

Providing pharmacy services in a basketball arena: Reflections on building a pharmacy in a COVID-19 surge facility

Dillon Warr, BS (MD student), Lewis Katz School of Medicine, Temple University, Philadelphia, PA

Eileen Storey, BA, (MD student), Lewis Katz School of Medicine, Temple University, Philadelphia, PA

Mark Denys, MHA, BS, RN, Student and Employee Health Services, Temple University, Philadelphia, PA

Suzanne Brown, MS, BSPHarm, RPh, Department of Pharmacy, Pennsylvania Hospital, Penn Medicine, Philadelphia, PA

Christina Rose, PharmD, BCCCP, Department of Pharmacy Practice, Temple University School of Pharmacy, Philadelphia, PA

Purpose. As Coronavirus disease 19 (COVID-19) has spread globally, hospital systems have seen an increasing strain on their ability to accommodate the growing caseload. This demand has led countries to adopt varying surge-facility or alternate care site (ACS) models to manage patient overflow. This report describes the experience of setting up pharmacy services at a city-run surge facility in Philadelphia.

Summary. The COVID-19 Surge Facility at the Liacouras Center (CSF-L) was initially developed to serve as a site for patients convalescing from acute inpatient stays in order to free up healthcare resources in surrounding hospitals. The CSF-L site required a distinct set of services to provide the desired level of care. This report details the preparations and challenges faced by the CSF-L pharmacy team in this endeavor, including identifying a pharmacy location that met regulatory requirements, obtaining proper licenses, coordinating drug procurement, filling staffing requirements, developing a formulary, defining the pharmacy and medication management workflow, and ensuring safety protocols were followed. This report explains the rationale for developing certain processes and suggests alternative options and ideal plans for developing future pharmacy services in an ACS.

Conclusion. Identifying a pharmacy leadership team early in the ACS planning process can lead to more efficient plans for pharmacy services. This report details the important steps taken, decisions made, and challenges faced in setting up pharmaceutical services at a COVID-19 field hospital.

Keywords: alternative care centers, alternate care site, COVID-19, field hospital, pharmacy, surge facility

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Address correspondence to: Dr. Rose
(rosecm@temple.edu)

Twitter: @CRosePharmD

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As coronavirus disease 2019 (COVID-19) has spread globally, hospital systems have seen an increasing strain on their ability to accommodate the growing COVID-19 caseload. This demand has led countries to adopt varying surge-facility or alternate care site (ACS) models to manage COVID-19 patient overflow. Soon after the onset of the COVID-19 outbreak in Wuhan, China, the Chinese government established a series of Fangcang shelter hospitals for the management of mild to moderate COVID-19 cases.^{1,2} ACS facilities have appeared in the most hard-hit

areas of the United States, including New York City, Boston, Baltimore, and Philadelphia, with many more US cities planning to open sites in the event of another case surge.³ US Department of Health and Human Services (HHS) guidance on establishing an ACS recommends a formal process to establish pharmacy services based on site and patient needs.⁴ Each site may be unique in terms of physical location, resources, and leadership. In order to develop pharmacy services, a pharmacy leadership team should be identified, and each site should determine

licensing requirements, policies, formularies, procurement processes, workflows, and staffing models that meet the facility's specific needs. That approach is consistent with a statement released by the American Society of Health-System Pharmacists (ASHP) in 2003 on the role of health-system pharmacists in emergency preparedness.⁵ ASHP recommends that pharmacists should have a key role in the planning and execution of pharmaceutical distribution and control, as well as drug therapy management, during disasters.⁵ The following report details the preparation and framework required to create a pharmacy and incorporate pharmacy workflow into the clinical care of patients at an alternate care facility.

Planning for pharmacy services at an ACS

The COVID-19 Surge Facility at the Liacouras Center (CSF-L) in Philadelphia was established to serve as a field hospital for patients convalescing from acute inpatient stays in order to free up healthcare resources and increase capacity in surrounding hospitals. The CSF-L site differed from previous field hospitals and the Fangcang shelters in that it served not as an isolation tool or overflow facility for patients with mild COVID-19 symptoms but as a hospital care ACS providing care for patients who would otherwise need monitored inpatient care.¹

On March 27, 2020, it was announced that Temple University's Liacouras Center would be the site for the City of Philadelphia's field hospital. In preparation for a potential strain on regional hospitals in April 2020, Philadelphia's Office of Emergency Management (OEM) arranged for the use of the Liacouras Center, Temple University's basketball arena, and transformed it into a surge hospital in the course of 10 days. The CSF-L site was a 152-bed facility designed as a hospital-level ACS to care for patients recovering from acute inpatient hospital stays, and pharmacy services were tailored to that expected level of care. It was determined that the CSF-L site

KEY POINTS

- Pharmacy leaders with a background in administration and clinical practice should be identified early in the alternate care site (ACS) planning process so that pharmacy workflow design can be based on site-specific factors.
- Licensing of an ACS pharmacy is needed to arrange drug procurement processes and ordering of equipment required for safe storage and distribution of medication therapies.
- Pharmacy staff members with experience in hospital practice, development of a strategic formulary, the use of an electronic medical record, and use of automated dispensing cabinets are preferred in order to establish an efficient and effective ACS pharmacy.

would care for only adults (>18 years of age) who tested positive for the COVID-19 virus. Criteria for patient admission were developed to ensure that transferred patients had access to the resources required for their level of care (Box 1).

