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**University of California, San Francisco
School of Medicine
In partnership with UCSF Professional Schools
November 2007**

Kanbar Simulation Center Mt. Zion Facility

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A Overview

A.1 Purpose

The purpose of this document is to outline the development plans for the Kanbar Simulation Center at Mt. Zion. This facility represents Phase I of a two phase development project at UCSF and will serve the school of medicine students and residents and selected interprofessional programs.

Phase II of the project will involve migration of the Phase I programs into a campus-wide simulation center, which will include mannequin, task and virtual simulation, clinical skills, and telemedicine training, on the second floor of the Campus Library. The Phase II facility will serve all of the UCSF professional schools.

A.2 Mission Statement

The mission of the Kanbar Simulation Center at UCSF's Mount Zion campus is to support the School of Medicine's educational mission of teaching, learning, assessment and research through realistic simulations and interprofessional team training for routine and complex situations, thereby improving patient care and safety.

A.3 Goals and Objectives

The goals of the Kanbar Center are to develop, maintain, and enhance quality care and patient safety by:

- Developing high quality simulation experiences based on the needs of clinicians and reflective of current and future health care practices.
- Assure opportunities to master core objectives, and assess achievement of designated levels of competencies.
- Allowing learners opportunities to practice and develop skills in order to achieve competency without putting patients at risk.
- Provide inter-professional team training for routine and complex situations.
- Providing opportunities for credentialing for practice.
- Conducting research necessary to validate the use of simulation as an effective method for obtaining competency.
- Facilitating learning beyond the center.

A.4 Background

The use of simulation to clinically train healthcare professionals is rapidly becoming the standard in health professions education. Simulators are particularly useful for training interdisciplinary teams to provide coordinated care and for developing clinical skills. In addition, simulation experiences are increasingly emphasized by a wide variety of health care regulatory organizations including LCME, RRC's, and JCAHO. More than 70 simulation centers have registered their sites with the Society for Simulation in Healthcare¹ and these represent only a fraction of the centers nationwide.

UCSF currently has several small and dispersed simulation activities with little to no coordination between them. The coordination of simulation experiences under one organization has many educational and economic advantages. A centralized facility for the professions schools and Medical Center would

promote excellence in clinical learning and practice, competency development, and interprofessional education, and would ensure that all campus learners have an opportunity to practice and evaluate learning and clinical competence without compromising patient safety.

Phase I of our implementation will focus on development of a centralized School of Medicine facility developed in conjunction with the Milton J. Pearl and Leonard D. Rosenman Surgical Skills Center at Mt. Zion. This 1800 square foot facility would provide simulation- based training to medical students, residents and participants in interprofessional education exercises. While not physically integrated with the existing Clinical Skills Center at 1515 Scott Street, the two facilities would share staff and begin to integrate their activities.

Phase II of our implementation includes migration of the Kanbar Simulation Center at Mt. Zion and the Clinical Skills Center to a new home on the 2nd floor of the Campus Library located at 530 Parnassus Avenue. The new 7,000 square foot facility would serve all of the health professions schools.

A.5 Justification

Simulation-based training of clinical, teamwork and decision-making skills is becoming standard practice for health professionals. Simulation experiences range from encounters with standardized patients to the use of full-body, mannequin simulators. A recent study by Kamin and colleagues² found that 50% of AAMC member medical schools use virtual patients to train medical students or residents and 36% use mannequins. Simulators are particularly useful for training interdisciplinary teams to provide coordinated care and for refining skills in the use of particular technologies.³ A recent study by Fernandez and colleagues showed that 90% of pharmacy students who trained on a mannequin to learn interdisciplinary team skills felt they learned patient care skills better than compared the lecture format⁴. Anesthesiology and cardiology, in particular, are leaders in the use of simulation-based education.

UCSF needs to provide learners with opportunities to study, practice and master core objectives, and assess achievement of core competencies. In addition, the center will demonstrate a commitment to innovative health care education, cutting edge research and the highest standards of patient care, thus attracting new faculty members, the best and brightest students and a highly professional staff. Development of a research program will also attract funding to the center and institution at large.

The Liaison Committee on Medical Education (LCME) expects that students will receive equal exposure to core learning objectives and they cite simulation as a technique for meeting this standard.⁵

The Joint Commission on Accreditation of Health Care Organizations (JCAHO) supports interdisciplinary collaboration for facilitation of patient safety. In a White Paper entitled *Healthcare at the Crossroads: Strategies for Improving the Medical Liability System and Preventing Patient Injury*, JCAHO suggests interprofessional teamwork and improved communication between health professionals during patient care planning and delivery will improve safety and quality.⁶

The consolidation of simulation experiences and equipment into a central unit has many educational and economic advantages. The high cost of simulation equipment mandates collaboration across departments, schools and institutions. Equipment purchased for one program when placed in a core simulation center may be used in unanticipated ways for other learners. There are learning experiences that require training across disciplines and professions and these are best facilitated in a core simulation center. Souza and colleagues⁷ found that the key success factors for centrally supporting medical education with technology included adequate staffing, key leadership closely aligned with the education team, cultivation of key relationships throughout the organization, involvement of learners, decreased reliance on external contractors, the ability to support a technical infrastructure and provide educational technology services, and a consolidation of funding. Centralization facilitates support, adoption,

interprofessional training activities and the incorporation of simulation as a learning modality is more closely aligned with the educational leadership.

