Turf Wars in Radiology: Emergency Department Ultrasound and Radiography

David C. Levin, MDab, Vijay M. Rao, MDa

In recent years, emergency medicine physicians have made strenuous efforts to take over responsibility for interpreting and billing for ultrasound and conventional x-ray studies performed in emergency departments. This is a battle that radiologists have largely won. The authors explore some of the history of this controversy and the reasons why radiologists still control emergency department imaging.

Key Words: Medical economics, diagnostic radiology, radiology, radiologists, department management, socioeconomic issues


Editor’s note: This article is part of a series by these authors expounding on the phenomenon of self-referral and its effects. The initial article appeared in the January 2004 issue of JACR; subsequent articles have appeared approximately bimonthly.

For two decades, emergency medicine physicians (EPs) have made efforts to perform and bill for imaging studies (principally ultrasound and conventional radiography) done on emergency department (ED) patients. Several years ago, our health policy research group in the Department of Radiology at Thomas Jefferson University Hospital conducted studies of how often EPs are actually the physicians of record who bill and are reimbursed for ultrasound and conventional radiography in ED patients [1,2]. We used nationwide Medicare data for 1997. Among all ultrasound studies performed on Medicare patients in EDs that year, EPs did only 0.6% [1]. Among all x-ray studies on Medicare patients in EDs, EPs did only 2.3% [2]. It was apparent from these studies that although EPs might often informally review plain x-rays or attempt to conduct focused ultrasound studies looking for specific abnormalities (such as blood within the peritoneum), the responsibility for the official interpretation in the vast majority of cases resided with radiologists (or cardiologists in the case of echocardiography). We recently conducted a follow-up study on the subject that looked at trends over an extended period of time [3]. Between 1993 and 2001, the percentage of ED ultrasound studies billed by EPs dropped from 0.6% to 0.3% (excluding the small percentage of cases in which the specialty of the physician provider could not be determined). The percentage of conventional x-ray studies billed by EPs dropped from 5.0% in 1993 to 2.2% in 2001. Clearly, this is a battle radiologists have won. It is therefore instructive to look at the history of this controversy to try and understand why it turned out the way it has.

Our previous publication [1] reviewed the history and provided a number of references from the emergency medicine literature through 1999 that advocated the performance of ultrasound by EPs. Their justification in 1997 was that radiologists were frequently not available during off hours and that EPs would restrict their endeavors to only a few targeted examinations for emergent indications, such as possible blood within the peritoneal cavity, abdominal aortic aneurysm, ectopic pregnancy, and pericardial effusion [4]. However, by 1999, what might be called “indication creep” set in, and a proposal was made to expand the use of ultrasound by EPs to include possible gallstones and other biliary tract disease, other obstetrical and gynecologic conditions, appendicitis, renal calculi, pleural effusion, deep vein thrombosis, carotid artery disease, scrotal trauma, and other medical conditions [5]. Calls were made for EPs to bill for their ultrasound and plain x-ray interpretations [6].

There was relatively little in the way of a formal response by organized radiology to this challenge. In 1997, the Society of Chairmen of Academic Radiology Departments and the Association of Program Directors in Ra-
diology developed a position paper on it, which was subsequently endorsed by the Society of Radiologists in Ultrasound. The essence of this position paper was that EPs should not be doing ultrasound examinations independently on ED patients for several reasons: (1) they were not adequately trained to do them; (2) there was no educational requirement from the American Board of Medical Specialties or the Accreditation Council on Graduate Medical Education for EPs to be given such training; (3) in most EDs, high-quality ultrasound was already being provided by radiologists and cardiologists; and (4) EPs generally do poorly when they try to interpret imaging studies. Although this position paper was briefly mentioned in an ACR publication [7], it was never published, and the ACR chose not to take a formal stance on the matter. By contrast, the American College of Cardiology publicly took strong exception to the notion that EPs should be doing echocardiography, pointing out that official interpretations of echocardiograms should be rendered only by physicians with sufficient training and experience and that EPs had neither [8].

In more recent years, there have been continued calls by the EP community for more involvement in imaging done in EDs, particularly ultrasound [9-12]. Despite that, our data [3] have shown that they have lost ground rather than gained it. In 2001, EPs all across the nation were reimbursed by Medicare for a grand total of only 1160 ultrasound examinations, roughly the number of ultrasound studies done in 2 weeks by the radiology department of a single moderately large general hospital. The number of x-ray examinations done by EPs (167,968) was considerably greater, but it had dropped by almost one-third since 1993, and their share of the total volume had dropped by more than half. Of course, these numbers do not reflect the informal or “practice” ultrasound studies conducted by EPs on ED patients or the plain x-ray cases they may review but not bill for. In most academic emergency medicine departments that teach ultrasound to their residents, the teaching is provided by EP faculty members [13], a likely example of “the blind leading the blind.”

