CISL

CENTER FOR IMMERSIVE AND SIMULATION-BASED LEARNING

STANFORD SCHOOL OF MEDICINE

2012-2013

Accomplishments Report

STANFORD SCHOOL OF MEDICINE
Center for Immersive and
Simulation-based Learning

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LETTER FROM THE ASSOCIATE DEAN

The academic year 2012-2013 saw continued growth in the use of immersive and simulation-based learning, as described below and in the details of this report. CISL is increasingly a significant element of the educational enterprise for diverse learner populations (primarily medical 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) 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.

This Report highlights the new activities of CISL, especially those occurring in the ILC, for the time period of August 2012- September 2013. The Report cannot describe the incredible scope of Immersive and Simulation-based Learning activities that go on throughout the Stanford Medicine facilities. A vast number of activities that were described in CISL Accomplishments Reports from 2006 to the present continue and to a large extent have become regular components of teaching, learning, and research at Stanford Medicine.

As noted herein the extent of use of the ILC by a large number of different participant populations continues to rise. In fact, the primary limitations on simulation are probably the access to the learner populations' time and access to the time of simulation-savvy faculty. From the ILC's internal standpoint, the current limiting factor is the number of trained simulation staff, which is being addressed by recruitments that are underway.

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. Simulation is a global enterprise thanks to more than 25 years of effort by CISL pioneers to bring simulation everywhere rather than parochially focusing only on Stanford. Thus, faculty also learn and adopt approaches from friends, colleagues, and collaborators around the world. CISL faculty continue with externally funded research either about simulation or using simulation to study other issues in healthcare. Collaborations between CISL and professors in other Stanford Schools and Departments continue to confirm the interdisciplinary nature of simulation and the culture of innovation at Stanford.

CISL has been active in supporting the School of Medicine initiatives to flip the classroom – creating snappy video segments about simulation, and helping faculty to film "clinical" activities in the simulation suite, for use in their own online teaching videos. Simulation is the ultimate "interactive activity" for learners to be engaged during the on-site portions of the flipped classroom. CISL continues to work with faculty and curriculum planners to integrate simulation into the interactive components of the medical school curriculum.

Stanford Hospital and Clinics is increasingly supportive of the efforts of CISL to use simulation to address quality and safety via simulation training of interns, residents, and fellows. CISL is working with the hospitals of Stanford Medicine with activities for single professional disciplines, and where possible for combined team simulation activities involving physicians, nurses, allied health professionals.

Stanford faculty and staff continue to be world-recognized leaders in ISL techniques, applications, and technologies who are highly sought 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 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

CISL STRATEGIC GOALS

1. Education and Training of Students & Clinical Trainees
Improve the education and training of Stanford students (undergraduate, medical and graduate) and Medical Center trainees (residents, clinical fellows and postdoctoral scholars) using ISL.

2. Healthcare Systems Improvement
Improve care delivery and operational outcomes of the Stanford Hospital & Clinics, the Lucile Packard Children's Hospital, VA Palo Alto, and the SHC/LPCH Insurance Company (SUMIT) by improving the individual and teamwork skills of healthcare personnel.

3. Assessment/Testing
Use ISL techniques for explicit assessment/testing of skills, knowledge, and performance of students, trainees, and experienced personnel.

4. Research
Promote, support and conduct fundamental research and evaluation about ISL and to use the ISL techniques as a research tool.

5. Provide ISL Learning to External Experienced Clinicians
Improve the clinical skills (both "technical" and "non-technical") of healthcare personnel, as individuals and in teams, through ISL.

6. Community Outreach
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 ISL.

7. Leadership and Advocacy
Provide leadership in advocating the future vision of immersive and simulation-based learning in healthcare for the nation and the world.

8. Faculty Development
Recruit, train and sustain faculty to become effective ISL educators.

9. Sustainability
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.

10. Management
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.
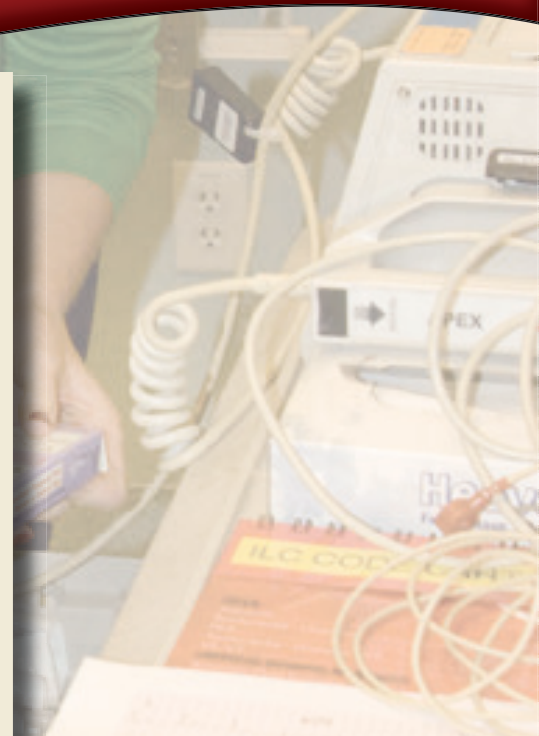
The Goodman Immersive Learning Center

Activity in the ILC has been steadily increasing as immersive and simulation-based modalities are becoming more integrated into curricula at all levels of medical education.

