Those recent “telemetry divert” warnings may be over. The most difficult, sensitive operation at the hospital last Sunday may have been the replacement of every telemetry unit at UCH without, literally, missing a heartbeat. Months in the making, a complex dance between multiple departments and teams replaced some 80 units on one big day. Sidebar: Planning for the worst turns out to be for the best.

Months-long project wraps up successfully

Sunday Service: Staff Fan out to Replace Cardiac Monitoring Devices

By Tyler Smith

Dozens of nurses, biomedical technicians, information technology specialists and other staff gathered at UCH Sunday to wrap up a months-long project that concluded by replacing the hospital’s entire wireless telemetry system.

The equipment allows clinical staff to monitor continuously patients with potentially life-threatening conditions like cardiac arrhythmias. Electrodes attached to a patient’s body sense heart rate and rhythm and oxygen saturation, while a processor translates the data from the electrodes. The information is transmitted wirelessly to a monitoring station, where providers get alerts or alarms when problems develop.

Staff wheeled carts pre-loaded with monitors, telemetry boxes and batteries to the units.

Provider teams gathered Sunday in a command center on the first floor of the Critical Care Wing. Their mission: swap out soon-to-be-discontinued equipment manufactured by Philips for new units from GE. Staff received brief instructions from Kathy Logan of Information Services (IS), who managed the project; and from Director of Critical Care, Cardiology and Dialysis Cathy Ehrenfeucht, RN, MS. At 8:30 a.m., staff began rolling carts laden with brand-new telemetry boxes, portable monitors and batteries to med/surg units throughout the hospital.

Vital signs. It was a complicated task that required close attention. The team had to ensure the switch from the old units to the new ones happened without missing, literally, a heartbeat. Any gaps in the transmission of the electrical signals from patients’ hearts to monitoring equipment could endanger their lives.

Administrative project lead Cathy Ehrenfeucht explains the change-over process in the command center.
By early evening, the switch-out of more than 80 units had come off “without any patient safety issues,” said Cardiac Intensive Care Unit and Telemetry Department Nurse Manager Maureen Dzialo, RN, although the team decided early on to have staff monitor each and every patient at the bedside until the installation was complete. They were concerned about potential interference between the Philips and GE signals (see sidebar).

The one-day roll-out was the climax of a process that began late last fall, when the hospital learned it would have to replace the Philips units. It required vendor selection, contract negotiations, technical preparation, workspace remodeling, and staff education. Despite its complexity, the job proceeded on a relatively fast track, Logan said.

“We wanted to get everything in before the Epic go-live September 3,” she said.

**Project manager Kathy Logan (center, background) speaks to staff in the command center just before the project began Sunday morning.**

**Required changes.** The hospital ultimately selected GE “on the basis of cost and usability,” said Biomed Contract Manager Fred Jaramillo. The project, which officially kicked off in late March, required plenty of physical preparation, including running cable through the ceilings for a new antenna system for the GE units.

Meanwhile, Jaramillo added, project leaders had to figure out where to install new GE equipment for 100 telemetry beds in the crowded hospital. Many racks of high-tech electronic equipment were needed to power the network for telemetry. “We partnered with IS to determine the space we needed,” he said. The equipment ultimately wound up in a telecommunication rooms in the AIP.

Facilities constructed a new “cockpit” — an area equipped with monitors that display the heart rhythm activity for every telemetry patient in the hospital — on the 10 East Intermediate Cardiac Unit (ICU). The new cockpit, adjacent to the old one, went into operation as soon as the conversion to the GE equipment was complete.

“Staff were well prepared for the transition,” Dzialo said. Nearly 400 nurses received training on the GE equipment during more than 50 sessions led by clinical nurse educators. “A GE clinical educator was here for the first week of training, then our educators took over training staff,” she noted.

Biomed also installed 16 new hard-wired GE bedside monitors in the ICU Thursday, July 14, before the telemetry conversion to allow nurses time to familiarize themselves with the new equipment, Logan said.

**“Roll-out preparations.** One day before the hospital-wide roll-out, the team prepared by building carts stocked with portable monitors — used to watch patients’ heart activity during the transition — and telemetry boxes and batteries for the new GE units.

