

Are trauma centers prepared for mass-casualty disasters?

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Natural and manmade disasters, including the terrorist attacks of Sept. 11, 2001 and Hurricane Katrina, have raised concerns about the capacity of trauma centers to absorb large numbers of patients from mass-casualty events. With many trauma centers having a patient census of 95 percent, can Americans be assured of access to an appropriate level of trauma care the next time a disaster strikes?

To answer this question, investigators at the Harborview Injury Prevention & Research Center surveyed 460 Level I and Level II trauma centers on July 4, 2005 to determine these hospitals' potential capacity to care for large numbers of additional trauma patients on a holiday that is traditionally the busiest day of the year for trauma centers. "Do Trauma Centers Have the Capacity to Respond to Disasters?" is published in October 2006 issue of the Journal of Trauma.

Surveys were returned by 133 centers, with a response rate of 31.2 percent for Level I centers and 27.6 percent for Level II centers. Level I and II trauma centers were defined as those that are designated as such by a state or local regulatory body, or those verified by the American College of Surgeons Committee on Trauma.

The survey revealed that there was a median of 77 beds available in the 59 Level I trauma centers and 84 in the 74 Level II centers that responded to the survey. Fifteen percent of the Level I and 12.2 percent of the Level II centers had an inpatient census of 95 percent capacity or greater. The average American has access to 10 Level I or II centers by

helicopter or ground transport within 60 minutes. Assuming the same distribution as for an average American, these data suggest there would be four Level I and six Level II centers available to treat trauma patients in a metropolitan area within the so-called "golden hour" for optimal care after serious injury.

"Our study indicates that the theoretical capacity of trauma centers to provide operative care and inpatient beds for an average American would not be exceeded by the number of serious non-fatally injured patients resulting from the types of terrorist attacks experienced in the United States and Europe in the last five years," says Dr. Frederick Rivara, a University of Washington (UW) professor of pediatrics and epidemiology, and the study's principal investigator. "The two largest U.S. attacks -- the Oklahoma City bombing and the 9/11 attack in New York City -- produced large numbers of fatalities but relatively few seriously injured patients because of building collapse, which tends to have the highest immediate mortality rate of any kind of terrorist bombing."

The investigators caution that future disasters could severely tax the system of trauma care in a specific city. In some areas, such as cities in the Northeast, there may actually be more than 10 centers available within 60 minutes. For other areas of the country, such as the Pacific Northwest, there are likely to be far fewer centers accessible within 60 minutes. If a mass-casualty event resulted in a large number of burns, the capability to manage a these burn victims would quickly be overwhelmed, especially at Level II centers.

The study identifies other factors that could compromise a trauma system during a disaster:

-- Bottlenecks in the evaluation and management of the critically injured trauma patients: While many hospitals reported that their disaster plans

include the availability of additional ventilators, the extent to which their availability would be increased was not readily available.

-- Level I and II trauma centers operating at near capacity during the summer: Many centers would have limited capacity to absorb additional trauma patients during the "trauma season." A coordinated response may involve transferring many of the medical and recovering surgical patients to other facilities to allow open capacity in the centers best able to care for trauma. This requires a functioning communication system. As the events after Hurricane Katrina demonstrated, the current system with its heavy reliance on federal support is inadequate.

-- Use of trauma centers as regional safety nets for the un- and underinsured: Increasing the number of uninsured at trauma centers will result in the closure of some centers, discourage other centers from seeking trauma certification, and reduce the surge capacity of current centers. If the trauma systems that have evolved in this country become fragmented because of fiscal pressures, then the ability to cope with mass casualty events will be dramatically curtailed.

In addition to Rivara, the study was conducted by Dr. Avery Nathens, a UW associate professor of surgery, Dr. Gregory Jurkovich, a UW professor of surgery, and Dr. Ronald Maier, a UW professor of surgery.

Source: University of Washington

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