Immersive Learning Center Programs by Target Population (as of September 2013)

UGME (Pre-Clin MS)	UGME (Clinical MS)	GME (Interns/Residents/Fellows)		CME or Equivalent	Nursing, Allied Health	Combined Team	Pre-Medical/ Community
Mini-CPX	ANES 306P Peds Crit Care	Neurology: Stroke Code	PICU Residents	APLS – Adv Pedi Life Support	Primary Cert in PALS	ObLS Obstetric Life Support	Med School 101
INDE 201 Baseline, Q1 Exercise	Internship Boot Camp Pilot	PICU/CVICU: Fellow Boot Camp	Anesthesia: ACRM I, II, III	EMed Faculty OBSim	LifeFlight Skills and Simulation	Code Blue Sim	Discovering Medicine
INDE 201 Bringing it All Together	NENS 301A Neurology	Anesthesia: EVOLVE	EMed: EMCRM I, II, III	Anesthesia Faculty Retreat	EM Nursing		
INDE 203 Q3 final, Std Family	OBGYN300A Procedures	Anesthesia Newbie Course	EMed: Peds EMCRM I, II, III	ATLS/ACLS	PCAP Physician Asst Program		
INDE 204 Project Prepare	EMIG Echo Workshop	Anesthesia: ImPRINT	EMed: Wilderness SIm	Difficult Airway	Genetics Counseling MS Program		
INDE 202 Clinical Skills	FAMMED 301A Fam Med	EMed: Intern Boot Camp	EMed: Disaster Sim	POC Ultrasound	Safe Patient Handling		
INDE 204 Adv Clinical Skills	PEDS 300A Deliv of Bad News	Oncology: Difficult Conversations		CRM Instructor Wkshp (Team)			
INDE 206 EMED	OBGYN 300A OSCE	Plastic Surgery OSCE		Simulation Instructor Course			
HHD CV Phys Block	MED 313 Ambulatory Med	Heme/Onc: Fellows Skills		MOCA - Maint of Cert for Anesthesia			
SURG 205: Advanced Suturing	CPX, CPX-R	EMed: Bedside ECHO					
MED 227: Bedside Ultrasound	ANES 306A Adult Crit Care	Surgery: Boot Camp					
INDE 205 Intro to Mgmt of Ill Pt (IMIP)	SURG 313A EMed	OB-GYN: Lap Surgery Training					
	MED 300A Bedside Rounds	OB-GYN: Intern Boot Camp					

Legend:
- Combined Modalities
- Part-task Skills Training
- Standardized Patient Program
- Mannequin-based Simulation

Task Training Activities by User Group

Standardized Patient Program Activites by User Group

Mannequin-based Activities by User Group

EDUCATION & TRAINING

TRANSITION TO INTERNSHIP BOOT CAMP

In May 2013, a group of 12 graduating medical students participated in a pilot course at the ILC that was designed to prepare them for the transition from student to resident physician. Created by Vivian Lei, a Stanford medical student, and led by Drs. Jeffrey Chi and John Kugler from the Department of Medicine and Dr. Phil Harter from the Division of Emergency Medicine, this simulation-based course allowed the students to review a wide variety of skills that are essential to working effectively as interns. The students practiced delivering bad news and engaging in other challenging patient interactions with standardized patients; gained competency in procedures ranging from basic airway management to vascular access using part task trainers; and learned how to respond to urgent pages, while identifying and managing critically ill patients in high fidelity mannequin-based simulations. This pilot course was very well received by both students and faculty and is currently being developed into an elective clerkship for 2013-2014.

"[V]ery very helpful course…really truly feel like we learn best by doing and making mistakes and then discussing…[simulation] is one of the best ways to do this. I would be completely happy doing an entire week of simulations like this and feel that I get a ton out of them every time."

