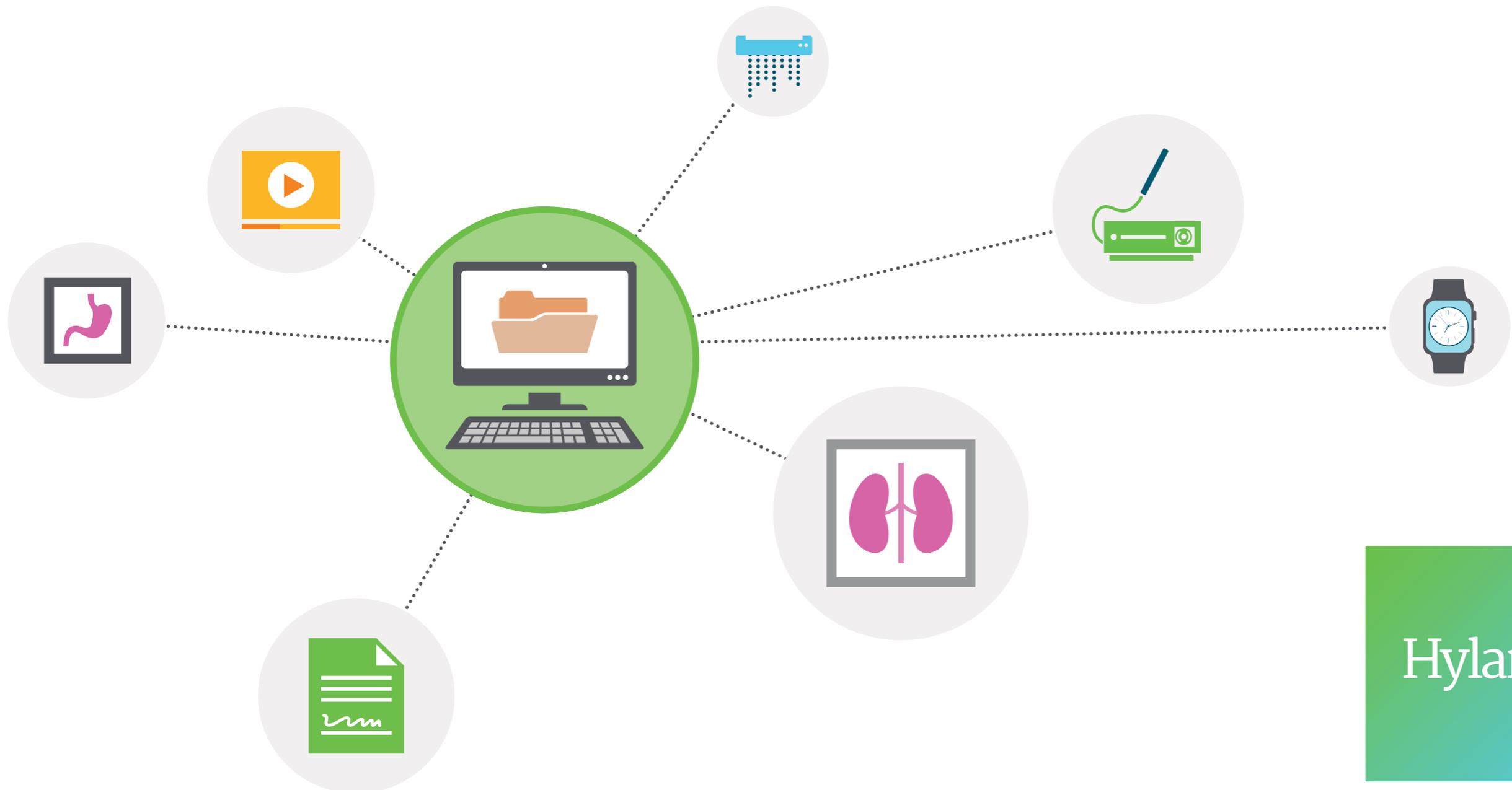


WHY YOU NEED A CONNECTED HEALTHCARE PLATFORM

Better healthcare begins by linking unstructured content to your EMR



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Introduction

MEET JOHN, THE CIO OF A LARGE HEALTHCARE INTEGRATED DELIVERY NETWORK (IDN).

John recently made the single most significant investment of his IT career — a *shiny new electronic medical record (EMR) system*. The application was deployed enterprise-wide and is intended to serve as the core clinical platform for patient information throughout the health system.



A lot is riding on this investment — for physicians, patients and John’s professional reputation. However, even prior to deployment, John realizes the EMR software won’t provide a comprehensive view of the patient out-of-the-box. Several system integrations will be necessary to complete the patient record and ensure the EMR becomes a true single source of clinical information for the enterprise. The approach John takes to content-enabling and optimizing the EMR will make or break the investment and perhaps, his career.