The pharmacy leadership team was not identified until 9 days after CSF-L operations and the medical leadership were determined and site setup was initiated. ASHP suggests that determining the required level of medical care in a field hospital and identify a pharmacy leadership team are critical first steps in establishing pharmacy operations.⁶ Identifying the pharmacy leadership early in the planning process is essential to ensure that all of the appropriate regulatory, safety, and workflow processes are identified. There were several critical items that needed to be considered in the formation of CSF-L pharmacy services: (1) the physical pharmacy location, (2) the licensure requirement for the CSF-L pharmacy,

including a board of pharmacy license and Drug Enforcement Administration (DEA) registration, (3) the source of medication procurement, (4) pharmacy personnel responsibilities, (5) formulary development, and (6) medication management and workflow.

Physical pharmacy location.

Determining the physical location of the pharmacy was one of the key initial steps in planning pharmacy operations. Even more so than during the setup of field hospitals in wartime or after natural disasters, the risk of infection was a major consideration in planning. To protect all of the facility's employees and volunteers, patient contact areas on or near the floor of the arena were designated as the Red Zone, while non-patient care areas were designated as the Green Zone. Finding a suitable location for a pharmacy in a basketball arena was a challenge due to several key constraints: The pharmacy would need to be (1) located in the Green Zone to minimize staff exposure to infected patients, (2) easily accessible for medication delivery, and (3) in a secure location to restrict access to nonpharmacy staff. According to most state laws, the minimum requirements for a pharmacy include a secure location that is not accessible to nonpharmacy personnel, access to a sink with running water, and a climate-controlled environment. In the basketball arena, the only areas that could be secured and locked overnight were lounges, dressing rooms, and concession stands. A midsize lounge with a locked door and in close proximity to the patient care areas was designated as the pharmacy. Figure 1 illustrates the final location of the CSF-L pharmacy in relation to other areas of the facility. Pharmacy leaders tasked with creating future surge facilities using a stadium model should consider the pharmacy location as a top priority in logistical planning.

Licensure requirements. Each state's board of pharmacy may have unique regulations on licensing a pharmacy in a field hospital. The board of pharmacy should be contacted

Box 1. Clinical Criteria for Admission to CSF-L**Admission criteria**

- COVID-19 swab positive
- Requires minimal assistance for ambulation and ADLs (ie, feeding, dressing, personal hygiene, toileting)
- Age of >18 years
- Able to tolerate oral diet

Exclusion Criteria

- Confirmed pregnancy
- Oxygen requirements of ≥ 6 L normal flow nasal canula or signs of impending respiratory failure
- Tracheostomy dependent
- Chest tube or other cavity drainage devices
- Nasogastric tubes for nutrition and medication
- Dialysis dependent
- Central or arterial line (except PICC lines)
- Surgical patient (≤ 2 days postoperatively)
- Communicable disease (besides COVID-19) requiring isolation precautions (eg, *Clostridioides difficile* infection, TB, MRSA infection, VRE infection)
- Body weight of >136 kg (300 lb)
- Any concerning laboratory trends within 48 hours of time of transfer (eg, worsening troponin levels, LFT results, or renal function)
- Receiving ongoing treatment with a study medication
- Treatment with a DEA Schedule II medication
- Ongoing cancer or transplant treatment
- Any type of monitoring required more frequently than every 4 hours
- Open wounds requiring wound care
- Homeless without defined housing disposition

Abbreviations: ADL, activity of daily living; CSF-L, COVID-19 Surge Facility at the Liacouras Center; DEA, Drug Enforcement Administration; LFT, liver function test; MRSA, methicillin-resistant *Staphylococcus aureus*; PICC, peripherally inserted central catheter; TB, tuberculosis; VRE, vancomycin-resistant enterococci.

for guidance as soon as planning for the field hospital starts. The National Association of Boards of Pharmacy's Task Force on Emergency Preparedness, Response, and the US Drug Distribution System recommended to all state boards of pharmacy that during a state of emergency, a temporary pharmacy facility can be created if it is under the management of a pharmacist-in-charge, it is located in a declared disaster area, and the board is notified of its location.⁷ The board has the authority to approve the temporary pharmacy and may make arrangements to monitor and inspect the facility. The CSF-L pharmacy was licensed as a satellite pharmacy

of the City of Philadelphia's Public Health Center 1 and approved by the Pennsylvania State Board of Pharmacy.

