

# **A Novel Bed-Mounted Projection System is as Effective as Pharmacologic Modalities to Treat Pediatric Preoperative Anxiety**

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**Background:** Most children undergoing anesthesia experience preoperative anxiety [1-4], which is associated with increased postoperative pain, emergence agitation, and sleep disturbances [5, 6]. Non-pharmacologic interventions that effectively decrease anxiety include parental presence at induction, tablets/phones, video games, and video glasses. Despite their efficacy, they share limitations of time, cost, and necessary patient cooperation.

We explore an inexpensive, novel, near-immersive Bedside Entertainment Theater (BERT) as an alternative method of preoperative anxiolysis. We propose that near-immersive video projection is the ideal non-pharmacologic intervention because it engages the child's attention while allowing for their passive participation in the preoperative process. The primary objective was to determine if BERT provides anxiolysis equivalent to other modalities without prolonging pre-induction time.

## **Methods:**

### *Context*

This retrospective cohort study was conducted between February 1, 2016 and October 1, 2016. Exclusion criteria included cardiac anesthesia patients and anesthesia recipients at locations where BERT was not offered.

### *Intervention*

BERT consists of a battery-powered projector (Asus P3B) enclosed in a custom acrylic case (Infection Prevention-approved), its clamp (Dinkum ActionPod) mounted at the bed's head,

and a 24 x 36" plastic screen mounted via Manfrotto Super Clamp and double ball joint at the bed's foot. Patients have a choice of age-appropriate videos that play from the preoperative area into the OR.

The intervention group included patients exposed to BERT. The control group included patients exposed to alternative methods of anxiolysis (midazolam, ketamine, phone/tablet, and parent present induction).

### *Outcomes*

Demographic data collected included gender, age, and ASA status. Timeliness was determined by comparing three preoperative periods. Efficacy of BERT versus other anxiolytics was determined by analyzing patient cooperation, and anesthesiologist assessment of anxiolytic response (medically sedated, age appropriate, playful, reserved, anxious, distressed, and panicked). Data were collected through chart review of the electronic medical record.

### *Data Analysis*

Chi-square analysis or Fisher's exact test was used, as appropriate, to determine differences between control and intervention groups regarding gender, ASA, and patient response to anxiolytic. Additional post hoc analyses using residuals were undertaken when appropriate. Analyses of differences in ages and time between groups were calculated using Mann Whitney U Test. Results were significant at a p value < 0.05.

**Results:** 686 patients were included. 343 patients were exposed to BERT, and a randomized control group of 343 patients were not. Results are presented as (control mean vs BERT mean, p value).

### *Demographics*

There were no differences between age (8.6 vs 7.7 years,  $p=0.45$ ) and gender (40.2% vs 45.5% female,  $p=0.19$ ). There was a higher proportion of ASA 1+2 patients in the intervention group compared to control (85.1% versus 73.5%  $p=0.002$ ).

### *Timeliness*

There were no significant differences in time of anesthesiologist evaluation of patient preoperatively (26.5 vs 23.1 minutes,  $p=0.16$ ), transport from preoperative area to OR (2.0 vs 1.5 minutes,  $p=0.5$ ), and patient arrival in OR to induction (20.5 vs 17.3 minutes,  $p=0.35$ ).

### *Response to Anxiolytic*

There were no significant differences in patient cooperation after administration of anxiolytic in the preoperative area ( $p=0.49$ ) and cooperation with induction ( $p=0.48$ ).

There was a difference in reaction to anxiolytic in the preoperative area ( $p<0.0001$ ) due to higher proportions of medical sedation in control group and playfulness in BERT group. Similarly, there was also a significant difference in reaction to anxiolytic at induction of anesthesia ( $p<0.0001$ ) due to higher proportions of medical sedation in the control and playfulness in BERT group.

**Conclusion:** These results demonstrate that BERT is not inferior to other modalities of anxiolysis. BERT is effective in augmenting pharmacologic anxiolytics, or as a standalone modality. The use of BERT does not increase time to induction and results in more playful patients.

## References

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