A Low-Cost and Novel App for Improving Anesthesia Operating Room Equipment Supply

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Background: Pediatric anesthesiologists are dependent on the immediate availability of specialized drugs and equipment for urgent and regular patient care. Commonly used equipment and drugs are kept in an anesthesia cart in the operating room. The non-availability of these items may erode efficiency, result in delays of cases, negatively impact the work environment and lead to unsafe delivery of patient care.

At our institution, missing items in the anesthesia cart were traditionally documented on paper for later review. There was poor uptake of the paper reporting. Our project created a low-cost app to be used for real-time tracking of bedside equipment shortages. This would assist us in identifying the scope and patterns of shortages and inform recommendations to each respective group (anesthesiologists, nurses, attendendants, administration) on how to mitigate and manage any ongoing supply issues.

In October 2015, the app was made available on mobile phones and desktop computers for reporting and tracking anesthesia supply shortages. The app sent out an SMS alert to the attendants for immediate re-supply.

Methods: Following institutional approval from the Quality Initiative Review Board, data collected from the last two months of paper documentation (September and October 2015) and the first two months from a database created via the app (November and December 2015) was extracted to identity patterns. Comparative statistics was used to assess the effectiveness of the app compared to the paper method of reporting.

The primary outcome was the number and location of reports made. Secondary outcomes include the impact of missing items on operating room efficiency and patient safety, the most commonly reported missing items, and the most common actions taken following the discovery of missing items.

Results: There was a 400% increase in reporting of missing items with the launch of the app. 28 reports of missing items were made during the last two months of paper reporting and 120 reports were made in the first two months of the app. The locations reporting increased from 9/24 to 22/24. The most commonly reported missing items reported via

the app were Wisconsin Size 1 laryngoscope blades and the most common times for shortages were 4am to 8am (morning). Rooms with most shortages were dental and the 'emergency OR'. Anesthesiologists perceived shortages to have high impact on efficiency 27% of the time and high impact on patient safety 18% of the time. Data was also processed using SPC charts and led to 5 changes in staffing/supply chain routine to mitigate supply issues. There were over 529 reports over 12 months with decreasing incidence of shortages per month.

Conclusions: The introduction of an app has resulted in increased reporting of missing anesthesia supplies while providing robust data that has useful for advanced analytics leading to QI changes. The lack of reporting by anesthesia fellows and residents suggest a significant number of incidents are still not reported and increased efforts are needed to increase awareness of the app.