Successful Practices in

College/School Involvement with Pharmacists Integration in Primary Care Practice

Primary Care Practice Model

Pharmaceutical Education 2010

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Ferris State University
College of Pharmacy
Grand Rapids, MI 49503

College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The practice site is an internal medicine clinic and practice site for medicine attending faculty. The facility employs 4 full time academic physicians and 6 part time private practice faculty to precept 30 internal medicine and combined medicine-pediatric residents. The clinic has 8 LPNs, 6 RNs, a pharmaceutical assistance coordinator, a diabetic educator, a referral coordinator and a full time social worker. The pharmacy practice consists of a full time faculty member who provides direct patient care and precepts student pharmacists during a 2 month ambulatory rotation. Students accompany residents and assess patients during the patient appointment with the resident. The clinic is an interdisciplinary learning community.

Student pharmacists are welcome additions to the resident practice; they check compliance adherence by contacting pharmacies, educate patients during office visits and provide extended education during follow-up visits. Students familiarize themselves with patient records and alert care members of current medications and review results to assess medication effectiveness. When patients qualify for community based assistance, students can participate in home visits with visiting nurses or in home aids and assess and resolve medication process challenges in the home environment.

The administrative model is best described as interdisciplinary consultative. The pharmacist faculty member participates in resident and medical preceptor discussions to collaborate in care planning. Individual follow-up appointments are arranged with pharmacy, nursing, or diabetic educators as dictated by the patient's need. This collaboration serves as a model to both the pharmacy students and the residents.

The faculty member is the only pharmacist FTE at the site and there are no drug distributive activities other than by pharmaceutical assistance distributions. The pharmacist faculty member spends approximately 80% of his time at the clinic. The majority of the time is spent in teaching, precepting and patient reviews. Follow-up appointments with the pharmacist most often consist of Medication Therapy Management and compliance education. Student pharmacists attend follow-up appointments with their continuity of care patients with the diabetic educator or nurse for hypertension follow-up.

Outcomes

Multiple benefits have been realized. Pharmacist and student participation in care has resulted in numerous interventions that improved patient care. Quality improvement projects have been completed. Audits that qualified for improved reimbursements and pay for performance programs have been realized. A medication use audit and the application of medical use guidelines for chronic pain management resulted in a change to the care of chronic pain patients and improved patient and provider satisfaction while meeting the criteria of the Interagency Residency Standards for Non-Malignant Pain Management. Providing patient education on devices or extended teaching about the goals of drug therapy offload some care responsibilities from teaching attendings.

Residents call the clinic for medication assistance for hospitalized patients when there are no hospital based pharmacists in that portion of the hospital. The residency program added a month of primary care that includes working with the pharmacist on research and quality projects in drug therapy. A collaborative research program to improve the residents' prescribing of Beer's Criteria Medications won an award at the local interdisciplinary research symposia.
Providing nursing in-services demonstrates the drug knowledge of the pharmacist and has created more opportunities for nurses to involve students in the activities of their days. Pharmacy students consistently state that this rotation provides opportunities to participate meaningfully in the care of patients. The residents expect them to contribute as team members and they rise to those expectations.

Some barriers were access to computer records and space issues. The records issue was overcome by affiliation agreements and a student orientation developed by the hospital. Space in the old clinic precluded all students being in the conference area where residents interact with preceptors. The new clinic provides ample space for all, as well as extra exam rooms for occasions when students spend extra time educating patients.

Future plans include the addition of a resistant hypertension clinic managed by the pharmacy faculty member. Additionally, the pharmacy students will be screening the residents' panel patients to identify care improvement opportunities. This will help internal medicine residents meet new accreditation standards and demonstrate to professionals in training the value each can bring to the collaborative care of patients.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The multidisciplinary Cognitive Disorder Clinic was implemented in August 2007 in collaboration with mmpc Neurology, an outpatient clinic setting. The Cognitive Disorder Clinic was initially composed of a Neurologist, Neuropsychologist, Care Coordinator and Clinical Pharmacist. In May 2009, the team expanded with the addition of a Social Work Graduate Student. The Cognitive Disorder Clinic schedules patients showing signs of memory loss for evaluation of Alzheimer's disease, pseudo dementia, frontotemporal dementia (FTD) and other degenerative conditions that can affect cognitive function.

During each clinic day four patients are scheduled to meet with the multidisciplinary team members over a period of four hours. Each team member focuses on their specialty during the morning portion of the clinic day. The multidisciplinary team meets to discuss treatment options during a noon conference. Follow up appointments for each of the patients are then scheduled for afternoon time slots for the following week's clinic. During follow-up the team meets with the patient regarding diagnosis and to discuss treatment plans. If it is determined that a pharmacologic agent would benefit the patient, they then meet individually with the clinical pharmacist to review the dosing schedule and receive counseling on the new medications.

A typical clinic schedule is as follows:

	Neurologist	Neuropsychologist	Social Work	Pharmacy / Care Coordinator
8am-9am	Patient 1	Patient 2	Patient 3	Patient 4
9am-10am	Patient 2	Patient 3	Patient 4	Patient 1
10am-11am	Patient 3	Patient 4	Patient 1	Patient 2
11am-12pm	Patient 4	Patient 1	Patient 2	Patient 3
12pm-1pm	Team meets to develop treatment plans			
1pm-5pm	Follow-up Appointments			

Team roles within the Clinic

Neurologist: Collects neurological history and performs neurological exam during a one hour appointment.

Neuropsychologist: Evaluates cognitive impairment based on neurological exam/questionnaire performance during a one hour appointment.
Clinical Pharmacist: Performs medication history, evaluates appropriateness of therapy and educates patients regarding medication use during a 30-45 minute appointment.
Social Work Graduate Student: Discusses concerns in regards to memory loss, directs patient/family members to community resources and collects information regarding impairments in day to day life during a one hour appointment.
Care Coordinator: Point of contact for the clinic, schedules appointments, organizes medical records and administers additional questionnaires during a 15-30 minute appointment.

Outcomes

At this time no clinical outcomes have been quantified. In the future we hope to collect information looking at patient outcomes, such as average cognitive decline rates, utilization of pharmacologic agents and responses to medications.

Table 1. Number of patients seen since start of clinic

Year	2007	2008	2009
Number of Patients	52	139	149

Table 2. Utilization of Pharmacologic Agents

	2007	2008	2009
# started on 1 new cognitive medication	Not Collected	17	26
# started on 2 new cognitive medications	Not Collected	45	48

*Cognitive medications = acetylcholinesterase inhibitor or NMDA receptor antagonist

Barriers: We continue to struggle with payment for pharmacy services. Currently the pharmacist documents the encounter and time spent with each patient in the electronic medical record. The neurologist then utilizes this information to include in his level of service. A future goal is to achieve reimbursement for pharmacist participation in this multi-disciplinary clinic.

Lessons Learned: The greatest asset to the development of this team was the founding members. The Neurologist's enthusiasm and drive to develop a clinic where patients could receive care from many specialties has enabled us to work effectively as a team and offer great patient care. We currently do not utilize written collaborative practices, but instead communicate recommendations to each other during scheduled meetings or via the electronic medical record.

While this has worked well for us, it may be beneficial to institute agreements in order to facilitate a more efficient work flow.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The Choctaw Nation health care system can be described as an integrated practice in the context of having available a broad spectrum of services to offer the people it serves, under one health care system. Our system is unique in that pharmacists have access to the complete Electronic Health Records of all patients within the system and direct access to all other health care providers in the system. This fosters the use of a team approach to health care delivery. Our system is comprised a central hospital/clinic and 7 outlying clinics staffed by approximately 45 physicians, 13 mid-levels, 70 nurses, 20 pharmacy technicians, and 30 pharmacists. The system offers primary care services such as family medicine and pediatrics, and specialty services such as diabetes care, ENT, cardiology, dentistry, surgery, podiatry, physical therapy, optometry, laboratory, behavioral health, and women's health. Hospital services include adult internal medicine, pediatrics, and OB/GYN. Our Pharmacy department includes both inpatient and outpatient services. The Pharmacy also offers a pharmacy-run Anticoagulation service and a Smoking-cessation clinic. Development is underway for the implementation for a Medication Therapy Management clinic and a Diabetes/Hypertension/Dyslipidemia Case Management clinic. Pharmacy Services also offers a PGY1 ASHP Accredited Pharmacy Practice Residency Program and is an instructional site for student pharmacists on rotation.

Administrative Model: Both our pharmacy-run Anticoagulation clinic and Smoking-cessation clinic is based on physician referral and is operated under protocol, and is offered in both outpatient and inpatient settings. Inpatient Pharmacy services also offers a Pharmacokinetic service which is initiated from physician referral and is based on a collaborative agreement with the Internal Medicine physician. Each service is individually managed by a Clinic Director who is responsible for the day-to-day operations and administration of the respective clinic. Student pharmacists often participate in these clinics under the direct supervision of a credentialed pharmacist preceptor.

Faculty Role/Staff Pharmacist Role: All pharmacists rotate through the various clinics, outpatient pharmacies, and the inpatient pharmacy. They are also involved in various committees such as the Pharmacy and Therapeutics Committee, the Patient Advocacy Committee, the Wound Care Team, the Discharge Planning Committee, Joint Commission Readiness Teams, Leadership Committees, among others. Pharmacists also function in other capacities such as Clinical

Applications Coordinator (health informatics) and billing specialists. Pharmacists also serve as Facility Directors at two of our outlying clinics. In both the inpatient and outpatient settings, every new medication requires our patients to receive pharmacist counseling on their medications. This is performed prior to the patient leaving each facility. Additionally, the pharmacy department has approximately 2-6 pharmacy experiential students at one time, who are supervised by credentialed pharmacist preceptors. Pharmacists throughout the health system are involved with our ASHP Accredited Pharmacy Practice Residency (PGY1) program as preceptors and/or program administrators. Pharmacists also rotate through our inpatient pharmacy providing clinical services to the Internal Medicine staff.

Outcomes

In the past, our Residents have performed research on various areas within the health care system. Some have been based on outcomes, some based on processes. There is no published literature to this point.

Benefits and Barriers: Many benefits arise from having a pharmacy department integrated into the health care system. It is a huge benefit to our patients in that pharmacy "completes" their visit to the system. This system allows pharmacy to ensure all medication therapy is appropriate and correct, with dosing and supply issues resolved prior to the patient leaving the respective facilities. Provider notes and labs (via Electronic Health Record) are reviewed by pharmacy with each patient to ensure accuracy/appropriateness of therapy. Providers also directly benefit from this structure. Problems can be immediately dealt with and resolved, and the pharmacy department serves as an important resource to provide drug information at the point of care. Pharmacy department leadership is currently researching the opportunity for pharmacists to decentralize into the various departments (Family Practice, Pediatrics, ER, and the Diabetes Wellness Center) to expand these services. This health system is also a training site for nursing, medical, and pharmacy students, in addition to being an accredited Pharmacy Practice Residency training site. Historically, many barriers to expanding pharmacy services revolve around staffing level issues. With each service offered comes staffing demands that must be accounted for when developing departmental budgets.

Future Practice Model: The future in this health care system is an exciting one. Projects currently underway include an MTM clinic, a Diabetes/Hypertension/Dyslipidemia Case Management clinic, and an expansion of student opportunities (pharmacy, medicine) at all facilities. In addition, opportunities to decentralize pharmacy practice into the various clinics would not only serve to foster the professional relationship between pharmacy and other health care providers, but would provide a valuable benefit to all stakeholders.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
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Description

Indigent Care Clinic (Interdisciplinary)
Staff-> 15 physicians of various specialties, 1 pharmacy faculty, 1 nurse practitioner, 1 EMT, three clerical staff support, 1 medical director, 1 clinic administrator

This practice model was emulated at a total of three other clinics with similar staffing components made possible by foundation grant support. Each clinic had 1 pharmacy faculty member, 1 nurse practitioner, 1 medical director, 1 clinic administrator, and multiple volunteer physicians.

Administrative Model: Pharmacist Collaborative Practice Agreements that are disease state specific. Faculty salary paid by college and supported in part by grant funding pursued by faculty member. No rent is paid to clinic. Pharmacist budget supported by foundation grants in excess of 750,000. No billing mechanism employed other than a scaled payment as these are uninsured/undocumented patients who do not qualify for Medicare or Medicaid and do not have private insurance (scaled fee based on FPL). Operational efficiencies include use of a home grown PMR, contract for drug assistance program to reduce medication costs, point of care testing devices to reduce laboratory costs, since part of University, Drug Information Resources made available at no charge to clinic staff.

Faculty role: Faculty member staff clinic 2 to 2.5 days per week (~ ¼ of FTE). No time spent on medication distribution. Precepting load is 3 different clerkships 9 months of the year taking 18 students + 1 resident. Clinical time spent in direct patient care services-assessment, education and counseling (75%) and research (25%).

Benefits and Barriers: Benefits include a collaborative environment, full autonomy, dynamic and diversified patient pool, cultural diversity, health literacy needs, opportunity for research and funding sources. Barriers include sustainability of funding sources (lack of billable model), transitory patient populations, staffing at clinics.
Establishment of services negotiated by faculty member before implementing services to include: emphasis of disease state management and referrals, scope of practice, staffing at site.

Revenue to school is lacking other than securing practice training sites for students and the grant support that co-funded 1 faculty member salary, our first resident salary, and one additional Am care faculty member for 2 years.
Outcome measures include: reduced ER visits and hospitalizations, access to drug assistance programs, reduction in BP, cholesterol, HgBA1C, FBG, smoking cessation, BMI, and improved quality of life. In addition clinical outcomes met and often exceeding the standards set by NCQA for physicians.
This site as mentioned is used for clinical 4th year rotations of pharmacy students, and our pharmacy resident and this year will begin to have interdisciplinary training with NP students from another private University.

Outcomes

We have received ADA recognition as a pharmacist-only multi site program for DSME and have collected clinical and behavioral outcome as required for certification. Have only presented data via poster presentations and foundation featured articles. Interested in being part of a practice-based research network.

Future Practice Model: Having a grant writer other than myself. More of a course load reduction to expand community presence and residency training. I had the three clinics who wished to partner with our University pay a licensing fee(3-year term) to have our services at their site run by a pharmacy faculty member with my oversight at service Director. These funds came back to the University. I would recommend a University coordinator to help ease some of the communication needs among the multiple clinic administrators and assist with accounting and budgeting with grant GL/accounts. Another lesson learned is to create a position that could be grant supported but focused on site/clinical services only and not didactic teaching responsibilities.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

Pharmacists currently have integrated clinical services into multiple practice sites that are supported by Touro University-California College of pharmacy. Vinay Patel, an assistant professor at the college, maintains 2 practice sites at a full time capacity, Lifelong Medical Care (East Oakland Clinic) and Touro University Medical Center.

