



CENTER FOR
IMMERSIVE AND
SIMULATION-BASED
LEARNING

STANFORD SCHOOL OF MEDICINE

2011 - 2012



ACCOMPLISHMENTS
REPORT



LETTER FROM THE ASSOCIATE DEAN FOR IMMERSIVE AND SIMULATION-BASED LEARNING

The academic year 2011-2012 marks the first full year of CISL operating as a part of Education Programs and Services in the School of Medicine. The growth in the use of immersive and simulation-based learning (ISL) described below and in the details of this report reflect the success of CISL in becoming a core component of the School's educational enterprise for its diverse learner populations (medical students, graduate students, housestaff and fellows, experienced clinicians).

We continue to be grateful for the generosity of Mr. Li Ka Shing, the naming donor of the LKSC, and of Hon-Mai and Joseph Goodman, the primary donors for the Immersive Learning Center (ILC) floor, for providing the opportunity to create this world-class integrated center where all modalities of immersive and simulation-based learning can exist in one spot. We have continued to become at home in the ILC and over the past year we made important strides in improving its physical plant and its simulation and audiovisual technologies. We are grateful to the dedicated work of our partners in Information, Resources, and Technology, especially Bob Burkhardt, Trent Tanaka, and Robert del Visco.

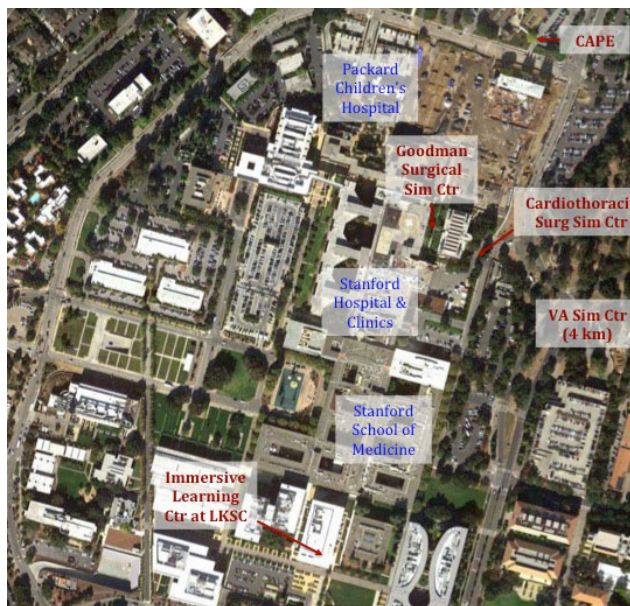
The use of the ILC is rising spectacularly, limited currently by the ability of our hardworking staff to meet the demand. Not only are more activities being launched, but many of them are also more ambitious in their education goals and their use of multiple interrelated simulation modalities.

Critical to CISL's missions are its people and, as is always the case, we have seen some comings and goings. Donna Sheridan completed her tour of duty as ILC Manager; she will help transition to a new Manager, hopefully in the near future. Mike Ignacio moved on to his "dream job", vacating the position of ILC Administrative Assistant, which was filled by DeeDee Perez. Kim Yaeger left and was replaced by Dr. Candace Pau as the Education Development Specialist, concentrating on Continuing Medical Education.

The CISL consortium of simulation centers in the Stanford family encompasses an amazing set of expertise and facilities, with six centers (beside the ILC, these are Simulation Center at VA Palo Alto HCS, Center for Advanced Pediatric & Perinatal Education, Goodman Surgical Simulation Center, Cardiac Surgery Simulation in the Falk Cardiovascular Building, and the LPCH Center for Nursing Excellence) and a very large number of programs taking place both in dedicated simulation centers and in-situ (in actual clinical work units). VA Palo Alto has announced a \$10 million project to build a new 18,000 gross square foot building to house a 9,000 net square foot simulation center. Design will start this fall, with completion of construction anticipated in 2014.

Stanford and affiliated faculty, clinicians, researchers, and staff continue to be innovators of ISL and to play major roles in the national and international adoption of ISL techniques and applications to improve quality and patient safety. Faculty also continue with externally funded research either about simulation or using simulation to study other issues in healthcare. Collaborations have begun between CISL and professors in other Stanford schools and departments, confirming the interdisciplinary nature of simulation and the culture of innovation at Stanford.

In the School of Medicine, CISL faculty were active in several of the working groups considering curriculum reform for the medical student education process. A theme of this effort has been the notion of "flipping the



classroom” – creating didactic resources (lectures or other video teaching snippets) that can be accessed by learners anytime, anywhere, leaving much more time for on-site interactive teaching. Immersion and simulation will play important role in these on-site interactive activities, in which learners will practice applying the concepts and knowledge that they have already acquired. An important corollary to this effort will be expansion of interprofessional education (IPE) for both students and experienced clinicians. Stanford is opening a dialog with Bay Area nursing schools to explore opportunities for joint simulation IPE for nursing students and medical students. Within the Stanford and affiliated hospitals, combined team simulation activities involving physicians, nurses, allied health professionals, and others are becoming more common.

Stanford faculty and staff continue to be world-recognized leaders in ISL techniques, applications, and technologies who are highly sought after as teachers, scholars, advisors, and collaborators. Our goal is, as ever, to improve the efficiency, quality, and safety of care for all patients, while simultaneously improving the education, training, and assessment of the caregivers. There is a saying so meaningful that it is found in both the Hebrew Talmud and the Muslim Qur’an (in various forms): “Whoever saves a life, it is as if he has saved all mankind.” We thank the many people involved in the inception, conduct, and support of immersive and simulation-based learning at Stanford. By their efforts we are certain that many individual lives around the world have already been saved. We are pledged to continue these efforts for the benefit of all humanity.



David M. Gaba, MD
Associate Dean,
Immersive and Simulation-based Learning

This document is designed to highlight the new activities of the Center for Immersive and Simulation-based Learning (CISL) under the purview of the Office of the Associate Dean for ISL, for the time period of August 2011- September 2012. For the most part, previous activities continue and to a large extent have become regular components of teaching, learning, and research at Stanford School of Medicine and its affiliates. This report is not intended to be an exhaustive summary of all CISL activities and programs.



STANFORD
SCHOOL OF MEDICINE

Stanford University Medical Center

STRATEGIC GOAL 1

EDUCATION AND TRAINING OF STUDENTS AND CLINICAL TRAINEES

Immersive and Simulation-based Learning (ISL) is used to improve the education and training of Stanford students (undergraduate, medical, and graduate) and the Medical Center's trainees (residents, clinical fellows, and postdoctoral scholars).

“MORE SIMS ALL AROUND! IT'S A GREAT WAY TO APPLY PHYSIOLOGY AND PHARM[ACOLOGY] (IN A WAY THAT STICKS).”

—MEDICAL STUDENT

Now in its second year of operation, the Goodman Immersive Learning Center (ILC) in the Li Ka Shing Center for Learning & Knowledge (LKSC) continues to provide dynamic and innovative immersive and simulation-based learning opportunities for students and trainees at all levels. Since September 2011, the ILC has averaged 1600 hours of learner activity each month. Many users have taken advantage of the numerous new educational programs that have been implemented during the 2011-12 academic year, utilizing the ILC's state-of-the-art simulation mannequins, standardized patient actors, as well as physical task trainers. The development of hybrid programs that combine two or more of these immersive learning modalities has been particularly exciting, and more such courses are planned for the future. In addition, students and housestaff continue to receive specialized simulation-based training in situ at Stanford Hospital and Clinics, Lucile Packard Children's Hospital, and the VA Palo Alto, as well as at other training facilities associated with the Center for Immersive and Simulation-based Learning.

