



# A partner for growth

## Philips iSite PACS the one solution for Carolinas HealthCare System

### Who/where

Carolinas HealthCare System  
Charlotte, North Carolina

### Challenge

Find the right PACS solution capable of rapid expansion in a cost-effective manner

### Solution

Philips iSite PACS including iSite Enterprise, iSite Radiology and iVault

Flexible and scalable in its technology *and* business model, iSite PACS meets the demands of this multi-hospital healthcare system.

Philips iSite PACS handles more than one million imaging studies per year for Carolinas HealthCare System.

As the largest public healthcare system in the Carolinas and one of the largest in the country, Carolinas HealthCare System (CHS) continues to rely on iSite PACS to keep pace with its dramatic growth.

So how did an organization of this size select and implement a PACS solution capable of such scalability? It began several years ago with a decision that proved insightful – an iSite Enterprise installation that turned 6000 – plus PCs into PACS viewing stations.

### A break from rigidity

Trapped between a growing demand for access to digital images and a cumbersome PACS, radiologists at Carolinas Medical Center (CMC), flagship facility of CHS, needed to find an alternative.

“Our legacy PACS product had a 10 workstation limitation,” recalls Wilford Greene, assistant director of radiology. “We had grown it to 11 workstations, but the vendor greatly discouraged us. So we began looking for a product that could be more distributed.”

Chris Ullrich, MD, neuroradiologist and former chief of radiology at CMC, describes their search for a more flexible solution, “We wanted a solution that could be deployed in a cost-effective manner, that could be accessed from anywhere in the enterprise, that was very flexible, and could be administered in a practical fashion.”

### Off to a promising start

After much consideration, CHS chose to implement Philips iSite Enterprise, the web-based image and information management system, to power their legacy PACS.

Initial plans were to network four core hospitals, Carolinas Medical Center, Carolinas Medical Center-Mercy, Carolinas Medical Center-University and Carolinas Medical Center-Pineville. The IT group hoped to piggyback on an available financial system architecture that linked PCs in each institution.

Placement of a pilot server and software got the system up and running in short order. “The radiologists were really impressed with the results,” says Greene. “They said, ‘We can read off this the quality is so good.’ We quickly saw that iSite PACS had great potential!”

# PHILIPS

## Technology that makes sense

Over the next couple of years as the iSite PACS product matured, CHS began its rapid growth. Implementation of an expanded suite of iSite PACS solutions brought access to diagnostic quality images to a broadening CHS audience.

Each element of the iSite PACS suite is now firmly integrated into CHS.

- **iSite Enterprise** – access to diagnostic quality images and patient information in three seconds or less anywhere across the enterprise
- **iSite Radiology** – an advanced radiology workstation with integrated advanced visualization functionality
- **iVault** – always online medical image storage solution with automated off-site disaster recovery services

Dr. Ullrich credits two characteristics of iSite PACS technology for allowing its quick adoption. First is the fact that iSite Enterprise is web-based, so clinicians have access to images, patient records, and radiology reports wherever the hospital network reaches.

Second is the iSyntax delivery technology. This just-in-time technology encodes the data into wavelets and delivers just the required amount of data to match the display resolution of the user's monitor rather than pushing the entire dataset.

"iSyntax has allowed us to gain excellent performance even on portions of the network that aren't high bandwidth," notes Ullrich.

Wilford Greene concurs, "iSite PACS uses iSyntax for efficient bandwidth utilization so referring physicians can look at images real-time without any problems and allows them to look at full-fidelity DICOM images remotely at the speed that iSite PACS offers."

"The ability to do least-cost retrieval is a tremendous benefit to us as well," adds Greene. "We can have an on-site DICOM processor pull local studies from the cache module and shared studies from our data center - this saves a lot of bandwidth.

Unlimited licenses, support, hardware obsolescence protection, future software upgrades and implementation services are all included in this fee-per-study model. The administration at CHS immediately recognized the benefit of this financial constant.



"In fact," he continues, "we ran one imaging center over a T1 line for more than a year. That site had two CT scanners, two MRIs, three ultrasounds and an X-ray system, along with two radiologists working full time. We'd have been unable to do that if those radiologists had to pull all studies back across the T1 from our main data center."

