

Considerations for development of pharmacy support models for COVID-19 alternate care sites

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Purpose. Guidance on alternate care site planning based on the experience of a health-system pharmacy department in preparing for an expected surge in coronavirus disease 2019 (COVID-19) cases is provided.

Summary. In disaster response situations such as the COVID-19 pandemic, healthcare institutions may be compelled to transition to a contingency care model in which staffing and supply levels are no longer consistent with daily practice norms and, while usual patient care practices are maintained, establishment of alternate care sites (eg, a convention center) may be necessitated by high patient volumes. Available resources to assist hospitals and health systems in alternate care site planning include online guidance posted within the COVID-19 resources section of the US Army Corps of Engineers website, which provides recommended medication and supply lists; and the Federal Healthcare Resilience Task Force's alternate care site toolkit, a comprehensive resource for all aspects of alternate care site planning, including pharmacy services. Important pharmacy planning issues include security and storage of drugs, state board of pharmacy and Drug Enforcement Administration licensing considerations, and staff credentialing, education, and training. Key medication management issues to be addressed in alternate site care planning include logistical challenges of supply chain maintenance, optimal workflow for compounded sterile preparations (eg, on-site preparation vs off-site preparation and delivery from a nearby hospital), and infusion pump availability and suitability to patient acuity levels.

Conclusion. Planning for and operation of alternate care sites in disaster response situations should include involvement of pharmacists in key decision-making processes at the earliest planning stages.

Keywords: alternate care site, COVID-19, disaster medicine, disaster pharmacy, disaster planning, pandemic

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An important challenge that arose in the early weeks of the response to the coronavirus disease 2019 (COVID-19) crisis was the need for pharmacy support of alternate care sites such as field hospitals. Most pharmacists had never considered this unique challenge, which posed many questions that typically had to be answered by individuals with limited or no experience in those unfamiliar practice settings. Many aspects of providing pharmacy services at alternate care sites are beyond the scope of this article; however, fortunately there are some great but little-known

resources that can assist in making better-informed decisions about the medication-use process during times of crisis.

Shifting patient care along the care continuum

Response to a disaster situation, depending on its nature and extent, may necessitate changes to usual standards of care. When a disaster strikes, shifting from usual standards of care to a surge model of care must be anticipated. Models of disaster surge reaction include conventional,

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contingency, and crisis models.¹ Under a conventional care model, patient care is provided according to the normal daily operations of a healthcare facility, and care spaces, staff, and supplies are consistent with usual daily practices. As the system fills with patients to its usual capacity, elective surgeries and similar activities may be canceled, but normal processes are still followed (think “business as usual,” with a few minor modifications).¹ As one transitions into a contingency care model, patient management necessarily begins to change; spaces, staff, and supplies are no longer consistent with daily practice even though usual patient care practices are maintained.¹ For example, an area of a hospital may be used for treatment of patients who are not normally treated there, (eg, intensive care unit [ICU] patients are housed in a postanesthesia care unit), or patients may be treated in areas that are not normally used as patient care areas, (eg, a convention center is converted to a low-acuity hospital); this is where alternate care sites fit in. When the healthcare system is overwhelmed and there is a substantial change in the level of care that can be delivered, crisis standards of care come into effect, and adaptive spaces, staff, and supplies outside the scope of usual standards of care are employed to provide sufficient care in a disaster environment.¹ Through preparedness, substitutions, and other efforts, the hope is that contingency and crisis levels are not reached. When these levels are reached, moving back to normal operations when resources become available or patient volume decreases should be the overall goal of the entire care team.

It is important to note that alternate care sites are a part of a contingency care model and that these sites are established in an attempt to provide care that is close to normal even if it is provided in an unconventional location.¹ Additionally, it is important to illustrate that an unconventional location, such as a convention center, does not have the same infrastructure as a traditional healthcare facility. Most pharmacists

do not realize that during medication shortages, they are operating in a contingency care mindset—providing the best care but with some modifications to the normal or standard level of care. To successfully and efficiently achieve a functional, near normal level of care, use of unconventional spaces is best suited to low-acuity, non-COVID-19 patient populations. If the same space houses high-acuity, ICU-level patients, there is a substantial decrease from the normal level of care for those patients in addition to the significant effort needed to provide a high level of complex care outside of a hospital setting.

