

ACCP COMMENTARY

Impact of the Pharmacy Practice Model Initiative on Clinical Pharmacy Specialist Practice

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This paper describes the goals of the American Society of Health-System Pharmacists' Pharmacy Practice Model Initiative (PPMI) and its recommendations for health-system pharmacy practice transformation to meet future patient care needs and elevate the role of pharmacists as patient care providers. PPMI envisions a future in which pharmacists have greater responsibility for medication-related outcomes and technicians assume greater responsibility for product-related activities. Although the PPMI recommendations have elevated the level of practice in many settings, they also potentially affect existing clinical pharmacists, in general, and clinical pharmacy specialists, in particular. Moreover, although more consistent patient care can be achieved with an expanded team of pharmacist providers, the role of clinical pharmacy specialists must not be diminished, especially in the care of complex patients and populations. Specialist practitioners with advanced training and credentials must be available to model and train pharmacists in generalist positions, residents, and students. Indeed, specialist practitioners are often the innovators and practice leaders. Negotiation between hospitals and pharmacy schools is needed to ensure a continuing role for academic clinical pharmacists and their contributions as educators and researchers. Lessons can be applied from disciplines such as nursing and medicine, which have developed new models of care involving effective collaboration between generalists and specialists. Several different pharmacy practice models have been described to meet the PPMI goals, based on available personnel and local goals. Studies measuring the impact of these new practice models are needed.

KEY WORDS clinical pharmacy, clinical pharmacy specialist, pharmacy practice, Pharmacy Practice Model Initiative.

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The 2013 American College of Clinical Pharmacy (ACCP) Certification Affairs Committee was charged with developing this commentary to address components of the American Society of Health-System Pharmacists' (ASHP's) Pharmacy Practice Model Initiative (PPMI), including adopting the integrated practice model and its potential impact on postgraduate year two (PGY2)-trained clinical pharmacy specialists.¹ The committee was composed of a pharmacy student and a resident as well as clinicians and pharmacy leaders who practice in a variety of health settings.

Hospital pharmacy practice and the role of hospital pharmacists have changed and evolved continuously since their inception. Change in the pharmacy practice model has been driven by several internal and external factors. The U.S. health care delivery model is undergoing transformational changes driven by the need for efficiency and improved outcomes. Changes in reimbursement have set the stage for improved patient access, with added emphasis on value-based care, while moving away from the traditional fee-for-service model. Medication use is increasingly complex, and the gaps in medication management during transitions of care are significant. Recent estimates suggest that 700,000 emergency visits and 120,000 hospitalizations result from adverse drug events annually at a cost of \$3.5 billion.² The evolving care delivery model has created a unique opportunity for pharmacists to bridge those gaps and transform medication management across the continuum of care.

PPMI Aims

PPMI was designed to identify and promote opportunities to alter and expand health-system pharmacy practice and to further stimulate the transition to a patient focused care model in order to increase the quality and continuity of care. The pharmacist's role in health systems is less product focused and more patient centered, striving for safe and effective medication use. However, this transition has been neither uniform nor rapid. Thus, despite success in many settings, significant opportunities exist to provide more consistent and patient-focused care.

PPMI provides numerous recommendations for practice improvement. However, there is concern that instead of promoting and expanding pharmacy practice roles broadly, adopting PPMI will lead to a compression of roles toward

a common "hybrid" practice model that will limit opportunities for clinical pharmacy specialists to direct and optimize the care of high-risk, complex patients. Yet, ideally, the intent of PPMI is not to diminish specialist roles but rather to ensure that clinical pharmacy specialists and academicians have knowledge of the pharmacy system, work collaboratively with other members in the department, and support a team structure that facilitates continuity of care and advances the practice of their generalist colleagues.

