

A Victory for ICU Safety

The implementation of a critical care software system improves information management in the ICU of a VA healthcare network.

The sharing of patient data such as hospital admissions information, laboratory results, progress notes, and imaging and authentication (access/verify) data throughout any healthcare facility is essential for maintaining the accuracy and efficiency of clinical care. A seamless flow of information is especially vital within the ICU, where seconds always count.

Among healthcare facilities of the Veterans Health Administration, the proprietary in-house Veterans Health Information Systems and Technology Architecture (VistA) and the VA Computerized Patient Record System (CPRS) cover approximately 80 percent of the documentation needs of clinical care. However, the typical VA hospital does not incorporate the ICU, anesthesia and post anesthesia care unit (PACU) into this integrated information.

VA healthcare providers within the California-based Sierra Pacific Network realized that to continue to be a comprehensive, integrated healthcare system characterized by exceptional accountability and healthcare value, they needed to address immediately all three of these issues. Together, they found a solution that integrated with VistA and met the documentation needs and CPRS coverage desired in the government's move towards paperless patient healthcare records.

Providing Critical Care for Vets

The VA Sierra Pacific Network is one of 21 Veterans Integrated Services Networks in the Veterans Health Administration. It serves over 1.2 million veterans residing in northern and central California, northern Nevada, Hawaii, the Philippines, and several Pacific islands including Guam and American Samoa.

VA hospitals serve only veterans and certain specially qualified dependents that meet a very specific and complex set of criteria, mostly based upon injuries or illness sustained while serving in the U.S. armed forces, so there is no private pay or Medicare/Medicaid involvement with the treatment they provide.

Among the healthcare providers within the VA Sierra Pacific Network is VA Palo Alto Healthcare System, Palo Alto, California. Maintaining one of the top three research programs in the VA and affiliated with the Stanford University School of Medicine, Palo Alto led the charge to improve patient safety in the ICU with a complete overhaul of their critical care documentation system.

The Search for a Viable Solution

Edward J. Bertaccini, M.D., associate professor of anesthesia at the Stanford University School of Medicine and staff anesthesiologist and intensivist at Palo Alto VA, was involved with the search for a vendor solution, and later, with its implementation. He says some of the primary objectives for the new solution addressed the core issues prompting the search for a replacement. Ease of use, configurability and maintenance were the main factors. "We preferred a Windows-based solution using off-the-shelf hardware," says Bertaccini. "This meant better hardware pricing and greater familiarity with the overall look and feel of the software." According to Bertaccini, both VA San Francisco and Palo Alto already had electronic medical records for their ICUs, but these required Unix-based hardware solutions and dedicated specialists in Unix and database administration. "This meant interacting with people who had minimal to no [healthcare] background," says Bertaccini.

"We also preferred to have a system administrator who was a nurse, so that this person would have both a significant medical background as well as a reasonable knowledge of Windows system administration," says Bertaccini. This type of Windows-savvy healthcare professional was much easier to find than a nurse with Unix training. "Such a person was far easier to communicate with regarding system preferences and configuration issues."

According to Bertaccini, the solution selection process initially involved only three vendors,

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however there were volumes of decision criteria used to evaluate prospective solutions. Input also came from a variety of sources within the organization, including physicians, nurses, respiratory therapists, pharmacists, IT and other administration staff from the Veterans Integrated Service Network (VISN) office. Palo Alto received demonstrations from all three vendors through a combination of onsite vendor representatives, as well as several site visits the Picis selection team made to other institutions throughout the country. "The final decision was made by a large group comprised of representatives from each of the five hospitals within the VISN, as well as people from our main office," says Bertaccini.

Deploying the New Recruit

The five integrated Veterans Affairs (VA) hospitals purchased Picis' ICU solution as a group to facilitate implementation and to share ICU data in a common data warehouse for analysis. VA Palo Alto was the first hospital to go-live with Picis, which implemented the system for 30 ICU beds, followed by 18 beds at VA San Francisco, and an additional 12 beds each in VA hospitals in Fresno, California, and Reno, Nevada. These VA hospitals are all tertiary care facilities with capabilities for significant multispecialty care.

