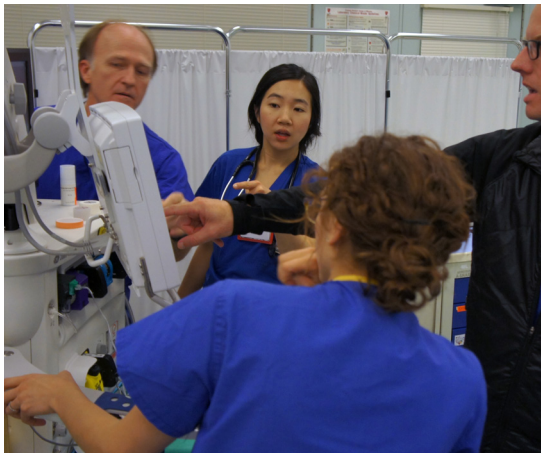
CISL
CENTER FOR IMMERSIVE AND SIMULATION-BASED LEARNING
STANFORD SCHOOL OF MEDICINE

Stanford | MEDICINE

2015 Accomplishments Report

Stanford School of Medicine | Center for Immersive and Simulation-based Learning



LETTER FROM THE ASSOCIATE DEAN

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

Once again, the Center for Immersive and Simulation-based Learning (CISL) has the opportunity to highlight what was new in the preceding academic year in immersive and simulation-based learning (ISL) in the Immersive Learning Center of the Li Ka Shing Center for Learning and Knowledge (LKSC). As is our custom, this Report describes primarily the new activities and cannot fully describe the extensive suite of ISL activities that have joined the mainstream of education, training, assessment and research.

We continue to be grateful for the founding gift of Mr. Li Ka Shing for the LKSC, and of the continuing generosity of Hon-Mai and Joseph Goodman, the primary donors for the Immersive Learning Center (ILC) for providing the opportunity to create and conduct powerful activities for teaching, learning, and scholarship in this world-class integrated center where all modalities of immersive and simulation-based learning can exist in one spot.

Stanford and affiliated faculty, clinicians, researchers, and staff continue to be innovators of ISL and to play major roles in its national and international adoption and to various applications to improve quality and patient safety. This past year saw the use of the ILC to host a Strict Isolation Training facility with simulations to prepare clinicians for the possibility of caring for one or more patients with Ebola Virus Disease. On a different topic, a newly emerging initiative of the School of Medicine on “Precision Health” has led CISL to articulate various ways in which ISL can contribute to the precision of existing modes of diagnosis and therapy and to the translational development of novel precision medicine interventions.

CISL faculty continue to conduct 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.

We are working hard to fully embed immersive learning into the curriculum of the School of Medicine for all learner populations, including fully experienced clinicians as individuals or interprofessional teams. 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. 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.

STRATEGIC GOALS

01 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.

02 Healthcare Systems Improvement

Improve care delivery and operational outcomes throughout Stanford Medicine, Stanford Health Care, Stanford Children's Health, the VA Palo Alto, and Stanford University Medical Indemnity and Trust Insurance Company (SUMIT) by improving the individual and teamwork skills of healthcare personnel.

03 Assessment/Testing

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

04 Research

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

05 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.

06 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.

07 Leadership and Advocacy

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

08 Faculty Development

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

09 Sustainability

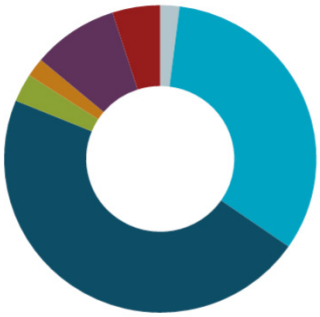
Provide financial and program planning and analysis of ISL programs, and to support the Office of Medical Development fundraising and ensure long-term financial viability of ISL activities.

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.

There are a wide variety of course offerings for our participants

ILC User Groups



- CME | Continuing Medical Education **(2%)**
- GME | Graduate Medical Education **(33%)**
- UGME | Undergraduate Medical Education **(47%)**
- MMI | Multiple Mini-Interview, medical student selection process **(3%)**
- Nursing **(2%)**
- SPH | Safe Patient Handling **(9%)**
- Strict Isolation **(5%)**

- Resident use showed the biggest increase—their simulation training was up by more than 900 hours compared to academic year ’14! This occurred mostly in the last 3 months of the year, and has been attributed to the addition of multiple new boot camps.
- Supported a variety of educational filming projects.
- Increased the number of inter-professional education programs.
- We have seen more innovation in academic year ’15, with the development of new task trainers such as a carotid blowout model, a low-cost 3D printed cricothyrotomy trainer, and a variety of new simulated skins. Many of these have come out of our newly established ILC Innovation Foundry.

Strategic Goal 1:

Education and Training of Students & Clinical Trainees

CLINICAL TRAINING ACTIVITIES FOR MULTIPLE USERS

Ultrasound Training

The Emergency Medicine, Anesthesia, Internal Medicine and Cardiology departments continue to educate medical students, residents, and faculty in bedside ultrasound utilization through various didactics and case-based simulation learning in the ILC. Through the use of the ILC's procedural simulators, the CAE Vimedix echocardiography and FAST exam simulator, and eight clinical ultrasound machines dedicated to immersive and simulation-based learning, many learner groups practice and hone a wide variety of ultrasound skills on a regular basis.

