ACS 2023 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Research Abstracts

Democratizing Access to Realistic Surgical Simulation with Augmented Reality - a Health Economics Review

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Introduction: Surgical training is traditionally learned by surgeons through repeated practice on patients 3. This is a time-consuming, costly and potentially ineffective process. During COVID this situation has worsened not only due to a lack of ability to operate due to redeployment, but also there has been less opportunities for trainees. This coupled with the emergence of a litigious world 4,5, we cannot afford to be practicing on patients, and neither can we rely on studying for from a book, a video, or even a one-off course 6. Simulation centres were also closed during the pandemic, and any access to it were highly limited due to costs and lack of comparison to alternatives 7.

Methods: We implemented this strategy by providing each trainee with a "lap box trainer" which allowed them - once requested by their faculty member - to perform a set of tasks ranging from learning modules all the way to full operations such as appendectomies & hysterectomies. Objective metrics were provided to trainees, and the faculty member provided subjective comments either in real-time on live courses, or remotely and in retrospect. The overarching aim of training in this manner is to reduce operative time, reduce risk of complications and to save the money.

Results: Combining this data from Needham et al8 with health services indices, and hospital stay 9,10, we estimate a £79pp cost savings. Extrapolated across 150 acute trusts 11 undertaking 10,000 lap appendectomies per day, the total cost saving would be £777.579 in one particular operation, for one surgical speciality.

Conclusions: The pandemic allowed us to utilise technology to remain productive and to see and hear loved ones. This allowed us to incorporate video-linked supervised operative training sessions using a new Mixed-Reality (real & augmented) platform involving hardware, a native application and a cloud-based server. This solution meant that we were able to increase accessibility by keeping costs down whilst maintaining fidelity to improve surgeon ability and to save hospital money.