

New Radiology Infrastructure Delivers Efficient Information Sharing By Existing RIS/PACS Platforms

SuperPACS™ Architecture Boosts Productivity, Lowers Costs For Imaging Services Providers

*By: Patrick Koch
Director of Worldwide Marketing
Healthcare Information Solutions
Carestream Health, Inc.*



New imaging modalities generate increasingly detailed information that can lead to greater diagnostic accuracy and more responsive patient care. However, the need to review, report, store and manage all of this information places additional responsibility upon healthcare providers with limited staff resources and budgets.

Hospitals, outpatient imaging centers and other multi-specialty clinics across the globe are also forming larger organizations to achieve economies of scale. The result is healthcare networks with multiple locations that serve a geographic region or even an entire country.

How can we efficiently serve these multi-site organizations and manage this data to derive maximum patient benefit at a reasonable cost? The answer lies in new information management technology that equips healthcare providers to streamline the delivery of radiology services through better utilization of personnel and equipment and enhanced sharing of patient information.

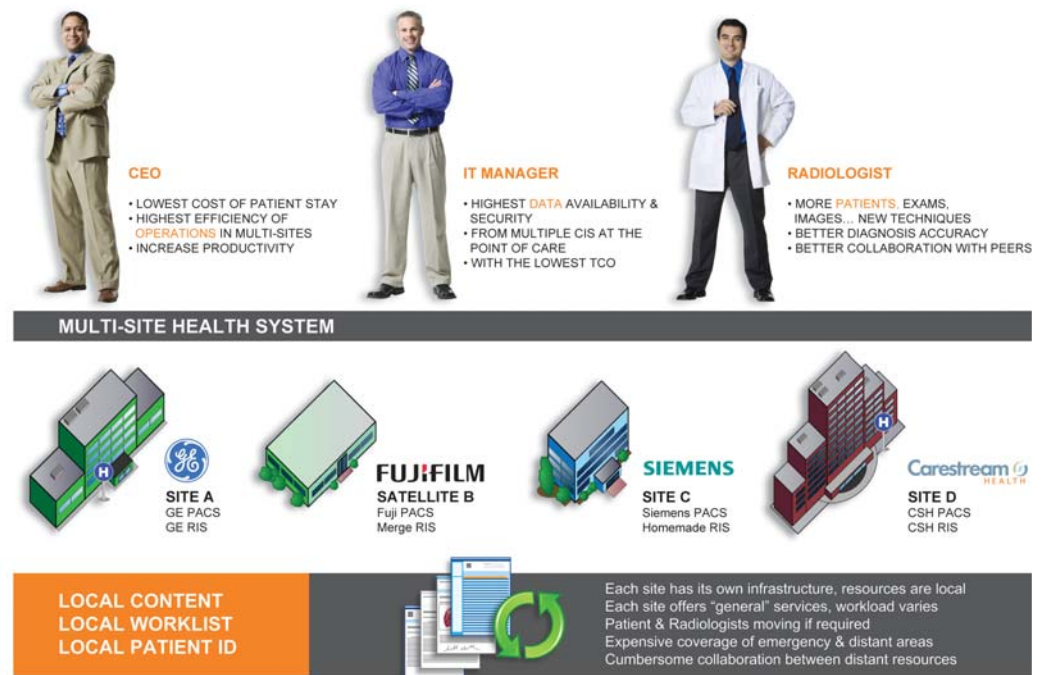
Current Infrastructure Designed for Local Use

Healthcare organizations are looking for efficient and inexpensive ways to support shared access to patient images and information. They face significant limitations since each facility's infrastructure was initially designed to manage, read and store radiology exams locally. Current workflow challenges include:

- The imaging workload varies at each site, with bottlenecks and peaks in some locations while others experience lower activity.
- Radiologists often travel to provide reading services at multiple sites and patients also travel to different facilities to obtain specific imaging services.
- Radiologists and clinicians have to be trained on multiple systems with different graphical user interfaces.
- Providing reading services for remote areas and emergency cases is expensive.
- Collaboration between distant resources is cumbersome.

Figure 1.

