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Kalamazoo Neurologic Imaging (KNI) Southwest Michigan Imaging Center has long been a regional leader in MRI. Its insistence on high image quality caused it to delay purchasing an open scanner until the introduction of the Panorama HFO. Now, after nearly two years of experience with the Panorama, it has been so pleased with the image quality that it has purchased a second Panorama HFO scanner.

When KNI Southwest Michigan Imaging Center needed a second MRI scanner to pair with its 3.0T scanner that serves inpatients at Borgess Medical Center (Kalamazoo, Michigan, USA) it chose a Panorama HFO. That decision illustrates KNI’s confidence in the speed and clinical utility of the system and marked the second time that this organization, devoted to state-of-the-art technology, had chosen a Panorama scanner.

KNI’s first Panorama HFO was installed in October 2005 in a center across the street from the hospital. It was the first Panorama HFO in Michigan, and the first open MR scanner for KNI.

“We had considered open magnets before, because of the need in the community for an open MRI unit to serve our patients,” says Azzam Kanaan, M.D., executive director of KNI. “But we elected not to have one for a long time because of the field strength.”

“In our research and in our site visits of all manufacturers’ open scanners, we did not feel the image quality of the low- and mid-field open scanners was adequate for us and the type of imaging that we do,” adds Gerry Turowski, service manager. “For example, diffusion wasn’t even an option. The scan times were long, and the overall image quality wasn’t up to our standards even with excessive scan times.”

While KNI decision makers saw the value of offering patients increased comfort, they were unwilling to compromise the high quality services that had been a hallmark of KNI since the early 1980s, when it was one of the first four sites in Michigan to offer MRI. So KNI continued to provide outstanding service with its fleet of eight mobile Philips 1.5T scanners and its stationary Philips 1.5T systems, which it eventually replaced with two 3.0T systems – one in a building connected to the hospital and the second in a nearby imaging center.

When Philips showed the Panorama HFO at RSNA in 2004, KNI’s interest was piqued. Dr. Kanaan and his colleagues visited Nevada Imaging Centers in Las Vegas, the world’s first Panorama HFO installation, and were impressed by the image quality.
**Focus on neuro imaging**

Dr. Kanaan was especially interested in evaluating the Panorama’s spine images, because of KNI’s dominance in neurological imaging. Neuro exams make up 70 percent of KNI’s volume, with orthopedic studies predominant among the remaining 30 percent. “I knew that basic brain studies were adequate on lower field scanners, so I wasn’t as concerned about that,” he says. “But we were told that the one Tesla Panorama HFO spine images are equivalent to the images coming from the 1.5T. We had 1.5T Philips scanners for a long time, and we were happy with those images, so I wanted to confirm that spine imaging wouldn’t be a challenge at the high field open system,” he says.

Turowski points out that the viewing habits of referring physicians also weighed on the purchase decision. “Here in Kalamazoo, our orthopedists and neurosurgeons like to see images, not just reports,” Turowski explains. “So to serve the physicians here, our images can’t just be good enough for us to diagnose. They have to look good to our physician base.”

Turowski adds that his background as an engineer made him comfortable that the Panorama HFO’s vertical field would enable image quality equivalent to a 1.5T scanner. “I have known since the beginning of MR that there is an inherent advantage to a vertical field,” he says. “The RF coupling to coils and the signal to noise is much improved, so a vertical field system performs at a better signal-to-noise level than its magnetic strength would indicate.” Turowski also appreciates the solenoid coils, particularly the durable connector design. “The ST Neck coil is very versatile. I have seen people do shoulders, knees and thighs with it,” he says.

“We also have the ST Body Spine XL coil now, which is particularly useful with our large patients.”

**Committed to the cutting edge**

Given the strong neurological case mix and the presence of two 3.0T scanners, it would be reasonable to assume that the Panorama HFO serves as a second-string scanner. But administrator Helen Osterwald is quick to point out that this isn’t true. “Last year we scanned 5,221 patients on the Panorama, and 3,490 on the 3.0T scanner that is at the same location,” she notes. “In addition, we did 7,700 procedures on the three Tesla at the

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**Atypical severe low back pain**

A 69-year-old female patient presented with atypical severe low back pain without radicular pain. Initial imaging reveals intense reactive bone marrow edema along the sacrum with relative sparing in the center of the sacrum. The sagittal T1- and T2-weighted images reveal abnormal signal intensity with reactive bone marrow edema. Findings have the appearance of bilateral sacral insufficiency fractures though prominent in appearance. The ST Body Spine M coil is used.
hospital site, and then used one of our mobile 1.5T scanners for nearly 3,000 procedures.”

