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Medication Optimization and Patient Education in Heart Failure: A Standardized Patient Case for Clerkship Students

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Abstract

Introduction: Heart failure is not only a common cause of hospitalization, it is also a condition associated with a high rate of readmission following discharge to home due to several factors including complex medication regimens. Medical management of patients with heart failure involves a number of monitoring parameters of which both physicians and patients must be aware, but are often not. **Methods:** In this exercise, clerkship students are presented with a patient scenario in which they are tasked with optimizing medication therapy as well as providing patient education regarding medications to engage and empower the patient to adhere to the prescribed regimen. **Results:** We found that students were most successful communicating the reason why medications were prescribed. Students exhibited similar performance regarding the likelihood of providing education regarding adverse drug events that could be anticipated. On the other hand, students were much less inclined to communicate appropriate monitoring and intensification information to patients. **Discussion:** Utilizing this case with third-year medical students highlights the need for additional opportunities for students to practice medication-related communication skills. In addition to its applicability to medical students, this case may also have utility in interprofessional education activities that involve learners from pharmacy or nursing programs who will be involved with reconciling, dispensing, educating, or administering medications to patients.

Keywords

Communication, Heart Failure, Clinical Reasoning, Patient Education, Patient Counseling, Interpersonal Skills, Medication Optimization, Monitoring, Intensification

Educational Objectives

By the end of this standardized patient module, students will be able to:

1. Formulate an optimized medication regimen for a patient with heart failure and comorbidities.
2. Educate a patient regarding a new medication regimen to engage and empower the patient to adhere to the recommended therapy.
3. Propose appropriate recommendations for monitoring and intensifying medications for heart failure management.

Introduction

According to the Centers for Disease Control and Prevention, half of all adults in the United States have one or more chronic diseases, and chronic illnesses are a leading cause of death.¹ Heart disease alone accounts for nearly 25% of deaths in the United States.² Heart failure is a complex condition for which patients are prescribed numerous medications. In addition, medical management of patients with heart failure involves a number of monitoring parameters of which both physicians and patients must be aware.

Unfortunately, data indicate that more than half of patients with heart failure do not receive discharge counseling about their condition or medications following hospitalizations.³ Without appropriate education regarding the medical management of their condition, patients may be confused and inadequately prepared to manage their health in ways that assure positive outcomes. This lack of education,

Appendices

- A. Logistics.docx
- B. SP Case Instructions.docx
- C. Recruitment.docx
- D. Behavioral Measures.docx
- E. Other Instructional Material .docx
- F. Student Instructions.docx
- G. SP Training and Instruction .docx
- H. Flyers.pdf
- I. Newspaper Ad.pptx
- J. Student Schedule Blueprint .xlsx
- K. Timekeeper Verbal Instructions.docx
- L. Fake Rx.pdf

All appendices are peer reviewed as integral parts of the Original Publication.

engagement, and empowerment may lead to additional hospital readmissions, defined as “admission to a . . . hospital within 30 days of a discharge from the same or another . . . hospital.”⁴ Not only is heart failure one of the most common reasons for hospitalization, but the condition is also associated with one of the highest rates of readmission.⁵ According to a study of Medicare patients, heart failure–related readmissions impact 11%-32% of discharged patients.⁶ These high rates of readmission, coupled with pressure from payers to decrease readmissions or risk the loss of reimbursement, have led hospitals to search for ways to prevent heart failure–associated readmissions.⁷

Educating patients about their medications is a fundamental part of patient care.⁸ Appropriate education about medications enables patients to more competently engage in managing their own health. This is especially important in patients with chronic conditions where adherence to prescribed regimens is imperative to achieve optimal health outcomes. Previous work by Fredericks et al. found that individualized, one-on-one patient education is the most effective way to deliver heart failure educational interventions, and personalized educational interventions have been associated with decreased readmissions.^{9,10} Data show that patients desire to receive medication education from their physician; thus, it is important to ensure that physicians are capable of fulfilling this request.⁸

This standardized patient (SP) scenario was a low-stakes, formative assessment designed to determine medical students’ ability to apply pharmacology knowledge to optimize medication therapies, provide medication education to patients, and establish appropriate monitoring protocols. Having completed basic pharmacology coursework should be a prerequisite to ensure success with this case exercise. Simulation cases with SPs that mimic real-world encounters allow students and faculty alike to understand strengths and weaknesses of curricular content as well as student ability to apply classroom learning in clinical contexts.