## Financial viability

Technological flexibility and scalability are critical, but a PACS system that expands rapidly must make good business sense from the start. In addition to a large initial outlay, traditional PACS can require ongoing capital expenditures for additional licenses, upgrades, support and hardware. iSite PACS simplifies this with a fee-per-study service-based delivery model.

Greene remarks, "Rather than trying to justify \$4 million in capital expense for a PACS system, we converted our old film costs into operating costs. That has helped us move even faster into the PACS world."

"In the current economic downturn, a lot of institutions have frozen capital spending," suggests Ullrich. "In that case, when you reach the end of your capacity, you either have to find capital or defer the upgrade until the economy improves. With the fee-per-study model, we are simply paying in proportion to our revenue stream. Our goal is to get that per-study or per-unit price to a level where it matches our revenue and leaves us a margin that is acceptable. We are achieving that."

“We have almost eight years of data from some of our core operations, all still online and immediately available, which is stunning.”

Chris Ullrich, MD  
Neuroradiologist, Carolinas Medical Center

### Continued Growth

Today, with 29 associated hospitals and more than 500 care locations, the CHS enterprise is far-reaching. Access to Philips iSite PACS is gradually added to new facilities as they come aboard and physicians joining the network get an introductory packet that contains instructions on the use of the iSite tool.

“Often, these new hospitals have their own RIS and HIS,” says Greene. “So, we put them on iSite PACS a little at a time and slowly grow them till they get to the point where they want to fully integrate their RIS. It’s easy to accomplish this because Philips iSite PACS is such a scalable product.”

With facilities ranging from clinics to therapy centers, hospitals to ambulatory surgery centers, patients often travel from one CHS site to another for medical treatment. No matter where they go in the system, their electronic medical record and associated imaging studies are available. Referring physicians take advantage of iSite PACS ability to present every study in a chronological fashion, allowing for detailed review of the patient’s care history.

Dr. Ullrich describes the versatility. “CHS has an organization called the Carolinas Physician Network with more than 700 referring physicians in offices around the Charlotte region. Images from most major offices are being archived in our central iSite PACS archive. So, when a patient comes into one of our hospitals, all their office X-rays are instantly available to us.

“Everybody knows that their productivity has been enhanced dramatically by instituting this kind of a system-wide solution,” adds Ullrich.

### Benefits of rapid access

“Our entire hospital enterprise has become much more efficient in a variety of ways,” claims Ullrich. “Fast data access leads to rapid interpretation of urgent or stat cases where the image and report reach the desktop almost instantaneously.”

- An X-ray of a broken bone taken in an urgent care clinic is immediately available to the orthopedist in the nearby hospital
- Physicians in the local clinic can consult long distance with sub-specialty radiologists while both look at the same study
- While a trauma patient is in transit in the helicopter, doctors in the ER are looking at images and making treatment decisions before the patient arrives
- Surgeons in the OR can compare multiple modality images, past and present, calling any image from the patient’s timeline in three seconds or less

“It is an extremely powerful decision support and efficiency tool for primary care physicians. It’s a very powerful engine for enhancing the productivity of our radiologists, our nurses and our operating teams – it’s palpably better than anything we’ve had before,” adds Ullrich.

### Open architecture, future flexibility

How does a good product get better? iSite PACS ability to add third-party image processing, workflow and diagnostic tools via an open application program interface (API) gives users the ability to customize the tool to suit their specific needs with:

- Advanced search and communications
- Pre-operative planning tools
- Digital templating
- Voice recognition software

“There are opportunities as well as challenges ahead for CHS,” Ullrich points out, “but because iSite PACS has a flexible API, it is the best suited to third-party applications running on it. So we will be adapting a variety of customized software solutions to overlay the basic iSite PACS infrastructure in a manner we could not have implemented with a competitive product. It is perfectly situated as we look toward Web 2.0 applications.”

Carolinas HealthCare System has pursued a unified vision of distributed technology. The Radiology and the Information Technology departments work closely together to achieve synergies of success over time. Implementation of iSite PACS continues to be a joint effort between the two. This effort results in patient information that is organized, comprehensive and readily available across the enterprise.

Ullrich believes iSite PACS has been a success. He concludes, “iSite PACS works. Radiologists are highly satisfied. The physician community has enthusiastically embraced it. It’s fair to say that iSite PACS is the most successful IT endeavor that CHS has undertaken in terms of adoption and use. It’s one of the only projects where people go out of their way to thank the administration for having done it.”

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