



# ISIS – Educating to Improve Health through Safe Patient Care

Carlos A. Pellegrini, MD, Chair, Board of Directors; Farrah Leland, JD, Administrator; Richard M. Satava, MD, Senior Executive Advisor

## Background

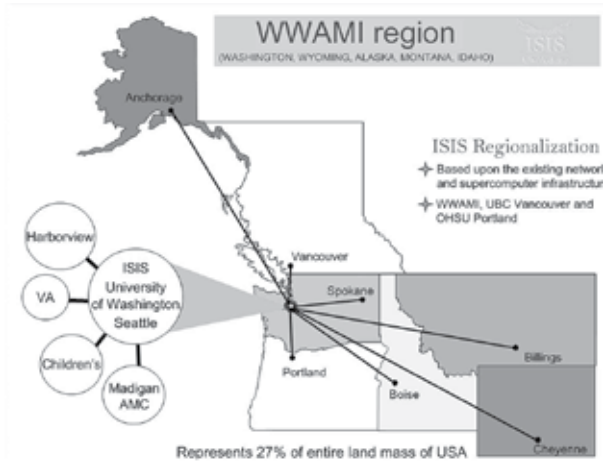
In the first four years of its formal existence, ISIS – the Institute for Simulation and Interprofessional Studies – has contributed to UW Medicine’s mission “To Improve Health.” ISIS has supported this mission through the education of medical students, residents, nurses and practicing physicians, through the creation of curricula, and through research in applied engineering and education – all using the platform of simulation and modeling. Much has been accomplished to fulfill these goals as ISIS continues to both mature and expand.

Even in these tumultuous financial times, ISIS has maintained a stable basis to continue both the training and research missions. In addition, by performing rigorous analysis of successes and failures, the initial programs have been strengthened by continuous improvement. A summary list of examples includes:

- Rigorous training to quantitative benchmark levels of competency has improved the clinical outcomes in patients – for example, the Central Venous Catheter (CVC) program has defined a specific protocol which mandates training until a uniformly high level of competence and standard team practice is accomplished between physicians and support staff – the result of which is that complications (including deaths) have been reduced to less than 1 infection per 1000 catheter days across a multihospital enterprise.
- All of the training areas, such as team training, communication skills and psychomotor skills, have begun not only expanding their continuity with other areas to provide a more comprehensive systems-level integrated approach (such as team training that includes hand-off), but have moved toward integration into clinical practice, as manifest by the psychomotor skills component of the CVC program above.

- ISIS has achieved a national leadership position in medical simulation and education through a rigorous training curriculum, innovative research program, and membership in the American College of Surgeons Accredited Education Institutes consortium.
- ISIS has been successful in competing for research funding, competing not only for federal grants and specific congressional special interest programs, but also for civilian opportunities such as the Josiah Macy Jr. Foundation.
- The opening of the new Harborview Medical Center (HMC) expands the ISIS training platform throughout a geographically dispersed simulation system because of the UW Medicine WWAMI regional medical school network (in Washington, Wyoming, Alaska, Montana, Idaho) (Figure 1) and the strong partnership between ISIS and Madigan Army Medical Center (MAMC). UW Medicine’s multi-site facilities at the University of Washington Medical Center (UWMC), Harborview Medical Center (HMC), and soon at Seattle Children’s and the Veterans Affairs Puget Sound Health Care System (VAPSHCS) continue to provide even more capability than ever possible before (Figure 1).
- The ISIS collaboration with MAMC and the Warrior Transition Unit (WTU) demonstrates commitment to our nation through intensive research to improve the health of our returning warriors through innovative application of simulation technologies.