Touro University Medical Center (TUMC) houses 1 pharmacist, 1 family nurse practitioner, 2 pediatricians, 4 family practice and 4 internal medicine physicians that form an interdisciplinary team only to serve as a community practice to the low-income residents of Vallejo and Benicia. The medical center also employs 5 medical assistants and 3 administrative assistants along with a business manager to help support the clinical services. The pharmacist collaborates with the physicians via a collaborative practice agreement to provide a warfarin monitoring and management service and provides comprehensive medication reviews for MTM consults referred. 100% of the time is spent on patient care services as there is no dispensing pharmacy on site. The clinic is entirely supported by the university and all providers at the clinic also maintain faculty appointments and didactic responsibilities at either the college of osteopathic medicine or college of pharmacy. The pharmacist has found the ability to integrate into the physician appointment scheduling system as well as the use of administrative assistants as a great operational efficiency. This has allowed the pharmacist to keep his schedule flexible enough so that he may block off times to be on campus for lectures and provide a system to make it easy for physician referrals. TUMC serves as a full time APPE site for 3rd and 4th year ambulatory care experiences, students are on 6 week rotations year round. Students are charged with the responsibility of obtaining vitals for the patient, a manual blood pressure reading, and interviewing the patient to obtain medication compliance, side effects, and history.

This practice site has been overwhelmingly beneficial to the physicians, student pharmacists, medical students, nurse practitioner students, and the colleges alike. The pharmacist experienced minimum barriers to implementation of the clinical services due to the absolutely open attitude for collaboration between the colleges. The physicians enjoy periodic therapeutic lecture updates from the pharmacist, reduced medication prior authorization paperwork, and having a pharmacist for drug information or patient consults. Unfortunately, none of the services provided at the clinic are currently reimbursed but the pharmacist has successfully pursued interest from our major insurer to review the cost/quality data for reimbursement in the future. This past fiscal year

the clinic, for the first time, generated a substantial 6 figure bonus from our major insurer thanks in part to the clinical pharmacy services. The pharmacist compiled quality data on the number of drug therapy interventions and patient education areas from the services provided. The pharmacist is continuously involved practice-based research by evaluating clinical data on blood pressure, cholesterol, and A1c control in our patient population and economic data from the health plan.

Lifelong Medical Care at East Oakland is a federally qualified health center that serves the community of San Leandro. Clinical pharmacy services are provided 1 day/week there to help ensure the very low income Medicare patients are receiving their medications in the most cost-effective manner. The pharmacist consults with patients by referral from their primary care doctors to review Medicare Part D coverage and employ a variety of measures (patient assistance programs, prior authorization, therapeutic drug substitution, and low income subsidy enrollment) to ensure he/she has the lowest medication cost possible.

Federal or state policy changes would be the most effective change that would strengthen a viable future practice model of this type, particularly in the area of recognition as a provider of medical services to be able to receive reimbursement from Medicaid or Medicare. Colleges of pharmacy looking to initiate a similar practice site should first seek out physician support in the community or internally within their educational structure. If a desire for collaboration exists then implementation, integration, and growth of services are very smooth and sometimes effortless. Second, observe and mimic systems that physicians currently utilize within a practice site to allow integration and communication between pharmacists and physicians to be as seamless as possible. Finally, be patient; continuous referrals might not occur until months after establishing a practice site. The key is to always be visible in the minds of providers and patients by giving case-based topic updates that highlight what services you can offer and leaving clinic informational flyers in patient lobbies or exam rooms.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

In Arizona, legislation (Arizona Revised Statute 32-1970) passed in 2000 that allows qualified pharmacists in specified health care settings (such as a community health center) to implement, monitor, and modify drug therapy as described by written protocols in collaboration with physicians. This practice model is referred to as Collaborative Drug Therapy Management (CDTM). The El Rio Health Center has three of these sites; the original clinic located at the main clinic on Congress and two expansion clinics located on the Pascua Yaqui reservation and El Pueblo. By focusing on disease state management, the clinical pharmacists have become integrated into treatment teams. Originally funded by the Health Services Resources Administration (HRSA) clinical pharmacy demonstration grant, the program has continued to grow because of successful outcomes that have been demonstrated and published.

The clinical pharmacist's responsibilities include coordination of care of patients with diabetes and common co-morbid disease states such as hypertension and dyslipidemia. In addition, the pharmacist is responsible for modification of drug therapy, measurement of blood glucose, hemoglobin A1c levels (A1C), education of patients, and identification/resolution of adherence and therapy related concerns. The largest portion of the pharmacist's work requires a comprehensive understanding of drug therapy, including formulary guidelines and drug protocols, continuous lab monitoring for improvement of patient outcomes as well as monitoring for actual or potential adverse drug reactions.

All interventions, pertinent lab data, patient demographics, and record of routine preventative therapy (i.e., monofilament exam, vaccinations, eye referrals, and podiatry referrals) have been tracked via an Access database. The database clearly and easily documents each patient's progress in a consistent manner, reports clinic statistics in a timely fashion, and produces a progress note that is included in the patent's permanent medical record.

The clinical pharmacists have become integrated in every aspect of the community health center from provider meetings, to staff education, grant writing, Pharmacy and Therapeutics Committee and recruitment/orientation of all new providers. By being heavily integrated in the practice, the clinical pharmacists have been able to become an invaluable asset to the practice teams and to administration.

Outcomes

The single most important outcome of this program has been improving patient outcomes in a primarily underserved population. The clinical pharmacists have been able to document statistically significant decreases in A1C, lipids, and blood pressure all while improving

medication therapy and patient satisfaction. Since inception of this program, over 2000 patients have been seen by the three clinical pharmacists.

Additional opportunities created by this program include creation of training sites for students and residents from various institutions, including the University of Arizona College of Pharmacy, Midwestern College of Pharmacy and A.T. Still College of Osteopathic Medicine. Although currently evolving, a partnership between El Rio Health Center and the University of Arizona College of Pharmacy will create an additional practice site for a faculty member and will further create opportunities for students to experience a dynamic practice.

Barriers: The single most challenging aspect of the practice is lack of substantial direct payment from third party payers, Medicaid and Medicare for the clinical services being provided by the pharmacist. Despite this, the practice continues to grow because of solid documented improvement in health outcomes, satisfaction by patients, providers, and the administration of El Rio Health Center.

Lessons Learned: For any practice to be successful, it is critical to document the interventions and outcomes that are a direct result of the pharmacist intervention. These results must be routinely shared with administration, providers, patients and payers. It is also critical to train students in this model so that they too can continue to develop primary care practices that will achieve future sustainable practices.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The practice setting for our primary care practice model is 135 miles from our mother institution in an Area Health Education Center. The AHEC concept of multidisciplinary and interdisciplinary care in a decentralized system has been around for over 35 years. The central focus of our practice setting is a three year family medicine residency program that has had a profound impact regionally and statewide. Over 50% of our graduates establish a practice in our service area and almost 90% remain in Arkansas.

A clinical pharmacy faculty position was added to the practice setting 25 years ago. From the beginning, the clinical pharmacy focus has been on promoting rational drug therapy for patients in our community. Our sphere of influence has expanded over the years as graduates have gone into the private and public sector to practice. As the only academic healthcare practice in a private practice community, it is an expectation that we are going to provide innovative, evidence-based clinical and educational services.

Our practice environment provides clinical rotation experiences for medical, pharmacy and nursing students. Health-career recruitment among regional high school and college students is also a significant focus of our program. Clinical pharmacy faculty members provide educational and experiential opportunities for all of these groups. These experiences may be individualized or part of a multi-discipline, integrated learning environment.

The factors that make our practice setting unique are the complexity of our patients and the diversity of their conditions. Our catchment area extends approximately 75 miles around our community. There is a strong likelihood that we are going to be the providers for most of the medical or obstetrical patients within this area who do not have an established medical home. In addition, we provide medical care for our own panel of clinic patients, as well as residents of a 125 bed nursing home facility. The prompt and efficient use of diagnostic resources, the development of a value-targeted therapeutic plan and the establishment of appropriate follow-up are integral to ensure desired outcomes in our patient population.

Clinical pharmacists, as well as student pharmacists on rotation, are involved in multiple levels of patient-care activity. The MTM concept has many attractive features that are most often are integrated into a larger treatment plan within our setting. A fairly common patient presentation

that we encounter is a 60 year old man with diabetes, hypertension, COPD, gout and atrial fibrillation who presents with symptoms of an acute stroke. We develop short-term and long-term evidence-based drug regimens that may include 7-10 medications required to address the patient's metabolic, respiratory, analgesic and cardiac needs.

Our clinical pharmacists have been involved in the development and implementation of a major research project called Medication Reconciliation in Transitions. This project came from recognition of the inadequate flow of medication lists when the patient came from a hospital stay to a clinic visit or when the patient went to see consultants who started new medications. The decision has been made that AHEC clinics in Arkansas will seek Patient Centered Medical Home accreditation by 2012. The medication reconciliation project will be a major step in that process.

The favorite educational activity for students provided by our clinical pharmacists is a trip to the pharmacy across the street from the hospital. We go to the beginning of the prescription drug shelves, take the bottle and ask, "What is it, how does it work, what are the side effects and what do you tell the patient?" This takes a large amount of time to cover many drugs but it is a great opportunity to integrate drug knowledge in a dynamic practice environment.

Outcomes

It is interesting that NIH finally developed funding and a term for what we have been doing for years. They call it translational research. We take information to the last step where it becomes part of a patient's treatment plan. The comprehensive evaluation process that uses the best resources in a timely fashion is an active part of our practice. Whether it is selection or development of a guideline or review of primary literature, the patient remains at the center of our focus. The evidence in the literature will only provide information for part of the journey into most cases. Our knowledge of drug therapy, the patient's current medical condition and the best available drug therapy combines to produce the best outcome possible. What is remarkable about our primary care practice environment is that nobody in our setting considers it remarkable. We have always worked as a team to produce the best care possible for a wide range of patients. The additional benefit of having a wonderful learning laboratory for all involved provides learning experiences that last.

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Area of Successful Practice: Primary Care Practice Model

Description

Pharmacists have the potential for a tremendous contribution in the provision of prenatal care. Unfortunately, this is a pharmacy practice model which remains largely undeveloped. Following is a description of the successful integration of primary care pharmacy services at a large community clinic site serving an obstetric population.

Since 1998, a clinical pharmacist has been working with an interdisciplinary team providing prenatal care services at the University of Arkansas for Medical Sciences (UAMS). UAMS is a teaching institution and the University Women's Clinic (UWC) is one of the practice sites for UAMS Ob/Gyn and Family Medicine medical residents. In addition to attending physicians (board-certified Maternal-Fetal Medicine specialists and Obstetrician/Gynecologists), advanced practice nurses, registered dieticians, social workers, lactation specialists, radiology technicians, and a variety of health care profession students practice at this site. The primary role of the clinical pharmacist is the management of patients with diabetes. Services include providing insulin initiation regimens, review of blood glucose logs, insulin dose adjustment, procurement of patient supplies, and patient follow-up between clinic visits. A secondary role is the training of the medical residents in the clinical aspects of diabetes in pregnancy. There is no medication dispensing at this practice site.

The pharmacist serves as a preceptor for UAMS pharmacy residents and pharmacy students in 4-week ambulatory care rotations. Direct-patient care and patient education compose a large part of the rotation responsibilities. Patients are provided with hands-on training in glucometer use as well as insulin injection technique, especially important for those with newly-diagnosed gestational diabetes. Medication histories, medication counseling, and recommendations regarding appropriate drug use in pregnancy and lactation are additional pharmacy student activities.

Contraception counseling is another pharmacy service at this clinic site. This is especially important in the teen pregnancy clinic. Student pharmacists orally administer a brief survey to the teen patients regarding previous and future contraceptive use. A discussion of the pros and cons of various contraceptive methods is tailored to the individual patient based on her survey responses. These surveys have resulted in a pharmacy practice residency project[1] and a student research summer fellowship which culminated in an award-winning scientific poster.[2] Analysis

of past surveys determined that the unintended pregnancy rate at this clinic is 88% with 90% of the clinic population receiving Medicaid funding. This information is the basis for an ongoing project examining the impact of pharmacist counseling on patient knowledge of emergency contraception.

Because depression is common in pregnancy, the pharmacist and student pharmacist also conduct depression screenings. Many positive screenings have resulted in referrals for psychotherapy and medication treatment. Analysis of these surveys have produced an award-winning poster presented by a student research intern at a national meeting,[3] a pharmacy residency research project[4], a second poster presented at an international meeting[5], and a manuscript currently in review. [6]

Starting in 2007, Arkansas State Board of Pharmacy regulations allowed students to administer immunizations if they were working under the direct supervision of an immunization-certified preceptor. The number of seasonal flu immunizations administered at UWC in the 2007-08 flu season was twice the number of the previous year due to this new pharmacy service.

Outcomes

This pharmacy practice benefits all involved. Based on reports of patient satisfaction, the patients are grateful for the extra counseling and the chance to practice new skills. More importantly, the pharmacist provides a continuity of care for the diabetes patients which is sometimes lacking at a teaching institution with a rotating staff. The medical residents appreciate the help with insulin dosing. The student evaluations report that the rotation is valuable learning experience. The mix of teaching students and health care professionals, direct patient care activities, and the opportunity for clinical and behavioral practice-based research is personally rewarding to the pharmacist.

Barriers: UWC is an integral part of an extensive outreach program established by the UAMS Division of Maternal-Fetal Medicine to provide health care for low-income patients throughout Arkansas. As part of that network, UWC provides obstetrical and gynecological services to numerous referrals from throughout the state in addition to local patients. Telemedicine overcomes the distance barrier by utilizing interactive video to provide diabetes education to patients at remote clinic sites.

A current project is to obtain the American Diabetes Association's certification as a Diabetes Self-Management Education Center to generate clinic income from the diabetes education. A future goal is to obtain continuous glucose monitoring sensors (CGMS) which will also generate billable services.

Advice: Perseverance is the key to developing an innovative pharmacy practice. The initial reaction of the attending physician was "Why do we need a pharmacist if we don't have a pharmacy?" Today the pharmacist is a valued member of the team with a percentage of her salary provided by the Department of Obstetrics and Gynecology.

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University of Charleston

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

The "Prevention Clinic" strives to prevent relapse of the diseases of drug and alcohol addiction through patient and health care provider education throughout Appalachia. The Clinic optimizes medication compliance for patients with a dual diagnosis of addiction and a psychiatric disorder since failure to maintain medication compliance for psychiatric disorders is well recognized as a significant contributing factor of addiction relapse.

Clinic Objectives:

1) Identify 1st, 2nd and 3rd line drug therapies for disease treatment and prevention for disease processes or procedures where healthcare professionals routinely prescribe or administer addictive medications.(e.g. opiates, benzodiazepines)
2) Educate patients and their health care providers on optimal alternative therapeutic agents for disease processes and procedures where healthcare professionals routinely prescribe or administer addictive medications. .
3) Optimize patient compliance of medications necessary to treat dual diagnosis.
4) Direct patient and families to appropriate treatment resources when appropriate.
5) Educate healthcare practitioners, patients and families on the pathophysiology of addiction
6) Educate healthcare practitioners, patients and families on drug diversion prevention in the home.
7) Provide ambulatory care practice experiential site for students and residents.

