White paper: Using Telehealth in the Emergency Department to Minimize Risk to Health Care Providers and Conserve Resources During the COVID-19 Response.

Submitted by:
Jaron Christianson, MD, FACEP
Erin Christianson, PhD

Emergency department staff is at elevated risk for contracting COVID-19. Exposure can lead to serious illness or prolonged quarantine. This places additional strain on departments that are often at or over capacity. Additionally, many hospitals have already run out of or are critically low on personal protective equipment (PPE) just weeks into what will likely be a months-long crisis (Wang et al. 2020; Elgin & Tozzi 2020). This is further compounding the risk to staff.

Emergency Department Barriers in COVID-19 Crisis

Front-line health care providers (HCPs) are faced with critical barriers to minimizing exposure risk in their emergency departments (EDs). Recent reports indicate that HCPs are disproportionately affected by COVID-19 and may have a higher rate of developing more serious complications of the illness (Ran et al. 2020; Bernstein et al. 2020) For example, by mid-February, more than 1,700 healthcare workers in China had been diagnosed with COVID-19, with multiple deaths (Ran et al. 2020). In an effort to slow the spread of COVID-19, immediate quarantines are required for anyone who has been exposed to this virus. This causes considerable psychological and financial stress to HCPs who are exposed as well as their EDs, which may not be able to provide appropriate staffing to meet public healthcare needs.

Another barrier is the critical shortage of personal protective equipment (PPE) available to HCPs. In many hospitals there was a low supply of PPE, even before the first COVID-19 case presented there. This is in large part due to hospitals adopting just-in-time (JIT) practices as a part of becoming “lean” (NEJM Catalyst 2018; Rebmann & Wagner 2009; Dunn 2009). Moreover, at the onset of this pandemic, individual consumers panic-bought face masks and supply chains were severely disrupted, which has not allowed hospitals to replenish their PPE supplies for HCPs who need them the most. One anecdotal source estimated that a single New York City hospital may use as many as 70,000 N-95 masks a day during the COVID-19 response (Santucci & Mosk 2020).

There is an increasing and, likely soon-to-be, overwhelming need by the general public to access healthcare during the COVID-19 pandemic. In EDs around the world, we have witnessed large masses of people requiring care within a short time window. In China, Italy and Iran, EDs are overrun, over capacity and operating with limited staff and resources.

In response to the current pandemic and unmet needs of hospitals and EDs, the US government has promoted the use of telemedicine wherever it can safely be used (CMS 2020). Furthermore, federal and state regulations surrounding the use of telemedicine have been relaxed so that HCPs can provide patient care where it is needed most (Wein, Goodman & Ferrante 2020). This paper specifically describes a telehealth solution that can overcome critical barriers faced by HCPs and addresses the emergency response required to help hospital systems use resources efficiently.

Telemedicine Solution in the Emergency Department

TeleTriage is a telehealth modality that has been used by several large health systems in the United States for several years. In its traditional form, TeleTriage significantly reduces door- to-doctor and left-without-being-seen (LWBS) times, allowing higher acuity patients to be attended to in a timely fashion. It also decreases overall length of stay and liability risk while increasing patient satisfaction. It is generally deployed in busy EDs with long wait times or across multiple EDs in a system. TeleTriage is exceedingly customizable and will often pay for itself with the reduction in LWBS rates alone.

By its very nature, TeleTriage is easily adapted to provide emergency care to patients who have possible or confirmed COVID-19 diagnosis. In the TeleTriage model, physicians are located remotely and can be deployed to various locations on a hospital campus (e.g., ED triage, respiratory tent, hospital entrances, patient care rooms) and evaluate patients upon arrival. Risk can be assessed by the remote physician and where appropriate, testing and treatment can be initiated. For lower acuity and the "worried well," tele-medical screening exams (teleMSEs) can even be performed. By initiating TeleTriage, at least one person-to-person interaction is eliminated. Furthermore, in this model, an experienced physician conducts the risk assessment, which greatly reduces the downstream risk to other HCPs and ED patients. Since remote physicians do not require PPE, resources are conserved. Overall, ED flow is improved and since patients are seen immediately, patient safety and satisfaction are increased.

