

Complications are not best predictor of hospital mortality

September 30 2009



John D. Birkmeyer, M.D., is a professor of surgery and chair of surgical outcomes research at University of Michigan Medical School. Credit: Copyright University of Michigan Health System. Used with permission

A compelling University of Michigan Health System study debunks assumptions about the role of complications in distinguishing good and bad hospitals.

The report in Thursday's <u>New England Journal of Medicine</u> confirms that serious <u>complications</u> are common after major <u>surgery</u> - about 1 in 6 patients - but the study shows what drives <u>hospital</u> mortality is failure to rescue.



Low mortality hospitals have medical teams with the ability to rescue patients by recognizing and heading off potentially catastrophic complications such as deep wound infections, pneumonia, kidney failure, blood clots, and strokes.

In spite of similar patterns of complications, patients at high mortality hospitals are nearly twice as likely to die after developing a serious postsurgical complication, according to the study.

It's a new view of what defines the safest hospitals for surgery.

"The general assumption has been that high mortality hospitals simply have higher complication rates. We were quite surprised to find that that's not true," says study author John D. Birkmeyer, M.D., professor of surgery and chair of surgical outcomes research at U-M Medical School.

Birkmeyer worked with U-M surgery resident Amir A. Ghaferi, M.D., the paper's first author, and Justin B. Dimick, M.D., M.P.H, assistant professor of surgery at U-M Medical School.

"Our finding was what distinguishes high quality hospitals and low quality hospitals is how proficient they are at rescuing people once a complication has happened," he says.

The study used data on 84,730 patients undergoing general and vascular surgery at 186 hospitals participating in the American College of Surgeons - National Surgical Quality Improvement Program.

"The findings give us a much better sense about where we should be looking if we hope to reduce hospital mortality rates with surgery," says Birkmeyer, the George D. Zuidema Professor of Surgery at U-M. "Rather than focusing only on what the surgeon does in the operating room, we need to focus on what's happening on the wards and in the



intensive care unit afterward."

The mortality rate at hospitals varied dramatically from 3.5 percent at the best hospitals to 6.9 percent at the very high mortality hospitals.

But there was not much difference in how many complications happened at these hospitals. Very high and very low mortality hospitals had similar rates of major complications - 18.2 percent vs. 16.2 percent.

But at low mortality hospitals only 12.5 percent of patients died from those complications, while at high mortality hospitals 21.4 percent of patients died.

The study found similar patterns in the outcomes of specific complications. For example, very high mortality hospitals had similar rates of postoperative bleeding compared to other hospitals, but patients were 50 percent more likely to die if bleeding occurred.

"We have a number of hypotheses about why some hospitals may be better than others in rescuing patients," says Birkmeyer, who is also director of adult bariatric surgery at U-M Health System. "Early recognition of a potential problem is crucial and may be related to the quality and quantity of nursing staff and relationships among team members -- for example, whether nurses are afraid to call the doctor at night."

Hospitals performing high risk surgery should have adequate resources for ensuring timely and effective treatment once complications are recognized.

"Those hospitals should have doctors in house after hours, rapid response teams, and surgical ICUs managed by board certified intensivists," says co-author Dimick.



Although variation in hospital outcomes with surgery has long been recognized, the study sheds new light on why hospitals have lower <u>mortality</u> than others.

"Our study was not designed to identify the 'silver bullet' underlying why some hospitals are more successful than others in rescuing people after surgical complications. However, a patient in need of a major operation should be thoughtful about choosing where and by whom their surgery is performed," Birkmeyer says.

More information: New England Journal of Medicine, Vol. 361, No. 14, Oct. 1, 2009

Source: University of Michigan (<u>news</u> : <u>web</u>)

Citation: Complications are not best predictor of hospital mortality (2009, September 30) retrieved 28 April 2024 from <u>https://medicalxpress.com/news/2009-09-complications-predictor-hospital-mortality.html</u>

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