

Strengthening Emergency Department Resiliency - Resident Deployment Considerations during a Mass-Casualty Incident

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COVID-19: coronavirus disease 2019
ED: emergency department
EOP: emergency operations plan
HUP: Hospital of the University of Pennsylvania
MCI: mass-casualty incident

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Abstract

In the event of a mass-casualty incident (MCI), hospital emergency departments (EDs) may be called upon to provide care to a large number of critically ill patients. As EDs plan for MCIs, determining how to best allocate staff members can play a significant role in the success or failure of a response. In academic EDs, a group that is often overlooked during MCI planning is the resident physicians. We argue that MCI plans at academic hospitals should consider the re-deployment of emergency medicine resident physicians in non-critical hospital rotations back to the ED.

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Background

Emergency departments (EDs) are expected to play a critical role in a community's response to a mass-casualty incident (MCI), an event that can be very disruptive; it is one of the worst-case scenarios that an ED must plan for.^{1,2} A sudden influx of critically ill patients can quickly overwhelm resources and compromise patient care.³ While some MCIs can be sustained, as was seen during the Omicron and Delta surges of coronavirus disease 2019 (COVID-19) across the United States, the vast majority are more discretely defined events, such as an earthquake or an active shooter; a situation that will stress a hospital's surge capacity in the short-term but will allow a relatively quick return to normal operations.

Maintaining adequate staffing in the United States is a serious issue, recently exacerbated by the COVID-19 pandemic. The United States Surgeon General sounded an alarm identifying burnout as one of the leading causes of resignations and early retirement of health care providers, making it difficult for the United States to be ready for the next public health emergency.⁴ Health care workers are experiencing burnout that greatly exceeds pre-pandemic levels.⁵ Emergency department residents are not immune; Chang, et al identified burnout and posttraumatic stress disorder symptoms among ED residents during the COVID-19 pandemic.⁶ For those who have worked in EDs during this time, incorporating lessons learned into future departmental and hospital MCI plans should be seen as imperative in order to optimize staffing and enhance organizational resiliency.

During an MCI, having the right people in the ED to meet the sudden influx of patients will be crucial to the ability to successfully care for victims. Part of this planning may involve the activation of off-duty ED personnel in an “all-hands-on-deck” response to best meet the needs of a surge of seriously ill patients.^{7,8} At academic hospitals, resident physicians can also play a key role in an ED's MCI response. We believe that in the event of an MCI, emergency medicine resident physicians should be repositioned to the ED or other points in the hospital that will serve as initial triaging and staging areas. Doing so will enhance a hospital's ability to meet the surge of urgent and emergent patients, and is aligned with the National Academy of Medicine's (NAM; Washington, DC USA) strategic plan aimed at shifting from the current crisis of workforce shortages and burnout to equilibrium represented by workforce well-being.⁹

Emergency Department Resident Preparation for MCIs

Within academic hospitals, resident physicians not only complete the final portion of their training before independent practice, but also play a crucial role in the delivery of care. While working in the ED, emergency medicine resident physicians undergo three to four years of

training in which they learn to diagnose, stabilize, and treat a myriad of emergent medical and surgical conditions.

During an MCI, the volume and acuity of patients require deviations from normal operating procedures. The focus of physicians and other providers working in an ED during an MCI will be the rapid triage and initial resuscitation of victims with severe but survivable injuries. Among all residents, emergency medicine residents are optimally suited to fulfill this role. Emergency medicine as a specialty focuses on the rapid diagnosis and treatment of life-threatening illness.

ED Staffing Challenges in Academic Hospitals

Emergency medicine resident physicians do not spend all of their time working clinically in the ED. Throughout their training, they are required to perform “off-service” rotations, which can include rotations on the general medicine and surgical floors, dedicated research time, or time working on elective rotations. Similarly, many residents from other specialties such as internal medicine, family medicine, and psychiatry are required to work clinically in the ED as part of their training. Thus, at any given time, an academic hospital ED may not be fully staffed by emergency medicine residents.

This reality poses challenges to an ED’s ability to handle surge in the response to an MCI. While off-service rotations are undoubtedly important for emergency medicine resident physicians, it means they may not be optimally placed in the event of an MCI. Similarly, having off-service resident physicians working in the ED during an MCI poses challenges as well, as it is optimal in a crisis for responders to work within their scope of practice.

