



Touch Surgery Supporting the Plastic Surgical Community

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One of the Sir Harold Gillies first principles “thou shalt make a plan” shapes the mind-set and toolbox of any plastic and reconstructive surgeon. For surgeons in training, exposure to expert operative planning and cognitive decision making is essential to developing the competency of an independent surgeon. However, as a result of changes in working hours, financial constraints, and patient safety concerns, these opportunities are increasingly harder to come by. Furthermore, the plastic surgeon’s toolbox continues to expand with newer technologies resulting in a wider breadth of surgical techniques with slow dissemination to the wider surgical audience.

Touch Surgery is a cognitive task simulation and rehearsal application freely available on mobile devices. Touch Surgery maps surgical procedures with expert surgeons, making surgical plans and simulations widely available to the surgical community. As a software solution that is accessible through touch screen devices, Touch Surgery is a scalable platform available to surgical users globally, and in less than 2 years, it has become the largest surgical community on mobile with over 1 million downloads.

Touch Surgery builds on a process called cognitive task analysis, a method for obtaining sophisticated performance expertise for areas where many covert decisions are linked with complex overt actions.¹ Using cognitive task analysis, Touch Surgery maps surgical procedures step by step combining the cognitive steps with a mapped anatomical virtual reality patient. This enables a surgical user to simulate, plan, and rehearse different procedures. Touch Surgery has an inbuilt assessment tool, which uses objective decision and precision metrics to evaluate knowledge of simulated procedures. This provides surgical users with immediate feedback and a record of their learning curve. In US residency programs (Harvard Orthopedics and Hopkins Orthopedics), individual residents share their scores with program directors and certificates of competence can be issued. This for the first time creates a data set that allows residents to demonstrate cognitive competence before they enter the operating room.

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A number of studies have evaluated the simulation and learning validity of Touch Surgery. Sugand et al² have demonstrated Touch Surgery to have construct validity (the ability to identify between experts and novices), face validity (the impression of simulating the procedure), and content validity (the comparison to content to the true operation). Follow-up studies from the same group have shown learning curves of engaging with the content of the application and an improved understanding of the procedure.³ In a randomized controlled trial by Brewer et al,⁴ the team showed that training on Touch Surgery demonstrated a significant improvement over traditional textbook learning.

Touch Surgery represents a tool that could make a significant difference to global surgical practice through facilitating dissemination of surgical techniques, approaches, and giving surgeons in training uncapped exposure to operative cases. Technological initiatives, such as Touch Surgery, mean that Sir Harold Gillies principles can be disseminated to a wider audience for better patient care and stand the test of time.

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