

See One, Do One, Teach One: Competence versus Confidence in Performing Procedures

Medical students must receive comprehensive training in clinical skills before being asked to perform invasive procedures without supervision.

Commentary by Sanjay Yadla and Eileen M. Rattigan, MD

Melanie is in her second week of the medicine clerkship, the first clinical rotation of her third year. She has been assigned to the busy internal medicine service at the city hospital and is excited to finally be interacting with and following patients. She is also excited, yet a bit anxious, to be assigned to the public hospital because everyone says that students get to do a lot more there. In particular, she is skeptical of her abilities to do things like draw blood and place catheters since she received little formal instruction on how to perform these procedures.

Melanie's only experience performing clinical procedures came during a 1-day seminar offered by her medical school to all of the rising third-year students entitled "The ABCs of Performing Basic Medical Procedures." During the seminar, Melanie had the opportunity to practice drawing blood from a mannequin arm. Her hand shaking from nervousness, she had some difficulty tapping the fake vein the first few tries but eventually hit it on her fifth attempt. She wondered if the veins of the mannequin were similar to those of a real patient and worried about how the patient would react if she missed.

Putting her fears aside, Melanie made a conscious effort to get involved in patient care. She explicitly asked her supervising resident to include her any time he was performing a procedure. During the first week, she watched him place a central line, insert 2 Foley catheters, and start a number of IVs. In fact, on 2 occasions, her resident walked her through all the steps as he started an IV—from choosing the equipment in the supply closet to tricks on protecting the patient's bed sheets from blood spots. He provided thorough explanations to Melanie's questions concerning how to know if the line is placed correctly and how to avoid potential pitfalls.

One day when the service was particularly busy, the resident asked Melanie to start an IV on a new patient while he went to the ER to get an H&P on a patient with chest pain. This was the first time that Melanie had been asked to perform a procedure on a patient. She became very nervous and was not sure that she remembered all of the steps of the procedure. Fears of creating an air embolism or a huge blood clot flooded her mind. What if she really hurt this patient? Melanie decided that she did not want to disappoint her resident and headed off to the patient's room to try.

Commentary 1

by Sanjay Yadla

The case addresses several issues that are important in the setting of medical education and the student's role in the provision of medical care. Members of the medical community are ethically obligated to place interest in the patient's welfare above their own interests and those of third parties. Students are no exception to this rule but have an additional obligation to their own education. In this case, the student must balance her concern for the patient's interests (ie, potential harm or pain), with her own interest in learning, and her resident's interest in having her complete the procedure.

It is generally accepted that students will impose some degree of relative risk, albeit low absolute risk, on patients in the name of education. Melanie has just begun her time on the wards and lacks experience with most procedures. Placement of an IV by a medical professional carries minimal risk. Inexperienced students, however, may have a higher relative risk of harming the patient. This additional risk to the patient is usually within acceptable limits to the student, the supervising resident, and the patient; this understanding is the basis for allowing students to perform procedures of gradually increasing risk as they gain more experience.

At university-affiliated hospitals, medical students are expected to participate in certain aspects of patient care. The level of involvement varies with the student's interest and abilities and the willingness of the resident to allow the student to participate. A student must make every effort to learn the required skills. Melanie appears to have made such efforts but is still doubtful of her abilities.

In Melanie's situation, there are several available options: she can decide not to perform the procedure, she can attempt it on her own, or she can request additional support as she attempts it. Should she decide not to perform the procedure and report back to her resident, it may be considered a failure of nerve, but she may have saved the patient from unnecessary harm. Should she resolve to calm herself and attempt the procedure, she will either be successful in placing the line without inflicting harm to the patient or will have to reevaluate the situation after several failed attempts. The likelihood for major injury remains small, but the relationship between Melanie and the patient will have changed. After repeated sticks, Melanie will be nervous, the patient will be nervous, and the likelihood of successful IV placement will diminish. Perhaps the best resolution for Melanie is to ask another student or a nurse to accompany her during the procedure. She may appreciate the added comfort of having someone with her during the procedure, while also gaining confidence from having successfully performed the procedure herself.

Melanie feels she was offered little formal instruction. I would argue that a seminar and in-depth resident teaching on 2 occasions are typically sufficient instruction on performing a basic procedure. It would therefore seem that the student is allowing her own emotions overwhelm her.

Placement of an intravenous catheter is a skill that can trouble both students and residents. Most medical schools offer some type of formal education on the performance of basic procedures before students begin clinical clerkships. Such formal education must include remediation for students who cannot perform skills at an adequate level and for students who remain uncomfortable with those skills. Melanie has received such education but still feels unprepared. She would have benefited from more practice on a mannequin or more formal instruction after the introductory seminar. Students' perceived competency is correlated with frequency of performance of basic procedures [1]. After several successful attempts on the mannequin Melanie may have felt ready to perform the procedure on a patient with confidence.

As a student new to the wards myself, I must admit to approaching each new experience with a great deal of curiosity and some measure of trepidation. If I were to let fear override my interest in learning and acquiring new skills, I would not live up to my responsibilities as a medical student and as someone expected to be proficient in those skills when I complete my studies.

Reference

1. Fincher RM, Lewis LA. Learning, experience, and self-assessment of competence of third-year medical students in performing bedside procedures. *Acad Med.*1994;69:291-295.