Following declaration of a nationwide public health emergency by the secretary of HHS on January 31, 2020, DEA granted DEA-registered hospitals and clinics permission to use their existing license to allow satellite hospitals and clinics providing care to patients with COVID-19 to handle controlled substances and to allow distributors to ship directly to those locations even though they were not registered facilities. If a hospital or clinic is not an affiliate of or owned by a DEA-registered hospital or clinic, it can still obtain a DEA license by entering into a written

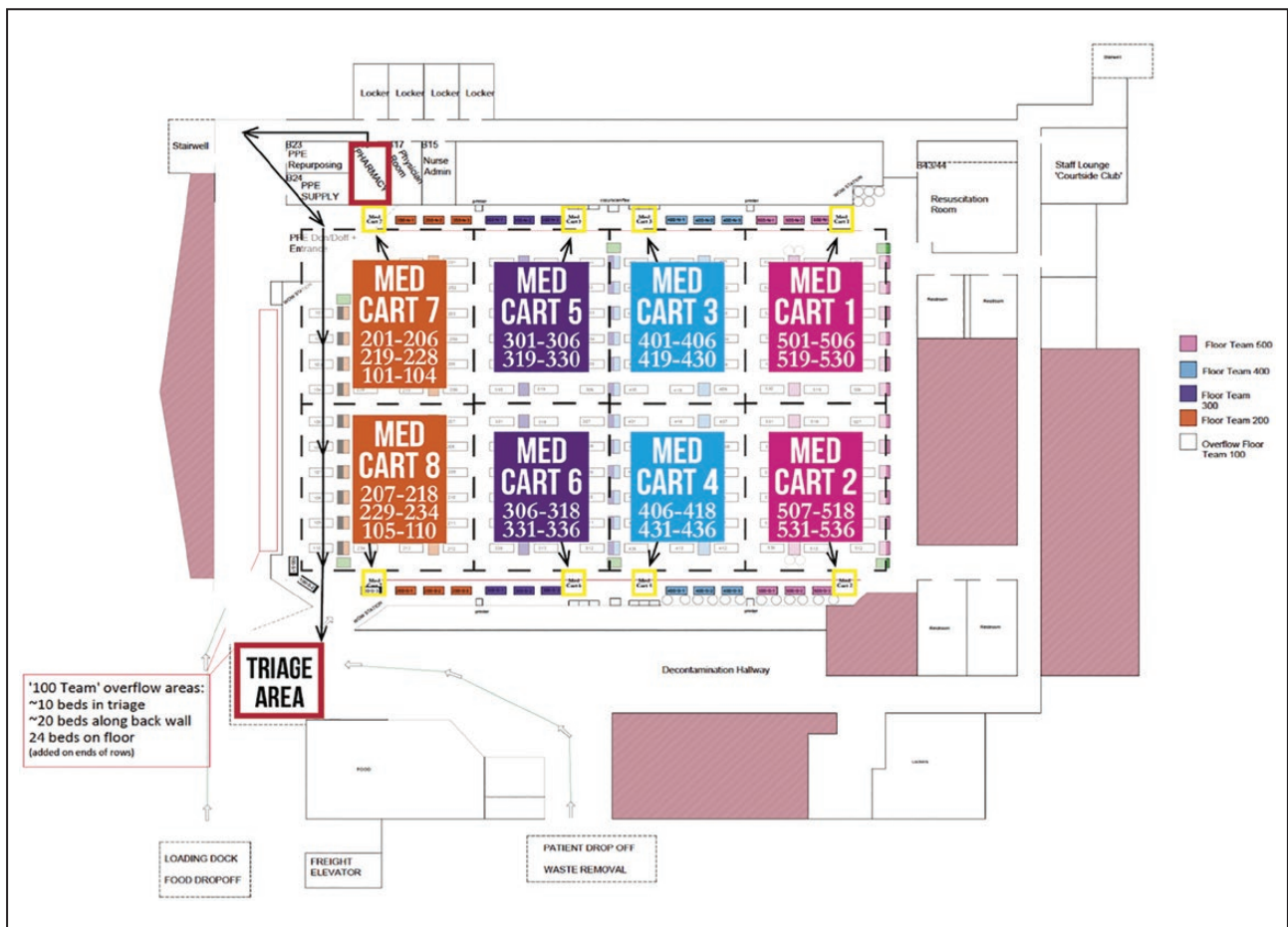
agreement with the satellite hospital or clinic or request an emergency DEA license by emailing Natural.Disaster@usdoj.gov.

Medication procurement. The method of drug procurement depends on how the facility is licensed. During a public health emergency such as the COVID-19 pandemic, the HHS Office of the Assistant Secretary of Preparedness and Response, in coordination with the Federal Emergency Management Agency (FEMA), may deploy the Strategic National Stockpile (SNS) cache of medication therapies to supply an ACS facility. The ACS facility leadership and personnel may not even be aware they will receive such supplies, nor are supplies guaranteed to contain all therapies necessary for patient care. The CSF-L site received mutual aid from the SNS and a starting supply of medication from a local academic teaching hospital while a subaccount through a wholesaler was being approved.

