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Impact of bed availability on requesting and offering in-hospital intensive care unit transfers: A survey study of generalists and intensivists

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Abstract

Purpose: To evaluate whether bed availability affects a physician's decision to request or offer an intensive care unit (ICU) transfer.

Materials and Methods: We administered mail-based surveys to determine the respondents' probability of either requesting an ICU transfer (generalist respondents) or offering an ICU transfer (intensivist respondents). Respondents randomly received clinical vignettes that were identical except for the number of available ICU beds (one or seven available ICU beds). Respondents also made predictions about the patient's outcomes.

Results: Among generalists and intensivists, there were wide ranges in decisions about ICU transfer. In the Generalist ICU request study, the average probability of transfer with one versus seven available ICU beds was 52.2% and 58.5% ($P = .41$), respectively. In the Intensivist ICU offer study, the average probability of transfer with one versus seven available ICU beds was 62.5% and 57.4% ($P = .24$), respectively. The most consistent association with decisions about ICU transfer was the predicted probability that a patient would require an ICU bed in the future if not transferred currently.

Conclusions: There is high variability in the decision to request or offer ICU beds. There was not a significant association between bed availability and ICU transfer decisions.

1. Introduction

One in 5 patients will die in an intensive care unit (ICU) and the care of ICU patients accounts for 0.7% of the gross domestic product in the United States

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[1,2]. With an aging population and greater burden of chronic illness, the utilization and need for ICU beds is already high and expected to rise [3]. Utilizing an ICU bed consumes a finite resource within an institution. There are currently no universally-accepted criteria for ICU transfer.

Because of existing limits in ICU bed availability, an ICU admission may limit access for future patients, requiring rationing of this limited resource. In 2005, the Society of Critical Care Medicine defined rationing as "the allocation of healthcare resources in the face of limited availability, which necessarily means that beneficial interventions are withheld from some individuals" [4]. Since ICUs deliver costly therapies to a relatively small number of patients, the ICU has become an area of focus in the rationing debate [3]. During Hurricane Katrina in 2005, rationing briefly took center stage in the United States [5]. In one isolated New Orleans hospital, patients with Do Not Resuscitate orders were given the lowest evacuation priority, which caused their family members to object and led to a mixed reaction among the general public.

While clinicians are often faced with decisions about prioritizing transfers and admissions to limited ICU beds, it is unstudied whether physicians incorporate bed availability into their decisions to move a patient to an ICU. For patients who deteriorate within the hospital, the initial decision to request an ICU bed is often made by generalists, such as hospitalists and family practitioners [6]. This initial *request* for an ICU bed is often required to trigger the process of transfer to an ICU. In some instances, this request is relayed to an intensivist who then *offers* the transfer or suggests continued care outside of the ICU. We used clinical vignettes in a mail-based survey to study factors associated with generalist requests for ICU beds and intensivist offers of ICU beds. Our primary hypothesis was that these requests and offers would be affected by bed availability. Because we were more interested in physician decision-making when resources were scarce but available, we presented scenarios where a single ICU bed was available and compared this to a scenario in which seven ICU beds were available. We also asked respondents to predict outcomes for the hypothetical patient and analyzed the association between these predictions and the likelihood of requesting or offering an ICU bed.

2. Methods

2.1. Human subjects' protection

Both surveys were approved by The Ohio State University Institutional Review Board with waivers of informed consent.

2.2. Study sample and administration

We conducted 2 separate mail-based surveys. The first study included a random sample of internal medicine and family medicine residents and hospitalist attending physicians at The Ohio State University Medical Center, an academic medical center, and Grant Hospital, a community-based teaching hospital, in Columbus, OH. In the United States, most residency programs in internal medicine and in family medicine are both three years. Hospitalists are usually providers of medical care for hospitalized patients who completed an internal medicine residency. All respondents provide in-patient care to adult patients. For ease of reference, we will hereafter refer to this as the "Generalist ICU Request" study. On September 15, 2008, we mailed self-administered surveys including a letter explaining the study purpose and a stamped return envelope. No incentive was included. Non-respondents received a duplicate survey four weeks after the initial mailing.

The second study was conducted in an identical fashion. However, the study population included a random sample of intensivists at 17 US academic medical centers. We subsequently refer to this as the "Intensivist ICU Offer" study. We initially mailed surveys for the Intensivist ICU Offer study on 4/10/2010. Participating centers included the divisions of pulmonary and critical care medicine at the Cleveland Clinic Foundation, Cleveland Metrohealth, Denver Health & Hospital Authority, Emory University, Northwestern University, Ohio State University, Penn State University, Rose National Jewish Hospital, Southern Illinois University, University of Cincinnati, University of Colorado, University Hospitals of Cleveland, University of Massachusetts, University of Michigan, University of Pennsylvania, Wayne State University and Yale University.

2.3. Questionnaire

We developed study vignettes through focus groups and a pilot administration to intensivists at The Ohio State University Medical Center. Vignettes involved a 72-year old female patient with chronic renal insufficiency and hypertension who presented to the Emergency Department with signs and symptoms of community-acquired pneumonia (see Supplementary Material for survey instrument). Despite in-patient care including appropriate antibiotics, the patient became hypotensive the morning after admission, received fluids and was moved to a step-down unit. The vignette was intentionally designed to have borderline criteria for ICU admission based on published guidelines for severe sepsis and severe community-acquired pneumonia as outlined by the Infectious Diseases Society of America (IDSA) and the American Thoracic Society (ATS) [7]. Adherence to these guidelines was not the primary focus of our study.

Subjects were randomly assigned to receive one of two vignettes. These vignettes were identical except that the