Academic pharmacy and patient-centered health care: A model to prepare the next generation of pharmacists


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Abstract

Objective: To provide evidence regarding existing partnerships between academic pharmacy and primary care that focus on training practitioners in patient-centered health care (PCHC).

Data sources: The report of the 2009–10 American Association of Colleges of Pharmacy Professional Affairs Committee identified 25 current U.S.-based examples of PCHC that incorporate the training and preparation of both student pharmacists and pharmacy residents.

Summary: The most frequently reported health care delivery model was an ambulatory care clinic followed by a Department of Veterans Affairs or military hospital clinic. Pharmacists worked alongside a variety of other health care providers in these settings. Collaboration occurred most commonly with family and internal medicine physicians but also with specialists such as psychiatrists, obstetricians/gynecologists, hematologists/oncologists, and other health care providers (e.g., nurses, physician assistants, dieticians, social workers).

Conclusion: In light of the increasing demand for primary care services, pharmacists’ documented ability to address these needs and the resulting benefits to patients, providers, and systems in these models, developing strategies for promoting pharmacist integration into PCHC is essential. Academic pharmacy provides a valuable platform for this integration through its expert faculty clinician involvement in care and practice-based research and student pharmacist and pharmacy residency training.

Keywords: Pharmacists, patient-centered care, ambulatory care, organizational models, needs assessment, pharmacy education.
Primary care is arguably the cornerstone of the U.S. health care system and generally how patients first access the medical system for care. In the primary care system, physicians often are responsible for managing and coordinating the care of patients and treating a variety of complaints, ranging from uncomplicated respiratory infections to complications arising from chronic diseases such as diabetes.1 Unfortunately, of all specialty areas in medicine, primary care is predicted to have the greatest shortage of physicians by 2025, with a predicted decline of approximately 46,000 physicians. Such a shortage may translate into longer waiting times for appointments, shorter patient visits with providers, and/or increased commute times for receiving care, which may lead to negative patient outcomes and/or provider stress. Such outcomes also may exacerbate the physician shortage problem and negatively affect patient care in the United States.2

To help counteract this physician supply deficit, a number of strategies must be used. One important strategy is to reduce complications arising from chronic diseases such as diabetes.1

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At a Glance

Synopsis: Based on analysis of the 2009–10 American Association of Colleges of Pharmacy Professional Affairs Committee report, evidence is provided regarding pharmacist involvement in academic practice partnerships engaged in residency and experiential training, in order to advance these practice models for training and integration in the expansion of patient-centered health care (PCHC). Ambulatory care clinics were the most frequently reported health care delivery model, followed by Department of Veterans Affairs or military hospital clinics. Pharmacists worked alongside a variety of other health care providers in these settings. Collaboration occurred most commonly with family and internal medicine physicians but also with specialists such as psychiatrists, obstetricians/gynecologists, hematologists/oncologists, and other health care providers (e.g., nurses, physician assistants, dietitians, social workers).

Analysis: The manner in which PCHC will be structured and evolve, including the official composition of the health care team and type of reimbursement pharmacists might receive as a member of the team, remains to be informed following implementation of the Affordable Care Act. The increased demand for primary care services and the strong evidence base for pharmacist integration into primary care services signal the importance for developing strategies for pharmacist involvement in PCHC. The authors contend that by fostering communities of practice, identifying factors predicting successful implementation of pharmacy models of PCHC, and promoting initiatives to disseminate effective practice models, academic pharmacy can provide a valuable platform for advancing these efforts.

Objective

This commentary highlights pharmacist involvement in academic practice partnerships engaged in residency and experiential training, in order to advance these practice models for training and integration into the expansion of PCHC. This article is limited to an examination of pharmacists’ roles in health care service delivery in the 25 reports identified (Table 1). Describing academic pharmacy examples in other health care settings (e.g., acute, long term, hospice) and comparing these data with other service delivery models is beyond the scope of this commentary.