**Not surprisingly, a project with so many moving parts required cooperation between departments.** The hospital managed that with weekly meetings of a work group that included representatives from Nursing, Biomed, IS and Facilities and staff from GE, Logan said.

“There were lots of departments involved, but we stayed on schedule,” she said.

In the end, the project promises to improve patient safety and the availability of telemetry in the acute-care units, Dzialo said. Over time, as the hospital expanded and telemetry needs grew, it purchased more telemetry boxes, which meant that many of them
operated on different frequencies. The result was that some boxes – those in the 7 East Internal Medicine Unit, for example – worked only in one area. Even if 7 East did not have a need for its eight wireless telemetry boxes, other units couldn’t use them.

Over the years, Dzialo added, the hospital also lost boxes, further limiting the availability of equipment to place on patients. The ultimate impact: not enough telemetry boxes to go around. “We have frequently gone on telemetry divert,” Dzialo said. “We’ve had to keep patients in the ED who need telemetry beds. Now we have more boxes that can be [monitored] in any acute-care area.”

"We’ve flat-lined!"

Preparing for the Worst Turns out for the Best

One of the most challenging parts of Sunday’s telemetry unit roll-out was managing the transition from the Philips to the GE system. Staff replaced the Philips boxes floor by floor, meaning that until the change-over was complete, the hospital was running two different systems.

It required maintaining a three-floor “buffer” between floors to prevent electrical signals from one system from leaking into and interfering with the other.

“During the switchover, Philips and GE were on the same radio frequency,” Biomed Contract Manager Fred Jaramillo explained. “We had to shut down Philips and bring up GE, one floor at a time, and monitor three floors above to make sure there was no interference.”

As a nursing team led by Marissa Streelman, RN, of the IMCU, worked on 6 East and West to get GE up and running, for example, the conversion team was to turn off Philips service on floors 7 and 8. Nurses on those floors were to watch patients at their bedside using portable monitors they wheeled up on preloaded carts.

But a glitch occurred shortly after the roll-out began Sunday morning.

Staff in the 10th floor “cockpit” monitoring cardiac rhythms for every patient in the hospital began noticing interference on the Philips units throughout the hospital minutes after GE started installing its antenna system on the first floor of the AIP.

“We’ve flat-lined. We can’t see anybody on the monitors,” CICU Nurse Manager Maureen Dzialo, RN, told the conversion command center by phone as she watched the monitors with staff.

She asked project manager Kathy Logan to halt the switch. The signal came back in less than a minute after the GE antenna system, which was interfering with the Philips telemetry system, was turned off.
The team repeated the same steps one more time, with the same result. At that point, Logan said, the team decided to shut down the Philips system entirely until GE went live throughout the hospital.

Patients remained safe because the hospital had geared up in advance for a worst-case scenario with extra staffing. Nurses monitored every telemetry patient from the bedside for the duration of the conversion, Dzialo said. The conversion was completed four hours ahead of schedule, Logan added.

The GE Conversion Team

» Kathy Logan, Project Manager/Systems Analyst, Project Lead
» Maureen Dzialo, Nurse Manager CICU/Telemetry, Clinical Project Lead
» Cathy Ehrenfeucht, Director of Critical Care, Administrative Project Lead
» Fred Jaramillo, Biomed Contract Manager, Biomed Project Lead
» Heidi Monroe, Organ Transplant, CNS/Clinical Nurse Educator, Educator Project Lead
» John Backus, Facilities Project Manager, Facilities Lead
» John Burgess, Network/Communications Project Manager
» Brett Coxey, Information Systems Network Support Technician
» Jo Ann DelMonte, Manager, Clinical Education and Professional Development
» Amanda Nenaber, IMCU/Cardiology Clinical Nurse Educator

» Kimberly Olsen, Program Manager, Cardiac and Vascular Center Pre/Post
» Anthony Rolfe, Facilities Coordinator
» Marisa Streelman, Nurse Manager, IMCU/Cardiology
» Kristin Wikler, Internal Medicine & Neurosciences Clinical Nurse Educator