

A evaluation platform for the anti-ulcers mattress

Y-H. LAI, M-W. SUE, L-Y. GUO. **A novel evaluation platform for the evaluation of anti-ulcers mattress.** *Gerontechnology* 2014; 13(2):232; doi:10.4017/gt.2014.13.02.086.00 **Purpose** Pressure ulcers are common in a number of people and are caused by the occlusion of capillary blood flow and increased contact pressure¹. A pressure relieving mattress was recommended to prevent pressure ulcers². Recently a mattress was designed by Lain Hong Shing Yeh CO. (Patent M427068), on which the surface was mounted on a mushroom shape support and in the form of a tray. By controlling the density and dimension of PE or EVA material during manufacturing, the mattress would have a resilient effect. The aim of this study was to develop a platform for the evaluation of the mattress using physiological signals and to determine its effectiveness in respect to the standard hospital mattress. **Method** Pressure Sensor Model #5330, Tekscan Ltd; OxyLab LDF, Oxford Optronix Ltd and LM35 temperature sensor, NS Ltd was integrated into the mattress evaluation platform. Four candidate mattresses, provided by patent holder, LAIN HONG co, and a standard mattress were evaluated. Subjects lay in supine position on each mattress for 30 minutes. Pelvis interface pressure, sacral blood perfusion, and temperature were recorded simultaneously by the platform. **Results & Discussion** Sacral temperature increased about 2.0-2.5 degrees C in all mattresses. *Figure 1* is the scatter plot showing the distribution of individual mattress Pressure and Perfusion. Although the contact pressure varied in 4 candidate mattresses, the perfusion of all new mattresses was higher than standard mattress. The newer geometric surface shape has advantages including (i) The gap between each mushroom shape support array could increase immersion and envelopment effects; (ii) Accumulation of moisture between the support surface and the skin could be removed by circulating air, which is beneficial because wetness of the skin could influence the hyperemia response during loading pressure. Presently, the platform could allow technicians to adjust the mattress material protocol. Next, we will combine subject evaluation questionnaire (ex. Kansei engineering³) with the evaluation platform to design the better anti-ulcers mattress.

References

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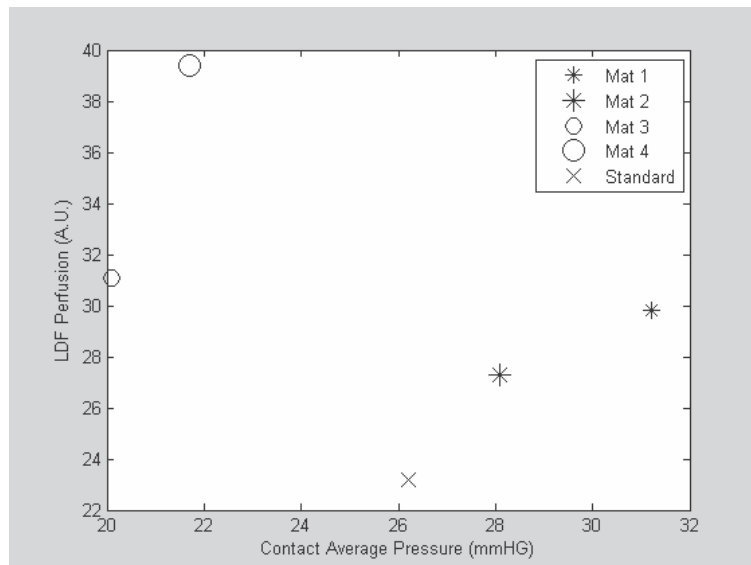


Figure 1. Scatter plot of pressure and perfusion