Methods

This case was created by Kelly Karpa, who is both a pharmacist and pharmacologist. The case was created to assess students’ abilities with determining medication appropriateness, communicating a medication-related treatment plan with a patient, and outlining appropriate monitoring parameters for the patient and the health care team. The case mimics an authentic patient situation that was encountered when Dr. Karpa was asked by a family medicine physician to consult with a patient for medication-related problems. The patient was a veteran who received free health care at a Veterans Affairs hospital but also saw an external family medicine physician as his primary care provider due to his suspicion of the government. During development, the case was reviewed by physicians from both family medicine and internal medicine. In addition, prior to using the case with third-year medical students, Dr. Karpa and two fourth-year medical students role-played the case so that the medical students could provide additional suggestions from a learner’s perspective.

Materials

Materials provided in this resource include logistical information (Appendix A), materials for the SP (Appendix B), recruitment materials (Appendix C), and behavioral measures (Appendix D), as well as a blueprint and timekeeper materials (Appendices E, J, & K).

Student instructions (Appendix F) for the case are also included. Briefly, students were informed they would have an initial encounter with a patient for 10 minutes, followed by a 10-minute period of time during which they could utilize any available resources to develop a plan. The encounter also included 10 additional minutes during which the plan was communicated to the patient. Specifically, students were told to assess medication appropriateness, communicate a plan to the patient, develop a plan to monitor and intensify the medications, and also attempt to engage the patient so that the patient would be likely to adhere to the therapeutic regimen.

Because students knew 6 months in advance that they would be released from their clerkships for 2 hours to report to the simulation center, it was assumed they knew they would be taking a medication-related objective structured clinical examination (OSCE). Thus, when students received instructions for this

specific case, they were informed of the goals and expectations for it. While the instructions use different verbiage compared to the specific learning objectives, both the learning objectives and the instructions involve optimizing medications, communicating with a patient, and intensifying therapy.

The SP training and instruction materials (Appendix G) were provided to the SPs 2 weeks in advance so that they could review them prior to formalized training with a faculty member. Included within these materials is an SP checklist for student assessment, which was used by the SP to indicate what the students had asked about, what the students had recommended, and what skills the students had utilized. The SP checklist also detailed the pharmacologic concepts that individual items addressed. The SP was asked to complete the checklist immediately after each student exited the room. After conclusion of the case, students reentered the SP room for 3 additional minutes. These 3 minutes were for the SP to provide feedback to the student. During feedback interaction, the SP was asked not to share specifics of the checklist with the student. It is customary at our institution that when OSCEs are conducted, the SPs never share the checklist items with students because we do not want students sharing details with other students who have not yet taken the OSCE. The SPs provide only general comments about student behaviors, mannerisms, and skills. Instead, the time was used to share information with the student regarding generalized strengths and weaknesses of the interaction.

Additional materials that faculty may find of interest include a newspaper ad (Appendix I) and flyer (Appendix H) that were used to recruit SPs. Also included is a sample student schedule blueprint (Appendix J) demonstrating how students flowed through this SP scenario and three additional stations (this scenario is represented in the blueprint as case 4.) Note that this case was on a different time schedule than cases 1, 2, and 3. Finally, the timekeeper verbal instructions (Appendix K) are a sample of the verbal instructions used by the timekeeper to keep students on schedule, and the fake Rx file (Appendix L) provides examples of new prescriptions.

Logistics

This SP case was one of four medication-related SP cases that took place at our regional medical school over a 2-day period. All 23 of the third-year medical students enrolled at this campus participated in these events. These SP student encounters were unable to be video recorded but were audio recorded for later review.

