



Call for Successful Practices in Medication Therapy Management in the Curricula by Colleges and Schools of Pharmacy

Full Submissions

December 2011



Note: The information contained in this report has been compiled by the American Pharmacists Association (APhA) and the American Association of Colleges of Pharmacy (AACP) from submissions received in a Call for Successful Practices in MTM Curricula. The information published in this report represents the original, full content submitted by those responding to the call for submissions with minor editing and copyediting modifications required for publication. APhA and AACP assume no responsibility or liability for any errors, omissions, inconsistencies or inaccuracies of the information contained within this report. Further APhA and AACP do not warrant or in any way guarantee the validity, accuracy, completeness or timeliness of the information contained within this report. For further information regarding any of the submissions, please contact the submitter directly.

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A general description of how MTM is incorporated into the curriculum

Medication Therapy Management (MTM) is incorporated into Drake's curriculum in the required Pharmacy Skills and Applications (PSA) series which spans the first (P1) through third (P3) professional years and incorporates lecture, lab, and experiential teaching through Introductory Pharmacy Practice Experiences (IPPEs). MTM is incorporated in the second and third years of the PSA series. Advanced Pharmacy Practice Experience (APPE) sites provide additional MTM opportunities in Community Practice.

A description of successful practice

Currently, MTM is introduced in the P2 year with a one-hour introductory lecture and corresponding two-hour lab. The introductory lecture focuses on the background of MTM including the Medicare Modernization and Improvement Act of 2003, the definition of MTM, how MTM differs from patient counseling and the core elements of an MTM service as established by APhA/NACDSF. Students are required to complete a one-hour online tutorial on the Outcomes Pharmaceutical Health Care[®] (Outcomes[®]) billing platform prior to lab. During lab, students are trained on the billing platform and work in pairs on cases where they identify and practice billing MTM claims on the modified version of the Outcomes[®] platform created for academic instruction. Occasional activities are incorporated into other labs, such as billing Education and Monitoring claims after counseling on new prescriptions.

During the P3 year, students have one two-hour lab in the fall and a lecture and lab in the spring that is specifically focused on MTM. In the fall, students are presented with a modified patient case from the faculty member's site where the pharmacist has recently completed a Comprehensive Medication Review (CMR). Students work in groups of three to review the case using a guided documentation sheet where they identify and prioritize all potential drug therapy problems. They complete an immediate and long-term plan for the patient and write a communication to the patient's physician. Finally, on the modified Outcomes[®] platform, the students submit MTM claims for the CMR and any billable drug therapy problems identified. In the spring semester, the lecture consists of describing the practical process of providing a CMR followed by a mock MTM consultation. For the mock consultation, students are provided with the patient's medication list and labs but are required to collect all other information needed to assess the case. The case is also a modified patient case from the faculty member's site, but has an added level of psychosocial as well as therapeutic challenges compared to the case from the fall. The lab activities are the same as in the fall, except the students bring the case from lecture and use the information they collected themselves. Anytime claim submission is deemed inadequate, the faculty member can send that claim into review-status for the student to adjust and resubmit accordingly.

In total, didactic teaching of MTM consists of two lectures and three labs, all of which are taught by the same faculty member over the course of two years. Since experiential education is also an

integral part of the PSA series, IPPE Coordinators work closely with preceptors in area community pharmacies to incorporate MTM services into IPPEs. During IPPEs, P2 and P3 students can apply MTM knowledge and skills learned in lecture and lab to practice. P2 students complete up to 42 hours in the “Community Wellness” IPE where they may have opportunities to assist community pharmacists with MTM services. Third-year students complete a 40-hour “Drug Therapy Problem Solving” IPPE where they may be assigned to a community pharmacy where the students focus primarily on MTM services. MTM activities an IPPE student may be involved in include identifying patients; flagging patients in pharmacy software; prioritizing patients using the patient list in Outcomes[®]; working through targeted interventions in Outcomes[®]; preparing for a CMR using the MTM profile; identifying drug therapy problems; contacting prescribers; and submitting claims in Outcomes[®].

Outcomes

Faculty who teach MTM both in the didactic and experiential setting continue to receive positive feedback formally and informally from students regarding the method of teaching MTM, including positive teaching evaluations. Comments from student evaluations include that while the didactic portion would not make them fully confident to perform an MTM session by itself, introducing it at the level it was taught made them more comfortable with knowing what it is and what a session should look like and provided them with confidence to practice MTM at an experiential site. Students appreciated the ability to receive feedback on documentation and billing in a “low pressure” lab environment prior to doing it for a site. Students also stated that the level of the cases was appropriate. Outcomes[®] have been positive at both IPPE and APPE sites and are measured through student, preceptor, and site evaluations. In addition, MTM interventions completed by students are tracked by type in the E*Value rotation management system. Student comments have been positive. One IPPE P3 student commented, “Have students keep doing the Outcomes[®] program. It is a great way for students to think back on classroom materials and information with drug therapy problems.”

Barriers to implementation

Several barriers were identified and resolved when incorporating MTM into the curriculum. First, the PSA series covers a variety of topics, and finding space in the series was a challenge. However, this was the best required series in which to place this topic, and it was determined that MTM was too important to leave as an elective course option. A second challenge was determining when to introduce MTM in the curriculum. Ideally, it would be beneficial to have the MTM case topics be presented concurrently with corresponding disease state topics in the Therapeutics course starting in the P2 year. However, it was determined that introducing the concept of MTM and billing should be done first, and the majority of cases should wait until after this time during the P3 year. Feedback from students has been that the importance of MTM does not really “click” until the P3 year. Another decision was determining which platform to use to teach about billing for MTM services. Outcomes[®] was chosen because it has a large patient base, is used nationally, has a positive reputation working with colleges, and provides extensive support to help with implementation and trouble-shooting. There were adaptations and adjustments that needed to be made to the billing platform for classroom teaching.

Barriers for IPPEs and APPEs relate primarily to site and preceptor identification, as well as preceptor workload and limited time available to complete MTM services and precept students in this area. The number of sites for MTM services has grown in the past year in Iowa due to the state of Iowa contracting with Outcomes[®] for provision of MTM services for state employees as a pilot program in 2010-2011. In several cases recently, preceptors have contacted the College seeking IPPE students to work on MTM at their pharmacies.

Advice or lessons learned

Collaboration is a key factor in successfully implementing MTM into the curriculum. It is unrealistic to expect that one person can do it all. The faculty member who teaches MTM in the classroom at Drake has residency, work, and site experience developing and performing MTM services. The experiential faculty, didactic faculty, and employees at Outcomes[®] collaborate often to streamline processes both in the classroom and at the sites, including reinforcing material learned in the classroom. Since MTM is rapidly changing and emerging, it is best taught by faculty members who can adjust to problems and barriers that come up, versus assigning the topic to a resident who may need to learn the subject. It is important that the experiential component lines up well with the didactic experiences to give students multiple opportunities to apply the concepts learned in the classroom. Students also must learn that they are not just fulfilling requirements at an IPPE or APPE site, but are key implementers of a new service that is vital to the successful future of our profession. This message often requires reinforcement by faculty members and preceptors who can share their enthusiasm and personal experiences. It is important to be flexible regarding how MTM is taught based on student feedback, the ability to set up MTM sites, and time available. Preceptors must be educated on what IPPE and APPE students can contribute to the MTM process based on where they are in the curriculum.

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A general description of how MTM is incorporated into the curriculum

This course is an individual class given to students in the fall semester of their third professional year.

A description of successful practice

I do have didactic lectures for the students, but for every 2-3 lectures I like to incorporate what I call labs into the course. When we talk about marketing your MTM practice I have them work on different marketing pieces that can be used. The first lab of the semester was just a discussion over a literature review that I had them do on MTM. Since this was after only the 3rd class they still didn't know much about MTM so I had them look up articles and then be prepared to talk about them. During class they took turns teaching the other students about one of the articles they read. I also teach them to use 3 different MTM platforms (Mirixa, Outcomes Pharmaceutical Health Care[®], and PharmMD). We have a training agreement with both Mirixa and Outcomes[®] where I can build cases for the students and they can complete them as if they were the pharmacist. We are working on something similar for PharmMD. My favorite thing that we have incorporated is example patients. I enter the appropriate information into either a Mirixa or Outcomes[®] platform for the students to see on their computer. For one of the classes I come either dressed up like a specific patient or act like a patient that is coming in for an MTM session. Of course I make the patients interesting and usually somewhat funny so the students have more fun with it. I draw a student's name out of a hat and that student has to counsel me for 5 minutes. After their 5 minutes is up I draw another student's name. This goes on until the students feel like they have asked all of the questions and counseled me on everything they want to. Then they document the encounter into the Mirixa or Outcomes[®] platform. I am able then to log on to the platform and see if they entered the information in correctly.

The activity that the student enjoyed the best was their semester-long MTM case. I had each student pick one patient in the world. Usually it was a relative, but some picked patients from their pharmacy or family friends. Throughout the semester as we went through the core elements of MTM, the students had to perform these core elements on their patients. They turned in different assignments related to these activities, and I would provide them with feedback to help in their MTM sessions. The information they provided me was deidentified as to not violate HIPAA or any other rules. At the end of the semester they once again taught the class by telling each other the challenges and successes they had through this process. It was an amazing day to see how many people they had helped.

Outcomes

I have not done any research on these activities, but the students reported that they really enjoyed the activities. My evaluations from this semester reflected that these were some of their favorite activities. By far their favorite activity was having their own MTM patient that they worked on throughout the semester. I heard stories about how students decreased the number of medications their patient was on, or were able to prevent a patient from going to the hospital. By far the most

surprising results ended in bettered family relationships. One student told me that she and her mother-in-law became much closer throughout this project. Obviously this was not one of my original goals for the course, but I'm glad that the assignment could help her on a personal level too. The best outcome I have had is that multiple students have asked me how they can start doing MTM in the pharmacies that they work in. They have also asked where they can do MTM rotations in their 4th year. Hopefully this will lead to some great MTM pharmacists.

Barriers to implementation

One of the biggest barriers was working with the Mirixa and Outcomes[®] systems. I am OK with computers but not a technology wiz, so trying to make the computers do what I wanted them to do was a challenge. It was also difficult having 72 students with unique passwords for these programs, and they would either forget their password or it never worked in the first place, and I would have to work with the company to get the passwords reset or figure out the computer glitches. Both of the companies were very nice and would walk me through things that I had trouble with; sometimes it was just inconvenient. Another challenge I discovered is that the students had not completed all of their pharmacotherapy sections at this point in their course work so there were only certain disease states that they knew how to treat. They were usually familiar with other disease states, but were not familiar with the guidelines for each of these. I tried to go over the guidelines for major disease states, but discovered quickly that was not my area of expertise so I left that up to those who teach pharmacotherapy. I tried hard to test them over their communication skills, the questions they asked, and their thought process instead of their knowledge of disease states and appropriate treatment

Advice or lessons learned

I have tried things that worked and tried things that didn't. You learn from your mistakes. I have already planned to tweak a few things for next year. For example: I will definitely teach Mirixa and Outcomes[®] farther apart. This will allow me the time to prepare for another computer system. This year I taught Outcomes[®] 1.5 weeks after I taught Mirixa and it was difficult for me to work with both computer systems at the same time to make sure everything was set up for the 2nd one while I was working with the 1st one in class. I will definitely give myself a little extra time next year. I also want to learn more about how others do MTM to give the students more advice than just my personal experience. Not all students will enjoy MTM. Some will love it. You just have to balance the two.

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A general description of how MTM is incorporated into the curriculum

Walgreens Pharmacy's Patient Care Centers of Greater Boston are pharmacist-run clinics located inside the retail pharmacy that serve as a community rotation site for PY4 students on clinical rotations. While the rotation is designed to strengthen the student's competency in performing traditional pharmacy operations, as community pharmacists and educators we recognize the importance of integrating medication therapy management (MTM) services into the six-week program. For this reason, MTM is a primary focus of students' advanced pharmacy practice experience (APPE) rotation at the site. The Walgreens Company has contracted with Outcomes Pharmaceutical Health Care[®] to conduct MTM services for their patients. At the pharmacy level, pharmacists access the Outcomes[®] online database to view patients from their store who have been identified as those that would likely benefit from an intervention. Pharmacists provide MTM services in the form of a Comprehensive Medication Review (CMR) or by consulting patients through the Targeted Intervention Program (TIP) process. Our students primarily participate in the preparation and delivery of CMRs.

Each week, students are provided with prescription profiles and refill histories for patients identified in Outcomes[®]. Using a template designed by faculty preceptors as a guide, students prepare a thorough review of the prescription profiles for drug-drug interactions, missing or inappropriate drug therapies, and medication adherence issues. In this write-up, students also provide pertinent counseling points for each drug listed. Students are required to prepare the document in a professional format, which is appropriately referenced. Any recommendations made by the student to adjust drug therapy or to initiate missing therapy must be supported by evidence-based medicine. The CMR write-up culminates with a list of questions that the student has generated for the patient based on issues identified while examining the prescription profile. Faculty preceptors at the site grade the written work-up prepared by the students according to a CMR evaluation sheet presented to the students at the start of the rotation. The final document is then utilized by pharmacists while conducting the CMR interview. Students are included to participate in CMR interviews that take place at the rotation site.

A description of successful practice

Students are assigned four patient profiles per week, from which they prepare the CMR write-ups. Patient profiles are distributed to students on a Friday, and they are given four days to submit the prepared document. It is estimated that students spend an average of 2.5 hours preparing each CMR write-up. This translates to 10 hours per week, and 60 hours over the course of the rotation.

