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Review Article

Pharmacist Involvement in Family Medicine Residency

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Abstract

Pharmacist involvement in Family Medicine Residency Programs (FMRPs) has become increasingly prevalent over the past four decades, ranging from involvement in didactic teaching to active participation in patient care. Pharmacists contribute to FMRPs by serving as faculty, preceptors, and educators, addressing gaps in pharmacotherapy education and enhancing patient care outcomes. By actively managing chronic conditions, providing medication reconciliation, participating in population health, and facilitating care transitions, pharmacists enhance patient safety and contribute to quality improvement efforts within FMRPs. Furthermore, pharmacist-run programs, facilitated by collaborative practice agreements, offer comprehensive disease management services and generate revenue for family medicine practices. Despite progress, challenges remain in advancing pharmacist participation in FMRPs, including the need for increased awareness of their role and scope of practice among program stakeholders. Pharmacist involvement in FMRPs is endorsed by key medical organizations and offers significant benefits for patient care, education, and practice sustainability. This paper examines the expanding role of pharmacists within FMRPs, driven by accreditation requirements, shifting medical perspectives, and the imperative for interprofessional collaboration.

Keywords: Pharmacist Family Medicine; Medication reconciliation; Population health; Care transitions; Patient safety; Physician collaboration

Overview

Pharmacist involvement in Family Medicine Residency Programs (FMRPs) has been documented for over 40 years and has steadily grown through the years. A 2017 survey by Lounsbery and colleagues showed an increase in participation of clinical pharmacists in FMRPs, with the prevalence increasing from 24% to 53% from 1990 to 2015, respectively [1]. Consequently, the growth in pharmacy residency positions has supported the growth of clinical pharmacists within FMRPs. Due to the rapid growth of pharmacy residency programs, medical residency training now includes teaching experience and faculty development.

The scholarship, teaching, and education of clinical pharmacists within FMRPs now support the overall FMRP faculty program requirements for accreditation. The Accreditation Council for Graduate Medical Education (ACGME) expanded its definition of medical residency faculty to include non-physician members,

such as clinical pharmacists [2]. In recent years, ACGME has also called for greater participation of family medicine residents on interprofessional patient care teams, supporting the need for pharmacists to be embedded into FMRPs. Pharmacists can serve in a faculty role for training and as preceptors for rotations, be involved in curricula, aid with committees, and participate in scholarly efforts [3,4]. Additionally, pharmacists can directly participate in didactic education and provide valuable pharmacotherapy information for primary care practice. Frequently, pharmacotherapy education within medical schools is limited due to condensed curricula; thus, clinical pharmacists can bridge this gap by providing supplemental education to aid with future practice as well as board preparation.

Pharmacists can use various teaching methods to enhance resident education in pharmacology. Case- based learning, journal clubs, and topic discussions encourage critical thinking and the application of knowledge. Integrating bedside teaching during patient encounters allows real-time learning and reinforces clinical decision-making skills. Pharmacists can also facilitate interactive workshops to provide hands-on experience in medication management and pharmacotherapy. Pharmacists can further enhance resident education by incorporating innovative teaching methods such as gamification, flipped classroom approaches, and technology-based tools like online modules and virtual patient cases. These interactive and engaging approaches can stimulate interest, promote active learning, and accommodate different learning styles. Pharmacists can also use their expertise to provide targeted feedback and mentorship to family medicine and pharmacy practice residents, fostering their growth and development as competent pharmacotherapy practitioners.

Additionally, the previously mentioned 2017 survey identified that there has been a heightened shift from didactic teaching to collaboratively participating in patient care [5]. Physicians' perspectives toward the effective utilization of pharmacists in their practice sites are becoming more favourable. The American Medical Association (AMA) encourages its members to add pharmacists to their teams to see improved outcomes [6]. The AMA strongly supports the engagement of pharmacists within family medicine to improve patient outcomes and published STEPS forward, a toolkit for embedding a pharmacist into a practice [7]. Moreover, the AMA Education Hub has online modules such as "Embedding Pharmacists into the Practice." Among its goals, one is teaching providers "how to collaborate with pharmacists to improve patient outcomes," as well as developing business plans and marketing pharmacists to patients [8].

Similarly, the American Academy of Family Physicians published an opinion paper and guidance to integrate pharmacists due to improved chronic disease state management. The American Society of Health-System Pharmacists (ASHP) also supports using pharmacists in primary care to help meet "the needs of patients directly and in collaboration with other healthcare providers."

