

Core Entrustable Professional Activities in Clinical Pharmacology for Entering Residency: Value of Interprofessional Health-Care Teams in Medication Prescribing and Medication Error Prevention

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Abstract

In recent years, health care has been increasingly delivered by interprofessional teams in the inpatient, outpatient, and transition-of-care arenas. For many reasons, effective communication between patient-centered care teams and patients is critically important in order to optimize care, ensure patient safety, and prevent medical and medication misadventures. In rapid-paced, high-stress medical environments, it is especially important to carefully evaluate the causes of all misadventures in a manner that avoids assigning blame and identifies the root causes and, through team activity, leads to development of remedies that reduce the likelihood of future misadventures. Using a series of illustrative cases, this paper seeks to bring attention to these issues and provide insights regarding some tools developed to assist in improving patient safety and effective team communication.

Keywords

Interprofessional team, team-oriented, teamwork, patient safety, patient handoff, communication, TeamSTEPPS, entrustable professional activities (EPAs), graduate medical education, interprofessional education and practice, clinical pharmacology, race, ethnicity, opiates

Modern health care is delivered by interprofessional teams, which may include physicians, nurses, pharmacists, social workers or case managers, and other health professionals. These caregiving teams rely on open and effective communication and integration of skills to deliver safe and effective care.¹ The importance of a well-functioning team cannot be overstated: 70% of medical errors (misadventures) can be attributed to a dysfunctional team,^{2,3} much of which can be attributed to poor communication between members of the care-providing team.

Further, health care is provided in a high-stress environment, with a great deal going on at a fast pace; well-functioning teams successfully combine collective intelligence, open communication, and inclusive collaboration.¹ The hallmarks of a well-functioning team are common goals, mutual respect and trust, and closed-loop communication; however, first-year residents and trainees often find themselves placed on caregiving teams that demonstrate varying levels of performance, ranging from highly functional to dysfunctional, and are required to quickly integrate themselves, which can result in suboptimal real-world training if the team demonstrates inadequate functioning and communication.

The ideal health-care team has had a chance to “practice together” and has a common and well-articulated goal; all members are valued and members know and are comfortable with their roles and responsibilities; finally, team members have a sense of being valued for their contributions. Surgical specialties are among the most “practiced” teams. Operating room (OR) teams train and practice together, use simulation when new or complicated cases are being considered, and are supported by well-established institutional protocols, procedures, and checklists. An area of inpatient health care in which the importance

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of team-oriented care has been recognized, but not fully realized, is transition of care, or patient “handoffs.”^{4,5} TeamSTEPPS (Agency for Healthcare Research and Quality; Rockville, Maryland) communication techniques such as Huddle, Check-Back, C.U.S., “I PASS the BATON,” and Debrief are valuable tools that can be used to improve communication and prevent medical misadventures during handoffs.⁶ Effective teamwork is more difficult in this setting than in the confined setting of an OR, because the factors involved in patient handoff are more temporally and spatially separated, less obvious, and more complicated. It is all too easy for important information, such as allergies, intraoperative problems requiring complex postsurgical aftercare, and observations during transfer to be lost in the transition to the “receiving team.” In the outpatient setting, it is important to recognize that patients and, in some cases their families and caregivers, are also important members of the health-care team because they are providers and recipients of critical information; the value of their input should not be underestimated. Casual observations communicated by family members and caretakers can provide valuable insights on patient well-being, especially when multiple medications are being taken to treat multiple conditions.

Patient factors that can contribute to misadventures involving medications include insufficient understanding of the need for prescribed medications, false beliefs regarding medications, fears regarding medication toxicities, burdensome dosing regimens, or spiritual or religious reasons for not wanting to take medications.⁷⁻¹⁰ Health-care practitioners need to be able to identify the reasons for patients’ poor adherence or nonadherence and communicate the importance of taking medications as prescribed, even if a patient ultimately chooses to not to receive or continue taking a medication.