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Commentary 2

by Eileen Rattigan, MD

This vignette is familiar to all physicians, young and old. The setting is July, the ritual time of upheaval in the medical world. New medical graduates become interns; interns become residents. Junior residents become senior residents. Second-year medical students are finally liberated from the classroom and ready to jump into action. All are brimming with excitement, and anxiety, as they assume their new roles and responsibilities. All are sent out onto the clinical wards to practice medicine.

The phrase "practicing medicine" holds different meanings to those at different levels of training. For the senior residents, to "practice" means to refine skills, expand the knowledge base and teach those more junior. For the medical students, to "practice medicine" literally means just that—to practice. This brings me to Melanie.

Melanie, the protagonist of this scenario, is an enthusiastic and interested student like all fresh third-year clerks. She is eager to learn and to participate in all aspects of patient care. She also wants to be an asset to the team. And, to the student, this value is inextricably linked to and largely misplaced in his or her ability to draw blood and place IVs. For many a medical student, an initial failure in these minor procedures is inversely related to confidence and, to some extent, self-esteem. I know this was true for me.

When I read about Melanie, I was transported back to my first clerkship, surgery. I recall one of the most terrifying, yet most eye-opening experiences of my early career. On a busy call day, I, too, was asked to place an IV in one of the patients. I had seen IV placement done a number of times; I had my checklist of all the required supplies, and I even had my diagram of the general assembly. I remember trotting off, perhaps a little overconfidently, to place my first IV, alone. The patient was morbidly obese with no clearly identifiable or easily palpable superficial veins. These obstacles were not present in the other patients where I had witnessed IV placement. I did hesitate for a minute or 2. But rather than ask for help, I gave it the "old college try." I failed. I actually failed 3 times. And, even now, when I think back to that day, my palms sweat, and the patient's screaming reverberates in my head. Despite this trauma, I was fortunate that the only injury I incurred was to my pride and that the only injury I inflicted on the patient was an ecchymosis or 2 or 3. I relay this story, not to humiliate myself, but rather to suggest the universality of the dilemma faced by Melanie.

The predicament in our scenario occurs all too frequently. Inexperienced and experienced residents, alike, often ask medical students to complete tasks independently that they may be willing to do, even if they are ill-prepared. Residents often forget that tasks they regard as simple, like IV placement or phlebotomy, are not trivial to a new trainee. So why did Melanie or I attempt to do a procedure independently for the very first time when both of us were faced with questions and fear? I suggest that this action is the product a widely accepted form of a maladaptive behavior entrenched in medical tradition and training. "See One, Do One, Teach One" is the axiom often quoted in this context. It implies that after minimal exposure and the completion of a procedure once (just once!), you will have mastered the skill and will be capable of teaching the next novice. In the minds of many of the uninitiated, any deviation from this streamlined pattern of training is unacceptable and is equivalent to failure. The more seasoned trainees recognize this as a severely flawed design, but they fail to convey a more realistic view to junior colleagues. Having fallen victim to this notion as a student, I have endorsed a modified scheme to my students during my residency: see many, do many, teach one.

See Many, Do Many, Teach One

See Many... Observation is an important first step. It provides a topographical map, but many of the important details required to reach your final destination are missing. At this stage your teacher guides you on the subtle intricacies of the gathering and assembly of the required equipment. At the bedside you closely observe the execution of every maneuver required to complete the task. With intensity and focus you subconsciously mimic each move made by the teacher until you, too, have completed your imagined procedure. Although this step is vital in the learning process, it minimally prepares you for the manual dexterity required to perform a procedure. Technical observations do, however, inspire us and move us to action. Once you are mentally prepared, you graduate to the next step: learn by doing.

Do Many... The successful execution of an invasive procedure of any sort requires patience, skill, and practice. Of course, there will always be a first time for everyone, but the first attempt at any procedure should never be unsupervised. And supervision should be the norm until a trainee is comfortable with the procedure. Many minimize this prerequisite in training. Medical students have the right to demand guidance from experienced seniors, no matter how trivial the assigned task. Supervision is invaluable in multiple ways. First, you are provided with the active, step-by-step instruction necessary to complete a task. This setting also allows you to establish appropriate and safe operating techniques. Direct supervision also provides the appropriate forum for immediate feedback and constructive criticism, both important in learning and refining accrued skills. Finally, this set-up provides a safe haven for both the operator and the patient in the event of a mishap or failure. With each subsequent attempt at a similar procedure, you become more comfortable, proficient, and confident.

Teach One... Once you have mastered a technique, you will naturally progress to supervising the technique for the next neophyte. Effectively teaching a procedure is not solely based in the execution of that task. Those who teach procedures must share their experiences with the students. From shared anecdotes of both procedural successes and disappointments, learners will develop a healthy level of anxiety and respect for techniques and will not be paralyzed by their own fears and failures.

Because of my own early ineptitude, I learned to recognize my limitations and the need to ask for help more freely. Melanie is a universal character who lives beyond the pages of our case. She is representative of all past, present, and future trainees at all levels and on all clinical services in hospitals across the nation. I challenge current students to examine their own behaviors and to modify them accordingly for the safe practice of medicine. Experienced hands are clearly an asset for any physician in training when procedures need to be done, especially when they need to be done emergently. However, competence and confidence in performing these procedures is a slow, stepwise process. And, oftentimes, you will need a helping hand.

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