

Vanderbilt Medical Center

Lexmark NilRead Enterprise Viewer helps Vanderbilt improve care through streamlined image sharing and collaboration.

Challenge

PACS Traffic, Clinical Workflow, Image Sharing Prove Troublesome

The Vanderbilt University Medical Center Imaging Informatics team manages implementation, maintenance, training and help-desk support for all systems supporting cardiology and radiology, including PACS, RIS, dictation and medical image viewing solutions. Prior to working with Lexmark Healthcare, Vanderbilt identified a number of medical image viewing-related challenges and opportunities:

- ▶ Vanderbilt Medical Center's main radiology PACS experiences heavy traffic from pre-fetching, prior relevancies and other non-diagnostic viewing requests. They needed to reduce this burden on the system by moving users to a viewer that was easier to use and easier for IT to manage.
- ▶ Vanderbilt annually receives approximately 40,000 CDs from more than 250 outside facilities containing patient imaging studies that must be ingested. Currently, physicians have to wait for patient CDs to be imported and consolidated with patient demographics before images can be reviewed. Vanderbilt needed a way to electronically transfer a portion of these images directly into their imaging system environment.
- ▶ Vanderbilt needed a solution that would allow medical researchers to upload, access and share imaging studies and other data. Vanderbilt did not want research data to be managed alongside active patient content unless appropriately indexed. Additionally, researchers were often using freeware applications that were not built for image sharing. These tools were mostly client-server applications that tied a researcher to a specific CPU, thus not allowing image access from other locations or devices.
- ▶ Finally, Vanderbilt leaders saw telemedicine as an important capability for delivering care more effectively to patients in outlying areas while improving collaboration with referring providers and optimizing bed-usage. They needed a viewer to support their telemedicine initiative.

Solution

Zero-Footprint Enterprise Viewing Provides Common Platform

Vanderbilt IT leaders determined these challenges could be addressed by an enterprise medical image viewer, a software application used by healthcare providers to visualize patient images and reports on virtually any computer or mobile device rather than dedicated image viewing stations.



Meet Vanderbilt Medical Center

Vanderbilt Medical Center is a comprehensive, Nashville, TN-based healthcare facility dedicated to patient care, research, and biomedical education. A major patient referral center for the mid-South, Vanderbilt has 1105 beds, 19,600 employees, 2,500 students pursuing advanced degrees in health sciences, and performs more than 53,000 surgical procedures annually across all facilities.

Products in use: Lexmark NilRead Enterprise Viewer

Focus: Medical Care and Image Management

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The Vanderbilt Imaging Informatics team evaluated eleven different enterprise viewing solutions, including NilRead Enterprise Viewer from Lexmark Healthcare. NilRead provides a universal, vendor-independent platform for accessing DICOM and non-DICOM image data wherever it resides, integrating with electronic health records (EHRs), vendor neutral archives (VNAs) and other applications.

Vanderbilt rated vendors on more than three dozen technical and application aspects. “NilRead was ahead of other vendors in virtually every category,” says Jennifer Tucker, Vanderbilt imaging system specialist. “One of the most important factors was NilRead’s ability to leverage Active Directory and LDAP. Vanderbilt is a large facility with more than 8,000 potential viewer users, including clinicians and healthcare staff. Creating a user database manually would have taken time away from valuable staff resources.”

Vanderbilt also wanted a zero-footprint application that does not require any downloads or plug-ins. “A true zero-footprint viewer should work like a YouTube video,” says Tucker. “You click to open it, you watch it and when you close it, it’s gone and there is no trace left behind. The whole point is to be able to log in anywhere, at any time and get the same type of response. Most viewer vendors we looked at were in their infancy when it came to zero-footprint, requiring additional third-party programs to work on the physician desktop. NilRead, on the other hand, is based on true, zero-footprint technology that runs on any browser and no additional software or plug-ins are required.”

To further test NilRead’s capabilities, Vanderbilt implemented a pilot project where it ran the enterprise viewer on a single server with active connections to PACS. The health system wanted to look at different types of studies coming from different modalities to see how NilRead would handle them. “In medical imaging, occasionally there are transfer syntax issues, especially when you connect an older modality to a newer viewing system. This was not an issue with NilRead,” says Tucker.

Vanderbilt also ensured physicians were actively involved in the viewer evaluation for input into the final decision. The health system initially provided access to 50 telemedicine physicians, radiologists and other clinical pilot users.

“We allowed physicians to use the system for 90 days and then we turned it off,” says Tucker. “I immediately began to get phone calls. Physicians in the pilot project had come to appreciate the convenience of accessing images on portable devices from virtually anywhere. When they had to temporarily go back to the legacy access method, which included establishing a remote login to the physician desktop via VPN and then launching the PACS viewer, they clamored for Vanderbilt to finalize the system purchase and reinstate NilRead access.”