While medication nonadherence is one problem affecting the patient–health-care team relationship, another important problem is bias, which can affect physician prescribing. This problem is most prominent in the prescription of opioid analgesics for chronic, non–cancer-related pain. The literature documents that prescribing patterns are significantly influenced by race and other social factors.¹¹⁻¹³ With this in mind, it is increasingly important that health-care providers be aware of the existence of such biases so they can be identified and do not prevent the appropriate treatment and alleviation of patient suffering.

The following clinical vignettes illustrate how lapses in team understanding with respect to medication adherence, treatment of pain, and patient understanding of medication instructions adversely affect care. These vignettes will highlight the importance of including patients and their family as part of the care-providing

team, discovering patients’ reasons for nonadherence in order to help treat them, and the value of interprofessional teams in safeguarding against errors and our own biases.

Case Vignettes

Case 1

Peter is a 64-year-old Asian male, who is a widower and runs a local grocery store in the community. He has a longstanding history of hypertension, with several admissions to the hospital for hypertensive urgency and several admissions for syncopal events. He is currently on 4 different medications to treat his blood pressure. Today, in Dr Spencer’s outpatient clinic, his blood pressure is 160/90 mm Hg, higher than it normally is during his office visits.

When Dr Spencer sits with Peter, he says, “Peter, I see that your blood pressure is higher than it normally is. Have you been taking all of your medications?”

Peter replies, “Yes, I have been taking my medications.”

“And are you still exercising a few times a week, as we discussed?” Dr Spencer asked.

“Yes, I go to the community center 4 or 5 times a week, just like we discussed.”

Dr Spencer takes Peter at his word and tells him that he wants to see him back in one week for a repeat blood pressure measurement to see if today was an aberration or if Peter’s blood pressure has become persistently elevated and he needs additional medications. He also instructs Peter to bring his medications with him to clinic the next week.

The following week, Peter returns to the clinic with his medications. Dr Spencer is with another patient, so his physician assistant (PA), Kelly, sees Peter first. His blood pressure is still elevated, at 165/85 mm Hg. Kelly asks Peter, “How are you doing with taking your blood pressure medications?” To which Peter replies, “I am doing well. I take them just as the doctor says.”

Kelly, concerned by Peter’s high blood pressure and history of syncopal events from hypotension, considers that Peter may not be taking his medications exactly as he is supposed to. So she asks Peter, “Can you show me which pills you take and at what times during the day you take them?”

Peter looks uncomfortable as he fumbles through his bag of medications and tries describe which pills he takes and when. Listening to Peter struggle to describe his medication regimen, Kelly realizes the problem is that Peter cannot remember which pills to take and at what times. She asks him to read the pill bottle labels and it becomes clear that Peter cannot read; although he has run his local grocery store for years, most likely

his wife read things for him until she died recently. It is likely that since then he has been too embarrassed to ask for help. Kelly recalls that Peter's wife used to set up his medications for him before she passed away, and is concerned that he may not be adherent with his medications.

Kelly discusses the issue with Dr Spencer and, to make it possible for Peter to follow the instructions correctly, they create a diagram that shows a picture of each medication Peter is supposed to take, along with the number of pills to take and a symbol for daytime or nighttime. One month later when Peter returns to clinic, his blood pressure is under better control and he is no longer having syncopal events.

Case 1 Commentary

Peter's case reminds us that for patients whom we are concerned may not be taking medications properly, we should not simply take their word that they are fully compliant. A number of factors, ranging from literacy to affordability of medications to worrisome side effects of medications, are all reasons for patients not to maintain a medication regimen. Far from being the patient's fault, the onus is on the health-care team to understand these barriers and find solutions to improve patient compliance and overall health. Sometimes, discovering the solution can be as simple as having another practitioner evaluate the patient, because different approaches to the same problem may yield better results.

