CIMIT®
Center for Integration of Medicine & Innovative Technology

Clinical Systems Innovation Program

The Clinical Systems Innovation Program is CIMIT's on-the-ground initiative to improve and advance the systems that support clinical care in real-world healthcare settings. The barriers to delivering and adopting systems innovations in such settings are staggering. Clinical environments are clearly demanding, fast-paced, and complex – and obviously have to be cautious and risk-averse in contemplating any changes in established practice patterns. It is difficult for innovative clinicians to even find the time and mental space to envision future needs, let alone establish partnerships with industrial and academic technology and systems-engineering collaborators, or to find needed funding. They need help to safely experiment with potential innovations while maintaining day-to-day operations. Beyond that, the institutions need help to disseminate the best of the results of specific innovations projects.

The Clinical Systems Innovation (CSI) Program provides clinical champions of change and administrative leadership with the needed support to overcome these barriers. As with other CIMIT programs, CSI has two intertwined elements: funding and facilitation. CIMIT facilitators work closely with project leaders, to ensure the creation and sustenance of multi-disciplinary teams and to catalyze connections with key resources, such as industry partners or academic collaborators or external funding sources, and to maintain project momentum in the face of predictable adversities.

CSI thus advances the process of constructive change, it helps recruit, grow and retain innovative multidisciplinary clinicians, and it raises the technology competency of the institutions. It does so in collaboration, not duplication, of other PHS resources such as I.S. and Connected Health.

The objective of the Clinical Systems Innovation Program is to transform systems of care through the application of enabling technologies within a 2-3 year timeframe. Clinicians, family caregivers or the patients themselves may be responsible for the delivery of care. It may occur at the point of care in the hospital, in the doctor's office, in the community at large or at home. The program also encourages innovation to enable consistent, high quality care as the patient transitions across different care environments.

Specific priority areas include:

- Innovative use of existing or novel point of care technologies enabling frontline providers to solve urgent problems.
- Innovations to enable management and rehabilitation from common conditions or traumatic injury in the home or community
- Innovations to enable consistent care as the patient transitions across multiple care environments.

CSI awards funds to those team projects that promise to address important specific needs of CIMIT healthcare institutions. Preferred projects are those with potential wider impact, if successful, and projects that would not be successful without CIMIT involvement. Submitted applications must have the endorsement of the institution. Grants of up to $100,000 direct cost per year are awarded with a competitive review process. These grants are seed funds to help clinicians and institutions craft novel approaches to implementing a complex new care pathway or to designing a new facility or better process, usually incorporating new technology. Solutions are sought in all environments across the continuum of care from the hospital to the home, as illustrated with specific examples in the diagram below.

CIMIT launched a pioneering initiative in 2002 with the MGH **"Operating Room of the Future"** (ORF) project, with the full support of the institution's clinical and administrative leadership. The ORF is a "living laboratory" that explores new technology platforms and systems of care for performing minimally invasive surgical procedures.

The ORF's programmatic approach has become the model for subsequent CIMIT efforts in other venues. The incorporation of data capture, analysis, and metrics of ROI are key to effectively disseminating the best of systems technologies and innovative patient-care pathways to other PHS facilities, and ultimately to the wider world. Success with the ORF project triggered a multiplier effect, contributing to or leading other pioneering initiatives in other surgical or procedure suites within the Partners Healthcare network, including:

- The **"Advanced Image-Guided Operating" suite (AMIGO)** at the BWH with the goal of integrating information from pre-operative and intraoperative imaging into a single, complete operational therapy delivery system and the **"Brigham Advanced Surgical Innovation Suites" (BASIS)** created as a state-of-the-art surgical laboratory, are examples. Newton Wellesley Hospital is also in the preliminary stages of creating an **NWH OperatingRoom-of-the-Future** environment in a community hospital setting – with broad implications for efficiency of the network as a whole.

- The ORF experience also dramatically demonstrated a new challenge: the current generation of medical devices, designed as stand-alone, proprietary instruments, are very difficult to integrate into an interconnected system. Without interoperability of the countless devices that can "hit" the institution's electronic medical-record network with data, or that require data from the EMR, it will be impossible to fully optimize the efficiency and safety of patient care. The full value of the huge investment in electronic data systems can not be captured without a solution to this challenge. Thus, CIMIT initiated and continues to support a **"Medical Device Plug-and-Play" (MD PnP)** Program within CSI to address this issue on a national level, working with academic, government, industry, and regulatory opinion leaders. It is hitting a resonance with all these stakeholders. Other providers such as Kaiser-Permanente are joining with us in driving this open-source approach forward.

In addition to its "multiplier effect" within surgical environments, the "Of-the-Futures" learning-laboratory model of clinical-systems innovation is spreading to other settings across the continuum of care, with CIMIT support. In 2005, the **MGH Ambulatory Practice of the Future** was launched with the mission of designing the ambulatory care practice that delivers ideal care in the ideal environment to optimize outcomes for patients and satisfaction for clinicians.

The phases of innovation include discovery, design/development, construction, implementation, outcomes measurement and iteration. Establishing and tracking metrics of success is a key component here, as with all CSI initiatives. CIMIT is the key technology collaborator in this important effort, in collaboration with important I.S. efforts from Partners.

Beyond more established multi-year initiatives, such as the Operating Room of the Future or the Ambulatory Practice of the Future, short-term exploratory working groups are also supported by the CSI Program to allow clinicians or healthcare administrators to explore problem areas and/or formulate novel approaches to targeted needs.

The Clinical Systems Innovation Program with its experienced and dedicated team of CIMIT facilitators, is the common denominator knitting this diverse portfolio of projects together. These individuals leverage "lessons learned" across initiatives, interconnecting key resources and enabling platform technologies, such as RFID, modeling and simulation tools, networked sensor solutions, and wireless communication technologies. With this help, each new clinical group need not start at the beginning or re-invent key infrastructure, but can build upon successes and learnings from other projects and teams. Beyond that, CIMIT extracts successes that may have wider application and/or commercial potential, and propagates them with all of its networking, tech-transfer and communications skills.