



Covid-19: The Mother of Invention

Optimizing the Community Hospital Pharmacy During a Global Pandemic

Summary

Health systems around the world have been impacted by the Covid-19 pandemic, forcing pharmacy leaders to reevaluate clinical services and adapt new solutions to an ever-changing landscape. Many of these solutions, including switching to ready-to-administer premixed solutions, have helped pharmacies overcome immediate Covid-19 challenges while simultaneously accelerating long-term organizational goals.

We evaluated the clinical experience as it relates to the pandemic. This article gives detailed information about initial problems and concerns, decisions that were made to address those challenges, and how those solutions not only helped one rural health system operate effectively but propelled it to reach long-term quality of care objectives.

About the Author

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As a clinical expert focused on patient-first care, Joan consults evidence-based research to effectively plan and operationalize short-term and long-term goals that improve clinical services. She has been a leader for her health system throughout the Covid-19 pandemic, and has successfully implemented innovative approaches that ensure efficient pharmacy operations under extreme circumstances.

The Ephraim McDowell Health system is a comprehensive, integrated healthcare delivery system consisting of 3 hospitals serving more than 119,000 residents from six counties in central Kentucky.

Background

In the community hospital pharmacy, we're constantly evaluating and identifying peer-reviewed and supported long-term goals to improve our distributive operations and clinical services. The *American Society of Health System Pharmacists' Practice Advancement Initiative (PAI) 2030 (Table 1.)* provides long-term recommendations that are typically implemented slowly and methodically over the course of 5 to 10 years, giving pharmacies the opportunity to review, adapt, refocus, and execute throughout the process.

However, due to the Covid-19 pandemic, pharmacies have been forced to adapt to a new reality and embrace change quickly and efficiently. The innovative organization-focused, practice-focused, and profession-focused approaches our pharmacy implemented in a short-time have already made great progress in meeting PAI 2030 objectives and improving patient quality of care.

As a pharmacy enterprise leader in a small rural health system, my team and I have re-evaluated our operations many times under duress (See Appendix A for Covid-19 Pandemic Questions to overcome). We worked quickly to alter our delivery of care in a way that keeps our department moving forward and meeting the expectations for our service line. In just under one year, we've had to address many issues in several key areas, including:



Workflow concerns: Patient access to medications, patient care and safety during the pandemic, and timeliness of medication delivery



Staffing and workload concerns: Managing additional workload, addressing staffing shortages, preserving personal protective equipment (PPE), and accommodating additional scopes of work



Medication storage concerns: Lack of floor and freezer space for emergency use product, smart pump shortages, and supply chain issues for basic supplies

Table 1. Excerpt from PAI 2030 Recommendations

Organization-focused

A12	Health systems should support innovative models for providing a safe and appropriate level of pharmacy services for small and rural hospitals or other alternative practice settings.
B6	Pharmacy practice leaders should ensure that their workforce has the necessary knowledge and competency to adapt to emerging healthcare needs.
C6	The pharmacy enterprise must have sufficient resources to develop, implement and maintain technology related medication use safety standards.
E4	Pharmacy practice leaders should ensure evidence-based medication use by continually analyzing and reporting use patterns and outcomes.
E5	Health systems should support inter-professional innovation centers designed to pursue breakthroughs in areas such as patient experience, medication use, clinical outcomes, operational efficiency, technology and revenue generation.
E6	Health systems should support the well-being and resiliency of their staffs.
E10	The pharmacy workforce should assess and mitigate risk in medication use systems across all settings.

Practice-focused

B2	Pharmacists should leverage and expand their scope of practice, including prescribing, to optimize patient care.
B3	Pharmacists should participate in and assume key roles on emergency response teams.
D1	Pharmacy technicians should participate in advanced roles in all practice settings to promote efficiency and improve access to patient care.
E2	Pharmacists should assume leadership roles in medication stewardship activities at the local, state and national levels.

