

Review Group Membership

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Introduction

Patient safety is becoming increasingly important in the medical field and can be achieved by improving psychomotor skills. Standard surgical training has traditionally been one of apprenticeship, where the trainees learn to perform the surgery under the supervision of a trained and experienced surgeon. Mastery of performance, especially of highly technical tasks such as microsurgery in ophthalmology field takes years of repeated practice to achieve. Thus, this is costly, time-consuming, and is of variable effectiveness. Laparoscopic surgery involves the use of instruments using keyhole and is generally considered more difficult than open surgery. Training using a virtual reality simulator or a computer simulation is an option to supplement standard laparoscopic surgical training. It is becoming an important part of training in ophthalmology field. A shift from counting cases to competence-based curricula for learning surgery is on its way, and the implementation of structured surgical curricula has also been shown to have a favourable impact on complication rates. In many ophthalmology departments, simulation training is a required part of the training curriculum. Surgical simulators represent an important step in narrowing the gap between clinical practice and simulator practice. Often, the simulator is also used for assessment, and surgical trainees are quantitatively evaluated on the surgical simulator as a form of diagnostic tool for ophthalmic surgical skills.

Objective/Aim

To assess the effectiveness/efficiency such as increased surgical proficiency and improves operating times, safety, cost-effectiveness and organizational issues of virtual reality systems for training of ophthalmic surgery.

Results and Conclusions

A total of 351 titles were identified through the OVID interface and PubMed. There were seven studies included which consists of one systematic review (SR), two randomised controlled trials (RCTs), three observational studies and one pre- and post- intervention study.

Effectiveness

There was fair to good level of retrievable evidence to suggest that the VR systems for ophthalmology training were able to improve surgeon operating performance and skills. Studies also reported that inexperienced residents or surgeons were more likely to benefit from the training curriculum using VR systems. The evidence related to trainees' satisfaction was inconclusive. One study reported that VR programme seemed to improve the surgeons satisfaction as the programme was reported as "more fun" to use (24.1% versus 4.2%) and they were more likely to use this type of programme again compared with the likelihood of using the traditional tools (58.6% versus 4.2%). However, another study reported no significant difference in satisfaction between residents trained by traditional wet-lab versus surgical simulation.

Safety

There was limited fair level of retrievable evidence to suggest that VR systems for training of ophthalmic surgery were safe with fewer complications such as posterior capsule tear or perforation.

Cost-effectiveness

There was no retrieval evidence on the cost-effectiveness of the VR systems for the training of ophthalmic surgery.

Training and learning curve for trainee

There was fair to good level of retrievable evidence to suggest that VR systems were associated with learning curves.

Methods

Literature search was done to search for published articles to assess the effectiveness, safety and cost-effectiveness of virtual reality training of surgical trainees in ophthalmic surgery. The following electronic databases were searched via OVID Interface: MEDLINE (1946 to present), EBM Reviews-Cochrane Database of Systematic Reviews (2005 to February 15 2016), EBM Reviews-Cochrane Central Register of Controlled Trials (February 2016), EBM Reviews-Database of Abstracts of Review of Effects (1st Quarter 2016), EBM Reviews-Health Technology Assessment (1st Quarter 2016) NHS economic evaluation database (1st Quarter 2016), PubMed and Embase database. The last search was run on 13 March 2016. Relevant articles were critically appraised using Critical Appraisal Skills Programme (CASP). Evidence was graded according to the US / Canadian Preventive Services TaskForce