

Case Study: Ahead of the Curve

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

By Linda G. Sowers

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.

When the radiology team at Einstein Healthcare Network in Philadelphia, Pa., 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."

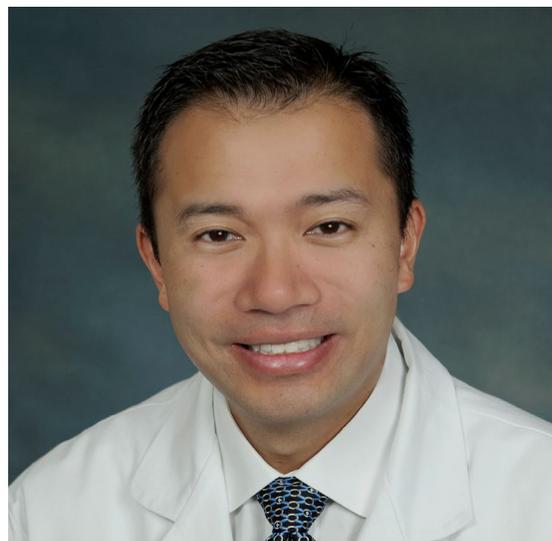
Now Lee and Matalon are spearheading an incremental CDS pilot project at Einstein that is validating that theory. In fact, one of the most vulnerable patient populations — children with minor head trauma — is already experiencing the positive impact of automated CDS.

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 about 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



Ryan K. Lee, MD, MBA, section chief of neuroradiology, is spearheading an incremental pilot project to integrate CDS into the EMR at Einstein Healthcare Network in Philadelphia.

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 the 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

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Continued on next page

Case Study: Ahead of the Curve

Continued from previous page

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](#) 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.

“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.”



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.

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Continued on next page

Case Study: Ahead of the Curve



Continued from previous page

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 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 the 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."

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. 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.

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Continued on next page

Case Study: Ahead of the Curve

Continued from previous page

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 health care 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.

Share Your Story

Have a case study idea you'd like to share with the radiology community? Please submit your idea to <http://bit.ly/CaseStudyForm>.



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