Rethinking RIS: Strategies to Streamline Operations

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Changing the Playing Field with Integrated RIS/PACS

RADIOLOGY AND IMAGING SPECIALISTS
RIS-driven Workflow Simplifies a Complex Practice

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Revving Up Workflow

Today’s radiology information system is the workhorse of radiology—gathering and organizing radiology department workflow and reporting. Simply, it’s the “brains of the engine,” says Ray Baraldi, MD, chief of radiology at Cooper University Hospital in Camden, N.J. Integrated RIS/PACS has been key to Baraldi and his radiology and IT team helping this 500-bed trauma center regain a competitive edge just across the water from Philadelphia. RIS-driven workflow has spurred 10 to 20 percent productivity gains among radiologists.

The story is similar at United Memorial Medical Center, a Batavia, N.Y.-based community hospital that includes five imaging centers—and Radiology and Imaging Specialists of Lakeland, Fla., whose 17 radiologists interpret 500,000 studies for more than 100 referring physicians annually. RIS allows administrators to trace facility metrics, uncovering inefficiencies and re-evaluating staffing, scheduling and equipment strategies. Training is key, too, to maximizing a RIS investment, as you’ll see in “Ensuring Success: RIS/PACS Consultation & Training” on page 15.

A new generation of speech technology also looks to push the process. Advanced Speech Understanding is all the buzz. Its native HL7 CDA architecture intuitively incorporates clinical data into the reporting process, eliminating duplicative processes, saving time and increasing accuracy. The result: The radiologist gets to dictate the way he or she prefers, but the structured report produced speaks the same language as healthcare information systems. That speaks volumes—and will streamline workflow, too.

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Cooper University Hospital in Camden, N.J., is a 500-bed level I trauma center that operates in a highly competitive market. The hospital sits in close proximity to Philadelphia, and the city dominates the local healthcare market. Consequently, Cooper University Hospital faces a tremendous challenge. It aims to retain university healthcare in the South Jersey region and prevent patients from migrating to Philadelphia for treatment. Cooper University Hospital houses six centers of excellence that include cardiology, trauma, critical care, neurosciences, orthopedic surgery and the Cancer Institute of New Jersey. One of the latest arrows in its competitive quiver is GE Healthcare Centricity RIS-IC.
The combination of integrated RIS/PACS and RIS-driven workflow has reshaped the enterprise, enabling it to increase productivity among all physicians and boost timeliness of patient care. The radiology department is better serving its users, too. Report turnaround time has dropped, and images are universally available, streamlining consultations and allowing physicians to make more informed treatment decisions. Here’s how the hospital achieved its results.

The journey from manual to filmless (and beyond)

Cooper University Hospital operates a high-volume radiology department. Each year, the department completes 200,000 studies and offers a full range of diagnostic imaging services on the main hospital campus and at three satellite imaging centers. Until a few years ago, the radiology department relied on film and manual processes to serve its patients and physicians.

“When I arrived in 2003, the radiology department was purely manual. It used ‘sneaker net,’ which was challenging on many levels,” recalls Jerry Mullen, administrative director of radiology. The hospital realized it needed to improve processes to remain competitive and provide quality patient care, so it began surveying the RIS/PACS landscape.

The ideal workflow model was clear from day one, according to Chief of Radiology Ray Baraldi, MD. RIS/PACS uses a single database, which streamlines integration of key functions. “The RIS is the brains of the engine; PACS is really just an image display,” explains Baraldi. The hospital focused on locating a solution to manage end-to-end workflow from scheduling to billing, says CIO Karen Graham. PACS-driven workflow, on the other hand, is radiologist-centric and can lead to broken steps—and delays—in the workflow process.

“The advantage of having the single database includes the effective and closely aligned functionality between the RIS and PACS, and the integration with the HIS. Integrating from a single database is important because the fewer databases that need to speak to each other, the better,” adds Baraldi.

RIS-driven workflow offers other advantages, too. For example, a sophisticated QA program monitors the number of exceptions and lost studies. The QA program shows that Cooper University Hospital has reduced these metrics to zero. The system also facilitates proactive planning, says Mullen, who plans to use it to create a three- to five-year business plan to optimize PACS and grow the hospital’s radiology business.

Currently, the department is developing a dashboard to monitor imaging utilization. “We can make sure that they’re trending in the right direction and optimize our schedules if we need to change them,” Mullen says. “At one site where we have a no-show rate of about 50 percent, we triple-book to make sure that the schedule reaches capacity. Without the report generated by Centricity, I wouldn’t know we need to overbook.” In addition, the feature helps Mullen track bottlenecks at all levels of the imaging chain. Finally, projections provided by Centricity will provide Cooper the data to make smart business decisions, answering questions about the number of technologists and equipment needed to support imaging centers in new catchment areas. Equally important, Centricity can help Mullen determine minimum profitable volumes for new endeavors.

