Radiology has long been considered a technical adjunct to clinical medicine, and over time, it has come to play a pivotal role in the delivery of first-rate healthcare. As a growing field, it “demands a breadth of knowledge that encompasses virtually the whole of clinical medicine and its underlying science.”¹ Despite the mounting recognition of the utility and importance of diagnostic imaging, formal instruction in this field is largely limited to postgraduate residency programs. If imaging is to be considered a cornerstone of current and future practice, then the question of whether more formal and mandatory radiology education would better equip future physicians must be addressed.

Currently, the majority of North American medical schools do not have mandatory radiology clerkship rotations.² Instead, the foundation of undergraduate radiology education is derived from teaching rounds provided by departments other than diagnostic imaging, or through student chosen electives. Although the aforementioned physicians are often well equipped to interpret images pertaining to their areas of expertise, and such rounds serve as an excellent method to explain and visualize clinical concepts, this situation is less than optimal for the actual teaching of radiological interpretation skills.³,⁴ Robinson and Voci (2002) assert that non-radiologist teachers tend to over-interpret images while illustrating clinical history and physical examination findings. Furthermore, assemblies of more than four students around a view box present the logistical problem of providing a reasonable view of the images in question.⁵ Finally, even when students begin to develop skills in pattern recognition, learning radiology in this manner does not instill comprehension of imaging jargon that will enable them, as future physicians, to fully appreciate reports using phrases such as “the mass is echogenic on ultrasound, has increased enhancement on a CT scan, or has increased signal strength on MR.”⁶

Indeed, elective time is available for any student who desires to supplement his or her knowledge or investigate the field of diagnostic imaging. There are, however, several issues that arise in learning radiology through elective work. Learning in the reporting room, although an excellent opportunity for one-on-one interaction with staff and residents, is often impractical given heavy radiologist workloads and interruptions by technical staff and consulting physicians. Also, these experiences too often consist of passive observation. Finally, the material covered at departmental conferences is often overly advanced for novices, who lack knowledge of the fundamentals of imaging.⁷

The absence of mandatory radiology curricula in undergraduate medical programs may leave students with the notion that an understanding of imaging is non-essential. This is not only unfortunate, but also untrue as nearly all disciplines encounter diagnostic imaging in some capacity. For example, non-radiologist physicians are often the first to
interpret chest radiographs. A report by the Massachusetts Board of Registration in Medicine revealed a growing trend of negative outcomes in patients whose radiographs were misinterpreted by emergency room physicians. Scheiner et al. (2002) found that clinical clerks were ill equipped to identify life-threatening conditions such as pneumothorax, pneumoperitoneum, misplaced feeding and endotracheal tubes, and congestive heart failure on chest radiographs after completing clerkships in internal medicine and surgery. In contrast, students who had completed a dedicated radiology clerkship were found to have significant improvement of these skills. Beyond image interpretation, formal radiology training could provide clinicians with a greater understanding of the indications and contraindications of ordering the various available imaging studies. Not only may student education benefit, but improved interdepartmental communication might also be fostered by teaching medical students about the type of clinical information that is appropriate and relevant to provide when ordering an imaging study. Overall, it is clear that a greater understanding of radiology would allow non-radiologists to provide better care for patients.

The lack of formal teaching is not the only barrier that radiology faces in realizing its vital role in the undergraduate stream. According to Liu et al. (2000), “the greatest danger to radiology’s future lies in ignoring that a significant minority of medical students view us as noncontributory and that our call to arms should be addressed in the rooms of the medical school; not the clinical wards of the hospital”. The literature makes it clear that not only do medical students lack radiological teaching, but also that this lack of exposure contributes to less positive perceptions of the field. Schlesinger et al. (1992), who surveyed first year medical students, found that the students regarded radiology as intellectually unchallenging. Moreover, past surveys have documented that only 1 in 4 laypeople believe that radiologists are even physicians. Without addressing diagnostic imaging’s low profile in undergraduate instruction, it seems unlikely that these attitudes would change. Gunderman et al. (2003) believe that establishing radiology as a key player in the medical school curriculum would facilitate a more favourable perception of the field among undergraduates. “If radiology is taught poorly or not at all, many of the best students will never think of entering the field, and radiology and the patients it serves will suffer.”

Even in recognizing the issue at hand, the question of how medical education can incorporate radiology into formal curriculum remains unanswered. Robinson and Voci (2002) believe the ideal method for teaching radiology to medical students would involve student-only conferences, dedicated teaching at the view box, and the use of interactive teaching files over an intense 2-week period. At the University of Rochester, an advanced elective program is available for students who are interested in a career in radiology. Students directly read and interpret images, perform fluoroscopic studies, and participate in interventional procedures following the aforementioned 2-week introductory course.

A dedicated clerkship in radiology is certainly not unheard of. The Indiana University Medical School, for instance, has a 1-month mandatory radiology rotation. At Wake Forest University, a distributed radiology clerkship, consisting of 10 half-day teaching sessions scattered throughout the core clerkship rotations, was successfully implemented. This approach, however, was found to have substantial disadvantages such as scheduling difficulties as well as discontinuity between teaching sessions. A continuous block clerkship was considered preferable by Chew and Relyea-Chew (2003). In Contrast, a University of Wisconsin study conducted by Collins et al. (2003) showed comparable efficacy between independent radiology clerkships and those integrated within an internal medicine rotation. It seems there are numerous ways to ensure that the fundamentals of radiology are ingrained in all graduating medical students, but educators must make it a priority to identify and rectify the lack of diagnostic imaging within their own undergraduate programs.

The benefit of taking a new approach to incorporating radiology into formal medical school curriculum is the production of safer and more proficient physicians of all types. As imaging is the primary means through which today’s physicians encounter internal anatomy, medical students would greatly benefit from combined anatomy and radiology teaching. The visualization of pathology and even physiology that imaging studies provide can be used to promote the solidification of otherwise intangible concepts. Perhaps even more compelling than the pleas of radiologists and medical students is the result of a study conducted at the University of Minnesota showing that 87% of clinicians polled believed that formal instruction in radiology should be mandatory for medical students.

Diagnostic Imaging plays a pivotal role in the delivery of first-rate healthcare. Currently, undergraduate instruction in radiology is largely conducted by non-radiologists during the clerkship rotations of other services. The optional nature of radiology electives does not adequately reflect the importance of instilling a sound understanding of imaging within all medical graduates. Instead, the lack of exposure that radiology receives in undergraduate curricula contributes to less than positive perceptions of the field among students. Instituting a mandatory clerkship rotation in radiology would facilitate proficiency among medical students, residents, and physicians of all disciplines and would undoubtedly provide a missing piece of the puzzle in modern medical education.

REFERENCES

Author Biographies

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