

Nurses have immediate electronic access to each patient's examination and test results. Barcoding helps prevent risks for patient safety.



Med Meets IT at MedCentral

MedCentral deployed a complete Siemens solution suite across its entire enterprise in an effort to increase patient safety and decrease costs through operational efficiencies. It ended up with even more, including dramatic improvements in workflows, processes, and interdisciplinary care.

By Kevin Self

'Med Meets IT' is the concept of seamlessly blending two independent fields – medicine and information technology – into a single, fully-integrated, harmonious solution that is easily accessible and conveniently deployed in a clinical setting, resulting in cutting-edge efficiencies and patient safeguards that were not even possible in healthcare until recently. Competition in today's healthcare markets is fierce. As consumers become more informed and begin shopping for hospitals, health systems are forced to re-

examine their operations to find new ways to introduce efficiencies and position themselves as world-class organizations. As anyone involved with healthcare management knows, this is easier said than done. Add regional and statewide competitive pressures into the mix and it is enough to make even the strongest provider turn and run quickly in the other direction. For this reason, it is all the more impressive when – despite mounting obstacles – a mid-sized, regional health system

demonstrates forward-thinking innovation to gain competitive advantage. Meet MedCentral Health System, a non-profit health system located in Mansfield, Ohio, U.S., that services a city population of approximately 50,000 and a county-wide potential patient pool of nearly 120,000. With 351 beds, 2,600 employees, two hospitals, and four other local facilities, MedCentral is situated between Cleveland and Columbus – larger cities home to two of the country's best cardiac treatment centers. So how is MedCentral

able to compete to the point of earning a number one state ranking by HealthGrades¹ for its cardiac surgery program?

The answer to this question resides in a number of system-wide solutions, but there is no debate that the organization's IT initiatives are at the heart of its recent rise to the top. With its tagline of 'Expert Care, Close to Home,' MedCentral epitomizes the concept of Med Meets IT across its entire enterprise.

Expert Care, Close to Home

Physicians practicing at MedCentral are more confident by the ability to deliver accurate information to the right person at the right time. Repeat patients are delighted they do not need to re-do paperwork before admission. Clinician recruitment and retention have never been higher. All are recent benefits of a strategic effort to improve patient safety. But this was not always the case. Four years ago, MedCentral was essentially in the dark ages as far as fully utilizing IT to deliver better patient care. The entire health system was operating on a manual, paper-based system, and the technology it had in place offered limited deployment and integration capabilities. When its financial system was nearing sunset at the end of 2004, MedCentral started looking for other solutions. The need to replace a single system quickly grew from a simple upgrade into a much larger initiative.

"We wanted to find a solution that could replace our financial system, but also expand to encompass all of MedCentral Health System's needs," says Chief Executive Officer James E. Meyer. "We wanted to enhance our ability to use IT to improve patient care and safety, and provide clinicians with better data at the point of care."

Enter 'Project Expert Care' – MedCentral's system-wide IT initiative.

Redefining Expert Care

If there was a single mantra for those involved with Project Expert Care, it was

'provide clinicians with better data, more efficiently, and at the point of care.' None of these goals were achievable with the old paper-based systems.

In 2004, MedCentral was inefficient and relied too heavily on manual processes that exposed the health system to human error and excess costs. And it was not an isolated problem. Nearly every department was plagued by delayed laboratory results, inaccurate data entry, or lost images. This environment was not conducive to maximizing quality patient care. In radiology, MedCentral was still hand-signing reports, and it was not uncommon for physicians to wait as long as 48 hours to receive them. In the laboratory, labels were printed and manually sorted – waiting 17 hours for hard-copy test results was considered acceptable. The same was true for nursing, where the staff was spending inordinate amounts of time manually extracting data from records to accommodate MedCentral's reporting obligations.

The objectives of Project Expert Care were simple: increase patient safety through improved workflow and decrease costs through greater operational efficiencies. The answer was to build an

enterprise-wide solution suite that would embrace the entire spectrum of care.

A New Nervous System

After an extensive evaluation of multiple healthcare IT vendors, MedCentral selected Siemens for two primary reasons: its vision for the future and its robust technology offering.