For this case, each SP student encounter lasted a total of 36 minutes. After the first 10 minutes of SP and student interaction, the timekeeper alerted the student that time had expired. The student was asked to exit the room, gather his/her thoughts, and develop a plan for the patient. After 10 minutes of plan development, students reentered the SP room and had 10 additional minutes to communicate the plan to the patient. After this time concluded, the SP had 3 minutes to complete the checklist and 3 minutes to provide feedback to the student regarding general strengths and weaknesses during the encounter. No SOAP (subjective, objective, assessment, and plan) note was required during this exercise. Instead, this particular case focused on students' medication-related communication skills.

Preparation and SP Training

One primary SP and one backup SP were trained for this case. The backup SP was trained in the event that the primary SP had a conflict with the case dates. For this particular case, only the primary SP was used for all medical students.

The SPs were sent a copy of case materials 2 weeks prior to the case training event. During training, the faculty member read the case aloud with the SPs, communicated the rationale underlying specific case components, and answered questions that the SPs raised. After initial script review, the SPs participated in role-playing. The SPs and trainer took turns acting out different roles, observing the interactions, and reviewing the checklist. At this time, any questions pertaining to the checklist were discussed and clarified. In addition, the faculty member and the SPs also discussed how feedback would be provided to students. Since the trainer was also the creator of the case, changes were made to the case and checklist when the SPs had appropriate ideas to incorporate.

A single faculty member listened to all audio recordings of each student's encounter with the SP. Some discrepancies between the SP's recall and the audio were noted. Specifically, the SP sometimes volunteered information relevant to the case without waiting for students to make a specific inquiry. Yet the SP identified that the student had completed the task. Thus, the audio was used as the definitive record as to whether the student (as opposed to the SP) had done the task or made the inquiry.

Results

This SP case has been used with all 23 of the third-year medical students at our regional medical school campus. The Table summarizes cumulative data from student assessments. In addition to providing patient education regarding the optimal drugs for the patient and potential side effects, students' ability to plan for therapeutic monitoring and intensification was also evaluated.

Table. Summary From Standardized Patient (SP) Checklist

General Assessment	NP (%)
Provide medication education on an optimized medication regimen	127/326 (39%)
Provide education regarding adverse drug events	22/65 (34%)
Develop plans to monitor/intensify treatment	18/138 (13%)

^aDenominator may be less than expected in each category. This is due to discrepancies noted on audio recording related to whether students fulfilled a specific parameter. If the SP inadvertently volunteered information or if the SP incorrectly marked student responses, these discrepancies disqualified certain student responses from being included in final data sets.

Students were found to be most successful explaining the reason the SP was to take an ACE inhibitor, beta blocker, and diuretic. However, students often neglected to optimize the regimen based upon the patient's comorbidities (e.g., asthma, benign prostatic hypertrophy, preexisting hypertension for which a calcium channel blocker had previously been prescribed.) Furthermore, students were not well versed in recommending appropriate follow-up monitoring for these agents. Moreover, students rarely educated the SP that medication intensification is to be anticipated with the newly prescribed heart failure medications, and they often failed to recommend self-monitoring to engage and empower the patient to be involved in his own health care.

In general, when conducting medication-related OSCEs, we have found from previous work that it is common for SPs to overestimate students' accomplishments on checklist items by around 10% when compared to faculty assessments. In past assessments, this discrepancy has largely stemmed from items about which the SP noted students had asked when, in actuality, the SP gave students the information (rather than waiting to be asked). In this specific case, we found that the SP tended to prompt students for drug and monitoring information rather than waiting to see if students would provide the information voluntarily (e.g., "Should I be checking my blood pressure?," "What lab work will you check to see if I am having any problems with these drugs?"). Not surprisingly, this led to discrepancies between the SP and faculty assessment scores. For example, in the Counsel About Medicine and the Plans to Monitor/Intensify Medicine domains, the SP collectively overestimated the faculty assessment by about 17% because the faculty member did not count items in which students were prompted (whereas the SP gave students credit for their answers despite the prompting). On the other hand, the assessments related to identifying and preventing adverse drug reactions were nearly identical between the SP and faculty. The SP was simply trying to help the students by prompting them; however, in real life, this would not occur with patients. While training the SPs, it should be reinforced that they should not try to help or prompt students to give the correct answers, particularly for high-stakes assessments. While SPs must be prepared to improvise in some areas, this is a situation in which SPs must stick to the original script. In addition, to improve the accuracy of the SP checklist assessments, the SPs could be instructed to check off items on the list as they occur (e.g., say to students, "That is a good idea; let me write that down so I don't forget"). Patients routinely write down information provided by their health care providers during office visits.