–Participant in the Transition to Internship Boot Camp course

INTERACTIVE LEARNING – FLIPPING THE CLASSROOM WITH ISL

The flipped classroom is a blended learning approach in which lecture material is presented as "homework" (online or via video), allowing class time to be spent on interactive, immersive, and experiential learning activities. As part of the Stanford Medicine Interactive Learning Initiative (SMILI; http://med.stanford.edu/smili/), the required preclinical medical student course, Human Health & Development (HHD), began using the flipped classroom model for some content blocks. In May 2013, all 92 first-year medical students came to the ILC for a 4-hour interactive session on cardiovascular physiology. Groups of students rotated through immersive learning stations, where they performed echocardiography using an ultrasound simulator, learned about respiratory variation in heart rate by observing standardized patients, and practiced diagnosing various pathologies on the Harvey® cardiopulmonary patient simulator.

DIFFICULT CONVERSATIONS
Oncology Communication Training Workshop

For two and a half days at the end of August 2013, Stanford Oncology fellows participated in The Karen K. Andregg Communications Workshop – Challenging Conversations in Oncology. This seminar included didactics, group discussion, and the backbone of the program: interviews with standardized patient actors (SPs) portraying oncology patients. The learners met and interviewed the SPs through 4 encounters representing challenging transition points in an oncology patient's care: initial diagnosis and treatment plan, sharing news of a positive test result/cancer recurrence, transition to palliative care, and saying goodbye. Learners worked with faculty in small groups, receiving individualized coaching as well as the opportunity to 'rewind' or 'pause' the encounter to try different strategies or get specific advice for a crucial moment. It was an intense, emotional and challenging program for all involved. As the program wrapped, the SPs took an uncharacteristic 'curtain call' in front of the learners and received a standing ovation.

"The SPs did an outstanding job. They fulfilled all of the necessary needs of our communication workshop, and more--they came across as 'real' and thus created the ideal environment for training...The entire program was outstanding and the best that I have encountered over the years working with SPs."

–*Jonathan Berek, MD, MMS*
Laurie Kraus Lacob Professor
Director, Stanford Women's Cancer Center
Chair, Department of Obstetrics and Gynecology

NEW HOUSESTAFF TRAINING
Specialty Boot Camps

To facilitate the transitional period for new housestaff beginning their training at Stanford, many departments have instituted full- or multi-day workshops as part of the orientation process. These boot camps often utilize immersive learning techniques to provide trainees with interactive, hands-on experience, including practicing procedural skills using part-task trainers as well as improving teamwork and communication through high fidelity mannequin-based simulations. The following are some of the housestaff training programs that have been conducted in the ILC this year:

- Anesthesia Newbie Course
- Emergency Medicine Intern Ultrasound Course
- General Surgery Intern Boot Camp
- Hematology/Oncology Fellow Training
- Internal Medicine Intern Boot Camp
- Neurology Intern Boot Camp (Stroke Code)
- OB-Gyn Intern Boot Camp
- PICU fellow/NP Boot Camp

Calvin Kuan, MD is a board-certified pediatrician and anesthesiologist who completed fellowships in pediatric critical care and pediatric anesthesia. He specializes primarily in pediatric cardiac anesthesia at Lucile Packard Children's Hospital and also attends in the pediatric intensive care unit at Children's Hospital Oakland.

In 2012, Dr. Kuan completed a medical simulation fellowship with Drs. David Gaba and Steve Howard at Stanford, and has since been seeking ways to expand the use of immersive learning and simulation in pediatrics.

FACULTY SPOTLIGHT: CALVIN KUAN, MD

Q. How do you currently use immersive and simulation-based learning in your teaching?

During my simulation fellowship, I helped develop the first pediatric scenario for Stanford anesthesia residents' Anesthesia Crisis Resource Management course. After gaining experience with this course, I branched out and developed simulation/CRM courses for different LPCH groups, such as nurses, respiratory therapists and pharmacists, and physician learners. In addition to these high-fidelity simulation exercises, I have also worked with the LPCH Heart Center (including CVICU, pediatric cardiology, and pediatric cardiothoracic surgery services) doing in-situ simulations to test our emergency ECMO deployment system.

Q. How have your learners responded to ISL teaching modalities?

Overwhelmingly the response has been extremely positive, with all learners consistently requesting more pediatric simulation experiences. Even though Drs. David Gaba and Steve Howard pioneered simulation and CRM over twenty years ago, use of ISL teaching in pediatrics is relatively young, primarily due in the past to lack of a good pediatric mannequin. Now that we have pediatric mannequins for all age and sizes, we are able to really develop high fidelity simulation experiences for pediatrics.

Q. What do you enjoy most about using ISL in your curricula?

What I enjoy the most about teaching through simulation is exactly what I experienced the first time I participated in the ACRM course as a first year anesthesia resident—the "A-ha" moment when the student realizes that he is learning something very useful that will stay with him for the rest of his career. It might be something like how to be a leader of a team in a crisis situation, or how not to fall victim to a fixation error, to using a cognitive aid to manage a crisis. In the simulation center, I can allow my trainees to be independent and make their own decisions and deal with the good and bad consequences of those actions.

