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Proceedings Paper:

Ricketts, H, Tang, M, Mushtaq, F et al. (4 more authors) (2016) A randomised controlled trial to assess the impact of patient specific mental rehearsal on surgical performance. In: British Journal of Surgery. SARS 2016, 06-07 Jan 2016, London, UK. Wiley , pp. 40-41.

<https://doi.org/10.1002/bjs.10158>

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A randomised controlled trial to assess the impact of patient specific mental rehearsal on surgical performance

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Introduction: Empirical evidence demonstrates that rehearsing a task mentally enhances its subsequent performance. Several studies indicate these techniques to be applicable in surgery. This study aims to compare a patient specific mental rehearsal process to a generic one.

Study design: Through semi-structured interviews, experts will be asked to describe how they perform laparoscopic cholecystectomy, focusing on visual and kinaesthetic cues. According to the transcripts, a Structured Mental Rehearsal (SMR) checklist will be created. Sample size calculations show that 16 participants are required (Competency assessment tool – CAT - 3 versus 2). They will be randomised to two groups. All will perform 6 virtual laparoscopic cholecystectomies (VLC). Anatomy will vary for each procedure. Group 1 will be using the SMR checklist and an anatomy specific 3D model, prior to each procedure. Group 2 will be using the checklist only. The primary outcome of study will be surgical performance, which will be assessed using CAT for laparoscopic cholecystectomy.

Pilot data: To assess feasibility, a smaller scale pilot study was conducted. 3D models were compared to didactic videos. Trainees who performed SMR using a 3D model performed significantly better (number of movements - 553 vs. 1391.5, $p=0.005$, total path length of instrument tip 1540.24 vs. 2837 $p=0.007$ and time 667 s, vs. 1283s, $p=0.003$).

Forward plan: This pilot study is expected to highlight the importance of patient-specific SMR as a tool of augmenting quality of surgery. As a secondary outcome, it will establish a scientifically tested methodology for the creation of SMR checklists in surgery.

Take-home message: This pilot study is expected to highlight the importance of patient-specific SMR as a tool of augmenting quality of surgery