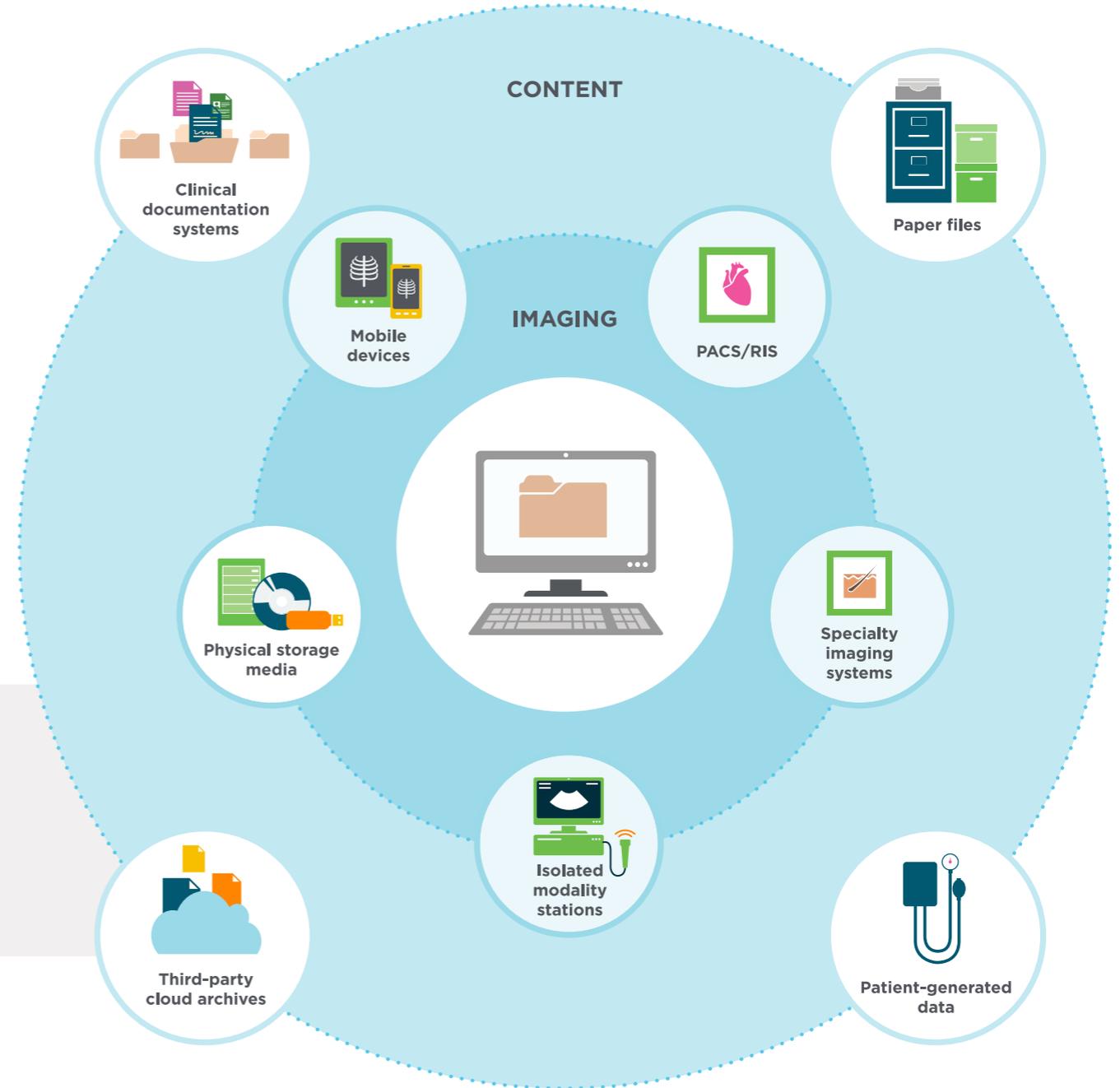
John doesn’t know it yet, but connected healthcare solutions will save his skin.



The incomplete EMR

EMR systems are designed to capture and manage discrete patient data that can be entered into fixed digital fields (e.g. vitals, symptoms, medications, diagnoses, etc.) and most do this job extremely well. However, much of the valuable clinical information that exists on a patient — both historical and current — doesn't fit neatly into these predefined boxes.