It is patently clear that a complete revolution in medical education is in progress, and that simulation is at the core of this revolution. ISIS has embraced this innovation and is continuing to push the limits of creativity. However, it is ever mindful that, along with innovation and creativity, there must be the stringent evaluation of effectiveness, appropriateness and financial prudence. To address both the creativity and the validation, ISIS will:



**FIGURE 1. The UW Medicine WWAMI region medical school network and multi-site facilities**

1. Apply sound principles of learning to design simulation-based curricula for interprofessional learners and then rigorously subject these curricula to validation.
2. Research best methods for, and demonstrate efficacy of, simulation as a platform for educating current and future healthcare professionals.
3. Demonstrate impact of learning through simulated programs of study on the safety and quality of care of patients and families.
4. Create programs that link across geographically dispersed sites through advanced communication and information technology by leveraging the unique advantages of the WWAMI telemedicine network.
5. Expand cooperation with MAMC and the VAPSHCS in contributing to the health and welfare of warriors returning from duty to their country.

## Rationale for the Existence and Expansion of UW Medicine ISIS

### A. BENEFITS OF SIMULATION AS A TRAINING PLATFORM

From a simplistic perspective, the hypothesis could be stated as follows: creating a learning opportunity through simulation increases the safety and quality of patient care. This occurs because trainees develop and sharpen technical skills under a specific curriculum, using objects and devices to practice on simulators instead of patients until meeting a defined minimum competency. In addition, trainees practice cognitive skills through scenarios in a controlled imitative setting that allows for simulated exposure to significant complications, allowing trainees to make and learn from errors, to hone skills with repetition limited only

by their stamina, and to learn at their own individual pace. Finally, trainees practice the communication skills and coordination of a team in a virtual environment.

The assumption is that patient safety and quality of care are improved by removing the first phase of the trainee's technical learning from the patient care setting. Not only is there scientific evidence that learners who practice in simulated environments improve performance in clinical care, but practitioners who initially train in a virtual setting express a greater degree of confidence in their ability to provide patient care in a safe manner. This is an additional benefit to utilizing this type of training environment. Confidence has been shown to increase the likelihood of appropriate judgment.

### B. WHY EXPAND NOW THE USE OF SIMULATION AND INTERPROFESSIONAL STUDIES AS METHODS TO EDUCATE HEALTHCARE PROFESSIONALS?

There are several factors that suggest this is the right time to increase the use of simulation and immersion studies into the changing paradigm of educating medical professionals. First, the health care delivery system has always been searching for ways to **improve patient safety**. This was heightened in the past eight years in the wake of the publication of the Institute of Medicine's landmark book, *Crossing the Quality Chasm* (2001). Aviation and other high-risk industries have embraced education, training and evaluation in a simulated environment; while it is difficult to validate efficacy of these training modalities through double blind trials in high-risk industries, industry leaders fully believe that simulating errors, learning how to solve them, and improving accuracy of operations in all aspects is instrumental in dramatically reducing errors in the field.

Second, **technology and science** are evolving at an ever faster pace. It is increasingly difficult to educate using the apprenticeship education model of the past 100 years as technological and other clinical advances make learning under the "see one, do one, teach one" model untenable. For example, the regulated restriction on residency work hours contributes to the growing inadequacy of the apprenticeship model. Also, the apprenticeship model does not allow for the opportunity of a structured curriculum that ensures the learner will have experience with all the necessary patients or procedures – it is hostage to whatever patient comes through the door. Simulated education on all levels can ensure that in those areas in which patients are not available, there will be the opportunity for simulation to help fill that void.

Third, there is substantiation of opportunities to **reduce cost**. Evidence indicates the time to perform an operation that involves a trainee is shortened if the trainee has completed initial training in basic technical skills in a low tech simulation environment. Other industries have shown evidence that **standardized processes** reduce cost and error (reduction in task saturation contributes to error reduction) through standardized supplies and equipment usage (lower supplies cost, streamlined training and maintenance of equipment), and through time reduction (streamlined processes).

Fourth, residency core competencies (designated by the Accreditation Council for Graduate Medical Education) include systems-based learning and professionalism. The ability to effectively **communicate** is at the fundamental core of both of these competencies. Further, risk management studies have clearly identified that inadequate, absent, or incorrect communication between members of the health care team and with the patient and family are significant causal factors in patient-related errors and in the likelihood that a patient will seek legal retribution. Simulation provides a rich opportunity to learn and practice these vital communication skills.

