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ACCP COMMENTARY

Addressing challenges of providing remote inpatient clinical pharmacy services

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Abstract

Telehealth and virtual/remote inpatient clinical pharmacy services have evolved exponentially over the past year, which has underscored unique barriers and limitations. This ACCP commentary identifies challenges to providing remote inpatient clinical pharmacy services and outlines guidance on overcoming them. The main challenges discussed are broadly categorized as legal/regulatory, administrative, technology and equipment, clinical service and provider, patient/caregiver, and equity. Nevertheless, opportunities to provide equitable patient care through remote inpatient clinical pharmacy services are numerous and will likely be sustained past the pandemic. Thus, future implications and opportunities are also envisioned.

KEYWORDS
clinical pharmacist, remote inpatient clinical pharmacy services, telehealth

1 | INTRODUCTION

Telehealth is the use of electronic information and telecommunication technologies to support long-distance clinical health care, patient- and professional health-related education, public health, and health administration.[1] Use of telehealth and virtual/remote patient care has increased over the past several years and expanded rapidly during the coronavirus disease 2019 (COVID-19) pandemic to minimize transmission of the virus in health care settings.[2] A 2018 American College of Clinical Pharmacy (ACCP) white paper provided guidance for comprehensive medication management services via telehealth encounters,[3] many key points of which are relevant to inpatient clinical pharmacy services. However, the rapid shift to remote services induced by the pandemic has elucidated several unique challenges for inpatient clinical pharmacy teams. This commentary identifies specific challenges for remote clinical pharmacy services in the inpatient setting and provides guidance on how pharmacists can overcome these challenges in order to implement and optimize the delivery of remote inpatient clinical pharmacy services. Challenges are broadly categorized into six main areas: legal/regulatory, administrative, technology and equipment, clinical service and provider, patient/caregiver, and equity.

1.1 | Legal/regulatory challenges

The legal/regulatory implications of delivering inpatient clinical pharmacy services remotely are relatively unexplored. Technology often outpaces regulatory policy, and the COVID-19 pandemic has spurred exponential growth of telemedicine, exceeding the rate of regulatory

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policy development.[4] Although some regulatory hurdles have temporarily been removed since the pandemic began, these changes have primarily applied to emergency medicine and ambulatory settings.[5,6] There may also be variations depending on the state in which the patient resides.[7] Legal considerations in providing clinical pharmacy services remotely for an inpatient population are not well described in the current literature, which may in itself discourage their provision.[8] Concerns related to malpractice in the acute care setting include an increased risk of communication errors, compliance with the Health Insurance Portability and Accountability Act (HIPAA), and data security.[9-12] Legal considerations specific to inpatient telemedicine are further complicated by the diversity of remote inpatient clinical pharmacy services, which can vary by location (eg, rural vs urban) as well as acuity (eg, floor vs ICU), specialty (eg, cardiology vs neurology), and population (eg, adults vs pediatrics). Although all relevant laws of privacy and beneficence still apply whether care is provided virtually or in person, clear guidance is lacking on how to abide by the current laws in inpatient telehealth settings. Moreover, because of the many reimbursement codes used across inpatient and outpatient settings, maintaining the relaxed reimbursement parameters adopted during the pandemic will be essential to ensuring sustainable practice models going forward.[5,13]

As such, the pharmacy profession needs to clarify the legal and reimbursement parameters for remote inpatient clinical pharmacy services delivered by telehealth. Specific factors related to liability and privacy protection are extremely important, given their potential to be daunting barriers for those wishing to implement new remote inpatient clinical pharmacy services. Clear legal requirements for working across state lines, and potentially national borders, are necessary to ensure patients and providers are both protected and treated fairly. Table 1 summarizes the legal/regulatory challenges associated with delivering remote inpatient clinical pharmacy services and proposed solutions.

TABLE 1 Legal/regulatory challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential Strategies	Future directions
• Credentialing/ licensing • Documentation • Malpractice concerns • Informed consent • Reimbursement code restrictions • CMS payment	• Establish a standardized process whereby credentialing/ licensing can be done across state lines or via a third party that maintains documentation necessary for multiple states/ institutions • Accept all documentation that is electronically but securely signed • Increase potential reimbursement codes for pharmacy • Remove all restrictions on direct care/virtual care allowed for reimbursement	• A national standard for credentialing/ licensing • Standardized documentation (templates) • Improved CMS payment for pharmacy services

Abbreviation: CMS, Centers for Medicare & Medicaid Services.

