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Imaging 3.0 in Practice
Lessons in Value

Six years ago, the ACR launched the Imaging 3.0 initiative to bring increased awareness to the value that radiologists bring to patient care — beyond imaging interpretation. Since then, the College has leveraged Imaging 3.0 to influence policy at the highest levels and position radiologists as stewards of appropriate imaging.

In the popular press as well as in research literature, we are telling a new story — one that defines radiologists as imaging consultants who share expertise with our colleagues and, increasingly, with our patients. Imaging 3.0 case studies are an important part of this narrative.

The seven case studies in this first issue of *Imaging 3.0 in Practice* represent a rich archive of more than 100 stories that we've collected over the years. We look forward to sharing more of these stories with you in future print issues and invite you to peruse the full Imaging 3.0 library at acr.org/Case-Studies.

These stories demonstrate how radiologists across the country, from small private practices to large health systems, are advancing quality patient care — and inspiring our community to adapt and innovate along the way. These stories constantly impress those of us who have the privilege of working on Imaging 3.0. I know they will move you, too.

I encourage you to spend time with the stories and related resources and educational questions in this and future issues. I'm confident that you'll walk away thinking more deeply about the next steps you and your team can take to enhance patient care now, and for years to come.

Geraldine B. McGinty, MD, MBA, FACR

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Case Studies

Case Study Published March 2018

Ahead of the Curve

Early adopters of CDS deliver more appropriate imaging and help ordering physicians prepare for PAMA's impact on reimbursement.

Key Takeaways

- Radiology leaders at Einstein Healthcare Network are partnering with the ED and other departments to launch an incremental pilot project to integrate CDS into the EMR.
- They developed a custom PECARN subroutine in the EMR to help ED physicians determine whether or not to order CT for pediatric patients with minor head trauma.
- Adherence to the PECARN guideline jumped from about 36 percent to more than 79 percent in the year since deployment of the CDS algorithm.
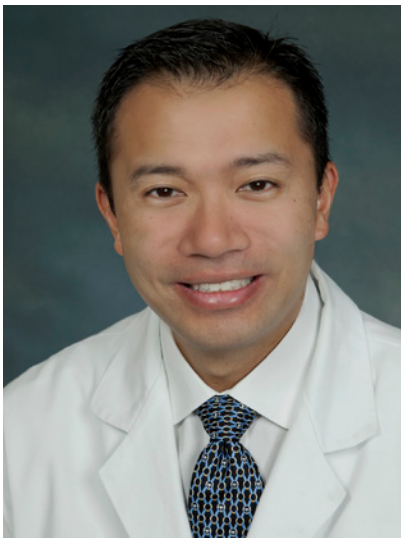
Ryan K. Lee, MD, MBA, section chief of neuroradiology, is spearheading an incremental pilot project to integrate CDS into the EMR at Einstein.

Related Content

Ahead of the Curve

Presentation: acr.org/CDSImplementation
Video: bit.ly/AheadoftheCurveVideo
Webinar: bit.ly/AheadoftheCurveWebinar

When the radiology team at Einstein Healthcare Network in Philadelphia first heard about the Protecting Access to Medicare Act (PAMA) of 2014, which requires providers to consult clinical decision support (CDS) for advanced image ordering, they had an uncommon response: Bring it on!

At the time, Einstein's chair of diagnostic radiology, Terence A. S. Matalon, MD, FACR, FSIR, was already evaluating the merits of CDS to enhance patient care at the network's three hospitals and 11 outpatient centers. The legislation further bolstered these efforts.

"Dr. Matalon started thinking about CDS before the PAMA legislation was even on the radar," says Ryan K. Lee, MD, MBA, section chief of neuroradiology at Einstein. "He thought it might be useful for our referring clinicians, and he became a driving force behind our rollout of evidence-based technology."

Now Lee and Matalon are spearheading an incremental CDS pilot project at Einstein that is validating that theory. In fact, one of the most vulnerable patient populations — children with minor head trauma — is already experiencing the positive impact of automated CDS.

In 2017, Einstein's radiology team implemented a CDS algorithm to help ED physicians determine whether or not to order head CTs for those pediatric patients. "Since we integrated guidelines from the Pediatric Emergency Care Applied Research Network (PECARN) into our EMR, adherence in the ED has increased from approximately 35 percent to 80 percent," Lee says.

Here's a look at how a phased approach to implementing the CareSelect Imaging™ CDS solution throughout the Einstein network is already paying dividends for patients — while also paving the way for referrers to achieve success under PAMA.

Early Lessons

As leaders of CDS implementation, Einstein's radiologists experienced a few bumps with the technology early on. According to Lee, who is also magnetic resonance medical director and director of quality at Einstein, the team initially tested another CDS system as part of a small trial project in 2013, but the 40 or so physicians recruited for the project found that tool too cumbersome.

"Based on that experience, we searched for a CDS solution that would not hamper physician workflow," Lee says. "In 2014, we found the right fit with CareSelect Imaging from National Decision Support Company (NDSC), which integrated seamlessly into our EMR and had minimal impact on our workflow — a key to gaining clinician buy-in." CareSelect Imaging expands on NDSC's foundational ACR Select® solution to electronically deliver the ACR Appropriateness Criteria®.

Robert A. Czincila, DO, chief of emergency medicine at Einstein Medical Center Montgomery, was one of the tool's earliest adopters, drawn by its seamless integration. "When you're in a very busy ED, time is of the essence," he says. "CareSelect fits right into our EMR and is now part of my daily routine. It does not impede care. In fact, it quickly becomes second nature. Most importantly, it helps us ensure we order the most appropriate imaging for our ED patients."

Launch Pad

Once he found the right CDS, Lee developed a plan to implement a phased rollout to referring clinicians and began recruiting volunteers to participate.

Many of Czincila's colleagues in the ED are among the approximately 80 volunteers who enrolled in the first phase of the CareSelect pilot project. Lee also recruited a cross-section of physicians from other ordering specialties, including hospitalists, neurologists, and even some outpatient physicians. "We tried to recruit as broad a spectrum as possible to ensure the feedback was relevant across our network," Lee says.

The radiology team enlisted participants using various methods, including email outreach (View the email at acr.org/CDS-Recruit) and direct engagement with the heads of specific departments such as ED, neurology, and internal medicine. Lee also presented the CDS pilot at internal conferences and meetings, and his team worked with NDSC to develop a CareSelect training video, which doctors in the early pilot had to watch before they were activated in the system.

As the pilot's first phase progressed, Lee regularly solicited feedback from participants — via online surveys and one-on-one meetings. "Many of our pilot users, particularly those in primary care, said that CareSelect was a helpful tool in helping them choose the correct study," Lee says. "Some said they're now more confident in ordering studies."

Czincila offers two reasons why he and his ED team are among those who are on board with CDS. "First, it's great for teaching our ED residents and fellows how to use evidence-based tools and provide the most appropriate care to patients in a timely fashion. And second, the CDS system helps reaffirm my own work and guides me toward the most appropriate imaging study based on guidelines and the patient's condition."

PECARN Power

Shortly after initiating the CareSelect pilot, the radiology team recognized an opportunity to extend the reach and impact of embedding evidence-based medicine into the EMR.

Lee learned of the Joint Commission's proposal to require the use of vetted algorithms, such as PECARN, in the setting of pediatric minor head trauma prior to ordering head CT. The authors who designed the PECARN study demonstrated that following the algorithm identifies those patients for which CT scanning is unnecessary. (Learn more about the study at bit.ly/PECARNStudy)

"Studies have shown that fewer than 10 percent of CT scans performed in pediatric patients for minor head trauma actually show traumatic injury," Lee explains. "When the PECARN algorithm is followed, it is possible to decrease unnecessary head CTs, while following through on those that are warranted."

Recognizing the opportunity to standardize the approach to ordering head CTs in this population, Lee asked NDSC about the possibility of creating a subroutine in CareSelect that reflected the PECARN algorithm.

NDSC answered the call, developing a custom PECARN subroutine that integrates directly into Einstein's EMR. Now, when a pediatric patient presents with minor head trauma, the PECARN algorithm automatically allows ED physicians at any Einstein facility to determine if they should order a CT.

"While CDS advises an ordering physician whether or not a given order is appropriate, it remains agnostic as to whether or not a scan should be ordered in the first place," Lee says. "The PECARN algorithm actually determines if a CT should be ordered at all. I believe that helping clinicians decide if an imaging study is appropriate is the next phase in the utility of imaging CDS, and we are one of the first to demonstrate its utility with PECARN."

Czincila says that having that expert information up front allows physicians to provide better patient care. "It's imperative that all of our medical staff and providers understand what's the safest and most appropriate test for each patient and that we endeavor to reduce overutilization wherever possible, especially for children," he says. "Thanks to the radiology team, the PECARN algorithm makes that possible at Einstein."