Outcomes

This practice has been a successful practice as shown by the fact that MTM services have been implemented across two districts that previously did not have MTM services. Pharmacists whose primary role has been to accurately dispense medications were now being asked to change their

roles and offer services that would take them out of the dispensing role and into a health care provider role. These services are not always easy to implement because high-volume stores have to work these services into everyday workflow. The pharmacists within our chain have improved greatly in implementing MTM services as well as working them into workflow due to educational guides on how to provide the actual MTM services. Although pharmacists at first may have been hesitant to offer these services, once they underwent training, they realized the benefits of offering these services. The financial gain for pharmacists also helps with these services because MTM allows pharmacists to be paid for their cognitive function, instead of their traditional role as a medication dispenser.

Students have also benefitted greatly from being involved in the process in that they now have a skill set that as time goes on will be required due to the evolution of pharmacy practice. Once students have been an active participant in these services, they realize the importance of implementing these services and forming relationships with their patients.

The most important beneficiary of this service has been the patients who have been involved within this process. Patients benefit from MTM services in that they gain more knowledge on their disease states and medications. When patients receive this education, it gives them a sense of empowerment to manage their health care and be an active member in the decisions that will affect them long term.

Barriers to implementation

The main barrier to implementation of MTM services with PharmD candidates was educating the students on the importance of providing these services. Most students have not been exposed to MTM and do not understand how patients benefit from receiving these services.

Once students have realized the importance of providing MTM services, providing relevant information to the patient as well as providing evidence-based recommendations to patients has also been a barrier to implementation. The way in which this barrier has been fixed is by providing the student with feedback after each patient write-up is submitted. During this process the pharmacist will gauge the student's understanding of the guidelines and help fill in any missing components that the student may have left out. If the student is still not able to provide recommendations, he or she will be referred to the guidelines and then be asked to resubmit the patient workup. In terms of providing patients with relevant information, the pharmacist will also ask the students to provide common adverse effects, rare but serious adverse effects, and black box warnings for each of the drugs the patient is currently taking. During the evaluation, the pharmacist and the students will have a discussion on what information should be given to the patient and what information is not relevant. Though this process can be time-consuming it allows for the student to gain confidence in giving MTM services upon graduation.

Patients also provide barriers to implementation because they sometime do not understand what the service is and feel as though the pharmacists are telemarketers trying to sell a product. It sometimes will take extra time to explain the benefits of the services and also explain that we as pharmacists are here to help patients understand why they are on certain medications.

There have been barriers with other pharmacists who provide the service, in that some pharmacists are not used to providing direct patient care. This barrier was overcome by giving the pharmacist disease state guidelines to review and also providing documents on how MTM services can be completed.

Advice or lessons learned

Some of the lessons learned from working with students are that when their education is limited on MTM they are less likely to understand why pharmacists are providing these services and less likely to provide their best work. The education process on why we are giving the services during the experiential education should have been provided during the didactic portion of school. Since some schools do not incorporate this learning into their curriculum, it sometimes takes longer to achieve the student's best work until they realize the importance of this service.

In terms of pharmacist participation in MTM services, pharmacists are also sometime resistant to provide MTM services when they have not been properly trained. Once the education component has been given to the pharmacist and they are encouraged by management to give these services, pharmacists are more than willing to participate.

With patients not understanding the full benefit of the MTM services, it is in the best interest of the pharmacist at the specific site to explain the benefits of MTM services. Patients who are approached by their everyday pharmacist will feel more comfortable participating in MTM services than those who are asked via telephone. Since the main goal of these services is to optimize patient outcomes, eliminating barriers provided by the patient should be realized and corrected.

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A general description of how MTM is incorporated into the curriculum

From the first semester, students learn MTM throughout the curriculum in lectures and progressive involvement in IPPE cases. P1 students work on a virtual patient in a required class and on three MTM cases with IPPE faculty. P2 students complete six more cases. P3 students continue to provide MTM services in both institutional and ambulatory settings, and an MTM elective is available for more intensive training. P4 students continue to refine their skills in community APPE settings.

A description of successful practice

During required didactic Practice of Pharmacy courses, foundational lectures on MTM are presented by college faculty. In the P1 through P3 years, a total of eight hours of didactic lecture are presented. During the lectures, MTM examples are discussed to provide students with initial experience with the MTM structure and process.

In the first semester of pharmacy school, P1 students gain MTM experience through a virtual patient activity in a required course. P1 students on Community IPPEs provide three MTM encounters; preceptors guide novice students through the encounter, encouraging them to understand the MTM process and to practice communication skills with patients and health care providers. Each encounter consists of two visits. The first visit allows the student and the preceptor to interview the patient and gather information. The second visit occurs a week later after the student has had time to work up the case and discuss with faculty.

In the P2 year, students complete five MTM encounters under site preceptors and complete one additional MTM session with an ambulatory patient in a retirement community. This encounter is directly facilitated by a faculty member. Students perform an in-depth medication review and work to identify and resolve actual and potential medication-related problems. During the P2 year, the students' depth of clinical understanding increases and is commensurate with their didactic training.

P3 students on Institutional IPPEs and in small group sessions with a faculty member develop and discuss MTMs for patients in both institutional and ambulatory settings. A recent addition to the P3 curriculum is an MTM elective to provide more intensive MTM training. Upon graduation, students completing the elective course (and other requirements) are eligible for APhA's Certificate for Delivering Medication Therapy Management Services in the Community.

P4 students gain additional experience with MTM encounters during the required Advanced Community APPEs. P1 MTM IPPEs account for 24 hours of contact time; P2 MTM IPPEs account for 32 hours of contact time; P3 MTM IPPEs accounts for 22 hours of contact time. P4 students completing required Advanced Community APPEs spend approximately 25% of the 200 hours devoted to providing MTM services.

Outcomes

The longitudinal and progressive MTM activities provide students with actual patient-centered care activities. This environment allows students to develop and refine patient interviewing and counseling skills, professional judgment, professional behavior, and the personal responsibility needed for pharmacy practice. The MTM activities create a patient-caring environment where students design and implement pharmacy care plans that are patient-specific, address health literacy, and are evidenced-based, and the activities enable students to advance their knowledge of polypharmacy and chronic disease states. The P1-P4 MTM activities allow students an opportunity to integrate curricular and experiential knowledge. With preceptor and faculty guidance, students are able to appropriately identify and intervene on medication-related problems. As evidenced by student reflections, students observe growth and progression in both their clinical and communication skills. In a single semester, 304 IPPE students in P1, P2, and P3 years documented 800 MTM encounters with 721 individual patients who reported having more than 2811 conditions. Students reviewed 4163 prescription medications and identified 2106 medication-related problems.

Barriers to implementation

A number of barriers exist to providing a quality MTM education. First, by design MTM tends to focus on our most complicated patients. Providing experiences for students that are appropriate to their level, but not overwhelming, is a challenge. In many settings, it is difficult to predict the complexity of patient cases that present when students are involved. It is important to introduce the students to MTM in a progressive manner in terms of independence of work, complexity of cases, and acquired knowledge. The faculty and preceptors provide guidance and assistance while encouraging the student to explore solutions and solve problems while providing the proper oversight of the encounter. Adequate supervision over so many student MTM encounters is a challenge for faculty and preceptors. Proper oversight of a student encounter with live patients requires very low student/preceptor ratios and is time consuming. Faculty accompany small groups of students to community centers, ambulatory clinics and other locations to work with live patients on “MTM days.” Participation in MTM days is mandatory, and each encounter consists of two visits. The first visit allows the student and preceptor to interview the patient and gather information. The second visit occurs a week later after the student has had time to work up the case and discuss with faculty.

Managing, tracking, and even understanding the full scope of student involvement in MTM activities throughout the curriculum is another challenge. Students work with many preceptors across many dozens of locations. The challenge is twofold: understanding what was done on a system-wide level, and evaluating the students’ learning experience. An online database using a survey software tool was developed to capture student MTM data and to provide the administration with insight into the type of patients, diseases, medications, medication-related problems, and action plans that students have encountered.

The very language we use to discuss MTM has created problems for its implementation. As MTM has evolved from a Medicare Part D requirement to a means of implementing pharmaceutical care, semantics and language have been among the biggest barriers to

implementation. Preceptors who do not have an “official” MTM service do not always understand that MTM can and should be a part of their everyday pharmacy practice. Education of both students and preceptors has been critical in overcoming the language barrier.

For the faculty-led MTM encounters in geriatric retirement communities and ambulatory care clinics, availability of patients has been the biggest challenge to implementation. Other challenges for faculty-led MTM include having the appropriate space and/or accommodations for conducting MTM interviews at the sites, limiting the size of the student groups to ensure a quality experience, and providing enough face-to-face time to allow students to practice and perfect their communication skills. Obviously, these barriers require continued efforts to ensure that there are a sufficient number of sites and patients that are willing to participate and that students have a quality learning experience.

Advice or lessons learned

These experiences are most beneficial to students when directly facilitated by faculty members; therefore, adequate faculty numbers are required to maintain the quality of the educational experience and reduce the risk of faculty “burn out.” Building and maintaining relationships with a cadre of practice sites to ensure an adequate supply of patients is an additional concern and requires a commitment from faculty and administration for continued success. The online MTM data collection system is beneficial to understanding the quality and quantity of student MTM activities and the potential impact of these activities to the community served by the College of Pharmacy.

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A general description of how MTM is incorporated into the curriculum

Medication therapy management (MTM) has been incorporated into a three-week block in our pharmaceutical care laboratory. The laboratory is part of a 4-semester sequence designed to teach and assess practical application of the skills necessary to become a generalist pharmacist. Students receive 3 hours of IPPE credit through our MTM curriculum.

A description of successful practice

Students were required to read select chapters from the American Pharmacists Association's text *A Practical Guide to Pharmaceutical Care* and then completed self-assessment worksheets that were case-based to reinforce identification of drug therapy problems and communicating with prescribers. They also completed a study guide after reading the American Pharmacists Association & NACDS Foundation's *Core Elements of an MTM Service Model Version 2.0*. Third-year professional pharmacy students received two one-hour lectures focused on MTM. Topics discussed included the differences between OBRA '90, brown bag sessions, disease state management, and MTM; the core element of MTM as defined by the American Pharmacists Association, Medicare Part D and eligibility; MTM-related documentation (SOAP note, medication-related action plan [MAP], personal medication record [PMR], and prescriber recommendations); documentation software; and billing strategies.

Students participated in a two-hour simulated MTM encounter in which they provided MTM services to one of their peers who was acting as a patient. Cases were developed, and the student providing MTM services was given preparation time to review the case. The "patient" was given information that the "pharmacist" did not have in order to appropriately answer questions regarding their health information, compliance, review of systems, cost-related issues, etc. Students completed a MAP and provider recommendations following the simulated MTM encounter.

Third-year pharmacy students enrolled in Pharmaceutical Care Laboratory IV provide MTM and point of care testing to volunteer faculty and staff of our university. Students would demonstrate the ability to effectively perform a comprehensive medication review and interpret findings to identify medication-related problems; demonstrate the ability to document an MTM encounter; and feel confident to integrate the core elements of MTM, clinical knowledge, and communication skills to effectively provide MTM. Five pharmacist faculty members and one pharmacy resident served as preceptors for the encounters and evaluated students' performance. Students performed a comprehensive medication review in which they reviewed participant-specific information, evaluated medication therapies, and developed a plan to resolve any medication-related issues. During each encounter, faculty evaluated each student's interviewing techniques, verbal and nonverbal communication, and complete evaluation of past medical history and current complaints. During the encounter, students assisted their participant with the formulation of a MAP. Students utilized the MAP template from the American Pharmacists

Association's MTM Core Elements Toolbox. Students used a health information form to develop a PMR. After the MTM encounters, students presented their results in small groups to increase peer exposure to the impact of MTM. Students' ability to effectively perform a comprehensive medication review was assessed using a faculty-developed rubric. The rubric was designed to assess interviewing techniques, verbal and nonverbal communication, and complete evaluation of past medical history, medication-related problems, and current complaints.

Outcomes

Our outcomes were illustrated in the *American Journal of Pharmaceutical Education*: Eukel HN, Skoy ET, Frenzel JE. Provision of medication therapy management to a campus population by third year professional pharmacy students. *Am J Pharm Educ.* 2010;74:182-189.

Barriers to implementation

The main barrier that we encounter is recruitment of participants. We offer free cholesterol and blood glucose screenings to all participants to overcome some of this barrier, but we still have a difficult time recruiting 50 volunteers each year. Adherence to HIPAA was difficult through the use of campus resources such as e-mail and campus mail.

Advice or lessons learned

N/A

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A general description of how MTM is incorporated into the curriculum

At the SC College of Pharmacy (SCCP) we incorporate MTM into the curriculum using several different methods: lectures, elective courses, laboratory sequences, and advanced practice experiences; however, the focus on this submission will be on one of the two MTM electives offered at the SCCP. During their third professional year, SCCP students have the option of taking two MTM-related electives: Developing an MTM Service and A Patient Centered Approach to MTM. The first elective, Developing an MTM Service, is offered in the fall semester and is designed to prepare students to develop and implement an MTM service into a community pharmacy setting. Students apply basic principles of small business administration and development to the creation of a pharmacy service. The second elective, A Patient Centered Approach to MTM, is offered in the spring semester and is designed to prepare students to care for patients participating in MTM services. The course develops students' communication skills and teaches them how to identify current as well as prevent future medication therapy problems in an MTM patient. For a more detailed description of A Patient Centered Approach to MTM, please refer to Kuhn C, Powell PH, Sterrett JJ, Elective course on medication therapy management services, *Am J Pharm Educ*, 2010;74(3): Article 40.

