

Experience and Outcomes of a Pharmaceutical Care Leadership Residency Program

Kassandra Bartelme, PharmD, BCACP¹; Andrew Bzowycyjj, PharmD, BCPS, CDE²; Janice Frueh, PharmD, BCPS³; Marilyn Speedie, PhD⁴; Gerald Jacobson, PharmD^{5*} and Todd D. Sorensen, PharmD⁴

¹School of Pharmacy, Concordia University Wisconsin; ²School of Pharmacy, University of Missouri - Kansas City; ³School of Pharmacy, Southern Illinois University at Edwardsville; ⁴College of Pharmacy, University of Minnesota; and ⁵Mayo Clinic Health System

*Dr. Jacobson's contributions are related to his previous role as System Director of Pharmacy, Acute Care Hospitals, HealthEast Care System, St. Paul, Minnesota.

Key Words: residency training, ambulatory care, leadership

Conflict of Interest: The authors declare no conflicts of interest.

Abstract

The University of Minnesota College of Pharmacy's Ambulatory Care Residency Program has graduated 22 residents from its Leadership Emphasis program from 1999 to 2014. The Leadership Emphasis program is unique in its design, providing a set of experiences over two years focused on developing leadership skills in practice development, establishing personal influence, advocacy in the profession, and teaching. The program's design has focused on bringing value to three distinct audiences: pharmacists enrolled in the program, the local pharmacy practice community, and the College of Pharmacy. This paper explores the program's contributions in each of these areas.

Program graduates from 1999-2009 were interviewed and cited the independent, yet mentored, activities of the program as instrumental to their professional and personal development. The program has provided significant value to the College of Pharmacy, primarily in the form of instructional support, service to faculty practice sites and development of new practice sites for APPEs. Teaching and precepting hours offset the salary of the residents, resulting in financial benefits for the College. In the second year of the program, residents pursue development of new practice sites, 15 of which have been sustained to provide at least a half-time pharmacist position, having a direct impact on pharmacy practice development in the region.

The program provides a win-win-win situation for all the stakeholders involved. Schools and colleges of pharmacy are encouraged to consider whether a similar program may assist in achieving its own goals in practitioner development, teaching and learning, and community engagement.

Introduction

Established in 1999, the University of Minnesota College of Pharmacy's Ambulatory Care Residency Program is a multi-site Postgraduate Year 1 (PGY1) residency program accredited by the American Society of Health-System Pharmacists that includes three distinct areas of emphasis. The Community Clinic Emphasis is a one-year experience focused on chronic disease management and the medication use system of an ambulatory care setting. The Rural Health Emphasis is a one-year experience based in a small rural health system and prepares residents to participate in

medication management across the scope of services of an organization serving a rural community. At least half of the Rural Emphasis experience is based in ambulatory care services. The Leadership Emphasis (referred to as the "Pharmaceutical Care Leadership Residency" and will be abbreviated PCLR in this paper) is a two-year program that combines the goals and objectives of the Community Clinic Emphasis with additional experiences designed to prepare individuals with the knowledge and skills necessary to lead advancement of pharmacy practice in ambulatory settings. The experience addresses four domains of leadership development – personal skills in establishing influence, advocacy in the profession, leadership through teaching and practice-based leadership.

The purpose of this paper is to describe the evolution and programmatic impact associated with the PCLR program over the past 15 years. Programmatic impact will be described from the perspective of the program's three key

Corresponding Author: Todd D. Sorensen, Pharm.D.
College of Pharmacy, University of Minnesota
7-178 Weaver-Densford Hall; 308 Harvard St. SE
Minneapolis, MN 55455; Ph: 612-625-8645
Fax: 612-625-9931; Email: Soren042@umn.edu

stakeholders: program graduates, the Minneapolis-St. Paul pharmacy practice community, and the University of Minnesota College of Pharmacy. To our knowledge, with the exception of one emerging program, this program design has not been replicated at another institution. It is hoped that with dissemination of our experience, this model will be adopted at other institutions as a part of their efforts to influence advancement of pharmacy practice in their region.