Real Results

A year after deploying the subroutine, the radiology group partnered with the ED to measure the impact of the PECARN project. Under Lee's guidance, both a radiology and
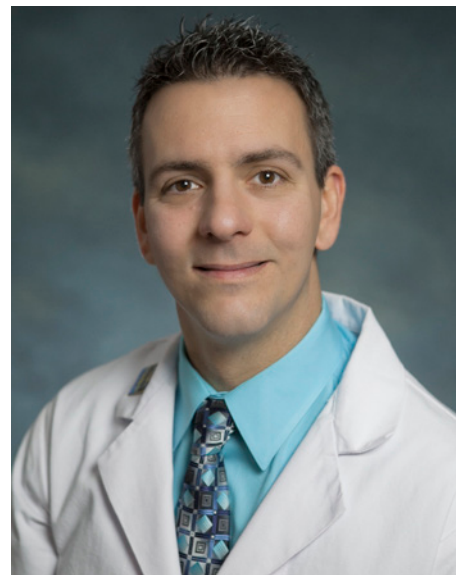
The CareSelect CDS solution is now part of the daily routine for Robert A. Czincila, DO, chief of emergency medicine at Einstein Medical Center Montgomery, and is an important teaching tool.

ED resident manually researched the medical records for about 150 head CTs performed for minor trauma in pediatric patients treated during the year before implementation of the PECARN technology.

"What we found was surprising," Lee says. "When we originally met with the ED physicians about PECARN, they indicated that they mostly used the guideline for ordering CTs. But when we tabulated the data, it showed that they followed the guideline about 35 percent of the time. After implementing the subroutine into the EMR, adherence to PECARN jumped to 80 percent."

Lee and his team are now analyzing the data to determine whether imaging utilization has actually decreased as a result of the PECARN guidelines being embedded within the EMR.

Another positive outcome of the CDS project has been what Lee calls the "learning effect." Five months after implementing CareSelect, the data showed an 18 percent increase in the number of studies that required no intervention by the CDS software. "This suggests that for clinicians who repeatedly order tests for similar indications, simply having clinical decision support in the EMR can have an educational benefit."

Legislative Mandate

With all of the advantages of CDS, it may be easy to forget about PAMA, which is scheduled to go into effect Jan. 1, 2020.

The legislation requires referring providers to consult appropriate use criteria through CDS prior to ordering advanced imaging exams in outpatients and non-life-threatening ED patients. Imaging providers — primarily radiologists and imaging centers — must confirm that consultation of an approved CDS on claims submitted to Medicare for reimbursement.

In the future, simply confirming the use of a CDS for advanced imaging studies will not be enough. CMS has stated that providers who consistently order inappropriate studies will likely face penalties, though this probably won't be for at least a couple of years after the 2020 mandate.

Nevertheless, Czincila urges health systems to get started with CDS now. "Considering the economics of medicine today, we need to stay on top of pending legislation in order to maximize our reimbursement. By getting on board with CareSelect technology, we know we're not only providing safe and effective care for our patients, but we're also documenting appropriate image ordering for which we will be reimbursed."

QUESTIONS FOR DISCUSSION

What are you doing to educate your team and referring providers about the potential financial impact of CMS's Appropriate Use Criteria Program?

How is your group working with referring providers to implement clinical decision support ahead of the January 2020 PAMA deadline? Will your group participate in the voluntary reporting period knowing payment is not at risk?

What guidelines beyond the Appropriate Use Criteria should your referring providers reference when ordering imaging studies?

Lee's advice is similar: You can't afford to wait. "Implementing CDS is not something that can be done overnight, because every institution is different," he says. "The reality is that you have to tweak it to make sure it works for your network. You really should give yourself enough lead time."

Another reason not to delay CDS deployment is that potential bonus points can be earned under the Improvement Activities category of the Merit-Based Incentive Payment System (MIPS) by reporting meaningful use of CDS.

Fast Forward

Now that CareSelect has proven its value at Einstein under the first phase of the pilot, the radiology team has big plans for the future. First up is an expanded pilot under which Lee has already recruited more than 200 additional volunteers to begin using the system, including the entire ED and all of the internal medicine residents.

"I approached the chair of the ED and said, 'A lot of your doctors have been using CareSelect, and we've been hearing positive feedback. What do you think about including all of your residents in this expanded pilot?'" Lee recalls. "She, in fact, did one better and decided to enroll all the staff and residents from the ED."

Lee also approached several other department heads to share information and results about the CDS pilot. (View a CareSelect Imaging guide at acr.org/CareSelectTips) The goal is to recruit as many users as possible to continue putting the software through its paces and optimizing it for Einstein. Matalon and Lee are planning to eventually turn CareSelect on for the entire network, making CDS mandatory for all imaging orders, about six months ahead of the PAMA deadline.

To educate the new volunteers about the pilot and using CareSelect, the radiology team created an updated training video. While watching this video is not mandatory, Lee says most new users find it helpful to get on board with the software.

The radiology team is also working with NDSC and the ED to build additional decision support tools into the CDS system, including one for pulmonary embolism (PE). "The PE

algorithm will have a significant impact on our patient population because we see many patients with that condition both in the ED and inpatient settings," Lee says.

Czincila sees immediate benefits to automating more guidelines in the system. "Ultimately, we need to do what's right for our patients," he says. "CareSelect allows us to practice in a way that uniformly confirms that we're ordering the most appropriate diagnostic study and enhancing patient safety. At the same time, it helps us become better stewards of healthcare costs for our network and ensures we are maximizing our own reimbursements. So, everybody wins."

Next Steps

- Take an incremental approach to implementing CDS. Launch a small pilot project to gain a foothold, then expand with more participants and add targeted decision rules like PECARN.

- Develop educational tools, like videos and handouts, and partner with department chairs to recruit volunteers for various stages of your pilot.

- Allow plenty of lead time to implement CDS and optimize it for your facility. Ask for feedback from participants to tweak the system to your needs.

Linda G. Sowers is a consulting editor

Further Reading

To learn more about implementing clinical decision support, check out these articles:

1. **Digital Guidance**
   CareSelect Imaging helps providers determine the most appropriate imaging exams at the point of care. acr.org/DigitalGuidance

2. **Homing in on Quality**
   Radiologists in rural western North Carolina are strengthening their relationships with local physicians and reducing inappropriate imaging via R-SCAN™. acr.org/HomingIn

Case Study Published September 2017

Behind the Curtain

Ohio radiologists collaborate with a patient advocate to implement a direct results delivery program that decreases patient anxiety and gives radiology a face.

Key Takeaways

- Cincinnati Children's Medical Center has implemented a direct results delivery program that allows patients and families to discuss their test results directly with a radiologist.
- Providing results directly to patients helps decrease patient and parent anxiety, while increasing their understanding of what radiologists do and how the department operates.
- Connecting with patients reemphasizes the importance of the individual behind the image, reinvigorating radiologists' sense of purpose and reducing burnout.

David C. Mihal, MD, diagnostic radiology resident at the University of Cincinnati Medical Center, initiated the department's direct results reporting project to give patients a chance to speak directly with radiologists.

When David C. Mihal, MD, diagnostic radiology resident at the University of Cincinnati Medical Center, began working on his practicum for ACR's Radiology Leadership Institute® (RLI) he knew he wanted to use the opportunity to make a real difference for patients and families. But before Mihal could improve the patient experience, he needed a better understanding of how patients and families perceived radiology.

To that end, Mihal turned to Dianne Hater, patient and family advocate in Cincinnati Children's radiology department, to help him focus his efforts to foster meaningful and positive change in patient and radiology relations. Through her research, Hater found that patients and families were often nervous about their imaging exams and, for some, uncertainty about how to obtain their imaging results increased their anxiety. "Patients and families want answers, so having to wait for results creates a lot of stress," Hater says.

Recognizing an opportunity to significantly improve the patient experience through better communication, Mihal initiated a direct results delivery pilot project that would allow patients and families to review their exam results directly with a radiologist immediately after image acquisition. Since its inception in 2015, the project has drawn praise from patients and families, with 92 percent providing positive feedback on surveys, and has led to 84 percent of participating radiologists and technologists reporting increased job satisfaction — leading the department to adopt it as an ongoing initiative.

Patient and Family Perspective

When Mihal decided to embark on a patient experience improvement project, he wanted to ensure the change would be something patients and families wanted and needed, not just what he assumed they needed. That's why his first step was to reach out to Hater for help. "I approached Dianne because she was deeply entwined in patient and family relationships at Cincinnati Children's, and I wanted to make some sort of real difference that would directly benefit them," Mihal says.

Once onboard, Hater, who became an advocate for patients and families after navigating the healthcare system during her own daughter's illness, began talking with the hospital's frontline staff, including registration personnel, patient advocates, and child-life specialists, about their interactions with patients and families who had undergone imaging. Many staff members reported that patients and families were often concerned about having to wait for imaging results, and they lamented having few tools available to help minimize patients' and families' anxieties.

Hater also interviewed radiology technologists, since they have the most interaction with patients during image acquisition. From these conversations, Hater found that many patients and families were noticeably nervous during and after their imaging exams, and the technologists often felt helpless because they were unable to share results with patients and families. "We just did the best we could to ease their anxieties with the limited time we had with them," says Erin Adkins, an imaging technologist and quality improvement coach.

For even greater insight into the patient-and-family perspective, Hater reviewed

patient feedback surveys from 2011 to 2015 to see what patients and families themselves had to say about their radiology experiences. That's when she discovered that patients and families were not only anxious about their results, but some were also stressed because they were unsure how to obtain their results. "Patients and families were saying, 'We just need answers. The waiting and not knowing is the worst,'" Hater says. "We knew there had to be a better way of communicating results."