For facilities that are opened by a local government and require a temporary pharmacy and DEA license, the ACS pharmacy can create an account with a wholesale distributor. If licensed as a satellite of a hospital or clinic, the pharmacy can be granted a subaccount within the parent account under an existing master agreement allowing for shipments to the ACS.

An ACS set up in a stadium, arena, or other nonmedical facility will not have the capability to compound and dispense sterile intravenous (IV) medications. The CSF-L site did not have access to IV infusion pumps for medication administration, which also limited the number of IV therapies that could be utilized and led to additional patient admission restrictions. Potential options for procurement of IV therapies may include a contract with a registered 503B outsourcing facility and allowing use of premixed therapies in manufacturer packaging. A facility may also allow for administration of compounded IV preparations for emergent use or IV push antibiotics; CSL-L leaders determined that such decisions would be made on a case-by-case basis.

Figure 1. Locations of medication carts at the alternate care site.



As it turned out, such preparations were not needed during the time the facility was admitting patients.

Pharmacy personnel responsibilities. In addition to identifying medication needs for the facility, it was also critically important for the CSF-L pharmacy team to determine staffing needs and identify both available and competent pharmacists to fill required roles. Ideally, such pharmacists' expertise and experience should be congruent with the site setting (eg, acute care pharmacy). The CSF-L pharmacy operated with a combination of on-site pharmacists and pharmacy technicians during the day and off-site pharmacists for overnight remote order verification and pharmacy services. Pharmacist interventions were recorded in the electronic medical record (EMR) system

(Epic Systems, Verona, WI) using the Epic iVent function in the course of order review. Pharmacy leaders intended to staff with at least 1 pharmacist and 2 pharmacy technicians per 75 patient beds during daytime hours. The pharmacist:patient ratio differed considerably from those at Fangcang shelter hospitals in Wuhan, in which 3 to 5 pharmacists were on-site per 1,000 patient beds.^{2,8} However, the Fangcang shelter hospitals were designed to handle mild COVID-19 cases, while the CSF-L site was modeled after a medical/surgical hospital unit. Other shelter facilities in China frequently used telemedicine to provide pharmacy services, so the number of pharmacists involved in the care of patients in Chinese shelter hospitals was greater than the number of on-site staff.⁸ It was decided

that if the CSF-L site filled to maximum capacity, more remote pharmacists would be deployed during the day shift to provide medication verification and patient counseling and for responding to drug information questions, reporting adverse drug reactions, and reviewing medication therapies to assure levels of quality and safety similar to those achieved by pharmacy services in the Chinese Fangcang shelter hospitals in Wuhan.^{2,8}

Licensed pharmacists with experience in hospital-based practices and the Epic EMR system were ideal candidates for the CSF-L site. Since the COVID-19 crisis placed increased demand on the healthcare system, recruitment of hospital pharmacists proved more difficult than anticipated. The pharmacy team initially partnered

with Philadelphia's Medical Reserve Corps (MRC). MRC provided a list of interested pharmacists and pharmacy technicians with varied levels of experience, but most lacked prior experience working in an acute care setting or with an EMR system. Each volunteer's limited schedule made it difficult for MRC to serve as the only source of the pharmacy workforce. Other potential sources of pharmacy staff included local school of pharmacy faculty and students. To supplement the volunteers obtained through MRC, a local staffing agency that the City of Philadelphia was already contracted with was used as a source of pharmacy and other healthcare staff in order to provide a more consistent and experienced workforce.

Since the field hospital environment varies considerably from routine practice environments, it was critically important to train all onboarding staff members in site-specific pharmacy workflows and processes.^{9,10} Since most pharmacy staff members had no prior Epic EMR experience, the pharmacy team coordinated in-person training and online training resources and provided a comprehensive orientation that included standard CSF-L procedures, pharmacy policies, and workflows.¹¹ COVID-19 treatment protocols and links to free references available through ASHP¹² were reviewed as part of the orientation process. The pharmacy leadership was available either on-site (during usual operating hours) or by phone (during off-hours) to answer any questions.

Formulary development. The CSF-L formulary was designed to accommodate the medication needs of patients with COVID-19 treated in a traditional medical/surgical unit. The formulary was developed by reviewing a list of inpatient medications used to treat stable patients with COVID-19 at Temple University Hospital (TUH), a large academic teaching institution in Philadelphia, as well as common drug classes used to treat chronic medical conditions. The World Health Organization (WHO), FEMA, and

ASHP field hospital formulary guides were also considered.^{6, 12} Medications required for the emergent treatment of cardiac decompensation were also included.

In order to keep the formulary limited, only 1 or 2 medications from each therapeutic class, with limited numbers of dosage forms, were included in the formulary. Injectable medications were limited to intramuscular and subcutaneous preparations due to inability to compound sterile IV products and a lack of IV pumps. Patients requiring Schedule II controlled substances were not accepted for admission to the facility due to the inability to adequately secure those drugs. CSF-L leaders decided that if patients were admitted with their own supply of Schedule III or IV medications, a pharmacist would identify and count those medications and document this information on a controlled substance log sheet. The charge nurse would be responsible for documentation of daily inventory in a controlled substance log, drug administration, and secure storage of scheduled drugs using a lockbox. The log would be checked by pharmacy personnel daily and before discharge to rectify any discrepancies. Determination of whether controlled substances will be permitted in a field hospital should be done early in the planning process to allow adequate time to develop policies for storage and handling. Access to an automated dispensing cabinet (ADC) can significantly simplify this process.