Fifth, practicing medical professionals should continuously **retrain** throughout their professional lives, embracing the philosophy of lifelong learning. This is evidenced in the requirement for Maintenance of Certification mandated by the American Board of Medical Specialties for all its boards. Furthermore, military deployments for prolonged periods, temporary absence from work for social, personal or family reasons, and the advent of new procedures/technology which keep the health care professional away from the regular practice of medicine for a prolonged period require retraining. Patient safety and quality of care are improved when practicing professionals regularly demonstrate proficiency in technical, cognitive and systems skills in a controlled virtual environment, both for new skills and for select skills they may commonly employ in their practice. Practitioners may also hone technical and cognitive skills for patient **scenarios they rarely encounter in their practice**, but must be able to recognize and respond to appropriately. ISIS will provide educational opportunities for practicing health care providers to acquire new skills and to validate competency in select existing skills.

Sixth, simulation technologies are now moving into the clinical arena through *in situ* training in actual emergency rooms, ICU and operating rooms to improve performance and efficiency in the actual clinical setting. Next generation simulators will permit “surgical rehearsal,” allowing a

physician to practice an operation on the patient-specific image before performing the procedure on a patient. Evidence indicates that “warming up” before a procedure improves performance by decreasing operating time and errors. Data from these and other clinical uses of simulation will feed into quality improvement, risk management, privileging and patient safety committees to improve quality of care while reducing cost.

## Research Imperative

As a Research Center in UW Medicine, ISIS is part of one of the top funded academic medical research institutions in the country, with a solid demonstration of collaboration across disciplines and in partnership with other UW world class Colleges and Schools such as the Information School, the College of Engineering and the School of Nursing, to name a few. ISIS is uniquely positioned to capitalize on these strengths to advance the knowledge of simulation as a platform for learning through disciplined research.

JOSIAH MACY JR. AND WILLIAM RANDOLPH  
HEARST FOUNDATIONS

Effective communication among health professionals is essential to high quality, patient-centered health care. Yet few training programs exist to impart these interprofessional communication skills, and most existing curricula in this area are directed toward practicing clinicians rather than trainees.

In collaboration with the Schools of Nursing and Pharmacy, ISIS received grants from the Josiah Macy Jr. and William Randolph Hearst Foundations (totaling over \$1 million) to develop an interprofessional curriculum for students based on the Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS™) models of effective communication.

TEAMSTEPPS NATIONAL IMPLEMENTATION —  
AHRQ/AIR

TeamSTEPPS™, a framework for ISIS training development, is a program developed by the Department of Defense, the Agency for Healthcare Research and Quality (AHRQ, a branch of the U.S Department of Health & Human Services), and the American Institutes for Research (AIR).

This team training framework targets patient outcomes by improving communication and teamwork skills among healthcare professionals (Figure 2). The four dimensions of TeamSTEPPS™ teamwork skills and competencies include: 1) leadership; 2) situation monitoring; 3) mutual support; and 4) communication. By increasing interprofessional

team awareness using the TeamSTEPPS™ tools, the goal is to target students' team performance, knowledge, and attitudes as outcome measures.

The University of Washington was chosen as the fifth TeamSTEPPS™ Training Center of Excellence for national implementation of TeamSTEPPS™. ISIS will hold eight Master Training Implementation training sessions for health organizations around the nation, including internal UW Medicine trainees.

#### FY10 ISIS-CONGRESSIONAL SPECIAL INTEREST APPROPRIATION FUNDING – DOD

In collaboration with Madigan Army Medical Center and the Boise VA, ISIS received a continuation of directed appropriation with a Congressional Add in the amount of \$4.054 million through the Department of Defense (DoD), United States Army Medical Research and Materiel Command (USAMRMC). The research projects are designed around a series of inter-operable pilot applications within each of the three core projects: 1) Distributed Skills Training and Healthcare Delivery; 2) Individual Healthcare Training; and 3) Team Training with Continuity of Care (TTCC).

ISIS provides an umbrella under which simulation experts combine their skills and develop a foundation for significant growth. ISIS improves resource utilization, provides scalability, reduces duplication of effort, standardizes curricula and provides a unique forum for interdisciplinary training.