In Peter's case, taking the time to investigate his understanding of his dosing regimen revealed the underlying culprit and improved the therapeutic relationship. This may also be an opportunity to involve a community pharmacist who is familiar with Peter. The community pharmacist may have noticed Peter is not ordering his medications as often as necessary, based on the instructions and number of doses ordered, and can communicate this information to the prescriber when refills are ordered. Additionally, a community pharmacist may be a source of information regarding monitoring of Peter's blood pressure when he picks up his prescriptions. Most community pharmacies have self-use blood pressure machines and increasingly, pharmacists can also offer to take a customer's blood pressure for them as part of their interaction. Community pharmacists may also provide monitoring cards for patients to record and keep track of their blood pressure measurements. Pharmacist Care Plans record the refill information for prescriptions and are able to determine if prescriptions are refilled too quickly or if they are lasting for too long a period of time. It is also important for health-care providers to ask questions in a way that requires patients convey complete information, such as "Tell me (or show me) how you have been taking your medications since your last

visit." For all of our patients, we must be aware of potential literacy problems, as they are a significant cause of nonadherence and a source of embarrassment for patients that may prevent them from asking for help.

Case 2

Rachel is a 45-year-old African-American woman with chronic low back pain. She has been seen by several surgeons in the area, and all of them have refused to provide her with an operation, stating that she is not a good surgical candidate. You have tried to manage her pain in your primary care clinic, but she is requiring higher levels of opioids to obtain pain relief, so you refer her to a local pain management specialist, Dr Kerr.

The following week, after seeing Dr Kerr, Rachel returns to your office, crying. She recounts how Dr Kerr did not believe she was in pain, called her "drug seeking," and dismissed her from the clinic without providing any treatment options or alternatives. She laments having driven more than half an hour from her home to have such an unpleasant experience when all she wants is help. She described in the past that sliding across the car seat to get in and out of the car causes her a lot of pain in her lower back. She also feels pain with every bump in the road and when she pushes on the gas and brake pedals. Rachel has been a patient of yours for many years and you have never had issues with her before. That evening, you call Dr Kerr to discuss Rachel.

When you ask Dr Kerr what happened during the appointment, she states, "I have been doing this for a long time and she just seemed to be drug-seeking. She has never had surgery and has pain that seems wildly out of proportion to her imaging findings. And when I offered her non-narcotic pain medications, she wanted nothing to do with them. I don't have time for patients who just want to be doped up on narcotics."

After talking for a short time more, you thank Dr Kerr for her input before ending the phone call. It seems strange that you and Dr Kerr could have such different views of the same patient. Knowing that Rachel is still in pain, you call and ask her to come back to your clinic the following day; you have a new plan. You recommend she see a specialist who practices in her community, just 5 minutes from her house. He is new to the area, but some of your patients who see him have told you good things.

A month later, Rachel calls your office to thank you for the referral. "Dr Ford listened. I felt like he really heard me. He changed my medications and started me in physical therapy, and I am feeling better. I still have pain, but I don't use my breakthrough pain medications as much." You tell Rachel you are happy to have helped her and hope that she continues to feel better.

Case 2 Commentary

Opioid prescribing is becoming an increasingly scrutinized practice. With the escalating opioid epidemic and concerns that initial prescribing patterns for the opioid-naïve can contribute significantly to their long-term dependence,¹⁴ an increasing number of providers are prescribing more cautiously due to concerns not only about addiction but about overdose,¹⁵ as well as regulatory monitoring of provider prescribing patterns. Despite these factors, between 1999 and 2014, the rate of opioid prescribing nearly quadrupled,¹⁶ with the highest prescribers being pain specialists, surgeons, and physical medicine and rehabilitation physicians.¹⁷

While opioid prescribers should be assessing patients for drug-seeking behaviors, it should not be at the expense of treating patients' pain and suffering. Making that determination can be especially difficult due to the subjective nature of pain, differences in patients' pain tolerance, and the discordance that can exist between patients' diagnostic imaging results and the patients' perception of their pain. In addition, prescribers may have their own biases about patients, how they believe patients should express pain, and how much pain patients should be able to tolerate; however, they may also have biases based on race and belief systems.¹¹⁻¹³ In this context, when a patient is having difficulty with a treating physician regarding a subjective measure such as pain, it is important to consider the problem from several aspects: patient history and reliability, correlation between imaging and patient symptoms, clinical pharmacology-related factors (eg, age, gender, family history, ethnicity, height, weight), socioeconomic status and patient and provider background.