"We bought into Siemens philosophy of Med Meets IT because it was extremely compatible with where we wanted to go in the future," says Michael Mistretta, Vice President of Information Services (IS) and Chief Information Officer at MedCentral. "MedCentral's decision to go with Siemens has been validated many times over. The incorporation of clinical and imaging data at the point of care has been almost transformational in our delivery for patients."

In addition to similar overarching philosophies, the tactical approach to developing a quality, state-of-the-art IT solution was the same – taking an enterprise approach over best-of-breed.

The two new partners decided on a comprehensive Siemens solution that included Soarian[®] Clinicals and Financials, syngo[®] Suite, a picture archiving and



Thanks to Project Expert Care, MedCentral's cardiac surgery program earned a number one state ranking by HealthGrades.

¹ Health Grades, Inc. is a U.S. healthcare ratings organization, providing ratings and profiles of hospitals, nursing homes, and physicians.

communication system (PACS) and radiology information system (RIS), Patient Identification Check, NOVIUS® Lab, Med Administration Check (MAK), and Siemens Pharmacy.

“Workflow was the backbone of the Siemens philosophy and one of the greatest successes of Project Expert Care. Siemens helped us to look at our workflows, how we were operating, and how Soarian would impact those workflows,” says Claudette Brown, RN, BSN, and Clinical Applications Manager in the IS department.

Brad Peffley, Vice President of Clinical Services, agrees. “We used Siemens consulting services along with our own staff to tear apart our existing processes and look at ways we could gain the biggest advantage from the new system.”

Although the initiative elevated the role of the IS department, senior management made it clear this was more than a technology upgrade. Project Expert Care was a system-wide initiative that was integral to the future of MedCentral.

“IT itself doesn’t touch a patient or deliver care, but it’s the nervous system for all the different activities involved with

patient care,” says Fred Crowgey, Projects Director for IT. MedCentral’s nervous system – its core for patient care delivery – was Soarian Clinicals.

“Soarian made us nimble and made results available in a timely manner,” says Michael David Patterson, MD, Vice President of Quality and Performance Excellence and Chief Medical Officer.

“Before that, we were reporting lab work on a paper. Nurses then used that paper chart for documentation. And the same was true for medications – we used a paper MAR [medication administration record]. It is hard to believe we were operating like that – and it was only a few years ago.”

Maximizing Efficiencies in Patient Care

As part of Project Expert Care, one of the first metrics baselined and monitored – as an indication of the efficiencies MedCentral hoped to gain from the Soarian solution suite – was reducing length of stay (LOS).

In 2003, the average LOS was 5.4 days. Today, that number has been reduced to 4.6 days – the equivalent of having an

extra 30 to 35 beds annually. Plus, MedCentral’s patient volume is 60 percent Medicare/Medicaid, which means dealing with diagnosis-related group (DRG) reimbursement. Under DRGs, the facility receives a set dollar amount regardless of the amount of time a patient stays in the hospital.

“If we can safely discharge patients – safety being our primary objective – each day that we can reduce that stay is a dollar savings for the organization,” says Janene Yeater, Assistant Vice President for Accreditation and Utilization Management. “Soarian, in part, enables us to speed that delivery of care, helping to directly improve our bottom line.”

One of the biggest benefits of Soarian Clinicals is rapid access to test results, particularly radiology reports and laboratory results.

The turnaround time in radiology improved dramatically when MedCentral moved from film to Siemens *syngo* Suite for RIS and PACS. Prior to the implementations, its average time for a final report was 24 hours – although 48 hours was not uncommon. Immediately after implementing Siemens digital imaging systems

A Microcosm of Project Expert Care: The Emergency Department

There is little doubt of the impact that Soarian and other Siemens solutions have had across the MedCentral enterprise. This, in fact, can be realized simply by examining its Emergency Department (ED) – an ideal microcosm of the benefits and efficiencies realized through MedCentral’s greater Project Expert Care initiative.

