

COMMENTARY

HOW NEW YORK CITY HEALTH + HOSPITALS SYSTEM-WIDE SPECIAL PATHOGENS PROGRAM RESPONDED TO COVID-19

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THE WORLD WENT ON NOTICE December 31, 2019, when the first report of a cluster of pneumonia of unknown etiology was reported to the World Health Organization.¹ History has taught us that an outbreak anywhere is a threat everywhere; distant outbreaks are always a flight away. Given New York City's position as an international transportation hub, coupled with a population of 8.3 million, a readiness posture is essential. The first laboratory-confirmed case of severe acute respiratory syndrome 2 (SARS-CoV-2) in New York City was March 1, 2020. What happened in the days, weeks, and months that followed positioned New York City as the nation's epicenter of the coronavirus disease 2019 (COVID-19) pandemic. This commentary will discuss the preparedness, response and resiliency stages of New York City Health + Hospitals (NYC H+H) System-Wide Special Pathogens Program for COVID-19 and its ability to stay nimble throughout the evolving crisis.

PREPAREDNESS: IT'S NOT A MATTER OF IF BUT WHEN

The System-Wide Special Pathogens Program—under development by Central Office Emergency Management

from 2014 until its founding in 2015—was inaugurated to respond to the Ebola epidemic and threats from other special pathogens, defined as diseases with the ability to cause significant morbidity and mortality.² Since then, the program has taken an “all infectious disease approach,” tackling the city's most pressing infectious disease threats from Zika in 2016 to measles in 2018.³ It has strived to maintain a state of readiness for special pathogens by conducting ongoing drills and exercises of varying scope and scale, leading trainings and simulations, and continuously updating and developing tools and resources to assist in preparedness and response. The program began monitoring the unfolding epidemic in China from the initial notification on December 31, 2019,⁴ and very quickly began preparing for the potential surge of cases that would present.

Clinical Guidance

Following reports of the cluster of pneumonia cases identified as possible severe acute respiratory syndrome (SARS), a sister virus of what we would discover to be SARS-CoV-2, we began to dust off and update the healthcare system's SARS clinical guidance on January 2, 2020. The Centers for Disease Control and Prevention released its first health

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advisory on COVID-19 on January 8, 2020,⁵ which provided additional clinical and infection prevention guidance to healthcare providers. Using this information, the System-Wide Special Pathogens Program coauthored with another division within the healthcare system, The Office of Medical and Professional Affairs, the first of what would be a series of clinical guidance documents on COVID-19, detailing the steps and measures needed to identify, isolate, apply infection control measures, and notify public health authorities for further assessment and testing for suspected COVID-19 patients.⁶

Drills and Exercises

To test plans and processes at the facility level, NYC H + H began conducting no-notice, COVID-19 secret shopper drills at its 11 hospitals, 6 post-acute care sites, and 5 ambulatory care clinics starting February 2, 2020. The COVID-19 secret shopper drills were conducted by an actor presenting as a patient to various points of entry into the site (eg, emergency department for hospitals) and assessing each facility's ability to screen patients with influenza-like illness, rapidly identify and apply source control (eg, face mask), isolate, apply appropriate infection control precautions, and notify public health authorities. Following each COVID-19 secret shopper drill, a hotwash (an after-action review) was held with facility leadership to discuss the drill's findings, including its strengths, weaknesses, threats, and areas for improvement.

In addition to the COVID-19 secret shopper drills, on February 26, 2020, all clinical care sites were instructed to conduct a facility-specific tabletop exercise with a scenario of at least 50 COVID-19 patients presenting and 6 inches of snow on the ground in order to better create a reality that could occur and analyze each facility's ability to ramp up staffing, space, and supplies. The System-Wide Special Pathogens Program developed a "COVID-19 Surge Planning Checklist," which included an extensive list of departments/areas within a clinical care site—from emergency department to pharmacy to intensive care units—and a set of considerations for each department to assess in the context of responding to a surge of COVID-19 patients. This tabletop exercise helped prepare each facility for what they would soon experience in the actual response phase.

In-Service Trainings

Given the novelty of COVID-19 as a new disease, there has been a steep and ongoing learning curve. It is essential that frontline staff are provided ongoing education as clinical guidance continues to evolve. During the preparedness phase, between January 8, 2020 and March 6, 2020, the program conducted 8 COVID-19 training and education sessions to more than 572 employees. The training sessions included a high-level overview of the clinical features of

COVID-19, the latest public health guidance, and, if needed, a live demonstration of donning and doffing personal protective equipment (PPE).

