



UNC Health Revamps Its Enterprise Technology, Improving Access, Timeliness and Interoperability

Health system transforms care, reduces costs and achieves HIMSS EMRAM Stage 7

A cardiac patient required a timely consult before being transported to another facility for advanced care. By hospital arrival, the receiving cardiologist had reviewed all of the patient's health records and images, avoiding costly repeat imaging and providing seamless care.

That smooth continuity of care and timely clinician access to medical images occurred one day after UNC Health went live with an ambitious, nine-month enterprise imaging initiative: They retired a dozen picture archiving and communication systems (PACS) across seven hospitals, implemented a new enterprise-wide platform for medical imaging and transitioned everyone to a new electronic medical record (EMR) system – almost simultaneously.

“People thought we were crazy,” said Vineeta Khemani, Executive Director, ISD Enterprise Architecture & Clinical Systems, UNC Health, based in Chapel Hill, N.C. “The scope

and timeline were aggressive, but we had good leadership support and a great vendor partner. Many in the industry, including vendors, didn't think it could be done.”

Paring down PACS as application portfolios grew

The journey toward unified access to medical documents, media and images began in 2014, with ICD-10 and meaningful use Stage 2 deadlines driving a major EMR deployment. At that time, UNC Health was composed of an academic medical center, a community hospital, one critical access hospital and



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approximately 200 clinics throughout North Carolina. The hospitals all ran independent IT systems.

With the Epic EMR installation, healthcare IT leaders like Khemani saw an opportunity to embark on a "One Patient, One Chart" vision to bring together imaging reports across all facilities and clinics. But the images remained siloed in facility-based and service-line PACS.

A year later, four more hospitals with diverse applications joined the UNC Health system, challenging that "vision of one." After going live with Epic, there were almost 200 interfaces, with a quarter of them belonging to imaging. Those numbers were growing exponentially with each facility addition.

The IT infrastructure's complexity and immature strategy generated challenges:

- Lack of business continuity and disaster recovery planning
- Lack of mature imaging practices outside of radiology and cardiology
- Proliferation of stand-alone, point-of-care imaging with no image retention
- Lack of enterprise image lifecycle management policy for electronically stored media

These problems persisted as the health system grew. Eventually, UNC Health had 32 systems in its imaging portfolio just within radiology and cardiology. It was time to simplify with a new enterprise imaging strategy and new

technologies that standardized data formats and provided universal image viewing from any facility or device.

"As part of the selection process, we wanted to know who could provide a true vendor-neutral image archive as well as partner with us on an aggressive timeline. We didn't want to go through the process of onboarding four different hospitals and then turn around and do re-work afterward. It needed to all be done around the same time," Khemani explained.

The organization standardized two of the incumbent radiology and cardiology PACS that could scale. It then set about simplifying its PACS portfolio by eliminating nine PACS and three reporting systems.

"It's not easy telling a radiologist or cardiologist who spends so much time reading images that we're changing their primary systems. We had to remove the hurdles and ensure continued access to all prior imaging studies," Khemani said. She converted clinicians' skepticism into motivation and deployed Hyland Healthcare's Acuo Vendor Neutral Archive (VNA), which provided the backbone for evolving imaging standards.

Acuo VNA consolidates enterprise-wide imaging information into a single repository that communicates seamlessly with IT systems. This reduces complexity and improves interoperability, reducing costs associated with proprietary PACS.

"That's why a lot of people are hesitant to change out their PACS systems – because it's a pretty costly endeavor.

It's almost as costly as implementing a system," Khemani said.

Another cost under the old system was time. To share images, healthcare professionals would burn images on CDs and DVDs or repeat imaging tests, slowing physician consults and treatments. Using the Hyland Healthcare NilRead enterprise diagnostic viewer, physicians can immediately access cardiology, radiology, dermatology and orthopaedic images when and where they need them, thereby improving the speed of care and eliminating lost time and expense burning CDs.

A better view of patient records

Today, UNC Health clinical users can view longitudinal patient records, including historical images, across the expanding system. Benefits to date include:

- Clinicians have timely access to images within the UNC Health system
- Patients save travel time by getting diagnostic imaging at closer locations
- Patients access their medical images through Epic MyChart, rather than request them on a CD
- Patients can share their medical images with providers outside of the UNC Health system
- Clinicians have universal viewing and access for all imaging specialties
- Patients and providers can view images on a phone or tablet



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MATTHEW CASTELLANO | System Executive Director for IT, Business and Revenue Cycle Systems and Innovation | UNC Health

“It was the right decision and the right time for UNC to start this initiative for our growth. UNC has expanded from 1,500 beds and 200 clinics in 2014 to more than 4,000 beds within 15 hospitals and over 700 clinics across North Carolina today,” Khemani said.