Clinic Management: The Prevention Clinic's patient care activities are managed under the supervision of Dr. Michael O'Neil, Associate Professor in the Department of Pharmacy Practice. Reporting of policies, procedures and activities are through the Pharmacy Practice Department Chair and through the University of Charleston's administrative office as required. Residents and students are under the preceptorship of Dr. O'Neil.

Clinic Site: The Clinic operates in the Pharm UC Clinics located within the University Of Charleston School Of Pharmacy. Two rooms (104E and 104F) are utilized for patient interviews and management. Patient waiting is in the Pharm UC and Walmart Pharmacy area.

Clinic Appointments, Hours and Scheduling: The Clinic operates 20 – 25 hours per week (Monday through Friday). Patients may call the School of Pharmacy's patient scheduling line (304) 357-4362 or be referred directly to the Clinic by their medical practitioner. Patients may cancel appointments using the same appointment line. Scheduling is performed by the Practice Department's Administrative Assistant or Dr. O'Neil. Appointments are entered into Dr. O'Neil's Outlook calendar. Follow-up appointments are made through the Practice Department's

administrative assistant or Dr. O'Neil. Clinic hours are determined based on academic responsibilities and as directed by the Department of Pharmacy Practice Chair person. The Prevention clinic can facilitate 15-30 patients per week.

Patient Screening: Before patients are scheduled for an appointment, patients are queried if they are currently "in recovery" from alcohol / medications or in an active treatment program. If the answer is no to both of these then patients are NOT eligible to be seen by the Prevention Clinic. Otherwise patients are scheduled for a clinic assessment. "Walk-in" patients are not accepted but are referred to the Practice Department administrative assistant for screening and scheduling.

Clinic Documentation: Upon initial arrival to the clinic, patients are asked to complete a basic medical and psychiatric history questionnaire. Patients will also be required to complete "Release of Confidentiality Agreements" for each practitioner that needs to be contacted regarding recommendations concerning patient care. Patients also sign a release of information agreement when records are required from other practitioners. All written information regarding a patient is kept in individual folders in a locked filing cabinet in Dr. O'Neil's office. All other patient information is kept on a secured web-based electronic medical record. Access to patient records is limited to only Dr. O'Neil and students / residents under his supervision.

Practitioner and Patient Communication: Patients may be referred through verbal or written communication to Dr. O'Neil. Patients may call the Clinic themselves to schedule an appointment. Once a patient has been appropriately screened for current treatment or recovery, a comprehensive assessment of the patient is completed. All clinical findings and recommendations are discussed with the patient as well as their practitioner(s). A formal report outlining the findings and recommendations is mailed to the practitioner's office for their records and a copy is maintained with the Clinic's EMR. Follow-up questions or information requests by practitioners or patients can be called in to the Center of Excellence for the Prevention of Drug Diversion and Substance Abuse at (304) 357-4361.

Costs: Currently, the "Prevention Clinic" is a free clinic. A sliding scale fee is being pursued.

Outcomes

Patient outcomes are currently being documented with the intent to present at a poster session at the AACP Annual Summer Meeting 2010. Individual outcomes have been very encouraging with excellent physician response to drug therapy recommendations. Patient tolerance and adherence also appears very promising. The success of actual prevention of relapse will take a considerable amount of time until we are able to evaluate the impact of the "Prevention Clinic".

*Benefits***:** In a national culture were ~ 10% of all adults are either addicted to controlled substances or alcohol the "Prevention Clinic" supports all types of practitioners including but not limited to primary care, family practice, psychiatry, dentistry and surgery. A comprehensive understanding of basic internal medicine as well as addiction medicine is required for the interaction with patients and their practitioners. This provides an excellent clinical environment for students and residents. This environment is also ripe for research and publications.

Barriers: Initial barriers were acquiring access to an electronic medical record. This was optimized by working with a private company specializing in pharmacy clinic documentation that is using the Prevention Clinic as a beta testing site. It was anticipated that patients would be lost for follow-up but that has not been an issue.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

Family Medicine Center (Academic Health Center)
This practice site is the primary outpatient clinic for the University of Colorado, Department of Family Medicine Residency Program. An interdisciplinary model of patient care is delivered with collaboration from School of Pharmacy and School of Medicine clinical faculty. It also has a large focus on becoming a Patient Centered Medical Home, and many clinical activities are devoted to this endeavor. Multiple professions practice at this site including two Clinical Pharmacy Specialists, two PGY2 Ambulatory Care/Family Medicine Pharmacy residents, 20 Attending Physicians, 18 Family Medicine Residents, two Nurse Practitioners, two Physician Assistants, 2 Behavioral Scientists, q Podiatrist, and 1 social worker. There are also over 20 other clinic staff members (e.g., Registered Nurses, Licensed Practical Nurses, Medical Assistants, Medical Records personnel, etc.).

Administrative Model: Clinical pharmacy services are provided in collaboration with the primary care medical providers. These services have a primary focus of providing point-of-care education to medical residents during their routine provision of patient care. This occurs within a standard medical precepting model and is also provided in response to individual consultation. Consultations are requested at the time a patient is being seen for their medical care, or via a task request through the electronic health record (Touchworks). The two Clinical Pharmacy Specialists are full time faculty in the School of Pharmacy with a secondary appointment in the School of Medicine, Department of Family Medicine as a component of the residency faculty team. Clinical pharmacy services are not governed under a collaborative drug therapy protocol.

Faculty Roles: The two School of Pharmacy faculty members provide a total of 0.25 FTE of clinical services, and spend 4 half-days/week in clinical service. One of these half-days/week is on the inpatient family medicine service at the University of Colorado Hospital. These faulty members also supervise the two PGY2 Ambulatory Care/Family Medicine pharmacy residents, who devote a total of 6 half-days/week in this clinical service. No time spent on medication distribution. When considering all four of these pharmacy personnel, the estimated time spent in education/precepting is 75% and providing direct patient care is 25%.

Benefits and Barriers: The benefits of this interprofessional model of patient care are providing a team-based approach to providing patient care and providing clinical education to both pharmacy

and medical residents. We believe that this model results in more comprehensive and optimal patient care, specifically from a pharmacotherapy perspective, that is evidence based. It also results in cultivating Interprofessional relationships between medicine and pharmacy in the formative stages of clinical development for both medical and pharmacy residents. Barriers to implementation are mostly financial. The Department of Clinical Pharmacy and Department of Family Medicine has collaborated on funding for a 0.25 clinical pharmacy FTE to enable this model. Funding has been successfully negotiated since 1998. However, having PGY2 pharmacy residents as a part of this model is essential. The University provides minimal to no financial support for these residency positions. One is funded thought he University of Colorado Hospital (a private institution that is completely independent of the University of Colorado) in exchange for 320 hours of pharmacy staffing. The other residency position is supported by a grant funded by Amgen with funding for benefits provided by the Department of Clinical Pharmacy. The other barrier is the inability to secure payment for clinical pharmacy services. Because the Clinical Pharmacy Specialists are under contract with the School of Medicine and not through the hospital, they are not able to bill for their direct patient care services. Therefore, all provision of patient care is done collaboratively with medical providers to assure that the A.F. Williams Family Medicine Center can generate clinical revenue. This site is used for experiential education of pharmacy students, medical students, nursing students, and physician assistant students.

Research/Outcomes

Multiple investigator initiated research projects have been conducted within this practice site. The projects that have been published are as follows:

- Vande Griend JP, Saseen JJ. LDL-Cholesterol Goal Attainment in High Risk Family Medicine Patients. J Clin Lipidology 2009;3:195-200.
- Marrs JC, Saseen JJ. Dyslipidemia Control in Indigent Patients with Medication Assistance Compared to Insured Patients. Pharmacotherapy 2008;28(5):562–569
- Miller AE, Hansen LB, Saseen JJ. Switching Statin Therapy Using a Pharmacists-Managed Therapeutic Conversion versus Usual Care Conversion Among Indigent Patients. Pharmacotherapy 2008;28(5):553–561.
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- Bestul MB, McCollum M, Hansen LB, Saseen JJ. Impact of the women's health initiative trial results on hormone replacement therapy. Pharmacotherapy 2004; 24(4):495-9.
- MacLaughlin EJ, Saseen JJ*, Malone DC. Costs of beta-lactam allergies: selection and costs of antibiotics for patients with a reported beta-lactam allergy. Arch Fam Med 2000; 9(8):722-6.
- Patel RJ, Witt DM, Saseen JJ, Tillman DJ, Wilkinson DS. Randomized, placebo-controlled trial of oral phytonadione for excessive anticoagulation. Pharmacotherapy 2000; 20(10):1159-66.

- Mehos BM, Saseen JJ*, MacLaughlin EJ. Effect of pharmacist intervention and initiation of home blood pressure monitoring in patients with uncontrolled hypertension. Pharmacotherapy 2000; 20(11):1384-9.

Future Practice Model: This model would be strengthened by additional financial support for a larger FTE allocation for the two Clinical Pharmacy Specialists, and by providing support for the PGY2 Ambulatory Care/Family Medicine pharmacy residency, independent of the hospital or funding from a grant. Additionally, administrative support to legally allow for reimbursement of direct patient care services provided by the pharmacy team would be of great help. Other school seeking similar collaborations should do so wholeheartedly, but should structure contacts in a manner that enables payment for direct patient care services.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

This is an integrated practice at a Veterans Affairs (VA) community based outpatient clinic (CBOC), one of over 700 CBOCs nationally, which provides ambulatory care services to veterans. The CBOC is physically distant from its primary medical center, the Charlie Norwood VA Medical Center, and offers primary care and mental health services to patients from the surrounding area. The CBOC employs three primary care physicians, two psychiatrists, two clinical pharmacists, one nurse practitioner, two social workers, one psychologist, five nurses and two licensed practical nurses. College of Pharmacy clinical faculty and a postgraduate year (PGY) 2 ambulatory care resident provide clinical services and education to patients and healthcare providers. A clinic manager oversees the operations of the clinic.

Administrative Model: Clinical pharmacists and clinical pharmacy faculty have prescriptive authority as outlined in the Scope of Practice and provide clinical pharmacy services as part of an integrated healthcare team. Providers may also consult patients to the Pharmacotherapy Clinic to help manage chronic diseases per protocol including hypertension, dyslipidemia, diabetes mellitus, chronic obstructive pulmonary disease, smoking cessation, coronary artery disease and chronic heart failure. Once patients have met their guideline driven goals of therapy, management is returned to the primary care provider. The VA pursues billing private insurers if applicable for all face-to-face clinic appointments. Two college faculty members and a PGY-2 ambulatory care resident collaborate to provide and manage the Pharmacotherapy Clinic. The VA provides work space and a learning environment for student pharmacists and residents. Operational efficiencies include the VA electronic medical record and clinic scheduling through reception.

Faculty Role/Staff Pharmacist Role: In addition to the two clinical faculty, there are two full-time clinical pharmacists employed by the VA at the CBOC. Their responsibilities include administration of anticoagulation and lipid clinics, management of non-formulary requests, walk-in medication requests and other medication management issues (e.g., drug shortages). The pharmacy resident provides these services as well as sees patients in the Pharmacotherapy Clinic. The VA clinical pharmacists perform clinical functions 100% of time as there is no dispensing pharmacy on-site. Prescriptions are mailed to patients through the consolidated mail outpatient pharmacy (CMOP). Urgent prescription medication needs are contracted to a local community pharmacy.

Benefits and Barriers: The benefits to all have been tremendous and measurable. First and foremost, the Pharmacotherapy Clinic was able to establish positive outcomes for patients (see outcomes below). Benefits to the Charlie Norwood VA Medical Center include improved patient outcomes through disease management and adherence, assistance in meeting performance measures that are tracked nationally, improved patient satisfaction and additional pharmacy resources. Benefits to the providers include greater achievement of performance measures for the patients under their management, educational presentations and resources, patient satisfaction, service as physician extender for certain primary care disease states, and increased number of services provided to the clinic as a result of education and training to clinical pharmacists at the site. Benefits to clinical pharmacists include education and training, enhancement of clinical practice through pharmacy resident and student interaction and presentations (formal and informal), improved professional satisfaction and additional pharmacy resources. Benefits to the College of Pharmacy include a rewarding practice site for pharmacy student and resident teaching and training, teaching material for clinical faculty, and an area of scholarship.

The distance between the CBOC and the medical center home creates a challenge in maintaining communication. Additionally, prior knowledge of VA policies and procedures is useful when developing this type of program in a CBOC, particularly since they are physically disconnected from the main medical center.

In addition to student pharmacists and pharmacy residents, the site serves as a teaching site for nursing students. In the future, the site will host medical students and residents as the new medical school matures.

Outcomes

Patient outcomes, including changes in hemoglobin A1c, cholesterol and blood pressure, and percent of patients meeting guideline driven goals are tracked through the clinic. Patients in the Pharmacotherapy Clinic had improvements in blood pressure, LDL cholesterol and A1c at three and six months after being consulted to the clinic, including a higher percentage of patients achieving goal values compared to baseline and non-Pharmacotherapy Clinic patients.[1,2] The practice site continues to serve as a resource for practice-related research.

Future Practice Model: Additional pharmacy services continue to improve patient care for the veterans seen at the CBOC. The key to success for this practice model was communication with the site and VA administration (pharmacy and primary care) regarding benefits, particularly with an academic unit, of the clinical services to be provided, specific operational needs (e.g., office space and set-up and equipment), persistence and follow through of the clinical faculty, professional development of the healthcare professionals, and demonstrating value to patient care.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

Pharmacy practice faculty are challenged by the multiple demands on their time, incomplete training in select areas, and the complex nature of their positions.[1] As practice faculty, developing a successful primary care practice with integrated pharmacy services can be challenging with limited physical time in clinic. Since July 2008, two practice pharmacy faculty have shared a primary care practice at Broadway Family Medicine (BFM), the practice site for University of Minnesota / North Memorial Hospital Family Medicine Residency program. Currently, each pharmacy faculty hold split positions with the College of Pharmacy Department of Pharmaceutical Care and Health Systems and School of Medicine Department of Family Medicine and Community Health.

BFM is a large family medicine residency training site with up to thirty physician residents and one pharmacy resident annually. BFM is located in North Minneapolis and serves an underserved patient population, predominantly African American followed by Caucasian and Hmong. The providers are diverse, including ten faculty physicians, one nurse practitioner, three registered nurses, one social worker, two licensed family marriage therapists, and two faculty pharmacists. The clinic sees on average about 600 patient encounters a week and pharmacy services account for about 30 (5%) patient encounters a week.

The clinic provides and teaches interprofessional patient care through the residency programs and student pharmacists on APPEs. Pharmacy Medication Therapy Management (MTM) services are provided through physician referral and team collaboration. Patients are managed by a collaborative practice agreement with the physicians at BFM allowing pharmacist management of chronic medications in accordance with standard guidelines, including, but not limited to: anticoagulation, asthma, CHF, COPD, depression, diabetes, dyslipidemia, hypertension, latent tuberculosis, and smoking cessation. Pharmacists are able to bill for their services using MTM, incident to billing, and spirometry codes. Pharmacist time in clinic comprises of approximately 20% educating and precepting (not only the pharmacy residents and students, but also the physician residents and medical students), 60% direct patient care activities, and 20% administrative duties (clinic meetings, committees, etc.). Each pharmacy faculty is on site two full days a week. There is no dispensing pharmacy on site.

