Torrance Memorial Medical Center
The Benefits of Enterprise-wide PACS

Facts and Figures
377 bed community hospital

225,000 imaging studies per year

"Go Live" Date: August 1, 2002

Modalities: CT, PET/CT, CR, MR, NM, US, Fluoro, and Mammography

RIS: Cerner Classic

Issues

Torrance Memorial needed a PACS that would fit its environment but the team did not have much PACS experience.

Solution

The hospital implemented Philips iSite "Enterprise First" PACS which they now consider one of their most successful initiatives.

Impact

Minimal staff needed to administer system

Improved workflow and patient care

Significantly decreased clerical errors

100% filmless throughout enterprise (except in OR and by special request)

20% increase in CT and 30% increase in US readings without increasing headcount

Customer Profile

The South Bay's first hospital, Torrance Memorial Medical Center was founded in 1925 and moved to its present 24-acre site in 1971. Torrance Memorial is a fully accredited, full service, 377 bed, nonprofit community medical center. Serving more than 300,000 people a year, the hospital continually grows and expands to meet the community's healthcare needs.

Torrance Memorial conducts approximately 225,000 imaging studies annually, including CT, PET/CT, CR, MR, NM, US, Fluoro, and Mammography. The radiology group includes 12 radiologists (with only 8 working on any particular day), and provides teleradiology coverage from 9 p.m. to 6 a.m. A pioneer in prevention, education, and community services, Torrance Memorial conducts business consistent with its values of service, excellence, knowledge, community, and stability.

The Challenge

When Torrance Memorial began its search for a Picture Archive and Communications System (PACS) in 2000, the staff lacked a general consensus on PACS strategy, had very little PACS experience, and were already committed to other significant projects, including a seismic retrofit. Additionally, the hospital did not have an Information Technology Director and the existing IT department was spread thinly across multiple projects.

Torrance Memorial's existing processes were very routine—the clerical staff managed the file room and distributed printed film throughout the enterprise. Although PACS was not scheduled to be addressed for another four years, the hospital's radiology department took the initiative and advocated for earlier deployment, seeking to address rising film costs, workflow efficiency, radiology satisfaction, referring physician and technology acceptance, and IT concerns.

TORRANCE MEMORIAL
MEDICAL CENTER

The Solution

The Philips Pilot Program gave Torrance Memorial the opportunity to fully evaluate the impact of PACS in its existing environment without financial risk. The Pilot enabled the hospital to develop institutional expertise with soft copy distribution and viewing, as well as gain user buy-in. The staff was able to determine if the existing network was sufficient for image distribution and evaluate the DICOM compatibility of their modalities.

Torrance Memorial considered other PACS vendors but felt that, overall, the offerings available were generic with limited legacy technology. "It seemed to me that everyone had a very common front-end user interface. The iSite user interface—with complete patient history timelines, relevant studies, and immediate access to all images with a single mouse click—was very different and attractive. This really drew us away from other vendors and set them apart," said Dr. Albert Grabb, Chairman, Department of Radiology at Torrance Memorial.

"Testing iSite PACS before committing to a contract was pivotal for Torrance's administration. No other vendor offered this unique product evaluation," noted Grabb. "After we installed the pilot, there was unanimous staff buy-in within three weeks. It was very easy for us to demonstrate to the administration the benefits of a full PACS deployment. If a hospital wants to create a stimulus for moving forward with PACS, it really needs to take advantage of the Pilot Program."

Moving to Full PACS

Philips' image delivery solution, iSite Enterprise, was fully deployed in September 2001. Minimal site preparation was required (no RIS integration) and the system was up and running within a day. Initially, the focus was on CT, but within a few weeks MR was added. Within 6-8 weeks, acceptance grew as priors became available on the server and a handful of clinicians were given WAN access from home or office through a virtual private network (VPN).

According to Ben Richard, Radiology/PACS System Administrator at Torrance Memorial, the training went smoothly: "iSite really is the easiest product to use. You can train a physician within five to ten minutes, which is unheard of with any other DICOM viewer that I have seen."

iSite training classes were developed to educate users and create super users to "teach the teacher." In just four months, a relatively indifferent group of people became convinced that PACS was a top priority. Throughout the hospital, everyone liked iSite Enterprise's speedy distribution of images across the enterprise, iSite Radiology's three-monitor reading station, and iVault's always online storage archive.

In April 2002, the Torrance Memorial team visited UC Davis Medical Center, one of the first iSite PACS installations, and by the end of the month preparation began for the move to full PACS. The PACS and Cerner Classic RIS were integrated with minimal hardware upgrades. The hospital's iSite PACS went live on August 1, 2002.