A description of successful practice

Four faculty members who have experience in advanced clinical community pharmacy practice developed and teach the "Developing an MTM Service elective. The elective is a 2-credit course and is offered via distance education technology to students on both campuses of the SCCP—Medical University of South Carolina (MUSC) and University of South Carolina (USC). The class meets once a week for 2 hours in the fall semester. Interactive lectures include topics on business plan development, marketing, logistics of offering an MTM service, and conducting and documenting an MTM session, as well as current and future opportunities. In addition, students learn how to defend the need for pharmacist-provided MTM services, by evaluating and discussing published literature on the topic. At the end of the semester, MTM providers from various practice sites in South Carolina are invited to class to participate in a question and answer session with SCCP students. The goal of this session is to expose students to non-faculty member practitioners who have implemented and currently conduct MTM services.

Final grades for the Developing an MTM Service elective consist of class participation and attendance, 4 homework assignments, and a business plan write-up and presentation. Students are divided into groups of no more than 4 students at the beginning of the semester. Their major project for the course is to develop a clinical pharmacy service, write a business plan, and formally present their plan to the class. The 4 homework assignments include a journal club write-up, marketing flyer, medication action plan, and reflective paper on the MTM Provider Panel Q&A session. Grading rubrics are used to evaluate homework assignments, business plan write-ups, and presentations.

Outcomes

During one semester, SCCP students enrolled in the Developing an MTM Service elective were asked to complete a 29-item survey evaluating course objectives and students' preparedness to implement an MTM service. The survey was administered on the first and last days of class. Significantly more students agreed or strongly agreed with all statements assessing course objectives and students' ability to implement an MTM program post-course compared to pre-course. Survey responses did not differ between students based upon previous pharmacy practice or MTM experience. Therefore, the Developing an MTM Service elective is effective in preparing students to develop and implement an MTM service in a community pharmacy setting.

Barriers to implementation

A major barrier to implementing the Developing an MTM Service elective involved the use of distance education technology. Coordination between the two campuses was required to ensure equal experiences despite campus location. Several times throughout the semester at least two faculty members were required to attend the class—one on the MUSC campus and another on the USC campus. By having a faculty member present on each campus, students were more likely to be engaged and less likely to participate in unprofessional behavior. A faculty member was present on both campuses during the journal club discussion, the MTM Provider Panel Q&A session, and the business plan presentations.

Advice or lessons learned

A faculty member with a master's in business administration and experience in developing business plans for pharmacy services was an invaluable resource to SCCP students enrolled in the Developing an MTM Service elective. The course would not have been as successful without this faculty member's input. It is important to contact MTM providers in the state at the beginning of the semester to ask them if they are available to attend the MTM Provider Panel. Providing them with a list of questions before the scheduled date helps them prepare for the material and topics that will be discussed during the Q&A.

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A general description of how MTM is incorporated into the curriculum

The School of Pharmacy offers MTM specifically as two required courses (PHPR 748—Medication Management Training 1 and PHRP 750—Medication Management Training 2) that are each one week in length during the fall semester of the third professional year. These one-credit hour courses are offered within a three-week (mid-semester) time span, during which the students have no other curricular obligations. MTM-related concepts are also integrated into other courses throughout the curriculum.

A description of successful practice

MTM 1 focuses on introducing students to the core elements of medication therapy management. MTM 1 is coordinated by two faculty members. Lectures were delivered by both course coordinators. In addition, four faculty members also provided lectures during the course of the week. Monday Individual reading & preparation (see Blackboard for assigned articles and materials). Students will be expected to have read the assigned readings prior to class on Tuesday. Students will also be required to find one person/patient on their own that they can interview and workup for an MTM assessment. These assessments will be presented on the fourth day of the course to members of their group, and will be the subject of the written assignment due on the last day of the course. Interviews with the patient should be conducted prior to the first class session. Tuesday Course Introduction, Syllabus review, Historical perspective of MTM 1 hr MTM overview and discussion of Core Elements 1.25 hrs Payment/Reimbursement for MTM Services, Example MTM case 1.3 hrs Communicating with Providers 1.5 hrs Identifying and Prioritizing medication-related Problems 1 hr Wednesday Developing a Medication-related Action Plan 1 hr Case Discussion/Video 3 hrs Thursday Presentation of individual MTM interviews to groups 2.3 hrs Each student will present the Findings (Problems, Prioritization of problems, and Action Plan) to the members of their group Each member of the group will grade each student Q & A session about presentations and written action plans 0.5 hr Friday Students should use the course content and any feedback they receive from classmates to help in the development of their action plan for the patient they identified as an MTM candidate. The written action plan should address only the 2 highest priority problems. The action plan will be graded by the course faculty. Submit your written action plans to the course coordinators via email by the end of the work day (5:00PM) on Friday. Points will be deducted for late submissions.

MTM 2 focuses on use of case-related problems for the application of learned patient care and medication therapy management principles. MTM 2 is coordinated by two faculty members. Monday Course Introduction and Outcomes[®] Online Training 1 hour Students are required to complete the Outcomes[®] Online Training Workflow and Implementation Strategies Lecture 1 hour Overcoming Implementation Barriers Lecture 1 hour Business Plan Introduction and Preparation Lecture and Discussion 2 hours Assignment — students are divided into 4 groups each with its own faculty member facilitator. Each group reviews a different MTM scenario (hospital, community pharmacy chain, community pharmacy independent, etc) where they

complete a SWOT analysis and answer several directed questions. Student groups then present the results of the SWOT analysis and directed questions to the entire class. Tuesday Guideline Utilization and Evidence Medicine Review Lecture 1 hour Formulary Considerations Lecture and Discussion 1 hour Group Case Assignment 1 hour Assignment — students are divided into 9 groups. Each group reviews a different patient medication profile consisting of multiple medications for various disease states, identifying potential medication-related problems. Each group then creates a list of questions they would like to ask the patient and/or physician. Course coordinators review the questions and provide answers to the students. Wednesday Group Case Assignment 1 hour Assignment — students are provided the answers to the questions they developed the previous day. Students then develop recommendations for the patient's medications. Guest Speaker/Roundtable 1.5 hours Three pharmacists who are providing MTM services within the community share their experiences, benefits, barriers, and motivations for providing MTM Services. Each pharmacist discusses how MTM is offered at their pharmacy and is then followed by a question and answer session. Group Case Presentations 2 hours Student groups present their patient case and recommendations for the patient's medications. Thursday Preparation for Patient Interview Students are provided a patient medication profile, with imbedded "errors," to review and prepare interview questions. Friday Patient Interview and Physician Letter Write-up 6 hours Students are assigned to a specific time and allowed 15 minutes to interview a mock patient (fourth professional year student). Students then have 45 minutes to write a letter to the patient's physician making recommendations about their medications. Recommendations include generic substitution, formulary alternatives, additions and deletions of medications, etc.

Outcomes

This is hard to address. We have been unable to survey our current graduates' involvement in MTM-related activities. However, by participation in these two courses, students were exposed to the different MTM core elements, gained familiarity with one online program to assist in MTM, met and had discussions with pharmacists in the surrounding area who provide MTM services, gained experience writing physician letters addressing their patient's therapeutic needs, had at least two opportunities to interview different patients, prepared business plans for the implementation of an MTM program (also included a SWOT analysis), developed the skills necessary to prioritize patient problems, had multiple opportunities to identify medication-related problems, and gained practice in completing various billing documents. As a school, we are working to integrate summative, performance-based assessments into our curriculum, which will help us assess some of the outcomes from these 2 courses.

Barriers to implementation

Based on the commentary from course evaluations, most students seem to feel that MTM is only relevant to community pharmacy and not other pharmacy paths. Therefore, some students do not put forth the effort, nor have the excitement, for learning about this concept. Most students do not seem to have the desire to do what it takes to implement an MTM program as a future pharmacist. In addition, because few pharmacy facilities are offering MTM in the surrounding area, they feel MTM is a concept to be learned, but not put in practice. We have attempted to overcome these barriers by having panels of pharmacists with MTM experience from different

practice settings lecture in the courses as well as provide cases where the setting involves areas other than community pharmacy. I think having the courses during the mid-semester break time (when no other courses are going on) actually works against us. Students see this as “vacation time,” although it clearly is not, and that these two courses are taking away from their “vacation time.”

Advice or lessons learned

Make the assignments as real world and applicable to real world situations as possible. Stress to students the importance and advantages that MTM can offer their patients and practice setting (broadly defined).

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A general description of how MTM is incorporated into the curriculum

A thorough overview of medication therapy management (MTM) principles is taught in a required Pharmacy Management course in the fall semester of the third professional year. Prior to this, students are given a basic introduction to the concept in the Introduction to Public Health course during the spring semester of the first professional year.

A description of successful practice

Since 2007, students have been asked to develop a business plan for an MTM service at a community pharmacy in the Pharmacy Management course. The business plan serves as a culminating project to allow students to apply the theory they have learned during the semester. The business plan deliverable is submitted and an 11-minute presentation is required. Students are randomly assigned into groups of 5 to work on the business plan approximately 4 weeks after the start of the 15-week semester. The assignment reads as follows: “You are a recent PharmD graduate from Texas Southern University and planning to start your own Medication Therapy Management Service at a community pharmacy. Submit a business proposal for a new service that you would like to propose to pharmacy executives. Develop your business plan based on a currently existing community pharmacy.”

Throughout the semester, students are provided twenty 90-minute lectures for 12 weeks on pharmacy management topics that will assist them in the preparation of the business plan. Business plans are submitted to the course coordinator during the 12th week to be assessed. Students present their business plans to the course coordinator and the entire class during weeks 13 and 14 of the semester. On the day of their presentation, students are asked to submit a PowerPoint handout to the course coordinator. Additionally, students are asked to submit peer assessments for each group member on the day of their presentation. At the end of the semester, students receive a total business plan grade and have the option to come retrieve their business plan.

Topics covered throughout the semester include:

- Introduction to Course Management Functions
- Medicare Modernization Act Medication Therapy Management Services Entrepreneurship*
- Strategic Planning in Pharmacy Operations
- Business Planning in Pharmacy Programs
- Appraising the Need for Value-Added Services
- Implementing and Evaluating the Outcomes of Value-Added Service
- General Operations Management*
- Managing Technology and Information Systems*
- Ensuring Quality and Reducing Medication Errors*
- Organizational Structure and Behavior*

- Human Resources Management Functions*
- Purchasing and Financing a Pharmacy
- Financial Analysis and Budgeting Corporate Finance*
- Third-Party Payer Considerations*
- Reimbursement for Value-Added Pharmacy Services
- Marketing Theory Purchasing and Inventory
- Management Ethical Reasoning in Business Accounting
- Financial Records Business and Labor Laws

Pharmacy managers from various pharmacy practice environments, including mass merchandiser retail, grocery retail, independent retail, hospital, and long term acute care, contribute to various lectures as designated by an asterisk(*) .

Outcomes

Students' success on the business plan is assessed in three categories: teamwork, oral communication, and written communication. Teamwork is assessed for each individual by his/her four peers in the assigned group utilizing a peer assessment rubric. Oral communication is assessed by the course coordinator based on his/her participation in the group presentation of the business plan utilizing an oral presentation rubric. Written communication is assessed by the course coordinator based on the submitted business plan by the group utilizing a business plan assessment form. The course coordinator completes the oral presentation rubric and the business plan assessment form, and team members complete four peer assessment rubrics for each teammate. Each rubric is worth a total of 100 points and contributes a varying percentage of each student's total grade received on the business plan. The peer assessment rubrics are valued at 15% of the total grade, the oral presentation rubric is valued at 25% of the total grade, and the written proposal is valued at 60% of the total grade.

A 2007 evaluation of the course to determine success of the business plan assignment implementation was conducted. Success of the assignment was based on student performance and student feedback. Rubrics were utilized to measure student performance on the business plans. Successful student performance was achieved if the following occurred: 1.) If 80% of the students received 85 points or greater on the oral presentation rubric, 2.) If 80% of the students received 85 points or greater on the peer assessment rubrics, and 3.) If 80% of the groups received 8 points or more in at least 8 of the 10 sections on the written proposal assessment form. In the course evaluation conducted in 2007, the average grade on the business plan assignment, including the oral presentation, the peer assessment, and the written proposal, for 120 students was 92.19%. Eighty-five percent (n=102) of the students received 85 points or more on the oral presentation, exceeding the 80% goal set, while 97.5% of students received 85 points or more on the peer assessment, again exceeding the 80% goal. Only four groups did not receive 8 points or more in 8 of the 10 sections on the written proposal assessment form; therefore, 83.4% of the groups met the goal set.

An anonymous online survey made available to students via surveymonkey.com revealed that a little over 76% (n=55) of the students agreed or strongly agreed that the development of the business plan would help them in the future. Approximately 72% (n=54) agreed or strongly

agreed that developing the business plan improved their teamwork skills, while 45.1% (n=51) and 44.6% (n=56) agreed or strongly agreed that the business plan assignment improved their verbal communication and written communication skills, respectively. Close to 80% (n=62) of the students felt working on the business plan allowed them to apply the management theory learned in the course.

Barriers to implementation

There has to be time dedicated to effectively grade the business plans. There are several components to the grade, which takes time to organize. Depending on the class time, presentations can take away needed lecture time.

Advice or lessons learned

When giving the assignment, be sure to specify a page limit (1 page) for each section of the proposal. Group sizes will vary from 4-6, depending on students withdrawing from the class and not having a multiple of 5 enrolled in the class. Develop an Excel sheet to help facilitate grading in a timely manner. Expect group conflict to occur. Fourth-year academic rotation students are of benefit to assist in asking questions during the presentations and helping organize the rubrics for all students when entering grades. Leave the percentage value for the peer assessment and oral presentation at 15% and 25% to allow students to feel like they have a “voice” when honestly assessing peers. Likewise, expect some students to give everyone all the points on peer assessment. Have students submit the peer assessment on the day of the oral presentation to allow students the opportunity to fully assess their classmates’ contributions. Have students submit oral presentation forms with their names on them on the day of the presentation in the order they are presenting to help facilitate assessment.