In this paper, the committee reviews the opportunities and challenges for clinical pharmacists that are posed by PPMI. Despite PPMI's emphasis on changing the focus of health-system pharmacy practice, the role of the clinical pharmacy specialist must also evolve. Clinical pharmacists, whether specialists or generalists, are the practitioners who focus on optimizing medication therapy and who use therapeutic knowledge, experience, and judgment to ensure optimal patient outcomes through comprehensive medication management (CMM).³ In turn, CMM ensures that each medication is individually assessed with respect to its appropriateness, effectiveness, and safety. This includes developing an individualized care plan to achieve the intended goals of therapy and providing an appropriate follow-up to assess outcomes. Thus, although many pharmacists provide some clinical services, clinical pharmacists, as defined in the ACCP Standards of Practice for Clinical Pharmacists, are the practitioners who provide CMM and related care for patients.⁴ As licensed pharmacists with specialized education and training, clinical pharmacists possess the clinical competencies necessary to practice in team-based, direct patient care environments. Additional clinical pharmacist criteria in the ACCP Standards of Practice include completion of accredited residency training or equivalent post-licensure experience and board certification by the Board of Pharmacy Specialties (BPS).

Clinical pharmacists practice with a defined process of care that includes patient assessment, medication therapy evaluation, development and implementation of a plan of care, and follow-up evaluation and monitoring with appropriate documentation. Clinical pharmacists are recognized by the American College of Physicians as key members of the clinical care team who practice in collaboration with other health professionals to provide high-quality, coordinated care that is specific to patient needs.⁵ These clinical care

teams are supported by a variety of clinical and administrative personnel. Clinical pharmacy specialists have typically completed postgraduate year one (PGY1) and PGY2 residency training (or possess equivalent clinical practice experience) and provide direct patient care to specialized/complex patient populations (e.g., critical care or oncology patients). Clinical pharmacy generalists are generally expected to be practitioners with 1 year of postgraduate training (PGY1) or equivalent experience who provide direct patient care to a broad population while typically sharing responsibilities with several other individuals to ensure a range of pharmacy services, including medication order fulfillment.⁶ Other health-system pharmacists have become operational specialists to meet the increasingly complex regulations in parenteral production and to efficiently manage technology and technicians.

PPMI Background

After a multiday interactive meeting in 2010, the ASHP Pharmacy Practice Model Summit described a set of short- and long-term goals for improved patient care and expanded pharmacist roles.^{1, 7} The resulting PPMI statements direct practitioners to identify gaps and opportunities that will facilitate the development of new pharmacy practice models that meet our nation's evolving health care needs through the effective

use of pharmacists as direct patient care providers. The summit report describes baseline assumptions and beliefs about pharmacy practice together with a justification of the recommendations for change, including the need for pharmacists to (1) assume greater responsibility for medication-related outcomes, (2) commit to helping patients make the best use of medicine, and (3) move from pharmacy-centric to patient-centric thinking about the mission of the pharmacy enterprise. The likelihood of the new models' success will be influenced by factors related to the future of health-system pharmacy, including greater influence of technology, expanded roles for technicians, and significant financial pressures on the health system. Furthermore, it is predicted that pharmacy leaders will be held responsible for achieving quality standards around medication use and improved patient outcomes. Selected recommendations from the summit (Table 1) provide a sense of the urgency and boldness of leadership required to engineer this transformation and build toward the future of health-system pharmacy.

PPMI content of specific interest to clinical pharmacy specialists includes a recommendation that pharmacists provide drug therapy management (DTM) for each patient.⁸ Although the PPMI consensus document does not specifically define DTM, it does recommend that pharmacists providing DTM be certified through the most appropriate BPS certification process and

