Successful Practices in

# College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists Services for Team Based, Patient Centered Care

Pharmaceutical Education 2011

## Table of Contents

Area of Successful Practice: Partnerships for Team Based Patient Care

# Presbyterian College

School of Pharmacy
South Carolina Free Clinic Association (SCFCA)
Clinton, SC 29325

**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

Since its inception, Presbyterian College School of Pharmacy (PCSP) has been committed to improving health care in rural areas. A partnership with the South Carolina Free Clinic Association (SCFCA) was formed to improve pharmacy services and overall health care that underserved patients received. The BlueCross BlueShield of South Carolina Foundation awarded grant monies in support of the creation of a pilot model pharmacotherapy service for the SCFCA. This pilot model consists of one-on-one diabetes education and management, a formal anticoagulation service, group diabetes education classes, and medication dispensing services. These services began at Good Shepherd Free Clinic in Clinton, SC which operates 3 days plus 1 evening a week. The clinic is currently staffed by one paid nurse practitioner and volunteer physicians. Prior to this partnership, the clinic also employed one pharmacy technician and would rely on several volunteer pharmacists.

In October 2009, a one-on-one diabetes education and management service was initiated at Good Shepherd. Diabetes was previously identified by the nurse practitioner as a critical need for these patients. Upon initiation, one PCSP faculty member saw patients two full days per week. Currently, two PCSP faculty members work together to provide three full days of coverage per week. Recommendations for medication therapy changes as well as laboratory orders are made according to a collaborative practice agreement between the faculty members, nurse practitioner, and medical director once a patient is referred to the service. Collaborative practice agreements were created for hypertension and hyperlipidemia in addition to diabetes management. This allows the faculty member to follow patients on a weekly to monthly basis in order to better meet their hemoglobin A1c, blood pressure, and lipid goals. Patients can also be referred to group diabetes education classes that are held at the School of Pharmacy one day a week. The group classes meet for 2 hours each day for 1 month and cover recommended topics by the American Association for Diabetes Educators.

A formal anticoagulation service has also been established through a collaborative practice agreement. This has improved monitoring and management of patients currently taking warfarin therapy as recommended per national treatment guidelines. Monitoring of patients' INR is more routinely done than prior to this partnership. Recommendations for warfarin dose adjustments and counseling by the faculty member are done on a patient specific basis in order to achieve the therapeutic INR goal.

Through the course of establishing pharmacotherapy services, an electronic medical record (EMR) was implemented at the clinic. The EMR is accessible to all providers at Good Shepherd Free Clinic as well as the pharmacist at PC Community Cares Pharmacy. Implementation of the EMR aided not only in documenting clinical encounters, but also in communication between providers with the dispensing pharmacy.

Prior to PCSP and SCFCA's partnership, medication dispensing was offered two days a week at Good Shepherd. Dispensing services were transferred to PCSP's PC Community Care Pharmacy in November 2010 and provides access for patients four days a week. The pharmacy is staffed by faculty, students, and volunteer pharmacists. Patients are able to receive medications when a pharmacist is present for counseling. A medication formulary has also been established to streamline prescribing as well as contain costs. Agreements between PCSP and Good Shepherd's medical director allow for automatic substitution and emergency supplies to help improve pharmacy care for patients.

## Outcomes

Currently one year outcomes associated with the diabetes one-on-one education have been analyzed. Statistically significant reductions were seen in reduction of hemoglobin A1c (-2.3 %, p=<0.001), systolic blood pressure (-6.2 mmHg, p=0.0213), LDL (-28.1mg/dL, p<0.001), and triglycerides (-84.5 mg/dL p=0.001). There were 30 patients (39 %) not at goal upon entry into the clinic who achieved a goal of A1c</=7 by 12 months. All patients who were at goal upon entry into the clinic remained at goal at the end of the 12 month follow-up. By the end of the first year, almost half of the patients (44.2%) were at A1C goal or below.

Based on the assumption of $820 savings per 1% decrease in hemoglobin A1c levels (Wagner EH, Sandhu N, Newton KM, et al. Effect of improve glycemic control on healthcare costs and utilization. JAMA 2001;285:182-189.), the clinic resulted in an average savings of $1,918 per patient, for an overall savings of $122,754 in the first year of operation. Given that this assumption is based on 1997 dollars, this amount can be inflated to 2010 dollars making the average savings per patient approximately $2,600. This is amounts to an cost avoidance for the clinic for the first year of operation of $167,364.

Several challenges were faced when developing this partnership. Limited faculty were employed at the inception of the service, which placed a significant workload on one person. One faculty member has to not only begin services but also secure the needed hardware, software, and networking as well as be the dispensing pharmacist for Good Shepherd on a number of occasions. However, with the growth of the school there are now 2 faculty members dedicated to one-on-one visits and group education classes, as well as separate pharmacists to fill the dispensing role. The Good Shepherd free clinic was also new to the concept of a non-dispensing clinical pharmacy faculty member. As a result, the staff struggled at times to understand how to support such a role in order to provide the highest level of patient care. It was learned that a clinical pharmacy faculty member needs both space and staff support from the clinic in order to remain focused on patient care and provider consultations. The data shows that the concept is sound and productive for the free clinic; administrative support would allow pharmacy faculty members to continue to improve patient care.

The partnership between PCSP and SCFCA has now been in place for over 1 year. Interest has been expressed by both parties to continue to expand this partnership and enter other free clinics in the general vicinity of PCSP. Plans are currently underway to go forward with this expansion of clinical services as well as addressing the need for increased medication access to other free clinics.

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# Purdue University

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Butler University College of Pharmacy

## Description

Ambulatory care faculty from Purdue University and Butler University Colleges of Pharmacy have partnered in a qualitative research project involving practice sites from five major hospital systems in the Indianapolis area. The research project consists of a patient questionnaire evaluating patient perceptions of care in a pharmacist-managed clinic. Five open-ended questions relate to patient opinions about how their health care has been affected by the clinical pharmacist, how care from a clinical pharmacist differs from care from a physician, and general opinions of pharmacist-managed care. Likert scale questions inquire about disease state education, medication, and compliance.

Each clinical pharmacist involved in this collaborative project maintains a medication management clinic practice (Table 1). Multiple pharmacists involved with this project have been practicing under scopes of practice for several years, and the remaining pharmacists are currently in the process of implementing scopes of practice. The clinical pharmacists at each practice site work alongside physicians, nurse practitioners, nurses, dieticians, social workers, and other health care professionals. This collaboration also includes members other than the practicing clinical pharmacists. Priscilla Ryder, Assistant Professor of Pharmacy Practice with Butler University, is involved with our project for her experience and expertise with qualitative research methods. Kara Nedderman, a PGY1 Resident with Community Health Network is working with Emily Papineau with initial project progress. Melissa Enriquez, a PharmD candidate from Purdue, is conducting all of the patient interviews.

| **Butler Faculty** | **Practice Site** | **Clinical Specialty*** | **Scope of Practice** |
|---|---|---|---|
| Emily Papineau | Community Health Network | DM, HTN, HPLD, COPD, Asthma | Yes |
| Darin Ramsey | Roudebush VAMC | DM, HTN, HPLD | Yes |
| Alison Walton | St. Vincent Hospital | AC, Geriatrics | In development |
| Jessica Wilhoite | St. Vincent Hospital | AC, Geriatrics | In development |
| **Purdue Faculty** | **Practice Site** | **Clinical Specialty*** | **Scope of Practice** |
| Jasmine Gonzalvo | Wishard Health Services | DM, HTN, HPLD, SC | Yes |
| Ashley Vincent | Clarian Health – Methodist | AC | Yes |
| Zach Weber | Wishard Health Services | DM, HTN, HPLD, SC | Yes |
| *HPLD: Hyperlipidemia; DM: Diabetes;HTN: Hypertension; SC: Smoking Cessation; AC: Anticoagulation; COPD: Chronic Obstructive Pulmonary Disease | | | |

## Outcomes

Jasmine Gonzalvo initially conducted a small pilot project to establish preliminary data with the original patient questionnaire. Following completion of the pilot project, she then contacted individual faculty members at Butler and Purdue Colleges of Pharmacy to describe the qualitative research initiative and assess interest in collaboration. The main goal behind creating the collaboration was to determine if patient perceptions of pharmacist care remained consistent across multiple disease states and hospital systems.

Our first meeting was in November 2010. We discussed our individual practice sites, shared our goals for the project, and determined a plan of action and timeline. Although, the goal of our collaborative project primarily relates to research and practice, the involvement of a pharmacy resident and student brings an educational component to the collaboration. Exempt or expedited IRB of ambulatory care faculty at both Butler and Purdue Universities has grown in the last several years, which makes partnership among us productive, efficient, and professionally rewarding. We anticipate sharing more of our mutual experiences with clinic growth and development, because our practice sites exhibit different strengths and areas for improvement. Overall, collaboration between our two universities and among our practice sites has greatly expanded our professional opportunities in a variety of avenues.

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# University at Buffalo

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The Department of Pharmacy Practice at the University at Buffalo (UB) in the School of Pharmacy and Pharmaceutical Sciences (SPPS) leads a three-way partnership with a large community-based physician group practice site [Buffalo Medical Group (BMG)] and a health insurance plan [Independent Health Association (IHA)].

UB's role in the partnership is multi-faceted, including the faculty development of a novel medication management referral program (MMRP) and the implementation of an accredited residency program, which in turn allows for integrated PGY1 residency training with advanced and intermediate PharmD experiential rotations. BMG's role in the partnership is to facilitate provider access to the MMRP and provide an environment that fosters patient interaction and a direct or virtual forum with the physicians within the group. Funding and steering committee administrative support is provided by IHA, with external advisory input and guidance on program metrics for clinical and economic outcomes provided by the steering committee at quarterly meetings.

While no formal partnerships technically exist, other healthcare education entities such as insulin pump trainers and clinical pharmacists participate on a regular basis. We also regularly engage the BMG Registered Nurses in the Health Maintenance Department that is responsible for Diabetic and Cardiovascular Initiatives.

There is a memorandum of understanding between UB and BMG and UB and IHA and an IRB-approved research protocol that is used to provide the framework for the MMRP. The program is managed by a steering committee, comprised of the key stakeholders from UB, BMG and IHA. The Pharmacy Practice Chair, MMRP faculty director and a UB PGY1 Resident are members of the committee along with the Medical Director and Associate Director of Clinical Services at BMG. For fiscal planning, the IHA Director of Pharmacy is a member of the committee. This committee meets on a quarterly basis to review cumulative MMRP outcomes data and make modifications for updated clinical and economic program metrics and analysis. The financial arrangement currently provides an annual grant ($79,500) from IHA to UB to support the PGY1 residency program.

The goal of the partnership is to provide and evaluate novel strategies to improve medication management using both clinical and economical outcomes for BMG patients. What I believe is unique about this partnership is that all the participants were involved in developing the program goals and outcomes. This ensures that all participants have a stake in the success of the program. Direct program marketing has primarily used an informal approach. We initially started with "physician champions" (physicians who were ready and willing to refer patients to the program, in its infancy) who used the MMRP and they became advocates for the program with their fellow

physicians by stating the benefits gained using objective outcomes data. Currently, the MMRP faculty and staff attend quarterly physician meetings in an effort to expand the use of the program In addition, discussions occur as needed with outside stakeholders to leverage the perceived benefits of the MMRP.

The partnership started in 2001, when UB approached BMG to investigate a novel approach to integrating a clinical pharmacist into a multidisciplinary team for patients with complex medication management issues. Coincidentally, IHA was interested in developing a strategy to interact with one of their largest medical groups to improve patient outcomes. Program development and financial planning led to the initiation of the partnership in the summer of 2005.

## Outcomes

There are three main stakeholders in this partnership, BMG, UB, and IHA, however faculty, patients, prescribers, staff, and countless students utilize this innovative practice setting.