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A general description of how MTM is incorporated into the curriculum

The Ohio State University College of Pharmacy has used an integrated approach to MTM in the curriculum. Through faculty collaboration and coordination, key educational topic threads have been woven and strategically linked to build from an introduction to MTM in the classroom, through simulations, dedicated assignments (ranging from Drug Related Problem [DRP] identification to pharmacoeconomic analysis), and certification programs; then progressing to real-life application during Introductory and Advanced Pharmacy Practice Experiences (IPPEs/APPEs).

A description of successful practice

Common themes associated with MTM guide the teaching of this concept at Ohio State. These themes include:

1. Communication
2. Decision-making
3. Use of health care information
4. Business/management

P1 year — Introduction to MTM: Students are exposed to MTM's history, evolution, and current and future state of practice through the 3 course series the first year of their PharmD program. Students have a lecture on APhA's Core Elements V 2.0; they learn about the concepts of pharmacist credentialing and scope of practice. In the drug information course, students revisit the Core Elements and apply drug information skills to pharmacy practice through role playing patient and physician interviews to gather background information (1 hour lecture, 2 hour workshop), database and literature searching activities (3 hour lecture, 2 hour workshop + project time), and composition of a drug information response (1.5 hour lecture + project time). In the health systems course, P1 students learn about Medicare Part D, health care reform, and the payer perspectives on MTM (1 hour lecture).

P2 year — Integration of MTM: Students are engaged with key MTM activities in various simulated, coordinated activities through the pathophysiology and therapeutics series (P&T) as well as the Professional Pharmacy Practice Laboratory (PPPLab) during this year. Both of these courses are three quarter course series. In P&T fall quarter, students receive lectures on the patient care process, including patient interviewing, physical assessment, lab tests, and drug related problems (DRPs) (7 hours lecture). Students then visit the clinical skills lab to reinforce concepts taught in lecture (8 hours in lab). In PPPLab, students complete a comprehensive medication review, including a simulated patient interview to gather patient information, and then the construction of a medication action plan, and simulated counseling activities so that students get to practice and receive feedback on each step in this process. In these reviews (one fall quarter, one winter quarter), students document a personal medication record (PMR) and medication action plan (MAP) (interview involves 3 hours of lab, 4 sections per week over 3

weeks + project time to document and formulate plan). In PPPLab, students also work with an electronic medical record so they can practice gathering patient-related health information as they simulate patient care. In P&T winter and spring quarters, students engage in verbal and written discussions with individual and group cases, which allow for practice and evaluation of their process for prioritizing patient problems and formulating patient care plans (3 workshop hours weekly for 2 quarters). In addition, two objective structured clinical examinations (OSCEs) are held in the P2 year, during which students identify DRPs and create action plans based on simulated patient cases (2 hours per student of direct OSCE time). The OSCEs create more high-stakes, evaluated and reflective experiences during which students must demonstrate the skills necessary to be effective MTM providers.

P3 year — Incorporation of MTM: Students in the P3 year continue practicing and receiving formative feedback on their MTM skills related to identification of DRPS, prioritizing problems, documenting encounters, and formulating patient care plans. The business aspect of MTM is also a key element this year through two quarters of management courses. During these courses, students receive lectures with content directly linked to MTM. These include Implementing, Reimbursing and Evaluating Outcomes of Value Added Services (3.5 hours), MTM Update and Health Reform (1 hour), Entrepreneurship (1 hour), Marketing Theory and Application (1 hour), and Evaluation of Pharmacy Services (1 hour). Students conduct an economic evaluation of a comprehensive medication review as a project in this course sequence. This project has students work through cost considerations from the patient's perspective, taking into account income, insurance, therapeutic alternatives, and drug expenditures while formulating an action plan for the patient case. Students have also been involved in this series designing a business plan based on a theoretical pharmacy for an MTM service. In the Self Care course, students conduct a comprehensive medication review, with documentation of a PMR and MAP (1 hour lecture, 1 hour workshop). In P&T, students continue to engage in verbal and written, individual and group cases (3 workshop hours weekly for 3 quarters). During the required capstone course, students receive the didactic portion of the APhA/ASCP Delivering Medication Therapy Management Services in the Community Certificate Program and have the option to complete 5 real-life patient cases during APPEs to obtain the certificate upon graduation (6 hours of live program, 6 hours of workshop). Two OSCEs are offered during this year, as well, during which students interview standardized patients to gather a full medical history, identify DRPs, create action plans, and document the encounter (2 hours total per student). During the Introductory Pharmacy Practice Experiences (IPPEs), students work with community partners to complete real-life MTM cases through Mirixa Corporation and/or Outcomes Pharmaceutical Health Care[®]. Students are trained on how to use both documentation systems and use them while on rotation with community pharmacists (2-4 hours).

P4 year — Application of MTM: Students engage in MTM with our community pharmacy partners as offered during their month-long rotations with the sites. As part of the first offering of the APhA/ASCP MTM Certificate Program for students in Spring 2010, students are encouraged to complete the required 5 cases during APPEs in order to obtain the certificate upon graduation. In addition, an elective experience available to P4 students at the college is the Partner for Promotion program, which is a 10-month longitudinal experience during which pairs of students are partnered with a community pharmacy site. These groups receive training and mentoring on a stepwise approach to developing advanced patient care services, including MTM, and create and

implement a business plan for a new patient care service at the site. Students and preceptors engaged in this program are involved in business planning, including cost analyses, pricing and compensation, consent and documentation forms, policies and procedures, and marketing as well as planning the logistics of the patient care process.

Outcomes

Approximately 75 students (out of a class of 123) have elected to complete the 5 real-life MTM cases during their APPEs in order to obtain the APhA/ASCP MTM Certificate upon graduation. OSCE activities have consistently resulted in very positive feedback from standardized patient reviewers for student history taking skills. For the small percentage of students that have been identified as “in need of improvement,” remediation processes have been put in place to allow students opportunities to further practice and reflect with patient interviewing in order to become competent practitioners. Per student comments in course evaluations, students have identified that they feel they sometimes hear “too much” about MTM. Since 2005, 75 students and 46 sites have been involved in the Partner for Promotion program. Approximately 50 percent of community pharmacies have sustained and continue to offer services developed during their involvement in the program, including pharmacies in 15 counties in Ohio, 2 stores in Kentucky, and a site in Seattle, WA. Per comparison of pre- and post-PFP program surveys, both students and preceptors display an improvement in perception of skills to create, provide, and sustain advanced patient care services in community pharmacies. Community pharmacy partners have anecdotally identified that graduates of Ohio State are equipped with the basic skills required to practice pharmacy in the current environment, including provision of immunizations, setting up and running health and wellness screenings, and conducting comprehensive medication reviews/MTM. In the summer of 2007, faculty members from Ohio State were invited to present on the integration of MTM throughout our curriculum at the annual AACP meeting in Orlando, FL. Faculty have also been invited to be involved with national research projects evaluating MTM in practice and the classroom.

Barriers to implementation

One key barrier that was identified by faculty at Ohio State was inconsistency in the strategies for teaching MTM. In 2004, in response to the initiation of Medicare Part D and MTM, an MTM Task Force was created. This task force invited faculty, students, and practitioners to join meetings about MTM. The purpose was to coordinate efforts and help disseminate MTM to various pharmacy practice settings. This task force has evolved to become a meaningful forum to discuss teaching and practice opportunities. In recent years, it was identified that faculty were teaching MTM in various years and courses, but using different forms and reference materials. This group worked together to create documentation forms and compile key references that could be introduced in the P1 year, and then carried through consistently to the P4 year. This has demonstrated a clear improvement in student learning and comfort with the MTM process of care and documentation.

In the simulated student experiences, such as the OSCEs, another struggle for faculty has been the resource of standardized patients. Hiring standardized patients is a fiscal barrier. Recruiting enough volunteers to engage in about 120 individual conversations per year is difficult; training

volunteers is time intensive. In order to overcome this financial barrier, faculty have asked for community/preceptor volunteers for some simulated activities. Additionally, pharmacy practice residents, graduate students, and other faculty members have assisted in some activities. This has allowed standardized patients to be hired for the full OSCE experiences.

Another key barrier that has arisen is variability in the experiential activities in which our students are involved related to accessibility of patients. The same barriers community pharmacists/pharmacies face in recruiting patients for MTM arise as problems for students trying to identify enough patients on which to do cases for the APhA/ASCP MTM certificate. To help alleviate this problem, the IPPE and APPE Experiential Directors at Ohio State are working closely with community pharmacy partners in management to identify core pharmacy sites for local companies in which MTM services are being offered consistently. This planning will help ensure that student experiences and opportunities to interact with patients are adequate and consistent. In the experiential setting, we have also encountered wide differences in the training our community pharmacy preceptors have with regard to MTM. To address this concern, faculty at Ohio State have offered the APhA/ASCP MTM certificate program at a reduced cost to college preceptors. Moving forward, our experiential faculty and community partner management are working together to create and build upon a core set of community sites. Face to face trainings are being scheduled for the summer coordinated with company meetings to match with schedules of pharmacists and help standardize the common knowledge and skills of preceptors related to MTM.

Advice or lessons learned

Faculty at The Ohio State University College of Pharmacy have identified that collaboration and subsequent coordinated and strategic integration of MTM throughout our PharmD program has been a key to success. Creation and continuation of the MTM Task Force has been a guiding force for this collaboration and coordination, helping keep faculty aware, on track, and consistent. The faculty network through a formal committee has facilitated strategic integration of MTM through our curriculum. Beyond the consistency of documentation forms, faculty have worked through many discussions to come to a common definition of MTM that describes professional practice in settings including and outside of community practice. We believe that this consistency in message and teaching has facilitated the building of MTM skills through the 4 years of our program.

As identification of resources is a common challenge among colleges of pharmacy, Ohio State has helped support the MTM teaching efforts through capitalizing on relationships with our local alumni as well as our Community and Ambulatory Pharmacy Residency Programs. Many alumni want to contribute to the college; volunteering as standardized patients for simulations has been a wonderful way to maintain relationships with alumni and train our current students, while exposing them to passionate, local pharmacy practitioners. Pharmacy practice residents serve as teaching assistants in our P&T sequence, pharmacy practice lab, and first-year practice course series. This is a win-win, helping train the next generation of pharmacy educators while exposing current students to MTM practitioners.

One general lesson learned by faculty at Ohio State is to “Just do it.” Material that is currently not being taught can be added and piloted the first year, and then assessed, justified, and refined for future offerings. If you do not start, then you have nothing to work from as you optimize the teaching being provided. Much of the MTM curriculum currently offered at Ohio State started as one faculty member adding a project in his or her course. These projects have grown and become linked with content and activities throughout the curriculum for a cohesive approach to teaching MTM to PharmD students.

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A general description of how MTM is incorporated into the curriculum

Required 2-month APPE rotation, in the 4-PD year. One month is classified as drug information and the other as geriatrics. Also, elective one-month APPE rotation and used for IPPE rotation. 66-70 students per year.

A description of successful practice

We have a 2-month APPE in our MTM Call Center. Twelve 4-PD students are involved with 6 new students every month. The new students undergo 5 days of didactic and hands-on training. This includes simulated appointment calls, comprehensive medication reviews (CMR), and crisis management. A special feature is our 3-hour crisis training, taught by a trainer for our local suicide hot line, where the students practice inquiring about the intent to commit suicide. We have an electronic chart (MTMExchange) and record all phone calls, using CallRec. We also use SchoolVue, a classroom monitoring software that allows us to visualize each student's computer screen and listen to their phone calls, in real time. This allows us to provide monitoring and assistance at any time during the telephone CMR. We provide a rigorous course on using the telephone and it emphasizes that the quality of the conversation rests entirely with the student. The UF MTM promise to our patients, is:

We will

Call only with your permission.

Schedule at your convenience.

Be prepared for you.

Give you our undivided attention.

Never be interrupted.

Never interrupt you.

Give you time to think.

See the February 2011 issue of *Pharmacy Today* for more information about the call center.

Outcomes

We have been able to meet our contractual obligations, for both quantity and quality, using students. What was a 2-year contract has been extended to a 3rd year. The student feedback is positive about the stimulating challenges and rewards of helping the patients we talk to. We have had to do 1 9-11 (hyperosmolar hyperglycemia coma) call and 1 live transfer to the suicide hot line for counseling, among the 1500 patients we served in 2010. The student "phone stories" are the most real and touching you can imagine.

Barriers to implementation

We went from an idea to a fully operationally program in 8 months. This was the product of a risk-taking Dean, IT support, business office contribution, and a faculty person with call center

experience. Our insurance partner has been supportive and appreciative as we have done not only MTM cases but assisted in eMTM chart testing/design, CQI program creation, and practice model development.

Advice or lessons learned

Our business deal is a contract for services. We do not have to bill anyone. Students will meet your expectations. Make them high.

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A general description of how MTM is incorporated into the curriculum

Medication therapy management is incorporated in a multitude of courses throughout the curriculum but it is perhaps most pronounced in our three-year, six-semester course, Pharmacy Practice Lab. The goals of the Pharmacy Practice Lab are to provide students with the necessary skills to successfully interact with patients and members of the health care team in the provision of pharmaceutical care. Faculty prepare students for patient-centered care through hands-on activities in the areas of drug information, prescription compounding and dispensing, patient assessment and counseling, aseptic technique, and immunization administrations. Early course activities include prescription interpretation and counseling, patient self-care assessment and counseling, aseptic technique in the preparation of parenteral products, patient communication, prescription compounding, pharmacy calculations, introduction to drug information skills, and pharmacy law. The final year builds upon previous Pharmacy Practice Lab courses to allow students the opportunity to practice patient-centered care and to establish mastery of skills in the areas of medication therapy management, drug information application, problem solving skills, and communication, often involving more complex patients.

