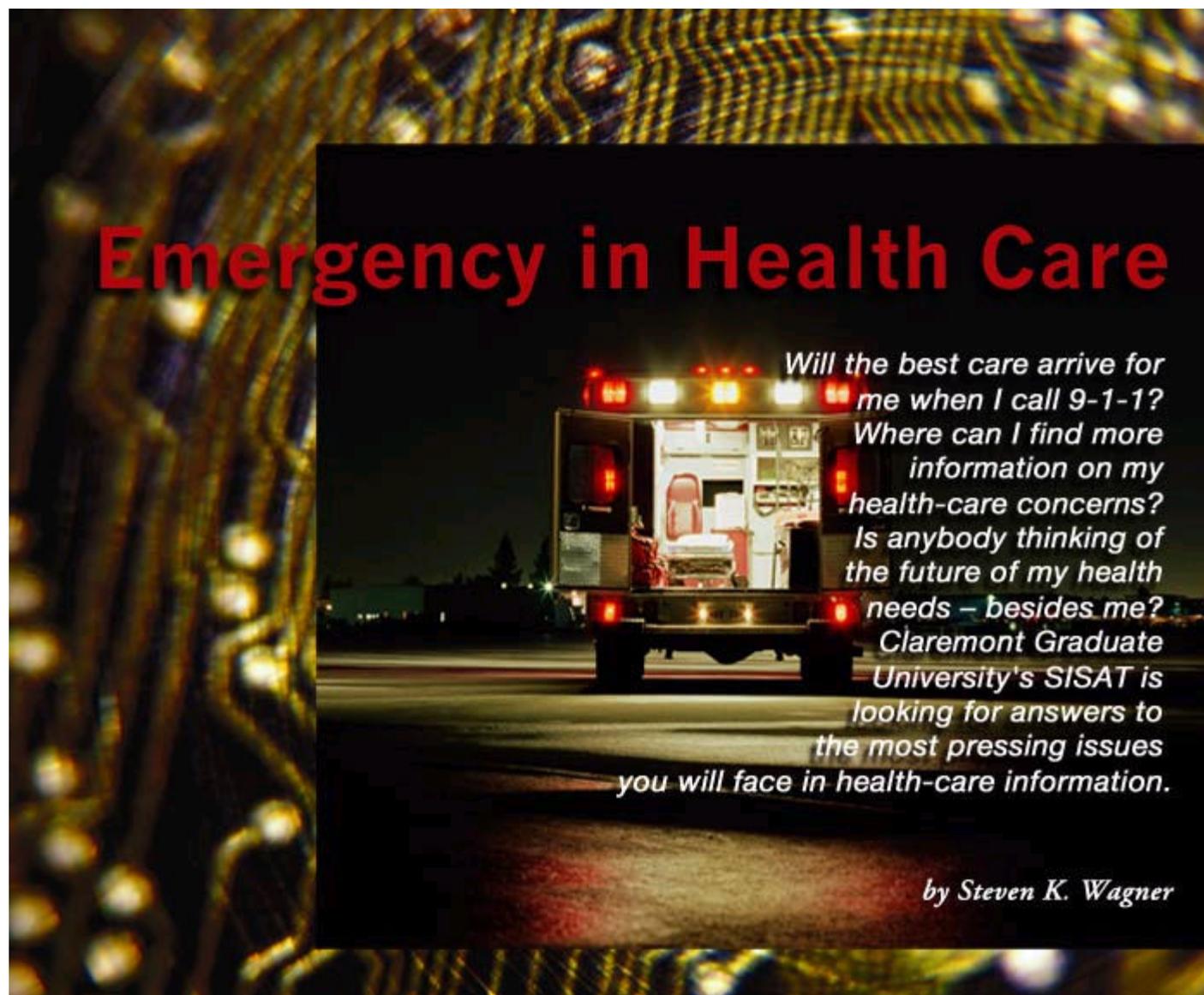


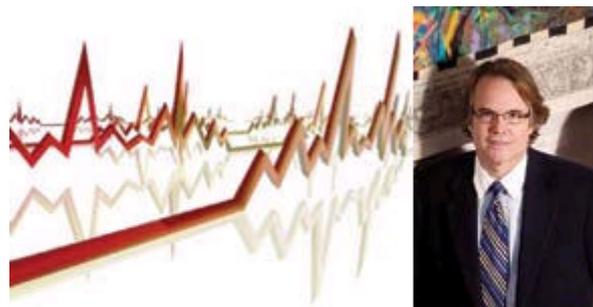
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# Emergency in Health Care

*Will the best care arrive for me when I call 9-1-1? Where can I find more information on my health-care concerns? Is anybody thinking of the future of my health needs – besides me? Claremont Graduate University's SISAT is looking for answers to the most pressing issues you will face in health-care information.*