UNDERGRADUATE MEDICAL EDUCATION PROGRAMS

MEDICAL STUDENTS

Pre-Clerkship & Clerkship

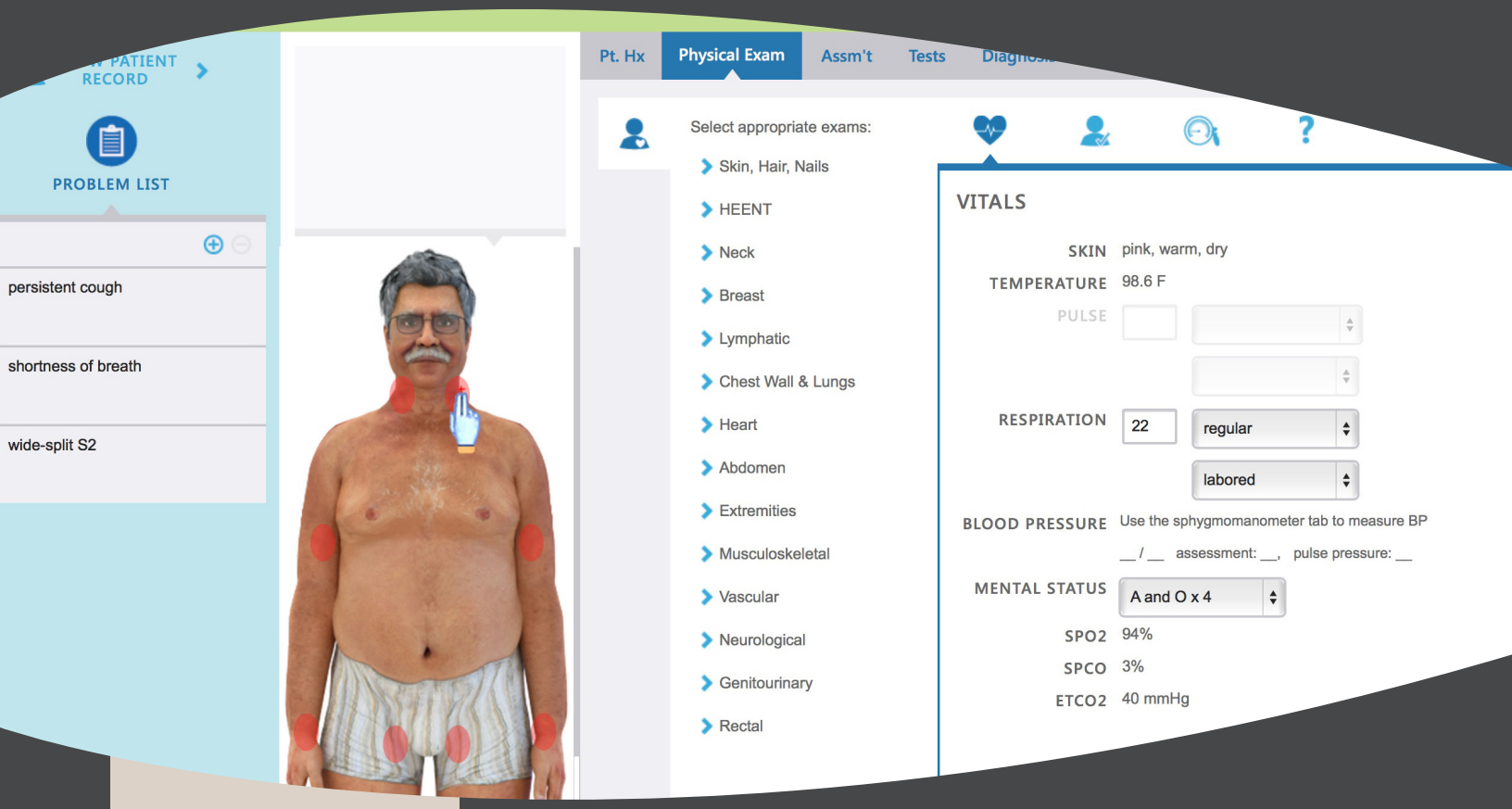
Pre-clerkship students have their early experiences in the ILC when they perform their first patient interview with standardized patient (SP) actors in the first few months of medical school. The use of SP actors is embedded in many student courses, particularly Practice of Medicine (POM). A continuing goal of the CISL team is to integrate more mannequin-based simulation into pre-clerkship activities.

Human Health and Disease (HHD) Cardiovascular Block

This pre-clerkship activity is one of the first experiences students will have in the ILC that involves "task training." Utilizing the "flipped classroom" approach, students view educational videos about cardiac physiology, ECG, and ultrasound followed by hands-on practice with task trainers under the supervision of faculty mentors. The students praised the session for its efficacy, its active learning format, and the interaction with instructors.

