Sport Science in the 2010 Vancouver Winter Olympics

Now that the Olympic flame is no longer lighting the sky of Vancouver and the star athletes of the winter Olympics are back in their home countries contemplating the next quadrennial that will take them to Sochi, Russia, in 2014, it is time for national governing bodies to evaluate their results, summarize the outcome of their investments, and reassess their priorities for the next Olympic cycle. As an associate editor of the *International Journal of Sports Physiology and Performance*, I was interested in assessing the impact of sport science on the results of the 2010 Vancouver Olympic Games.

The host country of the Games, Canada, with a population of about 35 million, finished at the top of the medal tally with an unprecedented gold medal count of 14. Canada based its Olympic aspirations on an initiative called *Own the Podium*, which provided financial support for Integrated Support Teams through National Sport Organizations and the network of Canadian Sport Centres. Integrated Support Teams included sport science and sports medicine professionals who provided support to coaches and athletes or teams: physiologists, sport psychologists, biomechanists, nutritionists, physical therapists/athletic therapists, and physicians. Additionally, a performance analyst was often part of an Integrated Support Team to support the use of innovations in video and technology for the purpose of performance enhancement. The Integrated Support Teams worked regularly with the coaches and athletes to ensure the latter received world-class care and support for their training, recovery, and competition programs, and to prepare them for optimal performance. According to Canada’s Own the Podium program, the delivery of sport sciences and sport medicine services was always athlete centered and coach driven. This approach required continuous communication and integration between the coach and the team of experts who supported the athlete and/or team. In addition, Own the Podium pursued excellence with a sport innovation and applied sport research program.

All in all, Canada’s winter National Sport Organizations Excellence Funding was multiplied by 5 compared with the previous Olympic quadrennial, and its investment in research and innovation was multiplied by 12 in this same period. To what extent Canada’s investment in sport science contributed to its Olympic success is not easy to quantify, but it may be worth mentioning that a number of Olympic events were won or lost by margins of just a few hundredths of a second. If sport science support provided such an edge, then Canada’s investment in sport science could be considered a successful bet.

The United States, another classic powerhouse in the winter Olympics, was relegated to third place in the Vancouver 2010 gold medal tally, but collected more medals than any other nation nonetheless. This excellent result is no coincidence, and the success of the U.S. athletes can also be partly explained by the sport science support received. Indeed, the United States Ski and Snowboard Association (USSA) teams have invested significantly in sport science over the past seven years.
Many see the rise of the U.S. alpine team as synonymous with the investment in sport science. In that period, the team went from ranked seventh in the world to winning seven medals at the Vancouver 2010 Olympics in Alpine skiing and 21 in total for skiing and snowboarding. The USSA employs nine sport scientists from across the various disciplines of sport science. There is also an extensive network of sports engineers to help with the development of technology on which skiing and snowboarding are very dependent.

The USSA teams have built a $U.S. 25 million training and sport science facility in Park City, Utah, called the Center of Excellence. This facility includes a physiology laboratory, recovery center, nutrition facilities (including demonstration kitchen and recovery bar), and indoor training facilities (including half pipes, ramps, tramps, start gates, running track, etc.) so that athletes can train all year round. This is a highly instrumented facility designed to capture everything an athlete does in training. This information is then analyzed and distributed to coaches and athletes along the developmental pipeline.

Talent identification has also been targeted by USSA, as it was recognized that the country has hundreds of international standard gymnasts that retire each year. A recent project to transfer gymnasts into aerial skiing resulted in one athlete making the Olympic final in Vancouver 2010, after being introduced to the sport only two years before. Applied physiologists now travel extensively with the teams throughout the World Cup season and have daily interaction with coaches and athletes during training sessions at the Center of Excellence in the summer. The staff members do a lot of monitoring of sessions in the field on snow, and undertake performance enhancement projects as well as traditional lab and field testing.

The response by athletes and coaches to these programs has been described by high performance officials as “terrific,” and there is now a culture of full integration and dependence on sport science in the teams. No longer seen as a luxury by coaches, sport science is now a highly effective element in their programs. This positive response may have been facilitated by the fact that many of the U.S. coaches have a strong background in sport science and are proactively pushing sport science staff to keep up with their demands.

All of the above suggests that investments in sport science can provide an excellent return in terms of performance outcomes. Moreover, the rich “sport science pedigree” of the nations at the top of the medal tally in Vancouver 2010 indicates that achieving consistent winning performances at the world stage is associated with a positive contribution from the sport sciences. Nevertheless, none of it is of any relevance unless accidents such as the one that tragically cut short the life of Georgian luger Nodar Kumaritashvili just hours before the Opening Ceremony can be avoided.

We members of the editorial team would like to invite our readers to submit their research on physiology and performance in winter sports to the International Journal of Sports Physiology and Performance.

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