SEEING THE BIGGER PICTURE

How to incorporate point-of-care medical imaging into your enterprise imaging strategy

Hyland™

CONTENTS

(click to jump to a chapter)

Where are all your medical images hiding?

The use of medical imaging to support and enhance patient care is growing exponentially.

Medical imaging no longer occurs solely in radiology and cardiology. Point-of-care imaging now occurs in nearly every corner of the hospital — from the emergency department to specialty departments such as surgery, endoscopy, dermatology and ophthalmology — and the number of images captured in these departments is growing dramatically.

Experts attribute this unprecedented growth to numerous factors:

Innovation: Point-of-care device vendors are building smaller, more portable units — most with a price tag that won't break the budget. That industry is expected to grow to from $8.7 billion in 2019 to nearly $20 billion in 2030[i].

Education: Most residency and fellowship programs now include specialty image capture and interpretation education. New clinicians not only understand how to operate the technology, they're confident making immediate care decisions based on the imaging procedure performed.

Information: Point-of-care imaging, from point-of-care ultrasound (POCUS) to scope cameras, mobile devices and more, empowers clinicians and staff to have a more significant impact on the patient experience and the patients treatment plans.

According to IHS Markit, approximately 75 percent of medical images captured today are non-DICOM in nature.

Despite their significant value, many point-of-care images images never find their way to the organization's core medical imaging archive.

The technology also encourages greater patient engagement. Clinicians can review images in real-time with the patient, describing what they see and how it may impact treatment plans. In addition, the patient often takes more ownership of their care when presented with information in this way. This improves treatment compliance and can lead to better health outcomes[ii].

The true value of these images, however, often remains hidden from the larger healthcare organization.

Despite their significant value, many point-of-care images never find their way to the organization's core medical imaging archive. The reason is rather simple. Radiology exams are standardized and archived in a PACS or VNA. Point-of-care imaging is facilitated in multiple departments across the organization which often lacks the standardization followed in the traditional imaging departments such as radiology. Often these medical images are stored in local, departmental archives or proprietary repositories disconnected from the imaging archive.

This can lead to compliance issues with government regulations or accreditation requirements and impact potential reimbursement[iii] for point of care imaging studies. Security becomes a challenge, both in terms of access to patient information and potential disaster recovery efforts. Without centralized archiving and the documentation of the study, billing for a point-of-care study may not be possible in turn affecting potential revenue.

Poor image management and archiving can impact patient care, as well. If point-of-care images are not accessible, clinicians may not know the images exist. This hidden-in-plain-sight leads to diagnosis and care decisions being made without complete knowledge and access to the comprehensive patient imaging record.

Connecting the PACS to the EMR is not enough

As mentioned earlier, nearly 75 percent of medical images captured today are non-DICOM (multi-media) in nature — almost all of them is the result of images captured outside radiology and cardiology. This makes point-of-care imaging a significant portion of clinically relevant data potentially absent from the patient's EMR.

Integrating the EMR with PACS, however, is not enough. While PACS expertly manages the flow of DICOM images, these systems aren't designed to natively ingest and manage non-DICOM assets.

PACS does not easily extend DICOM images to other systems or stakeholders outside of radiology and cardiology. Implementing multiple specialty PACS throughout the healthcare organization only multiplies the issues as many have found. They are left with multiple siloed systems to maintain in which there is no easy or cost-effective way to consolidate images for enterprise-wide access.

Some point-of-care imaging devices produce DICOM images, like POCUS and getting those images into a PACS can still be a challenge due to the lack of consistent metadata. These images then become inaccessible to clinicians creating a gap in a clinician's knowledge of their patient's full imaging history.