Educational infrastructure and training expectations

Standards and guidelines for experiential education and residency programs exist and support the pharmacist in PCHC. The Accreditation Council for Pharmacy Education (ACPE) emphasizes the importance for experiential education in pharmacy degree programs in standards 10, 13, and 14.5 The Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes focus on three areas: pharmaceutical care, systems management, and public health.5 The CAPE Educational Outcomes state that pharmaceutical care should be provided in cooperation with patients, prescribers, and other members of an interprofessional health care team. These educational outcomes combined with the ACPE standards have...
been a stimulus for the evolution of experiential education, resulting in expanded experiential educational programs, many of which are located in health care settings that provide collaborative opportunities for students to partner with academic pharmacists and other health care providers to provide PCHC.

The educational expectations of doctor of pharmacy degree (PharmD) programs focus on the provision of PCHC. Student pharmacists and pharmacy residents, in collaboration with clinician faculty preceptors, are available to address some of the gaps in patient care. Further exploration of the postgraduate year (PGY)1 and PGY2 pharmacy residency training programs is important. The American Society of Health-System Pharmacists advocates residency training as the best source of training highly qualified pharmacy manpower. The educational outcomes of PGY1 programs include a concerted focus on training pharmacy graduates to provide care in PCHC models. Outcome R2 of the PGY1 Accreditation Standards requires pharmacy residents to provide evidence-based, patient-centered medication therapy management (MTM) in interdisciplinary teams. This outcome highlights that the next generation of residency-trained pharmacists are oriented to practice in collaborative and PCHC models of care. With academic pharmacy meeting the ACPE standards and CAPE Educational Outcomes regarding practice in PCHC models for experiential education, as well as offering pharmacy residencies meeting the standards for focused training in PCHC models, academic pharmacy provides a critical mass of pharmacists ready to learn and practice in PCHC models and address primary care needs as they pertain to medication management.

Academic pharmacy and PCHC

Evidence of the pharmacist’s role in primary care was summarized in the 2009–10 AACP PAC report. A total of 151 unique reports were identified. Primarily descriptive reports of practice models involving pharmacists providing PCHC, most reports included PCHC related to management of prevalent chronic primary care diseases (e.g., diabetes, hypertension, dyslipidemia). Frequent settings for the provision of care were community pharmacies (19% of reports) and ambulatory care clinics (54% of reports). Although dispensing functions were included in many reports, other patient care services consisted of MTM services, disease management services, and educational programs. The majority described collaboration between pharmacists, physicians, and/or other health professionals, while others also alluded to the use of protocols or other guidelines to direct clinical care. PCHC was reported in rural, urban, and suburban geographical areas.

Nearly every model from the PAC report described clinical outcomes as the key component of its results. Of the 137 reports evaluating clinical outcomes, more than 60% demonstrated improved outcomes. A total of 66 reports evaluated humanistic outcomes and general demonstrated improvements in patient satisfaction, quality of life, and/or patient knowledge. Of the 33 reports evaluating economic outcomes, greater than 50% demonstrated reductions in medication costs, medical costs, or visits to the emergency department. Overall, the evidence demonstrates that these models of care are beneficial through improving control of chronic diseases, appropriate use of pharmacotherapy, and/or promotion of health and wellness.

To further examine clinical training for the next generation of pharmacists for PCHC, this commentary narrowed its review to include only those programs that participated in both residency training and experiential education for providing PCHC. When examining these reports of PCHC extracted from the PAC report (Table 1), several relevant themes emerged. First, most of these cases described a multidisciplinary, collaborative effort for the provision of patient care. The most frequently reported practice environment was an ambulatory care clinic (84% of reports). These pharmacists worked alongside a variety of other health care providers, most commonly physicians (84% of reports). Other health care provider collaborators included various nursing specialties (44%), social workers (24%), physician assistants (16%), and nutritionists (8%).

The majority of the programs from the narrowed pool involved academic connections beyond the experiential education realm. Pharmacy faculty members were patient service providers in 76% of the reports and served as research investigators in 68% of cases. Pharmacy educators clearly are taking an active role not only in direct patient care in primary care settings but also in disseminating information concerning the impact of such services.