This partnership contributes to the school's overall mission in each of three areas: education, research, and service. The site provides a well-respected ambulatory care site for the training of students and residents, modeling an interdisciplinary, patient-centered medical home, and a real-world environment for innovative patient care. This partnership also provides a patient care site that is open to translational research and generates data summaries on a regular basis for abstract and grant applications. For the last five years, a PGY1 resident has graduated from the program and each year a research project was initiated, conducted and completed as a result of this partnership. These projects are consistent with IH and BMG goals, in an effort to show real patient outcomes, instead of extrapolated national data. We provide an educational service not only to the patients and prescribers but also to our colleagues and fellow clinical pharmacists.
Clinical and economic outcomes have been tracked for the program since its inception, with the rigor of the dataset growing as the program has evolved. We are in the process of manuscript preparation; however some of our unpublished data is described below.

Clinical outcomes data (A1C, LDL and BP) are summarized every 3 months. These clinical outcomes are collected for each patient before they engage with the program and then at least 3 months later. These clinical outcome measures are then used to determine economic impact from models in previously published data. These calculations consistently yield an ROI between 3 and 5.

| | | **A1C (%)** | **LDL (mg/dL)** | **BP (mmHg)** |
|---|---|---|---|---|
| Before CPS | % at goal | 18% (14/76) | 47% (49/104) | 33% (1/3) |
| | Average | 8.6 (n=76) | 104 (n=94) | 134/81 (n=3) |
| After CPS | % at goal | 50% (38/76) | 72% (21/29) | 67% (2/3) |
| | Average | 7.3 (n=76) | 87 (n=29) | 126/79 (n=2) |
| | p-value | <0.001 | <0.001 | NS |

To address SUNY charter limitations to faculty service and legislative restrictions resulting from the lack of a NYS Collaborative Practice law, a research protocol is used to evaluate a novel medication management approach for the patients at BMG. Advice: Building a personal

relationship with the physicians you are working with is absolutely essential. Regardless of the partnership structure and role of the stakeholders, if the physicians are not comfortable with you or your knowledge base, your program will be hard pressed to show positive outcomes. When initiating a site like this, it is crucial to have the outcomes be tied to the health system and ensure that all the partners are involved in the inception of these goals and outcomes.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Denver Health Eastside Adult Internal Medicine Clinic

## Description

This new partnership was established in 2009 when the School of Pharmacy teamed up with Denver Health to hire two full-time Assistant Professors who jointly provide 1.0 FTE of clinical services at the Eastside Adult Internal Medicine Clinic. Outside of a newly-hired Anticoagulation Clinical Pharmacy Specialist, these faculty members became the first Ambulatory Clinical Pharmacy Specialists in the Denver Health system.

Due to the academic and clinical nature of the faculty members' positions, the partnership's focus is on education, practice and research. At the clinic site, the faculty members are involved in direct patient visits, telephonic patient management, pharmacotherapy consults, hospital discharge follow-up, clinical research and serve as preceptors for P4 APPE students, Denver Health PGY1 residents and School of Pharmacy Ambulatory Care/Family Medicine PGY2 residents. The primary clinical focus is cardiology/cardiometabolic risk, but as ambulatory care practitioners the faculty members are able to provide patient care and consultations for a variety of disease states.

Establishment of the partnership occurred in less than one year; discussions regarding the partnership started in early 2009, candidates were interviewed that spring, and the two faculty members were hired and began their appointments in August 2009. The faculty members are 50% funded by each partnering institution; by doing so, the School of Pharmacy was able to extend one faculty position into two and the Denver Health Eastside Adult Internal Medicine Clinic has full-time Clinical Pharmacy Specialist support.

The clinical service model implemented at the Denver Health Eastside Adult Internal Medicine Clinic was developed by representatives from both the School of Pharmacy and Denver Health (including the two faculty members) during a week-long Rapid Improvement Event (RIE). The RIE process is modeled after the "Lean" principles employed by the Toyota Production Systems to make work that is standardized, high-quality and financially feasible.

## Outcomes

The faculty members track metrics related to clinical patient outcomes (e.g., blood pressure, hemoglobin A1C, cholesterol), hospital discharge follow-up outcomes (e.g., patient satisfaction with transitions of care, 30-day readmission rates) and financial outcomes (e.g., direct patient visit revenue). The faculty members were able to demonstrate financial justification of their joint clinical position in the first six months of 2010.

The practice site serves as a resource for clinical research and there currently exist several ongoing retrospective and prospective studies in various stages of completion on which the faculty members are the primary and co-investigators. One of the newest ventures within the partnership is team participation by both institutions in the Health Resources and Services Administration (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative (PSPC) 3.0.

There are not yet any published data related to their clinical activities, but the faculty members anticipate publication of qualitative and quantitative clinical data within the next year. Internally, the faculty members and their clinic colleagues (e.g., physicians, nurses) have been recognized by Denver Health with a Team Award for the "Establishment of Ambulatory Clinical Pharmacy Services" and the resultant improvements in the metrics related to patients with diabetes.

*Barriers to implementation*: Initial barriers to implementation included execution of the logistics related to faculty involvement in direct patient visits. The faculty had to be granted provider numbers, trained to use the Denver Health scheduling system, educated on how to bill for their visits and receive virtual private network (VPN) access to be able to access patient data and charts off-site.

Because the Ambulatory Clinical Pharmacy Specialist model is new to Denver Health, it also took time to work through implementation of the clinical services model that was developed during the RIE process. Once in practice, some of the metrics and clinical responsibilities determined during the RIE were found to be neither optimally efficient nor useful to the clinic and appropriate changes were made.

While not necessarily a barrier, a struggle that the faculty members have encountered is appropriate and sustainable time and effort allocation to each institution. As the job responsibilities and demands for each institution have increased, it has become easy to work more hours and essentially become full-time employees at both institutions, which is an impossible feat to maintain.

*Advice or lessons learned*: The best advice we can offer for thriving in this type of partnership is to encourage and maintain open lines of communication between both institutions; it is necessary that all vested parties be on the same page to ensure all interests are accounted for. Additionally, faculty members must be protective of their time and balance their commitments to each institution so that they can be both effective clinicians and successful faculty members.

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# University of Iowa

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The University of Iowa College of Pharmacy has collaborative practice partnerships with five family medicine clinics that are part of a network originally created by the Office of Statewide Clinical Education in 1974 by the University of Iowa Carver College of Medicine. The College of Pharmacy began affiliation agreements in the year 2000, and was spearheaded by Roger Tracy, Assistant Dean/Director, Office of Statewide Clinical Education Programs, and William A. Miller, Emeritus Professor, College of Pharmacy.

Each health care setting employs and houses a faculty member directly associated with the College of Pharmacy. Each faculty member also serves as faculty for the family medicine residency program at their respective sites. Strategically placed in some of the larger cities, but also geographically dispersed, the health care institutions involved are:

Northeast Iowa Family Practice Center, Waterloo, Iowa:
Dr. James Hoehns, Associate Professor (Clinical)

Siouxland Medical Education Foundation, Sioux City, Iowa:
Dr. Lucinda Buys, Associate Professor (Clinical)

Broadlawns Medical Center, Des Moines, Iowa:
Dr. CoraLynn Trewet, Assistant Professor (Clinical)

East Des Moines Family Care Center, Des Moines, Iowa:
Dr. Kristin Horning, Assistant Professor (Clinical)

Family Practice Center, Mason City, Iowa:
Dr. John Swegle, Associate Professor (Clinical)

The focus of this partnership is to provide education and interprofessional training opportunities for pharmacists and resident physicians. It allows faculty members to be well-established in a practice setting, providing health services to the citizens of Iowa. It further provides an excellent platform for advanced and introductory practice opportunities for our PharmD students. Having faculty directly involved in a practice setting, working as part of an interdisciplinary team, is immensely beneficial to students. The practice setting yields authentic case discussions and clinical events that educate students on current disease state medication management. It's also an added advantage to have faculty in innovative clinical practices to collaborate with faculty members based at the college. Faculty are community-based for public and professional service and the network often creates opportunities for interesting clinical research.

Each site, usually through its medical resident educational foundation, has its own individual contract with the College of Pharmacy which is renewed annually. The financial agreement simple states each partner will pay half of the faculty member's salary.

Each health care setting provides various clinical services. Examples include anticoagulation, hypertension, diabetes and pain management clinics. Clinical Outcomes are tracked separately at each site. Educational outcomes include the number of trainees (pharmacy residents, medical residents, pharmacy students).

**Outcomes**

To initiate a practice partnership such as these, one must carefully create open communications to enable negotiation and renegotiation of contracts as the practice evolves. It is critical to consider how income generated by the shared faculty member will be distributed, how salary increases and discretionary funds will be distributed and how the pharmacist will receive feedback and evaluations. Clear communications and equitable distribution of work roles are a challenge with such diverse practices, especially when there is a significant distance from the other sites and to the college.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Pharmacists and the President's Pediatric Gastroenterology Clinical Team

## Description

Every Tuesday, the pediatric gastroenterology clinic at the University of Maryland Baltimore campus becomes an interdisciplinary clinical classroom for pharmacy residents and students, medical residents, nurse practitioners trainees, dental students, law students, and social work interns. Together rotations of students work under the supervision of experts in their profession to learn a new process of providing patient care.

This clinic is one of only three pediatric GI providers serving Maryland, and complex patients—from newborn to adolescents are treated for a range of difficult disorders. Failure to thrive, reflux, peptic disease and inflammatory bowel disease are among the most common problems. Diagnosis can be difficult, and the involvement of pharmacists in the room during sessions with the patient and family can facilitate identification of problems ranging from medication dosing, drug-drug interactions, and even unintentional misuse of medications. Children seen by the team also have complex medical and medication histories. Pharmacists collect the history by communicating with the patient and the family, in addition to communicating with their community pharmacies.

The pharmacist's impact has been noted by in many cases where children with chronic conditions in addition to acute gastrointestinal problems. One such patient was prescribed incorrect doses of ADHD medications which exacerbated the presenting problem.

## Outcomes

The most relevant outcome is the importance of interdisciplinary dialogue. The team regularly conducts debriefing sessions during which students walk through exercises to reflect on their role on the team and to debunk the myths others may hold about their profession. The outcome is simply, better team work, more complete recommendations for treatment of the problem, and improved communication with the patient and family.

The infrastructure and business capabilities such as billing and medical records have not grown as quickly as the clinical team's interdisciplinary capabilities. Electronic medical records would allow for pharmacists to make clinical notes and recommendation in the same file, to simplify communications and improve efficiency.

The clinic was initiated by UMB President Perman in his new appointment to campus in 2010. This collaboration involves the Schools of Pharmacy, Medicine, Law, Dentistry, Nursing, and Social Work, as well as the University of Maryland Medical System. The interdisciplinary

pediatric gastroenterology clinic is located in the University of Maryland Medical Center 5th floor subspecialty clinic at 22 South Greene Street in downtown Baltimore, Maryland.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Integrating Medication Therapy Management (MTM) Services and Diabetes Self-management Education into Primary Care for an Underserved Latino Population at a HRSA Patient Safety and Clinical Pharmacy Services Collaborative (PSPC) Clinic

## Description

The University of Maryland School of Pharmacy (UMSOP) entered a collaborative partnership with the Primary Care Coalition (PCC) of Montgomery County Maryland and ALFA Specialty Pharmacy (ASP; an independent pharmacy) almost 2 years ago to provide medication therapy management (MTM) services and diabetes self-management education at Mercy Health Clinic (MHC), one of the PCC's primary care clinics for low-income, uninsured, and high-risk patients with multiple chronic diseases and medications. Regarding the role of each partner, UMSOP provides faculty pharmacists for MTM services for clinic patients and facilitates rotations for pharmacy students and residents; the PCC facilitates the partnership and serves as liaison between MHC and the faculty pharmacists; MHC provides patients for MTM services and experiential learning rotation site for pharmacy students and residents; and ASP also provides pharmacist for MTM services for clinic patients and serves as preceptors for students of the UMSOP.