A description of successful practice

Faculty member Jeffrey Reist, Assistant Professor (clinical), is the coordinator for the entire Pharmacy Practice Lab three-year course series. Mary Starry, Assistant Professor (clinical), and Michelle Fravel, Assistant Professor (clinical), are two faculty members that facilitate and teach in the six-semester course. A full-time pharmacy technician staff member is employed in the lab, along with six graduate assistants. Guest faculty members from every aspect of the curriculum are invited to lead discussions and/or labs that are pertinent to their areas. For the first three years of their pharmacy education, students spend two hours each week in lab. First-year pharmacy students also participate in a one-hour discussion and a one-hour lecture each week, while second- and third-year students have a one-hour pre-lab lecture each week.

MTM Follow-Up Visit: One very successful model/activity within the Pharmacy Practice Lab is the OSCE (Objective Structured Clinical Exam) component within the fifth semester of this six-semester-long course. Students conduct a medication therapy management (MTM) follow-up visit in a simulated community pharmacy setting. Standardized patients are hired and trained to play the role of the patient. During the encounter, students review a patient chart for 15 minutes prior to the MTM visit. They are then given 10 minutes to conduct the focused follow-up visit interview with the patient. Following completion of this patient interview, students are given 50 minutes to identify drug therapy problems and compose a SOAP note for each problem identified. The information in the subjective portion of their note comes from their interaction with the patient. All necessary objective information is provided to the students following their interview with the patient. One week following completion of the project, students receive written feedback on their performance, including feedback from faculty on their SOAP notes and

feedback from the standardized patients on their communication abilities. Additionally, a one-hour small group discussion is held to cover the main therapeutic issues presented in the case.

Standardized Patients: Perhaps a unique aspect of this activity is our use of standardized patients. Pharmacy Practice Lab faculty collaborate with the UI Carver College of Medicine Standardized Patient Program, and rather than start a new College of Pharmacy patient pool, patients are utilized from an already proven and fairly stable resource. Standardized patients are recruited from within the University and from the community. Many have extensive acting experience either through community theater, the Department of Theater Arts at the University, or other theater training programs. Of course, not all of the standardized patients have acting experience; the Carver College of Medicine also employs several talented people who are committed to improving the quality of health education.

Outcomes

We feel the MTM follow-up visit OSCE allows students to demonstrate a variety of the skills used in the MTM process. The domains of communication, critical thinking, and clinical problem solving all come into play in this activity. Students have expressed that they feel this is a meaningful and useful way to demonstrate proficiency in these areas. We are currently using the performance measures of the OSCE along with several other measures to identify students who may need additional monitoring while on the APPEs to ensure success. This process provides us with an objective way of assessing students' ability to perform the included skills (chart review, patient interviewing, drug therapy problem identification, SOAP note development, and clinical plan development). We are now also using students' performance on this OSCE to identify students who need additional monitoring throughout their fourth year.

Barriers to implementation

One big hurdle to overcome to efficient implementation is our physical space. Private consultation rooms are hard to come by, oftentimes faculty giving up their offices. A hallway is used to check in patients and students, and it is crowded. Another barrier is the limited time of faculty members to run and process the assessments. Expenses of utilizing the standardized patients are also high. Furthermore, resources are limited to implement technology within this program. We would like to be able to videotape student/patient interviews and while this can be/has been done occasionally, physical space and IT personnel time are barriers to ramp up for all 108 students.

Advice or lessons learned

Pharmacy Practice Lab faculty are extremely pleased with this project (they will enter their third semester of implementation in the Spring of 2011) and feedback is largely positive. Faculty are quick to point out and advise others that it is very important to collaborate with the IPPE coordinator, among other relevant curriculum areas. Sequencing of the curriculum should always be considered when starting new activities and projects.

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A general description of how MTM is incorporated into the curriculum

Medication therapy management (MTM) competencies are developed in a sequential, integrated fashion throughout the four-year curriculum. Knowledge, skills, and values important to patient-centered care are developed through a combination of didactic, skills-based (applied), and experiential courses aligned so students across the Twin Cities and Duluth campuses can assume responsibility, in a progressive manner, for all patient drug-related needs, including complete and comprehensive MTM.

A description of successful practice

MTM competencies are developed through a combination of didactic, skills-based (applied), and experiential courses which are aligned and sequenced so students across our dual campuses may assume responsibility for all of a patient's drug-related needs, including complete and comprehensive MTM. Two 3-credit required courses introduced in the first professional semester, "Practice of Pharmaceutical Care I and II," prepare students to provide complete and comprehensive MTM services within the practice of pharmaceutical care. Students learn to identify patient-specific drug therapy problems and to work with the patient and prescribers to propose effective solutions for those problems.

In the first course, students begin talking to patients to understand a patient's medication experience and identify drug-related needs. Students develop assessment skills through role-playing both patient and practitioner. Within the first 6 weeks, students conduct a drug therapy assessment for a person they have not met previously, document this encounter, and present this case in class. Students further their understanding of pharmaceutical care by teaching it to another patient care provider. The final assignment requires the student to find another patient, conduct a comprehensive assessment, identify drug therapy problems, establish a care plan, and determine a follow-up evaluation time frame.

The second course in this sequence incorporates disease state and drug therapy knowledge into the creation of patient-specific care plans and establishment of follow-up evaluation parameters. Foundational knowledge, skills, and values introduced in these first two courses are continually emphasized in subsequent Pharmacotherapy and experiential courses, providing important vertical and horizontal alignment. This socialization process is designed so that students take ownership of these core values and maintain the highest standards of practice across all patient encounters.

Aligned with the didactic courses mentioned above, Pharmaceutical Care Skills I-V is a sequence of applied learning courses where specific skills important to providing MTM are practiced and assessed. Approximately 3 hours per week are designated to skill development with expert feedback. The Pharmaceutical Care Learning Center provides laboratory and simulation learning experiences which incorporate advancing rigor and challenge each progressive semester

throughout the first three years. Students practice and gain feedback on critical skills such as communication, patient assessment, and drug information. Standardized patients, learning technologies, and other performance assessments are used to evaluate a student's readiness for entry into the advanced practice component of the curriculum. The experiential course sequence is a continuum beginning in the first year with the Early Experiential Practice I-IV and running through the advanced pharmacy practice experiences leading up to graduation. Students gain early exposure to the practice environment with volunteer Community Teachers who meet with a team of first- and second-year students who apply the knowledge, skills, and values from their other professional courses. Students also spend 10 hours per semester with assigned pharmacist mentors at the pharmacist's practice site learning about the profession and observing MTM being conducted. These two components allow students to take knowledge from the didactic courses, practice within the skills, and ultimately see the application within the chaos of real-world situations.

Also within this course sequence, students have opportunities for interprofessional practice as they work within interprofessional teams to learn the foundations of teamwork, communication, and professionalism. For example, within the first semester of the professional curriculum each student spends approximately 10 hours solving problems within interprofessional teams of 12 students across medicine, nursing, dentistry, veterinary medicine, pharmacy, public health, and allied health sciences. Throughout the experiential course sequence, students prepare reflective writings and portfolios to document the growth of these critical patient care skills as they experience new contexts and practice settings. The experiential sequence continues into Introductory Practice experiences in which students have two 3-week experiences in community and hospital settings, providing opportunities to see the importance of continuity of care across health systems. Finally, within the advanced practice sequence our students complete eight 5-week rotations during their senior year. A required ambulatory care advanced practice experience must include an MTM component, allowing further refinement and development of MTM competency prior to graduation.

Outcomes

This model has been successful for us as determined by our student performance on embedded assessments as well as milemarker exams (e.g., progress test, OSCE) that measure student readiness for entry into the advanced practice experiences. These performance exams are blueprinted to competencies specifically aligned to MTM skills. In addition, we believe the MTM model within the state of Minnesota indicates the leadership of our students, faculty, and graduates to advance MTM as a standard of care for improving patient outcomes. Quantitative data have been published with regards to the improvement in patient outcomes.

Barriers to implementation

There are often challenges to implementing change and advancing new initiatives. A primary challenge that we faced was centered around the strategy for raising awareness of these new professional roles and responsibilities among faculty throughout the college. This took a collective effort by the profession, the college, and individual graduates to tell the story of what pharmacists can do. More importantly, it was important to collect data to demonstrate the value

of these services to patient care as well as the overall health care system. This documentation of value helped to advance our program so that MTM is now a part of our benefit plan at the University of Minnesota, and we have a thriving network of MTM pharmacists across the state helping to make a difference in the lives of patients.

Advice or lessons learned

The following highlights advice or lessons learned: (1) prepare pharmacy students for challenging new societal roles and responsibilities from the first day of class through to commencement; (2) learn the patient care process through repetition, practice, and reflection; and (3) integrate disease state and drug therapy knowledge presented throughout the curriculum into the manner in which students will apply this knowledge to deliver MTM services in practice settings across the continuum of care.

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A general description of how MTM is incorporated into the curriculum

With MTM a strong focus among health care stakeholders, students require a needed skill set to perform MTM activities in didactic and experiential settings. UMSOP has incorporated MTM into several courses and advanced pharmacy practice experiences (APPEs). Specifically, class time is devoted to MTM during the third professional year in 2 lecture courses, 1 practice lab, and 1 elective course. In the P4 year, MTM is a required component of community APPEs, and MTM elective APPEs are also available.

A description of successful practice

Didactic Learning in Pharmacy Practice IV (Phar 505, Fall Semester), a single 1-hour discussion-based lecture, is provided with the objective of exposing students to the history and goals of MTM development, the MTM core elements, and potential reimbursement strategies.

Beginning in 2011, in Pharmacy Practice V (Phar 506, Spring Semester), students will participate in a 1.5-hour active learning class with the objective of instructing students in the process and procedures of completing an MTM encounter. Topics to be covered include patient identification, application of the MTM core elements, documentation, provider communication, and follow-up. Upon completion of this class, students will work in teams to SOAP MTM cases provided by the instructor.

Practical application of student knowledge of MTM occurs in the Pharmacy Practice Lab (Phar 563). Students participate in a mock, real-world ambulatory care practice scenario that includes comprehensive medication reviews. Students are provided with a specific case and work in pairs to identify potential/actual drug-related problems and make appropriate recommendations. This MTM activity is completed amidst mock patient scenarios focusing on hypertension, cholesterol management, provider questions, and patient questions. In 2010, the lab was coordinated with Missoula Aging Services, resulting in patient participation from the community. Several students had the opportunity to practice their MTM skills on actual patients versus written cases.

In 2009 an elective course in medication therapy management was developed and implemented. This 1-credit course meets one day each week for one hour, and is available each spring to students in their third professional year. The primary objectives of this course are to enable the student to recognize and carry out the core elements of an MTM service, and to develop appropriate written documentation for provider and patient communication. Students participate in a variety of activities that include lecture, discussion, role-play, and interactive learning. Topics specific to the elective include identification of drug-related problems; MTM core elements; reimbursement strategies; MTM platforms (e.g., Outcomes Pharmaceutical Health Care[®], Mirixa); development, implementation, and evaluation of an MTM service; patient identification and monitoring; collaborative practice agreements; marketing; and frequent case discussions. Students interview the course instructor as a group for one mock interview and one-

on-one for a second mock interview. Additionally, students are required to identify a patient on their own, perform the core elements and document the MTM encounter, and present their patient to their peers.

Experiential Learning: In 2008, recognizing a need for students to incorporate more cognitive services, medication therapy management became a required component of the community APPE. Over the course of a four-week rotation students must identify two patients and perform the core elements of an MTM encounter. These encounters may be comprehensive medication reviews or disease state specific (e.g., diabetes self-management education). Additionally, students are required to provide documentation and written communication to the primary care provider. Students work with their preceptor to identify appropriate patients, set up an interview, and meet with each patient face-to-face. Upon completion of the interview, students discuss the encounter with their preceptor and document the case accordingly, providing follow-up as necessary. Additionally, each case is formally presented by the student to their peers. At the end of the community APPE, students complete a self-assessment tool that evaluates: (1) effectiveness of the activity as a learning exercise; (2) time spent on a single encounter; (3) activity strengths/weakness; (4) changes in their knowledge and skills related to key aspects of performing an MTM encounter, and (5) changes in their ability to assess, identify, communicate, and resolve medication therapy-related problems.

A four-week elective APPE in medication therapy management was first implemented in the Missoula area in 2009, with a second implemented in the Billings area in 2010. During the MTM APPE, students are introduced to the concept of pharmacy care and medication management through reading and web-based assignments. The student participates in as many encounters as possible, with a minimum requirement of three. Students are expected to perform patient interviews and comprehensive documentation of drug-related problems, assessments, and recommendations using medication management software and the Montana PharmAssist program. The student provides recommendations to both the patient and provider(s) and completes follow-up appointments as necessary. Each student also participates in opportunities for outreach and marketing of MTM programs and contributes to the development of tools for patient evaluation and education. In Missoula, the MTM elective is interdisciplinary, gaining referrals from the New Directions Wellness Center. New Directions is located within the same building as the School of Pharmacy and provides physical therapy and supervised fitness for persons with physical limitations, chronic conditions, or disabilities. At each intake appointment, patients are given the option to have a medication review performed by a pharmacy student. This process has generated numerous referrals over each rotation cycle and has integrated pharmacy practice with physical therapy.