Discussion

When reviewing student performance of this scenario, variability of students' preparedness to provide medication information to patients was apparent, especially in terms of individual items on the checklist.

For example, there were certain side effects that almost every student told the patient about. In contrast, there were monitoring parameters (that either physicians or the patient should be watching) that almost no students told the patient about. Historically, the current medical student curriculum dedicates very little time for students to practice patient communication skills specifically around the area of medication education. Yet increasing medical students' exposure to medication counseling may be beneficial to their future practice, as well as to the patients that they serve. Following medical school graduation, patient education and communication with patients about their medications are not only desired actions of residents but requirements. It is important for medical students to have opportunities to practice these skills prior to residency. Through practice, students can gauge their comfort, recognize deficiencies, and become aware of changes to make in future encounters.

This SP case reminds faculty of the necessity not only to view pharmacotherapeutic instruction as a basic science but also to translate these concepts into learning activities that have practical clinical applications. For students to fully grasp the ideas presented in basic pharmacology coursework, they must also be challenged to apply these principles in relevant clinical scenarios.

Medical students recognized the need for patients to understand why the medications were necessary. However, students did not provide comprehensive medication education and failed to consider parameters that are important to patients, such as "What should I expect?" (e.g., side effects) and "How will we know if this is working?" (e.g., "What will the doctor or I monitor?"). Based upon numerous experiences we have had observing medical student encounters with authentic patients over the years, this is quite common. Students are most comfortable conveying medical condition information to patients as opposed to medication information. Some of our previously published work, however, suggests that the majority of patients already know the reason why they have been prescribed a medication (e.g., water pill).¹¹ On the other hand, patients are less likely to be aware of side effects that can be anticipated (and how to manage them) or of drug interactions (and how to avoid them).¹¹ These latter medication parameters are areas that patients desire more information about yet are not routinely receiving education on. Despite the known importance of educating patients about chronic medical conditions to improve engagement and adherence, very few educational activities have been described in which students can be provided with opportunities to carry out and sharpen these skills.¹² We have recently added a brief exercise about medication communication to one of our required third-year courses so that students will have an opportunity to reflect on the types of information they provide to patients about medications (vs. the medical condition) and practice providing information without using medical jargon.

Although data suggest patients most prefer that medication information comes from their physician, it is important to recognize that other health care providers, including pharmacists, can also provide a wealth of medication information to patients.⁸ Thus, there is a role for interprofessional education around the concepts of medication education and management so that future physicians understand the role and scope of practice of pharmacists in providing comprehensive and collaborative patient care. At our institution, we have recently launched interprofessional simulation cases with SPs in which students from medicine, physician assistant, undergraduate nursing, nurse practitioner, pharmacy, occupational therapy, and physical therapy programs comanage an SP together. This not only permits students to learn how different disciplines approach the care of patients and to experience firsthand the roles and responsibilities of other health care professions but also allows them to practice working collaboratively and to employ skills relevant to teamwork and communication. In this particular case, pairing a medical student with a pharmacy student would have likely improved performance in the medication-related domains that we had hoped our medical students would master.

Data from this case show that students often failed to address titration of heart failure medications. It is difficult to determine whether students were unaware of evidence-based titration guidelines or felt this was information the patient did not need to know. Sharing this information with patients is important so that they can anticipate changes in doses and so that they, too, can ask and remind their health care providers about dosage titrations during future appointments. In fact, just knowing that dosage titrations

are to be expected may help to increase the likelihood of attending future appointments. This information allows patients to be advocates for their own care.

Lastly, medical students failed to provide adequate monitoring parameters for many of these medications. Monitoring medication is of extreme importance in order to decrease adverse drug events. It is important for patients to understand when and why blood draws are necessary, why blood pressure should be monitored frequently, and what to do with daily weight checks. If patients understand the reasons underlying this monitoring, they may be more inclined to adhere to these requests from health care providers.

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Ethical Approval

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