

# Virtual Reality for Pediatric Dental Procedures: VR-TOOTH Pilot Trial

Wenjia Wu<sup>1,2</sup>; Marie-Eve Asselin<sup>1</sup>; Nicole Hung<sup>3</sup>; Pascale Ouimet<sup>3</sup>; Olivier Fortin<sup>3</sup>; Christine Genest<sup>4,5</sup>; Maxime Francoeur<sup>3</sup>; Estelle Guingo<sup>3,6</sup>; Kate St-Arneault<sup>3,4</sup>; Annie Sylfra<sup>3</sup>; An Kateri Vu<sup>3</sup>; Janick Carmel<sup>3</sup>; Laurence Lessard<sup>3</sup>; Stephany Cara-Slavich<sup>3</sup>; Kathryn DeKoven<sup>7</sup>; Julie Paquette<sup>3</sup>; Hunter Hoffman<sup>8</sup>; Sylvie Le May<sup>2,3,4</sup>

<sup>1</sup>Department of Dental Medicine, CHU Sainte-Justine, Montréal, Canada, <sup>2</sup>Faculty of Dental Medicine, UdeM, Montréal, Canada, <sup>3</sup>CHU Sainte-Justine Research Center, Montréal, Canada, <sup>4</sup>Faculty of Nursing, UdeM, Montréal, QC, Canada, <sup>5</sup>Trauma Studies Centre CIUSSS de l'Est-de-l'Île de Montréal, Canada, <sup>6</sup>UQAM, Québec, Canada, <sup>7</sup>Department of Anesthesia, CHU Sainte-Justine, Montréal, Canada, <sup>8</sup>University of Washington, Seattle, USA

## Introduction

- Dental fear and anxiety (DFA) affects approximately 13.3% to 29.3% of children and is a significant cause of patients avoiding dental care<sup>1-2</sup>.
- Patients with special health care needs (SHCN) require special consideration during treatments due to medical or developmental conditions<sup>3</sup>.
- Virtual reality (VR) has been increasingly used to help distract patients during unpleasant procedures to decrease anxiety<sup>4</sup>.

## Purposes

- Assess the feasibility and acceptability of VR immersion as a tool to reduce DFA in pediatric dentistry for SHCN patients, their parents and healthcare providers (HCPs).
- Evaluate the effect of VR on children's DFA during dental appointments.

## Methods

- Recruited patients from 6 to 17 y.o needing dental procedures at the CHU Ste-Justine dental clinic
- Randomized to two groups: VR headset or muted-cartoon on wall-mounted TV
  - T0** Prior to the dental procedure
  - T1** 10 minutes after the start of the procedure
  - T2** End of the dental procedure
- Acceptability and feasibility:** recruitment rates and completion rates of planned procedures
- Satisfaction questionnaires:** for parents (visual analogue scale) and HCPs (6 questions Likert response scale with four options)

## Methods

- DFA:** Venham's Anxiety and Behavioral Rating Scales (VABRS)<sup>5</sup> from 0-5 at **T0,T1,T2**
- Physiological parameters:** oxygen saturation, pulse at **T0,T1,T2** & salivary alpha amylase<sup>6</sup> at **T0,T2**
- Statistical significance:** p<.05
- "Dream Dental" game by Paperplane Therapeutics supported by Pico Neo 4 with eye-tracking navigation & a clicker for interaction.

## Results

- 36 patients approached for recruitment, 25 randomized (recruitment rate of 69.4%)
  - M (64%) > F and the mean age was 10.2± 2.8 years.
- All participants completed the planned dental procedure.
- 77% (10/13) tolerated the headset well, 3 participants in the experimental VR group had the headset removed mid-treatment (3/10 = 23.1%).
- Parental satisfaction was high in both groups, with the mean rating on VAS of 9.7/10.
- All HCPs agreed that they would use VR again for other dental procedures for children.

Table 1. Mean anxiety and behaviour scores (VABRS) at each time-point

	Baseline (T0)		During the procedure (T1)		After the procedure (T2)	
	VR	Control	VR	Control	VR	Control
Anxiety (0-5)						
Mean ± SD	0.1 (± 0.3)	0.1 (±0.3)	0.77 (± 1.7)	0.6 (± 0.9)	0.5 (± 1.5)	0.2 (± 0.4)
P Values	p = 0.95		p = 0.69		p = 1.0	
Behaviour (0-5)						
Mean ± SD	0.2 (± 0.4)	0 (± 0)	0.8 (± 1.7)	0.5 (± 0.8)	0.4 (± 1.4)	0.1 (± 0.3)
p Values	p = 0.2		p = 0.9		p = 1.0	

## Results

- No significant differences in pulse, oxygen saturation, and salivary alpha amylase (P>0.05).

## Discussion

- No significant difference between groups on VABRS - sample size limited by pilot design.
- Individual interest with VR varies; patient selection is important.
- Different dental procedures.
- Children who were uncooperative (eg. needing active or passive restraints) were often not given recommendation by the dentist to participate.

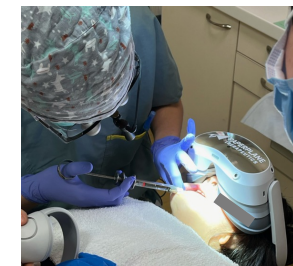


Fig 1. VR headset in use during a dental procedure

## Conclusions

- VR as a distraction method was feasible and acceptable during dental procedures in a pediatric SHCN population. Both parents and healthcare professionals' satisfaction were high.
- The results can be used to guide future, larger clinical trials.

## References

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