The ED is a primary patient entry point where data capture is essential, as well as one of the most stressful and fast-paced areas within any hospital. Small inefficiencies are amplified within the ED and can lead to problems further down the continuum of care. As such, it was a focal point at MedCentral when implementing its Soarian solutions. Here are some of the efficiencies realized:

- Reduced ED capacity from over 100 percent to around 85 to 90 percent
- Reduced triage-to-admission time from almost eight hours to 4.5 hours

- Reduced triage-to-discharge time from more than five hours to 3.2 hours
 - Eliminated the pre-implementation practice of boarding patients – some intensive care unit patients – in the ED
- MedCentral’s ED also continues to invest in IT solutions, the most recent being the Emergency Department Tracking Board, which provides ED clinicians the ability to automate portions of the admissions process. For example, if a patient is admitted in the ED and needs an X-ray, clinicians simply enter the appropriate data and Soarian will automatically send a notification to radiology. The radiologist, in turn, can monitor the ED Tracking Board to assess the incoming caseload from the ED – introducing time efficiencies and workflow improvements.

The ED’s end result – representative of the greater MedCentral enterprise – is improved patient safety, decreased costs, and better overall quality of care for the patient.

and PACS throughout the Radiology Suite, turnaround time was reduced to six hours. In recent months – despite the retirement of a radiologist and taking on volume from MedCentral’s outpatient center – turnaround time was further reduced to an average of two hours while maintaining quality levels.

“With PACS and our voice recognition software, the final validated radiology report – not the preliminary report – many times beats the patient back to the room from the X-ray department,” says Patterson. The story is the same for transcriptions. Despite moving all transcriptions inhouse and adding the volume from another facility, Siemens solutions enabled a reduction in radiology staff from six full-time equivalents (FTE) to 4.5 FTEs.

“Without a doubt, the PACS solution of *syngo* Suite has made radiology more efficient and drastically improved our throughput,” says Peffley.

According to Patterson, the same trend can be found examining the NOVIUS Lab implementation, which is a testament to the integration planning of the deployment. MedCentral’s laboratory is comprised of many independent systems and instruments operating in two different facilities, including an ADVIA WorkCell® CDX Automation Solution with ADVIA Centaur® Immunoassay Systems, ADVIA® 1800 Chemistry Systems, and ADVIA CentraLink® Networking Solution. With these Siemens solutions in place, “Laboratory results are completed within an hour or two. Before the implementation, it was 24 hours before a physician could even look at that result.”

The reduction in turnaround time enabled the lab to increase its labor efficiency as well. The number of lab procedures completed prior to the implementation was 9,975 per FTE. After the implementation, this metric jumped to 10,791 per FTE – almost a ten percent increase in productivity. In addition, all data is automatically verified before it is forwarded to Soarian Clinicals, helping to assure consistency and increased quality in the results review process, further enhancing patient safety.

“One person can now do the work of two under the old system,” says Debra



Real-time information on their handhelds helps ensure phlebotomists know about test changes – and provide the correct sample at the correct time.

Ruckman, Phlebotomy Supervisor. In the end, these efficiencies in the lab add up to better and more timely care for the patient.

“Our physicians now have greater expectations for lab results and availability. The effect is a completely different interaction with the lab,” says Terry Weston, MD, Vice President of Physician Services. “The conversation is not ‘where’s the report and when will I get it,’ but rather physicians are free to ask deeper questions and explore other possibilities.”

Enterprise Cost Reductions

The solutions now in place at MedCentral enable direct (i.e. reduced material costs) and indirect (i.e. time efficiencies) cost savings across the enterprise. The radiology department offers textbook examples of both.

By transitioning from a film-based system to PACS, MedCentral has eliminated the cost of film almost completely. Within the first month of implementation it was 95 percent filmless. This translates to an annual savings of about US\$450,000. What is more, that number does not include the additional savings of chemicals, canceled maintenance contracts, and other ancillary costs associated with film.

MedCentral has also realized indirect cost savings in radiology, including the elimination of transcription services,

as well as the intangible benefits of Siemens RIS/PACS integration.

“The integration of RIS and PACS saves us from doing many mundane tasks,” says Philip Calendine, MD, Chair of the Department of Radiology. “When we select a patient name from our worklist, all the demographics and patient information is automatically transferred. There is no manual data entry. When you’re reading 200 to 250 studies every day, saving an extra 20 seconds per study translates to hours over the course of a week.”

