

Adapting ambulatory care learning environments in response to the COVID-19 pandemic

Ambulatory care pharmacists and their learners were propelled into unanticipated unique practice situations when the coronavirus disease 2019 (COVID-19) pandemic began. Pharmacists and learners alike had to adapt to the rapidly changing ambulatory care practice environment, and preceptors had to get creative to maintain a robust learning environment. This article provides ideas and insights for creatively and sustainably precepting pharmacy learners in the ambulatory care environment during a pandemic by describing various practice adaptations from ambulatory preceptors across the nation.

When the COVID-19 pandemic began to affect the United States in early 2020, demands on healthcare systems rapidly changed. In the ambulatory care environment, many practices shifted to the use of telehealth platforms to conduct patient care visits remotely.^{1,2} Efforts to maintain physical distancing and limit exposures resulted in new processes such as drive-through laboratory testing and contactless prescription pickup at the clinic.³ When a face-to-face appointment was necessary, all parties involved were obligated to comply with new safety practices, such as screening temperature checks upon building entry, mask wearing, and use of protective eyewear while onsite.

Not only did the pandemic create a paradigm shift for ambulatory care pharmacists and patients, it created one for pharmacy learners as well.⁴ At the time of pandemic escalation in the United States, pharmacy students and residents in the ambulatory care environment experienced a multitude of changes to their clinical environment. In some cases, pharmacy learners were prohibited from being onsite to reduce COVID-19 transmission risk and conserve resources, such as personal protective equipment (PPE). These learners shifted to remote learning and virtual patient care opportunities, such as virtual patient visits, online journal clubs, and other activities that could be completed from home (Box 1)⁵. In cases in which learners were able to maintain their onsite presence, their learning and patient care experiences were altered based on the aforementioned changes to patient care in the ambulatory setting. While the adaptation to the new learning environments undoubtedly strengthened pharmacy learners in many ways, there are unknown downstream consequences to the disruption of their

learning experiences.⁴ As pharmacy preceptors, we have the responsibility to ensure that education in the clinical environment—albeit altered by the pandemic—allows learners to “advance their own practice long term.”⁵

Rural-based clinic or independent practice-based office. Modifications to ambulatory care environments depended heavily on location and resources. Practice adaptations at a rural-based clinic vs a large urban-based center vary based on numerous factors, including but not limited to PPE availability, personnel resources, and available technology and permissions (Table 1).

One such practice that remained open was a single academia-affiliated, rural-based family medicine clinic staffed by 5 physicians, 1 advanced nurse practitioner, 2 nurses, 1 pharmacist, 2 postgraduate year 2 (PGY2) ambulatory care residents, and numerous medical assistants and health professions students. Clinic operations were never suspended, and the personnel never worked remotely. Only 1 advanced pharmacy practice experience (APPE) student was removed from the practice site for the final 2 weeks as the college determined how it was going to maintain safety in the clinical environment, but students were permitted to return without further interruption for the next APPE. The PGY2 ambulatory care residents never worked remotely, as they were viewed as essential healthcare partners and licensed pharmacists, and their presence was maintained onsite.

Changes to clinic policies and workflow. The original design of the ambulatory learning environment fostered layered learning among the APPE students and PGY2 ambulatory care residents while maintaining a multidisciplinary culture. For approximately 4 weeks during the pandemic, most patients were transitioned to video telemedicine or telephonic care approaches, but others were still required to be physically onsite for activities such as International Normalized Ratio (INR) monitoring. The pharmacy team managed anticoagulation care needs at the clinic and, during the pandemic, facilitated plans that minimized care and monitoring interruptions. Clinic policies and protocols were created to require all clinic personnel to wear PPE at all times in the clinic, maintain physical distancing, and screen all patients before entry into the facility for cough, fever, or other symptoms associated with COVID-19. Following these policies, the pharmacist or PGY2 ambulatory care resident conducted the physical point-of-care (POC) INR testing or other vital sign assessments, such as blood pressure (BP), heart rate, or oxygen saturation level measurements. Whether the INR testing occurred outside the facility in a minimal-contact drive-thru

The Frontline Pharmacist column gives staff pharmacists an opportunity to share their experiences and pertinent lessons related to day-to-day practice. Topics include workplace innovations, cooperating with peers, communicating with other professionals, dealing with management, handling technical issues related to pharmacy practice, and supervising technicians. Readers are invited to submit manuscripts, ideas, and comments to AJHP, at ajhp@ashp.org.