Enterprise Viewing Streamlines Image Access & Sharing, Enables Teleneurology

Once NilRead was officially implemented at Vanderbilt, the IT team decided to validate a hunch that end-user adoption would be simple and fast. “During end user training, I simply sent out a URL to the system and told users to login using their Vanderbilt user id and password and to let me know if you have any questions,” says Tucker. “I wanted to see if I could give a limited amount of information to a user and have them be able to use the system.” This test was successful, validating the intuitive nature of NilRead that reduces the need for extensive end user education.

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The early success of NilRead resulted in the application being deployed to address a variety of challenges and opportunities at Vanderbilt, including:

House viewing

NilRead is aligned to be the designated “house viewer” for all Vanderbilt Medical Center facilities, including clinics and satellite offices. NilRead works alongside Vanderbilt RIS and PACS applications to make images available to enterprise clinical users, including those that have historically accessed PACS for this information. Once NilRead is fully rolled out, users across all service lines will be able to access patient images from wherever they are currently working, without having to find a specific workstation and log into a separate image viewer on the PACS system.

NilRead provides federated search capabilities, looking across gateways and long-term archives to locate stored images. End users can initiate pre-fetching and on-the-fly query and retrieve. Integration to the house dictation system enables NilRead to be the system through which dictation can be performed by radiologists in case PACS goes down for any reason. Physicians can use NilRead to route studies and collaborate online with referring physicians in preparing for procedures while the patient is in transit.

Reduction/elimination of CD imports

Vanderbilt focused NilRead image sharing capabilities on the institutions that generated the largest volume of CDs each year. NilFeed is an image sharing extension for all NilRead viewers. NilFeed allows a secure connection utilizing SSL and https:// without the need of a VPN. Using this functionality, Vanderbilt is now able to directly transfer patient images from referring institutions. This approach has not completely eliminated CD ingestion from all locations, but the workload from high-volume CD senders has been significantly reduced.

Research

Using NilFeed, clinical researchers are also able to more easily send data to Vanderbilt from outside hospitals. The IT department is now better able to keep research data separated from live patient data. NilRead not only gives researchers a robust, diagnostic-quality viewer, but it also gives them the flexibility to access images from remote locations and portable devices.

Telemedicine

One of the most innovative uses of NilRead by Vanderbilt is as part of a service that provides remote neurology consults. In the past, when patients presented with stroke symptoms at affiliate healthcare facilities, on-site neurologist availability was limited, resulting in a nearly one hundred percent transport rate to Vanderbilt. A high percentage of these patients, however, had not experienced a stroke. This situation resulted in unnecessary bed usage at Vanderbilt while taking patients away from family members and local providers.

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Today, Vanderbilt clinicians evaluate patients through teleneurology consults for healthcare centers that do not have access to a stroke neurologist. This allows affiliate hospitals to provide IV tPA, a time-critical medication that can improve chances of full recovery if administered within three-hours of the onset of stroke symptoms. If the consult indicates an interventional therapy can benefit the patient, transportation can quickly be arranged while the Vanderbilt stroke team prepares for patient arrival.

There are currently nine teleneurology sites using NilFeed to upload images to Vanderbilt PACS. Remote physicians treating neurology patients collaborate with Vanderbilt specialists using the NilRead viewer, which works cohesively with other applications.

Results

Enterprise Imaging Optimizes Efficiencies, Care & Outcomes

Using NilRead, Vanderbilt has begun reducing the non-diagnostic image viewing traffic workload on the main PACS. PACS will be primarily for diagnostic reads within radiology. This load-sharing provides greater efficiencies, while giving all physicians the flexibility to use a web-based viewer with simultaneous imaging viewing and collaboration tools that are accessible from any location.

By gradually eliminating the need for CD importing, Vanderbilt has been able to reduce the amount of work in user queues while speeding the turnaround time. Physicians can access images much faster than in the past because they no longer have to wait for manual import of images and matching to Vanderbilt demographic data.

Since the Teleneurology program began, patients around the region have received faster access to specialists for stroke diagnosis and stroke patient transfers to Vanderbilt have been reduced to twelve percent. The referring facility is now able to treat patients locally, keeping them close to family and familiar caregivers while allowing Vanderbilt to preserve beds for patients with more severe cases.

With the success of the Teleneurology program, Vanderbilt plans to extend telemedicine capabilities to other service lines through enhanced image sharing. Plans are for NilRead to be integrated with the organization's EPIC EHR, enabling Vanderbilt users to conveniently access patient images from within the EHR interface. “We've had an excellent experience so far with NilRead and our Lexmark partnership,” says Tucker. “The NilRead enterprise viewer is a valuable solution that has many applications for supporting a growing imaging volume and improving the way we access and share patient content.”

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