Outcomes

Overall, sharing the practice has allowed for synergistic practice-based research, lightened the administrative responsibilities for teaching and precepting, improved focus on practice development and innovation, increased diversity in teaching and precepting, and increased activity in professional service opportunities.

Barriers to implementation: Since this type of practice split position is still relatively uncommon at the University, communication between both entities (College of Pharmacy and School of Medicine) was difficult. This lack of communication created confusion and inconsistency in terms of how the revenue for MTM visits would be redistributed, overall expectations (clinical and otherwise), and how annual evaluations would be performed.

Due to the variety of issues and the revenue from Minnesota MTM Medicaid services, the positions for Associate Dean for Clinical Affairs, the Pharmacy Faculty Practice Group, and an Associate Department Head for Clinical Affairs were created within the College of Pharmacy. All practice faculty within the Department meet monthly with the Associate Department Head. With these additional administrative supports in place, the contract agreements between the two stakeholders are being negotiated for the revenue received and anticipated to provide funding for future practice faculty positions. The practice faculty has also begun defining expectations for practice faculty for promotion, tenure, and annual review within the Department.

Advice or lessons learned: The two faculty pharmacists at BFM have found great benefit in sharing a primary care practice. Spending some intense time in the beginning helped ease the transition of the new faculty, increase collegiality, and establish a foundation for collaboration in practice, teaching, and scholarship. Initially the practice faculty spent two days a week in clinic together for two weeks, and then scheduled time for overlap (1/2 day a week) in clinic and an hour meeting outside of clinic for six months. Not only did this assist in orienting the new faculty to clinic, this helped define time to discuss the teaching and precepting role for the residents and students. The faculty also developed a common mission and vision for the practice. They currently meet every two weeks to discuss a variety of issues including: clinic logistics and improvement, resident and student issues and evaluations, and joint research and scholarly projects.

The practice faculty also feels that having practice support within the Department and College is beneficial in the connection to the College and for professional growth. Having direct time with the other practice faculty in the Department has provided for collegiality, communication, and collaboration. It has also been a great benefit to have a physician mentor with the medical director at BFM. This interprofessional interest in the practice faculty professional growth has provided opportunities for additional lectures, presentations, and publications.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

Gateway Family Health Clinic (GFHC) is a group of three federally-qualified rural health clinics located in Moose Lake, Sandstone, and Hinckley (Northeastern) Minnesota. There are twelve family practice physicians, two internal medicine-pediatrics physicians, one internal medicine physician, three family nurse practitioners, and one physician assistant practice at these three clinics. A variety of specialists also see patients at the clinic on a weekly to monthly basis. A clinical pharmacist (Laura Traynor) was integrated into the primary care practice at the Moose Lake clinic in October of 2006 after about three months of preliminary planning between the faculty member, the College of Pharmacy, and the clinic leadership.

Administrative model: The faculty member practices at GFHC two days per week under an agreement between the College of Pharmacy and GFHC. GFHC completes the credentialing and contracting for the faculty member and also completes all billing and scheduling. GFHC pays the College of Pharmacy for a portion of the time the pharmacist spends at the clinic. The revenue generated by the pharmacist is shared between the College of Pharmacy's practice plan and GFHC. Reimbursement is obtained through a number of Medication Therapy Management (MTM) contracts, including Minnesota Medicaid and Prepaid Medical Assistance Plans (PMAP), the University of Minnesota's MTM benefit, and through Outcomes Pharmaceutical Care.

Faculty Role: The faculty member has both direct patient care functions and clinical administrative functions within GFHC. Patients are seen for general MTM services by physician consult or by patient self-referral. The faculty member operates under a collaborative practice agreement with the physicians at GFHC. Diabetes, hypertension, hyperlipidemia, anticoagulation, COPD, asthma, chronic pain, and depression are among the most common conditions seen by the pharmacist. The pharmacist also answers drug information questions and provides curbside consults for the providers of the clinic.

Clinical administrative functions have included assisting with projects such as medication reconciliation, medication refill policy, and urine drug screen policy. A 0.4 FTE is devoted to the above functions plus education of APPE students. The faculty member does not have any responsibilities for medication distribution.

Benefits: This practice provides benefits to both the College of Pharmacy and GFHC. The College of Pharmacy gains an ambulatory care practice site for student pharmacist APPEs and participates in the advancement of pharmacy practice in the state of Minnesota. The clinic gains a clinical pharmacist as a part of the primary care team. This practice generates some revenue through the provision of MTM services, which are split between GFHC and the College of Pharmacy.

Barriers: This practice does not generate enough income through the provision of MTM services to cover all of the faculty member's time in the clinic. This has been the most challenging barrier to overcome.

Outcomes

In 2008, a Rural Pharmacy Planning and Transition Grant, administered by the Minnesota Department of Health, was awarded to the faculty member and GFHC to explore expansion of MTM services to a second of the three clinic sites. A patient population analysis, patient focus groups, and provider roundtable discussions were held throughout the year to determine if there was a need for MTM services at this second clinic site. There was a desire for services to expand to a total of 0.8 FTE split between two clinic sites. Because of the lack of widespread reimbursement for MTM services, the clinic and the College of Pharmacy were unable to implement the desired plan. Instead, the pharmacist provides MTM services at the second clinic site one day per month. The results of this research were presented as a poster at the National Rural Health Association's Mediation Uses in Rural America conference in October of 2009.

Future Practice Model: More widespread reimbursement for pharmacist-provided face- to-face MTM services will help to strengthen future practice models of this type. Colleges or Schools of Pharmacy wishing to establish faculty practices within private primary care clinics should carefully assess the commitment of the practice site to integrate the faculty member fully into the operations and initiatives of the clinic before making a significant commitment of resources. Colleges or Schools of Pharmacy can help to expand this model by giving the faculty member (1) time to develop and maintain the practice and (2) mentorship when challenges are encountered by the faculty member.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

For the past 11 years, the University of North Carolina (UNC) Eshelman School of Pharmacy (ESOP) and School of Medicine (SOM), Division of General Internal Medicine have had collaborative agreements and shared faculty support for three clinical pharmacist practitioners (CPP) within the Internal Medicine outpatient clinic. As CPPs, we are licensed through the North Carolina Boards of Pharmacy and Medicine. CPPs prescribe medication therapies based on protocols and signed collaborative agreements with General Medicine physicians. The clinic is part of an academic health care system and consists of 23 attending physicians, 70 resident physicians, 3 clinical faculty pharmacists, 1 Ambulatory Care pharmacy resident, 2 physician assistants, 1 nurse practitioner, 13 nurses, 5 care assistants, 1 social worker and 1 nutritionist. There are 14,600 active clinic patients accounting for over 40,000 visits annually. Twenty-one percent of these visits are provided through our pharmacist-managed clinics.

The three faculty pharmacists serve as directors of five disease management programs within the General Internal Medicine clinic: diabetes, smoking cessation, anticoagulation, depression and chronic pain management. The faculty supervises the physician assistants, nurse practitioner, care assistants, social worker and nutritionist who also practice within these disease management programs. In addition to the supervisory responsibilities, each faculty pharmacist precepts an average of 10 students per year, 6 pharmacy practice residents, 24 medical resident physicians and 1 community pharmacy resident within the disease management programs, learning our proactive, planned care model. Due to divided obligations between the two schools, there is 1 total FTE among the three pharmacists that is devoted solely to patient care. Other portions of faculty pharmacist time/FTE coverage are devoted to health care system leadership, school and clinic administration, and didactic responsibilities. This model consists of scheduled clinic visits with the pharmacists, all clinic-based, for 15 to 30 minutes each, with no distributive aspects. Pharmacists currently bill for patient care services using the “incident to” billing model.

Faculty roles of the pharmacists in this practice site include 1 FTE being 100% ESOP devoting 50% of his time to clinical activities/experiential education, and the other 50% to didactic teaching, research, and SOP administrative involvement. 1 FTE is 25% SOP devoted to clinical activities/experiential education and 75% to the health care system as the newly appointed Director of Ambulatory Care Quality, stemming from our quality improvement work within our clinical practice. The final 1 FTE is 50% clinical/experiential education, and the other 50% is

serving as Director of the pharmacy experiential education program within the UNC Healthcare System. All three faculty have roles in didactic teaching, and two are course coordinators, one in the core Pharmacotherapy curriculum, and the other in a multidisciplinary diabetes care elective course.

The benefit of these pharmacist-directed services has been recognized through patient satisfaction surveys, as well as playing a key role in JCAHO presentations with quality improvement initiatives. The barriers we have encountered over the years do not include a lack of vision, as the ESOP administration and Division physicians have been extremely supportive of faculty pharmacist services. The main limitations have been a lack of state and residency training dollars. Fortunately, the general medicine physicians within our practice and the ESOP have ensured our continued existence, supported research on our clinical services and assisted in continued funding and advertisement to their colleagues on our practice model. Because of this collaborative work, new initiatives are being implemented by the ESOP and UNC Healthcare System to expand clinical services with pharmacists.

The three faculty pharmacists are highly involved in research activities within the disease management programs and collaborate with physicians in multiple areas. We have published multiple articles, and have presented numerous posters at national meetings including Society of General Internal Medicine, American Society of Health System Pharmacists, and the American College of Clinical Pharmacy. A representative sampling of publications includes the following:

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In addition to research activities, we produce monthly quality improvement "run charts" that collect pertinent data to the diabetes and anticoagulation program and are posted on our program website: www.med.unc.edu/im/staff/QI/reports/.

Lastly, we have had various visitors to our practice including: Nancy Henley, MD, Medical Director, State Health Plan of North Carolina; George Stokes, Executive Director, State Health Plan of North Carolina, Jack Walker, previous Executive Director, State Health Plan of North Carolina; United States Representative David Price; Philip Johnston, PharmD, Department of Pharmacy, Vanderbilt University; United States Senator Richard Burr; Michael J. Barry, MD, Chief, Department of General Medicine, Massachusetts General Hospital, President, Foundation for Informed Medical Decision Making, Boston, MA; Richard Wexler, MD, Director, Megan Gassert, Implementation Manager, Foundation for Informed Medical Decision Making; Quality of Care Committee, University of California at San Francisco.

Our pharmacy practice model has expanded not only in number but also in scope to include Family Medicine, Geriatrics, Hematology, Anesthesiology, and Endocrinology. In addition to clinical services, our computerized database for dictation and data collection/retrieval has also been exported, from which we report monthly data to hospital administrators on key clinical outcomes. With new collaborations with the Healthcare System and ESOP there is now work to expand to 10 ambulatory care pharmacist positions over the next 5 years using the pharmacist/quality improvement model we have developed over the past 10 years. All of the above noted activities provide our student pharmacists, who learn by directly working with the pharmacist clinician-educators, with a unique experience that is not found anywhere else.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

The Pharmacotherapy Service of the Family Medicine Center (FMC) on the University of Oklahoma Health Sciences Center campus is a disease management service focusing primarily on the treatment of diabetes and coagulation disorders. This primary care based service is staffed by six pharmacists and one dietitian, all University of Oklahoma College of Pharmacy (COP) faculty members. The FMC, staffed by 17 University of Oklahoma College of Medicine (COM) faculty physicians and 36 resident physicians, logs over 60,000 patient visits annually. The COP operates an independent community pharmacy in the FMC with two pharmacists and three technicians. The insurance payer mix of patients seen in the FMC is 50% Medicaid, 25% Medicare, 15% commercial insurance, and 10% self pay. This academic practice site annually provides over 30 introductory and over 50 advanced pharmacy practice experiences, with students scheduled every month of the year. Additionally, this site trains college residents in ASHP accredited PGY1 health-system, PGY1 community, and PGY2 ambulatory care pharmacy residency programs.

Administrative Model: All patients are referred from their primary care providers using referral forms that serve as individualized collaborative practice agreements allowing for medication initiation, titration, or discontinuation as well as laboratory assessment. The COP and COM operate under a memorandum of understanding, with medical supervision provided by a medical director. The FMC provides a clinic module of 6 exam rooms for these services as well as billing support. The COP provides faculty salaries. Currently, the service manages over 500 visits each month. Because the diabetes service has achieved recognition from the American Diabetes Association to provide diabetes education, the FMC billing department submits diabetes education G-codes for diabetes visits. All other visits are billed using the CMS "incident to" model. In addition, the dietitian submits medical nutrition therapy codes and collects payment for insulin pump training through contracts with pump manufacturers. In earlier years, pharmacist reimbursement was provided through a COP contract with Oklahoma Medicaid though this option is not currently allowed for pharmacist providers. Revenue generated is used to support one full-time administrative assistant, all point-of-care (POC) testing supplies (hemoglobin A_{1c} and lipid cartridges, strips for INR determinations, gauze, lancets, gloves, band-aids, and capillary tubes), part of the salary for the dietitian and sometimes for a PGY2 resident, and other incident clinic expenses such as waste management, office supplies, etc.

Faculty Pharmacist Role: The service is staffed by at least two FTE pharmacists daily, with one focusing on diabetes and the other on anticoagulation services. P-4 students conduct initial patient interviews and perform POC testing with faculty members approving or completing these interviews as well as reviewing all treatment plans prior to implementation. Residents, always

attended, are allowed greater autonomy in function as they are capable. There are no medication distribution functions provided. Using knowledge of rational drug therapy and local health care systems, these faculty practitioners function as advocates for each referred patient, developing, implementing, and monitoring treatment plans in support of care provided by their physicians and other health care providers. The service works to achieve evidence-based goals for each patient, often coordinating care so that it is seamless and continuous, a result that some patients may not gain from their involvement with usual care.

Outcomes

Diabetes: Retrospective chart reviews of compliance with national standards of care were performed on random samples of patients seen prior to services and at one and four years after the initiation of services. Hemoglobin A_{1c} decreased 3% from baseline at both year one and year four. Standards of care showing a statistically significant increase over baseline included the percent of patients having an annual A_{1c} measurement, a microalbumin screening, an eye exam referrals, a documented foot exam, and an influenza vaccination. The average systolic blood pressure also decreased significantly. This service received the Oklahoma Quality Improvement Organization (QIO) award in 2002 for best outpatient diabetes practices. Based on sustained quality of services, the practice was selected as a site for the ASHP Diabetes Traineeship Program when it was offered from 2003-06.

Anticoagulation: A baseline review of the INR's of patients selected at random from the FMC revealed that one-third were supra-therapeutic; one-third, in the target range; and one-third, sub-therapeutic. Pharmacist-directed anticoagulation services were implemented in 1998 using point-of-care testing with CoaguChek® devices, an established patient education curriculum, a consistent follow-up visit protocol, and the *Chest* guidelines for the appropriate use of warfarin. Currently this service cares for approximately 280 patients. Outcome data collected from 2006 to 2009 show that the percent of patients in the target range has steadily increased from 50% to 59%. In 2004 this clinic received the Roche Diagnostics DREAM (Dream of Achieving Excellence in Anticoagulation Management) Award.

