Seeing What Works

Computational modeling and simulation (CM&S) technologies are beginning to benefit healthcare in tangible ways, according to the experts quoted in our cover story (p. 340). By giving health professionals and medical device manufacturers the ability to see what works, CM&S holds tremendous value for educating clinical staff, designing technology that works for end users, and executing complex capital equipment planning and other strategies.

No longer the stuff of speculative fiction and theory, virtual reality is being used by clinical engineers to master complex tasks, such as troubleshooting telemetry boards, without disruption to the physical environment. Meanwhile, device makers are recognizing the tremendous value of CM&S in allowing them to predict the performance of medical systems prior to design verification.

The Johns Hopkins Medicine Simulation Center includes a 10-bed simulated hospital that features an operating room, trauma bay, inpatient and critical care rooms, and a labor and delivery room. Although it’s primarily used by hospital employees and medical students for research and education, the center also has become a resource for manufacturers, who use it for medical device usability testing.

Previously, said Julianne Perretta, lead simulation educator at the center, “very important decision makers at the hospital would sit at a conference table and argue back and forth at each other about why equipment would or would not work. Now, we take the bedside nurses, anesthetists, and surgeons, as well as anyone else who will be interacting with this equipment, and bring them in here and let them test it out for themselves in a simulated hospital environment. That way, we can see what will work and what won’t.”

Wesley Reid, Army service lead for the Department of Defense Biomedical Equipment Technician (BMET) Training Program at Fort Sam Houston in San Antonio, TX, believes that augmented reality (AR) technology, which allows computer-generated images to be superimposed on a user’s view of the actual world, is very close to revolutionizing healthcare.

Rather than being trained on closely patient simulators, clinicians may soon be sporting AR “smartglasses” that will allow them to work with patients while overlayed holographic images and computer-generated signs and symptoms are displayed. And during BMET training, Reid foresees AR giving students an in-depth look into complex technologies and how they will respond to technician servicing.

As CM&S technologies become increasingly mainstream, the ability for health professionals to see what works will improve exponentially.
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