

## TEACHERS' TOPICS

### Applying Therapeutic Knowledge and Skills in a Large Group Problem-Based Class

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*Therapeutics*, taught to 180 students, incorporates the principles of pharmaceutical care and problem-based learning. Two strategies, use of integrated patient cases and sharing of real patient experiences in the classroom, can enhance students' ability to integrate and apply therapeutic information. Integrated cases are developed to include drug-related problems from multiple therapeutic areas and are incorporated periodically through the course. To effectively work through these cases, students are expected to integrate previously learned information with new information. For other cases, real patients are invited to the classroom to share their illness experience. A detailed description of a real patient work-up, which also serves as an "integrated cardiology case," is described in detail. Students indicate a high rate of satisfaction with these strategies, which allow them to integrate information from multiple therapeutic areas while creating authenticity to their learning within a large group, problem-based learning environment.

**Keywords:** therapeutics, problem-based learning, case studies, integrated case, pharmaceutical care

#### INTRODUCTION

The pharmacy curriculum at the University of Toronto offers a 1 + 4 year undergraduate program, leading to a baccalaureate degree in pharmacy.<sup>1</sup> The educational outcomes of both the American Association of Colleges of Pharmacy (AACCP)<sup>2</sup> and the Association of Faculties of Pharmacy of Canada (AFPC)<sup>3</sup> emphasize the importance of students being able to provide pharmaceutical care to patients, while effectively working within an interprofessional health care team. In order for students to meet this outcome goal, in addition to required knowledge, development of specific skills are essential. These skills include the ability to gather relevant information from patients, to systematically assess a patient's medications, and to develop feasible care plans to resolve identified drug-related problems.

At the University of Toronto, the curriculum is aligned so that students' development of knowledge and skills are coordinated over the 4 years. *Therapeutics*, taught in the final 2 years of the pharmacy curriculum, with an emphasis on pharmaceutical care<sup>4</sup> and problem-solving, is taught to a class of 180 students, using self-directed, modified problem-based learning. The overall

goal of the *Therapeutics* courses is to enable students to optimize the knowledge and skills required to provide pharmaceutical care. In these courses, simulated paper-based cases are used as the starting point for learning. Each "problem case" focuses on one main therapeutic topic. Along with the problem case, students are provided with recommended readings from textbook and/or journal articles. Students, working in groups of 8, use a systematic thought process to work up the patient case prior to class. In class, a pharmacist-instructor facilitates the discussion and guides students through identification and resolution of drug-related problems for the patient. Over the 2 years, students are gradually exposed to a range of therapeutic problems from straightforward and well-defined to more complex and ill-defined by the end of the therapeutics courses in the fourth year.<sup>5</sup> This ensures that students' knowledge and skills are developed to between a multi-structural level and a relational level as defined by the SOLO taxonomy.<sup>6</sup>

This article discusses 2 specific strategies integrated into the teaching in the final year therapeutics course that can enhance students' ability to integrate and apply therapeutic information to patients. These strategies are the incorporation of integrated therapeutic problem cases into the course and the use of real patients in the classroom to create authenticity to students' learning.

The specific goals for incorporating "integrated therapeutic problem cases" into the course are

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- to provide students with an opportunity to gain insight into patient problems that are ill-defined and/or non-routine in nature; and
- to help review therapeutic topics previously covered and to provide an opportunity to apply learned information in a different context.

Inviting patients to the classroom serves several purposes. It provides:

- authenticity to learning within the problem-based learning environment;
- bridging for students between caring for simulated paper-based patient cases to real patients;
- an opportunity to interact and care for patients with ill-defined, non-routine problems;
- an appreciation for the patient's perspective of their illness experience.

## **INSTRUCTIONAL METHODS**

Use of paper cases in problem-based learning provides students with an opportunity to provide pharmaceutical care to simulated patients. Although the paper cases are based on real patients from practice, the patient problems are simplified to allow students to focus on one main therapeutic area.