Q. What advice do you have for instructors who are considering incorporating ISL techniques into their teaching?

First of all, find a good mentor who has experience in developing simulation courses, and even more importantly has experience with debriefing. Anyone can put together a simulation scenario, but it takes not only medical knowledge, but also an understanding of human nature, psychology, and a keen eye to discern what is going on in the mind of the participants, and experience with debriefing to be able to get them to reach that "A-ha" moment for themselves.

Take the time to learn about the cognitive side of simulation, not just the medical/technical side. And when developing your course, allow more time for debriefing and discussion than you initially think.

EMERGENCY MEDICINE NURSING SIMULATION TRAINING

Nurses at the Marc & Laura Andreesen Emergency Department at Stanford Hospital began a new simulation program at the ILC using mannequin-based simulations and part-task procedural training to provide practice with a wide range of clinical scenarios that may be encountered at the Level 1 trauma and stroke center. Participants in the program rotate through a critical care skills lab and multiple simulations involving medical and trauma resuscitations in both pediatric and adult populations. A critical component of the course is the stroke code simulation, which covers the entire course of a stroke patient in the emergency department from initial diagnosis to handoff. Since the program was first implemented in September 2012, approximately 150 nurses have participated in the training. Preliminary data comparing stroke code documentation compliance in the Emergency Department in the first quarter of 2012 (prior to implementation of the simulation program) to the first quarter of 2013 (after simulation implementation) showed an increase in compliance from 86% to 97%. The program, which was developed by Edward Shradar, RN, MSN, CNS, CEN and Ijeoma Okonkwo-Pope, RN, BSN, was featured in an article in the Stanford Hospital & Clinics Nursing Annual Report titled "The Use of Simulation Based Education to Advance Emergency Nursing Practice".

OBSTETRIC LIFE SUPPORT (ObLS)

ObLS was created to improve the response of obstetrical teams to cardiac arrest in the Labor & Delivery (L&D) unit at Lucile Packard Children's Hospital (LPCH). ObLS:A is a biennial six-hour training session that prepares providers who work in L&D to respond to maternal and neonatal arrest. Technical skills are practiced with task trainers; in addition, teams participate in mannequin-based simulations of maternal arrest with peri-mortem cesarean section and subsequent neonatal arrest. In 2012-13, seven sessions of ObLS: A were taught by instructors Andrea Puck, RN, CNS; Julie Arafeh, RN, CNS; and Ana Morales-Clark, RN; with a total of 55 participants.

ObLS: B is a four-hour training session taken by L&D nurses during the years in which they do not take ObLS:A. The content is particularly focused on airway evaluation and support, emergency induction of anesthesia and intubation. In 2012-13, eight sessions of ObLS:B were taught by instructors Andrea Puck, RN, CNS; Gill Hilton, MD; and Ana Morales-Clark, RN; with a total of 41 participants.

OBSim

In 2012-13, the OBSim team, lead by Lorena Behrmann, RN; Ana Morales-Clark, RN; Kay Daniels, MD; Kim Harney, MD; Gill Hilton, MD; Steve Lipman, MD; and Andrea Puck, RN, CNS; completed its latest series of multidisciplinary team in situ drills. In total, OBSim has conducted nearly 200 fully multidisciplinary team training exercises over the past 8 years. As a result, a major paradigm shift has occurred on the labor and delivery unit in how training and learning occurs, as well as in the institutional culture of safety and the approach to identifying and correcting occult errors in the system.

This latest series of scenarios highlighted the ability of parturients to compensate and maintain blood pressure during hemorrhage. Teams also were able to practice interpersonal skills with the help of an actor from the Family Centered Care Program (led by Karen Wayman, PhD), who played the role of the patient's sister in the scenario.

SAFE PATIENT HANDLING

On March 27, 2013, the Safe Patient Handling Program began in the ILC, just steps away from Stanford Hospital & Clinics. The hospital began to enhance its safe patient handling training five years ago, investing $1.5 million in new equipment, such as powered lifts that reduce the risk of injury to both patients and employees. The dedicated simulation space for safe patient handling makes it possible to maintain training levels without disrupting patient care. The training room features all lifting equipment currently in use in the hospital, including equipment that aids employees who are lifting patients from their vehicles. To accomplish practice with the equipment, the simulation space includes hospital beds as well as a portion of a car. The space will also serve as a testing ground for new equipment. In addition to training staff at SUMC, the Safe Patient Handling Program recently began offering courses to external learners as well. A full-day session entitled "Safety, Quality, and the Patient of Size" was held in the ILC in August 2013, and allowed local health care professionals to obtain hands-on experience with safety equipment.