STANDARDIZED PATIENT PROGRAM (SPP)

In the 2011-12 academic year, the Standardized Patient Program (SPP) continued administering numerous programs and exercises throughout the medical curriculum under the direction of Dr. Andrew Nevins, Medical Director.

CPX SERIES

The SPP administers a Clinical Performance Examination (CPX) series throughout the medical student curriculum aimed at assessing skills in history and physical examination, communication, and clinical reasoning. The “Mini-CPX” is a four-station examination administered toward the end of the second year of medical school; successful completion of the Mini-CPX is a requirement in order to begin clinical clerkships. The CPX is an eight-station examination administered to all clinical medical students as they enter their last year of clinical training and is a requirement for graduation.

INTERPROFESSIONAL EDUCATION (IPE)

As part of the CPX, the Stanford SPP conducted an exercise to test students' ability to work with a “standardized nurse” in a hospital-based encounter. This was done as a collaborative effort with a number of other California medical schools. In addition, Stanford is continuing to explore other IPE simulation programs in conjunction with a number of different health professional schools to engage in simultaneous interprofessional learning.

GRADUATE MEDICAL EDUCATION

Building on the SPP's developing role in graduate medical education, an exercise was developed in conjunction with the plastic surgery residency program aimed at assessing communication skills among surgical residents. In this program, plastic surgery and orthopedic surgery residents participated in a simulated patient encounter that involved consenting the patient for surgery. Via reviewing video recordings of encoun-



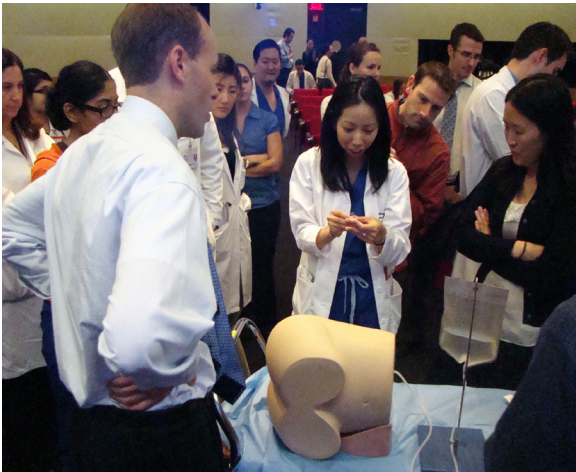
Family Medicine faculty take notes from the control room while watching student interactions with standardized patients.

ters as well as checklists completed by the standardized patient actors, course faculty were able to assess the detail and accuracy with which residents conveyed information to the patients. Standardized patient actors also assisted with the Department of Anesthesia's Evolve program for residents. In this program, standardized patient actors were combined with

mannequin-based simulation, making it one of the first hybrid exercises to take advantage of the physical proximity between the SPP and simulation program within the ILC. In July 2012, the Department of Neurology piloted another hybrid simulation—the Stroke Code for interns—that incorporated the use of a standardized patient actor in conjunction with simulation equipment. Collaborations with other programs in graduate medical education are planned for the upcoming academic year as well.

“IT IS ALWAYS A PLEASURE TO BE INCLUDED IN A STANFORD EXERCISE. THE ATMOSPHERE IS SUPPORTIVE AND WE ALWAYS FEEL APPRECIATED.”

—BG, STANDARDIZED PATIENT ACTOR



ILC simulationists brought a lumbar puncture trainer to demonstrate at the Department of Neurology Grand Rounds.

TASK TRAINING

Educational programs incorporating the use of physical part task trainers continue to be popular across departments. The Hematology/Oncology fellows participated in a new skills training program using lumbar puncture trainers as well as practiced the administration of chemotherapeutic agents. Under the direction of Dr. Kim Harney, Clinical Associate Professor of Obstetrics and Gynecology, student and trainees have been using task trainers specially set up within clinical contexts that offer simulated patient data and dialogue to accompany the learning of procedural skills. The Department of Neurology also continues to provide lumbar puncture and ophthalmologic examination training via trainers at the ILC.

The ILC has acquired several new task trainers now available for use by interested programs. These include new central venous catheter and thoracostomy trainers with ultrasoundable capability, paracentesis trainers, and the AirSim Bronchi trainer. Two OtoSim otoscopy trainers made available by Dr. Robert Jackler are also available in the ILC and are planned for use in preclinical medical student skills trainings in the coming academic year.

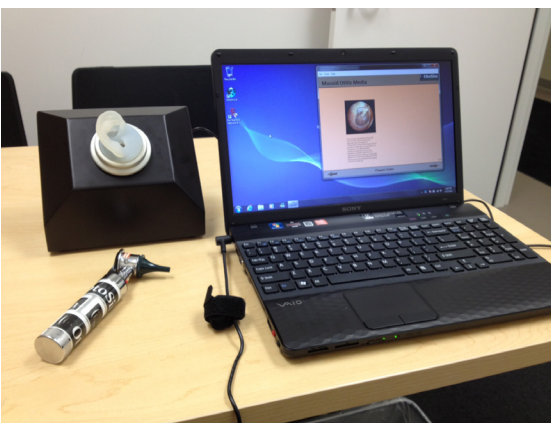
DEPARTMENT SPECIFIC ACTIVITIES

More departments within Stanford School of Medicine are taking advantage of the educational benefits offered by immersive and simulation-based learning. Several new courses and activities have been initiated over the past year. Some highlights of these programs are listed below by department:

ANESTHESIA

Under the direction of Drs. Calvin Kuan and Manchula Navaratnam, residents and fellows in pediatric cardiac anesthesia have been participating in crisis resource management simulation courses. Additionally, incoming pediatric critical care fellows and cardiovascular critical care advanced fellows received specialized skills training in a full-day, expanded version of a course that was initially piloted in July 2011.

Drs. Ankeet Udani and T. Kyle Harrison direct a simulation program for Department of Anesthesia interns entitled Intern Preparedness using Innovations in Teaching (ImPRINT). This course exposes interns to commonly encountered clinical scenarios and encourages camaraderie and teamwork through immersive learning. Different participant learning styles are addressed via a



The OtoSim trainer teaches students to perform an otoscopic examination and recognize common otologic pathology.



Critical care fellows practice obtaining intraosseous access and central line insertion using mannequins.

“REALISTIC CASE SCENARIOS WERE HELPFUL IN ILLUSTRATING KEY CONCEPTS IN CRITICAL CARE.”

–MEDICAL STUDENT

“EXCELLENT EXPERIENCE. ALWAYS ANXIETY-PROVOKING, BUT EDUCATIONAL AND ENJOYABLE.”

–ANESTHESIA RESIDENT

variety of teaching modalities, including podcast didactics, simulations, task training, and small group debriefing.

In addition, Department of Anesthesia residents continue to participate yearly in the Anesthesia Crisis Resource Management (ACRM) series, as well as Evolve, a multi-year simulation-based curriculum that utilizes both standardized patients and mannequin-based scenarios with an integrated case theme for 1st year residents and emphasis on leadership and supervisory skills for senior residents.