Program History and Evolution

The PCLR has operated under its original programmatic design since 1999 and direct costs are supported through College of Pharmacy resources. The program rationale and design has been described previously and is outlined elsewhere.^{1,2} Figure 1 provides an overview of learning experiences across two years. Initially one resident position per year was offered, but recognition of early success and value helped establish a second resident position each year, starting in 2005. A total of four residency positions continue to be supported annually.

The program is designed as a PGY1 pharmacy practice residency in the primary care setting combined with extensive leadership development experiences focused on leading practice transformation. It is unique in its focus on leadership in four defined areas: 1) developing personal skills in establishing influence; 2) engaging in advocacy on professional issues; 3) recognizing opportunities for leadership through teaching; and 4) leading practice change. Goals and learning objectives are defined for each of these areas and preceptors provide formal evaluations on leadership development goals quarterly. The learning activities associated with these domains have been described previously¹ but for reader convenience, selected examples are outlined here:

- Assigned readings from the leadership literature with facilitated debriefing and reflection sessions with preceptors.
- Readings and topic discussions on contemporary issues influencing the profession and medication management services and other practice management issues.
- Serving as facilitators at an annual leadership development retreat for students and providing teaching support in leadership courses.
- Completing a course titled "Building an MTM Practice" during their first year to enhance experiences associated with practice development and management gained at their first year practice site.

- Serving on the professional affairs committee of the state association and completing a concentrated advocacy experience with staff during the legislative session.

The most unique and comprehensive area of leadership development focuses on leading practice development. Few residency programs provide residents with the responsibility of envisioning, defining and implementing comprehensive medication management services in a setting in which a pharmacist has not practiced previously. Having achieved the required patient care learning objectives during the first year of the program, it is possible to place residents in a setting during their second year where they lead all aspects of practice development, including relationship building with team members, establishing patient targeting, referral and care management systems, measuring impact and communicating results to administrators. This learning experience is supported and precepted by off-site preceptors experienced in practice development. While some programs will require residents to develop new services within an established practice, the expectation to establish an entirely new practice and achieve sustainability at the completion of the residency experience is unique. It has also served as the basis for the community partnerships and practice advancement outcomes in the region described later in this paper.

Only minor changes have occurred in the program's learning experiences since program initiation. Initially the resident's first year practice sites were located within primary care clinics of a large integrated health system and precepted by clinical pharmacists employed by this system. As part of an expanding partnership with the Department of Family Medicine of the University of Minnesota School of Medicine and the creation of new clinical faculty positions by the College of Pharmacy, the clinical sites for the first year of the program shifted to University-managed primary care clinics and experiences were precepted by faculty with the College of Pharmacy. With respect to teaching experiences, teaching needs of the College's Pharmaceutical Care Learning Center (PCLC) were a significant factor in initially justifying the program's costs and nearly all teaching experience occurred within the PCLC early in the program's history. While the PCLC continues to be the home for the majority of residents' teaching experience, new and reallocated curricular resources have allowed for a diversification of the type of teaching experiences gained by residents.

While PCLR positions have and continue to be fully funded by the College of Pharmacy, external funding sources related to the practice development activities in the program's second year have offset some of these costs. During the first several

years of the program, organizations partnering with the program for the practice development experience were not expected to commit financial resources for the resident's time. However, any funds received by the organization from the State of Minnesota's Medical Education and Research Costs program (MERC) were returned to the College. The MERC program provides support to health care organizations for certain medical education activities in Minnesota that have historically been supported in significant part by patient care revenues.³ More recently, as a result of the success realized via the practice development efforts of the program and the increased demand for ambulatory care pharmacy practice expansion in the state, partnering organizations are expected to provide \$25,000 of financial support for the resident's effort committed to the organization (0.6 resident FTE over 12 months). Organizations keep any funds received from the MERC program.