Current crisis management

In responding to the COVID-19 crisis, a pharmacist team at our institution was tasked with creating a medication list to be used in the event that a large, urban, multihospital health system needed to set up an alternate care site at an off-site location (ie, a convention center) for non-critically ill, general medicine patients without COVID-19. These patients’ lower care acuity could be supported at the alternate site to free up critical hospital beds. To respond quickly to the request for alternate care site planning, several resources were pulled together to aid in the decision-making process. Most of these resources have limited visibility in the pharmacy arena. We highlight these resources here so that other pharmacy decision makers in similar circumstances can quickly locate and use them in COVID-19 surge planning and in preparing for disasters that might occur in the future. Two key resources should be highlighted:

- The “Alternate Care Sites” guidance document posted within the COVID-19 resources section of the US Army Corps of Engineers website, which provides medication and supply lists²
- The Federal Healthcare Resilience Task Force’s alternate care site toolkit,³ a comprehensive resource for all aspects of alternate care site planning, including pharmacy services

(see “Topic Collection: Pharmacy” section⁴)

Development of these documents was based on the extensive experience of the US government in responding to disasters. The provided medication lists are similar to what the US Public Health Service’s Rapid Deployment Force teams and the National Disaster Medical System teams use when responding to disasters such as Hurricanes Maria and Irma. Although the recommended disaster response medication caches will not be a perfect fit for all circumstances, they are designed for use in responding to most disaster types.

In addition to using available federal resources, our pharmacist team utilized our healthcare system’s historical automated dispensing cabinet (ADC) data to evaluate medications dispensed in multiple large Utah hospitals on general medical floors, as well as a list of the 200 most commonly used drugs in the United States.⁵ The resource lists were combined and evaluated through a consensus approach by 4 pharmacists with diverse pharmacy practice backgrounds to create a final medication list using a logical, best-estimate approach to assessing patients’ needs across transitions of care. Medications on the federal list were removed if they were not on the institution’s formulary, were anti-infectives used in treatment of tuberculosis (Utah is a low-transmission state), were anticipated to have low utilization based on historical ADC population data, or were drug class duplicates. The pharmacists on the team had broad multidisciplinary backgrounds, with expertise in areas including emergency medicine, disaster medicine, pediatric and adult surgery, critical care, ambulatory care, and management, and they represented multiple clinic and hospital sites across our multistate healthcare system.

Considerations for crisis management planning

Careful consideration should be paid to what in normal pharmacy operations would be small decisions but in disaster situations can result in huge downstream effects. For example, planning to support use of intravenous (i.v.) medications at an alternate site can result in a large medical supply and labor burden in a location without sterile compounding capabilities. In planning for our health system’s anticipated COVID-19 pandemic response scenario, our workgroup planned initially to support only low-acuity, non-COVID-19 populations requiring oral and/or intramuscular injections; in a stepwise approach to increasing acuity, limited gravity-flow infusions would be supported by the closest hospital pharmacy with sterile compounding capabilities. The logistical challenges of supply chain maintenance with use of an alternate care site cannot be overstated, and the workgroup planned to use the institutional supply chain process to support the planned alternate care site. Additionally, important staffing and equipment decisions must be made if sterile medication preparations are to be prepared at the alternate care site as opposed to being prepared and delivered from a nearby hospital. In an environment of limited resources, infusion pumps and their availability must be matched with patient acuity levels for administration of i.v. medications, and our workgroup anticipated limited availability of infusion pumps matched to the medication needs of low-acuity patients. There was another issue to be considered: Would sufficient nursing staff be available to maintain patients’ infusions? Our workgroup anticipated that the alternate care site would have limited nurse staffing due to mass deployment for high-acuity, COVID-19-related patient care needs in existing hospitals throughout the health system. Another consideration is the medication administration model to be utilized. Will patients maintain their own medication supply and self-administer their medications, or will the alternate care site be modeled similarly to normal hospital

Table 1. Considerations and Options for I.V. Infusion Pump Use at Alternate Care Sites

Infusion Pump Needs	Preferred Workflow	Workflow Alternatives	Resources Needed
<p>Consider obtaining infusion pumps beyond current supply</p> <p>Determine level-of-care assumptions for amount of i.v. medication use in care area(s)</p> <p>Determine criteria that necessitate patient transfer back to an established hospital</p>	<p>Continue using institutional i.v. pumps</p> <p>Can administer large-volume bags, pediatric syringes, and PCA and epidural infusions from same system</p> <p>CDS safeguards in place for added patient safety</p> <p>Nurses familiar with system</p>	<p>If institutional i.v. pumps not available, obtain infusion pumps from manufacturer</p> <p>May need 3 separate pump systems for large-volume bags, syringes, and PCA and epidural infusions</p> <p>If additional pumps not available, educate nurses to administer infusions using gravity-flow drip rates (this method only possible with i.v. bags)</p> <p>Still need infusion pumps for controlled substances (ie, PCA and epidural infusions)</p>	<p>Institutional i.v. pumps</p> <p>Pump tubing (primary, secondary, syringe pump, and tubing for PCA and epidural infusions)</p> <p>PCA keys</p> <p>Gravity flow rate guidance (per manufacturer⁶ and health system-developed references)</p>