SCRIBE Program (SURG 248)

This new elective course (developed by Emergency Medicine, Dr. Jessica Pierog) designed for medical students, focuses on performing clinical documentation in collaboration with the patient's physician during an encounter. The course covers documentation of patient histories, findings, procedures, results, and clinical course all within EPIC, the computerized electronic record used at Stanford. Video exemplars made using simulation were created to illustrate proper scribing techniques. Students then use the ILC to practice these skills in simulation-based practice encounters.



i-Human Program

i-Human

In collaboration with Stanford faculty and the CISL team, the virtual computer-based i-Human software (http://www.i-human.com) was piloted by second year students. It provides additional practice opportunities for patient history, choosing and interpreting physical examination, constructing differential diagnosis, selecting and interpreting laboratory results, developing a treatment plan, and documenting the encounter in the built-in replica of an EMR. The success of this program is currently being evaluated.

UltraFest

Under the direction of Dr. Laleh Gharahbaghian, and physician colleagues from multiple specialties, UltraFest entered its third year. This full-day ultrasound conference hosted over 200 medical students from all over the United States and teaches them about bedside ultrasound through hands-on workshops. This year we added full mannequin-based simulation to teach the concepts of crisis resource management, placing ultrasound into the context of use in dynamically changing situations.

GRADUATE MEDICAL EDUCATION PROGRAMS

RESIDENT TRAINING

Simulation in Medicine for Acute Response Teams (SMART)

Michael Lin, MD, developed SMART Sim, which is a monthly exercise held for residents in internal medicine. It presents trainees with various scenarios that they may face on the floor which require rapid intervention and stabilization. The goal is to improve residents' comfort level in critical care and specifically in rapid response team (RRT) scenarios. Residents learn to manage these emergent situations as a team in a simulation, and review the scenarios afterwards. Residents and faculty from the departments of Internal Medicine and Anesthesia run the program.

Intern, Resident and Fellow Boot Camps

The use of intense and focused immersive learning experiences for participants new to a field has been increasing at Stanford and across the country.

Below is a list of Boot Camps that took place in academic year 2015:

Fellowship Boot Camps:

- Pediatric Cardiology (New)
- Hematology/Oncology
- Pediatric Intensive Care Unit

Intern and Resident Boot Camps:

- Surgery Intern and PGY 2
- Emergency Medicine
- Anesthesia
- Neurology
- Medicine

Otolaryngology Emergencies Simulation Curriculum

This bi-annual simulation curriculum for otolaryngology residents contains some of the most complex scenarios that take place in the ILC. These combine the clinical and communication skills necessary for handling otolaryngology emergencies. One scenario focuses on "carotid blowouts" for which the team – under the direction of Jennifer Lee, MD – developed an innovative way to simulate a massive arterial bleed. Another scenario focuses on an intraoperative airway fire. These scenarios promote high engagement of the learners during very stressful clinical situations.

Pediatric Intensive Care Unit and Pediatric Anesthesia Fellows Crisis Resource Management (CRM) Simulation Course

This new bi-annual course developed by Drs. Calvin Kuan and Courtenay Barlow combined two fellow groups: PICU and Peds Anesthesia. This daylong course encompasses five scenarios that teach skills in crisis resource management, communication, leadership, and decision-making. This exercise also includes nurses and pharmacist to add to realism and to hone the interprofessional approach to critically ill patients.

Pain Management and Opioid Management Simulation

Jordan Newmark, MD continues to train Pain Medicine fellows and anesthesia residents in safe opioid management using SP actor simulation encounters. This program is a model for an approach to reduce the number of opioid-related deaths in the United States. Interesting preliminary findings indicate that trainees who discussed with the simulated patient, at length, the risk/benefits/alternatives associated with opioids, had higher patient-provider interaction scores, even if they did not prescribe opioids as the patient initially requested. Dr. Newmark plans to expand this program to colleagues in primary care, psychiatry, emergency medicine, and surgery.

> *"Simulation is absolutely invaluable. I thought it was great to be able to run through the motions and get a better sense for how all the things we have learned in theory are put into practice."*
> *(Neuro Boot Camp Participant)*

Strategic Goal 2:

Healthcare Systems Improvement

The CISL continues to encourage programs and exercises that are interprofessional in nature. The Code Blue simulations bring together the adult critical care team (physicians, nurses, respiratory therapists, and pharmacists) to sharpen their teamwork skills. Surgery and Anesthesia also have begun training collaboratively in several exercises per year.

Emergency Medicine Nursing and Life Flight continue to train in the ILC on new protocols and procedures (stroke and trauma).

All newly hired nurses and nursing assistants at Stanford Health Care are trained in safe patient handling in the ILC. This past year, over 300 hours of training occurred with a steep increase anticipated.

CISL continues to support Stanford Health Care's Transform Program by providing Instructor Courses that focus on techniques of in-situ debriefing. This program has been in operation for several years with the purpose of improving team communication and patient safety.

Lucile Packard Children's Hospital (LPCH) Pediatric Hospitalists Sedation Simulation Course

Calvin Kuan, MD developed this bi-annual course at the request of LPCH pediatric hospitalist faculty. To provide the hospitalists with more experience with sedation, they are given experiences that include common and simple, as well as rare and complex complications they might encounter. In addition to the small group simulation exercises, the faculty also has the opportunity to observe and practice medication calculations and dosing and practice drawing-up the medications to improve their skills.

