Augmented Reality as a Tool to Reduce Fear and Promote Cooperation During Pediatric Nasal Endoscopy

Presenting Author: Martine Madill, BA
Co-Authors: Thomas J. Caruso, MD, MEd, Douglas Sidell, MD, Kara Meister, MD, Ellen Wang, MD, Maria Menendez, MD, Samuel Rodriguez, MD

Introduction: Nasal endoscopies are anxiety-provoking for children, leading to decreased cooperation and suboptimal visualizations. Augmented reality (AR) is an emerging technology that may be helpful in reducing fear during minor procedures. This case series examines the use of interactive AR gameplay during nasal endoscopy. The primary objective was to determine the effect of AR on fear during pediatric nasal endoscopy. Secondary objectives included an examination of pain scores, compliance, and participant attitudes towards AR.

Methods: This case series was conducted at a freestanding academic children's hospital. Children aged 7-17 undergoing an outpatient nasal endoscopy were approached. During their procedures, patients wore an AR headset loaded with an interactive application. Outcomes were measured using the Children's Fear Scale, Numeric Pain Scale, and a modified Induction Compliance Checklist. Patients, parents and otolaryngologists completed satisfaction surveys after the procedure.

Results: Three patients were enrolled and reported low fear (average: 0.33/4), high satisfaction (average: 4.2/5), and no pain (average: 0/10). All procedures had perfect compliance. Parents reported high satisfaction (average: 4.33/5) and interest in AR. In all cases, children, parents, and physicians recommended AR.

Conclusion: These preliminary results suggest that AR may be an effective tool to reduce fear and promote cooperation during pediatric nasal endoscopy. AR is minimally obstructive to proceduralists, carries few side effects, and allows children to maintain visual contact with their parents and providers. Limitations include a small sample size, however enrollment in a prospective, randomized controlled trial is ongoing.

Figure 1: The Mira AR headset (right) requires less hardware at the nose bridge than the Samsung Gear VR headset (left), making it a minimally-obstructive tool for reducing fear and promoting cooperation in pediatric nasal endoscopy.