



# Center for Immersive and Simulation-based Learning

A Consortium of Medical Simulation and Immersive Learning  
at Stanford University School of Medicine

2009-2010 Accomplishments Report



“The entire LKSC is a marvel of innovation... We aim to bring to fruition a revolution in medical education that has largely been pioneered by Stanford faculty”. David Gaba, M.D.

## Center for Immersive and Simulation-based Learning

A Consortium of Medical Simulation and Immersive Learning at Stanford University School of Medicine

**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 Medical Center’s education and training programs.

### Strategic Goals

1. Education and Training of Students and Clinical Trainees
2. Healthcare Systems Improvement
3. Assessment/Testing
4. Research
5. Provide ISL Learning to External Experienced Clinicians
6. Community Outreach
7. Leadership and Advocacy
8. Faculty Development
9. Sustainability
10. Management

## From the Associate Dean for Immersive and Simulation-based Learning Center (ISL)

The academic year 2009-2010 marked a major transition for CISL. First, we re-envisioned ourselves as a consortium of simulation centers. This reflects the altered nature of our work as we took occupancy of the new Goodman Immersive Learning Center (GILC) in the Li Ka Shing Center for Learning and Knowledge (LKSC). Administratively, the operations of the GILC are run by the simulation component of Simulation and Educational Technology (SET), a division of the School of Medicine's Information Resources and Technology. Yet, even as we occupy the GILC, all of the existing simulation centers (Simulation Center at VA Palo Alto HCS; CAPE; Goodman Surgical Simulation Center) remain in business. Thus, CISL really is a consortium of these and other facilities, groups, and individuals all working to make immersive and simulation-based learning a regular and crucial part of the Stanford School of Medicine and its affiliated hospitals. Our 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. In addition to continued development of technology and pedagogy, a key focus going forward is on creating the organizational infrastructure to sustain continued development of ISL techniques and technologies.

SET created a simulation operations group directed by Sandi Feaster (who is also CISL's program director) featuring a Simulation Engineer (Kam McCowan) and a Simulation Technician (Teresa Roman-Micek), and a Continuing Medical Education Simulation Specialist (Kim Yaeger). They are supported directly by a Simulation AV Technician (Nick Shepherd) from SET's AV/IT Support group. The Educational Technology component of SET works closely with the Simulation component to ensure smooth operations of the entire GILC and the LKSC as a whole.

With this support, and after many years of planning, design, and oversight of construction, the GILC has just opened its doors for teaching. First, the Standardized Patient (actors) Clinic component and the Project Classroom opened. Then, following the installation of yet more AV systems and technological simulators the simulation facilities (mannequin-based, part-task, and virtual worlds) were launched. We are particularly 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 ILC (Immersive Learning Center) 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.

The other simulation centers within CISL each continue to thrive. The Goodman Surgical Simulation Center achieved renewal of its accreditation as a Level 1 surgical education institute from the American College of Surgeons. CAPE extended its leadership in neonatal, perinatal, and pediatric simulation.

Around the world simulation in healthcare continues to grow rapidly, based on foundations that in many cases was widely recognized to have been pioneered here at Stanford and its affiliates. Not only is simulation a part of academic training in medicine, nursing, and allied health, it is also becoming embedded into national initiatives in large hospital systems. Of note this past year is the creation of a national simulation program – SimLEARN – in the Veterans Hospital Administration, the healthcare component of the Department of Veterans Affairs. CISL faculty are playing a major role in SimLEARN, and the Simulation Center at VA Palo Alto is the official satellite site to SimLEARN's national simulation facility that will be built (by 2012) in Orlando, FL.

CISL and SET continue to work with many others around the world of like mind and vision. 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. This is a noble goal and we are pleased to once again present an update on our progress as pioneers of this effort.



David M. Gaba, M.D.

Associate Dean, Immersive and Simulation-based Learning



“Not only is simulation a part of academic training in medicine, nursing, and allied health, it is also becoming embedded into national initiatives in large hospital systems.”

David M. Gaba, M.D.