Strict Isolation Training

In September 2014, the Pan American Health Organization/ World Health Organization (PAHO/WHO) was informed of the first confirmed imported case of Ebola Virus Disease (EVD) in the United States. Several other cases followed, leading to hospitals revisiting their strict isolation procedures. The ILC was identified as the space to train and drill clinicians that would be caring for patients who might be admitted to Stanford. In late October, an exact replica of a Stanford Hospital patient care room was erected. This program was developed in collaboration with Brandon Bond from the Office of Emergency Management at Stanford Health Care. Over the next several months, teams learned the techniques of donning and doffing personal protective equipment (PPE), and practiced caring for a patient while wearing challenging PPE.

OB Simulation (in-situ)

The OBSim Team, with a grant provided by Stanford University Medical Indemnity and Trust Insurance Company (SUMIT), began planning to increase their OBSim drills from 30 to 45 per year beginning in the fall of 2015. Simulation staff from the ILC will be supporting this in-situ simulation effort at LPCH. The intent is to expand the range of participants from residents to attendings (including obstetrics, neonatology and anesthesia) as well as the full complement of labor and delivery staff members. Drs. Naola Austin and Kristina Milan have been added to the faculty.

Rehabilitation Services Simulation

The rehabilitation team has embraced simulation to help them work individually and as a team to provide rehabilitation services to patients who have complex care requirements (e.g., ventilators, monitors, IVs, central lines, etc.) and developing techniques to care for these patients. The team reports that this activity decreases their stress while caring for these patients. This ultimately leads to improving the safety of the patients. A staff member portrays the patient and then communicates how it feels to be in that role.

Standardized Patient (SP) vs. Actual Patient (AP) Assessment of Students

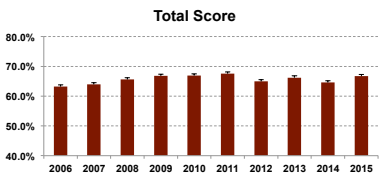
Drs. Amelia Sattler and Erika Schillinger are studying how well SP ratings mirror the experience of APs in clinic. They gathered data from both SPs and APs about students' professionalism and interpersonal skills. They concluded that AP feedback provides a valuable perspective, complementing that of the SPs, and prompts insights into incorporating the patient's voice and values into medical student training. Future training may focus on teaching students to better clarify and share information with patients.

Ten years of the Mini Clinical Performance Exam (Mini-CPX)

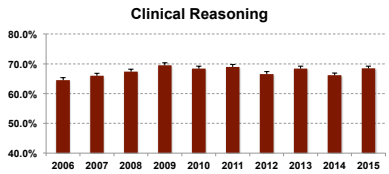
Each year the SP Program administers the Mini-CPX, with four SP encounters for all medical students completing their second year of study. The Mini-CPX has been administered for ten consecutive years. Due to its consistency, the ability to measure and interpret this data can be used as a harbinger of other curricular innovations or changes.

Strategic Goal 3:

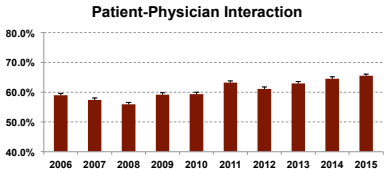
Assessment and Testing



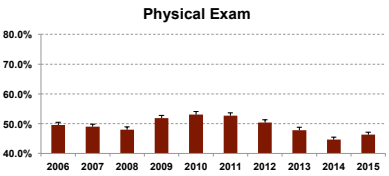
Overall performance has been stable over time (with some changes from year to year, but no stable trend)…



As have some domain-specific scores (Clinical Reasoning, History). Individual components of a particular domain will also be explored…



General uptrend in some domains (Communication)…



General downtrend in others (Physical examination)…

Strategic Goal 4:

Research

Completed Research

Anesthesia

The Agency for Healthcare Research and Quality (AHRQ) research project *Creating Simulation-Based Performance Assessment Tools for Practicing Physicians* has been officially completed. Stanford was key in the study design and leadership (David Gaba, MD, was co-investigator and chair of the performance assessment team), as well as acting as one of the research sites. Project-wide, approximately 250 board certified anesthesiologists were video recorded during one or more of four carefully standardized and challenging perioperative scenarios. A meeting of stakeholders and experts was held at Vanderbilt University in March 2015, where preliminary data and analyses were presented and discussed. Team meetings continue to be held bi-weekly. Several papers are currently being drafted from this project, and many more are planned.

Cardiac Surgery

James Fann, MD, and his colleagues have recently completed the three-year, multi-institutional AHRQ Grant *Improved Patient Safety by Simulator Based Training in Cardiac Surgery.*

Ongoing Research

Virtual Patient

Dr. Ryan Ribeira, Emergency Medicine Resident at Stanford and CEO of SimX (http://SimXAR.com) developed an augmented reality technology to produce software that projects a virtual patient into the real world and runs medical simulation cases around them. One can walk around the patient in a 3D space, talk to them, and use real world tools like a stethoscope and ultrasound machine to interact with the patient and progress through a training case. Dr. Ribeira demonstrated the technology at the CISL Symposium in November 2014.

