Researchers find way to reduce unnecessary lab tests, decrease patient costs by modifying software

November 4 2013

When patients undergo diagnostic lab tests as part of the inpatient admission process, they may wonder why or how physicians choose particular tests. Increasingly, medical professionals are using electronic medical systems that provide lists of lab tests from which medical professionals can choose. Now, a University of Missouri researcher and her colleagues have studied how to modify these lists to ensure health professionals order relevant tests and omit unnecessary lab tests, which could result in better care and reduced costs for patients.

"Ordering numerous lab tests can result in unnecessary testing and can cause physical discomfort and financial stress to patients," said Victoria Shaffer, an assistant professor of health sciences in the MU School of Health Professions. "We found that by changing the way electronic order set lists were designed, we could significantly alter both the number and quality of lab tests ordered by clinicians."

Shaffer and her research team studied how physicians selected lab tests using three order set list designs on the same electronic medical system. The first order set list design was an opt-in version in which no lab tests were pre-selected; this is the standard method of lab test ordering in electronic health records for most healthcare facilities. A second option was an opt-out version in which physicians had to de-select lab tests they believed were not clinically relevant. In the third design, only a few tests were pre-selected based on recommendations by pediatric experts. On

average, clinicians ordered three more tests when using the opt-out version than the opt-in or recommended versions. However, providers ordered more tests recommended by the pediatric experts when using the recommended design than when using the opt-in design.

"Essentially we found that including default selections, either with the opt-out method or the recommended method, increased the quality of lab tests the clinicians ordered. That is, clinicians ordered more tests recommended by pediatric experts with these methods," Shaffer said. "However, there were costs associated with using these approaches. Use of the opt-out method costs about $71 more per patient. Using a set of recommended defaults keeps costs down but requires consensus about which tests to set as defaults."

Shaffer, who also is an assistant professor of psychological sciences in the MU College of Arts and Science, believes that to further improve medical software and create the best end product, information technology (IT) experts who design the software should collaborate with experts who study how people interact with technology and medical professionals who would use the software.

"Problems with these software systems often occur because IT experts design the software with minimal input from the people who use it," Shaffer said. "IT experts and medical professionals should work together to design these systems to reach optimal performance, which results in the best care for patients. A wide variety of methods exist that could improve medical lab test ordering software and would ensure that only the most appropriate, relevant lab tests for patients are ordered while saving money in the long run."

Shaffer partnered with Adam Probst from Baylor Scott & White Health and Raymond Chan from Children's Mercy Hospitals and Clinics in Kansas City, Mo. Their study was published in *Health Psychology*.

Provided by University of Missouri-Columbia