EMERGENCY MEDICINE

Utilization Of Ultrasound Monitoring For Teaching

At Stanford Hospital, the Emergency Department faculty have been performing and teaching bedside ultrasound (US) for approximately 10 years, and have had an emergency US fellowship for the last 7 years. Previously, human models were used for teaching (all with normal pathology) and learners hoped to encounter pathology while on the job. Now, learners use the ILC and its various simulators for US training. The use of these simulators has helped enhance workshops and allow learners to see pathology prior to being on clinical shifts. Some of the ultrasoundable equipment available in the ILC include central line/peripheral line simulators, the Vimidex Echo/FAST Simulator, and lumbar puncture simulators.

Emergency medicine residents start their training during their intern orientation week, which includes a 2 full-day workshop with didactic and hands-on sessions in the ILC. They also have an additional full-day US workshop mid-year incorporating basic and advanced US applications with a smaller group, and application-specific workshops approximately 6-8 times per year during their resident core curriculum. Most senior residents also sign up for a 2- or 4- week US elective, which includes US scanning sessions in the ILC and in the ER.

Disaster Management

Emergency Medicine faculty members Drs. Jessica Ngo, Kimberly Schertzer, Rebecca Smith-Coggins, and Phil Harter lead the first disaster simulation this past year for the emergency medicine residents. The multi-casualty disaster scenarios were developed to prepare residents and students for potential future large-scale disasters. High-fidelity mannequins as well as live actors were used to create a disaster setting and injuries specific to a major earthquake and large organophosphate poisoning and explosion scenario.



Dr. Laleh Gharahbaghian of Emergency Medicine (L) demonstrates the use of abdominal ultrasound.

The disaster scenarios will continue to develop in the next year to teach health care providers how to coordinate a mass casualty event, prioritize limited resources, and treat different disaster specific injuries using the equipment they will have in a disaster. Three sessions were held in 2012 for the residents, and four sessions are planned to run in 2013 with the intent to expand this training to all health care providers.

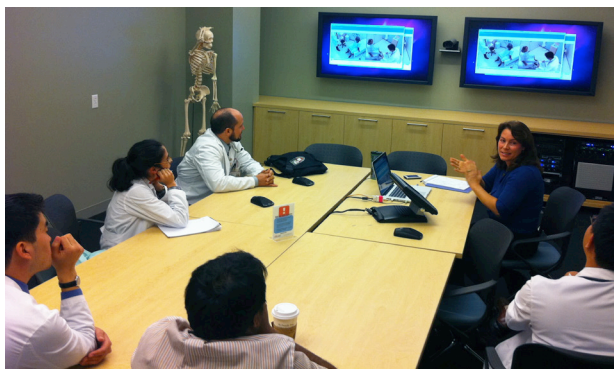
“LIKE THE HANDS-ON WORKING WITH TEAM--NURSES, ATTENDINGS AND STAFF.”
-EMERGENCY MEDICINE RESIDENT



Participants in the disaster management simulation attend to a trauma patient.

Emergency Medicine Resident Pediatric Code Boot Camp

In July 2012, all 36 emergency medicine interns and residents participated in a skills training directed by Drs. Kajal Khanna and Bernard Dannenberg, along with Lynda Knight, RN. During this program, house-staff were familiarized with the Broselow code cart and practiced the use of debfibrillators, pediatric intubation, and gaining intraosseous access using pediatric and neonatal mannequins.



A Family Medicine faculty member leads a group video debriefing for students in the Family Medicine core clerkship.

FAMILY MEDICINE

The academic program in Family Medicine, led by Erika Schillinger, MD, Rika Bajra, MD, Eva Weinlander, MD, Tracy Rydel, MD and Margo Vener, MD, MPH, has been employing group feedback on video recorded clinical encounters as a useful way to enhance professionalism, interpersonal and communication skills among core clerkship students. Individualized video review is becoming increasingly common, but is still not widely implemented in medical education, in part because of the constraints of limited faculty time. Group review is more cost-effective and students appreciate the value of peer feedback. This model is an effective and efficient means of modeling professional skills, providing feedback, and stimulating discussion of common professional issues.

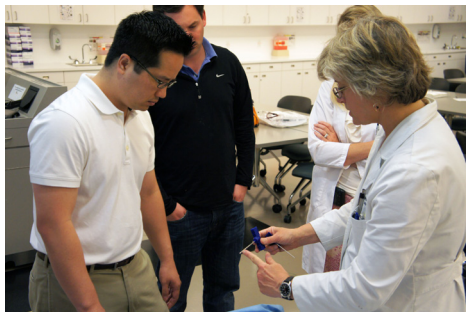
MEDICINE

Simulated patient rounds

Under the direction of Drs. John Kugler and Jeffrey Chi, SHC Hospitalists, medical students enrolled in the Medicine 300A clerkship (often at the start of their clinical rotations) continued to participate in simulated inpatient scenarios with mannequins in the Acute Care simulation rooms at the ILC. Over the course of the program, students diagnose and manage an acutely ill patient, learning how to generate a differential diagnosis, physical examination skills, and treatment options for common conditions. Student learning is maximized through experiential learning interspersed with small group discussion regarding the clinical condition, all performed at the bedside and facilitated by attending physicians.

Hematology/Oncology Fellow training

Under the direction of Drs. Jason Gotlib and Beth Martin, nine fellows in hematology/oncology participated in a new simulation course and skills training session. During this program, participants practiced procedural skills, such as lumbar puncture, and took part in a simulated patient call-in scenario, in which learners advised patients remotely and practiced making diagnostic and management decisions based on limited information.



(L) - Dr. Beth Martin demonstrates a procedure for fellows in Hematology/Oncology. (R) - Hematology/Oncology fellows practice injecting chemotherapeutic agents using the lumbar puncture trainers.

NEUROLOGY

In 2012, the Department of Neurology piloted the first Stroke Code hybrid simulation for incoming interns. In this innovative program, directed by Drs. Waimei Tai and Neil Schwartz, participants interacted with a trained standardized patient actor in the simulation suite, allowing for the display and instructor control of simulated patient vital signs and other clinical data (such as radiographic imaging and laboratory data) while still enabling learners to perform a full clinical examination and engage in dialogue with the patient. Based on the success of this course, future programs addressing additional clinical scenarios are being planned.

OBSTETRICS & GYNECOLOGY

The Department of Obstetrics and Gynecology continues to offer many programs for both medical students and housestaff. Dr. Kim Harney directs a medical student program for students rotating on the OB-GYN clerkship titled “Task Training with a Clinical Context”. Preparing the students to participate in the triage of labor patients is the goal of the Obstetrics Skills Simulation, which happens on Day 3 of the clerkship 8 times per year. Originally, a task trainer was developed to simulate the dilating cervix within a pelvis, to allow students to learn how to measure dilation and effacement (cervical thinning). Students rarely do cervical exams on live patients due to the increased risk of infection. To make the learning more interesting, self-guided PowerPoint cases were developed for each cervical exam. The slides create an interaction between the student and the patient through dialogue and suggested questions, in Spanish and English. Each case has a fetal monitoring tracing presented for their review, and some patients are found to be bleeding. The simulation sets up the possibility of students working independently or in groups to triage the patients. After a period of time, the faculty mentor (who has been teaching students how to deliver a baby in the next room) can listen to their presentations and help them understand the decision-making process. The teaching sessions touch on the several of the most serious complications in labor, so that hopefully, students are motivated to read more in preparation for their upcoming rotations in Labor and Delivery.

