

Early lessons learnt using simulation to rapidly deploy a trained observer programme during the COVID-19 pandemic in New York City

Tricia Yusaf ¹, Michael Meguerdichian,² Angela Astuto,³ Lisa Rucker,³ John Arbo,⁴ Komal Bajaj⁵

¹Obstetrics and Gynecology, Jacobi Medical Center, Bronx, New York, USA

²Emergency Department, Harlem Hospital Center, New York, New York, USA

³Internal Medicine, Jacobi Medical Center, Bronx, New York, USA

⁴Patient Safety Officer, Jacobi Medical Center, Bronx, New York, USA

⁵Chief Quality Officer, Jacobi Medical Center, Bronx, New York, USA

Correspondence to

Dr Tricia Yusaf, Obstetrics and Gynecology, Jacobi Medical Center, Bronx, NY 10461-1197, USA; yusaf@nychhc.org

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ABSTRACT

New York City became one of the epicentres of the COVID-19 pandemic in 2020. Simulation was used to establish the COVID-19 trained observer programme to mitigate healthcare workers' infection risk during patient care. The members of the trained observer group consisted of 32 staff members. At the start of the training programme, they were provided donning and doffing guides with a step-by-step description of personal protective equipment (PPE) usage, followed by in-situ PPE simulation training. Later on, as PPE protocols evolved, additional educational modalities were used and included training videos, picture demonstrations of common PPE mistakes and repeated in-situ simulations. The early lessons which emerged from using simulation to train observers during the COVID-19 pandemic were the following: address PPE shortages during presimulation planning, prepare to perform updates for trained observers and use multiple educational modalities to train observers. Adequate amounts of PPE should be available to train observers. Repeated simulations are necessary to update observers on PPE protocols. Multiple learning modalities should educate the trained observers and equip them for their role in COVID-19 units.

BACKGROUND

The first recorded case of COVID-19 in New York City (NYC) was on 1 March 2020, and by 5 May there were 171 723 confirmed cases with 13 724 confirmed deaths.¹ The Bronx had the highest hospitalisation rates and deaths related to COVID-19 compared with the other four boroughs in NYC.² There is a long-standing history of trained observers to assist healthcare teams by proactively identifying safety threats and assisting in safe personal protective equipment (PPE) use. The Centers for Disease Control and Prevention and the National Emerging Special Pathogen Training and Education Center offer guidelines for an Ebola trained observer programme. Crucial to the trained observer role is their ability to monitor compliance with PPE protocol, maintain situational awareness to anticipate possible contamination risks and assist during the donning and doffing procedure.^{3,4} Simulation is an educational technique that replaces real experience with guided experience in an interactive manner and has successfully been used previously to develop many Ebola trained observer programmes.

NYC Health + Hospitals/Jacobi is one of the 11 acute care facilities within the USA's largest municipal health system. Located in the Bronx, New York, it is a 457-bed, American College of Surgeons level 1 trauma centre with 3225 staff. Situated in an epicentre of the COVID-19 pandemic, NYC Health + Hospitals/Jacobi needed to deploy trained observers to expanding critical care areas rapidly. The guiding principle was that such a programme would provide support and potentially decrease provider cognitive load associated with donning and doffing during the surge of patients with COVID-19. This report describes the early lessons learnt during the implementation of this simulation-based improvement intervention.

METHODS

Essential to the start of the programme was the identification of stakeholders and obtaining buy-in from the staff. A steering committee was formed, and the departments of quality and safety, infection control, hospital administration, and front-line staff all provided input into the programme and were all supportive of this programme. Several authors of this paper are educators and are also members of the facility's medical staff, with specialised training in healthcare simulation education, and were recruited by the administration team to develop the COVID-19 trained observer programme.

Curriculum design

Kern's six-step approach to curriculum design⁵ informed this trained observer curriculum. A general needs assessment was conducted, and a need for staff support with PPE use and refreshers on evolving PPE guidance was established. The programme's goals were to establish a COVID-19 trained observer curriculum using simulation as one educational technique and then deploy the trained observers hospital-wide to promote safety and compliance with donning and doffing protocols to mitigate the risk of infection. The trained observer group members were assembled, all of whom had clinical backgrounds and were from the facility's dentistry department, operating room and physical therapy.

Before the training, the observers were provided a copy of the hospital's PPE protocols and a visual donning and doffing guide that included a detailed description of PPE usage. The observers then received PPE training at the start of the pandemic in



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Figure 1 PPE Tip: remove mask safely while doffing.

NYC using in-situ simulation in group sizes that allowed for safe physical distancing. Simulations were conducted in a quiet space within the clinical environment with standard PPE, including gowns, gloves, masks and bonnets. An orientation to the simulation education programme was performed and included a PPE donning and doffing scenario. In-situ simulation training was conducted in groups of two, lasting approximately 2 hours in duration. The facilitators performed a step-by-step demonstration of correct PPE usage, and then one member of the learner group performed the actual donning and doffing while the second member surveyed for adherence to the PPE protocol. The learner roles were then switched to allow for others to practise. The simulation educators performed group debriefing of the in-situ simulations. All authors were involved in the training of observers.