Since the UMSOP faculty pharmacists and ASP pharmacists have joined the primary care team at Mercy Health Clinic, the collaboration has strengthened the PCC's and the clinic's existing participation in the nationwide Health Resources and Services Administration (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative (PSPC) initiative. During the HRSA PSPC's special session at the American Pharmacists Association Annual Meeting in Washington, DC in 2010, the team received an award for most collaborative partners in the second year (PSPC 2.0) of participating in the PSPC initiative. Currently, the team is part of PSPC 3.0, and the University of Maryland School of Pharmacy is one of approximately 50 schools/colleges of pharmacy participating in this HRSA PSPC initiative. The PSPC provides a national platform and support for the faculty pharmacists from the UMSOP and pharmacist preceptors from ASP to continue providing MTM services and diabetes self-management education to the clinic's high-risk patient population.

Regarding administrative/leadership and inter-professional support, the pharmacists have received "buy-in" from the PCC and MHC administrative team and worked collaboratively with physicians and nurses to provide patients with comprehensive medication therapy review, education on diseases and medication adherence, and self-management training. Prior to providing these services, the pharmacists met with leadership from the PCC and MHC to provide an overview of clinical pharmacy services. Multiple meetings also occurred with the Medical Director, Executive Director, physicians, and nurses at the MHC to discuss integration of clinical pharmacy services into routine patient care. The pharmacist team provides MTM and diabetes

education as appropriate for patients who were referred by clinic's physicians, nurses, and staff. Referrals were made for patients who were on 4 or more medications and/or had 3 or more chronic diseases with potential or actual medication-related problems (i.e. adverse drug reactions, drug interactions, etc).

The distinctive and interdisciplinary nature of the clinic enables timely interventions through recommendations to physicians and subsequent modification of therapy as needed, prior to the patient seeing the physician or leaving the clinic. Furthermore, this clinic is unique in that nearly three quarters (74%) of patients with uncontrolled diabetes claim Spanish as their primary language. Therefore, the use of an interpreter is imperative to ensure proper care for this patient population. Pharmacists serve patients of all ages and backgrounds with focus on multiple medications, adherence, and chronic diseases.

## Outcomes

In terms of clinical outcomes, initial evaluation of patients showed improvements within the first year of clinic. Specifically, 78% of patients with pre- and post- A1c data had a positive clinical outcome, with mean A1c improved from 8.8%±2.0% to 7.8%±1.4% ($p=0.002$). Also, median A1c improved from 8.5% pre-CPS to 7.5% post-CPS. Blood pressure and LDL were also improved, but not statistically significant. Overall, clinical pharmacy services in this HRSA PSPC safety-net clinic resulted in positive clinical outcomes. It is anticipated that there will be further improvements in outcomes for this high-risk patient population.

The challenges and lessons-learned from this collaborative effort include a language barrier, lack of support staff as patient navigator, need for strong infrastructure at clinic to optimize coordination of patient care among multiple providers, and lack of compensation for pharmacists. To overcome these barriers, the language line is being used, and shared staff at MHC and the PCC assists with patient appointments and clinic schedules. Funding opportunities are being pursued to support an infrastructure and compensate pharmacists.

To further support and advance this collaborative effort, the PCC applied for and was recently awarded a grant from New York based Community IMPACT Diabetes Center to establish an infrastructure on improving integration of diabetes related patient services, including clinical pharmacy services and patient self-management education, for primarily Spanish-speaking patients with difficult to control diabetes. The project's objective is to develop an algorithm to direct patients into individual or group education and/or MTM services, incorporate the intervention into the patient care plan, assess the patient experience, cost, and clinical outcomes, and develop a plan to scale up and spread the methodology to additional clinic sites of the PCC. Furthermore, this project will provide a patient navigator and interpreter for clinical pharmacy services at the clinic.

In summary, this practice model reflected an innovative approach and cross-collaboration among multiple partners (UMSOP, PCC, MHC, ASP, and Medbank – a free/reduced cost medication program) in providing interdisciplinary and team-based patient-centered care for an under-served population. Meanwhile, pharmacy residents and students have gained a valuable inter-professional experiential learning opportunity. Finally, a memorandum of understanding (MOU)

between the School and the PCC continues to guide the faculty role and responsibilities, as well as other forms of cooperation among the multiple partners.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

MedStar Health Palliative Care: Pharmacists on the Pioneering Team

## Description

Beginning in 2007, the University of Maryland School of Pharmacy and MedStar Health at Union Memorial Hospital in Baltimore, Maryland, entered a long-term memorandum of understanding to continue the pioneering palliative care team begun by pharmacist Kathryn A. Walker, physician Christopher D. Kearney, and social worker Rene' Mayo. A nurse practitioner has recently been added to the team. Walker is the first pharmacist to be employed by the Department of Medicine at Union Memorial Hospital.

Due to the complex nature of palliative care patients, this team strives to operate in a transdisciplinary fashion to better care for patients and families. This type of care requires members of the team not only to work together but to cross train each other so that each one possesses enough skills to cover for the other disciplines on the team. This is considered the ultimate in team functioning, raising the bar above interdisciplinary care.

This team provides hospital-wide consultation services for patients and their families facing advanced illness and end of life decisions. The first goal in treating these patients is intensive pain and symptom management before addressing the rest of the palliative concerns. For every patient, the team completes a comprehensive medical history, medication review, and then opens a conversation with the family and the patient to discuss the patient's end-of-life goals. Then the team negotiates a treatment plan which often requires complex medication recommendations to individualize therapy and meet patient specific needs in the hospital and after discharge.

## Outcomes

Two major barriers to development of this service included the justification of the role of the pharmacist and cost of the service. This prompted the team to delve into researching the impact of their service. Results of the team's work have demonstrated the impact of this palliative care team intervention on the quality of patient care in the medical intensive care unit (Walker et al., 2010). When comparing patients referred to the palliative care team vs. controls receiving usual care, ICU length of stay was shorter and more supportive services were ordered after discharge from the hospital. Other notable outcomes include the dramatic increase in consult volumes by 50-100% every year since inception. The palliative care team has been credited with changing the culture in the hospital in many ways to improve the care of the dying.

Walker (2010) also published an examination of the role of the pharmacist on the palliative care team which explored the unique qualifications and important role of palliative care pharmacists in caring for patients with advanced disease. In addition to clinical team responsibilities, the pharmacist role includes extensive interdisciplinary education (medical, nursing, social work,

and pharmacy) through experiences such as rotations, workshops, lectures, discussion groups and journal clubs. Patients and families also benefit from the medication education pharmacists provide to help families in decision-making about care.

Walker's involvement as faculty in the Department of Pharmacy Practice and Science has enhanced the work of the team in two ways. First, the team has been better equipped to pursue research, scholarship, and valuable dissemination of team results. Also, Walker is empowered to extend beyond the usual roles and responsibilities of traditional inpatient clinical pharmacists.

MedStar has found that the palliative care team involvement results in both high quality care and significant health care costs savings. Future collaboration between the University of Maryland School of Pharmacy and MedStar is expected to involve expanding palliative care across the health-system and supporting the new teams by providing specialized training and centralizing data collection for service metrics and research.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

The Maryland $P^3$ (Patients, Pharmacists, Partnerships) Program

## Description

The Maryland $P^3$ (Patients, Pharmacists, Partnerships) Program™ is a chronic disease program for self-insured employers. Well-trained, licensed pharmacists coaches help patients manage the complexities of their chronic disease. Partners include the Maryland Legislature, the Maryland Pharmacists Association, and the Maryland Department of Health and Mental Hygiene Office of Chronic Disease, as well as self-insured employers.

The $P^3$Program™ was created in 2006, in response to the American Pharmacists Association (APhA) Foundation's *Ten City Challenge* (1,2) to emulate the ground-breaking Asheville Project (3). Western Maryland Health System in Cumberland, Maryland was selected as the university's initial site because only two endocrinologists were practicing in this rural area at the time.
The $P^3$ Program™ pharmacist is the link between medications, the patient, and health care providers. Most importantly, the pharmacist helps the patient mobilize their own resources and capabilities while promoting a standard of care.

$P^3$ Program™ pharmacists improve the health of the patients they serve, while reducing costs for employers. The $P^3$ Program™ has trained 170 pharmacists in chronic disease management, forged a new role for pharmacists in patient care, collaborated with primary care physicians for patients with diabetes, and coached four hundred patients to improved health. Most importantly, the program has drawn from its successful partnerships to improve the process of care and attend to the importance of medication adherence in patients with chronic disease. The program expanded from one employer to seven companies and hundreds of patients.

The program focuses on medication therapy management (MTM) and compliance with the appropriate disease specific standards of care (4,5) (foot, eye, vaccination, and dental exams), and laboratory tests. Pharmacist-coaches support the patient's development of disease specific knowledge, self-management skills, and medical management abilities. Participants meet one-on-one with their $P^3$ pharmacist who reviews medical and medication history, and assesses health behaviors, diet, tobacco use, and exercise regimen.

Clinical parameters are collected at each visit, including HbA1c, cholesterol, blood pressure, medication adherence, and medical visit compliance. Patients' skills in diabetes management are developed in five areas: a) blood glucose self-monitoring; b) oral medication and insulin self-administration; c) nutritional choices; d) appropriate foot, skin, eye and oral health care; and e) stress management**.** The pharmacist's communications with providers include recommendations related to the standard of care, including referrals to specialists such as a dietician, dentist, and podiatrist.

## Outcomes

Of the 176 participants tracked for 12 month clinical outcomes study (6), a combined total of 62.2% of participants in the $P^3$ Program™ had an HbA1c level at or below therapeutic goals (under 7.0%). On the other hand, a total of 29% of participants participating reported HbA1c levels over the goal (between 7.1 % and 8.9 %). The report (6) compares the percentage of $P^3$ participants with HbA1c over 9.0% (poor control) with the percentage of patients with diabetes in other insured groups who had poor control (7). Only 9.1% of $P^3$ participants during the evaluation period tested at HbA1c greater than 9.0%. For this same period, approximately 29% of patients with diabetes in commercial plans (Maryland and nationally) had poor control (7).

The data from patient visits showed that after 12 months in the program, 70% of participants had blood pressure control with readings of 140/90 mm Hg or lower. A total of 42.9% of $P^3$ participants reached the therapeutic blood pressure goal of less than 130/80 mm Hg. This compares to Maryland commercial plans reporting fewer patients reaching these same blood pressure therapeutic measures (55.6 % for less 140/90 mm Hg and 28.8% for less 130/80 mm Hg). Other measures relate to the ADA (1) 2008 guidelines. Seventy three percent of participants received annual eye dilated exams, 76.1% had foot exams, and 58.2% received dental exams.

The $P^3$ Program™ plans to improve vaccination rates by training and certifying additional $P^3$ Program™ pharmacists in immunization through the School's CE programs. Vaccinations could take place during regular patient visits. A new training module is now available to prepare $P^3$ Program pharmacists in hypertension management. The school is collaborating with its partners to expand the program to as depression, asthma, and chronic obstructive pulmonary disease.

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*Area of Successful Practice: Partnerships for Team Based Patient Care*

Medication Adherence and Medication Therapy Management in Complex HIV Patients:
A Clinical Collaboration

## Description

Patient-centered care for patients living with HIV/AIDS with the most serious medication safety risks are the focus of this Patient Safety and Clinical Pharmacy Services collaborative (PSPC) awarded by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services. The Evelyn Jordan Center HIV Clinic is the location for this PSPC Collaboration involving physicians from the Institute of Human Virology of the University of Maryland School of Medicine, the University of Maryland Medical System, and University of Maryland School of Pharmacy Assistant Professor, Neha Sheth, PharmD.

Patients receive their primary care in the clinic which serves a predominantly low-income population. Half of Evelyn Jordan Center patients are current or former substance abusers. Many experience other chronic disease(s) in addition to their HIV status. Eighty-five percent of the patient population is African American and 45% are women. Patients are referred for clinical pharmacy services by their primary care provider.