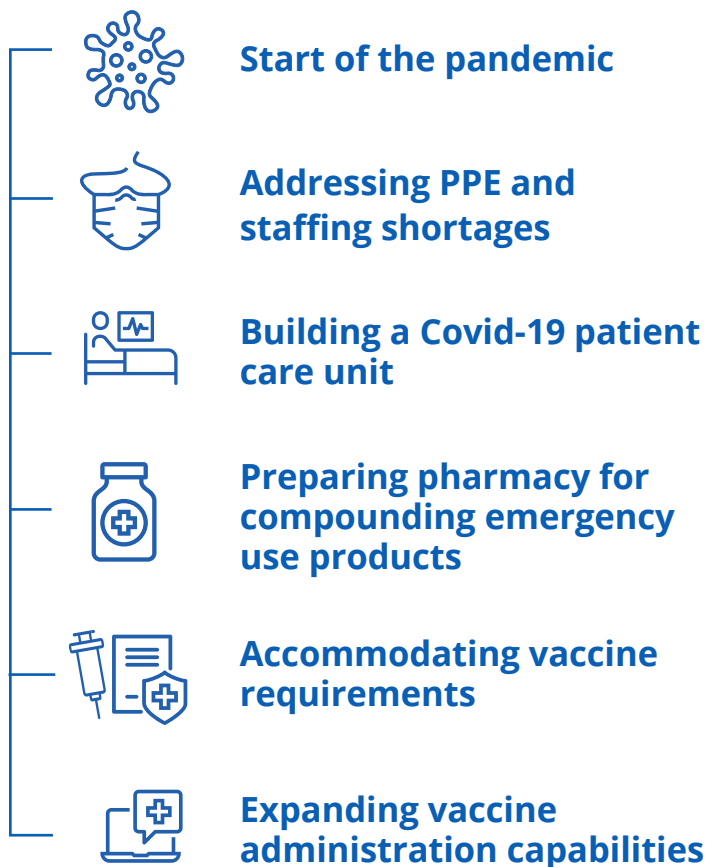
Profession-focused

B9	Pharmacists in all care settings should be included as integral members of the healthcare team and share accountability for patient outcomes and population health.
E12	Pharmacists should be leaders in federal and state legislative and regulatory policy development related to improving individual and population health outcomes.

Initial Covid-19 Pharmacy Protocol Solutions

Early on in the pandemic our pharmacy team focused on safe provision of care—for both our associates and our patients—to limit risk and optimize patient outcomes. But as our Covid-19 patient census surged, we had to address a variety of additional challenges along the way:

Covid-19 Protocol Solutions Timeline



PPE and Staffing Shortages

Lack of Personal Protective Equipment (PPE)

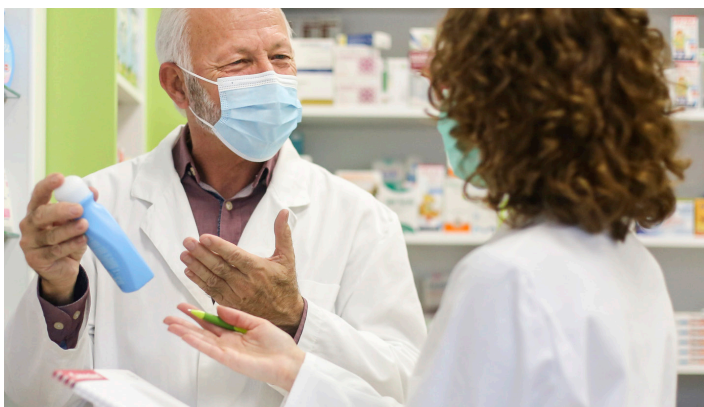
When PPE shortages led our organization to restrict the number of health care team associates who could work on patient care units, we responded with a comprehensive strategy:

- Relocated our decentralized clinical pharmacists to central pharmacy workstations
- Managed the distribution of loop masks while fit-testing all pharmacists for N95 masks and issuing supply to wear for appropriate and safe response to patient emergencies
- Conserved gown supply to align with CDC guidance by converting to re-usable, washable lab coats and disposable bunny suits for entire shifts
- Minimized PPE burn rates needed to safely enter patient care rooms for medication reconciliation technicians, pharmacy students, interns, and pharmacists by moving to telephone encounters with the patients

Staffing Shortages

Even with flexible PPE solutions, we were still short-staffed. The reality of pharmacy practice during a pandemic is that you cannot predict the impact that call ins by infected associates, exposures to Covid-19 positive patients or co-workers, and fear all play on attendance.

We were unable to ramp up staffing due to extremely limited “flex/prn” pharmacy associates and a lack of qualified certified technicians in our rural area to recruit, hire, and train quickly.