Imaging volume also has tripled, with 21 million images currently stored in the organization’s VNA Archive and 1.5 million to 1.9 million being added annually.

A boost for business

UNC Health also partnered with Hyland Healthcare to improve operational efficiencies, expedite workflows and reduce costs through an administrative technology refresh.

“A guiding principle in our information services division is to leverage the assets we have to their full capacity and not have individual point solutions. Hyland offered solutions that were extensive and scalable across many enterprise use cases, which certainly drives the value of an investment,” said Matthew Castellano, System Executive Director for IT, Business and Revenue Cycle Systems and Innovation, UNC Health.

UNC Health had a lot of unstructured content issues, particularly in human resources and accounts payable (AP). Using Hyland Healthcare’s content services platform, UNC Health added document capture, machine learning classification, extraction of data and automated workflow to its enterprise resource planning space to improve its “clean pass-through” and invoice-processing rates.

“In AP, we’ve eliminated steps needed to rekey data by extracting data via OCR [optical character recognition] and passing that through interfaces, so we don’t have individuals reading through paper and rekeying data to associate with the corresponding purchase order,” Castellano said.

UNC Health is also leveraging the same content services platform to support a variety of roles. Examples span from making unstructured clinical documents available for clinician care decisions within Epic EMR workflow, expediting processing of release of information requests for health information management, to simplifying remittance posting to support revenue cycle management. UNC Health is also able to develop its own applications that automate workflow and business process using Hyland’s low-code, drag-and-drop technology.

Achieving HIMSS Stage 7 certifications

Both Castellano and Khemani credit the use of Hyland technology with achieving top-level HIMSS accreditations.

For Castellano, attaining HIMSS Stage 7 is acknowledgment that his organization’s prompt handling and enterprise documentation speeds timely, informed decisions. “If providers have faster and more efficient access to the data, we can deliver better care,” he said.

UNC Health also recently recertified at Stage 7 in three HIMSS analytics domains, including the Electronic Medical Record Adoption Model (EMRAM), Outpatient-EMRAM (O-EMRAM) and the Adoption Model

for Analytics Maturity (AMAM). These certifications reflect the highest level of completeness in external health information exchanges, data analytics, governance, disaster recovery, privacy and security an organization can attain.

“The process of attaining HIMSS EMRAM 7 is more than achieving a certification,” Khemani explained. “It’s an opportunity for us to grow, learn and reflect on what we’ve been implementing and how it helped attain operational efficiencies and better outcomes.”

The health system is seeking DIAM Stage 7 certification. By reaching the top stage in the HIMSS Digital Imaging Adoption Model, UNC Health shows providers and patients it has an exemplary strategy to improve health outcomes.



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The future is now

Castellano advises healthcare organizations struggling with unstructured data and medical images to prepare for a paradigm shift. Invest the time to learn new technologies and train staff to be efficient and effective with new tools. "Be prepared to look at the time and processes in your current state and realize how those will be transposed in the future ... and take the time to ensure staff are skilled to manage new systems," he said.

Khemani believes governance is a key success factor by finding physician and departmental leaders to champion strategy, break down departmental silos and stay focused on the organization's mission to provide the best care possible.

"I remember talking to a key physician executive at the time we started our journey. He didn't believe he could give up his PACS workstation with a lot of images," she recalled. "A year later he was accessing everything he needed via the Hyland Clinical Image Viewer from within Epic on a mobile device anytime and anywhere. We made a believer out of him.

"Now, every organization that joins our health system benefits from our vision of One Patient, One Chart, One Clinical Imaging Record as soon as they transition to our Epic EMR," Khemani noted. "And the benefits extend to the patients they serve."

To learn more about content and enterprise imaging solutions, visit HylandHealthcare.com.



About Hyland Healthcare

Hyland Healthcare provides connected healthcare solutions that harness unstructured content at all corners of the enterprise and link it to core clinical and business applications such as electronic medical records (EMR) and enterprise resource planning (ERP) systems. Hyland Healthcare offers a full suite of content services and enterprise imaging tools, bringing documents, medical images and other clinically rich data to the healthcare stakeholders that need it most. This comprehensive view of patient information accelerates business processes, streamlines clinical workflows and improves clinical decision making. For more information, visit HylandHealthcare.com.

About UNC Health

[UNC Health](https://www.unc.edu) is a not-for-profit integrated health care system owned by the state of North Carolina and based in Chapel Hill. Originally established Nov. 1, 1998, by N.C.G.S. 116-37, UNC Health currently comprises UNC Hospitals and its provider network, the clinical programs of the UNC School of Medicine, and fourteen hospitals and eighteen hospital campuses statewide.