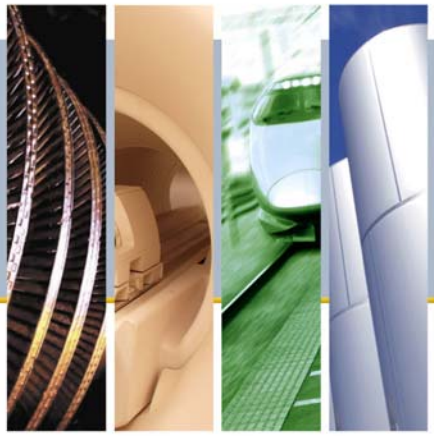

Quick Study

PROBLEM

Doctors, staff and radiology patients are unable to communicate effectively when using interventional MRI (iMRI) equipment. This state-of-the-art medical technology poses severe challenges to communications because of its extremely high acoustic noise levels and sensitivity to EMI/RFI.

SOLUTION

Install the IMROC™ optical fiber-based communication system, enabling up to seven medical staff members and a patient to converse routinely during iMRI procedures.

RESULTS

- Shorter iMRI procedure times, together with improved efficiency.
- iMRI staff members now remain in place – in the iMRI suite or in the control room – without needing to interrupt workflow simply to speak with one another.
- Unprecedented speech and sound quality – iMRI users benefit from advanced noise cancellation, as well as full ear protection during procedures.
- Full duplex, hands-free communications during iMRI procedures, with complete channel selection and noise control features.

For M. D. Anderson Staff, the End of the 'Runaround'

Hand gestures and lip reading are a thing of the past; iMRI procedure times are now dramatically shorter.

The Customer

The University of Texas M. D. Anderson Cancer Center (MDACC) is recognized among the leading facilities in cancer research and treatment, and has been cited more than once as the world's premier cancer center. The facility comprises more than 25 buildings in Houston and central Texas, including five research buildings, three outpatient clinic buildings, and a proton radiation clinic building. As a teaching hospital, MDACC employs nearly 1400 faculty. In 2008 alone, over 79,000 patients received treatment at MDACC.

M.D Anderson's Interventional MRI (iMRI) program, begun in 2003, has recently opened a new state-of-the art iMRI suite, used for a variety of image-guided interventions including percutaneous biopsies, cryotherapy, laser-induced thermal therapy, and sclerotherapy.

The Challenge

As pioneering leaders in clinical iMRI services, radiology staff members at MDACC are under constant pressure to make iMRI procedures run faster and smoother and to optimize workflow. But with all of its cutting edge technology, the new iMRI suite suffered from the same problem as all MRI suites: its high acoustic noise levels made normal communications impossible among the medical staff.

"Before we installed the system, everyone needed to remain in the suite during procedures in order to communicate. This impeded the workflow, such as rapidly prescribing scans or communicating with cytology," says MDACC imaging physics specialist Jason Stafford, Ph.D.

"We're able to perform a larger number of interventions in our MRI suite since the installation of the IMROC."

Kamran Ahrar, M.D.
Interventional Radiologist
M. D. Anderson Cancer Center

He jokes, "We used a 'digital-optical system' for communications -- hand gestures and sharp eyesight." But the lack of direct communications slowed procedures. Inevitably, the radiologists and staff would be forced to run back and forth between the iMRI suite and the control room to provide the needed guidance and clarifications.

According to Stafford, who also teaches MR physics at MDACC, clear communications are essential to the growth of iMRI practices. "I don't think many people working in this area realize the need for this equipment until they attempt to develop a clinical workflow with real-time or intermittent image guidance," he says.

For Kamran Ahrar, M.D., lead interventional radiologist at MDACC, the significance of adding real-time communications during a MRI scan was always clear. "Using the system has improved our efficiency," Ahrar says.

Ahrar, an associate professor at MDACC, is among the world's pioneers in iMRI. "We're able to schedule and perform a larger number of interventions in our MRI suite since the installation of the IMROC," he says. "We've used this communication system in 100 percent of the cases performed using interventional MRI."

The Solution

MDACC's pioneering iMRI activities currently focus on MR guided biopsies and ablations for the head, neck, soft tissue, bone, liver and kidney. Use of this most advanced suite is by physician referral only.

The MDACC iMRI suite is equipped with a short length, expanded bore diameter 1.5 T MRI scanner (Siemens Magnetom Espree), affording the physician easier patient access during a procedure. Visualization and control during procedures is enabled using two in-room MR consoles and control buttons at three different locations around the magnet. Along with the breakthrough Optoacoustics' IMROC fiber optic-based communications system, the suite includes:

- an integrated, floor-mounted' fluoroscopy unit (Siemens Axiom Artis);
- a specially designed MR-Miyabi patient transfer table to facilitate moving the patient smoothly from MR to angiography and back;
- an integrated MR guidance system (Biotex Visualase) to support procedures such as MR guided laser-induced thermal therapy; and
- an integrated cryotherapy system (Galil Medical).

The IMROC communications system combines numerous technological achievements – Optoacoustics' industry-leading fiber optical microphones, breakthrough fiber optical headphones, and advanced DSP-based adaptive noise reduction – to provide high-performance noise attenuation (30 dB) for up to eight iMRI suite participants.

Using the IMROC System During Procedures

Currently on a full day, the MDACC iMRI suite is used for as many as four separate procedures, with the IMROC system playing an elemental role. For biopsies the iMRI staff generally uses two IMROC headsets (radiologist and control room technologist); for ablations up to three headsets (radiologist, staff and technologist); for combined MR and fluoroscopy procedures, as many as five headsets are used.

MDACC interventional radiologist Kamran Ahrar, MD uses the IMROC system to converse with staff during a routine renal cryotherapy procedure.

IMROC's unprecedented high quality communications have dramatically changed the methods used in the MDACC iMRI suite, making procedures smoother and safer.

"IMROC allows real-time discourse, which we could never do without the device," Stafford says. "With IMROC installed, only the radiologist is in the scanner room now, and the technologist has returned to the control area. It has freed up the technician, so the workflow has really started hopping."

> **"The technologist has returned to the control area… workflow has really started hopping."**
>
> R. Jason Stafford, Ph.D.
> MR Imaging Physicist, MDACC

Stafford explains, "Procedures progress much more smoothly since the installation of IMROC. Before, if the technologist needed to prescribe a technically complex scan or call cytology, it was easier to leave the suite and go back to the control room. Now that we have IMROC, the technologist remains in the control room and is able to much more quickly respond to the needs of the radiologist during a procedure."

"Using IMROC translates into much shorter procedure times," Stafford summarizes.

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