The goal of the collaborative team is to identify patients with a high risk of treatment failure and to link them with additional medication support through clinical pharmacy services. These patients were identified by: a) history of antiretroviral medication noncompliance with potential effects of medication resistance; b) multiple disease states and co-morbidities requiring complex drug therapy(for example oncologic and substance abuse treatment); and c) patient understanding of disease states requiring further and in-depth education. Oftentimes, however, medication reconciliation and toxicity/lab values are the first level of information required for treatment. Dr. Sheth works with the nurses and case managers to ensure these information needs are met.

## Outcomes

The desired outcome is to improve patient adherence to their regimen (antiretroviral therapy and co-morbidity treatments) with problem solving around drug-drug interaction, drug-disease issues, multiple specialists and prescriber issues, dose specific modifications, poly-pharmacy, multiple hospital admissions and over-the-counter products.

The university clinical pharmacy expertise is provided to the sight through faculty, students and residents who provide critical services to those most in need. The investment represents a commitment to public health and student training. A formal agreement is in place with the

School of Pharmacy, the Evelyn Jordan Center, and HRSA for involvement in the PSPC collaborative.

While Ryan White Act grant funds support many of many clinical and nutritional services, the university continues to provide resources for the pharmacist to engage in clinical and educational collaborations. Pharmacy students and resident rotate onsite.

As in most resource-constrained settings with acute and chronic needs, the continued challenge is resources. Dr. Sheth remains focused on her patient-centered role, one that involves patient coaching, education, medication-related problem solving, and a support in overcoming obstacles to adherence. Yet a significant barrier to expanded coverage for at-risk HIV patients is funding for pharmacist services in the clinic.

In the future, the collaboration will gather outcomes related to the pharmacotherapy problems addressed, interventions employed, and patient outcomes reported. These data will be useful in process improvements in patient care, as well as in identifying priorities with the context of an interdisciplinary research program.

Evelyn Jordan Center is located on the University of Maryland Baltimore Campus in downtown Baltimore. The clinic is located in a University of Maryland Medical System facility at 16 S. Eutaw Street, Baltimore, Maryland 21201

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*Area of Successful Practice: Partnerships for Team Based Patient Care*

Expanding Pain Management and Clinical Care Capabilities
With Pharmacy Expertise on the Primary Care Team

## Description

The primary care clinic at University Care-Waxter is a prime example of how trust and respect between pharmacists and physicians results in improved patient care and demonstrable outcomes for patients. Dr. McPherson is celebrating the 20th year as director of pharmacotherapy services at the University Care-Waxter in downtown Baltimore. The clinic began as a geriatric care center and expanded overtime to include an adult patient population with diabetes (30%) and other chronic diseases (70%). Chronic disease and chronic pain often operate hand-in-hand, and the involvement of University of Maryland School of Pharmacy Professor McPherson has expanded the clinic's capability to treat these problems.

Patients are referred to the pharmacist by their primary care provider at Waxter when a patient is newly diagnosed, when laboratory tests suggest poor disease control and when the number and complexity of the medications may pose a risk to patient safety. The pharmacist role is to reconcile the medications in the electronic medical record, examine clinical laboratory values, coach patients in understanding their chronic condition, evaluate adherence "glitches" and medication safety concerns, and improve patient's abilities to self-monitor. A complete pain and medication history when assessed by an experienced pharmacist examines gaps or overlap in the pharmacotherapy, the resolution of which can lead to optimal treatment for each patient in care.

Ongoing monitoring of pain management is essential for patients with chronic disease to improve adherence and ensure proper medication dosages. Monitoring also keeps treatment current with functional status of patients as conditions change overtime. This sensitive balance of pain management medication, chronic disease medications, and the medical condition is optimized through the strong collaborative, trusting relationship between the physician and the pharmacist, but also between the pharmacist and the patient. Dr. McPherson regularly conducts pill counts, counsels patients in safe storage of medication, tracks self-management journals, keeps current on symptoms and reactions to medication, and requires drug testing for patients with a history of substance abuse.

## Outcomes

Accomplishments can be measured by the gratitude of patients successfully overcoming chronic pain. One elderly gentleman opened a new chapter in his life when his freedom from pain allowed him to string lights on the Christmas tree for the first time in over a decade. Many others of the over 8,000 patients seen by the pharmacy, can now perform activities of daily living through management of neuropathic or arthritic pain.

Another grateful group are the hundreds of student pharmacists who have rotated into the experiential learning with Dr. McPherson over the past 20 years. In addition to pharmacists, over a dozen licensed pharmacists have been trained through the palliative care residency at the University of Maryland School of Pharmacy. Not to be forgotten are the medical students and residents on rotation at Waxter have grown from the valuable expertise of the pharmacist in improving pain management. Students gain additional experience in pain management and complex drug regimens under Dr. McPherson's leadership when they serve in rotations in hospice locations throughout the region.

The clinic is a long-term collaboration involving the Schools of Pharmacy and Medicine of the University of Maryland Baltimore campus, and the sister institution the University of Maryland Medical System. The clinic was established long before the advent of inter-organizational agreements. The new electronic medical record (EMR) now captures more clinical and medication related data, and pharmacist service information. This raises the possibility that EMR may be instrumental in identifying services for reimbursement, as well as a documentation system to demonstrate patient outcomes over time.

University Care-Waxter is located off campus on the third floor of 1000 Cathedral Street in downtown Baltimore.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Suburban Hospital: Collaboration for Innovation

## Description

Recently, Suburban Hospital, an acute care facility serving a predominately aging population, has adopted an innovative approach to serving a total of 13,600 patients each year—a hospitalist approach. Each Suburban innovation has engaged pharmacists as collaborators and expert contributors to improve care thanks to a unique agreement among the University of Maryland School of Pharmacy faculty member, Dr. Lisa Charneski, Suburban Hospital medical director of hospital services, and the Suburban Pharmacy Department. The memorandum of understanding (MOU) is focused on innovations to create a safer, more patient-focused environment in this Washington, D.C. area facility.

The university's involvement has facilitated innovation, help establish new roles of pharmacist in the hospitalist model of care, has built a pharmacy residency program, and resulted in scholarly research.

Pharmacy initiatives include:

1. Establishment of multidisciplinary patient care rounds on medical floors;
2. Medication management discharge by a pharmacist at key transitions in care including the point of admission, transfer and discharge;
3. Prescription of medication safety evidence-based interventions;
4. Undertaking a pharmacist-delivered pneumococcal vaccine to patients; and
5. Engaging pharmacists as mentors and preceptors for a PGY1 residency program (beginning 9/10) and pharmacy students.

The university also participated in the Pharmacy Department's work to establish protocols and new care processes for medication management issues including medication-related treatment protocols ( falls, potassium, insulin dosing, IV to oral antibiotic conversion, and anticoagulation monitoring).

In order to accomplish these wide-reaching initiatives in a 239 bed hospital, staff pharmacist training was needed and the university has stepped up to help with development and preparation of Suburban's pharmacists under the new models of care. A recent grant from the Cardinal Health Foundation has also helped with expenses related to expanding the medication reconciliation program.

The challenges have been met addressed with a team approach and feedback to the hospital teams on patient satisfaction, patient outcomes and improvements in patient safety. Flexibility and good communication among the clinical care team and between clinicians and hospital have

been enabling factors in the rapid deployment of these initiatives. Dr. Charneski's work is seamlessly integrated into Suburban's many departments and units. The team's results have been presented at national and local meetings.

Location: Suburban Hospital, affiliated with Johns Hopkins Medicine, is located in Bethesda, Maryland on 8500 Georgetown Road.

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*Area of Successful Practice: Partnerships for Team Based Patient Care*

The Medical Intensive Care Multidisciplinary Team

## Description

When the University of Maryland Medical Center opened its new state of the art Medical Intensive Care Unit (MICU), a fully equipped team of health care specialists entered the doors with a new model of multidisciplinary critical care. Jeffrey P. Gonzales, PharmD, BCPS, FCCM, Assistant Professor at the University of Maryland School of Pharmacy, was part of this new MICU team.

Patients are admitted to the twenty-nine bed MICU for specialized care. Reasons for admission to the ICU are diverse, but may span from sepsis, acute respiratory distress syndrome, multiple organ dysfunction, to respiratory failure from asthma or COPD or intoxicants, to transplant and oncology issues. The multidisciplinary MICU team includes twelve to fifteen people from a pulmonary critical care attending, a critical care clinical pharmacist, critical care fellow, medical residents, interns and students, pharmacy residents and students, nurses and nurse practitioners, respiratory therapists, and dieticians.

The role of the critical care clinical pharmacist is to optimize and improve patient care by evaluating therapy as it relates to appropriateness of medications, indications, dosage, and delivery, and evaluating for drug-drug and drug-disease interactions. Dr. Gonzales also monitors for effectiveness and toxicity.

In addition, Dr. Gonzales designs and implements process-oriented improvements in the systems of intensive care including, the development of the MICU sedation guidelines and implementation and education of protocols to identify ICU delirium. Other drug therapy protocols, such as vancomycin dosing, diabetic ketoacidosis, and alcohol withdrawal in the MICU, help guide the team in the best quality of care with patient safety the primary consideration.

The pharmacist role in the MICU also includes one of providing drug information, providing bedside consults, and providing education to staff, medical fellows and resident, nurses, and pharmacy residents and students. This experience has provided an opportunity for the team, led by Gonzales, to examine and track patient outcomes as a result of the delirium assessment and changes in sedation.

## Outcomes

Locally, with the introduction of the new model, the MICU has shown a decrease in ICU mortality by 3.5% and increase in ventilator free days, as well as substantially decreasing the amount of mean daily doses and total doses of sedatives/analgesics. The role of critical care

pharmacists in the literature has also proven to be beneficial with pharmacist enforced sedation protocol reducing the number of days MICU patients are on a ventilator by 3.6 days and reducing the length of stay in an ICU by 3.6 days.

The current challenge globally is the shortage of expert critical care clinical pharmacists. Only half of the intensive care units nationally have direct patient care by pharmacists. With 87,000 ICU beds nationwide and growing, this is an area that should be focused on for proper care of the critically ill patient.

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Pharmacists Collaborative Role in Tobacco Cessation among the Underserved

Peoples Community Health Centers is a network of eight Federally Qualified Health Centers in the Baltimore area. The clinics provide cost effective, comprehensive, primary care services, as well as dental, prenatal, behavioral health, substance abuse counseling and treatment and on-site pharmacy dispensing. Charmaine Rochester, PharmD, CDE, Associate Professor, has provided advanced clinical care under collaborative practice agreements for adults with diabetes and metabolic syndrome at Peoples for five years. CDTM is a model in which one or more qualified pharmacists and physicians enter into a collaborative agreement, and the prescribers delegate the authority to the pharmacist to select, initiate, monitor and adjust drug therapy. Maryland is one of 46 states to allow pharmacists to practice under pharmacist-physician collaborative drug therapy management (CDTM). In Maryland, pharmacists must have a written and approved protocol, which would authorize a pharmacist to initiate, modify, continue, and discontinue specific medication therapy; order labs and evaluate patient outcomes.

During her weekly treatment session, Dr. Rochester recognized the high incident of tobacco use and the difficulty in securing pharmacotherapeutic aids for patient who choose to quit smoking. When grant funding became available, she undertook a full-scale tobacco cessation intervention and pharmacist-directed services to one of the most underserved populations, homeless and poly-substance dependent men. These men were patients of Peoples and were enrolled in a residential drug treatment program. Dr. Rochester's team of pharmacists worked with the dispensing pharmacists in the Federal 340(B) pharmacy purchasing program and coordinated the receipt of corporate prescription assistance and free medication from the government through the pharamcy.

The intensive eight-week program, named "Smokebusters" was patterned after the eight-week "Freedom from Smoking" from the American Lung Association and was started in January 2009. The pharmacist team delivered intervention involved: a) monitoring NRT and medications with black box warnings; b) providing patient education and self-monitoring abilities; c) motivational coaching; d) adherence counseling; e) medication management (including adverse reactions and side-effects); f) group behavioral counseling; and g) communication with the primary care provider.

