Title: Improving physician interventions in the pediatric post anesthesia care unit

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Introduction: Routine physician interventions at a tertiary care pediatric hospital’s post anesthesia care unit (PACU) have not been completely characterized. Anecdotal observation noted that at our institution, physician interventions (i.e., treatment of pain) were taking too long. A quality assessment study was undertaken to understand routine physician interventions in the PACU and attempt to maximize the quality and efficiency of these necessary interventions; this is critical due to limited resources affecting the quality of care and overall cost effectiveness of the surgical patient population. The hypothesis of this study is that physician interventions are frequent and that the response time for interventions and the utilization of physician resources could be improved with alterations in our system of care.

Methods: An initial voluntary survey of both ambulatory and inpatient populations was completed by PACU nursing staff. The survey documented a patient’s need for physician intervention, types of intervention, and the amount of time to complete the evaluation and intervention. A second survey was completed approximately six months later after three systems alterations had been implemented: 1. Education of anesthesia staff about the need for prompt treatment for non-emergent problems in the PACU; a goal was created - patients should receive required treatment within five minutes; 2. A cellular telephone was provided to the physician in charge of caring for patients in the PACU; and 3. A Post Anesthesia Orders Form was created by the authors for treatment of common problems in the PACU and approved by the hospital. The idea of standing orders had been rejected in the past due to the complexity of our patient population in terms of type of acuity, procedure, age, etc. The form is designed to be easily completed by the attending or fellow anesthesiologist performing the anesthetic; this team has the most complete understanding of the patient. Data from the first survey confirmed that pain, nausea/vomiting and shivering were the most common, non-life threatening physician interventions; these problems were addressed on the form. For these categories, five check box items with pharmaceutical interventions of acetaminophen, morphine, and ketorolac for pain, meperidine for shivering, and ondansetron for nausea and vomiting were included along with suggested dosing range per kilogram from the pharmacy and therapeutic committee. The anesthesiologist completing the form can: 1. Order appropriate medications using preprinted check boxes; 2. Check a box stating the patient should be evaluated prior to any intervention if the patient is felt to be too complex for standard orders; and 3. Write in on the form orders not covered by the preprinted categories.

Results: Survey I had 143 responses (ambulatory 104, inpatient 39); Survey II had 161 responses (ambulatory 104, inpatient 57); total response was 304 (ambulatory 208, inpatient 96). The total number of patients requiring physician intervention from both surveys was 109/304 (36%). The total type and distribution of physician interventions were pain 66%, nausea/vomiting 21%, delirium 2%, shivering 3%, and other 8% (such as apnea, hypotension, and respiratory distress). Survey I showed the time to receiving intervention was < 5 min. 56%, 5-10 min. 28%, 10-15 min. 14%, and > 15 min. 2%; Survey II < 5 min. 90%, and 5-10 min. 10%. This is statistically significant $\chi^2(3, N = 106) = 19.36, p < .001$. In Survey II 64/161 (40%) of the patients required intervention and of those 64 patients 30/64 (47%) had orders completed; of those 30 patients with orders 7/30 (23%) required evaluation and represents orders being inadequate to care for the patient’s problem or the form not being properly or fully completed.

Discussion: Physician interventions are common in the pediatric PACU and the most frequent were for treatment of pain and nausea/vomiting. With three interventions implemented, response time for patients to be evaluated and treated was significantly improved; the vast majority of patients reached our goal of being treated within five minutes. The number of physician evaluations was reduced by greater than 75% when the Post Anesthesia Orders Form was completed. Greater compliance in completing the Post Anesthesia Orders will continue to improve care and efficiency and is an ongoing goal. Future studies may want to address alterations of intraoperative management of pain and nausea/vomiting which reduce the interventions required in the post-anesthetic period and whether this improves quality and cost effectiveness of care in pediatric surgical patients.