1.2 | Administrative challenges

In addition to legal/regulatory issues, pharmacy administrators face administrative challenges when implementing remote inpatient clinical pharmacy services. Among the initial considerations for pharmacy administrators is garnering support from nonpharmacy hospital administration. Identifying opportunities for remote services to positively affect clinical, safety, and/or financial metrics can help justify these services. Other considerations include determining the practice model that best fits the institution, defining productivity measures to ensure accountability and consistency in the service quality provided equal to that for in-person clinical pharmacy services, and developing policies and procedures to streamline remote work.

When optimized, the potential benefits of clinical pharmacy programs that are important to pharmacy administrators include complying with Joint Commission antimicrobial stewardship programs[14,15] and National Patient Safety Goals[16] and ensuring disease core measures are met.[17,18] In addition, certain activities may improve efficiency; for example, essential double-checks currently performed in person by clinical pharmacists (eg, chemotherapy) could be performed remotely with the appropriate technology.[19,20] Implementation of remote inpatient clinical pharmacy services might also enhance the efficiency of workflow to allow additional time for in-house pharmacy staff to complete activities that cannot be done virtually.

Although remote inpatient clinical pharmacy services have the potential to benefit all institutions regardless of size, implementation in rural and critical access hospitals may be especially compelling. Implementation of remote services can advance pharmacy's role and clinical interventions at hospitals with limited onsite resources to a level similar to that at larger health systems.[21] Examples include enhancing medication safety programs, instituting medication monitoring programs, providing medication reconciliation (through technician support or video interactions), and maximizing clinical review of high-risk medications. Table 2 further details these administrative challenges and proposed management strategies.

1.3 | Technology and equipment challenges

The first technology and equipment barrier for current infrastructures includes an incomplete or lacking electronic health record (EHR) system (eg, must transfer records only in a paper chart or no EHR implemented). This limits the ability to provide an entirely remote

TABLE 2 Administrative challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential strategies	Future directions
• Gaining hospital administrative support • Determining an effective practice model • Developing productivity metrics and maintaining accountability • Ensuring equitable workload between remote and onsite pharmacists • Standardizing policies and procedures	• Identify opportunities to improve (or at least maintain) regulatory compliance with remote services (eg, Joint Commission, high-risk medications, National Patient Safety Goals, disease state core measures, CMS) • Identify key stakeholders: • Medical staff and advanced practice providers • Nursing administration and clinical nursing coordinators • Risk/quality personnel • Infection control • Develop a business plan, including determination of sustainable financial support • Stratify responsibilities and tasks of in-house and remote personnel • Consider a hybrid model, with potential benefits including: • Cross-training • Flexibility for staffing • On-call and cross-coverage • Continuous in-person relationships with providers • Ensure productivity metrics are objective. Examples include: • Quarterly/annual cost-benefit analysis • Acceptance rate of pharmacy interventions • Reduction in patient harm and event reports • Reduction in medications through stewardship efforts • Develop or update pharmacy policies and protocols, including those that allow for automatic adjustments/substitutions, standardize pharmacy documentation and communication, and enforce competencies • Create a work-from-home guideline that establishes a code of conduct and mandates standardized competencies	• Develop the role of the remote pharmacists at critical access and rural hospitals to improve access to clinical pharmacy specialists • Incorporate remote inpatient clinical pharmacy services as a potential standard of care among hospital administrators • Provide individual practitioner-scaled compensation for work specific to remote inpatient clinical pharmacists • Ensure administration-supported and funded research focused on quality improvement in remote inpatient clinical pharmacy services with patient outcome measures • Promote growth of informatics pharmacists and training programs

inpatient clinical pharmacy service, given that some onsite pharmacists may be needed to augment or supplement the information provided to remote personnel. In addition, even after purchasing relevant video and audio technologies, communication may be limited for reasons such as poor sound or visual quality, poor internet connectivity in some areas of the hospital or at home, or difficulty in transporting equipment on rounds or to patients/caregivers. Table 3 provides examples of technology and equipment challenges and potential strategies.