Medications (nicotine transdermal patches and varenicline) were paid for by the City Health Department directly to the 340(B) pharmacy. The grant also provided tobacco quit aids (puzzles, note pads, pencils, pens, sugar-free chewing gum, sugar free candy, straws and toothpicks); and culturally sensitive patient education materials, as part of a comprehensive tobacco use and dependence program for the homeless, recovering addicts. The pharmacist-led program offered individual counseling and a safe group environment with realistic strategies to overcome daily

triggers, and coaching to encourage smoking cessation efforts. Patients were assigned a support or accountability partner. Group meetings, scheduled one-on-one counseling, and patient assessments were conducted every week and nicotine transdermal patches or varenicline were dispensed in two-week quantities to eligible patients.

**Outcomes**

The pharmacists documented two quit rates; an initial 7-day quit rate for those who remained tobacco free for at least 7 days during the program and a 30-day quit rate for those who remained tobacco free for $\geq$30 days during the program. Results of the study show that 21 of the 47 patients (45%) quit tobacco use and remained tobacco free for 7 days. By the conclusion of the program, nine of the 47 (19%) patients demonstrated a $\geq$30 day quit rate. Seven of 47 (15%) also remained tobacco free, but they did not achieve 30-day abstinence as they quit at different time periods during the program. The relapse rate for the entire group was five of 47 (11%) during the eight-week period. Direct costs of preparing and providing the eight-week program equaled $28,645. The cost per participant quitting was $3,183 (for those abstaining at 30 days) and $1,145 for those participants quitting at least seven days.

The key limitation relates to pharmacist compensation for providing smoking cessation services through CDTM. Compensation faces two major barriers: 1) Federal, state and employer tobacco cessation benefits are a loose patchwork of patient eligibility requirements and service restrictions; and 2) Pharmacist-delivered services have not been recognized universally as a distinctly qualified and separate service which is eligible for reimbursement. Rochester's study shows that collaborative practice is a high-value model of care that enables medical and tobacco cessation care hand in hand with a continuity and partnership that is patient-centered.

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*Area of Successful Practice: Partnerships for Team Based Patient Care*

Preparing Community Pharmacy for New Models of Care:
The University of Maryland School of Pharmacy and Safeway Eastern Partnership

## Description

A new collaboration between Safeway pharmacies and the Department of Pharmacy Practice and Science at the University of Maryland School of Pharmacy began last summer with the purpose of expanding Safeway's clinical pharmacy programs. Safeway's expansion of services responds to legislative changes which open up the role of pharmacists in Part D and health care reform.

Meghan Sullivan, PharmD, assistant professor, is the liaison to Safeway in guiding the design, planning, implementation, training, and evaluation of a new menu of clinical services to be offered in their retail in-store pharmacy locations in the Maryland, Virginia, and Washington, D.C. Dr. Sullivan works with the Director for Clinical Services in the Safeway East Division to achieve these shared goals.

The first services slated for implementation are medication therapy management (MTM) and immunization services. The university has developed training modules and coaching for Safeway pharmacists as they receive certification at new levels of competency in clinical services. The first site in Georgetown, Washington D.C.is now conducting MTM and health screening in preparation for a slate of new clinical services to be offered by the pharmacy.

Through this collaboration, the university demonstrates a commitment to grow clinical pharmacy services in community retail settings while also providing on-site student experiences in these essential pharmacy services. University of Maryland School of Pharmacy student pharmacists are certified immunizers in addition to receiving training in MTM service provision, documentation, and billing. Safeway contracted with Mirixa and Outcomes for oversight of MTM services in 132 stores in the Eastern Division.

Policies and procedures have been revamped and streamlined to be made more user-friendly for the pharmacists. The new training modules integrate a step-wise approach to MTM services, and provide disease state quick guides to assist pharmacists. Sullivan is now targeting ten stores to pilot new policies and procedures. The end goal is to have all 225 pharmacists actively participating in Safeway's new MTM program.

In less than a year, close to 500 customers have been screened for cholesterol, blood pressure, osteoporosis and body mass index by Safeway pharmacists at community outreach events.

University partnerships with chain community pharmacies foster scholarship for faculty members and provide experiential rotations for student pharmacists, while promoting the expansion of the pharmacy profession to roles in new innovative models of care. Developing this partnership required a contract with a clear description of expected outcomes, and the recognition of inter-dependence among the entities. Regularly scheduled meetings among all parties are essential to foster good communication, monitor progress, and strengthen the relationship.

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# University of Maryland

School of Pharmacy
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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Collaborative Practice and Management of Buprenorphine Treatment
through a Federally Qualified Health Center

## Description

People's Community Health Center (Peoples) is a Federally Qualified Health Center providing services in eight Baltimore-area clinics. The organization provides behavioral health services in addition to substance abuse counseling, and treatment, in addition to primary care. The People's pharmacy participates in the Federal 340(b) pharmacy purchasing program and receives corporate funded prescription assistance. Like all safety net clinics People's patients are often plagued with financial, social, and emotional problems, which limit their ability to obtain, adhere, and benefit from specialized healthcare services, particularly medications.

There was a large population of opioid-dependent patients at PCHC and the physician thought it necessary to have pharmacists on the interdisciplinary team. Bethany DiPaula, PharmD, BCPP, who had training and experience with psychiatric and substance abuse patients, focused her practice on the opioid dependent patients. . She leads the university team involving pharmacy residents and student pharmacists. Starting in July 2009, she began attending the buprenorphine maintenance clinic along with her PGY2 residents for half a day per week.

To ensure interdisciplinary coordination and continuity of care, a Collaborative Practice Agreement was established between Peoples and the University of Maryland School of Pharmacy. The Collaborative Practice Agreement and related treatment protocol were submitted for review by Maryland's Joint Board of Pharmacy and Medicine.

The protocol development involved Dr. DiPaula and the People's Chief Medical Officer (CMO). The CMO was experienced in working with pharmacists, and was supportive of the pharmacists' goals. She strongly suggested that they provide follow-up (maintenance therapy) services to buprenorphine and naloxone (Suboxone®)-treated patients for opioid dependence after therapy induction.

Buprenorphine is a Schedule III, semisynthetic mixed opioid agonist/antagonist approved for the management of opioid dependence. It is available in two sublingual formulations, buprenorphine (Subutex®) and buprenorphine/naloxone (Suboxone®). The former is generally used for induction and the latter for maintenance once the initial dose is established. As a result of the Drug Addiction Treatment Act (DATA) 2000, physicians with a waiver may prescribe Schedule III, IV, and V narcotic medications with Food and Drug Administration approved indications for opioid dependence outside of a licensed drug treatment facility. In order to receive a buprenorphine prescribing waiver, the physician must have a referral system for patients to receive substance abuse treatment. The CHC devised a novel interdisciplinary team consisting of

a substance abuse counselor, psychiatrist, physician, and psychiatric pharmacist to provide pharmacologic and nonpharmacologic treatment and monitoring within the primary care setting.

Buprenorphine has unique dosing and administration requirements.When initiating buprenorphine, the patient must be experiencing acute opioid withdrawal symptoms. Buprenorphine induction starts with a test dose, usually 4-mg, given in the physician's office. Based on resolution of withdrawal symptoms, additional doses are given to determine a daily starting dose. Further dose adjustments may be necessary at follow up visits, especially early in therapy. Initially, patients require weekly or even daily monitoring. After the patient has stabilized monthly monitoring may be indicated. Patients must be properly educated on the administration of buprenorphine.

In addition, buprenorphine treatment has potentially significant drug interactions, particularly with benzodiazepines. Due to the legal implications, unique medication properties, possibility of drug diversion, drug-drug interactions, and complicated patient population, there is a novel role for pharmacists in the management of buprenorphine-maintained patients.

Dr. DiPaula participates in treatment planning, protocol development, and medication management and monitoring of buprenorphine-treated patients. The pharmacist team provides disease-state monitoring, consultations, patient education, and medication management appointments for those buprenorphine patients after completing induction. Referrals were evaluated for treatment adherence, medication efficacy, adverse effects and drug diversion. The pharmacist assisted in approving and refilling buprenorphine and naloxone (Suboxone®) prescriptions and ordering and monitoring laboratory tests, including toxicology screens. Pharmacists ensure treatment notes and recommendations are immediately available to the team. The clinic currently relies on paper charts for documentation.

## Outcomes

From July 2009 to December 2010, the pharmacist team treated 67 unique patients over 191 appointments. A total of 634 interventions were made.

The greatest challenges to the pharmacist team include frequent staff-turnover, difficulty obtaining independent reimbursement, and lack of electronic medical records. By offering medication management services the pharmacist freed the physician to focus on early therapy and extremely unstable patients. It also produced a more stable infrastructure allowing for optimal and efficient treatment of a larger number of opioid-dependent patients.

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The University of Michigan Health System (UMHS) and the University of Michigan College of Pharmacy have a long standing partnership in the development and implementation of innovative pharmacy services. This partnership recently began to focus on pharmacy practice models in team based ambulatory care. The primary goal was to implement pharmacy based MTM services and chronic care management delivered efficiently and effectively under the Patient Centered Medical Home model in the UMHS. This partnership fosters innovative patient care services, provides advanced educational experience for students and residents, generates creative research opportunities, and creates visibility for the pharmacy profession. The College of Pharmacy has a memo of understanding with nine of the health centers affiliated with UMHS to be reimbursed for pharmacy services.

The key to providing these services was to create a team of clinical ambulatory faculty providers. The team approach allowed faculty to share ideas and provide support for issues that individual team members may have encountered. To be a faculty member in this area at the University of Michigan, individuals need to be competent in our mission areas of teaching, service and research. Currently, seven faculty members provide pharmacy services across nine health centers. Patient care services are provided using established protocols developed based on our pilot studies and successful practices published by others. During the appointment, pharmacists evaluate therapeutic regimen, provide medication management (initiate medications and adjust dosage), provide education on chronic medical conditions and medications, assist in limited physical assessment, order diagnostic tests and medical equipments, initiate referrals to other health care providers. Faculty have been formally reviewed and endorsed by the Credentialing Committee at the University of Michigan Health System, which enhances their credibility with other health professionals.

We proposed that using our faculty as service providers and educators would result in improved medication quality, better access to care, and enhanced revenue to the health system. Establishing the partnership in the UMHS Patient Centered Medical Home took approximately 2 months. However, this partnership was possible in such a short time frame due to years of building a good relationship with the UMHS prior to this partnership.

## Outcomes

The providers and patients are embracing the ambulatory faculty as an integral member of the care team. During the first year, the faculty provided services to 950 patients as part of the medical home initiative. The faculty services were reimbursed more than $300,000 for their efforts, $200,000 from pay-for-performance initiatives and $135,000 through direct third party billing.

Analysis of overall impact on clinical and economic outcomes is currently underway and additional avenues for research are being pursued. Data are being collected to show the impact of the clinical pharmacists' participation as part of the medical home delivery team. We will be measuring the impact of the pharmacists in identifying and resolving medication-related problems, improving clinical quality measures, and reducing costs for patients and for payers.

Barriers to Implementation. As we expanded to new health centers, there were many physicians who were not familiar with pharmacists' role as a direct patient care provider. Initial low patient volume was counteracted by having pharmacists proactively identify patients through UMHS disease registries. Since the same pharmacist sees the patients at the health centers, the pharmacists have the opportunity to build a strong relationship with the patients and provide continuity of care. Also, the clinic staff and providers have access to pharmacy services around the year since the pharmacists are present at the health centers regardless of clerkship teaching obligations.

Advice or Lessons Learned. Colleges of Pharmacy have always been involved in efforts to improve patient care through enhancement of pharmacy services. Most of these efforts have been indirect unless the College is associated strongly with an Academic Health Center (AHC). At the University of Michigan, the College can work in partnership with the UMHS Department of Pharmacy Services to develop, test and implement model services that can eventually be disseminated to other practice settings. The joint effort described in this proposal focused on developing valued MTM services and chronic care management in medical clinics receiving funding under the Patient Centered Medical Home Model. The key has been the ability of both the College and the Department of Pharmacy Services to subsidize these efforts until their value is recognized and supported through reimbursement. In addition, using a team of ambulatory care faculty to provide innovative services has enhanced the value of services provided.

