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PURPOSE: This study documented physiological changes after 3 h of free skiing on shaped skis (SS) and conventional skis (CS). **METHODS:** Subjects (N=15) with experience using both types of skis, skied one of the two ski types for three consecutive hours (SS: Fischer RC4 RS and CS: Fischer RC4 SL or K2 5500). Average turning radius was 19.9 2.8m for SC and 49.9 4.5m for CS. Dynamic balance (pre and post) was measured with a KAT System. Peak isometric force from the best of 4 MVC's at 120° knee extension along with time to fatigue at 60% MVC were also recorded pre and post skiing. Fingertip La samples and RPE were collected and recorded at 1 & 2 h of skiing, while a second person counted ski turns per run. **RESULTS:** Subjects completed the same number of runs under each trial. Average turns within a run were also similar (SS: 112.5±33.6, CS: 112.0±28.8). Pre and post ski dynamic balance scores for SS: 1080.6±273 and 918.8±218 compared to CS: 1043.3±346 and 995.6±317 were not different. Mean La was similar (SS: 2.8±.8 mM/L; CS: 2.7±1.1 mM/L); however, mean RPE was lower for SS: 12.2±1.5 vs. CS: 13.4±1.5. Peak force after 3 h of skiing declined similarly (SS: 6.8±9.2% vs. CS: 5.1±9.7% from pre skiing values; however, mean time to fatigue occurred almost 30% faster after the CS trial (29.4±24.0%, vs. SS trial 2.3±16.7% **CONCLUSION:** Assuming: 1.) Workloads were similar between ski trials (same vertical feet skied, same number of turns made each run) and 2.) The outside leg imparts greater force during a turn on CS compared to SS (Raschner et al. 2000), then it is plausible to suggest the increased RPE and subsequent decline in sustained sub-maximal isometric force is due to an increased demand of the knee extensor muscles while skiing for 3 h on a CS. It also appears that common physiological measures such as La are not sensitive enough in such a paradigm to reflect changes in the muscle. Supported by SCSU Office of Sponsored Programs, Jon Theis & Fischer USA, and Snowbird Ski Resort

Conventional Ski (50m) Shaped Ski (20m)

Turns/Run	112.0 (28.8)	112.5 (33.6)
Balance pre (KAT)	1043.3 (346)	1080.6 (273)
Balance post (KAT)	995.6 (317)	918.8 (218)
Lactate (mM/L)	2.7 (1.1)	2.8 (0.8)
RPE (Borg)	13.4 (1.5)	12.2 (1.5)
Peak Force (% decline)	5.1 (9.7)	6.8 (9.2)
Time to Failure (%)	29.4 (24.0)	23.0 (16.7)