Interprofessional Education:

Radiologists and Technologists

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The quality of our performance hinges on what we know, which in turns hinges on the quality of our education. Formal education can take many forms: solitary or shared, passive or active, live or virtual, theoretical or practical, and so on. But one of the most important yet underrated forms of education is the kind that occurs on the job, often at the point of care. We learn not only from books and journals but also from one another, and our teachers include not only physicians but also other health professionals such as radiologic technologists. Likewise, radiologists have an important role to play in educating other health professionals, especially technologists. Only if radiologists and technologists educate one another and put such lessons into daily practice can radiology departments perform at their best.

In days gone by, much of this two-way reciprocal education between radiologists and technologists took place at the point of care, such as when technologists presented images to radiologists for review or when radiologists requested the aid of technologists in obtaining particular radiographic views or performing specific procedures. With the advent of picture archiving and communication system, which has typically introduced wider gaps in location and workflow between the two, such interactions tend to be less frequent. Although such technological changes may enhance efficiency and throughput, they have often undermined the quality of educational interaction. Simply put, people who interact less frequently are less likely to have opportunities to share knowledge with one another.

This widening gap places a premium on recognizing and capitalizing on existing educational opportunities and on creating them where they do not exist. One crucial step in doing so is to ensure that such interactions are not regarded as interruptions, nuisances, or rate-limiting steps in the workflow. Because of the frequent inequality in perceived levels of authority and responsibility between radiologists and technologists, such attitudes are more likely to be exhibited, or at least openly expressed, by radiologists. On both sides, however, pressures to work faster and with fewer delays are mounting, and this increases the probability that both radiologists and technologists feel "under the gun" to keep such contacts to a minimum to avoid compromising productivity.

Such attitudes can powerfully undermine the learning culture that every radiology department should strive to embrace. Both sides have something to offer. The radiologist often knows more about specific imaging findings, differential diagnoses, pathophysiology, and the clinical implications of various imaging diagnoses. Moreover, the radiologist is usually responsible for formulating diagnostic impressions and making clinical recommendations for further evaluation and management. By contrast, the technologist is usually the one who interacts directly with the patient, knows the imaging equipment and workflow best, and does the most to influence the patient's perception of the radiology department. When they work collaboratively, outcomes exceed the sum of their independent products.

Seizing such opportunities is important for a number of reasons. First and most importantly, it can enhance patient care. But no less important is the effect that doing good work has on both radiologists and technologists. It is discouraging to do work you are not proud of or even feel ashamed of. By contrast, when radiologists and technologists know they are doing their best for patients, their levels of satisfaction and fulfillment are likely to be higher, and this can have important benefits for morale throughout a department. When such improvements are the result of collaboration, they also tend to build a sense of team spirit or esprit de corps, which in turn opens to the door to further collaborative enhancements. In the best of all worlds, this can result in a virtuous cycle of improvement.

In an effort to show how this can happen, we share a series of five vignettes outlining real-world educational interactions between radiologists and technologists. This is not intended to be an exhaustive list but to serve as fuel for the imaginations of both, who can be on the lookout for similar opportunities as they arise in their own work environment. One of the beauties of such educational experiences is that they are both enduring and contagious. That is, as one person gains a new insight, he or she often retains it for a very long time. And they can cease being learners and become educators in their own right, sharing it with colleagues. Better ways of working can go viral

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and sweep through an organization completely independent of more formal channels such as grand rounds or in-services.

In our first scenario, a technologist asked a radiologist to help him review the anatomy of the blood vessels in the neck, so that he would better understand the images he was obtaining when performing computed tomographic (CT) angiography. The radiologist took some time to go through a set of images, describing the vessels, the tissues they supply, and the clinical implications of lesions at different sites. Shortly thereafter, the technologist was performing an examination on a stroke patient and noticed that the patient had a very significant degree of stenosis in the internal carotid artery. Before the examination was completed, he called the radiologist, who reviewed the images, contacted the referring physician, and helped to expedite a carotid endarterectomy.

In a case such as this, the radiologist was not turning over responsibility for image interpretation to the technologist. The technologist did not contact the referring physician directly, but instead simply contacted the radiologist sooner than he otherwise would have. The radiologist was able to review the images sooner and take immediate action, which seemed likely to offer clinical benefit to the patient. At the very least, both the referring physician and the patient were grateful that the findings were communicated so promptly. Had the technologist not received the extra education, he would not have been in a position to make such a difference. Both the technologist and the radiologist now talk and interact with each other more collaboratively than ever before.

