Cardiovascular Business
SPECIAL SECTION | HEALTH IT
Sponsored by an educational grant from Siemens Healthcare

NORTH KANSAS CITY HOSPITAL, NORTH KANSAS CITY, MO.

Technology & Teamwork Take CVIS Up a Notch

This is a tale of making cardiac care better. Better for patients, better for the caregivers providing it, and better for a hospital morphing and migrating to thrive in the new world of accountable care. The key ingredients? A new cardiovascular information system, detailed internal project planning and workflow evaluation, structured reporting, seamless and standards-based integration among devices and IT systems, and ample staff training, so says the tight-knit clinical and IT team at North Kansas City Hospital in Missouri.

— By Mary C. Tierney

North Kansas City Hospital is a larger hospital among a plethora of healthcare providers in greater Kansas City. With 451-beds and 600 physicians in 49 medical specialties, the facility has one of the busiest emergency departments in Kansas City. This facility, serving a large cachement area north of the Missouri River, is an accredited Chest Pain Center that blends high touch with high tech.

A new strategy for cardiovascular image management sought to improve cardiac care and strengthen the economics at North Kansas City Hospital. The results prove the success with savings in physician and staff time and quicker hospital discharges. Transcription was replaced by electronic notes and structured reporting, including searchable, quantitative data.

More physicians now have direct and quick access to the results they need, says cardiologist Jim Mitchell, MD. "We see this as a time saver, ultimately, for physicians and a way to save money for the facility today and going forward as the management of care changes," he says. "[Physicians] can fill in any needed information on a pre-populated structured reporting template, draw in the diagram, and use voice recognition dictation instead of typing. Reporting to the registries is easier and we are sure, when it comes to reimbursement, that our structured reports include the language we need to secure payment."

Mitchell's cardiology colleague Steve Gimple, MD, agrees. "Having the essential elements of reports structured offers an advantage to care, accreditation and payment," he says. "I can sign the report, and within two minutes, it is in the EHR for other physicians to access. That positively impacts patient care and even speeds up discharges; for example, in the case of nuclear studies when we provide results quickly and the patients can leave the hospital sooner."

Integrating cardiology

Looking back about three years, North Kansas City Hospital had five technology-rich cardiac cath labs and a variety of nuclear medicine systems, echo carts and IT systems to read, create and manage reports. But, they needed a cardiovascular information system (CVIS) that integrated them all, allowed physicians more access points to report efficiently, facili-

tated greater access to images and reports, and interfaced with their EMR. They wanted a system that would bridge the gap with internal reporting and remote access, and had a standardized plan for end-user devices. Other musts were easy business and clinical reporting, including seamless reporting with ACC registries including Cath PCI, ICD, STS and Action, and accrediting bodies such as the Intersocietal Commission for the Accreditation of Echocardiography Laboratories (ICAEL) and the Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories (ICANL). Another goal was greater confidence in charge capture.

A broad search of seven CVIS vendors narrowed down to three. A rigid and comprehensive RFP process helped make the purchase decision, with the final nod to implement Siemens *syngo* Dynamics coming from both the clinicians and physicians on the selection board.

"Previously we had an excessive amount of human intervention to get systems to talk to each other," says Manager, IT Applications Joe Singleton. "That didn't work for us; there were too many inefficiencies in getting cases done and reports out quickly.

Physician reporting was limited to specific places in the hospital and that needed to be expanded," he notes. "That's why this time we chose a system that would allow us to accomplish our 'dream workflow.'"

That dream workflow—for both non-invasive and invasive cardiology—was created by a team of clinicians and IT specialists who took the time to learn each other's languages. The team took to planning from the clinical and IT perspectives—enabling true collaboration to develop among the team in understanding one another's needs and goals. It also extended to hospital and physician coders so that the structured physician words and phrases brought in the appropriate codes to bill correctly and qualify payment, says Cardiac Cath Lab Clinical Nurse Educator Vickie Rupard, RN, BSN, RCIS.

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>
> Steve Gimple, Cardiologist

The collaboration and understanding started during the year-long planning process that commenced in July 2010, a year before the purchase decision was made. The team mapped and diagrammed workflows and collected clinical and administrative requirements. "We see comprehensive, advanced planning as the only way to implement any system," Singleton says. "Our internal IT staff maps dream workflows with clinicians in every area. We met regularly until we got them right. Once that planning was complete, we brought in the system."

