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**Keywords:** Academic-Community partnership, medication therapy management, community engagement, homelessness, medication related problems

### Abstract

An academic-community partnership between a Health Care for the Homeless (HCH) clinic and a school of pharmacy was created in 2005 to provide medication education and identify medication related problems. The urban community based HCH clinic in the Richmond, VA area provides primary health care to the homeless, uninsured and underinsured. The center also offers eye care, dental care, mental health and psychiatric care, substance abuse services, case management, laundry and shower facilities, and mail services at no charge to those in need. Pharmacist services are provided in the mental health and medical clinics. A satisfaction survey showed that the providers and staff (n = 13) in the clinic were very satisfied with the integration of pharmacist services. The quality and safety of medication use has improved as a result of the academic-community collaborative. Education and research initiatives have also resulted from the collaborative. This manuscript describes the implementation, outcomes and benefits of the partnership for both the HCH clinic and the school of pharmacy.

### Introduction

Academic-community partnerships have resulted in improvements in the outcomes of vulnerable patients with HIV/AIDS, diabetes, and hypertension.<sup>1-4</sup> The successful implementation of an academic-community partnership facilitates the sharing of resources and expertise to develop interventions to address health disparities and ultimately improve the health of a community.<sup>4-7</sup> Those who experience homelessness face enormous challenges including the receipt of timely, quality health care due to inaccessibility of many providers and unaffordable care.<sup>8-11</sup> Health care for the homeless is often provided by safety-net organizations, such as federally-funded community health centers or free clinics, and resources are often limited. Therefore, an academic-community partnership that focuses on care for the homeless

is likely to be a mutually beneficial collaboration that leads to improved health outcomes.

Homeless persons are vulnerable to poor medication outcomes due to their lack of access to health providers, poor and unstable living environments, and the high cost of care. Homeless persons often lack insurance and may not be able to afford the co-pay for medications even if they have insurance.<sup>12</sup> Those who experience homelessness also experience frequent transitions of care between the health care, social services, and legal systems, which may lead to inconsistent access to medications, medication errors, and gaps in medication use for chronic diseases.<sup>13,14</sup> These disruptions in care have been associated with decreased medication adherence and poor health outcomes.<sup>10,15</sup> The lack of privacy and a place to safely store medications are also barriers to optimal medication use.<sup>16</sup> Furthermore, homeless persons often are challenged to balance basic needs such as food and shelter with health care needs. It has been reported that homeless persons may trade medications for food.<sup>17</sup>

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Although homelessness is associated with poor medication outcomes, little is known about methods to improve medication outcomes among homeless persons. This descriptive report chronicles the development and implementation of an academic-community partnership as a strategy for addressing barriers to safe and effective medication use among homeless persons that receive health care at a Federally-qualified Health Care for the Homeless (HCH) Clinic.

The objectives of the partnership are to provide patient-centered pharmacist services, improve collaboration between providers within the clinic, and provide didactic and experiential opportunities for health care professional students to gain knowledge and experience in an HCH setting.

### Background

#### *The Daily Planet*

The Daily Planet, a Federally-Qualified HCH Clinic, has been serving Richmond's homeless population for more than 40 years and is a community leader in advancing health and providing comprehensive health care services to this medically underserved population. The organization has worked within the Richmond community to identify and respond to the ongoing, changing, and challenging needs of homeless and uninsured men, women and children in Central Virginia. In 2009, Daily Planet provided over 26,000 unique patient visits to 4,594 individuals in 5 clinical areas: medical, mental health, vision, and dental, as well as, case management services. Case management includes developing a treatment plan as well as linking resources for housing, job placement, social services, assessing benefits eligibility, laundry, and shower facilities for those living on the street, a clothing closet for men and women, mail services, and escrow banking.

#### *Virginia Commonwealth University School of Pharmacy*

The Virginia Commonwealth University (VCU) School of Pharmacy is a leader in professional and graduate education and research in the pharmaceutical sciences. The professional doctorate (PharmD) program prepares students to become critical members of the health care team by providing direct patient care in acute and chronic care settings as well as being a valued medication information resource for health care team members. Community engagement is modeled by the faculty, many of whom practice in ambulatory and long-term care settings that focus on serving the medically underserved.

