

## ASSESSING ICU TRANSFERS AT NIGHT: A CALL TO REDUCE MORTALITY AND READMISSION RISK

By Peter E. Morris, MD



Using an acuity tool to assess risk of death in patients admitted to an intensive care unit (ICU) has become a standard parameter for research and quality improvement studies. Tools such as the Acute Physiology and Chronic Health Evaluation (APACHE), Simplified Acute Physiology Score (SAPS), and Sequential Organ Failure Assessment (SOFA) are used to compare groups within studies and to compare specific ICU and hospital performance. Other tools have been designed to help assess intensity of ICU nursing requirements, such as the Therapeutic Intervention Scoring System (TISS) and the Nursing Activities Score (NAS).<sup>1</sup>

But what about tools that might help us to reduce mortality and readmission rates for patients discharged from the ICU? It is commonly understood that at the time of ICU admission, patients vary widely in their risk of death. They then progress through their ICU stay and at some point satisfy a minimum number of discharge criteria. Even at this point, however, an

important issue must be considered: risk across patients *discharged* from the ICU is unequal. In other words, at the time of ICU discharge, patients' probability of floor death or ICU readmission continues to vary. Although some patients may appear ready for discharge because they no longer need to be on a ventilator, are no longer in shock, or are not in a coma, the fact of these risk inequalities remains.

Recently, Zimmerman<sup>2</sup> proposed that ICU readmission rates were increasing in the United States. Combined data from several reports revealed that readmissions increased from 4.6% during the years 1988 to 1990 to 5.6% during the period 1993 to 1996. According to Zimmerman,<sup>2</sup> this trend continued from 2002 to 2003, during which period the rate climbed to 6.5%.

### Nighttime ICU Discharges and Undesirable Outcomes

For many years, readmission has been seen as an ICU and hospital quality benchmark. Several researchers<sup>2,3</sup> have proposed that readmission is a source of avoidable mortality. Over the last several years, others<sup>4-10</sup> have reported on the difference in outcome between those with a nighttime ICU discharge

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and those transferred during the day. (Roughly 10% of ICU discharges occur at night, according to these sources.) Of course, what constitutes “nighttime” varies across reports; some define it as discharge after 7 PM, some later—it simply depends on the facility. But even though the studies, which derive mostly from European and Canadian hospitals, have differed somewhat in their findings, undesirable outcomes of nighttime discharge tend to include higher ICU readmission rates, longer hospital length of stay, and increased mortality. These data are retrospective in nature and offer detailed descriptions, but they beg a fundamental question: What is an acceptable ICU readmission rate?<sup>2</sup> The answer remains elusive.

Nighttime ICU discharges occur for several reasons. One is that transfer requests are often delayed until evening due to limited floor bed availability, limited nurse availability, or other system limitations.<sup>11</sup> Another is that ICU beds remain highly occupied in some centers. In such situations, a bed request typically occurs for a patient who is more seriously ill than the bed’s current occupant. The nighttime discharge thus takes place because the staff triages the less ill patient to the floor in order to receive a more acutely ill patient from another area of the hospital. But what if the less acutely ill patient had remained in the ICU? Would he or she have benefited?<sup>11</sup>

Here’s another question. Why is a nighttime ICU discharge patient more likely to experience readmission? Perhaps it’s because patients released from ICUs at night are subject to transfer during a period when overall hospital staffing density is lower than it is during “routine” hours (ie, Monday through Friday, 8 AM to 5 PM). Nighttime staffing differences may not be apparent when examining only the density of a unit’s nurse to patient ratio, but differences may surface in night staffing for personnel such as patient transporters, unit managers, clinical nurse specialists, in-hospital physicians, dietitians, and pharmacists. It may be that within these initial hours of transfer at night, key pieces of information or therapies are overlooked that would have been noticed with the

increased density of medical personnel during the day. Although release from the ICU does signify that the patient has made some clinical progress since admission, receipt of patients to a new nursing unit inevitably poses multiple difficulties for the patients, their families, and staff members.

### Predicting Risk of Readmission

Several acute and chronic characteristics may affect the mortality risk for post-ICU patients.<sup>8</sup> Whether the reason for admission has resolved or remains at risk for recurrence is one factor to consider. How severely the critical episode affected the patient upon admission (eg, the number of organ dysfunctions, the presence of DNR [do not resuscitate] orders) may also play a role.<sup>8</sup> Other risk factors are poor pulmonary toilet capabilities, gastrointestinal hemorrhage, ongoing altered mental status, initial ICU admission from an outside facility or from a floor bed, and long original length of stay in the ICU.<sup>2</sup>

Can we identify, with any degree of accuracy, those ICU transfers that are at the highest risk for floor death or readmission? The answer to this question may very well be yes. Two recent reports have attempted to design and test a scoring tool to assess patients upon discharge from the ICU.<sup>12,13</sup> These investigators hoped to develop appropriate discharge criteria that could help hospitals avoid premature transfers and potentially reduce adverse outcomes associated with nighttime discharges.<sup>13</sup> The components of these tools are easily identified, and combining them into a protocol could lead to improved patient outcomes.

### Should ICU Discharge Tools Be Part of Future Practice?

The decision to discharge a patient from the ICU rests with the bedside nurse, the physician, and the respiratory therapist, with timely information given to the patient, the patient’s family, and the floor nursing unit personnel. Ultimately, though, a key aspect of efficient ICU operation is the anticipation of times of peak ICU bed demand. Hospitals’ analyses of these peak times may optimize safety by incorporating assessments of appropriate density of floor nursing staff, floor in-hospital physicians, and ancillary positions.<sup>11</sup>

In the hospital there are always administrative challenges to providing timely access to ICU beds.

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All groups of caretakers—staff from operating rooms, cardiac cath labs, emergency departments, and elsewhere—are competing for limited ICU space. Intra-facility interactions could be encouraged to determine whether there is equal high- and low-end acuity across different subspecialty ICUs. Are some subspecialties allowed to admit “softer” ICU patients, for example? Such interactions may lead to placing some groups of ICU patients into different risk categories upon discharge. A practice tool that can be used across subspecialties would certainly help to minimize variation in ICU bed utilization.

An ICU discharge plan that takes into account objective, easy-to-locate parameters in a quickly calculated score may be more likely to predict subsequent harm than would experience and intuition alone.<sup>4</sup> Optimally, these parameters should reflect items already taught as early-warning triggers for critical outreach and medical emergency teams.<sup>14,15</sup> In the future, such parameters may be used to develop a risk model that demonstrates good clinical judgment, optimizes a patient’s ICU stay, and maximizes the overall utilization of ICU beds.

The statements and opinions contained in this editorial are solely those of the coeditor.

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**FINANCIAL DISCLOSURES**  
None reported.

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