A Face to Radiology

To achieve that goal, Mihal and Hater conceptualized the direct results reporting project. They envisioned it as a natural extension of the department's existing "difficult news" program, in which radiologists deliver negative results directly to patients and families. Only in this case, the news would be mostly positive. "With the direct results reporting service, the results are often good, so the radiologists are able to immediately relieve the stress that patients and families feel, allowing them to walk away breathing a sigh of relief," Hater says.

To get the program off the ground, Mihal approached Brian D. Coley, MD, radiologist in chief and professor of radiology and pediatrics, and Bernadette L. Koch, MD, pediatric neuroradiologist and associate chief of academic affairs, about implementing it as a pilot project. Coley and Koch were both excited for the opportunity to reemphasize quality patient care and to give patients a chance to speak directly with radiologists. "This program provides patients with more positive experiences in radiology and puts a human face to the profession, helping patients understand the important role that radiologists play in their care," Coley says.

In addition to humanizing radiology for patients, the project also offered the chance for the department's radiologists to connect with their patients and feel more fulfilled as a result, says Alexander J. Towbin, MD, associate chief of clinical operations and radiology informatics and pediatric radiologist at Cincinnati Children's. "Oftentimes, as radiologists, we get detached from our patients. We are looking at pictures all day, and we see the body parts and the disease, but we don't

always see the child on the other side of the picture," Towbin says. "Speaking with patients is an excellent reminder that we are diagnosing real people."

A New Beginning

With support from the department's leadership, Mihal began rolling out the project slowly and purposefully. It's an approach he took in part to win support from his colleagues, many of whom were initially concerned that they would be unable to keep up with the volume of patients opting for the service. In fact, only seven of the department's 40 radiologists volunteered to participate in the project at first.

To put the radiologists at ease, Koch, who served as a physician champion on the project, reached out and encouraged them to participate in the consultations, explaining that each one takes only about 5 minutes. "As the program expanded and faculty saw how little time it actually took, it was much easier to get more radiologists involved," Koch says. On top of that, Mihal and his team addressed radiologists' workload concerns by limiting the number of patients who were eligible for the program. "I wanted to identify patients who would benefit the most from this service, while simultaneously limiting the number of patients to a manageable sample set," he says.

During the project's first of four phases, the department's technologists vetted patients and families, identifying those they thought were most likely to benefit from a direct consultation with a radiologist, such as patients and families who were visibly anxious or those who requested immediate results. Patients were excluded from the service if they were emergency patients, inpatients, had follow-up appointments already scheduled, were in a hurry to get to another appointment, or preferred to receive results from their referring physicians.

After deeming a patient eligible to receive direct results, the technologist would ask the patient and family whether they wanted to speak with the radiologist. If the patient and family opted for a consultation, the technologist located a radiologist from the volunteer pool, assigned the study to that radiologist,

and informed the patient that the radiologist would be in soon to discuss the results.

The radiologist would then read the study and deliver the results directly to the patient in the exam or consultation room. Wait time for the patient was typically less than 10 additional minutes. After the consult, the patient would fill out a survey regarding the interaction with the radiologist and drop it into a locked box before leaving the facility. This feedback was invaluable in helping Mihal and his team understand what was working with the program and informed ideas for positive change.

Adjustments and Growth

With only one patient per month opting into the program, the project's first phase did not attract as much interest as Mihal had hoped, so he and his team expanded the inclusion criteria and primary screening method. In doing so, they began allowing administrative staff to offer the service to any patient at check-in who did not have a follow-up appointment already scheduled. This doubled the rates of patients opting for consultation from phase one but was still not quite the volume for which Mihal had hoped.

While low patient participation rates were initially discouraging, Mihal and his team didn't let it derail them. Instead, they took it as a learning opportunity and made efforts to improve the program. "When you embark on

a project like this, it's important to measure your progress and look for areas of improvement," Koch says. "You must be open to changing small things to see if those changes will help rather than just abandoning ship."

For the project's third phase, the team expanded the program to all imaging outpatients. Patients opted into the program through a self-screening survey, which also included information that suggested a wait time of an additional 10 to 30 minutes. With this approach, only 8 percent of patients opted into the service — still well below the hoped-for engagement.

In the fourth and final phase of the project, the team tweaked the survey, this time excluding the reference to the additional wait time, which they found exceeded the actual average wait time for the service and likely caused patients to opt out. As a result, 33 percent of patients opted into the service, bringing the number to approximately one patient per day.

Program Feedback

In feedback surveys, patients and families were overwhelmingly satisfied with the service and reported feeling relieved and at ease after receiving their results from a radiologist. Comments included, "Made my day!" and "It immediately eased my mind and assured me everything was OK to return to work and school."

As a technologist, Adkins has been grateful for the opportunity this service provides to help lessen the anxiety that patients and families often feel. "When you see patients

Alan S. Brody, MD, consults with a young patient about a procedure.

and families enter the room who are visibly nervous, you can immediately put them at ease by offering to find a radiologist to speak with them," she says. "A lot of what we do is so quick and this provides some closure and more connection with the patients. It gives you satisfaction in knowing that you are part of improving the patient experience."

In addition to increasing job satisfaction, most of the radiologists and technologists involved in the program report little increase in their workloads as a result. "If anything," Coley says, "spending time with patients minimizes physician burnout. It personalizes what radiologists do and allows them to connect more directly with patients."

Towbin agrees and says radiologists owe it to their patients to put in the extra effort. "I volunteered for this program because I strongly believe that families deserve to get results as soon as possible," he says. "Some families want the results from the pediatrician, and some families want to know whether something is wrong immediately. As radiologists, our job is to meet our patients' needs."

Plans for the Future

Cincinnati Children's radiologists were so pleased with the results of the pilot project that they have now integrated it into their regular workflow as a permanent and ongoing program for outpatients undergoing radiographs. "It's been wonderful to watch this initiative grow," Towbin says. "Knowing that we are able to provide this service efficiently and help put a face on the radiology department is incredibly satisfying. It really has a positive impact on our day, and we feel like we are doing something special for patients and families. What's more, we're showing others that this can be done."

With this program as a proof of concept, Hater encourages all radiology groups to follow Cincinnati Children's lead and offer to deliver results directly to patients. As someone who's been on the receiving side of care,

Hater knows how powerful such interactions can be and how much it can mean to patients and families to have the answers they need, when they need them.

"There's no doubt how much patients and families appreciate it when they can get their results and have their questions answered immediately," she says. "It saves them from so much worry and allows them to move more quickly toward treatment and healing. This kind of patient-centered care is the way of the future, and radiologists are well positioned to lead this effort."

Next Steps

- Look for manageable ways to provide opportunities for radiologists to interact more directly with patients.

- Find others who are excited to implement patient-and-radiologist interaction initiatives. Work together to brainstorm innovative practices and strategies to accomplish goals.

- Don't be afraid to tweak what you are doing if something isn't working. Ask questions and look for ways to alter the project rather than abandoning it.

Chelsea Krieg is a freelance writer

QUESTIONS FOR DISCUSSION

How can your group work with patients or patient advocates to better understand what patients want from their healthcare experience, and how you can meet those expectations?

What steps can your group take to increase its number of patient encounters, whether through a dedicated patient consultation clinic or through less formal interactions? What value do such encounters bring?

How can you convince your colleagues that consulting directly with patients is the right thing to do for improved patient care and to further demonstrate radiology's value on the care team?

Case Study Published September 2016

Patient Forward

A multidisciplinary team invites patients and their families to a weekly thoracic oncology clinic at Elkhart General Hospital.

Key Takaways

- Leaders from radiology, cardiothoracic surgery, and other specialties involved in lung cancer screening and treatment at Indiana's Elkhart General Hospital partnered to create a multidisciplinary Thoracic Oncology Clinic.
- Patients and family members have a seat at the table, participating with doctors in their course of treatment.
- The hospital's cancer committee initiated the program to address a public health crisis involving the area's high percentage of smokers, as compared to the rest of Indiana.

Lung cancer patient Robyn Shank and her husband, Fred, listen intently as Robyn's doctors discuss her CT scan and potential course of treatment as part of Elkhart General Hospital's Thoracic Oncology Clinic. The weekly conferences give patients and their family members a seat at the table to plan their care.

Related Content

Patient Forward

Video: bit.ly/openingtopatients

As retired nurse Robyn Shank searched for the right place to begin her lung cancer treatment journey, she selected a place based on the experience of someone close to her.

"When a close acquaintance was diagnosed with cancer, her community hospital in Tennessee had a tumor board where physicians reviewed patients' cases, and the patients were involved in the process," Shank says. "I wanted that same level of involvement in my cancer treatment program."

Shank, 59, searched the Internet and found Elkhart General Hospital's multidisciplinary Thoracic Oncology Clinic. Started in 2012, the program incorporates low-dose CT technology for lung cancer screening and brings together all of the medical professionals involved in a patient's lung cancer treatment for weekly conferences with their patients. The lung cancer screening occurs first, and then the patient is referred to the Thoracic Oncology Clinic.

Shank and her husband make the 45-minute drive from their home in Sturgis, Mich., to the hospital in Elkhart, Ind., to attend the conferences. Patients typically attend an initial conference immediately following their lung cancer diagnosis. Upon completion of their treatment plan, patients attend a second session, during which they see a comparison of their CT scans before and after treatment.

