Background

Given that the average time for a child to desaturate after apnea ranges between 3.5 and 8 minutes depending on age (1), the transport of a postoperative pediatric patient from the operating room (OR) to the post anesthetic care unit (PACU) represents a period of increased risk for patient harm. In a study of postoperative pediatric surgical patients, Coté showed that pulse oximetry detected hypoxemia faster than clinical observation alone (2).

Correspondence with 10 academic pediatric hospitals revealed that only one used pulse oximetry routinely for every OR to PACU transfer. Pre-Intervention data at LPCH suggested that clinically significant hypoxemia occurred approximately once per week without routine pulse oximetry. The present study reports the frequency of hypoxemia after implementation of oximeters as a standard monitor during transport of patients to PACU.

Methods

Pre-Implementation:
- PACU nurses recorded episodes of hypoxemia on arrival to the PACU via the hospital’s serious safety reporting system.
- 23 patients were audited to identify use of a portable pulse oximeter and record the duration of time the patient was unmonitored between OR and PACU.

Implementation:
- Pulse oximeters were initiated for all transfers from the LPCH ORs to the PACU. Potential barriers and solutions were identified prior to implementation. The perioperative team was educated on the rationale of the intervention and the new processes.

Post-Implementation:
- 23 cases were audited. Compliance to pulse oximeter use and the duration the patient was unmonitored during transport were tracked.
- PACU nurses recorded episodes of hypoxemia.

Results

- Use of oxygen monitors during transport from the pre to post-implementation phase increased from 0% to 100% (p<.0001).
- Time unmonitored decreased significantly from a mean time of 288 sec [102 sec] to 23 sec [26 sec] (p<.0001) (Fig 1).
- Six episodes of hypoxemia on arrival to the PACU were identified in pre-intervention phase, and none in the post-intervention period.
- Hypoxemic events dropped from 6 per 506 PACU admissions to 0 per 597 admissions, p = .009.

Discussion

- Standard pulse oximeter use when transferring a patient from the OR to the PACU significantly reduced the amount of time a patient was unmonitored during the immediate postoperative period, and reduced the incidence of hypoxemia on arrival to the PACU.
- By decreasing average unmonitored transport time from almost five minutes to less than 30 seconds, we decreased the possibility of unobserved desaturations prior to PACU arrival.
- Reasons for sustained improvement include the build of an effective and standard process for procurement and availability of oximeters, and ubiquitous commitment due to multidisciplinary involvement in build and tracking of the intervention.
- The routine use of portable oxygen monitoring when transferring patients from the OR to the PACU is a low-cost, non-invasive safety measure that should be considered at any institution performing pediatric general anesthesia.

Figure 1: The average time that oxygen saturation was unmonitored during patient transport from OR to PACU after implementation of routine portable pulse oximetry monitoring decreased from 288 seconds to 23 seconds (p<.0001).

References