

## Regional Sweat Distribution in Young and Older Individuals

Sweating is the primary avenue of heat loss from the body during exercise and exposure to hot environments. However, ageing is associated with thermoregulatory decline, including attenuation of the sweat gland response, which may put older individuals at risk of heat-induced illness. There is currently limited data assessing whole body sweat distribution between young and older age groups with previous research focusing on a select number of regions. As the world is rapidly ageing, it is vital that more information is provided in this area. Therefore, this study investigated the regional and age-related differences in sweat rates in young and older individuals, using a body mapping approach.

14 young (18-30yrs) and 14 older (60-80yrs) healthy males volunteered for the study. All individuals attended a pre-test session and two main experimental trials. The main trials were split into two sessions, one to collect sweat from the torso, arms and hands and the other from the legs and feet. A modified absorbent technique was used to collect sweat in this study (Smith and Havenith, 2011, 2012). During the main trials participants rested for 30-min in an environmental chamber (32°C/50%RH) in a seated position before exercising for 25-min at 200W/m<sup>2</sup> on a treadmill. Participants then dismounted the treadmill and absorbent sweat pads were applied to the skin for a 5-min sweat collection period, during which participants exercised again. The absorbent sweat pads were weighed pre-post application to calculate regional sweat loss. Measures of core temperature, skin temperature, heart rate, thermal sensation and comfort were also recorded during the trial.

Preliminary results (young; n=14 and older; n=13) indicate that older individuals had a significantly lower gross sweat loss (273.9 ± 51.7g vs 376.3 ± 64.4g) during the trials compared to their younger counterparts (p<0.05). The highest sweat rates were observed at the upper and mid back and lowest at the extremities in both age groups. Younger individuals had higher sweat rates at the posterior torso and legs compared to the older group. Older individuals had a significantly higher change in core temperature than the young (0.5°C vs 0.2°C), despite rating lower values for thermal sensation and comfort throughout the trials (p<0.05).

In summary, older individuals had a lower sweat loss and consequently a higher heat gain than the younger group, despite feeling considerably cooler and more comfortable. The current study provides detailed regional sweat maps for a young and older population group (50 regions). These data show that despite similar low and high sweat regions, there were regional differences between age groups over the body. This information may be used for public health guidance during heat waves and also aid the design of clothing which could be tailored for individual needs.