Outcomes

In general, practices involving MTM in the didactic and experiential setting at the University of Montana have provided good outcomes. Overall, student comments regarding MTM in the didactic setting have been generally positive. A number of students have sought out the instructor outside of class time to discuss the MTM process and application in current and future pharmacy practice. Student comments regarding the ambulatory care simulation lab indicate that patient interviews make learning more realistic and enable students to apply critical thinking

skills and therapeutics knowledge to medication management. Evaluations of the elective course indicate that students feel the exposure to MTM prior to entering the practice setting and focusing on appropriate documentation and communication is very helpful. In the experiential setting, 95 percent or more of students have rated the required MTM activity in the community APPE as effective or very effective. While most students spend 2-8 hours on a single encounter, a significant improvement in the knowledge and skills related to performing an MTM encounter and the ability to resolve medication-related problems has been reported. Student-identified strengths of MTM activities include direct patient interaction, interaction with providers and other members of the health care team, refinement of skills in identification of drug-related problems and patient education, refinement of written and verbal communication skills, and the basic exposure to generalized medication therapy management. Based on didactic and experiential evaluations, these practices have shown success and will continue to be a part of the curricula.

Barriers to implementation

In the didactic setting, the primary barrier that was found with regard to MTM was lack of student knowledge that the process existed. Additionally, students lack the ability to identify areas where MTM may be incorporated into all avenues of pharmacy practice. By incorporating the history, current application, process, and procedure of MTM into pharmacy practice lectures and labs, these barriers have been and will continue to be overcome. In the experiential setting, identified barriers have included lack of time; lack of a designated counseling area; lack of access to patient medical records; lack of interest by patients; lack of provider collaboration; and lack of student and preceptor knowledge in how to provide generalized MTM. These barriers are being overcome by reinforcing the education of the principles of MTM provided to both students and preceptors. Additionally, faculty at the University of Montana have assisted preceptors in developing processes for identifying patients and ways to facilitate student involvement in the MTM process.

Advice or lessons learned

Over the past three years, after focusing on integration of MTM activities into the curricula, there have been some valuable lessons learned. First, having students practice MTM in the didactic setting via role-play; real-life scenarios; case discussion; and identifying, interviewing, assessing, and presenting non-scripted patients from the community has proven to be very successful in terms of students being able to apply these skills in the experiential setting and upon graduation. We have also found that some barriers are extremely difficult to overcome, while others are not as difficult. It is helpful to identify one or two barriers that have the feasibility for change, starting with those, and moving slowly with purpose. There are some barriers that may never be overcome (e.g., designated counseling space). It is best to find ways to adapt and work around those barriers. Our students have been very creative in helping identify options for working around non-modifiable barriers. Additionally, we have found that while feedback from preceptors with regard to MTM activities in the APPE setting has been generally positive, it is still a struggle at times to facilitate preceptor involvement in the process and in case discussion with the student prior to presentation to their peers. Overcoming this issue is a process of continued education among students, preceptors, and faculty. By having MTM a student-directed

activity, it has been much easier to incorporate into the experiential setting. Additionally, providing tools and templates to assist students in performing MTM encounters has been helpful to both students and preceptors.

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A general description of how MTM is incorporated into the curriculum

MTM is incorporated in pharmacy years 1-4 (PY1-4) in the classroom, skills lab, and APPEs. Foundational knowledge is introduced in PY1. Greater knowledge is then developed in a lecture with multiple lab activities to develop and apply MTM skills over PY2 and PY3. MTM reimbursement is discussed in the PY3 management course. Finally, MTM skills can be mastered in APPE PY4 rotations.

A description of successful practice

The goals for development and implementation at our college were several-fold. First, we wanted our students to have a continuously developing experience in MTM throughout their curriculum. Second, as faculty we strived to make these experiences as engaging as possible using various active learning techniques. Third, we wanted our students to be able to address multiple medication therapy-related problems on their APPEs with some experiences to draw from. The scope of MTM that is addressed in our curriculum is quite broad, ranging from medication therapy reviews to disease state management.

We believe that the successful learning experience at the UNM College of Pharmacy is attributed to faculty and preceptor teamwork and to the use of longitudinal learning. The concept of MTM as an integral part of pharmacy practice is introduced, developed, applied, and hopefully mastered over the span of UNM's 4-year pharmacy program. In pharmacy years 1-3 (PY1-3), the curriculum is designed to have didactic lecture classes with some active learning components as well as pharmaceutical care labs (PCLs) with a concentrated active learning focus. Unless otherwise specified, labs contain 30 students. Lab activities in PY1-2 contain simulated patient care activities, including hired, trained standardized patients. PY-3 labs contain actual patient care (de-identified) of currently hospitalized patients as well as standardized patients.

PY1: 2 1-hour lectures: Pharmaceutical Care and the Evolution of MTM; 5 1-hour lab activities: vignettes on prescription, OTC, and herbal medications. Focus on medication indications, therapeutic versus pharmacologic duplication, and therapeutic alternatives.

PY2: 2-hour lecture: Medication Therapy Management: Basic Implementation Steps; 2 3-hour labs containing 5 case series involving patient-centered care in OTC practice and associated MTM; 4 2-hour lab activities with partial MTM incorporation into prescription therapeutics; 2 3-hour labs containing 1 MTM case with multiple problems including herbal, OTC, and prescription therapeutics (Key Artifact for e-portfolio on MTM); 2 1-hour observed simulated clinical evaluation (OSCE) with standardized patients, one in the fall (OTC focus) and one in the spring (prescription therapeutics focus)

PY3: 1 2-hour lecture with associated activity on reimbursement and MTM using the same multiple problems case mentioned in the PY2 curricula (Key Artifact for e-portfolio on MTM); 1

2-hour tutorial on evaluation of patient care cases focusing on assessment and planning surrounding patient-related medication problems and management; 3 6-hour small group case series on evaluation of medication-related problems in a currently or recently hospitalized patient

PY4: 4 possible rotation sites that offer MTM services for APPEs,

Although many of these activities were previously taught prior to the implementation of the PCLs, the PCLs created time for focus in patient-centered care. Medication therapy reviews (MTR), although not initially a part of the PCL curriculum, were quickly added. Disease state management has been a part our curriculum for the last 8-10 years, as New Mexico has a “pharmacist clinician” licensure which includes prescriptive authority. The Key Artifact that occurs in PY2 and continues into PY3 addresses competencies in MTM including MTR and disease state management. In the PY2 activity, students interview a “patient” to get a detailed patient and medication history. The “patient” is another pharmacy student who has a detailed script with multiple medication-related problems including herbal, OTC, and prescription concerns. The student must then write a SOAP note describing all medical and medication-related problems. Additionally, MTM paperwork* is filled out and turned in. This activity is graded and returned to students, who then correct it and add it to their e-portfolios. This activity is continued in the 3rd-year management course where students re-explore this case and discuss issues of reimbursement and how to develop and run MTM in a pharmacy. The activity is also documented in students’ e-portfolio.

The PCL focus on patient-centered care allowed for a fairly smooth integration of MTM into the current curriculum with some minor barriers to overcome. Recognition of all the pieces that faculty and preceptors contribute became apparent when the curricular map was being created for accreditation. Part of the success of this curriculum is the continued and repetitive aspect of these activities. As no two cases are alike, students begin to become familiar with various medical and medication-related problems. The first round of students with this entire curriculum will graduate in May 2012. Students graduating in 2011 received 1 MTM case in PY2, and did not receive the MTM management activity secondary to a faculty member re-locating. We believe that the greatest success of this curriculum is yet to be seen in our students graduating with better patient-centered care skills and their ability to properly document this in practice.

*MTM paperwork is the paperwork that APhA and NACDS have endorsed for MTM documentation and patient care.

Outcomes

Implementation of this curriculum has been very successful. PY1-2 lab instructors as well as another faculty member met individually and in groups with the curriculum committee chair on several occasions to outline a plan to address the competencies and implementation of the MTM curriculum. Careful planning on timing of introduction, development, and application of concepts and MTM activities during PY1-3 began our process of implementation. This was followed by small group meetings with the PY1-2 lab instructors and 1-2 pharmacy practice faculty members to discuss lecture and lab activities that would build longitudinally. Initiation of these was accomplished for PY1-2 immediately. We felt that students would benefit from at least

a partial implementation in the first offering rather than not having any exposure to a focused MTM activity at all.

Although we do not have objective measures of the success of this curriculum, there are numerous subjective measures including collaborative teaching, improved patient-centered care skills, documentation of key artifacts for the curriculum, and the longitudinal development of the MTM curriculum. Faculty in PY1-3 of the curriculum interact with students on multiple activities and on multiple occasions. Faculty collaboration was essential to achieve this. Although only 2 of the activities are specifically tied together (Key Artifacts in PY2 and PY3 as shown in the descriptive portion), the teaching that occurs is still collaborative, with student knowledge and skills growing with each successive lesson/year. Collaborative teaching is valuable for students as they are introduced to different teaching methods that may contribute to more comprehensive understanding of the subject. Observed simulated clinical evaluations or OSCEs that now center on patient care with components of medication-related problems were introduced in PY2. Currently, this is the only required examination that has a standardized patient encounter with medication-related problems incorporated into the assessment. Students have improved in their ability to detect medication-related problems during their OSCE over the last 2 years of the new curriculum as evidenced by their assessment capabilities on their SOAP notes. We will be interested to see if this trend continues in future years. Students are required to maintain an e-portfolio to help document competencies. The MTM-related competencies have been partly integrated into the student's portfolios. The faculty member who taught the MTM management course left, so this remains undocumented, until the second round of students finishes PY3. In PY2, documentation via the portfolio has occurred 2 times. Longitudinal learning is an effective approach for 2 reasons. First, students have the opportunity on multiple occasions to learn the material, and second, students are given opportunities to build on past experiences that may lead to improved delivery of MTM. The repetitive nature of these activities cements the process in students' minds as well as offers multiple opportunities for instructor feedback on problem areas. The development of problem-solving skills does not occur quickly in many students and thus the iterative process increases the likelihood that it will "stick." The 1:1 feedback also encourages in-depth learning from reflection of previously introduced concepts.

Barriers to implementation

Our original MTM learning experience was a single, multi-step activity. At that point the students did not have enough foundational knowledge or hands-on experience to effectively learn and implement MTM. Although it was an activity that students enjoyed, it was clear that much more was needed. There are 3 main barriers that we faced implementing MTM in our curriculum: time, money, and organization, the same barriers that any implementation process negotiates. When we began this process, finding time to be collaborative with other pharmacy practice faculty (PPF) was difficult. PPF at UNM currently have a fairly large load of teaching, clinical practice, research, and service to committees. Scheduling a time when members could meet is not easily achievable in a short period of time. Our students really wanted MTM to be incorporated into their learning, as did we. However, finding time to be collaborative is only a portion of the time barriers. Finding time to give 1:1 feedback to students both written and verbal on each activity requires instructor dedication and commitment. Also, finding PPF to be mentors to evaluate the e-portfolios, which the MTM is a small portion of, is and was a barrier. Second,

and not far behind, is money. OSCEs take several thousand dollars to run effectively and efficiently with standardized patients. In times of hardship and budget cuts it becomes increasingly difficult to fund. The third barrier is the incredible organization that is needed to ensure that this process runs smoothly from PY1-4. The longitudinal nature of this curriculum requires continued monitoring to be sure all components continue to be taught and practiced. Faculty is used to being able to change an activity or lecture without having to consider the larger impact. When one activity builds upon another activity in different classes, this must be in the forefront of our minds. Strategic planning and implementation takes coordination, and continued success requires continued effort in time, money, and organization.

Advice or lessons learned

Mixed didactic and active learning in MTM develops problem-solving skills insightful to a multifaceted professional responsibility. A highly organized faculty member should lead the process. Start with a small group of 2-4 faculty members who are excited about incorporating active learning and MTM into the curriculum. Be sure that at least 1 of the members sits on the curriculum committee or is intimately familiar with the curriculum. Start planning at least a semester before implementation. Don't expect other faculty to "jump on board" immediately. Consider incremental steps for faculty who have a set way to teach topics. Consider novel ways to look at incorporation of MTM into some classes. Even small lessons added into current therapeutic courses could lend some longitudinal learning. Working as a team longitudinally across the curriculum increases the likelihood of more in-depth, multi-step learning, as it is reflective of multiple perspectives involved in patient care. Time must be set aside to ensure that activities are going according to plan. Continued revision of lesson plans is needed. Money will be needed for OSCE implementation. Having some form of documentation (in our case e-portfolios) helps with justification (i.e., money and time). Linking MTM to the COP's goals and objectives will also help with justification. Ensuring alignment from PY1-3 and APPEs is important (you don't want to teach something that they will not see in APPEs).

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A general description of how MTM is incorporated into the curriculum

The philosophy of pharmaceutical care and the MTM Core Elements are introduced, taught, and practiced in the Profession of Pharmacy 1 course (Fall semester, first professional year). This course allows students to experience what it is like to be a patient taking a medication for a chronic disease, conduct baseline MTM encounters with standardized patients, and engage friends and family members in individual MTM encounters. The students are responsible for completing each of the MTM core elements during every encounter. This course provides the students the foundation to provide MTM throughout the curriculum. These principles are then further expanded upon in the Profession of Pharmacy 2 course (Spring semester, first professional year) where the students partner with faculty preceptors to provide MTM to seniors who attend senior centers in the Pittsburgh area in a program called Silver Scripts. Students then walk through the steps of building an MTM practice in the community pharmacy setting and provide MTM through their Experiential Learning 3 and 4 courses (Fall and Spring semesters, second professional year). Throughout each of these courses, the MTM Core Elements are expected in each patient encounter. Standardized documentation and grading are used throughout these four courses. Finally, students have the option of selecting specific Advanced Pharmacy Practice Experiences (APPEs) where they can further work alongside preceptors who provide MTM to patients.