A.6 Proponents

A.6.1 Professional Schools

Each of the UCSF health professions schools (dentistry, medicine, nursing and pharmacy) have participated in the discussions and support the development of a centralized simulation center at UCSF. While the Mt. Zion facility will not be able to accommodate the training needs of all of the professions, it will prioritize interprofessional education as one of its instructional offerings. All of the schools will have the opportunity to participate equally in the campus-wide facility planned for Parnassus campus.

A.6.2 School of Medicine Leadership

The Dean of the School of Medicine, the entire medical education leadership team, including the Vice-Dean for Education, Associate Dean for Curriculum and the Associate Dean for Graduate Medical Education, fully support the development of a centralized simulation center and endorse the Mt. Zion facility as a first step towards achieving that goal. In addition the Chair of the Department of Surgery supports the development of the Mt. Zion facility as a partnership with the existing Surgical Skills Center.

A.6.3 Campus

In March 2007 the Library Space Program Planning Group submitted its report to EVC Eugene Washington recommending a focus on education to a portion of the 2nd floor of the Campus Library. The Planning Group recommended the following priorities for the space: clinical simulation/clinical skills, and technology-enhanced small group classrooms and smaller group meeting space. The space would include the required support infrastructure. On May 7th, 2007, the recommendation was approved by the Chancellor's Executive Committee.

A.7 Preliminary Timeline

2007

November: Work begins on Mt. Zion Facility

December: Appoint Interim Director

January: Soft opening of the center

2008

February: Appointment of Simulation Center Coordinator

April: Official opening of Kanbar Simulation Center, Mt. Zion Facility

A.8 Summary of resources required

The Kanbar Simulation Center at Mt. Zion will utilize 1800 square feet of space in the historic Mt. Zion Hospital Hellman Building located at 2200 Post Street, San Francisco, California. A generous donation from Maurice Kanbar will provide start-up funding for capital and operating expenses to include an adult and a pediatric full-body mannequin simulator, and part-task trainers for surgical skills, airway management, IV placement, pelvic examination, breast examination and birthing scenarios. The center will not focus its services on high-fidelity simulators, like the Meti HPS, as these devices are best suited

for recreating sophisticated physiological conditions, medical errors and treatment scenarios. The initial curriculum will focus on communication skills, team management and response scenarios.

Center staffing will require a part-time faculty member medical director, a full-time coordinator and a full-time technician. (*See Staffing for more details on staff responsibilities.*)

B Project Description

B.1 Current Situation

The Simulation Committee, appointed in November 2005 and chaired by Dr. Ron Arenson, used a web-based survey to document the types of simulations being used at UCSF. Chairs, residency and clerkship directors, and faculty from dentistry, nursing, pharmacy, and physical therapy provided descriptions of simulations currently in use. Reports were received of simulations at multiple UCSF sites, including Parnassus, SFGH, Mt. Zion, Fresno, and Laurel Heights. Over 20 different simulations were described. Generally, these simulations were to develop decision-making, conceptual understanding, technical skills and attitudes and behaviors. Many of these are simulations for individual learners, and nearly half involved a crew, team, or unit. Most of UCSF's simulations are conducted with concurrent critique. Six simulations have post-hoc debriefing through videotape review.⁸ Since this report was published, San Francisco VA Medical Center has opened a small simulation center.

B.1.1 SF-VAMC

The simulation facility at SF-VAMC is scheduled to open in November 2007. The facility has two rooms - one for ICU/operating/OR scenarios, and a second for multi-use/debriefing/conference space.

This facility has one Laerdal SimMan® to be used for team building exercises and code blue acute coronary syndrome/acute shock training. In addition part task trainers will be used to train residents in central line insertion, thoracentesis and laparoscopic surgery. Location: SF-VAMC Library, 4150 Clement Street, San Francisco, CA 94121. Facility coordinator: Richard Fidler, CRNA (Richard.Fidler@va.gov).

B.1.2 SFGH Anesthesia

Anesthesia currently owns one full-size MedSim™ mannequin. The simulator is used to train medical students, residents, nurses and physicians in decision making, communication and professional skills development. MedSim is used to train anesthesia residents in crisis management. The facility also has part-task trainers for IV placement, lumbar puncture, arterial line placement and airway management training. Contact person: Dr. Manny Pardo (PardoM@anesthesia.ucsf.edu).