We took additional steps to help meet organizational objectives while keeping staff safe and healthy:

- Created remote work options for our pharmacists to help support the on site teams
- Re-designed workstations to build in more than 6 feet between workstations and allow staff to spread out in the pharmacy
- Limited the break room capacity and staggered meals to support social distancing guidelines
- Replaced routine meetings—large and small—with virtual meeting room alternatives
- Adopted routine cleaning of all common surfaces, temperature checks to enter the hospital and department, and mask and PPE distribution logs
- Developed a 2-team schedule with minimal overlapping personnel to limit exposure risks throughout the full department
- Instituted a curbside delivery option for patient pick up when main entrances to hospital (and retail pharmacy) remained locked

Building a Covid-19 Patient Care Unit

As the Covid-19 patient hospitalization rate started to spike, our pharmacy team was invited to participate in helping to construct the new Covid-19 patient care units. When the organization began converting and renovating other hospital patient care units to manage the Covid-19 patients, our team had to anticipate the needs of these patients and providers in advance.

With limited time and resources, we worked to design safe drug delivery and handling in these high-risk units by evaluating current procedures and creating an effective implementation strategy.

To meet the increased demand of critical care parenteral medications in these patient care units, first we inventoried the availability of infusion smart pumps and added rental pumps as needed. We then loaded the smart pump profiles and infusion parameters to ensure patient safety and safe drug delivery.

Our implementation strategy focus:

- Expand drug distribution to Covid-19 patient care areas behind zip walls and barriers
- Modify automated dispensing cabinet contents to address the critical acuity of Covid-19 patients
- Tailor “cartless” drug delivery model to avoid unnecessary exposure of pharmacy associates
- Deliver on increased demand for parenteral medications
- Accommodate the increased workload for sterile compounding as 503B suppliers struggled to keep up with the increased demand for sterile products

Preparing the Pharmacy for Compounding Emergency Use Products

A Pharmacy Practice News article “Pandemic Nursing’ Is a Lethal Problem; ISMP Cites ‘Blame and Shame’ Culture” was released November 2020. As noted in the article, one nurse describes working in an under-resourced environment, working under high patient-to-nurse ratios, who may have stashes of medications left in patients’ drawers and closets.’ It would not be uncommon for the overstretched nurse to be asked to mix their own sterile products after hours for new orders or new patients in facilities that do not have 24/7 pharmacy services available. The article included 7 tips to avoid prescription errors (sidebar).

An additional article published by the *Institute of Safe Medication Practice (ISMP) Medication Safety Alert* “ISMP Survey Provides Insights into Preparation and Admixture Practices OUTSIDE the Pharmacy” in the Acute Care Issue from November 2020 highlighted the results of a survey of 444 practitioners who prepare admixtures outside the pharmacy. (See Appendix B for survey highlights).

These results did not make our pharmacy team feel comfortable with accepting workarounds for sterile compounding and we recognized that the best safety plan needs to include multiple strategies to assure safe drug preparation and administration.

The Pharmacy Practice News article included 7 tips to avoid prescription errors:

- Standardize to single concentration of IV high alert medication infusions if possible
- Standardize dose rate (mcg/kg/hr vs mg/hr) for certain IV infusions and make sure these are in smart pump drug libraries/use standardized order sets
- For common infusions, use premixed, commercially available solutions that are visually distinct when possible
- Affix bold auxilliary labels to critical care infusions when non-standard concentrations or high-risk agents (neuromuscular blockers) are dispensed
- Label all IV lines between the smart pump and the source container and close to the access point of the patient’s body: trace the line prior to hanging a new source container or programming the infusion pump
- Establish a process for conducting independent double checks before administering certain critical infusions
- Conduct daily safety huddles with physicians, pharmacists and nurses.



We reexamined many of our sterile compounding process and inventory purchasing decisions and made adjustments:

- Required refresher training on smart pumps and scanning
- Kept our associates informed and aware of new potential risks and inventory issues
- Provided orientation to nurses who float to new units before allowing them to accept new patients
- Standardized the look to our IV products and shared our IV handbook with all staff to provide a resource

for standardized concentrations, dosing charts, and infusion rates from our infusion pump directories

- Standardized sterile compound labels generated from the electronic medical record pharmacy system
- Utilized Medkeeper software for barcode scanning of all ingredients used for sterile compounding
- Implemented remote verification by the pharmacist during the admixture process
- Switched to commercially available ready-to-administer products to help reduce compounding burden and medication errors.

