

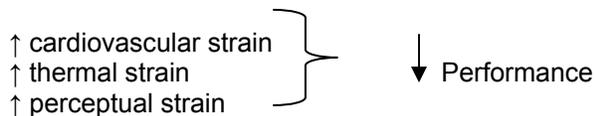
Performance Point

Sport Technology

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The human body works hard to maintain an internal temperature of $\sim 37^{\circ}\text{C}$. When exercising, athletes produce copious amounts of heat due largely in part to muscle activity. This heat is most effectively dissipated through the evaporation of sweat. As the environmental temperature and humidity increase the ability to evaporate sweat decreases and the athlete's internal temperature increases leading to several physiological changes and, potentially, a decrease in performance:



While sweating may be an effective means of cooling for able bodied athletes, quadriplegic athletes have limited sweating abilities and therefore they can overheat, even in cool environmental conditions.

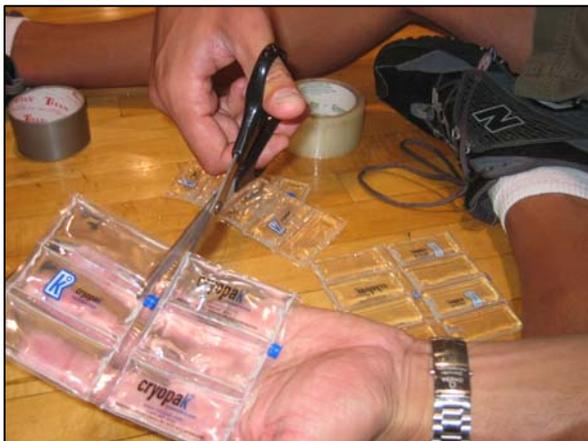
Specifically, during the course of a game, Quad Rugby players often obtain an internal temperature of $\sim 39.5^{\circ}\text{C}$ and show signs of hyperthermia. Typically, these athletes attempt to cool off by using misted water and wet towels. While these methods may help an athlete *feel* cooler they are not significantly affecting internal temperature and therefore the effects of hyperthermia persist.



Wheelchair specific ice-vest in use on Canada's bench during the 2006 Wheelchair Rugby World Championships.

Recently, a wheelchair specific ice-vest was developed based on the Thermoblazer[®] used by Canadian athletes at the 2004 Athens Olympic Games. The vests utilize the same freezable Cryopak[®] inserts as the Thermoblazer[®] but each insert is custom fit to the athlete in order to maximize the cooling surface area while taking into account the athletes sitting position and pushing requirements.

After several months of development the ice-vests were used extensively at the 2006 Wheelchair Rugby World Championships. With Beijing looming, athletes and coaches must be systematically trialing and implementing new technologies that could potentially enhance their performance at the Olympics.



Cryopak[®] freezable insert being custom cut to a wheelchair specific ice vest.

"The ice-vests that Canadian Sport Centre Pacific developed for us gave us a huge advantage at Worlds. They made us cooler and the other teams had no idea what we were doing. I think I told them that we were wearing bullet proof vests! It's great to know that our Sport Scientists are developing cutting edge products that help use gain a competitive edge."

Powering Sport Performance

The Canadian Sport Centre Pacific, in partnership with the network of Canadian Sport Centres and PacificSport Centres, delivers sport performance programs to help athletes and coaches win medals for Canada. Working in support of our national and provincial sport partners, the Canadian Sport Centre Pacific is creating a stronger system for the development of athletes, coaches, performance enhancement teams and sport performance facilities. www.cscpacific.ca