

IT Networks Revolutionize Diagnostic Imaging

ABRAHAM GUTMAN

Today's competitive medical imaging marketplace is marked by an increasing number of cases and patients for hospitals and imaging centers, a scarcity of radiologists and image-intensive clinical trials. The medical and business implications for those three areas of healthcare are bound by the need to provide a high standard of scan interpretation in order to achieve outstanding patient service and clinical research.



Hospitals and imaging centers face a number of challenges, including a scarcity of radiologists and escalating costs. This translates into the need to access remote interpretation services in a manner that is fast, reliable and does not cause additional capital investment on the part of those sending cases to be diagnosed, or those doing the interpretation.

In addition, competition and internal labor issues are further complicated by increased patient volume and quality of care expectations. This means that facilities can no longer rely on overworked understaffed radiology personnel, or exclusive offsite practices, to handle high patient and scan loads.

Radiologists face similar challenges, but are also concerned with building their business, and maintaining a high quality of life. Since radiologists are a rare commodity in high demand, they can be a bit more particular about their partners. Today's radiologist looks for facilities that can send/receive high quality lossless images, so an accurate interpretation can be quickly provided and the risk of misdiagnosis is reduced.

Radiologists also know that the right technology can help them increase revenue and maximize scan flow, without sacrificing the quality of service provided or their personal convenience. When receiving studies from multiple facilities becomes too complex, their available interpretation capacity gets artificially capped by the wrong set of technologies.

Similarly, cost efficiency, convenience and quality are factors critical to the success of image-intensive clinical trials. However, the need to recruit top-quality sites and ensure compliance is also top priority for pharmaceutical, bio-tech, device and clinical research organizations. The reliable and secure exchange of cases, and reduction of manual labor, paperwork and delays, has a significant positive effect on a trial's completion schedule.

Until recently, these three groups had to rely on one of two technologies to exchange images for different purposes. They either used PACS and point-to-point VPNs to create their own private networks, or used CDs and postal mail. Neither of these two practices entirely met the need they were trying to fulfill, as neither was designed for the long-haul transport of DICOM cases and the ever-increasing number of images. The industry was calling for a diagnostic image exchange, akin to the telephone network—something that specialized in the transport of DICOM studies, independent of software solutions used to store and visualize them, as well as those creating them and performing interpretations.

We have all experienced this separation in other parts of our work: there are good reasons why we don't get

our broadband service from Microsoft and don't buy our word processors from Verizon. The applications we use are different from the manner in which our data is delivered.

The Study of Myocardial Perfusion and Coronary Anatomy Imaging Roles in Coronary Artery Disease (CAD)—also known as the SPARC trial—is a good example of how a diagnostic imaging network can make a significant difference. The SPARC trial enrolls approximately 3,700 patients with, and without, a history of CAD who are being referred for routine clinical studies to one of four noninvasive imaging arms (stress SPECT, stress PET or PET/CT, or CTA). It is being conducted by some of the world's most prominent imaging hospitals and centers, including Brigham and Women's, Massachusetts General Hospital, The Mayo Clinic, Mount Sinai Medical Center, New York University Medical Center, Yale University, The Cleveland Clinic and The University of Florida at Jacksonville.

Previously, clinical trials utilizing images as part of the study protocol relied upon traditional mail and delivery services using computer discs, CDs and non-DICOM file transfer protocols. This traditional approach is not only costly and labor-intensive, but can significantly delay the completion of clinical trials due to slow delivery times, human error and hardware/software incompatibilities.

SPARC is using a diagnostic imaging exchange network to securely and rapidly exchange DICOM images and studies for the comprehensive 40-site clinical trial. This ensures the efficient transfer of studies between locations and the SPARC image repository, as well as to minimize the burden imposed on the different participating institutions.

Since early 2007, SPARC sites across the United States and Canada have been producing and exchanging significant numbers of PET/CT and CTAs with many thousands of images, ranging to more than 10,000 in a single study. The diagnostic imaging exchange network easily, seamlessly and efficiently handles these high volume transfers without the clinical study's participants deviating from their daily clinical workflow, or having to spend time creating and mailing CDs or using primitive file transfer methods.

Ultimately, improving people's lives is the greatest concern for hospitals and imaging centers, radiologists and clinical trials. As the business of healthcare progresses, technology is rising to the occasion to ensure that happens.

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