

## Can I use fitted sheets on ACTIVE (alternating pressure) therapeutic mattresses?

*At ArjoHuntleigh we understand the differing needs of healthcare providers and know that pragmatic decisions have to be made. We have produced the following fact sheet so that you can make an informed choice about whether to use a fitted sheet on Active (alternating) support surfaces*

### Background

The NPUAP-EPUAP Clinical Practice Guideline (2009) tells us that pressure ulcers are primarily caused by pressure and even low-pressure can be pathological if prolonged<sup>1</sup>; the functional role of the support surface is therefore to **'provide an environment' that enhances tissue perfusion**<sup>2</sup>.

Indeed this is the design goal behind ArjoHuntleigh therapeutic surfaces, whose performance characteristics have been designed to hold pressure on the tissue for **as low as possible for as long as possible** during the 5-minute deflation phase in each 10-minute cycle (Figure 1).

This modality has been shown to produce significantly greater tissue perfusion than those surfaces that retain a higher residual pressure (Figures 2 & 3)<sup>3</sup> and the therapeutic benefit has been reported across many complex and challenging clinical trials<sup>4</sup>.

To further optimise the off-loading profile, many ArjoHuntleigh surfaces also incorporate specialised features such as Heelguard™ and Wound Valve Technology™; both are particularly important for the protection of the most vulnerable areas: heels, surgical sites and wounds. In order to gain maximum benefit from these features we have, in the past, recommended that

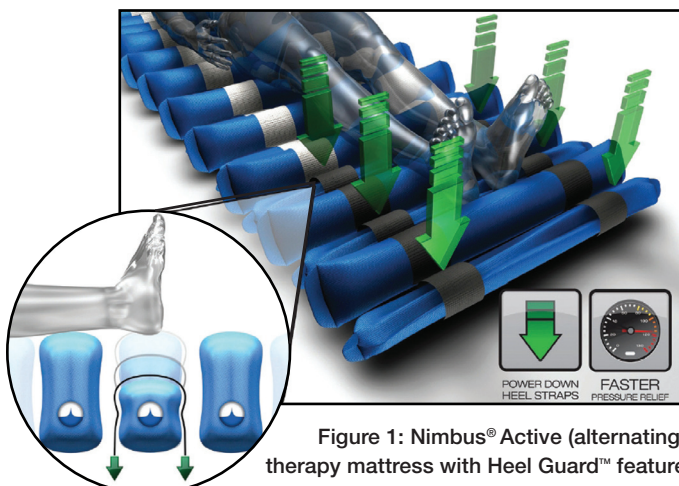
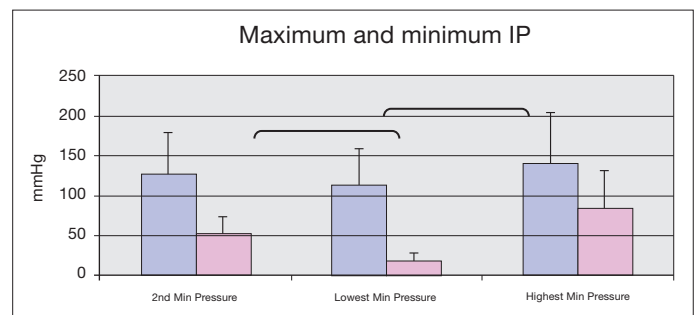
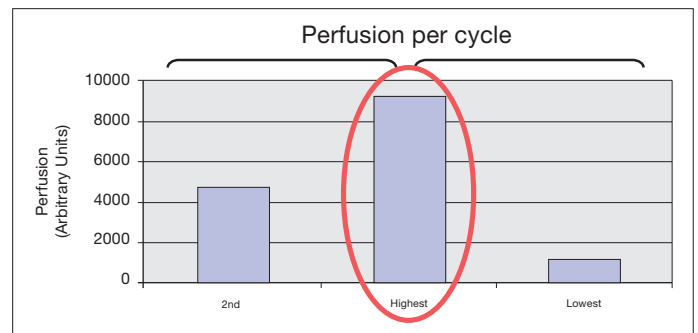


Figure 1: Nimbus® Active (alternating) therapy mattress with Heel Guard™ feature



Figures 2 & 3: Significantly greater tissue perfusion seen in surfaces providing the lowest residual interface pressure during cell deflation.



the mattress is dressed with a loosely draped sheet while tight 'tucking-in' is discouraged: this is to avoid the tendency for the sheet to create a 'hammock' across the deflating cell, which may apply residual pressure to the skin during the off-loading cycle. This hammock effect has been well described in the literature<sup>5 6 7 8 9 10 11</sup>.