Within the narrowed pool of reports, a variety of quantitative and qualitative outcomes were examined to determine the impact of pharmacists’ integration into the PCHC team. Outcomes most frequently included quality of life (64% of reports), improved medication adherence (56% of reports), and those specific to MTM (48% of reports). Patient results were consistently favorable in these reports and included improved patient care outcome measures (e.g., decreased glycosylated hemoglobin, increased medication adherence and awareness, decreased hospital readmissions, improved cholesterol levels).

From the analysis of findings in Table 1, PCHC that included academic pharmacists, student pharmacists, and pharmacy residents consistently resulted in improved patient satisfaction and outcomes, frequently at a reduced cost to the health care system. A redeployment of workforce within the PCHC team also was reported as, for example, physician time became available for more patient encounters if pharmacotherapy management was moved to a pharmacist service. Because the majority of the settings were ambulatory care clinics, the implementation and/or expansion of pharmacist services in these settings appears to be particularly appropriate and most readily financially justifiable. Likewise, although improved outcomes were documented in a variety of diseases (e.g., human immunodeficiency virus, depression), improved outcomes related to diabetes, hypertension, and dyslipidemia were reported most often. It is perhaps reasonable, therefore, for the pharmacy profession to consider targeting these prevalent chronic diseases as a vehicle for expanding the role of pharmacists in PCHC.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Scope of practice/resources</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boudreau DM, Capoccia KL, Sullivan SD, et al. Collaborative care model to improve outcomes in major depression. Ann Pharmacother. 2002;36:585–91.</td>
<td>Description of the practice model used in a randomized trial (see Capoccia et al.) in a university-based family practice clinic that averages 26,000 patient visits annually and provides care via collaboration of a multidisciplinary mental health care team.</td>
<td>PCPs include 20 faculty family physicians, 18 resident family physicians, and 4 PAs; PCPs are assisted by 3 RNs, 6 medical assistants, 1 clinical pharmacist, and 1 pharmacy resident; patients referred at end of visit where diagnosis of depression is made and prescription for antidepressant provided.</td>
<td>Clinical, humanistic</td>
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<td>Divine H, Nicholas A, Johnson CL, et al. PharmacistCARE: description of a pharmacist care service and lessons learned along the way. J Am Pharm Assoc. 2008;48:793–802.</td>
<td>Description of a pharmacist practice model conducted in an ambulatory care clinic that included 322 patients with diabetes and cardiovascular diseases.</td>
<td>University of Kentucky benefits program offers pharmacist-led care for chronic disease management by offering a coinsurance discount on blood glucose test strips (~$15–30/month); originally, benefits program covered operational expenses and pharmacist salaries, but a capitated pricing structure is used to generate a bill on a monthly basis for each plan member and a fee-for-service system was implemented; with new CDC funding, this program will expand to underserved areas in Kentucky.</td>
<td>Clinical, humanistic</td>
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<td>Indian Health Service. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model that serves patients with diabetes and hypertension at 8 sites in collaboration with an interdisciplinary, interprofessional health care team.</td>
<td>Indian Health Service integrated practice with support from department budgets to cover staffing demands for services offered; services based on physician referral; pharmacy services include inpatient/outpatient, pharmacy-run anticoagulation service, smoking cessation clinic, diabetes, hypertension, dyslipidemia case management clinic, pharmacokinetic service; pharmacists integrated into all administrative aspects.</td>
<td>Clinical, humanistic</td>
</tr>
<tr>
<td>Loughlin SM, Mortazavi A, Garey KW, et al. Pharmacist managed vaccination program increased influenza vaccination rates in cardiovascular patients enrolled in a secondary prevention lipid clinic. Pharmacotherapy. 2007;27:729–33.</td>
<td>Outcome evaluation in an ambulatory care clinic that included 742 patients and collaboration with physicians.</td>
<td>Large multispecialty group practice with a secondary prevention lipid clinic jointly supported by COP, practice department of cardiology and practice research foundation; clinical pharmacist collaborates with the cardiologists to optimize the pharmacologic and nonpharmacologic therapy for approximately 1,000 patients annually.</td>
<td>Clinical</td>
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### Table 1. Continued

