# Bridging the Gap in Surgical Training: A cost-effective Ostomy Simulation Model

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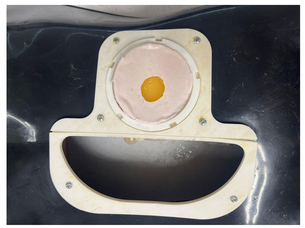
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## Introduction

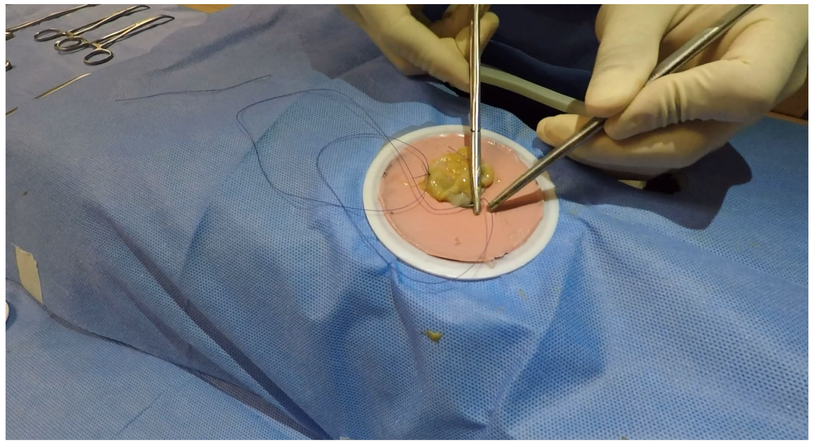
Simulation-based training has proven effective in accelerating learning curves and is recognized for assessing surgical competence. This study aims to optimize and validate a cost-effective, simulation model to assess and train surgeons in the proper maturation of a stoma.

## Methods

A low-cost, silicone-based model was developed to replicate key abdominal wall layers. The model was integrated into a custom-designed phantom accommodating bovine intestine within a simulated abdominal cavity. To assess construct validity, performance data using the OSATS and a Final Result Quality scale (from 1 to 5) were collected from general surgeons undergoing title revalidation in Chile. Additionally, surgeons of varying experience levels performed an ostomy procedure on the model. In this second group, data included demographic information, procedure accomplishment, and a perception survey to assess the model's fidelity to reality. Tissue realism was measured for the subcutaneous layer opening and muscle dissection (scale 1-10) while overall model fidelity was assessed (scale 1-7)

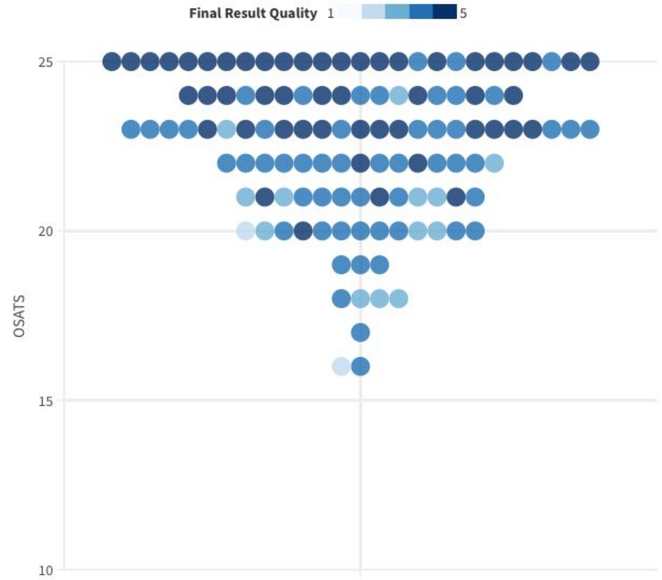






## Results

Performance information from 120 surgeons showed OSATS median 23 (range, 21-24) and Final Result Quality median 4 (range 4-5), with all participants completing the procedure. The distribution of the results is shown in Chart 1, each point is a participant. The second group, 2 colorectal surgeons, 2 colorectal fellows, and 2 general surgeons participated, all completed the ostomy procedure. Median scores for tissue realism of subcutaneous and muscle layers were 6.5 (range, 4,5-7,75) and 5 (range, 4-6), respectively. Overall model fidelity was rated 5.5 (range, 4.25-6). Suggestions for improvement included the addition of inferior epigastric vessels (noted by two participants), posterior aponeurosis (three participants), and enhancement of tissue laxity (two participants). One participant pointed out anatomical misalignment in the phantom's positioning of the ostomy model.




## Conclusion

This study demonstrated that the ostomy simulation model can discriminate between different levels of performance. The results indicate that this model allows surgeons of all levels to perform ostomies in a simulated scenario, making it a cost-effective tool suitable for training. Future iterations will attempt to improve the fidelity of the model. Once this is achieved, a learning curve for ostomy performance using the model will be developed.