Our approach is rapidly being recognized within the Academic Health Center. Due to the positive impact on quality of care at the sites with the pharmacists in the Patient Centered Medical Home, we've recently expanded to another health center for 2 half-day clinics per week. There are ongoing discussions to expand our program beyond primary care and into the specialty clinics.

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# University of Minnesota

College of Pharmacy
Duluth, MN

**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The Health of People Everywhere (HOPE) Clinic is a free triage/referral clinic run year-round by Student Pharmacists enrolled in the University of Minnesota College of Pharmacy, Duluth's elective Community Outreach course and Student Physicians enrolled in the University of Minnesota School of Medicine, Duluth's elective Rural Academy of Leadership course. While there are a number of Student-Run Free Clinics across the country, the HOPE Clinic is one of the few that includes Student Pharmacists as well as Student Physicians. Opening in October, 2008, the clinic operates two hours every Tuesday afternoon at the Churches United in Ministry (CHUM) Center, a homeless shelter and community center in downtown Duluth. The focus of the partnership is to provide free patient care and facilitate entry into the Duluth area healthcare system for adults from underserved populations, and to train Student Pharmacists and Student Physicians to work interprofessionally to provide patient care. Approximately 50 1st, 2nd and 3rd-year Student Pharmacists, 30 1st and 2nd-year Student Physicians, five pharmacist faculty and six physician faculty participate in the clinic each year.

The University of Minnesota College of Pharmacy expanded to the campus of the University of Minnesota Duluth in Fall, 2003. The University of Minnesota School of Medicine, Duluth opened in the Fall of 1972, focusing on Family Medicine and training Student Physicians during the first two years of their medical education, after which the students transfer to the University of Minnesota Twin Cities campus to complete their medical education.

From Fall, 2005-Fall, 2008 students and faculty from the Med School and College of Pharmacy worked together in planning an interprofessional free clinic. Initial discussions between pharmacy and medicine faculty and Student Physicians began in Fall, 2005. Student Pharmacists joined the discussions in Fall, 2006. Implementation plans were delayed during academic year 2006-2007 while faculty from the School of Medicine pursued clarification regarding professional practice liability coverage for physician preceptors volunteering at a free clinic. Staff at CHUM became aware of the plans for the clinic and offered space at their facility. Medicine and Pharmacy students prepared the space, converting a one-room efficiency apartment into an exam room, developed a policy and procedure manual for the clinic, and pursued fundraising possibilities suggested by faculty. An Executive Council comprised students and faculty advisors from Pharmacy and Medicine meet weekly throughout the academic year to plan and oversee HOPE Clinic's calendar-year activities. A CLIA Certificate of Waiver was obtained through the Med School to allow students to conduct CLIA-waived tests at the clinic. Initial funding was provided through internal funds from the School of Medicine and College of Pharmacy, as well as through external donations from a local business and local Medicine and Pharmacy organizations. The Minnesota Medical Foundation, based in the School of Medicine, Duluth, serves as the fiscal intermediary for the HOPE Clinic.

A patient is seen initially by a Pharmacy/Medicine Student team who conduct a history (including complete medication history) and physical examination. The student team then presents the patient's case to the pharmacist and physician preceptors, and a preliminary interprofessional care plan is discussed. The entire team then visits the patient to allow the physician preceptor to conduct a confirmatory physical examination. Only nonprescription medications are dispensed from the clinic. A nearby independent community pharmacy – which already provided prescriptions for CHUM's homeless clients through a voucher system – fills needed prescriptions for HOPE Clinic patients, with the pharmacist donating the medications. No controlled substances are prescribed through the HOPE Clinic. Students pick up the completed prescriptions and bring them back to the clinic, and then counsel the patient regarding the proper use of the medications to ensure that the patient at least leaves the clinic with the prescription. To address the patient's longer-term healthcare needs, depending on their qualifications the patient may be referred to the county Health Access Office, to the local Federally Qualified Health Center, to the local Veteran's Administration clinic or to the local Tribal Health Clinic. Students at the HOPE Clinic help the patient complete intake forms for the referral center.

The marketing mix for the HOPE Clinic includes referrals from the registered nurse who is a paid member of the CHUM staff, a brochure to potential donors, flyers posted at local area community meal sites and aid agencies, articles about the HOPE Clinic in the local newspaper and newsletters targeting local Medicine and Pharmacy organizations, sandwich board signs posted inside and outside of the CHUM center, a reception desk located in the CHUM drop-in center staffed by a Student Pharmacist and a Student Physician, and word of mouth from CHUM clients. In addition, students have made public presentations to potential donor groups and local medical and pharmacy organizations.

**Outcomes**

The HOPE Clinic generally sees 2-4 patients each week, and to date has served more than 200 patients. The clinic provides an ongoing opportunity for Pharmacy and Medicine students to provide interprofessional care to underserved patients. It has also provides opportunities for Student Physicians to experience first-hand and early in their medical training the contributions that a pharmacist can make to direct patient care. Descriptive statistics from the HOPE Clinic have been presented at national meetings of Family Medicine faculty, Pharmacy faculty and Student-Run Free Clinics. Student attitudes towards providing interprofessional patient care for patients from underserved populations are being measured. Having Pharmacy participate from the outset allowed pharmacists to define the role they would play in the clinic. Future plans are for the HOPE Clinic to incorporate nursing students in the patient care process; however, this will necessitate moving to a larger space, as the space currently available is inadequate to include additional health professions students and faculty preceptors.

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# University of Minnesota

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The Minnesota Visiting Nurse Agency (MVNA) is a non-profit organization that has been providing home health care and community health services to the Twin Cities Metro Area since 1902. MVNA serves individuals and families that are economically disadvantaged and at high risk for critical social and health issues. The MVNA home health department is comprised of registered nurses, licensed practical nurses, home health aides, homemakers, interpreters, physical therapists, and an occupational therapist, all of whom serve under the direction of a physician. The overall goal of the MVNA home health department is to keep clients at home safely by preventing unnecessary hospitalizations, emergent care, and premature nursing home placement.

MVNA and the University of Minnesota College of Pharmacy began their relationship in July 2007 when a pharmacy resident from the College of Pharmacy joined the home health department at MVNA. At that time, MVNA had defined a need for someone with drug information expertise due to the complex medication regimens of their clients. A pharmacy resident temporarily joined the MVNA staff three days per week to provide drug information to nurses and to determine how a pharmacist might be incorporated into the home health model at MVNA. The objective of the pharmacy program at MVNA was to have a pharmacist visit clients in their homes to ensure their medications were indicated, safe, effective, and convenient. By having a pharmacist identify, resolve, and prevent medication-related problems, clients would be able to stay in their homes safely. The goals of the program were twofold: to demonstrate improvement in clients' ability to take medications correctly and to reduce client emergent care and hospitalizations resulting from inappropriate medication use.

Upon admission to MVNA, clients taking nine or more medications, including over the counter and herbal products, are offered a pharmacist home visit. During the home visit, the pharmacist discusses each and every medication with the client and caregivers. The indication, efficacy, safety, and convenience, including affordability, are discussed for every medication. The pharmacist will then contact the client's prescriber with any recommendations for improving drug therapy. Common recommendations include discontinuing unnecessary or duplicate therapies or changing doses of medications. If changes are made, the pharmacist follows up with the client, caregiver, and the client's MVNA home care nurse to ensure change are made correctly. Many MVNA clients have multiple physician or pharmacies; as a result, the pharmacist visit may be focused on reconciling medications to compile one comprehensive medication list to share to with all of the client's physicians. All visits rely on collaboration among the pharmacist, client, home care nurse, pharmacy, and physician.

## Outcomes

The MVNA pharmacy program has experienced many successes since it began. In the three and a half years since its inception, the pharmacy program has served nearly 400 clients. On average, these clients take 18 medications and have eight medical conditions. Four drug related problems are typically identified per client. These problems may include duplicate therapies, ineffective doses, or nonadherence. Approximately 80% of drug related problems identified have been resolved through client education or changes in drug therapy. Preliminary data from 70 clients with complete records shows that hospitalizations were reduced from 32 to 16 and emergency room visits from 16 to eight after a pharmacist's home visit. A larger program evaluation is anticipated to be completed by the end of 2011.

A major milestone of the program was met during the 2009 Minnesota legislative session, when MVNA, the college and the Minnesota Pharmacists Association collaborated to secure reimbursement for the services provided during the in-home MTM consultations. In 2010, the program was recognized by *Minnesota Physician* as one of its innovations in patient care. Lastly, fifteen Advanced Pharmacy Practice Experience (APPE) students have completed five week rotations at MVNA.

Barriers to Implementation. The greatest barrier to implementation has been gaining reimbursement for this service. An organization must recognize this practice as one that adds value and may reduce other costs since few reimbursement opportunities currently exist. Additionally, effective communication is imperative to this practice and can be a challenge when face-to-face time among health care providers does not occur. The pharmacist must communicate via phone, electronic medical record, or fax with home care nurses, community pharmacists, and physicians.

Lessons Learned. Providing medication therapy management to home care clients has been a beneficial addition to MVNA. With their complex medical histories and medication regimens, home care clients are at greatest need for medication therapy management; however, their homebound status often limits access to these services. Providing medication therapy management in clients' homes is especially valuable since a pharmacist may be able to identify drug therapy problems unique to being in a client's home environment. Lastly, caregivers may be more involved when services are provided in the home. The key to success for this practice has been relationships. A collaborative relationship between the University of Minnesota and MVNA has been imperative; furthermore, collaboration among MVNA and health care providers in the community has been essential.

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# The University of Mississippi

School of Pharmacy
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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

The Delta Pharmacy Patient Care Management Project

## Description

The University of Mississippi School of Pharmacy is committed to improving health outcomes for patients through the implementation of innovative practice models. One School program, the Delta Pharmacy Patient Care Management Project, is a community-based research approach to providing new pharmacy services in the counties of the Mississippi Delta, a region with high rates of poverty, chronic diseases, health disparities, and limited access to care. The School's Delta program has multiple initiatives focused on Medication Therapy Management (MTM) service implementation, health information technology, health literacy and cultural competency, expanded provider networks, and improved access to care. Each component of the program has been designed to provide new opportunities for practicing pharmacists, residents, and student pharmacists and to allow for a meaningful evaluation of the impact of the services provided. One arm of the program is focused specifically on the integration of pharmacists on interdisciplinary teams in patient-centered medical home settings.

In 2008, School faculty began providing diabetes and asthma MTM services in Webb's Pharmacy in Yazoo City, MS, through the Delta Project. Primary care providers in local clinics referred patients to the pharmacy for disease-specific education and medication management. The G.A. Carmichael Family Health Center in this underserved area is a Federally Qualified Health Center (FQHC) committed to providing resources to ensure that all community residents have access to primary health care services, regardless of their financial or insurance status. This clinic provides care for a large number of chronically ill patients in the area. As professional relationships developed with the physicians in the G.A. Carmichael Family Health Center who referred patients to the community pharmacy, it became evident that a pharmacist working side-by-side with providers in the clinic could increase the level of services available for patients and positively impact outcomes.