<table>
<thead>
<tr>
<th>University</th>
<th>Description of a practice model in an ambulatory care clinic that serves patients in collaboration with primary care physicians.</th>
<th>Funding provided by the AIDS Education and Training Center; services based on PEP referral; clinic operates 6 hours per week.</th>
<th>Clinical, humanistic</th>
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</thead>
<tbody>
<tr>
<td>Palm Beach Atlantic University</td>
<td>March K, Mak M, Loutre SG. Effects of pharmacist interventions on patient outcomes in an HIV primary care clinic. Am J Health Syst Pharm. 2007;64:2574–8.</td>
<td>Description of a drug optimization clinic within a community health clinic providing care to 34 patients with HIV in collaboration with a physician and nurse.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>Florida Atlantic University</td>
<td>Description of a practice model in an ambulatory care clinic that serves 423 patients in collaboration with hematology and oncologists.</td>
<td>Foundation grant support for clinical pharmacy services based on home-grown patient medical record.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Arizona</td>
<td>Description of a practice model in a community health clinic that serves 2,000 patients at 3 sites and provides MTM in collaboration with internists.</td>
<td>VA health system model of care delivery and reimbursement.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Arkansas for Medical Sciences, AHEC</td>
<td>Description of a practice model in a community health clinic that serves 12,000 patients with multiple chronic care needs at 2 sites in collaboration with an interdisciplinary, interprofessional health care team.</td>
<td>AHEC system model of care delivery.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Arkansas for Medical Sciences, Women’s Clinic</td>
<td>Description of a practice model in an ambulatory care clinic that serves obstetric patients with diabetes in collaboration with an interdisciplinary, interprofessional health care team.</td>
<td>AHEC system model of care delivery.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Charleston</td>
<td>Description of a practice model in a community health center that serves pregnant women with diabetes in collaboration with an interdisciplinary team.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Charleston Women’s Clinic</td>
<td>Description of a practice model in an ambulatory care clinic that serves patients with substance abuse and chemical dependency in collaboration with primary care physicians.</td>
<td>Currently operates as a free clinic; sliding scale fees are being pursued to generate revenues for the clinic and provide patient care services.</td>
<td>Clinical, humanistic</td>
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<td>University of Colorado. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in a university-based clinic that serves patients in collaboration with an interdisciplinary team.</td>
<td>Clinic staff include 2 clinical pharmacy specialists, 20 attending physicians, 18 family medicine residents, 2 NPs, 2 PAs, 2 behavioral scientists, 1 podiatrist, 1 social worker, and 20 other clinic staff members (e.g., RNs, LPNs, MAs, medical records personnel); 2 full-time faculty have appointments with the school of medicine and provide clinical pharmacy services as part of their role on the faculty team working with residents; external industry support is currently available for a residency position.</td>
<td>Clinical, humanistic</td>
</tr>
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<td>University of Georgia. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in an ambulatory care clinic that serves patients with multiple chronic care needs at multiple sites in collaboration with physicians, nurses, and residents.</td>
<td>VA community-based outpatient clinic; pharmacy services provided by 2 COP faculty and resident in integrated practice; VA bills private insurers, if applicable; operational efficiencies include VA electronic medical record and centralized clinic scheduling.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Minnesota, Minneapolis. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in an ambulatory care clinic that serves 600 patients per week with multiple chronic care needs in collaboration with an interdisciplinary team.</td>
<td>Clinic staff include PCP (family physician), nurse (RN, NP), social worker, and psychiatrist; pharmacists bill for MTM services when applicable and use incident-to-physician billing and spirometry codes.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of North Carolina at Chapel Hill. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in a university-based clinic that serves 14,600 patients with multiple chronic care needs in collaboration with an interdisciplinary team.</td>
<td>Clinic staff include 23 attending physicians, 70 resident physicians, 3 clinical faculty pharmacists, 2 PAs, 1 NP, 13 nurses, 5 care assistants, 1 social worker, and 1 nutritionist; 3 full-time faculty appointments are supported by the campus and share time between teaching and clinical activities.</td>
<td>Clinical, humanistic</td>
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<tr>
<td>University of Southern California, Senior Health Clinic. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in a university-based clinic that serves geriatric patients in collaboration with an interdisciplinary team.</td>
<td>Clinic staff include 5 geriatricians, a fellow in geriatric medicine, a PA, 2 neuropsychologists, 2 clinical pharmacists, a social worker, a neurologist, a rheumatologist, and a rehabilitation specialist; academic health center support from geriatrics program; pharmacists fully integrated in the practice; a time-based facility fee is charged; patient encounters documented using pharmacist CPT codes; centralized appointment scheduling; all pharmacist activities generate a progress note; medical center funds 0.5-FTE pharmacist; facility fees and cash payments generated by the pharmacists help to offset the cost of a service; medical center marketing team promotes the pharmacy service to the community.</td>
<td>Clinical, humanistic</td>
</tr>
<tr>
<td>University of Tennessee, Pharmacy and Medical Schools Clinic. 2009–2010 call for successful practices. Accessed at <a href="http://www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx">www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx</a>, May 1, 2010.</td>
<td>Description of a practice model in a university-based clinic that serves patients with multiple chronic care needs in collaboration with physicians and nurses.</td>
<td>Clinical, humanistic</td>
<td>Pharmacists consult with physicians on chronic condition cases at the clinic; services are provided at no cost to patients at the current time.</td>
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<td>Clinic staff include 1 medical director, 5 attending physicians, 27 internal medicine residents, 3 faculty pharmacists, 1 nursing director, and 2 nurses; collaborative incident-to- physician billing pharmacies available in clinic 3 half-days per week (12 hours); patients referred to clinic from physician.</td>
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**Table 1. Continued**

