Training, assessment tools and selection in simulated environments of surgical trainees

Svensk titel: Träning, bedömningsinstrument och rekrytering vid utbildning av specialister i kirurgi i simulerad miljö

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Background
Surgery is associated with risk for adverse events. Laparoscopic simulation creates a safe training environment and avoids that patients are being subjected to operation by a surgeon on the steepest part of the learning curve. In addition to technical competence, surgeons’ nontechnical skills are important for patient safety.
Selection of surgical trainees by testing different areas of technical and non-technical competence and personality traits is uncommon in the surgical community.
The aim of the research project is to investigate the use of simulators in the training and selection of surgical trainees.

Methods
To increase knowledge of laparoscopic simulation, studies were conducted with surgical novices, trainees and experienced surgeons. Trainee and expert performance were investigated for simulator feasibility, effect of novices’ training with sense of touch (haptics) and 3D vision and the opinion of experienced surgeons by using the latest virtual reality (VR) simulator.
A mixed methods design with questionnaires and interviews with experienced surgeons was used to develop a structured assessment framework to complement the current non-validated selection process of trainees. A clinical trial based on the suggested framework including new surgical trainees is to be commenced autumn 2017.

Preliminary results
The Simball Box is a new kind of laparoscopic simulator with good feasibility and potential to mirror the technical progression with its metrics. LapSim VR simulator with 3D and haptics shortens the acquisition of basic skills in novices with 32 %. Experienced surgeons consider the haptics in LapSim to have limited fidelity, but in spite of this, they produced less stretch damage to the tissue with haptics enabled.
Experienced surgeons have quite consistent views on what makes a person unsuitable as a surgeon. This knowledge can be systematized to construct a set of “early warning signs” to detect during selection through assessment.
**Significance**
The findings from the studies concerning laparoscopic simulators have increased the knowledge of their usefulness, and could assist in construction of education programs and in selection and assessment.

**Publications**