SURGERY

The Department of Surgery introduced a curriculum for General Surgery residents designed to train leadership behaviors. Led by Drs. Aarthi Kannappan and Osita Onugha, the program utilizes multiple training modalities, including simulation. Other ongoing and planned ISL programs in the department include the following:

- Quality of Feedback – this initiative aims to understand the types of feedback that individuals find motivational, and attempts to catalogue the types of feedback most often given by faculty at Stanford.
- Nutrition and its effects on Surgeons and Surgical residents – this program will assess the impact of poor nutrition on decision-making and technical skills.
- Simulation training and its effects on confidence – the goal of this program is to understand the relationship between simulation training and confidence in the operating room.
- Creation of a media-rich, web-based, mobile-accessible Surgical Resident Survival Guide.
- Development and pilot of “SLICKER” (Slick Evaluations for Residents), a novel mobile platform for real-time faculty evaluation of resident technical performance in the operating room.
- Development of a surgical version of “Septris,” a gaming platform that teaches clinical decision-making for classic surgical diseases.



Department of Surgery housestaff practice surgical skills at the Goodman Surgical Simulation Center.

“[I LIKED] THE OVERALL COHESIVE SENSE OF CARING FOR A PATIENT START TO FINISH, [IT] FILLS IN GAPS IN KNOWLEDGE.”

–MEDICAL STUDENT

CARDIOTHORACIC SURGERY

The Department of Cardiothoracic Surgery utilizes the CT Surgery Simulation center in the Falk Cardiovascular Research Building at Stanford in the training of fellows, residents, and medical students. Under the direction of James Fann, M.D., the focus of simulation-based learning is in assessing cardiac surgery skills training and crises management in collaboration with other disciplines (including perfusionists and anesthesiologists) as part of a multi-institutional grant from AHRQ. Additionally, studies include teaching behaviors and spatial perception related to surgical skills acquisition supported by a grant from the Thoracic Surgery Foundation for Research and Education and an award from the Western Thoracic Surgical Association.

VASCULAR SURGERY

The vascular simulation and education lab has had a very productive year under the direction of Dr. Jason T. Lee. In 2011-12, the lab completed a nationally funded study that concluded that a simulation-based endovascular surgery curriculum improved trainee performance, as measured by technical skill, didactic knowledge, and learner satisfaction. The results were presented as one of the top 10 papers at the Society for Vascular Surgery Annual Meeting. The vascular team also organized a highly successful simulation symposium at the VEITH meeting with international colleagues, highlighting the multidisciplinary approach and interest that interventionalists have taken in vascular simulation.

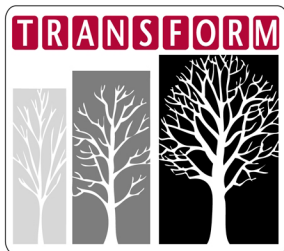
STRATEGIC GOAL 2

HEALTHCARE SYSTEMS IMPROVEMENT

To improve care delivery and operational outcomes of Stanford Hospital and Clinics, Lucile Packard Children’s Hospital, and VA Palo Alto (in conjunction with SUMIT, the SHC/LPCH Insurance Company), by improving the individual and teamwork skills of healthcare personnel.

PROJECT TRANSFORM

Project TRANSFORM, a research study funded by the Gordon and Betty Moore Foundation, evaluated the effects of a simulation-driven, patient safety program on clinical outcomes on inpatient units at Stanford Hospital & Clinics (SHC). This research was a collaboration among researchers from SHC (Nancy Szaflarski, PhD RN; Lynn Forsey, PhD, RN) and faculty at the Stanford University School of Medicine, with Clarence Braddock III, MD MPH (Associate Dean, Medical Education) serving as the Principal Investigator. CISL faculty include David Gaba, MD, Associate Dean for Immersive and Simulation-based Learning, Steven Howard, MD and Geoffrey Lighthall, MD, PhD. The goal of simulation training focused on improving early detection and treatment of hospital-acquired complications by enhancing teamwork and evidence-based practice.



A microsystem approach was taken to evoke practice change whereby unit-based medical directors (UBMD), unit managers and clinical nurse specialists (CNS) were involved in program interventions. UBMDs and CNSs from four inpatient units along with the project manager, Lynn Abel, RN, MSN, conducted four in situ simulation exercises and debriefings per month per unit on both day and night shifts. Reaching over 90% of registered nurses and house staff practicing on the study units, statistically significant decreases

in the aggregate rate of hospital-acquired severe sepsis/septic shock and acute respiratory failure, as well as weighted aggregate risk-adjusted hospital mortality, were attained. Given the results, microsystem leaders, researchers and administrative leaders elected to sustain the same program interventions over the following six months, except for decreasing the frequency of simulation training to one exercise per month per unit. At the end of the sustainability period, outcomes remained statistically significantly decreased. Efforts to spread the TRANSFORM program to other hospital areas are currently being examined.

SIMLEARN

In February 2010, the Department of Veterans Affairs announced the formation of the Simulation Learning, Education, and Research Network (SimLEARN), which is a system-wide strategic education and planning initiative to optimize clinical simulation training, education, and research efforts within VA. The VA Palo Alto is SimLEARN's satellite site, and simulation faculty (David Gaba, MD; Steven Howard, MD; T. Kyle Harrison, MD; Geoff Lighthall, MD; and Cynthia Shum, RN) have been conducting Instructor Training (or train-the-trainer) courses for VA clinicians for the past two years. In the current fiscal year, 17 simulation courses are scheduled to be completed. Three different curricula are being taught: Basic Instructor training (2.5 days), Code Team training (2 days), and Out of OR Airway Management training (2 days). Over 160 VA clinicians from all over the United States will be trained per year with similar numbers planned for the next three years.

WORDS THAT WORK

CISL and Stanford University Medical Indemnity and Trust (SUMIT) are collaborating on a program entitled "Words that Work", designed for Risk Management personnel. The goal of this simulation exercise is to assist the Risk Management team in developing a framework and vocabulary for interacting with family members or patients in challenging situations. Participants in the program will not only have the opportunity to interact directly with standardized patient actors, but scenario observers will also be able to actively participate during the simulations by using DialSmith Response technology to record their feelings and reactions to the scenario in real time. This program is being developed in conjunction with both the SHC and LPCH patient advisory councils.

ACLS AND ICU SIMULATION

Under the direction of faculty member Paul Mohabir, MD (SHC Intensivist) and ICU fellow Michael Mayette, MD, monthly code team training for the ICU staff is continuing in 2012-13. These 2-hour sessions bring together trainee physicians at all levels of experience (medical students to fellows), as well as hospital resuscitation team nurses, respiratory therapists, and pharmacists. The multiple scenarios have been built to reproduce real-life emergencies and cardiac arrests in order to assess the team's ability to run a successful resuscitation. The main focus of training lies in non-technical skills, such as management of stressful situations, leadership, communication, and effective teamwork.

These sessions are held in the ILC's Acute Care Suite (rooms configured to look and feel like ICU spaces). A high-fidelity mannequin is used with the occasional addition of actors as family members or a second patient. This program has yielded in-hospital improvements in team efficacy as well as successful rapid implementation of multiple adjuncts to reanimation, including the use of intra-osseous lines and end-tidal CO2 monitoring during codes at Stanford.

This program will be presented in an international conference on Emergency Cardiovascular Care Update in 2012 as an important innovation in ACLS training.

CODE SILVER (ACTIVE SHOOTER) EXERCISE

The Office of Emergency Management at Stanford University Medical Center organized a simulation program to evaluate Stanford's Emergency Operations Plan, including the Code Silver response to an active shooter on hospital premises. Such an exercise could never be conducted in the actual hospital, but the ILC offers a comparable but controlled environment. Goals of the scenario included evaluating the ability of the



Teams participating in the ICU ACLS simulation program are composed of individuals from multiple disciplines and different levels of training.