### Program Implementation

The mission of the Daily Planet – VCU School of Pharmacy Academic-Community Partnership is to strengthen and enrich

the lives of underserved populations in the Greater Richmond, Virginia community by reducing disparities related to medication use. The Daily Planet-VCU School of Pharmacy collaboration began in 2005 and initially focused on the provision of medication education to behavioral health patients by Community Pharmacy Residents. A shared vision for improving medication-related health outcomes among homeless persons has cultivated the growth and development of the partnership over the last five years (Figure 1). In 2006-2008, the VCU faculty members (SSG and JVG) and the Daily Planet providers (RO and DC) solidified their working relationships and began to increase the contributions of clinical pharmacist services in the clinic. In 2008, an electronic medical record (EMR) (eClinical Works<sup>®</sup> (Westborough, MA) was implemented in the clinic. Although this was a great advance, the quality of pharmacist visits was compromised, in part because the pharmacist faculty members were not employees of the Daily Planet, and therefore they were unable to access and document in real time their patient assessments and education sessions. This disrupted the continuity-of-care for the patient because the behavioral health social workers and nurse practitioner and psychiatrist were thus not able to review the pharmacist's recommendations prior to seeing the patient.

#### *Catalyst for Change*

In the summer of 2008, two faculty members and two Daily Planet providers crafted a plan to enhance and expand the clinical pharmacist services available to the clinic's behavioral health population. This program became the foundation for the team's successful participation in the first cycle of the Health Resources and Services Administration's (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative (PSPC). This collaborative has served as a catalyst for expansion and enrichment of the relationship between the VCU School of Pharmacy and the Daily Planet. The HRSA collaborative program focused on an expansion of the scope and availability of clinical pharmacy services for behavioral health patients. Team members from both organizations actively participated in six learning sessions hosted by HRSA in Washington, D.C. throughout 2008-2010. Topics discussed at these quarterly meetings included medication reconciliation strategies, effective utilization of electronic medical records, patient interviewing techniques, streamlining data collection, and developing research techniques. These sessions provided the team with new skills required to implement and measure change, as well as focused time to build their professional relationships.

### Program Results

In October 2008, pharmacists were granted real time write access to the EMR, and a structured format was created for

the documentation of the clinical pharmacist's patient interaction in the EMR. As a result clinical pharmacist encounters increased from 48 in 2007-08 to 369 in 2008-09 (Figure 2). Since then, the number of clinical pharmacist encounters has fluctuated due to variation in pharmacist hours at the clinic. Further, the clinical pharmacist encounters have evolved from provision of medication education to include comprehensive medication review and medication reconciliation, thereby increasing the duration of the pharmacist encounter. In December 2008, pharmacists began collecting data on patient medication adherence using a validated self-report tool, the Modified Morisky Scale, as well as information on each patient's lifestyle issues such as the use of over-the-counter medications, herbal remedies, tobacco, illegal substances, and alcohol.<sup>18</sup>

#### *Development of CMTM Model*

In October 2008, the Collaborative Medication Therapy Management (CMTM) model of care was developed as the foundation for expansion of the scope of clinical pharmacist services to behavioral health patients and the replication of services in the medical clinic. The CMTM model is based in part on the Medication Therapy Management model created by the American Pharmacists Association and National Association of Chain Drug Stores Foundation.<sup>19</sup> It is an interdisciplinary, patient-centered model that consists of a medication assessment, development of a care plan, and follow-up. During the medication assessment a pharmacist performs a comprehensive review of medications for appropriateness and effectiveness and medication-related problems are identified. The pharmacist then develops a care plan for problem resolution in collaboration with the patient's other providers. The pharmacist is also responsible for following up with patients and/or providers to resolve any medication-related problems that were identified during the medication review. A detailed description of the CMTM model has previously been reported.<sup>20</sup> Thus far, 695 patients have had a CMTM encounter. A retrospective analysis of 209 patients in the mental health clinic and 40 patients in the medical clinic indicated that 425 (2.0/patient) and 205 medication-related problems (5.1/patient), respectively, were identified during CMTM encounters. The majority ( $\geq 85\%$ ) of pharmacist recommendations to resolve the problems were accepted by patients and/or providers.<sup>20</sup>

In July 2009, the partnership received funding from the VCU Council for Community Engagement to promote coordination of medication reconciliation among providers. One of the key components of this project, a medication reconciliation campaign, was initiated to encourage patients to bring all of their medications to their clinic visits so that the pharmacist could perform a complete medication review and create a

personal medication record for the patient. Prior to this project, patients were not regularly bringing their medications to the clinic visits. The campaign resulted in nearly 40% of patients (139/379) who had a clinical pharmacist encounter between October 2009 and April 2010 in the behavioral health and medical clinics receiving a comprehensive medication review.<sup>21</sup>

In the Spring of 2010, 13 Daily Planet providers (physicians, nurse practitioners, and social workers) and staff participated in an anonymous survey that assessed satisfaction with clinical pharmacist services. Participants included 11 providers, and one administrative staff member (one individual did not indicate his/her type of position). Respondents liked working with the clinical pharmacist staff and regarded pharmacists as a valuable member of the health care team. Overall, they were highly satisfied with clinical pharmacist services (Table 1). One provider stated, "Enormous benefit in medication adherence, safety and positive outcomes. Patients enjoy talking to the pharmacist. Pharmacist presence has made a significant difference in the quality of care we deliver. Pharmacy staff made several significant life-saving or critical interventions."

