Canada's Top Secret edge

With the Olympics just around the corner, Canada is finally lifting the lid on some of the cutting edge projects in its Top Secret program. Giant treadmills, a cable to catapult speedskaters, and better bodysuits are just part of Top Secret, a program designed to make Canada's Olympians ski, skate and slide faster than the competition at next month's Games. When it came to sport gadgets, Canada used to trail the top winter sport countries. But over the last five years, almost $8 million has been spent on 55 projects collectively named Top Secret.OTP, the organization established to help Canada win more medals than any other country at its own Games, paid for Top Secret out of its $117-million budget.

``We're not doing anything that is illegal, but there are a number of developments we'd rather keep to ourselves than to tell the world," says Roger Jackson, head of Own The Podium.The slightest edge can make a difference. Canada lost four medals by less than a combined half a second at the 2006 Winter Games in Turin, Italy, according to Jackson.`` Our hope is that's three of four medals we'll be on the right side of for second and third, rather than being somewhere else, because we've paid particular attention to boots, bindings, skis, clothing, body position and that type of thing," he says.

Advances in equipment and clothing might not be visible to the eyes of spectators watching the Games in person or on television. But the athletes will stand on the start line knowing their equipment is now as good as, if not better, than their competitors. Winnipeg speedskater Clara Hughes, the defending Olympic 5,000-metre champion, says Top Secret worked with the team's speedsuit manufacturer Descente to develop a suit that reduces air friction and thus make her faster. ``We actually don't even know what the finished product is yet, but they've done a fantastic job and it's going to be interesting to see what these suits are like at the Games," Hughes says.Top Secret has been just that. Athletes, coaches, administrators and equipment manufacturers signed non-disclosure agreements to not reveal new equipment or technologies they were testing.

The veil has been lifted on some projects because it's too close to the Games for other countries to duplicate them. Beneath the veil is a myriad of tests, studies and projects that have infiltrated the lives of Canada's athlete. And Top Secret moved beyond making a faster skate or ski and into the heads of athletes. They have more information now on how to throw a curling rock with accuracy, what the fastest line down the mountain is, how to recover quickly from a workout and prepare for the next, as well as alleviate the stress and anxiety that inevitably comes with trying to win an Olympic medal at home.

Top Secret has two components. One is the hardware of boots, skis, skates, poles, helmets and suits. The other is human physiology. Athletes learned new ways of recovering quickly from training and peaking for major competitions. ``Our physiologist Dr. David Smith has basically been able to do everything he's ever dreamed of with us and he's had the means to be able to get the equipment and have the resources and the staffing to have us in the lab doing things that definitely have benefited us greatly," Hughes explains. ``It's going to show in our performance." Todd Allinger, who heads Top

Secret, oversaw development of a GPS unit that alpine skiers could wear and a binding plate for snowboards that made for cleaner carves down the mountain.``I think it brought Canada up from a level where we were below other top nations like the U.S., Germany, Norway and Russia in terms of technology and equipment," Allinger says from Vancouver. ``We're at least at the world-class level. In some cases, I think we're ahead of other countries."About 10 of the projects are unique to Canada. The rest were technologies that other countries were already using and Canada had to catch up, according to Allinger.

Wind tunnel testing, which helps athletes across several sports perfect aerodynamic positions, is well known, but Canada has done a lot more of it over the last four years. Some projects couldn't be hidden from the competition as Canadians were using them at international events. Allinger doesn't mind. He believes it gives the home team a psychological edge if their competition is wondering what the Canadians have been up to. ``We want people in other countries to know we're doing these cool things," he says. A treadmill with a pad large enough to hold two athletes at the University of Calgary allowed speedskaters and cross-country skiers to in-line skate and roller ski respectively on it. They were hooked up to heart-rate and oxygen monitors, while the video program Dartfish analyzed their body position and technique.``When you're on there skating, you can measure small changes in your technique because you'll start to drift backwards if you're not pushing efficiently," Allinger explains. ``You wouldn't notice that on the ice. "Speedskaters training at the Olympic Oval in Richmond, B.C., attached themselves to a cable, were pulled along the straightaway by a winch and released into the corner at high speed like a game of crack the whip. They refined their technique and tested new blades and suits at speeds difficult to sustain over a long training session. It also gave the speedskaters a sense of the technique they'll need to maintain flying around the Oval at the Games.``At the Games, they'll be going faster than they've ever gone before," Allinger points out.

The primary factor in the success of Canada's skiers will be if the wax and grind of their skis suits snow and weather conditions. This is tricky, given the wet conditions of the B.C. coast.``If you get your wax wrong, you're cooked," Jackson says. ``If you get it right, you're competitive."The University of British Columbia has worked with ski technicians from the various teams for the last three years testing waxes and grinds on various snow conditions in Whistler (alpine skiing), the Callaghan Valley (nordic skiing) and Cypress (freestyle skiing and snowboarding).

During the Olympics, a UBC expert in earth and ocean sciences will predict weather conditions a day ahead to give technicians times to prepare skis and boards accordingly. Some Top Secret projects were failures. While Canada's sledge hockey team has more effective picks on their sticks to propel themselves at the Paralympics, attempts to develop a new sledge failed. Bobsleigh pilot Pierre Lueders has said he intends to race his old rebuilt four-man sled rather than the Whistler Bomber that was designed for 2010.Allinger says 75 per cent of Top Secret projects were successful in that the athletes and coaches felt they were effective in training and competition.``It's research. It's a risk," says Allinger. ``Sometimes it bears fruit and sometimes it doesn't. "Top Secret may give

Canada's athletes an edge, but the difference it makes in winning, or not winning, medals is debatable. Other countries have not stood still in science and technology since Turin. ``The interesting part is we know the Germans, Australians and Americans are all doing the same thing," Jackson says. ``They're certainly not telling us what they're doing. Once in awhile something pops up and we understand they may be looking at the same program." Also, medals are won by athletes and not their high-tech boots.`` All of this research and all of the sport science are of no value whatsoever if the athletes do not have the talent, if they haven't trained extraordinarily intensively for several years, or if they don't have the coaching and the technique, or are not motivated to be absolutely the world's best," Jackson says.Allinger believes Top Secret will continue after 2010 in some fashion.

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