B.1.3 Milton J. Pearl and Leonard D. Rosenman Surgical Skills Center

The Surgical Skills Center was established in 2004 and dedicated to Dr.'s Milton Pearl and Leonard Rosenman, two extraordinary leaders in the Mt. Zion Department of Surgery. The current mission of the Center is to provide an opportunity for residents and medical students to learn and practice fundamental surgical skills and procedures with expert-level feedback in a safe educational environment. Training media include a variety of simulated and animal tissue models, task trainers for procedures such as airway management and vascular access, and computer-based simulators for endoscopic and laparoscopic procedures. Curricula are in place for medical student and intern-level skills. Curricula are being developed for upper-level surgical skills. Location: Mount Zion Hospital Campus, Hellman Bldg., Room C315, San Francisco, CA. Director/Coordinator is Frank Tendick (Frank.Tendick@ucsf.edu)

B.1.4 Clinical Skills Center

The Clinical Skills Center houses a standardized patient program. The center primarily trains medical students in physical exam and patient communication skills. Standardized patients allow learners to see patients in a clinical setting and receive feedback on their clinical skills directly from the patients. The sessions are videotaped and the video is reviewed with a faculty member who provides additional feedback to the learner. Location: 1515 Scott Street, San Francisco, CA. Facilities Coordinator: Bernie Miller (millerb@medsch.ucsf.edu).

B.1.5 SFGH Injury Center

The Injury Center, under the direction of Dr. Peggy Knudson, Professor of Surgery, is the home of curriculum research on the training of surgical residents in leading trauma codes and running major trauma resuscitations. The curriculum was developed by a team of trauma experts and includes a combination of five common and complex scenarios. The simulations are run on a Laerdal SimMan®. Thirty-five mid-level surgical residents are currently enrolled in the study. The Center is co-located with the Anesthesia Simulation Center. Location: SFGH-2nd floor Library, 1001 Portrero Avenue, San Francisco, CA. Facilities coordinator: Linda Khaw (lkhaw@sfghsurg.ucsf.edu).

B.1.6 Kanbar Simulation Center - Mt. Zion Facility

The Mt. Zion facility will focus on undergraduate and graduate medical education with opportunities for interprofessional exercises. Medical students currently encounter the simulator early in their curriculum and we plan to strengthen that exposure throughout their course of study.

Residents from different departments would participate in one-on-one training sessions as well as realistic crisis management exercises.

Interprofessional training sessions will allow participants to improve their leadership, communication, and team resource management skills, which are key components needed in managing medical crises. These will also provide a foundation for understanding how the Campus-wide Kanbar Simulation Center will function as a true interprofessional facility. Location: Mt. Zion Hospital Hellman Building located at 2200 Post Street, San Francisco, California. Contact: Kevin H. Souza (kevin.souza@ucsf.edu).

B.1.7 Kanbar Simulation Center - Campus-wide Facility (Phase II)

The existing Clinical Skills Center would be moved from off-campus leased space into permanent space on the second floor of the Campus Library at Parnassus, as proposed by the Library Space Planning Committee in 2007. This Clinical Skills Center will be augmented to include all aspects of a true virtual care center, containing specialized training laboratories that support teaching and practice of essential diagnostic and care delivery skills.

The permanent simulation center will include the following key elements: 1) training laboratories using standardized patients, actors trained to respond as patients with particular illnesses but able to provide the “human interaction” aspects of care; 2) training laboratories using computerized systems with mannequins to support learning using “invasive” techniques not possible to practice with human subjects (simulation laboratories); and 3) telemedicine training facilities, including state-of-the-art telecommunication systems, and 4) staff offices and support rooms, including equipment holding and maintenance, and the necessary computer and telecommunications support.

In order to link clinical scenarios or patient encounters occurring in the laboratory rooms directly to small group discussion and learning sessions, several small group classrooms should be located adjacent to the proposed Kanbar Simulation Center. Use of simulators during training sessions would allow for a

variety of alternative clinical practice scenarios reflecting the full range of patient diagnoses and pathologies, which practitioners can rarely see over a life time of practice. Thus the technologic investment in the center would be leveraged to enrich the clinical skills instruction and simulation suite and increase teaching opportunities throughout these facilities. Each of several clinical skills exam rooms could be used not only for training with a standardized patient, but also for telemedicine teaching and consulting and simulation.

B.2 Stakeholder Needs

Learners: Medical students, residents and other health professions students need a learning environment where they can practice skills ranging from learning the patient interview, physical exam skills, procedural skills, and team and communication skills. In addition they need to receive feedback on their activities and be provided with the opportunity to incorporate that feedback into new learning opportunities. The simulation center will provide them with a learning environment where they can 1) practice without risk of harming patients; and 2) engage in repetitive practice to master skills.

Faculty: Teaching faculty need a well staffed facility where they can develop, stage and offer simulation based learning opportunities for their learners. Faculty members need access to expertise in simulation-based health education including faculty development on the uses of simulation, curriculum development, and objective-based assessment. In addition, researchers need an environment where they can both develop and test simulation technologies and curricular innovations.

Leadership: As a world class health science institution committed to the highest quality education, patient care, research, and community service, UCSF's leadership needs to demonstrate that the campus is providing cutting edge facilities for their faculty to work and learners to develop their skills. UCSF is lagging behind other institutions in development and support of a simulation center and the Kanbar Simulation Center at Mt. Zion will demonstrate a commitment to excellence in the four domains of its mission. The Mt. Zion facility will also provide a proof-of-concept for UCSF to garner additional financial support from its community.

