Image Sharing: Is it missing from your Enterprise Imaging Strategy?

by Don K. Dennison
Introduction

Meaningful Use (MU) and Accountable Care Organizations (ACO) have placed an increased focus on coordination of care within and across enterprises.

This has raised awareness among care provider leadership on the importance of information interoperability, both inside and outside the enterprise.

As medical images are part of the patient's complete medical record, a strategy for sharing this information among care provider network members and partners is also required.

IT strategies among providers often include the consolidation of patient clinical records from across the enterprise into the EMR\(^1\). For images, a consolidation of imaging records acquired from all the facilities in the enterprise into a shared PACS\(^2\) or VNA\(^3\) is also common.

But patients don’t get care from only one network in a given region, so some method of sharing patient information across enterprises is required and must be a part of a complete health IT strategy.

A strategy that does not include an effective and cost-efficient method to share medical images among care provider networks is not complete and puts care coordination at risk.

This paper explores the practical options available to include image sharing within a health IT strategy, and gives guidance on how to incorporate the right one into your strategy.

ABOUT THE AUTHOR:

Don K. Dennison has worked in the medical imaging informatics industry for over 14 years. Currently serving as a consultant, he is a speaker and panelist on topics ranging from medical imaging record interoperability, integration of imaging data within the EMR, multi-facility integration and others. He has published articles and eBooks on patient identity management, VNAs, PACS and Enterprise Viewers. Don currently serves on the Board of Directors of the Society for Imaging Informatics in Medicine (SIIM) and chairs the ACR Connect committee for the American College of Radiology (ACR).

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1 Electronic Medical Record;
2 Picture Archiving and Communication System
3 Vendor Neutral Archive
Image Sharing: A Primer

The importance of access to a patient’s medical images is well documented. Whether medical professionals are using historic images as a comparison to newly acquired ones to determine disease progression, or assessing a patient’s condition in an urgent trauma transfer case to ensure that the right resources are prepped, the images provide valuable insight that is not available from reading the diagnostic report alone.

And while consolidating image management systems into a single platform, such as a VNA or PACS, is a sensible approach, there will always be a need to exchange images with external organizations.

Strategically, having a method to easily and effectively share imaging data among your care network partners can improve your quality of service and satisfaction among these affiliates. It can also expand your catchment area to include facilities that may not otherwise refer patients to your organization.

And it is important to remember that many patients’ images are acquired at free-standing imaging centers where sophisticated IT solution deployments cannot be used, due to the lack of IT resources at the site.
Integrating Externally Acquired Imaging Studies into Your Systems

The file sizes of diagnostic imaging studies are often much larger than other clinical records—in the range of megabytes to gigabytes in size for a typical study, and growing each year. And a patient may have several exams that need to be shared, creating a technical challenge that must be overcome.

To incorporate imaging information from an external enterprise into your systems, tools and work are required to link all the images to patient information and an identifier (MRN) used within your enterprise. Often, procedure and body part information also needs to be updated in order to have the images display as expected.

While medical images are portable, advanced workflow is often required in order to integrate them into the patient’s records within the systems as the receiving facility.

Common Methods for Sharing Images

A few methods for sharing imaging records consistently and on a large scale have emerged.

Consolidation of Imaging within the Enterprise
Where a care delivery network has multiple facilities, it is not uncommon for more than one image-management system, such as a PACS or VNA, to be in use. The first step to achieving a longitudinal patient imaging record is to consolidate the images into a large system, shared across the enterprise. This reduces the frequency of imaging records that need to be copied and shared among different systems on the network.

Exchanging Images across Enterprises
Where a patient’s medical images exist across different care networks, and are managed in different systems, special approaches need to be taken to broker the exchange of selected images, when needed.
In general, two methods are used.

The first, called Cross-Enterprise Document Sharing for Imaging (XDS-I), is defined by Integrating the Healthcare Enterprise (IHE) and involves the use of broker systems to cross-reference patient identity information, as well as a registry of data to be shared among consortium member organizations. This approach is popular in many parts of the world, especially in publicly funded health environments, where the use of a shared health information exchange infrastructure is generally accepted and trusted.

Consolidate your image management systems, using a shared PACS or a VNA with all your PACS connected to it, within your enterprise as much as possible, but always have a reliable method for exchanging imaging studies across networks outside of your enterprise.

The second method relies on secure, cloud-based file exchange methods. These online services typically rely on edge appliances that interface, using standards, with systems on the local network for automated sharing, as well as a web-based user interface for manual uploading of images. This approach provides the users and managers of the data control over what imaging records are shared with which members. It also provides clarity as to whether the shared imaging data reached the intended destination.

The online service often included other value-added functionality, such as image viewing and tools to communicate and collaborate with others authorized users within the sender’s virtual peer network.

