



## Small Urban Hospital Reaps Multiple Benefits from Multislice CT Business Case Study

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**Introduction**

For St. Joseph Medical Center in Reading, PA (SJMC), upgrading its CT was a smart decision, no matter how you slice it. Its new Siemens SOMATOM Sensation® 16 scanner has dramatically pared down scanning time, honed its diagnostic precision with images of exceptional quality, and given it an edge with an advanced range of new exams.

With careful thought and planning, leveraging the benefits of multislice technology has helped the 300-bed hospital carve out a new niche for itself in the local imaging market. Ken Smith (MBA), SJMC administrative director of radiology, explains, "Our Sensation 16 scanner is helping us prove every day that the advantages of advanced imaging technology need not be limited to large hospital settings."

In recent years, CT has become an extremely competitive commodity in the Reading area, with physicians requesting sophisticated exams and expecting results within two days of procedures. The new 16-slice scanner has enabled forward-thinking SJMC to meet these expectations and to compete favorably with a full spectrum of local imaging providers.

Moreover, the scanner is helping to pay for itself with revenues from an increased volume of exams as well as with savings from a decreased length of stay for in-

patient studies that took several days to schedule with the old scanner. Boosting profits, the new Sensation 16 already has pushed up CT volume on the main campus by 8 percent with more than 100 additional procedures per month.

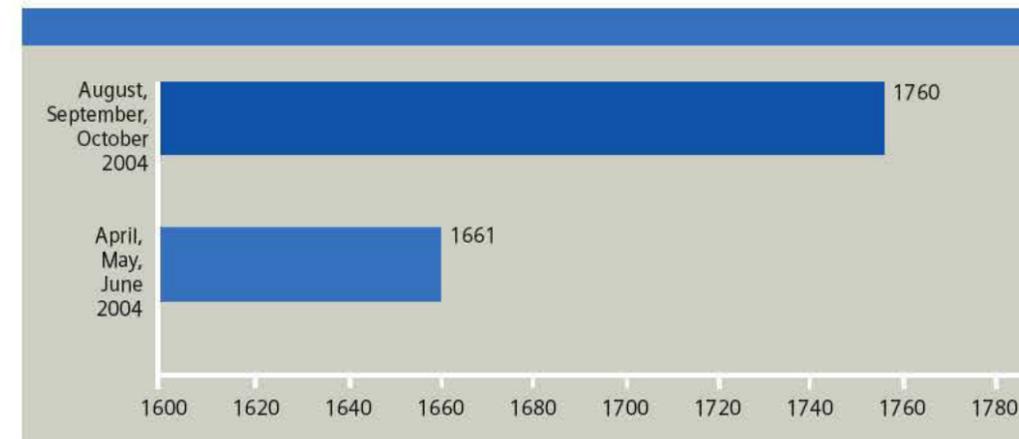
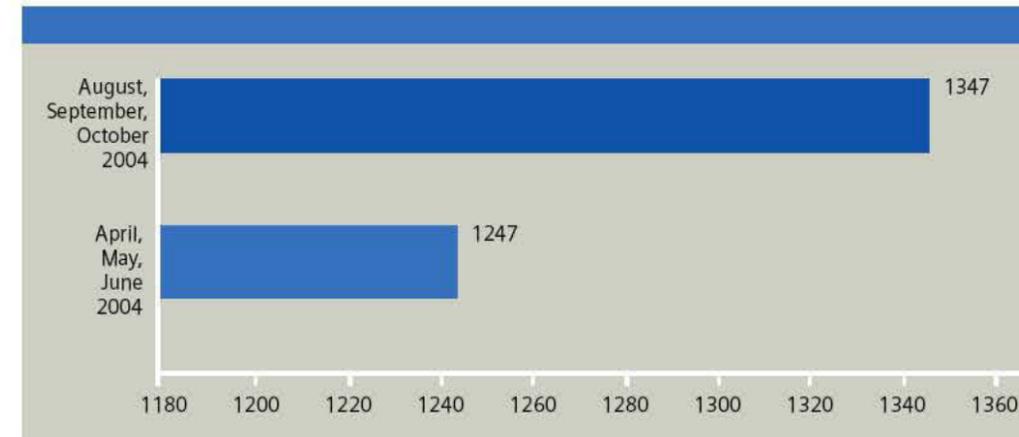
As it efficiently turns out a full range of high-quality images throughout the day, the scanner is also advancing the hospital's mission of rendering state-of-the-art patient care. "The entire department agrees that our fast, accurate CT diagnoses mean more rapid and accurate treatment, leading to better outcomes," comments Jason Dunlap, BS, RT(R)(CT), lead CT technologist.

