Journal of Digital Imaging

The Next Killer Ap

What is the Biggest Development on the Horizon for Radiology Informatics?

Any sufficiently advanced technology is indistinguishable from magic.

-Arthur C. Clarke

The public have an insatiable curiosity to know everything. Except what is worth knowing.

-Oscar Wilde

It's so much easier to suggest solutions when you don't know too much about the problem.

-Malcolm Forbes

From the first moment that I walked into a Radiology reading room, and heard the whirring "sound of technology" from 40 different fans on PACS stations and the Silicon Graphics workstations, I knew that I had finally found my place. It was the "Gee-whiz" factor of volume rendered images that caught my attention, and it is this same advanced technology today in the form of 3D and 4D ultrasound, 3D coronary anatomy reconstructions, and the real-time volume renderings that still make physicians' and patients' jaws drop. As the public rushes to find the latest and the greatest, regardless of the social and financial cost, we will find ourselves in the same race to educate about the appropriate usage of medical imaging and to provide imaging services in a clinically useful manner.

It is this final thought, the "clinically useful manner" that will be the holy grail for radiologists in the future: To have a well-designed comfortable workspace, with instantaneous image review, relevant clinical data, and a way to integrate imaging information with real-time patient care data to result in better patient outcomes, and of course, increased profitability, what will be created is a single integrated product that will be malleable to the individual radiologist's needs, yet encompassing in its' depth and breadth, creating a work center known as a Radiology Adaptive Desktop (RAD) Hub.

The Center for Strategic and International Studies has said that "the three major and simultaneous drivers of technological change over the next 25 years (will be): computation, genomics, and nanotechnology." These three factors will change the face of medicine from the practice it is today to a hard science grounded in knowledge of the function and errors of human anatomy, physiology, and genetics. Radiology will not only be in the forefront of this revolution, but will be able to benefit from nanotechnology and increased computational power. As desktop computers and monitors are increasingly capable of delivering the resolution and speed necessary for primary interpretations, the role of the traditional hardwired workstations in a hospital becomes less essential and the ergonomics of the workstation, both physical and mental, becomes much more relevant.

Many, if not all, of the applications to be integrated into RAD Hub are available today, but in the RAD Hub they would be centralized for timely action in an environment designed to enhance reader efficiency and accuracy. Imaging work areas will be able to incorporate not only the vast amount of volumetric data required for most primary reads, but also to provide the entire repository of the hospitals electronic medical records on the same system. It will provide real-time updates of queue status and work flow statistics to all users. This same system would have cross-sectional and plain film computer-aided detection to act as an immediate second

read. This is crucial because as the demand for imaging continues to grow at an exponential rate the time for a consultation with your partners rapidly disappears. Finally, this system would have a smart dictation system tightly integrated that could not only recognize speech in real-time, but have the ability to hotlink certain portions of the dictated report to specific images or labels on an image, adding additional clarity for the receiving physicians in reporting. Similar systems could be installed in physicians' offices with the ability to do a shared review over the Internet, guided by the radiologist, when needed. It is this value-added interpretation that will keep radiologists from becoming obsolete in a volume-rendered world.

Combining information in a more accessible format is at the core of what we attempt everyday by integrating provided clinical data with anatomic and physiologic imaging. However, there is all too often a paucity of information provided (Given History: headache; True History: multiple head traumas, surgery and an indwelling ventriculoperitoneal shunt that may be malfunctioning). RAD Hub will correct deficits in provided information, as well as increasing radiologist functionality and productivity within the system. RAD Hub will convert us from a passive connection point within the health care network into an intelligent or manageable hub in which we will be able to directly impact patient care in a direct and sudden way.

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Online publication 24 May 2006
doi: 10.1007/s10278-006-0637-1