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## CASE STUDY

Implementing Patient Safety Initiatives – Bar-coding at the bedside

## COUNCIL MEMBER

John Hummel, Senior Vice President Information Services, Sutter Health

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### The Company

Sutter Health is one of the nation's leading not-for-profit networks of hospitals, doctors, nurses and other health care services, with a chain of 27 hospitals and 18 clinics

<b>Company Line of Business:</b>	Medical
<b>Company Revenues:</b>	\$5.5 billion annually
<b>Company Size:</b>	5,700 beds, 32 hospital campuses, 17 clinics
<b>IT Budget:</b>	\$100 million capital, \$128 million operations
<b>Size of IT Organization:</b>	970 FTE's

### The Corporate/IT Context

Hospitals are under increasing pressure to adopt Patient Safety Initiatives designed to lower the cost of health care and raise the bar on patient care. The FDA has mandated that by 2005, hospitals nationwide have systems in place for bar-coding all medication delivered bedside. Known as Bar Coding Unit Measurement, it's designed to reduce mistakes – sometimes fatal – in the dispensing of medications to patients. Unfortunately, little technical work has been done and few solutions exist for hospitals. Committed to patient care, Sutter adopted a pioneering spirit and successfully designed and delivered a solution for its member hospitals.

### The Challenge

Sutter faced a number of challenges in this effort, including getting the actual bar code system developed. But the most challenging issue turned out to be delivering the application out to Sutter's 12,000 nurses working on its hospital floors. "Hospitals today do not have computers at the bedside, but if you're going to deliver on bar-coding, you've got to get them out there somehow," says John Hummel, CIO of Sutter Health.

### The Analysis

Creating a solution to the bar code bottleneck required Sutter to first figure out how to repackage medications by unit dose, and then find a vendor doing work with medical bar-coding. Hummel was particularly concerned that the system be able to do error redundancy checks, such as "checking doctors' orders and alerting the nurse using the PC that something was wrong," he says.

Once these struggles were addressed, Sutter considered a number of ways to deliver the bar code application to its nurses. "We brainstormed everything from satellite relay to cell phones in order to figure out how we could possibly do this," says Hummel. What the analysis revealed was that while technically Sutter had a number of options ("we could wire, put in infrared or go

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wireless”), if it wanted to move quickly, wireless was the right choice. “Most of our hospitals are old – and we’re rebuilding due to earthquake safety rules – so we didn’t want to put a lot of investment in wiring whole hospitals,” he says.

Hummel was also concerned about the type of personal computer used. “We couldn’t afford to change out batteries every four hours on a notebook,” he says. A tablet was another option, but with the average age of Sutter’s nurses approaching 55, it “had to have a screen readable in the middle of the night by a middle-aged nurse. And it had to be reliable and non-breakable.”

After evaluating all its options, Sutter made the decision to go with a notebook and a UPS (uninterrupted power supply) system on a cart at the side of all of its 5, 772 beds – and to do it wirelessly.

## **The Execution**

Sutter worked with bar code innovator Bridge Medical Technologies to develop its Electronic Medical Administration Record (EMAR) – a client/server system designed to track all of the 33 million doses of medications dispensed bedside by Sutter’s medical staff annually. With that many doses going to that many patients, Hummel knew the database would have to be solid and work with Microsoft to leverage Sutter’s investment in the SQL database.

For its wireless needs, Sutter turned to its current network vendor, Cisco, which “pointed out to us that we could leverage our current backbone and just extend it for wireless,” says Hummel. Sutter did a lot of testing to make sure it had the bandwidth to support the application without “using all the bandwidth we had.” And to ensure it has the additional bandwidth and availability requirements needed for its Patient Safety Initiatives, Sutter is currently in the process of going from a triple redundant Cisco Frame Relay to a Cisco ATM system, and is also adding Cisco ATM MPLS (Multiprotocol Label Switching). “MPLS is where we’re going,” says Hummel. “It allows for very high-speed bandwidth from huge numbers of users all of whom want to access data in a redundant fashion. We know in less than three years we are going to need that bandwidth.”

Hewlett-Packard (HP) was selected as the personal computer vendor. Sutter had HP optimize the notebooks and put auxiliary batteries on the carts that act as a UPS system (so they would charge and the notebook would always be on.).

## **The Results/The ROI**

“The ROI was a lot better than we ever anticipated,” says Hummel. In addition to a huge decrease in the number of credited medications (medications dispensed by the hospital pharmacy for a patient that are then not used or billed to patients and must be restocked) and fewer billing mistakes – a very big cost savings for hospitals – Sutter has discovered that roughly 50 percent of a nurse’s routine paperwork could be completed through the EMAR system. “We found we had freed up, on average, an hour to an hour-and-a-half of nurses’ daily shifts,” he adds.

## **The Technology and Services Providers**

- Bridge Medical Technologies
- Cisco networking solutions (wireless, ATM and ATM MPLS)
- Microsoft NT SQL database (leveraged existing investment)

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### **The Lessons Learned:**

- Pay attention to ergonomics: The number one problem of the entire installation was the design of the carts carrying the PCs. Sutter had originally planned for one cart for two rooms, but quickly found that didn't work. "Dragging around the carts drove the nurses crazy," he says. "We ended up buying a cart for every bedside. We should have spent more time on ergonomics and the needs of the nurses on the floor."