

Rapid surgical innovation puts patients at risk for medical errors

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Kellogg Parsons, MD, surgical oncologist at the UC San Diego Health System.
Credit: UC San Diego School of Medicine

Researchers at the University of California, San Diego School of Medicine have found that the risk of patient harm increased two-fold in 2006 – the peak year that teaching hospitals nationwide embraced the pursuit of minimally invasive robotic surgery for prostate cancer. Results of the study are published in the July 2 online issue of *JAMA Surgery*.

"This study looked at the stages of innovation and how the rapid adoption of a new surgical technology—in this case, a surgical robotic system—can lead to adverse events for patients," said Kellogg Parsons, MD, MHS, surgical oncologist, UC San Diego Health System and first author of the paper. "There is a real need for standardized training programs, rules governing surgeon competence and credentialing, and guidelines for hospital privileging when novel technologies reach the operating rooms of teaching and community hospitals."

In 2003, there were an estimated 617 minimally invasive robotic prostatectomies (MIRPs) performed in the United States. By 2009, this number increased to 37,753 procedures. In 2005, patients were twice as likely to experience an adverse event if they were undergoing MIRPs compared to a traditional open surgical procedure. The following year – was considered the tipping point for the adoption of MIRP when it equaled or exceeded 10 percent of all cases.

"The trend observed here is not new to [robotic surgery](#). The same phenomena occurred with the move to minimally invasive approaches to gallbladder and kidney surgeries, both surgeries that are now well documented to improve safety and outcomes," said Christopher Kane, MD, professor of surgery and interim chair of the Department of Surgery, UC San Diego School of Medicine, who was not involved with the study. "Whenever a new technology is adopted there is a temporary period where there may be an increased risk to the patient. This can be reduced by extensive surgical training, vigorous credentialing standards and extended mentorship by experienced surgeons. This report should encourage the adoption of more rigorous credentialing standards proposed by professional organizations rather than by individual hospitals."

Kane added that robotic prostatectomy by experienced surgeons has proven to be beneficial to the patient with less blood loss, reduced infections and shorter hospital stays.

"A responsibility of deploying a surgical technology should include the responsibility to monitor it as it diffuses throughout the real world to ensure safety," said David C. Chang, PhD, MPH, MBA, director of Outcomes Research at UC San Diego School of Medicine and the paper's senior author. "Surveillance of surgical safety should be ongoing, much like the Centers for Disease Control monitor changes in trends of infectious diseases across the country."

The UC San Diego team used Patient Safety Indicators, developed by the Agency for Healthcare Research and Quality (AHRQ), to develop a nationwide data sample to analyze surgical provider performance and potential in-hospital adverse events from 2003-2009. Data for the prevalence of robotic prostatectomy was pulled from AHRQ and compared to published data from Intuitive Surgical Inc., the manufacturer of the da Vinci robotic system.

"One potential intervention would be the development of standardized training and credentialing programs, much like the aviation industry requires of flight crews inexperienced with new types of aircraft," said Parsons, who is also an associate professor of surgery at UC San Diego School of Medicine. "An independent, continuously updated tracking system for the adoption of new surgical technology is also essential. Prior estimates of [robotic prostatectomy](#) uptake, provided exclusively by the robot manufacturer, substantially overestimated the speed with which it was adopted by the surgical community."

Provided by University of California - San Diego

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