the elevator, one of the transporters realized that she no longer heard the flow of oxygen and that the NRM bag was deflated. When they returned to the floor, she immediately called for help. The patient was reconnected to the wall oxygen source in her room at 15 L/min. However, by that time, the patient was noted to be severely hypoxemic and markedly short of breath. Over the next hour, her condition continued to worsen. Because she did not wish to be intubated, she expired approximately 30 minutes after arrival to the floor. A root cause analysis later attributed the death, at least in part, to inadequate delivery of supplemental oxygen and insufficient observation during the transport process.

Although it is tempting to ascribe this tragic outcome to technical problems with oxygen delivery systems and process problems with transport, it would be a mistake to ignore some of the sociocultural and communication issues that were undoubtedly at play. Try to picture the scene at the patient's bedside before the patient was rolled out of her room to the scanner. The two transporters see the dyspneic patient and wonder whether a nurse should be present, but the transport scale says that it isn't necessary. It would take a very strong culture of safety to empower them to approach the nurse or a physician to question what appeared to be a clear-cut assessment (of course, there was no way they could know that the assessment had been done hours earlier and was now irrelevant to the current situation). Moreover, they were probably reassured by the presence of a physician, the patient's son; there was no way they could know that this physician worked in a nonclinical department.

The son, too, was placed in a terribly difficult position. We don't know if he shared the transporter's concerns about his mother's stability, but, as a nonclinician, he may have been unsure. Moreover, his role was to be a family member, not a health care provider—always a tricky balance, and one that has become trickier since the patient safety movement has begun encouraging patients to "speak up" when they see something wrong.^(2,3) Finally, as a faculty member at the institution, he may well have struggled with whether to assert himself as a "VIP," worried that he would be branded as being overly demanding. In analyzing this case, it is easy to shuffle all these issues to the bottom of the deck (after all, creating a new transport protocol is far easier than trying to dampen authority gradients or think through the appropriate role of patients' family members in ensuring safety), but it would be a mistake to omit them from consideration and possible intervention.

Returning to more concrete matters, let's consider the issue of delivering supplemental oxygen. One study of intrahospital transport of non-ICU patients found that oxygen therapy was frequently interrupted.⁽⁴⁾ In this study, the authors reported high levels of variability among hospitals in the responsibilities of respiratory care practitioners and nurses for oxygen therapy on acute care units. As we consider the issues surrounding the delivery of oxygen to the patient in this case, a number of questions arise: Who is adequately trained to assess oxygen delivery devices for transport? What is the required assessment of the oxygen system? When is it done? What are the contingency plans if the patient's condition changes en route? The critical care guidelines recommend that the oxygen source have an adequate supply to provide for the patient's needs (flow rate over time of transport to and from destination) plus a 30-minute reserve.⁽¹⁾ Respiratory therapists are best prepared to provide education and be involved in improving care related to oxygen therapy and should be brought into any discussions regarding how to make intrahospital transport safer.

Recommendations for Improving the Safety of Intrahospital Transport

To address this important—and we believe underreported and understudied—patient safety issue, hospitals should first assess their current practice and policies. This assessment should include a review of the following elements: which patients are being transported and to which locations, pre-transport assessments, transport personnel competency and responsibilities, handoff communication, necessary equipment and supplies, and transport monitoring ([Table](#)).

Examples of Best Practices

Hospitals will have variable answers to the questions posed in their review of practice and resources, and the literature does not include scientific assessments of various strategies and practices. Nonetheless, our review of the literature, monitoring of listserv communiqués, and discussion with various providers has pointed us to certain practices worthy of consideration.