The evolution of the PCLR's applicant pool is a final area to note. During the first years of the program, not surprisingly the size of the applicant pool was small (typically 3-4 candidates for one position) and most attended schools and colleges of pharmacy in the upper Midwest. The program's growing national reputation combined with increased interest in ambulatory care pharmacy practice has led to significant growth of the application pool. Over the past 4 years, the program has received 12-19 applications annually comprised of pharmacy graduates from across the U.S.

In summary, the learning experiences delivered through the PCLR have not changed significantly from its initial design. Program evolution has brought about only minor changes, largely administrative, that have capitalized on new funding opportunities, resource alignment and increased market activity associated with ambulatory pharmacy practice.

Program Impact

Over the program's history, its value has been most directly realized by three groups: program graduates, the College of Pharmacy and the pharmacy practice community in the region. We have summarized key outcomes and perspectives that reflect the success of the program from the viewpoint of each of these three stakeholders. Within each summary, we have also included a brief editorial from an individual who can speak directly to the impact of the program to that stakeholder group.

Value to Program Graduates

First and foremost, the program was designed to prepare graduates to lead change in ambulatory pharmacy practice. It has not been the intent of the program to prepare individuals for a narrow set of roles; however, it is clear that the program's learning activities align well with the desired skills

of pharmacy practice faculty and the majority of applicants to the program have academia as their career goal. Recognizing this as a desired career path of many program participants, matriculation to academic positions can be used as a marker of success. Thirteen out of 22 graduates were hired into practice faculty positions (in pharmacy or family medicine) as their initial position post-graduation (Table 1). This represents 93% of the graduates who pursued this career path immediately upon completion of the program.

In order to more broadly describe the impact of the program from the perspective of its graduates, a series of semi-structured interviews was completed with those individuals graduating over the first 10 years of the program's existence. These individuals have had the opportunity to realize the program's impact on the early portion of their career.

An interview guide was developed to explore five different themes: 1) personal and professional development; 2) practice development; 3) advocacy; 4) teaching roles; and 5) value to the College and program enhancement. Pharmacists who completed the program between 1999 and 2009 were interviewed individually in person or by phone. Interviews were 40-60 minutes in length and were conducted by two of the authors, with responses recorded via written notes. A formal content or thematic analysis through a systematic coding process was not conducted as it was deemed that the investment of time and resources required for that type of analysis exceeded the expectations for this exercise. Rather, interviewers simply reviewed interview notes and individually identified the most compelling themes, then reconciled any differences in individual findings. This evaluation was deemed exempt from full review by the University of Minnesota Institutional Review Board.

Several themes were gleaned from the interviews. Each resident cited that they had the ability to make the residency what they needed it to be to match their goals and career aspirations. A majority of the respondents identified being "on your own" to develop a new practice site while still within a structured program and under direct mentorship was invaluable to their personal and professional development. Likewise, they noted learning how to identify a practice site champion, concisely articulating what your role on the team is to the various staff members in the clinic, and creating/communicating a vision were essential skills learned and refined during residency and subsequently used in practice development efforts post-residency. The concentrated rotation with the Minnesota Pharmacists Association was cited by each participant as the source of developing skills in advocacy. Several respondents indicated that this experience provided important insights into communicating the importance of advocacy to students and

Reflection from a Program Graduate

I never thought I wanted to be a leader. The PCLR was attractive to me because it provided a platform to pursue opportunities to “encourage the heart.” This aspect of leading change has been a driving force behind what I find most fulfilling professionally and personally. Through my experiences in the PCLR, I discovered a passion for providing clinical pharmacy services to underserved patient populations and working in collaborative environments with patients, learners, and health care professionals. In my current professional roles as a faculty member and clinical pharmacist, I often find myself focusing on how to utilize my strengths more effectively to impact patient care and students’ learning experiences.