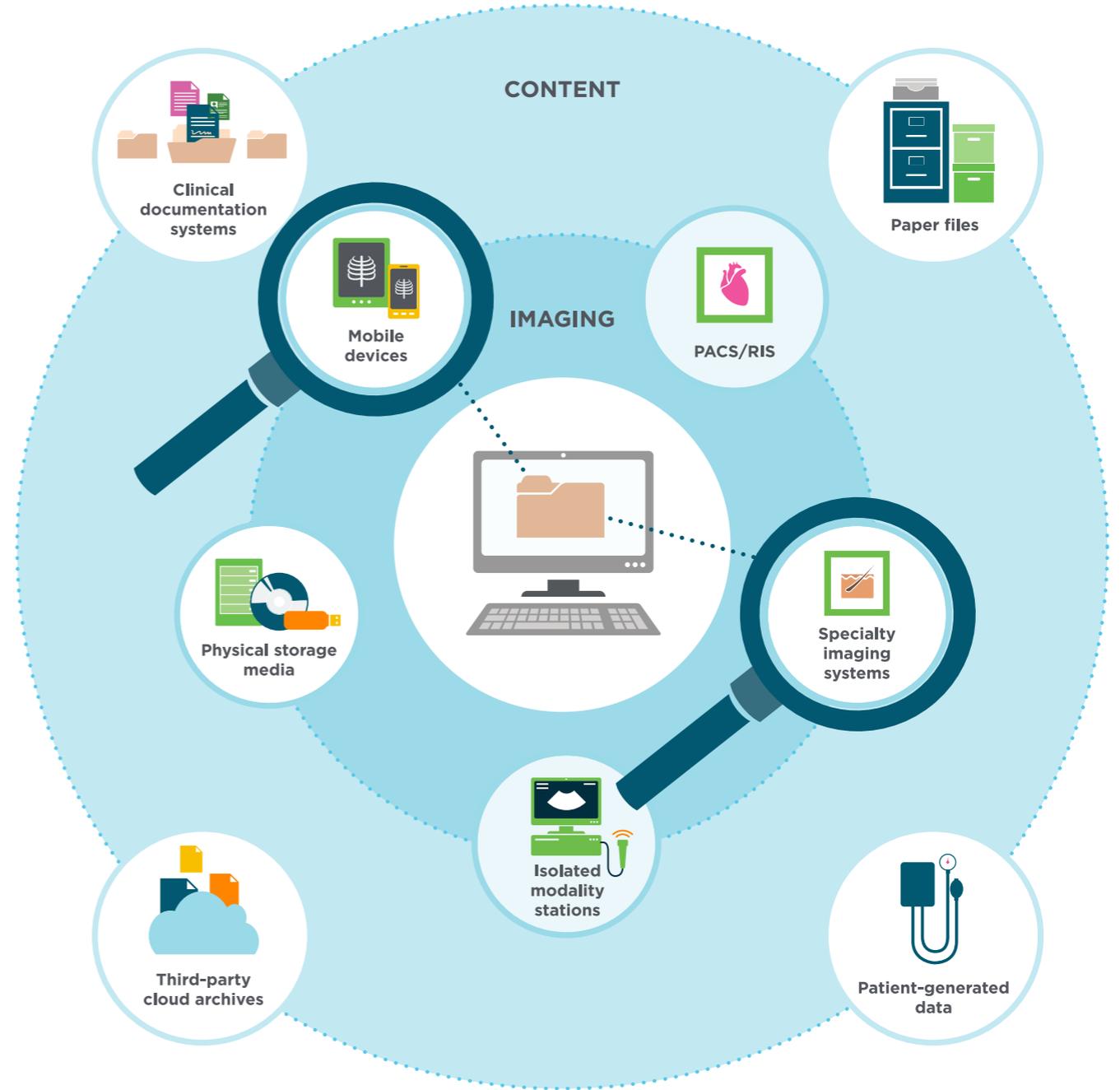
John was aware of this, but even he is surprised by just how much clinically relevant information lives outside his EMR. He's discovering it in all corners of the health system — from legacy systems to specialty department applications to mobile devices.



*According to analysts like Gartner and IDC, as much as **80 percent** of patient information is unstructured* in nature and not natively captured by or stored in an EMR. This unstructured content includes historical paper records and other clinical documents, diagnostic medical images and much more.*

*Source: www.itbusinessedge.com/slideshows/six-reasons-businesses-need-to-pay-attention-to-unstructured-data-08.html

To make his EMR a comprehensive source of all patient information, John will need to identify the major sources for unstructured content, harness it and link it to the EMR system. John knows this will be a journey, but creating individual integration interfaces could be prohibitively time- and labor-intensive, outrageously expensive and may never result in the level of integration desired. Connected healthcare solutions can help John expedite the process more cost-effectively, while laying the groundwork for future interoperability and scalability.

