SIMULATION CENTERS





They don't say 'ouch'.

Over the past 10 years, healthcare has experienced a vast increase in the number of simulation centers. There are about 1,000 centers in the United States and the number is expected to continue to increase. With high-risk specialties like emergency medicine, anesthesiology, and surgery leading the way, simulation-based training has evolved from a luxury to a necessity.



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Although each simulation center is unique in size and function, our experience has identified several universal elements that apply across all simulation design projects, both large and small. In this three-part email series, we will discuss the primary spaces in a simulation center and the importance of their functions.

Skills Areas

The skills area is the heart of any simulation center. Whether it includes a full-sized OR, a skills lab, or a standardized patient room, these areas define a simulation center.

At a very basic level, a general skills area may contain four to eight beds, equipped with medium-or low-fidelity manikins, a skills lab, and control room. To create a greater level of realism, simulation suites are often designed to accurately replicate actual hospital rooms, such as patient rooms, ORs, and ED treatment spaces equipped with support elements such as medical gases, monitoring devices, and patient lifts in order to allow scenarios for role play of real-life situations.

Simulations vary in their complexity, from teaching basic bedside skills like checking vitals to more complex skills such as coordinating a whole patient care team during a surgical procedure. They often require sophisticated specialty manikins and the appropriate clinical tools and equipment to create a realistic patient care environment.

Technologies

The most common technologies include:

Standardized patient simulation. This involves the use of individuals trained to play the roles of patients, family members, or others to allow students to practice physical exam skills, history taking skills, communication skills, and other exercises.

Patient Simulation. This uses low-, medium-, or high-fidelity manikins that are capable of simulating physiologic changes such as a loss of pulse, dilation of the pupils, or a sudden drop in blood pressure. High-end models can run from \$20,000 to \$200,000, and they can be wirelessly controlled by an operator from within the control room. Custom scenarios can be loaded to provide unique experiences, such as creating stress that might lead to medical errors. Procedures can be performed on the simulators such as bag-mask ventilation, intubation, defibrillation, chest tube placement, and others.

Task trainers. Typically the bulk of the items in a simulation center are full- and partial-body manikins such as intubation heads, central

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venous line chests, intraosseous line legs or umbilical artery cannulation trainers used to practice specific skills.

Virtual reality procedural trainers. A

common form of virtual reality involves the use of haptic (touch) feedback to produce a feeling of resistance when using instruments in a simulated environment. This technology is frequently used in endoscopic and laparoscopic dexterity training. These trainers typically are focused on minimally invasive procedures such as endoscopic, laparoscopic, endovascular, and urologic procedures. Students can practice skills like deploying a stent while monitoring patient vital signs and watching a screen, similar to watching a fluoroscopy screen in the operating room.

Computerized simulation. Computerized simulation uses computer programs that allow the learners to practice decision making skills and specific knowledge sets such as Advanced Cardiac Life Support (ACLS) trainers and trauma management trainers.

Case Study:

University of North Carolina, Chapel Hill Koury Oral Health Sciences Dental Simulation Center

They don't say ouch, but the 105 manikins in the College of Dentistry's new simulation lab help beginning dental students master skills in a much more realistic way.

The facility introduces dental students to the challenges of treating real patients, helping students make a smoother transition from the classroom to the clinic.

In the past, dental students worked on bench-mounted dentiforms – sets of imitation teeth used to teach dental procedures. While the experience helped students learn basic skills, it offered limited preparation for real-life dental treatment.

The simulation clinic changes that, giving students immediate experience working in the mouths of "patients." Manikins positioned like reclining patients hold dentiforms in their simulated jaws. From their first days in class, students learn to approach their work from above and behind, using mirrors and other instruments to watch what they are doing.

Sized to house a full 100-student DDS class at one time, the simulation lab contains 54-inch benches

 "It's an incredible space, and everyone is enjoying the new communal and classroom spaces. This is a huge enhancement for our experience at UNC. We all feel fortunate to be able to learn in this kind of environment."
Matt Scheske, D.D.S. Class of 2015 class president

www.dentistry.unc.edu/news/ncdentalreview/NCDR_fall12_web.pdf

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University of North Carolina Chapel Hill, Koury Oral Health Sciences Dental Simulation Center and fold-away simulator units for each student. Techniques and instructions are broadcasted to each station from a centralized instructor station via monitors at each bench.

A materials lab adjacent to the simulation lab provides benches and additional support space and counters. The simulation and materials lab mimic professional clinics in utility services and finishes.

Large windows adjacent to a main pedestrian arcade allow views into the simulation lab to showcase the space, which is unique to dental education.

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