Abbreviations: CDS, clinical decision support; i.v., intravenous; PCA, patient-controlled analgesia.

operations of nursing retrieval and administration of medications? Both are good models, but the upstream decision results in significantly different staffing needs downstream for both pharmacy and nursing services. Our workgroup anticipated using a model whereby patients would manage their own medication supply and self-administer medications at the alternate care site to reduce nursing and pharmacist staffing needs. In our recent experience, these were important questions to ask early in the planning stages that pharmacists may not normally think of asking or be involved with. Other important pharmacy planning issues include security and storage of drugs, state board of pharmacy licensing, Drug Enforcement Administration (DEA) licensing of alternate care sites, and staff credentialing, education, and training. Recent temporary relaxation of DEA rules to allow for easier support of alternate care sites by existing healthcare facilities has made some of the licensing challenges easier.⁷ Key assumptions and planning details are outlined in [Appendixes A and B](#) and in [Tables 1, 2, and 3](#).

Conclusion

Planning and operating alternate care sites involves a number of different considerations that are not normally considered by pharmacy personnel. In addition, the assumptions regarding patient care services to be provided at an alternate care site have a significant impact in such circumstances. With this in mind, pharmacists should be involved in key decision-making processes at the very early planning stages. From adaptation of policies and procedures to decisions as to what medications should be kept on hand, these are all challenges that pharmacists are not normally faced with but may need to be addressed in a stressful crisis environment. Working as a team, pharmacists, physicians, nurses, and other healthcare providers will make many good decisions together to treat patients in the best manner with the available resources at hand. Adaptation is key in successfully planning for and operating alternate care sites.

Table 2. Considerations and Options for Staffing at Alternate Care Sites

Staffing Issue	Potential Workflow	Alternative Workflow	Resource Need and Considerations
On-site pharmacist staffing and workflow (EHR-trained central pool)	Pharmacist virtual support (if severe shortages)	Nurse management and/or dispensary	Pharmacy staffing needs directly impacted by medication management decisions for patients (eg, patient self-management of medications requires less intensive pharmacist staffing) Pharmacist selection (eg, good fit, flexible) On-site pharmacist staffing is first choice Consider pharmacist staffing for all shifts (eg, for 250-patient unit, consider 4-pharmacist coverage: 2 for day shift, 1 for swing shift, 1 for overnight shift) Consider utilizing pharmacy interns and students to assist in providing staffing support
Use of CSP-trained pharmacy technicians and/or staff	CSP staff on-site with isolator; short beyond-use dates	Centralized CSP preparation, with ADC-dispensed first doses	Adjust needs based on increasing patient acuity Trained CSP preparation staff and supplies as recommended in USP <797> Compounding aseptic isolator
Unique patient populations	Staffing by pharmacists with relevant experience (eg, pediatrics)	Staffing by other pharmacists as available	Provide additional resources, references, and training

Abbreviations: ADC, automated dispensing cabinet; CSP, compounded sterile product; EHR, electronic health record; USP <797>, *United States Pharmacopeia* general chapter 797.

Table 3. Considerations and Options for Transitions of Care at Alternate Care Sites

Transition of Care Needs	Potential Workflow	Workflow Alternative(s)	Resources Needed
Obtain accurate medication list prior to admission (ie, perform medication history taking and medication reconciliation) for each patient, including those arriving with outpatient prescriptions vs medications provided at the alternate care site	Pharmacist to call patients and/or caregivers and pharmacies to obtain accurate, complete medication list Pharmacy technicians could assist in performing this function (pharmacists review and finalize)	Nurse could perform on-site Pharmacist could perform on-site, but preferable to perform remotely	Pharmacists, pharmacy technicians, and/or pharmacy interns Phone Remote system access Computer
Provide discharge education	Pharmacist to call or utilize video visit with patient and/or caregiver to provide discharge education, particularly for high-risk medications (eg, insulin, anticoagulants)	Pharmacist to provide in-person (if delivering medications as well)	Pharmacist and/or pharmacy technician Phone Remote system access Computer
Provide discharge medications	Utilize current discharge medication program whereby pharmacy technician delivers medications and pharmacist provides counseling as needed	Could utilize one hospital pharmacy location and provide curbside services	On-site dispensing pharmacy vs satellite vs centralized services

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Disclosures

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Appendix A—Key assumptions and issues in medication list planning for alternate care sites

The medication and medication supply list is based on several assumptions, and changes to these assumptions may significantly impact the list. Notable assumptions are outlined below.

