

Making Sense of Convexity

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Introduction

Integrated convex ostomy appliances have been available in Australia since 1981. There are now new convex products providing more choice in convex design, depth, style and brand. Where traditional convexity provides peristomal skin pressure by incorporating a rigid convex flange into the appliance, new products include construction where convexity is obtained by incorporating an extra thickness of hydrocolloid into the flexible pouch adhesive/skin barrier to give added thickness where it is needed i.e., next to the stoma. Convex appliances are well accepted by patients and clinicians, are simple to use, cost-effective, perform well, and are often the product of choice when pouching problematic stomas. However, do the newer styled products offer any further advantages over traditional convex products? And when should shallow, moderate or deep convexity be used? While there have been many studies on 'traditional' convex pouching systems, little has been documented regarding the newer styles.

A panel of Australian Stomal Therapy Nurses was formed to discuss these issues and formulate recommendations for less experienced clinicians with regards to the selection and use of convex ostomy products. Some clinicians have limited experience with convex products due to perceived associated costs, limited access to convex products or lack of experience and knowledge when choosing convex products.

The Existing Definition of Convexity

Convexity is defined as the outward curving of a faceplate which begins at the aperture of the faceplate and extends outward. It may be categorised as shallow, medium or deep.¹

- Support is the degree of rigidity required to overpower the peristomal skin's ability to deform. This can be categorised as minimal, moderate and rigid.¹
- Existing categories: shallow (1/16 inch or 1.58mm), moderate (1/4 inch or 6.35mm), and deep (greater than 1/4 inch or 6.35mm).¹

Differing Depths

The panel opinion did not favour deep convexity overall and recommended that it be used rarely. The panel found deep convexity is necessary in daily practice up to only 5% of the time, while moderate depth convexity was useful 95% of the time (based on the existing definition of moderate convexity of 1.58mm–6.35mm).¹

The panel reasoned that deep convexity has been known to easily lift off if a body fold is created as a result of the stoma construction and the associated potential risks of peristomal skin ulceration. However, there are occasional cases where deep convexity has been used successfully as a non-surgical alternative to protrude the stoma.²

It is recommended that the required depth of convexity be determined by observing the tension of the abdominal wall. Tension arises from the thickness of the abdominal wall, particularly if the patient is obese. In preference to deep convexity, the panel suggests the use of a seal or convex ring over a moderate convexity for greater softness and flexibility. Adjusting the depths of convexity, including the use of a seal to increase the depth of moderate integrated convexity, can better

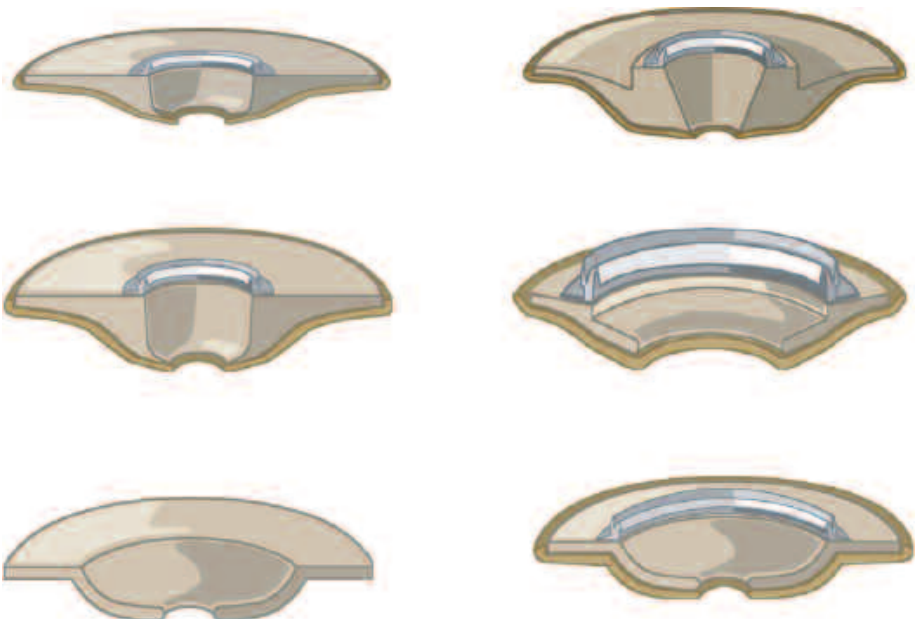
assist with stoma protrusion and help maintain a seal between skin and appliance without using deeper convex products.

Appliances with moderate depth convexity are extensively used as the general shape and gradient of dish provides adequate stoma seal at the site of the stoma and not over the wider parastomal plane. These appliances are generally not associated with the occurrence of peristomal pressure ulcers and patients report greater comfort resulting in greater compliance.³

Fully flexible convex appliances (those without an integrated dish), while conformable and comfortable, may not be rigid enough to provide the necessary support to protrude the flush/retracted stoma and protect against leakage. There are currently insufficient studies on these newer styles to fully determine their effectiveness in a variety of situations. However, it might be suggested that there is a need for these flexible types of convexity as the compliance rates may be higher due to the acceptance of more comfortable products. However, this has not been established.