Automating Patient Safety

Patient safety was the underlying reason for Project Expert Care, and no two solutions implemented at MedCentral are more directly associated with patient safety than the Siemens barcoding solutions: Patient Identification Check and MAK. “Prior to go-live with Patient Identification Check, I would do three or four disciplines a month with people misdrawing a patient,” says Project Expert Care Director Crowgey, also formerly the Lab Director. “For the first year after implementation, in every place that Patient Identification Check was used, I didn’t do a single discipline.”

In fact, since the implementation of Patient Identification Check in March 2006, there has not been a single patient identification error. This is due,

Summary

Challenge:

- Inefficient and time-consuming paper reporting system
- Inadequate paper-based documentation
- Increased risk for patient safety due to human error in manual processes
- Medication errors that threatened patient safety
- Excess turnaround times for lab and radiology reports
- High costs associated with film-based imaging technology
- Extensive back-logs in the Emergency Department

Solution:

- Siemens Soarian Clinicals workflow management technology enables best-practice implementations and continuing process improvements
- NOVIUS Lab streamlines and standardizes laboratory processes, reducing turnaround times
- An ADVIA automation system, along with ADVIA chemistry and immunoassay systems, and the ADVIA CentraLink data management system automates the laboratory
- Patient Identification Check automates patient safety through point-of-care barcoding technology – helping ensure the five rights of patient safety
- Med Administration Check (MAK) automates medication administration through point-of-care barcoding technology – helping ensure the five rights of medication administration
- *syngo* Suite improves communication through the use of complete imaging management workflow, increasing efficiency and access to digital information

in large part, to the quick adoption of the technology by phlebotomists. “We had a strict policy for labeling tubes among the phlebotomists – basically three strikes in a year and you’re out,” says Crowgey. “They quickly recognized that using technology would preserve their jobs, as well as help reduce the potential to make an error.” Patient safety is also reinforced by using mobile devices, according to Karen Phalor, ASCP, an IT analyst and medical technologist at MedCentral. “By simply using their handhelds, phlebotomists can be fed real-time data when there are changes or tests added – this enables the correct sample at the correct time.” If Patient Identification Check is the safety net for patient identification – satisfying the five rights of patient safety – then Med Administration Check (MAK) is the equivalent for medication – satisfying the five rights of medication administration. Patient Identification Check coordinates the efforts of the lab with that of the phlebotomists. MAK coordinates the efforts of the pharmacy with that of the nurses.

The data generated shortly after go-live with the integrated Siemens Pharmacy and MAK solution speaks volumes to the layer of safety the technology provides. “The first week that we launched the solution, we caught 383 medication errors – the wrong patient about to receive the wrong medication, or about to receive it at the wrong time, or at the wrong dose,” says Patterson. “That was a humbling experience. I can’t imagine a healthcare system even considering a future without something like Pharmacy MAK in place.”

Core and Quality Measures

MedCentral has seen a dramatic turnaround in its ability to share information because of Soarian. “Our core measures have improved so much that we’ve not only hit our goals, but we’re also talking about raising the bar,” says Patterson. “You can pick any core measure and I can directly relate how Soarian assisted with that quality-of-care improvement.” When MedCentral first started capturing core measurement data:

- Acute myocardial infarction (AMI) was in the 50th percentile. Today, MedCentral is at 93 percent
 - Pneumonia was in the mid-30th percentile. Currently, is it at 90 percent
 - Congestive heart failure was one of MedCentral’s lowest baseline scores. Currently, it is at 94 percent
- “We’re on the upper level of our stretch goal for congestive heart failure and looking to extend that beyond the national average,” says Michael Schwartz, Executive Director of Cardiovascular Medicine, and adds that the functionality and flexibility of Soarian Cardiology – Siemens cardiovascular information solution – and *syngo* Dynamics – Siemens cardiology PACS – have also helped recruit and retain the best cardiologists. The department is a source of pride for MedCentral. In 2007, 2008, and now also for 2009, HealthGrades named its cardiac surgery program the best in Ohio – awarding it a Number One ranking. In an effort to enhance reporting functionality to the already robust Soarian offering, MedCentral recently launched Soarian Quality Measures, which will streamline the quality improvement process by automating chart abstraction and help expedite the submission of quality measures – as defined by the Centers for Medicare and Medicaid Services and The Joint Commission.