The final CSF-L formulary was designed to allow for sufficient medication management when used in conjunction with patient-supplied medications (Box 2).

The clinical pharmacist worked with the chief medical officer and medical staff to approve the formulary and develop admission order sets, which included therapies for respiratory care, acute pain, sleep, delirium, venous thromboembolism prophylaxis, bowel management, nausea, gastroesophageal reflux disease management, and migraine treatment. These order sets were

critical to ensure that formulary therapies for common chronic or symptomatic conditions were selected by providers. As has been done at other ACS sites, therapeutic interchange of agents in commonly used drug classes (angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, proton pump inhibitors, histamine H₂ receptor blockers, second-generation antihistamines, and inhaled corticosteroids) for available formulary agents was allowed by the pharmacists.^{2,9} These protocols were modified from approved protocols at TUH and approved by the CSF-L medical staff.

Medication management and workflow. The pharmacy workflow involved 4 key processes: (1) patient admission, (2) new medication orders, (3) medication administration, and (4) patient discharge (Figures 1-3). The workflow was similar to that of an inpatient hospital medical/surgical unit but allowed for use of patient-supplied medications. Since ADCs were unavailable for purchase or use, all patient medications were stored in secured medication carts with patient-specific drawers located in patient care areas (Figure 1). A stock medication cart containing medications required to treat emergent conditions was also available to nurses when a pharmacist was not on-site. A code cart containing medications needed to treat cardiac or respiratory arrest was maintained in a resuscitation room separate from the patient care area to limit potential access. A process for reporting of any patient safety issues and medication errors on a paper report form was developed by the nursing staff leadership. When an error or safety issue was reported, the leadership and staff of the applicable departments created an action plan to prevent future issues.

Patient admission. Patients were required to arrive with at least a 5-day supply of medications dispensed and appropriately labeled by an outpatient pharmacy, and the CSF-L pharmacy dispensed any additional medications deemed necessary by the admitting providers. This process, while cumbersome,

Box 2. Medications in CSF-L Formulary by Therapeutic Category^a

Antiviral	Emergency
Hydroxychloroquine	Adenosine ^{b,e}
Antibacterial	Amiodarone ^{b,e}
Amoxicillin/clavulanate	Atropine ^{b,e}
Azithromycin	Calcium chloride ^{b,e}
Cefpodoxime	Dextrose ^{b,e}
Levofloxacin	Epinephrine
Linezolid	Etomidate ^{b,d}
Analgesic	Glucagon ^b
Acetaminophen	Lidocaine ^{b,e}
Gabapentin	Magnesium sulfate ^{b,e}
Ibuprofen	Naloxone ^{b,e}
Ketorolac ^b	Norepinephrine ^{b,e}
Cardiovascular and anticoagulants	Rocuronium ^{b,d}
Amlodipine	Sodium bicarbonate ^{b,e}
Apixaban	Succinylcholine ^{b,d}
Aspirin	Gastrointestinal
Atorvastatin	Bisacodyl
Bumetanide	Bismuth subsalicylate
Carvedilol	Famotidine
Clopidogrel	Loperamide hydrochloride
Diltiazem	Magnesium hydroxide
Enoxaparin ^b	Ondansetron ^{a,b}
Furosemide	Pantoprazole
Heparin ^b	Polyethylene glycol
Hydralazine	Sennosides ^a
Isosorbide dinitrate	Simethicone ^a
Lisinopril	Neurologic and psychiatric
Losartan	Haloperidol ^{a,b}
Metoprolol tartrate	Melatonin
Nifedipine	Olanzapine
Nitroglycerin	Quetiapine
Rivaroxaban	Risperidone
Endocrine	Sumatriptan succinate
Insulin glargine ^b	Trazadone
Insulin lispro ^b	Ziprasidone ^b
Levothyroxine	Respiratory
Metformin	Albuterol sulfate
Methylprednisolone sodium succinate ^b	Benzonatate
Prednisone	Dextromethorphan/guaifenesin
Siagliptin	Diphenhydramine

Continued on next page

was chosen in order to decrease the medications on formulary and limit the amount of medications stocked on-site. On a patient's admission to the CSF-L site, a pharmacist verified the identity of the medications brought into the facility, documented verification in the EMR, and placed medication bottles in a patient-specific drawer of a medication cart. The admitting team entered orders for these medications in the EMR, and the pharmacist documented verification of medication identity and specified that the medications were patient supplied (Figure 2). This information was able to be viewed by all patient caregivers.