Barriers to Implementation

- Physician unfamiliarity with and resistance to the role of pharmacists providing direct patient care
- Inadequacy of billing systems (e.g., Oklahoma Medicare initially denied pharmacist eligibility to participate in "incident to" billing practices, and current reimbursement rates are generally inadequate to support services fully)
- Administrative personnel support for patient care scheduling, coordination, and billing (a more substantial problem as patient volume increases)
- Administrative cost of initiating and sustaining billing systems, meeting compliance standards, and using electronic medical records and/or other documentation systems
- Clinic space (the spaced needed for a model of patient care using faculty members as attendings to students and residents who provide care is greater than that needed for services provided by pharmacists clinicians only)

Advice or Lessons Learned

- Establishing a new service in any therapeutic area takes a minimum of 12-24 months. A constant presence is needed to establish relationships with physicians and staff within the organization and to provide meaningful and reliable services that meet provider and patient needs. This patience is not always appreciated within academic pharmacy.
- Maintaining relationships with the billing and compliance department is an ongoing process because these individuals are often unfamiliar with pharmacist billing options. This takes substantial time that may not always be appreciated by academic pharmacy administrators.
- Students and residents are capable of providing advanced services but only under the constant supervision of expert faculty practitioners. Students should not be counted on to "sell," initiate, or sustain advanced clinical pharmacy services, an expectation mistakenly held by some academic pharmacy administrators.
- The service's maturity and administrative stability allow for development of younger faculty members, particularly those hired immediately following residency training.
- Scholarship in primary care pharmacy services should be expected but is reasonably produced after approximately 3-5 years of sustained services.

Suggested Resources

1. Letassy NA, Armor BL, Britton ML, Farmer K. Pharmacist-Managed Diabetes Service in a Family Medicine Practice Improves Patient Outcomes. *Drug Benefit Trends*. 2003:Oct. Supp.,21-32.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The Senior Health Center (SHC) at the University of California, Irvine (UCI), Medical Center is part of an academic health center. The SHC provides primary care to elderly and disabled Medicare beneficiaries. The site follows a well-developed multidisciplinary approach to patient care. Professional staff at the SHC includes 5 geriatricians, a fellow in geriatric medicine, a geriatrics physician assistant, 2 neuropsychologists, 2 geriatrics clinical pharmacists, a geriatrics social worker, a neurologist, a rheumatologist and a rehabilitation specialist. Specialists contribute to patient care on a case-by-case basis.

The pharmacist is fully integrated into the practice. Patients are referred by the clinicians on both formal and informal bases. More complex issues, such as a thorough pharmacotherapy review, medication therapy management, selection of a Medicare Part D program, etc. are handled by appointment. Issues such as advice regarding therapeutic alternatives, patient education, evaluation of medication-related problems, and general information questions are managed by "curbside consultation".

Appointments are managed by the hospital call center. A time-based facility fee is charged; the pharmacist documents patient encounters using pharmacist CPT codes. A fee-for-service charge is applied for patients receiving the independent comprehensive pharmacotherapy evaluations. No charge is made for curbside consultations. All pharmacist activities generate a progress note in the chart.

The program was begun at the request of the SHC medical director, who has a long history of working collaboratively with pharmacists. The medical director incorporated the pharmacist into the training programs for geriatrics medical fellows, residents, and students. The pharmacist attends staff and provider meetings and is a part of all relevant decisions on SHC policies and procedures.

The medical center funds 0.5 FTE for the pharmacist. Because the site is used as a teaching site for University of Southern California student pharmacists, there is faculty coverage beyond 50% time.

A pharmacist is present in the SHC 3.5 days/week. An adjunct faculty member is present 2.5 days, and a full-time faculty member is present 1 day. The entire time is devoted to the activities described above, as well as other clinical activities. The SHC conducts a once-weekly Health Assessment Program for Seniors (HAPS), a comprehensive evaluation clinic during which patients are seen by a physician, pharmacist, psychologist, occupational therapist and dietitian. The pharmacist also makes home visits to evaluate or monitor pharmacotherapeutic progress for selected patients

The pharmacists manage the prescription refill requests and prior authorization requests for patients in the SHC. Pharmacists also provide comprehensive pharmacotherapy evaluations with dictated reports to older adults who are not part of the SHC practice.

The Program in Geriatrics at UCI actively supports the program. The medical center provides funding because of the program's commitment to a fully-integrated patient care team. Facility fees and cash payments generated by the pharmacists help to offset the cost of the service. The medical center's Medicare marketing team actively promotes the presence of a geriatrics clinical pharmacist to the community.

Benefits: Both clinicians and patients at the SHC benefit from the presence of the pharmacists. The clinicians have readily-accessible help in managing their patients. Clinical pharmacists manage most medication-related issues, giving physicians extra time to deal with medical issues. Patients benefit by having their medication regimens refined by a clinical pharmacist. Extra care is taken to ensure that each patient it taking the most rational medication regimen. Patients have a better understanding why these medicines need to be taken and what to expect from them. Because this is a teaching site, student and resident physicians and pharmacists experience the value of a true interdisciplinary approach to geriatric health care.

Barriers: The biggest barrier is reimbursement for pharmacy services. We have a system in place which generates some income but it is not truly representative of pharmacy services provided. For SHC patients who are referred by their doctors, clinical pharmacy services are free of charge, except for the facility fee. Options for fee-based services are somewhat limited by Medicare regulations that state how hospital-based programs may charge for services. Medicaid patients are seen on a capitated basis, so pharmacist-generated cost savings are the primary mechanism by which the practice can benefit economically from pharmacist services.

Outcomes

At the Senior Health Center, all pharmacist interventions are well documented. Clinical pharmacy notes become part of the permanent medical record. Clinical pharmacy appointments are tabulated at the end of each month. The students are also asked to keep a log of all the clinical interventions which are made during their 6-week experience. However, there has not

been a systematic evaluation of outcomes. A symposium describing the practice's experience with the value of the interdisciplinary care was presented at a meeting of the American Society of Consultant Pharmacists.(1) Recently a pharmacy resident and a geriatrics fellow completed a research project on the impact of clinical pharmacy services at the Senior Health Center.

Current practice-based research being conducted at the SHC include a California-wide project evaluating student and pharmacist impact on helping underserved Medicare beneficiaries choose Medicare Part D plans (Lipton, HL, Partners in D, UCSF School of Pharmacy, funded by Amgen Foundation). We also are working with the American Society of Consultant Pharmacists Foundation to evaluate the use of MonitorRx, a clinical practice application to reduce medication-related problems in older adults. A manuscript on the APPE is in development for submission to AJPE.

The most important factor that makes this a successful site is the commitment of the administration and medical staff to the provision of excellent patient care. The foundation was laid through mutual experience with different disciplines and the recognition of the unique knowledge and skills that each possesses. As with most other situations, relationships are fundamental.

It is important for a new practice to develop and implement strategies to document activities and outcomes from the outset. Once a practice is ongoing, it becomes more difficult to initiate an evaluation program. It also is essential to ensure that there is sufficient time for scholarship, and not a total emphasis on patient care activities.

Toward that end, funding is crucial. The current environment is not particularly favorable for funding in geriatric pharmacy. Many federal, and most private, sources are experiencing barriers to increased funding, and few have programs directed toward pharmacy practice. Collaboration with other disciplines, ensuring that pharmacy practice is an important and identifiable component, is perhaps the most appropriate way to begin to secure funding.

Finally, a program wishing to begin a new geriatrics practice should identify an individual with strong qualifications to initiate the effort. Resources must be available to allow that individual to mentor junior faculty and establish a viable and recognizable program.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The USC International Travel Health Clinic (ITHC) was established in 2000 and is located in the student health and family medicine centers on two campuses of an academic institution. Initially the clinic primarily served the student health center, but shortly after implementation, the program was expanded to a second campus site at the medical center location to allow access to a larger population including members of the surrounding communities. The goals of the pharmacist-run international travel health clinic are to 1) educate travelers on their personal risk for travel-related illness and personal safety, 2) recommend necessary non-prescription products and travel related equipment, 3) provide appropriate medications for the prevention or treatment of specific travel-related conditions, 4) administer required, recommended, and routine vaccinations, 5) maintain a database of all travel clinic encounters including, but not limited to, immunizations provided, destinations visited, and type of traveler, 6) document financial viability of the travel clinic service, 7) educate the university students, faculty/staff, and the general community on the value of the pharmacist-run travel clinics 8) and serve as an educational site for students, residents, and fellows.

Prior to the establishment of the ITHC, collaborative practice relationships between the university pharmacy, student health and family medicine were already in place for other patient care programs. A practice protocol and policy and procedure was written by school of pharmacy faculty and approved and signed by the medical directors of the university student health center and family medicine. Student health and family medicine staff created a template in the clinic scheduling system to schedule travel patients separately for the pharmacist providers, and organized reception staff to send out and receive necessary documents. At the student health center location, practice space was arranged by student health staff and nursing staff was organized to support immunization orders from the pre-travel health pharmacist providers. At this location student health staff conducts scheduling and billing, and visit fees are included as part of student health center fees of which the school of pharmacy receives a portion. Each traveler receives a 30 minute consultation from the clinical pharmacist and immunizations are administered by nursing staff. At the medical center location, the ITHC is adjacent to the university pharmacy, which allows the pharmacist to facilitate filling prescription medications and show the patient nonprescription medications and travel related equipment. Each traveler is charged a consultation fee and charged for any vaccines or medications received from the pharmacy. The visits are 1 hour long allowing for a 30 minute consultation followed by

administration of vaccines by the clinical pharmacist in a private exam room. Billing is fee-for-service and payment is collected at the pharmacy. The ITHC is an official yellow fever vaccination site and is listed in the travel clinic directories on the websites for the Centers for Disease Control and Prevention (CDC) and the International Society of Travel Medicine (ISTM). Two and three full clinic days a week are offered at the student health location and the medical center location, respectively. The clinics are staffed by full-time residency-trained pharmacist faculty with Certificate of Knowledge in Travel Health (CTH®) from ISTM.

Outcomes

Due to the extremely high demand for pre-travel health services, patients are occasionally seen by the non-specialist, non-pharmacist primary care providers (PCPs) when the pharmacy clinic schedule is full. The quality of care of pre-travel health services was not measured prior to the establishment of the pharmacist-run service, so it is not possible to provide pre and post quality of care outcomes. However, a quality assurance study was conducted for the entire year of 2007 at the student health center location and included outcomes for both pharmacist and non-pharmacist providers, and the pre-travel care given by the ITHC was by far superior to the care provided by the PCPs. Of the 513 patients included in the study, 342 were seen in the pharmacist-run ITHC and 171 by PCPs. Patients who were seen in the ITHC were more often recommended antibiotics for travelers' diarrhea when indicated (96% vs. 50%, $P < 0.0001$), and patients who were seen by a PCP were more frequently prescribed inappropriate antibiotics for travelers' diarrhea (21% vs. 3%, $P < 0.0001$). In addition, those who were seen in the ITHC were more likely to receive their medication (75% vs. 63%, $P = 0.04$). Patients who were seen in the ITHC were more often prescribed antimalarials when indicated (98% vs. 81%, $P < 0.0001$) and patients who were seen by a PCP were more frequently prescribed inappropriate antimalarials (19% vs. 2%, $P < 0.0001$). Patients who were seen in the ITHC were ordered vaccines more often when indicated (99% vs. 90%, $P < 0.0001$), and patients who were seen by a PCP were more frequently recommended inappropriate vaccines (17% vs. 4%, $P < 0.0001$).

Barriers: The ITHC is the only service of its kind in the university and has served as a model for other academic institutions and pharmacists interested in establishing their own pre-travel health practices. The ITHC sites serve as practice sites for community pharmacy practice and primary care residents, pharmacy students, medical residents, and infectious disease fellows. As with any successful practice, barriers to implementation have existed. An initial challenge was the lack of a structured support system from clinic staff to schedule patients and to send out to and receive pre-appointment travel history forms from patients. This challenge was overcome by maintaining constant communication with clinic staff and supervisors, participating in staff meetings and clarifying the function and need for the forms, and training new clinic staff. Also, most clinics are used to doing same day appointments, but the travel clinic requires construction of a patient specific travel counseling book, thus appointment schedulers had to be trained to schedule travel patients appropriately. Other providers had to become comfortable with our

skills before they started referring patients, and protocol had to be signed to allow the pharmacist to order vaccines, medications, and serology. Another barrier to rapid expansion, specifically at the medical center site, is the lengthy visit time for each patient. Each visit is one hour long to accommodate the time it takes to educate, vaccinate, help the patient select non-prescription medications and equipment, process prescription medications and resolve any third party insurance issues. This process flows efficiently when the pharmacy staff processes the patients' prescriptions and clinic visit fees once the ITHC pharmacist has completed the pre-travel education session and is administering immunizations. The ITHC strives to provide exemplary service to patients and upholds high standards in patient care. As described above, ITHC pharmacists ensure that patients receive critical information, and appropriate medications and immunizations with regard to their specific destination and itinerary details.

Advice and Lessons Learned: An area of improvement for our practice is the need to increase marketing of the program beyond referrals from our own clinicians to other community-based physicians as well as developing an internet presence to enhance self-referral. Schools looking to develop this type of practice first need pharmacists with the knowledge and skills to run a travel medicine clinic, but the topic is infrequently taught to any large extent at schools of pharmacy nor in PGY1 residencies. If the school already has an overseas or study abroad program, the travel medicine clinic would be an essential service to those students. Student health and family medicine will be your best partners, largely because their knowledge is general, but they are more likely to see the traveling population. Lastly, the school must invest in commercial software programs to run an efficient program.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

Major depressive disorder is common yet often unrecognized in many primary care settings. Since 2002, a psychiatric pharmacist–run depression consult service was established in the LAC/USC Rheumatology Clinic. On any given morning of clinic, approximately 50 patients are seen by 5 rheumatology fellows and 6 medical residents supported by 3 attending rheumatologists who are faculty in the USC Keck School of Medicine. Patients with depressive symptoms who might need antidepressant therapy who are not already being seen by a mental health provider, as well as patients who are currently taking an antidepressant for depression are referred to the psychiatric pharmacy faculty member for a more detailed evaluation of their depressive symptoms and treatment. If patients meet criteria for major depression and consent to treatment with antidepressant medication, the psychiatric pharmacist recommends a treatment plan to the referring rheumatologist. Since patients are typically seen every 3 months by their rheumatologist, the psychiatric pharmacist schedules more frequent separate follow-up appointments to evaluate antidepressant therapy, including dosage adjustment and management of adverse effects, as well as assessment of treatment adherence.

Administrative Model: During initial meetings regarding establishing a psychiatric pharmacy practice within the LAC/USC Rheumatology Clinic, the chief of rheumatology expressed interest in not only improving the care of his patients with major depression, but also improving the ability of the rheumatology fellows and attendings to identify and treat major depressive disorders. For that reason, the practice model chosen was that of active collaboration in which the psychiatric pharmacist sees patients separately from the rheumatologists, writes a consult note in the medical record, and verbally consults with the referring rheumatologist who is responsible for writing prescriptions when needed. The psychiatric pharmacist sees patients separately from the rheumatologist for both initial evaluations and follow-up appointments.

