

PACS USERS STILL WAITING FOR INTERNET REVOLUTION

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Hailed as the crown jewel of the Information Age, the Internet has undoubtedly transformed the world. But the impact of the Internet on PACS and radiology operations may be considerably less than initially anticipated.

One can speculate that the Internet's ubiquity, connectivity, low cost, and ease of use will revolutionize the practice of radiology, particularly now that the specialty is embracing PACS and converting its internal operations to the digital domain. Many possibilities exist, including the transmission of images over the Internet to vast reading centers serving hundreds of hospitals. Reports could be returned almost instantly, also via the Internet.

Because they handle so many images, such centers could be staffed with top subspecialists. They would operate 24 hours a day year-round so that doctors attending patients would always have speedy access to imaging results, even during off hours. With large volumes, such centers could offer services at a deep discount from prevailing rates, and the radiologists who practiced there could still make a good living, perhaps working only six hours a day. Night-shift radiologists would be paid a premium.

On paper, such a prospect seems almost inevitable, but the scenario will be a long time coming, if it ever does. Such an arrangement could save the healthcare system a great deal of money too, but there are no market mechanisms to effect the change. Most U.S. radiologists are not paid by the hospital where they work, but by insurers who pay the professional fee separately from the technical fee. This pattern is also true of Medicare and Medicaid.

Thus, hospitals have no interest in what radiologists are paid and therefore no motive to seek alternative arrangements. Insurers might prefer the alternative, since it would cost them less, but they have no authority to compel new arrangements in the provision of care.

A local reality

But there is a deeper reason that sometimes escapes notice in speculating about the future. Medical care is essentially localized, for the most part taking place where the patient is. The attending physician must see the patient, and samples for lab tests must be taken from the patient. The patient must also be present for imaging or other examinations.

Interventions like surgery and many other kinds of therapy require both the patient and the therapist to be present in the same room. While telemedicine systems can be deployed for limited kinds of treatment (such as where patients are remote from their diagnosticians and therapists), such systems have their own problems and no one prefers them when they can visit a doctor or hospital instead.

Furthermore, people providing medical care find working in a local system more natural and satisfactory. Working with colleagues they know personally is more reassuring than working with faceless persons whose skill and judgment are unknown quantities. In the context of radiology, local radiologists do more than interpret images; they also supervise operation of the department and maintain quality control among the technologists. All this gets lost when radiologists are remote.

Even if the Internet does not bring a revolutionary reorganization to radiology, does it open up other possibilities? The answer is yes, but of a limited sort, again because medical care and radiology must be practiced where the patient is.

Impact of ASPs

The idea of application service providers (ASPs) is to place most of the hardware and software necessary to operate a system such as a PACS off-site, shared by many users who otherwise have no particular connection with one another. On-site, all one needs are "thin clients," that is, small computers that download programs and data as they need them and that can offload heavy computing tasks to the off-site computers.

This model, however, does not fit PACS well at all, because of the local nature of PACS operations. PACS must have a network that connects all the local imaging devices, and also must include specialized workstations with unusual requirements for spatial resolution and brightness.

The PACS network must be able to respond within a second or two to requests for imaging studies, which comprise unusually large files. This means that PACS must have large local storage. If the imaging machines, networks, workstations, and storage must all be on-site, how much can be located off-site?

The long-term storage could be off-site, and some companies do offer this service. This has some advantages, offering secure, remote storage, eliminating the possibility of damage from a local disaster such as a fire or flood. Of course, an institution could achieve this security with a back-up site of its own.

The providers of such ASP services can handle chores like file migration to new media, which may be an advantage of this approach. Outside the reach of the local area network serving the PACS and the rest of the enterprise, the Internet has an indisputable role for distributing images to referring physicians and other users.

Aside from the direct functions of PACS, the Internet has a number of appropriate uses, including scheduling examinations and returning reports. It can also be used for monitoring system performance, troubleshooting, and remote maintenance. Software downloads and information distribution are also suitable tasks.

All of these functions make radiology and PACS more efficient and serviceable, but they do not fundamentally alter current practices. The Internet is important, but it is not a revolutionizing development.