In the case of Rachel and Dr Kerr, much of the difficulty stemmed from the difference in the degree of pain Rachel expressed compared with what Dr Kerr expected Rachel's pain should be, based on imaging results of her low back. When Rachel transitioned to a physician in her community more accustomed to working with patients from her cultural and demographic background, the lines of communication were more open and the therapeutic relationship thrived. All physicians and providers bring with them certain biases, many of which are most pronounced with respect to subjective matters. However, when a patient fails to have a good therapeutic bond with a prescribing provider, considering referrals to physicians from different backgrounds or with different practice patterns may help patients find a provider with whom they can connect and derive therapeutic benefit. In Rachel's case, she felt heard by the new physician, and his addition of a physical therapist as a member of the team to provide Rachel with nonpharmacologic assistance in managing her pain helped her find relief.

Case 3

Lucille is a 58-year-old African American woman recently diagnosed with breast cancer who has undergone mastectomy and presented to your clinic for consideration of chemotherapy with tamoxifen. During consultation, you discuss the risks and benefits of long-term tamoxifen therapy, including common side effects. She says she understands and agrees to undergo treatment. She is adherent for her first year of treatment, but then begins to miss appointments and doses.

She eventually comes back to your clinic, and you ask her why she has been missing appointments and skipping medication doses. "Lucille, we haven't been seeing you as often as we would like for your treatments. Are you doing alright?" you ask.

"I've been doing alright, but it's just been hard to keep the appointments. My car broke down and I have trouble getting rides from my friends, so I haven't been able to make all the appointments. And sometimes it's hard to afford the medications, so I don't see a point in coming when I can't afford to take the medication."

After talking with her about the importance of her medications, you contact the on-call social worker and ask her to talk with Lucille. The social worker discusses assistance programs for medications and for transportation vouchers to get to and from her appointments, as well as counseling services available closer to Lucille's home that can offer techniques for dealing with her symptoms. At the end of the visit, Lucille thanks you for helping her. For the next 2 years, Lucille is adherent with her medications and never misses a visit. Her cancer remains in remission and she does well.

Five years after her diagnosis, Lucille is found to have a recurrence of her cancer, with painful bony metastases to her spine. When she comes to your office, you discuss additional medication options and treatments for her metastatic disease. After hearing what you have to say, Lucille states, "I'm willing to give it a try if it will help my pain." You set her up for radiosurgical treatment of her bony metastases and enroll her in a clinical trial for treatment of her disease recurrence. While her spine disease and associated pain improve, she has numerous side effects from the medications.

She returns to your office after several cycles of the medication and states, "I am done. I don't want any more treatment. The side effects are ruining my life and I just don't feel like me anymore. I have no quality of life." You counsel her extensively about changes that can be made to the medications and other options, but she decides she does not want anything more done. You agree to stop the cancer treatment and tell her to contact you if her symptoms start getting worse.

Several months later, Lucille presents to your office with intractable back pain and shortness of breath. You admit her to the hospital and obtain X-rays that

show her disease has progressed significantly. You talk to her about the images and what they mean, and she states that she just wants to be comfortable and with her family. Instead of trying to convince her that additional treatments may provide some benefit, you contact the palliative care service for assistance. They make recommendations regarding comfort care medications and help to arrange for home hospice. With their assistance, Lucille is able to be sent home and dies with family at her side.

Case 3 Commentary

In this vignette, we explore several reasons for patient medication nonadherence: medication cost, difficulty keeping appointments, and troublesome side effects. In such situations, it is important to recruit other health-care providers to help deliver appropriate care. Social workers can put patients in touch with assistance programs to finance medications and educate them regarding other services in their area (eg, supportive care, transportation). The services of a counseling psychologist can be enlisted to help address emotional distress resulting from the disease, from treatment, or other emotional or psychological concerns.

Additionally, it is important to include and assist patients in their treatment decisions and recognize when a patient has transitioned from focusing on quantity of life to quality of life as the primary goal of their care. This transition is important and includes much more than simply discontinuing medications. Supportive services, such as palliative and pastoral care, are excellent resources for helping patients come to terms with their illness and plan for the next stages. More importantly, they can help patients understand their options and transition to the final stages of their life on their own terms.