B.3 Business Plan

B.3.1 Services

The Kanbar Simulation Center should provide access to a full spectrum of clinical simulation technologies and educational support for the use of clinical simulation in the following areas:

- Basic and clinical education of health care professionals
- Faculty development
- New curriculum development and curricular innovation
- Competency assessments in health care professions education
- Educational outcomes research

Examples of Simulation Teaching, Assessment and Research Services

- Faculty Development in Clinical Simulation for Teaching
 - Guide faculty through case development process
 - Construction of assessment instruments
 - Running and debriefing of various scenarios/cases

- Identification of curricular tools and technologies most appropriate to educational goals
- Consultation regarding faculty research and educational interests
- Provide faculty with practical, high quality peer review and objective practical feedback on teaching using clinical simulation
- Supporting High Quality Competency Assessments Using Clinical Simulation
 - Support departments and individual faculty in designing appropriate simulation scenarios and case scripts for assessment of targeted competencies.
- Supporting and Promoting of Excellence in Educational Research Using Clinical Simulation
 - To promote clinical simulation educational practices that are based on sound theory and evidence from peer-reviewed research literature
 - To support faculty in evaluating outcomes for simulation-based education projects
 - To disseminate new theory and evidence on simulation based education in the health care professions

B.3.2 Educational Methods

The Kanbar Simulation Center should offer high-fidelity mannequins, task trainer and virtual reality simulation for teaching assessment and research. Educational methods available include:

- Team-based learning
- Problem-solving
- Individual skills practice
- Testing and evaluation
- Remediation

B.3.3 Curriculum

Medical Students

The Essential Core and Clinical Studies course leadership and governing committees will be invited to develop simulation-based learning opportunities at the Center. Sample curricula include:

Surgery: Train medical students in basic procedures such as phlebotomy and placing an intravenous catheter, arterial blood gas, Foley catheter insertion, nasogastric tube insertion, knot tying and suturing, PPD testing, removal of skin staples and sutures, delivery of babies, intubation, central line insertion, chest tube insertion, emergency airway access—either by open or percutaneous approach, running a code, running a trauma resuscitation, using a coude catheter for difficult Foley insertion, lumbar puncture, paracentesis, and thoracentesis.

Foundations of Patient Care (FPC): FPC will use proposed simulation center to help students learn physical examination skills, and practice and refresh skills they have initially learned on their peers or patient educators. Specific skills that the simulation center will enhance include direct ophthalmoscopy, cardiac auscultation, female and male genitourinary system examinations, and musculoskeletal examinations. Students will also learn and practice procedural skills such as venipuncture, arterial blood gas puncture, and suturing. In addition, the simulation center will allow FPC to better assess student

competencies in specific skill areas and in more realistic settings. For instance, we will be able to systematically measure students' abilities to accurately assess physical exam findings such as ophthalmologic findings or cardiac murmurs, to perform parts of the physical examination not done on standardized patients (e.g. pelvic exam), and demonstrate procedural skills.

Residents

School of Medicine departments will be invited to offer basic resident skills training at the Mt Zion facility. These may include the following:

OB-GYN/School of Nursing: Interdisciplinary training for residents and nurses. The center can be used to train for the mother and fetus before delivery and the mother and neonate after delivery, including practicing Leopold maneuvers; monitoring multiple fetal heart sounds; and birthing (natural or with instruments).

Emergency Medicine: Training in crisis management, communication and teamwork for individuals and teams to test conceptual understanding, technical skills, decision making skills and attitudes and behaviors. Additional training would be offered as pediatric case reviews including resuscitation, conscious sedation and basic procedures.

Pediatrics: Training for pediatric residents, fellows and nursing staff to include Children's Hospital Advance Life Support Training (CHALS); neonatal resuscitation, procedural skills to include IV placement, central venous catheter placement, arterial line placement, bag-valve- mask ventilation, endotracheal intubation, thoracocentesis and chest tube placement, pericardiocentesis, and lumbar puncture.

Other Health Professions

In interprofessional simulation scenarios, students have the opportunity to hone their skills in communication, critical thinking, crisis management, and collaboration while leveraging their technical and communication skills to enhance patient safety and quality of care. Examples of activities include an accident scene (simulated serious injuries), where knowledge of initial management of trauma; mutual understanding of roles of emergency response teams; and demonstrated teamwork could be practiced; discharge planning scenarios; interprofessional team rounds, conversations and negotiations regarding patient needs; or team problem solving around a medical error.

C Implementation

C.1 Staffing

The Kanbar Simulation Center Mt. Zion facility would be staffed as follows:

C.1.1 Interim Medical Director (Faculty):

The Interim Medical Director will report to the Vice Dean for Education, with a primary commitment to the Associate Dean for Curriculum.

This medical director will take a leadership role in establishing the center in its temporary location at Mt. Zion (Phase I) and planning for its permanent location in the Campus Library (Phase II), selecting equipment and staff, developing and evaluating educational programs, supervising staff and managing budgets. This position will coordinate simulation activities with the Department of Surgery's surgical skills center and with other simulation centers at UCSF.

The position requires clinical and educational experience in the following areas: the use of simulations and educational technology, leadership, organizational and educational program development and interprofessional education. The candidate must have management abilities to develop program policies and procedures for a state-of-the-art clinical simulation program, and to supervise technical and support personnel. Appointment: 25-40%.

