First-ever joint simulations at soon-to-open Maternal/Fetal Health

Campus Partners Join Forces to Test Systems at New TCH Unit

By Tyler Smith

If everything goes as planned, the first delivery and surgery at the new Institute for Maternal/Fetal Health on the Anschutz Medical Campus will take place this fall. But don’t think those involved with the launch have been simply looking at their watches while waiting for the big day.

In fact, dozens of providers and administrators from both University of Colorado Hospital and The Children’s Hospital – which will jointly operate the new center – have been laying the groundwork for the opening for months.

Most recently, the two hospitals and the University of Colorado School of Medicine joined forces to stage patient-care simulations of unprecedented scope. The goal: help providers identify and address potential customer service and safety issues prior to the arrival of the first patient.

The joint program, formally announced last summer (Insider, July 21, 2010), will initially serve healthy mothers who deliver by C-section high-risk infants who, in turn, need surgery for cardiac, intestinal and other problems. Mothers will deliver in and stay at a newly constructed unit at Children’s while the baby goes through surgery, rather than have to move across campus to UCH, as they do now.

Strength in numbers. The approach pools the two hospitals’ neonatal intensive care unit expertise while taking advantage of Children’s pediatric surgical skills and UCH’s extensive obstetrical (OB) experience. Respiratory therapists from UCH will also serve as consultants at the new center.

The catch, of course, is the Institute for Maternal/Fetal Health has yet to handle its first live case. And many of the providers who will staff it have rarely, if ever, practiced together. So the hospitals have staged several dry runs and enlisted the help of the School of Medicine for good measure.

The two multi-scenario simulations, staged March 11 and April 7 at Children’s, used both live patient actors from the University's Center for Advancing Professional Excellence (CAPE) and adult and infant mannequins from UCH’s Work, Education and Lifelong Learning Simulation (or WELLS) Center programmed to simulate various clinical scenarios (see sidebar).

Children’s Simulation Program took the lead in creating and scripting the scenarios for each simulation, as well as gathering data from the exercises for evaluative reports.

Each of the three entities has developed its own simulation programs to help health care workers train, improve or refresh their skills and hone their critical-thinking ability, among other things. The recent exercises marked the first time the programs pooled their resources to take advantage of their distinct strengths to create these clinical-care simulations.

The aim, said Children’s Simulation Program Director Kathleen Ventre, MD, was to put the entire process of care – from a patient’s arrival at the hospital parking garage through admission, clinical
Care and discharge – under the microscope, and to ferret out and correct flaws before the first real patient comes through the door.

**Crash course.** "It’s analogous to using a crash-test dummy with an automobile," Ventre explained. "We were intentionally stressing the system in the interest of patient safety. Our aim was to simulate high-stakes, low-frequency events to determine whether the medical teams and hospital systems were prepared to handle them in this new environment."

The March and April events each included three separate simulations that involved some 20 providers from both hospitals each time, she said. Anesthesiologists, OB and neonatology physicians and nurses, and respiratory therapists played their roles each time.

They weren’t the only ones put under the spotlight, she added. The simulations also tested the adequacy and layout of delivery and operating room space, equipment, staffing, and the reliability of communication between team members, within the unit as a whole and between other services in the hospital, such as the code team, the blood bank and transport.

"We looked at communication among individual team members, communication between OB and Neonatal teams, and communication between teams and key hospital services,” Ventre explained. “And we looked at communication back to the team from the hospital.”

**Filling the cracks.** Between the first and second simulation days, multidisciplinary task forces that included staff from both hospitals who had participated in the exercise met to identify "gaps" in patient care and develop strategies to close them.

The April exercise showed significant improvements, Ventre said, although some issues remain. She anticipates additional, although smaller-scale, training sessions before the unit opens.

The simulations gave staff from both hospitals a rare opportunity to comprehensively inspect and review systems and processes, and assess the program’s readiness, said WELLS Center Director Allen Wentworth, RRT, MEd. He also videotaped a portion of the scenario in which the neonatal team had to resuscitate a newly born “infant.” That footage provided a further resource for the post-simulation reviews.