“THANK YOU! THIS WAS INCREDIBLY VALUABLE.”

–CODE SIM PARTICIPANT

Hospital Command Center to effectively manage the incident, evaluating the cooperation between hospital security and law enforcement agencies, and evaluating the ability of the Emergency Department to manage a surge event with multiple patients. Participants in the exercise included representatives from Stanford Hospital & Clinics, Lucile Packard Children’s Hospital, Stanford University School of Medicine, Stanford University Department of Public Safety, Palo Alto Police Department, Palo Alto Fire Department, Santa Clara County Sheriff’s Office, Santa Clara County EMS, Santa Clara County Office of Emergency Services, and Santa Clara County Public Health Department. Upon conclusion of the exercise, a debriefing session was held to analyze data obtained as a result of the simulation. Based on this analysis, areas of improvement were identified and additional training exercises are planned.

STRATEGIC GOAL 3

SIMULATION FOR PERFORMANCE ASSESSMENT

To use Immersive and Simulation-based Learning techniques for explicit assessment/testing of skills, knowledge, and performance of students, trainees, and experienced personnel.

CLINICAL PERFORMANCE EXAMINATION

The Immersive Learning Center continues to house the Clinical Performance Examination for medical students entering clinical rotations. Scenarios for the CPX are standardized across all eight participating institutions in the California Consortium for the Assessment of Clinical Competence (CCACC), which is tasked with developing and evaluating the patient encounters.

MULTI-MINI INTERVIEW

The ILC is also the site for the Multi-Mini Interview (MMI), administered to applicants to Stanford School of Medicine. The MMI consists of multiple encounters between the applicant and various interviewers and may involve completion of tasks or participation in simulated scenarios. In a Medscape article interview with Dr. Charles Prober, Senior Associate Dean for Medical Education, the resources available at the ILC are cited as major factors in the success of the MMI, now in its third year of use at Stanford. According to Dr. Prober, “...we were able to take advantage of the layout of our simulation floor that allowed us to smoothly move students from one interview room to the next. Also, because all rooms are under video surveillance from a central control suite, we could troubleshoot any technical difficulties in real time.” The MMI will continue to be held in the ILC for applicants interviewing for matriculation in 2013.

EVALUATION IN MOCA

Although the Maintenance of Certification in Anesthesia (MOCA®) simulation course does not currently involve explicit performance assessment (participants are not graded or scored), CISL and the Stanford Department of Anesthesia are participating in a multi-center trial to graft performance assessment methodology onto the ongoing MOCA program. Dr. Gaba is a key co-investigator on the project and heads the Performance Assessment Team charged with developing the metrics and instruments for assessing both medical/technical skill related to the management of specific challenging scenarios, and non-technical/behavioral skills of dynamic decision-making and teamwork. The project is finishing the preparatory phases and will begin collecting data on actual MOCA course participants (eventually numbering approximately 200 nationwide) in October 2012.

To promote, support and conduct fundamental research and evaluation about ISL and to use the ISL techniques as a research tool.

AHRQ-FUNDED STUDY

The AHRQ study “Creating simulation-based performance assessment tools for practicing physicians” (1 R18 HS020415-01) is nearing implementation at Stanford. This 3-year, 12-site study grafts performance assessment measures onto the existing Maintenance of Certification in Anesthesia (MOCA) simulation course, which is offered multiple times yearly at Stanford. New simulation scenarios have been developed for the study and will be ready to use in MOCA courses beginning in late 2012. Dr. Gaba leads the team that is creating performance assessment metrics and tools for both real-time on-site raters and post-hoc video raters to score the performance of Board-certified anesthesiologists in the MOCA simulation course on medical/technical performance and on behavioral/non-technical performance.

COLLABORATION WITH VHIL

CISL has embarked on an exciting new collaboration with the Virtual Human Interaction Laboratory (VHIL), which is directed by Jeremy Bailenson, PhD, Associate Professor of Communications at Stanford University. Dr. Bailenson’s laboratory specializes in the study of virtual environments in non-medical arenas. This partnership, consisting of Drs. Bailenson and David Gaba, along with other members of the ILC, VHIL, and IRT, hopes to combine VHIL’s expertise in virtual worlds and human interactions with CISL’s focus on communication and interpersonal dynamics in the clinical setting. The goal is to explore new aspects of social interaction in medicine via a joint research study.

FOUNDATION IN ANESTHESIA EDUCATION AND RESEARCH GRANT

Edward R. Mariano, MD, Associate Professor of Anesthesia at Stanford and the Chief of Anesthesiology and Perioperative Medicine at the VA Palo Alto, has been awarded a Foundation in Anesthesia Education and Research (FAER) research education grant for his study titled “A prospective study to determine the efficacy of simulation-based training on practicing anesthesiologists’ acquisition of ultrasound-guided perineural catheter insertion skills.” It is a 2-year study that will begin in Fall of 2012.

SMALL BUSINESS INNOVATIVE RESEARCH GRANT

Stanford Mechanical Engineering Associate Professor Allison Okamura and Dr. Gaba received a sub-contract on a Small Business Innovative Research grant titled “A novel hands-free haptic robot for medical simulation”. Dr. Okamura’s laboratory is developing palpation simulation for this project. Dr. Gaba and CISL will collaborate to conduct assessment of the simulation with clinical personnel, likely at the Immersive Learning Center.



Participants in the Maintenance of Certification in Anesthesia course monitor patient progress during a simulation.



Dr. Jeremy Bailenson (L) assists Dr. David Gaba (R) with a demonstration of a virtual environment in the Virtual Human Interaction Laboratory.

PROVIDE ISL LEARNING TO EXTERNAL LEARNERS

Through Immersive and Simulation-based Learning, improve the clinical skills (both “technical” and “non-technical”) of healthcare personnel as individuals and teams.

LPCH HOSPITALIST TRAINING

Drs. Calvin Kuan, Jen Wagner, Echo Rowe, and Manchula Navaratnam have organized a series of airway management and CRM courses for the LPCH pediatric hospitalists this year to help train them for crisis management and to train them for their upcoming expansion of sedation services at LPCH.

POINT OF CARE ULTRASOUND

The Stanford Division of Emergency Medicine held a CME course titled “21st Century Medicine: Utilizing Point-of-Care Ultrasound to Optimize Patient Care, Safety, and Satisfaction” at the ILC. Under the direction of course director Dr. Sarah Williams and a multidisciplinary faculty, participants learned strategies for utilizing point of care ultrasound as part of patient care as well as how to use ultrasound to perform invasive procedures such as placing central lines, paracentesis, thoracentesis, and arthrocentesis. The course was offered twice in 2012.

STANFORD ADVANCED AIRWAY MANAGEMENT AND FIBEROPTIC COURSE

The Department of Anesthesia, under the direction of course director Dr. Vladimir Nekhendzy, held a CME course designed to train practitioners in the advanced management of difficult airways. The program was held at the ILC and featured 10 state of the art difficult airway stations, including emergency airway management, extubation of difficult airways, and immersive airway simulation training. Participants also learned advanced techniques for flexible fiberoptic intubation and had the opportunity to attend mini-workshops on fiberoptic evaluation of the lower airway and lung separation.



(L) Participants in the Stanford Advanced Airway Management Course practice fiberoptic laryngoscopy. (R) Course director Dr. Vladimir Nekhendzy of Anesthesia demonstrates a difficult intubation.