After a few years of post-PCLR life, I’ve noticed there are two common ways in which leading change abilities are developed – through formal instruction or by hands-on experiences with trial and error. The PCLR’s unique structure of providing both types of leadership development experiences is an ideal environment to comprehend and put into action these abilities. Completing the PCLR has given me more confidence with handling uncertainties, problem solving obstacles, and celebrating rewarding experiences of day-to-day life.

advocating at the practice site for an expanded role of the pharmacist. Teaching roles were cited as important for developing confidence in tailoring a message and creating teaching points for an audience. This experience also provided important experience in designing teaching activities methodically using the ADDIE model (analysis, design, development, implementation, evaluation). Graduates perceived the residency program is beneficial to the College by exposing students to resident mentorship and progressive practice models for experiential education sites. Overall, residency graduates learned beneficial lessons in influencing others (e.g. students, residents, other health care providers, and clinic staff), developing vision and communication skills and overall confidence in their abilities.

Value to Sponsoring Organization

The program was initially conceptualized with the learning needs of individuals desiring to lead practice change in ambulatory care. However, securing resources for implementation required that the vision for the program also bring significant value to the sponsoring institution.

Teaching Service to the College

Residents commit approximately 40% of their time serving the teaching mission of the College of Pharmacy. This effort is distributed across several activities. Most significantly,

residents devote time to small group instruction in Pharmaceutical Care Skills course (e.g. “skills labs”) series. Residents generally provide eight hours of in-class instruction weekly plus additional time in instructional preparation and evaluation of student assignments during both fall and spring semesters. In addition to providing instruction and feedback, residents also collaborate with faculty to develop and test new learning activities. Annually, this results in over 1000 hours of instructional support across the four residents.

In addition to providing core support to Pharmaceutical Care Skills courses residents also provide instructional support to other courses and curricular initiatives. Over the past several years this has included support to online courses delivered to non-pharmacy students, case development and “team-based learning” facilitation in pharmacotherapy courses, small group facilitation for early experiential education learning activities, leadership development support at an annual student leadership retreat and several other “ad hoc” instructional initiatives. These efforts combined are estimated to provide another 1000 hours of support to the College’s teaching mission.

Service to Faculty Practice Sites

Residents spend 60% of their time in their first year developing patient care knowledge and skills in a clinical practice led by a faculty member. While this experience is first and foremost focused on the resident’s development as a practitioner, it does also create a strong symbiotic relationship between faculty and residents in support of the patient care services of the clinic. Residents generally provide service alone one full day per week once preceptors have determined they are prepared for this level of independence. This allows the faculty member to devote additional time and flexibility to meeting their academic responsibilities. Residents also assume some preceptor responsibilities with student pharmacists completing Advanced Pharmacy Practice Experiences (APPE) at the site. Residents collaborate with the faculty preceptor on quality improvement and other scholarly projects at the site. These efforts help support faculty members’ academic contributions and their progress towards promotion.

Site Development for APPEs

Over the past 15 years, the second year practice development activities of the residents has contributed to a significant expansion of the number of ambulatory care APPE offerings. Resident-initiated medication management practices that were sustained past the residency period have established APPE offerings for the College, providing a capacity of up to 80 new ambulatory care APPE placements each year. Importantly, several of the new practices developed by residents are located in underserved

Reflection from the Sponsoring Institution's Dean

The Leadership residency program has contributed a great deal to the College of Pharmacy. It was initially established with funding that had been designated for a pharmaceutical skills laboratory faculty position. It was decided that the allocated funding could instead support two residents who, by splitting time teaching in the skills lab with their clinical practice learning activities, would both provide outstanding teaching support for the curriculum while fulfilling much of the practice experience expectations of a PGY1 residency in their first year of two. The second year was envisioned to involve engagement in practice development activities which would teach leadership skills. This aligned with a broader goal of the College to stimulate and support the development of new pharmacy practices in the state. The college gained excellent teaching support while creating a mechanism to directly contribute to one of its strategic goals. The residency program was an outstanding vehicle to create partnerships between the College and several federally-qualified health centers in Minneapolis-St. Paul and family medicine teaching clinics affiliated with the University. The advocacy experience residents have with the Minnesota Pharmacists Association (MPhA) also contributed to our goal of advancing practice. The advocacy work of the residents during their MPhA-based learning experience contributed to passing changes to the state practice act. Ultimately, this program model has produced outstanding practitioners and leaders for practice and academia while also providing important contributions and value to the College across its teaching, scholarship and service missions.