The Stanford Hospital TRANSFORM Program

Under the direction of Clarence Braddock III, MD, MPH; Nancy Szaflarski, PhD, RN; and Carole Kulik, MSN, RN, the Stanford Hospital TRANSFORM Program is a microsystem-level, patient safety program aimed at improving clinical outcomes and safety culture in inpatient areas at Stanford Hospital. The Program consists of several multifaceted interventions, including in situ simulation training of registered nurses and residents in internal medicine and surgery. Originating as a research project in 2010, the Program achieved significant improvement in hospital-acquired complication rates and risk-adjusted mortality, which has led to the Program being sustained.

The goal of simulation training is focused on improving early detection and treatment of hospital-acquired complications through interdisciplinary teamwork and evidence-based practice. With the support of Nursing Development Specialist (Janette Moreno, MSN RN), the medical director and clinical nurse specialist on each inpatient unit facilitates two high-fidelity training exercises per month and conducts debriefing using a standardized checklist. Technical competencies are focused on diagnostic and treatment actions contained in established clinical guidelines for the selected complications. Nontechnical competencies are based on crisis resource management principles applicable to early detection and treatment. Each training exercise and debriefing session lasts no longer than 30 minutes to minimize impact on competing clinical priorities and bed availability. Training occurs on both day and night shifts. The Program is currently operating on four inpatient units but efforts to spread the Program to other inpatient areas are being closely examined.

PERIOPERATIVE COGNITIVE AIDS
The Stanford Emergency Manual

The Stanford Emergency Manual is a cognitive aid for perioperative critical events that has been developed and tested through extensive simulation by the Stanford Anesthesia Cognitive Aid Group (SACAG): Steve Howard, MD; Larry Chu, MD; Sara Goldhaber-Fiebert, MD; David Gaba, MD; and Kyle Harrison, MD.

Over the past year, the manuals have been made accessible in Stanford operating rooms, then spread to anesthetizing and perioperative locations. The implementation team, led by Sara Goldhaber-Fiebert, MD and Mary Lou Jackson, RN, conducted numerous in situ operating room trainings utilizing simulation to familiarize staff with use of the manuals. The Stanford Emergency Manual was also made available for download and use at other institutions via the http://emergencymanual.stanford.edu website, which includes implementation tips, testimonials and descriptions of use, and other resources. The Stanford Emergency Manual is part of a national movement toward the use of cognitive aids in medicine, led by the Emergency Manual Implementation Collaborative, which was co-founded by Stanford simulation leaders.

Susan Eller, RN, MSN joined CISL in 2012 as Director of the Goodman Immersive Learning Center. Prior to coming to Stanford, Susan was the Director of Interprofessional Education for the Department of Simulation Technology and Immersive Learning at Northwestern University's Feinberg School of Medicine. Susan brings with her over 20 years of clinical experience in Emergency Medicine nursing, as well as a wealth of knowledge and experience in simulation operations, curriculum design, faculty development, and debriefing and facilitation.

ILC STAFF SPOTLIGHT: SUSAN ELLER, RN, MSN

Q. How did you get started in simulation?
One of my first experiences with immersive learning was teaching skills to and assessing clinical competencies in paramedics when I was an EMS System Coordinator. Then, as a nurse educator in the emergency department, I used mannequin-based simulation scenarios for part of our annual nursing education day. After that I went to work at the medical school, using simulation for teamwork and patient safety training for medical students and new graduate nurses.

Q. What attracted you about joining CISL?
After working in immersive learning for several years, I was thrilled to have the opportunity to work with nationally recognized leaders such as Dr. Gaba at Stanford where simulation-based education for healthcare and patient safety was first established. Working at the ILC and teaching at our instructor courses has given me a great opportunity to learn new debriefing methods and start to develop more blended learning opportunities.

Q. How has the ILC grown in the past year since you arrived at Stanford?
We have started doing more SP programs for graduate medical education and practicing professionals. On the mannequin based simulation side, we have worked with SHC nursing groups and introduced a transition to internship program for medical students that uses many immersive learning techniques.

Q. How do you recommend new instructors get started with learning to use ISL in their teaching?
New instructors should take some form of an instructor/simulation course that emphasizes scenario development and debriefing techniques since those skills are essential to creating a good learning environment. We have a couple of options available at the ILC and are working on developing both online modules and shorter classes for faculty development in simulaiton-based education techniques.

Q. What new programs or developments at the ILC are you excited about for the coming year?
The transition to internship pilot is now becoming an elective clerkship, so we are excited to be working with Drs. Kugler & Chi to help with further development of that program. The ILC has also been asked to do some consulting on a program that would use SPs to assist in training practicing physicians in shared decision-making; I see a lot of potential for future growth of using SPs/real patients to enhance healthcare communication.