Box 1. Activities That Can Be Accomplished in the Virtual Environment^{1,5}**Live Activities**

Journal club presentation
 Disease state or drug therapy topic discussion
 Patient case discussion
 Patient workup
 Participation in telemedicine
 Educational in-services
 Diabetes self-management and teaching classes (resident only)

Asynchronous Activities

MTM reviews (eg, OutcomesMTM; West Des Moines, IA)
 Process prior authorizations
 Coordinate patient enrollment in medication assistance programs
 Creation of drug information handouts
 Answering drug information questions
 Writing activities (eg, patient case report, review article)
 Data analysis
 Educational sessions (eg, grand rounds)

Abbreviation: MTM, medication therapy management.

fashion or in the care rooms, APPE students conducted the interview under pharmacist or PGY2 ambulatory care resident supervision for screened patients. Multidisciplinary care plans were created with physicians, and the physician/pharmacy care team would ultimately communicate all decisions back to the patient, being mindful to limit the number of people in a single care room. Extra precautions were put into place to protect the safety of APPE student learners by limiting their time with, and thus exposure to, patients. Therefore, physical examinations or monitoring tests (vital signs, INR, or other POC tests) were conducted by the pharmacist or PGY2 ambulatory care residents. Students are often less comfortable with these activities and would have been in close proximity to patients for a longer period of time if allowed to perform these tasks. Recognizing this assessment and skill limitation, as an alternative experience pharmacist and residents served as practice patients for testing of POC INR, foot examinations, BP measurements, or other relevant skills. However, student communication and interaction with patients was supported, cosigned electronic documentation remained an expectation, and learner participation in the multidisciplinary interactions was encouraged.

Pharmacy learner involvement in telemedicine.

Equipment was needed for virtual platforms to be conducted at the clinic, and it was delivered and installed within 72 hours of implementation of an institutional policy to care for patients via telemedicine. Minimal training was received;

however, the institution used a single platform, Zoom (Zoom Video Communications, Inc.; San Jose, CA), for the affiliated college and patient care, with appropriate security measures taken. Learners and faculty healthcare workers were familiar and comfortable with scheduling appointments as well as maintaining privacy with waiting rooms and passwords, which avoided delays in patient care. Pharmacy students participated in video telemedicine visits depending on patient permission, technology, and physical distancing opportunities within the room where the call was being conducted. Since students are licensed interns, oversight is required, which likely increases the number of individuals present together in a single room. Telehealth had advantages because participants could be in different locations within the same facility and maintain physical distancing requirements. PGY2 ambulatory care residents and the pharmacist served as physician extenders to maintain chronic disease management with established patients via video telemedicine or telephonic communication. Residents and the pharmacist took the lead on scheduling, emailing necessary links to patients, triaging connection barriers, and conducting the video telemedicine encounters. Video telemedicine calls were initiated by a PGY2 ambulatory care resident, and after a complete interview was conducted, care plans were discussed with the pharmacist preceptor and ultimately the physician, who then joined the video call similar to the in-room clinic design. Documentation reflected the multidisciplinary care approach and referenced the current Centers for Medicare & Medicaid Services (CMS) 1135 waiver, remote location of the patient, and the appropriate Current Procedural Terminology (CPT) billing code. Chronic care management telephone calls were only conducted by the PGY2 residents or pharmacist, which introduced yet another platform to aid in care management during the pandemic that was deemed successful and will continue to be used even when the pandemic subsides. CMS guidance was followed for determining length of visit. Focused documentation requirements reflected the care goals addressed as established by the physician, which was the main difference from the workflow used for telehealth video calls that were billed using CPT code 99490. Both telehealth video and telephonic calls have been maintained, but due to patient preference, more patients are attending in-clinic care visits.