By bringing together experts from both the military and public sectors, we have created a five-state simulation consortium that encompasses both the WWAMI region and the Western Regional Medical Command (WRMC).



**FIGURE 2.** Health professional students work as a team in one of the largest interprofessional training events in UW history.

The strategic goals of the consortium are:

- The advancement of research, development, validation, cost containment, and application of innovative simulation technologies to: enhance best practice and training in the area of medical education; research and then develop innovative distributive information technologies and “Capabilities Toolkits” to facilitate development of educational curricula; use these distributive technologies and toolkits to demonstrate the feasibility of delivering healthcare at a distance.
- To leverage the capabilities and resources of each sector (DoD and UW civilian) to address collaboratively many common regional issues, such that the framework that this collaboration establishes can be migrated as a national infrastructure.
- To conduct pilot research and validation projects which will serve as models for future curriculum development and training projects.
- Create a specific program with MAMC and the WTU to bring remote healthcare to the homes of the returning warriors – to keep them connected to their parent hospital (MAMC) and their military unit.

#### UW Medicine ISIS Poised to Expand

With all the new opportunities in the world of health service provider education, the challenge is to select those that will provide the greatest benefit. To that end, ISIS leadership has a broad basis of linkages across UW Medicine to help direct the priorities in terms of development of new curricula, creation or acquisition of simulation equipment, and expansion of its research and development initiatives. The Institute's priorities will be guided by the core principle of the Learner-Focused/Patient-Centered Education paradigm. As such, ISIS will prioritize research projects and learner initiatives that contribute to the mission of education to improve health through safe patient care. The learner-focused priorities will be based upon the complementary needs of UW Medicine residents, UW Medicine and affiliate institution interprofessional health care teams (physicians, nurses, and technicians), medical students, graduate medical trainees and WWAMI region community-based health care providers. Other ISIS users are physicians and other health care providers in the WWAMI region, community physicians and health care professionals, and institutions that might benefit from ISIS programs through Continuing Education offerings and other purchased training venues. Additional users would be persons participating in regional, national and international simulation, and interprofessional training programs that collaborate with or purchase access to ISIS programs.



The board of UW Medicine ISIS, comprised of a broad cross section of UW Medicine leadership, will set the strategic priorities that will assist ISIS leadership to critically evaluate the resource cost/benefit of proposed courses, purchases and research projects that utilize simulation and interprofessional studies. ISIS faculty will participate in the research and development of simulators and related equipment that support the educational priorities and in validation studies of simulation as a platform for learning through a series of extramurally and select intramurally funded projects.

As ISIS matures, the opportunity exists to expand its mission to improve health regionally, nationally and globally. As we evaluate this potential, we envision ISIS core trainees to be the students, physicians and interprofessional health care providers of UW Medicine, Seattle Children's and VA. Regionally, ISIS will expand to reach out to practicing health care providers and to affiliate institutions who host UW Medicine trainees, and to State of Washington health care providers and institutions that may find benefit in collaborating with, or purchasing simulation and interprofessional training programs from ISIS. Nationally and internationally, ISIS will improve health as ISIS faculty publish research, offer new curricula, devices, and methods of evaluation and training, and provide regional training across a distributed linked network.

#### A. ISIS STRUCTURE

The structural design of ISIS is based upon a cross-disciplinary, cross-departmental, cross-school/college model of collaboration in research, curricula design, simulation-based training, and technological development. The governance is centered on an advisory board that includes a broad constituency within UW Medicine, namely, all the owned and operated hospitals, and all affiliated hospitals where UW Medicine practices, and aims to bring aboard faculty from other components of the University of Washington who can expand the interprofessional concept. In order to keep up with the rapid pace of change, the structure continues to evolve as new partners develop and expand their programs and as external collaborations emerge.

Recognizing that such a large board cannot meet with the frequency required for effective management of operations, the Board delegates to an Executive Committee. The Board Executive Committee oversees the ISIS Operations group

which serves as an intermediary between the Executive Committee and three ISIS subcommittees (Patient Safety/Quality; Interprofessional Education/Practice; Research/Development). The ISIS Operations group provides expert advice and counsel to the Executive Committee, and through it, to the ISIS Board on strategies and tactics and leads implementation of the strategic and operational goals recommended to the Dean by the Board.

