

Center for Diagnostic Imaging (CDI)

Since implementing the Vendor Neutral Archive (VNA) from Lexmark Healthcare more than 12 years ago to manage all medical images and unstructured patient content, the Center for Diagnostic Imaging (CDI) has grown from just 20 locations to 115 permanent imaging centers and more than 100 mobile imaging units. CDI performs approximately 1.2 million exams a year for its hospital and physician practice partners. Currently, CDI has more than two billion images in the VNA.

Challenge

Due to the volume and variety of its business partnerships, CDI must accommodate diverse workflows and technology solutions.

"The VNA is CDI's core system for managing and sharing medical images across the enterprise," said Linda Bagley, senior vice president process and technology at CDI. "It allows us to easily work with each of our hospital and physician practice partners, offering managed services to those that do not have a VNA and providing interoperability with those that already have a VNA or PACS solution in place. It gives us great flexibility for supporting diverse image management and sharing requirements."

Solution

"We've never used a PACS solution to run our imaging business," said Bagley. "We started with a VNA, which gave us the interoperability we needed to grow the company, managing patient images across systems and networks. Today we have over 200 VPN connections with hospital and medical group partners for image exchange. With all the regulations nowadays, healthcare organizations have to be able to connect with anybody to meet the interoperability requirements. That's why there is so much movement toward a vendor neutral architecture."

CDI's business is built on having leading technology to offer its partnerships.

"Our goal is to stay ahead of the industry by continually enhancing our technology platform and demanding the most from it in order to be productive and cost-efficient while providing the best patient care," said Bagley. "We chose a VNA solution because we wanted to use multiple viewers and a RIS-driven workflow in our markets. Most vendors we looked at were not doing these things at the time we implemented our system, so it was hard to find a PACS vendor that wanted to work with us. We had multiple markets and partnerships and they were

Meet Center for Diagnostic Imaging (CDI)

Center for Diagnostic Imaging (CDI) is one of the country's largest providers of multi-specialty outpatient imaging services, operating in 40 states with a staff of more than 3,500 associates.

- ▶ **Imaging Centers:** 115
- ▶ **Mobile Imaging Units:** 100
- ▶ **Exams:** 1.2 million
- ▶ **Images in VNA:** 2 billion

Products in use: Vendor Neutral Archive

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Linda Bagley

Senior Vice President, Business Process and Technology

running on different systems. The VNA allowed us to achieve the interoperability and cost-effective image-sharing approach needed to grow and connect our markets together.”

Flexibility to meet healthcare clinical and business needs

As a large organization supporting clients across the United States, CDI must have the ability to set up a variety of business arrangements and exchange information easily with provider partners. Every day CDI manages multiple, simultaneous outpatient radiology workflows across the enterprise with multiple hospitals and a vast mobile imaging division.

“We initially used the VNA to route images for cross-market reads of imaging exams,” said Bagley. “So, if scans were performed in Florida, we had sub-specialty support in Minnesota doing the interpretation of the studies. As we have progressed with different viewer offerings, we now have the capability to route and pre-fetch images and send them to the local market while maintaining a single instance of our main archive. The VNA created the opportunity for CDI to create the needed workflows within our markets.”

“If a hospital partner wants to continue on its existing PACS platform, we can provide everything else for the enterprise workflow, allowing the connection from their viewer to our VNA. This flexibility makes it easier for us to be collaborative with our partners,” said Bagley. “It is important to work with our radiologists by creating consistency in workflow. If they’re reading in the hospital on a certain viewer, we can create that same viewer availability within our outpatient centers, creating efficient workflows and creating better turnaround on the reports.”

Results

The value of partnership

As CDI has grown and built its enterprise infrastructure with the VNA as the backbone, Lexmark Healthcare has been a strategic resource.

“Lexmark Healthcare has always been right there with us, strategizing on how to solve technology issues to be more effective. They have always been willing to dig in and understand the issues and what we are trying to accomplish. It has been a very collaborative partnership,” said Bagley.

CDI has also found Lexmark Healthcare technology to be among the best in the industry.

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Patient-centric care

With VNA, CDI has seen real improvements in the care provided to patients. Time is often of the essence in patient care, and with quick, easy access to images, providers can focus on providing treatment—not searching for files or waiting for copies to arrive.

“We had a patient case in Minnesota referred to us by a provider in California,” said Bagley. “The provider had not previously referred anyone to us, but because of the way our infrastructure was set up, we were able to get him online in near real-time as we were scanning the patient here in the Minneapolis-St. Paul area. He was able to view the images at the same time as our radiologist, which provided a better patient result.”

“In another case, a patient in a rural trauma center in northern Minnesota had been in a car accident and needed to be airlifted to the Minneapolis-St. Paul area for treatment,” said Bagley. “In the past, the patient would have had to wait in the emergency room while film was produced or medical images were burned onto a CD to accompany the transport. Because of our VNA and the connectivity between hospitals, the patient was able to be loaded into the helicopter and sent ahead to Minneapolis while we transmitted images to waiting physicians.”

“These capabilities enable healthcare providers to be much more patient-centric in providing care with fewer delays,” said Bagley. “When you realize you could possibly have an impact on someone’s life, that’s when all the investment in the right technology really matters. Patient care is core to CDI’s mission.”

CDI has begun taking advantage of analytics information derived from the VNA to improve patient safety and provider efficiency.

“We can do a lot more with data analytics based on information we pull from the DICOM record,” said Bagley. “We’re doing CT dose monitoring for patient safety. As a leader in patient safety within our industry, we will continually look for ways to capture the high-quality diagnostic images we are known for, while using the smallest amount of radiation possible for each patient. We are also looking at how we are protocoling MRs in one market versus another. We are looking at quality on an associate-by-associate basis in order to continuously improve the images being produced across our markets. VNA is helping us gather all of this information. The more we are able to look at how we are doing things today in the enterprise, the better we’ll be tomorrow.”

Opportunity to drive new revenue

CDI has gone beyond achieving “soft dollar costs.” The company turned its VNA investment into a real source of revenue.

“The economies of scale of our technology infrastructure lets us offer medical image archiving services to our provider partners at a very competitive rate,” said Bagley. “An orthopedic group may perform patient scans then have us perform the professional reads and store the images for them. CDI is able to generate revenue while providing valuable services to clients that don’t want or have the imaging knowledge to build their own imaging management infrastructure.”



First to the cloud with VNA

Since the company began, CDI has worked hard to stay ahead of the marketplace. They were one of the first radiology organizations to prepare for meaningful use by establishing incentive programs for physicians. They were involved in early efforts to improve clinical decision support, establish electronic ordering and work with HIEs and even competitors to establish standards that would move the industry forward. Now, CDI is one of the first organizations to utilize a cloud-based deployment of VNA.

"I still get asked by my radiologists when we are going to the cloud," said Bagley. "I tell them we are a cloud. We began twelve years ago creating a large, private cloud infrastructure that can handle multiple connections. We now have more than 200 VPN connections with hospital and provider partners in over 40 states for exchanging images."

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