First, the use of a TSS or another tool that standardizes the pre-transport assessment is an essential component of safe intrahospital transport.⁽⁵⁾ However, this case clearly demonstrates that the tool itself will not ensure safety. Developing a structure for how, when, and by whom it is used and ensuring competency for its use is as important as the instrument itself. One hospital uses a "Ticket to Ride" system, in which the ticket serves as the communication form between sending and receiving personnel. The ticket includes patient identification, stability, and risk information. The transport personnel are responsible for ensuring the nurse completes the ticket and that the ticket is with the patient until return to the home unit. Another best practice is a checklist system used by the sending nurse. The checklist outlines the essential steps of patient identification, pre-transport assessment (including need for analgesia or sedatives), notification to providers and accompanying personnel when necessary, and checking supplies and equipment necessary for transport.

There are many implications for further study of patient safety during intrahospital transport of acutely ill patients. Identification of risk factors for negative outcomes associated with intrahospital transport of acutely ill patients would help inform the development of a useful pre-transport assessment tool. Hospitals often retrospectively identify these risk factors after sentinel events occur (eg, patients with escalating oxygen therapy requirements, as in this case). Other risk factors, such as altered mental status, morbid obesity, and use of sedative agents and/or sleep apnea, may not be familiar to care providers. Intervention studies are needed to evaluate system improvements, such as transport teams or innovative communication systems.

Partly because the issue of transport tends to "fall between the cracks" of divisions, departments, and providers, it has been the subject of too little research, too few innovative quality improvement practices, and possibly too little regulation. The time has come to rectify this, lest more patients fall victims to the risk of moving around the hospital.

Take-Home Points

- Intrahospital transport is probably quite risky but has been understudied.
- In considering how to improve the safety of transport, the focus should be on standardized assessments, use of checklists, ensuring that the appropriate providers and technology accompany the patient, creating contingency plans for changes in patient condition, and enforcing the standards.
- The issue of respiratory assessment and oxygen delivery is frequently poorly handled, and would benefit from the engagement of respiratory therapists in the planning process.
- Some attention should also be paid to cultural issues that may get in the way of individuals raising appropriate concerns regarding the transfer process.

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Table

Table. Questions in Assessing Transport Policies and Procedures

Which patients are being transported?

- Focus initial efforts on the most frequent source units and patient types (ages, clinical diagnoses).

To which locations are most patients transported?

- Are these destinations in the main hospital, adjacent buildings, across the street?
- Are there special safety hazards in any of the units (eg, MRI magnets)?

Pre-transport patient assessments

- What criteria are used to determine patient stability, patient risk, and level of monitoring during transport?
- Who is responsible for this assessment?
- What is the recommended timing for this assessment?
- Do the assessment criteria include risk factor assessment based on the type of procedure/diagnostic, patient positioning during transport, and duration of transport time?
- Does the assessment take into account the possibility of decline in clinical condition and the need for escalating support (eg, increase in oxygen flow rate and change to NRM with same oxygen saturations)?
- How is this assessment communicated to the care team, the transport personnel, and the destination personnel?
- Finally, how is compliance monitored?

Transport personnel

- Who transports patients (unlicensed and licensed personnel)?
- What are their specific responsibilities before and during transport?
- What level of training and competency assessment is done related to patient safety during transport?
- Are they required to have Basic Life Support (CPR) certification (in the case of an arrest, could they initiate the ABCs of CPR)?
- What is the content of their training (does it cover how to get help during transport or how to receive and provide handoff communications)?

Handoff communication

- How are the patient's condition, potential safety risks, and needs communicated?
- Is a checklist used? Is patient identification included?
- What is the responsibility of the sending and receiving providers and/or transporters?

Necessary supplies and equipment for transport

- What equipment is required to accompany the acute care patient during transport (eg, mask with Ambu bag, ECG monitor)?
- Who ensures that therapies (eg, oxygen, infusions, etc.) are maintained during transport?
- Would the transport personnel know how to use or troubleshoot any accompanying equipment/supplies, if needed?

Transport monitoring

- What basic level of monitoring is expected during transport (eg, change in level of consciousness, color, respiratory effort, IV pump alarm, etc.)? And are the transporters qualified or adequately trained for this?
- What is the expected level of intervention (eg, replace an oxygen mask if it falls off, silence an IV pump)?

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