Starting a TeleTriage Program

Successful TeleTriage programs are established with experienced staff and an appropriate platform to deliver care. For staffing, we recommend using Emergency Physicians with telemedicine experience because they have specialized training, an efficient approach to patient care and possess a skill set that is ideally suited for TeleTriage and COVID-19 screenings. TeleTriage staffing can be accomplished internally depending on the ED group's desire and capacity, or another option is to use a third-party staffing solution.

There are several options for a platform. It is important to consider if it is necessary for the platform to integrate into the EHR or if stand-alone option is adequate. The choice of a platform will likely come down to speed of implementation and cost. More "full-service" options will take longer to implement but offer significant flexibility such as robust queuing of patients in a virtual waiting room and the ability to staff multiple hospitals with the same physician. In almost all cases, the hardware can be as simple as a tablet and stand. The following are brief examples that describe different scenarios for TeleTriage implementation.

TeleTriage Scenario 1

Staffing: The local Emergency Physician group staffs TeleTriage.
Platform: Out of the box hardware with free apps, such as Zoom.
Advantages: 1) Cost. In this case, the cost is essentially that of the emergency physician plus hardware/software costs that are approximately $500 per workstation. 2) Speed. This can be instituted in days.
Disadvantages: 1) Flexibility. Options such as Zoom typically require a continuous video feed, since it is too time consuming to initiate a new video session with each patient. This means that the remote physician can only be present on a single patient-facing workstation. This will limit the physician to the triage area of the main ED or, if present, the "Hot Zone"/COVID-19/URI

area. 2) Using the local physicians may put a strain on the medical group's capacity, especially if multiple physicians fall ill or are quarantined.

TeleTriage Scenario 2

Staffing: Third-party Emergency Physician staffing solution is used. An example of this is InDoc.

Platform: Robust, flexible platform, designed specifically for TeleTriage is used. An example of this is EmOpti.

Advantages: 1) Augmented staffing. This gives the hospital access to an isolated/healthy workforce that is not at risk for illness, quarantine or the periodic staffing holes that commonly occur. A dedicated TeleTriage staffing group employs Emergency Physicians who are highly skilled, efficient and comfortable with using telemedicine to deliver patient care. The cost of the remote physician is often similar to the cost of using a local physician. 2) Flexibility. A platform designed for TeleTriage will allow the Emergency Physician to appear on-demand in multiple places within one hospital or even in multiple hospitals. This gives the ED group a level of surge protection and allows for creativity about how to direct potential COVID-19 patients to safe areas.

Disadvantages: 1) Speed. Unless your hospital has an emergency plan that allows for rapid credentialing, which is increasingly more common, it will take time for an outside physician to get hospital privileges to work in your ED. Further, platforms that integrate with your EHR will require vetting and approval from your IT department. There are ways to mitigate this, such as initially deploying a non-integrated platform or utilizing a system that your hospital already has access to for telemedicine. 2) Cost. Increasingly robust and flexible platforms are more expensive than out of the box versions. However, the cost of the platform is rarely prohibitive and the benefits nearly always greater.

Other Considerations:

- If you plan on doing TeleMSEs, then you should have at least one additional room so that the physician does not bottleneck triage while doing their exam.
- Always have an additional room and an ED tech assigned to triage who can carry out orders that are placed by the TeleTriage physician.
- If the local group will staff TeleTriage, an adequate home setup is necessary. At a minimum, the physician should have two monitors and an external web cam/microphone. A laptop has insufficient workspace. Also, a reliable internet connection is a must. We suggest that the physician have the ability to tether their computer to their phone in the event of an internet outage.
- Additionally, if the local group will staff TeleTriage, consider having the physicians take a short course on how to conduct an on-line patient exam. This is an example: Jefferson University
- To get buy-in from the nursing staff, the patient interactions will have to be quick and efficient so that the triage process is not significantly lengthened.
- Buy-in from other physicians comes in short order. A recent published study compared the ordering patterns of a TeleTriage physician with the physical physician in ED and found them to have a high rate of concordance (Izzo et al. 2018). The advantages of a TeleTriage physician quickly outweigh the occasional disagreement on testing.

