

A novel use of telemedicine during a hospital mass casualty drill

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Abstract

During a mass casualty disaster drill at NewYork-Presbyterian's Lower Manhattan Hospital in April 2019, the Emergency Department (ED) used telemedicine to see low-acuity 'walking wounded' patients. This telemedicine service is provided every day as ED Express Care Service and staffed by off-site, board-certified Emergency Medicine attending physicians. This novel use of the ED Express Care Service allowed the ED to provide timely, safe, quality care while expanding resources and ED capacity through rapid assessment, treatment and discharge of the low-acuity patients.

Keywords

Telemedicine, emergency medicine, disaster planning

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Introduction

Disaster scenarios can quickly overwhelm emergency departments (EDs) and existing care-delivery processes, particularly in urban areas already facing high-volume care needs. While traditional responses rely on leveraging additional personnel, bringing in external support can be logistically challenging and costly for large hospital systems. Telehealth – defined as the use of telecommunications technologies to support clinical care – presents a significant opportunity in disaster settings to maximize scarce care resources.¹ During a recent mass casualty drill at NewYork-Presbyterian's Lower Manhattan Hospital (NYP/LMH), the impact of incorporating telehealth into triage and treatment procedures was examined.

NewYork-Presbyterian – Lower Manhattan Hospital

NYP/LMH is an urban community hospital with 180 inpatient beds, affiliated with NewYork-Presbyterian Hospital (NYP) since 2013. NYP/LMH is a certified stroke centre and is not currently designated as a ST-elevation myocardial infarction (STEMI) or American College of Surgeons (ACS) trauma centre; however, due to hospital closures and consolidation in Manhattan in recent years, NYP/LMH is the only hospital and ED serving the area south of 14th Street. The Lower Manhattan has undergone significant

revitalization efforts in the last decade, resulting in a doubling of the residential population. With close proximity to multiple tourist attractions and activities, over 15 million people visited Lower Manhattan in 2018.² Since 2013, our ED has seen a significant increase in volume, with visits expected to reach approximately 50,000 in 2019. To best serve this diverse and growing population, the NYP/LMH ED is open 24 hours a day, 7 days a week and provides urgent and emergent care to the local community. General surgery, medicine, and obstetrics/gynaecology services are available to the ED, and additional surgical subspecialties are available on a more limited basis. While NYP/LMH is not an American College of Surgeons-designated trauma centre, it does care for trauma patients based on Emergency Medical Services triage guidelines. In disaster situations, the hospital has cared for many victims of trauma. This hospital provided care to patients after the September 11th attacks as the closest hospital to the

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World Trade Center; more recently, the hospital treated the bulk of patients suffering injuries after a terrorist drove a van through a pedestrian walkway in Lower Manhattan on 31 October 2017.

Leveraging telehealth during a mass casualty drill at Lower Manhattan Hospital

On Friday, 5 April 2019, between 8 a.m. and 9 a.m., as part of the annual disaster scenario planning process, NYP/LMH held a mass casualty drill simulating an explosion on a subway with patients sustaining blunt and penetrating trauma. Twenty-two patients arrived to the NYP/LMH ED, with 18 adult cases and four paediatric cases. Using Simple Triage and Rapid Treatment (START triage) criteria, three adult patients were green tagged, having the lowest acuity complaints. The rest of the patients were red and yellow tags.³