Pharmacists are well-positioned to aid with patient panel and population health management and provide pharmacotherapy training to learners. Depending on state laws, pharmacists can prescribe and fill gaps in areas where family medicine providers are needed. Prior literature demonstrates that pharmacists have helped reduce primary care provider burden, potentially inappropriate medication prescribing and medication burden, and emergency department visits while increasing primary care use and preventative screening measures [9]. Additionally, pharmacists are able to help with chronic disease state management and have demonstrated positive outcomes, including improvements in hypertension, diabetes, and ischemic vascular disease – just to name a few [10,11]. Finally, involvement in transitional care management provides an opportunity for the clinical pharmacist to collaborate and improve patient care, promote patient safety, and support the education and training of family medicine residents [12].

Addressing Access to Medications

Pharmacists are in an ideal position to assess cost concerns and medication access. A survey from 2019 found that approximately 23% of adults had difficulty affording their medications [13]. Increasingly, patients must pay more significant portions of their medication costs via higher copays or other out-of-pocket costs.

Pharmacists can assist with determining less expensive alternatives when possible. While drug costs are not often transparent without directly calling the pharmacy or insurance company, we can utilize some resources to provide insight. Examples include checking GoodRx, which shows direct acquisition costs for patients without insurance coverage. Toggling between different formulations (capsules vs. tablets) and strengths can demonstrate some cost savings opportunities. Pharmacists also can appropriately assess therapeutic interchanges if a generic option or less expensive alternative exists when a patient is prescribed.

a brand name (ex: fluticasone/salmeterol is available as Airduo®, a "generic" option, as well as Advair®, which is an expensive, brand name only therapy). Pharmacists can also provide education and assistance to determine insurance preferences and coverages – for example, how cost can vary between pharmacies and 30- and 90-day supplies of chronic medications. Pharmacists can also evaluate opportunities for deprescribing at every visit. Not only is this a direct cost savings opportunity, but it can also benefit someone with Medicare to delay going into the coverage gap.

For individuals with low income who are either uninsured or have Medicare, manufacturer assistance programs remain ideal options to help with medication costs. Enrollment for programs can range from a telephone call to a detailed application. Multiple online platforms help link individuals with appropriate programs, including NeedyMeds©, Rx Assist©, and Healthwell© [14-16]. During the COVID-19 pandemic, many manufacturers changed the criteria of these programs, either loosening restrictions on necessary income documentation or changing income requirements necessary to meet inclusion requirements. Additionally, some manufacturers provided additional programs regardless of patient income. For example, Janssen CarePath created a XareltowithMe

Coverage Gap Support, which decreased the cost of out-of- pocket Xarelto® to $85 per month between April and December [17]. For all these programs, some of the steps and applications can be extensive, warranting paperwork from both the prescriber and patient – so assistance from pharmacists who can help with the documentation and progress can be advantageous.

Individuals' medication copays are also variable based on insurance coverage. Manufacturer coupon cards are valuable for commercial insurance (non-federal coverage) patients. Pharmacists can review medication lists and identify appropriate coupons to utilize to help decrease cost burdens. As with patient assistance programs, pharmacists can help enrol patients for coupons during their appointments. Pharmacists can also ensure patients receive updated coupons annually (many coupons expire after a year) or find a therapeutic alternative if coupons are no longer available.

Finally, pharmacists can be a resource when patients enroll in Medicare plans or change during open enrolment season (October 15-December 7). Selecting an Advantage Plan or a Part D Plan can be overwhelming, with many patients needing guidance on factors to consider. Pharmacists can help to enter complete medication lists and provide education on various considerations (ex: monthly premiums, copays, deductibles, insight into when a coverage gap would occur, etc). While pharmacists cannot legally inform a patient to select a specific plan, they have unique training to provide insight and help a patient be better informed on the process.

Cost continues to be a significant care barrier for many patients – regardless of backgrounds, care settings, and environments. Pharmacists can significantly help with cost reduction and ensure resources are provided to patients in need.