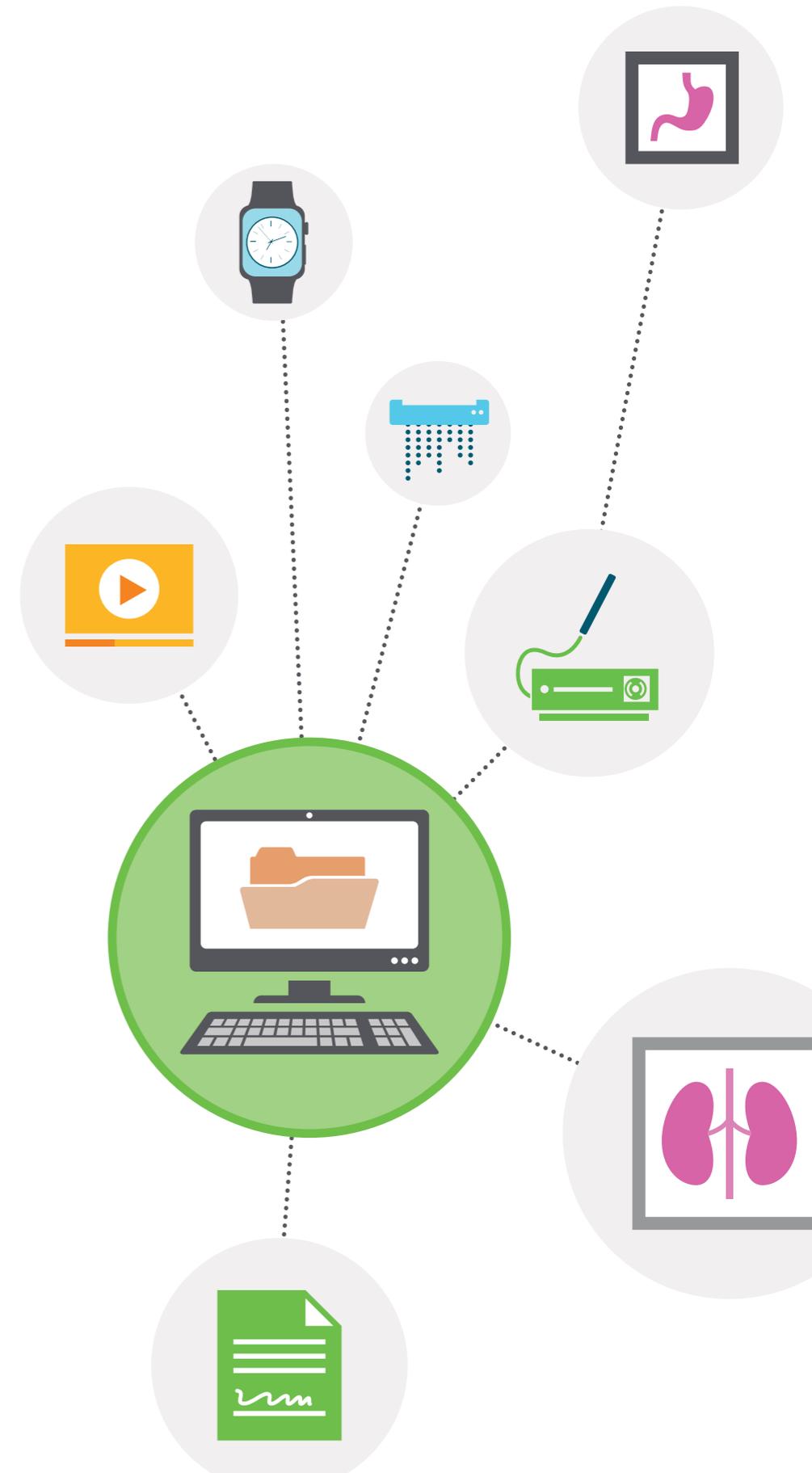


What are connected healthcare solutions?

Connected healthcare solutions are a suite of enterprise imaging and content services tools that allow healthcare providers to create a platform for capturing, consolidating, managing and exchanging unstructured content throughout a healthcare enterprise. These solutions can be implemented together or individually depending on the needs of the healthcare system, but each are designed from the ground up to be open, vendor-agnostic and completely interoperable with new and existing systems.

Connected healthcare solutions enable providers to harness unstructured content from all corners of the healthcare enterprise, regardless of the originating system, and place it at the fingertips of clinical stakeholders by linking it to the EMR. Much like an EMR system serves as an enterprise clinical platform for structured patient information, a connected healthcare platform serves as an enterprise system for unstructured content. When combined, healthcare providers are left with a comprehensive record that provides complete visibility into a patient's medical history. All the data and content clinicians need to make informed medical decisions are easily accessible. No more searching for related documents or imaging studies. No more making diagnoses based off incomplete information.

This type of integration is just what John needs to take his EMR to the next level.



Enterprise-first imaging

REDEFINING PACS



John's take:

"When it comes to medical imaging, I need to serve multiple masters. I need to create a cost-effective infrastructure that enables image exchange and collaboration while keeping both radiologists and primary care physicians happy."

Medical images represent the most significant portion of clinically-relevant data absent from John's EMR. Making these images available to physicians in context of the patient record is not only one of the first steps to becoming recognized as a HIMSS Level 7 facility, it's instrumental to empowering informed clinical decisions and improving patient care.

Simply linking existing picture archiving and communication system (PACS) to the EMR is not a viable option. John's IDN recently acquired a neighboring health system and inherited multiple PACS in the process. As a result, John now has 16 distinct and disparate PACS in use throughout his enterprise. Integrating each of these PACS with the EMR would be a hefty undertaking. Similarly, consolidating these studies into a single "super PACS" would be cost prohibitive due to the data migration fees required to move the data from one proprietary system to another.

Maintaining these multiple PACS is not sustainable and the IDN has plans for continued growth. John needs to find an effective way to consolidate PACS images and link them to the EMR while enabling future flexibility and scalability.