The Interprofessional Education/Practice committee will oversee medical student, resident and physician/nursing educational initiatives as well as research projects on learning, curricular development, and assessment of practice. The Research/Development Committee will focus specifically on the development of instrumentation, devices, and simulators, and will focus its research on the technical aspects of such developments. In close cooperation with the Interprofessional Education/Practice committee, it will carry out validation of educational methods and new devices that are introduced in the market. The Patient Safety/Quality committee will explore, in close cooperation with hospital centers for clinical excellence and quality improvement, specific areas of patient care that are identified as potential targets for dedicated simulation training for improvement of outcomes. This committee will ensure that UW Medicine quality/safety priorities are clearly reflected in the goals and initiatives of ISIS. In addition, ISIS will provide data and reports back to the respective hospital committees in a manner that will facilitate decisions that improve clinical care, reduce risks, facilitate credentialing, etc. The three committees will collaborate to ensure complementary initiatives and mutual progress, and will be accountable to the Executive Committee, and through it, to the ISIS Board. These committees serve as the interface between the laboratory training of students, residents, nurses and physicians with the continuing effort of improving the clinical practice of medicine.

Operationally, ISIS will have several components in different geographic sites which report to a single core operational umbrella, headed by the Executive Medical Director. The intention of the core oversight is to create a forum to assure cross-site best practices, common policies and procedures, and core expertise to complement site-specific focus and resultant operational variances.

B. ISIS GOVERNANCE



## ISIS Leadership

### BOARD OF DIRECTORS

**Thomas Benedetti**, ISIS Chair, Patient Safety and Quality

**William Bremner**, Chair, Department of Medicine

**John Clark**, Chair, Department of Biological Structure

**TBD**, Medical Affairs, Clinical Systems & Community Relations, Vice Dean for Regional Affairs, Rural Health, Graduate Medical Education, Professor of Family Medicine, School of Medicine