However, in order to prepare students for practice in settings in which patients often are receiving 5-7 medications,<sup>7</sup> and in which elderly patients commonly take many more, it is important to expose students to patients with multiple issues and drug-related problems. This emphasizes the interrelationship between conditions and how to set priority in resolution of multiple drug-related problems. Including such integrated patient cases at several points in the course provides students with an opportunity to work through multiple therapeutic issues and also serves as a review of previously learned information, as students are now required to apply this information in a different context. By providing the opportunity to gradually work through more difficult topics and multiple problems, students are able to gain the required knowledge and develop their skills in assessment and management of drug therapy problems.

Integrated cases are developed to include drug-related problems from 3 to 4 therapeutic areas, where some topics have been previously covered in the course. Students are informed that the patient in the paper case may have a combination of real and potential drug-related problems, both of which provide the basis for discussion of topics. An example of an integrated case used in the third year is a female patient who presents with an acute episode of Crohn's disease; the patient also has a history of rheumatoid arthritis (RA) which is not optimally managed, with reliance on nonsteroidal antiinflammatory

drugs (NSAIDs) and periodic use of corticosteroids for pain relief. In addition to the management of Crohn's disease, management of this patient's RA will be discussed. Additionally, patient's potential risk for NSAID-induced peptic ulcer disease (PUD), as well as her risk for osteoporosis related to longterm corticosteroid use would need to be addressed. Topics that students would have covered in the course previous to this case may include inflammatory bowel disease (IBD) with a focus on ulcerative colitis, RA, osteoporosis (with focus on prevention), and PUD. The integrated case allows students to discuss another aspect of IBD-Crohn's disease; review management of RA; review management of PUD, specifically in the context of NSAID-induced PUD; and discuss the management of corticosteroid-induced osteoporosis. Working through this case provides students with a learning opportunity where previously learned information is reinforced and integrated, and the student is required to apply the information in a different context. Integrated cases are incorporated 2 to 3 times in each course and each case is allotted a double class time for discussion (3 hours with 2 breaks). An example that will be discussed further is the integrated case incorporated at the end of the cardiology block in the fourth year; however, instead of providing students with a paper case, a real patient is invited to the classroom. This patient's presentation becomes the "case" for class discussion.

### **The Patient as "Teacher"**

In the fourth-year *Therapeutics* course, students are introduced to real patients in the classroom setting. An example of this is the integrated therapeutic case at the end of the cardiology block. A patient with a significant cardiac history is invited to share his or her experience with students. Students are given clear guidelines in preparation for this case discussion. The class time of 3 hours is split so that one third of the time is spent interviewing the patient and two thirds is used for discussion of therapeutic issues. Four student volunteers interview the patient in front of the class of 180 and help gather relevant patient, drug, and disease information. Students may also provide the patient with information related to his or her medications, if they are comfortable with the information; the students are encouraged to inform the patient that they will follow up with any other issues. The pharmacist instructor is present throughout this session and may intervene as appropriate. Upon completion of the interview by student volunteers, students from the class may ask questions to clarify information. The patient is encouraged to share experience related to his or her illness, as well as experience with the health care system and with health care professionals, specifically, pharmacists.

The patient is then thanked for his or her contribution to the students' learning and escorted out. Following a short break, the instructor facilitates a discussion of specific patient issues identified by the class. A detailed description of how a patient's experience can be used to enhance learning in therapeutics is outlined below.

### **Recruiting Patients**

Many consumer advocacy organizations are active in increasing community awareness of particular illnesses and conditions. Local organizations such as these are a valuable resource for providing names of individuals who may be interested in educating health care providers. For example, through the Parkinson Foundation of Canada, 2 individuals with Parkinson's disease have visited our classroom to share their life experiences. Other helpful contacts are health care providers in institutions and in the community. For the psychiatry section, through a pharmacist contact in a tertiary care psychiatric institution, patients with bipolar affective disorder and with schizophrenia are invited to the therapeutics class, along with their psychiatrist. In complex therapeutic areas such as these, students can benefit from the psychiatrist's interview of his or her patients, thereby helping students understand the complexity of their illnesses and the specific role that can be played by the generalist pharmacy practitioner.