*by Steven K. Wagner*



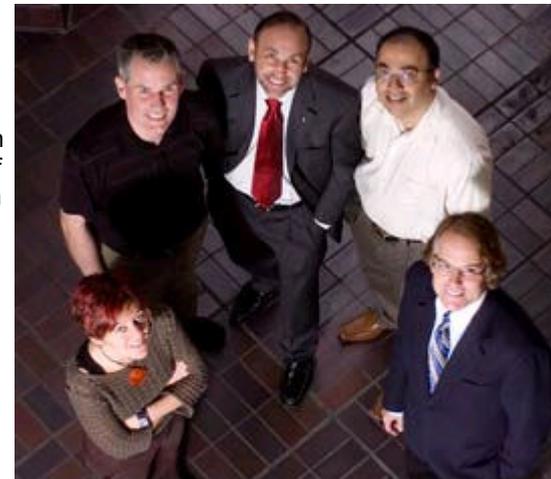
*As Tom Horan was lifted into the ambulance, the irony began sinking in. Moments earlier, a large wave had tossed him into Malibu Beach, leaving Horan with a lacerated head and dislocated shoulder. As witnesses dialed 9-1-1, he was thrust into a world that was strangely familiar to him.*

Indeed, this was more than a dangerous and traumatic event for Horan, associate professor at Claremont Graduate University's School of Information Systems and Technology (SISAT), and executive director of the Claremont Information and Technology Institute. The events that followed both in the ambulance and in the emergency room at a local hospital propelled him into a real-world intersection with the focus of his research: analyzing the role that information technology (IT) can play in making emergency response systems more effective, thus improving health care. Horan was no longer the disengaged researcher studying hypothetical dilemmas—he was the “end-user” in an emergency health-care system that is becoming increasingly infused with, and driven by, information technology.

As the ambulance raced toward the hospital and his head began to clear, Horan began asking important questions—questions that might not have occurred to those not involved in a related study: Why hadn't he been given a pain reliever? Had emergency personnel responded to the 9-1-1 call within their contracted time period? Would his medical records be waiting in the emergency room when the ambulance arrived? Would anyone there be apprised of his injuries as he sped toward the hospital?

To add to the irony, Horan is also beginning a case study evaluating the use of emergency response IT with the world-renowned Mayo Clinic, consistently ranked as one of the country's top medical centers. The study, funded by a grant from the National Science Foundation, will evaluate the implications of effective IT at a major medical center that owns all aspects of an emergency response system, including the dispatch service, emergency medical systems, and the thriving health-care component. That, and other case studies, are expected to culminate in recommendations for improving the use of IT in managing emergency response systems throughout the United States.

“At Mayo we're focused on delivering high-quality health medical care during transport into any medical facility, including our own medical centers,” said Dr. Scott Zietlow, Trauma Surgeon & Medical Director of Medical Mayo Transport, who is collaborating with Horan on the study. “Our research with Claremont provides an important opportunity to take a comprehensive look at how pre-hospital care can be linked to health outcomes, including how well our information systems capture this impact.”



*SISAT Faculty (clockwise from lower left):  
Goudy Leroy, Terry Ryan, Dean Lorne Olfman  
Samir Chatterjee, and Tom Horan*

“We're interested in the whole process, the end-to-end performance—from the time of a 9-1-1 call through dispatch through delivery to the hospital through health care and out the door,” Horan said of their collaboration. “We'd want to understand empirically how timeliness can be improved through IT and the role that information could potentially play in improving quality of care.”

For example, Horan noted, enhanced IT could enable a heart attack patient's electrocardiogram to be sent electronically to the hospital while the ambulance was in transit, expediting care and improving the patient's treatment and chances for recovery. IT also could make a patient's entire medical history available to hospital staff, including the vitally important prescription medication profile, before the ambulance arrived at the emergency department.

The Mayo Clinic study, which will conclude in 2008, follows a similar case study undertaken by Horan to evaluate San Mateo County Emergency Response Services in northern California. That system differs from the Mayo Clinic operation in one distinct way: San Mateo County does not own the various emergency components.

“The timing of [Horan's] research is quite fortuitous, as we are just entering into a strategic planning mode to craft a vision for the next-generation EMS [emergency medical response] system,” said Barbara Pletz, EMS administrator for San Mateo County. She went on to cite the results of the study as “an opportunity to rethink our overall EMS process, and how advances in technology can improve the timeliness and quality of our system.”

"They were so pleased with our work in San Mateo County that they asked us to stay on and help with their strategic planning effort as they redesign their system over the next 10 years," Horan said of the case study, which began in 2006.

Still, the Mayo Clinic study remains Horan's priority. His research will focus on two areas of interest: the role of a patient's personal health record in expediting and improving treatment, and the nature and quality of in-ambulance treatment—treatment that generates data that could be electronically transmitted to the hospital in real time.

"We care about the end-users—patients, consumers, disabled people, the underrepresented—and their use of technology," Horan said. "The question is, how does their ability to gain control of and access to personal health information affect the nature of health-care services and the care they receive as well as their own health management?"

According to Horan, many of the IT challenges that he'll be examining in the context of health care have already been addressed by the banking industry, which now makes user records available online— instantaneously. All that is needed to achieve the same in health care is incentive—financial or otherwise.