*This document is designed to highlight the new activities of the Consortium for Immersive and Simulation-based Learning (CISL) under the purview of the office of Associate Dean for ISL, for the time period of August 2009- September 2010. 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.*

<http://cisl.stanford.edu>

## Deployed Curricula Using Immersive and Simulation-based Learning (Including Standardized Patient Program SPP) by Target Population as of October 2010

Pre-Clerkship Med Students	Clerkship Med Students	Interns / Residents/ Fellows	Combined Team (Housestaff, Attending, RNs, Allied Health)	CME or equivalent	Nursing, Graduate Students, Allied Health		
<b>Ongoing Courses</b>							
Procedures Course - POM Q5	ANEST 306A Adult Crit Care Sims (STARS)	Anesth Novice Resident Sims	EM CRM1	IMPES - ICU Combined Team CRM Simulations	NeoSim	CISL CRM Instructor Training	RT Student Sims (Foothill College)
Intro to Mgmt of Ill Pt (IMIP) POM Q6	Med 313 - Ambulatory Med (SPP)	ACRM I, II, III	EM CRM2	Sim DR - Perinatal Combined Team Training	PediSim	CAPE Simulation Instructor	Sedation for Pediatrics
SURG 254 Operative analysis and techniques	PICU/NICU/ CVICU Critical Care Clkshp	Pedi Sim I, II, III	EM CRM3	Disclosure of Unanticipated Consequences	Pedi ERSim	P.A.S.S. program as part of the Society of Pediatric Anesthesia	Defibrillator and CPR Training for Nurses
CPX Series (SPP)	Neo Critical Care for NICU Subinternship	NeoSim I, II & III	SCARED- Int Med	Mock Drills for Cardiac Arrests	OBSim	ATLS	Primary Certification in PALS
Suturing Skills	Deliv of Bad News for Gen Ped Clkshp (SPP)	Pedi ER Sim I, II, III	SCARED - Surgery	Mock Drills for Medical Emergency Team	Sim DR - Perinatal Team Training	ACLS	Versant Nursing Program at LPCH
Anesthesia SIG	SURG 313A - Emergency Med Sims	Sims for Card Surg Fellows	SOS - Int Med	Trauma Combined Team Training	ECMO Sim		LifeFlight Skills and Simulation
Critical Care SIG	SURG 228 - Intro to Vascular Disease and Rx	OB Sim I; SimDR I	Perinatal Counseling (SPP)	OB - BLS	Critical Care Transport		Project Transform (in situ Sim)
INDE 201 - 206 - POM (SPP)	Surg 229 - Adv. Vascular Disease	Cardiac Surgery CRM (NEW)	Compass. Deliv. of Bad News (SPP)	Management of emergencies in Radiology (in situ) Sim Drills	MOCA Course for Anesth Certification		GENE 286A - Genetics Counseling MS Program
	SURG 300A - Trauma Surgical Sims	Int Med Invasive (CVC) Procedures	Surgical Core Curriculum	Pedi Anesth Sims (in situ) Sim Drills	Debriefing Course		PCAP - Physician Assistant Program
	INDES 301A - Fam Med (SPP)	ECMO Sim	Laposcopic Surgery Training for OB/GYN	SHC Recognition of Critical Events (in situ) Sim Drills			
	OBGYN 300A - (SPP)	Surgery Intern Boot Camp		Labor & Delivery (in situ) Sim Drills			
	PEDS 300A - Pediatrics (SPP)			Pedi CVICU (in situ) Sim Drills			
				Project Transform (in situ) Sim Drills			

# "Awesome!"

"I really felt thrown into the situation and that it was realistic – that we had to think on our feet. I feel more prepared for clerkships in general and especially for being in the ER." – MS2

## **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).**

Since CISL's inception in 2004, Immersive and Simulation-based Learning (ISL) activities continue to expand at Stanford. With the opening of the Goodman Immersive Learning Center in the Li Ka Shing Center for Learning and Knowledge (August 2010), we expect to see an exponential growth in the variety of immersive learning activities, ranging from simulation and standardized patient exercises, task and skills training, to the use of virtual reality and virtual worlds. As of September 1<sup>st</sup>, the clinical skills area became operational with standardized patient exercises occurring regularly in the new mock clinic spaces. The staff and students are getting familiar with the new software, which should enhance the ability to smoothly run exercises and collect data. We expect to be fully operational with mannequin-based simulation activities by November.