Mapping out a plan

Planning became a three-part process: understanding clinical needs, integrating devices, and creating and refining reporting templates. On the clinical side, Cardiology Manager Cathy Sullivan was a key liaison communicating clinical needs as were Rupard and Rhonda Taylor, supervisor of the non-invasive cardiology, neurology and vascular lab. Drs. Mitchell and Gimple offered the cardiologist perspective. Stacey Holle, the senior business systems analyst, bridged clinical needs with IT, while hemodynamics/Sensis clinical IT specialist Amy Dewey and clinical IT specialist for CPACS/*syngo* Dynamics Mike Chastain worked with Singleton on the IT side to make it all work.

Cardiologist Jim Mitchell was a key member of the clinical team that joined with IT to make the transition to electronic reporting smooth. Here he views images in one of North Kansas City Hospital's five cath labs.

"The IT team spent a lot of time in the clinical areas following our processes, understanding how we care for patients, following patients, following physicians and asking them where else they wanted to report from to increase efficiency—such as in the CCU both on and off campus, " Sullivan explains. "They documented everything with an eye toward how we could do it all better. IT truly came to appreciate the patient care processes, and translated them into the information technology world in terms of all of the interfaces we needed between devices and people, and access to data for the physicians."

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Cathy Sullivan, Cardiology Manager

IT took on the challenge of working through interfaces and integration—defining a way to link all the clinical devices to the CVIS. The third piece of the puzzle was the creation of structured reporting templates. The liaisons worked with physicians and one another to refine the templates with all of the needed features and fields for appropriate documentation, viewing, coding, and registry and accreditation reporting, along with physician requirements.

Beginning to end, planning took a year. Planning for training was next. Singleton says it is ideal to train key IT and clinical super-users one to three months prior to the go-live, then start training staff. Physicians initially learned the non-invasive report templates for echocardiography, nuclear cardiology, and EKGs.

syngo Dynamics went live in July 2011 with 100 percent physician participation in the non-invasive areas of echocardiography and nuclear medicine. Next were the cath labs, with a new lab coming on-line every two weeks. Hemodynamic and electrophysiology integrated recording via Siemens Sensis followed, including bidirectional connectivity with *syngo* Dynamics. "Our non-invasive side ramped up quickly. Once physicians had access in their offices, they wanted to be able to report everywhere," Sullivan recalls. "We were glad to accommodate that—and are still developing additional deployment strategies."

The IT service line for cardiology includes Siemens *syngo* Dynamics cardiovascular imaging and information system, Lumedx Apollo for outcomes reporting, and Siemens Sensis for hemodynamics. These systems are integrated with one another and our electronic medical record using both HL7 interfacing connections as well as database-to-database links.

The time investment both in planning and building relationships between IT and the various cardiology stakeholders allowed the North Kansas City team to pursue an aggressive implementation timeline. Purchase orders were issued in mid to late July, and by the end of September the CVIS, outcomes reporting solution, hemodynamics system and the first of five cath labs on-line and interfaced.

The group currently uses various remote access technologies including virtual private networking and virtual desktops to make systems available in eight remote facilities, including three community hospitals and five physician practices.

On the infrastructure side, the hospital team virtualized the CVIS in a high-performance environment with high availability. Full data integration now allows physicians in the cath lab to pull up echo exams when they need to cross reference exams. A new high-performance environment means prior images come up instantaneously. All equipment is monitored in near real-time remotely by IT, notes Chastain. Problems are identified quickly and IT heads to the cath lab to diagnose the problem within a couple of minutes. "If we do our job right, we have to be fully engaged and fully available," he says.

syngo Dynamics also interfaces with the health system EMR and ADT systems to send demographic data to populate order entry and modality worklists, thus improving patient safety and expediting billing. It also helps in inventory management. Once a physician verifies a report, *syngo* Dynamics populates results into the Cerner EMR for use by clinicians, and eventually support state-wide health information exchanges in Kansas and Missouri.

How it works

Reporting in the cath lab begins with a technician entering key clinical data. These data automatically populate the *syngo* Dynamics worksheet, thus improving accuracy and timely reporting. Physicians may report from a workstation in the cath lab, using easy-to-use, point-and-click picklists and diagrams. They log in via a single-sign-on badge. Voice recognition keeps typing to a minimum. Data for the ACC Registry also automatically flows from Sensis to the outcomes reporting system. Physicians can confirm or change the data as they are reviewed.