ADVANCED PEDIATRIC LIFE SUPPORT (APLS)

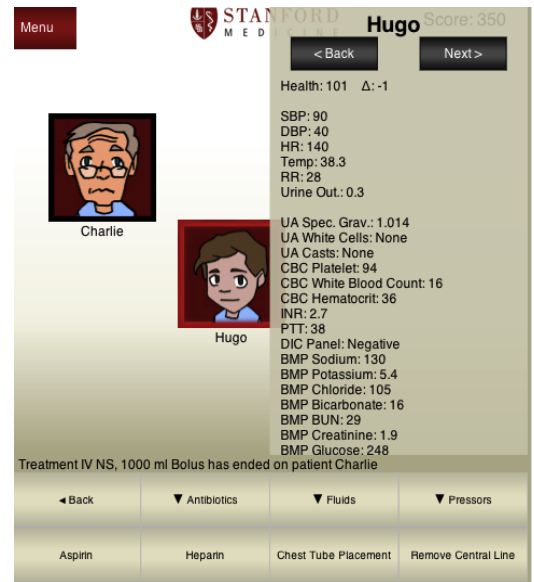
The Advanced Pediatric Life Support (APLS) Pediatric Emergency Simulation Course was offered three times in 2012. Course director Dr. Sangeeta Chona of Emergency Medicine led a large pool of faculty instructors who covered multiple topics ranging from advanced airway management to pediatric FAST examinations. Held at the ILC, the APLS course utilized part task trainers for dedicated procedural training as well as mannequins for team-based high-fidelity simulation. Participants were able to immediately apply new clinical knowledge and techniques to challenging clinical scenarios in the simulation suite, followed by video-assisted debriefing.

SEPTRIS MOBILE EDUCATIONAL GAME

The Septris game (<http://cme.stanford.edu/septris/>) is a free interactive case-based online CME activity developed to provide an innovative approach to teach physicians about sepsis—a condition that strikes approximately 1.1 million people per year in the US, and is responsible for more than 215,000 deaths.

Dr. Lisa Shieh and Eileen Pummer, RN organized a team of physicians and instructional designers to make Septris. The program teaches the early identification and optimal management of sepsis, as well as how to differentiate between forms of sepsis, establish and implement early goal-directed therapies, and develop communication skills within healthcare teams.

Since it was built as a mobile web application, Septris requires no download and will play on every mobile phone, tablet, and most computer web browsers. To ensure the game is also an effective learning tool, the designers infused Septris with educational strategies such as authentic, challenging patient scenarios, “debriefing” by Dr. Septris after correct or incorrect actions, time pressure, scoring, and user control and creativity. As of Summer 2012, Septris has been played 12903 times. Stanford is currently conducting learning outcomes research on physicians, residents, and medical students. EdTech and the IRT development team are working on a redesigned Septris Version 2 and the project team is also developing a collection of Surgery cases.



A screen capture of the Septris game interface shows the clinical data of a virtual patient.

CISL SEMINARS AND SYMPOSIA

The Simulation in Medical Education (SiME) Seminar Series, originated by Dr. LeRoy Heinrichs, Professor Emeritus, over a decade ago, will continue in 2012 with invited speakers from across the nation. In 2011, invited speakers for the SiME series included Dr. Geoff Lighthall (“Live Problem-Based Learning”), Dr. T. Kyle Harrison (“Scenario Design: A How-To Workshop”), and Dr. Jeremy Bailenson (“Virtual Reality, Social Identity, and Health”). Planning is also ongoing for the 6th annual CISL Symposium, which aims to bring together clinicians, educators, and others interested in ISL, not only from the Stanford community, but also from other institutes around the country and internationally. The goal of the symposium is to share knowledge and expertise regarding ISL, as well as to engender dialogue and foster collaboration to address challenges in the field.

STRATEGIC GOAL 6

COMMUNITY OUTREACH

To develop and conduct outreach programs for local community and lay groups, as well as public safety and public health organizations, and healthcare providers, exposing them to the benefits and potential of Immersive and Simulation-based Learning.

WGEA WORKSHOP

Educational Technology and CISL led a workshop at the 2012 Western Group on Educational Affairs meeting (Asilomar Conference Center, Pacific Grove, California) on April 2, 2012. Brian Tobin moderated the session titled “Short Instructional Videos: Flipped Classroom and Public Video Courses at Stanford University” that included efforts in simulation and interactive classroom instruction representing work from faculty (Julie Theriot, Tina Cowan, Neil Gesundheit, Sakti Srivastava, Charles Prober), students (Steven Sloan, Morgan Theis), and staff (Joe Benfield, Brian Tobin) from the School of Medicine. The workshop examined novel techniques in simulation and video instruction that can promote active learning and reinvent the medical school classroom.

CISL WEBSITE

The CISL website <http://cisl.stanford.edu> continues to be the hub of information for simulation and immersive learning activities in the Stanford School of Medicine. Over the past year, there have been over 6500 visits to the CISL website from around the globe, with new visitors accounting for 80%. In 2012, major updates were made to the site to reflect changes in the CISL reporting structure and to add information regarding new programs in the ILC. Additional resources for clinicians and educators regarding developing ISL programs in consultation with the ILC will also be made available via the website.

STRATEGIC GOAL 7

LEADERSHIP AND ADVOCACY

To provide leadership in advocating the future vision of Immersive and Simulation-based Learning in health care for the nation and the world.

The Department of Surgery continues to meet the requirements necessary for accreditation by the American College of Surgeons Education Institute (ACSEI).

The Department of Anesthesia is an ASA Endorsed Simulation Program and is able to offer the Maintenance of Certification for Anesthesiologists (MOCA).

Kay Daniels, MD and the OB Sim team act as the West Coast Simulation Center for American College of Obstetrics and Gynecology (ACOG).

Andrew Nevins, MD, Medical Director of the Standardized Patient Program, is the new Chair of the California Consortium for the Assessment of Clinical Competence (CCACC), a statewide group of clinicians and medical educators, which creates and coordinates the CPX to assess clinical skills essential to the practice of medicine.

James Fann, MD, Professor of Cardiothoracic Surgery, holds several key positions nationally, including Chair, Simulation Committee, Joint Council on Thoracic Surgery Education (JCTSE), 2008-present; Co-director, Thoracic Surgery Directors Association (TSDA) Boot Camp 2009-2012; Co-director, TSDA Senior Tour in Cardiothoracic Surgery, 2011; Co-director, American College of Surgeons (ACS)/STS/AATS "Cardiothoracic Surgery in the Future: Technology Overview for Residents and Medical Students" 2009-2012; Member of the Jury of the European Association of Cardiothoracic Surgery-Ethicon Cardiovascular Simulation Award, 2011. Additionally, Dr. Fann has been named the recipient of the Doty Award from the Western Thoracic Surgical Association to study simulation training.

Dr. David Gaba continues his role as founding and current Editor-in Chief of the only indexed, peer-reviewed journal in simulation – *Simulation in Healthcare* (circulation of >2900 worldwide). In 2011 the Journal received its first impact factor of 2.036, ranking favorably compared to other journals in the health-care quality and education arena, and a remarkable achievement for a new journal in only its 6th year of publication.

CISL continues its leadership role nationally and internationally. With the opening of the LKSC, the ILC faculty and staff have hosted many individuals and groups interested in building new simulation facilities, teaching immersive learning, and understanding the technology used in simulation.

CISL is a founding and current member of Advanced Initiatives in Medical Simulation, and CISL remains active in legislative advocacy, returning to Washington D.C. periodically to meet with legislators and their staff to educate them about simulation.