Programme implementation and evaluation

After completing the training programme, observers' competency was determined by their ability to complete all aspects of donning and doffing as determined by the COVID-19 Donning and Doffing Competency Checklist developed by the NYC Health + Hospitals Special Pathogens Unit. After completing training, the observers were deployed to the patient units and directly assisted the clinical staff who felt they needed aid during donning and doffing. The trained observers then collated their reflections on what was useful and where there was room for improvement related to the donning and doffing practices of the COVID-19 clinical staff. These reflections were collected via debriefings or emails, and trends were shared during daily leadership huddles by the quality department members to inform improvement efforts. The curriculum's effectiveness was determined by reflections of the trained observers and authors after group debriefings and individual staff emails obtaining feedback information.

Repeated training using in-situ simulation was performed when PPE protocols evolved. By the time repeated training was needed, a training video was available that was viewed before the simulation. Additional educational adjuncts included small group discussions, lectures and other visual guides. The visual guides included infection control practices, donning and doffing PPE, and reusable PPE care and cleaning.

Identifying lessons learnt

During the programme's initial implementation, lessons learnt were gathered from the observations of the trained observers, steering committee and the authors of this paper during regularly scheduled debriefing sessions. The grounded theory approach⁶ was used to identify common themes and codes and

determine programme utility, further programme directions and key implementation lessons. TY and KB performed coding, and any disagreements were brought to the rest of the authorship for resolution.

RESULTS

Between 23 March 2020 and 15 May 2020, 32 interdisciplinary trained observers were deployed to 10 units. The curriculum's effectiveness was based on the data gathered from the experiences of the observers. Through iterative cycles of data collection and constant comparative analysis for emergent themes, the authors developed a list of PPE challenges and ways to mitigate these challenges. Common themes included challenges with N95 usage, donning PPE, doffing PPE, cleaning PPE and identifying appropriate hospital attire. From these themes, codes were generated and included prevention of PPE contamination, wearing jewellery at the same time as PPE and strap placement of N95 mask. Observers' feedback and reflections led to developing a 'PPE Tips' series based on common challenges that were observed (figure 1). A total of six PPE Tips were produced from common themes and were distributed hospital-wide, and included information about (1) safe N95 mask strap placement, (2) covering the straps of the N95 mask with a bonnet to prevent contamination, (3) N95 doffing best practices, (4) doffing of gowns used for PPE, (5) avoiding wearing personal items like jewellery and (6) cleaning procedure for reusable PPE items. These were shared widely, including on flat screens and screen savers. Given the unrelenting toll of the pandemic and the multiple sources of information/feedback being processed in real time, it was not explicitly tracked as to what reflections generated by observers led directly to process improvements, a component of the programme we will ensure is enhanced for future iterations.

Three early lessons emerged from using simulation to train observers during the COVID-19 pandemic.

Address PPE shortages during presimulation planning

PPE supply can impact both the quality and ability to train staff and must be considered during planning. Perfect practice to ensure the staff's safety cannot be accomplished without using actual PPE. Adequate amounts of PPE are essential for infection control and to the success of the observer programme. The programme reserved enough PPE for training the observers from the first day of deployment. By having a system in place to track the current inventory of equipment, trainers can anticipate the amount of equipment needed in the future and secure it to make it accessible to the staff at all times. Early and continual engagement of stakeholders is essential to allocate sufficient personnel to the observer programme and address PPE shortages for the duration of the pandemic.

Be prepared to perform training updates for the observers

Guidelines continuously changed throughout the pandemic as new information about the spread of infection and its containment was discovered. As a result, trained observers needed ongoing and updated simulated PPE training to keep pace with the evolving PPE guidelines. Based on the trained observer feedback, repeated simulations helped educate the observers about evolving PPE protocols.

Multiple learning modalities are helpful to train observers and equip them for their role in the unit

As learners have various learning preferences, equipping trained observers with multiple educational modalities to disseminate

information created improved access to just-in-time coaching opportunities. The observers used the visual guide and video from their training to ensure widespread information dissemination on PPE protocols. They also employed another modality titled PPE Tips, which used visual demonstrations of common PPE challenges (figure 1). Applying this method of engaging the staff facilitated discussions around various donning and doffing scenarios. The trained observers' curriculum contained multiple educational adjuncts that the observers used to coach the clinical team when donning and doffing their PPE and when the staff was critically thinking about the choice of PPE protocols to use during donning and doffing. We will continue to monitor improvements in the PPE challenges that were identified.

CONCLUSION

During the COVID-19 pandemic in NYC, a trained observer programme was integral in helping healthcare providers don and doff PPE. The conclusions are based on observations of the trained observers and authors. There were three vital lessons learnt through using simulation to rapidly establish a trained observer programme, including addressing PPE shortages, performing regular training updates and using multiple learning modalities to equip observers with approaches to keep staff safe. These lessons should be generalisable to other settings and sites and help others accelerate their programmes if there would be a second surge in COVID-19 cases. We hope that our experience will assist others who are developing similar programmes.

Twitter Tricia Yusaf @TriciaYusaf

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ORCID iD

Tricia Yusaf <http://orcid.org/0000-0002-3285-7987>

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