In 2010, the School of Pharmacy Delta Project Administrators approached the Chief Executive Officer of the G.A. Carmichael Clinic, a physician, to discuss opportunities for incorporating pharmacy services. This clinic is an example of a patient-centered medical home (PCMH) model that supports primary care teams who attend to the multi-faceted needs of chronically ill patients. This partnership has a practice, research, and service focus. The School of Pharmacy would provide support for a pharmacist to be part of this team for one year and the clinic would allow the School of Pharmacy to evaluate the impact of these services. The School executed a Business Associates Agreement with this FQHC to establish a partnership for this on-site collaborative care. At this site, School of Pharmacy faculty provide patient-centered care that is focused on diabetes in collaboration with a family medicine physician. Two School of Pharmacy faculty and two pharmacy residents are on-site one half day per week clinic. Patients with a hemoglobin

A1c (A1c) greater than 9 percent are referred to the pharmacist for comprehensive medication reviews, medication adjustments, and disease education. Pharmacists meet individually with patients for one hour on the initial visit and for 30 minutes on follow-up visits. The interdisciplinary team in the G.A. Carmichael Clinic is participating in the Health Resources and Services Administration (HRSA) Patient Safety and Clinical Pharmacy Services Collaborative (PSPC). The goals of the partnership are to improve care for patients; to demonstrate the positive impact of pharmacy services on clinical, economic, and humanistic outcomes; to contribute to the national collaborative results through the PSPC; and to establish FQHC support of additional pharmacist involvement. The service was marketed to providers within the health care system through individual meetings and one physician was identified as an initial partner based on interest in assistance with diabetes care. At this time, marketing strategies to outside providers is not necessary as services are limited to this FQHC.

**Outcomes**

The Delta Pharmacy Patient Care Management Project is evaluating the impact of pharmacist diabetes services on clinical, economic, and humanistic outcomes in this patient centered medical home model. These outcomes are documented in a pharmacy software system, Assurance™, and assessed annually. Physician acceptance of the pharmacy services in G.A. Carmichael Family Health Center has been remarkable. Signs of successful implementation include physician letters of support for the program, requests for additional pharmacists to provide services, and development of a collaborative practice agreement, which is underway. Patients are engaged in the program and the average attendance rate for pharmacist visits is approximately 80 percent, much higher than traditional medical appointments. Outcomes for the high-risk diabetes patients in the PSPC population of focus are documented and reported monthly in the HRSA PSPC platform. These outcomes include hemoglobin A1c, number of clinical pharmacy services provided, number of preventable adverse drug events (pADE) and adverse drug events (ADE). In the second year of participation in the PSPC, this partnership recently received two national awards at the annual PSPC meeting in Dallas, TX: the Clinical Pharmacy Services Improvement Award and the Health Outcome Management Award, for reporting health outcome measures for at least 5 consecutive months and for utilizing these outcomes to manage the identified population of focus.

Barriers to Implementation. An initial barrier to implementation of pharmacy services was physician and staff understanding of the capabilities of the pharmacist. Although the physician was eager to partner, it required several weeks of working side-by-side and detailed discussions of patient cases to fully gain trust in the pharmacists' abilities. Another challenge encountered in this setting was the need for social work assistance for this underserved population, which was available only on a limited basis. Initially, follow-up visits with the pharmacists were scheduled by clinic staff and many were not rescheduled optimally. Timely follow-up is critical for these high-risk patients who are receiving medication adjustments at each visit, so the pharmacists have taken on this responsibility of rescheduling patient appointments.

Advice/Lessons Learned. Through this experience, the pharmacy service implementation team realized the importance of developing relationships and good rapport with all members of the health care team. If possible, educate clinic staff early in the process so that everyone understands what type of service is being provided. This will allow each person in the clinic to

feel a part of the new service and will provide the information necessary to identify patients who may benefit from the new service and assist with implementation. Rather than targeting a number of providers, the team focused efforts on one provider and this has proven to be an effective strategy for successful implementation. This partnership created an extraordinary site for introductory and advanced pharmacy practice experiences and for resident training. Our experience and preliminary outcomes from this partnership provide the foundation to expand this model to a private physician practice in a neighboring county.

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# The University of Oklahoma

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

Bedlam Diabetes Specialty Clinic

## Description

The Bedlam Evening Clinic, in operation since August 2003, represents an innovative, collaborative program for healthcare services to the medically indigent and underserved in Tulsa and northeastern Oklahoma. Diabetes is a common disease state in Oklahoma, and the evening clinic sees and treats a multitude of patients with symptoms of and complications from diabetes. Recent rates for diabetes in Oklahoma reveal:

- 7 out of every 100 adults in Oklahoma have diabetes, ranking it 16th highest in the nation for the ratio of people with diabetes to the general population.
- 29.3 out of every adult 100,000 deaths in Oklahoma are due to diabetes, ranking Oklahoma 13th highest in the nation for diabetes-related deaths.
- In 2005, 225,000 Oklahoma adults were diagnosed with diabetes, and by 2007, 10% of the total adult population was diagnosed with diabetes.
- Based on information from the 2007 Commonwealth report, Oklahoma ranked 50th in access to healthcare.

Bedlam Diabetes Stability Clinic (BDSC), an entity of the University of Oklahoma (OU) School of Community Health, was created to address this need with goals of advocacy for the patient's enhanced self-care through the provision of educational programming on a variety to topics connately tied to diabetes. These include food choices, management strategies, exercise, comorbidities, and stress management for patients that are newly diagnosed or controlled yet who still struggle with glucose control. This patient population is targeted because access to education about their disease state is only available on a limited basis, traditionally limited to diagnostic information during the clinic visit.

Bedlam patients diagnosed with diabetes seen in both Bedlam Longitudinal (Bedlam-L) and the Evening Clinic (Bedlam-E) are eligible for enrollment. Although Bedlam-L patients are scheduled with specific providers who follow up as clinically indicated, in-depth education was not a component. To address this need, the University of Oklahoma College of Pharmacy-Tulsa (COP) acquired funding from Blue Cross/Blue Shield of Oklahoma for a specialty diabetes clinic. Additional partners in the initiative were the College of Nursing (CON) and the School of Community Medicine. The resulting program represents a combination of practice, education, research, and advocacy partnerships among these four entities.

A protocol to identify patients meeting criteria for inclusion in the program was developed and approved by the Medical Director for OU-Tulsa Community Health-Bedlam physician. As the program developed and dialogue between the partners expanded, the need for education earlier in

disease prevention and/or management was identified. The patient population was expanded to include those patients recently diagnosed with diabetes who had not achieved the targeted glucose control, whether short- or long- term. This patient population was chosen for several specific reasons. Barriers to medical care, including access to education on their chronic condition and access to medication were identified as two of the most pressing. Participating in a smaller targeted program would help them be better self-advocates and better identify resources in the Bedlam clinic system. This is supported by the literature in that pharmacists are ideally placed to educate patients about treatment options, the importance of self-management, the availability of new treatment modalities and delivery devices, and the need to optimize glucose control to prevent long-term consequences.

The protocol for education and module delivery and outcomes methodology were approved by the University of Oklahoma Health Sciences Center (OUHSC) Institutional Review Board (IRB). The goals of the clinic are to [1] provide education and self-advocacy skills to the participants and family members to make the best choices possible for each participant, [2] discuss the educational topics and evaluate [via a pre- and post- test] how applicable the information was to the participant, [3] practice making better choices and discussing alternatives when the first choice was not available, and [4] illicit feedback from the patient and support network on the most effective lessons and progress to-date.

The specialty clinic was marketed internally to the prescribing physicians regarding the availability of the program for referrals. Notices of the program were distributed and selected patients were contacted individually. Announcements were posted each evening the clinic was held. Participants were given a binder with a schedule and program information. Each module included a brief recap of the previous topics, handouts, an educational component that might include a video, and participant discussion on problems they may have encountered, strategies they used [successful or not], and plans for incorporating changes.

## Outcomes

The OU College of Pharmacy aims to improve patient outcomes while simultaneously providing an opportunity for collaboration and scholarship with other colleges/depts. The collaborative work from the BDSC has thus far borne several successful scholarly endeavors in just its initial months. Future scholarship will revolve around refinement of measurable outcomes, program evaluation, and perceptions of multiple stakeholders of effectiveness and overall fit within the scope of services provided by the Health Sciences Center.

Lessons learned included the need to identify and start patient recruitment early. We would also recommend focus groups. These might be composed of:

- Patients with varied of lengths of time since their diagnosis
- Patients with long-standing disease management needs regarding the more pressing challenges
- Other healthcare professionals to assist in program design

This practice model identified the patient population early and targeted patients newly diagnosed with diabetes. Education and tools for more effective self-management quickly emerged as the leading needs. A particular strength of this program is our encouragement of all patient

participants to bring a family member or significant other for support. The literature suggests this will enhance the likelihood of beneficial outcomes. All our participants liked to share their everyday experiences from multiple viewpoints.

This practice model can be expanded to communities of scholars interested in specific disease state management, care of the indigent, and researchers interested in integrating services with the pharmacist providing the educational component, whether to patients or other healthcare providers.

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# University of Pittsburgh

School of Pharmacy
Pittsburgh, PA

**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

Strategic, appropriate management of antibiotics is one of the most pressing issues currently faced by health care providers. In both hospital and outpatient settings, studies show that patients who are treated with an antibiotic and are re-infected or acquire an additional infection face a much greater risk of developing resistance to that antibiotic. When that happens, patients endure longer, more expensive treatments, often with more toxic second- or third-choice drugs.

According to the World Health Organization (WHO), hospitals represent a critical component of the antimicrobial resistance problem worldwide due to the combination of highly susceptible patients, intensive and prolonged antibiotic use, and cross-infection.

Through the deliberate implementation of an interdisciplinary team dedicated to antibiotic management, the University of Pittsburgh School of Pharmacy, in conjunction with the University of Pittsburgh Medical Center-Presbyterian hospital in Pittsburgh, Pennsylvania, has been able to significantly impact the use of antibiotics in a large urban hospital setting.

Known as the Antibiotic Management Program, this venure began as a means of addressing a spike in hospital-acquired Clostridium difficile (CD) infection rates that occurred in June 2000. The rate jumped from 2.7 to 10.4 infections per 1,000 hospital discharges. In addition, the infections resulted in more severe outcomes.

To conquer this problem, in 2002, the Antibiotic Management Program was formed. The hospital's infection control staff had conducted a study to determine the riskiest antibiotics for treating CD, concluding that clindamycin, ceftriaxone and levofloxacin were associated with increased CD infection risk. Use of these antibiotics was restricted, requiring prior approval by the team before it was dispensed. Program members were on call around the clock for consultation, including fellows studying infectious disease who were able to use the experience to meet fellowship accreditation requirements.

The team initially focused on two strategies: the appropriate empiric selection of antibiotics and readdressing antibiotic selection once an organism and susceptibilities were identified. From a patient care perspective, CD infections have been reduced to pre-outbreak levels, and mortality has been dramatically reduced.

An overarching commitment to education was crucial to the success of the program. By asking prescribers to call for prior approval in order to use certain antibiotics, the team was essentially asking for a culture change among the staff. To encourage compliance, the team dedicated itself to explaining why the drugs were restricted and helping the prescribing physician to identify

equally efficacious alternatives. By taking an educational, collegial approach, the team was able to create better buy-in, which was critical to compliance and, ultimately, successful outcomes.

The team also created the UPMC Antibiotic Guide, now in its sixth edition, which serves as both an online and hard-copy reference resource for helping physicians choose appropriate drugs for various infections. A set of pathways was incorporated into the hospital's order-entry system to walk physicians through their antibiotic selection based on patient symptoms.

Effective management of antibiotics must move beyond simple restriction to be successful. A multidisciplinary approach is critical; the Antibiotic Management Program includes pharmacists, physicians, and microbiologists. UPMC's Division of Infectious Diseases, Department of Pharmacy, Hospital Infection Control Group, and the director of the health system collaborated to gather support for the institutional funding for the program.

Infectious Disease (ID) fellows are also integral to the program, which incorporates their service into their fellowship accreditation as a recognized learning experience. This team works together not only to address current issues, but also to collaborate on research exploring very resistant, newer problematic pathogens.

One such collaborative effort identified a combination therapy for a type of Acinetobacter, which resists all conventional antibiotics and is perhaps best-known for infecting U.S. soldiers returning from the Iraq War. Through a study funded by the Pitt School of Pharmacy, the team found that one combination of antibiotics could treat Acinetobacter, dramatically reducing mortality rates from 100 percent to 20 percent.
The research recently was accepted for publication. Another Pitt-funded study is exploring drug combinations for the same organisms, which are extreme-drug resistant isolates.