communities, adding increased opportunities for students to gain experiences serving low-income, culturally diverse patient populations. Ultimately, these relationships have served as a catalyst for expanded relationships with the College, including development of community engagement projects.

Resident Projects

All residents must complete a defined project as part of their residency experience and many have focused on program development or assessment of existing initiatives that directly support the teaching mission of the College. Some examples include:

- Community needs assessment and resource development supporting development of a community engagement elective course.
- Feasibility evaluation of a potential international APPE with partners located in Africa.
- Development of a "Wellbeing" elective course.

Faculty Development

While the PCLR program is not designed specifically to prepare graduates for academic positions, the range of learning experiences do strongly support development for this career path. The program has served as an effective environment for preparation of UMN clinical faculty, with four graduates matriculating to UMN faculty positions immediately post-residency.

Reflection from a Health-System Partner

With the implementation of the affordable care act (ACA) it was clear to our health care system that the focus of patient care and its associated resources was going to shift dramatically from inpatient to outpatient services. The mandate to establish Accountable Care Organizations (ACOs) with patient outcome responsibilities extending beyond a hospital admission and discharge was a key driver for our health-system. Our pharmacy program's contribution to optimal medication management was well-established in the hospital setting but not present in the clinic setting. Our inpatient medication reconciliation pharmacists were identifying frequent examples of poor medication management as the cause of our ED and inpatient admissions. We needed to somehow show the link and prove the value to the patient and the healthcare system of placing a pharmacist prepared to deliver medication management services in each of our clinics. Our goal was to successfully create an umbrella of effective medication management across the ACO.

The challenge was to accomplish this in a financial environment that was rapidly changing as well. The predictable "fee-for-service" model was vanishing, and in its place was a new and more poorly understood reimbursement model. Requesting resources would be difficult, and those resources would have to show results quickly. The PCLR program was an excellent solution. We were able to convince our administration of the "theoretical" value of a medication management services program in the clinic and the PCLR program provided an affordable, trained pharmacist to establish our first clinic-based medication management position. It was hugely successful, and we not only hired our resident at the end of the year, but two more pharmacists dedicated to the medication management program as well. With the momentum generated from this first year, we elected to serve as the sponsoring site for two additional PCLR residents in the 2014-2015 program year. All of this would have been difficult, if not impossible, to accomplish without the PCLR program as the original catalyst.

Financial Summary

In the current model under which organizations hosting residents for their second year practice development experience provide \$25,000 of funding to the program, the direct cost of salaries and fringe benefits for four residents is approximately \$145,000 annually. In return, direct support of the school's educational offerings includes over 2000 hours of didactic instructional support, APPE teaching support, and clinical service coverage supporting scheduling flexibility of clinical faculty to meet their own teaching responsibilities.

Value to the Practice Community

The residency program's impact on practice development in the region is evident. Of the 21 residents engaging in the second year practice development experience (one residency graduate had a modified 2nd year experience focused on instructional design and course management), 15 new practices were sustained with at least a part-time pharmacist practitioner at the conclusion of the resident's experience. This success, combined with changes in health care emphasizing quality in the ambulatory care setting have altered the dynamics that lead to second year partnership development. During the first several years of the program, potential partners were recruited by program administrators. To some degree, the program had to "sell" the experience to a potential partnering organization. Over the past several years, administrators have not had to proactively recruit practice partners, rather local health care organizations contact the residency program seeking to host this experience (and providing \$25,000 of salary support) typically 6-12 months in advance of the potential start of a resident's second year.

