RSNA® Radiological Society of North America

820 Jorie Blvd
Oak Brook, IL 60523
TEL 1-630-571-2670
FAX 1-630-571-7837
RSNA.org

NEWS

RSNA Press Release

Remote-Control MRI Exam Performed Over the Internet

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Media Contacts:

RSNA Media Relations: (630) 590-7762

Maureen Morley
(630) 590-7754
mmorley@rsna.org

Heather Babiar
(630) 590-7738
hbabiar@rsna.org

At A Glance

- A new software program allows an experienced remote operator to control an MRI machine over the Internet, by logging onto any personal computer.
- Ninety percent of remote-control scans were deemed "excellent," versus 60 percent of traditional scans performed by a less-experienced technologist onsite.
- This software will enable patients to undergo complex MRI exams, no matter where they are located.

OAK BROOK, Ill. — Radiologists have developed a remote-control mechanism that allows an experienced off-site operator to control a magnetic resonance imaging (MRI) machine by logging onto the Internet from a personal computer. The quality of the images from remote-control scanning was found to be superior to images obtained by a less-experienced technologist onsite. The technique is outlined in the November issue of *Radiology*.

"Some patients require specialized scans that not all of our technologists are familiar with, so we implemented a software program that enables us to run the MRI machine from a remote location," said J. Paul Finn, M.D., lead author and chief of diagnostic cardiovascular imaging at the David Geffen School of Medicine at the University of California at Los Angeles (UCLA). "A technologist who is skilled at performing that particular scan can log on from a personal computer and perform the exam via remote control."

After accessing the password-protected program online, a remote operator can control all of the necessary imaging parameters to conduct the exam, while a technologist onsite can give the patient instructions, monitor patient safety and administer any intravenous contrast material that might be needed. This means that specialized skills in MRI can now be implemented wherever they are needed, even if the necessary expertise is not available at the site where the MRI machine is located.

Dr. Finn said the software program was tested by performing some of the most demanding scans needed at the hospital, such as scans of pediatric patients with congenital cardiovascular disorders. The rationale was that the patients undergoing these exams are the ones for whom specialized assistance might be needed most.

In the study, 30 adult and pediatric patients underwent traditional MRI with the technologist onsite, and an additional 30 patients (also composed of adults and children) were scanned by

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a remote operator. The same MRI machine was used for all scans. The images were then assessed for image quality.

Overall, 90 percent of remote scans were rated as "excellent," versus 60 percent of scans performed with the operator onsite. Since the study was originally accepted for publication, Dr. Finn indicated that an additional 50 patients have been scanned with the remote-control technique, also with excellent results. This likely reflects expertise of the personnel operating the MRI machine from off-site. As with many institutions, onsite staff at UCLA may have limited experience in performing specialized cardiac or vascular scans.

Dr. Finn added that because the types of diagnostic scans they have studied are among the most complex currently undertaken, it seems reasonable to suggest that the results can be generalized to other types of studies.

"At UCLA, we have already established interstate and transatlantic remote-control connectivity, and initial results are very promising," he said. "As the speed and reliability of the Internet increases, it seems inevitable that distance will provide no barrier to the global application of this technology."

Dr. Finn emphasizes that the same technology can also be applied to computed tomography (CT)—especially for use in an emergency setting, such as a natural disaster or on the battlefield. Such events may overwhelm local resources, where technologists trained in specialized imaging techniques can be hard to find.

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"MR Imaging with Remote Control: Feasibility Study in Cardiovascular Disease." Collaborating with Dr. Finn on this paper were Roya Saleh, M.D., Stefan Thesen, Ph.D., Stefan G. Ruehm, M.D., Margaret H. Lee, M.D., John Grinstead, Ph.D., John S. Child, M.D., and Gerhard Laub, Ph.D.

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