Digital workflow delivers

“Centricity has had a tremendously positive impact for all the physicians throughout the hospital,” Baraldi says. “The ease and ability of

The IT Angle

RIS/PACS weds IT and clinical systems, and the success of an installation hinges on both partners. “The most important part of the deployment is integration within your IT department. RIS/PACS is a clinical tool, but it’s truly on IT project, you have to engage your IT department,” says Jerry Mullen, administrative director of radiology at Cooper University Hospital in Camden, N.J. CIO Karen Graham was a key player in the hospital’s RIS/PACS project from day one, as the project dovetailed with her focus on corporate, rather than departmental, IT structure.

The hospital initiated its RIS/PACS project by soliciting input from the IT department, sharing its clinical and workflow goals with a clinical and IT-based team. The IT department, in turn, evaluated the architecture of various systems under consideration to ensure a good fit with the hospital’s infrastructure. “Find a vendor that fit’s the hospital’s approach to IT implementation,” recommends Graham.

Prior to deploying GE Healthcare Centricity RIS-IC, the hospital invested in appropriate IT infrastructure and digital imaging systems such as CR and a gigabit network. It also placed RIS/PACS workstations in key areas throughout the enterprise—including ORs and on clinical floors.

The plan worked. Cooper University Hospital has leapfrogged over early adopters, says Mullen. Physicians have embraced digital image management, CPOE and RIS/PACS-embedded voice recognition to help the hospital become a filmless, paperless provider of swift, high-quality healthcare.
image and report review has increased efficiency and productivity across the board for our physicians. Some report 10 to 20 percent increases in productivity.” The productivity increase is even more dramatic in the radiology department, where radiologists read 50 to 100 percent more studies per day, according to James Kovacs, MD, section head of abdominal and body imaging. Graham uses a different stat to describe overall workflow. “Prior to Centricity RIS-IC, radiology workflow comprised more than 50 steps. Since Centricity, the hospital has reduced that number to fewer than 10.”

Productivity gains derive from ease of use, integration with other systems such as CPOE and elimination of manual, paper-based processes. For example, in many cases radiologists and technologists communicate via Centricity instead of by telephone, which reduces wait time and miscommunication. Features like a simple red flag, rather than a phone call, to alert radiologists to a STAT study also save time.

Improved patient care under the microscope

Importantly, the decision to deploy Centricity RIS-IC has improved patient care in a number of ways at Cooper University Hospital. The hospital defines radiology as a service department. Its job is to image patients and provide results to other physicians, so they can determine the next step in patient care. “That’s why we need RIS/PACS,” says Baraldi.

Prior to RIS/PACS, the hospital relied on film for image acquisition and review and an antiquated courier system for distribution. “It was difficult to discuss findings,” recalls Eric Hume, MD, vice chair of orthopedic surgery. With Centricity, referring physicians can review images simultaneously with radiologists and specialists. The system relays more detailed information more rapidly. Physicians can point to or list the slice position number and measure and describe findings collaboratively.

Digital image management also slashed radiology turnaround time. The benefit to patients is two-fold, says Kovacs. Physicians can view images expeditiously, a critical factor in the trauma center. “Our ability to get patients back to where they need to be and to relay results impacts patient care on a daily basis,” continues Kovacs. Plus, patients can access their studies, enabling smoother referrals.

The winning combination

GE Centricity RIS-IC and RIS-driven workflow is the perfect combination at Cooper University Hospital. The academic hospital and trauma center has improved workflow, report turnaround time and patient care since embracing the new system. What’s more, it enables data-driven decision-making and provides a solid foundation for future growth.

INSIDE the Digital Department

Orthopedics is traditionally a heavy consumer of imaging, and the orthopedic surgery department at Cooper University Hospital in Camden, N.J., fits inside the bell curve. It differs from some other sites, however, in its commitment to integrated RIS/PACS, RIS-driven workflow and state of the art, image-enabled surgical suites.

Three operating rooms are outfitted with video capability, workstations and a display that can be pulled down into the surgical field. Video routers that can pull images from a variety of different locations and monitors are scattered around the rooms. The routers can pull images from a variety of different locations. RIS/PACS workstations provide access to order entry via the intranet and internet. Orthopedic surgeons can navigate through imaging datasets to project images on screens throughout the room. Rooms also feature light cameras, jacks for different video signals and USB and video ports for new equipment.

Nine other ORs include PACS workstations.

Although the current configuration provides image access in all ORs, the hospital plans to build several new operating rooms that further take advantage of RIS/PACS, laparoscopy and other video image generating technology. The key component is a video router system and a computer with access to the internet, says Eric Hume, MD, vice chair of orthopedic surgery.

Centricity helps the department provide high-quality patient care outside the OR, too. In the film world, the image isn’t always in the right place, forcing the physician to make a decision without the data, order another image or wait for the data to arrive by courier. These issues no longer exist at Cooper. Images are always and universally available. And although orthopedic surgeons were a bit skeptical about the ability of the hospital’s standard monitors to display imaging data, their fears were unfounded. “It turns out any plain vanilla box [display] around the hospital works just fine to look at the AP lateral tibia fracture before and after the nail was put in to verify the alignment. And exploding a single CT or MRI panel on a 15- or 17-inch monitor shows detail not visible on three-by-four inch plain film panels,” says Hume.