### **MANNEQUIN-BASED SIMULATION PROGRAMS**

Mannequin-based simulation exercises have been an integral part of Stanford's clinical training for over 20 years. These exercises, under the tutelage of David M. Gaba, M.D., Professor of Anesthesia and Associate Dean for Immersive and Simulation-based Learning have been among the first courses offered to clinical trainees and have led to world-wide recognition of Dr. Gaba and his colleagues as mentors and researchers in simulation.

**Some of the longstanding courses using mannequin-based simulation at Stanford are:**

- **ACRM - Anesthesia Crisis Resource Management I, II & III**
- **STARS - Simulation Training for Acute Resuscitation Skills**
- **IMIP - Introduction to the Management of the Ill Patient**
- **NeoSim – Neonatal Simulation (newborn resuscitation)**

"I have been a patient actor for close to 20 years and this is the best facility I have ever worked in."

J.D. (Patient Actor)

### **STANDARDIZED PATIENT PROGRAM (SPP)**

Standardized patient actors have been used at Stanford since 1994 beginning with 2 exercises for family medicine and internal medicine clerkships. These sessions were held in real clinic spaces on weekends and evenings without video capture. Today, in the new ILC, there are 12 clinic spaces that can be used for a variety of training activities from practice of medicine courses for medical students to "delivering bad news" scenarios for all learner groups in both adult and pediatric environments. These spaces have full AV capability using the B-Line Clinical Skills software.

Stanford has been a member of the California Consortium for the Assessment of Clinical Competencies (CCACC) since 2000, serving in a leadership role in the consortium. Andrew Nevins, M.D., Medical Director for the SPP, is the incoming president of the California Consortium. Dr. Nevins is also very active in developing use of virtual reality patient cases as part of the student experience.

Some of the longest standing standardized patient exercises are listed below, and with the opening of the new ILC, new exercises are being developed to expand the learning experience.

- CPX - Clinical Performance Exam
- Mini-CPX
- CPX- R (remedial)

### **DEPARTMENT-SPECIFIC ACTIVITIES**

#### **PEDIATRICS**

There are multiple programs for neonatology and pediatrics. Residents in general pediatrics take part in a combined three-day NeoSim (Neonatal Resuscitation Program) and Pediatric Advanced Life Support (PALS) Program prior to beginning their residency at LPCH. Emphasis is placed on skills and the basics of crisis resource management. Participation results in a PALS card from the American Heart Association (AAP) and an NRP card from the American Academy of Pediatrics. All residents return to PALS and NeoSim in their third year of residency to renew their card status with the AHA and AAP.

A similar program is presented to Emergency Medicine interns prior to beginning their residency at LPCH. This program is under the direction of Drs. Chona, Dannenberg and Wang.

## **SURGERY**

This past year, the general surgery residency skills and simulation curriculum has undergone a revision in recognition of the evolution of surgical training toward a more integrated skills-based approach. Weekly activities (with protected time for the residents) enhance the learning of surgical skills.

SURG 228 (Introduction to Vascular Disease) has been a highly successful course developed by Jason T. Lee, M.D. for the past four years. This simulation-based course offered to pre-clinical medical students has exposed them to the basic pathophysiology and treatments of vascular disease.

Due to the overwhelming success and request for additional learning, SURG 229 (Advanced Vascular Disease and Treatment) has been added to the curriculum. This course goes into greater depth about the pathophysiology of vascular disease, and expands on previously learned basic technical skills to teach more advanced skills on more challenging anatomy. The course also focuses on vascular access, closure devices, and teamwork in the angiography suite.

## **MEDICINE**

The Immersive Learning Center in the LKSC is pleased to be working in collaboration with Abraham Verghese, M.D. and the Department of Medicine. A HARVEY® simulator was purchased for use in the Immersive Learning Center to teach students cardiovascular physiology.



