

An assessment of the conformability of superabsorbent dressings

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Introduction

Superabsorbent dressings are widely used in the treatment of chronic wounds due to their enhanced absorption and retention properties. Due to their complex structures, they are unable to be cut by the clinician during application. Folding these dressings to conform to different body areas is common practice in order to ensure a good fit to the wound area. This study aimed to investigate the ability to fold superabsorbent dressings, and the effectiveness of dressings when in folded configurations.

Methods

Assessment of conformability

Dressings were assessed for bending length in order to understand flexibility. Each dressing was taped to the side of a lab bench, the length of bend was recorded (Figure 1).

Folding techniques were then used to allow the dressings to conform to different body parts of a volunteer. Ten folding techniques were assessed for each dressing.

Assessment of fluid management when folded

The ability to handle fluid was assessed with two tests:

- 1) Wicking- A 1ml volume of coloured Solution A was syringed onto each dressing, the width of fluid spread recorded.
- 2) Simulated wound models:
 - **Model 1** - Dressings were taped in a folded configuration to a heated steel plate with a fluid inlet (Figure 2). Fluid was supplied to the dressing over 24 hours in order to assess fluid uptake capabilities.
 - **Model 2** - Dressings A & B were taped in their folded conformations to a simulated leg with a fluid inlet. Fluid was supplied to the dressing over 24 hours in order to assess fluid uptake capabilities.



Figure 1- Bending length assessment of a superabsorbent dressing



Figure 2- Wound model 1, with folded dressings applied

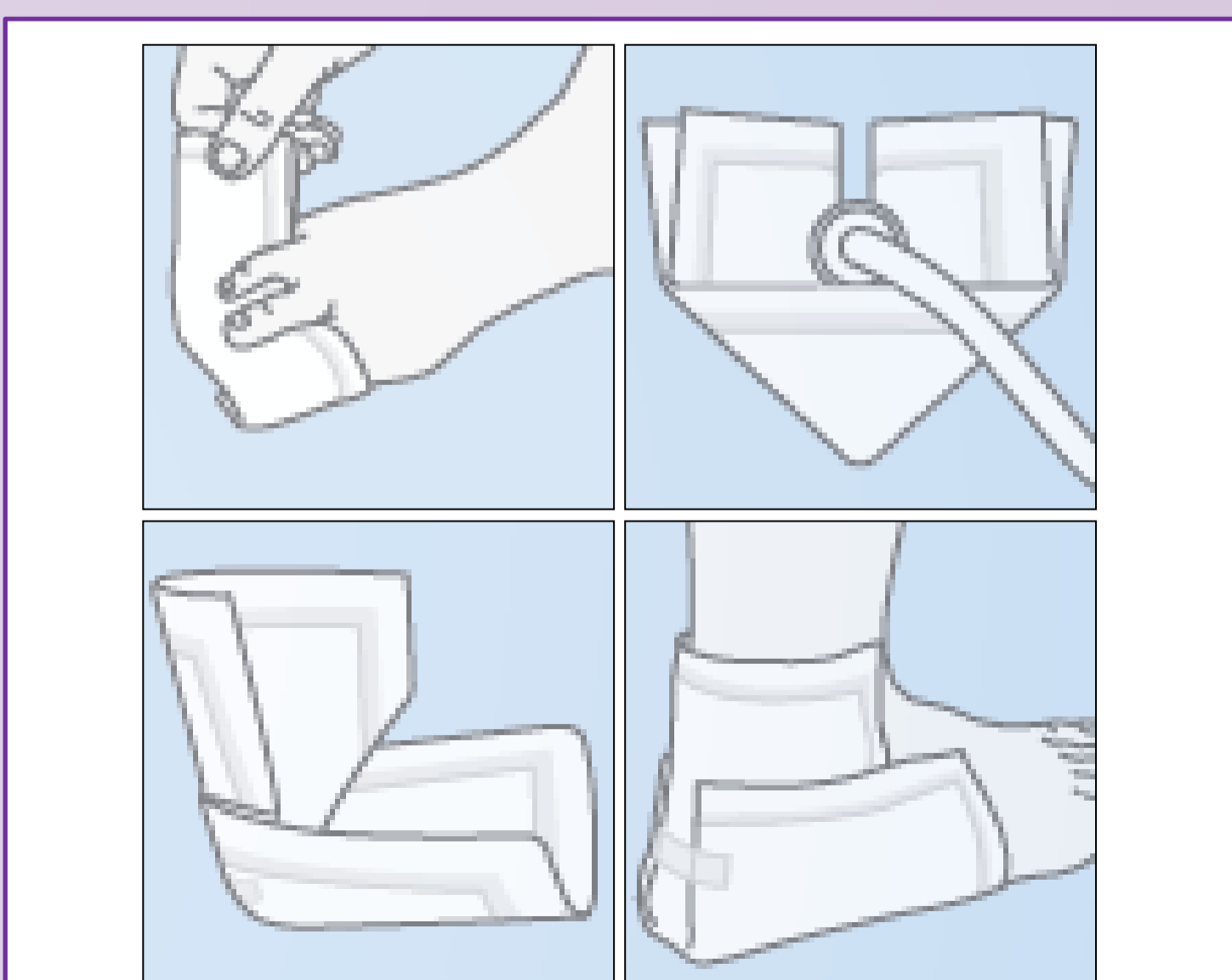


Figure 3- Examples of folding techniques

Results & Discussion-

Assessment of conformability

Dressings showed a large amount of variation in the bending length tests, with some dressings remaining more rigid than others. Table 1 shows the bending length of each dressing, the larger the number the more flexible the dressing is deemed to be.