C.1.2 Operations Manager (Staff):

The operational manager will report to the Associate Director for Administration in the Office of Medical Education with a primary commitment to Medical Director for the Kanbar Simulation Center.

The manager will take an operational role in establishing the center in its temporary location at Mount Zion and planning for its permanent location on the main campus, selecting equipment and supervising staff, running and maintaining simulation equipment and working within a budget. Appointment: 80% Kanbar Simulation Center and 20% Department of Surgery Surgical Skills Center.

C.1.3 Simulation Technician (Staff):

Under the direction of the Simulation Center Operations Manager and Surgical Skills Center Medical Director, the incumbent will provide technical support for all simulation activities, including preparation, maintenance and repair of computerized manikins (software and hardware), task trainers and related multimedia peripherals for the Milton J. Pearl and Leonard D. Rosenman Surgical Skills Center at UCSF / Mt. Zion, Kanbar Simulation Center and the Clinical Skills Center. In addition, the technician will train faculty and other Simulation Center staff in the operational aspects of simulation.

C.2 Facilities

Operating Area

- The operating room simulation suite will incorporate the use of mannequins in an environment utilizing a typical O.R. setup, such as lighting, supplies, treatment and monitoring equipment.
- In addition to the medical equipment, the room will be equipped with cameras, microphones and other digital recording equipment to capture the sessions for concurrent viewing/broadcast to remote locations and for review and debrief after the viewing sessions. In an adjacent control room an instructor would be able to change clinical events based on learners' knowledge and response.
- Utilities required in the space include: compressed air, oxygen, nitrogen, CO₂, normal power, and data outlets. Surge protected and UPS supported equipment is required for the simulation hardware. No emergency power is required.
- Activity times during the training sessions in the Operating Room environment are typically 1-2 hours long.
- The room should accommodate as many as six people involved in the simulation instruction.

Emergency Trauma Area

- Utilities required in the space include: compressed air, oxygen, nitrogen, CO₂, normal power, data outlets. The number of outlets should accommodate a typical intensive care bed environment, utilizing a commercial headwall system. No emergency power is required. Surge protectors required for mannequins.

The Debriefing Room:

- The debriefing room will be used to discuss what is going to happen or happened during the simulation. It should have a live video feed from the simulation room.
- The debriefing room should be configured with either moveable tables and chairs, or lounge seating with arm tablets with data jacks for instructor and wireless connection for students, mobile large flat screen, and with smart board/moveable white board system. Storage is needed for AV equipment (computer, DVD player, computer link, polycom link).
- The debriefing room will have direct adjacency to the simulation suite.

The Simulation Suite Supply/Equipment Room:

- The supply/equipment room will be configured with storage for supplies (medical supplies) and simulators.

Security and access control requirements include:

- Security should include card key access to the suite. Manual override (internal programming) would be ideal to control the doors at the entry.
- The storage area needs additional locking.
- The simulation rooms and mannequin storage areas should have key locks.

Emergency power is not required; however, UPS for server surge protection is desirable.

Floorplan

The Kanbar Simulation Center, Mt. Zion facility, is located at 2022 Post Street, Mt Zion Hospital, Building C, 3rd Floors. It represents 1749 ASF and is composed of the following rooms (*see Appendix A for preliminary floorplan*):

Purpose	Location	Size
OR Area	C3-22	688 ASF
Part Task Simulation	C3-22A	103 ASF
Part Task Simulation	C3-22B	107 ASF
Technician's Office / Scenario Control Room	C3-22C	104 ASF
Birthing Simulator (OB) / Storage	C3-22D	112 ASF
Debriefing Room	C3-22E	173 ASF
Medical Directors Office	C3-22F	107 ASF
Operations Manager Office	C3-22G	107 ASF
Server Room / Technician Office	C3-22H	140 ASF
Storage	C3-22J	77 ASF
Bathroom	C3-22K	20 ASF
Cabinet	C3-22L	11 ASF

C.3 Equipment

HUMAN PATIENT SIMULATORS

Priority	Simulator	Make/Model	Est. PRICING
1	Portable and Advanced Patient Simulator	Laerdal SimMan® is a portable and advanced patient simulator for team training. SimMan® has realistic anatomy and clinical functionality. SimMan® provides simulation-based education to challenge and test students' clinical and decision-making skills during realistic patient care scenarios.	\$25,490
1	Infant Simulator	With the Laerdal SimBaby® critical care interventions—such as infant CPR, airway management, drug administration and defibrillation, to name a few—can be practiced on the simulator, better preparing healthcare professionals for critical events involving infants.	\$23,770
2	ALS simulator	The Laerdal Advanced Life Support Simulator simulates a wide range of advanced life saving skills in medical emergencies. The simulator responds to clinical intervention, instructor control, and preprogrammed scenarios for effective practice of diagnosis and treatment of a patient. With spontaneous breathing, airway control, voice, sounds, ECG, and many other clinical features, the ALS Simulator is the fully functional emergency care simulator.	\$9,950
3	Pediatric HPS	The METI PediaSim® is a pediatric version of the HPS and ECS simulators that provide all the same features of the adult version but calibrated to mirror the parameters and responses of the young patient, such as distinctions in anatomy, reactions to drugs, types of injuries and underlying physical conditions.	\$45,360
3	Airman Management Simulator	AirMan offers the capability of presenting a multitude of difficult airway situations with the touch of a button via the remote control. AirMan helps meet the training needs of difficult airway management for hospital and prehospital care providers.	\$9,900