Faculty Role: This consult service is provided by a psychiatric pharmacy faculty member one morning per week. Each of the school of pharmacy's ambulatory care pharmacy residents have clinical rotations in this clinic, which allows them to become more sensitized and more skilled in recognition and treatment of depressive disorders in primary care settings. Final year PharmD students also rotate in this clinic as part of their ambulatory care APPEs to add a psychiatric component to their experience.

Benefits and Barriers: The benefits of this consult service include an improved recognition and treatment of patients with depressive disorders in this clinic, increased knowledge and skills of medical staff regarding depressive disorders, and an excellent site to add a psychiatric component for ambulatory care pharmacy residents and students. A barrier to this practice is that clinic services run by pharmacists are very time-intensive, since precepting residents and student pharmacists occurs only when patients are seen.

Outcomes

Analysis of the first 100 patient consultations seen by the psychiatric pharmacist found that approximately 25% of referred patients did not meet criteria for major depression and antidepressant treatment was not indicated, thereby reducing the risk of exposure to adverse effects and/or inappropriate therapy when none was necessary. 35% were referred to the psychiatric clinic since more than antidepressant medication treatment was indicated, and 40% of patients were kept in the rheumatology clinic and initiated or continued on antidepressant medication. Patients treated for depression the year before the consult service began (control) were retrospectively compared to the patients treated for depression in the first year by the psychiatric pharmacist (intervention) (1). Some key differences included the finding that patients seen by the pharmacist were more likely to receive dose titration and higher doses in comparison to those seen by the physicians. Medication adherence was statistically greater at the 3-month (0.82 vs. 0.61, $p = 0.001$) and 6-month intervals (0.83 vs. 0.58, $p = 0.002$) for the intervention group in comparison to the control group. 37% of the control group discontinued antidepressant therapy by the third month versus 4% in the control group ($p = 0.01$).

(1) Lam TT, Stimmel GL, Tesoro JT, Quismorio, Jr. FP. Outcomes of a Psychiatric Pharmacy Consult Service Implemented Within a Rheumatology Clinic, presented at the Western States Conference for Pharmacy Residents, Pacific Grove, California, 2004.

Future Practice Model/Advice & Lessons Learned: Establishing a depression consult service within a non-psychiatric clinic setting adds a unique experience for both medical staff and pharmacy residents and students. Providing this consult service once weekly also yields much value without a significant time commitment of the faculty member. While a psychiatric component is a major part of the training of family medicine physicians, it is not a usual component of the training of ambulatory care pharmacy residents or students. Bringing specialists into primary care and other clinic settings is one option to enhance the experiences of pharmacists who will practice in primary care settings.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

In September 2008, the University of Tennessee College of Medicine (UT COM) partnered with the University of Tennessee College of Pharmacy (UT COP) to provide pharmacist services to a primary care clinic located within an academic medical center. The clinic serves as the primary training location for UT COM internal medicine resident physicians. The staff includes one medical director, five attending physicians, 27 internal medicine residents, three faculty pharmacists, one nursing director, and two nurses. Several years prior to this partnership, the medical center provided pharmacist services to this clinic. Though physicians were aware of potential expanded pharmacist's roles within a clinic, services were terminated due to financial restrictions before these services were expanded to direct patient care.

Administrative Model: Through an affiliation agreement with the academic medical center, three pharmacists each participate in a rotating schedule to provide patient care within the clinic. The pharmacists are currently developing a collaborative practice agreement that will increase the role of pharmacists in providing direct patient care. This will include a protocol that will allow the pharmacists to add or adjust drugs within a defined scope of practice with continued physician follow-up between pharmacist's visits. The faculty pharmacists are fully-funded by the UT COP, and patient care services are currently being provided no cost to patients. However, there are plans to implement an incident-to physician care billing process in the near future.

Faculty Role: Three pharmacists are responsible for the provision of 1 FTE of patient care at this clinic. Pharmacist services include medical record reviews, drug therapy recommendations, patient counseling, and direct patient care. For medical record reviews, pharmacists review charts for patients scheduled with medical residents later that day, identify drug therapy problems, and provide written recommendations. During the afternoon, the pharmacists are available to counsel patients about medications and make verbal therapeutic recommendations as medical residents present patients to attending physicians. Direct patient care services by pharmacists are currently being implemented for patients with diabetes mellitus, with plans to expand to other chronic illnesses in the future. Pharmacist appointment times are currently allotted within three half days per week for a total of 12 hours. No medication distribution functions are performed. Pharmacist appointments are made upon physician referral within the

clinic, primarily for patients needing additional assistance achieving goals of therapy. A scheduling protocol has been established in which the patient must be seen by a medical resident at least once between each pharmacist appointment. This was established to ensure that the medical residents continue to benefit from the experience of actively managing diabetes collaboratively with the faculty pharmacists. Once a collaborative practice agreement is implemented, pharmacists will make therapeutic adjustments at their appointments and recommend follow-up considerations for the medical resident at the next appointment. The pharmacists also assist in weekly primary care-related topic discussions for the medical residents. In these discussions, pharmacists provide expanded information on appropriate drug use for conditions commonly encountered in primary care.

On a weekly basis, pharmacist time is distributed as follows: 40% medical record review with written recommendations prior to clinic, 30% direct verbal recommendation to residents and attending physicians while in clinic, and 30% direct patient care through pharmacist appointments. The pharmacists integrate education of up to 5 student pharmacists in introductory pharmacy practice experiences, up to 3 student pharmacists in advanced pharmacy practice experiences, as well as PGY-1 and PGY-2 pharmacy residents.

Outcomes

No economic, clinical or behavioral patient outcomes are available at this time. However, this clinic has recently joined a pharmacist practice-based research network and has been awarded external funding for a research project. This research will focus on improved clinical outcomes through a collaborative care model for patients with diabetes mellitus. The three pharmacists at this clinic have positive preliminary results from another site (results to be published at completion). Data will be collected on enrolled patients for 12 months following the March 2010 implementation date, and enrollment is expected to be completed by fall 2010. Annual quality improvement assessments will be conducted after transition to electronic medical records, which begins January 2010.

Barriers to Implementation: The UT COP uses this clinic as an experiential teaching site for students and pharmacy residents. The faculty members are able conduct research and scholarship in conjunction with their patient care activities at the clinic. The collaboration also benefits the UT COM through provision of a multidisciplinary patient care and enhanced education of medical residents. The medical residents provide patient care in the inpatient setting; therefore, the hospital may also benefit from improved medication use based on the expanded education the residents receive within the practice setting. Limited space for patient care (i.e., examination rooms) is a primary barrier that restricts the amount of time that is available for direct patient care from the faculty pharmacists. The three half-days that were selected for pharmacist appointment times were the times with the least number of other providers in the clinic.

Advice or Lessons Learned: The implementation of a collaborative practice agreement will increase the role of the pharmacists and it will provide reassurance to the medical director that adjustments made to each patient's treatment plan will be done in accordance with prevailing clinical practice guidelines. One of the many keys to success when developing an interdisciplinary patient care model in primary care is ensuring appropriate and continual communication among all key stakeholders.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

In September 2007, the University of Tennessee College of Pharmacy (UT COP) partnered with an academic medical center to integrate clinical pharmacy services at a hospital-affiliated primary care clinic within the community. Pharmacist services are provided through both multidisciplinary and interdisciplinary strategies: based on individual patient needs; some patients are seen by pharmacists on the same day as their physician visit and some are seen by pharmacists by appointment in-between physician visits. The clinic is staffed with two internal medicine physicians and two family medicine physicians, three clinical pharmacists, and four nurses. The majority of the patients have private insurance, with the remaining insured as follows: 18% Medicare, 4% state Medicaid, and 3% self-pay.

Administrative Model: A general scope of practice and process was developed for pharmacist involvement. Disease-specific collaborative practice agreements and protocols are planned for the future. Pharmacists consult with the primary care physician before implementing drug therapy adjustments, laboratory monitoring, or referrals. Currently, pharmacist care services are being provided at no cost to patients. The long-standing relationship of the UT COP, the academic medical center and its department of pharmacy fostered the upper-level facilitation of the pharmacists' involvement in this practice site.

Faculty Role: Three pharmacists are responsible for the provision of 0.5 FTE of patient care at this clinic. Direct patient care is primarily provided through pharmacist appointments which are allotted 4 half days per week for a total of 16 hours. No medication distribution functions are performed. After implementation of pharmacist appointments at the clinic, the average number of pharmacist appointments has been 45 visits per month. When no appointments are scheduled, pharmacists typically perform chart reviews for upcoming physician appointments, to provide both therapeutic recommendations and suggest patients who may benefit from pharmacist referral. Faculty members assigned to this clinic each month typically serve as secondary preceptors for up to 3 student pharmacists in advanced pharmacy practice experiences (APPE). They also serve as preceptors for up to 5 students on introductory pharmacy practice experiences (IPPE) in the second and their years of the curriculum.

Outcomes

Pharmacists are conducting an ongoing practice-based research project, as part of a larger network, which assesses the impact of pharmacist-physician collaboration on diabetes outcomes and quality improvement in care. Preliminary results of this project suggest significant reductions in A1C, LDL, total cholesterol, and diastolic blood pressure. Also, significant improvements are being demonstrated for achievement of Healthy People 2010 goals of urine microalbumin and A1C screening, and proportion of patients achieving an A1C less than 7%. Follow-up data collection for this project is expected to be completed by January 2011. When finalized, these data, including those from clinic sites who are also part of the research network, will be submitted for publication.

Barriers and Benefits: The academic health system operates the primary care network to which this clinic belongs. The desired benefits to the health system include improved patient and physician satisfaction and improved physician efficiency. Physician satisfaction has been documented through surveys, but patient satisfaction related to pharmacy services has not been specifically evaluated. Multiple factors influence physician efficiency, which proves difficult to objectively evaluate. Responses from the physician satisfaction surveys have indicated a perceived improvement in efficiency. The UT COP benefits from the opportunities for placement of IPPE and APPE students and pharmacy resident education. Also, faculty members are able to engage in practice-based research in conjunction with their patient care responsibilities. The agreement between the UT COP and health system is for pharmacist-generated net revenue through direct billing to go to the UT COP. However, the current patient volume and billing reimbursement are insufficient to justify the overhead costs for implementing a system for billing.

During pharmacist appointments, delays are encountered because pharmacists must discuss therapeutic plan implementation while physicians are conducting their own appointments. These time delays have been noted by the pharmacists, but to date have not been addressed as concerning by either physicians or patients. This delay issue should be alleviated once collaborative practice protocols are implemented. An initial concern was the availability of space to see patients. This issue was resolved when the physicians were able to identify an examination room that was not in regular use and could be operated on a scheduled basis by the pharmacists.

Advice and Lessons Learned: Based on our experiences, all stakeholders, including physicians, should be involved early and come to agreement as to the overall goals of establishing clinical pharmacist services in the primary care setting. Timelines may be useful in the development process for major milestones (e.g., collaborative practice agreements, student and resident rotations, billing). In this practice setting, pharmacists had never participated in patient care, which required a mutual exchange and agreement on rationale, process, and expectations.

Clinical pharmacists can develop mutual trust with collaborating physicians through involvement with direct patient care in a stepwise manner (e.g., involvement with patients requiring intervention on the same day as physician appointments).

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

The University Health Network Antimicrobial Stewardship Program (ASP) is a multi-disciplinary team whose focus is to ensure that the right patients are receiving the right antibiotics. An outpatient parenteral antimicrobial program (OPAT) is one of the initiatives of the ASP. The OPAT pharmacist is also an assistant professor at the Leslie Dan Faculty of Pharmacy at the University of Toronto.

The OPAT multi-disciplinary model consists of a pharmacist working closely with an Infectious Diseases physician, a project manager, and a data analyst. There is also a great deal of collaboration with the following constituents:

- inpatient units (MDs, pharmacists, and nurses),
- community partners such as Community Care Access Centers (CCACs) who arrange home care services including nursing, personal care, blood technicians
- community pharmacies (such as Calea) specializing in the preparation of intravenous products

Administrative Model Medical directives and delegated acts were not developed as the pharmacist and the physician work closely together and share a mutual understanding. In collaboration, guidelines around entry criteria and monitoring parameters for the various anti – infectives were developed and are being utilized. ASP program funding covers the pharmacist, data analyst, and project manager salaries, while the physician bills directly to the government.

Faculty Role/ Staff Pharmacist Role:
The pharmacist in collaboration with the physician performs the following:

- leads the development of the structure and process flow of the program
- receives notification of patients being referred to the program
- conducts initial assessment to determine eligibility
- ensures that the patient has been educated about the program
- works with the patient to develop a care plan
- conducts follow-up patient assessment and adjusts the plan as needed
- discharges the patient from the service
- maintains an up-to-date database of the patients to whom care has been provided

This program is just being launched, and as such, a breakdown of time spent on varying activities cannot be determined.

Benefits and Barriers: Our program facilitates seamless care from the inpatient to the outpatient setting to improve care elements such as timely assessment of lab values, and therapeutic drug monitoring. This is a newly developed service but we do hope that inpatient providers, the institution and patients will all benefit from reduced lengths of hospital stay, patient readmission, and relapses while on outpatient antimicrobial therapy.

Logistical barriers exist that are related to the flow of information between the inpatient environment and the community care providers, because of the necessity to protect patient privacy. With the support of our hospital management team, negotiations continue with external sources. These negotiations emphasize the importance of collaboration and the role of pharmacists, specifically their contribution to long term monitoring of drug therapy.

This program will provide a unique learning opportunity for student pharmacists and residents, medical residents and fellows. Mentorship for practicing pharmacists who want to establish similar programs is also an educational goal for our program.

Outcomes

Our program is being set up to demonstrate impact and outcome measures and as such we are seeking research ethics approval to be able to publish this information once it becomes available. We hope to be able to show outcome measures of:

- patient satisfaction with care
- reduced re-admission for complications related to outpatient intravenous antimicrobial use
- more timely discharge from hospital
- fewer access device complications

In the long term we also hope to show reduced hospital stays for various infectious disease diagnoses. This outcome would result in a cost savings for the organization while maintaining a high quality of care.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

This primary care community practice provides team-based patient care to both ambulatory and home-bound elderly individuals. Health professional team members involved in providing this comprehensive care include a chiropodist, a dietician, a nurse, a nurse-practitioner, a pharmacist, physicians, and an occupational therapist. The team also consults with others such as a psychogeriatrician from the area teaching hospital. One of the mandates of CHCs include health promotion and disease prevention. To meet this goal, in addition to individual clinical services, the centre's health promoters plan health-related educational workshops for patients and individuals in the community. The health care team is also involved in delivering these educational programs.

Administrative Model: The administrative model is based on an interdisciplinary care model. As physicians, pharmacist and nurses work closely, care plans and recommendations for therapy are discussed and medical directives are not used. All health professionals at this site are salaried by the Ontario Ministry of Health and Long-Term Care. The clinical staff report to a clinical coordinator and an Executive Director. The health care team meets both formally and informally to discuss patient-related issues. The clinic receptionist books patient appointments for all health professionals.