Site Recognition

It is noteworthy that not only are the practices developed by residents in their second year of the program frequently sustained, some have been recognized for innovation and quality. One of the practices developed in a federally-qualified health center early in the program was recognized by the Health Resources and Services Administration as a "high performer" and studied as part of a best practices evaluation. This practice was also awarded the "Innovative Practice Award" by the Minnesota Pharmacists Association. A

practice developed within a home health agency site also received the MPhA "Innovative Practice Award" and was recognized by *Minnesota Physician* with an "Innovations in Patient Care" award. The innovation and impact demonstrated from this site paved the way for approval by the Minnesota Legislature for a pilot program that expanded the MN Medicaid MTM program to include payment to pharmacists providing medication management services via home visits.

Conclusion

The leadership residency model presented here provides a "win-win-win" situation for trainees, the College of Pharmacy and the local pharmacy practice community. Residency graduates gain a wide range of learning experiences in practice development that build leadership skills and support their ability to succeed in similar roles following their residency training. The College gains significant teaching and program development support while also fostering a program that creates practice advancement relationships with the local health care community. Health care organizations have had access to a model for partnership that allows exploration of new service development at a relatively low cost. Schools and Colleges of Pharmacy are encouraged to consider the impact this residency model could have in achieving their respective goals and create additional experiences at their own institutions.

References

1. Sorensen TD, Biebighauser S. Pharmaceutical Care Leadership: An Innovative Residency Model. *J Am Pharm Assoc.* 2003;43:527-32.
2. Pharmaceutical Care Leadership. University of Minnesota Ambulatory Care Residency Program. <http://pharmacy.umn.edu/residency/sites/index.htm>. Accessed February 19, 2014.
3. Medical Education and Research Costs Program. Minnesota Department of Health. <http://www.health.state.mn.us/divs/hpsc/hep/merc/>. Accessed February 19, 2014

Figure 1. Pharmaceutical Care Leadership Residency - Learning Activities Timeline

Year 1											
July	August	September	October	November	December	January	February	March	April	May	June
Program Orientation	Academic Day	Academic Day	Academic Day	Academic Day		Academic Day	Academic Day	Academic Day	Academic Day	Academic Day	
Broadway / Smileys Clinic Experience								Advocacy/MPhA			
"Applying Medical Literature to Practice" Course	Fall Semester Teaching and Learning					Spring Semester Teaching and Learning					
	Leading Change in Pharmacy Course					Foundations in Teaching Course					
		MPhA Annual Meeting (Req'd)	"Building MTM Practice" Course					APhA Annual Meeting (Req'd)			
					ASHP Mid-Year Annual Meeting (Elective)						
Year 2											
	Academic Day	Academic Day	Academic Day	Academic Day		Academic Day	Academic Day	Academic Day	Academic Day	Academic Day	
Practice Development (Site determined Spring of Year 1)											
	Fall Semester Teaching and Learning					Spring Semester Teaching and Learning					
Residency Project											
AACP Annual Meeting (Elective)		MPhA Annual Meeting (Req'd)	ACCP Annual Meeting (Elective)			ASHP Mid-Year Annual Meeting (Elective)			APhA Annual Meeting (Elective)		Project Presentations/ Graduation
Longitudinal Experiences: Direct Patient Care, Practice Management, Residency Project, Teaching/Precepting, Leadership Discussions Resident is required to attend two national professional meetings each year											

Abbreviations: MPhA, Minnesota Pharmacists Association; Req'd, required; ASHP, American Society of Health-System Pharmacists; APhA, American Pharmacists Association; AACP, American Academy of Colleges of Pharmacy; ACCP, American College of Clinical Pharmacy