Table 1. Selected Recommendations From the ASHP Practice Model Summit¹

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- 1 DTM should be provided for each patient by a pharmacist in both inpatient and ambulatory care settings
 - 2 Hospital and health-system pharmacists must be responsible and accountable for patients' medication-related outcomes
 - 3 Proactive and ongoing assessments and risk mitigation of medication use systems must be a primary responsibility of all pharmacists
 - 4 Every pharmacy department should identify DTM services that should be provided consistently by pharmacists
 - 5 All patients should have the right to care by a pharmacist
 - 6 All distributive functions that do not require clinical judgment should be assigned to technicians
 - 7 Uniform national standards are needed for the education and training of pharmacy technicians
 - 8 Adequate pharmacy resources must be available to safely develop, implement, and maintain technology-related medication use safety standards
 - 9 Pharmacist completion of ASHP-accredited residency training or achievement of equivalent experience is essential for pharmacists to provide DTM
 - 10 Pharmacists providing DTM should be certified through the appropriate Board of Pharmacy Specialties certification process
 - 11 Pharmacist-provided DTM should be prioritized using a patient medication complexity index to identify patients with greatest need
 - 12 Pharmacists should facilitate medication-related continuity of care
 - 13 Pharmacists should be part of accountable care organizations and medical homes
 - 14 In ideal pharmacy practice models,
 - a Pharmacists should be accountable for the development and documentation of medication-related components and must have oversight and responsibility for drug distribution
 - b The role of pharmacists in frontline practice should not be limited to drug distribution and reactive order processing
 - c Individual pharmacists must accept responsibility for both clinical and distribution activities of the pharmacy department
 - d Individual pharmacists should not be engaged in DTM without an understanding of and responsibility for the medication use or delivery systems
 - e Clinical specialists are necessary to advance practice, education, and research activities
 - f Contemporary pharmacy education must prepare pharmacists for an expanded role in DTM in hospitals and health systems
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DTM = drug therapy management.

be granted privileges to write medication orders. PPMI also recommends that the scope of practice of pharmacists include prescribing as part of the collaborative practice team if pharmacists are appropriately credentialed and privileged for that activity. Furthermore, PPMI states that pharmacists providing DTM must be residency trained and perform a variety of direct patient care activities (including those found in the ACCP Standards of Practice).⁴ Thus, the PPMI statements appear to indicate that the activities traditionally provided by clinical pharmacy specialists will continue to be important components of care.

Moreover, when the broad range of PPMI patient-focused care goals is examined, it appears that a team of pharmacy practitioners will be needed and their roles matched to patient severity of illness and risk of adverse medication-related outcomes. This will require a specialist's level of practice expertise in cases involving patients with complex medication regimens, high-acuity illness, or unique therapeutic needs. The individual in this role has been described as an "attending pharmacist" who may delegate selected activities to others but who remains accountable for patient outcomes.⁹ Furthermore, clinical pharmacy specialists also play essential roles in practice advancement, research and scholarship, and education of students, residents, and pharmacy staff.¹⁰

Workforce Training to Meet PPMI Goals

Fully achieving the broad range of PPMI goals will require a well-trained workforce practicing at the highest possible performance levels: "top of license." In this respect, ACCP endorses a future in which formal postgraduate residency training becomes mandatory for practice in direct patient care.¹¹ Earlier, the ASHP 2015 initiative called for 90% of the health-system pharmacist workforce to have completed residency training, which was incorporated as a PPMI priority.¹² PGY2 residency program expansion is also acknowledged as important to achieving PPMI goals.⁸

An ACCP white paper details the residency training needed and other approaches to developing clinical practice knowledge and skills.¹³ Nontraditional pharmacy residencies are being used today to achieve the outcomes of traditional PGY1 training.^{14, 15} A combination of traditional staffing and clinical training rotations over an extended period fulfills the requirements

of an accredited traditional PGY1 program without excessively taxing either the workforce or the staffing budget. Broadening this approach to professional development may be essential to increase the number of clinical pharmacy generalists needed today and in the future. A detailed process has been outlined to describe the training and skills required for pharmacists to demonstrate residency equivalency.¹⁶

Residency training programs benefit health-system pharmacy departments by contributing to patient care and practitioner/staff development. Pharmacy residents can extend clinical pharmacy services within the health system by participating on rounds, writing notes, performing order verification, responding to questions from members of the health care team, providing informal and formal teaching, participating in research and other departmental projects, and taking part in patient and staff education. Moreover, residents should be heavily involved in the mentoring and teaching of students and/or more junior residents (i.e., PGY2 residents precept PGY1 residents; PGY1 and PGY2 residents precept students).^{17, 18} Participation of pharmacy residents and students in patient care should be built into the fabric of a team-based pharmacy practice model, just as medical residents and medical students are incorporated into the medical practice model. Clinical pharmacy specialists must allocate sufficient time to mentoring, teaching, and modeling high levels of practice.

