Responding to unforeseen disasters in a large health system

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Purpose. To describe how health systems may respond to sudden changes in operations by leveraging existing resources and to share one organization's experience responding to the coronavirus disease (COVID-19) pandemic.

Summary. In a health system based in Illinois and Wisconsin, pharmacy services are provided by a single, integrated department responsible for all aspects of pharmaceutical care within the organization. Hospital, retail, ambulatory care, and population health services are all managed under one leadership team. All pertinent ancillary services are also managed within the department, including informatics, supply chain, and drug policy. During the COVID-19 pandemic, the pharmacy services leadership has successfully managed volume and capacity challenges by redirecting resources to where they are needed. A disaster response framework based on Federal Emergency Management Agency guidance was put in place, and change management principles were used to rapidly operationalize change. Components of the nimble response have included quickly increasing capacity, thoughtful and timely communication to all team members, strategic decision making with available data, creating an agile pool of labor, and maintaining an efficient system supply chain. Well-being and resilience are emphasized alongside reflection on lessons learned. Some changes made in the urgent response to the pandemic are being considered for long-term implementation.

Conclusion. Organizations have the potential to respond to almost any situation if they are integrated and teams work together to build flexibility. The keys to success are thoughtful maximization of existing resources and strong communication.

Keywords: COVID, emergency, leadership, pandemic, system

In late 2019, reports of a novel virus—severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)—surfaced. The world was getting used to these types of healthcare concerns: Zika virus infection had our attention in 2016, influenza hit hard in 2017, and 2018 had us worried about Ebola infection. Some health systems faced challenges related to these diseases, but most were not significantly impacted. What the world was soon to find out, however, was that the impact of SARS-CoV-2 would be devastating and require a nimbleness never before required of the healthcare industry.

Advocate Aurora Health (AAH) is a not-for-profit health system located in Illinois and Wisconsin that cares for 3 million patients annually through its 28 hospitals containing 3,874 beds, more than 500 sites of care, and 70 retail pharmacies. As it became clear that the coronavirus was going to have significant impact, leaders at all levels of the organization worked together to activate disaster plans. The complexity of the organization simultaneously provided challenges and was an asset. Daily meetings focused on the coronavirus disease 2019 (COVID-19) pandemic were initiated by hospital site leaders and the senior leadership—both within pharmacy and across service lines—to begin coordination.
of anticipated changes. The pharmacy department needed to move quickly to respond effectively and manage the changes.

A surge operations incident command (SOIC) team was formed by the health system's leadership as a guiding coalition to address the anticipated need for increased capacity and other issues, as recommended by the Federal Emergency Management Agency (FEMA) incident command system.1 One of the first objectives was to increase bed capacity by 100%, based on the anticipated patient volume and the organization's ability to staff its facilities appropriately. This team also delineated 5 levels of emergency management change to provide a framework for management of resources (Table 1).

Several new practices were implemented or expanded through the SOIC. Clinic visits were transitioned to telehealth services whenever possible, tents were constructed to manage emergency department volumes, and automated dispensing cabinet capacity was expanded. Each of these changes impacted pharmacy operations, sometimes with potentially positive long-term implications.

Retail pharmacies expanded a curbside pickup service from a single-store pilot project to implementation at all stores within 2 weeks. This service now accounts for 30% of all store transactions and will continue indefinitely. Mail-order pharmacy service was promoted as a no-contact, reliable service, and patients have embraced this option, as evidenced by a 270% increase in volume from January to June 2020, with no increase in patient complaints. All retail pharmacies remained open by following system safety practices.

The system pharmacy department worked to manage numerous changes in staffing, practice, and operations, in addition to organization-wide incident command and emergency management responsibilities. System pharmacy services supported sites by shuffling staff to accommodate demand, compounding highly used medications centrally, and expediting the establishment of infrastructure to support new units in the electronic health record (EHR) with order verification, medication distribution, and clinical review. Key elements of responding to the organization’s needs included communication, working with fluid infrastructure and the operations of central business units, to manage numerous changes in staffing, practice, and operations.

Communication

During a command and control situation, communication of changes and rationale becomes vital to keeping team members synchronous. The classic question of communication in leadership is whether priority should be placed on timeliness or accuracy; unfortunately, in a situation of rapid change out of necessity, the former is generally recognized as the best path. Messages need to be regular and efficient, which is a challenge in a department with over 2,000 employees.