Several Factors Determine the Effectiveness of a Convex Flange

- Depth of convexity
- Shape and gradient of convexity
- Ability to minimize pressure points
- Abdominal wall



Convexity and Wound Management

Shallow or moderate convexity is also very useful for complex wound management problems. In the case of fistulae, it is possible to create depth without using deep convexity. Patients experience very few problems using moderate to shallow convexity, and good skin management around the fistulae is easily achieved. It is recommended that when selecting integrated convex appliances, moderate depth which is both flexible and comfortable is the preferred choice overall for clinicians.

Ostomy Belts

Many clinicians also advocate the use of an ostomy belt to maintain even pressure or exert an accentuated convex effect. The panel agreed that over 50% of convex users needed to wear an ostomy belt. The belt, which attaches directly to the pouch ring or skin barrier flange, stabilises the skin barrier on large or flaccid abdomens and when the stoma is sited within skin folds.

Characteristics of Convexity

Because the preceding definitions were written prior to the development of newer products, the panel discussed the issue of changing the definition to encompass a broader scope.

The panel proposed a more ‘blanket’ definition, as follows:

“Characteristics of Convexity”

The outward curving of a skin barrier designed to apply some form of direct pressure to the immediate peristomal skin, promoting a good seal between ostomy pouching system and skin. The degree of obtained pressure depends not only on the depth, rigidity and gradient of the convex skin barrier but on the shape and the rigidity of the abdominal wall.

Indications for using convex products

- Flush/retracted stomas experiencing leakage with fluid or firm output
- Retracted stomas or stomas at skin level
- Majority of loop ostomies
- Telescoping stomas
- Wrinkles, scars or creases near the stoma
- Flaccid abdomens

Contraindications

- Well-fashioned stomas
- Stomas with a spout
- Peristomal hernia

Convexity - Precautions

- Peristomal varices
- Prolapsed stomas
- Peristomal Crohn’s ulcer
- Peristomal pyoderma gangrenosum
- Mucocutaneous separation

Cut-To-Fit Convexity vs. Pre-Cut Convexity

Stomas can be irregular in shape and require custom design. While cut-to-fit or mould-to-fit products can solve issues such as early post-operative oedema and irregular sized stomas, the overall preference by the panel is to use a pre-cut product wherever possible.

With pre-cut apertures, the downward pressure obtained from the convex design is delivered to the immediate peristomal skin. Pre-cut options also favour those with limited dexterity for cutting or moulding. Cut-to-fit or mould-to-fit appliances, while useful, may not be exerting the necessary direct pressures needed to overcome the problems. The convex effect may also be lost if the stoma is significantly smaller than the maximum possible appliance aperture. Often the use of a pre-cut integrated convex product with a seal can overcome the use of cut-to-fit or mouldable product use while addressing the needs outlined above.

Recommendations

- Assess the patient's abdominal contours (folds/creases) and rigidity to determine needs for choosing flexible or rigid convexity
- Assess the peristomal plane
- Assess the stoma characteristics, output, protrusion, etc.
- Observe the stoma where possible in both its' inactive and active states to determine if there is telescoping
- Use integrated moderate depth convex appliances when choosing to use convexity
- Consider routine convex use on loop ileostomies
- Consider the use of an ostomy belt
- Add seals or rings to flat or moderate depth convex barriers to increase depth but not rigidity before choosing deeper convex products
- Routinely follow up with patients using convex appliances to determine performance and outcomes

Follow Up

While convex appliances are widely used and accepted, they are pressure devices and as such should be reviewed intermittently. Patients once discharged, may experience weight gain or loss or develop herniae which may accentuate convex pressures to the parastomal plane. In particular, deep convex appliances have been associated with pressure ulcer formation and require closer monitoring. Also cut-or mould-to-fit appliances may be discontinued in favour of a pre-cut aperture once the 'final' stoma size is established.

Conclusions

Convexity as a problem solver has proven historically to be an extremely useful tool for those involved in stoma care. It is cost-effective, easy to use and offers a person with a stoma a good quality of life.

The panel indicated a preference for moderate depth integrated convex products and recommends a regular review every six months for patients with a permanent stoma as abdominal contour changes, such as hernia formation which may result in convexity being no longer needed, even for patients using shallow convexity.

As newer style convex products are developed by ostomy product manufacturers, more studies need to be performed to evaluate their effectiveness in the clinical situation.

An additional information sheet, "Case Studies in Convexity Product Management," may be helpful as an adjunct to this discussion paper. It is a series of case studies for the use of convex products in various clinical settings.

References

- 1 Bonnie Sue Rolstad RN, St Paul, Minnesota 1992. Indications and uses for Convexity in Ostomy Management.
- 2 Carmen George 2002, Peristomal pressure ulceration JSTN 22/4 pages 17-21
- 3 Bourke and Davis 2003, JSTA 23/1 pages 7-12



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