Building a world-class simulation enterprise at OHSU

When boarding an airplane, passengers find it comforting to know that the pilots have spent many hours in a flight simulator honing their skills. A similar expectation has developed in health care, where simulation training has fundamentally transformed education programs. As health care becomes more complex and interdisciplinary teams become the norm, simulation is emerging as the key to developing the highly technical skills, good judgment and interdisciplinary teamwork required of today’s health care providers.

Simulation has been an integral part of OHSU’s medical, nursing and dental curricula for many years and part of what has earned the university its place among the nation’s top-rated teaching institutions. OHSU helped develop the first statewide simulation network in the U.S. (the Oregon Simulation Alliance) and a nursing network now recognized as a national model (the Oregon Consortium for Nursing Education). Today, OHSU is poised to become an international model in simulation training.

Launching a new simulation vision at OHSU

OHSU has embarked upon a new vision for simulation education that includes expanding simulation curriculum, centralizing key simulation activities and building a new interdisciplinary simulation facility.

With philanthropic investment, OHSU’s simulation vision will bring in new partners and new possibilities for improving education and health care quality in our region and far beyond.

The Simulation Solution

“Health care is evolving, and so should health care instruction. The traditional apprenticeship model of ‘see one, do one, teach one’ is no longer enough to prepare health professionals for the challenges to come.”

— OHSU president Joe Robertson, M.D., M.B.A

Architect’s rendering of simulation’s new home at OHSU: the OHSU/OUHS Collaborative Life Sciences building on Portland’s South Waterfront.
Building a sustainable program

OHSU’s new simulation vision has already started to become reality, with the consolidation of existing programs and construction of new facilities. The following is a rough schedule for how simulation training will expand over the next several years:

2012-13 Begin transition to centralized model.

2013-14: Expand centralized simulation resources and services; recruit simulation staff and faculty; new simulation facilities open.

2014-15: Expand programs and facilities across OHSU; adapt new facilities for simulation; increase academic enrollment; integrate simulation more thoroughly into curriculum.

Facilities: The new facility will include flexible simulation rooms and practice stations, and space that can be adapted to the needs of multiple disciplines and the varying needs of undergraduate students, advanced specialty learners and current practitioners.

Team players: the interprofessional training advantage

With its new center for interprofessional training, OHSU is leading the charge to make collaborative practice the new standard of care, everywhere. Simulation training is essential to making it possible.

In 2011 OHSU broke ground on the Oregon University System/Oregon Health & Science University Collaborative Life Sciences Building (CLSB), an innovative center for interprofessional learning and discovery located on Portland’s South Waterfront. A partnership that includes OHSU, Portland State University and Oregon State University, the CLSB will foster collaboration among all types of health and science professionals, accommodate learners from a wide range of professional health programs and provide training for faculty and current practitioners. OHSU plans to dedicate 20,000 square feet of the new facility to state-of-the-art interprofessional simulation facilities.

When the CLSB opens its doors in 2014, OHSU students will be among the first in the nation to receive this level of exposure to team-based, interprofessional simulation training — a distinct advantage as health care practice moves in this direction.

Developing a strong core

As part of its new simulation vision, OHSU will develop a central simulation core to unite OHSU’s wide-ranging simulation programs. With the new facility in the CLSB as its hub, OHSU’s simulation program will feature a full menu of centralized services such as curriculum design, faculty development, operations infrastructure and research support. The new facility will also become a resource to other organizations, which will be able to access sophisticated simulation rooms and equipment for their own training purposes or participate in OHSU-sponsored continuing education programs.
The many forms of simulation at OHSU
Simulation is a teaching and assessment method that uses a variety of technologies and specialized instruction. Simulation takes many forms, including:

Human patient simulators (mannequins): Participants learn on interactive mannequins that can model patient symptoms and responses to treatments. These simulators allow learners to develop technical skills ranging from starting IVs to administering anesthesia. Working on mannequins also tests critical thinking and judgment, as learners strive to find the best diagnosis and treatments.

Standardized patients (actors): Working in simulated clinical environments, learners interact with live actors, who arrive with detailed histories, specific symptoms and full personalities.

Simulated clinical environments: Realistic settings such as an emergency room or operating room allow entire teams to practice their communication and decision-making skills in stressful situations, such as sudden heart failure. Using sophisticated technology, instructors create authentic situations and challenges. Afterward, participants debrief with instructors and peers.

Technical skills stations / high and low fidelity simulators: Learners utilize computers or anatomical models to practice specific skills such as root canal therapy, laparoscopic surgery and endoscopic procedures.

Community outreach: OHSU collaborates with a variety of community partners to bring simulation training to students and current providers across the region. Working with emergency medical service agencies, OHSU helps recreate mass casualty incidents in the field with full scale fire, rescue, and aeromedical response. OHSU also helped design a simulated ambulance that brings crucial field training to paramedic students across the state. OHSU trains providers around the region in neonatal resuscitation and provides courses designed to allow practicing anesthesiologists to maintain their certification.
Making real progress in simulation training

Simulation stories

**Diagnosis: broken heart**

The ambulance delivered Thelma, 76, to the hospital with shortness of breath. A diabetic with a history of heart failure, Thelma said she was downcast because of her husband’s recent death. She didn’t respond to diuretics and her blood pressure was dropping. Why? The nursing student reviewed Thelma’s medical history, talked with her and ultimately concluded that Thelma’s symptoms were complicated by grief. Thelma’s situation seemed very real to the student, despite the fact that she was a high-fidelity mannequin programmed to simulate human physiology and emotion—from the “crackles” in her lungs and a racing heart beat (displayed on an actual heart monitor) to her discussion about death (through a microphone in the mannequin).