In the second scenario, a patient was undergoing a CT scan of the abdomen and pelvis to assess for a suspected abdominal mass. The technologist had performed numerous such examinations over many years, and based on this experience, she suspected that the best thing for the patient would be a triple-phase examination. In fact, the technologist had collaborated with the radiologist in helping to formulate the triple-phase protocol. So instead of performing the examination as ordered, she phoned the radiologist and asked if he wanted to change the protocol. After getting the answers to a few questions, the radiologist agreed, and the patient underwent the more appropriate examination. This not only prevented a repeat examination but helped to reinforce an even better working relationship between the two.

In the third scenario, a young technologist working weekends was approached by a radiologist who was holding an infant manikin and told that the patient was not breathing. The radiologist then supervised the technologist as he followed the appropriate procedure for a code. When the technologist had finished, the radiologist went back through the whole scenario, step by step, reviewing the rationale behind each component. The radiologist then repeated this process two more times in succeeding months, to make sure that the technologist felt comfortable with the code procedure. The technologist reported that this substantially boosted his confidence, so that if such a situation arose in daily clinical work, he would be much better prepared to handle it appropriately.

In this case, the radiologist took the time to review the code procedure several times because he knew that the technologist would often work alone on weekends and might be the only person with the patient who could recognize and respond to an arrest. It transformed the technologist from someone very unsure and uneasy about what to do in such an emergency into someone who felt ready to handle the situation. The radiologist was not educating about radiology in the usual sense, but he was preparing a member of the department to provide better medical care to the patients it serves. Later, the technologist was able to share some of what he learned with his colleagues, helping them to perform better, as well.

In our fourth scenario, an orthopedic surgeon was unhappy with the quality of lateral elbow radiographs that were being obtained in a radiology department. Because the patient positioning was not always optimal, it made it difficult for her to assess both preoperatively and postoperatively for dislocations. To address this concern, a group of radiologists and technologists met with the surgeon, discussed the problem and the rationale behind providing better views, reviewed a variety of educational materials on patient positioning, and then carried out an educational quality-improvement project, which resulted in a dramatic reduction in the number of repeat views that were being obtained. This improved the quality of the work the department was doing and saved everyone, including patients, time, and effort.

In this case, radiologists were not educating technologists and technologists were not educating radiologists. Instead both were learning about a problem from a referring physician and then partnering to understand better and improve the quality of their daily work. Both radiologists and technologists learned something about appropriate positioning and the rationale behind it and better understanding the referring physician's need for particular images helped them to enhance their performance in both obtaining and interpreting these radiographs. And although the orthopedic surgeon was initially dissatisfied with the quality of images that the department was producing, the opportunity to partner with technologists and radiologists actually produced a more collaborative working relationship going forward.

In the fifth scenario, a need was identified among radiology residents at a large academic medical center for additional hands-on instruction in sonography. The large volume of daily studies and patient workflow were such that it was very difficult to provide such in-depth education on the clinical services, primarily because of delays it would entail in clinical care. So an ultrasound technologist was engaged as a clinical instructor, and residents were released from their clinical rotations 2 hours each week for hands-on ultrasound practicums. Residents reported that this dedicated weekly instruction in the performance of a large number of routine sonographic examinations substantially increased their level of familiarity, knowledge, and skill in performing and interpreting such examinations.

This story provides a good example of interprofessional education in a somewhat more formal form—a noncredit course that has been designed to meet an identified educational need.

Because of the clinical demands on faculty radiologists, the feasibility of offering such a course was dramatically enhanced by asking a clinical sonography instructor to do the teaching. Although this entailed some out-of-pocket cost to compensate the instructor, everyone involved agreed that this option was much less expensive than the opportunity cost of asking a faculty radiologist to take time away from a clinical service to teach it. Equally important, however, the technologist educator probably has more clinical experience performing such examinations on a daily basis than any radiology faculty member.

As these and many other examples could attest, there are innumerable opportunities for radiologists and technologists to learn from each other, and in some cases with each other. Some of the most readily apparent benefits include improved patient care and increased confidence and satisfaction with aspects of daily work. But there is an additional benefit that deserves to be highlighted. Such opportunities for mutual education help to build a learning culture that can soon permeate an entire department, ensuring that people feel free to share questions and insights with one another. The goal of every organization should not be to hide ignorance or maintain a pretense of omniscience but rather to foster collaboration and learn to improve the quality of work we do every day.