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# Selected Topics: Disaster Medicine

## MASS CASUALTY DISASTERS: WHO SHOULD RUN THE SHOW?

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☐ **Abstract—Background: A clear command structure ensures quality patient care despite overwhelmed resources during a mass casualty incident (MCI). The American College of Surgeons has stated that surgeons should strive to occupy these leadership roles. Objective: We sought to identify whether surgeons, as compared to emergency physicians, are sufficiently prepared to assume command in the event of a mass disaster. Methods: We surveyed hospital-affiliated surgeons and emergency physicians to assess their knowledge of MCI response principles and to gauge opinions regarding who should be in charge during a disaster. Results: One hundred and forty-nine (58%) surveys were completed, 78 by surgeons and 71 by emergency physicians. Both groups demonstrated a critical lack of knowledge regarding fundamental principles and key logistical components of preparedness and MCI response. Surgeons as a group were even less prepared than emergency physicians. Of those surgeons who had reviewed their hospital's disaster plan, half (50%) still did not know where to report for an MCI activation. Nonetheless, both groups believed they had sufficient training and both asserted they ought to occupy command positions during a disaster scenario. Conclusions: Errors in disaster triage have been known to increase mortality as well as the monetary cost of disaster response. Funding exists to improve hospital preparedness, but surgeons are lagging behind emergency physicians in taking advantage of these opportunities. Overall, it is imperative that physicians improve their understanding of the MCI response protocols they will be tasked to implement should disaster strike.** © 2015 Elsevier Inc.

☐ **Keywords—mass casualty incident; disaster; disaster management; incident command; triage**

## INTRODUCTION

Hurricane Katrina, Hurricane Sandy, the earthquake in Haiti, tsunamis in Sri Lanka and Japan, and the outbreak of civil war in Syria are all recent examples of disasters requiring a coordinated response. These events were all well publicized and received international attention, but they are not common. Less publicized disasters occur every day: bus accidents, a bleacher collapse, or even a multi-car collision. These situations produce casualties that can overwhelm hospital resources and disrupt normal hospital function. In order to effectively respond to mega-disasters abroad, physicians must first be prepared to handle multi-casualty incidents within their own hospital.

When mass casualty incidents (MCIs) occur, a transformation takes place in which doing the greatest good for the greatest number of individuals takes precedence over doing the greatest good for a single individual. This shift in ideology requires a change in triage principles, alterations in patient care, and revised prioritization of available resources. Successful disaster response requires well-defined leadership roles. Those in charge require clinical expertise to treat the injured, an understanding of hospital triage principles, and experience in caring for patients when resources are scarce.

The American College of Surgeons (ACS) has stated that surgeons should lead disaster planning and management efforts especially when involving physical trauma (1). The skills required to successfully manage trauma-related disaster responses are an extension of the same skills surgeons use in everyday practice. Many sources

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agree with the ACS, i.e., an experienced surgeon is better equipped to be in charge during an MCI (2). Drawing on experiences from multiple terrorist events in Israel, Einav et al. has recommended that event managers and primary triage officers dealing with terror-related MCIs be attending surgeons (3). However, not all agree. Ashkenazi et al., of Hillel Yaffe Medical Center in Hadera, Israel, found that many health care providers, including physicians, nurses, and emergency medical technicians (EMT), feel a nonsurgeon would be an appropriate leader during a disaster (4). Britt et al. recommend that the person with the most relevant experience, regardless of specialty, should assume the role of triage leader in an MCI (5).

With disparate opinions in the literature regarding who should command an MCI, we sought to identify whether surgeons, when compared to emergency physicians in the same region, are better qualified to assume leadership positions in the event of an MCI. We judged which group was best qualified to lead based on which ones most accurately identified correct MCI response protocols and disaster triage principles in sample scenarios.

## METHODS

After Institutional Review Board approval, a two-page survey with 16 questions pertaining to disaster protocols, triage principles, incident command structure, clinical experiences, and professional experience in treating common injuries encountered in mass casualty incidents, including exposure to nuclear; biological; or chemical agents (Figure 1), was distributed to regional surgeons and emergency medicine faculty at nine hospitals in California's capital city of Sacramento and the surrounding area.

Physicians were identified through physician rosters on hospital websites under the department headings "Emergency Medicine" and "Surgery," and surveys were mailed to the appropriate hospital or office addresses. A repeat mailing to all participants 1 month after the first was done to increase response rates. Participants were reminded not to reply if they had already completed the survey. All surveys were answered anonymously and no physician was incentivized or forced to complete the survey. There were 11 additional demographic questions included that focused on fellowship training, practice setting, and military experience.

Responses were tabulated and entered into a database. The responses were divided between surgeons and emergency physicians. Descriptive statistics were used to categorize the response from the surveys.

## RESULTS

Fifty-eight percent (n = 149) of the 255 surveys were completed. The response rates were 73% for surgeons and 48% for emergency physicians. Surgeons were older, more likely to have completed fellowship, in practice for longer, and more often had been involved in the military. More surgeon respondents (60%) than emergency physician respondents (48%) were employed at a Level I or Level II trauma center. In both groups, many (50%–60%) had at least some experience with MCIs (Table 1).

Few surgeons had reviewed their hospital's disaster plan. This fact was highlighted when they were asked if they knew where to report in case of a disaster or MCI; 57% of surgeons reported to the wrong location. Of surgeons that reviewed the disaster plan, 50% still did not know where to report in the event of a disaster. Twenty percent of emergency physicians, after reviewing their hospital's MCI plan, made the same mistake. Fifteen percent of surgeons and 18% of emergency physicians from non–trauma centers believed they could not receive trauma patients, even in the event of an MCI. Two percent of surgeons were unclear of their hospital's trauma designation (Table 2).

Only 52% of surgeons knew the appropriate location to conduct casualty triage compared to 82% of emergency physicians. When asked about the specific color code used for triage, for example, green for walking wounded and black for expectant, only 24% of surgeons recognized the correct colors. Only one-third of surgeons compared to nearly two-thirds of emergency physicians answered the question about command structure correctly. Even with the broad deficiencies in knowledge, the majority of surgeons felt they should be designated as triage officer (51%) or incident commander (58%) in a mass casualty incident.

When trauma surgeons were analyzed separately, their responses mirrored emergency physicians. Trauma surgeons had more experience than other surgeons with multiple casualty situations (90% vs. 56%, respectively) and, thus, were more familiar with triage coding categories and correct triage areas than were non–trauma surgeons. Trauma surgeons, like other groups, believed that they should be in charge overall (91%) (Table 3). When leadership roles were broken down into specific scenarios, the trauma surgeons were more realistic than other surgeons, believing they should only be in charge if the situation fit into their areas of expertise. None of the trauma surgeons thought they should be triage officer or event commander for a hazardous material event (Table 4).

## DISCUSSION

When mass disasters occur, effective management of resources greatly influences the success of the response. Gosselin emphasized that nearly two-thirds of surgeons who responded to the Haiti earthquake had no previous disaster training or experience (6). As a result of