

## The Short and Long Term Effects of Skiing with the Opedix Knee Support Tights on Knee Performance and Injury

Michael J. Decker, Ph.D.

325 ski professionals (68% men; 32% women) with a mean age of 40.6 years were randomly selected from Vail, Aspen, Breckenridge, Keystone, Beaver Creek, Heavenly and Northstar ski resorts to determine the short and long term effects of skiing with the Opedix knee support tights on knee performance and injury. 83% of the participants were from ski school, 11% ski patrol and 6% had other on-mountain employment. Skiing was the primary means of employment (80%) followed by snowboarding (17%) and telemarking (3%).

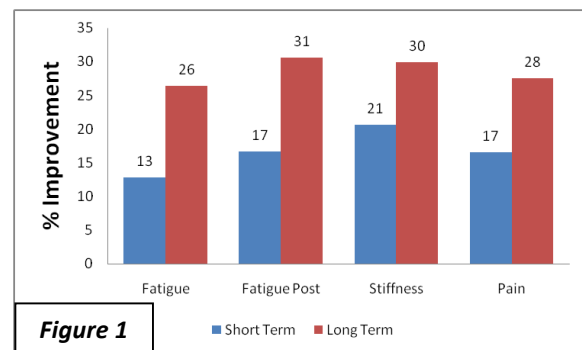
The baseline values of fatigue during and after skiing; knee stiffness and pain were measured with standardized questionnaires near the midpoint of the 2010-2011 ski season. The measurements of these variables were repeated after skiing with the Opedix knee support tights for 1 week (short term) and at the end of the ski season (long term).

### ***The Ski Professionals had below Average Knee Function***

On average, knee function and performance were measured to be abnormal at the onset of testing. 67% reported a previous knee injury of which half required knee surgery. Further, 20% of the ski professionals demonstrated baseline scores indicative of knee arthritis.

### ***Knee Pain, Stiffness and Fatigue were Reduced 28%***

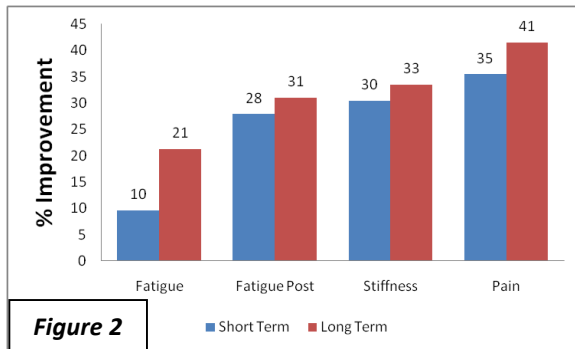
Compared to the baseline values for all of the participants, the knee performance variables of muscle fatigue during skiing, muscle fatigue after skiing, knee stiffness and pain were improved on average by 17% after one week of skiing with the tights and progressively improved by 28% at the end of the season (Figure 1).



### ***Knee Pain, Stiffness and Fatigue were Reduced 31% in Arthritic Knees***

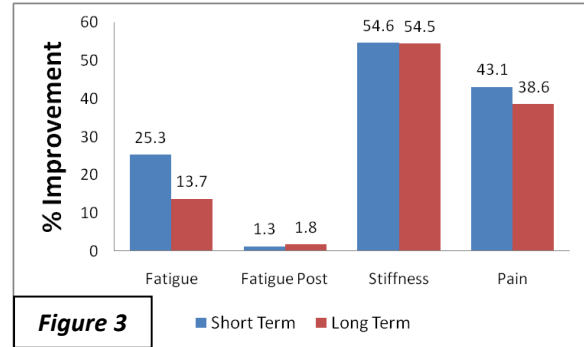
The benefits of the Opedix knee support tights were dramatic in skiers that were measured to present knee arthritis. Compared to the baseline values, all knee performance variables were improved by 26% after one week of skiing with the tights and progressively improved by an average of 31% at the end of the season (Figure 2). Of particular functional importance for this population of skiers was the dramatic reductions found for knee stiffness (33%)

and pain (41%) found at the end of the ski season.



### ***Opedix Knee Support Tights were Superior to Compression Garments during Skiing***

10% of the participants reported to normally wear compression tights while skiing. For this subgroup, we measured the baseline values of fatigue, knee stiffness and pain when skiing with compression garments; and determined how these variables changed in the short term and long term while skiing with the Opedix knee support tights (Figure 3). The results in Figure 3 represent the improvements in knee performance when skiing with the knee support tights relative to the compression garments. Although muscular recovery after skiing was comparable between garments, the knee support tights were far superior during skiing performance. These results indicate that the form fit of the knee support tights does act like a compression garment to help blood flow and muscular recovery after skiing but the sense and respond technology primarily accounted for the positive performance benefits during skiing.



### ***Knee Injuries were reduced by 43% at Vail Resorts for the 2010-2011***

Compared to the 2009-2010 ski season, total knee injuries knees were reduced by 43% at Vail Resorts. No individuals reported a knee injury while wearing the knee support tights during skiing. Estimating the amount of money saved on health care and lost time costs from this injury reduction while skiing with the knee support tights are near \$2 million dollars.

### **CONCLUSION**

Skiing with the Opedix knee support tights dramatically enhanced knee function, pain and stiffness during skiing. These knee performance effects were immediate and continuously improved throughout the ski season; and surpassed the effects of compression garments. Skiing with the Opedix knee support tights may be an easy remedy to ski injury prevention and a means to promote skiing for populations with knee arthritis.

*\*Dr. Michael Decker is currently a Senior Research Scientist in Biomechanics at the University of Denver.*