Having off-service residents working in the ED during an MCI is not optimally utilizing their talents. Residents in other specialties are not specifically trained in emergent stabilization. That is not their role in the health care system, and while their clinical skills are vitally important, they are not the skills EDs require during an MCI. One study of family medicine residents found that by measure of competency, they were not adequately prepared to respond to a medical disaster.¹⁰ Rotations in the ED are important for off-service residents. They not only contribute to their education, but also allow them to develop invaluable personal and professional relationships with ED colleagues. During normal operations, their presence should be welcomed and encouraged. However, MCIs are a unique situation where resources must be optimally placed to do the most good for the greatest number of patients. Having off-service residents in the ED is not the optimal use of their medical abilities; EDs could consider assigning them to the hospital’s “green zone” for patients with less critical injuries.

Additionally, a reality for academic EDs is that a sudden influx of critically ill patients may require changes to the normal supervision provided by attending physicians. Residents may be asked to provide more care to patients semi-autonomously, while the attending physicians provide care elsewhere, particularly if operating under crisis standards of care conditions.¹¹ Depending on the injuries, residents may be required to perform some procedures such as splinting, establishing central venous access, or intubating independently. Asking an off-service resident to do such things is well-outside of their scope of training and could lead to delays in providing much-needed care. Conversely, emergency medicine residents, particularly senior residents, should be able to fulfill this role safely and effectively.

Staffing Reconfiguration – COVID-19 Pandemic Lessons Applicable to MCIs

Re-deploying residents in response to an influx of critically ill patients is not without precedent. The Hospital of the University of Pennsylvania (HUP; Philadelphia, Pennsylvania USA), in anticipation of an influx of critically ill patients with SARS-CoV-2, re-deployed many of their anesthesia residents to their intensive care units (ICUs).¹² For HUP, anesthesia residents were a natural choice as they have significant ventilator and critical care management experience. This was also an important consideration at the University of Washington (Seattle, Washington USA) in determining how to re-deploy their residents. They recognized that residents who were asked to work outside of their usual clinical setting were more prone to errors and fatigue.¹³

Re-deploying emergency medicine resident physicians from other parts of the hospital to the ED during an MCI does have drawbacks. Perhaps the most obvious is that re-deploying them to the ED would leave the service they were working on short-staffed. Other services may be reluctant to allow emergency medicine residents rotating with them to leave. Any ED MCI plan that calls for the re-deployment of its residents back to the ED must be done in conjunction with the other services in the hospital that would be impacted. This should also be done on a case-by-case basis as some services that emergency medicine residents rotate through such as trauma surgery or anesthesia will also likely have an outsized role to play in an MCI and will likely benefit from the additional help. A potential solution is that shifting emergency medicine resident physicians to the ED would be matched by shifting non-emergency medicine residents in the ED back to their specialty services. This would not only compensate for any disruption in care, but would also ensure that everyone was operating in a familiar environment during an MCI. Another possible strategy could be shifting only those emergency medicine residents on elective rotations back to the ED.

Strategic Benefits of Resident Redeployment

As the initial point of contact for most patients during an MCI, EDs should take proactive steps in both their departmental and hospital-level MCI plans to ensure that their residents are re-deployed to a familiar clinical setting, maximizing their skillsets to provide the most benefit to patients. This has the added benefit of potentially reducing stress and fatigue, which all contribute to physician burnout.^{13,14}

Limitations

These recommendations apply primarily to academic EDs and hospitals. Community hospitals do not typically have resident physicians, and their considerations for adequate staff allocation during an MCI will vary. Similarly, training requirements for physicians outside of the United States vary considerably. International academic EDs should endeavor to determine how best to incorporate their physician trainees into MCI responses.

Of course, as mentioned above, there is value to having emergency medicine residents rotate through other services. The off-service rotations are incredibly valuable to their education. Efforts should be made to transition emergency medicine residents back to their original rotations as soon as possible and with minimal disruptions. Similarly, off-service residents who may have been deployed away from the ED should be returned as soon as possible to minimize disruptions to their educational experience.

Conclusion

An MCI can put a tremendous strain on an ED and must be well-prepared for. An effective emergency operations plan (EOP) for MCI should account for the allocation of resources to ensure they are maximally utilized to meet the increased

demand. Academic EDs are fortunate to have an additional resource: emergency medicine resident physicians. Accounting for their optimal deployment should be a part of every academic ED's EOP.

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