Adoption of **Wireless Temperature Monitoring Systems** On the Rise

While wireless temperature monitoring systems may appear out-of-sight, out-of-mind for health-system pharmacists and pharmacy directors, the peace of mind these systems can provide is invaluable. They can ensure the optimal conditions of your medication storage areas while improving pharmacy workflow and efficiency. In addition, they are easy to implement, relatively inexpensive and provide a smart solution to staffing challenges. They also make it easy to meet The Joint Commission requirements for temperature recording of stored medications while providing advanced data collection and reporting capabilities.

Wireless systems effectively automate your temperature monitoring activities. A typical system comprises hardware, software, and a PC or server. Temperatures are measured by a probe and users are able to view these recorded temperatures, respond to alarms, document follow-up actions, and generate summary reports. You can even customize the temperature alerts in your system to accommodate your facility’s needs.

The use of these systems can also free up technicians’ valuable time, increase the ease and accuracy of required documentation, and ensure proper storage conditions for your pharmaceutical products.

Adoption of wireless temperature monitoring systems has grown rapidly this year, with 25% of hospitals reporting such a system in place, up from 14% in 2007. (see *P&amp;P*’s State of Pharmacy Automation third annual survey, August 2008). The number of those planning to adopt systems in the near future also jumped. Currently, 58% of all hospitals are planning system implementations, versus 2007, when just 47% were planning implementations.

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**Real-Time Adjustments Offer Convenience**

*By John Foster, PharmD, MBA*

Baylor Health Care System provides a full-range of inpatient, outpatient, rehabilitation and emergency medical services to the Dallas-Forth Worth and surrounding areas through a network of 13 hospitals and other care locations. Our motivation for implementing a wireless temperature monitoring system was to meet The Joint Commission’s medication management standards requiring monitoring and daily logging of medication refrigerator temperatures.

Prior to implementation of the Freshloc Technologies system, our hospitals used a manual process that was labor intensive and error prone. Without the ability to make real-time adjustments, we were at risk from a compliance perspective as well as from a financial perspective for loss of product. We chose Freshloc because they had the smallest sensors and the broadest applicability. This system can also be used in foodservice, lab, warmers and any other area that requires temperature monitoring.

The first system was installed in March 2007. Including site visit, procurement, configuration, installation, training, validation, go-live and maintenance, the process took about six months from start to finish.

Freshloc provides a convenient method of monitoring temperatures and easily retrievable historic data. By moving from a manual to an electronic system, the burden of monitoring temperatures has been eased for pharmacy and nursing. With immediate notification, medications can be moved to a new storage location, minimizing potential loss of product. Freshloc provides continuous temperature monitoring which in turn provides continuous compliance with The Joint Commission standards.

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**Case Studies**

**WHERE TO FIND** Temperature Monitoring Systems

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John Foster, PharmD, MBA, currently serves as corporate director of pharmacy for Baylor Health Care System where he is responsible for management of pharmacy operations, finances, technology, and clinical services.

Freshloc Technologies

For more information, circle reader service number 78
Web-based System Allows for Added Flexibility

By Mark Stutzman, RPh

Joel Pomerene Memorial Hospital is a small, 50-bed facility located in Holmes County, Ohio with a patient population of more than 2,500 admissions per year. Nearly 12,000 patients are treated annually in our emergency department and more than 1,200 elect to have surgery. Care areas include maternity, medical-surgical care, 24-hour emergency care, surgical services, full-service lab and radiology care, respiratory care/sleep lab, physical rehabilitation, occupational care, several physician clinics, as well as an urgent care clinic.

Prior to implementing E-Control Systems’ wireless temperature-monitoring system, temperatures at our facility were manually checked once a day. In our newly remodeled Med-Surg and Special Care units we installed refrigerators with digital readouts that send an alert if the temperature goes outside of the set range. However, all other non-pharmacy locations have standard under-the-counter refrigerators with no alarms. Prior to purchasing simple digital thermometers that were mounted on the outside, we had to unlock, find the thermometer, take the reading and then lock the refrigerator back up again.

We have one refrigerator each in special care, obstetrics, obstetrics operating room, the recovery room, one in ambulatory care, ED, one attached to our night box Pyxis, two in our Med-Surg Units, and three refrigerators in pharmacy. So even for a hospital our size it takes some time to cover.

The E-Control Systems’ wireless temperature monitoring system is web-based and network-based which allows us to monitor temperatures at a facility seven miles away as well as at two clinics a quarter mile away. Being web-based also allows other departments to log into the software and see only their specific temperatures. And the ability for self-installation allows for a significant reduction in cost.

The implementation took place at the end of 2007 and involved the placement of an IntelliGate device near a network hub on each floor and attaching the probes and placing the IntelliSensor near the refrigerator/freezer that needed monitoring. I then called technical support and they logged into the PC and began the process of recognizing the sensors.

We will soon be adding all of the dietary department’s refrigerator/freezer/ambient air temperatures as well as three temperature/humidity sensors in the operating rooms.

The system has brought improvements such as technician satisfaction, and confidence that temperatures on the main campus and at our off-site facilities are being continuously monitored. We have the data table backed up to the network server, guaranteeing us access to the data, so being able to print out data for any time period will easily satisfy storage requirements. We calculate a savings of about a half-hour of tech time each day.

Mark Stutzman, RPh, graduated from the University of Cincinnati College of Pharmacy and has served as a pharmacist at the Joel Pomerene Memorial Hospital for the past 22 years.

System Keeps Pharmacy on Alert

By Peter Lutz, PharmD

Children’s Hospital Boston is a 400-bed comprehensive center for pediatric health care located in Boston with a growing ICU and surgical population. Children’s is the primary pediatric hospital of Harvard Medical School. Main inpatient facilities include MICU, M/SICU, CCU, Level IV NICU, stem cell transplantation, oncology, cystic fibrosis, inpatient psychiatry, and many others. Clinics include several community-based sites, including a multi-service hospital 15 miles outside of Boston.

All of our patient care areas where medications are stored in refrigerators and freezers required continuous temperature monitoring. The challenges we faced in monitoring environmental conditions in various locations throughout our facility were primarily internal, such as ensuring that network jacks were active.

We implemented our Isensix wireless temperature monitoring system in two phases: August 2007 (main campus install) and February 2008 (community clinics install). The process took approximately three months from conception to installation with most of the time devoted to internal information gathering, such as identifying network jack locations and related data. We needed to organize the information before doing a walk-through with Isensix to confirm the implementation plan.

We chose Isensix as they were furthest along in development and because what they had to offer was excellent. The most important aspect of a wireless monitoring system is the software that allows you to fulfill your responsibilities to the organization. This includes customizable alerts to cell phones, pagers and e-mail. So if a refrigerator containing $200,000 worth of monoclonal antibodies or $20,000 worth of immunizations blows a compressor, we are covered.

When the system was first installed, there was some equipment-related temperature instability that has since been resolved through repairs and refrigerator/freezer upgrade. Because we now know the exact medication storage temperatures continuously, we are able to more easily identify refrigerators or freezers that require maintenance or upgrade.

Pharmacy is responsible for the medication storage performance and outcomes, so we are thrilled to have continuous knowledge of the temperatures and peace of mind knowing that we will be alerted by the system if there are problems. The nursing staff is also pleased with the new system, as they were formerly responsible for manually documenting medication refrigerator and freezer temperatures daily.

Peter Lutz, PharmD, earned a Doctor of Pharmacy degree from Massachusetts College of Pharmacy and a BS from Northeastern University and currently serves as associate director of pharmacy at Children’s Hospital Boston.
Monitoring Challenges Tackled

By Blair Galbreath, PharmD and Michael Mello

Northridge Hospital Medical Center is a 425-bed, not-for-profit facility located in Northridge, California, serving nearly 130,000 patients annually.

Our challenge in monitoring medication storage was to ensure that individuals were recording refrigerator temperatures reliably each day. Refrigerators in the main and satellite pharmacies required attention and we used manual thermometers.

We implemented the SensoTech wireless temperature monitoring system in March 2008. Our supply chain department made the decision based on functionality, ease of use, reporting capabilities, and pricing. The ability to track the temperature on an hourly basis versus a 24-hour basis, notification by e-mail or page, and history reports were key features for us.

The system has been an excellent improvement for our hospital. SensoTech records on a continuous basis and if the temperature is ever out of the designated range immediate alerts are sent to the biomedical and pharmacy departments, through both computer notification and an audible alarm on the device itself. To date, we have had only one situation with an out of range temperature and we were immediately alerted, allowing us to take the necessary action. We plan to incorporate the SensoTech system on all the medication refrigerators located on the patient care units.

I feel much more confident now for our next Joint Commission survey. Just knowing we have the documented temperature records over a considerable period of time provides reassurance that our medications have been stored safely.

Blair Galbreath, PharmD, is director of pharmacy and Michael A. Mello is director of materials management at Northridge Hospital Medical Center in Northridge, California.
Drug Inventory Waste Reduced

By Brian Sargent

Stanford Hospital is a 450-bed, multi-discipline facility in Stanford, California with specialized areas that include cancer treatment, organ transplant, cardiac care and a trauma center.

Before implementing the CheckPoint wireless temperature monitoring system from Tempsys, we had a difficult time monitoring and recording the temperature of the refrigerators in the pharmacy. Keeping track of the medication refrigerators spread all over our facility and in different buildings was a huge challenge.

We implemented the CheckPoint system just over a year ago. We chose the system for its two-way communication and because each sensor has its own memory. The data is critical to us, so any technical advantage to preserve the data against accidental loss or computer failure is important. The installation was completed in about two days and most of that time was spent with IT working to get the alert e-mail past our internal computer security. Now that everything is in place, we can easily add a sensor for any new refrigerator anywhere on the floor.

The fact that temperature data is readily available anytime is a tremendous value. It relieves us of the burden of keeping manual logs, but more importantly, CheckPoint has saved valuable products on several occasions thanks to timely alerts. For example, we had an incident where a refrigerator died during off-hours. An alert was sent by the system and the medications were moved to another refrigerator. Without the alert, we probably would have been forced to discard more than $10,000 of inventory.

The Joint Commission has not surveyed us since implementing CheckPoint, but the system creates a temperature log of 96 readings per day that far exceeds the once-a-day requirement. Also, we avoid the problems associated with staff forgetting to take readings, backdating information, or inaccurate readings that come with a manual temperature log.

Brian Sargent is a business system analyst at the Stanford Hospital pharmacy in Stanford, California.