| University of Tennessee, Pharmacy and Medical Schools Clinic. 2009–2010 call for successful practices. Accessed at www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx, May 1, 2010. | Description of a practice model in a university-based clinic that serves patients with diabetes and other chronic conditions in collaboration with physicians (family, internal medicine). | Clinical, humanistic | Pharmacists consult with physicians on chronic condition cases at the clinic; services are provided at no cost to patients at the current time. |
| Vazquez SR, Campbell J, Hamann G, et al. Anticoagulation clinic workflow analysis. J Am Pharm Assoc. 2009;49:78–85. | Process assessment conducted in a hospital outpatient clinic that included 250 patients on anticoagulation therapy at 3 sites in collaboration with physicians, MAs, and laboratory staff. | Process | Patients referred from internal medicine clinic; clinic staff include 1 medical director, 8 attending physicians, 12 internal medicine residents, 1 pharmacist, 1 nurse practitioner (NP), and 1 medical assistant (MA). |

**Clinical, humanistic**

| Wayne State University. 2009–2010 call for successful practices. Accessed at www.aacp.org/resources/education/Pages/SuccessfulPracticesinPharmaceuticalEducation.aspx, May 1, 2010. | Description of a practice model in an ambulatory care clinic that serves patients with diabetes at 3 sites in collaboration with physicians and nurses (NPs). | Clinical, humanistic | Federally qualified health center look-alike; clinic staff include 12 physicians, 8 MAs, and 2 pharmacists; relationship between a private pharmacy practice and COP department of pharmacy practice supported by primary care and pharmacy department; documented monitoring of indicators and analysis of results per ongoing monitoring of indicators and analysis of results per ongoing monitoring of indicators and analysis of results per ongoing monitoring of indicators |
| Process | Patients referred from internal medicine clinic; clinic staff include 1 medical director, 8 attending physicians, 12 internal medicine residents, 1 pharmacist, 1 nurse practitioner (NP), and 1 medical assistant (MA). |