PART TASK TRAINERS

Priority	Simulator	Make/Model	Pricing each
1	Female Pelvic	The Limbs & Things Clinical Female Pelvic Trainer (CFPT) Mk 2 presents accurate anatomical and tactile representation of the female pelvis for 'hands on' examination and diagnosis of pathologies and abnormalities. It can be used for many levels of training from undergraduate onwards as well as for family health. The uncluttered design of this model enables trainers to concentrate on essential anatomy and procedure. Skills include recognition of anatomy and appropriate landmarks; digital vaginal examination; bi-manual examination; cervical smear procedure (including use of	\$2115.00 x 5

		speculum); dry catheterization (Foley catheter sizes 10, 12 & 14); digital rectal examination procedure; and family planning.	
1	Male Pelvic	This Limbs & Things Male Pelvic Trainer presents key anatomical features, both externally and internally, for teaching 'hands-on' examination and diagnosis. Skills include testicular examination, rectal examination of the prostate and dry catheterization (Foley catheter size 16 and retrograde catheters).	\$2149.00 x 5
1	Eye Examination	The Eye Examination Simulator (Limbs & Things) is used for teaching and practicing the use of an ophthalmoscope, examining the ocular fundus, and learning and identifying diseases and conditions within the eye. Skills include use of an ophthalmoscope; examination technique; identification of up to 90 pathologies and communication skills.	\$1100.00 x 5
1	Breast Examination	The "Strap-on" breast examination simulator (Limbs & Things) provides the opportunity of training of professional-to-patient communication; examination techniques; identification of anatomical landmarks and lymph nodes; and diagnosis of pathologies.	\$1250.00 x 2
1	Breast Examination	Breast Trainer - Examination & Diagnostic: life-size realistic breast used for training in examination procedure and diagnostic techniques.	\$600.00 x 8
1	Adult IV Training Arm	A Laerdal lifelike adult arm reproduction with replaceable skin and veins designed for peripheral intravenous therapy. Skills include: <ul style="list-style-type: none"> • Venipuncture possible in the antecubital fossa or dorsum of the hand • Peripheral IV line insertion and removal • Palpable veins enable site selection and preparation • Infusible veins allow peripheral therapy with IV bolus or push injection method Peripheral IV line maintenance including assessment and rotation of site an dressing, solution and tubing change	\$399.00 (adult) x 10 \$165.00 (infant) x 5
2	Arterial Arm Stick Kit	A Laerdal lifelike adult arm reproduction with replaceable skin and arteries designed for: <ul style="list-style-type: none"> • Simulation of hand placement during performance of Allen's Test • Arterial pressure • Artery palpation • Percutaneous puncture sites in both brachial and radial artery Infusible arteries with ability to pressurize system, enable blood backflow in syringe	\$400 x 10
3	Airway Heads	LAERDAL –Head complete Infant Airway Mgmt LAERDAL –Deluxe Difficult Airway Trainer #261-10001 (adult) (Surgical Skills Center has Airway heads for use at the Mt. Zion facility)	\$319.00 \$1,802.00
3	Ear Exam	The Limbs and Things ear exam simulator is examination of the external acoustic meatus and tympanic membrane directly with an otoscope, and foreign body removal. Skills include: <ul style="list-style-type: none"> • Use and handling of an otoscope (not supplied) • Examination of the acoustic meatus and tympanic membrane • Communications skills and examination protocol Earwax and foreign body removal	\$2000.00

C.4 Technology

The use of a clinical skills management system to control standardized patient checklists, student reflection exercises and video capture and deliver of simulated clinical encounters is essential to a successful clinical skills center. Likewise, the capture and recording of simulation-based learning activities is an important way to facilitate feedback to the learner.

B-Line Medical's SimCenter and SimCube system is a comprehensive solution for managing and operating a large clinical skills or simulation training center. B-Line Medical's solution handles testing and assessment, digital video recording, center management, and simulator integration via a web-based application. SimCenter Modules include:

Digital Recording and Distribution

- Automated digital recording
- Video automatically integrated with assessment and portfolios
- 100% web-based video access
- Real-time encoding
- Captures dozens of feeds simultaneously
- Years of RAID protected video storage
- Flexible and scalable solution
- Installations handled by B-Line Medical or your preferred vendor



Web-based Case and Checklist Development



Key Card Tracking



Real-time Testing and Automated Assessment



Real-time Monitoring and Control



Center Scheduling and Resource Management



Automated Recording and Digital Asset Management



Automated Reporting for Students, SPs and Faculty



100% Web-based Annotation, Debriefing and Assessment

Clinical Skills

- Large scale testing and assessment
- Real-time center setup and monitoring through a single interface
- User management (SPs, students and faculty)
- Intuitive drag and drop content builder
- Centralized case library
- Center and rotation scheduling
- Real-time examination scoring
- Report formats: PDF, HTML, Excel and raw for 3rd party evaluation
- Fully integrated with Digital Recording and Distribution

