THIS IS NOT A DRILL.

OR IS IT?

Surprise simulations combine technology and team skills to prepare responders for the next hospital emergency

A voice booms over the loudspeaker: "Code Blue. Fourth Floor. NICU waiting room." Suddenly, the room is abuzz as the medical team bursts onto the scene and springs to action. A moment of hesitation. But that's not trepidation — just the realization that this is a drill or what is commonly referred to as a mock-code.

Despite the fact that it's just a manikin lying on the floor — seemingly unconscious and unresponsive — the responders quickly get to work resuscitating the "patient" as more code-response team members arrive. For all intents and purposes, this is a real patient.

"We're definitely not fooling anybody. When they come in and get to the bedside and see the simulator, they know it's a mock-code," says Geoff Miller, Director of Simulation Technology and Research at Sentara Center for Simulation and Immersive Learning at EVMS and Associate Director of the Simulation in Medical Education Fellowship. "And that's part of the construct that is medical simulation. It's not the real thing, but we create enough realism for teams to respond to the incident as they normally would."

Mr. Miller, along with Joel Clingenpeel, MD, MPH (MD '98), Associate Professor of Pediatrics and Director of the Simulation in Medical Education Fellowship, and Dana Ramirez, MD (MD '98), Assistant Professor of Pediatrics and the Pediatrics Residency Director, started these mock-code simulations in collaboration with Children's Hospital of The King's Daughters (CHKD) to provide a rigorous evaluation of how a team of health-care professionals responds to a critical event. A code — often designated by a color — alerts hospital staff to a particular type of emergency and conveys critical information quickly, so the proper team can assemble.

But why fake an emergency? The answer is two-fold: practice and teamwork. Both can help reduce delays, diminish errors and increase confidence and comfort levels of providers, resulting in more efficient and effective patient care and safety.

After completing a fellowship in EVMS' pediatric emergency medicine program at CHKD

1. PREP

2. DRILL

3. EVALUATION

where she took part in occasional mock codes, Kellie Williams, MD, became the first participant in EVMS' Simulation in Medical Education Fellowship. This allowed her to combine her clinical training with her background in medical education. Now, part of her job includes working with EVMS' pediatrics residency program to create a curriculum that emphasizes team skills, using mock codes as a basis.

> *"Every time we do a mock code, we use a component of team skills."*
>
> Kellie Williams, MD,
> simulation in medical education fellow

"Every time we do a mock code," Dr. Williams says, "we use a component of team skills — like communication, leadership, situational awareness, mutual support and team structure — and we look at those, along with the clinical aspect of it."

Dr. Williams hopes the mock codes can be repurposed year after year to help improve the team skills of not only residents, but also the code-response team as a whole. "If you don't practice it and revisit these skills often, you are going to forget about it," she says.

The code-response team — which includes physicians, residents, nurses, respiratory therapists, EMTs, pharmacists, managers, techs and security from departments across CHKD — participates in the drills just as they would in real situations. "You can almost think of them as a 9-1-1 system inside the hospital," Mr. Miller says. "They are trained a little bit differently in terms of their specialties to handle acute or life-threatening events."

To keep the code-response team sharp, the drills take place once a month at random. The responders never know whether a code is real until they arrive at the scene.

"Since we are all working together, we should practice together," says nurse Stacy Leigh, MS, RNC, Resuscitation Education Coordinator at CHKD. "The goal is to perfect our practice so that when performance is required, it's already a well-oiled machine."

The mock-code coordinators often base their drills on patient cases, Ms. Leigh says. But they also occasionally create scenarios outside the typical codes — such as an adult patient experiencing respiratory distress in a children's hospital. The coordinators take a back seat during the mock code itself to observe and note the response team's actions and interactions.

Once the drill is complete, which usually takes 10-15 minutes, the responders and coordinators assemble to debrief. "We are not necessarily recalling what happened, but why it happened," Mr. Miller says. "We go over what went well and what practices we want to carry forward. Then we discuss things we can improve on in the future."

> *"The goal is to perfect our practice so that when performance is required, it's already a well-oiled machine."*
>
> Stacy Leigh, MS, RNC,
> resuscitation education coordinator at CHKD

The larger group then breaks off into subgroups — clinicians meet with clinicians, nurses meet with nurses, pharmacy staff meets with pharmacy staff, etc. — to address specific clinical-care concerns in their areas of expertise. Then, the entire group reconvenes to discuss subgroup findings and to determine if an

4. DEBRIEF

element of effective teamwork could have mitigated any of the issues.

"We express any concerns in a way that is positive and productive for teams," Mr. Miller says. "The idea being that there are no clinical problems that don't relate to some sort of team-building skill, and so far we've found that to be 100 percent true.

> *"We express any concerns in a way that is positive and productive for teams."*
>
> Geoff Miller, director of simulation technology and research

"Most people like to couch a clinical problem as a clinical problem, but with most of the issues we've seen, had we enacted some sort of teamwork skill, the problem probably could have been avoided."

The program at CHKD has been so well received that the coordinators are looking for opportunities to integrate the team-based concepts outside of mock codes. "The nice thing about this effort is that this type of training is not exclusive to resuscitation," Ms. Leigh says. "It can be employed in all sorts of work environments. These techniques are universal in application, and as the concepts become more familiar, they can be practiced hospital-wide."

EVMS simulation experts are in the early stages of implementing a similar program at Sentara Norfolk General Hospital, thanks to a generous gift from Mark Greenspan, MD, Associate Professor of Surgery, and his wife Betty Greenspan.

They established the Greenspan Education Fund, which will be used to enhance the simulation curriculum for fourth-year EVMS medical students and surgical residents. It also will support surgical education projects at Sentara Norfolk General Hospital. □

MEET THE PATIENTS

The experts at the Sentara Center for Simulation and Immersive Learning at EVMS rely on a family of manikins, or patient simulators. Depending on the training scenario, they have adult men and women, pregnant women, children, babies and even newborn manikins to use.

These life-like robots, manufactured by Laerdal, have the ability to breathe, talk, cry, bleed, convulse and go into cardiac arrest, says Andrew Cross, Associate Director of Simulation Technology, all while recording and providing valuable data that is used to evaluate the code response team. Controlled by a computer, the manikins have sensors built inside to track how the team or provider is performing.

"The manikins are very good at simulating the abnormal findings and allowing people to practice the more invasive procedures like CPR, intubation and starting IV lines. You know, all of those kinds of things that we can't pay our standardized patients enough to do," Mr. Cross quips. □