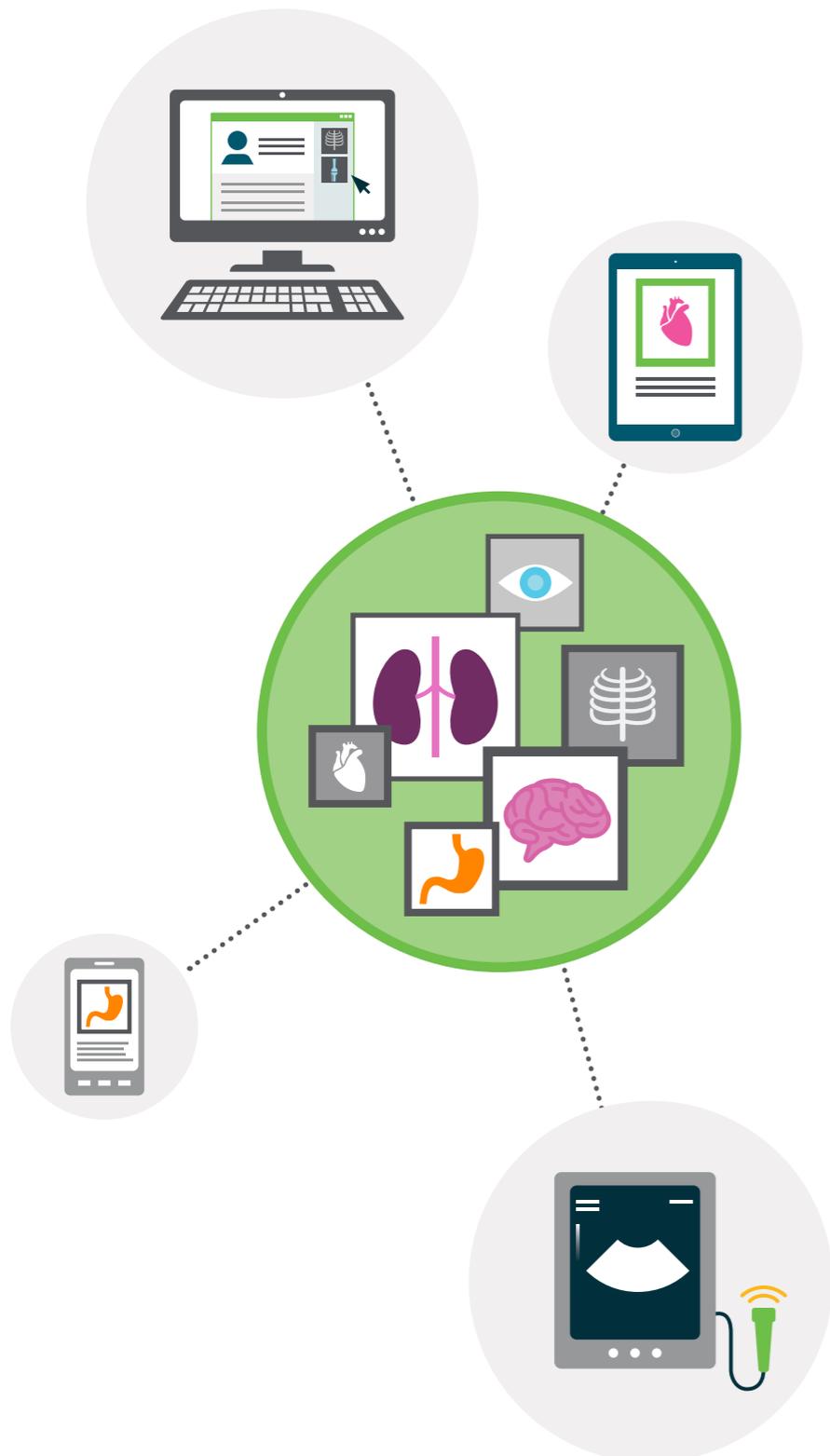


PACS 5-year cost of ownership =

\$2.84 million

per PACS, traditional archive strategy including conversion, migration and project management*

*Source: Sectra White Paper: The Children's Hospital of Philadelphia



How connected healthcare solutions can help

Enterprise imaging technologies such as a Vendor Neutral Archive (VNA) and universal image viewer can help John gain control of PACS images. An independent VNA provides a single repository that seamlessly communicates with relevant IT systems and uses industry-accepted standards to remove proprietary data formatting. A VNA can ingest images from all of John's PACS, providing a foundation for enterprise-wide image access. Plus, because the platform is standards-based, images can be easily integrated with the EMR, and even exchanged with other partners in the care continuum.

A single consolidated imaging repository will also enable John to eliminate many of the 16 PACS in use throughout the enterprise, simplifying the imaging portfolio and significantly reducing the associated maintenance and migration costs. Plus, the VNA will enable future PACS inherited through acquisition to be easily integrated into the enterprise system.

Adding a web-based universal viewer will allow images stored in the VNA to be easily accessed and viewed at the point-of-care via the EMR or remotely via any mobile device with browser access. This will arm physicians with the quick referential image viewing capabilities they need to make informed clinical decisions.

A universal viewer with advanced visualization capabilities can also untether radiologists from their PACS workstations, enabling them to interpret and edit images from anywhere with a diagnostic-grade monitor. This added flexibility will improve their performance and overall job satisfaction.

SPECIALTY CLINICAL IMAGE MANAGEMENT



John's take:

"Clinically-relevant medical images exist in many other systems besides PACS. I'm discovering them in departmental applications in dermatology, ophthalmology, gastroenterology, pathology, surgery and more. Image-enabling the EMR means putting these images in context of the patient record as well."

Most of the medical images and video stored in specialty department systems or isolated modalities aren't based on the DICOM format that PACS use. The majority are visible light images stored as native JPEG or MPEG files. PACS are unable to ingest these images without extensive DICOM-wrapping, which again adds significant cost and labor to the process of centralizing these assets as part of an EMR image-enablement initiative. Furthermore, many PACS viewers don't offer the toolsets or capabilities necessary to effectively display, edit and annotate non-DICOM image sets.

Moreover, John is realizing that these types of images aren't just contained in specialty systems and modalities, they're also floating around on the enterprise-issued mobile devices (e.g. smartphones, tablets, etc.) in use by clinicians in the ER and other points of care. John is not only concerned about the clinical blind spots these images create, but also the potential security risks they invite. The IDN's image management policies and procedures and disaster recovery and business continuity plans currently don't take these images into account. John wants to have better visibility and control over these specialty images, but how?



75%
of medical
imaging assets
are non-DICOM*

VNA study data
expected to reach

7.2 billion
objects per year
by 2021**

*Source: 2013 IHS VNA Study
**Source: Medical Enterprise Data Storage - World - 2017, Participant Summary, IHS Markit

How connected healthcare solutions can help

Because it is vendor agnostic and designed to accommodate multiple standard file formats, a VNA can easily accommodate visible light images in conjunction with DICOM studies from PACS. No DICOM-wrapping is required, which again eliminates added costs.

A web-based universal viewer can provide access to these specialty images at the point-of-care in context of the patient record in the EMR. It also can provide the toolsets necessary for specialists in every department to fully interpret and manipulate their specific image sets.

Finally, image acquisition and connectivity software can be implemented to tap into the camera roll on enterprise-issued mobile devices, pulling these images into the VNA and EMR and restricting their exposure outside the enterprise.