RESPONSE: ADAPTING TO RAPID CHANGES

Continued Education and In-Service Training

Healthcare Facilities

In-service trainings at healthcare facilities—hospitals, ambulatory care, and post-acute care—aimed to build on existing infection prevention education to include an all-infectious disease emergency management approach and relevant COVID-19 updates. Emphasizing the importance of prompt identification, isolation, and notification of potentially infectious patients helped contextualize source control, exposure prevention, and communication within the facility and ensured staff were aware of what processes and precautions to take. Between March 17, 2020 and May 13, 2020, the program conducted 6 additional education sessions, including virtual sessions, and training more than 460 employees.

Ongoing preparedness and response strategies reviewed during in-service trainings included PPE donning and doffing and developing a "Special Pathogens Cart," which expanded the traditional isolation cart commonly used in a hospital setting and adapted it for use across all healthcare facilities.

In addition to reviewing and demonstrating PPE donning and doffing procedures, it was critical to review methods to prevent breaches in PPE to ensure staff have adequate range of motion while in PPE, understand the importance of hand hygiene throughout the doffing procedure, and know what steps to take if PPE become visibly or grossly contaminated.

To ensure the availability of appropriate supplies and quick access to contact information, the in-service trainings also provided recommendations on instituting the Special Pathogens Cart, showing facilities how to prepare a dedicated cart with PPE, disposable supplies, disinfectant, and quick access to contact information for facility leaders and the local health department. This was especially important in ambulatory and post-acute care facilities, where the risk was previously thought to be low. The COVID-19 pandemic, however, has since proved that patients may present anywhere to seek medical attention.

Mitigation strategies reviewed during in-service trainings included source control measures, such as ensuring hand sanitizer, facemasks, and tissues are widely available at points of entry for patients; ensuring symptom and travel screening are documented at registration; and engineering controls to limit exposure, such as placing a patient in a private room with the door closed if no airborne infection isolation rooms are available at the facility.

Alternate Care Sites and Isolation Hotels

In April 2020, New York City began using hotels to offload noncritical and ambulatory patients from surging hospitals.⁶ These hotels were used to hold patients who tested positive for COVID-19 or were awaiting test results and could not safely isolate or quarantine in their home. Transforming the hotel environment to fit the needs of this population required intricate planning using a range of operational and logistical processes, including infection prevention. As processes were developed, the program provided 6 in-service trainings to hotel staff between April 9, 2020 and June 5, 2020, training over 100 hotel staff. Education and training for hotel staff was focused on PPE guidance, based on location and care activities provided; extended-use protocols; hand hygiene; and strategies to prevent cross contamination within this unique setting.

Infection Prevention Environmental Assessments

As hotels continued to be used for residents in isolation or quarantine, the program conducted numerous environmental walkthroughs and assessments across multiple hotels to assess patient flow from entry to room placement, dedicated areas for clean and soiled supply and equipment, donning and doffing locations, and various procedures that require infection prevention input, such as meal delivery to hotel room, cleaning and disinfection processes, and methods to prevent cross-contamination throughout the hotel.

In addition to isolation hotels, the city opened several alternate care sites for lower-acuity patients to relieve the climbing census at hospitals. In early April 2020, the city transformed the Billie Jean King National Tennis Center into a temporary hospital.⁷ As with hotels, infection prevention strategies had to be adapted, augmented, and applied to a large, nontraditional, and, in this case, open space for patient care. An assessment was conducted to ensure staff were educated on how to don and doff PPE, appropriately store PPE in alignment with reuse protocols, identify designated locations for clean supply storage, and use various methods to prevent cross-contamination throughout the patient care areas.

Retrofitting routine infection prevention processes to unique alternate care settings with limited space and differing layouts required thorough and meticulous planning.

Guidance and Resources

As the pandemic evolved and public health guidance continued to change, it quickly became evident that healthcare personnel across the system needed readily and easily comprehensible information, rather than long, sometimes impenetrable, detailed policies. The System-Wide Special Pathogens Program developed over 15 job aids, checklists, photo guides, and training videos

throughout the spring of 2020.⁸ These resources provided concise and direct information related to the type of PPE required, based on location and patient care activity, for clinical and nonclinical staff and vendors; photo guides and just-in-time training videos for donning, doffing, extended use, reuse, and storage of PPE; and methods to prevent cross-contamination. The program closely monitored all public health guidance and promptly reviewed and updated clinical guidance and resources to ensure all material reflected the latest recommendations.