**Richard Ellenbogen**, Chair, Department of Neurological Surgery

**David Fisher**, ISIS Seattle Children's Representative

**Cindy Hecker**, ISIS HMC Executive Director

**TBD**, ISIS Chair, Interprofessional Education and Practice

**Tom Norris**, Vice Dean Academic Affairs

**Carlos Pellegrini**, ISIS Board Chair

**Paul Ramsey**, Dean, UW School of Medicine, CEO, UW Medicine

**Larry Robinson**, Chair, UW Medicine Safety and Coordination Committee

**Brian Ross**, ISIS Executive Director

**Richard Satava**, ISIS Senior Executive Advisor

**Debra Schwinn**, Chair, Department of Anesthesiology

**Mika Sinanan**, ISIS Chair, Research and Development

**Johnese Spisso**, Vice President of Medical Affairs (VPMA) UW, COO, UW Medicine

**F. Bruder Stapleton**, Chair, Department of Pediatrics

**Eileen Whalen**, ISIS HMC Executive Representative

**Frederick Wolf**, Professor and Chair, Medical Education & Biomedical Informatics

**Stephen Zieniewicz**, ISIS UWMC Executive Representative

**Brenda Zierler**, Associate Dean of Technology Initiative, Biobehavioral Nursing and Health Systems

### EXECUTIVES OF THE BOARD COMMITTEE

**Carlos Pellegrini**, ISIS Board Chair

**Richard Satava**, Senior Executive Advisor

**Brian Ross**, Executive Director

**Mika Sinanan**, Chair, R&D Committee

**TBD**, Chair, Interprofessional education and Practice Committee

**Thomas Benedetti**, Chair, Patient Safety and Quality Committee

**Margaret Gilshannon**, Administrative Director

## ISIS Faculty

### CORE FACULTY MEMBERS

**Adedipe, Adeyinka** — Emergency Medicine

**Davies, Jo** — Anesthesiology

**Fialkow, Michael** — OB/GYN

**Hurley, William** — Emergency Medicine

**Landel, Grace** — MedEx

**Lin, Simon** — Pediatric Dentistry

**Lombaard, Stefan** — Anesthesiology

**McDonough, Karen** — Medicine

**Metzner, Julia** — Anesthesiology

**Souter, Karen** — Anesthesiology

**Taitsman, Lisa** — Orthopaedic and Sports

Medicine

**Varghese, Thomas** — Surgery, Cardiothoracic

**Vitin, Alexander** — Anesthesiology

**Wright, Andrew** — General Surgery

**Wu, Michael** — Ophthalmology

### ADJUNCT FACULTY MEMBERS

**Allan, Christopher** — Orthopaedics and Sports Medicine

**Amies, Anne-Marie** — OB/GYN

**Barei, David** — Orthopaedics and Sports Medicine

**Beard, Mark** — Family Medicine

**Benvenuto, Kris** — Emergency Medicine

**Chapman, Jens** — Orthopaedics and Sports

Medicine

**Dembo, Gregory** — Anesthesiology

**Dunbar, Robert** — Orthopaedics and Sports

Medicine

**Edwards, Thomas** — Anesthesiology

**Ferreira, Manuel** — Neurological Surgery

**Flinger, Corrine** — Pathology

**Friedrich, Jeff** — Surgery

**Hagman, Melissa (Moe)** — Internal Medicine

**Joffe, Aaron** — Anesthesiology

**Kent, Christopher** — Anesthesiology

**Martin, Alexa** — MEDEX

**Morris, Amy** — Pulmonary and Critical Care

**Neff, Margret** — Pulmonary and Critical Care

**O'Connell, Kathy** — OB/GYN

**Payne, John** — Surgery (University of Hawaii)

**Peterson, Gene** — Anesthesiology

**Plitt, Ken** — Anesthesiology

**Reid, Jennifer** — Emergency Medicine (Seattle Children's)

**Rozet, Irene** — Anesthesiology

**Sardesai, Maya** — Otolaryngology

**Sayre, Cindy** — Neurological surgery

**Sekhar, Laligam** — Anesthesiology

**Sivarajan, Gouri** — Anesthesiology

**Sivarajan, Murali** — ENT

**Souders, Jenny** — Anesthesiology

**Stanley, Robert** — ENT

**Starnes, Benjamin** — Surgery, Vascular

**Strandjord, Tom** — Pediatrics (CHRM)

**Trescot, Andrea** — Anesthesiology

**Vater, Youri** — Anesthesiology

**Von Saint Andre, Amelie** — Pediatric ICU

**Wolff, Juvann** — Nursing

**Wong, Karen** — Anesthesiology

**Zaichkin, Jeanette** — Neonatal Outreach

### RESEARCH FACULTY MEMBERS

**Chen, Frederick** — Family Medicine

**Gallagher, Thomas** — Internal Medicine

**Cline, Lauren** — Nursing

**Jense, Ryan** — Anesthesiology

**Lendvay, Thomas** — Pediatric Urology

(Seattle Children's)

**Masuda, David** — Medical Education

**Odegard, Peggy** — Pharmacy

**Shannon, Sarah** — Nursing

**Seehan, Florence** — Cardiology

**Wang, Carolyn** — Radiology

**Whipple, Mark** — Otolaryngology

**Zierler, Brenda** — Nursing

### CVES FACULTY MEMBERS

**Oelschlager, Brent** — Surgery



**FIGURE 3.** Mixed Use Cadaver/Dry Lab at ISIS-HMC



**FIGURE 4.** Orthopaedic surgeons training in the ISIS Cadaver Lab at ISIS-HMC

### C. ISIS FACILITY

UW Medicine ISIS is an umbrella organizational structure. ISIS has, or will have, core training facilities at University of Washington Medical Center (UWMC) (opened 2006), Harborview Medical Center (HMC) (opened 2010), Seattle Children's, and the Veterans Administration Puget Sound Health Care System (VAPSHCS). Furthermore, ISIS has close collaborations with several other regional simulation centers, namely, Madigan Army Medical Center, University of British Columbia, and Oregon Health Sciences University. ISIS, along with UW Medicine's Northwest Hospital and Medical Center's Community Health Education & Simulation Center (CHESC), is also a founding member of the Pacific Northwest Healthcare Simulation Collaborative (PNWHSC), a partnership of simulation centers and industry leaders from across the state.