Accommodating Vaccine Requirements

On top of the usual critical care drugs that needed to be compounded we were also facing demands for preparing vaccines within the narrow time frames for administration or waste. With shortened beyond use dates, we were less able to batch the doses and this added to an already overburdened sterile compounding team.

When our organization enrolled for vaccine distribution, we were required to identify what freezer storage capacity we would have for the vaccine. With all hospitals in the country facing the same obstacle, we weren't able to order more storage units because there was limited supply and exaggerated demand. Finding premixed ready-to-administer options that don't require frozen storage helped us free up space in our existing freezer for vaccine storage

Commercially available premixed ready-to-administer products can:



**Free-up
refrigerator/
freezer space**



**Reduce
compounding
pharmacy
workload**



**Preserve
essential
supplies during
a pandemic**

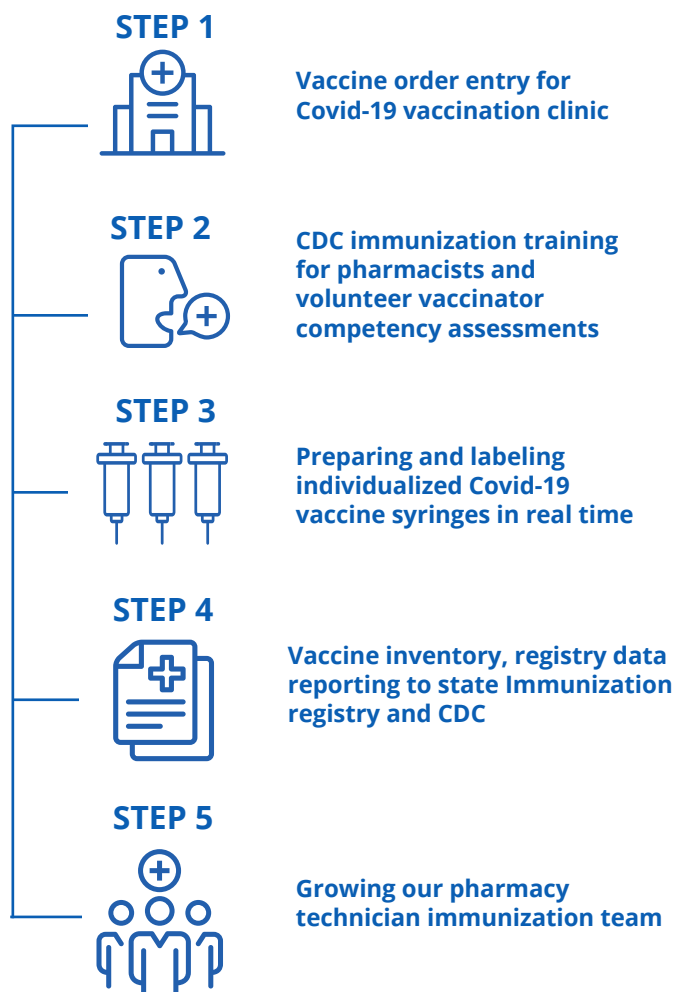
Our team evaluated whether the benefit of time saved by premixed products outweighed the additional cost. We considered the reduced workload for an already over-extended sterile compounding team and the improvements that could be made to the distribution process when staffing resources are maxed out.

Ultimately, we decided that the benefits offered by commercially available premix solutions outweighed the incremental cost in regards to reducing our compounding burden.



Expanding Vaccine Administration Capabilities

With the shipments of the Covid-19 vaccine, our team was asked to design mass vaccination clinics and determine how to best utilize pharmacy associates to assist. We outlined a plan in which our responsibilities expanded to include:



Results

Pharmacy staff in our state and across the country have responded to the call to step up and make a difference in their communities by providing quality life saving treatments and vaccinations during the pandemic. We have had to be adaptable to change, and our pharmacy team has taken a leadership role to add value for the good of the community throughout the pandemic.

Pharmacies around the world have demonstrated the true value and support we bring to providers, nurses, and patients. The creative and innovative improvements made in our practices have helped reinvent departments, align to long-term goals in a short period of time, and created new standards of care that will benefit our organizations for years to come.

At a time of unprecedented demand for efficient workflows we have also made innovative changes to minimize the stress and problems faced by our pharmacy associates every day. In the process, we have accelerated our organizational objectives to reach many long-term goals, in a short period, as outlined by aligning to several PAI 2030 recommendations.



