Time to Wake Up: Anesthesia Handoffs During Glioma Surgery are Associated with Delayed Perioperative Assessments

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Introduction

Inappropriate and frequent handoffs are a major cause of both medical and surgical errors. Intraoperative anesthesia handoffs may be associated with a higher risk of poor postoperative outcomes including longer lengths of stay (LOS), longer intubation times, and morbidity. Therefore, we sought to clarify the association between the number of anesthesia handoffs and perioperative outcomes.

Methods

We prospectively collected perioperative data on patients undergoing elective surgery for supratentorial gliomas from a single surgeon and a tertiary referral center from 2012-2017 (n=409), Anesthesia handoffs were dichotomized into Attending and Non-Attending Provider (NAP) ie. CRNA or resident) handoffs. The primary outcomes were 30-day readmission and mortality, LOS, time to neurological exam and extubation. Secondary outcomes were intraoperative hemodynamic deviations (hypoxic time, hypertensive time). Logistical regression models were used to examine the relationship of handoffs and morbidity. Cox proportional hazard models were used to assess the relationship between handoffs and temporal outcome variables while controlling for surgery duration, ASA score, blood loss, infusion volume, tumor histology, total anesthetic, etc.

Results

Of the 409 patients, mean (SD) age was 56.4 (16.6) and 48% (n=197) were female. Median surgical duration was 188 minutes (interquartile [IQR] range: 126.2-254.1). The 30-day mortality rate was 1.2%. 154 (37.7%) patients had more than one NAP handoff. Multiple thresholds were identified with a provider-dependent relationship of remaining intubated: NAP>=1 (HR: 0.28 [95CI:0.001-0.65]), NAP>=2 (HR: 0.3 [95CI 0.002-0.85]) and NAPs>=4-6 (HR:0.023 [95CI: 0.001:0.57]). NAPs >=4 were associated with a prolonged postoperative neurological assessment (HR:0.07[95CI:0.006-0.86). No association between NAPs and 30-day readmission or death.

Conclusions

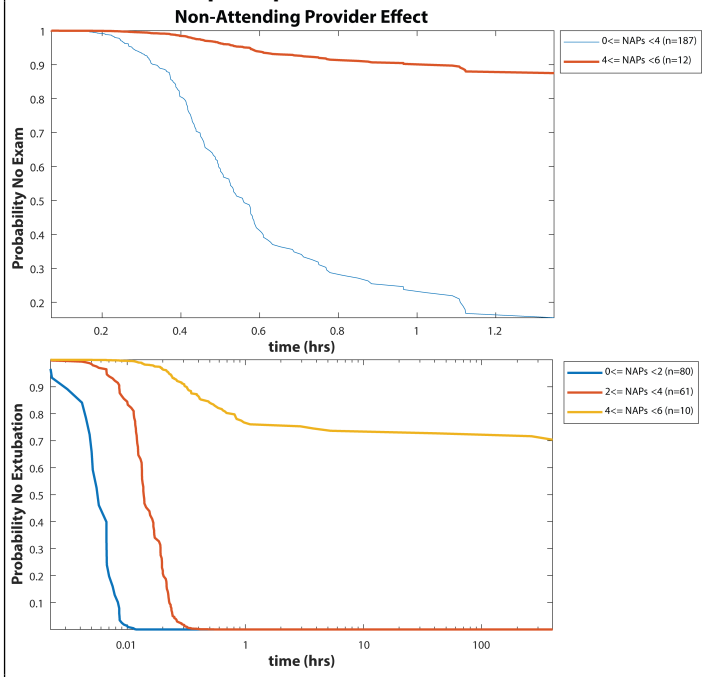
Frequent NAP handoffs are associated with prolonged extubations and delated perioperative assessments, although not related to higher morbidity/mortality rates. Implementation of a formal handoff system within anesthesia providers may reduce time to postoperative neurological assessment and potentially reduce associated hospital costs and patient morbidity.

Learning Objectives

Frequent anesthesia handoffs may delay patient extubation and postoperative neurological assessments.

Decreasing anesthesia handoffs may prevent medical errors and expedite neurosurgical assessments.

Effect of Anesthesia provider handoffs and perioperative outcomes



Effect of Anesthesia provider handoffs and time to neurological exam/extubation. NAP=non-attending providers (CRNAs or residents).

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