Strategic Goal 4: Research (continued)

Otolaryngology – Parotid Surgical Simulator

Dr. Davud Sirjanil, Assistant Professor & Chief of Otolaryngology at the VA Palo Alto and Director of Salivary Program at Stanford, and his team developed a parotidectomy surgical simulator, which incorporates novel technology to allow trainees to practice superficial parotidectomy. This simulator provides an objective measure of stretch on the simulated facial nerve as well. This simulator can be utilized to enhance surgical skills training with direct feedback and potentially differentiate levels of competence.

Airway Device to Prevent or Reduce Ventilator-Associated Pneumonia (VAP)

Natalie Stottler, a student from Stanford's Biodesign course, developed the "Wickit Medical" device, which aims to prevent VAP. Their group used various airway models in the ILC to test out different geometries for their prototypes. This process was incredibly important not only for direct device testing, but also to gain a better understanding of the parts of the anatomy they were working with.

Internally Funded Research

The Simulation Team in the ILC has been working on developing a low cost trachea model made with a 3D printer and simulated skin. This model was created and tested in the newly established ILC Innovation Foundry.

Strategic Goal 5:

Provide ISL Learning to External Experienced Clinicians

The ILC continues to host programs for practicing clinicians both from Stanford and other organizations around the world. These activities include Continuing Medical Education (CME) and other advanced training (i.e. ultrasound). Below is a listing of some of the courses that are new or have been enhanced over the past year.

Continuing Medical Education (CME)/Continuing Education Units (CEU)

- Advanced Airway Management and Fiberoptic Course (CME)
- Advanced Pediatric Life Support with PALS Certification (CME)
- Center for Immersive and Simulation-based Learning Instructor Course (CEU/Nursing)
- Emergency Medicine Maintenance of Certification (CME)
- Maintenance of Certification in Anesthesia (CME)

Non-CME Courses

- Advanced Trauma Life Support
- Faculty Ultrasound Training
- Emergency Medicine Faculty Clinical Skills Training

Four new CME online courses were filmed in the ILC clinic suites with Standardized Patients. The courses and faculty directors include:

- Prescription Drug Misuse by Dr. Anna Lembke
- Office 911 Emergencies by Dr. S.V. Mahadevan and Dr. Matthew Strehlow
- Managing Shoulder Pain in the Clinic by Dr. Eugene Roh and Dr. Ninad Karandikar
- Screening for Depression by Dr. Cheryl Gore-Felton and Dr. Oxana Palesh

CISL Symposium

During academic year 2015, CISL held two Symposia. The CISL Symposia are designed to bring the Stanford community together to highlight the work in ISL among colleagues both at Stanford and outside of Stanford. Each Symposium has a theme, with a relevant keynote speaker. The rapid-fire IGNITE format captures audience attention and maximizes the number of presentations possible.

Strategic Goal 6:

Community Outreach

The November 2014 CISL Symposium focused on communication and teaching skills, as highlighted in the keynote speech, *Power Up Your Teaching of ACGME Communication and Interpersonal Skills with Techniques from Business and Performing Arts* by Dr. Richard Snyder. Dr. Snyder and colleague Rebecca Stockley led an afternoon session titled: *Let's do it! Hands on Improv Acting and Behavior Design Workshop for Teaching Communication in Healthcare.*

Presentations and demonstrations included:

Andrew Baek *Self-Service Instructional Media Solutions*

Matthew Hasel *Oculus Rift and ViewVaster w/iPhone*

Trent Tanaka *3D Printing & Education*

Henry Curtis, MD & Teresa Roman-Micek *Task Training Models for Advanced Learning*

Ahmad Y. Sheikh, MD *Frame Dependence Influences Surgical Trainees*

Ming Tsao, MD *Ultrasound Use for Neurology Residents*

Ryan Ribeira, MD *Medical Simulation Software for Augmented Reality Glasses*

Vivan de Ruijter, MD *Google Glass Driven Validated Competency Metric for Real Time Surgical Performance*

James Lau, MD *An Intervention to Address the Suboptimal Learning Environment for Medical Students in the Surgery Core Clerkship*

Michael Chen, MD *Version 3.0 Mobile Simulator*

Dana Lin, MD *SICKO*

Nikita Joshi, MD *Can Sim Be Social?*

Cara Liebert, MD *Increasing Time for Simulation in the Clerkship: The Surgery Core Clerkship Flipped Classroom*

Laura Mazer, MD *Interactive Video Training for Surgical Residents*

Anna K. Finley Caulfield, MD *Emergency Neurological Life Support (ENLS)- Intracranial Hypertension and Herniation*

Sakti Srivastava, MBBS, MS *Fantastic Voyage*

The CISL Symposium Spring 2015 theme was *Celebrating 20 Years of the Stanford Standardized Patient (SP) Program: Celebrating the Real.*

Keynote speaker Gayle Gliva-McConvey provided an historical perspective over three decades on the use of SP Actors with her talk *Widening the Lens: Beyond the Expected SP Role*. Ms. Gliva-McConvey and Elias Escobedo (Stanford SP Program Trainer) gave a workshop in the afternoon titled *Using Physical Examination Teaching Associates (PeTAs) to teach medical students the nuances of a physical exam*. Dr. Drew Nevins, Medical Director of the SP Program and Karen Thomson Hall, Manager of the SP Program also gave a workshop on *How to Create an SP Case.*

Stanford Summer Medical Internship Program

CISL is also committed to providing the next generation of potential healthcare students with experiential opportunities to give them insights into medicine. CISL partnered with Drs. Eva Weinlander and Sarita Khemani to offer sessions in the ILC for the Stanford Summer Medical Internship Program for High School Students.

