Game On: Assessing the Impact of Interactive Gaming on Pediatric Induction of Anesthesia

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Introduction

- Pediatric preoperative anxiety is widely prevalent and can affect the **patient experience, safety, and speed of induction.**
- Traditional methods to mitigate preoperative anxiety have limits.
- Audiovisual distraction methods have promise of reducing anxiety without drawbacks of pharmacologics.
- The Bedside Entertainment and Relaxation Theater[1] (BERT) is a novel approach of incorporating audiovisual distraction to engage pediatric patients preoperatively.
- This study explores the effectiveness of interactive games via BERT in reducing preoperative anxiety.

Objectives

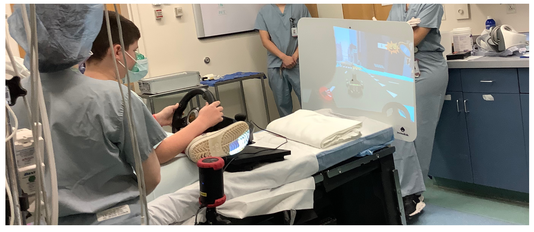
- **Primary Objective:** To evaluate the impact of interactive games via BERT on reducing pediatric patients' preoperative anxiety.
- Secondary Objectives: To evaluate the impact of interactive gaming on patient induction compliance, caregiver anxiety levels, perioperative timelines and administered pharmacologics.
- Secondary Objective: To investigate OR staff perceptions of BERT.

Methods

Design: Prospective, randomized controlled trial

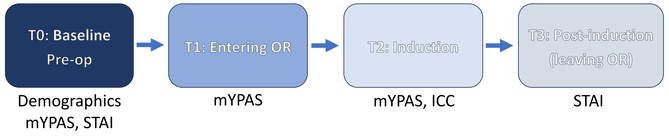
- Standard care vs standard care + BERT interactive games
- Children aged 4 to 14 undergoing non-emergent surgery with inhalational induction.

Intervention: Interactive games delivered via BERT



Quantitative Measures

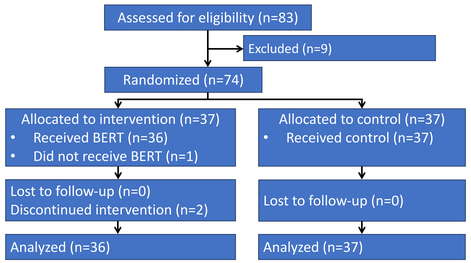
- Modified Yale Preoperative Scale[2] (mYPAS) for patient anxiety, Short State Anxiety Inventory[3] (STAI) for caregiver anxiety, and Induction Compliance Checklist[4] (ICC) for induction compliance.



- Health professional survey[5] to assess OR staff opinions.

Results

Study Flow Diagram

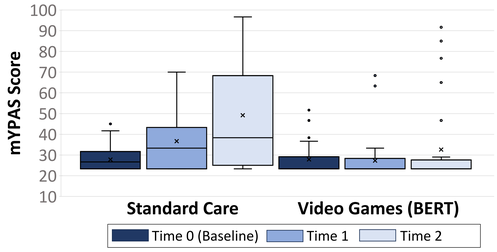


Baseline Demographics of Enrolled Patients

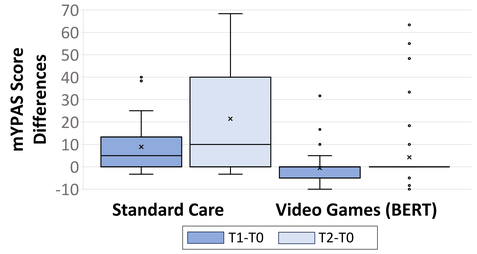
	Standard Care (n=37)	BERT (n=36)
Age (years)	6.5 +/- 2.0	7.4 +/- 2.1
Sex (female)	17 (45.9%)	17 (47.2%)
Weight (kg)	25.1 +/- 9.8	28.2 +/- 11.1
ASA 1 or 2	35 (94.6%)	35 (97.2%)
Caucasian	25 (67.6%)	25 (69.4%)
Hispanic/Latino	13 (35.1%)	13 (36.1%)
Prior Surgery	8 (21.6%)	14 (38.9%)
Anxiety	1 (2.7%)	1 (2.8%)
mYPAS_T0	26.7 [23.3-31.7]	23.3 [23.3-29.2]

Presented as: mean +/- standard deviation, n (%), and median [IQR]

Interactive Games via BERT Reduce Patient Preoperative Anxiety



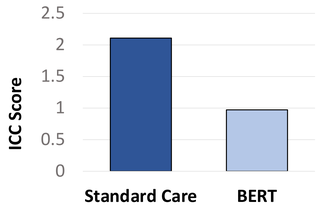
**P<0.01 between groups for Time 1 and Time 2



**P<0.01 between groups for both differences

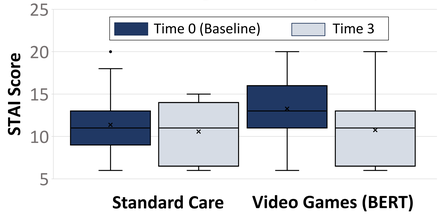
BERT Gaming Improves Induction Compliance and Reduces Caregiver Anxiety

Induction Compliance



*P=0.01 between groups

Caregiver Anxiety



*P=0.03 between group differences

BERT Gaming Supported by OR Staff

Role	# Respondents
Anesthesiology Staff	12
Circulating Nurse	6
CRNA	3
Scrub Technologist	3
Surgery Resident	5

What do you think about the use of the system during induction of anesthesia?	Very Favorable/Favorable	27 (90%)
In your opinion the system is useful for the:		
Child	Yes	29 (97%)
Caregiver	Yes	27 (90%)
Staff	Yes	23 (77%)
Are you favorable to continue usage of this system during inhalational induction?	Very Favorable/Favorable	29 (97%)
Do you feel the system is a disturbance?	No	21 (70%)

BERT Periop Times Consistent With Standard

	Induction to Intubation	In Room	PACU
Standard Care	0:06 ± 0:02	0:48 ± 0:12	2:39 ± 1:14
BERT	0:07 ± 0:01	0:40 ± 0:08	2:34 ± 1:08

Times in HH:MM, Tonsillectomy & Adenoidectomy surgeries, p>0.05 for between group comparisons

Pain Med Use Unchanged with BERT

	Intraoperative Morphine Equivalents (mg/kg)
Standard Care	0.13 ± 0.07
BERT	0.10 ± 0.05

p>0.05

Discussion

- Audiovisual distractions are promising alternatives or adjuvants to classical means of alleviating pediatric preoperative anxiety.
- Such modalities require minimal preparation and waiting times compared to classic alternatives.
- BERT is a non-invasive option that allows user to see surroundings (ie. caregiver) while engaging in a game.
- Other alternatives, such as virtual reality and augmented reality, have shown promising results as well.
- Different audiovisual distractions may suit different patients and different centers based on unique characteristics.

Conclusions

- BERT interactive games are effective at alleviating preoperative patient anxiety.
- These games are also effective at improving caregiver anxiety and patient induction compliance.
- OR staff believe BERT interactive games are helpful for patients and support its continued use in the OR.

Acknowledgements

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