Top 3 Issues for Decision Makers



In addition, each site uses a different patient identification, making a single view of patient history across all the enterprise almost impossible. Also PACS-to-PACS communication must use uncompressed DICOM format (which is very slow) and this method duplicates studies, which increases the need (and cost) of data storage. For all these reasons, linking disparate RIS and PACS platforms directly has proven difficult, expensive and inefficient. The alternative of replacing all the legacy RIS and PACS systems with a solution from a single vendor is not financially sustainable.

In an attempt to address these issues, Carestream Health has designed a new approach that employs a SuperPACS™ Architecture to integrate existing RIS and PACS systems throughout the enterprise. This will allow healthcare systems with disparate RIS and PACS platforms to achieve a holistic view of the patient, the resources and the workflow—despite the fact that data is stored on a variety of systems and platforms in different locations.

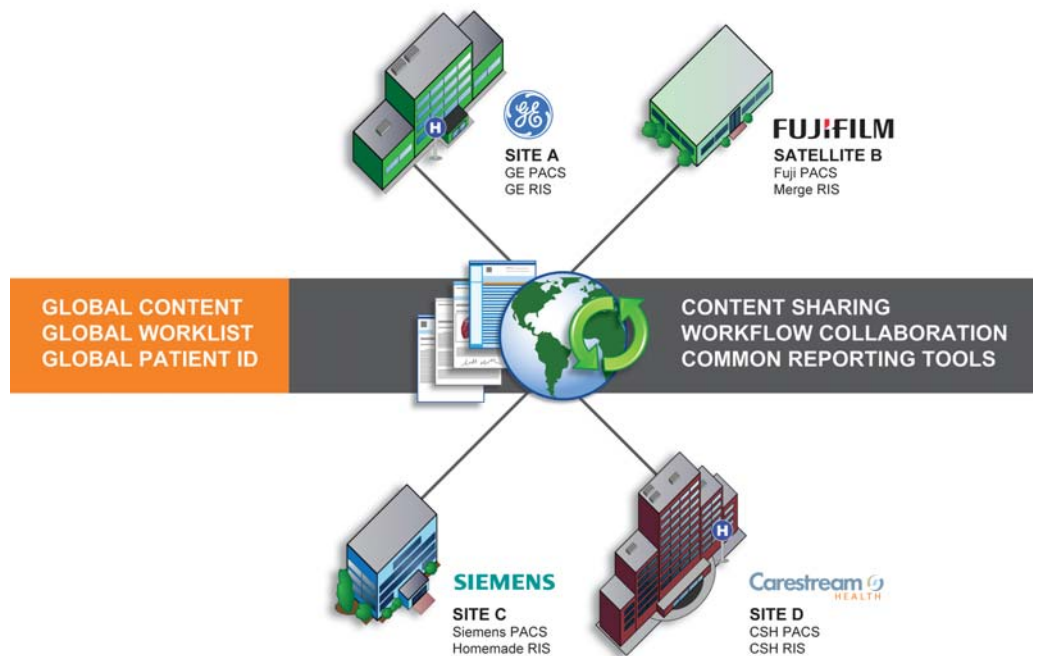
Global Worklist Can Expedite Delivery of Report

In this environment, each RIS and PACS platform communicates with the SuperPACS Architecture through a local node. This new grid infrastructure collects patients and study information from each RIS and PACS database to create a centralized and synchronized virtual database. The new virtual database allows patient content to be readily accessed by authorized clinicians at any location, from any system. This platform can accommodate multiple patient identifications and diverse document types using IHE XDS Registry and Repository profiles.

Figure 2.

Next Gen Solution: Virtualize Existing RIS/PACS...

CARESTREAM RIS/PACS WITH SuperPACS™ Architecture



It also creates a global patient worklist that consolidates local worklists from multiple locations so each radiologist (at any location) can access the list of unread exams as well as prior exams and patient history across the entire healthcare organization. Load balancing among available radiologists can be based on pre-defined thresholds of the studies, also called “threshold reporting.” Priorities and rules of assignment can be programmed into the system to designate the most appropriate radiologist based

either on skills, sub-specialization, availability or current workload. Images, annotations, measurements and reports are automatically sent back to the original PACS and RIS.