The upshot? RIS/PACS has become a business essential in the 21st century orthopedic surgery department. “It’s like email or the ATM; we couldn’t do without it,” states Hume.
Radiology and Imaging Specialists in Lakeland, Fla., is a complex radiology practice. The group provides professional services for four hospitals in central Florida and operates five geographically diverse imaging centers. Its 17 radiologists interpret 500,000 studies for more than 100 referring physician offices annually. In addition, Radiology and Imaging Specialists leases its image management system to another practice.
he practice’s complex configuration is profitable in the booming central Florida market, but it does present significant challenges, COO and CIO David Marichal explains. “When I arrived in 2003, the practice had no RIS or PACS. There were too many workflow inefficiencies for a standard standalone PACS.”

Marichal realized that web-based RIS architecture could address many of the practice’s challenges by providing a consistent view of the practice from any location.

In 2004, Radiology and Imaging Specialists deployed GE Healthcare Centricity RIS-IC, integrating the system with a third-party PACS. The transition to RIS-driven workflow reinvented the practice; it facilitates streamlined workflow for all users, which, in turn, trims expenses and improves service.

"The patient exam and report distribution are timely, which satisfies patients and referring physicians. And we know we will be paid. These aren't mutually exclusive benefits."

David Marichal, COO & CIO
Radiology and Imaging Specialists

The first step: workflow analysis
Radiology and Imaging Specialists was mired in inefficient workflow prior to installing Centricity RIS-IC; however, simply purchasing a system does not guarantee optimal results. The practice deployed RIS and PACS concurrently and built its workflow around the synergy of the two systems, designating Centricity RIS as the workflow engine. The rationale behind RIS-driven rather than PACS-centric workflow is simple. RIS begins and ends the work process. Radiology workflow starts with scheduling and ends with billing; PACS can not handle those tasks. RIS puts information in the hands of every decision-maker—from the radiologist to the scheduler and the technologist, says Director of Informatics Sal Tejeda.

Radiology and Imaging Specialists undertook a thorough workflow analysis prior to deployment, examining every step of every process of its business. One of the top complaints of employees? Paper and the requisite paper shuffling in a non-automated practice. Prior to the RIS/PACS deployment, scheduling and billing required multiple phone calls and considerable paperwork. Both drained efficiency. In contrast, the ideal scheduling and insurance workflows are based on solid, efficient processes that allow a practice to capture all necessary information for authorizations and pre-certifications. RIS/PACS automates theses key workflows; the practice is confident that staff has efficiently gathered all information needed for both reimbursement and patient safety. In addition, items like patient allergies and contraindications are visible across the system to prevent problems.

RIS-driven workflow also helped the practice improve physician workflow, allowing it to deliver everything radiologists need to accurately interpret the study in the minimum number of clicks. The patient record and images are available in a single location. RIS/PACS also separates studies for referring physicians who complete their own interpretations. Images are in a distinct worklist and don’t cross-contaminate radiology workflow. “Everyone is happy,” Marichal says. “The patient exam and report distribution are timely, which satisfies patients and referring physicians. And we know we will be paid. These aren't mutually exclusive benefits.”

From paper-driven to film-free via IT
Technology is the ticket to the transition from inefficient, paper-heavy radiology to streamlined, digital workflow. Radiology and Imaging Specialists invested heavily in technical infrastructure to support its RIS/PACS implementation.

Its sophisticated network infrastructure is built around a fiber optic network that connects all of the practice’s imaging centers. Recently, the practice upgraded from a VPN mesh to a hub and spoke-straight VLAN configuration. The hefty network also supplies bandwidth needed to share workload among radiologists. Because the web-based system provides consistent, universal access across imaging centers and at radiologists’ homes, they can view and share daily worklists to support every site.

Another critical component in the IT recipe is the workstation. “It’s important to provide a positive experience for end-users. This requires workstations that meet RIS and PACS hardware requirements,” explains Marichal. Radiology and imaging Specialists opted for Windows-based PCs with 256 RAM. The practice also redesigned its reading rooms to accommodate workflow.

“The reading rooms are built around the electronic system, putting everything we need at our hands,” explains Christian Schmitt, MD, informatics medical director. Reading room workstations have a four-monitor configuration so clinical information from the RIS is easily viewed and displayed in addition to the PACS viewing tools on the other three monitors. Workstations are configured with 4 GB of RAM to accommodate any tools radiologists need to view data and images.

A final piece of the puzzle is a robust data center that can pass all data from one location to others. The 600-square-foot center includes an uninterruptible power supply (UPS), backup battery, independent generator, climate control and fire suppression. The result is near-perfect uptime.

Inside the RIS-driven practice
RIS-driven radiology delivers a number of benefits: efficient, accu-
rate billing, improved patient care and streamlined workflow. Prior to RIS/PACS, Radiology and Imaging Specialists relied on paper billing. The practice was not sure it captured all charges because the process hinged on paper.

Centricity RIS-IC, on the other hand, features an electronic charge interface. Coders vet items before they go to the billing interface to simplify and accelerate the process.

Scheduling is equally efficient. With universal access to all sites and imaging resources, schedulers can place patients in the first available slot. “That’s important because referring physicians want the first available appointment, or they’ll take their business somewhere else,” notes Marichal. The integrated, brokerless system also drives an intense resource utilization program at Radiology Imaging and Specialists, in which the practice analyzes how much of the time slot it uses for each type of exam to optimize imaging resources.