Tours

Over 50 tours of the ILC were provided last year to groups from around the world ranging from healthcare clinicians and administrators, technology specialists, to board members and donors. We are pleased to open our doors and share the wonderful work that is done in the ILC.

CISL Symposium Presentations are listed below:

Jordan Newmark, MD *Use of Simulation to Research and Teach Opiod Management*

Kat Wentworth - *Ensuring Excellence in Reproductive and Sexual Health Skills Through Experiential Learning with Gynecological and Male Urological Teaching Associates (GTAs/MUTA)*

Tyler Johnson, MD & Stephanie Harman, MD *Improving Physician Communication: A Randomized, Controlled Trial to Measure the Effect of a Communication Curriculum on the Habits of Internal Medicine Interns*

Ming Tai-Seale, PhD, MPH *Creating a Zone of Openness to Increase Patient-Centered Communications: Role of Standardized Patient Instructor*

Cynthia Shum, RN, MEd *Unfolding Scenarios: A Unique Opportunity for Learners*

Amelia Sattler, MD & Erika Schillinger, MD *Actual Patient and Standardized Patient Perspectives of Medical Students' Communication Skills and Professionalism*

Lucy Lee, MD, Krista Birnie, MD, Arun Gupta, MD, & Becky Blankenburg, MD *Enhancement of Medical Student and Resident Delivery Room Skills via a Novel Online Simulation*

Lars Osterberg, MD, MPH *Using i-Human for Coaching Medical Students in Clinical Skills*

Kathleen Bevin, RN, MSN, CNS *Life Flight and ATCN*

Henry Curtis, MD *Playback Theater for Medical Humanities*

Dana Lin, MD *SCRUBHUB - Mobile Assessment of Operative Performance*

Colin Buck, MD *A Perspective on Ebola in Liberia*

Laura Harwood, MS *Immersive Ebola PPE Training*

Strategic Goal 7:

Leadership and Advocacy

The CISL colleagues, faculty and staff continue to create and deliver innovative immersive curricula and expand their leadership roles locally, nationally and internationally. Many faculty members at Stanford (who frequently teach in the ILC or at other centers throughout Stanford) publish in a variety of journals, present on simulation and immersive learning throughout the world, and are recipients of grants and awards.

In April 2015, David Gaba, MD, won the prestigious Eliasberg Award from the Icahn School of Medicine at Mount Sinai (the inaugural winner of this award was Linus Pauling).

In addition to scholarly activities, many CISL colleagues and staff also hold leadership positions in various simulation and clinical professional societies.

Strategic Goal 8:

Faculty Development

We strive to help faculty develop new and innovative courses as well as obtain their own experiential learning in simulation. CISL has, since its inception, offered instructor courses for both internal and external learners, with a focus over the past few years of expanding our internal resources of educators.

CISL also developed a one-day course for the Transform Program (in-situ simulation) team from Stanford Health Care. This course focuses primarily on providing optimal debriefing during the types of in-situ scenarios used in this program.

Up-and-coming SIM Advocate! Michael Lin, MD

Dr. Lin reflects on his experience in the ILC:

"I developed the Simulation in Medicine for Acute Response Teams (SMART) program because I saw an educational need within the residency program - I wanted to improve residents' confidence and experience in managing critical care and acute medical situations.

I started by talking to faculty and directors in my departments (Anesthesia and Medicine), and found overwhelming support. I contacted the simulation center staff, who were also very excited to help me develop the program. My program directors were kind enough to give me time and funding to take the simulation instructor course, which gave me a foundation in basic course design, execution of simulations, and constructive and educational debriefing sessions.

Our first session was in May 2015. Each time we run it, we make improvements to the scenarios. We've had residents, fellows, and attendings participate as instructors in the programs. The simulation center has been invaluable in their support, both logistical and as consultants regarding program and scenario design. I'm excited as to what we've built so far, and I envision this to grow to become a regular part of the medicine residency training experience. Participant feedback has been overwhelmingly positive."

> *"It was helpful to practice in a group setting so that we could learn from one another during the session. The teaching afterwards was fantastic and the debriefing was very helpful in going through specifics such as dosing of medications and management decisions."*
> *(SMART Sim Participant)*

2015
Instructor Course Graduates

CISL Simulation Instructor Course

Nerissa Ambers - *Nursing Administration*
Christine Aceves, MSN, RN, CNL, CEN - *Nursing Administration*
Jia Chang, MD - *Emergency Medicine*
Marianne Chen, MD - *Anesthesia*
Todd Collins, RN - *Nursing Administration*
Jane Gonzales, RN- *Quality, Patient Safety & Effectiveness*
Sarah Hilgenberg, MD - *Pediatrics*
Patricia Hock, RN - *Emergency Medicine Nursing*
Brian Lee, RN, BSN, CMSRN - *ENT/Plastic/Trauma*
Maytinee Lilaonitkul, MD - *Anesthesia*
Michael Lin, MD - *Internal Medicine*
Larry Mo, MD - *Emergency Medicine*
Ho Geol Ryu, MD - *Anesthesia*
Jenny Shaffer, RN, BSN - *Center for Nursing Excellence LPCH*