## **ANESTHESIA/CRITICAL CARE**

In addition to the long-running ACRM courses, the Difficult Airway Course, led by Dr. Vladimir Nekenky was the first skills course held in the Immersive Learning Center in the LKSC. This 2-day course was attended by residents and faculty to enhance their airway skills. A Critical Care airway course was also held in the ILC.

## **Strategic Goal 2: Healthcare Systems Improvement**

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

## **RISK MANAGEMENT**

The CISL works closely with Stanford Hospital and Clinics and Lucile Packard Children's Hospital Risk Management Department. Under the direction of the Stanford University Medical Indemnity & Trust (SUMIT), CISL group leadership and Risk Management identify areas to minimize risk, and develop simulation activities to address these improvements.

## **PEDIATRICS**

Linda Knight, RN, CCRN, CPN was awarded an Innovations in Patient Care grant for a research project titled: **Improving Code Team Performance and Survival Outcomes: Implementation of a Composite Resuscitation Team Training.** This project is looking at multi-disciplinary code team performance for all team members at Lucile Packard Children's Hospital through various team-training exercises. In-situ mock codes throughout the hospital will be studied.



## STANFORD HOSPITALS AND CLINICS - PROJECT TRANSFORM

Project TRANSFORM is a new research study, funded by the Gordon and Betty Moore Foundation for \$1.1 million dollars, to evaluate the effect of a simulation-driven, patient safety program on patient and staff outcomes at Stanford Hospital. Under the leadership of Drs. Clarence Braddock, Nancy Szaflarski and Lynn Forsey, registered nurses and physicians on inpatient units are participating in high fidelity, in-situ simulation exercises focused on improving early detection and treatment of common hospital-acquired complications. Project Manager, Lynn Abel, has worked extensively with unit-based medical directors and clinical nurse specialists in conducting interdisciplinary and nursing simulation exercises around the clock. The project represents a collaborative effort between faculty at the Stanford University School of Medicine (including simulation experts, David Gaba, M.D., Associate Dean for Immersive and Simulation-based Learning, Steven Howard, M.D., and Geoffrey Lighthall, M.D., PhD) and nurse researchers at SHC.

**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.**

## LUCILE PACKARD CHILDREN'S HOSPITAL – Nursing Orientation Report Card

While undertaking the redesign of nursing orientation at Lucile Packard Children's Hospital, a gap in the transmission of information from general hospital to unit orientation was identified. Linda Hargreaves, MSN, CNSc et. al developed a nursing orientation report card. Unit managers were unaware of the strengths and weaknesses of newly hired experienced nurses identified in nursing orientation and knowledge therefore could not tailor the unit orientation to meet the specific needs of these orientees. In order to facilitate better exchange of performance data, a nursing orientation report card consisting of a 100- point score containing a summary of skills, critical thinking, and knowledge, using a Benner level measuring tool to assess clinical performance in simulated scenarios.

**Strategic Goal 4: Research - To promote, support and conduct fundamental research and evaluation about ISL and to use the ISL techniques as a research tool.**

CISL members collectively participate in research activities that relate to immersive learning. Additionally, CISL funds several mini-grants annually to increase the use of Immersive and Simulation-based Learning throughout the Stanford community. The focus in 2010 was on medical student education and training.