Recommendations for using Telehealth/TeleTriage:

- The CDC, AMA, CMS and WHO all support the use of telehealth as a key component of the COVID-19 response.
- In 2015, CMS issued guidance on the use of telehealth modalities for the screening of potential Ebola patients (CMS).
- The CMS guidance will soon be updated to include the COVID-19 response, as well, per a recent ACEP announcement.

Resources:

- Free TeleTriage Platforms:
  - Zoom
  - Skype
  - Doxy.me
- Paid TeleTriage Platforms:
  - EmOpti – Offering free 90 days for COVID-19 response and a non-integrated platform.
  - InTouch
  - Bluestream Health
- TeleTriage Staffing and Consulting
  - InDoc
- Telehealth Carts:
  - Deluxe Option
  - Discount Option
- Speakers/Microphones:
  - Pioneer
  - Jabra

References

1. Wang X., Zhang X. & He J. Challenges to the system of eserve medical supplied for public health emergencies: reflections on the outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic in China. *BioScience Trends*. 2020; 14(1):3-8.
2. Elgin B. and Tozzi J. (2020, March 17). Hospital workers make masks from office supplies amid U.S. shortage. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/articles/2020-03-18/hospital-makes-face-masks-covid-19-shields-from-office-supplies
3. Ran L., Chen X., Wang Y., Wu W., et al. Risk factors of healthcare workers with corona virus disease 2019: A retrospective cohort study in a designated hospital of Wuhan in China. *Clin Infect Dis.* 2020. Epub ahead of print. Doi: 10.1093/cid/ciaa287.
4. Bernstein L., Boburg S., Sacchetti M., & Brown E. (2020, March 17). Covid-19 hits doctors, nurses and EMTs, threatening health system. *The Washington Post*. Retrieved from https://www.washingtonpost.com/health/covid-19-hits-doctors-nurses-emts-threatening-health-system/2020/03/17/f21147e8-67aa-11ea-b313-df458622c2cc_story.html
5. Rebann T. & Wagner W. Infection preventionists' experience during the first months of the 2009 novel H1N1 influenza A pandemic. *Am J Infect Control*. 2009, 37(10):e5-e16.

6. NEJM Catalyst. (2018, April 27). What is Lean Healthcare? *NEJM Catalyst.* Retrieved from https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0193
7. Dunn L. (2009, September 17). 5 Key principles for hospitals from Toyota's lean production system. *Becker's Hospital Review*. Retrieved from https://www.beckershospitalreview.com/news-analysis/5-key-principles-for-hospitals-from-toyotas-lean-production-system.html
8. Santucci J. & Mosk M. (2020, March 22). Internal memos by chief surgeon at New York-Presbyterian Hospital revealed new details about the coming threat. *ABC News*. Retrieved from https://abcnews.go.com/Politics/internal-memos-chief-surgeon-york-presbyterian-hospital-revealed/story?id=69735650
9. Centers for Medicare & Medicaid Services. (2020, March 17). Medicare telemedicine health care provider fact sheet. *CMS.gov.* Retrieved from https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet
10. Wein E.H., Goodman R.B. & Ferrante T.B. (2020, March 17). COVID-19: States waive in-state licensing requirements for health care providers. *Foley & Lardner LLP.* Retrieved from https://www.foley.com/en/insights/publications/2020/03/covid-19-states-waive-licensing-requirements
11. Izzo J.A., Watson J., Bhat R., Wilson M., et al. Diagnostic accuracy of a rapid telemedicine encounter in the Emergency Department. *Am J Emerg Med.* 2018. 36(11):2061-2063.