

Institutional Pressure to Reduce Report Turnaround Time Is Damaging the Educational Mission

Darel E. Heitkamp, MD, Aaron P. Kamer, MD, Nicholas A. Koontz, MD

Academic radiologists work hard to support many important professional missions, chief among them education, research, and excellence in patient care. Program directors and other trainee advocates must be ever vigilant to strike the right balance between the educational interests of their residents and fellows and the needs of their groups' clinical practice [1]. Inevitably, however, issues arise that pit the interests of education against those of clinical service, at times challenging the core beliefs of an academic department.

To be fair, the line separating service from education is often ill defined, and interpretation can depend somewhat on one's fundamental view of the graduate medical education (GME) landscape [2,3]. What may appear to some as a blatant misuse of residents for service needs may to others represent a vital educational experience for transitioning trainees to independent, autonomous practice. As the organization responsible for accrediting the majority of physician graduate training programs in the United States, the ACGME shows great interest in this topic and routinely monitors GME programs for perceived conflicts between service and education [4].

In truth, educational activities and service activities need not be

mutually exclusive of each other. Most resident and fellow curricula are composed of assignments that are both educational and help to fulfill important service needs. Many would argue, for example, that the greater the number of imaging studies residents and fellows have the opportunity to interpret during their training, the better prepared they will be for jobs in independent practice.

A CULTURE OF REPORT TURNAROUND

Although the conflict between service and education is certainly nothing new to GME, radiology's continued leveraging of new technology has ushered in a rapidly evolving culture of clinical productivity and radiology value. Within the context of this new paradigm, a much more ominous clash between service and education has been gaining substantial traction over the past decade. Educators and administrators should recognize the various manifestations of this growing potential threat to education so that changes to the clinical environment can occur without undue harm to trainee education.

Academic radiology groups have absorbed substantially more clinical work over the past 10 years, enabled in part by the technologies of PACS and voice recognition software. Such

integrated technology has, in fact, extended the business reach of groups by allowing them to provide expert radiologic services to more customers regionally, nationally, and even globally [5]. This increased clinical volume has coincided with the emergence of medicine's quality improvement culture [6], a new framework of evaluation that relies on metrics and observation to improve systems [7-9]. Together, these forces have created an environment that has transformed report turnaround time (RTAT) into the de facto value center of radiology around which many workflow decisions are made [10-13].

RTAT, an easily calculated metric of radiology efficiency, describes the elapsed time between the completion of a radiologic examination and the generation of its finalized report. It represents only one element of overall report quality, which includes other criteria seemingly more difficult to quantify, such as accuracy, clarity, readability, and brevity [14,15]. RTAT's simplicity and ease of measurement, however, have made it perhaps the most used quality metric for diagnostic radiology both within and outside our specialty [12,16,17].

The pressure to consistently improve RTAT over time has had a profound effect on radiology

workflow, as success often translates into positive departmental quality dashboards, met hospital compliance targets, and even bonuses or at-risk money as a part of employee compensation plans [16-18]. It is in this context that the behavior of academic radiology groups, driven by the continual pursuit of better RTAT, is beginning to redefine the conventional debate between service and education.

Radiology's embrace of integrated technology has exponentially improved efficiency, resulting in turnaround times today that are measured in minutes rather than days [19,20]. RTAT can be evaluated temporally to establish month-over-month or year-over-year progress, an easy metric to provide to hospital administrators or accrediting agencies as a concrete measure of quality improvement. Other important ways in which radiologists add value to patient care, however, are not so easily quantified or analyzed, such as valuable time spent consulting with patients, providing decision support for clinical providers, and supporting multidisciplinary conferences with subspecialty radiology input [21]. At the present time at least, radiology's measurable value may indeed be overrepresented by RTAT [16].

THREATS TO EDUCATION

Today's RTAT culture has created a new conflict between service and education that, for many programs, threatens to erode the very fabric of the educational mission. Many academic groups are making changes to their radiology workflow to achieve shorter RTATs, often in response to requests from ordering care providers, results of clinician satisfaction surveys, or self-imposed goals intended to produce data for quality

bonuses or institutional quality projects [17]. When considered individually, each of these gradual RTAT-inspired changes to the workflow results in only a small loss to trainee education, but taken together they may substantially degrade the academic mission.

There are many examples of how the pursuit of improved RTAT may negatively affect trainee education. One such practice involves staff radiologists pulling dictated studies out of residents' voice recognition queues without taking the time to review the studies together at the workstation. In many cases, this practice starts as a workaround solution to a specific workflow problem, but with time it may spread widely within a department and become the *modus operandi* of many faculty members.

In some cases, the radiology faculty members have good intentions to provide feedback to residents regarding the quality and accuracy of reports pulled from their queues. However, in practice we have found this to be fairly inconsistent and easily neglected under such a workflow paradigm. Without the benefits of immediate, specific feedback and subsequent teaching at the workstation, the strategy of pulling studies directly from trainee queues eliminates the opportunity for residents and fellows to learn from the faculty readout process, an activity that most educators feel is a highly effective means by which trainees learn. In our experience, this practice is a dangerous endeavor that risks relegating trainees to little more than report generators. Yet the lure of improving efficiency and reducing RTAT has made this a rapidly growing workflow strategy in many academic radiology departments.

Another example of how the struggle for better RTAT can impede

education involves the growing practice of excluding trainees from specific studies in the daily workflow. For example, the RTAT expectation for emergency department studies might be to produce finalized reports within 60 or even 30 min of examination completion. In many programs, radiology faculty members respond to this kind of clinical pressure by discouraging residents and fellows from picking up these high-priority studies for fear that their RTAT averages will become unacceptably long [17]. The educational implications of this behavior may mean that trainees get substantially less exposure to vital domains of radiology, such as the imaging of trauma patients, stroke evaluations, or critically ill inpatients [17]. Even at our own institution, the RTAT expectations of an entire hospital started to induce changes in faculty behavior whereby residents were being discouraged from reading after-hours cases. Only by acknowledging and consciously addressing the issue were we able to avoid this educational pitfall.

The RTAT-driven workflow change that appears to most substantially undermine trainee education is the expansion of faculty radiologist coverage to services that traditionally operate with only trainees. These are often call rotations that provide emergency or after-hours imaging in the kind of fast-paced environments that best mimic private practice. Providing attending radiologist coverage for these shifts certainly reduces RTAT, but at what cost to the educational mission? Losing trainee independence on these services is particularly detrimental to trainee maturation, as these experiences are essential to the stepwise transition to autonomous practice that residents and fellows need in their training [22].

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