Population Health Management

A common, great way to utilize pharmacists in family medicine is through Population Health Metrics such as Stars Ratings. These ratings focus on health plan quality measurements based on customer satisfaction and the quality of care a plan delivers. The goal of Star Ratings is to improve the quality of care and general health status for people with MedicareStar Measures that many pharmacists are involved in include:

- Appropriate use of high-risk medication for older adult patients (65+)
- Treatment of patients with diabetes
- Treatment of patients with hypertension
- Medication adherence for diabetes patients (Oral diabetic medications)
- Medication adherence for patients with hypertension (RAS antagonists)
- Medication adherence for patients using cholesterol medications (Statins)
- Statin utilization in patients with diabetes
- Treatment of patients with osteoporosis
- Medication reconciliation post-discharge

Pharmacists can manage these common Star Measures. Pharmacists can ensure these measures are met through patient appointments and telephonic calls. Achievement of a 4- or 5-star rating can provide family medicine practices with revenue in the form of reimbursement from insurance companies. Star Ratings are based on the percentage of patients meeting each measure; each insurance company determines individual thresholds for achievement of each Star Measure.

Additionally, pharmacists may be actively aiding with accountable care organization (ACO) metrics. Pharmacists can proactively help with population management (e.g., patients identified with elevated or outdated HbA1c, uncontrolled blood pressure, etc.), identify patients with treatment gaps, and provide education (e.g., vaccinations, depression screenings, and more). Prior literature demonstrates a beneficial impact when clinical pharmacists are involved with ACO benchmarks [18,19].

Direct Involvement in Transitions of Care

As patients transition from diverse levels of health care, such as hospital admission, discharge, and clinic visits, there can be changes in medication regimens, which creates a potential for errors. Through medication review, clinical pharmacists have demonstrated improved patient safety outcomes by improving medication lists' accuracy, identifying potential drug interactions, assessing for risk of adverse effects, and reducing polypharmacy [20]. The impact was more significant when patients at considerable risk for readmissions or adverse outcomes were targeted for transitional care management. (4) During transitions of care, the pharmacist can also address any questions or concerns the patient or caregiver may have about therapy, which may help improve adherence to therapy and increase patient satisfaction [21].

The transitions of care process can help pharmacists expand their collaboration with the interprofessional team by identifying and resolving medication therapy problems for patients with chronic diseases and addressing adherence and polypharmacy. It also provides opportunities for educational sessions and discussions with family medicine residents on pharmacotherapy topics [22-24]. Transitions of care can also lead to collaboration in quality improvement initiatives related to various medication-related processes.

Prior literature demonstrated positive impacts when a multidisciplinary approach was utilized for transitions of care and environments as applied in an outpatient setting [25,26].

Pharmacist Run Programs

Medication management is an essential component of successfully treating many chronic diseases. In primary care offices, the physicians are at the front lines to identify and diagnose various

conditions, initiate treatment, and monitor for appropriate outcomes. The dilemma is that primary care physicians are often stretched thin to cover a maximum number of patients given that 74 million individuals live in healthcare provider shortage areas (HRSA 2024). Because of this, the physician only has limited time with the patient during a visit and often may have to exclude certain discussions given this restraint.

Pharmacists have the training and knowledge to act as a physician extender to provide monitoring and follow-up with treatment escalation or de-escalation based on the patient‘s clinical presentation. One model that incorporates the pharmacist is the Expanded Care Team Pharmacist Model [27]. In this model, the pharmacist is embedded in the physician office and uses Collaborative Practice Agreements (CPAs) in conjunction with PCPs to initiate, discontinue, and dose adjust patients' medications around a specific disease state. This allows the physician to conduct patient visits on more acute needs or initial diagnoses of new conditions, while the pharmacist serves as the point of contact for monitoring and follow-up.

In addition to cost savings for patients, pharmacists can provide cost savings and revenue for family medicine practices through several services and the use of billing codes. Consequently, pharmacists are well-trained and can manage several disease states typically via Collaborative Practice Agreements (CPAs). Through the use of CPAs, pharmacists can manage chronic disease states including but not limited to diabetes, hypertension, hyperlipidaemia, COPD, asthma, HIV/PrEP, Hepatitis C, alcohol and substance use disorder, obesity, osteoporosis, and smoking cessation. Pharmacists can monitor these patients for treatment safety and efficacy and subsequently dose-adjust, discontinue, and/or initiate therapies for patients referred via CPA. Using pharmacists in this manner provides cost savings to the practice by freeing up provider appointments for those complex patients. In turn, this provides revenue for the practice through providers‘ higher-level billing codes.

In many states, pharmacists can bill for their services, too, generating revenue for the practices. Pharmacists may bill using various CPT codes. Billing for pharmacy services can vary by regulators, insurance providers, and healthcare systems. Currently, under Medicare, clinical pharmacists can bill services as incident to physician services billing, and there are examples of how this can be applied to reimbursement strategies [13].

