



the weekly source for radiology professionals

<< vol. 18, no. 18 - May 2, 2005 >>

## A Virtually Better MRI Exam

*Multi-media headset calms patients' fears*

By Dana Hinesly

Article available online at: <http://www.rt-image.com/0502virtuallybetter>

The scenario is all too familiar for MRI technologists: After much coaxing, a timid patient enters the MRI scanner, only to be overcome by fear, promptly ending the exam.

But for Doctors Hospital in Augusta, Ga., and St. Mary's Hospital in Decatur, Ill., instances like this are fading to a distant memory, thanks to the recent installation of their CinemaVision virtual reality system, a versatile, convenient and user-friendly 3-D video and sound headset system developed by Resonance Technology Company, Northridge, Calif.

CinemaVision immerses patients in a calming virtual world during scans, enabling them to see a video image equivalent to a 62-inch screen viewed from a distance of five-and-a-half feet.

"The screen quality is great. I was really impressed," says Jayson Newton, RT(R)(MR), MRI supervisor at Doctors Hospital, where the system has been in use since early this year. "It feels like watching a TV in a living room. Patients forget they're wearing a headset."

This "virtual" perspective is accomplished through the system's aspect ratio, which gives patients the feeling of being in a much larger space. And because the system completely blocks out ambient sights and sounds, patients can focus their attention on the video without distraction. This is especially critical for young children who often struggle to remain still for extended periods of time.

"We have so many little ones who have trouble completing the exams, but we play cartoons through the CinemaVision virtual reality system and they're fine," says Newton. "To them, it's just another way to watch TV."

### Making More MRIs Happen

CinemaVision helps patients who might otherwise resist often-intimidating MRI exams to take advantage of one of today's most valuable diagnostic tools. By allowing patients to enjoy television shows or movies of their choice, on either VHS or DVD, the system significantly increases the number of patients who can take advantage of the procedure without sedation. Patients can opt to bypass visuals altogether. St. Mary's Hospital installed the CinemaVision system, in part, because of this adaptability.

"I like the system because it is hooked to our cable TV and it has DVD and VHS capabilities," says Orville Kirkendoll, RT(R)(CT)(MR), lead MRI technologist at St. Mary's. "It also has radio and CD capabilities if the patient would rather listen to music."

By providing these benefits, the system offers a cost-effective solution that minimizes sedations and cancellations due to MRI-induced claustrophobia.

### Reducing Downtime

Placing priority on patient comfort creates a win-win situation for patients and imaging facilities. MRIs are often a key revenue generator, and time when the machine sits idle translates to lost money.

Not only does CinemaVision reduce the number of required patient



Cover photo by Steve Bracci



*The virtual environment can give radiologists a distinct advantage by boosting patient satisfaction and simultaneously increasing the throughput of their scanners.*



*By blocking outside stimuli, the headset allows the patient to become engrossed in the movie, improving their ability to lie still as long as is necessary to complete the exam. The noise-canceling headset enhances relaxation by blocking out the loud, unsettling gradient noises that emanate from the machine during the scan.*

sedations by keeping the patient comfortable, it also decreases the number of canceled or interrupted exams, increasing productivity and making the entire process easier for both patients and technologists.

"There are always patients who don't know they're claustrophobic until they get here. So often, even after taking it slow, we will have to reschedule," explains Newton. "This technology helps us deliver the best quality of care we can to patients."

In addition to more satisfied patients and improved patient care, less sedation means fewer departmental bottlenecks. Techs can complete the exam in less time and patients can walk out of the exam room, immediately returning to their regular routine while freeing up space in the recovery area.

"The most noticeable improvement is the increase in productivity," says Tim Block, BA, RT(R), director of radiology at St. Mary's Hospital. "Since installing CinemaVision, we've only had a couple of patients who had to reschedule for any reason."

Block isn't the only one to notice a difference. The team in St. Mary's imaging department has also experienced a marked increase in productivity.

"Before CinemaVision, we'd probably have to reschedule four or five patients a week to do the MRI with oral sedation or anesthesia," says Kirkendoll. "Since we installed the system, only three patients required anesthesia." He adds that one of those three patients was sedated because he routinely experiences shortness of breath when lying prone.

Similarly, Doctors Hospital has realized a considerable increase in the volume of patients able to complete exams without medication. Newton recalls one young girl who broke down shortly after entering the imaging lab. "She was crying and saying 'I'm not going to do it,'" says Newton. After taking the time to explain that the headset would allow her to watch TV during the exam, she calmed down and was able to successfully complete her scan. "To me that's awesome. She did actually have something wrong, so CinemaVision allowed her to get treatment faster. I have dozens of stories just like it."

While neither St. Mary's nor Doctors have conducted a formal analysis of the exact changes in sedation rates, perhaps the best gauge of the improvement is felt by repeat patients.

"I had a patient last week who'd had four previous scans with anesthesia," says Kirkendoll. "I had her put on the headset and she got through it. She said it was great and that she didn't need sedation after this."

