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Development Of A Breast Reconstruction Training Environment

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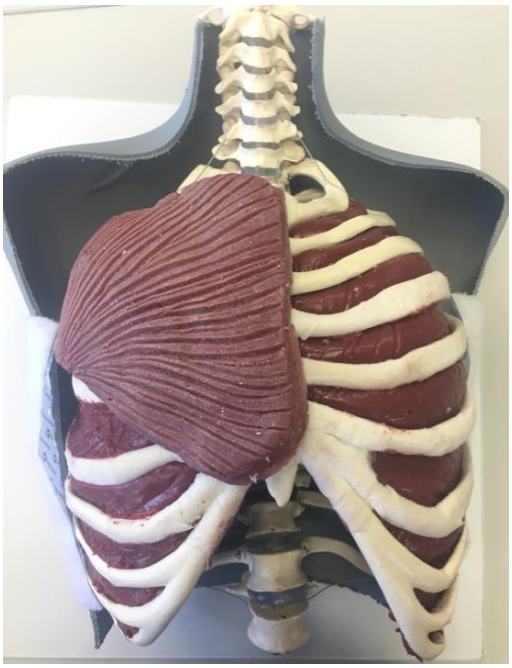
Background:
Breast reconstruction following mastectomy remains an essential component of the holistic approach to treating women affected with breast cancer. The training of plastic surgery residents in this domain can prove to be a challenging task due to limited access to non-patient models. A recently performed survey of all plastic surgery programs in Canada indicates the need for a simulated environment where the appropriate techniques can be practiced. Advanced and increased simulation-based training is one way to teach residents necessary skills, improve outcome of surgery and create a dynamic teaching environment.

Methods:
A modified Delphi technique was used to survey plastics surgeons with an expertise in breast reconstruction from 6 university centers with plastic surgery residency programs across Canada. A list of the most challenging steps in teaching alloplastic breast reconstruction was obtained. Using various commercially available silicon materials, a benchtop post-mastectomy breast reconstruction simulator was created by casting and molding techniques. The model was built in order to accommodate both sub-pectoral and pre-pectoral implant based reconstructions. Senior plastic surgeons with an expertise in breast reconstruction were recruited and asked to perform a sub-pectoral, implant based breast reconstruction on the simulator. Following the procedure, participants were asked to complete a 22-point questionnaire using a 5-point Likert scale to grade the simulator on its physical attributes, realism of experience, realism of material and overall experience.

Results:
Six relevant anatomical components were successfully included in the simulator, notably, rib cage, intercostal muscles, pectoralis minor muscles, dissectible pectoralis major muscle, acellular dermal matrix sheet and a three-layer skin envelope. A pneumothorax indicator was also incorporated. The simulator was designed to be completely reusable with no disposable components necessary for each use. Face and content validation results based on the

evaluations performed by expert plastic surgeons showed excellent results among parameters evaluated, with an overall mean score of 4.52 on 5 (90.4%).



Conclusions:
Given the realism offered by the simulator as well as its reusability, this project has the potential to revolutionize the way in which breast reconstruction is taught and mastered by plastic surgery residents with the ultimate goal to improve patient outcomes and ensure patient safety.