While an interprofessional approach is important in caring for patients with cancer or other terminal condition, recognizing when the decisional balance has shifted from the benefits of treatment being outweighed by its side effects to the opposite is important in understanding patient medication adherence.¹⁸ By understanding this shifting target, prescribers can help tailor treatment to patients' unique goals and maintain a positive relationship in which patients feel empowered as active participants in their care.

Case 4

Patient Sarah is a 32-year-old Hispanic woman who received outpatient high-dose intravenous chemotherapy as consolidation therapy for her acute myeloid leukemia, recently confirmed to be in remission. Ten days later, Sarah was admitted for severe granulocytopenia and her oncologist prescribed pegfilgrastim (Neulasta; Amgen; Thousand Oaks, California), a

granulocyte colony-stimulating factor, to help her granulocyte count recover quickly and reduce her chances of becoming septic. The hand-written order was sent to the central hospital pharmacy on a Saturday, when the oncology pharmacy was closed. Within an hour, a medication for Sarah arrived at the nursing station. The floor nurse put the medication on her cart and informed the oncology PA that Sarah's medication had arrived and would be delivered to her during the next medication rounds. The oncology PA inspected the medication before it was delivered to the patient, as was the practice, and discovered eszopiclone (Lunesta; Sunovion Pharmaceuticals Inc.; Marlborough, Massachusetts) had been sent from the pharmacy. She contacted the on-call oncology pharmacist, who called the dispensing pharmacist to inform him the wrong medication had been delivered to the floor for Sarah. The pharmacist told her that "Neulesta" was nonformulary and therefore the prescription had been changed to Lunesta. The oncology pharmacist contacted the dispensing pharmacist clarified the order was to be filled for the oncology medication Neulasta, then notified the oncology PA that the correct medication would be delivered shortly. The error was corrected, and the patient subsequently received pegfilgrastim as originally ordered.

Case 4 Commentary

Medication errors are a major hazard in health care. In this instance, a member of the patient care team whose duty it is to check all medications before administering them prevented a medication misadventure. By recognizing the error and contacting the oncology pharmacy specialist, the oncology PA demonstrated the value of effective communication. A TeamSTEPPS tool that may be valuable in such an instance is C.U.S. This acronym refers to "I am Concerned, I am Uncomfortable, this is a Safety Issue." Another valuable TeamSTEPPS tool is the Debrief.⁶ As a patient safety initiative, using a debrief to gather all of the relevant individuals (in this instance, the oncology PA, oncology pharmacist, central hospital pharmacist, floor nurse, etc.) to discuss where things went wrong can assist in identifying the root-cause of the incident in order to learn and prevent the situation from recurring.

Neulasta is given by injection. The central hospital pharmacist may have misinterpreted the hand-written order and assumed the order was for Lunesta, an oral sleep medication that he called "Neulesta." As part of the debrief, the issue of hand-written orders and/or verbal communication regarding medication names can be discussed as leading to medication errors and solutions can be offered to the problem. In addition, use of generic names would have also provided an additional means of clearly identifying the correct medication (ie, pegfilgrastim, an injectable formulation vs eszopiclone,

an oral formulation). The debrief is not intended to assign blame; it allows for discussion and resolution in the interest of improving patient safety and treatment outcomes and is an example of how a team approach to patient care can provide the necessary checks and balances.

Discussion and Conclusion

The true value of an interprofessional team resides in its ability to relate to patients from various backgrounds and strengthen the likelihood of a positive therapeutic relationship. Interprofessional team-based health care requires a thorough understanding of each team member's style of communication, roles and responsibilities, values and ethics, and teamwork.¹⁹ When we consider patients as valued members of their own health-care team, they can share responsibility with their providers in communicating their concerns and insights and, as a result, participate in improving their own treatment outcome. By understanding these underpinnings, health-care providers can build stronger bonds, increase treatment adherence, and empower patients to be active participants in their care. The TeamSTEPPS tools (Huddle, Check-Back, C.U.S., "I PASS the BATON," and Debrief) are excellent instruments and contribute to improved team communication and patient safety.⁶