Inviting Patients

Held from 7-8 a.m. every Thursday, the conference's early hour doesn't deter participants from attending. Each session includes a team of physicians from thoracic surgery, radiology, interventional radiology, pathology, medical oncology, radiation oncology, and pulmonology, along with an oncology nurse practitioner. Other participants can include registered dietitians, registered nurses, a research nurse, director of oncology services, case managers, physician assistants, cancer registrars, nurse navigators, and palliative care staff.

Most importantly, the patient is there with a family member, sitting at the head of a u-shaped conference table. This aspect of the program is so well received that organizers had to limit the number of family members attending the conferences.

"With lung cancer management, patients are at the center," says Samir B. Patel, MD, founder and director of the value management program at Radiology Inc. in Mishawaka, Ind. Including families in these conferences improves the patient experience, he says.

"No patient comes alone," Patel continues. "Lung cancer is a life-altering disease and, with that, patients want to have as many supporters with them as possible. It improves the experience for the patients to have family members with them, not only for support but also to listen and ask questions."

Addressing a Public Health Crisis

Patel is also a member of the Elkhart General Hospital's board of directors. He and the interventional and diagnostic radiologists of Radiology Inc. helped establish the Thoracic Oncology Clinic at a time when the community was facing a significant public health issue.

According to the Centers for Disease Control and Prevention, Elkhart County, an area known for its recreational vehicle manufacturing industry, has a high percentage of

smokers, compared to the rest of Indiana. In response, Elkhart General's cancer committee, along with senior-level executives and administrative personnel, initiated efforts to address this crisis.

The cardiothoracic surgeons and radiologists teamed up to give multiple presentations to the hospital's senior leadership, presenting a vision for what would eventually become the Thoracic Oncology Clinic. The cardiologists were seeing patients who had heart disease, but many of their patients had similar risk factors for lung cancer. At the program's onset, the cardiologists were the greatest advocates for lung cancer screening.

With the introduction of low-dose CT technology, which reached Elkhart in 2012, the hospital felt comfortable launching the Thoracic Oncology Clinic. Low-dose CT was a safe way to address the community health crisis involving heavy smokers.

"We had to weigh the risks of radiation dose versus the benefits of CT lung screening," says Albert W. Cho, MD, vice chairman of radiology at Elkhart, who was also involved in the creation of the lung screening program. "We didn't want to expose patients to high doses of radiation for a screening exam. There needed to be a balance. The low-dose technology provided that."

Overseeing the Program

Leading the day-to-day operations at the clinic is Jackie S. Lenfestey, MSN, FNP, APRN-BC, and the program's point of contact for both physicians and patients. Within five days of a patient's CT scan, Lenfestey calls the patient to discuss the results and next steps.

"I tell patients that the goal of the clinic is to pull together all the doctors and hospital personnel working on their case, to agree on the stage of their cancer, and to give the patient the best options for their treatment," she says. "Throughout the process, we keep the patient at the forefront of care."

Lenfestey also answers patients' questions. "The most frequent question I get is, 'Is it ok to ask questions?'" she says. "Patients are surprised that they, along with their family, can actively participate in the dialogue between the specialists and safely ask questions to better understand their cancer and options for management."

Developing a Treatment Plan

In addition to Lenfesty, interventional radiologists have a great deal of contact with the patients, providing minimally invasive options. With that level of involvement, Patel says interventional radiology is a

> "You can talk about cancer and what it does to the body, but you really get a feel for it when you see the scans."
>
> – Nazar H. Golewale, MD

key participant in the thoracic oncology program. Nearly all of the patients in the program have seen an interventional radiologist for procedures, such as image-guided biopsy, prior to their lung cancer diagnoses. Having a "familiar face" at the conference goes a long way to optimizing the patient experience.

One of the clinic's participating doctors, interventional radiologist Nazar H. Golewale, MD, receives a list of cases in advance of each weekly conference. During the conference, he posts the patient's images on a large screen and uses layman's terms to explain the anatomy. "In many cases, patients have never seen CT scans before attending one of the conferences," Golewale says. "You can talk about cancer and what it does to the body, but you really get a feel for it when you see the scans."

Doctors, nurses, and other hospital representatives meet weekly with lung cancer patients who are at the center of the Thoracic Oncology Clinic. They review CT scans, discuss treatment options, and study treatment effectiveness.

Shank doesn't shy away from the details of her disease and, in fact, relishes being closely involved in her treatment process. "Once doctors reviewed the CT scans with us, explaining everything we saw on the screen, we came up with a treatment plan," she says. "The doctors explained what the treatment would entail and, when they were done, asked if that was still the course I wanted to take. They took as much time as I needed to explain everything."

Building a Strong Team

A cohesive staff is imperative to developing a multidisciplinary program like this. Organizing such a group can be challenging, though, as some physicians are employed by a hospital or multispecialty group, and other physicians work on contract. Such is the case at Elkhart, which contracts with Radiology Inc. for its radiology services. The synergy between the interventional and diagnostic radiologists of Radiology Inc. and their collaborative partnership with physicians in other specialties are key to the success of the thoracic oncology program.

"We're fortunate with our scenario, in that we take a collegial approach to problem solving even though we come from different disciplines and are not employed by the hospital," Cho says. "We discuss together what we need and how to get something done. It's a win-win for us and the patients. And the hospital is addressing a health crisis in the community."

Spreading the Word

As of January of 2016, 443 unique patients have been imaged through the lung cancer screening program, and 14 lung cancers were diagnosed as a result. All but one of these diagnoses included completed staging information, such as the extent of the patient's cancer, the tumor size, and whether or not the disease had spread to lymph nodes or other organs in the body. All 14 patients went on to participate in the Thoracic Oncology Clinic.

The success of the lung cancer screening program and the Thoracic Oncology Clinic spreads mostly through a grassroots, word-of-mouth campaign.

"I get phone calls from people who live an hour to an hour and a half away," Lenfestey says. "I talked to someone who heard about our program from someone at their church. People who have been diagnosed with lung cancer are hearing about our program through the community, and they want to come to Elkhart for their treatment and to be a part of the program."

Cho is encouraged to see patients interested and involved in their own care, instead of being passive recipients of it from their doctors. When the Lung Cancer Screening Program started at Elkhart General, it was important to allow patients to self-refer into the program. Because cost could be a barrier for some patients, program organizers sought and received a grant from Elkhart General Hospital's foundation to cover the cost of scans for low-income individuals.

Eliminating Stigma

Involvement in the Thoracic Oncology Clinic not only helps patients learn more about their disease and treatment plan, but also gives them a place where they feel they can openly discuss their condition, sharing their fears and concerns. Lung cancer patients are often hesitant to discuss their disease, more so than patients with other forms of cancer, Lenfestey says. There's a certain stigma associated with the disease, with patients often feeling like this is something they brought on themselves through lifestyle choices.

For Shank, however, talking about her disease was a no-brainer. "My mother was a school teacher, so I think it's up to me to teach everyone how good a program like this can be," she says.

Next Steps

- Bring together physicians from multiple disciplines throughout the hospital to share knowledge and best practices.

- Once the program is established, maintain patient data for reporting purposes and to promote the program's benefits.

- Incorporate low-dose CT imaging into the program to reduce the risk-to-benefit ratio for lung cancer patients.

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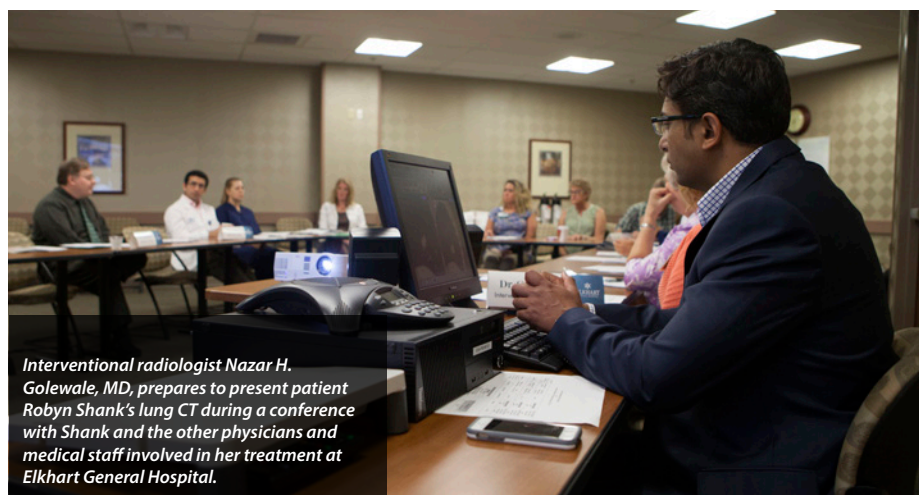
Interventional radiologist Nazar H. Golewale, MD, prepares to present patient Robyn Shank's lung CT during a conference with Shank and the other physicians and medical staff involved in her treatment at Elkhart General Hospital.

QUESTIONS FOR DISCUSSION

How can your group lead development of a multidisciplinary team that consults directly with patients facing complex health problems?

What value does meeting regularly with patients facing complex health problems bring to patient care and to a multidisciplinary team of providers?

What role can your group play in identifying and helping to address a public health crisis, like lung cancer, in your region?