FACULTY DEVELOPMENT

To recruit, train, and sustain faculty to become effective Immersive and Simulation-based Learning educators.

Calvin Kuan, MD, Clinical Associate Professor of Anesthesia, is currently completing a medical simulation fellowship/apprenticeship with Drs. David Gaba and Steven Howard, during which he has implemented the first ever pediatric scenario for the ACRM course for anesthesia residents.

James Lau, MD, Clinical Associate Professor of Surgery, was named Director of the Goodman Surgical Simulation Center, which is an Accredited Educational Institute of the American College of Surgeons.

James Fann, MD, is serving as course co-director of Operative Anatomy and Techniques (Surg 254), a course at Stanford University School of Medicine.

Drew Patterson, MD, PhD, is one of the faculty instructors for the Health & Human Disease course at Stanford School of Medicine; he is preparing to use simulation techniques for teaching cardiovascular physiology to medical students.

SELECTED PUBLICATIONS

1. Leeper N, Lee JT, Cooke JM. **Two decades of progress in vascular medicine.** *Am J Med.* 2011;124:791-2.
2. Lee JT, Son JH, Chandra V, Lilo EA, Dalman RL. **Long-term impact of a preclinical endovascular skills course on medical student career choices.** *J Vasc Surg* 2011;54:1193-1200.
3. Aparajita R, Zayed M, Casey K, Dayal R, Lilo E, Lee JT. **Development of and implementation of an introductory endovascular training course for medical students.** *Ann Vasc Surg* 2011;25:1104-12.
4. Zayed M, Dalman RL, Lee JT. **The vascular surgery trainee pool: A comparison of 0+5 versus 5+2 applicants.** In press, *J Vasc Surg.*
5. Lee JT. **How to teach new technologies to physicians to get the quickest and safest transfer to clinical practice? The state of the art on educational programs.** In *European Society for Endovascular Bioprostheses* 2011, Elsevier, Inc.; 2011.
6. Szaflarski NL, Forsey L, Abel L, Morton J, Hernandez-Boussard T, Braddock C. **An In Situ Simulation Training Program to Improve Inpatient Adult Clinical Outcomes Through Early Detection and Treatment of Hospital-Acquired Complications.** *Simul Healthc* 2011, 6(6): 415.
7. Hicks GL, Jr., Gangemi J, Angona RD, Jr., Ramphal PS, Feins RH, Fann JI. **Cardiopulmonary bypass simulation and assessment at the Boot Camp.** *J Thorac Cardiovasc Surg* 2011; 141: 284-292.
8. Joyce DL, Dhillon TS, Caffarelli AD, Joyce DD, Tsirigotis DN, Burdon TA, Fann JI. **Simulation and skills training in mitral valve surgery.** *J Thorac Cardiovasc Surg* 2011; 141: 107-112.
9. Plerhoples T, Zak Y, Hernandez-Boussard T, Lau J. **Another Use of the Mobile Device; Warm-up for Laparoscopic Surgery.** *J Surg Res.* 2011 Mar 31[Epub ahead of print].
10. Davis D, Lee G. **The use of standardized patients in the plastic surgery residency curriculum: teaching core competencies with objective structured clinical examinations.** *Plast Reconstr Surg.* 2011 Jul;128(1):291-8.
11. Kardong-Edgren S, Gaba D, Dieckmann P, Cook DA. **Reporting inquiry in simulation.** *Simul Healthc* 2011; 6: Suppl S63-S66
12. Fann JI, et al. **Evaluation of simulation training in cardiothoracic surgery: the Senior Tour perspective.** *J Thorac Cardiovasc Surg* 2012; 143: 264-272.
13. Liu DC, Khabbaz KR, Fann JI. **The use of simulation in cardiac surgery training.** In: *Textbook of Simulation*, Tsuda ST, Scott DJ, Jones DB, Eds, Cine-Med Publishing 2012; pp 551-560.
14. Gaba DM: **Adapting space science methods for describing and planning research in simulation in healthcare: science traceability and Decadal Surveys.** *Simul Healthc* 2012; 7:27-31
15. Mudumbai SC, Gaba DM, Boulet JR, Howard SK, Davies MF: **External validation of simulation-based assessments with other performance measures of third-year anesthesiology residents.** *Simul Healthc.* 2012; 7:73-80.
16. Fann JI, George L, Hicks, Jr., Feins RH. **Simulation in cardiothoracic surgery.** In: *The Comprehensive Textbook of Healthcare Simulation.* Levine AI, Bryson EO, DeMaria S, Jr., Schwartz AD, Eds, Springer, in press.

SELECTED PRESENTATIONS:

CISL faculty and staff give many academic presentations ranging from local to national and international forums. The totality of such presentations is far too large to provide a complete listing. However, we are pleased to provide a partial listing of presentations by CISL-affiliated personnel over the past year:

1. Zak Y, Plerhoples T, Lee JT, Visser B. **A novel approach to the resident skills curriculum: Modules on rare and common procedures linked together with simulators created by the learner.** Presented at the 4th Annual Meeting of the ACS-Accredited Education Institutes, Chicago, IL, March 29-30, 2011.
2. Lee JT. **How to teach new technologies to physicians to get the quickest and safest transfer to clinical practice? The state of the art on educational programs.** Presented at 7th European Symposium of Vasc Biomaterials. Strasbourg, France, May 13-14, 2011.
3. Zayed MA, Casey K, Lilo E, Dalman RL, Lee JT. **Interactive online training improves trainee test performance in vascular surgery.** Presented at the Vascular Annual Meeting, Chicago, IL, June 15-18, 2011.
4. Zayed M, Dalman RL, Lee JT. **The vascular surgery trainee pool: A comparison of 0+5 versus 5+2 applicants.** Presented at the 26th Annual Meeting of the Western Vascular Society, Kauai, HI, September 18-20, 2011.
5. Dawson DL, Mitchell EL, Lee JT, Mills JL, Laird JR, Heydati N, et al. **Validation of simulation as a tool for assessing endovascular procedural competency.** Presented at the 26th Annual Meeting of the Western Vascular Society, Kauai, HI, Sept 18-20, 2011.
6. Lilo E, Son J, Lee JT. **Long-term impact of a preclinical simulation-based course on the medical student experience.** Presented at the 139th Annual Meeting of the American Public Health Association, Washington, DC, Oct 29-Nov 2, 2011.
7. Feaster, S., Friedl, K, Okuda, H, Smith, R., Feinstein, D., Deita, M, Dongilli, T. **“Medical Simulation: A Vision for the Future”**. I/ITSEC. Orlando, FL. December 2011. Panel Presentation
8. Feaster, S, Reisen, T, Lutz, J, Shatzer, J. **“Advanced Data Analysis and Reporting of Simulation Program Activities”**. IMSH 2012. San Diego, CA January 2012. Preconference workshop.
9. Dorsey C, Zayed M, Dalman RL, Lee JT. **Evolution of vascular training for general surgery residents: Endo is essential.** Presented at the 83rd Annual Meeting of the Pacific Coast Surgical Association, Napa, CA, February 18-20, 2012.
10. Kannappan A. **The Effect of Positive and Negative Verbal Feedback on Surgical Skills Performance and Motivation.** Presented at Surgical Education Week, Association for Surgical Education, San Diego, CA, March 2012.
11. Tobin B. **Short Instructional Videos: Flipped Classroom and Public Video Courses at Stanford University.** Presented at the 2012 Western Group on Educational Affairs meeting, Pacific Grove, California, April 2, 2012.
12. Lee JT, Peruzzaro A, Gaba D, Krummel T, Dalman RL. **See one, sim one, do one, teach one: Results of a randomized prospective trial of endovascular skills training.** Presented at the Vascular Annual Meeting, Washington, DC, June 7-9, 2012.
13. Gowing R, Chandra V, Peruzzaro A, Lee JT. **Case-specific EVAR simulation: A pilot comparison of simulated aneurysm repair with actual live cases.** Accepted for presentation, 27th Annual Mtg of the Western Vascular Soc, Park City, UT, Sept 22-25, 2012.
14. Lin D. **The Assessment of Emotional Intelligence Among Candidates Interviewing for General Surgery Residency.** Accepted for presentation at Dana Lin, M.D., American College of Surgeon's Clinical Congress - Surgical Forum - Excellence in Research Award - Surgical Education, Chicago, IL, October 2012.

