

# Evaluation of Three-Dimensional Printing as a Patient Education Tool in Colorectal Surgery

Holly Sprosen, Sharon Jay, Helen Collins, Janet Ansell  
Tauranga Hospital, BOPDHB, New Zealand

## Introduction

Three-dimensional (3D) printing is rapidly becoming utilized in a multitude of industries including healthcare (1). Within surgery, research has identified preoperative planning and training as the most commonly employed applications for 3D printed models (2).

Despite the increasing importance placed on patient and family/ whānau education, few studies have directly examined its potential in this field, including in Colorectal Surgery (1,3).

This study aims to evaluate the effectiveness of using 3D printed stoma models as a tool for patient education in Colorectal Surgery.

## Method

This is a pilot study with fourteen patients who had undergone pre-operative education using the stoma models. A short questionnaire was completed online or posted on different aspects of the pre-operative education.

## Results

- 100% of patients agreed they would recommend using these models in continued patient education and that visualisation of the stoma model helped them understand how it would look on their own body.
- Other areas of benefit included improved understanding of the situation and surgery for patients and their family/ whānau (86% and 93% agreeing respectively).
- The stoma models were found to be less useful in easing psychological stressors, practical education in stoma management and direct comparison with patient's own stomas.

## Patient quotes:

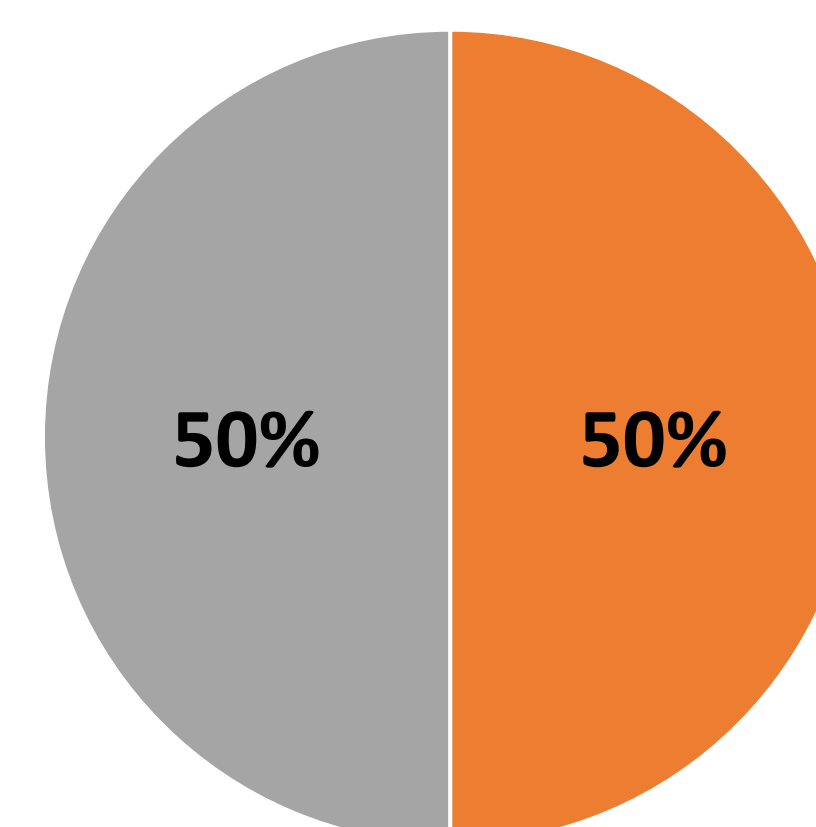
*"Knowing the unknown beforehand was a great help"*