COMMUNITY OUTREACH

THE 6th ANNUAL CISL SYMPOSIUM

The CISL Research & Development Symposium was conceived as a forum for members of the immersive and simulation-based learning community at Stanford University Medical Center and beyond to share ideas, identify potential collaborations, and learn more about simulation in healthcare. This year's symposium, held on May 24, 2013, featured K. Anders Ericsson, PhD as the distinguished keynote speaker. Dr. Ericsson is Professor of Psychology and Conradi Eminent Scholar at Florida State University, and is a renowned expert on deliberate practice and expertise. Dr. Ericsson's engaging and thought-provoking presentation addressed how simulator training can be improved by examining masters and experts in other fields, such as elite athletes and chess players.

Following the keynote address, the Symposium featured brief, "lightning-round" program/project presentations in the Ignite format, showcasing some of the exciting work being done in ISL at Stanford. Presenters represented many clinical departments, including Medicine, Surgery, OB-GYN, Anesthesia, Emergency Medicine, and Neurology, as well as colleagues in Educational Technology and the Stanford Center for Medical Education Research and Innovation. The Symposium concluded with several topical breakout sessions, including a panel discussion on the use of simulation to address ACGME milestones, a mini-course on debriefing principles and techniques, and an interactive program on creating medical media to enhance simulation programs.

> **"I learned how to listen to a sick patient and try to come up with questions and solutions to solve the problem."**
>
> *–Participant in the Discovering Medicine program*

DISCOVERING MEDICINE & MED SCHOOL 101

High school students from a number of local schools had the opportunity to experience a day in the life of a medical student through Stanford Hospital & Clinics' Med School 101 program, and Discovering Medicine @ Stanford, offered by the Stanford Medical Youth Science Program. As part of the students' visit to Stanford School of Medicine, they participated in a hands-on, interactive learning session in the ILC. Using a case-based approach, students were introduced to multiple immersive and simulation-based learning modalities, including practicing procedural skills on part-task trainers and mannequins, as well as learning the elements of a patient history by interacting with a standardized patient.

LEADERSHIP & FACULTY DEVELOPMENT

CISL INSTRUCTOR COURSES

CISL offers intensive multi-day instructor workshops for both teams and individuals interested in learning the fundamentals of immersive and simulation-based learning pedagogy. In 2012-13, groups from the University of California, Davis, Department of Anesthesiology and Cooper University Medical Center, NJ attended CISL's two and a half day CRM Instructor Workshop, where they participated in a wide variety of activities, including debriefing practice and scenario design and implementation.

In addition, CISL also offered two 2-day Simulation Instructor Courses for internal faculty and staff participants within Stanford University Medical Center. Participants represented multiple departments across the School of Medicine, including General Surgery, Anesthesia, Neonatology, Emergency Medicine, and Neurology, and included instructors teaching at the medical student, housestaff, and experience practitioner levels.

In addition to continuing to offer instructor courses, CISL is also currently developing interactive web modules for simulation instructor course content, with the intent of compiling a comprehensive, publicly accessible repository of resources for the healthcare educator using ISL techniques.

> **"The mix of hands-on training and active discussion and participation was perfect. This course has somehow, unbelievably, generated a great deal of excitement and enthusiasm in the participating faculty in simulation and developing/increasing its use at our institution. Very seldom have I been this inspired!"**
>
> *–Participant in the CISL CRM Instructor Workshop*

IMPROVISATION TRAINING FOR SIMULATION INSTRUCTORS

On April 8th, 2013, CISL faculty and staff, members of the local medical community, and improvisation training experts gathered at the Li Ka Shing Center to spend a half day exploring drills for communication, listening, leading, following, awareness and coping with stress. Organized by Steven Howard, MD, Associate Professor of Anesthesiology and Richard Snyder, MD, Stanford Anesthesiology Alumnus, the multidisciplinary symposium featured training techniques from improvisational theater and business to facilitate mastery of non-technical skills in healthcare. Among the participants were Patricia Ryan Madson, retired Stanford professor of Drama and author of *Improv Wisdom*; Dan Klein, full time improv teacher at Stanford; William Hall, founding member of BATS Improv (Bay Area Theater Sports); Terry Stein, MD, Kaiser Permanente Director of Clinician Patient Communication; and Paul Preston, MD, Regional Safety Educator and Program Director of the Patient Safety Fellowship at Kaiser Permanente. Some the improv exercises from the course are already being piloted in ILC instructor courses, and future curriculum development and research are being planned.

PUBLICATIONS, PRESENTATIONS & HONORS

PUBLICATIONS

Fann JI, Feins RH, Hicks GL, Jr., Nesbitt J, Hammon J, Crawford F, and members of the Senior Tour in Cardiothoracic Surgery. Evaluation of simulation training in cardiothoracic surgery: the Senior Tour perspective. *J Thorac Cardiovasc Surg* 2012; 143: 264-272.

