Study: Minimally injured people sent to trauma centers cost hundreds of millions per year

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During a three-year period in seven metropolitan areas in the western United States, the emergency medical services system sent more than 85,000 injured patients to major trauma hospitals who didn't need to go there—costing the health care system more than $130 million per year, according to an Oregon Health & Science University study published today in the journal *Health Affairs*.

The study gathered data from emergency services calls from 94 EMS agencies in the seven metropolitan areas from January 2006 through December 2008. The agencies were using national trauma triage guidelines to decide where to transport the injured patients, so the study's findings are likely representative of what happens across the United States.

"What our study shows is there are huge cost implications in how EMS systems work to get injured patients to the appropriate hospitals," said Craig Newgard, M.D., an associate professor of emergency medicine at OHSU who is director of the OHSU Center for Policy and Research in Emergency Medicine and the study's lead author. "And it shows how very early decisions in the process of health care—even prior to a patient arriving at the hospital—can lead to much higher costs downstream for our health care system."

The OHSU study gathered data from EMS agencies in the metropolitan

areas of Portland/Vancouver, Sacramento, Calif., Santa Clara, Calif., and Salt Lake City, Utah. It also gathered data from King County (Seattle) in Washington state, San Francisco, Calif., and Denver County of Colorado.

The data showed that more than 301,000 injured people were transported to hospitals in the seven regions during the study period. About 248,000 of them were "low-risk" patients who, if the EMS national triage guidelines had been followed, should not have been taken to major trauma hospitals. More than a third of those patients—more than 85,000—were taken to a major trauma hospital.

The results were higher costs to the health care system because the cost of care at trauma hospitals is significantly higher than at non-trauma hospitals. Care at major trauma centers costs more due to several factors, including the around the clock availability of trauma surgeons and other experts who provide care to the most complex patients and the necessary technology and resources required to care for these patients.

The OHSU study found that the average cost of care for a trauma patient at a Level 1 trauma hospital—the most advanced level—was $5,590 higher than at a non-trauma hospital. Even when restricted to patients with minor injuries, the average per-patient cost at Level I trauma centers was $4,833 higher than non-trauma hospitals.

"Care in major trauma centers is expensive and that is very justifiable for patients who need that level of care," Newgard said. "But among patients who are minimally injured, that translates into large excess costs."

Because the severity of injury is often not apparent at the scene, the national EMS guidelines include more than two dozen "triage criteria" for deciding whether a patient should be taken to a major trauma center

following an injury event. Among the criteria are low blood pressure, confusion, penetrating injury to the torso and high-risk auto crashes. Generally, if any of the criteria is met, the guidelines say the patient should be taken to a trauma center.

Newgard said the study did not explore the reasons that patients who didn't meet the criteria were taken to major trauma centers anyway. But a follow-up study that he's leading suggests major reasons include patient request and hospital proximity.

A co-author on the paper was John McConnell, Ph.D., director of OHSU's Center for Health Systems Effectiveness, which explores a wide range of health economics issues.

"A lot of current efforts aimed at slowing healthcare spending are focused on patients with chronic illness, but we need to think more carefully about out-of-hospital and trauma services," said McConnell. "This study shows that there are substantial cost savings that may be obtained if we can improve our ability to guide patients to an appropriate level of care."

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