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TALKING POINTS

PhD students develop new healthcare technologies

The College of Engineering and the School of Nursing are forging an unlikely bond to develop new healthcare technologies as boons for both patients and medics.

Doctoral Industrial Engineering student Yi You Mei is designing an electronic "dashboard" device that monitors falls in geriatric patients, while doctoral Nursing student Kavita Radhakrishnan is developing an interactive "telehealth" service that gives bariatric (weight-loss) surgery patients and their healthcare providers around-the-clock access to each other.



The collaborative healthcare projects are the byproduct of an even closer collaboration: the marriage of Michael Hluchyj ('76 B.S. Electrical Engineering) and Theresa Hluchyj (B.S. School of Nursing). It's their fellowship that supports Mei and Radhakrishnan with annual stipends of \$25,000 each.

"Fellows will work on research projects from both disciplines," the Hluchyj Fellowship stipulates, "seeking solutions to real problems in the clinical setting using engineering-based approaches." The payoff is two new inventions.

Mei is designing and implementing an electronic "falls reporting" device for the post acute care system at Jewish Geriatric Services (JGS) in Longmeadow. At first, Mei was interested in providing JGS with the medical version of a digital dashboard, a device used in the business community to provide executives with a personalized desktop portal that incorporates such features as company metrics, charts, trends, stock quotes, voice mail, and e-mail messages.

"My original intent was to create a medical desktop dashboard for JGS," said Mei. "But the nursing facility does not have the technological expertise to use a complicated dashboard, so I had to think smaller."

She decided to focus on what, in effect, is one instrument on a dashboard. It provides nurses with a running electronic record of the falls within the facility. The fall rate for long term care facilities is one or two falls per bed per year. The most likely individuals to fall are those who have fallen before. Nurses need this information to know who is most vulnerable to falls and take preventive measures in the future. It's very important to track this statistic.

Mei's new system will begin automating the current falls reporting paperwork at JGS using existing software (Microsoft SharePoint). She has designed a simple electronic form to collect falls data, one that is user-friendly for the nurses and staff inputting data via computer. The data can then be displayed by a dashboard-type desktop tool.

As Mei explained her goal, "Okay, I said to myself, we should make everybody's job there, from nurses to administrators, easier by converting all the paperwork on patient falls into a user-friendly electronic format."

Meanwhile, Radhakrishnan is working on a telehealth platform that will make life, health, and the pursuit of happiness a lot easier for patients recuperating from bariatric surgery. She has a background as both a telecommunications engineer and a registered nurse that inspired her to invent a new telehealth technology, meaning the delivery of health-related services and information through telecommunications technologies.

"What happens with bariatric surgery is that for about 18 months after the surgery patients are supposed to have a very strict regimen of diet and exercise," said Radhakrishnan about the problem she's addressing. "But they do this now in almost complete isolation. The healthcare providers don't really know if the patients are doing their management, and the patients don't have any regular feedback and encouragement."

Radhakrishnan is working with about 30 post-bariatric-surgery patients from Baystate Health in Springfield to develop a long-distance, health-related communication and information system designed to help them manage their post surgery diet and exercise regimen more effectively and give them direct feedback from actual nurses and doctors. The system she is working on gives providers an inexpensive method of objective measurements to show how the patients are doing. Simultaneously, it gives patients direct email access to their providers, positive feedback, and the feeling that somebody is watching over them.

"Seeing positive results, as this system would provide, is a really good motivator," Radhakrishnan says about her bariatric patients. "The feeling that somebody is calling and checking on them makes the patients know that somebody cares about them and their health."

The Hluchyj fellowship is the glue that holds all this research together. "Before I received this fellowship, I was actually working as a nurse fulltime and going to school fulltime," says Radhakrishnan, who also has a one-year-old baby. "So the fellowship allowed me to drop most of my nursing hours and invest that time in research. I'm hoping to go into teaching and academia, and the Hluchyj has helped me establish academic relationships and establish my research credentials."

Jenna Marquand of the Mechanical and Industrial Engineering Department, as well as Cynthia Jacelon and Joan Roche from the School of Nursing, are serving as faculty advisors for both Mei and Radhakrishnan.

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