Tracheal extubation performed in the Post-Anesthesia Care Unit after adenotonsillectomy safely decreases anesthesia time and improves OR efficiency.

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Background
Historically, anesthesia occurs within the walls of the operating room (OR) and recovery occurs in the post anesthesia care unit (PACU). At Children’s Hospital of Michigan (CHM), the anesthesia department extends anesthesia workflow into the PACU which allows routine emergence and tracheal extubation in this area. CHM utilizes PACU nursing staff with specialized airway training supervised by the Anesthesia Department. The location for extubation is always based on the anesthesiologist’s discretion but we believe when medically appropriate that PACU extubation can facilitate OR turn over and provide improved patient throughput and potential cost savings. Every minute of OR time costs $62. (3) In our opinion, PACU extubation can increase OR efficiency, provide improved utilization of staff, and decrease idle OR time.

Results
A review of 600 charts revealed that tracheal extubation occurred in PACU nearly 3 times as often compared to in the operating room. Patients extubated in the PACU tended to be slightly younger and weighed slightly less as compared to the patients extubated within the OR. Surgical and PACU times were similar between the groups. Anesthesia time in the operating room was significantly reduced in the PACU extubation group compared to the OR extubation group (63 min vs. 56 min p=0.001). Use of bronchodilators were not significantly different between groups with no adverse outcomes in either group.

Design
Retrospective cohort analysis of approximately 600 adenotonsillectomy (T&A) patient charts were examined from January 2014 to December 2015 at CHM. Data collected include age; gender; start and stop times of anesthesia, surgery, PACU; extubation location and time, need for bronchodilators. Adverse outcomes were also reviewed including reintubation, post operative ventilation, or non-invasive post operative assisted ventilation.

Discussion
Extending the anesthesia workflow into the PACU can be a safe and effective method to decrease anesthesia time and improve efficiency in the OR. The time saved allows for the OR turnover process to begin in parallel and allows for setup for the next case as the previous patient emerges in the PACU. This can be done without increasing complications or adverse outcomes. Moreover, other factors that may delay emergence from anesthesia, such as inexperienced trainee involvement (5), polypharmacy (6) or electronic charting time (7) can be minimized when exiting the OR does not depend on tracheal extubation. We believe that the impact of delayed emergence can be mitigated when exiting the OR no longer depends on readiness for tracheal extubation. One could argue that not rushing tracheal extubation but rather transporting to the PACU with a secure airway may in fact decrease airway events. Few articles have been published regarding the PACU extubation, however Lucier presents a case study of a "typical" patient that presents for PACU extubation. At CHM, an average time saving of 7 minutes translates to a cost savings of $434 per case. In a busy otolaryngology operating room the time saved per case could allow an additional T&A to be scheduled with additional surgical revenue by extending workflow into the PACU. . At Children’s Hospital of Michigan, we believe that PACU extubation and emergence is safe and potentially cost-saving and this is which is why we set out to collect this important and impactful data.

Limitations
As a retrospective study, chart documentation may not capture subtle differences and minor events that could influence interpretation of data. Highly skilled PACU RN staff may make our setting unique and difficult to replicate.

References