Case Study Published March 2017

Structured for Care

An academic tertiary care center implements structured reporting, achieving 94 percent compliance among radiologists.

Key Takaways

- Radiologists at Montefiore Medical Center led an effort to implement structured reporting templates across the department for CT, MRI, and ultrasound exams.

- The team developed the templates through an iterative process that included input from nearly all of the department's radiologists.

- Within two years, the team released templates for 95 percent of corresponding exams by volume and achieved a 94 percent compliance rate among radiologists, who bought into structured reporting after being directly involved in the template development process.

Shlomit Goldberg-Stein, MD, musculoskeletal radiologist and director of imaging report quality at Montefiore Medical Center and assistant professor in the department of radiology at Albert Einstein Medical Center, is co-chair of Montefiore's Structured Reporting Committee.

Shlomit Goldberg-Stein, MD, a musculo-skeletal radiologist at Montefiore Medical Center, and Meir Scheinfeld, MD, PhD, director of Montefiore's Division of Emergency Radiology, both completed training at an institution that used department-wide structured reporting. The experience gave them a great appreciation for the benefits of consistent, quality reporting.[1,2]

So when Goldberg-Stein and Scheinfeld began working together at Montefiore in 2014, they enthusiastically proposed replacing the radiology department's traditional reports with structured templates. The challenge was getting their colleagues to agree to the change.

Convincing even a small group of radiologists to abandon their traditional reports for structured ones, which organize findings in a standard way and use consistent language to describe common findings, can be difficult. Change is hard for everyone, and structured reporting requires a major change for radiologists to overhaul the product at the heart of their work — their imaging reports.

At Montefiore, the challenge was even greater because its imaging department is no small group and is also physically separated across several hospitals and outpatient centers. The department has well over 100 radiologists, including more than 80 attendings, more than 35 residents, and about a dozen fellows, who serve four hospitals and 11 outpatient facilities for the academic tertiary care center in the Bronx, N.Y.

"We have a large faculty and many of our members have been dictating reports their individual way for 20, 30, 40, or more years. Even some of our young attendings have very strong opinions about how their reports should look," says Goldberg-Stein, who is also director of imaging report quality and an assistant professor in the department of radiology at Albert Einstein Medical Center. "We knew our biggest challenge would be getting everybody on board to standardize our reports across the sprawling enterprise."

In 2014, with strong support from radiology department chair E. Stephen Amis, MD, FACR, Goldberg-Stein and Scheinfeld committed to overcoming this challenge. They became co-chairs of the department's Structured Reporting Committee and launched a performance improvement project to develop and implement structured reporting templates for all cross-sectional imaging exams. Within two years, the team released templates corresponding with 95 percent of dedicated exams by volume, and the department's radiologists were using the templates 94 percent of the time.[3] (To see a sample template visit acr.org/MontefioreTemplate) Here's a look at how the team at Montefiore achieved this difficult task.

Identifying the Problem

Before Montefiore instituted structured reporting, its radiologists typically used traditional narrative reports. Goldberg-Stein says the problem is that narrative reports are highly variable, and the actionable information within them may be hidden. "Some radiologists believe their personal reporting style and idiosyncrasies are valuable," she says. "But the intended subtleties may not be appreciated or understood by referring physicians. If radiologists as a group don't communicate findings clearly and consistently, that can be detrimental to patient care and can lead to

inappropriate treatment down the line."

This is especially true when it comes to emergency medicine, where minutes often matter. Danielle B. Weinman, MD, emergency medicine attending physician at Montefiore, says she spent a lot of time scouring the unstructured reports to find the information she needed to care for patients. "I felt like I was reading on and on, looking for the meat within the text," she says. "As an ER physician treating a high volume of patients who have varied needs, I don't have time to hunt for information in a report."

Goldberg-Stein and Scheinfeld knew structured reporting could resolve many of these issues. With this in mind, they began working together to develop a plan for instituting structured reporting within the department and pitched the idea to Amis, who was immediately receptive to the proposal.

"I thought it was a great idea, because every so often I would sit down and review about 100 of our reports, and they were all over the place," says Amis, who is also a professor in the department of radiology at Albert Einstein College of Medicine. "With structured reporting, our reports are consistent, and we confirm that the interpreting radiologist has gone through everything in a structured way and has recorded exactly what he or she saw."

Defining the Scope

After giving his approval for the project, Amis worked with Goldberg-Stein and Scheinfeld to outline three project criteria: First, the project would focus on CT, MRI, and ultrasound reports. (X-ray reports were excluded from the project's first phase because they were generally succinct.) Second, they would develop the templates using a consensus approach, with input from radiologists throughout the department. And finally, while findings would be presented in a structured order within the report, the radiologists would still be able to describe the findings in the manner they wanted (no standardized lexicon was mandated).

"We established these criteria because we wanted to make sure we had complete buy-in from the faculty," Amis explains. "Structured reporting can be pretty onerous if you don't approach it in the right way. It

was extremely important to me that we got input from the members of each division and that we gave them some latitude in how they phrased their interpretations. I didn't want to just shove this down their throats."

Educating the Radiologists

Once the ground rules were established, Goldberg-Stein and Scheinfeld drove the project. Their first step was to educate their colleagues about structured reporting. They delivered presentations during staff and resident meetings, publicized the goals of the structured reporting initiative through internal communication channels, disseminated examples of structured reports, and shared several peer-reviewed papers and other literature about the benefits and challenges of structured reporting.

From there, Goldberg-Stein and Scheinfeld asked the radiologists to provide their impressions of structured reporting through an online survey. Eighty-two radiologists participated in the survey, the results of which indicated that while 79 percent of residents favored instituting structured reporting, only 39 percent of attendings approved. Twenty three percent of attendings and 7 percent of residents opposed the move, and the remaining respondents were unsure how they felt about structured reporting.

Mordecai Koenigsberg, MD, FACR, director of ultrasonography and director of the residency program at Montefiore, was one of the radiologists who were initially skeptical of the initiative. "I have very strong feelings that reports should be organized in a certain manner, and I was concerned that one person would determine how the reports would be structured and then everyone else would just have to follow along," explains Koenigsberg, who is also a professor of radiology at Albert Einstein College of Medicine. Koenigsberg quickly realized his assumptions about the process were inaccurate.

Testing the Templates

After gauging Montefiore radiologists' initial impressions of structured reporting, Goldberg-Stein and Scheinfeld recruited approximately 35 representative radiologists

E. Stephen Amis, MD, FACR, chair of the radiology department at Montefiore Medical Center and professor in the department of radiology at Albert Einstein College of Medicine, immediately supported the structured reporting initiative.

from all of Montefiore's sites to serve on the Structured Reporting Committee. The committee was then divided into six subcommittees that corresponded with the six primary subspecialties that perform cross-sectional imaging: abdominal, cardiothoracic, musculoskeletal, pediatric, ultrasound, and neuroradiology. These subcommittees were responsible for crafting the initial drafts of the reporting templates.

As the subcommittees created the draft templates, they rolled each template out for a limited trial with the radiologists who read those exams most often. Based on the feedback the radiologists provided during this limited trial, the subcommittees revised the templates before releasing them again, this time for a site-wide trial open to all of the department's radiologists, including trainees.

During this second two-week trial, the co-chairs again collected feedback from the radiologists and shared it with the subcommittee members, who voted on whether to implement each suggested change. They then shared the voting results with the entire department. "We took everyone's comments seriously and addressed every comment by either accepting or rejecting it," Scheinfeld says. "For those comments that we rejected, we

provided a reason why they were rejected. This transparent approach was critical to getting everyone to go along with the project."

Implementing the Templates

As the Structured Reporting Committee finalized each template, the co-chairs worked with the IT department to optimize and standardize the voice command fields, ensuring the template would load and auto-populate correctly during dictation. From there, the committee announced a predetermined date when the new standard department-wide template would begin to auto-populate for all users at the start of exam dictation. These "go live" events were facilitated by the IT department to ensure a continuous and uninterrupted workflow.

Within two years of initiating the project, the team released templates corresponding with 95 percent of dedicated exams by volume. Many of the templates were disease-specific and facilitated increased adherence to national reporting guidelines, including Lung-RADS™, Li-RADS®, and Pi-RADS™. Additionally, an analysis of 12 exam types showed that the radiologists used the templates 94 percent of the time.

"We're pleased with the high level of compliance, especially since we don't offer an incentive for using the templates or a penalty for not using them," Scheinfeld says. "People have ultimately come on board because they think it's a good idea, and they have realized that structured reporting has benefits."

In Koenigsberg's case, he made a conscious decision to give structured reporting a try and soon his skepticism dissolved. He says the committee's iterative process, which included input from all of the department's radiologists, was especially motivating. "I bought into the approach as I used it," Koenigsberg says. "I found that it made me more efficient because a lot of the housekeeping that you've got to address in your reports is already taken care of. This allows you to spend time talking about a particular area where there is a pathology that you'd like to really go in-depth on."

Referring physicians also appreciate the structured reports. "I like the organization of the structured reports," Weinman says. "I can move through the report more quickly and look at everything more thoroughly. I can easily check the organ system I am most concerned about and check for anything that could have masqueraded as a different symptom and led us astray. This allows me to provide better patient care. It's a real change for the positive."