### 2010 Awarded Mini Grants

MINI GRANT PROJECT TITLE	FACULTY	TARGET AUDIENCE
Simulation in Cardiac Valve Surgery and Crisis Management in Residency Training.	James, I. Fann, MD David Joyce, MD Thomas A. Burdon, MD R. Scott Mitchell, MD Steven K. Howard, MD T. Kyle Harrison, MD David G. Gaba, MD	Surgery residents
Procedural Skill Training for Direct Ophthalmoscopy and Assessment of Ophthalmoscopic Fund of Knowledge Using Prosthetic Eye Model.	Douglas Frederick, MD	Year 1 and 2 medical students
Enhanced Use & Availability of Task Trainers for Invasive Procedure Training in the ICU.	Geoffrey K. Lighthall, MD, PhD Jon-Eric Holty, MD Dan Sedehi, MD	VA ICU residents
Introducing Medical Students to the Male Genitourinary and Rectal Exam.	Lars Osterberg, MD, MPH Marty Bronk, MD Erika Schillinger, MD Pree Basaviah, MD Ian Tong, MD	Year 2 medical students
Patients as Partners in Education: Can Patients Reliably Evaluate Students?	Erika Schillinger, MD Tracy Rydel, MD Sam LeBaron, MD	Year 3 and 4 medical students
Preparing Medical Students for the Female Genitourinary Exam.	Nounou Teleghani, MD, PhD Bertha Chenn, MD Julieta Gabiola, MD Erika Schillinger, MD Paula Hillard, MD Lars Osterberg, MD Ian Tong, MD	Year 2 medical students

## OTHER RESEARCH HIGHLIGHTS

### VASCULAR SURGERY

Jason T. Lee, M.D. has multiple research interests relating to simulation.

The major aim of Dr. Lee's funded research efforts is to determine if a simulation-based endovascular surgery curriculum will improve trainee performance to be measured by technical skill, didactic knowledge, and learner satisfaction. Another research goal is to use endovascular simulation as a tool to promote procedural efficiency in the catheterization lab and reduce procedural errors. To accomplish these aims a multi-center prospective randomized trial of surgical resident educational curriculum has been constructed with collaboration from Stanford University School of Education. Dr. Lee hopes this project will lead to development of a nationally adopted endovascular curriculum and assessment tool to determine fundamentals of endovascular surgery. Already in the second year of this study, there has been promising initial results consisting of a clear improvement in skills for trainees in the operating room who have been exposed to increased simulation time.

**Strategic Goal 5: 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.**

### CONTINUING MEDICAL EDUCATION (CME) ACTIVITIES

The CISL is moving forward to offer innovative, world-class Continuing Medical Education (CME) programs that are free from commercial support or bias. Many of the programs will be offered in the new Li Ka Shing Center for Learning and Knowledge (LKSC).

### SIMULATION INSTRUCTOR TRAINING COURSE

The CISL Crisis Resource Management (CRM) Instructor Course has had high visibility both nationally and internationally and has been instrumental in assisting

Stanford faculty and other healthcare professionals around the world to begin on the simulation journey.

CISL will continue to offer the popular CRM Instructor Course along with content subsets (from the instructor course) that will be offered as one-day intensive workshops, such as the art of debriefing. Participants in this program will have the opportunity to learn from experts in the field about the power of debriefing, how to facilitate effective debriefings and how to refine debriefing skills through feedback.

### SPECIALTY TRAINING FOR EXPERIENCED CLINICIANS

The Division of General Surgery offered one of the first CME programs in the LKSC for practicing surgeons, 'Surgical Quality, Best Practice, and Innovation' (September 2010). This program featured Single Site Laparoscopic Simulation taught and hosted by the faculty and staff of the Goodman Surgical Simulation Center and held in the new Immersive Learning Center in the LKSC.

The American Board of Anesthesiology has created a new mandate that includes the use of simulation in order to maintain anesthesia certification. The Maintenance of Certification in Anesthesia (MOCA), requires anesthesiologists to participate in one simulation program every ten years. CISL is proud to be planning a certified MOCA simulation course. This course will continue to push Stanford at the forefront of simulation and CME both locally and nationally.

CISL's newly hired CME Specialist, Kim Yaeger, RN, MEd, nationally recognized for her work in simulation, continues to meet with faculty and assist them in developing simulation and immersive learning CME programs. A variety of programs and offerings have been identified as potential CME programs that are both innovative and reproducible as CISL continues to add and expand its existing CME offerings.

Information about CISL programs can be found at <http://cisl.stanford.edu>.

Information about CME programs at Stanford can be found at <http://cme.stanford.edu>.