The pharmacy leadership team consists of a “cabinet” of vice presidents and directors with system-wide scopes of responsibility who report to the system vice president of pharmacy. They are responsible for the department’s strategy and the operations of central business units. Each hospital or retail territory is led by a director who reports to one of the vice presidents. The directors implement system changes and manage site-specific needs.

The pharmacy cabinet met daily for an hour to discuss a standard agenda that consisted of updates on system incident command, human resources (HR), staffing issues, capacity planning, staff messages, regulatory changes, supply issues, and anything else escalated to the pharmacy leadership. This strategy created a forum for swift

| Table 1. Emergency Management Change Levels |
| Level | Summary | Components |
|-------|---------|-------------|
| 1     | Protocols in place | Incident command and all protocols in place |
| 2     | Units established at all acute care sites | Every acute site has a designated unit for affected patients; temporary testing sites erected across most acute campuses; 1–800 consumer number launched; virtual visit availability extended to 24/7; targeted elective procedures and well visits postponed; visiting hours modified |
| 3     | ICU capabilities expanded | ICUs converted to multiple-patient room occupancy; ICU capabilities expanded into other appropriately equipped units at acute care sites; expanded postponing of procedures and visits |
| 4     | Targeted ambulatory sites repurposed for nondisease care | Targeted services moved to key ambulatory sites to help stem spread and free capacity for affected patients |
| 5     | Temporary/pop-up acute care sites created in nonhealthcare locations | In partnership with government, nonhealthcare sites such as hotels and retail space converted to patient care sites |

Abbreviation: ICU, intensive care unit.
decision making and allowed for high-level discussion of issues. The participants were limited to cabinet leaders and critical partners such as the HR team, which was an important factor for efficiency and departmental representation. The flow of the meetings was to report updates and ask clarifying questions to ensure all were aware of needs and developments related to each of the agenda topics. Action items and in-depth discussion were addressed outside of the cabinet meeting. Within the first week of the coronavirus response, a blue-sky session referencing the ASHP coronavirus toolkit to prioritize action items was conducted.

Another consolidation strategy was streamlining communication to the entire pharmacy department. There was initially a high volume of daily emails ranging from infectious disease recommendations to regulatory updates. Consolidation became a priority to avoid overwhelming frontline team members and mitigate the risk that changes would be overlooked. A structured process of submitting communications to the pharmacy senior communication advisor arose. The advisor was able to aggregate updates daily and send them directly to all pharmacy team members. All communications were also uploaded to the pharmacy department website to provide access to team members looking for information. Attachments were minimized in favor of links to ensure document control.

Weekly live webinars by the system pharmacy leadership discussed the coronavirus situation and efforts to support sites, connecting system pharmacy leadership with frontline employees. Before the coronavirus pandemic, similar webinars were used to communicate department changes, and the increased frequency of webinars during the COVID-19 response garnered positive feedback from attendees. These webinars included a real-time question and answer portion and were recorded for on-demand viewing. Highlights from sites were shared when impact planning became more prominent. For example, the pharmacy director from the site experiencing the biggest influx of patients shared lessons learned during one broadcast. Connecting sites that had experienced volume increases with sites anticipating such increases gave perspective and continuity to the changes being made as a system.

Another forum to coordinate efforts was a daily planning call for site pharmacy leadership teams. Sites needing system support were able to escalate their needs to key players in pharmacy automation, informatics, and remote order verification. The primary goal of the calls was to synchronize changes needed to operationalize site plans for increasing bed capacity. Examples include conversion of perianesthesia care units to intensive care units (ICUs), private rooms to semiprivate rooms, and outpatient areas to medical-surgical units. Creation of new units and changes in unit scope were prioritized, and operational plans were communicated. This created a streamlined pathway for getting information to key stakeholders to accelerate unit creation or conversion.

The health system also created a coronavirus resources page with consistently updated information as a "one-stop shop" for handling employees’ questions and support needs. One of the resources on this Web page was a link to pertinent medication information that was managed by the system pharmacy team. Pharmacy information included treatment guidelines and medication handling procedures. Pertinent updates were emailed daily in the same fashion as pharmacy updates, with communications consolidated whenever possible.

It is very difficult to measure the success of communication efforts, especially when there are so many changes in a short period of time. However, from the 2019 engagement survey to the 2020 survey, which was completed after the first surge of COVID-19 cases, the score for the question regarding timely, transparent, and useful communication jumped 14.9 points. The score regarding trust in senior pharmacy leadership also increased, by 16.4 points. These results would indicate that the efforts collectively put into communication and dissemination of information were valued by team members.