“Centricity RIS-IC helps track productivity from schedulers to technologists,” notes Darla Mosley, applications manager. “We’ve been able to determine how long a patient is in the office, how long the exam takes, and then we can adjust our times accordingly, which helps with the schedule. We can accommodate more patients than we did before.”

In addition, if the practice is backlogged in one area, it can shorten exam time a bit. Finally, the system helped justify the RIS/PACS investment. Prior to RIS/PACS, Radiology Imaging and Specialists staffed each center with six radiologists. Post-deployment center staffing dropped to four radiologists. Ancillary staff has been reduced approximately 10 percent through attrition.

Optimized patient care
Automating processes to improve productivity and the bottom line is essential in today’s tight economic environment; however, the first priority in healthcare is patient care. Centricity RIS-IC helps Radiology Imaging and Specialists meet it dual objectives by speeding turnaround time and improving access to images.

Consider for example oncology patients. Many travel to different Radiology Imaging and Specialists sites for imaging studies. Centricity RIS-IC collects images from various sites, making them available in a single application for review at cancer conferences. “We can make decisions about the patient’s therapy based on adequate and thorough information rather than one piece of information or one study,” says Schmitt.

An ongoing process
RIS/PACS is not a project that begins and ends on certain dates. It is an ongoing process that begins before deployment and, in an ideal situation, continues after installation as the practice taps into the system to derive new benefits.

Radiology Imaging and Specialists initiated its deployment with an implementation team with broad membership including radiologists, technologists, schedulers and IT staff. The team thoroughly evaluated and tested workflows to maximize efficiencies with Centricity RIS-IC and offered a strong training program. The practice wrapped introductory training into a six-week simulation before going live with the system. The training included a post go-live debriefing at the end of the first week, and the practice holds staff refresher training at least once a year or after product upgrades/updates.

The center aims tap into RIS/PACS to raise the bar again. For example, Radiology Imaging and Specialists intends to reward schedulers who meet established benchmarks, which requires metrics and a solid RIS reporting system, says Marichal. Centricity fits the bill.

Reinventing the practice
Centricity RIS-IC has provided Radiology and Imaging Specialists a means to reinvent its practice, improving workflow and patient care across the board. The imaging center group is completing more studies and turning them around in a shorter time frame with fewer staff. In other words, the practice has found the recipe for success in 21st century imaging center business.

Featuring interviews and Q&A with clinical and IT thoughtleaders from:
- United Memorial Medical Center
  Batavia, N.Y.
- Radiology & Imaging Specialists
  Lakeland, Fla.
- Cooper University Hospital
  Camden, N.J.
In some respects, United Memorial Medical Center (UMMC) of Batavia, N.Y., is a typical community hospital. It is composed of five campuses including a 111-bed hospital and four imaging centers. The group completes 50,000 imaging studies annually. Imaging modalities include multidetector CT, CR-based digital mammography, ultrasound, MRI, CR and digital fluoroscopy.
As the only hospital in the county, UMMC is somewhat challenged. For starters, it employs a single radiologist (supported by a specialist assistant in radiology), which can make it difficult to manage imaging volume, provide acceptable report turnaround time and review the breadth of modality procedures, especially subspecialty and ER reads. Four external radiologists based in Buffalo, N.Y., help manage the center’s daily workload, so robust digital image management processes are critical. Secondly, the metropolitan areas of Rochester and Buffalo are within an hour’s drive; it’s important to maintain high-quality local care to keep patients local.

The organization’s decisions to deploy GE Centricity RIS-IC in 2001 and to pioneer PACS with integrated RIS and voice recognition in 2006 play a vital role in UMMC’s ability to provide optimal, local patient care. What’s more, workflow and report turnaround time are significantly improved with integrated RIS/PACS and RIS-driven workflow.

**RIS rules**

Centricity RIS-IC is the workhorse behind the smoothly functioning radiology department at UMMC. The rationale behind the staggered, RIS-first deployment is quite simple. The RIS provides a means to capture accurate information and populate the PACS, says Lisa Foss, medical imaging supervisor. An interface with the HIS also facilitates patient processing and scheduling. “RIS-driven workflow helps bring the patient through the department a lot smoother. Data like patient registration flows from the HIS to the RIS, leading to fewer data entry errors and less manual work for technologists,” says RIS/PACS Administrator Mary Niland.

Physicians, both referring doctors and radiologists, benefit, too. The RIS centralizes all radiology reports and imaging files, providing streamlined access to reports and images for referring physicians. It also provides a line of communication between radiologists and technologists, which boosts workflow. For example, the radiologist can view images immediately after acquisition. If a study requires additional views or a retake, the radiologist can relay that information to the technologist—without leaving his chair or breaking workflow.

Both parties in the image reporting equation—referring clinician and radiologist—also gain from embedded voice recognition. Prior to Centricity, UMMC used a third-party system that required an additional server, interface and HL7 message. The Centricity system streamlines management, says Niland, and allows the radiologist to manage reports from a single home page, which, in turn, helps cut turnaround time.