Nevertheless, the ability to provide remote inpatient clinical pharmacy services has also been advanced during the pandemic and is contingent upon acquiring and maintaining the appropriate technologies and equipment, which will ensure the ability to access relevant data and communicate between groups. Thus, health-system administration buy-in and financial support for appropriate technologies are paramount. Critical needs include a robust EHR program, technologies for rounding teams and the remote pharmacist, and technologies for communicating with providers and patients/caregivers. In addition, successful integration of HIPAA-compliant technologies supported by an infrastructure of informatics teams is a necessity.

Several institutions have published on successful use of technology to support their remote inpatient clinical pharmacy services, especially after the onset of COVID-19. In China, a media platform called "WeChat" was used to perform medication consultation by a pharmacist.[22] In addition, a quick response (QR) code was posted around the institution to allow convenient access to the platform. Stanford Health Care installed computer workstations on wheels with video capability, provided additional tablets

TABLE 3 Technology and equipment challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential strategies	Future directions
• Incomplete or unavailable EHR • Access to and cost of video/audio technologies for remote pharmacists • Inadequate or limited video/audio equipment for the rounding team • Difficulty transporting video/audio equipment with the medical team during bedside rounds • Ensuring HIPAA security of all technologies • Addressing disparities in access to equipment and technologies	• Consider use of hybrid models, which may assist those off-site if EHR is not optimized • Invest in ensuring no wireless internet dead zones • Invest in quality microphones • Use a streamlined platform that helps minimize background noise and ensures good video/audio quality • Outline best practices for video/audio rounding practices to ensure inclusiveness of remote participants • Invest in devices to mobilize video screens (station on wheels) • Include a requirement for a HIPAA-compliant workspace for remote pharmacists • Consider online platforms used by other institutions • Review state regulations that may allow exceptions for HIPAA-compliant technologies (eg, FaceTime) • Ensure technologies have equitable features for those who speak other languages or have disabilities • Invest in technologies that patients/families may use if they do not have personal devices • If possible, use technologies that allow remote access to pumps and monitors in patient rooms	• Use EHRs that fully allow sharing of medical information between health care systems • Provide universal and portable health information (eg, microchips, QR code, health card, or health apps/passport) • Provide universal/national wireless internet access and charging stations • Increase the ability to routinely control pumps and monitor remotely at all institutions • Build remote access technology centers for systemically marginalized populations to use remote health care resources

Abbreviations: EHR, electronic health record; HIPAA, Health Insurance Portability and Accountability Act.

that remained in patient rooms, and used HIPAA-compliant video conferencing via the vendor Zoom (San Jose, CA).[23] At Children's Mercy Kansas City, patient profile reviews were completed remotely with the EHR program, daily interdisciplinary rounds were conducted with Microsoft Teams (Updox, Dublin, OH), and patient education and counseling were completed by phone or Microsoft Teams.[24] Ultimately, hospitals should ensure access to secure resources for remote clinical pharmacists, collaborating providers, and the patients they serve by selecting HIPAA-compliant vendors for their institution and developing a plan to implement and maintain technologies.

1.4 | Clinical service and provider challenges

Many studies show the impact of inpatient clinical pharmacists on patient outcomes when participating in multidisciplinary rounds in various specialties.[25-27] However, participating in walking or table rounds in a remote/virtual environment may be challenging in some health care settings. For example, clinical activities that require direct nursing and patient interaction may be limited without the appropriate technology solutions. Nevertheless, if institutions have EHR and remote access capabilities, most of the clinical pharmacy services outlined in the ACCP Standards of Practice for Clinical Pharmacists (SOP) can be provided.[28] These include process-of-care activities such as assessing the patient's medication-related needs, evaluating and optimizing medication therapy, developing and implementing a plan of care, providing follow-up evaluation and medication monitoring, and writing documentation.