Communication and Collaboration

With a healthcare delivery system as large as NYC H+H, the prompt distribution of updated guidance, new resources, and key announcements from leadership, especially during the peak of the pandemic in New York City, was essential. In early March 2020, the program, in collaboration several departments, expanded the existing special pathogens intranet dashboard to create a dedicated COVID-19 Guidance and Resources intranet page. The COVID-19 intranet page gave NYC H+H staff easy access to policies, training tools, employee resources, frequently asked questions, and alerts and announcements from public health and NYC H+H leadership, ultimately serving as the primary source for communication throughout the system.

Although announcements, policies, and resources are continuously shared on the COVID-19 Guidance and Resources intranet page, a dedicated email address was established in March 2020 to promote ongoing communication and collaboration across the system. Maintained and monitored by the program, the dedicated email address allows staff to ask specific questions and convey issues or concerns—from job-specific questions to concerns regarding exposure and testing. The program regularly reads each new email and directs the questions or concerns to the appropriate departments.

RESILIENCY: THE PATH FORWARD

As the COVID-19 pandemic will be with us for the foreseeable future, we must adapt to this new reality. In order to prevent the spread of COVID-19, we have instituted a series of new processes and protocols that cover the patient experience: from the initial point of entry into any clinical care site to the confines of the campus and the point of exit. The System-Wide Special Pathogens Program has been working with each clinical care service line to ensure proper processes and plans are in place.

Electronic Health Records System Travel Screening

To address COVID-19 within the electronic health records system registration process, the travel screening

Table 1. Service Line-Specific Checklist

<i>Operational Control</i>	<i>Select Considerations</i>
Engineering controls	<ul style="list-style-type: none"> • Ensuring a functional HVAC (heating and cooling) system • Installing physical barriers, such as clear plastic and sneeze guards or curtains • Ensuring appropriate bed placement, such as maintaining 6 feet of separation between beds • Ensuring an adequate supply of HEPA filters • Streamlined patient transport process • Limiting the number of entrances
Administrative controls	<ul style="list-style-type: none"> • Revising human resource policies, including sick leave • Limiting gatherings and providing alternate shifts, staggered work schedules, and/or video/ audio meeting capabilities • Conducting health screening assessments at points of entry to facility • Screening, testing, and symptom monitoring processes conducted for employees • Revising communication strategies to include up-to-date clinical guidance and public health notifications • Maintaining a log of employees and visitors into facility for contact tracing
Social distancing strategies	<ul style="list-style-type: none"> • Determining the maximum number of patients who can be seen in waiting rooms • Posting social distancing markers using tape or signs that denote 6 feet of spacing in applicable areas • Rearranging furniture, removing shared objects like magazines
PPE and respiratory stations	<ul style="list-style-type: none"> • Providing staff training on PPE use and infection prevention and control • Producing and hanging posters and signage for appropriate PPE use and infection control strategies, such as washing hands • Ensuring an adequate number of sinks, respiratory hygiene stations, hand sanitizer stations as available
Cleaning and disinfection	<ul style="list-style-type: none"> • Ensuring a cleaning and disinfection plan for daily and terminal cleaning is in place • Cleaning, disinfecting, and reprocessing reusable medical supplies

Abbreviations: HEPA, high-efficiency particulate air; HVAC, heating ventilation, and air conditioning; PPE, personal protective equipment.

section was divided into 3 groups of questions that address patient symptomology, exposure, and travel. For symptomology, patients are asked a series of questions about the signs and symptoms of their COVID-19-like or influenza-like illness. For exposure, patients are asked a series of questions related to their exposure to someone with COVID-19 and their own diagnostic testing results within the past 14 days, the amount of time that correlates with the incubation period of SARS-CoV-2. Lastly, for travel, patients are asked a series of questions related to domestic and international travel to assess if they had recently visited any area with active community transmission of COVID-19 or other travel-associated infectious disease outbreaks. This entire process helps automate and facilitate early recognition of patients presenting with communicable diseases, including COVID-19.

Safety Plans

The program facilitated development of each clinical care site’s facility-specific safety plan—which includes specific processes and protocols that outline how a facility will prevent the spread of COVID-19—by creating service line-specific checklists for hospitals and post-acute and ambulatory care clinics. These checklists include high-level operational controls and a bulletined list of considerations

that are crucial to each facility’s safety plan. Table 1 summarizes the main components of the checklist.

CONCLUSION

As the COVID-19 pandemic has evolved, moving our healthcare system from conventional to disaster capacity, the System-Wide Special Pathogens Program has stayed nimble and ready to adapt. As we move into the suppression phase of the COVID-19 pandemic, we must stay vigilant and ready for all peaks and valleys this virus may bring and be prepared for other infectious diseases that may come our way.

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