While not all encompassing, common pharmacist-run programs can be found in Table 1.

Chronic Condition	Description
Respiratory Disorders (asthma, COPD) [28]	Following the diagnosis of asthma and/or COPD, family medicine pharmacists can provide follow-up monitoring to assess for medication adherence, correct inhaler technique, insurance problems, and need for escalation or de-escalation in therapy.
Anticoagulation [29,30]	Pharmacist-led anticoagulation clinics are referral-based clinics where the pharmacist performs point-of-care INR checks, warfarin dose adjustments, anticoagulation bridging for procedures, and management of vitamin K necessity. This can be paralleled to pharmacists within family medicine clinics, where the pharmacist works under a CPA to ensure therapeutic monitoring by adjusting warfarin dose based on laboratory testing.
Diabetes [31-36]	Clinical pharmacists have a long history of assisting with the management of patients with diabetes in family medicine and primary care settings, especially in the realm of family medicine and internal medicine physician residency programs aligned with either embedded pharmacists or pharmacy practice residency programs. Historically, pharmacists have been involved in the management of patients with diabetes mellitus type 2, most commonly using oral agents, non-insulin injectables, or basal/bolus insulin regimens. This area continues to expand for pharmacist involvement, now incorporating diabetes technology such as insulin pumps and continuous glucose monitoring devices.
Hypertension [37-39]	There are numerous ways in which a pharmacist can get involved in team-based care to treat hypertension. Community pharmacists can provide education around medication side effects, proper technique for home blood pressure monitoring, and assessing adherence based on fill history. Pharmacists embedded in family medicine offices can do similar tasks in addition to recommending medication changes based on therapeutic responses. By having more frequent follow ups with the healthcare team, patients often get closer to their blood pressure goal more quickly.
Hyperlipidaemia [40,41]	Pharmacists notably can provide counseling to patients around the importance of taking and being adherent to statin medications for cholesterol. Additionally, pharmacists can recommend initiating other classes of medications to lower LDL, total cholesterol, and/or triglycerides depending on patient presentation.
Weight Management [42]	As part of a patient's weight loss journey, they can get referred to the pharmacist who can assess comorbidities, prescribe medication to assist concurrent lifestyle changes that lead to weight loss, and ensure regular monitoring.

Smoking Cessation [43,44]	Studies around smoking cessation success often state that a combination of behavioral counseling and medication management are key for the patient to have a success quit attempt. Pharmacists within family medicine clinics can follow up closely during the initial phases of a quit attempt to ensure the patient is appropriately taking medication and addressing any withdrawal symptoms. This can allow the family medicine physician to focus on more acute problems during a visit versus spending the bulk of a visit discussing tobacco use disorder.
Infectious Diseases (Hepatitis C Virus, HIV prevention and treatment) [44-49]	The most recent clinical guidelines for the treatment of HCV states that primary care physicians (PCPs) are competent and able to treat uncomplicated cases, especially in the setting of hepatologist deserts. Similarly, PCPs are also prescribing more HIV PrEP and treatment without the need to consult infectious disease specialists. As PCPs are taking on more prescribing responsibilities, pharmacists can get involved
	to assist in managing drug-drug interactions, prior authorizations, and routine adherence checks to ensure successful treatment.
Medication-Assisted Treatment [50-52]	Pharmacists can be incorporated into a collaborative care team for SUD and MAT within a family medicine residency clinic to provide patient and resident education, improved medication adherence, and more frequent follow-up with patients.

Table 1: Common Pharmacist-Run Programs.

Financial Implications and Revenue Generation

In addition to cost savings for patients, pharmacists can provide cost savings and revenue for family medicine practices through several services and the use of billing codes [53]. Consequently, pharmacists are well-trained and can manage several disease states typically via Collaborative Practice Agreements (CPAs). Through the use of CPAs, pharmacists can manage chronic disease states including but not limited to diabetes, hypertension, hyperlipidaemia, COPD, asthma, HIV/PrEP, Hepatitis C, alcohol and substance use disorder, obesity, osteoporosis, and smoking cessation. Pharmacists can monitor these patients for treatment safety and efficacy and subsequently dose-adjust, discontinue, and/or initiate therapies for patients referred via CPA. Using pharmacists in this manner provides cost savings to the practice by freeing up provider appointments for those complex patients. In turn, this provides revenue for the practice through providers' higher-level billing codes.