Pharmacy Team Accomplishments During the Covid-19 Pandemic

- Created innovative models to provide safe and appropriate pharmacy services for both Covid-19 and non-Covid-19 patients
- Expanded our scope of practice to assume key roles in patient access and care
- Redesigned patient workflow to support safe precautions that limit exposure across departments and support the well-being and resiliency of our patients, visitors, and staff
- Assessed and mitigated risk of medication errors, created alternative processes to address insufficient resources related to medication admixing and personnel safety standards
- Designed and implemented novel treatment protocols and optimized pharmacy operations with ready-to-administer medications that streamline distributive and clinical services
- Prescribing (emergency orders and refill authorizations via executive order of Governor), anticoagulation clinic remote management
- Leadership roles- design/roll out of Covid-19 vaccine for health care workers and then as a regional vaccination center and bamlanivumab clinic
- Because of the need for safe and effective drug delivery, our pharmacists regularly participated in a Pharmacy Shared Governance Clinical Roundtable. This allowed us to make needed adjustments on the fly and better position ourselves for vaccine rollout. (See Appendix C for a list of Roundtable project Accomplishments)

Appendix A: Questions to Overcome During Covid-19 Pandemic

Workflow concerns	How do we improve public health by expanding patient access to care?
	How do we prevent disruption of medication therapy to our patients during a pandemic when clinic office visit access is limited and patients are not able to refill prescriptions?
	How do we assure medication safety in this age of “pandemic nursing” where nurses are in under-resourced environments, higher patient to nurse ratios, or working in makeshift units?
	How can we assure that our patients get critical components of care timely if we are reduced to manual compounding of common and life-saving drips due to backorders?
	Are there more efficient and productive processes if we are open to consider change?

Staffing/ workload concerns	How do we keep all the balls in the air during the pandemic AND do the new work associated with new treatment options?
	How do we manage the additional workload if we have associates across all departments who have called off due to their own or their family member’s illness, stress, or lack of child care?
	How do we continue to be a resource and support to our providers and nursing if we are not able to practice on the floors due to limited supply of PPE?
	Are we able to advance pharmacist and pharmacy technician scopes of practice when duty calls?
	How do we support our staff during stressful mandated furlough when elective procedures are paused?
	Are there ready-to-administer (premix) solutions available for other compounded drugs to help free up staff time and ease pharmacy workload during the pandemic?

Floor space/ freezer/ concerns	Are there room temperature ready-to-administer (premix) solutions available that can help free up refrigerator/freezer space?
	How can we improve and stay ahead of supply chain issues for basic supplies like syringes, needles, and sterile fluids for compounding?
	How do we find room in the pharmacy or on the nursing units for storing new refrigerated or frozen vaccine or treatments?
	How do we manage to prepare and label 300-600 Covid-19 vaccination doses per day for our vaccination clinics?

Appendix B: ISMP Survey Provides Insights into Preparation and Admixture Practices OUTSIDE the Pharmacy

- Only 30% of participants agreed or strongly agreed that their organizations required those who prepare sterile admixtures outside the pharmacy to undergo formal training, annual competency assessment and verification.
- Only 64% agree or strongly agreed that labeling process is followed
- Admixtures outside the pharmacy were in less than ideal locations (37% performed at bedside, 28% at nursing station desk and 16% at computer workstation)
- 31% of participants were aware or personally experienced errors when preparing or admixing injectable medications in the past 12 months. The most common errors reported were 1) wrong preparation technique (21%) 2) incorrect diluent or diluent volume (20%) 3) incorrect dose/concentration or volume (19%) 4) no labeling or labeling errors (19%)
- Concerns about accuracy of the final product, interruptions, and distractions were identified as challenges, especially when more than 1 vial or a partial vial was needed when preparing a sterile product. Survey respondents identified the following to be the biggest safety challenges faced in preparing sterile admixtures outside the pharmacy:
 1. Rushing, especially during emergencies in a fast paced, stressful environment
 2. Interruptions that cause lack of focus or require multitasking
 3. Incorrect drug, concentration, dose, diluent or volume (look-alike vials)

Appendix C: 2020 Pharmacy Team Accomplishments via Shared Governance Clinical Roundtable

Roundtable Projects	11
New Order Sets	6
Clinical Order Sets Reviewed	49
MUEs	7
Monographs	9
TOTAL	82