"Great course!" Very interesting. I learned a great deal that I expect will make me a better physician and help me run my simulation program. A home run!" - Instructor course participant, May 2010



**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.**

The CISL consortium members and centers routinely participate in community outreach programs. Presentations and tours for K-12 students as well as college students interested in careers in medicine provide these young people with an opportunity for “hands-on medicine”.

The semi-annual Packard 101 and SHC Community Fellows program highlight simulation as part of their experience. These programs bring in local government, business and administrative leaders, exposing them to multiple facets of healthcare.

The Stanford Medical Alumni has also become more aware of simulation activities at Stanford, and there is a goal to recruit alumni to assist in simulation activities.

#### THE CISL SYMPOSIUM

The symposium is now in its fourth year. The annual symposium is a popular event that highlights many of the simulation activities that occur throughout the year. Updates on CISL mini-grants are presented, as are other works in progress and research.

#### CISL WEBSITE

The CISL website (<http://cisl.stanford.edu>) is a wealth of information for both internal and external viewers. In FY10 the website had over 12,000 visits from 135 countries.

**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.**

#### DEPARTMENT OF SURGERY

In 2007 the Department of Surgery received Level I (highest level) accreditation from the American College of Surgeons as an ACS Education Institute (ACSEI). The centerpiece of the Institute is the Goodman Surgical Simulation Center (GSC), which houses state-of-the-art simulators and audiovisual capabilities. The goal of the ACSEI is to train “learners” using advanced technology. In June 2010, Dr. Thomas Krummel received notice that reaccreditation of the Stanford Education Institute had been granted.

#### ANESTHESIA

CISL has been recognized as an American Society of Anesthesia (ASA) Endorsed Simulation Program.

#### OBSTETRICS

The OBSim Team, under the direction of Drs. Kay Daniels and Steve Lipman was chosen from a national pool of academic centers to be the West Coast Simulation Center for the American College of Obstetrics and Gynecology (ACOG). Only 9 centers were selected across the country. This will help shape the face of obstetrical training nationwide.

#### EXTRAMURAL ACTIVITIES

Dr. David Gaba, Associate Dean for Immersive and Simulation-based Learning continues his work as Editor-in-Chief of the only peer-reviewed journal in simulation – *Simulation in Healthcare*. The Journal increased its frequency of publication by 50% this past year (from 4 times per year to 6). Dr. Gaba continues to be a popular and sought out speaker world-wide on safety and simulation. He delivered the 40<sup>th</sup> Joseph Clover Lecture to the Royal College of Anaesthetists (Great Britain) in March, 2010. He serves on the Board of Directors of the Society of Simulation in Healthcare and is the Treasurer of Advanced Initiatives in Medical Simulation.

Sandra Feaster, RN, MS, MBA is the co-chair of the Public Affairs and Government Relations Committee (PAGR) for the Society for Simulation in Healthcare ([www.ssih.org](http://www.ssih.org)) and has been actively working to help encourage the passage of legislation to fund simulation activities nationally. She is also the co-chair of the Administrative and Management Committee of the American College of Surgery – Accredited Education Institutes.

CISL instructor course participant  
examining a mannequin.

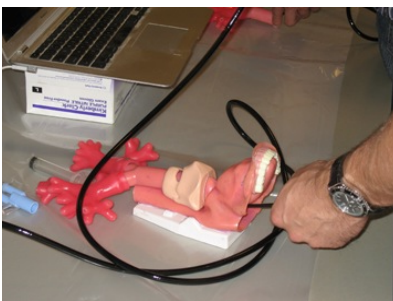


## Strategic Goal 8: Faculty Development - To recruit, train and sustain faculty to become effective Immersive and Simulation-based Learning educators.

The CISL-funded and instructor training course with the Stanford Faculty Development Center (SFDC) bringing together simulation instructors/leaders from multiple departments and domains and disciplines at Stanford. We expect this collaboration to continue and expand in the years to come.