References

1. Mayo AT, Woolley AW. Teamwork in health care: maximizing collective intelligence via inclusive collaboration and open communication. *AMA J Ethics*. 2016;18(9):933–940.
2. World Health Organization. Being an effective team player. In: World Health Organization, ed. *Patient Safety Curriculum Guide: Multi-Professional Edition*. Geneva, Switzerland: WHO Press; 2011:133–151.
3. Weller J, Boyd M, Cumin D. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgrad Med J*. 2014;90(1061):149–154.
4. Foster SMM, Tanja PhD. The effects of patient handoff characteristics on subsequent care: a systematic review and areas for future research. *Acad Med*. 2012;87(8):1105–1124.
5. Manser T, Foster S. Effective handover communication: an overview of research and improvement efforts. *Best Pract Res Clin Anaesthesiol*. 2011;25(2):181–191.
6. AHRQ. TeamSTEPPS® 2.0. <https://www.ahrq.gov/teamstepps/instructor/index.html>. Accessed April 4, 2018.
7. Alosaimi FD, AlMulhem A, AlShalan H, et al. Psychosocial predictors of patient adherence to disease-modifying therapies for multiple sclerosis. *Patient Prefer Adherence*. 2017;11:513–518.
8. Schillinger D ME, Wang F, Chen LL, et al. Language, literacy, and communication regarding medication in an anticoagulation clinic: Are pictures better than words? In: Henriksen K, Battles JB, Marks ES, et al, eds. *Advances in Patient Safety: From Research to Implementation (Volume 2: Concepts and Methodology)*. Rockville, MD: Agency for Healthcare Research and Quality; 2005: 199–212.
9. Sawesi S, Carpenter JS, Jones J. Reasons for nonadherence to tamoxifen and aromatase inhibitors for the treatment of breast cancer: a literature review. *Clin J Oncol Nurs*. 2014;18(3):E50–E57.
10. Witkop ML, McLaughlin JM, Anderson TL, Munn JE, Lambing A, Tortella B. Predictors of non-adherence to prescribed prophylactic clotting-factor treatment regimens among adolescent and young adults with a bleeding disorder. *Haemophilia*. 2016;22(4):e245–e250.
11. Burgess DJ, Crowley-Matoka M, Phelan S, et al. Patient race and physicians' decisions to prescribe opioids for chronic low back pain. *Soc Sci Med*. 2008;67(11):1852–1860.
12. Burgess DJ, Nelson DB, Gravely AA, et al. Racial differences in prescription of opioid analgesics for chronic noncancer pain in a national sample of veterans. *J Pain*. 2014;15(4):447–455.
13. Burgess DJ, Phelan S, Workman M, et al. The effect of cognitive load and patient race on physicians' decisions to prescribe opioids for chronic low back pain: a randomized trial. *Pain Med*. 2014;15(6):965–974.
14. Barnett ML, Olenski AR, Jena AB. Opioid-prescribing patterns of emergency physicians and risk of long-term use. *N Engl J Med*. 2017;376(7):663–673.
15. Garg RK, Fulton-Kehoe D, Franklin GM. Patterns of opioid use and risk of opioid overdose death among Medicaid patients. *Med Care*. 2017;55(7):661–668.
16. CDC. Vital signs: overdoses of prescription opioid pain relievers – United States, 1999–2008. *MMWR Morb Mortal Wkly Rep*. 2011;60(43):1487–1492.
17. Daubresse M, Chang HY, Yu Y, et al. Ambulatory diagnosis and treatment of nonmalignant pain in the United States, 2000–2010. *Med Care*. 2013;51(10):870–878.
18. Fink AK, Gurwitz J, Rakowski W, Guadagnoli E, Silliman RA. Patient beliefs and tamoxifen discontinuance in older women with estrogen receptor–positive breast cancer. *J Clin Oncol*. 2004;22(16):3309–3315.
19. Interprofessional Education Collaborative. <https://www.ipecollaborative.org/>. Accessed March 21, 2018.