1. The primary population consists of low-acuity, general medicine patients with minimal intravenous and dietetic support needs.

2. Medications:

- Continued use of normal drug supply chain, acquisition, and procurement processes
- Continued use of the health system's usual medication management processes, policies, and procedures, including the electronic health record, telemedicine, etc
- Optimized patient self-management of medications:
 - Prioritization of use of home medications
 - If automated dispensing cabinets (ADCs) are available, use for support for first doses
- Will operate under necessary licenses and regulatory considerations
- Will primarily utilize formulary-approved medications and therapeutic interchange lists

3. Medication supplies and equipment:

- Small refrigerator, locked controlled substance storage location, and ADCs (if available)
- Limited intravenous medications needed secondary to appropriate conversion to oral and/or intramuscular injection dosage forms
- Limited syringes and glucometers for insulin self-administration; patients obtain own supply to manage own care

4. Pharmacist staffing, including transitions of care from hospital to home:

- Number and intensity of onsite pharmacists' activities will depend upon medication setup decisions.
- There will be a shared pool of trained caregivers, including pharmacy interns, students, and technicians; US National Guard troops; emergency medical technicians; and nurses and nurse aides
- Medication reconciliation and discharge counseling will be conducted, ideally with an established room-delivery prescription discharge process.

Appendix B—Key medication-related and staffing questions to consider in alternate site care planning

To further optimize and refine medication and medication supply planning for alternate care site locations, additional considerations may be helpful in the decision-making process, as outlined below.

1. Medications:

- Will patients be responsible for self-administration of their medications (if brought from home)?
- How will medications be distributed, including any medications the patient may bring from home (eg, self-control vs cartfill and daily medication delivery)?
- How will health system policies and procedures be adapted and/or suspended to allow for the use of alternate care sites? Specific considerations may include the policies surrounding patient-administered medications and expectations for non-health system staff working at the alternate care site.
- How many days of medication therapy will be maintained on-site?
- If the patient acuity level increases, will access to first doses of intravenous (i.v.) medications come from automated dispensing cabinets (ADCs), and how will compounded sterile preparations (CSPs) be managed?
 - Higher patient acuity will increase the need for i.v. fluid support and could increase the need for narcotic support for pain management.
- How will medication billing occur (for medications the patient does not bring from home)? Will the same charge rates and markups be used?

2. Medication supplies and equipment:

- Will CSPs be prepared on-site? If so, will a compounding aseptic isolator be used by trained CSP preparation staff?
- Will i.v. infusion pumps be needed? If so, infusion pumps with a downloaded drug library are preferred.

- Will additional ADCs be available?
- Are there additional computers, printer, labels, carts, controlled substance locked cabinets (ie, locked file cabinets) available for setup at the alternate care site?
- What is the plan for home health and other durable equipment needs?
- Medical-grade refrigerators will be needed; however, the size and amount will depend on the scope of care at the alternate care site.

3. Staffing considerations:

- Will a shared pool of caregivers of different levels of experience be created? How will differences in training and/or background be addressed?
- Will only existing health-system personnel be utilized for staffing of the alternate care site?
 - If additional staff members are retained from other health systems or sources (US Public Health Service, US National Guard), considerations include
- Credentialing for access to electronic health record (EHR)
- Providing in-the-moment, on-site training of newly retained staff from an outside health system vs staffing with existing, EHR-trained staff
- ADC user entry and credentialing
- Will pharmacist staffing follow a centralized, decentralized, or hybrid model? Will remote and/or virtual order verification by staff located at a hospital within the health system be considered?
- Will the health system's community pharmacies be tasked with filling prescriptions for new medication starts for patient self-administration at the alternate care site?
 - If the community pharmacies do not accept credit card payments over the phone, will policy be adjusted to allow phone payments so that they can fill patients' medication prescriptions? (If payment policy is not changed, consider use of commercial retail outpatient pharmacy mobile applications for payment processing.)