CISL Transform Instructor Course

Deborah Arnold, RN - *Quality, Patient Safety & Effectiveness*
Shelly Arthofer, RN - *Quality, Patient Safety & Effectiveness*
Dan Azagury, MD - *Surgery*
Jeffrey Chi, MD - *Internal Medicine*
Dan Cline, RN - *Nurse Administration*
Teresa Cordeiro, NP - *Nursing Education & Practice*
Jessica Evanchak - *Nursing Education & Practice*
James Huddleston, MD - *Orthopaedic Surgery*
Laura Johnston, MD - *Med/Blood and Marrow Transplantation*
Ikuko Komo, RN, CNS - *Nursing Education & Practice*
Molly Kuzman, APP - *Nursing Education & Practice*
Katie Kvam, MD - *Neurology*
Theresa Latchford, CNS - *Nursing Education & Practice*
Gordon Lee, MD - *Surgery*
Dana Lin, MD - *Surgery*
Erin McCalley, CNS - *Nursing Education & Practice*
Paul Mohabir, MD - *Med/Pulmonary and Critical Care Medicine*
Lisa Muniz, RN - Quality. *Patient Safety & Effectiveness*
Kim Rhoads, MD - *Surgery*
Noraliza Salazar, RN - Quality, *Patient Safety & Effectiveness*
Pam Schreiber, CNS - *Nursing Education & Practice*
Neil Schwartz, MD - *Neurology*
Lisa Shieh, MD - *Med/Internal Medicine*
Joe Simmons, APP - *Nursing Education & Practice*
Sandy Srinivas, MD - *Med/Oncology*
Colleen Watters, RN - *Nursing Education & Practice*
Cheryl Vistnes, RN - *Quality, Patient Safety & Effectiveness*
Teri Vidal, RN - *Nursing Education & Practice*

Strategic Goal 9:

Sustainability

The ILC is supported by the Dean's office in the School of Medicine, with additional funding coming from external courses, Graduate Medical Education, Stanford University Medical Indemnity and Trust Insurance Company, and recently, a generous gift from Joseph and Hon Mai Goodman (the original donors for the ILC). We are ever grateful for the Goodman's continued commitment to CISL's work and we are always commited to providing mindful stewardship of the resources provided. David Gaba, MD, continues to be supported in part by his efforts on external research grants.

The ILC continues to be a key site for faculty and staff to test simulator prototypes or simulation games and for the production of high visibility videos and other enduring materials for use in online courses or to supplement or replace lectures in the School of Medicine.

A space in the ILC has been created for an Innovation Foundry, where staff and faculty can brainstorm ideas, create usable tools, and test them in the ILC. We believe that this will bring new innovations to the ILC and help develop the next levels of immersive and simulation-based learning.

CISL Team grew in 2015

CISL welcomed the Learning Spaces team in January 2015. The Learning Spaces team manages scheduling and coordinates support (including audio visual and clinical resources) of the School of Medicine learning spaces: lecture halls, flexible seminar rooms, labs, and the ILC. This team integration creates a more streamlined scheduling workflow for ILC events and more immediate facilities support for the ILC.

Strategic Goal 10:

Management

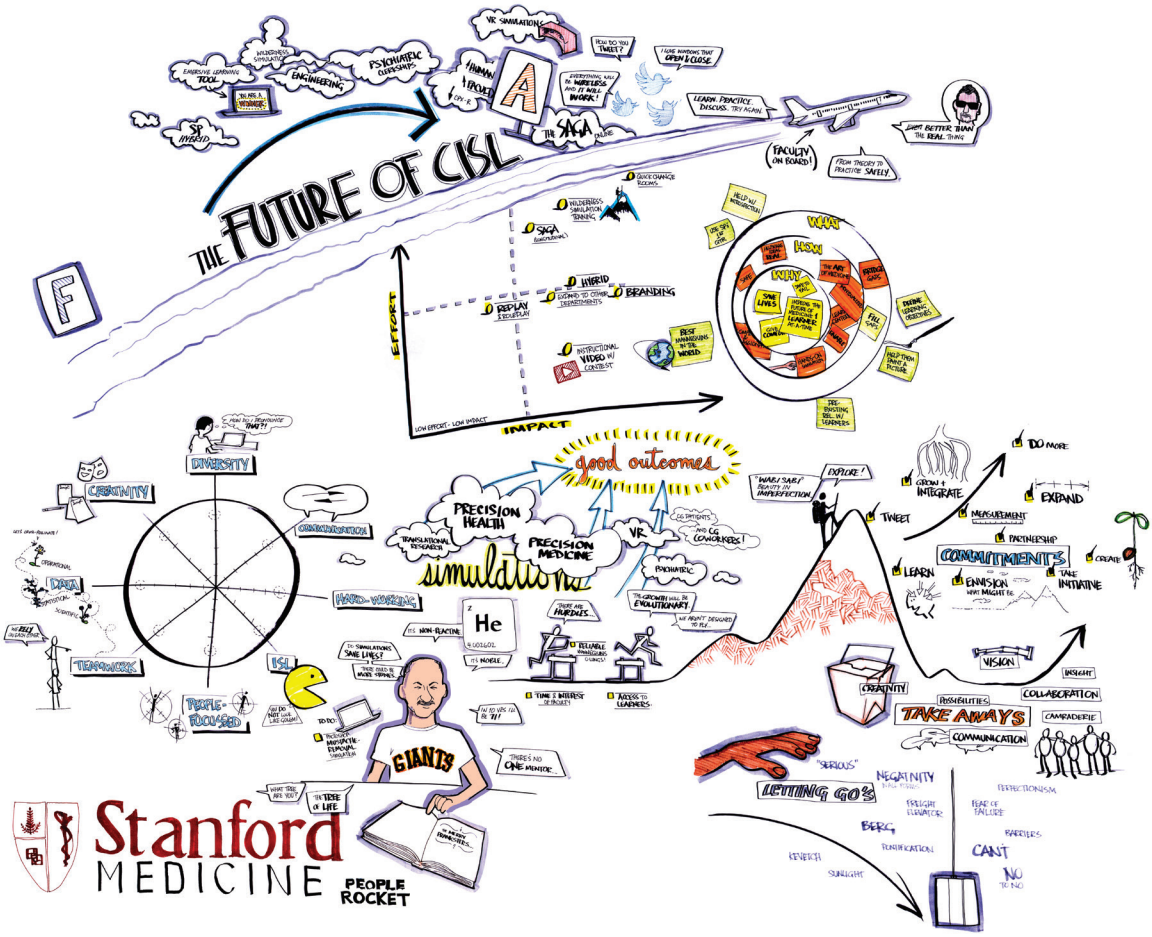
Precision Health

The School of Medicine has a new major initiative on "Precision Health" (https://med.stanford.edu/precision-health.html.) Precision Health involves both the implementation of novel personalized interventions and also the precise implementation of standard traditional interventions. Simulation can play an important role in training as it can be used to hone the skills of individuals, teams, and systems to help them deliver Precision Health. At CISL we are uniquely positioned to address this new innovation by utilizing experiential ISL training of individuals and teams for:

1) Managing complex care situations and the response to complications or uncommon but serious events; teamwork and communication between/with co-workers, patients, and families.

2) Preparing to deliver novel "precision" therapies (especially those with some risk): staff can practice the process of conducting the new therapies or collecting specific data about the therapies.

This would potentially enable the teams to work out the kinks of the delivery process, without risk to the patient. Both of these applications could in-principle be done using SP actors or mannequin-based simulation, or with various hybrids of the two modalities.



Strategic Planning and Process Improvement

The CISL team met for a strategic planning retreat in the Summer of 2015 to map their direction and course. In addition to building camaraderie among the newly expanded CISL family, the retreat enabled CISL to contemplate new initiatives, which staff members have already begun working on. The team is working on two major initiatives:

1) developing a social media presence, and

2) learning and utilizing LEAN techniques to improve program workflows.

We look forward to our journey together as a team.

CISL Affiliates

We are pleased that our Stanford affiliates have continued their work in patient safety, education, research and innovation.

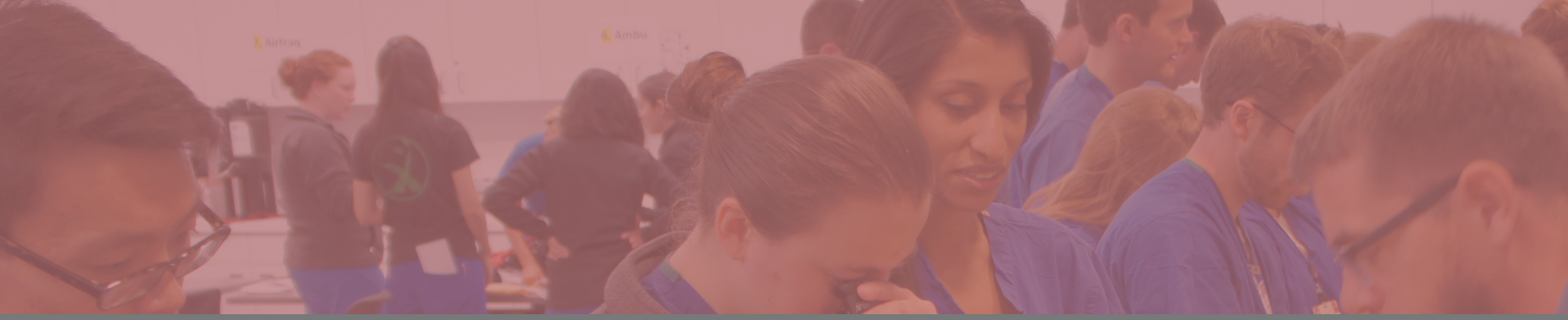
Cardiac Surgery Simulation at the Stanford Cardiovascular Institute
http://cvi.stanford.edu

Center for Advanced Pediatric and Perinatal Education
http://cape.lpch.org

Goodman Surgical Education Center
http://goodmancenter.stanford.edu

Stanford Center for Medical Education Research and Innovation
http://mededresearch.stanford.edu

VA Palo Alto Health Care System Simulation Center
http://www.paloalto.va.gov/anes_sim.asp



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.

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