

Researchers have found little or no 'July effect' in the field of neurosurgery

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The 'July effect' is the theory that more medical and surgical errors, and, consequently, greater levels of morbidity and mortality occur during July, the month during which fourth year medical students become interns and residents advance to higher levels of training where they face greater challenges and more responsibility.

There is debate as to whether the July effect exists in neurosurgery and, if so, to what extent. Some studies have found that it may apply to specific disorders or groups of patients, and others that it doesn't appear to exist at all. To obtain a more comprehensive answer, researchers from Columbia University, New York University, and the University of Pittsburgh decided to test whether the July effect exists in adult patients treated by neurosurgeons. The findings are published in the article "Assessment of the 'July Effect': outcomes after early resident transition in adult neurosurgery," by Bryan A. Lieber, MD, and colleagues, published today online, ahead of print, in the *Journal of Neurosurgery*.

The authors examined data from neurosurgical cases, managed between 2006 and 2012, in which information on resident participation was included. These included 16,343 cases managed in [academic medical centers](#), where residents were part of the surgical team, and 20,792 cases managed at community-based hospitals, where no residents were involved. The data were obtained from one of the largest prospective medical databases—the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database—which contains data on 30-day morbidity and mortality as well as a wide variety of other

postoperative outcomes. The authors focused on adult neurosurgery as a whole as well as on four neurosurgical patient populations: those undergoing spine surgery, cranial surgery, open vascular surgery, and subarachnoid hemorrhage.

The 12-month academic training year was broken down into four quarters, and data on neurosurgical patients who were treated during the first quarter (Q1: July through September) were compared with data on neurosurgical patients treated during the fourth quarter (Q4: April through June) to assess whether there were significant differences in [postoperative complications](#) or deaths between the two time periods. Quarters were used because the ACS NSQIP database does not provide monthly totals. Q1 is the period in which interns and residents begin to take on new challenges and responsibilities; it is during this period that a July effect, if present, would be found. By Q4, interns and residents have spent most of the year dealing with and learning from these challenges and responsibilities, and will soon advance to a higher level of training. Different levels of surgical training were examined: intern (post-graduate year [PGY] 1); junior resident (PGY 2 through 4); senior or chief resident (PGY 5 through 7); and fellow (training that goes beyond residency).

The authors looked at postoperative patient mortality and morbidity ([complications](#)) during the 30-day period following surgery. Complications were broken down into medical complications (such as pneumonia, stroke, and deep venous thrombosis) and surgical complications (such as surgical site infections and bleeding that required transfusion); they were also broken down into mild complications (such as superficial wound infections) and severe complications (such as strokes and heart attacks). In addition, the authors examined factors related to efficiency, such as the duration of surgery and length of the entire hospital stay.

In general, the overall results showed no significant differences in neurosurgical patient outcomes in academic medical centers between Q1 and Q4 with respect to mortality, medical complications, or mild complications. The authors report no clear evidence for decreased efficiency during Q1, as compared with Q4.

The authors looked at postoperative mortality and complications among neurosurgical patients treated at community-based hospitals for the same yearly quarters. They found no significant differences in mortality or complications between Q1 and Q4.

When the four neurosurgical patient populations were examined, the authors found no significant differences in mortality or morbidity between Q1 and Q4. When the various levels of neurosurgical training were stratified, the authors found no significant differences between Q1 and Q4 with respect to patient mortality, [medical complications](#), or mild complications. However, they did find an increase in the rate of [surgical complications](#) during Q1 for cases involving junior resident participation (8.7% vs. 6.9% in Q4, $p = 0.04$), which they attribute to a modest (1.58%) increase in transfusions, and an increase in the rate of repeated operations (2.19% vs. 1.73% in Q4, p

Based on their own clinical experiences, the authors note that the July transition period is 'fraught with clinical challenges.' Nevertheless, they state that overall their findings show "no clear evidence for an increase in rates of morbidity or mortality during this transition period" (Q1). In fact, they continue, "if there is a July Effect, the effect size is probably too small to detect." Based on the results of this study, the researchers infer that neurosurgery as a field has been successful in guiding trainees during this critical and challenging period.

"With the emphasis on quality of care in current U.S. healthcare reform, our findings are reassuring," says the corresponding author, Blake E. S.

Taylor, a Columbia University medical student, "as it appears that neurosurgical training programs are providing residents with excellent clinical and surgical education without compromising patient care."

More information: ES Jr. Assessment of the 'July Effect': outcomes after early resident transition in adult neurosurgery. *Journal of Neurosurgery*, published online, ahead of print, Dec. 15, 2015; [DOI: 10.3171/2015.4.JNS142149](https://doi.org/10.3171/2015.4.JNS142149)

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