#### *Development of Interdisciplinary Educational Collaborations*

This academic-community partnership has also facilitated the development of several inter-professional didactic and experiential educational opportunities. An interdisciplinary teaching model was piloted in the Fall of 2009 with the VCU School of Social Work and resulted in the offering of a new elective course for Doctor of Pharmacy and Masters of Social Work students, PHAR 651 *Medical Access and Care for Underserved Populations*. This course allows students from both schools to work with and learn about the unique needs of underserved populations. Eleven pharmacy and social work students worked cohesively during the initial offering of the course to strengthen the medication reconciliation campaign at the Daily Planet. They learned to appreciate the contributions of multiple health care providers within the Daily Planet integrated health care.

#### *Research*

Although the foundation of the partnership is service-based, practice-based and community-based participatory research opportunities have evolved as a result of the partnership. Research ideas originate with academic and community partners. Additionally, the team is working to establish a database infrastructure that will help the Daily Planet with grant reporting requirements and also facilitate research.

**Future direction of the Academic-Community Partnership**

During the Fall of 2010, CMTM services were expanded to a broader segment of the Daily Planet through its patient-centered medical home model. Medication adherence counseling, personalized patient medication and disease state education, provision of medication adherence reminders and devices, and training were piloted in the medical clinic. Implementation of the complete CMTM model for all eligible patients will enable the Daily Planet to comprehensively meet the medication-related health care needs of the patients they serve. The Daily Planet-VCU School of Pharmacy is a viable model for other community and interdisciplinary partners to improve medication use among vulnerable patients. As the partnership evolves, the long-term efficacy of the partnership will be evaluated as well as clinical and economic outcomes of the CMTM model.

**Discussion**

The academic-community partnership between the Daily Planet and VCU School of Pharmacy has resulted in the development of a novel CMTM model and the integration of the model with the Daily Planet's behavioral health and medical clinics.<sup>20</sup> The partnership has also provided opportunities for health professions students to gain expertise in the provision of health care and identifying and addressing medication needs of homeless individuals. The partnership has resulted in a mutually beneficial relationship between The Daily Planet and the VCU School of Pharmacy. The majority of pharmacist services are provided in-kind by the VCU School of Pharmacy to The Daily Planet. In turn, The Daily Planet is a unique practice site for PharmD students and residents to gain hands-on experience with providing CMTM to homeless individuals. The Daily Planet also provides resources such as office space and computers to support pharmacist services. Both partners are also engaged in the education initiatives. In particular, a social worker (RO) from The Daily Planet has actively contributed to the development and teaching of the elective course, which has enriched the learning experience for PharmD students. The team has also worked together to implement and develop innovative interdisciplinary initiatives to improve medication use among homeless persons.<sup>20,21</sup>

The Daily Planet has been very receptive to research opportunities. As a result, numerous research projects by faculty, graduate students, a fellow, and PharmD students have been conducted. Research projects always include team members from The Daily Planet and School of Pharmacy. The Daily Planet is a well-respected community leader in provision of homeless health care services and has 25 – 30 established community partners. The School of Pharmacy

has been able to build upon these relationships to support various community projects.

The team has identified several factors that have contributed to a successful partnership. First, a mutual respect for individuals' roles and responsibilities facilitates an open environment that promotes innovation and learning between both partners. In the beginning stages of the partnership, obtaining buy-in from providers and staff regarding services and projects was crucial to establishing trust and developing rapport between both partners. As the partnership has evolved, frequent communication via e-mail and face-to-face meetings remains critical to keeping everyone up-to-date with key information regarding services and projects. Establishing a formal mission and objectives for the partnership creates a foundation for work towards shared goals between the partners. Finally, both partners have a strong passion for advancing health care among homeless persons which has fostered a spirit of collaboration with a common goal of improving medication-related health outcomes.