During the time of this unannounced drill, the ED is staffed by two attendings in the adult ED for patients 21 years and older, and one paediatric Emergency Medicine attending. There is no additional in-person provider coverage until after 9 a.m. In addition to the three attendings, NYP/LMH also had access to a telemedicine Emergency Medicine attending via our ED Express Care Service. The Express Care Service was launched in 2016 to decrease ED wait times and improve patient experience for patients with low-acuity complaints. In the current usual workflow, patients entering the ED at NYP/LMH are triaged by a nurse and given a brief medical screening exam, as required by the Emergency Medical Treatment and Labor Act (EMTALA),⁴ by a physician assistant (PA) or nurse practitioner (NP). Patients qualifying as low acuity are offered the choice between waiting for the ED attending or having a real-time video visit with a board-certified Emergency Medicine physician from Weill Cornell Medicine, affiliated with NewYork-Presbyterian Hospital. Video visits are conducted in private rooms equipped with telemedicine carts capable of secure audio/video communication between the patient and provider. These ED Express Care physicians see patients at two NYP EDs, the NYP/LMH site and the Weill Cornell Medical Center ED site, from 8 a.m. to midnight.^{5,6} Through the ED Express Care programme, rapid discharge of low-acuity patients has been shown to increase flow in the ED, reduce overcrowding, and cut length of stay for these from 2.5 hours to 31 minutes.^{7,8} Patient needs commonly addressed via Express Care include suture or staple removal, wound checks, medication refills, and other issues commonly seen in an urgent care setting. Patients requiring simple procedures such as laceration repair have also been seen through Express Care in conjunction with on-site PAs and NPs for procedural support.

Given the provider resources available in person during the drill, the ED Express Care attending was contacted to evaluate and treat the three green tag patients. These patients walked into the ED with minor injuries, primarily localized minor extremity lacerations, similar to cases usually seen via our ED Express Care pathway. The ED disaster lead attending and nurse leader ensured that the patients could be appropriately considered green tags and contacted the Express Care attending via hospital-adopted instant messaging to start patient evaluations. Since the PAs and NPs were not present at the time, a staff nurse was in the room with the patient while the ED Express Care attending evaluated the patient's injury over the live video feed (Figure 1). The nurse was also able to provide the telemedicine attending with information on vital signs to compensate for paper charting.

The Express Care nurse and physician team saw all three green tag patients, recommending laceration repair when the oncoming PA arrived at 9 a.m.

During the disaster drill debrief, the use of ED Express Care was praised by all parties as a way to expand capacity for 'walking wounded', low-acuity patients. ED Express Care was not previously used during any disaster drills at NYP/LMH and it had not been used during the disaster drill at the other NYP location with ED Express Care (Weill Cornell Medical Center). The Emergency Management team has now recommended its use as part of the disaster plan.

Discussion

Telemedicine has been used in response to natural disasters and disaster drill responses across the country. A rural ED simulation in Illinois focused on the care of a sepsis patient introduced remote electronic intensive

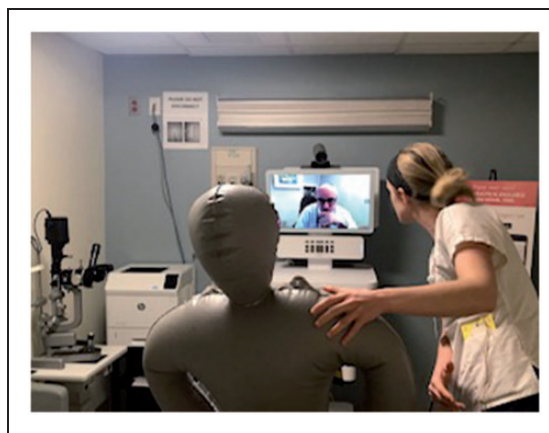


Figure 1. Nurse discussing patient with ED Express Care attending.

care, bringing the intensive care experts to the bedside through a telemedicine platform.⁹ Similarly, during a drill performed at three hospitals in Los Angeles, paediatric specialists were able to perform telemedicine triage and consults from the hub location, away from the actual disaster sites.¹⁰ In addition, NYP has experience using telemedicine services for peer-to-peer consultation when delivering services in Puerto Rico after Hurricane Maria.¹¹ The drill conducted at NYP/LMH builds on existing literature, representing a novel use of our ED Express Care programme to expand care resources in a disaster by aiding in throughput for low-acuity patients, and thereby freeing up ED capacity for sicker patients during a simulated disaster event.