Faculty Role/Staff Pharmacist Role: The home-based care for the elderly is a unique program called the Seniors Home Health Program (SHHP). Without this program, many elderly will not have access to health care services. The average age of patients enrolled in this program is 80 years of age. The team provides comprehensive, holistic, patient-focused care regular with follow-up care. The staff pharmacist at this site is also an Associate Professor at the Leslie Dan Faculty of Pharmacy. Patients may be referred to the pharmacist by any of the team members or they may self-refer. For homebound frail elderly, the pharmacist (and the team) visits the individual in his/her home to assess their drug-related needs. By working closely with patients and/or their caregivers, the pharmacist identifies their health and treatment goals and identifies all relevant drug therapy problems. The pharmacist works closely with the patient/caregiver and the team to develop a comprehensive care plan. Each member of the team contribute to the care plan and follow-up is done through home visits or by telephone. All ambulatory seniors are seen at the clinic where they receive pharmaceutical care.

Benefits and Barriers: The SHHP, through comprehensive home based case, allows individuals to stay in their home longer and minimizes hospital admissions. All health professionals have a common documentation chart (which is now being converted to electronic documentation) which enables easy sharing of client information. The pharmacist also provides on-site experiential training for students in the post-BSc Doctor of Pharmacy program. A primary component of the pharmacist's role is educating patients on their medications; a better understanding enhances adherence to drug therapy.

Several of the health care professionals at this site work part-time which requires creative strategies to maintain communication regarding client care. For ambulatory seniors, the pharmacist contacts the patient's community physician, which can be a challenge, especially as the pharmacist is not available full-time. With respect to sustainability, the positions are dependent on ongoing provincial government funding.

Outcomes

An evaluation of the pharmacist providing pharmaceutical care to ambulatory seniors was initially done as a pilot project over 6 months. Based on the significant number of drug therapy problems identified and resolved, the centre provided funding for a pharmacist on an ongoing basis. The pharmacist's role at this centre has been reviewed as a model at other centres. The benefits of the pharmacist is also seen through referrals from physicians external to the centre. The physicians and the pharmacist have been invited and presented this interdisciplinary care model at various local and provincial conferences.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

We are a community based Family Health Team (FHT) serving a large and diverse community in downtown Toronto, Canada. The team consists of 13 family physicians, 2 nurse practitioners, 3 RNs, 2.5 social workers, 1 dietitician, 1 diabetes nurse educator, 1 diabetes program dietician and 1 pharmacist who spends 50% of her time with the team. A psychiatrist and psychiatry resident work 1 day per week.

In our FHT, we have a lead physician and an administrator. The team reports to these individuals and in turn, our administrator reports to our liasion at the Ministry of Health. The administrator reports on the work we do and plans for the future and the Ministry funds accordingly.

The pharmacist (currently 0.5FTE) spends 100% of her time involved in direct patient care activities (no distribution role). She is involved in chronic disease management, with an emphasis on INR monitoring, hypertension and respiratory care. She also provides drug information to the team and assists with drug selection, as needed.

The major stakeholders are the government (MOH) with regards to fiscal responsibility and providing more accessible, interdisciplinary care. Our patients are primary and important stakeholders.

A barrier for the pharmacist is lack of funding for a full time position as this limits her role at the FHT. With more time at the FHT, I believe I could provide more of my valuable services to a greater number of patients who need them.

The FHT is a multi-disciplinary educational hub and provides placements for medical residents, social work and dietetic students as well as student pharmacists.

Outcomes

While no formal outcome measures exist at this time, numerous testimonials (both letters and videos) praising our team-based approach to care have been received from patients.

Continued/increased funding to have more pharmacists in FHTs and similar practice settings will strengthen this practice model. The public/medical community is still not fully aware or appreciative of the role of the pharmacist in the FHT; however, as more and more pharmacists enter this type of practice setting, this awareness will change and patients will benefit from full integration of pharmacists, and the care they can provide, into this primary care practice model.

The Faculty of Pharmacy deems this program, 'successful' as it brings together in a meaningful and functional manner an impressive roster of health care professionals to serve a large number of patients in an integrated team approach, while providing extensive educational opportunities for learners from several health professions.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

The McMaster Family Health Team (FHT), located in Hamilton, Ontario, Canada is an academic FHT with a dual mandate of training future health providers in an interprofessional model while providing comprehensive primary care services for nearly 30 000 patients. The FHT consists of 2 teaching units: McMaster Family Practice and Stonechurch Family Health Centre which conduct approximately 70 000 patient encounters per year. There are 25 academic full-time physicians and 8 community or part-time faculty physicians. Other professional staff includes 15 nurses (8 nurse practitioners, 1 registered nurse, and 6 registered practical nurses), 6 social workers, 2 dietitians, 3 pharmacists, a lactation consultant and a chaplain; all work in various combinations of full- and part-time positions, with some shared staff between the units. On site-consultations are available from psychiatry, geriatrics, internal medicine and palliative care.

Most of the learners in the units are family medicine residents and undergraduate medical students, with more than 55 family medicine residents based in the 2 units, with more than 15 of them working full-time during any 1 period. There are also nurse practitioner, social work, dietitian, pharmacist and midwifery students. Funded through the Ontario Ministry of Health and Long-Term Care, the McMaster FHT employs 1.8 full-time equivalent pharmacists. Given the highly collaborative nature of practice, the FHT has found medical directives necessary for expediting patient care only in select circumstances including warfarin and insulin dosing and laboratory test ordering.

In their clinical practices, pharmacists do not have medication distribution responsibilities and are able to devote at least 70% of their time to their roles as clinicians, working collaboratively with other health providers to prevent, identify and resolve drug-therapy problems for patients with a variety of acute and chronic conditions, and educators. The remaining 30% of pharmacist time is spent leading the planning, delivery and evaluation of programs for chronic diseases.

As educators of family medicine residents, pharmacists are appointed to the Department of Family Medicine, McMaster University and our full-time pharmacist is also appointed to the Leslie Dan Faculty of Pharmacy, University of Toronto. A large proportion of interprofessional education on-site occurs through the provision of patient care and it is not unusual for students from one profession to be supervised through a clinical case by a supervisor from another profession (e.g., pharmacist supervising medical resident, nurse practitioner supervising student pharmacist). Pharmacists also provide formal teaching sessions for learners and our full-time pharmacist tutors family medicine residents through their scholarly project and evidence-based medicine curricula.

Experiential rotations are provided by the pharmacy team for post-baccalaureate pharmacy residents and Doctor of Pharmacy students. Our pharmacy team is also in the midst of trialling employment of an undergraduate pharmacy co-op student from the University of Waterloo. The FHT's capacity for providing additional rotations for pharmacist learners is limited primarily by physical space considerations though undergraduate pharmacist learners are welcomed for short exposures to family health team practice.

Anyone desiring additional information about our program and culture are referred to: Price D, Howard M, Hilts L, Dolovich L, McCarthy L, Walsh AE and Dykeman L. Interprofessional education in academic family medicine teaching units: A functional program and culture. Can Fam Physician, September 2009; 55: 901 - 901.e5.

Outcomes

The Faculty of Pharmacy deems this program, 'successful' as it brings together in a meaningful and functional manner an impressive roster of health care professionals to serve a large number of patients in an integrated team approach, while providing extensive educational opportunities for learners from several health professions.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

The Family Health Team (FHT) is an academic teaching unit that provides primary care to a surrounding community of approximately 12,000 people, with special attention to the needs of the aging population, children, women and those with chronic diseases. The FHT is part of the University Health Network (UHN), one of Canada's largest teaching hospitals, affiliated with the University of Toronto. Our interprofessional team includes approximately 20 physicians, 2 pharmacists, 6 registered nurses, 3 registered practical nurses, 1 dietician, 1 social worker and 1 chiropodist. The FHT is an academic training site for approximately 30 family medicine residents/year and other health professional students, including undergraduate pharmacy and Doctor of Pharmacy students.

In 2008, the FHT became the site for Canada's first and only primary care residency program. This 12-month program provides the resident with experience in a variety of ambulatory settings. The majority of required and elective rotations are completed longitudinally, allowing the resident to maintain continuity of care in the FHT.

The FHT is recognized as a leader in interdisciplinary practice and education. Examples of this include monthly interdisciplinary case conferences, weekly interdisciplinary care rounds, and integrated care rounds with psychiatry. Furthermore, the FHT is currently establishing chronic disease care models whereby role identification, appreciation and allocation are the focus.

The 2 full-time equivalent (FTE) pharmacist positions in the FHT are employed by the UHN and funded from two sources: the UHN and the Ontario Ministry of Health and Long-Term Care. The pharmacists have academic appointments to the Faculties of Pharmacy and the Department of Family and Community Medicine at the University of Toronto.

Approximately 75% of the pharmacist's time is allocated to direct clinical patient care services. The role of the pharmacist is focused in several areas:

1. Chronic disease management:
    a. Anticoagulation Monitoring and Management of warfarin therapy: Pharmacists operate under a medical directive and assume responsibility for providing education and ongoing monitoring for > 200 patients on warfarin therapy.
    b. Medication reconciliation: All new patients over the age of 65 and any patients recently discharged from hospital are automatically booked for medication reviews with the pharmacist.

c. Diabetes care: Pharmacists work in collaboration with physicians and the interprofessional team to manage patients with diabetes which includes insulin initiation and monitoring.
d. Chronic Pain: Pharmacists work in collaboration with physicians and the interprofessional team to manage pain in complex, chronic pain patients.

2. Medication Management: Patients can be referred or self-refer to the pharmacist for comprehensive medication reviews. Monitoring and follow-up of pharmacotherapeutic recommendations are carried out via telephone or clinic visits.
3. Medication Triage: The Pharmacist manages all medication-related telephone calls and walk-in appointments for medication-related issues.
4. Patient Education and Drug Information: In addition to the provision of education to patients within our FHT, the pharmacists are involved with group and one-one education sessions for patients of the Diabetes Education Centre, the Falls Prevention Program and Seniors Wellness Program at UHN.
5. Teaching: Pharmacists are responsible for providing clinical training and teaching for undergraduate pharmacy students, pharmacy residents, Doctor of Pharmacy students and medical residents and other health professional groups. The FHT takes an average of 6-8 students per year.

Outcomes

Pharmacists are involved in research within the FHT in various areas including medication risk assessment, interprofessional care and diabetes. They are also expected to supervise both pharmacy and medical resident research projects.

Sample citations:

- Papoushek C. Developing a Collaborative Care Model for Diabetes Care in a Family Health Centre – A Qualitative Study, Department of Family and Community Medicine (2007-08)
- Waters, I., Barker, K. K., & Kwan, D. (2005). Interprofessional care training program pilot project (short reports). Journal of Interprofessional Care, 19(2), 174-175
- Kwan D, Oandasan IF, Barker KK, Waters I, Dickson A, Herr G, et al. Implementation of an Interprofessional Education Curriculum in a Primary Care Setting: Key content and skills for successful Interprofessional Education initiatives (poster presentation). Canadian Association of Continuing Health Education (CACHE). Calgary, AB, 2005, September 24 - 26.
- Kimpton S and Papoushek C. An Investigation into Risk Reduction Strategies and Goals to Decrease Cardiovascular Risk for Patients with Type 2 Diabetes. Department of Family and Community Medicine, Toronto, Ontario (2002-03)

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- Siu V, Cameron K, Marr P, Hamandi B, Fernandes O. Post-hospital discharge: Medication discrepancies and drug therapy problems in primary care. Canadian Society of Hospital Pharmacists Professional Practice Conference, January 2010 (poster presentation)
- Leung V, Kwan D, Banez C, Nasmith L. The Use of Benzodiazepines for Insomnia in Older Adults: Effect of Group Education on Readiness to Change and Knowledge. Professional

Practice Conference, Canadian Society of Hospital Pharmacists, Toronto, Ontario, February 2006 (Abstract published in the Canadian Journal of Hospital Pharmacists 2006; 59 (suppl 1):50)

- Langford, B, Jorgenson D, Kwan D, Papoushek C. Implementation of a Self-Administered Questionnaire to Identify Patients at Risk of Medication-Related Problems in the Family Health Centre. Pharmacotherapy 2006; 26(2): 260-68.

Successes, Barriers and Future Practice Considerations: The integration of the pharmacist within the FHT has been successful as evidenced by the evolution of the role over the last ten years. In addition to direct patient care activities, the pharmacists are actively involved in teaching, research and FHT program planning and development. As such, balancing administrative and clinical time has been a challenge. With support from the FHT and Department of Pharmacy administration, we have been successful in increasing the FTE complement from 0.75 to 2 FTE and we are currently awaiting approval for an additional 0.5 FTE. Recognizing the growing demand for pharmacists in family medicine practices in Canada resulted in the creation of our specialized residency in primary care.

In an effort to improve efficiencies and quality of care, our future goals will include the establishment of additional collaborative practice agreements pertaining to chronic disease management (diabetes, hypertension, hyperlipidemia). We are currently partnering with the Leslie Dan Faculty of Pharmacy to explore the development of an elective course in Primary Care Pharmacy Practice. The intent of this course is to expose pharmacy students to the innovative role and opportunities for pharmacists in a family health setting.

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College/School Involvement with Pharmacists Integration in Primary Care Practice
Area of Successful Practice: Primary Care Practice Model

Description

Harborview Medical Center (HMC) is one of the nation's leading academic medical centers, the county hospital for the greater Seattle area and the only Level 1 adult and pediatric trauma and burn center serving Washington, Alaska, Montana and Idaho. A part of UW Medicine, which also includes the University of Washington Medical Center and Seattle Cancer Care Alliance; HMC serves a broad spectrum of patients including the indigent, non-English speaking poor, mentally ill and incarcerated. HMC provides ambulatory care services through multiple primary and specialty care clinics where 24 clinical pharmacists play a critical role on interdisciplinary teams in all seven primary care and multiple specialty care clinics. These clinical pharmacist specialists are located within the provider room where attending physicians oversee the practice of medical residents. This co-location enables pharmacists to closely partner with the healthcare team and provides multiple opportunities for teaching and clinical interventions.

Administrative model: Washington State has liberal collaborative drug therapy management (CDTM) practice laws where upon referral; pharmacists are responsible for starting, stopping and adjusting medications in order to meet therapeutic goals. HMC found this model of practice allowed the greatest flexibility in caring for primary care patients with multiple chronic conditions. The protocols are based on the current literature and allow the pharmacists to use their clinical judgment to select a drug therapy regimen that best suits the patient's conditions, goals and lifestyle. A description of the practice model was published by ASHP in "Collaborative Drug Therapy Management Handbook", editors Tracy and Clegg. The CDTM agreement is signed by the Ambulatory Care Medical Director on behalf of all HMC clinic physicians.

Pharmacists also participate in public health initiatives including the management of the Smoking Cessation program and involvement in various health literacy projects including translating patient information sheets into multiple languages.