The Risk of not including Image Sharing in your Strategy: Portable Media

Unless an efficient, on-line method of imaging record exchange is provided, providers will resort to exporting the patient’s medical images to portable media, such as CDs, DVDs, or USB drives.

The risks of allowing this approach are many, including the lack of traceability, delays in access to the information, failures to import the data on the receiving end, and loss or damage of the media. As the imaging data contains protected health information (PHI), and is often unencrypted, this method also represents a real privacy and security issue. Finally, the ongoing cost of creating, transporting, and importing the images this way is significant.

http://www.ihe.net/
The use of portable media to share imaging records is costly, frustrating to staff, and adds the risk of introducing delays in access.

What is the Right Method for an Effective Strategy?

The discussed methods are all feasible, but hold different advantages, depending on the organization’s environment. And it often makes sense to employ several approaches, depending on the scenario.

**Consolidate Inside**
For inside the care-delivery network, the use of a PACS that is shared across all the facilities ensures that diagnostic images are available at the point of diagnosis. Where there may be too many PACS to consolidate to a shared system, the use of a VNA can be used as a sharing hub, receiving and providing records to PACS connected to it. The addition of a web-based Enterprise Viewer, which can be directly embedded in the EMR, can ensure that images are available as part of the patient’s records for all users.

**Exchange Outside**
If an imaging-capable Health Information Exchange (HIE) organization is available in your jurisdiction, it may provide a method to share medical images between connected facilities. It is often expensive to establish these data exchange brokers, and also have costs to manage, so pricing may be prohibitive. They may also depend on strict integration methods to interface with your systems, and may depend on a feed of all patient registration information to perform the necessary patient identity (MRN) cross-reference function. The cost of interfacing may not be justified for a facility sharing a low volume of studies.

HIEs are often established to serve a defined jurisdiction, such as a local region or state. Exchanging imaging records with facilities in other jurisdictions is often suboptimal, or not possible. Where an image-sharing-capable HIE is not available or will not meet your needs, a cloud-based service is often the most pragmatic approach.

Cloud-based image sharing services have several advantages, including the ease of on-ramping a facility or a user. Authorized users have visibility of the imaging records being shared through the web-based user interface. Analytic dashboards provided by the service showing image sharing patterns can often serve to provide insight into patient referral patterns, and even support process or service improvement.
Combining Methods

It is quite common to use a shared PACS or VNA to consolidate images internally, and then to use this system to connect to an image sharing service to exchange image records with other organizations. Even for organizations participating in an imaging-enabled HIE, where it is not connected to the necessary destination facility, the online image sharing service can often provide a useful alternative solution.

Discussion

With the current focus on avoiding unnecessary exams through the use of Clinical Decision Support, it is not hard to imagine that, if a method to access an existing imaging record exists, a policy could be defined that does not reimburse an organization for acquiring new images (for the same imaging procedure).

Even with a strategy to consolidate image management systems within the enterprise, as new facilities are acquired or become affiliated with your care network, a cost-effective image sharing service, that can be established quickly, can serve as a viable solution until the data migration and system consolidation projects can be completed.

Using an Enterprise Viewer to view images within an EMR (internal users), Referring Physician Portal (external users), and Person Health Record (external users) can avoid the need to move the images around, but it can also be an effective way of allowing authorized users to first view the images, and then—when needed (e.g. in a patient transfer of care scenario)—download or transfer them to their own PACS or VNA.

Studies\(^5\) have shown that when images are available, at the same time as a physician is reading the diagnostic report, that they state higher level of satisfaction, greater confidence in their understanding of the findings, and even improved efficiency determining in the correct treatment plan. The availability of images will increasingly become an expectation of clinicians as they focus on quality of outcomes.

\(^5\) Veena R. Iyer, MBBS, Peter F. Hahn, MD, PhD, Lawrence S. Blaszkowsky, MD, Sarah P. Thayer, MD, PhD, Elkan F. Halpern, PhD, Mukesh G. Harisinghani, MD.

Image Sharing Strategy Evaluation Questions to Consider

Does your health IT strategy include a secure, online method to share images with external enterprises to avoid the risks associated with portable media?

Is your current method of exchanging medical images the most efficient and effective that it can be? Does it reach all the necessary partners outside of your network? Is it seamlessly integrated with your EMR, and easy enough to use with little to no training?

Are imported images being presented properly to users in your PACS and EMR image viewer?

Are the consumers of the exchanged imaging data – Radiologists and Physicians – among your network members and partners satisfied with the current methods used at your organization? Are you measuring their satisfaction?

If images from outside your enterprise cannot be made available within your systems, including the EMR, in a timely fashion, can you achieve your quality metrics? Can a goal of patient-centric care be achieved without access to their relevant images?

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