Scaling the Approach

While Montefiore is a large academic center, institutions of any size can implement and benefit from structured reporting, Goldberg-Stein says. "The main thing is to tailor your initiative and implementation timeline to your organization," she says. "A small private practice might have to come to different compromises than a large academic center to

bring as many people on board as possible, but that's OK. Be responsive to those radiologists who are skeptical of structured reporting, while maintaining a focus on the ultimate goal of improving reporting quality."

Next Steps

- Educate your team about structured reporting and conduct a survey to gauge members' impressions of the reporting method.

- Create a timeline for developing, testing, and implementing structured reporting templates, including radiologist input every step of the way.

- Partner with your technical team to ensure radiologists can access the templates within their existing workflow.

Jenny Jones, Imaging 3.0 managing editor

ENDNOTES

1. Boland GW, and Duszak R. Structured reporting and communication. *J AM Coll Radiol*. 12.12 (2015): 1286–1288. bit.ly/ForCommunication

2. Schwartz LH, Panicek DM, Berk AR, et al. Improving communication of diagnostic radiology findings through structured reporting. *Radiology*. July 2011;26(1):174–81. bit.ly/structuredfindings

3. Goldberg-Stein S, Walter WR, Amis ES, et al. Implementing a structured reporting initiative using a collaborative multi-step approach. *Current Problems in Diagnostic Radiology*, bit.ly/multistepapproach Accessed Feb. 9, 2017.

Further Reading

To explore the resources Goldberg-Stein and Scheinfeld used during the educational phase of the structured reporting project, check out these articles:

1. Improving Consistency in Radiology Reporting Through the Use of Department-Wide Standardized Structured Reporting bit.ly/ImprovingConsistency

2. Improving Communication of Diagnostic Radiology Findings Through Structured Reporting bit.ly/CommunicatingFindings

3. Journal Club: Structured Radiology Reports are More Complete and More Effective than Unstructured Reports bit.ly/Unstructured

4. Structured Reporting: Patient Care Enhancement or Productivity Nightmare? bit.ly/ProductivityNightmare

5. Creation and Implementation of Department-Wide Structured Reports: An Analysis of the Impact on Error Rate in Radiology Reports bit.ly/DepartmentWide

QUESTIONS FOR DISCUSSION

How do radiologists in your group traditionally format and write their reports? Are the reports consistent from radiologist to radiologist? Is the actionable information easy to find?

How can structured reports improve the radiologists' workflow and help referring physicians provide better patient care? What imaging studies would work best as structured reports?

How can you convince your colleagues to use structured reports, and how would you involve them in developing structured reporting templates?

Case Study Published August 2014

The Value of Hard Work

The radiologists at Radiology Inc. in Mishawaka, Ind., have found a way to quantify non-billable value-added actions, and hospital administrators are taking notice.

Key Takeaways

- The "Radiology Value-Added Matrix" acts as a scorecard that captures quantified value-added actions performed by radiologists.
- At the end of a defined time period, radiologists multiply the total number of value-added hours by the Medical Group Management Association's average hourly rate for radiologists to show the total amount of money saved.
- Radiologists must present this information to hospital leadership in order to demonstrate their value beyond reading images.

Samir B. Patel, MD, FACR, founder and director of the value management program at Radiology Inc., developed a way to quantify his group's value-added actions.

Related Content

The Value of Hard Work

Video: bit.ly/HardWorkvideo
Webinar: bit.ly/HardWorkWebinar

A few years ago, Samir B. Patel, MD, FACR, of Radiology Inc. found himself in a bind. During contract negotiations with one of the hospitals his practice serves, the hospital president told him something no radiologist wants to hear: The physician leadership had taken the position that if Patel's group didn't want to "play ball" and accept the hospital's terms, the president should sever the relationship with Radiology Inc. From the physicians' perspective, all radiologists do is read images and, for that reason, would be easy to replace.

This sentiment was a misperception, however. The radiologists at Radiology Inc. do much more than simply read images — they sit on hospital committees, attend conferences to educate themselves on the latest trends in radiology, and undertake practice improvement projects, among other responsibilities. However, since they traditionally had no way to quantify these value-added tasks, it had always been difficult for them to prove their worth to the hospitals in anything other than relative value unit (RVU) terms.

Quantifying Contributions

Patel had identified this lack of a mechanism for verbalizing non-work RVU actions performed for the benefit of the group and was in the midst of developing a program for quantifying them. He quickly realized the value of having such a "scorecard" to show

how much value his practice was adding to the hospitals without being compensated for doing so. The result was the "Radiology Value-Added Matrix," a document that captures quantified value-added actions ranging from the development of protocols to participation in peer review, duties that many radiologists do not typically account for in any concrete way.

"Previously, success was defined as how many exams one could do in a particular period of time, so it was purely based on volume," explains Patel. "There was no emphasis, to the degree that there is now, on quality and service."

The matrix has helped Patel and his colleagues identify activities beyond imaging interpretation that enhance quality patient care. For example, one area in which Radiology Inc. has saved its hospitals money while at the same time improving care involves self-editing radiology reports.

In addition to reducing report turnaround time and showing how many hours of transcription time radiologists saved the hospitals by self-editing, Patel can then multiply the hours saved by the average payment rate for a transcriptionist, thereby deriving a total dollar amount saved without the hospitals having paid out any money.

At the end of a defined time period, Patel multiplies the total number of value-added hours for all non-work RVU activities by the Medical Group Management Association's determination of the average hourly rate for a radiologist's time. In doing so, he can demonstrate the amount of money his practice saved the hospitals. During the first year the matrix was in operation — which only covered the non-RVU services provided to one hospital — Radiology Inc. provided close to half a million dollars in added value for which they were not directly reimbursed.

"The Value-Added Matrix is a great tool to summarize all of the efforts that the radiology department is providing to the health system,"

notes Gen Lankowicz, MD, vice president of medical staff affairs at Elkhart General Hospital in Elkhart, Ind. "At our hospital, our radiologists are among the strongest physician leaders, and they actively participate in many groups. The Value-Added Matrix is a way to quantify all of the extra time and effort they contribute."

Speaking the Right Language

As confident as Patel and his colleagues were that the matrix communicated their value in no uncertain terms, they still had to convince hospital leadership that it was the real deal. So Patel assembled several hospital executives and presented the department's results.

"This is the language they speak," says Sheila Witous, chief administrative officer at Radiology Inc. "It's sometimes hard to move from radiology-speak to hospital administrator language," but, she says, the matrix is the perfect way to translate value-based information so that both sides understand each other.

Kreg Gruber, president of Memorial Hospital of South Bend in Indiana, says that the matrix struck a chord with him because "the metrics are very defined and measured in terms of time and output," which provides a sort of value-based scorecard. This approach has won over hospital administrators at the highest levels because, continues Gruber, "it puts some meat on the bones of all the other things that they do."

Gregory S. Lossasso, president of Elkhart General Hospital, agrees. Before the advent of the Radiology Value-Added Matrix, he says, "I would sit and have to ask the director of the department, 'Are they there? Are they

not there? Are they doing things or not?' This way I can actually get a quantifiable report that tells me everything they're doing."

Recording Measures

Patel explains that the matrix has two key components: the input side and the output side. "The input side is where we record the amount of time that radiologists spend on different activities," says Patel. "On the output side, at the end of every year, we take a look at all of the activities that were performed, and we summarize it into an executive summary that we present to the hospital in each of the four major categories: quality, service, utilization management, and professional development." (View a sample input report at acr.org/ValueMatrix and a sample output report at acr.org/ValueManagement)

Allison E. Lamont, MD, department chair of radiology at Elkhart General Hospital, thinks the matrix will help radiologists define their added value.

And the matrix is flexible enough to be used by just about any practice or department. Allison E. Lamont, MD, department chair of radiology at Elkhart General Hospital, thinks that all radiology departments can use the matrix to effectively reflect radiologist engagement in value-added activities. "Can you demonstrate that you've got a pretty deep bench within your radiology department? When you challenge those radiologists to be engaged in what they can contribute, you've got it — you've got quantification of it, and

then you can take it to your administrators in the hospital and show them: We've got A through Z covered here."

Patel and his colleagues have found the matrix to be a useful way to capture valuable activities they had been doing all along. If used by other radiologists, it could help not only protect hospital contracts, but also potentially justify medical directorship fees. Since all that potentially stands between a practice and the continuation of its contracts is a series of misperceptions, radiologists would be remiss not to begin using their own matrix as soon as possible.

Next Steps

- Determine all of the non-work RVU tasks performed by the practice.
- Quantify these activities, along with the time spent on each, in the form of a Radiology Value-Added Matrix.
- Present the findings to hospital administrators.

Chris Hobson, Imaging 3.0 senior communications manager

Further Reading

Value Management Program: Performance, Quantification, and Presentation of Imaging Value-Added Actions bit.ly/ValueAddedActions

> **QUESTIONS FOR DISCUSSION**
>
> *What value-added services beyond image interpretation does your group provide that it's not reimbursed for?*
>
> *How can/does your group track these non-billable service hours and attempt to quantify the amount of money saved as a result of these actions?*
>
> *How is your group keeping hospital administrators informed about the value-added services it provides?*

Case Study Published July 2015

When the Radiologist Becomes the Patient

One New York City radiologist establishes a rounding program to raise her department's profile and help patients.