Interdisciplinary Care

The ability for various departments and disciplines to work together and easily share information was a priority from the beginning – the primary reason for taking an enterprise approach to Project Expert Care. “When we examined the Soarian solution from an integration perspective – bringing together pharmacy, lab, radiology, et cetera – it was our top pick,” says Phalor. Clinicians at MedCentral credit two features of the Soarian implementation for enabling this interaction: the functional screen and online access. The functional screen is part of the nursing admission assessment that identifies criteria points from each discipline. Nurses mark each criteria point exhibited

by a new admission. Soarian processes the completed functional screen and automatically prompts a consult referral to the relevant discipline.

"The functional screen has been significant in improving our patient care, but it also helps decrease our length of stay," says Joann Plaster, Vice President of Nursing and Social Work Services. "The sooner you can get all the necessary disciplines involved in the care, the faster that patient gets better."

In the first month of operation with Soarian's rules and workflow technology – the system on which the functional screen is based – MedCentral saw a double-digit percentage increase in the number of consults delivered to the various disciplines.

"This functionality also goes a long way with Joint Commission and other compliance reporting," says Yeater. "This process is now automated and patient care is done consistently and in a standardized fashion, which directly impacts accreditation."

Access to information has been, perhaps, the single greatest benefit of the Soarian solution. "There's a lot of data available that we didn't have before," says Peffley. "Whether it's patient statistical information, departmental statistical information, or financial information and budget reports, I can get it myself and it's available almost immediately."

The result is better communication between departments, particularly with the nursing and the medical staff. "Nurses have access to results immediately and electronically. The physicians – even from home – also have online access," says Weston. "This is a vast improvement and makes a nurse's reporting capability exponentially stronger and faster." Expressing similar sentiments, Crowgey adds: "Online access to the right information at the right time improves patient care and supports faster clinical decision-making. It is just good quality patient care."

A Foundation for the Future

MedCentral, with its suite of Siemens solutions in place, is only beginning its



Turnaround time for radiology reports has decreased from 24 hours to two hours with the implementation of PACS and voice recognition.

Project Expert Care initiative. The health system already has plans to expand the use of existing technology to remote facilities and has a list of new technologies that are in some stage of planning. These include Computerized Physician Order Entry (CPOE), further utilization of its Emergency Department Tracking Board, Siemens critical care application, Soarian Plans of Care, Decision Support with embedded analytics, Soarian Cardiology and AXIOM® Sensis, Soarian Quality Measures, radio frequency identification (RFID) capabilities, and Soarian Health Information Management (HIM). "The goal is to have our entire enterprise on one Soarian system," says Patterson. "Siemens will beat every other vendor and win the race to a complete enterprise solution. This is the secret to our great partnership. MedCentral will help Siemens to achieve that goal, because we want to be the first health system to implement the solution."

Kevin Self is a writer for Launch International, a company specializing in strategic marketing and sales enablement for technology companies.

Further Information

www.siemens.com/syngo
www.siemens.com/Soarian

- The PACS, part of *syngo* Suite, helps provide security as well as remote and easy access to archived digital images across various disciplines
- The RIS, part of *syngo* Suite, enhances imaging communications to and from the radiology department and integrates seamlessly with the PACS
- Soarian Cardiology and *syngo* Dynamics aid in moving from modality-focused to patient-centered care

Result:

- Workflow efficiencies resulting in reduced length of stays
- Increased patient safety by automating processes and minimizing human error
- Increased laboratory efficiency, decreased laboratory turnaround time, improved laboratory efficiency, and increased laboratory capacity
- Significant improvements in core measures
- Reduced costs through greater productivity and elimination of materials and outsourced services
- Increased interdisciplinary communication
- Enhanced accessibility to information