

Reactive support surfaces used for prevention of pressure ulcers : comparison of pressure imaging

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I INTRODUCTION

In our Long Term Care Unit (Unité de Soins de Longue Durée—USLD) which has 41 beds, water overlay mattresses were the only support surface used for preventing pressure ulcers. We wanted to assess the efficacy of memory foam and static air mattresses vs the water support surface we normally use and have used a sensor pad to do so.

II METHODOLOGY

A. Population:

- 32 subjects (25 inmates and 7 personnel members)
- 11 men & 21 women
- Age: 25 USLD residents between 56 & 100, 7 personnel members between 19 & 52
- Weight: between 29,6 kg & 96,5 kg
- BMI: between 15,4 & 38,7

B. Devices used:

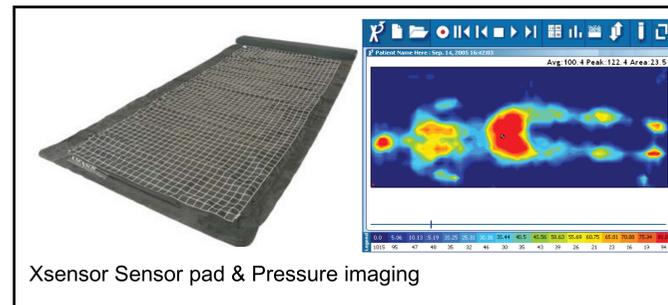
Pressure ulcer preventing devices used

- Memory form mattress: Novaform*
- Static air overlay: Repose*
- Water overlay: Hydromodule*
- Sensor pad used: XSensor X3*

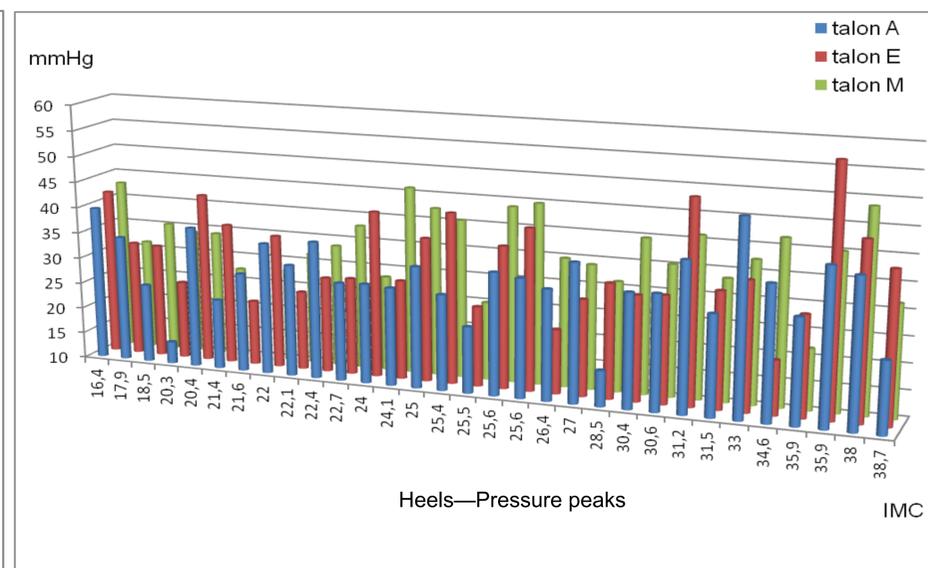
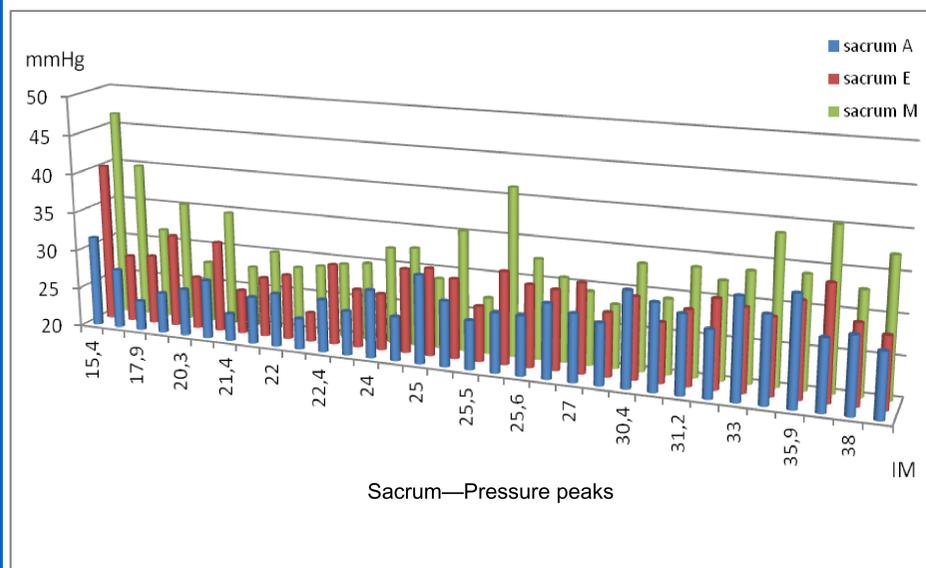
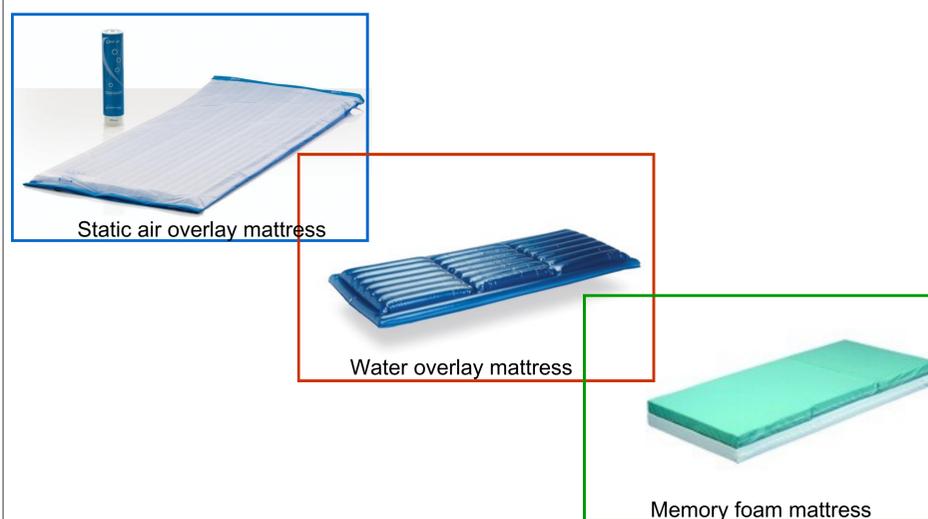
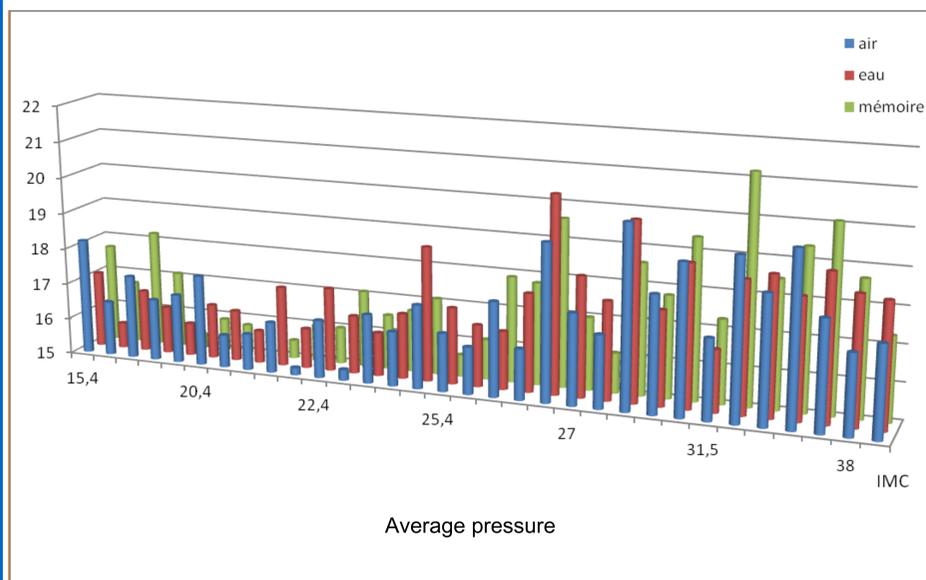
C. Methods:

Comparison of the average pressure measured with the different support surfaces at the heels and at the sacrum.

Every subject has used each support surface on which the sensor pad was placed. After one and a half minute of lying still in supine position, a pressure image is made. The paired Student's t-test was used for the statistical analysis and to detect significant differences of pressure level between the used devices.



IV RESULTS



V DISCUSSION

A. Average pressure

No significant difference has been shown between the 3 support surfaces.

The pressure images however illustrate a better pressure distribution with the static air support vs the memory foam mattress.

B. Pressure peaks

The best results at the sacrum level are obtained with the static air mattress. The water device comes second best, and the memory foam stands third.

These results are confirmed at the heels where the scores between the water device and the memory foam are closer however.

Vanderwee and Defloor have already evidenced in 2008 that the static air overlay mattresses generate less pressure than the memory foam mattresses do.

It must be stressed that the patient's position is of utmost importance ; whenever a leg slightly outlies the body symmetry, the heels suffer higher pressure.

C. Advantages and limits of the assessed support devices

STATIC AIR OVERLAY MATTRESS

Advantages: efficacy, light weight, easy storage (mattress stored in pump requiring little storage space, low price.

Limits: maceration, air instability (lower however than with water), puncture risk, more expensive than water overlay mattress.

WATER OVERLAY MATTRESS

Advantages: efficacy, insignificant cost.

Limits: weight, missing or approximate water volume setting, water getting cold and uncomfortable when the patient leaves the bed, water instability, need of monthly water replacement and puncture risk (use of electric bed increases the risk).

MEMORY FOAM MATTRESS

Advantages: efficacy, no handling needed after setting up, comfort.

Limits: price, maceration, important storage volume required, heavy weight for personnel.

VI CONCLUSION

Our study shows the efficacy of a water overlay mattress which however is not very convenient to use.

The lesser results shown with the memory foam mattress may have been induced by the pressure measuring method.

The static air overlay mattress is easy to use and thus is a valuable alternative. It works, it is light, it is easy use and it takes only seconds to install it. We have already used it in emergency situations when a pulsed air mattress suddenly deflates at night.

A daily follow up protocol implemented during the test within the unit has shown that the assistant caregivers only need to inflate the static air overlay mattress weekly. We are thus looking forward to replacing our old water overlay mattresses. Considering the price of the static air overlay mattress, we do hope to avail of more than one device in each department.