Key Takeaways

- As chairperson for two radiology departments, Sabiha Raoof, MD, has built a dedicated team at Jamaica and Flushing hospitals in Queens, N.Y., that is committed to being a visible part of patient care.
- Both radiology departments, under Raoof's guidance, have hired high-level radiologists, acquired advanced equipment, accredited all facilities through the ACR, and established a radiology consultation service for referring physicians.
- After her own struggle with cancer, Raoof and her colleagues launched the "Make a Difference" rounds to visit patients and let them know someone is always available to address their immediate concerns.

Sabiha Raoof, MD, FACR, chief medical officer and patient safety officer in the department of radiology at Jamaica Hospital Medical Center, spearheaded Make a Difference rounds to improve the patient eperience at her hospital.

Related Content

Mad Rounds

Presentation: acr.org/MadRounds
Video: bit.ly/MADRoundsvideo
Blog Post: bit.ly/MADROUNDSBLOG

When chairperson Sabiha Raoof, MD, FACR, first began heading the radiology departments at Jamaica Hospital Medical Center and Flushing Hospital Medical Center in Queens, N.Y., in 2001, she prepared herself for inevitable hurdles. As her initial staff of five radiologists grew into a group of 20 board-certified and subspecialty-trained radiologists, she knew she needed to maintain a strong relationship with hospital administration. This rapport would allow swifter changes and access to additional funding for her department.

Raoof also made sure she was part of any committees or meetings that were relevant to her department. "It isn't just about reading images," she says. "Any time there was a clinical decision or problem, I always wanted to make sure I was a part of that process." Now overseeing a staff of nearly 200 people, Raoof has succeeded in getting all of her department's facilities ACR accredited, and has built a robust IT presence with PACS and EMR, high-end CT and MR scanners, and much-needed software, including dose monitoring software. ACR's Dose Index Registry® (DIR) is currently in the implementation stage to compare against national benchmarks, in addition to CareSelect Imaging™, a clinical decision support tool that includes ACR Select®, the digital version of the ACR Appropriateness Criteria®, to enhance the appropriateness of image ordering.

Cancer Diagnosis

The one hurdle Raoof did not expect to confront, however, was her own breast cancer diagnosis. She began regular screenings when she turned 40, and performed a mammogram between seeing patients. Her diagnosis was life changing. "I see so many patients with cancers, but when it is your own film you're seeing, it is a whole different experience," she explains. "At that moment, I felt everything had been taken away from me in one split second."

Despite being a radiologist and belonging to a family of physicians, Raoof quickly began to experience the firsthand challenges of being a patient. She observed how those battling cancer were under enormous pressure to make timely choices for their health, choose the right physicians, and deal with complicated insurance issues. After her final surgery, for example, Raoof was shocked when she was asked to pay $50,000 for the procedure. The surgeon did not accept health insurance. "That was the last thing I wanted to think about at that point," she says.

However, she also recalls examples of physicians who kept her on course, and the experience enabled Raoof to see things from the patient's perspective. "One of my physicians was outstanding," she recollects. "There was always a smile on her face, and that encouragement was enough for me to keep going. Some were excellent in what they did, but had little interaction with the patient; and that made me wonder what we were doing wrong in our department."

"Make a Difference" Rounds

In 2012, after finishing chemotherapy, Raoof noticed the hospital was finding new ways to prioritize patient satisfaction. With the administration's approval, Raoof began visiting patients on one of the more challenging floors of the hospital: post-surgical. "I started talking to patients," she says. "I was having a

> ## "When you're a patient, every single thing, no matter how small, becomes significant."
>
> –Sabiha Raoof, MD, FACR

five-minute interaction and helping them solve issues, such as 'My breakfast was cold today,' or 'I need an extra pillow,' or 'I need the doctor to visit.' When you're a patient, every single thing, no matter how small, becomes significant."

When the CEO mentioned her visits during a meeting, senior staff members from emergency care, family medicine, and public affairs joined Raoof in the weekly visits, which was the genesis of the "Make a Difference" or MAD rounds. The rounds began with managers and directors of services and then expanded to include other non-clinical staff members who were not always aware of what happened in the life of a patient.

Raoof explains that the program is wholly designed to help patients, so there are no data tracking or survey tools utilized by staff. The hospital's philosophy focuses on communication with the patient, which takes precedence over measurement and tracking. "After having done this for the last three or four years, I can name many patients who have expressed how appreciative they are about the help," she states. "We are really trying to solve their issues while they are still here." (View a MAD Rounds schedule at acr.org/RoundsCalendar).

The diversity within the patient population makes the presence of MAD rounds even more vital. The staff is equally diverse, and Raoof explains how the hospitals provide resources that allow all patients to express their concerns more comfortably. "It can't get any more diverse than what we have in Queens, New York," Raoof comments. "But we have a great mix of people in the department, where even our technical staff is frequently bilingual." The hospitals also provide a language bank to translate numerous languages, such as Spanish, Hindi, Urdu, Tagalog, Chinese, and Polish.

Looking Ahead

While other areas in the hospitals have had regular staff cuts, the radiology department has been exempt. "Dr. Raoof has proven her dedication to improving both the department of radiology and Jamaica Hospital as a whole since she joined our team 18 years ago," says CEO of Jamaica Hospital Medical Center, Bruce Flanz. "Through her unwavering focus, she has transformed her departments into state-of-the-art facilities, which is helping us transition into the Imaging 3.0® era. Her departments are staffed with competent, well-trained, and dedicated physicians, as well as a professional, patient-focused technical staff. Her departments are fully ACR accredited and provide value-based, high-quality care that has earned the respect and trust of patients and everyone within the institution, including me. I am proud to work with such a dedicated leader, and it is easy for me to continue to support her tireless efforts on behalf of our patients."

Additionally, radiologists maintain strong relationships with other departments that now advocate for them. A radiology consultation service established by Raoof and her team has helped direct referring physicians to the correct subspecialty radiologist and opens communication between her departments and other clinicians. She feels this service is in line with the goals set by ACR's Imaging 3.0. "I feel Imaging 3.0 reflects everything I've been trying to do over the years, and I am now seeing all of the pieces coming together," she states.

Raoof says she also benefits from being a member of the Radiology Leadership Institute® (RLI). "There's a lot that medical schools don't teach you. The RLI seminars teach you to look at the budget process and really focus on the financial piece," Raoof observes. "It is enlightening to understand the terminology and how and why decisions are made." Raoof is currently working with the administration to review the ordering practices of clinicians to assess what images are being ordered and how radiologists can help steer providers in the right direction during the ordering process. CareSelect Imaging is an important part of helping the department reach these goals.

What is Raoof's advice for other radiologists who want to stay relevant in the future, while keeping patients at the forefront? "In this day and age you have to get out there and be visible, because the reading might be done by a computer tomorrow, and our field could disappear," she stresses. "The only way we can survive is if we show other clinicians that we can contribute to patient care, and can show patients we are an important part of their clinical team."

Next Steps

- Maintain strong relationships with hospital administration to access funding for your department. Stay visible, and let others in the department and in the hospital know about new initiatives and how they can participate.

- Find creative ways to interact with hospital patients on a regular basis. Encourage other staff members to let patients know (preferably in person) that they are available to answer any of the patients' immediate concerns.

- Seek out information and take advantage of ACR's myriad tools, including CareSelect Imaging, as well as resources provided by Imaging 3.0 and the RLI.

Amena Hassan is a freelance writer

QUESTIONS FOR DISCUSSION

How do you maintain strong relationships with hospital administration to access funding for your department?

What does your department do to stay visible and let others in the department and in the hospital know about new initiatives and how they can participate?

What contact does each member of your department have with patients, and what have you learned collectively from your patients in recent months/years?

Case Study Published February 2018

Engaging the Physician

Using R-SCAN®, radiologists collaborate with family medicine clinics to enhance imaging appropriateness of lumbar spine orders.

Key Takeaways

- Baylor College of Medicine radiologists worked with referring physicians to reduce unnecessary imaging for low back pain through R-SCAN.
- Incorporating educational interventions into a CME track within the health system encouraged involvement by referring providers, nurse practitioners, and physician assistants.
- Following a radiologist-led educational intervention, clinicians ordered nearly 38 percent fewer imaging studies for low back pain and increased their appropriateness rating for such orders by approximately 23 percent.

Christie M. Malayil Lincoln, MD, assistant professor of radiology and neuroradiology and faculty senator at Baylor College of Medicine, co-led the effort for reducing imaging for low back pain at Baylor.

Related Content

Engaging the Physician

Webinar: bit.ly/BaylorRSCANWebinar

Sometimes the best patient care involves no imaging at all. So when the radiologists at Baylor College of Medicine noticed that some referring physicians were ordering more MRIs for low back pain than seemed appropriate, they took the lead to study the situation and deploy a solution for improved patient care.

In doing so, the radiologists turned to the ACR's Radiology Support, Communication, and Alignment Network (R-SCAN®), an innovative quality improvement initiative that brings radiologists and referring clinicians together to enhance image ordering and reduce unnecessary imaging.

