Understanding Stoma Baseplate Convexity Characteristics: The Journey From Bench to Bedside

[Poster #]

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Introduction

- Evidence supporting the use of convex pouching systems in ostomy care is increasing, with multiple consensus statements published that describe the principles of convexity and considerations in clinical practice[1–4]
- While convex products with different characteristics suiting individual patient needs are available, their effective and consistent implementation in clinical practice can be challenging
- There is a need to help translate emerging evidence to support clinicians in practice.

Study Objective

To evaluate the effect of baseplate convexity on skin tension and fat compression and how their characteristics influence the magnitude and location

Methods

- A finite element (FE) analysis simulating the application of convex baseplates with different geometries and flexibilities (**Figure 1**) to an idealised, flat abdomen (**Figure 2**) was conducted
- Two sets of outputs, maximum principal strain (MaxPS) and minimum principal strain (MinPS) were generated
  - MaxPS measured the outwards effect of the baseplate on the abdomen skin layer (elements coloured according to the level of greatest tension/stretch)
  - MinPS measured the downwards effect of the convex baseplate on the abdomen fat layer (elements coloured according to the peak level of compression/squeezing)

Figure 1. Stoma system baseplates

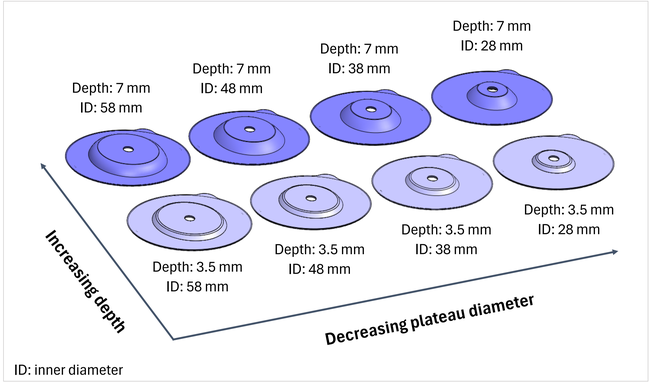
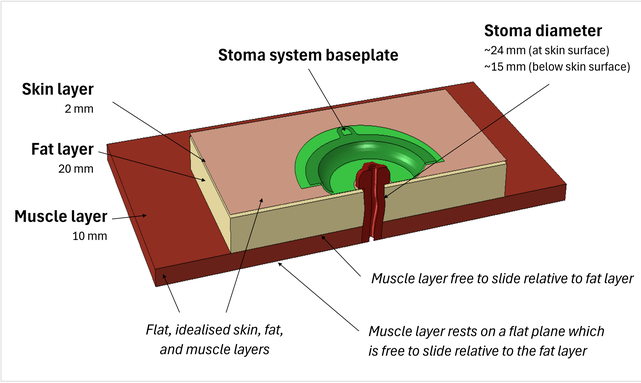


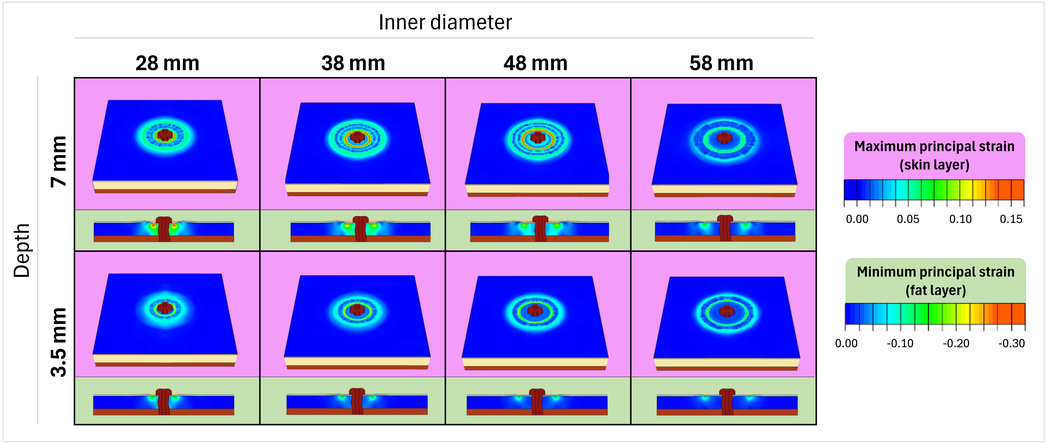
Figure 2. Flat abdomen model with stoma baseplate



Results

- The magnitudes of MaxPS and MinPS in the abdomen was found to depend on both the inner diameter and depth of convexity for each product
- The greatest skin tension (MaxPS) and fat layer compression (MinPS) were found to be in the region directly under the inner diameter of the EVA baseplate (**Figure 3**)
- The regions where greatest skin tension and fat layer compression occur vary based on the inner diameter of the EVA component for each product
- The skin had areas of low level tension in the peripheral regions of the baseplates created by the adhesive on the flange of the product lifting the skin
- The 7 mm depth baseplates generated a higher level of central skin tension and fat layer compression than the 3.5 mm depth baseplates

Figure 3. Comparative outputs for baseplate range after application to flat abdomen model



Discussion

- The findings illustrate the role of convexity in ostomy care and the value of having a range of baseplate geometries to address patient-to-patient variation in stoma type and peristomal skin
- The convex product range under investigation produced skin tension and fat compression at different locations and magnitudes based on the depth and diameter of convexity
- Future work to explore the clinical utility of these findings is warranted

Conclusion

FE modelling are useful tools to help the ostomy provider consider product selection in clinical practice

References

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