Real-time two-way communication during rounds between clinical pharmacists and providers is also challenging in a remote environment and yet vital to pharmacist integration within a team, allowing for pharmacist-to-provider education. If in-person rounding is not possible, pharmacists need to educate on new ways of rounding using various online resources. Another challenge is determining the best system for communicating with providers when proposing or making clinical interventions. Options include telephone calls from a secure line, instant messaging with HIPAA-compliant technology, and written documentation in the EHR. Yet even under the best of circumstances, this may be time-consuming. Therefore, a hybrid model that uses onsite pharmacy personnel is often necessary to maintain certain in-person activities, such as emergency response. In addition, hospitals need to develop systems for providers to contact their team clinical pharmacists, such as instituting a pharmacy coverage list that is accessible in the EHR.

Building and maintaining rapport with providers is also challenging in the virtual environment. In usual onsite practice, a provider can contact one pharmacist, who will perform all aspects of clinical pharmacy services. In the remote environment, these same activities may require several pharmacists. Without smooth communication between remote and onsite personnel, a provider may lose trust in the pharmacy department. In addition, clinical pharmacists performing remote inpatient services may wholly rely on EHR documentation, which may

TABLE 4 Clinical service and provider challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential strategies	Future directions
• Maintaining pharmacist presence on rounding services • Transitioning pharmacy practice models to remote/virtual • Providing health care practitioner education • Communicating with providers and providing recommendations • Building and maintaining rapport with providers • Establishing clinical activities that require onsite personnel (eg, emergency response)	• Optimize technology/equipment as described in Table 3 • Use written educational handouts for providers and distribute electronically through the hospital intranet • Leverage existing educational platforms within the institution • Partner with academic resources (university/school of pharmacy) to gain access to remote educational platforms • Shift in-person educational formats to virtual • Standardize documentation of recommendations • Designate an in-house pharmacy representative to relay information to team when virtual options are unavailable • Consider use of a hybrid model to ensure some onsite pharmacists are available as described in Table 3	• Conduct clinical pharmacist-directed research, including clinical studies designed to incorporate and link virtual pharmacist rounding with patient outcomes • Incorporate education on telehealth into school of pharmacy curriculums • Develop the role of remote pharmacists at critical access and rural hospitals as described in Table 2

not include important information gleaned from direct contact with providers, nurses, and patients, potentially resulting in missed or suboptimal interventions. Physical absence of the clinical pharmacist may also result in less trust and rapport, potentially decreasing accepted interventions. Hence, the ability to establish and sustain rapport with providers is needed.

Despite the many clinical service and provider challenges, however, virtual services can be successful. For example, a recent study showed that one clinical pharmacist was able to provide tele-ICU services to 136 ICU beds across eight facilities and had 89% of interventions fully or partly accepted.[29] Table 4 summarizes clinical/provider challenges and proposed solutions.

1.5 | Patient/caregiver challenges

Significant challenges with remote inpatient clinical pharmacy services also arise from the lack of direct patient/caregiver interaction, especially with respect to medication reconciliation and transitions of care. Obtaining accurate medication histories and educating patients/caregivers to ensure understanding of the care plan, optimize adherence, and improve therapeutic outcomes are called out as essential components of the clinical pharmacist's process of care in the ACCP SOP.[28] Pharmacists need to ensure that their remote inpatient clinical pharmacy services continue to protect and develop the patient-pharmacist relationship.

In the absence of technology or when patients/caregivers cannot fully use technology, pharmacists may need less advanced strategies, such as a phone call, for medication reconciliation. In certain situations, these strategies may be acceptable for communicating relevant information to the patient/caregiver. Pharmacists can also overcome these disparities by preparing written counseling and educational materials for common discharge medications in advance; however, ultimately, this will still require onsite personnel for communication to the patient/caregiver. Other aspects of care that can be accomplished remotely include non-discharge medication education and additional supportive conversations about pharmacotherapy. A system should be developed that ensures patients/caregivers can contact a clinical pharmacist for medication questions during the hospital stay. Table 5 further describes the challenges associated with patient/caregiver aspects of care and proposed strategies for addressing them.

