

# A Pilot study into feasibility of Virtual Reality as a distraction tool to reduce anxiety and improve paediatric patient experience during Induction of Anaesthesia.

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## Introduction

Paediatric patients often experience anxiety during induction of anaesthesia. A multitude of distraction techniques are used in order to minimise distress and anxiety, with varying levels of success.

Virtual reality is emerging as a tool that can be useful in the paediatric population for painful procedures. The study aimed to assess the feasibility of VR use during intravenous and inhalational induction of anaesthesia, to reduce anxiety and improve the paediatric patient experience. To date, there is no published study into application of VR during anaesthetic induction.

## Methods

Children and caregivers were consented for the use of VR headset before entering the anaesthetic room. After initial preoperative checks, the VR headset was applied to the child and an immersive VR game was chosen for the children to participate with using a hand-held controller. Anaesthetic induction was performed with either IV or inhalational induction, whilst the child continued to play the VR game. Once the child was anaesthetised the head set and hand controller were removed. Free text comments were collected from the anaesthetist's perspective regarding the induction. A post-operative questionnaire for the child was undertaken looking at both side effect profile and a system usability score, SUS, for the use of VR headset. Free text comments from the caregiver and child were also obtained

## Demographics

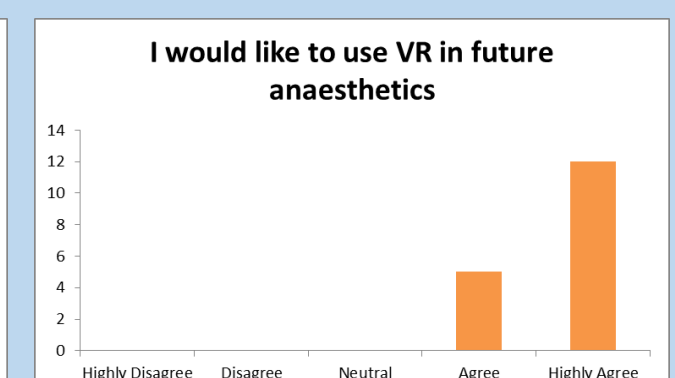
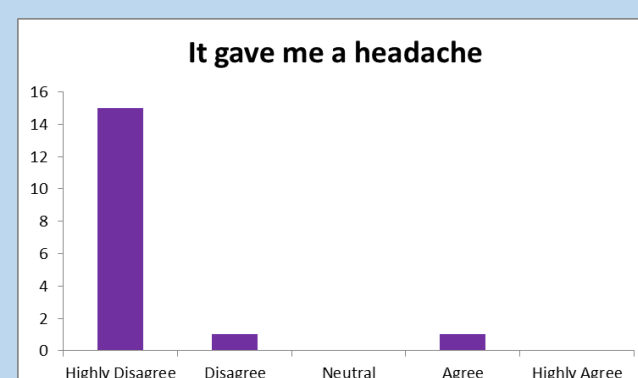
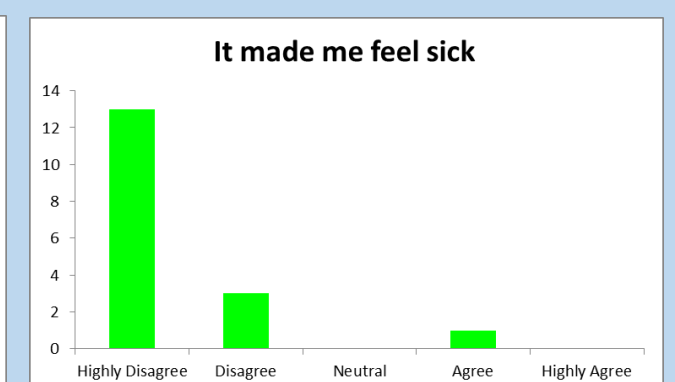
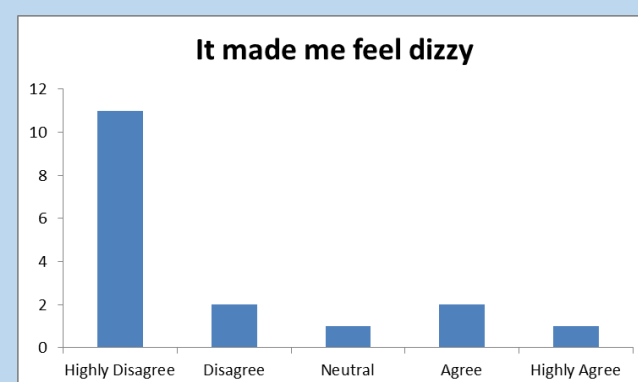
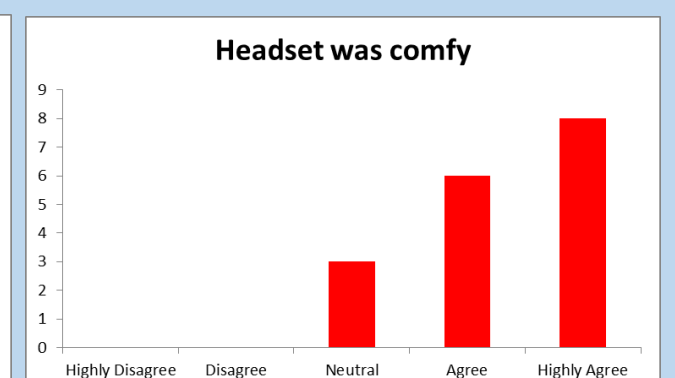
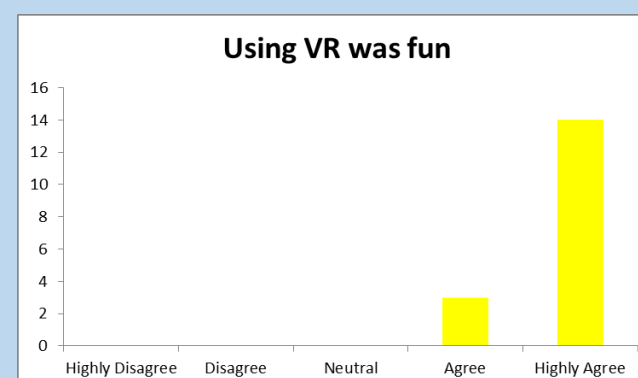
- 21 patients (6M, 15F)
- Age range 5-16
- 4 Excluded
  - 1 Disliked game choice
  - 3 removed headset before induction of anaesthesia (All under age 8)
- Inductions : 11 IV, 5 Gas, 1 Combination