Certification/Credentials for Practice

Board certification is one way in which clinical pharmacy specialists can, in part, demonstrate competency. The PPMI recommendations endorse board certification for those who provide DTM.⁸ ACCP's position is that pharmacists who are responsible for the delivery of CMM should be board certified.¹⁹ Institutional support for board certification is an important driver for achieving this milestone.

Credentialing is another means by which clinical pharmacy specialists can demonstrate competency. As previously noted, one recommendation of the PPMI summit calls for health-system pharmacists to gain privileges to write medication orders.⁸ From the existing regulations, it appears that clinical pharmacy specialists will likely meet such privileging criteria and help further expand these clinical responsibilities in team-based settings. The Council on Credentialing in Pharmacy has called for local

credentialing and privileging processes to support a framework for advanced pharmacy practice.^{20, 21} Along these lines, the roles of clinical pharmacy specialists and other “advanced practice” pharmacists are becoming better defined.

In 2009, the Veterans Health Administration created medication prescribing authority procedures for residency-trained clinical pharmacy specialists (or those with equivalent experience) who are also board certified.²² Legislation in California has created an advanced practice pharmacist designation for pharmacists with advanced training, experience, and specific credentials recognized by the California State Board of Pharmacy.²³ These advanced practice providers will have expanded roles and privileges in a collaborative practice environment. Ultimately, third-party payers will demand that pharmacists achieve and maintain adequate credentials for specialist practice, consistent with their expectations for other health care practitioners. Other examples of expanding the scope of pharmacy practice have been described elsewhere in the United States.²⁴

In lieu of external credentials and an adequate supply of specialists, it is the hope of this committee that health-system pharmacy leadership will raise expectations for practice, support staff development that facilitates the acquisition of the knowledge and skills needed to carry out more advanced practice responsibilities, and then create opportunities for qualified generalists to assume these responsibilities within the health system.

Specialists on the Pharmacy Team

PPMI does not differentiate between generalist and specialist roles within the pharmacy team, whereas ACCP provides a framework (ACCP Standards of Practice) for describing what all clinical pharmacists do as a routine part of CMM in order to help define and codify specialist practice.⁴ In addition, literature support for the clinical pharmacy specialist’s role already exists and has been documented in the care of a variety of patient populations. Indeed, clinical pharmacy specialists have defined patient care roles in cardiology,^{25, 26} critical care,^{27, 28} infectious disease,²⁹ and team-based acute care, to name but a few.³⁰ Moreover, clinical pharmacy specialists have an additional set of diverse responsibilities including didactic teaching, research, and quality improvement activities that may take them away from the bedside, which

PPMI includes as optimal components of its pharmacy practice models.¹⁴ When the clinical pharmacy specialist is absent, PPMI emphasizes continuity of care so that patient care needs are still addressed.

Defining a pharmacy team made up of both generalists and specialists who share responsibility for patient outcomes can achieve the continuity and sustained high level of patient care that PPMI is aiming for. A key factor in providing this consistent, high-quality patient care is an understanding of the roles played by each member of the pharmacy team in the process of care. Individual roles will depend on the available personnel; their knowledge, skills, and experience; and their leadership and management abilities. With consistent and direct patient care as the stated goal, the team’s structure and leadership should be designed to achieve the desired outcomes with the available personnel while identifying and filling any gaps in care. Successful teams usually include a team leader, specific team members (e.g., pharmacy generalists, specialists in clinical and operational pharmacy, technicians), and appropriate support systems (e.g., informatics, automation). In one setting, departmental strategic planning to redesign the model of care led to the creation of teams with roles for the leader and team members and specific team-related goals. This in turn led to practice transformation, but the specialist responsibilities were shifted to decentralized pharmacists, and the team leader was given responsibility for the team’s output and achievement of quality goals.²⁰ In such models, the pharmacy team mentors and trains pharmacy students/residents and shares patient care responsibilities to facilitate time for teaching and other activities. Communication, shared responsibility, and a focus on patient care are essential for this approach to succeed.