**Now, with the greater availability of fitted bed linen, the question is whether these can, or indeed should, be used on more sophisticated<sup>12</sup> powered surfaces, designed specifically to periodically off-load pressure beneath the most vulnerable patients?**

Although this FAQ sheet is geared toward the effect of fitted sheets on *Active* or alternating surfaces, similar considerations are appropriate for those *Reactive* surfaces, such as low air loss mattresses, which are designed to reduce pressure across the tissue through a process of immersion and envelopment.

## How might a fitted sheet affect mattress performance?

In our own tests, we observed a fitted sheet (with elasticated retention edge) create a 'hammocking' effect in which the fabric 'bridged' across the deflating cells and counteracted the potential pressure reduction associated with normal cell deflation. However, although there is a demonstrable link between off-loading performance and blood flow (Figures 2 & 3) we cannot determine, by observation alone, as to whether or not this hammock effect might adversely affect tissue outcomes.

We also noted:

- The sheets did not fit well on the deeper cell, powered, mattress replacements.
- The Wound Valves (Nimbus® range) were obscured (Figure 4).
- Fit was tight and fabric stretched (hammocked) over the deflating cells (Figure 5).
- The mattress was pulled out of shape by the sheet when the head of the bed was raised (Figure 6).
- The ability of the deflating cells to produce a low-pressure environment was impeded: in some instances, pressure was double that seen with a standard cotton sheet<sup>13</sup>.

## Overall Conclusions: Using a fitted bed sheet with minimal effect on mattress performance

We understand that you may wish to use fitted sheets and so we offer the following advice:

- 1 Ensure the sheet is the correct size to fit a deep-cell, air-filled mattress so that stretching or 'hammocking' does not compromise the benefit of pressure-redistribution associated with cell deflation.
- 2 Use a 4-way stretch sheet for minimal interference of cell deflation in active/alternating therapy surfaces. This is also important when using Reactive/constant low pressure surfaces which reduce pressure through a process of body immersion and envelopment. The effect is likely to be less marked in reactive systems, but further work is required.
- 3 Ensure the sheet does not impede observation and access to mattress controls such as Wound Valves.
- 4 **Ensure the sheet does not interfere with access, visibility or operation of CPR controls.**
- 5 If using a fitted sheet for the first time, with a patient previously nursed on a loose non-fitted sheet, do not assume that repositioning and skin assessment intervals will remain the same.

## References

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- <sup>4</sup> ArjoHuntleigh Clinical Evidence Brochure 2011; V6.0 [www.arjohuntleigh.com](http://www.arjohuntleigh.com)
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- <sup>8</sup> Australian Wound Management Association. Clinical Practice Guidelines for the Prediction and Prevention of Pressure Ulcers. 2001; 21 Free at: <http://www.awma.com.au/publications/publications.php#clinical>
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- <sup>11</sup> Hampton S. Importance of the appropriate selection and use of continence pads. *British Journal of Nursing*. 2005; 14(5): 265-269.
- <sup>12</sup> National Institute of Health and Clinical Excellence. Clinical guideline 29. 2005.
- <sup>13</sup> ArjoHuntleigh data on file, 2011.



Figure 4:



Figure 5:

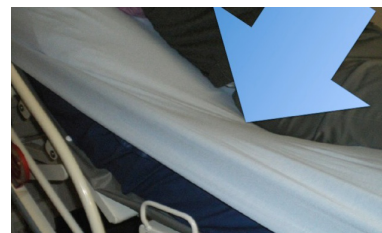


Figure 6:

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