POINT-OF-CARE IMAGE INTEGRATION



John's take:

"Sometimes a clinician needs to capture a diagnostic image during a patient encounter without a radiology order. I've come to learn these images typically remain on the isolated modalities with which they were captured. As a result, they aren't included in PACS and we aren't being properly reimbursed for these services."

The act of clinicians capturing diagnostic images in the ER or patient bedside is becoming more common with the rise of new technologies like the portable ultrasound. These devices help accelerate diagnosis and treatment, but they can often become black holes for patient information. Images captured in this manner typically fall outside structured, order-based radiology processes. As a result, they aren't integrated with or managed by PACS or integrated with the EMR. Also, since orders are never generated for these procedures, providers are often not reimbursed for them, which leaves money on the table.

How much are you leaving on the table?



CPT Code 93306: Echocardiography, transthoracic, real-time with image documentation (2D)

2018 Medicare inpatient global payment:
\$213.78

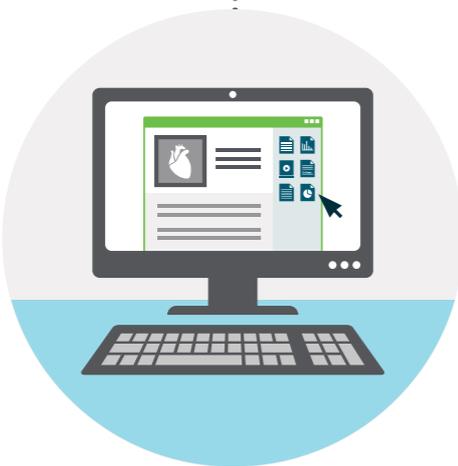
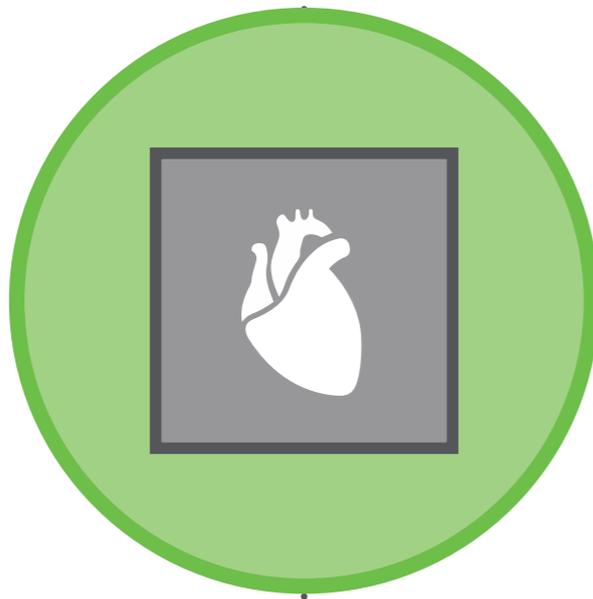
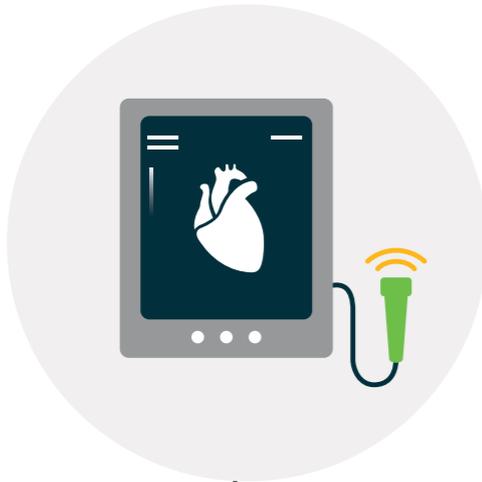
2018 hospital outpatient prospective payment:
\$486.69



CPT Code 76536: Ultrasound soft tissues of head and neck real time with image documentation

2018 Medicare inpatient global payment:
\$119.49

2018 hospital outpatient prospective payment:
\$144.46



How connected healthcare solutions can help

Using a combination of image acquisition and connectivity software, a VNA and a universal viewer, John can bridge the DICOM worklist gap that currently exists between most point-of-care imaging devices and PACS. Imaging orders can be automatically generated when the procedure is entered into the EMR by pushing an HL7 message to the point-of-care imaging device where a DICOM worklist query can be performed. Once the image is captured, a link to the study can be sent back to the designated PACS, VNA or EMR. Using this approach, John can ensure point-of-care images are included as part of the patient record and tracked for proper charge capture.

Content services

PATIENT REGISTRATION



John's take:

"There is nothing patients hate more than filling out the same medical forms over and over again. It would be ideal to leverage our EMR to ease this burden for patients while streamlining clinical and administrative workflows."

The current patient registration process throughout John's IDN is paper-based and manual. Patients must fill out paper medical forms, often multiple times, and administrative staff scans and indexes this information for inclusion in the EMR.

Furthermore, patients often bring historical medical information with them for physicians to review during an exam. The influx of paper is inefficient and susceptible to loss and human error.



