

Pediatric radiology extenders: boon or bust for radiology residents

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The presence of physician extenders has increased in medicine during the last three decades [1]. Similarly, the role of radiology extenders (RE) is increasing because of increasing workloads, around-the-clock service demands and limits in the radiology workforce. REs are defined as physician's assistants (PA), nurse practitioners and radiologist's assistants (RA) who provide care under the supervision of a radiologist [2]. The joint statement from the American College of Radiology and the American Society of Radiologic Technologists defines RA responsibilities as including but not limited to performing fluoroscopic exams and peripheral venous access procedures and conveying the radiologist's report to referring clinicians [3].

While the prevalence of REs increases, their use has been controversial since the introduction of an RA training program in 1970 [4]. General concerns regarding REs range from medico-legal fears to the potential for other medical specialties to employ REs to perform and interpret their imaging tests [5, 6]. A specific concern regarding REs in academic radiology is that REs will decrease the number of certain procedures performed by residents, preventing development of resident expertise with these procedures [5, 6]. Opponents' concerns about RE performance, acceptance and teaching skills have also been raised. While no work to assess RE acceptance is available, physician extenders outside radiology are generally accepted by patients and residents [7–13]. Fluoroscopy performed by REs is reported to be at least equal to fluoroscopy performed by radiology residents in terms of image quality,

fluoroscopy time, work flow and patient satisfaction [14, 15]. REs must be trained adequately to teach residents and routinely evaluated for teaching effectiveness, and radiology residents must be encouraged to accept an RE as an educator if the RE is to function as a clinical educator [16]. Proponents of REs postulate that "The effect of these extenders on residents and fellow education is likely to be positive. They relieve house officers of mundane tasks that have little educational value" [17]. Proponents expect REs to provide academic radiologists and radiology residents more time for teaching and learning advanced skills, respectively, while the RE performs the repetitive, routine tasks of the radiology service [16]. They expect REs to teach radiology residents the repetitive tasks that the resident must be able to perform but need not always perform [16].

The division of pediatric diagnostic imaging at my institution experienced increasing workloads and service demands compounded by limited staffing in 2006. Our ability to provide pediatric fluoroscopy services suffered. Given that there was a shortage of pediatric radiologists, increased demands on our time and ever-increasing complexity of exams in other modalities, radiology residents filled the gap by performing most of our routine pediatric fluoroscopy under the supervision of the attending pediatric radiologist. As a result, our radiology residents primarily spent their time in pediatric diagnostic imaging performing pediatric fluoroscopy with limited experience in other pediatric imaging modalities. This arrangement was untenable. The skewed educational experience led to residents' dissatisfaction and complaints. Part-time employment and training of a PA to function as an RE ensued. Duties of our RE include performing routine pediatric fluoroscopy (bladder catheterization and VCUG, contrast enema, upper gastrointestinal series [UGI], small-bowel follow-through [SBFT] and modified barium swallow) and teaching

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residents routine pediatric fluoroscopy. We expanded the hours of our RE over several years to reach full-time employment in March 2010.

The new model of practice with a pediatric RE at my institution altered the experience of attending radiologists and residents in pediatric radiology in ways predicted and feared by those on either side of the RE debate. Attending radiologists were afforded greater time to interpret other modalities and teach residents at the workstations. Residents, alleviated of their pediatric fluoroscopy duties by the RE, pursued greater time in other pediatric imaging modalities. The residents were permitted to tailor their exposure to pediatric fluoroscopy without quotas for procedures performed. Our residents opted universally to perform few (or zero in the case of two residents) fluoroscopic exams after our RE was employed. As our residents opted for greater exposure to other areas of pediatric radiology and indicated considerably increased satisfaction with their educational experience, they became less comfortable with routine pediatric fluoroscopy and procedures such as pediatric bladder catheterization compared to residents trained prior to employment of our RE.

While the breadth of our residents' experience in pediatric diagnostic imaging was greater following use of an RE, I found our residents' waning proficiency in pediatric fluoroscopy unacceptable and chose to intervene. The radiology residents are required now to perform pediatric fluoroscopy for 10% of their pediatric radiology rotation. I hope to see resident proficiency with pediatric fluoroscopy increase nearly to the level attained by residents trained prior to employment of the RE despite the RE performing the majority of our routine pediatric fluoroscopy.

I witnessed the manifestation of one fear of RE opponents; the RE reduced the number of procedures performed by radiology residents, preventing the development of proficiency with these procedures [4]. Based on my experience it is reasonable to anticipate this effect on many procedures (fluoroscopy, paracentesis, thyroid biopsy and vascular access). This could occur via direct competition from the RE for procedures or through residents' volition as happened at my institution. Either way, it is likely that resident comfort in the performance of certain procedures will atrophy. Practice makes perfect and we must ensure residents perform an adequate number of procedures such as VCUG if we wish to maintain radiologists' proficiency.

I was troubled with my residents' waning skills in pediatric fluoroscopy, but a residency program director or another pediatric radiologist might view diminished comfort with pediatric fluoroscopy and other select skills of a radiologist as devastating, inconsequential or a welcome and expected evolution of the radiologist's role. Atrophy of certain procedural skills occurred previously in medicine.

Most physicians can serve witness to the fact that clinical skills once considered essential for the graduating medical student are now mostly the dominion of non-physicians today (e.g., phlebotomy and peripheral intravenous catheter placement). While my ability to catheterize the bladder of infants, adolescents and children with various genitourinary anomalies is essential to my daily practice as a pediatric radiologist, it is not an essential proficiency for every radiologist. One could argue that it is more important for radiology residents to experience the broader spectrum of pediatric radiology training afforded by the use of an RE in order to attain other advanced skills.

Should we intervene with pediatric fluoroscopy and other repetitive procedures like UGI, SBFT, vascular access, etc., or should we accept that many of the procedural skills learned now by repetition during radiology residency will diminish as the prevalence of REs increases? We need to ask ourselves as clinical educators whether it is essential for a practicing radiologist to be proficient with all procedures such as VCUG, pediatric bladder catheterization, vascular access procedures, etc., in light of the increasing prevalence of REs trained specifically to perform these procedures and given the need for radiology residents to acquire broad knowledge, experience and proficiency with more complex imaging modalities and procedures. Should our governing societies (American College of Radiology, American Board of Radiology, Society for Pediatric Radiology and Accreditation Council for Graduate Medical Education) provide direction for residency program directors and radiology clinical educators regarding expected proficiencies at the end of radiology residency training?

My experience leads me to believe that REs will diminish resident proficiency with certain pediatric radiology procedures unless quota and minimum proficiencies for graduating radiology residents are established by governing societies or individual training programs. The efficacy and appropriateness of such guidelines and quotas are open for debate given that RE performance of certain pediatric radiology procedures affords residents greater breadth of training and proficiency in other possibly more important areas of our specialty. Until such guidelines become available, I suggest individual residency program directors set minimum expected proficiencies and procedural quotas for their graduating residents to ensure certain skills will not atrophy in the presence of REs.

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