Non-DICOM specialty images present an even greater challenge as some PACS require these images to have DICOM-wrapping, a process that can be both expensive and time consuming. In addition, those PACS that do ingest these images often lack viewer tools that will effectively display images for clinicians or allow editing and annotation of those images.
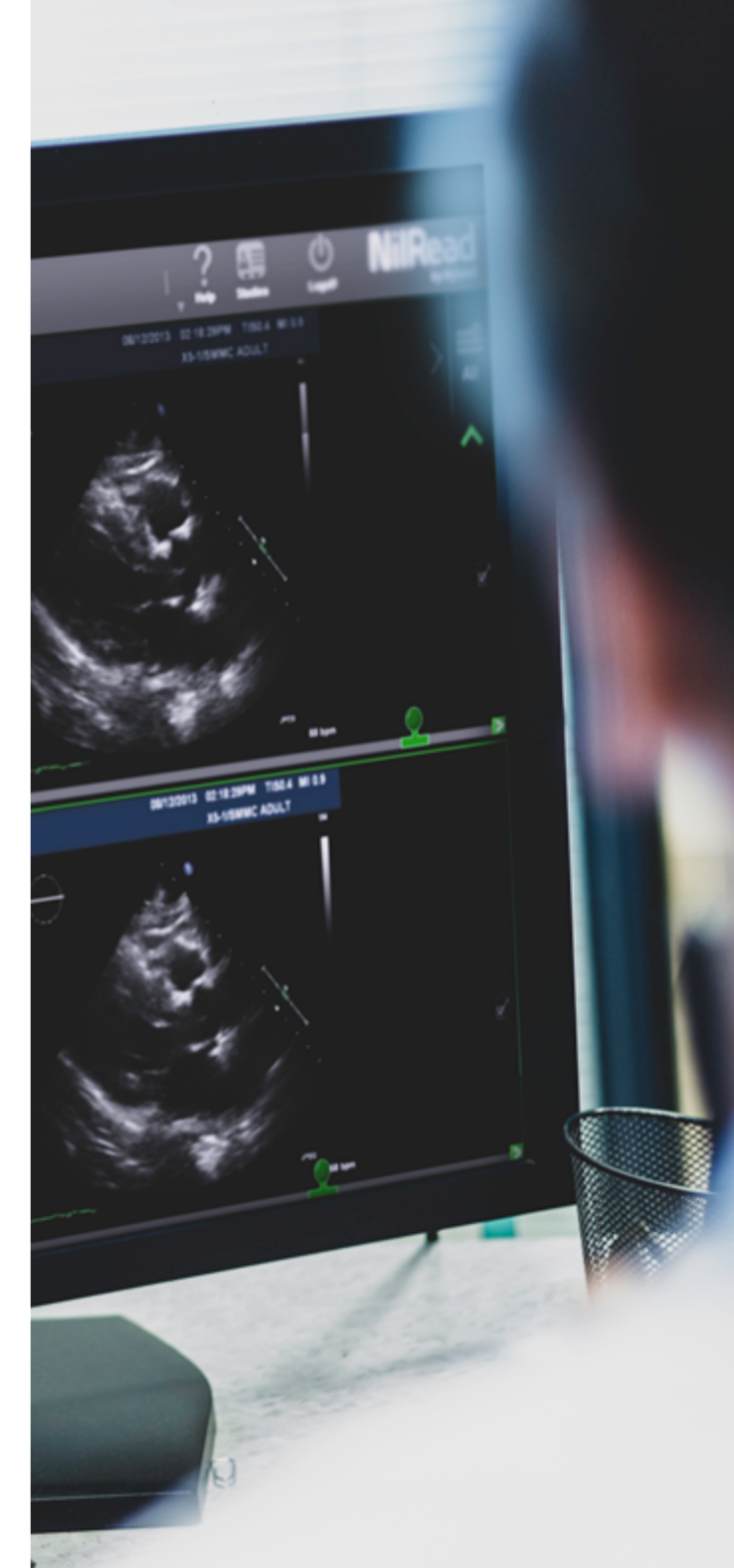
Read more about the benefits of enterprise imaging over PACS.

Bringing it all together: 3 key components

Healthcare systems can complete the patient picture with the right enterprise imaging solution. Enterprise Imaging allows healthcare organizations to connect, manage and view DICOM and non-DICOM images from any department together while providing data security, reducing costs and improving the quality of patient care. To bring it all together, healthcare organizations should focus on three key components:


1. CAPTURE AND CONNECT

To make medical images readily available to clinicians, healthcare organizations should invest in solutions that capture data from across the healthcare organization and connect it to enterprise clinical applications. Hyland Healthcare's image capture and connectivity solution suite, PACSgear, can integrate this data to the imaging archive and cross enterprise document share (XDS) repository — helping create a seamless, automated, robust patient imaging record.

The right solution suite also allows healthcare organizations to choose application components that fit their current needs and provides flexibility for future growth.