Dressing	Bending Length (mm)
Dressing A	128
Dressing B	91
Dressing C	78

Table 1- Bending length of each dressing, a higher number indicates increased flexibility

On application to volunteers only Dressing A was able to be folded using each of the ten techniques (see figure 3 for examples of folding configurations). The rigidity of Dressing B prevented some configurations from being successfully applied to the body. Dressing C was able to be folded, however it was noted that some configurations would prevent fluid uptake due to the water resistant backing.

Assessment of fluid management

Wicking:

The three dressings demonstrated a difference in wicking capabilities (table 2).

Dressing	Width of fluid spread(mm)
Dressing A	49
Dressing B	36
Dressing C	20

Table 2- Width of fluid spread (wicking) of each dressing.

Fluid wicking is important in superabsorbents to prevent gel-blocking and to allow use of the entire pad for absorption. The effect of fluid wicking can be seen in the simulated leg wound model where Dressing B did not allow effective absorption and caused leaking from the model.

Wound Models:

Model 1: All dressings were able to be applied to the wound model successfully when folded. Dressing C showed significant bulging away from the model over the 24 hours.

Model 2: In the simulated leg model, only Dressing A was able to perform effectively when folded to conform to the simulated leg (Figure 4). Dressing B absorbed at the bottom of the pad, and fluid was able to leak from the model. This behaviour was attributed to the rigidity of the dressing which prevented close contact on all points of the simulated leg.

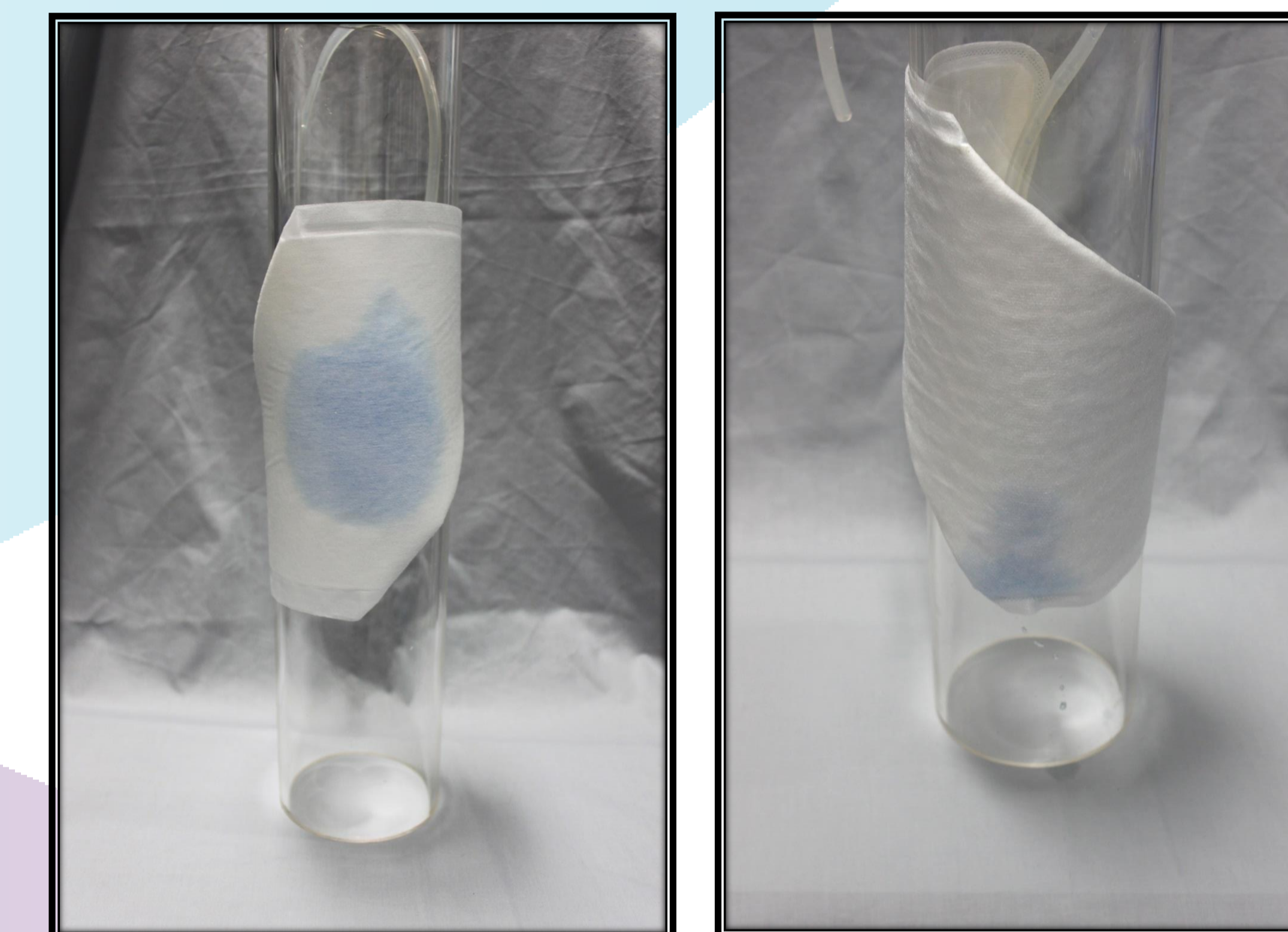


Figure 4- Dressing A (left), and Dressing B (right) applied to a simulated leg wound model. Dressing A shows fluid spread at the point of intake, Dressing B was seen to absorb lower down the dressing, and leakage was noted.

Conclusion-

Although the folding of superabsorbent dressings is commonplace, and vital to effective use not all dressings are able to be folded in an effective manner. Dressing selection should therefore be carefully considered in respect to the area of application on a patient.