By David Jordan, FIBMS

e-Centron from Rees Scientific

Located in Mountain View, California, in Silicon Valley, El Camino Hospital is a not-for-profit community hospital and is licensed for 395 beds. Named five consecutive times to Hospital and Health Networks magazine's "Most Wired" list, the hospital provides a broad spectrum of services to the surrounding community.

About 10 years ago, Joint Commission surveyors began inspecting hospitals' methods for recording temperatures in blood banks, medication and breast milk storage refrigerators, laboratory refrigerators, incubators, and other temperature-sensitive areas. At that time, El Camino Hospital employed thermometers and a manual logging system to meet Joint Commission requirements. However, this system only provided us with three or four snapshots of the temperature conditions in our devices over the course of a 24-hour period, in the best-case scenario. On holidays or during high-census periods, we may have captured even less information.

Recognizing the drawbacks of the manual system, we decided to move to Rees Scientific's hardwired electronic system for tracking and recording temperatures throughout our facility. To further improve our efficiency in temperature monitoring, in the fall of 2007, we implemented Rees Scientific's wireless e-Centron system. The system monitors nearly 70 devices throughout El Camino Hospital's campus, including pharmacy and laboratory refrigerators, medication refrigerators on the nursing units, and breast milk refrigerators in the NICU, and operates over our campus-wide wireless network. About 50% of our temperature probes are currently wireless, and by the time we move to our new hospital in July 2009, we will be collecting 100% of our temperature data wirelessly.

System Selection

We selected e-Centron for two reasons: First, we had been largely satisfied with Rees' hardwired temperature monitoring system, and second, the e-Centron system is scalable. This is particularly important to us since we plan to monitor an ever-expanding number of refrigerators and other devices, such as blanket warmers and air pressure detectors, in our new facility. Each e-Centron server is capable of collecting data from 128 wireless probes across our network, and should we reach capacity on one server, we simply need to add another to monitor more devices. The system's flexibility in meeting our projected growth made it a sensible choice for our facility.

How It Works

Placed in devices throughout the hospital, the e-Centron probes constantly detect and transmit temperature data to the nearest wireless network repeater. The repeaters then transmit the data to a centralized e-Centron server. Using e-Centron's Web-based interface, users can generate or view a variety of reports based on location, date and time, event type, or multiple criteria. e-Centron also allows us to set temperature parameters for each location. If the probe detects a temperature outside our established upper or lower limits, the system alerts the appropriate manned desk by telephone and the appropriate manager or supervisor by e-mail.

We are less interested in detecting periodic temperature spikes resulting from normal personnel activity than we are in identifying longer-term system failures. As such, we have built time delays into the system to avoid receiving excessive false alarms. For instance, by setting a five-minute delay for a medication refrigerator, we can avoid receiving alarms during high-volume med passes, when the refrigerator door will be opened on a frequent basis. If the refrigerator remains out of range for more than five minutes, an alert is sent so the appropriate action can be taken.

Once the e-Centron system helps us identify a systems failure, an engineer is sent to inspect the device and the probe in question to determine the cause of the out-of-range signal. The department supervisor is then responsible for following up on any equipment maintenance or replacement, as well as any staff discipline or training issues, that may be needed.

System Benefits

The use of a wireless temperature monitoring system offers El Camino Hospital several obvious benefits. First, we are reassured that items, including medications, vaccines, laboratory reagents, and breast milk, are being properly stored. Therefore, we have peace of mind that our patients are receiving uncompromised products and our facility is avoiding the unnecessary costs associated with product wastage.

Secondly, e-Centron helps us avoid catastrophic system failures by readily identifying equipment that is trending towards malfunction. Instead of finding a broken freezer full of wasted medications on a Monday morning, our pharmacy staff may be able to alert our maintenance team to the freezer's deteriorating condition before it completely breaks down. Using a wireless temperature monitoring system like e-Centron, a hospital can avoid losing high-cost drug inventory and irreplaceable items, like freeze-dried bone for implant, due to equipment failure.

e-Centron has also improved the ease with which El Camino Hospital achieves Joint Commission compliance. With each survey, we find a greater number of areas in which we need to demonstrate temperature control, and the wireless system allows us to automatically and continuously record temperature conditions across our facility. We estimate that this task, if performed manually, would require a dedicated FTE. The e-Centron system's wireless data collection technology has relieved our staff of this tedious task and allowed them to refocus their efforts on more vital and interesting duties.

We anticipate our use of the system will only increase. In fact, upon moving into our new hospital, we may expand our use of e-Centron to monitor temperatures in some of our off-site units, such as our dialysis centers. El Camino Hospital is known as "The Hospital of Silicon Valley," and we are proud to use all relevant technology, such as the e-Centron system, to improve the efficiency and reliability of our operations and, ultimately, the care we provide to our patients. ■

David Jordan, FIBMS (Fellow of the Institute of Biomedical Sciences, the U.K. governing body for laboratory scientists), has worked in hospital laboratories for nearly 40 years. He currently serves as the manager of general services in the clinical laboratory at El Camino Hospital, where he has worked for four years.

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