**A Busy Urban Facility**

Located in the heart of bustling downtown Reading, SJMC is a busy urban hospital serving a population that cuts across the socioeconomic spectrum. With a staff of seven board-certified radiologists, it delivers a full range of imaging modalities, from ultrasound and digital radiography (DR) to magnetic resonance imaging (MRI). The Siemens Sensation 16 was installed in July 2004. During the three months that followed, CT procedure volumes grew by 8 percent, while monthly CT reimbursement charges grew by 6 percent. (See chart )

At SJMC, all radiologists read CT, assisted by six CT technologists as well as a departmentwide administrative staff. One of the smaller area hospitals, SJMC competes with Reading Hospital in the western suburbs, which is three times its size. SJMC benefits from its affiliation with the Catholic Health Initiatives, a well-respected national system of 65 hospitals headquartered in Denver, CO.

While a progressive and successful facility, SJMC may not be representative of the type of hospital typically associated with cutting



edge CT. Certainly, its dedicated clinical and administrative professionals have the highest level of professional skill and commitment. However, like most facilities in today's competitive healthcare environment, SJMC must carefully justify all financial decisions to ensure new equipment will be fully utilized and eventually pay for itself.

**The Race to Keep Pace**

In addition to strengthening the department's competitive position in the local market, several other factors drove the decision to move up to multislice, according to Dunlap. For some time prior to the acquisition, the radiology department's caseload had been rising

steadily. The demand for CT exams in particular was growing. "Our existing single-slice Siemens SOMATOM scanner was terrific when first purchased, but throughput had become too slow to keep pace with our escalating exam volume," explains Dunlap. "We added a second and third CT shift—and the table was still constantly occupied from 6 in the morning until 8 at night."

Over the years, the modality's growing sophistication also had opened up an important new range of procedures the single-slice unit was unable to perform. In particular, SJMC's dated CT technology would not support high-quality CT angiography (CTA) and other advanced exams, which have strong reimbursement



levels. Referrals from within the community for these studies consistently went elsewhere. The hospital even sent out many of its own cases or utilized alternative procedures with less desirable results and lower reimbursements.

“With the single-slice, radiology staff members also were pushing themselves to the limit, working extremely long hours,” notes Smith. “Frankly, it is very much a tribute to their efforts that the modality continued to move forward day after day.”

### Multislice — A Smart Solution

Knowledgeable about the latest technological advances, the department and hospital administration were convinced a multislice CT would provide a successful solution. Dunlap explains that, as any radiology professional knows, one of the technology’s major benefits is that it acquires a significantly greater volume of CT data during a shorter time period than a single-slice unit. This is because the multi slice gantry contains multiple X-ray detectors that create numerous thin, highly detailed anatomical image slices at one time, compared to the single-slice that creates only one.

“However, the benefits proved to be more dramatic than anticipated,” he says. “Our sharp, detailed multislice images are able to precisely visualize small anatomical structures during scan times that may be as much as 75 percent less than on a single-slice unit.”

The hospital also knew that stepping up to more sophisticated technology would enhance exam throughput, allowing more patients to be seen in a day, while leveraging clinical time for enhanced patient care. Despite its extended hours

and packed schedule, SJMC’s department of radiology had a significant exam backlog. Therefore, it knew it had a ready supply of business waiting in the wings to keep the new scanner busy.

SJMC also was aware that multislice would expand its range of procedures. The technology’s accelerated scan times enable a full range of advanced clinical applications and an important improvement in the quality of simpler procedures. “Finally, with multislice, CT imaging is no longer constrained by the patient’s limited breath-hold time,” says Dunlap. “Fast scan times significantly reduce artifacts due to patient breathing and other motion typical of longer, single-slice procedures.”

