CMPMedica
United Business Media

November 2006

The Newsmagazine of Imaging Innovation & Economics

DIAGNOSTIC IMAGING

MAGNETIC RESONANCE

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Hands-on know-how guides successful switch to 3T

Practical tips from one early adopter demonstrate dos and don'ts of transitioning to 3T MR imaging

Three years ago, Liberty Pacific Medical Imaging, a developer, owner, and operator of diagnostic imaging centers, purchased its first 3T MR scanner. At that time, LPMI was considered an early adopter among outpatient centers. Today, 3T MR has become one of the nation's fastest growing modalities.

The decision to choose a 3T scanner was a simple one: We wanted to carve out a niche in the market and build a reputation as a center of excellence. We wanted to become leaders in throughput and image quality, a balance that is not easily achieved in the outpatient realm. The mere thought of 12-minute lumbar studies with 3T image quality brought tears of joy to our eyes. But that joy soon turned to befuddlement.

Use of 3T at Liberty Pacific Medical Imaging is no longer limited to neurology studies. Applications in orthopedics and MR angiography have exploded as physicians in the community understand the value of 3T scans.

We discovered that maintaining 3T image quality meant sacrificing throughput on most exams. Three months after installation, one of our 1.5T scanners accomplished 26 scans in an 11-hour day, with good image quality to boot. The same day, during the same time period, we performed 21 scans on our 3T machine. We quickly learned that the 3T device doesn't run like our trusty 1.5T units. It's not a plug-and-play system.

The 3T is a different beast altogether. It demands significantly more time, money, and attention from our professional staff than we previously anticipated.

TWEAKING THE SYSTEM

Our first step was to shorten the sequences and protocols by using less of the magnet's signal, thereby increasing the efficiency of the 3T device. The result was a sacrifice in image quality as throughput increased. We had spent months marketing the power of 3T and promising better image quality in less time than our competitors. That was a mistake. Don't oversell new technology until you are sure you can deliver.

At that point, we were in jeopardy of losing our niche market position. We were competing on service and the strength of our radiologists while paying twice as much for the 3T unit. This didn't sit well with me. Our images looked the same or, in some cases, worse than those of our competitors. The referring physician community

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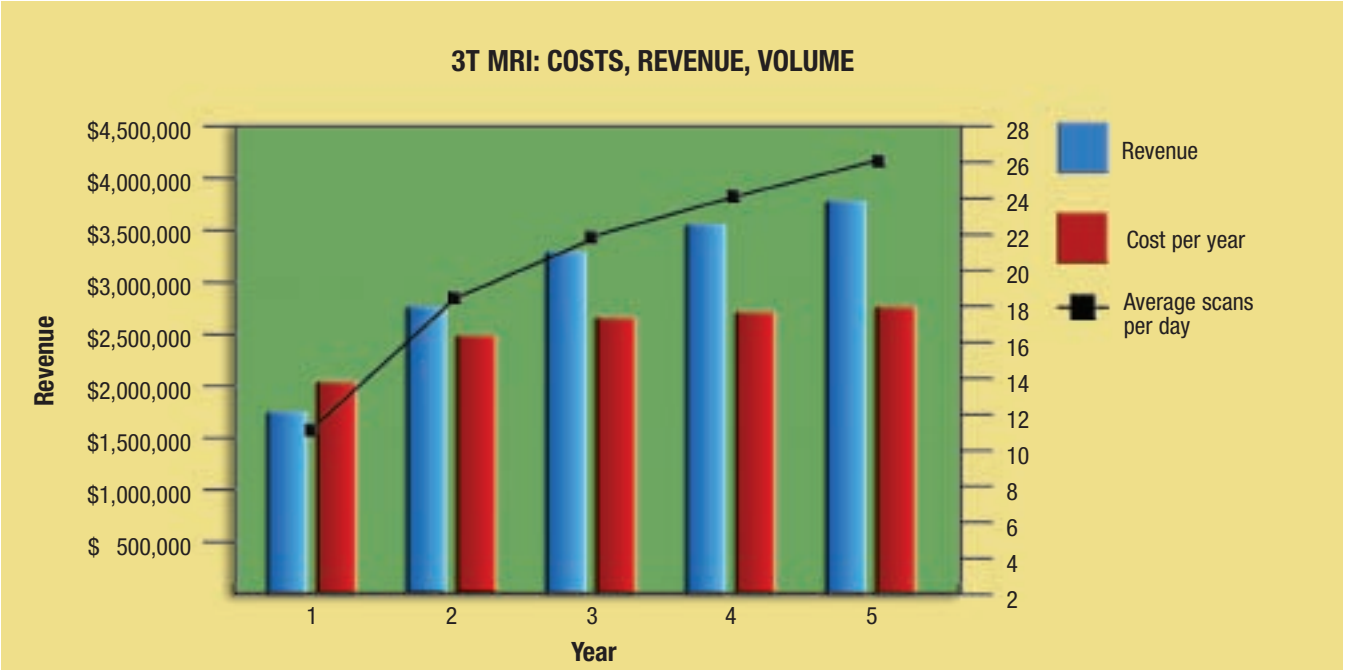

Revenues and costs reflect $615 reimbursement per 3T scan.

soon heard of our position, which exacerbated the problem. But we persisted in trying to harness the power of 3T in a way that included better throughput and enhanced image quality.

Fortunately, the onsite radiologist and technical staff were determined to make our work with the 3T unit balanced and efficient. Dr. Bonnie Flannigan, a neuroradiologist, committed nearly one year to perfecting protocols and reducing sequence time. Flannigan was relentless in her quest. As part of her mission, she gathered information from centers around the country and attended meetings constantly. With help from the vendor's applications and the service team, we tackled each exam one by one.

