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## CLINICAL COMMENTARY

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# The Emergency Room and the Hospitalist

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Hospitalization and Emergency Department (ED) visits are intimately related, common, and costly. There are alternatives to each, some of which may actually be safer, making understanding their inter-relatedness important. Between 17.4 and 21.8% of US noninstitutionalized adults reported having an ED visit in 2015. 5.2% of individuals under age 65 and 15.2% of those 65 years or older were hospitalized.<sup>1</sup> Nationally, the cost of hospitalization remains substantial. In 2012, aggregate inpatient hospital costs by all payers added up to \$377.5 billion, with more than half (55%) of Medicare-covered stays being for medical rather than surgical reasons.<sup>2</sup> This data demonstrates the human and economic burden of inpatient hospitalization on the health care system.

Hospitalization is an important intervention but not without risks or costs to the patient. Hospitalized patients are at risk for both iatrogenic and nosocomial complications. One university hospital reported 20% of patients had hospital related complications. These included adverse reactions to procedures, drugs, and transfusions, acquired infections and falls.<sup>3</sup> The potential harms of hospitalization are particularly pronounced for elderly patients, especially in the setting of prolonged immobilization, including accelerated bone and muscle loss, and sensory deprivation.<sup>4</sup> Elderly patients are also at increased risk of losing the ability to carry out activities of daily living (ADLs). In one prospective observational study, 17% of patients age 70 or over had declines in ADL function during hospitalization and the majority of patients with pre-admission ADL decline did not recover baseline function by time of discharge.<sup>5</sup>

The potential benefits of avoiding a hospital admission must be placed in context with known risks of negative outcomes related to ED discharge. Medicare data from 2007-2012 found that 0.12% of patients died within 7 days of discharge from an ED; over 10,000 deaths per year. These only included patients without life-limiting disease on the ED claims. Hospitals with the lowest inpatient admission rates tended to have the highest early death rates among ED discharges.<sup>6</sup> Thus, identifying patients more likely to have poor outcomes following ED discharge remains important. Known risk factors for early death after ED discharge include age, male sex, number of preexisting medical comorbidities, and diagnosis of noninfectious lung disease, renal disease, and ischemic cardiac disease.<sup>7</sup> Given the above, the health care system and patients may benefit from alternatives to admission when appropriate and safe. Analyses

need to stratify risks of poor outcomes, re-presentation to the ED, and subsequent admission. Little is known about how hospitalists and ED staff can work together to accomplish this. A prospective cohort study showed that the introduction of an acute medicine consultant who provided telephone triage assistance to the ED was associated with a 21% reduction in hospital admissions.<sup>8</sup> While these findings suggest input from a hospitalist to ED triage can decrease the number of admissions, the effect on patient safety and future resource utilization are not known.

Several studies have examined factors predicting whether patients presenting to the ED need admission. Models to determine which patients need admission have included age, patient acuity, primary medical complaint, and mode of arrival as most predictive of the need for immediate hospital admission.<sup>9,10</sup> Additionally, in a case-control study of ED patients age 65 or older, those with cognitive impairment, systolic blood pressure less than 120 mmHg, pulse rate greater than 90 bpm, and change in disposition from "admit" to "discharge" were at increased risk of 7-day death or ICU admission.<sup>11</sup> A study of preventable hospitalizations reported effectiveness of patient education, exercise and rehabilitation, and telemedicine in reducing admissions, while case management, medication review, specialist clinics, and hospital-at-home programs were not shown to reduce admission rates.<sup>12</sup> However, another study found about a third of referrals for hospital admission that were deemed preventable were avoided by utilizing next-day specialty clinic appointments.<sup>13</sup>

The Patient Protection and Affordable Care Act of 2010 established the Hospital Readmission Reduction Program which penalizes hospitals for excess 30-day readmission after inpatient discharge. There is growing literature identifying readmission risk factors. Although ED visits resulting in initial admission differ from readmissions, it would be reasonable to expect a level of concordance between the risk factors for admission and those for subsequent readmission. Risk factors for readmission include specific medications, polypharmacy, specific medical conditions, black race, recent hospitalization, low health literacy, and leaving against medical advice.<sup>14-17</sup> In a systematic review of 34 studies, the proportion of readmissions subjectively deemed avoidable ranged from 5 to 79% with a median of 27%.<sup>18</sup>

Screening tools have been developed to identify patients at risk for readmissions. The LACE index identifies patients at risk of readmission and incorporates length of stay, admission acuity, the Charlson Comorbidity Index which measures comorbidity burden, and number of ED visits in the past 6 months. The LACE index was developed from 4812 discharges from Ontario hospitals and was externally validated.<sup>19</sup> The HOSPITAL score is more extensive and identifies patients at risk of avoidable readmission based on: hemoglobin, discharge from an Oncology service, serum sodium at discharge, having had a procedure, whether initial admission was elective, number of hospitalizations in the past year, and length of hospitalization.<sup>20</sup> The HOSPITAL score has been externally validated in 117,065 patients in an international multicenter study.<sup>21</sup>

One well-studied intervention to prevent hospital readmissions is early outpatient follow-up appointment. Higher rates of early follow-up in patients with acute heart failure exacerbations has been associated with a lower risk of 30-day readmission.<sup>22</sup> Similarly, patients discharged after chronic obstructive pulmonary disease exacerbations with primary care or pulmonologist follow up within 30 days had reduced risk of repeat ED visit and readmission.<sup>23</sup> However, two other major studies were unable to demonstrate an association between post-discharge outpatient follow up and either repeat ED visits or readmissions. A 12 month retrospective observational study of all 4989 general medicine discharges to home from a large academic hospital showed no difference in ED visit, readmission, or 30-day mortality rates between patients discharged with a documented follow-up appointment and those without an appointment.<sup>24</sup> Additionally, an observational study of 3661 patients age 65 and older using data from a randomized controlled trial did not show an association between 7-day post-discharge follow-up and 30-day readmissions.<sup>25</sup>

These studies document the human and economic burden of transitions of care between community, emergency room, and inpatient settings. Although hospitalists are developing an understanding of which patients are more likely to be readmitted, there is little consensus on which patients can be safely sent home from the ED. Hospitalists who work closely with the ED may be well-positioned to bridge the gap between ED and inpatient settings. By identifying which patients can be discharged from the ED, hospitalists help decrease both the economic and health costs for those who do not truly require hospitalization. However, as the emergency medicine literature demonstrates, sending patients home from the ED is not without risks. More research on ED triage with hospitalist review could improve patient care while potentially bringing down costs.

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