

## Analysis of 3,298 Consecutive Neurosurgical Cases Demonstrates that Overlapping Surgery has no Adverse Effect on Patient Outcome

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### Introduction

Overlapping surgery is commonly practiced. However, a dearth of evidence exists to support or refute the safety of overlapping surgery. We endeavored to determine whether overlapping surgery is associated worsened morbidity and mortality in a large series of complex, neurosurgical cases.

### Methods

A retrospective cohort study was completed for all patients who underwent neurosurgical procedures at Emory University Hospital between January 1, 2014 and December 31, 2015. Logistic regression models were executed to compare outcomes for overlapping and nonoverlapping surgery. Investigators were blinded to study cohorts during data collection and analysis. Patients were operated on for pathologies across the spectrum of neurosurgical disorders in 3298 included cases. The primary outcome measures were 90-day postoperative mortality and morbidity.

### Results

Of 3298 operations, 1518 (46%) were nonoverlapping while 1780 (54%) were overlapping. The mean age was similar across study groups. The majority of the cohort was female (54% vs. 46%). Patients who underwent overlapping surgery were more likely to be female (56% vs 44%,  $p=0.002$ ). The distribution of American Association of Anesthesiologists Score was similar between overlapping and nonoverlapping surgery cohorts. Median (IQR) surgical times, in-room and skin-to-skin, were significantly longer for overlapping surgery (203[153.8] vs 173[148.3];  $p<0.001$  and 125[130] vs 98[120];  $p=0.002$ ) than nonoverlapping surgery. Overlapping surgery was more frequently elective (91.3% vs 84.3%;  $p<0.001$ ). Regression analysis failed to demonstrate a correlation between overlapping surgery and complications such as mortality, any or severe morbidity or unplanned readmission. Measures of baseline severity of illness, such as ASA>3 and emergent surgery, or complexity of surgery, such as the presence of a co-surgeon associated with mortality, overall and severe morbidity, unfavorable discharge location and functional status, both at discharge and follow-up (OdR>1, CI>1 for all).

### Conclusions

These data indicated that overlapping surgery can be safely performed if appropriate safety precautions and patient selection are followed.

### Learning Objectives

Understand factors associated with outcome measures related to overlapping surgery.