

Telemonitoring Helps Save Lives, Improve Care

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The eICU is an advanced monitoring system that uses high-speed data transmission tools to network ICUs together so that supplemental monitoring and clinical interventions can be performed from a single location by critical care nurses and an intensivist physician. Sutter's eICU system, the first of its kind on the West Coast, debuted in Sacramento in 2003 and in the San Francisco Bay Area in 2006. Expansion of this concept to other hospital-based health care systems is planned by the end of 2007.

Using early warning software and advanced video and electronic monitoring systems, intensivists and nurses keep a close eye on critically ill patients on a 24/7 basis. The eICU system serves as a high-tech and centralized safety net for patients who may be right down the street or over 100 miles away. It is currently monitoring beds throughout the Sutter Health Hospital system in two hub sites, located in the San Francisco Bay Area and in the Sacramento region. Recently, St. Joseph of Orange affiliates at Santa Rosa Memorial and Petaluma Valley Hospitals also joined this growing network of ICU specialty care through their CareWatch Program. Currently, this network services 247 ICU beds with an average daily census of 140-150 patients in 15 hospitals throughout the Bay Area Region. Patients are monitored 24/7 by an experienced critical care nurse. From 4 p.m. to 7 a.m., a Board-certified intensivist physician is available to provide timely support for crisis situations, identify and suggest correction of small problems before they become major issues, and promote the ever-evolving standards of care and Best Practices demanded of various quality and regulatory organizations. Clinical interactions are coordinated through the managing physician, and the eICU's Level of Involvement is tailored to the preferences of each Attending physician.

Early Recognition Saves Lives

Medical studies have shown that patients in intensive care have better outcomes when they are monitored by full-time intensivists. By bringing more skill and judgment to the bedside through this technology, the patient's odds of coming out of the ICU alive and healthy are much higher with eICU monitoring. While a full-time intensivist continuously on-site could achieve the same effect, these physicians are becoming less available and the critical care needs of the progressively aging population continue to grow. Thus, having these physicians in all the locations where needed is becoming a less

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tenable solution over time. Through the eICU, doctors can now see early warning signs, proactively intervene, and prevent severe outcomes. This also helps minimize invasive support measures.

Paradigm Shift

One of the most profound implications of the eICU, however, is that it allows doctors to determine best practices and provide standardized oversight for intensive care. The trend in the 21st century is for improving processes and quality. With the eICU system, this technology can be used to transform the practice of intensive care medicine from each doctor's personal style to a standard Best Practice approach to patient care.

The eICU is constantly learning about new treatments and can discuss current studies with the bedside doctors. The need for support is greatest at night, when nurse staffing may be least familiar with the overall management plans and physician oversight at a minimum. The Program has been instituted as a Quality and Process improvement initiative and does not replace any staffing or care process already in place at a facility. As an ancillary benefit, the access to higher level support acts as a mentor to nurses new to the ICU, as they often call the eICU team to ask questions about medications or patient care. The versatility of this Program is evident by its ability to integrate the areas of need within any participating affiliate. The eICU Program is seen as a valuable tool to allow specialty physician consultation in smaller institutions where access is limited. It also has become a mechanism to improve oversight of care in larger facilities where physician input is greater, but the process of care may be more complex and cumbersome.

eICU and Improvements in Outcome

The Sacramento eICU hub has recently published their work in the management of sepsis. One significant benefit of the eICU programs is that care can happen faster, and in a more coordinated fashion. With a disease process like sepsis, timely management is essential to better outcomes. The Sacramento eICU's work in sepsis management has helped decrease adverse events associated with this high-morbidity, high mortality disease. Furthermore, even though patient care has become more fragmented and complex, the Bay Area eICU Program has demonstrated that by working in collaboration with affiliates, compliance with Best Practice initiatives can be achieved for every patient, every day. For example, compliance with DVT prophylaxis had ranged from 70 percent to 80 percent at one Sutter affiliate prior to a collaborative effort involving eICU oversight and interventions to handle gaps in care when detected. After only two months, compliance with this Best Practice had increased to 95 percent to 100 percent.

Anesthesiology and Critical Care: Revisiting the Forefront

Vigilance is paramount for physicians who practice in a telemonitoring environment. Many parallels can be drawn between the role of a physician with critical care skill who utilizes information from a monitor—and integrates this information with clinical acumen to formulate a diagnostic and therapeutic plan in an ICU—and an anesthesiologist who performs a similar function for patients in an operating room. The emergence of these programs offers opportunities for anesthesiologists to broaden their practice to provide more “value-added” services to the hospitals where they practice. Anesthesiologists who received additional fellowship training in critical care may be ideal candidates to participate in such programs. Eighty-five percent of ICUs in the United States are staffed by intensivists who have backgrounds in Pulmonary Medicine. Often, these practitioners are concerned about concurrently running an office, with associated high overhead costs. Night call in an eICU environment is made more difficult due to the fact that these practitioners lose office time following an eICU shift. By its nature, anesthesia practices integrate night call responsibilities and accommodations for post-call fatigue into their practices, with much less impact on a practice’s overhead costs. There is a growing demand for the skill sets of anesthesiologists in ICUs even if the practitioners have not completed a specific Fellowship Training in Critical Care. In addition, as the intensivists are called upon to leverage their cognitive skills and judgment across a wider base of patient care, a void in on-site technical support may develop at individual facilities. One example is the growing demand for aggressive and timely management of sepsis. Emerging standards of care for the management of sepsis often call for placement of central venous pressure monitoring to guide fluid resuscitation. On-site support for such tasks is limited in many facilities. If an intensivist’s practice concentrates on telepresence monitoring and care, other options for in-house technical support for this function may lie with an emergency room physician, who may have limited time to provide this type of support, and hospitalists who have limited skill sets in this regard. For an in-house anesthesiology service, this type of function can fit well into most practices as it can be performed on a less than emergent basis, allowing time to garner appropriate resources. An anesthesia service providing this type of service may be perceived as a “value added” by an administration promoting greater quality improvement initiatives by its hospital-based physician citizens. Such value additives may form the basis of compensation packages bundled into other services provided to the hospital, such as acute pain management of obstetric anesthesia care. Regardless of which side of the monitoring system an anesthesiologist falls toward, it brings the specialty closer to assuming a greater role as a hospital-based perioperative or resuscitation-focused physician, similar to colleagues in Europe and other countries around the world.

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In combination with electronic patient records and bedside charting, the networking of multiple ICUs through the eICU optimizes the costly resources of all participating affiliates for the benefit of patients, providers, and payers. The eICU concept has been recognized by the Leapfrog Group for its technological innovations that trigger “leaps” in quality, customer service, and affordability. The Sutter Health eICU Program has also been recognized this year as the most innovative approach to health care delivery from the Adaptive Business Leaders Organization. Early recognition of the benefits this service provides can accelerate the adoption by the health care and the medical community of emerging technologic solutions that facilitate the right care to the right patient at the right time.

Critical Care CME Program

In this issue of the *Bulletin*, Module 1 of the new Critical Care CME Program is available. There will be eight modules for this program. After each module is published in the *CSA Bulletin* (one per season), it is posted on the CSA Web Site at www.csahq.org. Each online module uses a self-assessment and evaluation; once these are completed, you may print your CME certificate. You may also contact the CSA office at 800-345-3691 to obtain the materials by fax or mail.