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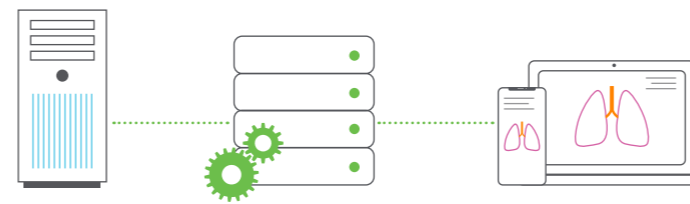

2. ARCHIVE AND MANAGE

A vendor neutral archive is crucial to a healthcare organization's enterprise-imaging infrastructure. The centralized solution, based on open standards, is good at managing and distributing very high volumes of medical images in a cost-effective way. It is an essential piece of technology, because it enables interoperability across the enterprise. This also promotes a flexible infrastructure that can facilitate future growth.

The right VNA should help eliminate vendor lock and block, streamline clinical workflows, facilitate better image sharing and collaboration and promote security and disaster recovery. Hyland Healthcare's powerful Acuo VNA provides healthcare organizations with true ownership of all their DICOM and non-DICOM imaging information.

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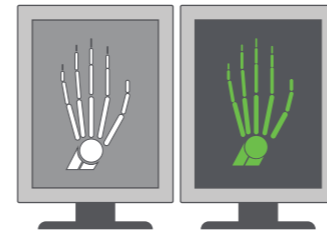
3. VIEW

Another important element of an enterprise imaging infrastructure is a universal viewer. The viewer should be flexible, allowing for clinical and diagnostic viewing — both within the EMR and outside of it. The viewer should also provide advanced visualization capabilities that can benefit traditional imaging centers, such as radiology and cardiology, by allowing them to interpret imaging studies remotely. The universal viewer should also be zero-footprint and web-based — meaning that no code or plug-in is needed to run it. Users should be able to access it immediately via any browser-based device.

Hyland Healthcare's NilRead universal viewer is a vendor-independent platform for accessing a full range of DICOM and non-DICOM image data from virtually any departmental archiving solution, whether dermatology, ophthalmology, radiology or radiation oncology. Based on a true zero-footprint, web-based architecture — there is nothing to install and images never reside on the workstation.

Medical images in a modern healthcare system

Now that we know more than 75 percent of medical images captured today are non-DICOM in nature and living in departments outside radiology and cardiology, let's take a hospital tour. We will see if we can locate those images, discover how departments are using medical imaging and review what solutions exist to help connect those images to the hospital's imaging archive and EMR. We'll start in the Emergency Department.

Emergency Department

Emergency Department clinicians and physicians employ point of care medical imaging for evidence imaging, which focuses on imaging as documentation of a patient's current state[v]. That might include photos or videos or visible light scope of facial injuries or POCUS imaging to help a guide a clinician when inserting specific catheters such as a PICC line. Connecting these images to the patient record benefits healthcare specialists and, in many cases, the patient by providing historical medical information that could direct future care.
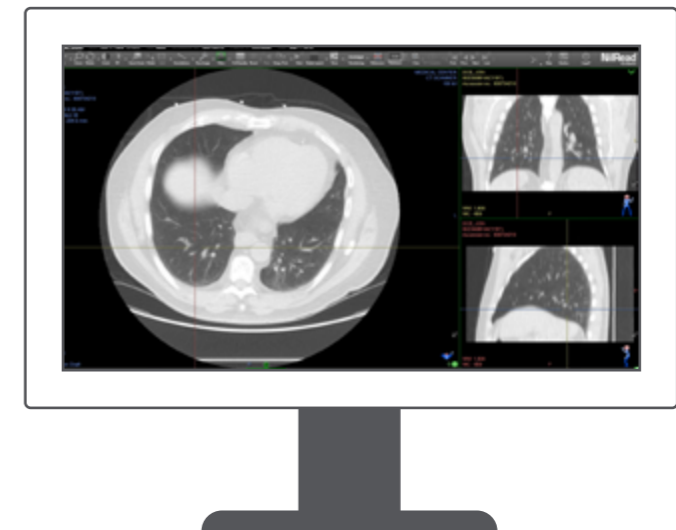
Gastroenterology

From ultrasound, visible light scopes, to ingestible pill-sized cameras, medical imaging in gastroenterology continues to rapidly evolve. These images, including video, help gastroenterologists pinpoint problems throughout the entire digestive system. These types of images are critical in diagnosing many diseases processes such as colon polyps and mitigating such diseases as cancer. These images also are key to the longitudinal patient imaging record.