ED capacity can be challenging to measure during a disaster. On the ground, care teams are often tasked with work that falls outside of the delivery of care – while our teams were caring for the red and yellow tag patients during our drill, they were simultaneously engaged in constant communication with other relevant stakeholders. During our mass casualty incident drill, providers had to notify NewYork-Presbyterian Hospital's transfer centre of the disaster scenario and pending transfers for multi-system injured patients. The team leaders also had to coordinate calling in sick call coverage, as per our usual practice during disasters, and initially communicating with the Express Care telemedicine attending regarding the scenario and green tag patients needing evaluation. The ED attending physicians in the LMH ED were able to focus on the sickest patients while the ED Express Care telemedicine attending saw the low-acuity patients. Using ED Express Care to expand capacity was critical in allowing providers to continue caring for the high-acuity disaster and non-disaster-related patients arriving in the ED during the drill.

When hospitals are in the planning stages for disaster preparedness and for designing drills to test the system, they should evaluate and seek to optimize all available resources. As health systems expand telemedicine services and build out hub-and-spoke care-delivery models, these operations should be included in their emergency preparedness plans and tested during required drills and simulations. With the inclusion of telemedicine-based approaches, however, comes greater scrutiny on the functional capacities of the technology and equipment. Efforts must be made to ensure that equipment is well maintained, incorporates back-up sources of energy, and utilizes appropriate communications technology in the case of downtime or other unanticipated events impacting function.

As hospitals seek to ensure preparedness, simulations and drills prove useful tools to bring to light areas of improvement and best practices in the event of a real disaster. Our ED Express Care Service use in

our disaster simulation demonstrates the utility and expansion of telemedicine resources to ensure all patients are cared for in a timely manner, particularly for non-emergent cases or the 'walking wounded'.

Conclusion

In the future, we will continue to use the ED Express Care Service for disaster drills and mass casualty incidents to ensure patients are seen in a timely manner, allow providers to plan for their management based on procedures needed, and discharge them quickly to ensure ED throughput and patient safety is maintained.

Declaration of Conflicting Interests

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References

1. Tuckson RV, Edmonds M and Hodgkins ML. Telehealth. *N Engl J Med* 2017; 377: 1585–1592.
2. Nachowitz J. Lower Manhattan Residential Development and Population Growth. Downtown Alliance. 2019; <https://www.downtownny.com/residential-market-data>.
3. START Adult Triage Algorithm. Radiation Emergency Medical Management: REMM (US Department of Health and Human Services). <http://www.remm.nlm.gov/startadult.htm> (accessed 31 October 2019).
4. Emergency Medical Treatment and Labor Act. Centers for Medicare and Medicaid Services. <https://www.cms.gov/Regulations-and-Guidance/Legislation/EMTALA/> (accessed 31 October 2019).
5. Davis J. NewYork-Presbyterian Hospital builds out NYP OnDemand digital health services suite. *Healthcare IT News* 2016 July 26. <https://www.healthcareitnews.com/news/newyork-presbyterian-hospital-builds-out-nyp-ondemand-digital-health-services-suite> (accessed 4 June 2019).
6. Sharma R, Gordon J, Greenwald PW, et al. Revolutionizing the delivery of care for ED patients. *N Engl J Med Catal* October 5, 2017.
7. McHugh C, Krinsky R and Sharma R. Innovations in emergency nursing: Transforming emergency care through a novel nurse-driven ED telehealth express care service. *J Emerg Nurs* 2018; 44(5): 472–477.
8. Sullivan T. NewYork-Presbyterian builds out telemedicine psychiatry and express care services *Health IT*

- News 2017, April 24. <https://www.healthcareitnews.com/news/newyork-presbyterian-builds-out-telemedicine-psychiatry-and-express-care-services> (accessed 4 June 2019).
9. Bond WF, Barker LT, Cooley KL, et al. A simple low-cost method to integrate telehealth interprofessional team members during in situ simulation. *Simul Healthcare* 2019; 14(2): 129–136.
 10. Burke RV, Berg BM, Vee P, et al. Using robotic telecommunications to triage pediatric disaster victims. *J Ped Surg* 2012; 47: 221–224.
 11. Siwicki B. NewYork-Presbyterian specialists use telemedicine to treat stranded Puerto Ricans. Healthcare IT news. 2017, November 9. <https://www.healthcareitnews.com/new/newyork-presbyterian-specialists-use-telemedicine-treat-stranded-puerto-ricans> (accessed 13 Aug 2019).