AWARDS:

Jeffrey Chi, MD (Clinical Assistant Professor, Internal Medicine)

- Henry J. Kaiser Family Foundation Award for Excellence in Preclinical Teaching, June 2012

Ruth Fanning, MD (Clinical Assistant Professor, Anesthesia)

- “Irish Education 100 honoree” 2011- Awarded in New York 2012.
- Ellison C Pierce Memorial National Patient Safety Foundation/American Hospital Association Fellowship for 2012-2013

Gordon K. Lee, MD (Assistant Professor, Plastic Surgery)

- Henry J. Kaiser Family Foundation Award for Excellence in Clinical Teaching, June 2012

Jason T. Lee, MD (Associate Professor, Surgery – Vascular Surgery)

- Henry J. Kaiser Family Foundation Award for Excellence in Clinical Teaching, June 2011

Paul Mohabir, MD (Clinical Associate Professor, Medicine - Pulmonary and Critical Care Medicine)

- Alwin C. Rambar-James B.D. Mark Award for Excellence in Patient Care, June 2012

Erika Schillinger, MD (Clinical Associate Professor, Internal Medicine)

- Franklin G. Ebaugh, Jr. Award for Advising Medical Students, June 2012

STRATEGIC GOAL 9

SUSTAINABILITY OF FINANCES OF SIMULATION

To provide financial and program planning and analysis of ISL programs, and to support the Office of Medical Development fundraising and ensure long-term financial viability of ISL activities.

The ILC operates as a core educational facility of the School of Medicine. CISL leadership is working with finance and administration of the School's Educational Programs and Services to determine appropriate mechanisms for recouping expenses for activities that have external funding, such as CME courses, research, equipment development/testing, hospital training. As the programs continue to grow in the ILC, alternative means of funding will help maintain sustainability. The CISL continues to look for grant funding and other external sources to augment and grow its programs.

The Immersive Learning Center is grateful to Karl Storz Endoscopy America for the donation lease of airway management equipment for use in multiple clinical simulation activities. The equipment includes fiberoptic laryngoscopes, C-MAC® video laryngoscopes, traditional laryngoscopes and blades, and light sources.

**“THIS WAS THE BEST THING WE HAVE
EVER DONE IN MED SCHOOL.”**

—MEDICAL STUDENT (INTRODUCTION TO
MANAGEMENT OF THE ILL PATIENT COURSE)

STRATEGIC GOAL 10

MANAGEMENT

To create management infrastructure and procedures that effectively coordinate and integrate the Center's priorities, activities and resources among its constituent units and within the School and University.

CISL EXECUTIVE AND ADVISORY COMMITTEES

The CISL Executive Committee is composed of clinicians, educators, and instructional technologists who are involved in ISL activities. Members represent multiple departments and clinical specialties with a variety of interests within immersive learning. The committee, which convenes quarterly, is divided into research and education subgroups. Efforts of the research subcommittee have concentrated on compiling and centralizing information regarding ISL-related studies and projects to facilitate collaboration. The education subcommittee focuses on strategies for faculty development as relates to ISL as well as development and evaluation of ISL curricula at all levels of training. Oversight of the CISL Executive Committee is provided by the CISL Advisory Committee, which meets biannually.

**Deployed and New Curricula Using Immersive and Simulation-based Learning
by Target Population (as of July 2012)**

Pre-Clerkship Med Students	Clerkship Med Students		Interns/Residents/Fellows		Combined Team (Housestaff, Attendings, RNs, Allied Health)	CME or Equivalent	Nursing, Graduate Students, Allied Health
ONGOING COURSES							
INDE 201-206 POM (SPP)	OBGYN 300A Exam (SPP)	OBGYN300A Proc (Skills)	ACRM I, II, III (Sim)	EMCRM I, II, III – Adults & Peds (Sim)	ICU Mock Code (Sim/Skills)	NeoSim, PediSim, OBSim (Sim)	Primary Cert in PALS (Sim/Skills)
CPX Series (SPP)	PEDS 300A (SPP)	PEDS 300A Deliv of Bad News (SPP)	Pedi Sim I, II, III (Sim)	SOS & SCARED (Sim)	IMPES ICU Combined Team CRM (Sim)	Simulation Instructor Training (Sim)	LifeFlight Skills and Simulation (Sim/Skills)
SURG 254 Operative Analysis and Techniques (Skills)	ANES 306A Adult Crit Care (Sim)	INDE 301A Fam Med (SPP)	NeoSim I, II, III (Sim)	OBGYN Lap Surgery Training (Skills)	SimDR Perinatal Combined Team Training (Sim)	ATLS/ACLS (Sim/Skills)	GENE 286A Genetics Counseling MS Program (SPP)
Procedures Course – POM Q5 (Skills)	ANES 306P Peds Crit Care (Sim)	MED 313 Ambulatory Med (SPP)	Peds ER Sim I, II, III (Sim)	Bedside ECHO – TTE/TEE/FAST (Skills)	Project TRANSFORM (in situ Sim)	MOCA - Maint of Cert for Anes (Sim)	PCAP Physician Asst Program (SPP/Skills)
Intro to Mgmt of Ill Pt (IMIP) – POM Q6 (Sim)	SURG 228 Vascular Dz and Rx (Sim/Skills)	SURG 313A EMed (Sim/Skills)	OBSim I; SimDR I (Sim)	Difficult Airway (Skills)	Pedi Anes Sim (in situ Sim)	APLS – Adv Pedi Life Support (Sim)	
	MED 300A Bedside Rounds (Sim)	NENS 301A (Skills)	Invasive Procedures (Skills)	Anesthesia EVOLVE (Sim/SPP/Skills)	Labor & Delivery Drills (in situ Sim)	Regional Anesthesia (Skills)	
	SURG 300A Trauma (Sim)		Surgery Boot Camp/Core Curriculum (Skills)		OB-BLS (Sim)		
NEW COURSES							
			Neuro Stroke Code (SPP/Sim)	PICU Residents (Skills)	LPCH Hospitalist (Sim)	Difficult Airway (Skills)	
			Heme/Onc (Sim)	PICU/CVICU Fellows (Skills/Sim)		POC Ultrasound (Skills)	
			EM Intern Boot Camp (Skills)	ImPRINT Anes Interns (Sim)			



CENTER FOR
IMMERSIVE AND
SIMULATION-BASED
LEARNING

STANFORD SCHOOL OF MEDICINE

CISL Mission

To improve patient safety, patient care, education, and research through innovations in immersive and simulation-based learning techniques and tools through embedding them throughout Stanford University Medical Center's education and training programs.



STANFORD
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