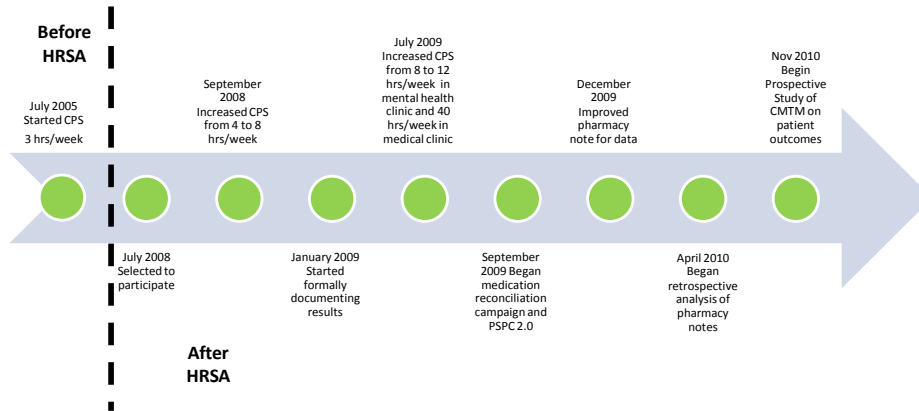
**Conclusion**

The innovative partnership between the Daily Planet and VCU School of Pharmacy is one strategy for addressing medication-related health disparities among those who experience homelessness. The partnership has resulted in a mutually beneficial relationship that has advanced pharmacist services and created education and research opportunities. This partnership can be modeled by other schools of pharmacy that have opportunities to work with medically underserved populations in the safety net setting.

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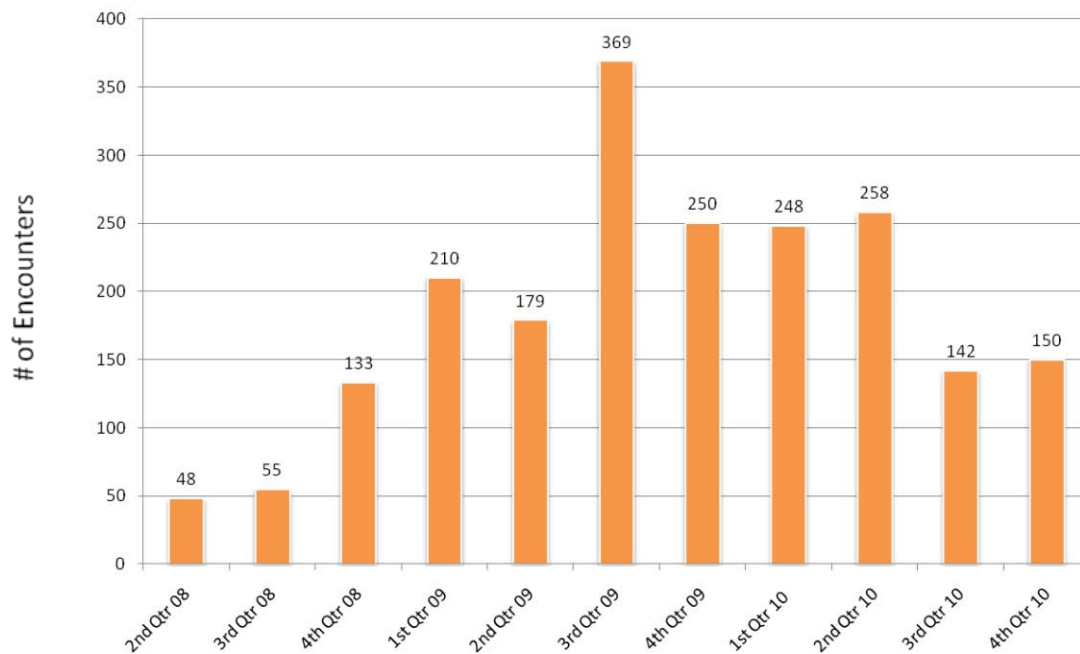
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Figure 1: Timeline of the progression of the clinical pharmacy services



CPS – Clinical Pharmacy Services; HRSA – Health Resources and Services Administration; PSpC – Patient Safety and Clinical Pharmacy Services Collaborative

Figure 2: Number of clinical pharmacist-patient encounters by quarter





	Mean* ( $\pm$ SD)
My patients have a better understanding of their medications after a pharmacist consultation. (n = 12)	5.8 ( $\pm$ 1.2)
The information I receive from the pharmacist is valuable. (n = 13)	5.9 ( $\pm$ 1.1)
The services provided by the pharmacist result in positive outcomes in my patients. (n = 13)	5.7 ( $\pm$ 1.2)
The pharmacist progress notes in eClinicalWorks are helpful. (n = 13)	5.4 ( $\pm$ 1.0)
The pharmacist is helpful in identifying adverse drug events in my patients. (n = 11)	5.7 ( $\pm$ 1.1)
The pharmacist is helpful in maintaining a complete list of my patients' medications. (n = 9)	5.8 ( $\pm$ 0.8)
The pharmacist adds value to the Daily Planet health care team. (n = 13)	6.3 ( $\pm$ 0.9)

\*1 = very strongly disagree, 2 = strongly disagree, 3 = disagree, 4 = Neither agree nor disagree,  
 5 = agree, 6 = strongly agree, 7 = very strongly agree  
 eClinicalWorks = Daily Planet's electronic medical record