Pharmacists bill for services using the *facility fee* portion of a clinic charge (CMS-recognized providers also charge a *professional fee*) based on visit time and intensity. These visits require documentation in the medical record, which includes time spent on patient education. In order to bill for services, our pharmacists undergo the same credentialing process as physicians and

includes a scope of practice document and source verification of their education, training, licensure and credentialing.

Clinical faculty role: Every clinical pharmacist is an affiliate faculty member at the University of Washington School of Pharmacy and provides ongoing learning opportunities to PharmD students throughout their four years of education and training. Our pharmacist preceptors are lab instructors and didactic lecturers and are well-known to our students throughout their schooling. Not only are HMC clinics very popular APPE sites and routinely have several PharmD students (about 40 per year) and pharmacy residents on clinical rotations, but students are also able to complete IPPE requirements in our six ambulatory dispensing pharmacies. A recent IPPE project had P2 students participating in the HMC-wide medication reconciliation program. Students conducted patient interviews to obtain complete medication histories and entered the information into the electronic medical record in preparation for medication reconciliation go-live.

UW Medicine has trained hundreds of pharmacy residents since 1978. In 2007, a 2-year pharmacy administration residency program was created in concert with the Master in Health Administration degree to address the impending pharmacy leadership gap. Graduates of the program have successfully entered health-system leadership roles immediately following completion of the program.

Additionally, HMC has developed a rigorous, integrated and comprehensive 4-year internship program that is structured to coordinate pharmacy practice activities with the intern's didactic content which enables the interns to staff as pharmacists and provide integral clinical services during their P4 year. The program also has a leadership track which identifies one student each year who receives additional mentoring and support for pharmacy leadership activities.

Benefits and barriers: Establishing a role for the pharmacist on the patient care team touches several stakeholders:

- **Patients** appreciate the extra time and attention the pharmacists spend specifically on their medication-related issues.
- **Physicians** are under pressure to increase their efficiency by seeing more patients per clinic session so appreciate that opportunity to refer patients with complex medication regimens to pharmacists for management and enjoy the collegiality and expertise that pharmacists bring to the healthcare team.
- **Nurses** can refer patients with medication issues to the pharmacist and rely on their expertise for medication-related patient care services.
- **Administrators** are more supportive when pharmacists are authorized for services (in our case, a facility fee)

With the current pay-for-performance incentives, our clinical pharmacists are full participants in quality improvement initiatives within their clinic and provide leadership for medication-related measures. As compared to non-pharmacist care teams, those with a pharmacist have shown improved HgA1c, blood pressure and lipid management in diabetic patients; improved adherence to evidence-based therapy in patients with congestive heart failure; enhanced adherence to antiretroviral therapy in AIDS patients; and reduced hospitalization/ER visits for children with asthma.

Outcomes

Our clinical pharmacists are actively involved in practice-based research and have been published. Select articles include:

- Simoni JM, Huh D, Frick PA, et al. *Peer support and pager messaging to promote antiretroviral modifying therapy in Seattle: a randomized controlled trial.* J Acquir Immune Defic Syndr. 2009 Dec1;52(4):465-473.
- Brennan C, Riddle S, Lessler D et. al. *Leadership for Cost Effective Medication Use Decisions*. Poster presentation at the UHC Fall Quality and Safety Forum; 2009.
- Erickson TN, Devine EB, O'Young TS, et al. *Effect of Switching Medically Vulnerable Patients with Uncontrolled Diabetes from Isophane Insulin Human to Insulin Glargine.* AJHP 2006;63:1862-71.
- Frick P, Tapia K, Grant P, Novotny M, Kerzee J. *The effect of a multidisciplinary program on HAART adherence.* AIDS Patient Care STDS. 2006 Jul;20(7):511-24.
- Simoni JM, Frick PA, Huang B. *A longitudinal evaluation of a social support model of medication adherence among HIV-positive men and women on antiretroviral therapy.* Health Psychol. 2006 Jan;25(1):74-81.
- Odegard PS, Goo A, Hummel J, Williams KL, Gray SL. *Caring for poorly controlled diabetes mellitus: a randomized pharmacist intervention.* Ann Pharmacother. 2005 Mar;39(3):433-40.
- Kalister H, Newman RD, Read L, Walters (Clegg) C, et al. *Pharmacy-based evaluation and treatment of minor illnesses in a culturally diverse pediatric clinic.* Arch Pediatr Adolesc Med. 1999 Jul;153(7):731-5.
- Hanson L and Brennan C. *Improving Continuity of Care Between Inpatient and Outpatient Management of Anticoagulation Therapy*. California Journal of Hospital Pharmacy, October 1998.
- Brennan C and Woodward J. *Drug Therapy*. In: Spach DH, Hooton TM, eds. The HIV Manual. New York: Oxford University Press, 1996.

Future practice model: Several of our primary care clinics are participating in the National Institute for Healthcare Improvement's "Medical Home Model Collaborative" to better define how this practice model should be designed and delivered. Our objective is to define the role of the pharmacist, demonstrate the tremendous value pharmacists bring to the healthcare team and their strong influence in improving patient outcomes.

Advice and lessons learned: This model works extremely well for us as this partnership between our school-based and clinic-based faculty leverages the strengths of each. The development and expansion of this practice model was greatly enhanced by a supportive and visionary physician champion who has collaborated with us from the very beginning. He is articulate about the positive impact pharmacists have on patient care and outcomes when they are part of the healthcare team. Finally, our clinical pharmacists are the most talented and passionate professionals I have ever had the pleasure to work with.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

Health Centers Detroit (HCD) Medical Group is a private physician practice. Their mission is to deliver quality affordable care to the citizens of Detroit and surrounding area. This is an urban clinic, which provides care to underserved patients with a predominately African American population. HCD participates in the Voices of Detroit Initiative and is a Federally Qualified Health Center Look-Alike. There are a total of 3 practice sites, 12 physicians, 8 medical assistants, and 2 pharmacists within the group. The clinic also serves as a teaching site for medical, pharmacy, nursing, and medical assistant students.

A collaborative practice relationship between HCD and pharmacy practice was developed in the year 1999. Dr. Linda Jaber, professor of pharmacy practice at Wayne State University, volunteered her time one day a week at the clinic. Initially the physicians did not utilize her services extensively, and she began providing patient education. Dr. Jaber's persistence led to the development of a good working relationship with one of the physicians of the group. This ultimately led to the development of a collaborative practice agreement for a comprehensive pharmacist-managed diabetes clinic (PMDC). The PMDC quickly became the main source of diabetes referrals for HCD patients at that site. The diabetes clinic subsequently became a rotation site for student pharmacists, residents, and Dr. Jaber's diabetes research fellows.

A retrospective analysis was conducted to evaluate the effect of the PMDC on glycemic control and adherence to the American Diabetes Association (ADA) standards of medical care guidelines.[1] A random sample of patients referred to the PMDC (n=28) was compared to a random sample of patients managed exclusively by their primary care physician (PCP) for diabetes (n=29). Results demonstrated a significant hemoglobin A1c (A1c) reduction in the PMDC group (10.3 ± 2.1 to 7.9 ± 1.8% ($P < 0.0001$) and a non-significant A1c reduction in the PCP group (8.2 ± 2.8 to 6.8 ± 1.8%, $P = 0.065$). Aggressive antihyperglycemic combination therapy was also more frequent in the PMDC group compared to the PCP group (61 vs. 21%; $P = 0.003$). Furthermore, PMDC patients demonstrated significantly greater adherence to the ADA guidelines when compared to PCP patients. This study highlights the benefits of a PMDC in a private physician practice.

The success of the PMDC, coupled with the new requirements for ambulatory care rotations and the increasing prevalence of diabetes in an urban underserved community, led to the

development of a new position. Dr. Helen Berlie, a former fellow of Dr. Jaber's, was offered a unique clinical faculty position with WSU and HCD. The executive board of HCD believed the addition of a clinical pharmacist to its staff would be an asset to the medical group. They approached the chair of the pharmacy department in pursuit of creating this position and agreed to fund 30% of Dr. Berlie's salary. This innovative position introduced a new reimbursement structure; it became the first clinical faculty position in the department of pharmacy practice to be partnered with a private physician practice. This enabled an expansion of the pharmacy services provided. Dr. Berlie has extended the pharmacist managed diabetes clinic to a second HCD clinic and receives referrals from the majority of providers in the medical group. She spends a total of 3 days a week between the 2 HCD clinics, in addition to Dr. Jaber's half day. At the request of the physicians, Dr. Berlie recently initiated a smoking cessation clinic at HCD.

Faculty responsibilities of Drs. Jaber and Berlie include managing collaborative practice clinics and precepting in an advanced pharmacy practice ambulatory care rotation. The goals of the clinics are to ensure the safe and effective use of medications, enhance compliance with the medical guidelines, increase medication compliance, and ultimately improve patients' quality of care and quality of life. Duties during clinic visits include: diabetes education, medication counseling, instruction on nutrition/exercise, evaluation of home blood glucose logs and adjustment of medication regimen as necessary. Faculty are given prescriptive authority under the delegation of the referring PCP. Capillary blood glucose, blood pressure and weight are taken at every visit, and foot exams are conducted annually. Pertinent laboratory parameters (A1c, fasting lipid panel, electrolytes, etc.) are ordered in accordance with the ADA recommendations. The PMDC also provides support for underserved patients by identifying eligibility for patient assistance programs and facilitating the application process. The designated visit time for initial visits is one hour, and 30 minutes for follow-up visits. The clinical pharmacy services provided by faculty, students, residents, and fellows are intended to facilitate the care provided by PCPs of HCD, ultimately enhancing the continuity of care provided to HCD patients.

The PMDC provides continued assessment and management of diabetes mellitus (DM) and its complications. It also provides cardiovascular risk reduction strategies for the following associated diseases: hypertension, dyslipidemia, obesity, and smoking cessation. Upon the request of the physicians, collaborative drug therapy for these disease states can also be provided in the absence of diabetes. Clinic visits are scheduled separately from PCP visits, however, there is usually a brief interaction between the patient and the PCP. Visits to the PMDC are billed as a level 3 visit under the PCP. Soap notes are used to document clinic visits; the original notes are filed in the medical chart and co-signed by the referring PCP.

Benefits of the PMDC clinic include improved management of patients with diabetes, as mentioned above. In addition, PCPs are afforded more time to deal with more acute medical

issues. The PMDC regularly serves as an ambulatory care rotation site for pharmacy students, residents, and fellows. It also has the potential for revenue for the clinic. The main barrier of the PMDC is related to patients; poor transportation to and from clinic and invalid phone numbers can hinder the ability to provide proper care to patients.

The future practice model is intended to expand the clinical services in support of physician and patient needs. The introduction of a disease prevention/health promotion clinic targeting high risk patients (metabolic syndrome, obesity, increased diabetes risk, etc.) to prevent chronic diseases would be of great benefit to patients, physicians and the health system as a whole.

1.Nowak SN, Renu S, Clarke A, Campbell E, Jaber L. Metabolic Control and Adherence to American Diabetes Association Practice Guidelines in a Pharmacist-Managed Diabetes Clinic. Diabetes Care 2002;25(8):1479.

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College/School Involvement with Pharmacists Integration in Primary Care Practice

Area of Successful Practice: Primary Care Practice Model

Description

The Hendricks Pharmacy International Travel Health Clinic was established in July 2007 to help serve the needs of individuals traveling overseas, particularly to developing countries. The clinic is located in an independent community pharmacy in Claremont, CA that is part of the Good Neighbor Pharmacy Network. The specific goals of this clinic are to maintain patient health by educating patients about health and personal risks and advising patients on good health practices to prevent food-, water-, and vector-borne diseases while traveling abroad. The clinic operates under a collaborative practice protocol with the Chair of Family Medicine at Western University of Health Sciences, College of Osteopathic Medicine of the Pacific. This collaborative practice protocol allows the pharmacists at Hendricks Pharmacy as well as community pharmacy practice residents and student pharmacists from Western University of Health Sciences to administer all necessary vaccines and to order appropriate travel related medications to patients prior to their departure from the United States. The clinic is also recognized as an official yellow fever vaccination center by the Centers for Disease Control and Prevention.

The international travel health clinic is overseen by Karl Hess, PharmD Assistant Professor of Pharmacy Practice and Administration at Western University of Health Sciences, College of Pharmacy. Dr. Hess counsels the majority of patients seen at the clinic; however, residents and student pharmacists from the College of Pharmacy participate in these sessions as well as manage a minority of cases independently. Each patient visit takes approximately one hour to complete, 20 to 30 minutes for counseling, 10 to 15 minutes for vaccine administration, and 15 to 30 minutes for documentation of the service. Visits are documented in a chart note and are also logged into an Excel spreadsheet that contains patient demographic and travel itinerary information, specific travel related risks, pharmacist made recommendations, and products administered and/or ordered for the patient. Hendricks Pharmacy dispenses all medications ordered from the travel health clinic and pharmacists or student pharmacists administer all vaccines at the time of the patient's visit. Insurance plans are billed for services rendered; however, the majority of patients pay out-of-pocket since these services are typically not covered. After the patient's visit, their primary care provider is faxed a standard form indicating which vaccines and/or medications were given to the patient at their time of visit in the travel health clinic.

Benefits of this service include:

1. Increased patient awareness and understanding of travel related risks and measures for their prevention.
2. Increased recognition by physicians and other health care providers of the pharmacist's capability to provide patient specific counseling according to destination and ability to administer immunizations.
3. Training residents and student pharmacists to be able to provide this service and to administer immunizations.
4. Generation of revenue for the pharmacy (the clinic changes an office fee for each appointment)

In the future, a drug information service will be added to this travel health clinic to help better meet the needs of physicians and other health care practitioners in answering patient specific questions regarding the use of vaccines and/or travel related medications.

Outcomes

A manuscript detailing the outcomes of this travel health clinic was recently submitted to the Journal of the American Pharmacists Association for publication. Complete details, including full data and patient outcomes, will be published in the March/April 2010 themed issue focusing on the pharmacist's role in public health.

Primary outcomes include:

1. Approximately 500 patients seen since July 2007
2. 85% of pharmacist made recommendations accepted by patients
3. Statistically significant increases in self-reported patient understanding of travel related issues
4. 96% patient satisfaction with their overall visit to the clinic
5. Patient acceptance of recommendations was significantly correlated with overall satisfaction

Barriers to Implementation: There exists a significant lack of understanding of travel related disease risks and need to receive vaccines and/or medications for their prevention amongst the general patient population. Therefore, much of the time spent implementing this clinic was on patient and provider education on the need to receive vaccines and medications for international travel. Pharmacists, residents, and student pharmacists will also need to be immunization certified and a collaborative practice protocol will need to be established before seeing patients. Pharmacist immunization and collaborative practice protocol laws may vary from state to state.

Lessons Learned: Mailed and in-store advertisements, physician detailing, and presentations to patient and provider groups will help to ensure continuous awareness for the need for travel

health services and may help to maintain a steady flow of patients. The majority of patient visits to this travel health clinic have been during the summertime (i.e. June, July, and August); therefore, an adequate supply of vaccines, syringes, needles, medications, etc are necessary. Unfortunately, vaccine shortages may occur during the summertime, so preparations should be made beforehand.

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