Dan Ireland, vice president of clinical support services, credits the center’s workflow success story to a complete pre-RIS workflow analysis. “Our goal was to use technology to streamline activities,” Ireland says. By strategically locating status boards within the department and placing barcode scanners in radiology rooms, UMMC has slashed its paper consumption, replacing paper with electronic data flow. The workflow analysis helped the hospital track pressure points to help it determine where to place PACS workstations. Wall-mounted units and mobile carts complement fixed workstations to provide physicians access to images and lab results anywhere in the hospital, including at the patient bedside.

Centricity RIS-IC enables electronic billing, another critical work-
flow booster. Prior to Centricity, UMMS used a courier service to ship hundreds of billing reports to its billing company every day. Now, reports are generated automatically within Centricity and sent electronically to the billing company, saving the time and dollars associated with the paper approach. In addition, bills can be generated more rapidly, which translates into accelerated collections.

Centricity RIS-IC provides other significant advantages, too. The RIS incorporates data-mining capabilities, helping the medical center optimize resources. For example, when evening technologists complained about their workload and clamored for another FTE, Foss ran a technologist productivity report for seven days. She found that volume was significantly higher during the 3 to 7 p.m. period. Instead of hiring an additional tech or authorizing overtime, Foss juggled the schedule to provide triple coverage during the department’s busiest hours, saving the hospital critical dollars and keeping hard-to-replace employees satisfied.

The workflow and data-mining benefits of Centricity RIS-IC and PACS are ongoing, says Director of Radiology Darren Kazmierczak. “We’re constantly reevaluating our workflow to see what we can change efficiently, and it’s all based on having RIS/PACS.”

**Customer satisfaction**

Customer service can be a tall order, particularly in tight departments with a single radiologist. Centricity helps UMMS maximize its single radiologist and provide outstanding service to internal and external customers.

> “Our ER physicians are much more satisfied [since we added RIS/PACS]. They can review images right in the ER, and they can share them with patients.”
> 
> Dan Ireland, vice president of clinical support services, UMMS

Take for example the emergency department. ER physicians have specific, critical needs—specifically rapid, accurate review. The hospital runs weekly ER reports to monitor turnaround time. “When we first implemented Centricity RIS-IC, we measured turnaround time in hours. Now we measure it in minutes. We turnaround 68 percent of ER reports within 15 minutes,” Niland says. That rapid turnaround helps physicians provide timely, informed patient care.

Another bugaboo in the conventional ER is discrepancy tracking. Prior to RIS/PACS, UMMS relied on a manual process with the radiology department staff walking to the ER every morning to chase films and bring them back to the department for the radiologist to review. Any discrepancies between the initial ER read and the radiologist’s review required paper forms and phone calls. Now, images are shared electronically between the departments. If a radiologist finds a discrepancy, Centricity generates a note to inform the ER.

> “Our ER physicians are much more satisfied,” sums Ireland. “They can review images right in the ER, and they can share them with patients.” Centricity streamlines consults, making it easy for physicians to transmit images to Buffalo hospitals for sub-specialty review as needed.

The digital system also helps the hospital maintain a competitive edge with referring physicians, specifically by helping the hospital minimize report turnaround. Some primary-care physicians admitted to referring patients out of town in the center’s pre-RIS/PACS days because it was difficult for the single radiologist to make a timely diagnosis, says Ireland. Since Centricity, however, some have returned to UMMS because the radiologist can return results with an hour of the study. In fact, in the last year UMMS improved on its 5 percent annual growth rate, achieving a phenomenal 19 percent growth. Ireland credits the growth to Centricity. “With RIS/PACS, we’re able to provide the level of service expected by our primary-care physicians and patients.”

One patient group particularly satisfied with digital image management model is STAT patients. “Patients who come to the hospital for STAT work can wait in the waiting room because reports are completed so quickly. The radiologist can call the referring physician with results to find out if the patient should go to the office, ER or home. Patients aren’t driving home to find out they should return to the hospital,” explains Foss.

**A perfect fit**

Centricity RIS-IC is a perfect fit for UMMS. The community medical center has achieved key goals since deploying the integrated system. Customer service is improved via rapid report turnaround; business is booming and physicians, technologists, and patients are satisfied. The system provides access to data, helping the center continue to improve services. Paper is gone, and film consumption is negligible.
The Next-Generation ‘Smart’ Report

Standard voice recognition technology is far from cutting edge. In fact, voice recognition has existed in various forms since the 1960s; however, after 40 years on the market, healthcare has not tuned in to speech. In fact, fewer than half of all hospital specialties embrace voice recognition technology.

The mediocre adoption rate is somewhat paradoxical particularly in radiology as the report is the final product of the radiologist’s work and necessary for payment and clinical decision-making. One reason behind the less-than-enthusiastic acceptance of speech recognition is most systems are add-ons to radiology workflow rather than an integrated part of the workflow process.

GE Healthcare aims to re-draw the speech market by injecting new utility into voice recognition. The company is collaborating with M*Modal to develop a next-generation natural language processing system.

The evolutionary solution—Advanced Speech Understanding—weds sophisticated technology and workflows. The speech engine is embedded in Centricity RIS to make reporting part of the natural workflow. Advanced Speech Understanding meets the dual challenges facing speech. It makes speech an integral part of the radiology workflow and capitalizes on the rich patient data available at every step of the radiology process.