Creating blended live and virtual practice and learning environment for learners.

Students and residents who were not permitted to remain onsite or had their onsite responsibilities significantly changed required a hybrid of virtual live and asynchronous experiences to complete their rotations. Ambulatory care preceptors had the task of not only maintaining their practice, but also creating innovative activities for learners that could be completed remotely (Table 1).

Health systems differ in their willingness to grant pharmacy learners remote access to their electronic health

Table 1. Ambulatory Care Clinic Details Before and During COVID-19

Clinic	Clinical Practice Structure Prepandemic	Changes Made to Clinic Structure During Pandemic	Impetus for Changes Made	Successes	Challenges
Rural-based clinic or independent practice-based office	<ul style="list-style-type: none"> 4 full-day layered learner pharmacy presence Multidisciplinary team approach: resident and/or student participated in in-person visits staffed by pharmacist-physician care team Documentation of encounter in electronic health record with physician billing 	<ul style="list-style-type: none"> Minimal changes Learners remained Pharmacy collaborative visits maintained in-person for POC monitoring Transitioned small number of visits to video telemedicine and others to telephonic management Equipment required 	<ul style="list-style-type: none"> Local school deferred to clinical site Academic-affiliated clinics deferred to individual clinic 	<ul style="list-style-type: none"> Maintained learner participation with face-to-face encounters with PPE and safety considerations Seamless transition to participate in telephonic and video telehealth encounters 	<ul style="list-style-type: none"> Barriers to rural population resources for video telehealth encounters Most patients requested to return to clinic, limiting student/resident opportunities with virtual or remote platforms
Hospital-based clinic	<ul style="list-style-type: none"> 5 full-day pharmacist presence Varied pharmacy learners schedule Weighted responsibility Independent pharmacy schedule 	<ul style="list-style-type: none"> Learner removed from onsite Remote work flow initiated with learners involved Full video telemedicine or telephonic management No additional equipment required 	<ul style="list-style-type: none"> Local school deferred to clinical site 	<ul style="list-style-type: none"> Allowed graduation of learners due to remote learning capabilities Decreased no-show rate with remote care approach Billing strategies enhanced with telehealth 	<ul style="list-style-type: none"> Technology literacy Non-face-to-face interaction with learners Limited resource for laboratory monitoring

Abbreviations: COVID-19, coronavirus disease 2019; POC, point of care; PPE, personal protective equipment.

record (EHR), so patient care opportunities differed depending on the level of access. For many of these activities, layered learning was maintained as a more senior learner (resident) precepted a junior learner (student) on items such as a virtual case presentation or review of created drug information materials. It was also possible to engage other colleagues (eg, medical science liaisons) in live, synchronous activities such as online journal club presentations.

Hospital-based clinic setting. Modifications were required for ambulatory care learning experiences based on adjustments in workflows that affected activities for ambulatory preceptors for postgraduate year 1 (PGY1) residents on their ambulatory care experiences (Table 1). Since patient care had to continue, the clinical pharmacist workflow changed from face-to-face visits to solely telehealth almost immediately, as the ambulatory care administration dictated the change via use of Doximity (Doximity, Inc.; San Francisco, CA) and AmWell (American Well Corporation, Boston, MA). Patients were contacted to inform them of the change to telemedicine, and workflows were updated accordingly.

One of the major obstacles to overcome was allowing residents to complete the ambulatory care experience and not delay graduation from the program. It was decided that the residents would follow the same workflow as the clinical pharmacists during the pandemic, since they were already set up with remote access to the EHR and the use of Doximity required little training. Contact with the preceptor was maintained through instant messaging and telephone, which is often not as effective as face-to-face interaction. Additional challenges included preserving a stimulating ambulatory care experience, maintaining the health and safety of the resident, and optimizing the training environment with little disruption to the activities outlined in the learning experience description for the ambulatory care rotation. Topic discussions, journal clubs, and case presentations were continued via virtual platforms, such as Microsoft Teams (Microsoft Corporation; Redmond, WA) and Skype (Microsoft Corporation; Redmond, WA). In addition, the staffing requirement was maintained using virtual means.