"RIS integration is a very important piece of the larger PACS picture," said Dr. Grabb. "We thought that we would be filmless in CT with just Web distribution, but the percentage of errors made by technologists incorrectly entering demographics is upwards of 20–25%. You cannot have a clean database until you implement RIS integration and features such as DICOM Modality Worklist."
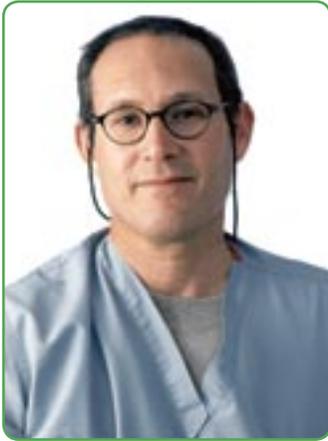
Realizing the Enterprise-Wide Benefits of PACS

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Minimal Staff Requirements

Torrance Memorial did not have the funds to dedicate staff to PACS administration. A few IT staff were needed to support the digitizer and hardware, but administratively, iSite is very self supportive. Additionally, Philips' 24/7/365 Heartbeat monitoring provided a much needed security blanket.

"Torrance Memorial's IT department is extremely impressed with Philips' product architecture and is a strong advocate for this project," said Dr. Grabb. "Implementation of Philips iSite PACS has also made it easier to recruit team members. We are now viewed as a cutting edge, technologically advanced, innovative department."

Always Online

With iVault, there is no real difference between short-term, near-term, and long-term storage. Prior to iVault, Torrance Memorial stored all of its long-term film archives in two separate file rooms. Now, one continuous RAID storage system provides immediate access to all data online within the archive—eliminating the traditional tiered architecture. In order to take advantage of clinical workflow based on how frequently exams are viewed, multiple copies and levels of data redundancy are created, leveraging internal mirroring to make sure the most requested data is available from multiple locations. This maximizes performance

without any degradation in image quality—a study that is five minutes old is as accessible as a study that is five years old.

Administration

iSite has built-in tools and functionality providing administration with the flexibility to monitor user access, addressing many of the security and scheduling challenges outlined by HIPAA. This functionality is administered in an easy-to-use graphical interface specifically designed for intuitive navigation and deployment; traditional systems often employ command lines that require users to memorize command keys, data, and acronyms.

Radiologists

The three-monitor radiology workstation set-up was developed to increase radiologists' reading efficiency. All patient data, demographics, and worklist information is provided on the flat panel that allows users to view color images. Radiologists can then set up their images on the flat panel which leaves the large monitors for diagnostic purposes—uncluttered by icons and buttons.

Torrance Memorial's radiologists are assigned different types of work from various modalities. Worklists are customizable with respect to modality type, time, and location. Radiologists have instant access to all studies via the patient history timeline, and hanging protocols can be established based on specific radiologists' preferences.

"My own productivity has improved by 40–50% with certain modalities and as a department our throughput is up 15–20% without increased headcount. We are completely filmless within the department and are around 98% filmless throughout the enterprise," added Dr. Grabb. "Physicians are able to work in real time and almost

Dr. Albert Grabb, Chairman, Department of Radiology, Torrance Memorial Medical Center

every study is read within one to two hours after it has been performed. Gone are the days when physicians had to pick up the phone and call in to the radiology department and request an interpretation. Now, the interpretation and studies are available with the click of a mouse."

Technologists

iSite has enabled Torrance Memorial's technologists to cut process time in half. Significant time has been shaved off patient preparation per exam and patient load volume has doubled. The Modality Worklist improves workflow and helps reduce administrative errors. The technologists use iSite to QC: check and correct labeling, ensure all the required images are captured, manipulate images, and create use presentation states for the radiologists. The relationships between technologists and radiologists have also improved because the radiologists do not have to constantly call technologists for changes—the correct images are presented the first time.

"Many times we want the study to be presented in a very specific fashion," said Dr. Grabb. "We want the order of the sequences to be consistent and with spine imaging the various levels are labeled prior to interpretation. Also, in MR there are no defined window-level states as there are in CT, so the window and leveling can be done by the technologist prior to interpretation by the radiologist."

The Results

Since installing iSite, Torrance Memorial's staff has seen dramatic improvements in their workflow, eliminating two-thirds of the steps previously required to get a study from the modality to the radiologist and referring physician. The staff has immediate access to prior studies and reports, and both paperwork and misplaced films have diminished immensely. Consults are done on-the-fly, resulting in fewer consults, and reports are provided in a timely fashion. Also, physicians can review studies elsewhere in the hospital, resulting in diminished traffic in the reading room.

CT was virtually filmless three weeks after installation, although a small percentage of studies are still printed for some offices. Within eight to ten weeks, the MRI staff was comfortable with soft-copy reading and film was subsequently turned off four months later. US studies performed at the outpatient center were immediately 100% soft copy. Overall, clerical errors have significantly been reduced and throughput has been increased without increasing headcount. In addition, patients going to other hospitals can now transport their images on a CD that costs the hospital $.50 compared to $2 per sheet of film. The hospital is now almost completely filmless, printing films only for the OR and by special request.

"I have never partnered with an organization that is as committed to product quality, support, and customer satisfaction as Philips. They combine the energy and innovation of a start-up company with the weight and stability of a Fortune 500 company. As an institution with limited resources, the success of our PACS implementation is a testament to the iSite product," said Dr. Grabb.