The UW Medicine ISIS facilities and operations are designed to be as flexible as possible to allow for 80% or greater utilization of classroom and training laboratory capacity. While there are similar features among simulation center facilities, each facility may have unique programmatic features that dictate the needs of the physical plant.

ISIS has 2500 square feet of space in the ambulatory Surgery Pavilion on the first floor of UWMC. The facility has a 425 usable square foot "smart" conference room that

holds 40 people, a full-sized equipped operating theater, a large open room (dry lab) holding approximately 12 low-definition virtual equipment stations, and a small administrative suite. The space is adequate to hold 3,680 hours of virtual OR, team training and crisis management courses annually, and can hold at least two multi-trainee courses simultaneously. The space can be made available 24/7 for independent training opportunities.

ISIS has full use of the Center for Videoendoscopic Surgery lab, a Department of Surgery operated facility of approximately 2000 square feet, which has three rooms on the 6th floor of the UW Health Sciences Building: an animal care (cleaning, shaving, etc.) and pre-anesthetic room; a laboratory that has 4 animal operating bays equipped with state-of-the-art videoendoscopic and anesthesia equipment; and a smaller office with two cubicles for computer work. ISIS-HMC has 8,000 square feet of space on the 3rd floor in the new Ninth and Jefferson Building at Harborview Medical Center. It has a 9-bay mixed use cadaver/dry lab (Figure 3); a second dry lab; a cadaver lab (Figure 4); conference facilities; and a small administrative suite. Seattle Children's is considering another option that will be explored in the future: creating an in situ training opportunity in an actual patient care unit by transporting simulators (e.g., mannequins) to an available unit.



The following principles are considered when building simulation training sites for UW Medicine ISIS:

- Public face (reception), administrative suite, and faculty/staff shared work stations
- Conference facility for a minimum of 40 people (classroom)
- State-of-the-art communication software and cabling
- Virtual operating theater with mirrored window to observation station, control room
- Large flexible multi-purpose room with temporary partitions (dry lab)
- Connections to/from live operating room theater(s)
- Storage, supplies and equipment
- Access to a kitchen facility for guests
- Options: Virtual OR, ICU, ER bay, preferably convertible
- Facilities for animal surgery and/or cadaver surgery capability. A number of additional facility factors need to be taken into consideration, such as refrigeration, staging area, ventilation and cleaning requirements. May also require shielding where radiography may be used.

#### D. ISIS FINANCES

The two most important factors that influence the long-term success of ISIS are a sustainable funding platform for core infrastructure and protected focused faculty effort from a broad representation of UW Medicine and partner colleges and schools, such as Engineering and Nursing.

ISIS facilities are training labs that use inanimate, animal and cadaver models to create training platforms for self-learning and course-based training programs. The core infrastructure is built to encourage use of the facilities through the creation of excellent curricula; coordination and management of self-learning and classroom-based programs; use of the facilities for intra- and extramurally funded research, validation and development projects; and availability of the center for distributed simulation training throughout WWAMI and experimentally, through Second Life virtual worlds. Based on a capacity analysis for UWMC

and the proposed HMC facilities, there are 195,000 total learner hours available; when ISIS is at full capacity (80% utilization), ISIS would provide approximately 160,000 learner hours. The expectation is that intra- and extramurally funded projects will “purchase” facility and core technical faculty and staff resources as appropriate. Additionally, there is a critical basic infrastructure that administers UW Medicine ISIS that cannot rely on project-based funding. It is this infrastructure that requires a form of consistent, reliable funding to ensure the success of UW Medicine ISIS.

UW and UW Medicine leadership have made ISIS a top priority in their conversations with state and federal leaders, key philanthropic and regional and national business partners, and UW Medicine senior leadership. ISIS faculty have submitted competing project proposals to a number of foundations. The ISIS Board and leadership of UW Medicine are confident these efforts will prevail and ISIS will have funding for small and large projects that support its core mission and vision. Intramural funding is also anticipated from multiple UW Medicine constituencies whose core mission aligns with the strategic mission of ISIS and whose constituencies will benefit from the outcomes of ISIS programs and projects, particularly our patients and our trainees.