*"There seems to be a difference between the model and mine"*

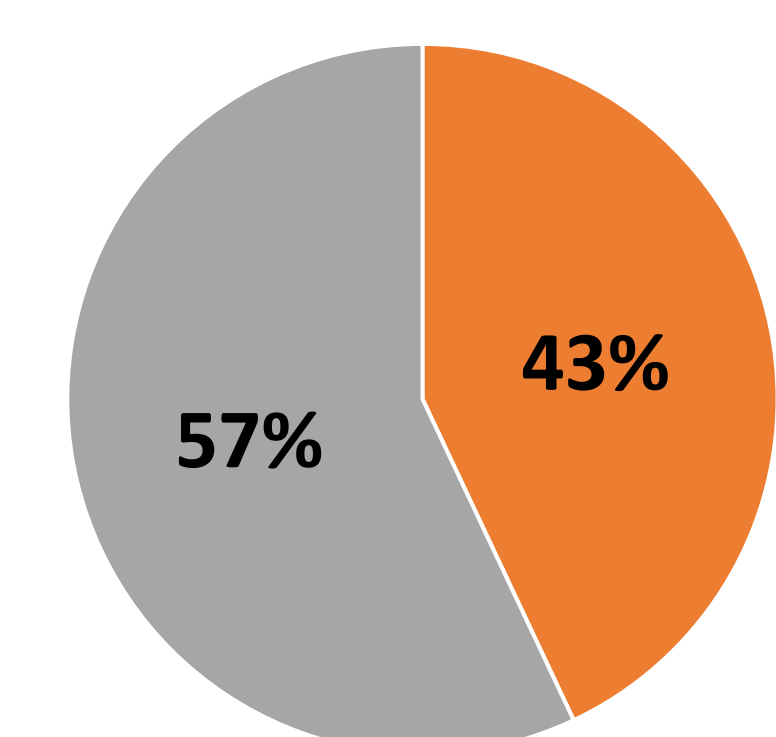
- Study Participants



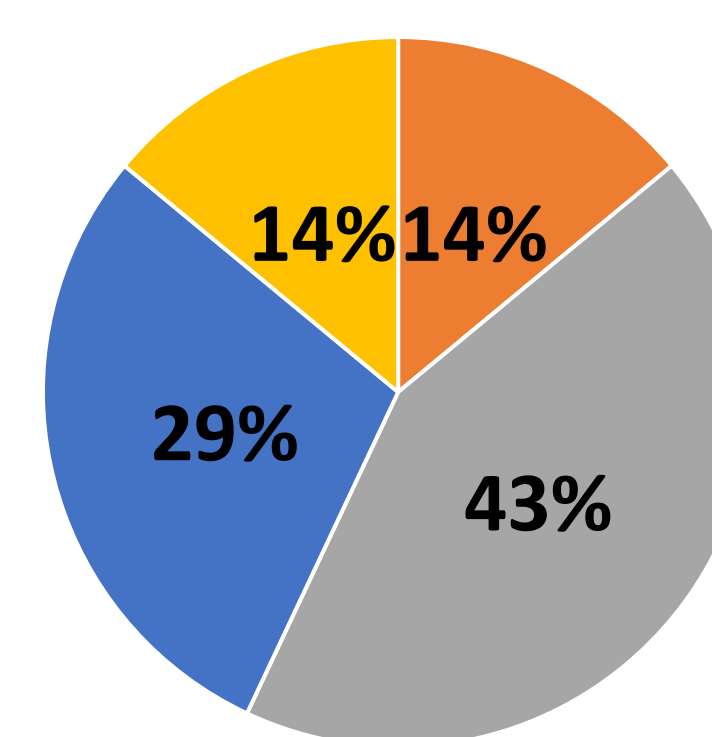
Seeing the stoma helped me understand what it would look like on my own body



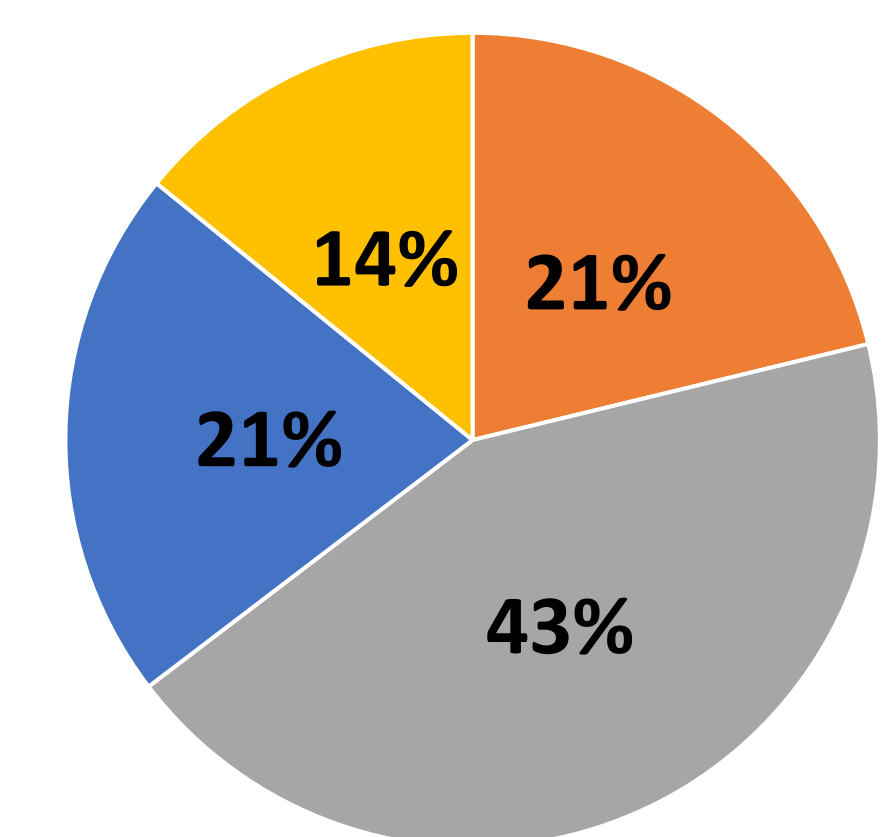
I would recommend using these models in continued patient and whānau education



Seeing the stoma model before the operation helped me to learn how I would manage mine



Using the stoma models helped to overcome some of the worry and misconceptions



■ Strongly Agree ■ Agree ■ Neutral ■ Disagree

## Conclusion

3D printed stoma models are effective tools in patient education in Colorectal surgery. Future research is recommended to further quantify areas of most value.

## Contact Information

**Dr Holly Sprosen**

holly.sprosen@bopdhb.govt.nz

Tauranga Hospital  
BOPDHB  
Cameron Road  
Tauranga, New Zealand



## References

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2. Papazarkadas, X., Spartalis, E., Patsouras, D., Ioannidis, A., Schizas, D., Georgiou, K., ... & Nikiteas, N. (2019). The role of 3D printing in colorectal surgery: Current evidence and future perspectives. *in vivo*, 33(2), 297-302.
3. van de Belt, T. H., Nijmeijer, H., Grim, D., Engelen, L. J., Vreeken, R., van Gelder, M. M., & Ter Laan, M. (2018). Patient-specific actual-size three-dimensional printed models for patient education in glioma treatment: first experiences. *World neurosurgery*, 117, e99-e105.