OBJECTIVE: We hypothesized that IONM-Anesthesiologist team communication can improve anesthetic care and patient safety. This communication has not yet been studied. We carried out a retrospective review of IONM quality assurance data to determine how signal changes in IONM modalities were communicated to the anesthesia providers and the qualitative outcomes of these interactions.

METHODS: After institutional review board approval this retrospective descriptive study we collected all the patients’ electronic anesthesia and IONM records from May 2010 through February 2015 from both institutions. Inclusion criteria for the study were the patients whose QA documents were marked for having issued a notification or an alert to the anesthesiologists. Alerts and notifications that were conveyed to surgical or other service providers in the operation theater were excluded from the study.

Alerts were defined as significant changes in the IONM signals that warranted an immediate intervention by the anesthesia teams. Notifications were defined as formal intimation of abnormal changes in the signals that did not constitute an alert, but if neglected could lead to deterioration in the perioperative condition of the patient undergoing surgery.

A communiqué between a member of the IONM team and anesthesia providers was defined as any instance that led to the IONM team calling out to the anesthesia provider about a substantial change in the IONM signals. This call-out occurs once surgical or mechanical causes have been ruled out.

RESULTS: In total, we accessed and retrieved IONM and anesthesia records of 3,112 patients who underwent surgical procedures (1480 from the pediatric hospital and 1632 from the adult hospital) from May 2010 to Feb 2015. Out of the 3,112 records analyzed, we noted 1019 (32.74%) events of communiqués either to the surgical or anesthesia teams. Of these, 358 (34.05%) instances of communiqués in the form of notifications and alerts were shared with the anesthesia providers. A total of 11 alerts that pertained to persistent burst suppression were issued to anesthesia providers. In all 11 cases, anesthesia providers acknowledged the alerts and took corrective measures. Changes in the infusion regimens of TIVA were implemented in all and led to the resolution of the problem in 10 (90.90%) patients. In one elderly patient undergoing a craniotomy, the EEG remained in burst suppression despite the anesthetic intervention. Of the 11 alerts, five (54.45%), four (36.36%), and two (18.18%) were issued for patients undergoing spine corrective surgery, craniotomies, and other procedures (carotid endarterectomy and lower limb salvage surgery), respectively.

A total of 347 notifications issued to anesthesia providers (Table 1), of which 276 (79.54%) resolved, while 71 (20.46%) persisted after interaction with the anesthesia providers. Of these, 268 (77.23%) notifications pertained to EEG signal changes. Ninety-seven (36.2%) notifications were related to intracranial surgeries, while 145 (54.1%) and 26 (9.7%) were issued in spinal and miscellaneous surgeries, respectively. Anesthesia records indicated that an immediate change in the anesthetic drug administration was made in all the cases. One hundred and seventy-eight (66.42%) EEG notifications reflected deeper planes of anesthesia or patients going in to burst suppression. Ninety (33.48%) notifications were also issued when the EEG signal frequency or EEG spectral index increased, indicating that the patients were enduring lighter planes of anesthesia.

Three SSEP notifications issued to anesthesia providers were related to mal-positioning of an extremity and one (2.94%) with extravasation of intravenous fluid in the limb. All four of these issues were resolved after anesthesia providers took corrective actions.

CONCLUSION: Given the importance of team performance in patient safety and understanding, communicating the factors affecting IONM modalities has assumed a greater level of importance. Effective communication and adoption of standardized tools and behaviors is essential for the delivery of high-quality, safe patient care especially during the critical situations that arise when neuromonitoring signals are severely compromised. Continuous EEG and SSEP monitoring stands out as a useful real-time adjunct to help anesthesiologists adjust their anesthetic dosing and reduce positional nerve injury. Anesthesia providers can gather important information from the unprocessed EEG and SSEP monitoring. Efforts to educate anesthesia teams about neuromonitoring modalities and improve communication with the neuromonitoring team should proceed in tandem with advances in neuromonitoring technology.

References: