2008 Health Devices Achievement Award
Carroll Hospital Center, Westminster, MD

Contact: Wayne R. Jenkins, CBET, BioMedical Manager
waynej@carrollhospitalcenter.org, 410-871-6754

Initiating Departments: BioMedical, Dietary, Pharmacy, Laboratory, Nursing, Facilities and Information Systems

In November 2007, Carroll Hospital Center, a nonprofit, 200-bed community hospital in Westminster, Maryland, installed TempGenius™, a state-of-the-art wireless temperature monitoring system manufactured by Compliance Control, Inc.

Previously, each of Carroll Hospital Center's 135 refrigerators and blanket warmers were monitored manually, twice daily, by department personnel. Readings were recorded by hand on paper charts taped to the device door. With a growing number of devices that required monitoring, this task was impeding productivity and workflow. Staff members struggled to balance consistent device monitoring with their increasing patient care duties. In addition, if a staff member recorded an abnormal reading, all contents of the refrigerator or freezer had to be thrown out, since there was no way of determining how long the temperature had been out of range (i.e. the device could have malfunctioned hours or minutes before the out-of-range temperature was discovered). With each refrigerator and freezer containing between $500 and $600 worth of food, beverages, medications and lab specimens, this was becoming a financial concern as well.

Plus, supervisors remained unaware of device problems unless they checked the device sheet themselves or questioned their staff. And since devices were monitored by an ever-changing rotation of staff members, all prone to human error, it often took days or weeks to detect a reoccurring problem.

After researching various solutions, the hospital purchased the TempGenius system for the following departments:
• **Dietary** – Monitors all refrigerators and freezers containing patient-related food and beverage items.
• **Pharmacy** – Monitors all refrigerators and freezers containing patient medications.
• **Laboratory** – Monitors all refrigerators and freezers used to store reagents and patient specimens, as well as the ultra low temperature freezers used by the Blood Bank and Operating Room.
• **Nursing** – Monitors all blanket warmers.

The implementation of the TempGenius system was a total team effort, with the hospital's BioMedical Department handling overall system management, Information Systems overseeing network management and software installation and Facilities addressing device repair issues and temperature monitoring.

Thanks to the system's easy installation and intuitive operation, orientation and training for new employees takes just minutes. While the BioMedical Department provides one-on-one training to anyone who requests it, most departments feel confident instructing new hires themselves.

To view readings, employees simply log on to their computer. Readings are updated every five minutes and displayed as numeric values and in graph format, allowing users to view temperature trends over the last 24 hours and pinpoint possible problem areas and inefficient equipment. If a temperature is out of range, a special corrective action window appears on the user's computer (alerts are only sent to the affected department). After checking the device (to prevent misuse, temperature adjustments must be made manually), the staff member records any action taken (e.g. "Adjusted temperature setting," "Closed door," "Notified Facilities Department," etc.), along with his or her initials. Managers and supervisors also receive a text message via e-mail any time an out-of-range reading is recorded on their devices. After hours, alerts for Dietary devices are sent to the hospital's Shift Coordinator's telephone.

To prevent false alarms, a device's temperature must be out of range for a given period of time (each device is programmed differently, depending on its contents). This way, devices can be restocked and cleaned without triggering a temperature alert.

The TempGenius software also includes a report section, where employees can view average hourly temperatures for their devices in chart or graph format. Past data can be retrieved and sorted by day, week or month. TempGenius can be programmed to record humidity readings and follow different alert styles as well, such as flashing strobe lights.

The Dietary, Laboratory, Pharmacy and Nursing Departments are getting use to the new system and have noticed increases in staff productivity and energy conservation (inefficient equipment is quickly identified). Since users can view the exact time an out-of-range temperature was recorded, device contents can often be saved, rather than automatically discarded. Supervisors appreciate being notified of device problems and corrective action taken, and staff members are able to spend more time on direct patient care. The TempGenius system is also an important patient safety tool and helps the hospital meet Joint Commission and College of American Pathology standards.

Due to the overwhelming success of the TempGenius initiative, the hospital is considering installing the system in other areas and devices to avoid potential temperature related problems with equipment.