"We were able to collect data and move beyond simply observing and debriefing teams,” he said. “[The simulations] gave us a chance to refine every component of the program and address gaps we identified.”

For example, the March exercise revealed an unacceptable time lag between the birth of the infant and the call to the neonatal team for resuscitation, Wentworth noted. By the second simulation, he said, the team was notified to be ready for a scheduled C-section and was “ready to roll” when the call for help arrived.

**Can we talk?** The initial exercise also exposed communication problems between the many providers involved in the resuscitation. "In March," Wentworth said, “it didn’t seem that there was one clinician who took command of the situation. The roles everyone was to play weren’t clearly defined. In April, as the team was getting ready and setting up,” he added, “they decided on who would call the shots for intubating, compressing, giving meds and bagging.”

Most of the communication issues, Ventre maintained, were the result of "teams that are not used to working together in this new environment. Individual team members identified patterns of communication that were not as reliable as they could have been,” she said.

Other times, she added, some practitioners noticed that they didn’t "close the loop" when communicating with other team members. That is, they didn’t include the back-and-forth needed to ensure people understood each other.

“Effective care coordination requires precise forms of communication,” Ventre stated. “We’ll be training together more to refine the communication process.”

Participants found that in some cases, communication between units needed to be improved. For example, the blood bank at...
Children's faced challenges when the "mother" experienced post-partum hemorrhaging that caused blood loss that was well beyond the amount a pediatric hospital is used to.

“We held meetings to refine the approach to a maternal hemorrhage," Ventre said. “Protocols that work well for children don’t necessarily translate to pregnant patients.”

The review of the first simulation also exposed staffing issues – anesthesiology has elected to increase staffing for the TCH OB service, Ventre said – and even problems with the layout of the delivery and operating rooms.

“Team members found the arrangement of the [delivery] bed and the medical carts was not ideal,” for efficient patient care, she said.

“We looked at every level of care and customer service until the ‘patient’ was admitted, consented and walked [to the unit],” Ventre said. The standardized patients later completed written evaluations that rated their level of satisfaction. They also provided expanded feedback about their experience.

“We wanted to know how satisfied they were with the instructions they received and how well cared for they felt they were,” Ventre noted.

The live-patient portion of the simulation showed “the importance of [staff] providing clear, explicit, supportive guidelines for seemingly mundane things like parking,” she said. Things staff may consider minor, such as momentary confusion with the computer system, she added, can trigger anxiety on the part of the patient.

“We found through the simulation that patients are sensitive to these types of issues,” Ventre said. “Patients wouldn’t typically disclose that.”

Finding such “rough spots” is the goal of simulation, Barley pointed out, particularly for a group only beginning to work together.

“It’s good to allow newly formed teams doing new work to try out what it’s going to be like in a live situation,” she said. “When they see the first patient, they will have already broken the ice. The team will already know about and have dealt with the issues.”

Simulations Cranked up the Pressure on Providers

The two simulations staged at Children’s each included three separate scenarios. In each one, the “infant,” a mannequin provided by the WELLS Center, was born with a neural tube defect. Shortly after birth, the baby’s breathing and pulse stopped, which necessitated a call to the neonatal resuscitation team. The team had to intubate, compress and ventilate the baby and administer medications and fluid, said WELLS Center Director Allen Wentworth.

The WELLS Center also supplied the “mother,” a mannequin named Noelle. In one scenario, Noelle suffered post-partum hemorrhaging after delivering by C-section. Her condition required a hysterectomy.

In a second scenario, Noelle had post-partum hemorrhaging while she rested in a ward bed after...
delivery and went into cardiac arrest. Her condition required a call to the code team to defibrillate her.

In the third scenario, Noelle went into respiratory failure. In the April simulation, she had to be transported via LifeLink ambulance to intensive care at UCH. An anesthesiologist and an attending from the new center accompanied her, Wentworth said. She was transported through the Emergency Department and then assigned a room in the Burn Center.

At that point, Wentworth said, “challenges posed by capacity issues” at UCH stalled the simulation. But he said the hospital “frequently admits mothers to the intensive care unit. I am sure the patient would be well cared for.” The issues will be noted in a full report that summarizes the findings of the April simulation, and the hospital will address them, he added.