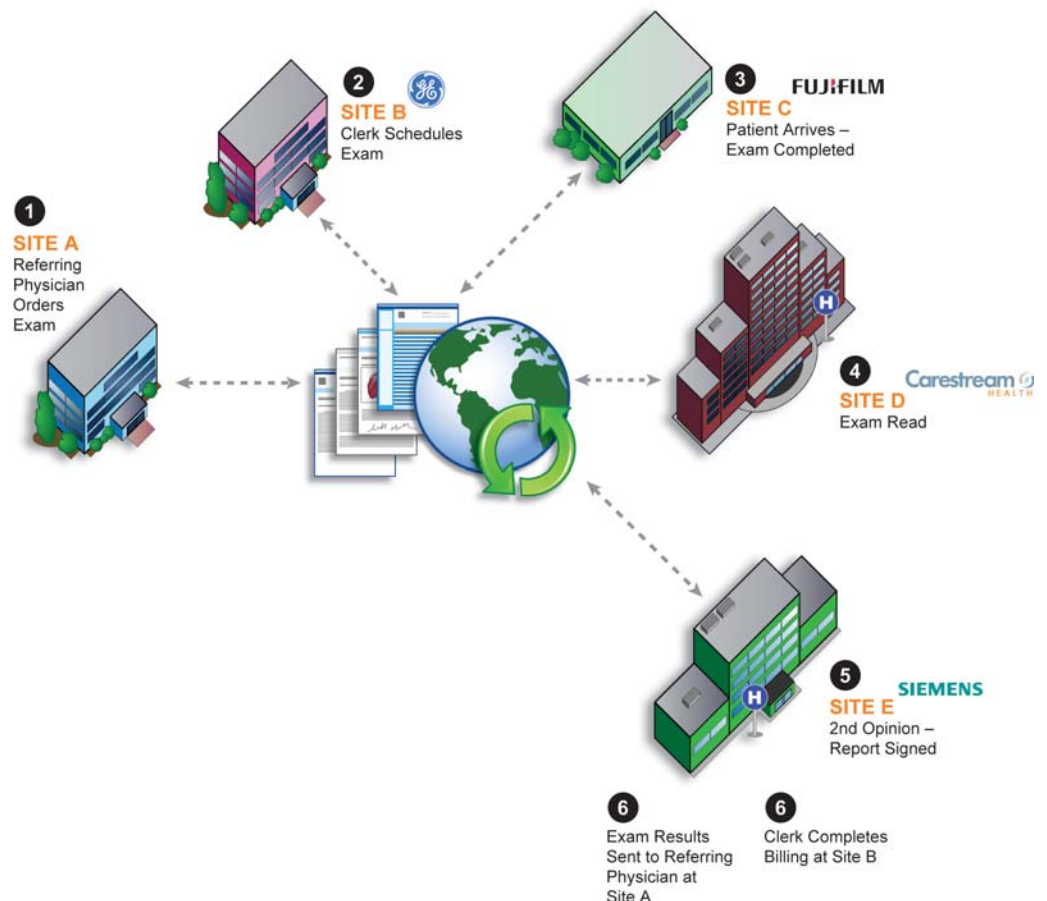
Here is an example of the new virtual workflow in a multi-site environment:

1. A clinician, sitting in a remote clinic, orders an imaging exam by logging into a Web-based RIS portal.
2. A scheduling clerk in the main administrative office schedules the imaging exam at the location closest to the patient's home.
3. When ready, the imaging exam is sent from the local PACS to the SuperPACS. This exam becomes part of a global worklist and is automatically assigned to the appropriate radiologist (based on customer-defined rules) for immediate review. This radiologist can be based at any location including a home office.
4. Second opinions can easily be obtained for complex cases since each user has access to advanced collaboration tools such as instant messaging and a shared desktop.
5. The report is then dictated (eventually using speech recognition) and signed. The SuperPACS sends it back to the originating RIS and PACS.

Figure 3.

Virtualize Your Enterprise Workflow

CARESTREAM RIS/PACS WITH SuperPACS™ Architecture



On top of expanding the reach of the radiology workflow to requesting physicians, this new Web-based RIS/PACS architecture can dramatically shorten report turnaround time and expedite reporting to referring physicians. As a result, patients can receive more responsive diagnosis and treatment. Critical results can also be identified and placed into a specialized, high-priority workflow in which exam notifications are sent (based on a predetermined frequency) until receipt is acknowledged.