New medication orders. When new medication orders were placed in the EMR, the pharmacist assessed and verified each order (Figure 3). If a nonformulary medication was ordered, the pharmacist determined if a formulary equivalent was available. If the medication had no formulary equivalent and was deemed medically necessary, it was ordered and obtained from a partner outpatient pharmacy and delivered to the facility. If the new medication was on formulary, a 24-hour supply of the medication was labeled, filled, and delivered to a medication cart in the patient care area. For stat medication orders, a nurse met a pharmacy staff member at the entrance of the Red Zone and hand delivered the medication. This strategy limited pharmacy use of PPE while expediting medication delivery. If the medication was not urgently needed, the pharmacy staff delivered a 24-hour supply to the medication carts with all other daily medications at 2 PM. All medication deliveries were batched to avoid unnecessary use of personal protective equipment (PPE) and potential staff exposure to infection. Any medications ordered after the pharmacy closed for the day were verified by a remote pharmacist. The medications were not available to patients until the pharmacy reopened. Medications required for the treatment of emergent conditions during pharmacy off-hours were available in limited supply in a stock medication cart.

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Box 2. Medications in CSF-L Formulary by Therapeutic Category

Glycopyrrolate/formoterol ^c
Mometasone/formoterol ^c
Tiotropium bromide ^c

Abbreviation: CSF-L, COVID-19 Surge Facility at the Liacouras Center.

^aOral formulations unless indicated.

^bInjection formulation.

^cInhaler.

^dRapid sequence intubation kit.

^eCode cart.

Medication administration. The EMR served to alert the nurses to any medication requiring administration and was the site for documentation of medication administration. An EMR order specified if a medication was from a patient's own supplied stock or a unit-dosed medication dispensed from the CSF-L pharmacy. All patient medications were stored in the patient-specific medication carts. Many of the technologies that have automated medication storage and administration, such as ADCs and barcode-assisted medication administration, were not available at the CSF-L site. These technologies would have been implemented if more time and resources were available. Although automation technologies were not available, regulatory agencies' and pharmacy organizations' best practices were applied to design safe medication storage and administration policies and procedures.¹³ Nurses were trained in the facility's medication administration policies and procedures. For example, only a charge nurse was able to access the stock medication cart, and independent verification of these medications was performed and documented in a log by 2 nurses before medication administration. This documentation log also served as an inventory mechanism, which was critical for tracking the current drug supply and anticipating potential medication shortages, a heightened area of concern during a pandemic given the increased demand for particular medications combined with disruptions to the supply chain.^{2,14,15}

Patient discharge. If a patient was not going to need any medication therapy

upon discharge, all medications in the patient drawer were disposed of in an appropriate pharmaceutical waste receptacle. Any unused unit dose medications could be quarantined for 72 hours¹⁶ and then placed back into the pharmacy stock to avoid unnecessary waste. Patients discharged with a new prescription had an electronic prescription sent to their outpatient pharmacy of choice, and the CSF-L staff arranged to schedule home delivery. If patient-supplied medications brought into the facility were continued upon discharge, patients were discharged with the remaining supply as well as a prescription and discharge instructions.

Infection control. Unlike field hospitals set up for other types of emergencies, those established in the setting of a pandemic are especially vulnerable to ongoing infection risk, requiring careful consideration of how to protect the staff without compromising patient care. During the planning process, the pharmacy team designed processes in coordination with teams in charge of PPE and infection control to ensure the safety of the pharmacy staff, avoid contamination of the pharmacy area, and limit waste of PPE. PPE for pharmacists and all staff consisted of N95 masks, face shields, gowns, and gloves. Areas for donning and doffing PPE upon entry to and exit from patient care areas were identified for all CSF-L staff. These checkpoints were implemented to ensure that pharmacy staff members were never in the Red Zone (patient care area) without adequate protection and never transmitted anything to the

Green Zone (the location of the pharmacy), potentially putting other facility staff members at risk.