These fast, artifact-free images—along with today’s advances in computer technology—have opened a whole world of possibilities for the modern modality, and SJMC wanted to reap the benefits.

“Prior to the upgrade, in general, the medical community was aware of our limited CT capabilities,” comments Smith. “We knew we were missing a lot of business as a result. But what we didn’t know was just how big a piece of the pie we might enjoy until we actually upgraded.”

### Affordable Advanced Technology

SJMC was pleased to find that rapidly dropping costs and special features designed for small hospitals had made the move to a multislice CT more feasible than ever before.

After performing a preliminary financial analysis, the hospital identified a strategy that played an important role in the

project’s early financial success. It decided to relocate its existing single-slice scanner to the hospital’s outpatient facility situated six blocks from the main campus. There, it would be utilized as needed for simple exams, adding to overall CT volume and profitability.

Because of its ongoing positive experience with Siemens, SJMC looked at the Siemens 16-slice SOMOTAM Sensation CT and at another manufacturer’s product with similar specifications. “In particular, we felt Siemens’ service on our single-slice CT had been outstanding,” said Dunlap. Examining various equipment options in depth, SJMC found that the Siemens SOMATOM Sensation 16 offered a full range of outstanding features, from a streamlined user interface to ultra-fast reconstruction time and dose reduction technologies. It also provided a full range of advanced applications. SJMC placed the order.

### Streamlined Installation

The new CT was up and running quickly, integrating easily with supporting technologies from a full range of vendors, including an existing PACS and 3D processing stations. For added 3D capabilities in the radiology department, the hospital selected the dual-console Sensation 16 CT configuration with the Navigator console and the Wizard, which serves as a primary reading station attached directly to the scanner. This provides a fast, cost-effective, and convenient alternative to a dedicated 3D station.

## A Full Range of Exams and Benefits

### State-of-the-Art Procedures

Noting that few CTA studies were performed prior to the upgrade, Dunlap comments, “With the SOMATOM Sensation 16, SJMC’s CTAs are finally a valuable and truly practical exam. Using the single-slice scanner, CTAs took over an hour, from patient preparation through processing, with a lot of time spent tracing the aorta and running multiplanar reformatting. Now the complete study from start to finish requires about 15 minutes, and the results are much higher quality.”

With the 16-slice scanner, CTA studies performed each month have now entered the double digits, and SJMC is enjoying lucrative reimbursements as a result. Currently, the hospital is ramping up to greatly expand its CTA volume.

### Routine Procedures

Abdomen, pelvis, kidney, and brain studies remain a mainstay of the department. But now, in part because image reconstruction is significantly faster, these are completed in a fraction of the time. Multiplanar reconstruction studies have nearly tripled with the new technology. Routine abdomen and pelvis exam time has been cut in half. Brain and spinal CTs are not only much faster but also benefit from reduced motion artifacts.

Additionally, thoracic spine imaging is on the upswing. With the old scanner, these procedures had been impractical and uncomfortable, lasting more than an hour. Another area of growth has been interventional procedures, including

biopsies and drainage, which previously had been performed using other modalities. The hospital has also begun to get its feet wet in virtual exams such as colonoscopy.

### ER Procedures

During the three months following installation of the new 16-slice scanner, emergency room (ER) procedures jumped by more than 14 percent, totaling more than 200 CT ER procedures overall. When time is critical, doctors are now eager to take advantage of advanced CT to locate and evaluate problems and intervene as quickly as possible. More ER patients are referred for CT than ever before, and the radiology department confidently supports the volume.

### Quality Control

One of the key workflow improvements realized with the new multislice scanner is the ability to perform quality control (Q/C) checks before the patient leaves the table. Previously, lengthy exam processing times forced technologists to move on to the next patient before confirming that the previous images were satisfactory.

### Keeping It In-House

Now referring few CT exams elsewhere, SJMC's internal CT volume has contributed significantly to its growth. The new ultra-fast technology's more comfortable and satisfying patient scanning experience is an important benefit. To promote its new capabilities, the department created educational marketing materials and organized staff meetings for referring physicians.

Previously the wait for outpatient imaging appointments was up to two weeks. Today, typically patients can be accommodated

within 24 hours. Without a backlog of exams, radiologists are able to read and report on scans more quickly.

