PHOENIX CHILDREN'S HOSPITAL: **MANAGING UNSTRUCTURED CLINICAL IMAGING ACROSS THE ENTERPRISE**

CASE STUDY

A CLINICAL IMAGING MANAGEMENT SOLUTION HELPS ENSURE PATIENT PRIVACY, IMPROVE WORKFLOWS AND ENHANCE CARE QUALITY

Inside any hospital across the nation, there is a huge volume of clinical data that is difficult to capture in the electronic health record (EHR). For Phoenix Children's Hospital dermatology and plastic surgery departments, unstructured (non-DICOM) clinical imaging was the issue.

With the visual nature of dermatology and plastic surgery, photography is an essential part of patient care. Though the pictures and clinical images used in those specialties are unlike the structured images used in radiology: X-rays, CT, MRI and PET imaging. Structured (DICOM) images have metadata associated with them. Unstructured images do not, and that is what makes unstructured data difficult to manage, store and easily access.

"Breaking down existing specialty imaging barriers and consolidating patient information beyond radiology is critical for any hospital," said Jeff Lyons, Phoenix Children's Director of Clinical Ancillary Systems, Information Technology. Phoenix Children's knows the barriers well. To help ensure unstructured clinical imaging and its related data made it to the EHR, Phoenix Children's clinicians and assistants manually copied pictures and images from cameras to a USB drive or media card. Then they randomly created image names, searched for each patient's name in the EHR, imported images and scoured the hard drive for the correct image to import.

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JEFF LYONS | DIRECTOR, CLINICAL ANCILLARY SYSTEMS, INFORMATION TECHNOLOGY | PHOENIX CHILDREN'S HOSPITAL

In many cases, staff had to print images and scan them into the hospital's health information management system. This complex process is common in many hospitals and can pose HIPAA compliance and patient safety risks. "Even if staff is doing their best to capture and secure images, there's still a chance an image could end up in the wrong record," he said.

There was also the risk that clinicians could use their own unsecure mobile devices to capture needed images, according to Lyons. "What if the image isn't deleted?" he asked. "That's a risk every hospital across the country faces."

SECURING PATIENT PRIVACY, IMPROVING CLINICAL WORKFLOWS

To protect patient privacy, doctors and nurses at the point of care needed a secure way to capture and store clinical pictures and videos. "We looked at how images are being captured, how they are being stored and protected. We didn't want to compromise protected health information (PHI) in any way," Lyons said.

For 10 years, the hospital had partnered with Apollo for its clinical multimedia workflow management solution, Apollo EPMM® (rebranded as **arcc™** in 2018). "We began using Apollo EPMM as a pathology-centric application," he said. Pathologists capture diagnostic images through a camera on a microscope.

With security in place, the hospital IT department next set up software in offsite neuropathologist offices to provide faster access to slides for those involved in the hospital's patient care. "We could then share slides without the neuropathologist making a trip to the hospital. The neuropathologist office could scan their report into the repository with the slides," Lyons explained. "That opened the door to telepathology opportunities."

Phoenix Children's IT department looked at other picture-taking and workflow opportunities. "We ramped up IT compliance and questioned how all images are being managed," he said. "We recognized potential security issues and wanted to expand protection. We went to the hospital compliance department and executive physician group with our concerns."

THE IMAGING TRANSFORMATION

Then in 2016, Apollo incorporated a new mobile application, **arccMobile™**, for Apollo's imaging workflow solution. Phoenix Children's now gives clinicians the ability to securely capture and send images wirelessly from their own mobile phones to the patient's record.

"About 99 percent of people own a mobile phone," said Lyons. "Since clinicians use their own phones to download the app, it didn't cost the hospital a thing. The infrastructure was already there." Clinicians use high-resolution cameras to capture pictures and directly import them from the camera to the patient record, as well.

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Lyons said the **arcc** security features inspired adoption:

- **CONTROL.** The hospital determines who views images and what functions are allowed through role-based image access.
- **PRIVACY AND PATIENT SAFETY.** Patient wristbands have a unique patient-ID barcode that clinicians scan using **arccMobile**, ensuring captured images and pictures go to the correct patient record—and images automatically delete from picture-taking devices during the upload to the patient record. This allows patients and family to protect their privacy by only giving access to certain departments or doctors and restricting access to others.
- **SECURITY.** Captured images and videos are automatically encrypted and sent wirelessly to the **arcc** server and then accessible from the EHR.
- **ENHANCED PROTECTION.** All images are stored in an inaccessible location on the device and automatically deleted from mobile phones after sending.
- **EASY ACCESS TO ENSURE TREATMENT NEEDS ARE MET.** Images are stored securely in **arcc** and accessible via the EHR by medical staff enterprise wide when needed.

The resulting enterprise-wide access to critical images allows doctors to consult with peers quickly and can mean patients get treated faster with the right course of action. "It's a great diagnostic tool," said Lyons.

Parents can send an image of a child's suspected medical issue by email, and doctors can automatically send that picture to the patient's record. An ER physician can take a picture of an injury and send it to a hospital specialist for a consult, even when the specialist is offsite.

In surgery, images are captured all day long, Lyons explained. Most surgical suites have a camera mounted above the table to capture video and pictures. "We interfaced all surgical cameras with arcc to ensure those images are immediately available to show patients and their families what was done," he said.

Lyons pointed out that providers are happy with the solution. "They like the ease, the ability to scan wristbands and the fact that images are automatically erased off of mobile devices to protect patient privacy."

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AN ENTERPRISE-WIDE SOLUTION: BEYOND DERMATOLOGY AND PLASTIC SURGERY

Imaging is crucial in dermatology and plastic surgery, said Lyons. "Pictures show patients and their families post-surgical or treatment progress. Images help clinicians trend in real time to see if care is working over time."

But the story goes beyond dermatology and plastic surgery. "**arcc** is a solution for all clinical departments that need to capture visible light images, apply structure to those images, securely store them and ensure all images—structured and visible light—are easily available to all clinicians through the EHR," he said. Lyons calls **arcc** "a fantastic solution for visible light imaging," adding, "The second you snap the picture and click send, the image is in the patient's record."

Lyons' team searched every picture-taking opportunity in the hospital—ophthalmology, otolaryngology, surgical areas, the ER and orthopedics—and interfaced those opportunities with **arcc**. "The capability to manage all clinical images with one solution makes **arcc** a one-stop shop," he said. "**arcc** is helping all doctors who use images in patient care to improve documentation enterprise wide."

The value of **arcc** is self-evident and multiplying. Said Lyons, "The opportunities keep growing and growing."