The CISL family remains very active both nationally and internationally; a highlight of their activities is listed below (NOTE: This is not an exhaustive list):

### Articles and Book Chapters



- Clark EA, Fisher J, Arafah J, Druzin M: Team training/simulation. *Clin Obstet Gynecol.* 2010 Mar;53(1):265-77.
- Daniels K, Arafah J, Clark A, Waller S, Druzin M, Chueh J: Prospective randomized trial of simulation versus didactic teaching for obstetrical emergencies. *Simul Healthc.* 2010 Feb;5(1):40-5.
- Fann JI, Calhoun JH, Carpenter AJ, Merrill WH, Brown JW, Poston RS, Kalani M, Murray GF, Hicks GL Jr, Feins RH: Simulation in coronary artery anastomosis early in cardiothoracic surgical residency training: the Boot Camp experience. *J Thorac Cardiovasc Surg.* 2010 May;139(5):1275-81.
- Gaba DM: Do as we say, not as you do: using simulation to investigate clinical behavior in action. *Simul Healthc* 2009; 4: 67.
- Gaba DM, Dunn WF: Procedural risks in thoracentesis: process, progress, and proficiency. *Chest.* 2009; 135: 1120.
- Gaba D, Feaster S: Mannequin-based simulation in healthcare. Edited by Scott R, Van Diepen L, Markert R. Washington, D.C., Department of Veterans Affairs, Employee Education System, 2010, pp 5-20.
- Gaba DM: The pharmaceutical analogy for simulation: a policy perspective (editorial). *Simul Healthc.* 2010; 5: 5-7.
- Halamek LP: Lost Moon, Saved Lives: Using the movie *Apollo13* as a video primer in behavioral skills for simulation trainees and instructors. In press 2010.
- Hargreaves L, Shanks S, Halamek LP, Nichols A: A hand-off report card for general nursing orientation. In press, *The Journal of Nursing Administration.* 2010.
- Kennedy J, Nichols A, Halamek LP, Arafah J: Nursing department orientation: Are we missing the mark? In press, *Journal for Nurses in Staff Development.* 2010.
- Lee HC, Chitkara R, Halamek LP, Hintz SR: A national survey of pediatric residents and delivery room training experience. In press, *Pediatrics.* 2010.
- Lee JT, Qiu M, Teshome M, Raghavan SS, Tedesco MM, Dalman RL: The utility of endovascular simulation to improve technical performance and stimulate continued interest of preclinical medical students in vascular surgery. *J Surg Educ.* 2009;66:367-373.
- Lee JT, Teshome M, de Virgilio C, Ishaque B, Qiu M, Dalman RL: A survey of demographics, motivations, and backgrounds among applicants to the integrated 0+5 vascular surgery. *J Vasc Surg.* 2010;51:496-503.
- Lipman SS, Daniels KI, Carvalho B, Arafah J, Harney K, Puck A, Cohen SE, Druzin M: Deficits in the provision of cardiopulmonary resuscitation during simulated obstetric crises. *Am J Obstet Gynecol.* 2010 (Apr 22).
- Manser T, Harrison TK, Gaba DM, Howard SK: Coordination patterns related to high clinical performance in a simulated anesthetic crisis. *Anesth Analg.* 2009; 108: 1606-1615.
- Parent RJ, Plerhoples TA, Long EE, Zimmer DM, Teshome M, Mohr CJ, Ly DP, Hernandez-Boussard T, Curet MJ, Dutta SJ: Early, intermediate, and late effects of a surgical skills "boot camp" on an objective structured assessment of technical skills: a randomized controlled study. *Am Coll Surg.* 2010 Jun;210(6):984-9.
- Rall M, Gaba D: Patient Simulation, *Miller's Anesthesia.* Edited by Miller R. Philadelphia, Churchill Livingstone, 2010, pp 151-192.