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Lipman S, Wong JY, Arafeh J, Cohen SE, Carvalho B. Transport decreases the quality of cardiopulmonary resuscitation during simulated maternal cardiac arrests. *Anesthesia & Analgesia* 2013 Jan:116(1):162-7

Lee R, Enter D, Lou X, Feins RH, Hicks GL, Gasparri M, Takayama H, Young JN, Calhoon JH, Crawford FH, Mokadam NA, **Fann JI**. Multi-center coronary artery anastomosis assessment: the Joint Council on Thoracic Surgery Education tool is reliable among raters. *Ann Thorac Surg* 2013; 95: 2064–70.

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.

Schmidt EM, **Goldhaber-Fiebert SN**, Ho LA, McDonald KM. Simulation Exercises as a Patient Safety Strategy: A Systematic Review. *Annals of Internal Medicine* 2013; 158:426-32

Tsui J, Benfield J, **Lin D**, **Williamson J**. Stanford School of Medicine E-Book Pilots. *Educause Learning Initiative*. 2013 Jan; 1-5.

PRESENTATIONS

CISL faculty and staff continue to be very active in the national and international simulation communities; the following represents only a sampling of the many presentations and speaking engagements by CISL affiliates over the past year.

Feaster SJ. "The Future of Simulation in Healthcare: How will we educate, train, and teach communication to our learners." Presented at the California State University, Fullerton 1st Annual Healthcare Information Technology Conference, Fullerton, CA, February 22, 2013.

Feaster SJ. "Interprofessional Education." Presented at the 6th Annual Meeting of the Consortium of American College of Surgeons-Accredited Education Institutes, Chicago, IL, March 15, 2013.

Gaba DM. "Simulation -- another gift of anesthesiology to the rest of healthcare." Presented at the International Anesthesia Research Society, T.H. Seldon Lecture, San Diego, CA, May 4, 2013.

Gaba DM, **Feaster SJ**, **Lighthall GK**. "Simulation: Bringing Life to Healthcare Challenges." Presented at the 5th Annual Healthcare Simulation Conference at Johnson County Community College, Overland Park, KS, September 7, 2012

Kuan C. "Teamwork in Pediatric Cardiac Anesthesia." Presented at Congenital Cardiac Anesthesia Society 2013 Meeting, Las Vegas, NV, March 14, 2013.

Salzman D, **Eller S**, O'Connor L, An-Grogan Y, Pribaz P. "Assessment of Team Performance in Simulation- Workshop." Presented at the 19th Annual Meeting of the Society in Europe for Simulation Applied to Medicine, Paris, France, June 13, 2013.

Salzman D, **Eller S**, O'Connor L, An-Grogan Y, Pribaz P. "Mix it Up! Effective use of Blended Learning for Simulation-based Healthcare Professions Education." Presented at the 19th Annual Meeting of the Society in Europe for Simulation Applied to Medicine, Paris, France, June 12, 2013.

Tai WA, Bauman JJ, Vora N, Melamed E, Schwartz N. Simulation "Code Stroke" Training for Neurology Residents Increase Knowledge Translation to Action. Presented at the 2013 International Stroke Conference, Honolulu, HI, February 6-8, 2013.

HONORS & AWARDS

- **Ankeet Udani, MD**, Fellow in Stanford's Anesthesia and Research in Medicine (FARM) program, was awarded a Research Fellowship Grant from the Foundation for Anesthesia Education and Research titled: "The effectiveness of simulation-based deliberate practice versus a standard didactic curriculum on learning regional anesthesia."

- **Sara Goldhaber-Fiebert, MD,** received a grant from the Vice Provost for Online Learning to develop an online course for medical students entitled: "Emergency manual implementation in the clinical clerkships – a blended learning approach." The course provides clinical medical students with a collection of innovative online videos illustrating principles of crisis resource management, and specifically the role of cognitive aids such as emergency manuals. Dr. Goldhaber-Fiebert is a Clinical Assistant Professor in the Anesthesia Department and Co-Director of Evolve simulation course, as well as faculty for multiple simulation courses.

- The Anesthesia Patient Safety Foundation (APSF) named **Steven K. Howard, MD** Chair of the Committee on Scientific Evaluation. The APSF is the oldest foundation focusing on patient safety in healthcare. The Scientific Evaluation Committee acts as the grant review committee/study section, annually recommending to the APSF Executive Committee which proposals are worthy funding. APSF currently provides approximately $750,000 of grants per year. Dr. Howard is an Associate Professor of Anesthesiology at Stanford University School of Medicine.

- Stanford School of Medicine's **Information Resources and Technology (IRT) department** was named a finalist for the 2013 AMX Innovation Awards in the Automation and Control Initiative category for their work on the Immersive Learning Center automation and control technology. The control system implemented by IRT for the ILC allows for the coordination and use of 48 video cameras, 70 displays, 25 video captures, 60 microphones, and 12 headsets in over 30 rooms within the facility.