Osterwald explains that the organization’s mix of scanners is a reflection of its need to meet the needs of the community while remaining on the cutting edge. “Truly, we have felt that the Philips 1.5T is the workhorse. It does everything well. But the Panorama serves a portion of the community that is difficult to serve otherwise, and it is a good general scanner. And we have 3.0T scanners to be at the cutting edge of the technology.

As a predominantly neurological service, we do a lot of head and neck MRA and we acknowledge the power of the 3.0T field strength for that,” Osterwald adds. Nevertheless, Dr. Kanaan has also been impressed by brain MRA on the Panorama HFO. “In principle, we direct brain exams including vascular studies to the 3.0T system,” Dr. Kanaan says. “However, when there are limitations that prevent us from using the 3.0T — whether size or claustrophobia — we use the Panorama HFO for these studies, and I’ve been happy with the results. I’m looking forward to being able to do spectroscopy as well.”

“The ability to image larger patients has expanded KNI’s catchment area.”

**Severe degenerative joint disease**

A 63-year-old female presented with chronic neck pain and radiculopathy into the left upper extremity. The sagittal images (top row) demonstrate degenerative changes, most prominent at the C5-6 and C6-7 levels where central disk herniations with significant cord compromise are seen. Grade 1 retrolisthesis of C5 on C6 and anterolisthesis of C7 on T1 vertebral body. Moderate to severe central canal stenosis is clearly apparent on the thick slab myelogram slices. The 2 mm axial views (bottom row) show significant cord compromise at C6-C7 and C5-C6. Diagnosis is spinal cord compression with moderate spinal stenosis. Scanned with the ST SENSE Neck coil. Due to patient size and claustrophobia, the exam was completed without sedation only because of the open aperture of the Panorama HFO and excellent image quality it delivers.
In addition to neuro studies, KNI uses the Panorama for orthopedic imaging and abdominal imaging. Dr. Kanaan points out that positioning is very important in joint imaging, but certain positions, such as shoulder abduction, simply aren’t possible in a cylindrical magnet. “We are using isocenter imaging, moving the table to place the region of interest in the sweet spot of the magnet,” he says. “The radiologists dealing with musculoskeletal imaging, as well as our orthopedic surgeons, are very satisfied with our joint studies.”

Bariatric program increases demand for Panorama HFO’s wide bore
Borgess Medical Center recently instituted a bariatric program, which has added to the demand for the Panorama’s wide open bore. In fact, a large number of the patient slots are now occupied with these obese patients. The ability to image larger patients has also expanded KNI’s catchment area – including capturing some market share from Kalamazoo’s other hospital.

“Our hospitals are very similar,” Osterwald says. “We are within five minutes of one another. Both are over 400 beds, and both are general hospitals with a lot of depth. But one difference is that they do not have an open scanner. They send their large patients to us, because it makes more sense to transport across town than to send them to Indiana, where the next closest high field open scanner is located.”

“The extremely obese patients take longer to scan to get the same quality,” Dr. Kanaan admits. “But these are patients who cannot be scanned anywhere else, except possibly in a CT scanner.”

Buying a second Panorama HFO appears the best choice
In fact, KNI cites its location is the only drawback to the Panorama HFO: inpatients requiring the Panorama now have to be transported via ambulance across the street to the imaging center. “When we decided to put a second scanner at the hospital site, we originally assumed we were going to get a 1.5T,” Turowski says.

“But soon we realized that getting a 1.5T would not solve the problem that on average 25 patients per month have to be transferred across the street by ambulance, primarily because of obesity.”

“And, on the Panorama HFO, we have a two week backlog, which is far more than our goal of three days,” he continues. “That convinced us of the need for a second high field open scanner.”

“When we got our first Panorama HFO, we quickly determined that no significant extra time was needed to produce good studies, and the patients were really very comfortable in the scanner, even if they were claustrophobic or large, or needed to be imaged in an unusual position,” Dr. Kanaan says. “It was convenient for the patients and as physicians we were comfortable that we had the image quality we required to make a proper diagnosis. I am glad we chose the Panorama HFO, and because of the results, there was no hesitation on our part to sign for a second unit when the time came to add another MR unit in our facility.”