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Setting: Urban Vs. Rural

Pharmacists are well positioned to provide patient education as well as training and education for family medicine residents in urban or rural settings. Each setting presents specific challenges; therefore, consideration must be given to designing pharmacy services based on the patient population, access to resources, and needs of the residency program.

In general, urban settings can present challenges in communication due to language barriers and medication management issues due to complex conditions such as HIV, resistant TB, and Hepatitis C.

However, urban areas may have better access to specialized services, multidisciplinary team care, and other healthcare resources. Rural areas usually have greater challenges with chronic disease management and limited healthcare resources [54,55]. The rural setting can provide a greater opportunity for integration into the community which may allow for a more personalized approach to patient care.

Despite some differences noted in each, there are multiple similarities including potential for high patient complexity, patient financial difficulties, and negative view of the healthcare system.

In both arenas, patients frequently experience health inequities. Pharmacists play a crucial role in addressing health inequalities in both rural and urban family medicine clinics by improving access to care, especially in underserved areas. In rural settings, where healthcare resources are often limited, pharmacists can offer more frequent follow up care, preventive care measures such as screenings and vaccinations, and overall health education, helping to bridge gaps caused by provider shortages. In urban clinics, they can target social determinants of health by providing culturally competent care, facilitating access to various services, and offering chronic disease management services tailored to the diverse needs of the population. Through these efforts, pharmacists help reduce disparities, promote health equity, and improve patient outcomes across different communities.

No matter the setting, a pharmacist can have a significant role in medication management for the patient. In an urban practice the pharmacist usually can collaborate with a multidisciplinary team to provide services in medication management for chronic

diseases or have an independent practice structure under a collaborative practice agreement. In rural settings with limited healthcare resources including providers, a pharmacist may have the opportunity to have a different scope of practice to provide patient care as well as more frequent follow up between provider appointments if provider access is limited. Pharmacists may have a greater role in accessing affordable medication for patients as well as addressing adherence. Telehealth may also play a role in accessing pharmacists for the education and training of family medicine residents.

Despite the increase in pharmacist participation in the training and education of family medicine residents there still are opportunities to advance involvement in family medicine residency programs [56]. A potential roadblock to involvement may be due to the lack of understanding of the role of the pharmacist [57]. (2) By educating residency program staff and administration the pharmacist can describe the changing role of pharmacy in patient care, improved outcomes through collaborative effort, and the potential for decrease in costs. The pharmacist can also address potential concerns with the misperception of duplication of services.

Before proposing clinical pharmacist involvement in a residency there should be a thorough evaluation of the needs of the patient population and where pharmacy services provide the most value for the program [58]. The pharmacist should take the opportunity to gain more knowledge about the program, residents, and understand the roles of other team members. Clinical pharmacists participating in resident training

have shown to have the greatest impact on medication management especially with chronic disease management, transition of care, and educating team members on the basics of deprescribing. Clinical pharmacists have also shown value in patient care safety and educating residents on a variety of pharmacology topics.

The pharmacist should develop a detailed job description of pharmacy services that will be provided to the program. This should be reviewed with the program to ensure a clear understanding of the role of the clinical pharmacist for all team members. Through increased visibility and access the pharmacist can educate residency program staff and proactively address any concerns with the role of the clinical pharmacist, explain the value of services provided, and promote collaboration to improve patient care.

The pharmacist scope of practice can vary from state to state as defined by the pharmacy practice act and regulatory oversight board. There are Individual states that allow the pharmacist to expand the scope of practice through a Collaborative Practice Agreement (CPA) with a physician. CPAs have given pharmacists the opportunity to improve patient care by participating in protocols for medication management of chronic disease such as diabetes, hypertension, and hypercholesteremia [59]. There are a few states that will recognize a pharmacist for advanced practice if specific criteria are met. For instance, North Carolina in 2001 was one of the first states to establish a Clinical Pharmacist Practitioner (CPP) license through a cooperative effort between the Board of Pharmacy and Board of Medicine [60]. The designation helps position pharmacists to provide enhanced patient care, improve outcomes, and increase provider satisfaction.

Billing for services under a CPA or as an advanced practitioner also depends on state and federal regulations. Information on rules and regulations for pharmacy practice and billing for services can readily be found on the website for the state Board of Pharmacy or Department of Health. The local or state chapter of a professional organization can be source of valuable information on pharmacy practice regulations as well as billing for services.

Conclusion

Pharmacists can have a significant impact on patient care as well as actively participate in the education and training of family medicine residents. AMA, ACGME, and ASHP strongly support pharmacist involvement in the medical education of family medicine residents.

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