In addition to the ID fellows who assisted with round-the-clock questions regarding CD antibiotics, pharmacy students on rotation with team member Potoski, a School of Pharmacy preceptor, are exposed to a relatively unique practice setting. Ultimately, the team hopes to create additional opportunities for students to work in a laboratory setting.

## Outcomes

These opportunities have created significant competitive advantages for students who hope to pursue careers in infectious disease pharmacy. Additionally, team members present at UPMC's medical grand rounds every year in recognition of their status as specialists in the field.

Program effectiveness is tracked through a documentation sheet that tracks calls to the team for approval and advice, which are entered into a database that the team hopes to grow to allow for further analysis. Documentation also allows the team to follow up on patients for whom advice was sought to measure outcomes of recommended protocols.

Future partnerships of this type should ensure that they can assign dedicated pharmacists to the program and make it their clinical focus. It is also important to establish inroads that will allow for a multidisciplinary approach. New programs would benefit greatly by ensuring in advance that appropriate resources, including funding, have been allocated to ensure the program's

success. The Antibiotic Management Program offered funding through the School of Pharmacy that served as an incentive for faculty's scholarly efforts, resulting in studies that could offer a significant impact. Such dedicated funds are a strong component of this kind of partnership.

In conclusion, the Antibiotic Management Program represents a successful partnership that not only improved patient care but also provided educational and research opportunities for students, faculty and hospital staff. It has produced research that contributes to the wider body of knowledge of a very pressing health care problem.

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# The University of Rhode Island

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The Committee of Health Professions Education held a summit in 2002 in which 150 multidisciplinary heath care educators discussed strategies for integrating a core set of competencies into the curriculum of future healthcare professionals. An important core competency described was the ability of professionals to cooperate, collaborate, communicate, and integrate care as part of an interdisciplinary healthcare team.

Team-Based, patient-centered care *must* begin with undergraduate inter-professional education. The following describes the development of an academic interdisciplinary partnership with the University of Rhode Island Colleges of Pharmacy and Nursing and the Warren Alpert School of Medicine at Brown University. Educational experiences such as this furnish students with the confidence and the skills needed for the pursuit of post-graduate inter-professional collaborations.

Five years ago the Director of the Professional Practice Laboratory (PHP 515/516)at the University of Rhode Island College of Pharmacy began an initiative to develop a series of interdisciplinary practice laboratory modules to be held with students in the University's College of Nursing. This collaboration was regarded as highly successful by not only the faculty facilitating this seminar, but also the students from each discipline. It still remains an essential part of the curriculum of the respective programs today.

In an effort to continue to grow such partnerships, in 2008 the Laboratory Director approached the Director of Curricular Affairs and the Associate Director of Preclinical Curriculum at the Warren Alpert School of Medicine at Brown University to discuss the potential to provide new collaborative learning opportunities for our students in the health-care programs. The medical school's Office of Curricular Affairs embraced the proposal and the process of working together to develop an expanded undergraduate, team-based, educational workshop had begun.

The workshop's curriculum has been modified and improved each year, (High-fidelity human patient simulation was sampled) with this year's results holding the greatest promise. Second year medical students joined with senior nursing and P3 pharmacy students in a half-day workshop. The students are assigned to equally balanced inter-disciplinary teams. It is in these teams that the students begin to gain a greater understanding of the knowledge and skills *each* healthcare practitioner offers toward patient care.

Throughout the workshop, students work in small groups to discuss patient-case scenarios and teach each other about the medical, therapeutic and nursing aspects of chronic obstructive pulmonary disease and asthma. Each table is supplied with: placebo inhalers, spacers, placebo

diskus inhalers, peak flow meters and incentive spirometers. These tools allow the students to work together on demonstration, inhaler technique and patient teaching points.

Also during the three-hour workshop, each multidisciplinary team (medical, nursing and pharmacy student) meets with a standardized patient. They interview, physically assess, confer on a diagnosis and select "appropriate" therapy for this pneumonia patient. Half of these teams are assigned specific roles within the standardized patient encounter (i.e. the nursing student takes blood pressure; the medical student makes a diagnosis; the pharmacy student recommends appropriate antibiotics) while the other half of these teams are given no specific instructions but asked to divide up responsibilities in examining the patient.

## Outcomes

The results of this initiative have been very positive. Survey data over the last three years has confirmed the students' overwhelming approval of the interdisciplinary team-based learning approach. The results also verify that at the workshops conclusion, each of the disciplines had a greater understanding of the each other's knowledge and skills.

There are clear benefits to inter-professional education. The importance of interdisciplinary healthcare teams in the provision of patient care is well recognized for improved patient outcomes. Teams composed of healthcare professionals from different disciplines who conduct individual assessments and develop patient care plans independently *are not* considered interdisciplinary teams. We cannot expect our students, (pharmacy, nursing or medical students) to go from the classroom into a clinical setting and to then be able to function as a patient focused team with no cohesive training. Experiences such as this foster interdisciplinary trust and the necessary communication skills for students to effectively participate as active members of healthcare teams in the future as healthcare providers.

Barriers to implementation of programs such as this include: space (the final frontier), and proximity of academic institutions. Challenges to a program such as this are many. The logistics of holding this one-day practicum are daunting, as each if the three discipline's class size is approximately 100 students. In addition, our event took place on the Brown University campus (30 miles from URI's main Kingston campus).

Determining the appropriate level of education for the three student disciplines was also challenging. In the first year of the workshop, third year nursing students participated. Through survey data it was determined that this cohort of students did not yet have the same level of educational experience to feel comfortable participating in the workshop activities with the other disciplines. Conversely, the following year, students from the College of Nursing's Family Nurse Practitioner Graduate Program participated, and were at a much higher practice level than the students in the other two disciplines.

A final challenge comes with faculty. We cannot expect our students to adopt an *esprit des corps* if the faculty has not fully embraced it themselves. Teaching, research and service oftentimes takes place in silos. We too may need inter-professional training to be able to effectively work as a team.

Educational experiences such as this inter-professional workshop will ultimately serve to enhance any patient centered care program.

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# Wilkes University

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**College/School Involvement with Partnerships Contributing to the Implementation of Pharmacists' Services for Team-Based, Patient-Centered Care**

*Area of Successful Practice: Partnerships for Team Based Patient Care*

## Description

The Wilkes University School of Pharmacy (WU-SOP) is dedicated to pharmacist involvement in interprofessional training and practice. The School of Pharmacy is one of 17 area wide institution-members of the Northeastern/North central Pennsylvania Interprofessional Education Coalition (NECPA-IPEC). The NECPA-IPEC represents over 20 professional programs including medicine, nursing and pharmacy. The Wilkes University Department of Pharmacy Practice Chair serves as co-chair of the coalition and department faculty are heavily involved in its works. The coalition brings together students and faculty from different disciplines as learners in the clinic care environment. One of the first clinical Interprofessional education (IPE) initiatives was at a local Volunteers in Medicine (VIM) clinic which is the focus of this report.

The WU-SOP began their partnership with VIM in the spring of 2008 which coincided with the opening of the VIM. The VIM is a free clinic that serves the indigent, and working un-insured patients of Luzerne County. The clinic offers comprehensive primary and specialty care and services, which make up the basis of a patient-centered medical home. Each clinician provides a different aspect of care based on their profession and expertise. To that end, VIM welcomed adding clinical pharmacy services when the opportunity arose. The partners value the concept of interprofessional training and clinical practice, both of which went a long way towards the eventual creation of the relationship and formation of a contract. School of pharmacy department of pharmacy practice faculty member, Kimberly Ference, was hired to solidify the relationship and began serving as the VIM Director of Pharmacy Services summer of 2008. The relationship has prospered and now affords the opportunity for pharmacy students and resident to learn and practice side by side with students of different disciplines such as medicine, nursing, and physician's assistants. In the fall of 2009, WU-SOP added a faculty member with a background in nutrition to the team to provide specialized dietary services. Our regional AHEC has become involved in hopes of further organizing and documenting IPE activities within the clinic.

Description and Marketing of the Partnership. Wilkes faculty members proving services at VIM are fully funded by the SOP, a model that is common at Wilkes. In kind support is provided by VIM in the form of administrative staff, space and collaboration in teaching. A standard affiliation agreement is in place which identifies roles, responsibilities and provides mutual indemnification. A limited-scope collaborative practice agreement has been in place since 2009. The primary focus of the collaboration is practice and education; however research and advocacy are intricately involved in the process. The clinic and its patients benefit from clinical services and research demonstrating the achievement of practice standards for patient care despite caring for an underserved population. This scholarship serves as the basis for support for grants and other philanthropic funding opportunities. The university realizes benefits in all areas through faculty providing advanced pharmaceutical services which allows for hands on training for both

students and residents in the areas of clinical practice and scholarship. This furthers to strengthen the collaborative relationship and allows for novel opportunities in these areas. The faculty member provides clinical services using a collaborative practice agreement under VIM's medical director. Currently there is not a need for marketing the partnership as the relationship fulfills the needs of both the university and clinic.

Process of Establishing Pharmacist Services in the Partnership. Discussions about a potential partnership were carried out between the WU-SOP department of pharmacy practice chair and VIM's executive director and began in the spring of 2008 when a mutual need was identified. After four months of negotiation and interviewing for the position, the partnership was formally established in the summer of 2008. Implementation of comprehensive pharmacy services and a collaborative practice agreement were fully established in approximately 1 year after initiation of the position.

Future Partnership Practice Model. As stated previously, VIM has a solid infrastructure in place for IPE. Future plans include developing formal interprofessional learning modules which could serve as a model of clinical teaching for other institutions.

## Outcomes

We feel that this practice model has been successful in meeting and exceeding requirements for student education (IPPE and APPE) by exposing them to a unique patient population while introducing interprofessional practice, education and scholarship. Collaboration of the various clinicians to provide holistic patient care serves as a role model to inspire future practice.

Outcomes specific to the Pharmacotherapy clinic are not being tracked at this time, however, a mechanism to capture this information is being developed will be initiated in the summer of 2011. VIM serves as a living laboratory for a local medical college whose students are studying the clinic's success in treating diabetic, hypertensive and asthmatic patients as part of a first year healthcare foundations course. A stipulation in clinic's grant funding requires VIM to report clinical outcomes improvements (e.g. A1c, blood pressure, cholesterol, etc) be quantified and reported back to the funding organization.

Benefits and Challenges. As stated above, this partnership enhances education, service, research and advocacy by allowing faculty, residents and students to take part in patient care for this underserved population. VIM reaps benefit by providing access to specialty pharmacy free of charge. Wilkes derives return on its investment by introducing students to contemporary interprofessional practice in a service-learning environment, a unique population and a different model for delivering healthcare.

Initially, VIM believed that the knowledge and skills offered by a pharmacist was limited to the dispensing of a medication product. They did not fully realize the potential for clinical pharmacy services as a means of enhancing patient care. However, this was quickly resolved through education and discussions supported by published studies demonstrating the impact of a pharmacist on patient outcomes. Within months of establishment, the Pharmacotherapy Clinic began seeing an increase in frequency of referrals and complexity of the cases. This speaks to the amount of respect afforded to pharmacist's knowledge and skills. Currently, the

Pharmacotherapy clinic is functioning at full capacity and remains in high demand. The success of the clinic is truly in the collaboration that occurs in real time.

Advice. An early lesson learned as pharmacy services were established related to involvement in the patient assistance programs offered through drug companies. These programs may be beneficial and in some cases are necessary to ensure patients have access to medications on a consistent basis. The application process, which is primarily clerical in nature, can be cumbersome and time consuming. Until recently, the clinical pharmacy team was solely responsible for facilitating this process. When weighing the educational value of student participation and time spent performing this activity, it was determined that there was not a significant enough return on investment to warrant their continued participation under its current form. At this time, students are introduced to the process and facilitate limited number applications, which is sufficient in allowing them to achieve competence in this activity while reserving their time for other more clinically-oriented activities. If contemplating assisting with such programs, consider securing clerical support for the administrative tasks which would allow the pharmacy team to explore clinical opportunities to further support expand this program (e.g. counseling for new medications, ongoing therapeutic drug monitoring programs).

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