In August 2003, the five medical centers within the VA Sierra Pacific Network (VISN 21) in northern California and Nevada began implementation of CareSuite Critical Care Manager to automate the documentation and workflow of 120 intensive care beds in all five hospitals. Additional digital input boards had to be purchased to allow for the interfacing of many bedside-monitoring devices with the Picis workstation. Since implementing the new intensive care unit information management system, Palo Alto has experienced substantial gains in critical care reporting efficiency. The healthcare system also utilized the solution to train new staff members and clinicians to streamline their workflows around the system's bi-directional information-flow operational capabilities. "It's been a very good teaching tool, as well as a management tool to review everything that happens to the patient," says Eran Geller, M.D., director of critical care at VA Palo Alto Medical Center.

Rounding-up Data at the Point of Care

The Critical Care Manager technology automatically documents physiological data from ventilators, monitors and medical devices, and successfully integrates critical care data with the VA's VistA system, helping to improve the accuracy and efficiency of their clinical care. Physicians use this data to highlight events and clinical results as each resident presents his patients during rounds.

At VA Palo Alto Medical Center, approximately 100 nurses and physicians, plus another 40-50 residents and

interns, currently use the Critical Care Manager solution. Clinicians use wireless laptops mounted on carts to view each patient's complete clinical record during their medical rounds. Because of the extensive integration the Picis solution provides, physicians enter orders in VistA during their rounds while reviewing a patient's course rather than having to wait until the end of rounds or having to leave rounds to enter a patient order. "I definitely believe that having all of this information at your fingertips during rounds helps physicians make patient care more efficient and more accurate because the data is right there and one can easily verify the validity of the data being presented," says Geller.

Medical staff can now view all of the electronic information available on a patient—virtually all information within the VA system—during rounds. They use the VistA CPRS interface to view the patient's chart, and the Stentor Radiology package to look at X-rays, CT scans and MRIs. Finally, all of these solutions are accessible from remote locations via secure network connections. This has helped clinicians provide more thorough care of VA hospital patients even during off hours.

Key Applications

Physicians are using Critical Care Manager to show trends of physiological abnormalities that have occurred to a patient in the ICU such as graphed changes in a patient's blood pressure and heart rate that occurred overnight.

The ICU pharmacists also use a wireless laptop to concurrently review all medications for each patient in VistA to make sure they are appropriate and there are no untoward interactions between drugs. Seamless access is achieved because the critical care manager software and VistA are viewable on the same screen and share a single sign on.

Intensive care data is now being transmitted from Critical Care Manager back to VistA every 24 hours where the official, legal record of the patient is kept up to date. This data sharing provides the hospital with comprehensive automation, a complete electronic patient record and a significant pool of data for analysis and reporting. This also enables physicians to look at the patient's VistA record (EKGs, X-rays, CT scans, MRI's) and Picis data all on the same screen.

Achieved Solution Objectives

Since the implementation of the Picis solution, the VA Palo Alto Medical Center has realized substantial improvements to its critical care information management processes. The significant advantages of the interfaces between the Picis system and VistA are the primary reason VA Palo Alto replaced its existing critical care information system with Critical Care Manager. Some of these

For more information about CareSuite Clinical Care Manager from Picis, www.picis.com

advantages include a quick acceptance and buy-in of the new solution by nurses and doctors because most found the software easy to use. There is no formal in-service for physicians, either—another benefit since this eliminates the customary downtime spent learning a new system—time that would otherwise have been spent providing patient care. Physicians and staff also appreciate that Critical Care Manager screens can be configured to meet user needs. They customized screens at Palo Alto to resemble screens staff had used in the past, which made the transition to the new system comfortable and quite rapid, increasing staff satisfaction with the system.

Forward-looking Applications

Currently, VA Palo Alto and San Francisco VA Medical Center are utilizing Critical Care Manager to share their results for data analysis. Picis' advanced data extraction tool

automatically exports all ICU data into a comprehensive data warehouse where researchers evaluate best practices, compare data between centers and study clinical outcomes. Dr. Gerard Ozanne, at the San Francisco VA, and Dr. Geller continue to work closely with Picis and VA personnel to not only implement a clinical information system, but also to mine their ICU data for correlations in quality of care and outcomes. Ozanne and Geller have already identified several clinical parameters that were previously unknown which appear to have a significant effect on patient mortality post discharge from the ICU. Geller says, "When you see the whole picture, you sometimes pick up on a different understanding of the data because you have all of the information in front of you."

They are exploring this correlation further to determine its impact on patient care and to develop possible preventative steps.

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