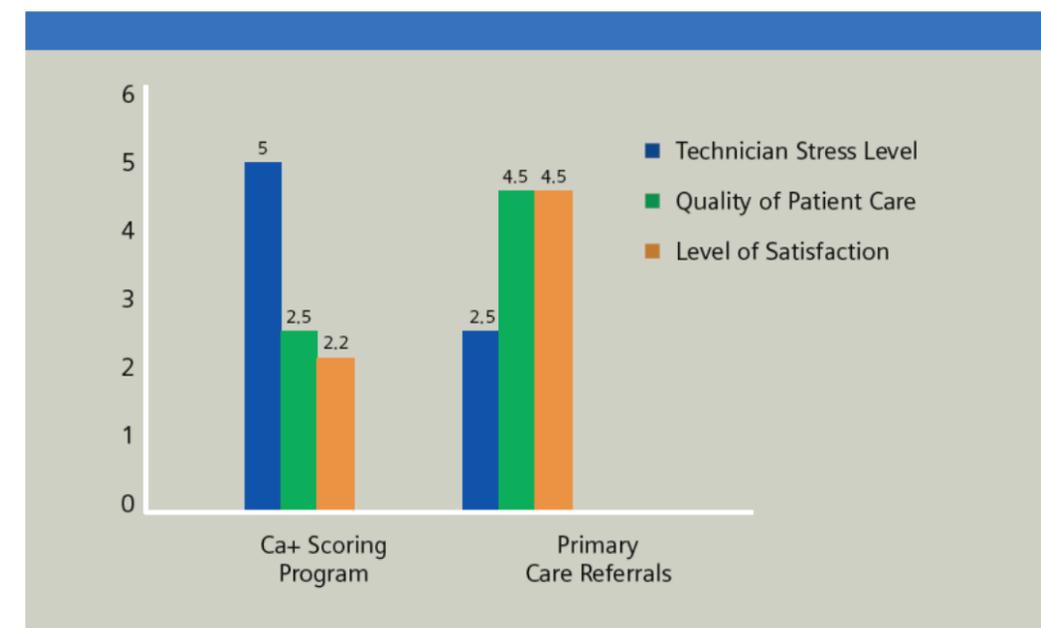
Currently, word about the hospital's advanced new CT capabilities and streamlined scheduling is spreading throughout the community. And that has been enough to keep the scanner humming with activity throughout the day.

### A Fast and Flawless Transition

Transition of the staff to the new technology was equally fast and flawless—particularly important in a smaller hospital where every department member is a key part of the team.

"A Siemens applications specialist was onsite for about a week when the equipment was first installed," explains Smith. "By the conclusion of the session, all of our staff was proficient on the equipment. They found it extremely easy to learn."

The hospital's tight-knit and dedicated radiology staff had all pulled together simply to make do with the old scanner. Following installation of the new scanner, a survey of six radiology technologists revealed significant improvement in the radiology workplace. Job satisfaction, in particular, rose dramatically with the acquisition. Radiology staff have taken advantage of the technology for professional growth, with one technologist completing CT certification. Dunlap attended a fellowship program at the South Carolina Heart Center to learn to leverage the full CTA and cardiac scanning capabilities of the new CT.



Radiologists have commented enthusiastically about the new CT. "I think our new SOMATOM Sensation 16 CT is terrific. It improves the clinical utility of CT by a significant amount and lets us do some very interesting studies," says Irving Ehrlich, MD, FACR, chairman of the department of radiology for SJMC. "I'm impressed with the new Siemens technology and clinical capabilities," comments Barry Tom, MD, SJMC radiologist.

In-house and off-site referring physicians are extremely pleased with the rapid turnaround as well as the high-quality results. Within seconds of the scan's completion, they can walk over to the radiologist's office and look at images on the PACS. "The ability to do coronary CTA adds significantly to the clinical armamentarium for chest pain patients," says Gary Lattin, MD, referring cardiologist.

While the SOMATOM Sensation 16 is busy throughout the day, SJMC sees significant room for growth going forward, particularly in CTA exams. The radiology and hospital administrative teams agree that not only has the multislice CT helped SJMC expand its volume and enjoy a bigger piece of the imaging pie today, but its advanced technology and applications will lead SJMC successfully into the future.