Evolving expectations for the resident. As the pandemic continued the pharmacist workflow evolved with the needs of the clinic; therefore, the expectations of the resident also changed from a completely remote rotation to a hybrid model. The resident was expected to participate in clinical activities onsite as needed while minimizing unnecessary exposure, which was a challenge as cases of COVID-19 were increasing at an alarming rate. The current resident model is a blend of onsite learning and physical distancing, with PPE being required during all patient interactions. This is combined with virtual learning to maximize the safety of the resident. Telehealth continues to be the method of choice for patient encounters, especially for the highest-risk patients,

and has been easily maintained because patient preference has been to continue with telemedicine appointments in most instances. One of the services that could not be continued virtually was anticoagulation due to lack of resources in our laboratory to obtain the POC INR, thus making face-to-face visits necessary for anticoagulation in patients who need onsite INR monitoring.

Discussion. It has been stated that reactions or responses to crisis can lead to problem-solving, innovation, and advancement.⁶ Interestingly, the profession of pharmacy has been focusing on well-being and resilience for the last couple years, not just for licensed pharmacists but for pharmacy students and residents as well.^{7,8} This recent focus by the profession on these topics serendipitously prepared pharmacists and pharmacy learners to be better equipped to handle the learning and practice environment changes recently experienced. Pharmacists are problem-solvers at heart and equipped with the confidence and mental fortitude to function highly during national and global emergencies. The profession of pharmacy requires pharmacists, residents, and students to filter through the noise of distractors and determine optimized medication therapy plans that consider patient-specific factors such as cost and/or ability to adhere and anticipate care and policy needs, while maintaining safe, innovative practices.

Numerous methods are available to continue providing APPEs and challenging resident training programs during a pandemic by innovating care flow and utilizing advances in technology. Opportunities have been explored to leverage pharmacy residents during the pandemic by positioning them to participate in planning strategies for resource deployment, policy development for drug shortages, and advocacy for service reimbursement as well as to practice as pharmacists, among other activities.^{9,10}

Pharmacy preceptors are dedicated to the advancement of all pharmacy learners. It remains essential during uncertain times such as a pandemic to seek alternative perspectives when different approaches are needed. Seeking peers for fresh, outside perspectives to develop and maintain high-level training will be required throughout the duration of the pandemic, but should never be abandoned. Special circumstances will arise, such as immunocompromised or otherwise high-risk learners, and further amendments to training plans might be required. Similarly, adaptation of learning programs will be necessary for students exposed to patients who test positive for COVID-19. Ambulatory pharmacists, students, and residents are frontline providers and thus will likely encounter these situations and need to proactively have a plan in place to handle each.

The adaptations made to precepting and practicing in the ambulatory care environment presented in this article proved to be successful in maintaining a challenging and rewarding learning environment while maintaining optimal patient care practices. Integration of technology, such as use of telehealth for patient visits and creating learning

opportunities that could be completed offsite, was efficacious. Challenges included telehealth implementation such as having the appropriate technology and infrastructure, acquisition of access for learners, and training on how to use the technology. Other challenges included flexing with local school and college of pharmacy policies as rules changed so that students were allowed to maintain an in-person presence at their rotation site and similar policy changes at the institutional level related to resident presence onsite.

Closing notes. Possibly more challenging than adapting to all the required alterations forced by the COVID-19 pandemic are the unknown duration and scale of effects this pandemic will have on ambulatory practice. As pharmacists and preceptors raced to create acceptable learning opportunities for pharmacy students and sustained rigorous training programs for PGY1 and PGY2 ambulatory care residents, all while maintaining their own clinical practice, there were numerous success stories. Ultimately, pharmacy preceptors in all care settings are being required to adapt and innovate new learning tactics and possibly cultures to continue successfully integrating pharmacy learners into clinical practice. One change clearly established in the ambulatory sector is the importance of technology integration, which will likely be a sustained model for the future, as it safely meets the needs for many chronic care management patients as well as communication with learners.

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