Simulation

- Web-based annotation and debriefing
- Simulator data integration
- Physiological trending
- Dynamic and "clickable" simulator log files and trends
- Synchronizes multiple camera angles and XGA feed
- Integrated participant portfolios (SPs and simulation)

Monitoring

- Seamless software and A/V control integration
- View 2 video angles, control cameras and evaluate from one screen
- Toggle between and page to any room in the facility

SimCube provides a portable and easy to use solution for capturing simulation encounters. SimCube records multiple video feeds digitally, allows faculty to monitor, evaluate, and annotate simulation activities remotely, and effortlessly builds portfolios for each participant including links to all video and assessment data.

SimCube can be used to record encounters with standardized patients, task trainers, or high-fidelity mannequins, and automatically captures any data output from simulation devices along with the video, providing a wealth of material for debriefing purposes. It also manages users, provides tools for scenario and checklist creation, and has a robust feature set for reporting and statistical analysis. SimCube is web-based, allowing full access to recording, monitoring, and debriefing functionality from any computer with a web browser and internet access, no additional software or licenses required.

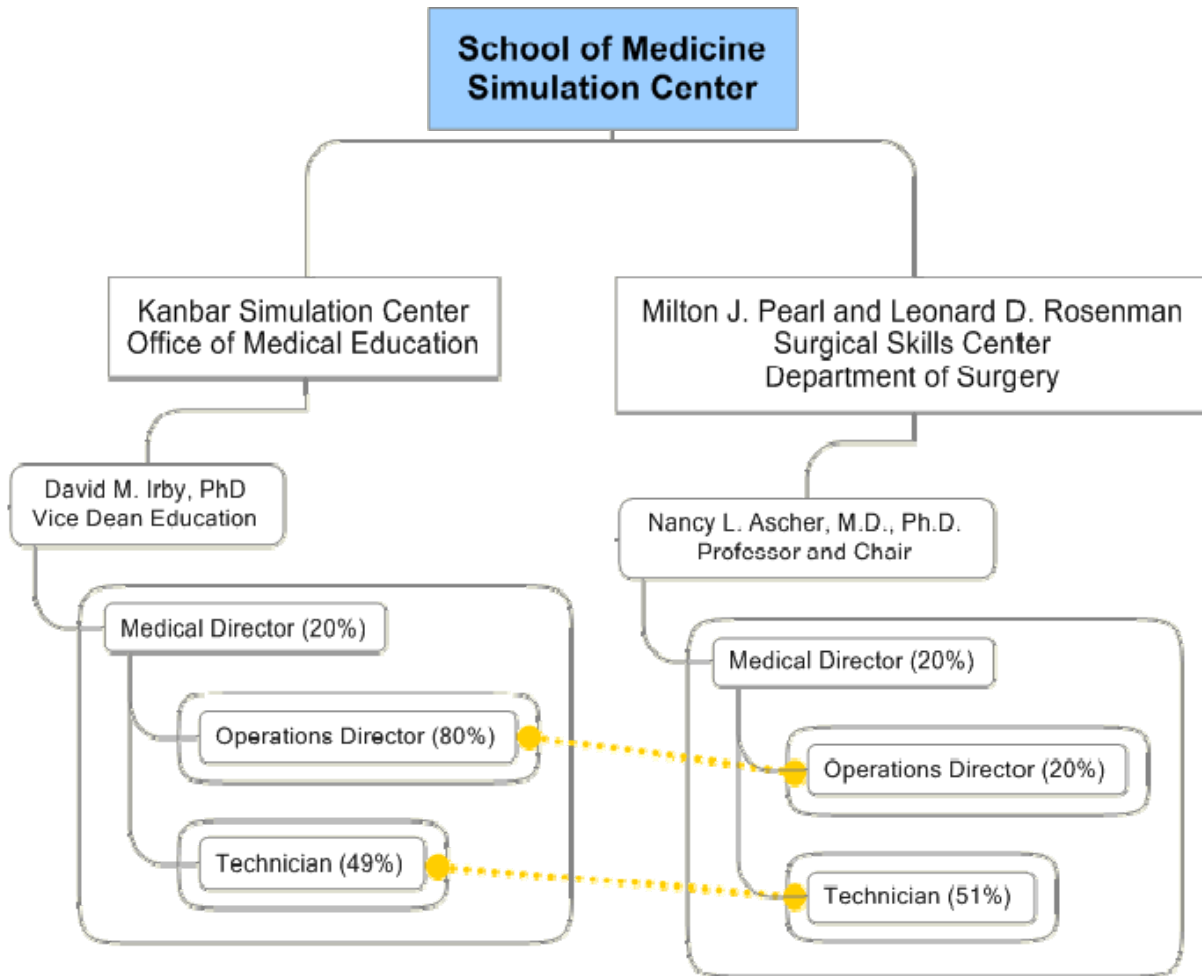
The SimCube can be plugged into B-Line Medical's center-wide SimCenter solution to work hand in hand within a diverse simulation environment that includes both simulators and standardized patients. This flexibility allows users to start small and expand with ease when they secure additional simulators or move into a larger space.