Advanced Speech Understanding delivers added value by incorporating clinical data into the reporting process to eliminate duplicative processes. For example, during the scheduling process the scheduler captures data like signs and symptoms. Such data can be found at every step of the imaging chain and is critical to the final radiology report. Advanced Speech Understanding pulls the data through the imaging workflow to make it available to the radiologist for the report.

The enabling technology for the next-generation solution is a structured documentation process based on HL7 Clinical Data Architecture (CDA). The native HL7 CDA architecture combines and re-uses data, allowing radiologists to spend less time working on reports while simultaneously producing a higher value document.

Advanced Speech Understanding bridges both flavors of traditional speech technology—free-form documentation and structured reporting. Structured reporting offers certain advantages, particularly the ability to exchange data with other healthcare information systems. Radiologists, however, tend to shun structured reporting because it can be more time-consuming than free-form documentation. HL7 CDA provides a means to dictate in the way radiologists prefer and produce a structured report that speaks the same language as other healthcare information systems.

Speech: The last word

Speech is one of the next frontiers in radiology workflow. Effective speech recognition can help address the tough challenges in the radiology world by boosting productivity and improving the final radiology product. Advanced Speech Understanding represents the evolution of speech recognition technology. It will boost adoption and improve radiology workflow and products.
RIS in the Outpatient Imaging Center

Increasing Efficiency, Maximizing Revenue

With the economic challenges of the Deficit Reduction Act (DRA), marketplace competition and the quest to streamline processes facing outpatient imaging centers, anything that can help increase efficiency is more than welcome. A good RIS helps centers track patients, physicians and revenue—while staying on schedule and on budget. The right tools can even help organizations determine when and where to expand their services.
We set out to produce a RIS that increased the efficiencies and maximized revenue within the facility," says Rhonda Eckstein, director, Product Management, Dynamic Imaging Solutions, GE Healthcare Integrated IT Solutions.

One way the RIS increases efficiencies is with key event monitoring. "That ensures that each step of the process is completed before the patient can move on to the next step," she says. For example, before a patient is considered registered, the system makes sure that all required information has been collected.

Relying on RIS

"We rely on the RIS very heavily," says Mark Weathersbee, CIO at Jefferson Radiology, a user of GE’s Centricity RIS-IC.

Jefferson uses Centricity RIS-IC for scheduling, creating call-back lists, arrival tracking, exam memos, communication between technologists and radiologists, and to help the group go to a paperless reading room.

The paperless reading room was a new initiative last fall that Weathersbee says was primarily physician-driven. "They decided on their own that they didn’t want to deal with so much paperwork," he says. The biggest obstacle to a paperless reading room was the doctors having to manually input patient numbers rather than use the bar-coded documents. Once the doctors adjusted to the new process, it "really made the workflow go a lot easier and quicker."

Electronic reports have been beneficial for referring physician practices, says Weathersbee. About 60 percent of access to the online reports and images is by the practices’ nurses, staff and support personnel. The ability to facilitate that access has improved Jefferson’s position in the marketplace, he says.

To get the most out of its RIS, Jefferson customized it in many ways, Weathersbee says. One way was scheduling. "Schedulers need to have a lot of clinical data," he says. For example, does a particular CT exam need contrast? Frequently the schedulers would arrange one study and then, at the time of the appointment, clinicians would make changes. "Based on information in the medical record, the protocol was different," Weathersbee says. "It was a constant burden for schedulers. The radiologists and technologists were always asking why the schedulers couldn’t schedule the right exam."

To combat the problem, the practice decided to go with simple, generic scheduling that involves an exam list for each organization, the modality code and the body part code. The list is driven off of the CPT list, but it’s generalized and allows schedulers to get the key components of what the physician office wants to know—location, date and time for the exam.

Once the appointment can be confirmed with the office, the referring practice caller can get off the phone, which is appreciated. “Once the exam is scheduled, we collect authorization information as needed,” Weathersbee says. The generic exams are created in the RIS as a non-billable/non-reportable exam. “That keeps them from going through the system by accident,” he explains. “They can’t reach the finalized signed state as a generic exam. The tech has to go in and do an Enter/Edit of the exam to make it a specific code that makes the exam billable and reportable.”

This process is a good example of Jefferson Radiology’s ability to configure the RIS in a unique way that solved a business problem and let the practice improve its customer service, Weathersbee says. It also helped improve the practice’s revenue cycle. The protocoling worklists within the RIS allow proofing against the authorization codes. “Through reports we can create in the RIS, we can make sure we have the proper authorizations and we’re not performing exams for which we’re not going to get paid.”

Jefferson recently acquired a practice with two locations, for a current total of eight locations. Within the next few months, the two...
new sites will be consolidated to one and a new facility will open in a
different area. The RIS helped the practice evaluate the overall vol-
umes for the modalities being implemented at those two additional
locations, Weathersbee says. “Data captured in the RIS was definitely
a decision point in deciding what to do with those two offices.”