Infrastructure Delivers Both Cost, Efficiency Improvements

This new infrastructure presents a significant improvement to the delivery of radiology services that should delight CEOs as well as radiology managers. Eliminating travel for radiologists is an obvious opportunity for time and cost savings. Creating virtual radiologist pools to balance the image reading workload can dramatically improve the productivity of scarce radiologist resources. Threshold reporting continually monitors exam volume and automatically routes exams to the most appropriate radiologists based on pre-determined rules.

Radiologists' productivity is further improved with the new advanced report generation offered by this breakthrough architecture, which utilizes exam type to provide the radiologist with a set of structured answers to use as the basis for report creation. It will also provide a standardized format for reporting that improves readability and understanding across the continuum of care.

Leveraging the virtualization capabilities of this new solution enables any authorized user to execute any step of the workflow from anywhere across the entire enterprise. This allows healthcare systems to build virtual pools of scheduling clerks, transcriptionists and 3D lab technologists. More effective use of these personnel resources can result in a higher utilization rate and a lower cost per study.

Screening campaigns also can benefit from an automated workflow. Studies can be automatically routed to multiple radiologists at different locations for primary and secondary reading and double blind reading. Reports can be efficiently routed back to the centralized location.

Additionally, CIOs and IT managers will be able to consolidate their IT infrastructure across all sites to achieve higher data availability and disaster recovery at a lower total cost of ownership. IT staffs also gain the flexibility to build enterprise repositories of patient-centric information in secure data centers or keep data in the legacy archives.

New Reading Tools Expedite Comparisons of Complex Exams

But this is just the beginning. Radiologists are in great need of enhanced reading tools that can expedite interpretation and reporting, particularly for complex exams where data sets need to be compared. While dedicated 3D applications provide advanced tools, it is much more efficient (and less costly) to access these applications from the PACS desktop.

In addition to embedding MPR, MIP, volume rendering, vessel tracking and cardiac analysis tools, the latest version of CARESTREAM PACS offers:

- Real-time volume matching and automatic registration for CT, MR and PET/CT exams to synchronize views of the region of interest from multiple data sets and makes it much faster and easier for radiologists to measure and compare tumors, nodules and other anatomical structures. This capability speeds the comparison of current and prior cases, which can dramatically improve report turnaround time and help enhance diagnostic accuracy.
- A power viewer that builds a single virtual study with real-time volume matching of all relevant studies (new and prior) to automatically register and synchronize them in one click.
- Native PET/CT reading with full functionality for image manipulation including fusion, synchronized views, standard uptake value and volume matching comparison of current and prior cases.

Platform Delivers Holistic View of Patient Information



Efficient and convenient sharing of patient information requires innovative information storage and management architectures. To that end, Carestream Health is transforming the traditional radiology archive into a patient-centric repository of fixed clinical content. Clinicians gain a single point of access and convenient user interface to review patient information that is stored on a variety of different systems in different locations. Radiologists will also enjoy the convenience of accessing needed patient information such as laboratory reports from their PACS desktop.

With this technology, physicians and specialists can make better decisions in less time, and avoid the days it currently takes to locate and view patient records stored in isolated information systems.

When these repositories are combined with fully featured viewing and distribution capabilities and linked with electronic medical record platforms, healthcare providers will—for the first time—be able to provide a single view of all patient information and apply the full utility of information technology to the delivery of patient care.

Further increases in efficiency, quality and productivity are needed as providers worldwide are asked to deliver an expanding number of procedures and services with a limited workforce and budget. Technology has the opportunity to link information in ways never before possible while enabling cooperation on regional, national and international levels. This combination of technology and community promises to spur continued innovations in healthcare that can both enrich and extend human life.

For More Information

To learn more about CARESTREAM RIS/PACS and SuperPACS Architecture, contact your Carestream Health representative, call us at 1-877-865-6325, ext. 655, or check us out on the web: www.carestreamhealth.com/superpacs.

SuperPACS™ ARCHITECTURE and CARESTREAM PACS information is provided for planning purposes. Commercial availability is pending submission to and clearance by FDA and other regulatory agencies.