SimCube's software and hardware package is comprehensive, and includes the following:

- User management and content creation
- Digital recording of multiple video feeds
- Synchronous playback of video and physiological data
- XGA encoding for capture of monitors, 3D scenarios, EMRs and more
- Predefined & free text annotation
- Evaluation & assessment
- Usage, session and aggregate reports
- SimBridge™ integration (centralize data from multiple simulators)
- Automatic generation of participant portfolios
- Scenario & checklist creation
- Portable & scalable
- 100% web-based



C.5 Organizational Structure



C.6 Budget

Kanbar Center Budget Projections to FY08-13

Kanbar Gift Fund = B2228 & Mirror = 41002

	Proposed Budget FY07- 08	Projected Budget FY08-09	Projected Budget FY09-10	Projected Budget FY10-11	Projected Budget FY11-12	Projected Budget FY12-13
Program Expenses:						
Payroll Expenses:						
Academic Payroll	42,000	74,880	78,624	82,555	86,683	91,017
Staff Payroll	109,288	174,790	239,712	249,300	259,272	269,643
Subtotal Payroll:	151,288	249,670	318,336	331,856	345,955	360,661
Non-Payroll Expenses:						
Foundation 1% assessment	9,680	3,718	3,865	4,039	4,199	4,385
GAEL	439	724	923	996	1,038	1,082
Supplies	3,000	3,105	3,214	3,326	3,443	3,563
Telephones/Fax	3,000	3,150	3,308	3,473	3,647	3,829
Travel	6,000	6,300	6,300	6,600	6,600	6,900
Subscriptions/Memberships	500	500	575	575	600	600
Entertainment	1,500	1,575	1,575	1,655	1,655	1,740
Computers	5,000	5,000	5,500	5,500	6,000	6,000
Temporary Employee Salary	24,000					
Medical Supplies - syringes, IV bags, hoses, moulage, soda lime	4,000	4,000	4,140	4,285	4,435	4,590
Gases	3,000	3,000	3,105	3,214	3,326	3,443
Annual Maintenance on Mannequins	10,000	10,000	11,000	11,000	12,000	12,000
Annual B-Line Maintenance	0	15,000	15,000	17,000	17,000	20,000
Subtotal Operations:	60,439	52,354	54,639	57,623	59,743	63,747
Capital Expenses (Year 1 Only):						
Office Equipment (year 1 - copier, printers)	8,000					
Projector	1,500					
Furniture, Carpet, Paint	30,000					
Entertainment - Opening Event	1,500					
Hardware/Software	10,000					
Security (Proximity Lock)	5,000					
Training	10,000					
B- Line	270,000					

	Proposed Budget FY07- 08	Projected Budget FY08-09	Projected Budget FY09-10	Projected Budget FY10-11	Projected Budget FY11-12	Projected Budget FY12-13
Adult Emergency Care PS (Laerdal SimMan)	25,490					
Infant Simulator (Laerdal SimBaby®)	23,770					
Pediatric HPS - (METI Pedia Sim)	45,360					
Airman Management Simulator	9,900					
ALS Simulator (Laerdal Advanced Life Support Simulator)	9,950					
Female Pelvic (Limbs & Things Clinical Female Pelvic) \$2,115 ea x 5	10,575					
Male Pelvic (Limbs & Things Male Pelvic Trainer) \$2,149 ea x 5	10,745					
Eye Examination (L&T Eye Examination Simulator) \$1100 ea x 5	5,500					
Breast Examination Strap On (\$1,250 ea x 2)	2,500					
Breast Examination Table Top (\$600 ea x 8)	4,800					
IV Training Arm - Adult (\$399 ea x 10)	3,990					
IV Training Arm - Infant (\$165 ea x 5)	825					
Arterial Arm Stick Kit Laerdal (\$400 ea x 10)	4,000					
Airway Heads - Laerdal Infant Airway Mgmt	319					
Airway Heads - Laerdal Adult Difficult Airway	1,802					
Ear Exam	2,000					
Subtotal Start-up Capital costs:	497,526					
Grand Total	709,252	302,024	372,975	389,479	405,698	424,407

D Risks

If simulation training facilities proliferate at UCSF, they will continue to create inefficient use of space, time, and personnel. A fundamental review of the way we currently educate health care providers suggests collaborative simulation training is optimal for teaching skills and improving the quality of patient care. A dispersed simulation environment will result in duplication of effort, increased costs, and a scattered approach to education. When facilities are not centralized, they often cater to a narrow audience (e.g., intubation simulator) and can be susceptible to an “object” focus rather than a person focus. To meet the stated goals of the IOM for patient safety and the PEW Foundation for creating health providers for the 21st century, the vision of centralized interprofessional training facilities must be realized. At a space constrained campus such as UCSF, a centralized facility is essential. Placing trainees and educators in close proximity to each other will ensure a dedicated collaborative environment.

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F Appendix

F.1 A. Preliminary Floorplan