Models of Care in PPMI

Several different pharmacy practice models have been described that potentially meet PPMI goals. Such models of care are evolving and depend on a variety of internal and external factors, including patient population, physician or programmatic priorities, available personnel, and hospital type. No single model will fit all institutions. Among the many models, the patient-centered integrated practice (PCIP) model is described as a proactive, comprehensive, flexible, adaptable, and efficient approach to achieve

efficient patient-focused care. This model maximizes the strengths of specialists and extends their impact by organizing the pharmacy team.^{31, 32} This team assumes many clinical and operational responsibilities and is accountable for all aspects of pharmacy services from patient admission to discharge, resulting in less fragmented care. Successful teams identify a key pharmacist to serve as a resource for other members of the interdisciplinary team on each shift. The team leader may be a specialist but, if not, should be a pharmacist with the skills necessary to provide oversight and direction for the team's patient care, teaching, and other activities.

Additional pharmacy practice models include the drug distribution-centered model, the clinical pharmacy specialist-centered model, and a hybrid model that combines features of the other models.^{20, 32, 33} In the drug distribution-centered model, pharmacists tend to have limited patient care involvement, with responsibilities predominantly focused on processing orders and dispensing medications. In this setting, clinical pharmacy specialists are often the primary team members involved with consultations and patient-focused activities. If the department tries to transition from this practice model, specialist practitioners must take on the additional responsibility of mentoring and modeling patient-focused services for new clinical pharmacy generalists. Professional development of existing practitioners should proceed with a proactive plan based on the patient care areas of greatest need in order to systematically expand the clinical pharmacist's direct patient care activities across the institution.

Clinical pharmacy specialist-focused and hybrid models similarly rely heavily on clinical pharmacists with advanced training to provide most of the patient-focused care. If these specialists are not also familiar with the medication formulary or the drug distribution systems, the intended outcomes may not be fully accomplished. Furthermore, because nonintegrated specialist services are generally provided only during limited hours on weekdays, fragmented patient care could potentially result, especially if the clinical pharmacy specialist is away for a prolonged period. PPMI clearly recommends that the pharmacist team provide continuous services throughout the day, evenings, weekends, and holidays, with no reduction in the level of service during the absence of any pharmacy team members. The success of the team also largely depends on well-trained technicians

responsible for the logistics of medication distribution and other tasks that do not require a pharmacist's judgment. To meet the demands and challenges of a dynamic health system, the pharmacy model should be developed such that the practice of each pharmacy employee is targeted to the highest level possible. Research on the impact of these models is needed to foster practice model change and establish best practices.

Creating Change

Changes in pharmacy model delivery can be difficult and threatening. Moreover, change can be very slow, and some successful programs have spent a decade or more on the process. Triggers for change are widely varied and may include personnel changes, dissatisfaction among current practitioners, technology upgrades, and economic/financial pressures. One hallmark of successful programs is the use of strategic planning processes that incorporate the staff to identify opportunities and stimulate engagement. Indeed, successful models have focused on the key relationships that must be fostered within the patient care team and provide for the development of existing staff together with the hiring of qualified new staff.

Pharmacists have been given permission to practice in new ways and provided the tools to be successful. Indeed, PPMI offers new roles for clinical pharmacists as advanced providers. Of importance in this model, the vision for the department and the goals for practice must be understood and shared by individual team members. A 2007 article proposes a systematic framework for pharmacy redesign to assist in setting priorities according to feasibility and potential reward.³³ Examples of successful programs include a hybrid practice model developed at the University of Pittsburgh Medical Center that used some of these principles to incorporate academic specialists and unit-based generalists into a dynamic team.³⁴ At the University of Wisconsin, one goal is to develop a comprehensive pharmacy practice model, with all pharmacists accountable for medication management working in teams to provide clinical and distributive services by an integrated, patient-centered, unit-based, decentralized pharmacy practice model.³⁵ Similarly, at the University of North Carolina, redefining practice roles with recognition of the importance of centralized pharmacists highly skilled in distribution processes and technology,

working together with clinical pharmacy generalists, has allowed practitioners to provide a broad range of decentralized patient care and distributive services. In addition, refining clinical pharmacy specialist roles provides for a focus on unique populations.³⁶ Other examples of transformation were discussed at a PPMI summit in Cleveland.³⁷ For departments unprepared to embark on a major overhaul, pilot programs comparing smaller-scale changes have been used. In a 2012 report, a pharmacist-only model was compared with a pharmacist-technician model for impact on patient care interventions in two nursing units over a 2-week period.³⁸ In that report, broader use of technicians and a focus on documentation substantially increased the interventions made by both groups.

