

## Volume 8 - Issue 2, 2008 - Cover Story: Streamlining Emergency Radiology Services

### Streamlining Emergency Radiology Services: Collaborative Approach Gets Results

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**According to the Centre for Disease Control, over 115 million patients per year visit emergency departments in the United States. At our institution, approximately 48% of the admissions originate in the emergency department. However, emergency departments are not just where the critically ill present for acute intervention. The number of patients seeking primary and even preventative care in the emergency department has ballooned as the number of under- or uninsured people has increased.**

#### Collaborative Approach Gets Results

Emergency medicine relies heavily on medical imaging for triage, treatment and disposition. The percentage of emergency department patients that are imaged approaches 50%. Many of these patients are imaged multiple times. At our institution, we average 1.15 examinations per emergency department visit. By conservative measures over 57 million emergency radiology studies are performed each year; more liberal estimates place the number of emergency radiology examinations at 105 million.

At our institution the number of emergency medicine visits has increased by approximately 5% per year over the past few years. However, emergency radiology imaging services are growing by 7 - 8% per annum. This disparity is not only a reflection of the demand for urgent care but is also a function of emergency radiology's essential role in helping physicians to properly triage patients.

Across the country, busy emergency departments treat patients 24 hours a day/7days a week/365 days a year. The importance of an integrated, fully functioning, streamlined emergency radiology service is imperative and should address a number of key areas.

#### Quality Management and Workflow Efficiency

Preparedness is a major component of effectively responding to any emergency. It is difficult to predict when and to what extent tragedy will tax the resources of the radiology department. However, creating an elastic system that can expand and contract with the volume of cases, allows emergency radiology to better serve patients. A dedicated emergency radiology manager is helpful in this regard.

The radiology manager can coordinate the various technologists and clerical staff to optimise their efficiency. He or she can also interface with referring physicians to resolve many of the non-medical issues. The manager is also available to help the radiologist trouble-shoot any number of problems, be they administrative, technical or image-related. This division of labour allows the radiologist to concentrate on interpreting images and providing consultations rather than being distracted by administrative, scheduling and clerical issues.

Facilitating communication between the various members of the emergency radiology team can be a challenge under normal circumstances. When the pace is quickened and resources are stretched, open channels of communication are essential to prevent patients from falling between the cracks. In our department, we have designed and implemented a real-time, web-based electronic protocolling and tracking system

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that allows all members of the radiology team (staff, residents, technologists, clerks and administrators) to monitor and manage workflow within emergency radiology. Such tools orchestrate the movement of patients in and out of emergency radiology quickly and safely.

Automated and streamlined workflow fosters more efficient and improved quality of care. Streamlined internal workflow and improved patient throughput leads to quicker disposition, and higher referring physician satisfaction and ultimately lead to better patient outcomes. Healthcare savings are also realised when effective triage of emergent diagnostic studies can be tailored to the patient in consultation with the ordering physician based on demographics, clinical history, relevant data and physical examination.

### **Reducing Medical Errors**

Medical errors cost the healthcare system billions of dollars every year. Although radiology accounts for a fraction of this number, and while emergency radiology is an even smaller fraction of this number, there is always room for improvement. Obviously, we can reduce our errors by effectively communicating the correct diagnosis the first time. There are, however, other aspects of the quality control rubric that are less well thought of, that should be considered, especially in light of the recent attention to imaging overutilization and radiation exposure. How do we insure the proper examination is ordered in the appropriate setting?

The utility of the various imaging modalities is well-documented in both the acute and non-acute setting. Based on this experience, we have designed internal authorisation and protocolling procedures for higher order examinations, such as CT and MRI, which have decreased the number of unnecessary, inappropriate and incorrect examinations.

Prior to the patient's departure from emergency radiology, examinations are checked to ensure no additional images or sequences are needed. In highly critical cases that are often encountered in level 1 trauma settings, staff or residents are available to give near real-time preliminary readings at the scanner. Effective triage of imaging modalities, timely provision of appropriate examinations and expedited interpretations are paramount to positive outcomes. Designing imaging algorithms and protocols specifically tailored to answer the clinical questions posed in the ED saves time, saves money and saves lives.

### **Staff Management**

As with any specialty, having a dedicated group of highly trained radiologists with emergency radiology as their primary focus confers an advantage. Exposure, experience and expertise in this medium not only aid in the appreciation of subtle or atypical findings that can significantly impact patient outcome in a positive manner, but also allows for improved efficiency. Emergency radiology is more than simply interpreting images. It also entails image planning, resource triaging and clinical consultation in a fast-paced setting where the resources are limited and the stakes are high.

The approach to emergency radiology requires collaboration with emergency medicine, medicine, surgical and critical care colleagues. Imaging plays a major role in the triaging and the disposition of patients in the emergency department. Radiology staff should be proactive team members rather than passive consultants. Active participation among radiologists facilitates more efficient patient care.

Several staffing models exist, however, emergency radiology needs to support the emergency department and, in many settings, the remainder of the hospital during off-peak hours. Staffing 24/7 allows for contemporaneous interpretations that have an impact on patient care. This reduces the potential for patient recall for further evaluation and delayed diagnosis.

### **Conclusion**

Problems inherent to emergency medicine populations are well documented. One of the largest challenges is to determine which patients need higher order level of care - hospitalisation or intensive clinical intervention versus those that can be managed conservatively or even followed up in an out patient setting. Medical imaging plays a significant role in the decision. The role of emergency radiology is not only to acquire images and to render interpretations, but the goal is to do so in an efficient and safe manner that aids the referring physician and protects the patient.



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