**Clinical, humanistic**

| Yanchick JK. Implementation of a drug therapy monitoring clinic in a primary-care setting. Am J Health Syst Pharm. 2000;57:S30–4. | Process assessment conducted in a primary care clinic that included 104 patients per month. | Process, clinical, economic | Patients referred from internal medicine clinic; clinic staff include 1 medical director, 8 attending physicians, 12 internal medicine residents, 1 pharmacist, 1 nurse practitioner (NP), and 1 medical assistant (MA). |

**Clinical, humanistic**

Abbreviations used: AHEC, area health education center; AIDS, acquired immune deficiency syndrome; CDC, Centers for Disease Control and Prevention; COP, community pharmacy; CPT, Current Procedural Terminology; FTE, full-time equivalent; HIV, human immunodeficiency virus; HRSA, Health Resources and Services Administration; LPN, licensed practical nurse; MAs, medical assistants; NPs, nurse practitioners; PCP, primary care provider; RN, registered nurse; VA, Department of Veterans Affairs; VAMC, Veterans Affairs Medical Center; VCC, veterans choice center; VHP, veterans health administration; WCHS, Women's Health Initiative Study; WTE, whole-time equivalent.
Ongoing challenges
As the Affordable Care Act transitions to implementation, the manner in which PCHC will ultimately be structured and evolve, including the official composition of the health care team and type of reimbursement pharmacists might receive as a member of the team, remains unknown. Because an increasing number of pharmacists are included in new roles in PCHC models, demand for pharmacists with specialty training will increase. Professional organizations have recognized this need and issued statements recommending postgraduate residency training for pharmacy graduates providing direct patient care by 2020. Pharmacists and pharmacy residents, communities of practice (3) promoting initiatives to disseminate effective practice models.

Future directions
In light of the increased demand for primary care services and the strong evidence base for pharmacists’ integration into primary care services, developing strategies for promoting pharmacist integration into PCHC is essential. Academic pharmacy provides a valuable platform for these efforts, much as it did in the birth of clinical pharmacy. How can this be accomplished? Research related to practice development argues for efforts of three different types: (1) fostering communities of practice, (2) identifying factors predicting successful implementation of pharmacy models of PCHC, and (3) promoting initiatives to disseminate effective practice models.

The communities of practice described by Wenger and colleagues increasingly have come to be seen as meaningful, effective mechanisms for promoting knowledge transfer, performance improvement, implementation of evidence-based practice, and interdisciplinary research collaboration. Related to the engagement of student pharmacists and pharmacy residents, communities of practice also facilitate learning in the practice setting and development of professional identity. As such, communities of practice offer considerable potential for capacity building by bolstering efforts of both expert and novice pharmacists in providing PCHC. Academic pharmacy provides one obvious venue for growing such communities to provide a way for practitioners to share tips and best practices, ask questions of their colleagues, and provide support for each other.

Research into factors that predict the adoption and success of pharmacy models of PCHC is a necessary complement to existing studies that assess outcomes. Such predictive studies could be carried out with and within communities of practice that develop into practice-based research networks. Implementation studies are needed to provide insight into variations in effectiveness of care processes. Similar, studies identifying patient, provider, and contextual factors that affect adoption and success are essential for providing guidance regarding which model(s) of PCHC to implement, as well as the who, where, and how of implementation. The data analyzed for this commentary provide a launching point for such studies. Pharmacists reported that services were initiated often through an informal volunteer effort, which led to institutionalizing the service after value was demonstrated and relationships formalized.

Conclusion
As the demand for access to primary care services continues to grow, pharmacists have demonstrated an important contribution to PCHC. Innovative models of care delivery with pharmacists as integrated health care team members demonstrate improved patient health outcomes among other positive results. Serving as a comprehensive platform and communities of practice, academic pharmacy at PCHC sites featuring student pharmacists, pharmacy residents, preceptors, and academic pharmacy faculty members demonstrates a working model for training exemplary pharmacists in PCHC settings. To maximize these established partnerships and models available through academic pharmacy, pharmacy should foster these communities of practice, identify factors for the prediction of successful implementation of PCHC pharmacy models, and promote initiatives to disseminate effective practice models. Academic pharmacy has a demonstrated and valuable platform for enhancing and developing these efforts.
References


