

Enhancing Support Surface Therapeutics and Decreasing User Error Using Continuous Bedside Pressure Mapping†

Jennifer A. Edwards, MSPT; Shari L. Scheider, PT, DPT; Kristen M. Thurman, PT, CWS, FACCWS*
Swedish Medical Center, Englewood, Colorado

Purpose/Problem

National guidelines recommend examination of support surfaces for appropriateness and functionality upon every encounter with a patient, as an important element of pressure ulcer prevention.¹ Bedside practice involves the “hand check” for bottoming out to ensure adequate pressure relief by a support surface.² Due to time, bed coverings, and patient comfort, this is often not practiced as often as recommended. A continuous bedside pressure mapping (CBPM) system offers a visual image of pressures that exist between a patient and a support surface, allowing caregivers to quickly assess those pressures in real-time, continuously.^{3,4}

Methods

A 32-year-old woman, 5'11" tall, weighing 145 pounds was placed on the same air mattress for the following test scenarios. The scale for the pressure mapping device was not changed during the study.

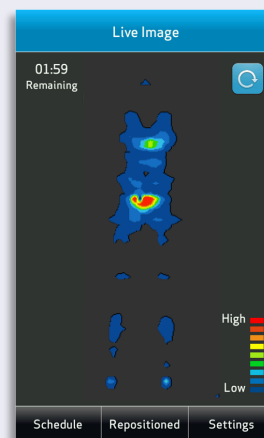
Air mattresses were adjusted in 4 clinical scenarios:

1. Under-inflated, as if the mattress was not adjusted appropriately for the patient or was not functioning appropriately and therefore allowing bottoming out
2. Over-inflated, as if the mattress was maximally inflated manually (not using the max inflate button that would re-set after a short time to default setting) for a transfer and not re-set back down to therapeutic range
3. According to patient weight/default setting
4. According to the CBPM image

Peak pressures and images were obtained from the CBPM system. Red areas on the pressure map indicate pressure of ≥ 75 mmHg.

Bottoming-Out or Not Properly Inflated

Air mattress not inflating properly and patient bottoming out



Peak Pressure: 125 mmHg

Instead of having to do a hand check and disrupting the patient,



the CBPM monitor allows for continuous monitoring of bottoming out and mattresses that are not functioning properly

Air Mattress Set Based on Default Setting

Air mattress set by patient weight/default mattress setting



Peak Pressure: 46 mmHg



Default setting is 4 bars, medium comfort setting, upon delivery; most times, it is left at this setting when in use.

Outcomes

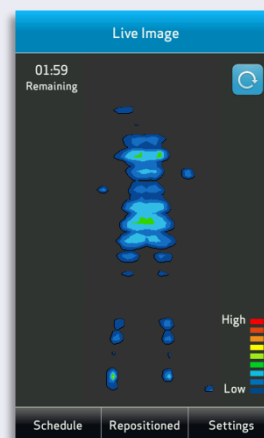
Using the CBPM system, air mattresses were adjusted to find lower peak pressures and improved images on the pressure monitor for individuals, maximizing the therapeutic value of the support surface. Inappropriate uses of support surfaces were also readily identified, as peak pressures were very high when mattresses were overinflated or under-inflated. These pressure changes were not always obvious without the CBPM image.

Conclusions

The real-time, continuous feedback of the CBPM system allows caregivers to easily monitor the appropriateness of support surfaces for individual patients, the proper functioning of each support surface, and the appropriate use of each support surface to gain the maximum therapeutic value.

Air Mattress Over-inflated

Air mattress left over-inflated after transfer or repositioning



Peak Pressure: 56 mmHg



Instead of using the **AutoFirm** button, which will reset to default settings after 15 min, the **comfort adjustment** button was set high which keeps the mattresses maximally inflated indefinitely.

Air Mattress Set Based on CBPM Image

Air mattress adjusted using the color image from the CBPM monitor



Peak Pressure: 30 mmHg



Air mattress readjusted using the CBPM monitor to find the best pressure redistribution, for this individual 3 bars.

References

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4. Behrendt R, et al. Continuous Bedside Pressure Mapping and Rates of Hospital-Associated Pressure Ulcers in a Medical Intensive Care Unit. *Am J Crit Care* 2014;23:127-133.

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