### **Guidelines for Patient Participation**

Patients should be comfortable in sharing their personal experiences in front of a large group of students and to be able to respond to questions from students. They should also be able to communicate information related to their illness and their experience with health care providers. These may be positive or negative experiences. The key to sharing negative patient experiences is to frame them in a context that serves as a valuable learning point for students. Patients should be aware that they may answer questions posed by students, but only if they are comfortable in responding to them. Once initial contact is made with a patient, discussing their expectations and concerns, as well as the instructor's expectations and guidelines, are important to ensure that the patient's visit will be beneficial for students' learning and a positive experience for the patient.

### **Student Instructions for Interacting With the Patient**

Students need to clearly understand the purpose of the patient's visit. As patients who are invited to the *Therapeutics* class become the "class case" for discussion, students need to be given appropriate preclass reading assignments to prepare for the class. Instructions should

also be provided with respect to the format for class discussion and how to initiate discussion with the patient and think ahead and plan for the type of questions that should be asked. When students volunteer to interview a patient on behalf of the class, it is beneficial for them to discuss the interview strategy in advance with the instructor. Students should also be informed of the specific process for in-class discussion and post-class follow up. Appendix 1 is an example of student instructions provided for the integrated cardiology case.

### **Class Discussion**

Following the patient interview, the instructor first elicits the interviewers' impression of the interview they have just conducted and asks them to share their thoughts about the interview process with the class. Students often discuss what they were comfortable with and what was difficult to ask. Following this discussion, the instructor facilitates the class discussion on the "patient case."

The discussion starts with students listing all of the patient's present health concerns or issues. Patients who have been invited to the class have presented with a history of myocardial infarction (MI), dyslipidemia, hypertension, angina, ventricular arrhythmia, and non-cardiac conditions such as osteoarthritis and diabetes mellitus. To guide students in systematically reviewing therapeutic information for each of these topics, a general discussion of the therapeutic area is followed by specific discussion and application of current evidence-based guidelines to this patient's care. For example, the discussion with students related to myocardial infarction may follow a series of questions, such as:

- What are some general risk factors for coronary heart disease (CHD)?
- What were this patient's specific risk factors prior to the development of CAD?
- Can the condition being discussed be caused or be worsened by drug therapy?
- If yes, what drugs can contribute to this and what is the mechanism by which they do this?
- Did any drugs contribute to the development of this patient's condition?
- How is an MI diagnosed?
- How was this patient's MI diagnosed? How is this different from current guidelines?
- How is MI managed acutely?
- How was this patient's MI managed? How is this different from current guidelines? Why?
- What is the role of drug therapy in post-MI management? Specifically, discuss the evidence-based information related to drug therapy.

- Discuss this patient's post-MI management. How is this different from current guidelines and why?
- What are specific drug-related problems (real and/or potential) or concerns for this patient at this time?

This is followed by a discussion of appropriate strategies to resolve/prevent these problems. Similarly, a discussion of the patient's other conditions, such as dyslipidemia, ventricular arrhythmia, osteoarthritis, etc, are discussed. When the management strategies for each of the conditions are considered, the place in therapy and the appropriateness of drug therapy in the context of other conditions are specifically addressed. A care plan to help address any potential or real drug-related problems identified by the class is outlined, with specific monitoring parameters to be considered for follow-up care for this patient.

#### **Follow-up With Patient and Students**

Following the class discussion, if students identify additional questions and/or specific recommendations for this patient, these are summarized, following which the instructor agrees to contact the patient and encourage him or her to discuss these with his or her physician(s). Previously when this occurred, the patient was appreciative for the information and followed up with the instructor regarding his or her discussion with the physician. Relaying this information back to students, with feedback on strategies that may have been implemented (eg, change in dose) is very empowering for students as future pharmacists. It also helps reinforce that a generalist pharmacist practitioner can play a valuable role within the health care team in patients with complex medical problems.

#### **ASSESSMENT**

Through student feedback, both strategies—use of integrated cases and patients as “teachers” in the classroom—serve important roles in helping students to integrate and apply therapeutic information. As a result of the students' debate about the appropriateness of an agent for a patient, based on the patient's other conditions, concerns, and needs, students indicate that the integrated cases help them better understand the place for specific drugs within a therapeutic class in therapy. Students have requested that additional integrated cases be incorporated into the course.