In summary, our students experience the need for pharmacist-provided patient care within the first week of the curriculum and then are positioned to further engage in the skills necessary to provide patient care (MTM) throughout the first professional year. This foundational experience prepares the students to be better equipped to complete Experiential Learning in the second professional year where they work alongside pharmacists in community pharmacies to better understand how MTM can be provided in a community setting. While the students continue to build their patient care skills, knowledge, and experience throughout the curriculum, these four courses provide the foundation by which our students learn to provide MTM.

A description of successful practice

Profession of Pharmacy 1 (PoP1): Fall semester, P1 year. This course provides the students with the foundational concepts of the profession of pharmacy as a whole, beginning with the first day of class. Below is a sequential list of the experiences in this course:

1. Medication experience: Students are provided a “diagnosis” and a “prescription” for a medical condition they could have as a young adult and are instructed to pick up their “prescription” at one of two on-campus pharmacies. At the pharmacy, a P4 student (precepted by a community pharmacy resident) greets the “patient” and then provides the P1 student individualized patient counseling via the Indian Health Service model and their prescription (placebo capsules). For the next week, the P1 students are expected to take their medication and report their experience via a written reflection and class discussion. This experience allows the students to recognize the need

for a pharmacist to engage patients beyond the provision of drug product. We use this activity to teach the philosophy of pharmaceutical care and introduce the MTM Core Elements. Logistics: 1 hr. didactic preparation, 4 hr. practicum, 1 hr. in-class debrief. Personnel: 1 faculty member, 3 community residents, 4 P4 students, 1 staff member, UPMC Investigation Drug Service for placebo medication.

2. Standardized Patient Experiences: Students learn the components of an MTM encounter through step-wise practice with standardized patient (SP) actors. The students have a total of four SP experiences in this course. The first two encounters are in small groups (students plus facilitator) where the students individually practice introducing themselves to the patient and gathering patient-specific data regarding medical and medication histories. The third SP encounter is considered a “practice” encounter for their final exam, completed in a group of three students without a facilitator. The fourth SP encounter is the course final exam worth approximately one third of the total grade. The students individually conduct an MTM encounter with the SP while being video recorded and evaluated by a faculty member. The SP cases are based on the information the students are expected to know based on basic drug knowledge taught within the course. Complete MTM documentation including a physician letter, personal medication record, medication action plan, and billing form are expected. Logistics: 21 hrs in class didactic and active learning (small group, practicum, quizzes, and discussion), 16 hrs SP experience total (5.5 hrs per student), 3 hrs active learning debrief. Personnel: 2 faculty coordinators, 1 staff coordinator, 4 SP actors each experience, 4 facilitators each experience (mix of faculty and residents).

3. Friends and Family: The students are instructed to engage two friends or family members who take at least one medication each in an MTM encounter. Students complete MTM documentation as listed above. Students then present their cases in a small group format to a faculty member. Logistics: 1 hr didactic preparation, 4 hr small group case discussion. Personnel: 1 faculty coordinator, 6 faculty/resident case facilitators.

Profession of Pharmacy 2 (PoP2): Spring semester, P1 year.

1. Silver Scripts: This educational and community service experience began in 2004 and is now successfully in its 8th year. As a school we partnered with Pittsburgh-area senior centers to provide seniors an opportunity to have an MTM encounter with a pharmacist and student. Since the students have already learned the process of an MTM patient encounter in the fall semester, the preparation for these experiences focuses on learning about the medication-related needs of the elderly and the logistics of providing care in the community. Students are assigned to a senior center in a group of 10 with a faculty/resident pharmacist and 2 P4 students. At the center, the students work in pairs to meet with at least one patient during each of two visits. Typically student pairs see 1-3 patients each visit. The P1 student pairs begin the patient visit by collecting the subjective and objective information from the patient; the faculty facilitator then works with the students to complete the patient visit by providing the assessment and plan. The P4 students assist the faculty member in keeping the P1 students organized and on-task. At the conclusion of the patient visit, the patient is provided a hand-written personal medication record and medication action plan that was reviewed by the faculty member. The P1 students complete the full MTM documentation as listed in

POP1 after the experience and which is evaluated by a faculty member. Logistics: 5 hr didactic preparation, 8 hrs senior center experience, 2 hr debrief. Personnel: 2-3 faculty coordinators, Director of Experiential Learning, 2 staff, 11 senior centers, 11 faculty/resident facilitators, 15-20 P4 students.

2. Experiential Learning 3 and 4: Fall and Spring semesters, P2 year. This two-semester course is designed to allow students to walk through the steps of building an MTM practice within a community pharmacy setting. Students are paired with community pharmacist preceptors that are open to providing patient care. Some have a small MTM practice and/or provide immunizations, but all are willing to allow students to work with patients. Students meet at their site weekly for 10 weeks each semester to complete a series of assignments focused on MTM and building a patient care practice (engaging patients, learning about the community and area physicians, conducting and evaluating a public health project, and ultimately providing MTM to patients). The faculty coordinator meets with students in class three times each semester to prepare the students for their assignments, and subsequently students meet in small groups with faculty facilitators three times each semester to provide feedback and guidance to the students. Students are evaluated on their work. Students complete full documentation as noted in POP1 for each patient encounter. Logistics: 6 hrs didactic prep, 9 hrs small group discussion, 80 hrs total at community site. Personnel: 1 faculty coordinator, Director of Experiential Learning, 2 staff, 10-12 faculty/resident small group facilitators, 60-70 community pharmacy sites/preceptors.

Outcomes

Since the 2003-2004 academic year, we have continued to build the components of the courses. We have a number of indicators of the positive influence these experiences have had on our students and patients:

1. Medication experience: Prior to implementing this experience, the students questioned the need for pharmacist provision of patient care. They remarked only about what they saw in practice vs. recognizing patients' actual needs. Classroom discussion and engagement has increased substantially.
2. SP experience: During the experience, students comment about how they see the value of what pharmacists can do. The SPs remark about how impressed they are at the professionalism and compassion demonstrated by our students. Most importantly, since implementing the SP experience in 2008-09, the students perform at a higher level during their Silver Scripts experience. They comment on increased understanding of how to approach a patient and are confident in their abilities. In a recent assessment, 96% of students scored at/above 80% in their SP final.
3. Friends and Family: We see this experience as an important bridge between the SP experience and Silver Scripts, with students gaining a different perspective when interviewing a "real" patient vs. SPs in the classroom. In a recent assessment, 98% of students scored at/above 80% in their Friends/Family presentation.

4. Silver Scripts: Nearly every site has invited us back with requests coming yearly to expand to new sites or come back at different times in the calendar year. We now have P4 students volunteering in advance to assist with the experience because of how impactful it was to them. Our faculty and residents easily provide their time each year, as they have seen the value the experience brings to the students and patients alike. Students frequently cite this experience in their portfolios as a “transformative experience.” Students on average identify one drug therapy problem per patient, care for nearly 200 patients, and conduct nearly 150 blood pressure assessments each year. In a recent assessment of their documentation, 78% of students scored at/above 80% in their first Silver Scripts visit, with performance improving at the second visit with 95% scoring at/above 80%.

5. Experiential Learning 3 and 4: This course provides students the opportunity to face the real-life issues encountered by pharmacists trying to build patient care practices. Preceptors have commented on how prepared our students are, noting they are self-directed learners making it easier for the preceptor to facilitate the experience. Faculty find the students are engaged in small group discussions asking questions pertinent to practice. Recently, students have commented on how “easy” it is to approach patients. This is a marked change since the inclusion of the P1 SP experience. We also see students utilizing the skills they learn in this class (patient care, public health outreach, measuring clinical outcomes) in other courses and their student organization projects. In a recent assessment, 100% of students scored at/above 80% in their workflow/process map assignment, and 100% of students scored at/above 80% in their public health projects.

Barriers to implementation

The first barrier we encountered was that of differing opinions among our faculty about how and when to teach students about patient care. When we began Silver Scripts it was truly an experiment to see if the students would be able to realize the tremendous needs of patients. We were overwhelmed by the positive response from the students and the sites. The students’ response and subsequent performance in other courses made an impact on our faculty that allowed us to grow and expand the patient care curriculum.

There are six main barriers we have faced within each of these courses.

1. Current practice vs. what we envision MTM to be: Within each of these experiences, we have to be sure to include modeling of best practice and provide multiple opportunities for students to discuss their concerns about current practice. We have done this by having multiple small group discussions and debriefing sessions. Facilitators all have to be able to deliver a similar message to students.

2. Coordination of standardized patients: Scheduling and coordination with the SPs occurs weeks in advance of the semester and requires planning and continual communication with the SP coordinators in our Medical School. We now have dedicated staff to work with faculty to coordinate the experience.

3. Finding and communicating with sites: Course faculty work closely with the Experiential Learning team to identify sites. The EL team does all of the communication with the sites, which requires a full understanding of the course material.

4. Variability between sites: Given 108 students and multiple sites there is inherently variability between experiences. In all cases, students are prepared in a standard way, have standard assignments, and have on-campus debriefing sessions to discuss their experience with other students and faculty. We have found these debriefing sessions to be critical in addressing the variability between sites.

5. Grading: In each of these experiences, students complete full MTM patient encounters and documentation. The amount of time to grade and provide substantial feedback is significant. We developed a standard rubric for grading that is used throughout all 4 courses. Faculty and residents involved in grading meet to discuss expectations. Each year we have changed how many and which faculty grade, but we find it essential to provide the feedback despite the time involved.

6. Amount of faculty time: A significant amount of faculty time is essential for the success of these experiences. We feel that faculty time is best spent on direct interaction with the students. Course and experience coordinators provide the majority of planning and grading time. Faculty who facilitate experiences are provided specific guidance, and their time is limited to precepting the experience on a given day. We have engaged residents who have added greatly to the depth of faculty and are serving as models for our students. We have engaged P4 students where appropriate, and we have dedicated course support staff who are essential in the behind-the-scenes planning and communication within each course.

Advice or lessons learned

1. Teamwork and coordination are essential: Each course involves multiple faculty, residents, P4 students, staff, and experiential learning sites. Coordination and cooperation between all involved, including the students in the course, is essential.

2. It takes time: We've built these experiences within individual courses over time. One positive experience leads to another. Our Silver Scripts experience has been transformative not only for our students but also for our faculty and staff. We've made changes one experience or course at a time.

3. Start within a course: It is easier to make changes within one course than throughout an entire curriculum. Within a course, the course faculty have the ability to choose how they deliver the curriculum and so change can happen more efficiently.

4. It's never too early to start: Our P1 students have demonstrated to us year after year that they are capable of contributing to a patient care visit without extensive drug knowledge. They have also taught us that if they learn early, it is easier to accept that patient care is an expectation of pharmacists.

5. Bridging classroom work and experiential learning is easier than you think: When faculty work together in course planning, the connections become obvious between the classroom and EL when you focus on the patient. We have a standard expectation of a patient visit, and this allows faculty in any course to build on this experience through more detailed drug knowledge or experiences.

6. Focusing on patient care opens many doors: We have used these experiences to model and discuss professional behavior, recent literature, policy and advocacy issues, controversial topics, billing and compensation, practice management, and much more.

7. Be creative: Within every school/college community there are likely more resources than are imaginable. We reached out to our Medical School to begin working with SPs, our community to find senior centers, our preceptors to help us teach MTM, and our local pharmacies to assist with a number of experiences. We had to “step out of our classroom box” and stretch ourselves to find these experiences, but when we did, the learning opportunities for our students expanded beyond anything we were capable of in the classroom.

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A general description of how MTM is incorporated into the curriculum

Medication therapy management (MTM) is taught in P1 as a part of the Introduction to Pharmacy course. This includes didactic lecture, team activity, invited guest lecture, and IPPE hours on MTM. USN uses a block system to teach. In the block system students take only one class at a time, focus intently on that content area, and master the content before proceeding to the next block. Students are engaged in instructional activity with faculty and peers for six hours a day from 8am to 3pm from Monday to Thursday. Introduction to Pharmacy is taught for 5 days from 8am to 3pm, accounting for 30 hours of teaching in addition to assessments. MTM is taught for an hour, followed by team activities that include 20 presentations and discussions (approximately 3.5 hours). I also include an invited guest lecture on MTM in the real world by a community pharmacist practicing MTM, which usually lasts for an hour including the Q&A session. Finally, students also need to do an IPPE assignment on MTM services, which is then discussed in the class. Thus, in total, around 6 hours (of the total 30 hours) are spent on MTM services in P1 class.

A description of successful practice

MTM is taught in four different ways.