Why have radiologists been able to fend off this aggressive effort by EPs to encroach on the practice of sonography and x-ray imaging? There are several reasons. First, aside from patients’ visits to EDs, EPs do not control patients any more than radiologists do. A major reason why radiologists have lost turf battles to cardiologists over things such as coronary angiography and echocardiography—and now in many departments nuclear cardiac imaging as well—is control of patients. A specialist who controls a patient can generally direct the workup of that patient and can self-refer the patient for imaging studies if the necessary equipment is located in his or her own or group’s office. That situation does not pertain in EDs.

Second, the training offered to emergency medicine residents is far less rigorous than that provided to radiology residents. For example, the current guidelines of the American College of Emergency Physicians calls for 16 hours of classroom instruction and for only 150 supervised studies to be performed, many of which could be on normal volunteers [9]. The guidelines of the ACR and the American Institute of Ultrasound in Medicine, by contrast, call for a minimum of 3 months of formal training and the performance of 500 supervised ultrasound examinations during that training. An interesting study by Hertzberg et al. [14] tested the ability of radiology residents at a respected academic institution to properly perform and interpret ultrasound examinations at various levels of experience. They found that even after having done 200 cases, the residents made significant errors approximately half the time. Obviously, the American College of Emergency Physicians training guidelines of 150 cases are not adequate to ensure competence.

Third, radiologists have the expertise in imaging; EPs don’t. As an example, Eng et al. [15] conducted a study in which panels of radiology faculty members, radiology residents, EP faculty members, and EP residents all interpreted the same test set of x-rays, half of which were normal and half of which had significant abnormalities. Receiver operating characteristic curves were calculated for the four panels. The mean areas under the curves were 0.85 for faculty radiologists, 0.78 for radiology residents, 0.70 for EP faculty members, and 0.65 for EP residents. The accuracy rate for faculty radiologists was 80%, compared with 71% for radiology residents, 59% for EP faculty members, and 57% for EP residents. It is apparent from these data that radiologists do far better at interpreting conventional x-rays than do EPs; in fact, even radiology residents outperform EP faculty members by a substantial margin. We are not aware of any side-by-side comparisons of radiologists and EPs in interpreting ultrasound examinations, but it seems likely that the discrepancies would be even greater, because ultrasound examinations are more operator dependent and may be more difficult to interpret. It also seems likely that credentials committees in most hospitals understand that although EPs are very good at practicing emergency medicine, they are not sufficiently trained or experienced to be allowed to render the final interpretations of imaging studies. Concern for good patient care and the risk for liability have generally kept this responsibility in the hands of radiologists.

Fourth and finally, most of the advances in the science and knowledge of conventional radiography and noncardiac ultrasound have been made by radiologists. There is a well-known adage that today’s research is tomorrow’s...
clinical practice. The fact that most of the research on noncardiac emergency applications of these two modalities has been conducted and published by radiologists is a major reason why they have been largely able to maintain control of the field.

When it comes to scheduling their work hours, most EPs are more fortunate than radiologists. Emergency medicine physicians generally work clearly defined shifts and then are free to go home, with no further professional responsibilities until their next shifts. Radiologists have more open-ended work schedules. They must stay until the work gets done and cover nights and weekends, in addition to their regular weekday work hours. This obviously puts a strain on radiology departments, especially in this era of highly subspecialized radiology and a serious manpower shortage. Emergency medicine physicians often have unrealistic expectations if they think that subspecialized radiologic expertise should be instantaneously available in EDs around the clock every day of the year. If a trained radiologist cannot view images immediately at the time of an urgent situation in an ED, it obviously makes sense for an EP (or even a trained ultrasound technologist) to try to make an initial and unofficial interpretation on which treatment can proceed. But our data [3] demonstrate that the system seems to be working right and has kept the ultimate responsibility for image interpretation in the hands of radiologists, the physicians who know how to do it best. And by the way, the program requirements for residency education in emergency medicine, as spelled out in the American Medical Association’s [16] Graduate Medical Education Directory 2004-2005 (the “green book”), still say absolutely nothing about any requirement that residents in that field receive training in ultrasound or conventional radiography.

REFERENCES