“State-of-the-art mannequins are crucial for teaching health care providers how to observe medical problems and make decisions while avoiding risk to real patients,” said Paula Gabrud, Ed.D., R.N., senior associate dean, OHSU School of Nursing. “Thelma can travel anywhere in Oregon to bring simulation training to communities across the region.”

**Tiny patients, big stakes**

As quickly as the 26-week-old twins were delivered by emergency Caesarean, the 12-member team worked to revive them. A rapid, coordinated approach in the first 90 seconds was critical to avoid brain injury. High-risk deliveries require extremely effective teamwork. “Every second counts, every action is critical,” said JoDee Anderson, M.D., M.Ed., director of pediatric simulation education and assistant professor, OHSU School of Medicine.

Fortunately for these very real twins, the team — including neonatologists, nurses, nurse practitioners and respiratory therapists — had rehearsed this stressful scenario together through simulation training. “Optimizing interprofessional teamwork requires deliberate, collaborative efforts; our teams come together regularly to hone these skills in simulation,” said Anderson. As a result, OHSU has dramatically reduced mortality and brain injury in this fragile group of patients.
The art of breaking bad news
As a third year medical student, Frances Biagioli, M.D. had to deliver some devastating news to a patient and waiting family members: terminal lung cancer. It was a difficult moment, even though the patient and family were actors (a.k.a. standardized patients). Biagioli struggled with her own emotions and was grateful for the practice to get it right.

“The art of medicine is both to cure and to care for patients,” said Biagioli, now an associate professor in the department of family medicine, OHSU School of Medicine. While scientific knowledge can be learned from a textbook, many of the skills crucial to delivering excellent care can only come from practicing with people. Standardized patients provide a rare opportunity for students to receive the kind of honest feedback, both positive and negative, that will help them develop confidence caring for real patients.

Grace under pressure
Early on a rainy Monday morning, Polk County Emergency Medical Services (EMS) received a 911 call reporting a high speed motor vehicle collision involving two vehicles and as many as six injured passengers. Within 15 minutes two hospitals, several ambulances, firefighters, and a helicopter team were activated and going through their well-rehearsed response.

“This time, the injured passengers were a mix of high fidelity mannequins and actors. But the quick, coordinated response was very real,” said Robert Cloutier, M.D., program director for OHSU’s Emergency Medicine Simulation. “Every level of the EMS system was involved in this high stakes simulated crisis, which tested the team’s medical skill as well as the overall communication and coordination.” Polk County is one of many communities in Oregon where OHSU has contributed to EMS training, allowing paramedics opportunities to practice critical resuscitation and team skills in the field under the most realistic conditions possible.

Above, left: OHSU helped develop this mobile simulation unit designed to provide hands-on training for emergency medical technicians statewide. Middle: A School of Medicine faculty member monitors a simulation exercise. Right: Undergraduate medical students practice CPR on a mannequin.

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The future of health care

Research is showing that simulation training is effective in many health care settings, and more medical and nursing boards are mandating simulation for credentialing. Simulation at OHSU is projected to increase at least 15 percent annually.

OHSU’s simulation leadership

Co-directors
Jeffrey A. Gold, M.D., has received more than $1 million in NIH and AHRQ funding to explore how simulation training can improve the way intensive care unit doctors use electronic medical records.

Jeanne-Marie Guise, M.D., M.P.H., is the author of the Clinical Teamwork Scale (CTS), a widely adopted tool for evaluating teamwork. Her research has received more than $4 million in NIH and AHRQ grants.

Erica L. Mitchell, MD, FACS chairs the Association for Program Directors in Vascular Surgery Education Committee and is developing a national vascular surgical skills lab and simulation curriculum.

Training and research leaders
JoDee Anderson, M.D., M.Ed., is co-author of the national Neonatal Resuscitation Program and author of the Behavioral Assessment Tool for simulation evaluations.

Paula Gubrud, Ed.D., R.N., FAAN, is OHSU’s associate dean for academic partnerships, technology and simulation and nationally recognized for integrating best simulation practices in nursing training.

Michael Seropian, M.D., is the immediate past president of the Society for Simulation in Healthcare and founding member of the Oregon Simulation Alliance.

Donn H. Spight, M.D., F.A.C.S., is the medical director for VirtuOHSU, OHSU’s nationally accredited surgical simulation facility.

“Optimizing interprofessional teamwork requires deliberate, collaborative effort; our teams come together regularly to hone these skills in simulation.” — JoDee Anderson, M.D., M.Ed.

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Giving opportunities
OHSU estimates that startup capital costs for the new facility will be $5 million. With philanthropic support, OHSU can build on its excellent program and lead the next generation of simulation innovation.

Equipment: OHSU plans to build a flexible, two-floor facility capable of serving a variety of teams and specialty needs. The new facility will feature state-of-the-art simulation theaters and require high-performance technology capable of supporting all forms of simulation.

People and infrastructure: Great programs require extraordinary people. Support in this area will help OHSU retain, develop and recruit faculty with established experience and national recognition in all aspects of simulation education, research and patient care. Philanthropic support would also help pay for central services staff and resources.