

## Need to optimise disposition in ED patients presenting with infection



Emergency department (ED) patients with suspected infection admitted to the intensive care unit (ICU) are associated with lower in-hospital mortality and costs than those initially admitted to the floor or discharged home, according to a new study published in the journal *Critical Care*.

"Our findings demonstrate worse outcomes and higher costs in ED patients with unpredicted short-term deterioration (i.e., those initially admitted to the ward or sent home who ultimately ended up in the ICU within 72 hours), and they highlight the importance of optimisation of disposition in ED patients presenting with infection and at risk of future deterioration," writes Shannon M. Fernando, MD, MSc, Division of Critical Care, Department of Medicine, University of Ottawa (Canada) with co-authors.

Sepsis is a major cause of morbidity and mortality, with approximately 19 million cases per year worldwide and resulting in 5.3 million deaths. ED physicians have traditionally used the systemic inflammatory response syndrome (SIRS) criteria for screening patients with suspected infection, with presence of two or more of the criteria being indicative of sepsis. Rapid initiation of treatment in these patients has improved outcomes, whereas delays in treatment are associated with increased mortality.

Aside from sepsis recognition and treatment initiation, in order to appropriately risk-stratify and optimise disposition, ED clinicians must also be able to predict short-term deterioration in patients presenting with infection. This includes determining whether the patient requires treatment and monitoring in the ICU, is appropriate for management on the hospital wards, or is well enough for discharge home.

The present study sought to examine the outcomes and associated costs of patients directly admitted from the ED to the ICU with a diagnosis of suspected infection (including those with and without sepsis) and to compare them with patients initially admitted to the hospital wards or initially sent home but requiring ICU admission within 72 hours. Researchers used a prospectively collected registry from two hospitals within a single tertiary care hospital network between 2011 and 2014. Patient information, outcomes, and costs were stored in the hospital data warehouse.

A total of 657 patients were included; of these, 338 (51.4%) were admitted directly from the ED to the ICU, 246 (37.4%) were initially admitted to the wards and then to the ICU, and 73 (11.1%) were initially sent home and then admitted to the ICU. In-hospital mortality was lowest among patients admitted directly to the ICU (29.5%), as compared with patients admitted to the ICU from wards (42.7%) or home (61.6%) ( $P < 0.001$ ). As compared with direct ICU admission, disposition to the ward was associated with an adjusted OR of 1.75 (95% CI, 1.22–2.50;  $P < 0.01$ ) for mortality, and disposition home was associated with an adjusted OR of 4.02 (95% CI, 2.32–6.98).

As regards costs, mean total costs were lowest among patients directly admitted to the ICU (\$26,748), as compared with those admitted from the wards (\$107,315) and those initially sent home (\$71,492) ( $P < 0.001$ ). Cost per survivor was lower among patients directly admitted to the ICU (\$37,986) than either those initially admitted to the wards (\$187,230) or those sent home (\$186,390) ( $P < 0.001$ ).

"Limitations in resources preclude the ability to admit all patients at risk of future deterioration to the ICU, but our work strongly suggests that the creation of new clinical decision instruments for risk stratification of ED patients with infection may be helpful in optimising disposition," the authors note. "Furthermore, use of electronic screening tools on hospital wards may be useful in identifying patients with early clinical evidence of deterioration, who may otherwise be missed."

According to the authors, there are several limitations affecting the generalisability of the study's results. These include the use of International Classification of Diseases, Canada (ICD-CA) codes for case identification, which can create misclassification bias, and data from two hospitals that exist within the same city and health network. "Given the known regional variation in ICU admission practices, our findings may not be generalisable to all practice settings," the authors add.

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