Average minutes dedicated to each element of a doctor visit

Filling out paperwork and forms:
8 minutes

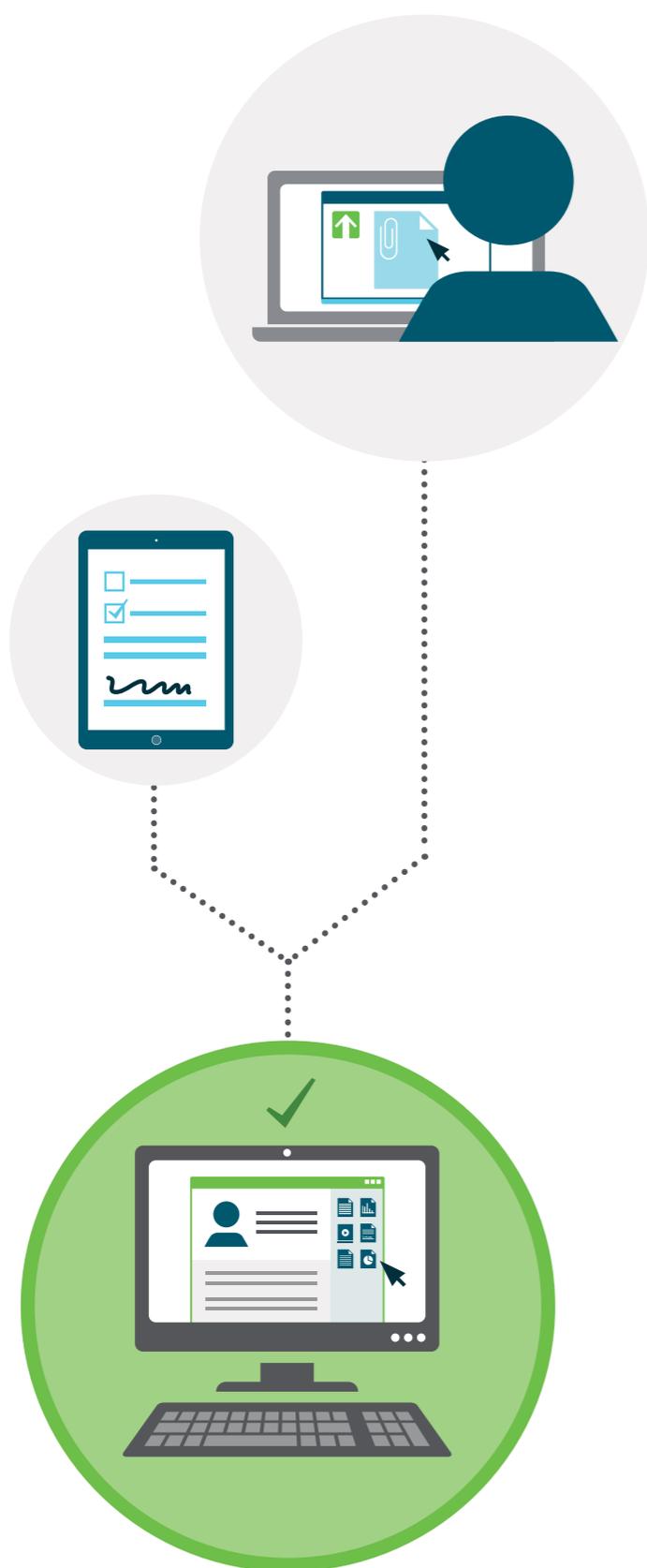
Waiting in the waiting room:
18 minutes

Waiting in the exam room
11 minutes

Being seen by a doctor:
16 minutes

53 minutes total

*Source: Concierge Key third-party research

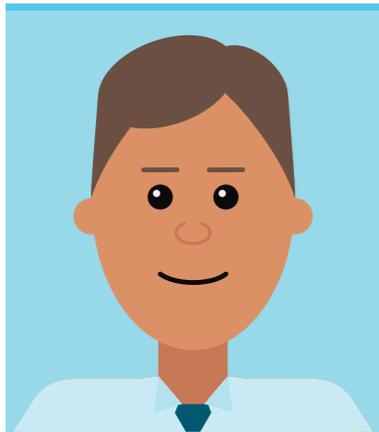


How connected healthcare solutions can help

Using a mobile capture content service, John can enable the electronic completion of patient registration forms. This solution can integrate with the EMR to prepopulate fields already recorded in the patient record, allowing patients to focus on adding new information. Patients have the option of completing the electronic forms onsite using a tablet or at home prior to an appointment via a secure login on their personal computer or mobile device.

The mobile capture solution also integrates with the EMR patient portal, allowing patients to electronically upload any related health content (e.g. photos, scanned documents, Word files, etc.) directly to the EMR. Administrative staff will no longer need to scan and index registration forms and accompanying documentation. They can now focus on higher value tasks, while patients spend less time in the waiting room filling out forms.

CLINICAL CONTENT MANAGEMENT



John's take:

"Clinical documents — both paper and electronic — reside in systems throughout our enterprise. Some are stored in departmental content management solutions, while others simply reside in Microsoft Office folders. Many of these documents are relevant to a patient's medical history, but few are accessible via the EMR or included as part of a patient's overall health record."

Clinical documents — whether referral letters, transition of care documents, or clinical narratives and notes — often contain information critical to patient care. These documents can originate as paper, electronic documents, fax or email and are often stored at all corners of the enterprise in multiple systems from different vendors. Consolidating this documentation and linking it to the EMR can be a challenge.



How connected healthcare solutions can help

An enterprise information platform can help John provide a single foundation for the management of clinical documents throughout the IDN. Based on open standards, this platform can integrate with existing legacy systems and consolidate clinical documents in a single archive for easy access, management and retention. The platform can be deployed enterprise-wide and customized to meet the specific needs of each department. Automated workflows can be created to ensure time sensitive information gets to the right people to support, faster more informed decisions. Furthermore, the platform can be easily integrated with any EMR, allowing John to make his core clinical platform even more valuable and content rich.

