

## **Enhancing comfort and function through temperature controlled back supports - a case study review**

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### **Summary**

Temperature dysregulation can negatively affect both function and comfort for wheelchair users with high level spinal cord injury (SCI), multiple sclerosis (MS) and cerebral palsy (CP). Case study reviews show the JAY J3 temperature controlled back support enables users to control their own back support temperature, leading to improved comfort and function.

### **Aims & Objectives**

- 1) To clarify the importance of promoting a good microclimate in relation to the back support surface;
- 2) To highlight the negative impact of temperature dysregulation on function and comfort for individuals with high level SCI, MS or CP;
- 3) Demonstrate by case study analysis the use of a temperature controlled J3 back support to improve function and comfort for a SCI, MS or CP sufferer.

### **Background**

Reducing both heat and humidity at the skin surface interface are essential aims in seat surface selection in order to promote a good microclimate. Development of support surface technologies relative to the seated position that can enable users to control heat, cooling and ventilation are of vital importance for users with autonomic dysfunction.

This paper will present a case study review of a wheelchair user with high level SCI, MS or CP and analyse their specific temperature dysregulation challenges. It will then focus on the use of a user controlled temperature controlled J3 back support, via a product development trial, to aid heat regulation in order to improve comfort and function for the user. The back support features an integral heat and ventilation pad within the foam overlay which includes fans and lithium battery. The user will use this equipment for a period of one month, and act as their own control by using the equivalent standard J3 backrest for one month. The user will report back on functional differences and their subjective rating of comfort over that time.

According to Davis et al (cited in Pinter et al, 2015) heat generation from physical exercise and increased ambient temperature are the most important heat challenges for MS sufferers.

Heat sensitivity is common in MS and the accompanying fatigue leads to decreased motor function (Davis et al, 2010). Deficits in function and comfort caused by increased temperature may be reduced by removing heat stressors and promoting cooling.

According to Hagen (2015) temperature dysregulation is a commonly reported problem in individuals with high SCI, and excessive sweating is common. Guidance from the National Spinal Injuries Centre, Stoke Mandeville Hospital (2010) advises that strategies to promote temperature regulation are important to prevent situations of hypothermia or over-heating.

### **Discussion**

The case study review will discuss the outcomes of the product development trial in relation to a wheelchair user with SCI, MS or CP.

## References

Davis, SL et al (2010). *Thermoregulation in multiple sclerosis*. Journal of applied Physiology. 109 (5) 1531-1537

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