**Clinical and operational decisions**

Under normal circumstances, every attempt is made to make data-based decisions and implement changes in alignment with the overall department strategy. The rapidly evolving coronavirus situation made that approach impractical, and decisions were made faster and with less information.

Clinical data were of poor quality during the entirety of the initial coronavirus pandemic response. Organizations such as the Centers for Disease Control and Prevention (CDC)^3^ and Institute for Health Metrics and Evaluation (IHME)^4^ made recommendations, and trials of a multitude of therapeutic options were started, but the data quality was inferior to the usual standard. Nonetheless, the pharmacy drug policy center (DPC) team collaborated with physician experts to create use criteria for popular therapy options and treatment pathways. Treatment pathways and internal guidelines from the DPC and internal expert committees are a staple for our general practice, ensuring consistency in treatment and predictable practice. In one example of efforts in this area, remdesivir distribution was coordinated with state health departments, since regulations were changed frequently and varied across borders. The DPC, infectious disease pharmacists, and interdisciplinary leadership collaborated on internal guidelines to identify patients who were the most appropriate candidates to receive this therapy.

A dashboard comparing current needs to available resources was created by the system’s center for health information services (CHIS) to track system resource utilization. This included vital information such as total numbers of beds, ICU beds, and ventilators needed within the system. The
Establishing a labor pool

The differing labor needs of various practice sites posed a significant system challenge. Some hospitals were at maximum capacity, while others were able to take on extra work due to low census resulting from the postponement of elective procedures. To address this situation, a centralized labor pool was established. This labor team was responsible for formulating a plan to redistribute employees to where there was a need and to minimize furloughs.

The labor team tracked staffing needs and created a list of individuals and their skills to coordinate training for redeployed employees. The list was created through a system-wide survey of all inpatient, ambulatory care, and retail pharmacy staff. When a report of need was received, the labor team created an algorithm to compare the skills needed, location of need, and other factors to a list of employees (Figure 1). The process ensured that all stakeholders involved in redeployment were coordinated.

Current employees were the primary source for the labor pool to be redistributed as appropriate. Also, job postings targeting recent pharmacist retirees, pharmacy students, and technicians were created. A factor in deciding who to deploy first was the degree of training needed. A skill tree was created to systematically allocate people to where they could provide value (Figure 2). To bolster pharmacist support, many pharmacists applied for temporary license transfer through the conduit created in each state.

Two centralized services were expanded to offload work from sites: the integrated service center (ISC) and pharmacy integrated clinical services (PICS). The ISC, which is typically responsible for centralized packaging, clinic procurement, and product distribution, was able to quickly expand the quantity and variety of compounded medications to reduce workload on individual hospital sites. The advocacy of state and national pharmacy organizations led to changes in Food and Drug Administration guidance that allowed this expansion. Technicians were redeployed from hospital sites to the ISC to compound products. The PICS, the system’s remote order verification team, expanded its hours of operation and increased the number of units covered. Emergency licensing provisions in both Illinois and Wisconsin allowed more flexibility to align assignments with volumes.

Medication histories were compiled by phone to encourage safety by reducing contact with patients. This approach also allowed sites with reduced censuses to support sites with staffing needs. Pharmacists and technicians from the retail sites were quick to step up and volunteer to support medication history-related activities; since the same EHR platform is used in all of the system’s retail pharmacies and most of its hospitals, they needed minimal training. This serves as a good example of how the labor pool attempted to use available resources.

These innovations are being evaluated for continuation as a “new normal” due to the positive response received from staff. Over the past several years, a labor pool has been coveted as a means to support sites with short-term staffing needs. Some sites were challenged to reach medication history completion goals prior to the pandemic, and continuing remote support could help them reach this goal in the future. Management of the system pharmacy labor pool will move to a permanent team.

Supply chain efficiency

Pharmacy supply chain (PSC) activities are managed by a system team. Daily supply chain calls were used during the acute response to coordinate site inventory updates and answer questions about supply concerns. Inventory numbers were collected and managed centrally, with the PSC team leading recommendations on product redistribution.