HEALTH INFORMATION MANAGEMENT



John's take:

"Many of our current patients received care at our health system long before we implemented an EMR. We have file rooms full of historical paper medical records that aren't currently linked to the EMR. Without access to these documents via the electronic record, our clinicians only have a partial view of the patient's medical history."

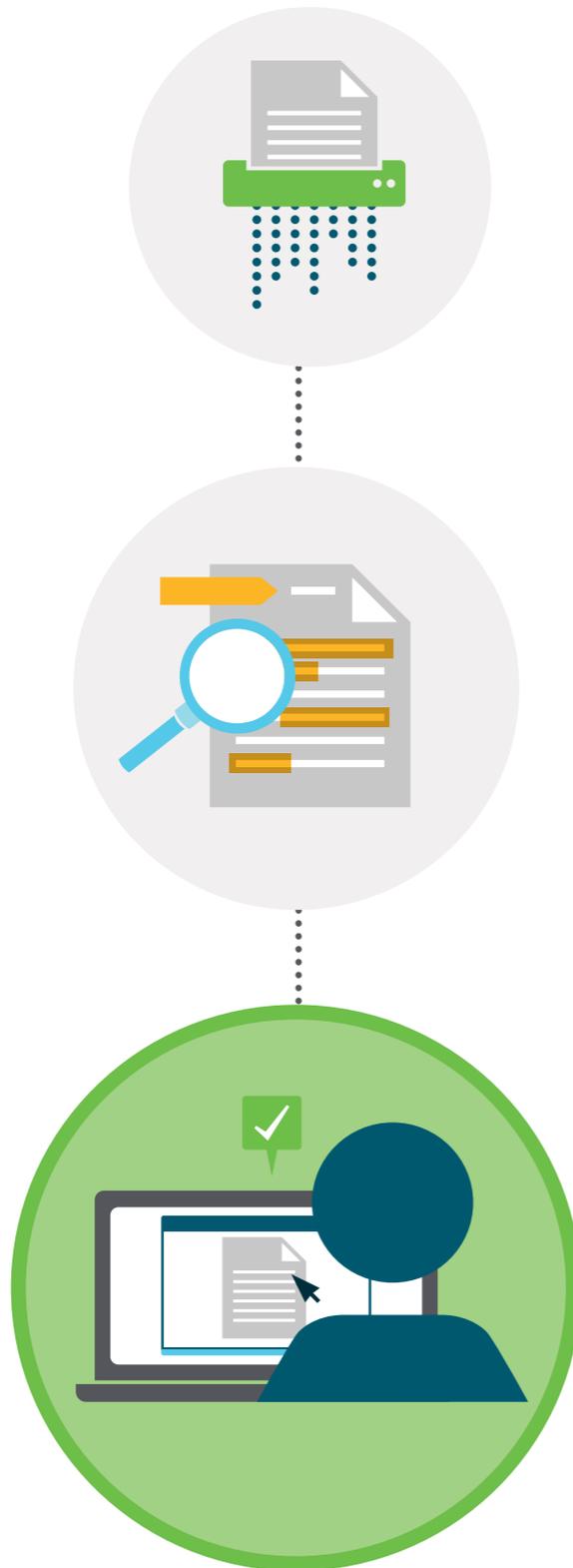
Until recently, health information management (HIM) was a paper-based process and certain aspects of it still are. The move to EMRs means ensuring traditional paper files are reconciled with new electronic records. Using traditional methods, this can be a labor-intensive and time-consuming process that requires staff to scan and index millions of pages of clinical documents and link them to the EMR. This effort can take several years to complete and is vulnerable to human error.



of all U.S. hospital spending consists of administrative costs



*Source: A Comparison of Hospital Administrative Costs in Eight Nations, Health Affairs 2014



How connected healthcare solutions can help

Using medical records classification, John can streamline the process of making historical paper records accessible via the EMR. The solution automatically captures and identifies document types — with the option to assign visit numbers and patient identifiers — and routes exceptions to staff to review. By automating time-consuming, error-prone documentation tasks, John expedites information availability while freeing his HIM staff from an administrative burden.



Connected healthcare to the rescue

There is a wealth of unstructured information John must link to the EMR to make it the single source of patient data he and his clinicians need it to be. This will be a journey, but by building a connected healthcare infrastructure using open, standards-based technologies, John can ensure he meets the needs of today while ensuring the interoperability to quickly scale in the future. With a connected healthcare platform, John can create a super highway for getting diagnostic images, photos, video, clinical documents and other unstructured content into the EMR. By infusing this core clinical platform with the missing 80 percent of patient information, John optimizes his EMR investment, making it a more valuable resource for clinicians by ensuring it contains all the content necessary to empower informed medical decisions.

About Hyland Healthcare

Hyland provides connected healthcare solutions that allow organizations to harness unstructured content at all corners of the enterprise and link it to core clinical and business applications such as electronic medical record (EMR) and enterprise resource planning (ERP) systems. Hyland is the only technology partner that offers a full suite of content services and enterprise imaging tools, putting clinical documents, medical images and more at the fingertips of the healthcare stakeholders that need it most. This comprehensive view of patient information accelerates business processes, streamlines clinical workflows and improves clinical decision making.

Recognized as a Leader in Gartner's Magic Quadrant for Content Services platforms, Hyland is dedicated to ensuring its solutions adhere to the latest industry and interoperability standards. More than 50 percent of the U.S. hospital market trust connected healthcare solutions from Hyland Healthcare to manage their unstructured patient content.

Hyland[®]

Learn more at [Hyland.com/Healthcare](https://www.hyland.com/Healthcare)