A key player in the Mayo Clinic study will be Claremont's Kay Center for E-Health Research, a growing entity in the School of Information Systems and Technology. The Kay Center, which Horan directs, will focus on a number of specific end-user groups, including the disabled and the uninsured. Methodology, some of which will be initiated by the Kay Center, will include focus groups, interviews, national surveys, systems analyses, and pilot programs.

**"...enhanced IT could enable a heart attack patient's electrocardiogram to be sent electronically to the hospital while the ambulance was in transit..."**



Established in January 2006 through a \$1 million gift from the Kay Family Foundation, the Kay Center is charged with conducting national research on development and implementation of e-health systems in the health-care industry, with a focus on preventive health, chronic disease management, and disability determination. Research projects emphasize innovative approaches and varying user perspectives.

The Kay Center's mission is straightforward: to advance scientific understanding and public policy improvements relative to how new electronic health information systems can best incorporate health, chronic disease, and disability needs to enable industry efficiencies and promote the welfare of society.

The scope and objectives of the Kay Center include research, policy impact, and education. In collaboration with various research partners, the center has undertaken research studies, policy forums, and training initiatives focused on bringing the advances of e-health systems to diverse and often underrepresented health-care consumers.

"It's become a national voice," Horan said of the Kay Center. "We're doing things that no one else is doing."

Newer still is the school's recently established master's degree program in health information management (HIM), which kicks off in the fall. The program, which was approved in March, was proposed and developed by SISAT Professor Samir Chatterjee.

"We hope to have about 20 students enrolled for the first term," Chatterjee said. "We want to grow in an orderly fashion due to our internship program—it's very difficult to place 100 students in internships. After our first year we'll scale it up to 40 students and so forth."

HIM, or medical informatics, is a growing interdisciplinary field that prepares specialists to design and manage health-care information systems. The field is specifically concerned with the cognitive, information-processing, and communication tasks involved in health services, using information science and computer-based technology to support these functions.

Recently, a major national effort has been initiated to meet the growing need for HIM professionals. The new degree program is a response to that shortage. It's comprised of 44 credit units, 10 courses, and a mandatory clinical immersion, or practicum project; classes are derived from four interdisciplinary domains: information technology, management, e-health medical informatics, and biostatistics. The clinical immersion project places students in a health-care setting where they will work closely with high-profile health-care providers, such as the VA Greater Los Angeles Healthcare System, the City of Hope, Cedars-Sinai Medical Center, and Kaiser Permanente.

The program is specifically designed for:

- Students who have completed a bachelor's degree and are hoping to enter the health care and IT management fields.
- Mid-level managers who are seeking a career change.
- Individuals with an interest in health and biology research.
- Those involved in a related industry and who want to enter HIM on a part-time basis.
- Consultants for large firms who are entering the HIM sector.
- Entrepreneurs who wish to establish new companies and want to learn how best to manage electronic medical data.

"This is really the first program of its kind in Southern California," Chatterjee said. "There is nothing in this area focusing on the use of information combined with management aspects of health-care information. That's what we believe our niche is."

On the research side, the work of Assistant Professor Gonyer Leroy is elevating the School of Information Systems and Technology in a different way. Leroy is studying the visualization of consumer health information—readability—under a grant from the National Library of Medicine, National Institutes of Health. The study began in 2005 and will continue for at least the next year.

Using WebMD, a popular medical website, Leroy and three students are examining text found online in hopes of developing algorithms that can help users more easily find, understand, and recall information. The project ("**Tools for the End Users**") is focusing on three specific groups: non-native speakers, the elderly, and severely ill patients.

"Each group has specific needs," Leroy said. "The elderly have memory problems, non-native speakers have vocabulary problems, and severely ill patients are stressed and often have memory problems. We're trying to develop prototypes that will help these people."

Specifically, Leroy and her colleagues are evaluating text with high readability—12th grade—requirements. Using their own algorithm, which remains under development, they are categorizing information in what they believe is a topically useful, understandable, and relevant way. The algorithm incorporates word color coding, increased font sizes, and other variables.

"This is very important," Leroy said. "If 85 percent of the American public searches online for information, what's the cost to health care if only one percent makes an incorrect decision? These are the kinds of implications we're thinking about."

Clearly, the School of Information Systems and Technology



is leaving its mark in more ways than one. Just ask SISAT Dean Lorne Olfman, who applauded its many and varied research and educational efforts.

"Our focus on the application of information systems and technology to health care is important because our mission is to be on the cutting edge in designing and applying information systems and technology to important social problems," he said. "Health care is one of the world's most pressing social problems.

"We are now one of the leading programs in health-care informatics in terms of funding, publications and curriculum, and we expect to continue at this high level of achievement. The future certainly looks bright."

With the research and teaching underway at Claremont's School of Information Systems and Technology, the future will certainly be brighter for those of us who may one day find ourselves dialing 9-1-1.