Informatics Specialists Needed

Any changes made to the PPMI pharmacy practice model must be supported by health information technology (HIT), and the pharmacy informatics specialist is a new role with substantial importance to the development of new pharmacy infrastructure. One of the key recommendations of the PPMI summit calls for “sufficient pharmacy resources ... to safely develop, implement, and maintain technology-related medication-use safety standards.”⁸ Recommendations regarding the optimal use of HIT as it pertains to pharmacy practice, as outlined by a section on pharmacy informatics, includes that technology should be designed to support pharmacists as clinical medication managers, and automation and other features should increase the efficiency of medication distribution and facilitate the transition of pharmacists into more patient-centered roles.³⁹ Along these lines, pharmacy informatics specialists, working with clinicians, have developed CDSSs (clinical decision support systems) within the electronic health record to help identify high-risk patients.^{40–42}

Challenges for Clinical Pharmacy Specialists

PPMI goals include raising the level of pharmacy practice; however, in some settings, an attempt to make pharmacist roles more homogeneous by reducing the emphasis on CMM (in favor of more targeted, less comprehensive activities) has created challenges for clinical pharmacy specialists. Nevertheless, PPMI encourages that practitioners practice at the top of their

license and training. As such, maximizing the effectiveness of clinical pharmacy specialists while also hiring PGY1-trained generalists as well as training and expanding the roles of existing pharmacists and technicians are recommended to achieve the degree of success described by PPMI. Recognition outside the pharmacy department of the unique role of clinical pharmacists as advanced providers can strengthen support for their essential role in practice model transformation.²⁴

Challenges for Clinical Pharmacy Faculty

Academic medical centers are pivotal in training the next generation of pharmacists, yet how academic clinical pharmacists are best integrated into future PPMI practice models has not been well described, thereby presenting challenges for clinical pharmacy faculty. Clinical faculty must be prepared to actively model an optimal patient care role while reserving time for didactic teaching and scholarly activity. Some have argued that incorporating clinical faculty members, whose many roles and responsibilities may run counter to the goal of providing consistent clinical services, is incompatible with practice models that emphasize consistent patient-centered care for every patient at all times (i.e., 24 hrs a day, 7 days a week).³⁹ However, the continued contributions of academic clinical pharmacists to existing practice models should not be overlooked. Indeed, these academicians often serve as innovators of new clinical pharmacy programs and conduct much of the research regarding the successes of pharmacy services or practice models. Integrating clinical pharmacists with faculty appointments should be viewed as mutually beneficial. At the University of Pittsburgh, the new model includes clinical “pods,” with unit-based pharmacists and clinical faculty sharing patient care roles in addition to conducting collaborative research projects and other scholarly work.³⁹ As a result, hospital staff have become more engaged with the faculty, and student training programs have been enhanced.

If students and residents are mentored by an academic “attending pharmacist” while effectively integrated into practice models as “practitioner-learners,” their experience is enhanced, and many times, they have the opportunity to expand direct patient care services within the institution.⁹ Pharmacy practice model change performed in collaboration with academic

programs has the potential to produce students who are better prepared for PGY1 residency training and a future in health-system pharmacy generalist practice. In addition, clinical faculty often serve on hospital committees, improve quality by helping institutions meet regulatory standards, and provide staff education and development.⁴³ Creating collaborative teams of faculty members with a variety of appointments (e.g., tenure-track, non-tenure-track, adjunct) to provide consistent patient care services is one way academic pharmacists can be integrated into new practice models while maintaining continuity of care and providing effective training experiences for students. It is therefore incumbent on practice sites and affiliated faculty to negotiate and clearly define the hours and activities of the faculty and students when they are in the hospital or clinic setting.