Multiple strategies were employed to ensure hospitals had an adequate medication supply, including maximization of product allocations, increasing on-hand inventory, bulk purchases, and supply redistribution. Additionally, products on the coronavirus treatment algorithm were inventoried daily, and the central team made recommendations on how sites should adjust purchasing habits for items in high demand. Use criteria were established to allocate products to the patients who would benefit most.
One example of the PSC team working in conjunction with the DPC and pharmacy and therapeutics (P&T) committee was the response to an anticipated shortfall of albuterol metered dose inhalers (MDIs). As supplies were dwindling across the country and wholesalers began to allocate supply, PSC expressed concern. In response, the system DPC team researched and compiled recommendations for albuterol inhalers to implement a conservation program, which included pivoting from patient-specific distribution to a common-canister process. The P&T committee and infection prevention team approved this model, which was rapidly operationalized.
to reduce inhaler waste. To mitigate safety concerns, cleaning and storage requirements were developed and instructional videos were created and distributed.

Management of limited supplies and medications is a constant for the PSC team, pandemic or not. As regulations related to PPE began to be changed, procedures were modified to conserve supplies and PPE items were redistributed in the same way as medications when necessary. Team members were encouraged to be creative and contribute to new approaches. When ideas such as compounding hand sanitizer or adjusting emergency response teams to minimize exposure surfaced, each one was vetted thoroughly.

**Well-being and resilience**

Well-being and resilience cannot be permitted to take a back seat, especially in times of high stress and dynamic workload. The pharmacy department undertook efforts to maintain well-being, including a “buddy system” for leaders, workload redistribution, and consistent messaging. There was an amazing display of positivity throughout the pharmacy department and organization. Humor was also incorporated where it was appropriate by distributing relevant memes to leaders.

Most pharmacies participated in the nationwide “A World of Hearts” campaign, displaying colorful hearts in the pharmacy windows and anywhere patients or team members could see them. Local businesses donated food and care packages to hospital departments, including pharmacies. Some site pharmacy departments sent care packages to other sites with surge workloads to show support and solidarity.

Managing the pandemic as one team brought out organic collegiality.

**Conclusion**

Now that the management of the coronavirus pandemic has shifted from an acute response to a chronic approach, the changes implemented in response to this crisis are being evaluated to determine if they are sustainable solutions. The HR team is evaluating work from home as a long-term option for team members not providing direct patient care. Remote medication history taking is being evaluated systematically to determine the impact on quality and productivity, which may lead to expansion of services. Creating a labor pool has made a case that on-demand support is in dire need; therefore, the pharmacy director of business operations has put together a task force to evaluate sustainable solutions. All of these and more changes are being evaluated on a strategic level.

Change management5 has been another critical process in managing coronavirus response. Pharmacy cabinet, P&T committee, and organization leaderships created vision and increased communication frequency. Employees in the organization brought ideas forward and were celebrated through several channels, boosting a sense of collaboration. Change is always difficult, but the AAH process was successfully adapted for short-term decisions.

Efficiencies have been created, while AAH has instilled an ability to be nimble and respond to challenges as a system. The system pharmacy leadership is compiling a toolkit of materials for situations where we need to increase flexibility in the future. The tools will be made available on a shared platform and maintained through document control. Lessons learned are being extracted to further improve our ability to respond to everyday challenges, whatever they may be.

Preparedness in the face of an unexpected disaster is dependent upon excellent communication, flexibility, cooperation, effective use of resources, and resilience. The established framework of FEMA incident command was a helpful starting point, but quick assessment and leveraging of all aspects of the system pharmacy department have been critical to managing this unprecedented situation. Through it all we have found that the biggest challenges can sometimes present unforeseen opportunities.

**Disclosures**

The authors have declared no potential conflicts of interest.

**References**

1. Federal Emergency Management Agency. ICS resource center. https://training.fema.gov/emisweb/ics/index. html. Accessed May 26, 2020.
2. American Society of Health-System Pharmacists. ASHP COVID-19 resource center. https://www.ashp.org/COVID-19. Accessed April 13, 2020.
3. Centers for Disease Control and Prevention. Information for healthcare professionals about coronavirus. https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html. Accessed May 26, 2020.
4. Institute for Health Metrics and Evaluation. COVID-19 projections. https://covid19.healthdata.org/united-states-of-america. Accessed April 13, 2020.
5. Kotter JP. Leading change: why transformation efforts fail. Harvard Business Review website. https://hbr.org/1995/05/leading-change-why-transformation-efforts-fail-2. Accessed September 24, 2020.