Table 1. Summary of Graduates of Pharmaceutical Care Leadership Residency

Resident	Years of Residency	2 nd year Practice Site	Status of Practice	Initial Position	Current Position
1	1999-2001	Chain Community Pharmacy	Sustained - Organization has expanded MTM program to several locations in state and nationally	Clinical Pharmacist/Teaching Specialist	Freelance teaching and writing
2	2000-2002	Federally-Qualified Health Center	Sustained – multiple pharmacy positions funded by site	Manager, Pharmacy Services (at 2 nd year practice site)	Ambulatory Care Pharmacy Program Manager, Staff Model HMO
3	2001-2003	Federally-Qualified Health Center	Sustained – 0.5 FTE pharmacist position funded by practice site	Assistant Professor at a U.S. School of Pharmacy, ambulatory care focus	Associate Professor at a U.S. School of Pharmacy
4	2002-2004	Federally-Qualified Health Center	Not sustained	Pharmaceutical Industry Research Fellowship	Medical Affairs & Strategic Portfolio Management Manager, Pharmaceutical Company
5	2003-2005	Family Medicine Clinic	Sustained - shared funding between University and practice site	Assistant Professor at a U.S. School of Pharmacy, ambulatory care focus	Same
6	2003-2005	Family Medicine Clinic	Not Sustained	Clinical Pharmacist at a Federally Qualified Health Center	Same
7	2004-2006	Federally-Qualified Health Center	Not Sustained	Assistant Professor at a U.S. school of pharmacy, health systems focus	Associate Professor at a U.S. school of pharmacy (different than initial) / Pharmacy Practice Department Chair
8	2005-2007	Federally-Qualified Health Center	Not Sustained	Assistant Professor at a U.S. School of Pharmacy, ambulatory care focus	Clinical Pharmacist, VA health system
9	2005-2007	Pharmaceutical Care Learning Center/Course Management*	N/A	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same
10	2006-2008	Federally-Qualified Health Center	Sustained – 1 FTE position fully funded by center	Assistant Professor at a U.S. school of pharmacy, public health and ambulatory care focus	Same
11	2006-2008	Home Care Agency	Sustained , 50/50 funding between CoP and Agency	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same
12	2007-2009	Federally-Qualified Health Center	Sustained , 0.8 FTE position funded by center	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same
13	2008-2010	Student Health Service	Not Sustained	Clinical Pharmacist, federally-qualified health center	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus
14	2008-2010	Federally-Qualified Health Center	Sustained , 1 FTE position funded by center	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same
15	2009-2011	Primary care clinic in an integrated health system	Sustained , 1 FTE position funded by center	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same
16	2009-2011	Outpatient programs of a community hospital	Sustained , through redistribution of existing staff	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same

17	2010-2012	Primary care clinic in an integrated health system	Not Sustained	Primary care research fellowship	Clinical Pharmacist and Medication Management Program Evaluation Specialist within an integrated health system
18	2010-2012	Family medicine teaching clinic	Sustained , 1 FTE funded by health system and Family Medicine Residency Program	Clinical Pharmacist and Family Medicine Residency Program faculty within an integrated health system	Same
19	2011-2013	Primary care clinic in an integrated health system	Sustained , 0.6 FTE funded by health system	Clinical Pharmacist within an integrated health system and Medical Information Consultant for a publishing company	Same
20	2011-2013	Primary care clinic in an integrated health system	Sustained , 0.6 FTE funded by health system	Clinical Pharmacist in charitable clinic	Pending geographic relocation
21	2012-2014	Primary care clinic in an integrated health system	Sustained , 1 FTE funded by health system	Clinical Pharmacist and Team Lead for ambulatory care pharmacy within an integrated health system	Same
22	2012-2014	Primary care clinic in an integrated health system	Sustained , 1 FTE funded by health system	Assistant Professor at a U.S. school of pharmacy, ambulatory care focus	Same

*A modified second year plan was designed for this resident based on specific career goals of the resident aligned with ad hoc instructional support need.

Abbreviations: MTM, medication therapy management; HMO, health maintenance organization; FTE, full-time equivalent; U.S., United States; N/A, not applicable