To achieve what referring doctors want while staying focused on what radiologists need requires a careful balance. As other 3T sites came online, we contacted them and shared information. This component was critical to our success. Additionally, our vendor provided software and hardware updates as well as applications training. It didn't take long for us to begin making headway.

Now, almost three years later, the 3T is finally living up to its hype. Many industry professionals believe that within two more years, it will become the gold standard in imaging. Although certain limitations in specific absorption rate and T1 relaxation times are still prevalent, the extra signal strength is unmatched by most 1.5T systems. For example, we offer spectroscopy studies that can be obtained in under one minute as well as imaging of articular cartilage that allows for better surgical preplanning. We've also seen a decrease in artifacts resulting from patient motion.

Further, we are no longer limited to performing only neurology studies. Applications in orthopedics and MR angiography have exploded in recent months. Physicians in the community are now requesting 3T scans as they learn its value.

JUSTIFIABLE EXPENSE?

The future of 3T looks even brighter for breast, cardiac, and spinal imaging. But does all this good news justify spending an extra $40,000 in annual service as well as $900,000 on the magnet itself? The answer is as complex now as it was three years ago when we made the decision to buy a 3T. It falls somewhere between yes and no.

Do the potential scan volumes warrant the additional expenses? Premarketing of the magnet to physicians should reveal strong interest and a keen understanding of technology differences. The cost differences between 1.5T and 3T are large but not overbearing if the right volume is present. Payments on a 1.5T run about $30,000 a month versus $47,000 a month for a 3T system on a five-year dollar buy-out program.

The question remains whether a facility can provide 40 additional scans per month to offset the cost. Also, a facility considering an additional or 3T replacement system should track demand through the front office and radiologist requests from referring physicians. If referring offices are calling and not scheduling, track this activity and calculate lost opportunity costs. Factor these calculations into the equation.

The effects of the Deficit Reduction Act of 2005, which could decrease reimbursement for outpatient centers by up to 50%, must also be considered when making a 3T purchase decision. (This is true even if Congress enacts a two-year

moratorium on the legislation.) We have witnessed many clients shying away from the added expense until the impact of the DRA is determined.

The additional fixed expense of 3T needs to be carefully evaluated. In addition to higher service and equipment costs, a facility needs to pay for training, marketing, experienced technologists, and "3T safe" MRI ancillary equipment. All of this adds up fast and can be quite costly. The most common pitfall is buying solely because of competitive pressure. If your center lacks an onsite radiology team, employs a weak technical staff, and/or has a limited capital expenditures budget, you may want to think twice about a 3T purchase and save yourself the disappointment.

ACTION PLAN

If your decision is to move forward in light of the considerations presented above, then be prepared to take some critical steps:

- Replace weak staff or invest in training through educational programs and hands-on training at other centers with 3T. Technologists should be experienced in 3T equipment or have more than five years' MRI experience.
- Find alternative radiology support. A 3T center should have a dedicated radiology group that clearly understands the work involved in refining the studies from 1.5T protocols.
- Expand the current marketing budget. Marketing costs, excluding labor, should take up 3% to 6% of the magnet's expected gross revenue.
- Ask a vendor for flexible and deferred payment options. Some lenders offer six to 12-month payment skips on 3T systems to allow a center to ease into the technology and manage cash flow.

Other factors to consider include the center's referral base. A facility's focus referral base should be primarily neurology and orthopedics if the 3T initiative is to be successful.

Future developments in 3T, as well as the center's current and projected procedure mix, are other factors. Newer coil development, increased gradient strength, and upgrade paths are on the horizon for 3T. Centers must decide if they are affordable and within their five-year budget. Vendors have been offering one-year obsolescence agreements because of the rapid changes in technology. If future applications such as breast, cardiac, and abdominal imaging are of critical value to a center, it may be best to continue operating a 1.5T magnet. While 3T is making progress in these areas, it still has a ways to go.

Sites should also project how they might succeed with 1.5T over the next five years. Analyze potential market opportunities by looking ahead for the next three years. Evaluate the age of competitors' equipment and assess their viability and likelihood for upgrading. Waiting for competitive pressure could just add expense. Be aware that transitioning from 1.5T to 3T is a forklift upgrade and usually means construction and downtime costs. Without warning, a five-year internal rate of return can bottom out when gear is swapped just three years later. When other competitors are finishing their final payments and spending $200,000 on small upgrades and new coils, your center could be spending $2 million and starting the payment cycle all over again.

Last but not least, consider the space and throughput limitations of the center. At Liberty Pacific Medical Imaging, we made a mistake early on when we introduced the 3T in our single modality outpatient clinic. The applications were primarily neurology, which made it harder to compete for other uses. Today, a 3T can stand alone as a primary MRI and serves as a good alternative if the center is space-challenged and needs additional throughput.

Owning a 3T system can be a risky business if not managed correctly. Its applications can be abundant, and the technology can be exciting. But when it is used improperly, the adverse effects can leave a lasting negative impression. ■

TOP FIVE PROCEDURES FOR 3T, 1.5T SCANNERS

Encino Imaging Center, 3T scanner

Code	Description	Frequency
70553	MRI, brain, w/o contrast, then with contrast	776
72148	MRI, lumbar spine, w/o contrast	680
73721	MRI, any joint, lower extremity	441
72141	MRI, cervical spine, w/o contrast	412
70551	MRI, brain, w/o contrast	322

Long Beach Imaging Center, 1.5T scanner

Code	Description	Frequency
72148	MRI, lumbar spine, w/o contrast	869
70551	MRI, brain, w/o contrast	646
73721	MRI, any joint, lower extremity	645
70553	MRI, brain, w/o contrast, then with contrast	502
72141	MRI, cervical spine, w/o contrast	498

Procedures performed between January 2005 and February 2006 at two sites in same region of California.