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Research In-Progress

The Effect of Augmented Reality Training in Simulated Laparoscopic Appendectomies

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Introduction: The role of surgical innovations in training has been highlighted before, but the importance of its implementation in a timely manner was emphasised during the COVID-19 pandemic, during which many surgical trainees at all levels lacked theatre exposure due to cancellations of elective lists.

Methods: Utilising the LapAR™ by Inovus Medical Ltd (UK), we asked surgical trainees in a number of London and Manchester University NHS Trusts to perform several Augmented Reality simulated appendectomies interspersed with LapPass tasks. Objective metrics measured include time to completion, distance travelled, smoothness, acceleration, handedness and time in view. A comparison was made with a benchmark score set by an experienced minimally invasive surgery (MIS) surgeon. Subjective performance feedback was also provided by experienced surgeons using the work-based assessment (WBA) framework.

Preliminary Results: We found that the performance metrics improved when comparing initial & final benchmarks. In addition, the final benchmark metrics of the trainees were compared to that of the experienced MIS surgeon. Notably, time to completion and distance travelled were both markedly reduced following the intervention period. WBA based review of performance demonstrated a marked improvement in surgical skills.

Next Steps: Augmented Reality task training using a high-fidelity Laparoscopic box trainer such as the LapAR™ improves objective and subjective performance in appendectomies. It can be inferred that this technique improves the technical skills acquisition and refinement for surgical trainees. Further work needed with larger numbers of trainee volunteers for further validation and potential implementation. We aim to publish this data and recruit surgical residents from other health systems in addition.

