

Health Information Technologies Associated With Better Outcomes, Lower Costs

CHICAGO—Patients at Texas hospitals that have automated some aspects of their health information systems appear to have fewer complications, lower death rates and reduced costs, according to a report in the January 26 issue of *Archives of Internal Medicine*, one of the *JAMA/Archives* journals.

"In recent years, American health care has been criticized as fragmented, expensive, unsafe and unfair," the authors write as background information in the article. "Clinical or 'health' information technologies, such as electronic medical records, computerized provider order entry systems and clinical decision support systems, have emerged as one antidote, promising reductions in waste, gains in communication, improvements in quality and new accountabilities through automated performance measurement." A hospital's clinical information system can be divided into four categories, the authors note: medical notes and records, test results, order entry (instructions for the treatment of patients) and decision support (programs that assist physicians and other providers with decision-making tasks).

Ruben Amarasingham, M.D., M.B.A., of Parkland Health & Hospital System and University of Texas Southwestern Medical Center, Dallas, and colleagues compared urban hospitals in Texas using a tool that measures physicians' interactions with the information system. Physicians from 41 hospitals rated their facilities' automation in each of the four areas in surveys taken in 2005 and 2006. The researchers then examined rates of inpatient death, complications, costs and length of stay for 167,233 patients older than 50 who were admitted to these hospitals for a variety of conditions during the same timeframe.

For all of the medical conditions studied, increased automation of notes and records was associated with a 15-percent decrease in the odds of in-hospital death. At hospitals with higher order entry scores, those with myocardial infarction (heart attack) had 9 percent lower odds of death and those undergoing coronary artery bypass graft had 55 percent lower odds of death. Patients with all causes of hospitalization had 16 percent lower odds of developing complications at hospitals whose decision support systems were highly automated. "Higher scores on test results, order entry and decision support were associated with lower costs for all hospital admissions (-\$110, -\$132 and -\$538, respectively)," the authors write.

"Prior reports have suggested that decision support helps health care providers manage large amounts of incoming data, provides context for decision making in light of guidelines and may help physicians avoid 'sins of omission,' reputed by some authors to be the largest source of medical errors," they continue. "Knowledge aids provided in this fashion could reduce the risk of complications and possibly death, providing a theoretical basis for the association we observed."

"Clinical information technologies hold great promise as a tool to improve hospital medicine," they conclude. "We found that, for certain conditions, greater automation of a hospital's information system may be associated with reductions in mortality [death], complications and costs, suggesting that information technologies that are properly designed and executed around clinical workflows could meet that promise."