1. Lecture: The students are taught the definition of MTM, the history of MTM, the importance of MTM in today's pharmacy, barriers in implementing MTM, and examples of different MTM practices in the real world. They come prepared to the class reading the APhA/NACDS publication Medication Therapy Management in Pharmacy Practice: Core Elements of an MTM Service Model (Version 2.0).
2. Team activity: Students (n = 102) are divided into 20 teams, and each team is given a country from "Pharmaceutical Care in Community Pharmacies: Practice and Research from Around the World" published in the *Annals of Pharmacotherapy*. Each team makes a PowerPoint presentation to the class about the pharmaceutical care from each country, and the class is encouraged to ask questions to the presenting team. This activity often broadens their thoughts about MTM.
3. Invited guest lecture: A pharmacist from a community setting is usually invited to talk to the students about the MTM services provided in their pharmacy and also answers students' questions. This usually helps a lot since the students can see how MTM works in the real world.
4. IPPE hours: USN P1 students go to community pharmacies every other Friday as a part of the IPPE assignment and spend eight hours in the pharmacy. During this time, they are given assignments to be completed with the help of the preceptor based on the curriculum taught during the past two weeks. The IPPE assignment given to students after the Introduction to Pharmacy block includes a question on MTM such as "Have a discussion with your pharmacist about any pharmaceutical care/medication therapy management services offered in your

pharmacy. If there is an MTM service/Disease State Management offered by the pharmacy, write a report on that. If there is no Pharmaceutical care/MTM service/DSM available in the pharmacy, speak with your pharmacist to understand his/her attitude towards the same. Also, try to understand the barriers perceived by the pharmacist towards implementing these services. Report your findings.” This exercise usually helps the students to get a better idea of MTM in the real world. The IPPE assignments are later discussed in the class. In addition, when they are taught “evaluation cycle,” as part of the active learning they are encouraged to develop an MTM service, usually based on the Healthy People 2010 objectives for pharmacists to reinforce the idea of MTM services.

Outcomes

Students while giving feedback on the class often talk about MTM and their intention to do MTM when they graduate. While speaking with the students and during class discussions, the class is usually very attentive and enthusiastic about MTM and the future of pharmacy with MTM services. Here is some of the feedback from them. “I felt that MTMs were by far the most important subject taught and so greater detail would be great.” “Very insightful. Insurance and MTMs were the most important parts to me.” “Very informative, and learning about MTM was interesting and inspiring.” “Pharmaceutical care is a major component that we, as a professional, must utilize.” “Gave me a better understanding of how pharmacy is practiced in other parts of the world.”

Barriers to implementation

Amount of time needed to make 20 presentations, with each presentation taking at least 10 minutes. However, since USN has a block system this was not a huge problem. We spend a whole afternoon making pharmaceutical care presentations and discussing it.

Finding a community pharmacist to come and talk to the class about MTM services offered in their pharmacy. Took the help from clinical faculty to find willing community pharmacists.

Advice or lessons learned

Encouraging students to be a part of their profession and taking charge of the future of pharmacy with MTMs really works. I am not sure about the long-term outcomes of this, but for the short term, the majority of the students like the concept of MTM.

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A general description of how MTM is incorporated into the curriculum

Concepts of MTM are incorporated throughout the curriculum at UT COP in multiple required courses. The specific courses and MTM-related content are described below. These courses primarily span the 1st and 2nd professional years, with additional experiences gained during introductory and advanced pharmacy practice experiences. This description has been restricted to required courses in the curriculum.

A description of successful practice

The Introduction to Pharmacy course contains an introductory lecture on medication therapy management, and small group discussions that focus on patient care issues. In the Basic Clinical & Communication Skills course students gain skills in documenting patient care, patient interviewing, and medication use review, to name a few. This course is designed to introduce the role of the pharmacist as a problem-solver and patient educator. Skills learned during lectures are demonstrated by students during a lab. The course includes 12 lecture hours and 12 lab/recitation hours.

The Introduction to Patient Care course is a course composed of small groups that observe Applied Therapeutics group presentations. Students in the first professional year are required to observe 5 presentations during the semester. This course incorporates 10 hours of small group discussions related to MTM patient care. Students are also required to complete HIPAA training prior to their involvement in the course.

Self Care & Non-Prescription Drugs: Nonprescription drug therapy is an essential component of pharmaceutical care. This course is designed to provide the first-year pharmacy student with the information needed to: 1) recognize conditions that are self-treatable with nonprescription drugs; 2) assess patients' needs, risk factors, and potential adverse events; 3) assist with product selection; 4) advise and counsel patients on therapeutic options and outcomes of therapy; and 5) recognize appropriate physical assessment techniques needed to evaluate a patient's condition and response to therapy. This class incorporates 41 lecture hours of MTM-related topics.

The Immunization course utilizes the APhA Pharmacy-Based Immunization Delivery certificate course. This allows for all students in the curriculum to have earned this certificate prior to graduation. The course includes 12 hours of lecture/recitation and 8 hours of self-study.

The Patient Assessment course teaches students basic patient examination techniques. This includes both a physical examination and patient interviewing techniques. The course incorporates 14 lecture hours and 12 recitations that review and simulate physical assessment of all the major body systems.

The Pharmacy Management & Economics course incorporates MTM-related topics such as the medication use process, performance improvement, and business plan development. There are also 2 lecture hours of MTM-specific overview. This course incorporates 10 lecture hours and 8 small group projects of MTM-related topics.

The Medication Therapy Management course is designed to incorporate multiple aspects of MTM. It incorporates clinical skills (to review and resolve drug therapy problems), management (developing collaborative practice agreements, billing for cognitive services, provider communication, and continuous quality improvement, to name a few), and theoretical aspects of practice (health belief model, MTM practice around the world). The course also incorporates a guest lecture series for pharmacists who practice MTM in different settings to describe their role to the students. The recitation component of the course provides the students opportunity to strengthen their clinical skills (through discussion of patient cases) and exposes the students to documentation systems commonly used in the community setting to bill for MTM (Outcomes Pharmaceutical Health Care, L.C.[®] documentation system). This course incorporates 32 lecture hours and 30 recitation hours of MTM-related topics.

The Applied Therapeutics course is a small group active learning experience in which students gather subjective and objective information about an actual patient and present this data (along with an assessment and plan) to identify and resolve drug therapy problems. This course is required for 2 semesters of the curriculum, with each student presenting 5 patients each semester.

Introductory Pharmacy Practice Experience: In addition to the experiential component of IPPE (includes both community and hospital pharmacy experiences), students are required to maintain a daily reflection journal, provide an assessment of the operational structure of the practice sites they are assigned to, review the standards of practice from the state pharmacy law, perform multiple medication reviews, assess the health literacy level of patient education materials, assess the work flow to identify potential areas for a medication error to occur, and complete a written communication addressed in response to a letter from another health care professional. These are all individual activities to be completed by each student. Students spend approximately 160 hours at their rotations sites for this course. Students at the UT COP experience up to 18 months of APPE experiences and month-long electives. With the college having multiple campus locations, there are also multiple regions of the state in which students can experience APPE rotations. The four major regions include Memphis (west Tennessee), Nashville (middle Tennessee), Knoxville (east Tennessee), and Chattanooga (east Tennessee). Students are required to complete at least 1 advanced community rotation and 1 ambulatory care rotation. Advanced community and ambulatory care rotations are available in all of these regions of the state.

Outcomes

Most students successfully progress through these aspects of the curriculum with an understanding of how each component builds upon the prior components. Though we don't have a structured outcomes assessment system, the feedback we get from our community pharmacy preceptors is that they are quite impressed with the level of MTM knowledge and experience our students have.

Barriers to implementation

The integrated curriculum described above was an intricate process of curriculum revision that took place in 2004 to 2005. It was at this point that the MTM course was added to the curriculum and the didactic portion of the curriculum was shortened to 2.5 years, to make room for 18 months of experiential rotations. This curriculum change presented some challenges, since it required moving some basic science courses out of the curriculum and to the pre-requisite course list. The largest piece related to teaching of MTM is the required course that was also implemented with the curricular changes at UT COP. This course has been fine-tuned to create a learning environment that balances both clinical skills and knowledge with management-related knowledge. These were significant changes to the curriculum and involve a significant number of faculty for successful completion.

Advice or lessons learned

The practice of MTM is complex; therefore, the way we incorporate aspects of MTM in the curriculum is also complex. However, it does not need to be difficult. Repetition related to how MTM can be incorporated into clinical practice is important, but also having pharmacists provide their experiences with MTM is vital.

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A general description of how MTM is incorporated into the curriculum

The Core Elements of MTM (2.0) are introduced in the second professional year through our Pharmaceutical Care Laboratory sequence. A pre-lab session (2 hrs) introduces students to MTM; then in lab (3 hrs), students evaluate a patient case and complete all the documentation related to a comprehensive medication review, including correspondence to the provider. In the third professional year, student pharmacists each conduct two face-to-face MTM encounters with patients at a local primary care clinic that serves the underserved population of Morgantown and the surrounding region.

A description of successful practice

In fall 2010, the School of Pharmacy enhanced an existing relationship with a local primary care clinic serving uninsured, low-income patients. We partnered to develop and implement a new MTM program to fulfill educational needs of the School and patient care needs of the clinic. The program involves provision of MTM services by third professional year (P3) students to patients of the clinic, under supervision of a pharmacist faculty member or PGY-1 pharmacy practice resident, as part of ambulatory care Introductory Pharmacy Practice Experiences (IPPEs). Individuals involved include regular clinic staff, a pharmacist faculty member whose primary practice site is the clinic, two faculties who co-coordinate ambulatory care IPPE activities in the P3 year, additional faculty and resident preceptors, and P3 students. The P3 year of IPPE consists of ambulatory and acute care activities; one half of the class participates in the ambulatory care arm in a given semester.

In our curriculum, our IPPE sequence is accompanied every semester by a 1-credit-hour didactic component (not counted toward IPPE hours). This classroom time is used to explain activities, outline performance expectations, and prepare students for the on-site activities. During the first of two 1-hour classes, the faculty introduces the MTM activity, giving background information regarding the clinic, providing a quick refresher on the elements of a comprehensive medication review, and describing the process and expectations of student performance for the MTM appointment. After this session, students receive a de-identified sample patient from the clinic records. Students have one week to perform a comprehensive medication review (CMR) for the patient prior to the next class session.

The second 1-hour class is highly interactive and is devoted to discussing the sample patient. The faculty solicits information from students such as drug-related problems identified through the CMR, information they would discuss with the patient during the face-to-face encounter, and recommendations to the provider. Throughout the discussion, one faculty member documents the identified problems and assessments and the information is displayed through the lecture computer/projection screen (the documentation format used is that which is requested of the students, allowing them to view an example in progress). In addition, this class session is used

for students to share any issues they encountered when performing the CMR and clarify questions they may have regarding the activity.

For the MTM appointments, patients are identified by the faculty member practicing at the clinic. This clinic has its own in-house pharmacy that provides medications at no (or very little) cost to patients. At this pharmacy, patients receive refills of their entire medication regimen every month on a specific date (this is scheduled in advance, at the previous month's medication pick-up date). The faculty member identifies patients scheduled for medication pick-up on dates corresponding to student availability, and patients are scheduled for an MTM visit through the clinic office staff. This parallel scheduling was expected to increase patient show-rate, since the patient would need to come to the clinic to receive their monthly medications. Interested patients may also directly request an appointment. These student-provided MTM services are a recognized patient care service of the clinic.

P3 students are paired and schedule two 2-hour MTM visits over the course of the semester (i.e., 4 hours of IPPE). The pair receives a de-identified patient profile one week prior to the patient visit; information includes basic demographic information, the problem list from the electronic medical record (EMR), the medication list from the EMR, and the medication list from the pharmacy record. Students perform a comprehensive medication review and create a ranked problem list. The students arrive at the clinic for the appointment and meet with a pharmacist preceptor (pharmacy practice faculty member or PGY-1 pharmacy practice resident). The student pharmacists have 30 minutes to give a formal patient presentation of their patient to the preceptor prior to the patient encounter. During this time, students also identify the 2 or 3 key points that they would like to discuss with the patient. During the patient encounter, the students review each medication with the patient, focus on key counseling points, clarify any issues or discrepancies identified through the CMR, address patient concerns, and complete a written medication record and medication action plan for the patient to keep. These encounters generally last from 30 to 75 minutes. After the patient encounter, the remainder of the 2-hour block is used to debrief and provide formative feedback to the students. As time and accessibility allows, the students may explore the patient chart in the EMR for additional supporting information. After the encounter, the students complete and submit a SOAP note to the preceptor. The SOAP note will include documentation of the encounter as well as recommendations to the provider to be managed at the patient's next primary care visit or at a later date. This SOAP note is reviewed by the preceptor and revised (as necessary) by students, and a final, signed copy is placed in the patient's EMR as official documentation of the MTM service. This documentation is then viewable by the patient's provider.

Outcomes

In the first semester of implementation, MTM services were provided to 40 patients, with an additional 41 patients scheduled for the current (second) semester. In the first semester, roughly half of the scheduled patients did not attend their scheduled appointment, but the patient show rate has improved noticeably in our second semester. SOAP notes documenting MTM services for the first 40 patients have been placed in the EMR, and documentation of visits from this current semester is ongoing. Analysis of data related to the problems identified, interventions, and provider recommendations from the MTM services is ongoing. This service fulfills

educational outcomes of IPPE and benefits patients and providers of the clinic. Partnership between the clinic and the School will support sustainability of the MTM service.

Barriers to implementation

A major barrier encountered in this activity has been patient no-shows. This was anticipated due to the nature of ambulatory care practice as well as special considerations for this clinic's patient population such as lack of transportation. However, even if a patient does not come, MTM service is still provided. The student pharmacists still perform a CMR and complete a SOAP note reflecting the issues identified through the CMR and recommendations to the provider. This SOAP note is reviewed by the preceptor and revised (as necessary) by students, and a final, signed copy is placed in the patient's EMR as official documentation of the CMR. It is viewable by the provider; therefore, the identified issues can be addressed at the patient's next routine primary care appointment. It is reinforced to students that they are still making an impact on the patient's care, even if they do not have the opportunity to meet the patient in person.

Advice or lessons learned

The success of this project owes to enthusiastic and supportive administration and staff at the clinic. In addition, the faculty involved devotes a significant amount of time to creation and implementation of this program and are fully vested in its success. We have also had the great benefit of having a residency teaching certificate program and residents on academic rotations, allowing for their participation as preceptors for this activity.

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