

Tired, Using the Wrong Hand: Lessons Learned From the EYESI Virtual Reality Surgical Simulator, a Potential Tool in Resident/Fellow Surgical Teaching

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PURPOSE

The EYESI VR simulator (VR Simulator) is a new potential surgical teaching tool for ophthalmology residents and retina fellows. The purpose of this study was to determine the effect of sleep deprivation and use of the non-dominant hand on surgical performance using the VR simulator.

METHODS

The study was performed using the EYESI simulator (VR Magic, Germany), a virtual reality system that includes a computer model of microsurgical instruments and intraocular anatomy. Trainees were assessed on surgical simulations to determine their manual dexterity, degree of tremor and their ability to peel the ILM. For each task participants were assigned a score based on speed, precision and ability to avoid complications by the VR Simulator. After participants completed two baseline training sessions they were challenged sequentially using their dominant and non-dominant hands and pre- and post- prolonged sleep deprivation to determine effect of these variables on surgical performance.

RESULTS

There was an 8% decrease in surgical performance with use of the non-dominant hand using the VR Simulator ($p=0.005$). There was an average decrease of 3.2% in surgical performance under sleep deprived conditions after being up for an average of 17.5 hours, this was not statistically significant ($p=0.48$).

CONCLUSION

The EYESI VR simulator allowed ophthalmology trainees to perform tasks to improve manual dexterity, degree of tremor, and ability to peel ILM in virtual reality. There was a small statistically significant difference in surgical performance between the dominant and non-dominant hand. There was no significant deterioration in surgical performance following prolonged sleep deprivation.