Lessons from Other Disciplines

Changes in the delivery of health care in the United States and economic forces trying to decrease inpatient costs and lengths of stay have led to changes in other medical disciplines that can inform the pharmacy model's evolution. For example, internal medicine physicians with a practice focused only on acute care medicine—so-called hospitalists—now treat a high proportion of inpatients. This focus allows them to efficiently manage acute care and the transition of patients back to their primary care physicians as well as coordinate care with consultants and specialists.^{44, 45} However, despite this rapidly evolving practice area, hospitalist training standards have not been defined, leading to questions about appropriate pathways to these new roles and the optimal integration of hospitalists with other clinicians.^{46–48} Indeed, the hospitalist trend in U.S. health care can be seen as analogous to the changes recommended for pharmacists by PPMI. For example, both hospitalists and pharmacists are driven by the need to provide competent, patient-centered care on a consistent, around-the-clock basis, and both, too, have looked to generalist practitioners to change their practice to meet this need while not diminishing the role of collaboration with established specialists.⁴⁷ Moreover, the greatest success in patient care provided by pharmacists, as with hospitalists, is likely to occur when pharmacy generalists and specialists work in tandem to meet the needs of the individual patient.

Other lessons regarding the effects of change in practice models and certification can be learned from nursing. The roles and titles within nursing have evolved to include multiple practitioners (e.g., licensed practical nurse, registered nurse, B.S. registered nurses, research-focused doctoral-trained nurses, and advanced practice registered nurses [APRNs] with a master's degree). However, recognizing that the training requirements for advanced clinical practice are now more consistent with doctoral-level preparation, the American Association of Colleges of Nursing has endorsed the doctor of nursing practice (DNP) as the terminal degree for advanced nursing practice.⁴⁹ Of interest, justification of the DNP as the optimal preparation for advanced clinical nursing providers cites the successful development of the Pharm.D. degree. Advanced practice nurses are also named as important members of the clinical care team.⁵ Factors that contribute to a need for advanced training of nurses are familiar to pharmacists, including the rapid expansion of the knowledge underlying practice, increased complexity of patient care, national concerns about the quality of care and patient safety, shortages of nursing personnel, shortages of doctoral-prepared nursing faculty, and increasing educational expectations for the preparation of other members of the health care team.⁵⁰ This change has created fear and confusion within the nursing profession. Some have cautioned that the mandate for DNP training is unrealistic given the many obstacles faced by health care, the profession, and colleges of nursing and could have unintended consequences, such as reduced production of APRNs.^{51, 52} However, despite the evolution of these specialists, the role of the nurse generalist is not expected to be diminished or eliminated, and registered nurses are also considered important members of dynamic clinical care teams.⁵ Pharmacy can continue to learn from and partner with other health professions to adapt practice models to meet the needs of patients and health systems.

Research Needed

With the increasing complexity of patient care and the dynamic health care environment, more research demonstrating the benefit of new pharmacy practice models on patient outcomes is needed. Ultimately, the true measure of success of improved pharmacy practice models lies in their ability to improve clinically important end

points such as length of hospital stay, readmission rates, quality of hospital experience, and cost of hospitalization. Yet documentation of the impact of these newly developed and implemented pharmacy practice models, medication safety programs, and medication clinical surveillance programs on patient outcomes remains scarce. Moreover, despite the many real and perceived barriers associated with conducting practice-altering studies, including complex study design, confounding variables, financial constraints, and privacy and security challenges, these studies are essential if the profession is to move forward and meet the demands of a changing health care society. Indeed, documentation of the positive and negative aspects of new practice model initiatives will inform future practice.

Conclusion

In this paper, the committee reviews the opportunities and challenges for clinical pharmacists across the country that are posed by PPMI. While the largest component of the PPMI statements is changing the focus of health-system pharmacy practice, this committee cautions that clinical pharmacy specialists must remain essential members of the patient care team and continue to lead the development and implementation of these improved direct patient care models. Promoting certification and developing local privileging processes are likewise important components in codifying the practice roles of clinical pharmacy specialists. Simultaneously, clinical pharmacy specialists must be prepared to lead and facilitate the development of more clinical pharmacy generalists in order to ensure continuity of care and increase the impact of pharmacy services on optimal patient outcomes. Documentation of the new pharmacy practice models developed to meet PPMI goals and studies measuring the impact of these new practice models are needed.

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