

# Implementation of a Low-Profile Micropressure Support Surface for the Prevention of Perioperative Pressure Ulcers in Cardiac Surgery Patients

Presented at Fall SAWC, Las Vegas, Oct 20-22, 2017 – selected as the best abstract in Clinical Research section

## BACKGROUND:

Patients undergoing cardiac surgery are at increased risk for developing perioperative pressure injuries, with reported incidence of up to 29.5%.<sup>1</sup> A low-profile alternating pressure (AP) micropressure support surface with hundreds of comfort nodes, designed to periodically off-load static tissue pressure and minimize shear stress during surgery, was evaluated. The device was recently employed for cardiac operations in a large tertiary care center, and its effect on rates of perioperative pressure injuries was studied.

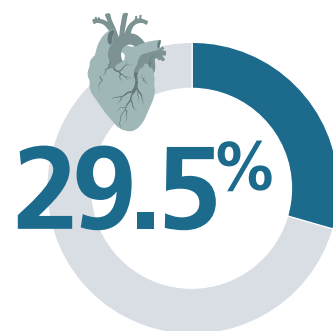
## OBJECTIVE:

The purpose of the interim analysis was to evaluate the implementation of the micropressure support surface in a large hospital setting.

## METHODS:

The micropressure support surface was employed for open cardiac operations between June 1, 2016 and November 30, 2016. Operating room staff was asked to complete feedback forms to quantify any barriers to implementation, including issues with device setup, ease of use, and operation. Patient charts were reviewed to determine rates of perioperative pressure injuries (defined as occurring within 72 hours of surgery) in patients for whom feedback forms were completed.

**Cardiac patients  
at risk for PIs**



**Incidence rate  
for developing  
perioperative  
pressure injuries**

## Results:

The micropressure support surface was employed for 2,056 cardiac operations during the evaluation period. Feedback forms were completed by OR staff for 364 cases (average surgery duration  $4.8 \pm 1.1$  hrs, BMI  $29.0 \pm 6.0$ ). Radio frequency interference between the surface and the electrocautery unit and overlay-control unit connection were identified as potential concerns by OR staff. For cases where feedback forms were available, there were zero perioperative pressure injuries after implementation of the micropressure support surface.

## Conclusion:

A low-profile AP micropressure support surface system can be successfully implemented in a large hospital cardiac surgery setting. No perioperative pressure injuries were reported for surgeries with completed feedback forms during the evaluation period. Concerns about radio frequency interference and support surface connection have been addressed through hardware and software updates, improved device positioning and additional staff training. Further research is needed to better understand the clinical impact of this device on reducing incidence of perioperative pressure injury.

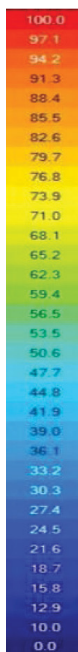
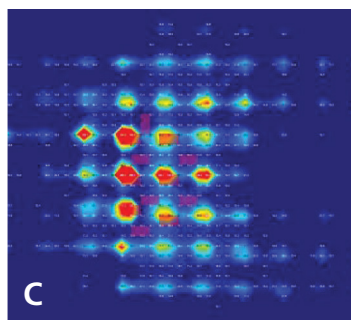
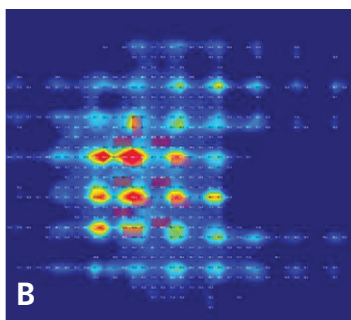
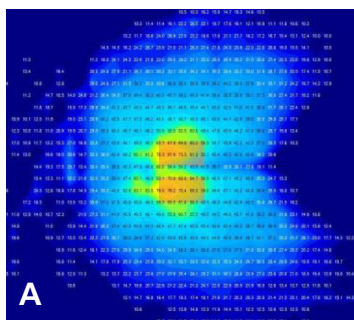
**A prospective randomized clinical trial (6,000 subjects) to evaluate the clinical efficacy will start shortly at this institution.**



**364**  
cardiac operations\*

**0** perioperative pressure injuries after implementation of the micropressure support surface

\*Average surgery duration  $4.8 \pm 1.1$  hrs, BMI  $29.0 \pm 6.0$

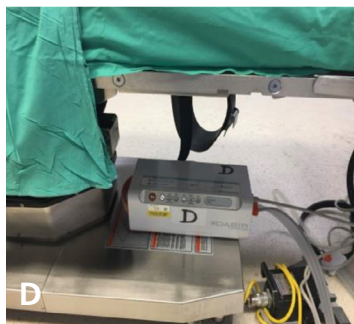


**Fig A:** Interface pressure (IP) map of male subject's pelvic area, lying on OR pad alone.

**Fig B and C:** IP maps of pelvic area with subject lying on the overlay placed on top of the OR pad while Zone 1 (Fig B) and Zone 2 (Fig C) are inflated. Red colors indicate IP of 100 mm Hg or higher.

**Fig D:** The AP control unit was initially placed on the foot pedestal of the OR table.

**Fig E and F:** To eliminate radio frequency interference between the AP control unit and improve visibility, the control unit was moved to custom-engineered mounting brackets located at the foot of the bed.



## REFERENCES:

1. Rao A.D. et al. "Risk Factors Associated with Pressure Ulcer Formation in Critically Ill Cardiac Surgery Patients: A Systematic Review," *Journal of Wound, Ostomy and Continence Nursing*. 2016;43(3):1-6.