## Presentations

- Dua M, Teshome M, Qiu M, Parent R, Lilo E, **Lee JT**. Are surgical simulation skills transferable among different subspecialties? Examination of laparoscopic experience on endovascular performance. Presented at the 10<sup>th</sup> annual International Meeting on Simulation in Healthcare, Phoenix, AZ, January 23-27, 2010.
- **Lee JT**, Lee GK, Zayed MA, Lilo E, Dalman RL. Design and implementation of an integrated 0+5 vascular surgery residency. Presented at 20<sup>th</sup> Annual Winter Meeting of the Peripheral Vascular Surgical Society, Vail, CO, January 29-Jan 31, 2010.
- **Lee JT**, Zayed MA, Dua M, Lilo E, Lee GK, Dalman RL. Design and implementation of a prospective randomized trial to improve resident operative performance: Utility of a simulation-based endovascular curriculum. Presented at the Association for Surgical Education Meeting, San Antonio, TX, April 22-24, 2010.
- **Lee JT**. "Endovascular Simulation 2010: A Research Tool or Valuable in Training?" Presented at the Association for Program Directors in Vascular Surgery Meeting, Chicago, IL, April 16, 2010.
- **Lee JT**. "Patient-specific Simulation" Presented at the Vascular Annual Meeting, Boston, MA, June 9-13, 2010.
- Aparajita R, Casey K, Dayal R, Lilo E, **Lee JT**. Development of an introductory endovascular training curriculum for medical student education: a multicentre study. Presented at the Annual Spring Meeting of the Peripheral Vascular Surgical Society, Boston, MA, June 9-13, 2010.



## Awards and Grants

- David M. Gaba, MD, Associate Dean for Immersive and Simulation-based Learning was awarded the 2010 Henry J. Kaiser Family Foundation Award for Outstanding and Innovative Contributions to Medical Education at Stanford University School of Medicine. Dr. Gaba's 20+ year career as a practitioner, an advocate, a developer and a thought leader in the field of simulation-based education is without par.
- 2010 Stanford Med Scholars Program – Ji H Son, MS, for project entitled "Feasibility of Open Vascular Surgery Simulation as Effective Teaching Tool"
- 2010 Society for Vascular Surgery medical Student Award (\$3000) – Ji H. Son, MS, for project titled "Utility of Open Vascular Surgery Simulation"
- Thumb CMC imaging and seed grant for simulation awarded to Amy Ladd, MD. OREF/RJOS/DePuy Career Development Award 1 July 2010- 30 June 2011: "Thumb CMC Joint in Women: Anatomy and function in Symptomatic and Early Arthritis Subjects"
- 1/1/10-12/31/10 Ronald and Ann Williams Charitable Foundation supporting visiting scholar Elisabet Hagert MD, PhD, Julia Lee visiting medical student, Amy Ladd MD: Upper Limb Kinematic Study of the Upper Limb

**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 the Medical Director fundraising and ensure long-term financial viability of ISL activities.**

The Immersive Learning Center is available for students and housestaff teaching without charge. The Center's staff provides technical expertise as well as educational assistance. Medical education take high priority at Stanford and the Dean of the School of Medicine has made it possible to prioritize the resources to provide such education.

**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.**

Li Ka Shing Center for Learning and Knowledge (<http://lksc.stanford.edu>) successfully opened in August 2010 to its first group of medical students. As the Immersive Learning Center begins to host more activities, infrastructure support and procedures are most imperative. The staff is actively developing these structures and is sharing them with the CISL consortium.

The infrastructure of the Executive Committee has also changed to reflect the broader scope of simulation at Stanford. The core Executive Committee provides oversight to a variety of developing working groups. These working groups will help develop guidelines, consultation to faculty wishing to utilize simulation and immersive learning in their teaching, and look for research opportunities and other cutting edge activities.

## CISL Executive Committee

David M. Gaba, MD - Associate Dean for Immersive and Simulation-based Learning  
gaba@stanford.edu

Clarence H. Braddock, MD, MPH  
cbrad@stanford.edu

Sandra Feaster, RN, MS, MBA  
sfeaster@stanford.edu

Lou Halamek, MD, FAAP  
halamek@stanford.edu

Thomas M. Krummel, MD  
tkrummel@stanford.edu

Jenn Stringer, MLIS  
jenn@stanford.edu



A Consortium of Medical Simulation and Immersive Learning at Stanford University School of Medicine

<http://cisl.stanford.edu>

Li Ka Shing Center for Learning and Knowledge  
Stanford University  
291 Campus Drive, LK311  
Stanford, CA 94305-5217