Newton's team shares that experience: "We've had patients who look at the scanner and say 'I'm not getting in there,'" he explains. "But with the CinemaVision system, it's a totally different exam. Patients who've been there before say it was much easier."

### **Commonplace Fears**

In recent years MRI has proven to be far more effective than X-ray mammography in detecting cancer and is also widely used to diagnose sports-related injuries, especially those to the joints and skeletal structure. Because it does not involve X-ray exposure, MRI is often the preferred diagnostic method for examination of the male and female reproductive systems.

Many people, particularly children, are apprehensive about MRI exams. Even older children routinely experience difficulty either because the specifics of the exam are unclear or simply because they become bored during the exam. Both reactions lead to fidgeting and other behavior that can adversely affect MRI results.

Children are certainly not the only ones who have difficulty with MRI exams. Fear of the unknown and claustrophobia often create hurdles between MRI technologists and a successful scan for patients of all ages.

"An estimated 20 percent of patients react with fear or claustrophobia to

confining, dark and often noisy MRI procedures and cannot be imaged as a result," says Mokhtar Ziarati, founder and president of Resonance Technology and an innovator in high-performance MRI-compatible audiovisual systems. "The virtual reality system relaxes patients by putting entertainment inside the MRI while patients are being imaged, helping them to tolerate the exams better."

Patients fearful of the MRI experience are often referred for alternate yet less effective imaging exams. Others suffer in silence. Roughly one in five patients either requires sedation to reduce anxiety associated with MRI claustrophobia or are not able to undergo the test at all.

### **How It Works**

MRI scanners use radiofrequency waves and a strong magnetic field to produce clear, detailed pictures of internal organs and tissues. Conventional audiovisual systems generate high electromagnetic emissions or noise that interferes with the signals that create the MRI image.

Cinemavision overcomes this problem by using custom designed shielding to partially block the noise as well as a specially created noise cancellation system. This system is similar to the one used in airline pilot headsets to block ambient engine noise. It is also carefully built to ensure that the MRI's magnetic fields and radiofrequencies do not interfere with its own electronics, which contain no magnetic components and have inductors without magnetic cores.

### **Star of the Small Screen**

For medical centers seeking options to facilitate patient comfort in the MRI exam room and ensure they get the best imaging exam possible, there are several common methods. In addition to audio-only headsets, one popular choice places static images of calming scenes in the patient's field of view. Other systems actually project images from DVD or VHS machines onto the internal surface of the MRI directly in front of the patient. All of these devices distract patients during the exam, enabling them to forego sedation.

By blocking outside stimuli, the headset allows the patient to become engrossed in the movie, improving their ability to lie still as long as is necessary to complete the exam. The noise-canceling headset enhances relaxation by blocking out the loud, unsettling gradient noises that emanate from the machine during the scan.

The comfort and technology of the virtual reality system offers an open and constant line of communication between the patient and the technologist. The same set of headphones that allow patients to hear movies or listen to their favorite CDs or radio stations doubles as a two-way radio to keep patients informed about the procedure at all times.

Even for adults at ease in confined spaces, often the seriousness of the exam itself makes the process difficult. The simple act of explaining how to use the cinema system can help alleviate some of that stress.

"You're talking with patients before the exam, first, going over the procedure and what to expect. Then you start discussing the TV and what they want to watch," says Dena Splittstoesser, RT(R)(MR). "Suddenly you're talking about something else. It gets their mind off of the exam and what they're about to do."

### **Staying a Step Ahead**

The virtual environment can give radiologists a distinct advantage by boosting patient satisfaction and simultaneously increasing the throughput of their scanners - important considerations in the competitive world of medicine.

Not only does the system increase revenue with fewer cancelled and interrupted exams, but by offering a comfortable environment, it also encourages patients to seek out the facility for future exams, as well as referring others take advantage of the facility's technology.

"We have two open MRI scanners within a five-block radius of the hospital,

so we needed a way to compete with the open scanner," says Newton. "With CinemaVision, we can get better images because patients are comfortable inside the scanner."

Not only does it work within the MRI without interfering with the images, but it is cost-effective, both in its operation and installation. Because patented new Resonance Technology innovations eliminate the complex installation and operation of analog technology, CinemaVision can be installed with minimal wires or drilling into the MRI penetration panel and, generally, on a weekend day.

"CinemaVision can be installed in minutes. Our MRLaserLink eliminates filters and time-consuming wiring," says Ziarati. "Radiologists no longer need to interrupt scanning for a day to deal with installation and contractors."

This new option can give a radiology facility an edge in the marketplace by enhancing the patient's comfort and experience during an MRI exam. It also gives radiology departments a viable and affordable solution for patients limited by fear and claustrophobia. So sit back, relax and enjoy MRI.

**– Dana Hinesly is a freelance writer living in California. Questions and comments can be directed to [editorial@rt-image.com](mailto:editorial@rt-image.com).**

---

Copyright © 2005, [Valley Forge Publishing Group](#), All rights reserved  
400 Chesterfield Parkway, Suite 100, Malvern, PA 19355  
p. 800-983-7737 | f. 610-644-3688 | e. [info@rt-image.com](mailto:info@rt-image.com)