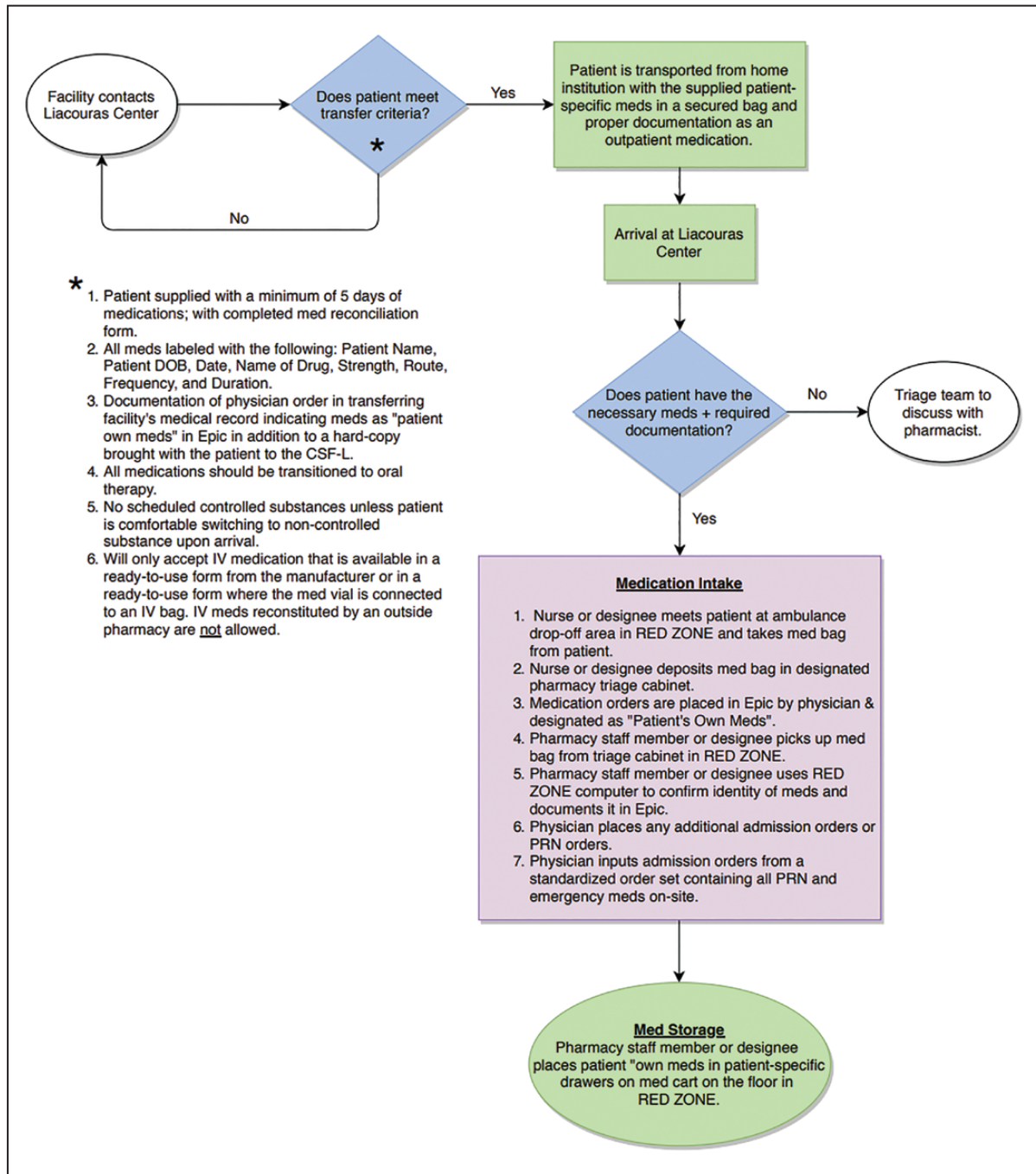
Infection control considerations also required the pharmacy team to find ways to minimize unnecessary virus exposure for pharmacists and conserve PPE by designing workflows that allowed for minimization of trips into the Red Zone and involved use of remote pharmacy services.¹⁵ The workflows were designed to allow pharmacists to update medication carts, communicate with nurses and providers, and potentially interface with patients to address medication-related issues with as few trips to the Red Zone as possible. Walkie-talkies and phones were provided to the pharmacists, nursing staff, and providers to serve as a convenient method of communication.

Pharmacists could review and verify medications in the EMR either from within the pharmacy suite in the Green Zone or from home during overnight hours. This remote order and verification system echoed similar systems created in Wuhan, China, with the same goal in mind.^{2,17,18}

Summary of challenges

Ultimately, the CSF-L site was open for less than 10 days and its staff treated only 14 patients, but the site was prepared to care for over 150 patients. The development of pharmacy processes was successfully used to care for the number of admitted patients, but there were multiple challenges faced and lessons learned. Establishing a pharmacy leadership should be a priority after the senior ACS leadership is identified; this will allow planning for all regulatory and licensing issues early in the process. If an ACS is operated by a nearby hospital or institution, the institution's pharmacy leadership may fulfill all ACS pharmacy leadership responsibilities. In forming an ACS pharmacy leadership team, designating a pharmacist with experience as a pharmacy director in hospital practice, as well as a pharmacist with a strong clinical, regulatory, and hospital-based background, should be a requirement.

Figure 2. Alternate care site pharmacy workflow for new admissions. Epic refers to an electronic medical records system (Epic Systems Corporation, Verona, WI).