Funded through the Centers for Medicare & Medicaid Services' Transforming Clinical Practice Initiative , R-SCAN offers radiologists and referring physicians tools to study image ordering practices, institute educational interventions for improved ordering, and conduct post-intervention impact analyses. Among these tools is CareSelect Imaging™, a clinical decision support system that includes ACR Select®, the digital version of the ACR Appropriateness Criteria®. CareSelect Imaging optimizes image ordering, reduces unnecessary imaging exams, and lowers the cost of care.

To begin, radiologists and referring physicians enroll in R-SCAN and select a targeted improvement area from a list of Choosing Wisely® topics.

In Baylor's case, the radiologists chose the "Imaging for Low Back Pain" topic and collaborated with referrers from Harris Health System in Harris County, Texas, to improve image ordering in that area. Their efforts led to a nearly 38 percent reduction in lumbar spine MRI orders and an approximately 23 percent increase in the appropriateness rating for such orders. Here's how they did it.

Approaching the Clinicians

Christie M. Malayil Lincoln, MD, assistant professor of radiology and neuroradiology and faculty senator at Baylor College of Medicine, and Melissa M. Chen, MD, who was a neuroradiology fellow at Baylor College of Medicine at the time, led Baylor's effort to reduce inappropriate imaging for low back pain using R-SCAN.

They selected the topic after noticing that two of Harris Health System's high-volume family practice clinics were ordering more imaging studies for low back pain than were probably necessary. (Most patients with uncomplicated acute low back pain do not require imaging.[1])

Lincoln and Chen wanted to explore whether the clinics were ordering the studies as a force of habit. "When a patient complained of back pain, was the automatic response to order imaging time and time again?" Lincoln wondered.

To answer their question, Lincoln and Chen approached Brian C. Reed, MD, director of disease control and clinical prevention at Harris County Public Health, who at the beginning of the project was the vice chair of community health in the Department of Family & Community Medicine. Reed immediately recognized the value of the project and how it aligned with Harris Health System's commitment to implementing higher quality standards in line with the Institute for Healthcare Improvement's Triple Aim.

In addition to reducing unnecessary imaging, Reed hoped the project would shorten wait times for patients who truly

need MRIs. "We were involved in another quality improvement project that reduced wait times for patients who needed imaging for osteoarthritis of the knee," says Reed, who is also an associate professor of family and community medicine. "I thought this project might have a similar effect for patients who required imaging of the lumbar spine." (Learn more about the wait time project at bit.ly/ Unnecessaryimaging.)

Reed introduced Lincoln and Chen to Samuel Willis, MD, and Luu Phong, MD, the directors of the two Harris Health clinics with the highest incidence of inappropriate image ordering for low back pain. Both clinicians were receptive to using R-SCAN to enhance imaging appropriateness, and they recommended a third clinic that also struggled with appropriate image ordering.

Coaching the Clinics

With the referring clinicians on board, Lincoln and Chen partnered with three other members of the radiology group — Christopher J. Yen, MD; Darshan Variyam, MD; and Kevin Y. Wang, MD. Together, the radiologists reviewed the 300 MRIs that referring clinicians from the three clinics ordered for patients experiencing low back pain during a 10-month period. Focusing on outpatient studies, the team used the CareSelect Imaging tool through the R-SCAN portal to analyze 90 of those exams and determine whether they met the evidence-based guidelines in the AC.

"When we looked at the lumbar MRIs, we focused on the outpatient population because they all have very different acuity levels than inpatients or emergency room patients, and we didn't want to dilute our information," Lincoln explains.

The review process confirmed that the referrers were in fact ordering lumbar spine MRIs inappropriately based on the evidence-based guidelines.

In response, the radiologists attended the monthly continuing medical education (CME) luncheons at each of the three health clinics and taught referring providers, nurse practitioners, and physician assistants about appropriate image ordering for lumbar spine. Incorporating the lessons into scheduled

CME time limited the impact to the clinicians' regular workflow.

During each session, the radiologists highlighted various scenarios — for example, one showing a patient who has cancer and another presenting a choice between ordering a lumbar spine MRI in the acute or chronic stage. At the conclusion of each session, attendees were given time to contemplate the different scenarios and ask questions before determining whether imaging should be ordered.

The educational effort had a positive impact on radiologist/clinician relationships. "The sessions allowed me to meet with the referring providers, whether they were physicians, nurses, or physician assistants," Lincoln says. "It let us engage in a conversation about how providers should order studies in a more targeted way and helped us understand their predicament as well. "

According to Lincoln, the "predicament" refers to the number of patients providers see on a daily basis and the difficulty they have in finding the time in peripheral clinics to assess whether or not the imaging is necessary. In some cases, patients want imaging regardless of the situation.

Achieving Positive Results

In the 10 months following the educational period, clinicians from the three clinics ordered a combined 187 MRIs for low back pain, down from the 300 orders made during the pre-intervention period.

Using CareSelect Imaging, the radiologists found that referring physicians consulted the AC for 79 of the post-intervention scans, equating to 42 percent of the total scans ordered. The combined average appropriateness rating for MRIs from all three clinics was 5.8 during the post-intervention period, significantly more than the 4.7 rating received during the pre-education period. These results indicated that the educational intervention led to improved image ordering.

The results also indicate that referring clinicians are now looking for other ways to treat lower back pain before turning to advanced imaging. "After we suggested that physicians should explore alternate ways to treat patients before ordering an MRI, we

As a neuroradiology fellow at Baylor, Melissa M. Chen, MD, who is now a clinical neuroradiologist and assistant professor in the department of diagnostic radiology at the University of Texas MD Anderson Cancer Center, co-led the effort to reduce inappropriate imaging for low back pain.

saw an increase in the time from the initial clinic visit to the MRI exam," Chen explains. "Physicians are now recommending treatments such as medication, physical therapy, or other interventions before they send their patients for imaging."

As Reed had hoped, the reduction in unnecessary imaging also seems to have reduced wait times for patients who urgently needed MRIs. The Baylor team is working to measure this reduction in patient wait times for MRI as part of the next iteration of the project.

Lincoln attributes the project's positive results in large part to the camaraderie that developed between the radiologists and referring clinicians. "The back-and-forth dialog through the educational sessions opened a direct, two-way line of communication we didn't have before, positioning us as consultants who now guide appropriate imaging," she says. "We wanted to impact patients in a positive way, and we wanted to do it in partnership with our referring providers. We achieved both objectives."

Along the way, the radiologists cemented their role beyond image interpretation as partners in providing quality patient care. "R-SCAN allows radiologists to be seen as leaders in decreasing inappropriate imaging in a meaningful way," Chen says. "It allows radiologists to be more in control when caring for patients, rather than sitting back and waiting for things to happen."

For more information about R-SCAN, visit rscan.org or email rscaninfo@acr.org.

ENDNOTE

1. Patel ND, Broderick DF, Burns J, et al. ACR appropriate-ness criteria for low back pain. *J Am Coll Radiol.* 2016; 13(9):1069–1078. Accessed on Dec. 21, 2017.

Next Steps

• Uncover opportunities for improving imaging appropriateness at your institution.

• Reach out to referring providers about participating in an R-SCAN project to improve imaging appropriateness.

• Explore providing CME credit for the educational intervention phase of an R-SCAN project.

Amena Hassan is a freelance writer

Further Reading

Reducing Inappropriate Lumbar Spine MRI for Low Back Pain: Radiology Support, Communication and Alignment Network
bit.ly/InappropriateMRI

QUESTIONS FOR DISCUSSION

What types of imaging and which physician groups do you suspect account for the largest number of inappropriate orders?

How does inappropriate ordering impact patients' finances, treatment, and satisfaction?

How can you handle patients and/or ordering providers who insist on imaging orders that we know to be medically inappropriate?

The Imaging 3.0 Impact

" Providing patient-centered care is a passion of mine. The Imaging 3.0 case study on Making a Difference (MAD) rounds provided me a forum to share my passion with others in my specialty. This and other case studies are helpful for radiolo-gists and encourage them to think outside of the box. We need to be an integral part of the healthcare delivery system and should become more patient-fo-cused. The Imaging 3.0 roadmap has been a great resource for me and has helped me transform my two departments of radiology."

– Sabiha Raoof, MD, FACR

" To me, the Imaging 3.0 case study series has been an extremely important part of the Imaging 3.0 movement. It is a great way to share the fabulous work that many radiologists from around the country are doing to improve patient care and shape the healthcare system that we all want and need."

– Marc H. Willis, DO, MMM

" The Imaging 3.0 case study series has been very valuable to my professional life. I was proud to be included in one of the first Imaging 3.0 case studies, and it was a defining moment for me to be able to share our work. The case study propelled our group's work with our hospital and referring physicians and led to ACR panels at the annual meeting. We were able to share our success stories and strategies and seed such work in other arenas. Imaging 3.0 is the blueprint for transforming radiology to lead the improvements needed in healthcare. The case study series is a very effective resource for all radiologists to learn from other leaders in radiology."

– Syed Zaidi, MD

" The Imaging 3.0 case study series is a unique platform for radiologists to share such great stories about the true worth (value) that our specialty brings to healthcare. It helps many within and outside of radiology to understand the tremendous impact we can have and do have in patient care, which may not seem obvious at first glance."

– Samir B. Patel, MD, FACR

" We change cultures by changing the stories we tell. Imaging 3.0 case studies are the stories of radiology's future."

– James V. Rawson, MD, FACR

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