Liberty Pacific Medical Imaging chose Centricity RIS/PACS-IW (formerly Dynamic
Imaging’s IntegradWeb RIS/PACS) when developing new imaging centers in Castro
Valley, Calif., and Columbus, Ohio. Centricity RIS/PACS-IW includes a contract
management module that incorporates complex logic to estimate net revenue
based upon payor use of DRA, HOPPS or both DRA and HOPPS fee schedules. The
highlighted areas are calculated for each visit and enable centers to accurately
project the impact of DRA on their patient/payor mix versus budget.

New RIS for new locations
Liberty Pacific Medical Imaging
chose Centricity RIS/PACS-IW
(formerly Dynamic Imaging’s IntegradWeb RIS/PACS) when developing new imaging centers in Castro
Valley, Calif., and Columbus, Ohio, in the beginning of 2007, says CIO Anthony
Draye. When developing new centers, the organization had to
deide whether to continue with an under-performing, legacy RIS
or employ a new RIS, according to Draye. They decided to look for
a new RIS. “Dynamic Imaging [which was acquired by GE late in
2007] had what we were looking for and having one vendor for both
RIS and PACS in the outpatient world adds efficiency.”

Liberty Pacific appreciates that the Centricity product is a “very
modern and well-engineered software product.” Choosing RIS
software that has a forward-thinking technology roadmap behind
it gives imaging centers peace of mind that their systems will evolve
with them. Using a product that is up-to-date with modern soft-
ware standards ensures that it is “future proof.”

The billing capabilities of the RIS also appealed to Liberty Pacific,
Draye says. “In the current environment, billing is very impor-
tant.” Plus, “we didn’t have to buy third-party software to do docu-
ment management or other specific functions. It’s all in this one
product. It’s a complete RIS.”

Liberty Pacific probably gets the most bang for its RIS buck
through the daily, weekly and monthly performance analysis con-
ducted through the system, Draye says. “The RIS produces the daily

reports we need to make sure we’re filling our schedule efficiently so
that our patients have the best possible access to our imaging ser-
vice.” Weekly, he can see how the organization is tracking toward
volume and collection goals. Monthly, reports are produced to track
progress toward annual goals. “A systematic approach to reviewing
our performance data is very important to us,” he says. “It’s some-
thing we really like about our RIS.” Another plus is that “it doesn’t
take a lot of manpower to produce that data.”

Those reporting abilities provide a “snapshot view of all key indi-
cators,” says Eckstein. That includes volumes and revenues, out-
standing accounts receivable and unbilled accounts. Users also can
monitor staff, physician referral patterns, unbilled accounts, and,
most importantly, medical reports—the final product. “A timely
interpretation is what the referring physicians are looking for,” she
says. “We have management reports that allow facilities to track
closely where those medical reports are.”

One element of the RIS is DRA Logic. For multiple, same-
day procedures, some insurance companies reduce the tech-
nical component by 25 percent. “We built that logic in,” says
Eckstein. Users only need to load their payer contract and
the system will automatically calculate the 75 percent reim-
bursement of the technical component and display expected
net revenue. Without that, users wouldn’t automatically
take such discounts into account and “have no way of know-
ing if they’re getting the correct payment.”

To choose the best RIS for your organization, Draye says he
would “encourage someone to try and match their workflow
with the RIS products they’re evaluating. They should imagine them-
se/hems using that RIS and think about its features and the most
important aspects of their workflow and make sure the two are in
synch.” Because a RIS is not “one size fits all,” he says, “it requires lots
of effort to properly integrate a system into an organization’s work-
flow. Choosing the right RIS is key to successfully achieving that.”

Coming soon…
GE has plenty of new features on the horizon for Centricity users.
The company recently released its CPT level billing logic, Eckstein
says. “Our collectors desktop work queues are in development, as
well as authorization alerts for those payors that require authoriza-
tion before a study is performed.” The collectors desktop tool
involves user-specific worklists that will automatically display a
user’s accounts to be worked for follow-up based on system rules.

Aside from these kinds of tools, Eckstein says GE has kept the focus on
a user-friendly system. “We tried to remain consistent on all screens.
Specific data fields always link the user to a specific place. We kept that
consistency from screen to screen. That has made it very user-friendly.”

With all of these considerations, Eckstein says the product “truly is an
entire solution—with a single desktop, scheduling through, zero bal-
ance, billing and collection system—that hopefully increases efficiencies
and facilitates maximum reimbursement. That’s what it’s all about.”
ENSURING SUCCESS

RIS/PACS Consultation & Training

What happens between a facility and a technology vendor after they ink a contract can make the difference between success and failure in a RIS/PACS implementation. Having just experienced the smooth “go-live” of their new integrated Centricity RIS/PACS from GE Healthcare, Blount Memorial Hospital radiology staff members know firsthand the value of solid consulting and training services.

**Kick-off to go-live**

With the flip of a switch on Sept. 10, 2007, Blount went live with GE Centricity RIS-IC 10.5 and Centricity PACS 3.0.1 to manage the 120,000-plus imaging procedures the main hospital performs annually. As part of the contract with GE, Blount received an array of consulting and training services to help them maximize benefits from the new system from the clinical, IT, management and operations perspectives. It was evident that day that the RIS/PACS consultation and training services from GE had paid off for the 305-bed community hospital in Maryville, Tenn.

