MEDICAL EDUCATION AND 3D PRINTING: THE DESIGN AND VALIDATION OF A SIMULATION MODEL FOR LAPAROSCOPIC HYSTERECTOMY AND VAGINAL CUFF CLOSURE - A RESEARCH PROPOSAL

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ABSTRACT: Poster (1C)

Purpose: Competency in advanced laparoscopy is increasingly expected of obstetrician-gynecologists. One of the obstacles in obtaining this competency is a relative lack of frequent and early exposure to advanced procedures, such as laparoscopic hysterectomy. Simulation offers a low-stakes means of skill development outside of the OR, but there are few studies on its use for laparoscopic hysterectomy. The use of 3D printing for simulation has shown promise in other surgical specialties, but has not yet been described for gynecological surgeries. The aim of this study is to use 3D printing to develop a validated, realistic and customizable simulation model for laparoscopic hysterectomy that allows colpotomy and vaginal cuff closure.

Methods: We propose a single-centre observational study with staff and resident physicians in obstetrics and gynecology at tertiary care centre. The study will have two phases: model development and validity testing. Currently, model development is being carried out in collaboration with the 3D team, and a first iteration of a model uterus, cervix and vagina with cuff has been developed. Suggested alterations to anatomical structure and functionality of the model was provided to the 3D team, and the second iteration is now under development. Once the model is deemed satisfactory, it will be placed in a box trainer on which participants will perform pre-determined laparoscopic tasks. Performances will be captured by video and scored by two gynecologists using the validated Global Operative Assessment of Laparoscopic Skills scale. Participants will also be asked to rate the realism of the model.

Next Steps: We anticipate that the second iteration of the model will be satisfactory to trial functionality, at which time we plan to seek feedback on model anatomy and function from gynecologists trained in minimally-invasive surgery. If deemed necessary based on this feedback, we would proceed with development of a final iteration that would be used for the validity testing phase of the study. We hope to demonstrate that three-dimensional printing can offer residents in obstetrics and gynecology with a realistic and customizable model on which to practice laparoscopic hysterectomy, including colpotomy and cuff closure.