- **Geoffrey Lighthall, MD, PhD**, was named to the American Board of Anesthesiology (ABA) Objective Structured Clinical Examination (OSCE) Development Advisory Panel. In 2016, the ABA's oral examination for board certification in anesthesiology will transition to a new format that includes OSCE assessments. Advisory Panel members will guide the development of an OSCE assessment center as well as the individual OSCE stations offered during the examination.

UPDATES FROM CISL AFFILIATES
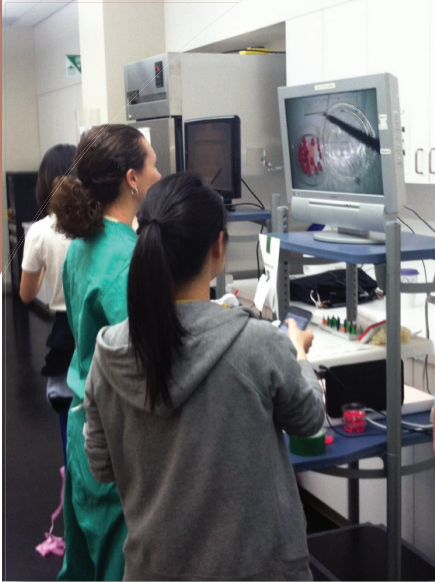
Goodman Surgical Simulation Center
The Goodman Surgical Skills curriculum introduced the first annual Fundamentals of Laparoscopic Surgery (FLS) Championship tournament with the General Surgery residents. Events included bead drop, running bowel, and port closure using a camera with a simulated abdomen. The winning team included Drs. Yijun Chen, Kevin Helling, Sepideh Gholami, Kirellos Zamary, and Micaela Esquivel. In addition, Dr. Dana Lin received the American College of Surgeons, Excellence in Research Award, for outstanding research in Surgical Education. For more information about the Goodman Surgical Simulation Center, please visit http://goodmancenter.stanford.edu/.

Center for Advanced Pediatric and Perinatal Education (CAPE)
This is an exciting time for CAPE and for Packard Children's Hospital. CAPE has closely aligned its strategic goals with those of Packard as it evolves from a stand-alone children's hospital to a pediatric and obstetric healthcare system. Just as its physical footprint is expanding so, too, is its influence on the care of children and pregnant women in Northern California and beyond and CAPE leadership is working closely with Packard administration in determining how they can meet the expanding training needs of pediatric and obstetric healthcare professionals. Just as simulation is a cornerstone of safety and quality programs in other high-risk industries, it is a component of the Strategic Plan for Packard Children's Hospital and the work conducted at CAPE is playing an essential role in helping Packard become a world-class healthcare system. For more information about CAPE, please visit http://cape.lpch.org/.

Cardiothoracic Surgery Simulation at the Stanford Cardiovascular Institute
James Fann, MD continues to serve as the Chair of the Simulation Committee of Joint Council on Thoracic Surgery Education. The Committee has been focused on the development of the simulation curriculum and assessment tools. Additionally, Dr. Fann is a co-director of the annual Cardiothoracic Surgery Boot Camp sponsored by the Thoracic Surgery Directors Association. The mission of Boot Camp is to enhance residents' early training and further simulation-based learning. Because the focus is on simulation, Boot Camp has stimulated the development of numerous effective simulators (including vessel anastomosis and valve trainers and cardiopulmonary scenarios for crisis management). In order to provide a structured syllabus for simulation skills training and crisis management, Dr. Fann has been involved in a multi-institutional grant from AHRQ that has generated a 2-year, 300-page syllabus, which is currently in year 2 of evaluation.

Stanford Center for Medical Education Research and Innovation (SCeMERI)
The Stanford Center for Medical Education Research and Innovation (SCeMERI), under the leadership of Dr. Clarence Braddock, was launched in 2012. The establishment of the center is part of a broader effort by the medical school to transform medical education. The center was designed to foster and support scholarly approaches to education innovation and rigorous scholarship regarding those innovations. SCeMERI has collaborated with CISL in several exciting ways. Scholars from SCeMERI presented at the CISL Annual Symposium. SCeMERI is also participating in innovative explorations of simulation in education, such as training using virtual reality technologies and evaluating the CPX examination. For more information about SCeMERI, please visit: http://mededresearch.stanford.edu/.

CISL

CENTER FOR IMMERSIVE AND SIMULATION-BASED LEARNING

STANFORD SCHOOL OF MEDICINE

The Goodman Immersive Learning Center
Li Ka Shing Center for Learning & Knowledge
291 Campus Drive, Ground Floor
Stanford, CA 94305-5217

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

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