A second critical factor to ensure the future success of ISIS is to have sufficient protected, focused faculty effort from a broad constituency of UW Medicine and partner colleges and schools. The faculty are the content experts; as such, they are a critical resource to develop curriculum content, provide and evaluate training programs, and develop research and development proposals for future initiatives. It will be incumbent upon the UW Medicine ISIS Board and UW Medicine leadership to build a compelling vision that captures the imagination of faculty leaders and faculty such that there is a groundswell of faculty prepared to include active, focused participation in ISIS into their academic careers. Creative solutions, such as giving credit toward promotion for the development, validation and implementation of specific curriculum, will encourage faculty.

## Summary

In six short years, ISIS has gone from a concept to a robust, multi-institutional, interprofessional educational institute that supports the training of the entire UW Medicine enterprise. However, this is a pivotal transition period for UW Medicine ISIS. ISIS-HMC opened in January 2010; discussions are underway for the program and facility at Seattle Children's. ISIS has initiated training of the first phase of a system-wide central venous line placement simulation training module, and even at this early stage, initial data has returned that allows ISIS to modify and improve this course. It is the first system-wide training initiative based on UW Medicine quality and safety priorities. When initial evaluation is completed, this module will likely form the basis for a national model in system-wide training and assessment. ISIS could be the coordinating body for cross-institutional e-learning and simulation-based

initiatives for the health care delivery system. The governance and infrastructure has senior leadership and operational linkages across the broad spectrum of UW Medicine clinical, research and teaching programs, and has close partnerships with key UW schools and colleges. ISIS will be strengthened by a solid foundation of cross-institutional passionate faculty commitment of effort and by a consistent financing of core operating and facility infrastructure. In the years ahead, the current faculty and staff involved in ISIS are excited about these prospects as we look forward to meeting our mission through the support of the broad UW Medicine constituency, our collaborating UW Colleges and Schools, our close ties with the military and veterans medical centers, and our regional and national partner organizations.

---

## RELATED PUBLICATIONS

1. Awad SS, Fagan SP, Bellows C, Albo D, Green-Rashad B, De la Garza M, Berger DH. Bridging the communication gap in the operating room with medical team training. *Am J Surg* 190:770-774, 2005.
  2. Berg DM, Milner RE, Fisher CA, Goldberg AJ, Dempsey DT, Grewal H. A cost-effective approach to establishing a surgical skills laboratory. *Surgery* 142:712-721, 2007.
  3. Grogan EL, Stiles RA, France DJ, Speroff T, Morris JA Jr, Nixon B, Gaffney FA, Seddon R, Pinson CW. The impact of aviation-based teamwork training on the attitudes of health-care professionals. *J Am Coll Surg* 199:843-848, 2004.
  4. Harrington DR, Roye GD, Ryder BA, Miner TJ, Richardson P, Cioffi WG. A time-cost analysis of teaching a laparoscopic entero-enterostomy. *J Surg Educ* 64:342-345, 2007.
  5. Institute of Medicine. To Err is Human: Building a Safer Health System. Washington, DC: National Academy Press, 2000.
  6. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academy Press, 2001.
  7. Issenberg SB, Scalese RJ. Simulation in health care education. *Perspect Biol Med* 51:31-46, 2008.
  8. MacRae HM, Satterthwaite L, Reznick RK. Setting up a surgical skills center. *World J Surg* 32:189-195, 2008.
  9. Pellegrini CA. Surgical education in the United States: navigating the white waters (2006 ASA Presidential Address). *Ann Surg* 244:335-342, 2006.
  10. Undre SK, Koutantji M, Sevdalis N, Gautama S, Selvapatt N, Williams S, Sains P, McCulloch P, Darzi A, Vincent C. Multidisciplinary crisis simulations: the way forward for training surgical teams. *World J Surg* 31:1843-1853, 2007.
-