Additionally, physicians have the flexibility to view and report on EKGs, echo, and nuclear exams from their office or the other locations.

To the physicians, the CVIS transition was smooth. "It was like the IT guys set it up one night and turned it on, even though we know it took a lot of planning," Mitchell says with a smile. "They showed the

physicians how to use customized reports and we were using them."

So what are the benefits of electronic reporting? Time savings, inventory, and performance improvement, Taylor notes. "We see time savings in report turnaround and quicker decision-making," she says. "The progress notes and dictation used to be a five-step process. Reports used to take one to three days, and now they are available within minutes or a couple of hours." Paperwork, too, has been eliminated.

The physicians have seen clear benefits as well. "We can see this will potentially speed up care for chest pain management, and have a positive impact on length of stay," Mitchell says. "We are seeing greater physician efficiency for sure, in the hospital and in physician's offices, with access to cath lab reports. There is a lot more availability of patient information. In critical care situations, this helps physicians make faster and more informed decisions. Workload balancing [enabled by electronic reporting] between physicians helps with our time management as well." By sharing the number of patient's exams waiting to be read, for instance in echo, patients can be diagnosed, treated, and discharged more efficiently.

Tighter inventory management via CVIS is trimming costs, too, and allowing for more informed supply acquisition. Cath lab staff query inventories, and are narrowing the scope of wires and stents ordered to bring down par levels. Electronic data tracking helps the facility track expired materials and order stents for overnight delivery rather than having to stock them. Savings thus far have topped $100,000.

Customizable features of Sensis also help with charge capture, namely in light of the 260 code changes in 2013 alone, Dewey notes. The cath lab subcommittee also uses the data captured to monitor best practices and stats such as average stents placed, the mix of bare metal vs. drug eluting, fluoroscopy time, and contrast use with an eye toward national averages.

The cardiology department will soon add a PET/CT system. The new system will be integrated into the CVIS environment for easy viewing and reporting as well.

Communicating 101

So where were the pain points? "In all the change," Sullivan says as several other teammates nod in agreement. "And the best way to deal with it is conspicuously, being visible and showing value," Singleton echoes.

"Change is not without strife as physicians adjust to the new way of reporting," Sullivan says. "We see the benefits in reduced length of stay, getting reports in a more timely fashion, seeing an improvement in the quality of reporting in terms of improving access for physicians, and in reporting to registries, accreditations and reimbursement."

"This brings a cultural shift for sure," Sullivan says. "If you don't document it, you didn't do it. The top priority of the clinical staff is to take care of patients. They don't want to spend a lot of time documenting. We capture data at the bedside and prepopulate the report [with key patient data]. That helps with accuracy, time, registries, reporting, and evidence-based practices."

Communication was central to project success. A good social relationship is the first piece of team-building, Singleton says. "We all need to listen, respect what each of us has to offer and work closely so that things can get done." That goes for physicians, clinicians and IT folks. Physician champions, such as Mitchell and Gimple, pass the word to colleagues on the value of evidence-based practice, and urge them to buy in. "Showing physicians how it works and how quickly it can be helps to get them on board," Mitchell notes. "Reports used to be dictated, then typed, and we had to fill out a diagram by hand. This replaces all of that. It is quick, gets rid of variables in procedures, and doesn't involve a lot of typing, which we as physicians don't usually like."

Singleton recommends taking the long view and investing time on the front-end in system planning, then moving on to plan the implementation.

Chastain and Dewey stress the need for training for IT folks before go-live. "Sending a technical person to service level training will help your team to customize the system," Chastain says. "Class-based training offers a deeper understanding of what the product can do and how to do it."

Make sure that physicians invest enough time to become fluent with reporting, Chastain recommends. Virtualization of servers is another must, since it consolidates IT resources, provides maximum availability, and flexibility in service delivery.

Take the long view and invest time on the front-end in system planning. Then move on to plan your implementation.

Joe Singleton, IT Applications Manager

Ultimately, it all comes down to better patient care. "Having a more readily accessible, complete picture of patient data allows us to take better care of patients," Mitchell says. "A lot of people have worked hard on this project, integrating systems and working together closely with physicians, nurses and IT. It has paid off well for our patients, physicians, staff, and overall healthcare efficiency. We are just beginning to see the benefits. Asked if we'd do it again, I'd say, 'yes.'" CVB