Real Time Assessment of Perioperative Child and Adult Behaviors and Behavioral Interactions

Authors: Senthilkumar Sadhasivam MD, Anna Varughese MD, Joel Gunter MD, Alexandra Szabova MD, Dean Kurth MD, Paul Willging MD, Jillian Ellis BA, Lauren Hoke BA, Eileen Beckman RN, Crystal S. Lim MA, Todd Nick PhD and Lindsey Cohen PhD.

Affiliation: Dept of Anesthesia, Cincinnati Children's Hospital Medical Center, Cincinnati, USA.

Background and Aims: Postoperative maladaptive behavior is a common and significant problem in children undergoing outpatient surgery. This clinically important and often-overlooked problem can be avoided with effective perioperative behavioral interventions. Poor compliance at induction had been shown to be associated with emergence delirium and postoperative maladaptive behavior in children. Non-anesthesia related factors, including children's anxiety and distress; and parents’ and health care providers’ distress promoting behaviors can unfavorably prolong discharge times and negatively affect post-discharge experience, parental satisfaction, and overall quality of perioperative outcomes and economics. Currently there is no real time instrument to evaluate the behavioral interactions among children, parents, and health care staff in the perioperative setting. In this study, we developed a new real time scale, Perioperative Adult Child Behavioral Interaction Scale (PACBIS) and tested its inter-rater reliability in a homogeneous group of children (and their parents) undergoing Tonsillectomies and Adenoidectomies who often experience significant postoperative pain and behavioral changes adversely affecting their perioperative outcomes. By identifying these children (and parents) at higher risk of postoperative behavioral changes, pain and poor outcomes before hospital discharge, we can tailor our perioperative management effectively to benefit them and improve overall perioperative outcomes. The aim of the study is to evaluate the reliability of the newly developed perioperative specific real time instrument, PACBIS in assessing perioperative behaviors. The long term goal is to use the PACBIS to do real time behavioral interventions to improve perioperative coping skills and minimize distress behavior, and eventually improve overall perioperative experience, clinical and economical outcomes.

Methods: We developed a real time instrument (PACBIS) to evaluate the behavioral interactions among children, parents, and health care staff in the perioperative setting by modifying a simple video-based instrument, Child Adult Medical Procedure Interaction scale – Short form (CAMPIS-SF); and we have added multi-perspective self and staff assessment domains, adult-adult interactions; and have named this perioperative period specific behavioral interaction scale as the Perioperative Adult Child Behavioral Interaction Scale (PACBIS). Ninety-five children 3-12 years of age undergoing outpatient tonsillectomy and adenoidectomy accompanied by at least one parent were recruited in this study. The PACBIS was used to assess perioperative behaviors of children and behavioral interactions with parents and health care staff at different distress settings (anesthetic inductions and recovery room).

Results: Weighted kappa statistics showed moderate to excellent inter-rater reliability (kappa 0.42 to 0.81) between the two real time behavioral observers of the PACBIS in assessing behaviors during anesthetic induction and recovery room events. Both real time observers had more than 80% agreement in coding coping and distress behaviors of children and coping and distress promoting behaviors of parents/anesthesiologists and recovery nurses using the new real time scale, PACBIS.

Discussion: Postoperative maladaptive behaviors such as temper tantrums, waking up at night, sleep difficulties, crying, attention seeking and afraid to be alone are common (47%) in children. These often overlooked clinically important problems can be avoided with effective identification and modification of perioperative behavioral interventions. There is no clinically feasible perioperative behavior
interaction scale to identify unfavorable perioperative interactions. The new scale, PACBIS is better than other existing behavior assessment instrument because it is more appropriate and specific for the perioperative period, and it allows "real time" coding and possibly in future real time behavioral interventions, which is not possible with other available instruments. The new PACBIS scale offers many potential advantages over other existing validated video-tape based scales, such as 1. real time advantage does not require extensive videotaping/ time-consuming coding, 2. it is perioperative setting specific; 3. it is a simple and not time consuming scale; 4. it incorporates coping behaviors in addition to distress behaviors; and 5. and it has additional self-assessment and staff observation domains.

**Conclusion:** The first, clinically feasible, real-time perioperative period specific behavioral assessment instrument, PACBIS, has good inter-rater reliability in assessing perioperative behaviors in children. The real-time advantage of perioperative period specific PACBIS presents a number of future clinical utilities including immediate identification and modification of behaviors that are associated with poor perioperative outcomes in children.