## References:

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- Vagnoli L, Caprilli S, Robiglio A, Messeri A. Clown doctors as a treatment for preoperative anxiety in children: a randomized, prospective study, Pediatrics, 2005, vol. 116 (pg. 563-7)10.1542/peds.2005-0466
- Piskorz J, Czub M, J Spec CM. Effectiveness of a virtual reality intervention to minimize paediatric stress and pain intensity during venepuncture. J Spec Pediatr Nurs 2018;23:e12201.doi:10.1111/jspn.12201 Google Scholar
- Knight K, McClenaghan CE, Singh B. Virtual reality distraction from painful procedures in the paediatric emergency department Archives of Disease in Childhood 2019;104:204-205.

## Results

- All children agreed that using the VR headset was fun and that they would like to use it again for further anaesthetics
- Most children found the headset comfortable
- There were a minimum of side effects- The most common being dizziness.
- The average system usability score was 88.8 (77.5-100)
- One patient with multiple challenging anaesthetic inductions reported that it had been "50% better than normal."
- There were no safety issues or complications with induction of anaesthesia



## Discussion

The initial pilot study has shown that there is scope for the use of VR in induction of anaesthesia in both intravenous and inhalational inductions.

VR can be used safely to help as a distraction aid in the paediatric population and is well tolerated VR works best in the age group 8 years and above.

The study has also highlighted the need for more age specific games and the need for further research into this emerging and exciting area.