Inviting patients to the classroom to share their illness experience provides authenticity to student learning. A more important benefit has been the increased awareness of students regarding the importance of the patient's understanding, expectations, and concerns about their drug therapy. By addressing these issues, pharmacists

can effectively prevent drug-related problems.<sup>8</sup> Students also start to understand the importance of the role of the pharmacist within a health care team. Hearing the patient's experience of their medication use and how pharmacists can best help them, can empower students to realize the importance of their professional role. In formal course feedback with a response rate of 60% to 75% in the last few years, 90% to 95% of responders have consistently indicated they found the use of real patients in this course enhanced their learning in the therapeutic area represented. Students frequently request more authentic experiences such as this. Specific student comments related to the use of real patients in the classroom include:

- “It is very helpful to hear first hand about patient's experiences versus paper cases.”
- “These are real patients with real problems, so it was great to see the true application of the material learned in class.”
- “These classes provided a real-world experience.”
- “Added insight into what they felt about their disease state and treatment they were on.”
- “It makes you realize that real patients are much more complicated than on paper.”
- “Very interesting! We want to see more of this – real patients.”

#### **Other Added Benefits**

An unplanned benefit from the integrated cardiology case is the insight gained by students into the historical perspective on the progression of evidence-based medicine. At the time when the patient had the initial MI, thrombolytics were still investigational; additionally, the role of beta blockers and angiotensin-converting enzyme inhibitors in post-MI management was not established. Consequently, students have become more aware of the impact of clinical studies on practice and the importance of evidence-based medicine in optimizing drug therapy.

Additionally, the patients' willingness to discuss the personal aspects of their illnesses and the impact that care providers have had on their health helps illustrate the importance of caring in the context of pharmaceutical care. As noted by Fjoitof,<sup>9</sup> the college culture can make a difference in imparting the role of caring and instilling this in our students. Students' comments following discussions with patients in the classroom demonstrate that these interactions can be valuable in developing professionalism and the ability to care for patients. Students also indicate that knowing they can make a difference in their patients' health and well-being increases their motivation for learning.

## SUMMARY

Students' ability to integrate and apply therapeutic knowledge and skills can be enhanced by incorporating integrated therapeutic cases within problem-based courses and by inviting real patients to share their illness experience with them. These strategies help to create an environment in which students can engage in effective learning. In addition, they help students understand the importance of caring for patients and the valuable role a pharmacist brings to the health care team.

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Appendix 1. Integrated case used in a therapeutics course.

## PHARMACY 421 (THERAPEUTICS) Leslie Dan Faculty of Pharmacy, University of Toronto INTEGRATED CASE – CARDIOLOGY

### Student Learning Objectives

At the completion of the readings and classroom discussion, students should be able to:

1. Demonstrate an understanding of the relevant information which is important to gather from patients in order to assess their risk for progression of CAD.
2. Discuss role of drug therapy in post-MI management.
3. Identify and discuss management strategies for addressing drug therapy problems in patients with cardiovascular conditions.
4. Develop a Pharmacy Care Plan for a patient with multiple cardiac conditions.
5. Identify specific types of drug therapy information that a pharmacist should discuss with patients.
6. Demonstrate an understanding of the patient's experience of their illness and their interactions within the health care system.

**PLEASE NOTE:** *All students shall maintain confidentiality with respect to the information discussed with the patient in this class.*

### Class Format

#### Step 1: up to 50 minutes

- Four student volunteers will interview the patient
- Once the four students have completed the interview, students from the class may ask questions of the patient

During the interview, students should try to address the following:

- Patient's medical and medication history
- gain an understanding of the patient's experience with his illness
- gain insight into the general expectations and needs of individuals with cardiac disease.

#### Step 2:

- Patient will leave the room. Students will take a 10 minute break.
- Following the break, students should be prepared to discuss the following issues:

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- The interview process – what worked well, what could be improved upon
- Discussion of patient's experience of his/her illness
- List this patient's specific issues / concerns related to drug therapy and/or medical conditions
- Significant adverse effects of amiodarone and appropriate parameters to be monitored.
- Management of dyslipidemia.
- Management of patients following an MI

**Required Readings**

1. Applied Therapeutics, Koda-Kimble, et al. 2005, pages 20-18 to 20-24 and information on adverse effects of amiodarone.
2. Relevant readings on dyslipidemia and post-MI management from previous case discussions.