1.6 | Equity challenges

The challenges with providing high-quality remote inpatient care equal to that provided during in-person inpatient care and ensuring fair treatment and protection among clinical pharmacists who practice remotely cannot fully be addressed without considering equity. Although each patient may receive an offer for a virtual patient educational session with a pharmacist, the quality of that session is a function of factors such as access to technology, adequate internet connection, and technology literacy. Thus, although this is an *equal* offer of care to all patients, it may not ultimately be an *equitable* provision of care. Data support that statistically significant disparities in internet access exist on the basis of age, sex, race and ethnicity, income, and education.[30] Clinical pharmacists and administrators should proactively identify and provide resources to patients in need of tangible interventions (eg, a functional device, a hospital translator on the call) while also making an effort to factor in intangible consideration (eg, coordinating timing of calls when caregivers are present

TABLE 5 Patient and caregiver challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential strategies	Future directions
• Medication reconciliation • Medication education • Ensuring access to a clinical pharmacist for questions throughout the hospital stay • Protecting the patient-pharmacist relationship	• Optimize technology/equipment as described in Table 3 • Develop a medication reconciliation app for patient/caregiver use or institutional EHR programs to efficiently and accurately report home medications and identify home pharmacy • Use encrypted asynchronous (eg, encrypted email or text) or real-time videoconferencing platforms to review prescription bottles from a caregiver in the patient's home • Anticipate patient discharges and provide written educational materials (in patients' primary language) to the nurse or physician • Ensure the patient/caregiver is in a private and secure area during virtual encounters • Use a translator for all patients/caregivers who do not speak English as their primary language • Use the teach-back method to gauge patient/caregiver understanding of the patient education • Develop a process to ensure patients/caregivers recognize a clinical pharmacist is on their care team and that they have access to him or her for questions throughout their hospital stay	• Allow family member/caregiver access (with patient permission) to the EHR patient portal • Incorporate telehealth experiences with patients/caregivers into school of pharmacy curriculums • Conduct clinical studies evaluating patient/caregiver engagement in and adherence to increased access to their own health information • Increase use of technologies to streamline communications to other providers or pharmacists during transitions of care (eg, discharge or transfer from the hospital)

TABLE 6 Equity challenges, potential strategies, and future directions for remote inpatient clinical pharmacy services

Challenges	Potential strategies	Future directions
• Inadequate patient access to technology • Inadequate patient access to the internet • Technology literacy issues • Language barriers • Vision or hearing barriers • Inclusion of caregivers for those with special needs • Inequity in access to technology, internet, and HIPAA-compliant workspaces for clinical pharmacists	• Use hospital-provided devices • Use onsite personnel to assist patients/caregivers with technology literacy, vision, or hearing issues • Ensure access to remote translator services 24/7 • Coordinate timing of calls with caregivers when they are involved in the care of patients with special needs • Develop policies and procedures by pharmacy administrations to ensure reasonable equity in the ability of clinical pharmacist employees to provide remote services	• Ensure universal/national wireless internet access and charging stations • Build remote access technology centers for systemically marginalized populations to use in receiving remote health care resources • Develop or support national or state "digital health equity" team composed of policy-makers, public health experts, and community leaders to address disparities in the community, such as development of technology donation and redistribution programs

for those with certain disabilities). Hospitals should continually address these disparities, such as purchasing devices to provide to patients/caregivers for in-room video counseling, having onsite personnel to assist patients with technology literacy issues, and providing remote access to translators. In addition, state and national investments in larger infrastructures can address systemic inequities in communities, such as health systems building satellite care campuses near areas with fewer resources and/or limited health care access. Inequities may also exist among the clinical pharmacists who provide remote care. Access to personal technologies/equipment and HIPAA-compliant spaces at home may vary, and pharmacy administrators will need to address these scenarios. Table 6 summarizes equity challenges and proposed solutions.

2 | CONCLUSION

Use of remote inpatient clinical pharmacy services has increased rapidly during the COVID-19 pandemic, underscoring many challenges for clinical pharmacy departments. The ability to provide remote services has the potential to expand the reach of clinical pharmacists to areas that currently lack access to these clinical services. Identifying potential barriers for health systems is important in advancing the

future of pharmacy practice. Many legal/regulatory, administrative, technology/equipment, and equity challenges exist that result in barriers to implementing provider-facing and patient/caregiver-facing activities. This paper summarizes these challenges and proposes solutions as institutions implement remote inpatient clinical pharmacy services. Pharmacists and pharmacy organizations are highly encouraged to leverage their resources to expand the role of the inpatient clinical pharmacists in telehealth.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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