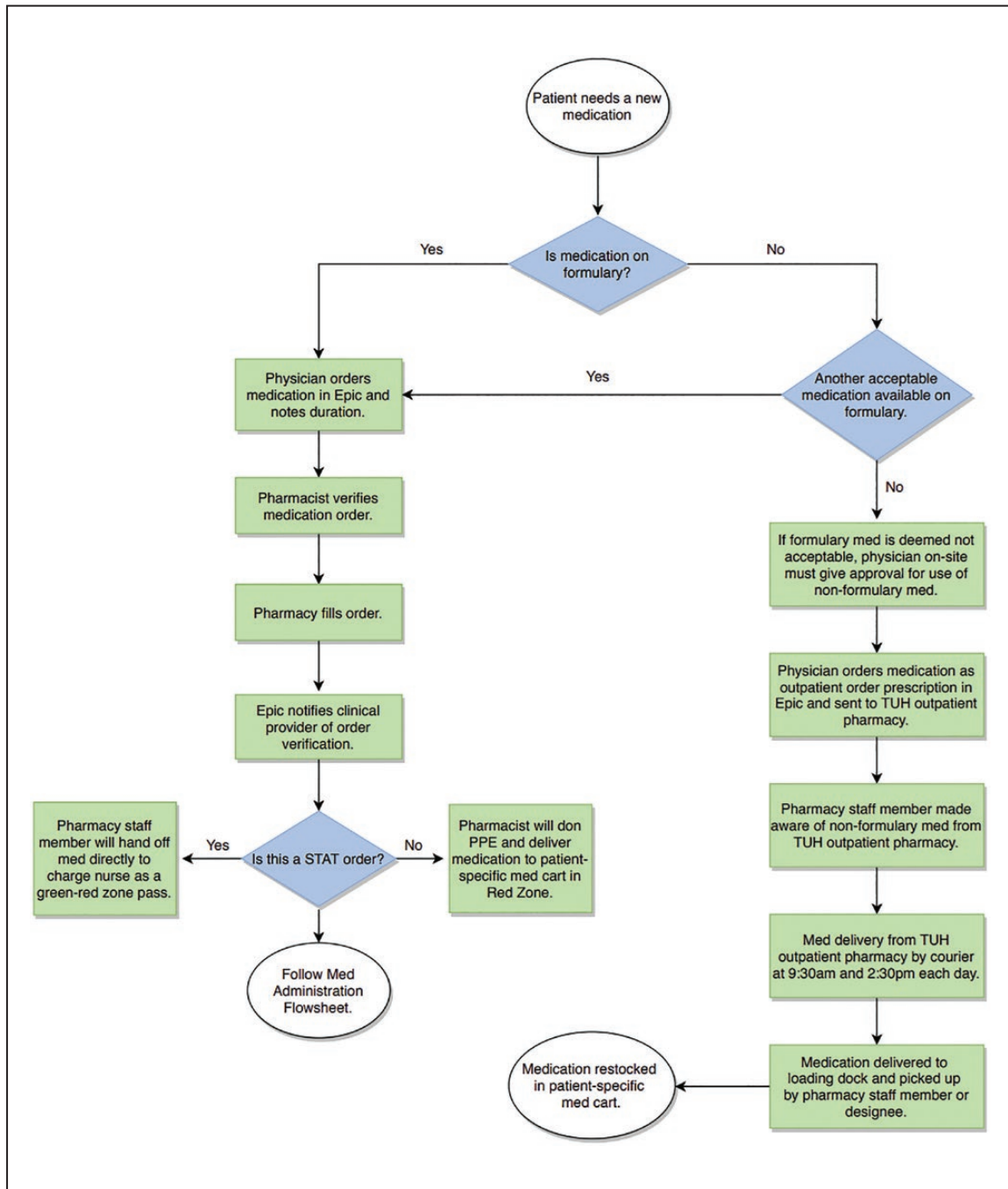


These individuals are needed to ensure that pharmacy facilities and pharmacy processes developed meet legal and regulatory standards, that supply chain resources are identified, and that formulary and clinical programs meet the needs of patients.¹⁹ After the pharmacy leadership is identified, the necessary

equipment required to maintain safe, efficient pharmacy services should be purchased and obtained. Other hospitals in surrounding areas were using all available ADCs for in-hospital COVID-19 surge management, and ADCs were unavailable to order from proprietary companies due to shortages

and shipping delays. ADCs would have streamlined pharmacy workflows considerably and would have allowed for more secure handling of controlled substances. If time had allowed, the pharmacy leadership could have contacted directors at hospitals around the Philadelphia area and requested ADCs

Figure 3. Alternate care site pharmacy workflow for new medication orders. Epic refers to an electronic medical records system (Epic Systems Corporation, Verona, WI); TUH, Temple University Hospital.



for loan or lease. Identifying qualified pharmacists to staff the CSF-L site was another difficult task. Since the site was not affiliated with a local hospital, the pharmacy leadership was responsible for vetting volunteers and hiring pharmacists and technicians. Volunteers were either unavailable for

significant amounts of time or lacked inpatient pharmacy experience, which made staffing with volunteer labor unattainable. Increased use of daytime remote order verification, working with a staffing agency early in the process, and deployment of pharmacy school

faculty and students could be additional staffing options.

Conclusion

This article details the steps taken, decisions made, and challenges faced in setting up pharmaceutical services at an ACS in Philadelphia. While some of

the pharmacy processes and challenges described overlap with those described previously in China and other areas of the United States,^{1,3,17} this report provides a comprehensive framework and offers lessons in how to develop a pharmacy and design pharmacy services given limited resources and time constraints, highlighting the need for partnerships with public health authorities, local hospital systems, and effective communication with ACS leadership.

Disclosures

The authors have declared no potential conflicts of interest.

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