

# Biofeedback of Continuous Bedside Pressure Mapping to Optimize Effective Patient Repositioning

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## Purpose/Problem

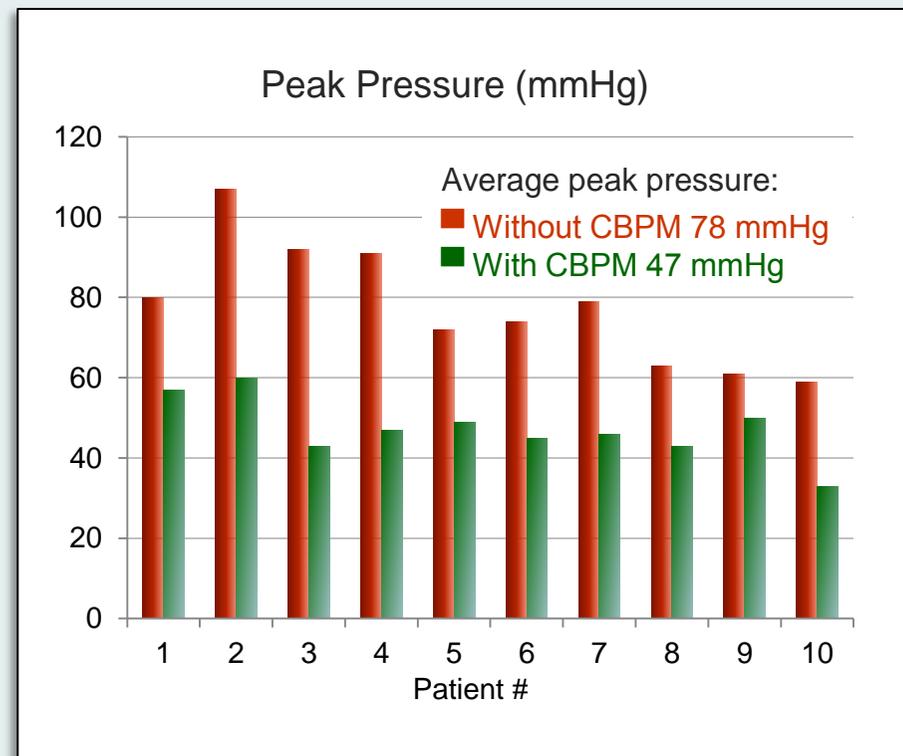
Biofeedback is a process that enables an individual to learn how to change physiologic activity for the purposes of improving health and performance. Precise instruments measure physiologic activity and these instruments rapidly and accurately 'feed back' information to the user. The presentation of this information — often in conjunction with changes in thinking, emotions, and behavior — supports desired physiologic changes. For decades, patients have been repositioned in bed without any feedback confirming that their positioning is effective. A new continuous bedside pressure mapping (CBPM) system\* now offers caregivers feedback through a visual image of where pressures exist beneath patients.

## Methods

Bedside caregivers were asked to reposition patients to the best of their abilities, using pillows and positioning aids without the visual feedback from the CBPM system. Once positioned, caregivers were shown the image of where pressures existed and then were able to reposition the patient to alleviate areas of higher pressures. Data from the CBPM device, in the form of visual screenshots and peak pressure values, were obtained after each episode of repositioning.

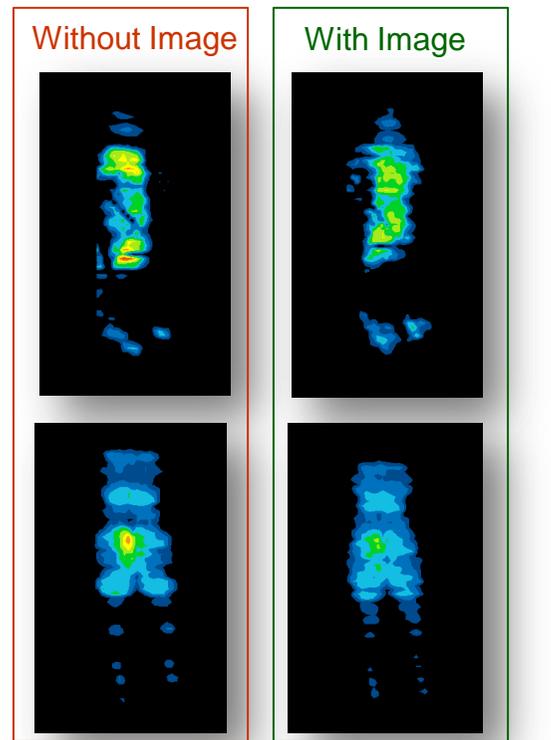
## Outcomes

### Peak Pressures without & with CBPM Feedback



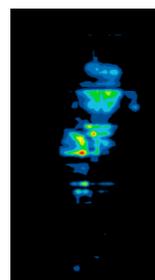
### Patient Repositioning without & with Seeing CBPM Image

**Patient 1**  
 During scheduled repositioning the CBPM system shows caregivers how to position more effectively with lower peak pressures.



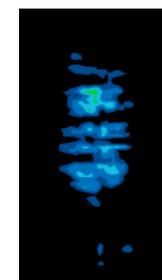
**Patient 6**  
 ICU patients are less stable to fully turn. The CBPM system helps staff make minor adjustments to decrease high pressures beneath the patient.

Objects beneath patients can cause high pressures.



A patient's pressure map when lying in bed with a bed pan beneath him

Peak pressure: 107 mmHg (red areas)



The same patient's pressure map when lying in bed with no objects beneath him

Peak pressure: 42 mmHg (green areas)

## Results

Screenshots displayed lower pressures when the feedback from the CBPM system was utilized by caregivers. Lower peak pressure measurements were also evident after the visual image from the CBPM system was made available to the bedside caregivers.

## Conclusions

With the biofeedback from the CBPM system, caregivers were able to more effectively reposition patients. Effective patient repositioning plays an important role in minimizing pressure under bedbound patients, which is an essential component of preventing pressure ulcers.

## References

- NPUAP and EPUAP. Pressure Ulcer Prevention: Quick Reference Guide 2009. Available at: [www.npuap.org/Final\\_Quick\\_Prevention\\_for\\_web\\_2010.pdf](http://www.npuap.org/Final_Quick_Prevention_for_web_2010.pdf)
- Thurman K, Wickard S. Take the Pressure Out of Pressure Ulcers. *Long-Term Living* 2011 October;60(10):22-23.

\*The M.A.P.™ System, by Wellsense, USA, Inc., Nashville, TN  
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