A video capture solution, like Hyland's Video Touch 4K, helps clinicians capture images and video and easily associate them with the correct patient record. Using industry standards such as DICOM XDS and HL7, the solution connects video and images to an imaging archive or Hylands content platform, EMR.
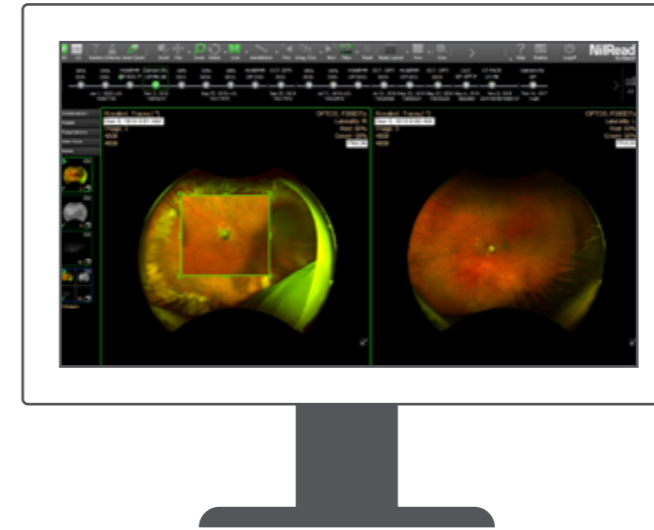
Ophthalmology

Medical imaging is the most essential part of the ophthalmic examination[v], providing ophthalmologists with views into multiple retinal layers. From optical coherence tomography (OCT) to confocal microscopy and beyond, eye doctors employ specialty imaging equipment and image archives that have changed the way they identify pathology and monitor therapy response[vi].

Providing specialists outside ophthalmology with access to those images is beneficial, as the results of the eye exam can uncover and monitor health conditions like diabetes and hypertension[vii].

Dermatology

Technological advances in smartphones is changing the way dermatologists document cutaneous disease processes. Creating a digital view of patient allows Clinicians to evaluate and monitor such diseases processes as skin cancer. To facilitate information transfer between colleagues and fellow providers, document cutaneous disease, assess response to therapy and monitor and diagnose skin cancer, where imaging plays a crucial role[viii]. Emerging technologies, like three-dimensional, total-body photography, mobile smartphone applications and computer- assisted diagnostic devices will continue allow dermatologists to monitor patient skin health and achieve better diagnostic accuracy resulting in earlier detection.

Dermatological medical imaging technology is a critical part of patient care. Collected images are often stored on mobile devices or in proprietary imaging systems and only viewable via that technology, leading to departmental silos. Opening those silos so that images are stored in a VNA and accessible via a universal viewer helps build a complete imaging record for the patient.

Surgery

Since the advent of the X-ray, medical imaging has played a critical part in the operating room. Today, surgical with the addition of multi-media imaging. Surgeons have the ability to document tissue masses and tumors pre- and post-removal, and then compare those with follow-up images to assist with a patient's treatment plan.

Encounter based imaging

Some point-of-care imaging technologies, like POCUS, aren't specific to one department. These studies can take place throughout the healthcare facility. However, unlike radiology-based ultrasound studies, these procedures often lack a radiology order that provides critical metadata that connects patient information with the patients DICOM imaging information. Without this type of data the patient's images cannot be associated to their imaging record. To mitigate this, clinicians and staff often enter patient and study data manually, introducing possible errors. Images sent to imaging archives without the proper indexing creates many hours of manual reconciliation and worse the possibility of images not being accessible for viewing when needed.

A solution like Hyland Healthcare's Image Link Encounter Workflow can help create modality worklist at the point of care eliminating manual processes. The solution automates order creation for captured encounter-based images and streamlines the secure routing of these studies to the imaging archive. It also helps ensure the ability for reimbursement of these studies.

Conclusion

Clinician use of point-of-care imaging devices and modalities will only increase as the technology continues to evolve. Ultrasound lead globally in the medical imaging growth in no small part because of POCUS and its expanded use in ambulatory and emergency care[viii].

Ensuring these images are available to clinicians where, when and how they need to view them is imperative to patient care and outcomes. An enterprise imaging solution that focuses on capturing, managing, viewing and sharing a full range of DICOM and non-DICOM image data while streamlining workflow across the organization is the best possible answer to point of care imaging possible answer.

Contents

Where are all your medical images hiding?

Connecting the PACS to the EMR is not enough

Bringing it all together: 3 key components

Medical images in a modern healthcare system

Conclusion

13 / 15

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