Phil Berler provided management consultation services from GE from kick-off through post go-live. “Phil knows the radiology business,” says D. Charles Price, RN, Blount’s clinical analyst, project manager, information systems. “He managed a radiology department for 17 years in New York City. He knows the systems from the technologist and management standpoint. For me, I was a staff nurse before I took the technology job and he helped me to understand the process from a general standpoint. He was always ready with an answer.”

Berler, one of the seven-member team, spent several days onsite evaluating the workflow at Blount. “The first few times he watched flow in the department—beginning with admitting and scheduling,
through obtaining images and archiving—he sat with various employees or stood in different areas of the department to watch how we did business,” says Price. “He was onsite at least five times, plus sent emails and conducted conference calls.” From there, Berler drafted a future workflow report based on the current workflow.

Under the looking glass
As an example, one of the problems Berler discovered was overbooking and insufficient use of scheduling personnel. “Before we had only one person per modality doing scheduling at the front desk; now we have three who can schedule [appointments] for all of the modalities,” says John T. Cadieux, BS, RT (R), technical coordinator, radiology. The scheduling change has allowed for more efficient use of the imaging equipment with less idle time for each system. “Phil helped us do away with scheduling books and streamline patient throughput.”

Throughout the planning and testing process, Berler made subsequent visits to see how Blount staff was doing with the changes in workflow and suggested adjustments as necessary. For a period, both the old system and new system ran concurrently, followed by a simulation where the new system was put through a dry run. “During the planning phase, the team planned for a certain piece of the implementation to go a certain way. But during the simulation, we found out that process would not work in real-time. We had to look at the process again and make changes,” says Cadieux.

Training musts
Training was another key to RIS/PACS success. “GE had a ‘train the trainer’ mentality,” he says. A master training program provided special emphasis on creating super-users, who became the go-to people onsite. Master-user training was very thorough, Cadieux says, including onsite training, online training using WebEx, and training for both systems at GE training facilities.

Cadieux says he and PACS Administrator Mike Headrick, RT, spoke with supervisors to decide who the super-users would be, asking questions like: “Who can we trust to handle this responsibility? Who is going to take on this responsibility and handle it well?”

Once chosen, super-users were trained on what was relevant to their jobs, Cadieux says. “We set up an intro class to the system, began two- to three-hour training sessions a week later for three technologists and three schedulers at a time, and then did another training session one month before go-live.” Cadieux says that GE assisted with the initial super-user training session to ensure things went smoothly. “After that, we and the super-users began training the rest of the facility,” he says.

“We hoped that the training would provide the super-users with a base of knowledge of what the system administrators do so that we would not be bombarded post go-live,” says Cadieux. “If there are only two people who know how to fix the problem, then you are going to be swamped. Having a super-user to handle the small things—such as patient exam merges—keeps workflow moving on my end.”

WORKFLOW ANALYSIS IS A KEY COMPONENT TO ANY SUCCESSFUL GO-LIVE: DARTMOUTH-HITCHCOCK

John Sundnas, RIS/PACS administrator for Dartmouth-Hitchcock Medical Center in Lebanon, N.H., has 25 years of experience implementing and supporting pathology and radiology clinical information systems, including successful go-lives for GE Healthcare’s RIS and PACS.

A key component to a successful go-live, says Sundnas, is analyzing facility and patient workflow. Part of that involves including the entire facility in the workflow analysis and documentation process.

According to Sundnas, Dartmouth-Hitchcock performed a workflow analysis to determine how film flowed among the center’s 400 healthcare providers and to find the best way to provide access to digital images. Sundnas says that by using a recommended implementation plan from GE, they were able to create a workflow plan that they were able to alter and adjust as needed throughout the entire process.

✓ Analyze & Document Facility Workflow
Spend time up-front to conduct a workflow analysis of all staff and their activities including schedulers, technologists, residents, fellows and staff radiologists. Pay close attention to the image library to determine how film flows to viewing workstations. Ask yourself: “where were images being used, and how do we provide filmless viewing at those stations?”

✓ Analyze & Document Patient Imaging Workflow
Look at patient workflow in relation to imaging. Ask yourself: “If patients come in with their own films, are they leaving the office with their films?” If a film leaves the office, have you tracked it? Does the patient get that film? What can we do to manage that flow? Do we have tracking tools?”

✓ Involve Everyone to be Fully Vested in the System
Sundnas says that by including multiple departments and staff members in the workflow analysis prior to go-live helps to vest everyone more fully in the implementation. Get them involved by providing a weekly forum for them to express their concerns, give insight into their day-to-day activities to accept changes that are coming and make the transition successful. Sundnas says they continue to hold weekly meetings within the department to share information and bring up concerns about the system and how it is working.

Answering the call to action
In January, the RIS/PACS and training was put to a big test. Blount experienced a “code blue” as the result of an ice storm in the area causing the emergency room to overflow. “If we hadn’t trained and implemented the way we did, we would not have been able to handle the catastrophe,” says Cadieux. “We were able to get a lot of patients through quickly. The GE RIS/PACS made it so smooth.”
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