Let it Snow! Let it Snow!

~ By Elizabeth Eidlitz
(As published in the Milford Daily News, Milford, CT, December, 2001)

When late October surprises us with Indian summer beach days and garden parsley is still growing in November, it's easy to imagine that snowflakes are restricted to greeting cards.

The reality, however, is that for those who can't escape to Florida for the winter, the driveway accumulation of snow and ice can pose a dangerous challenge.

Some experts estimate that shoveling snow requires the same exertion as running 9 mph, contributing to back injuries and heart attacks.

In selecting a snow shovel, there is a more important consideration than ribbed non-rusting aluminum blades versus non-stick graphite blades, or aluminum tubing with rubber grips versus wax-coated hardwood handles - namely, the straight-shaft versus the bent-shaft shovel.

The bent-shaft snow shovel has long been promoted and sold as an ergonomically designed tool even though there is no scientific literature to support this claim. Deciding to put the theory to the test, The Liberty Mutual Research Center for Safety and Health in Hopkinton, MA, conducted a study in January 2001 to measure the strain of snow shoveling on the heart and back.

Ten male volunteers were issued winter coveralls, gloves and boots. A heart rate monitor/transmitter was placed on the chest of each and a heart rate monitor/receiver was clipped to the back of the coveralls. A Lumbar Motion Monitor, also clipped to the back of the coveralls, was used to track trunk position. The shafts of two snow shovels were instrumented with force/movement transducers.

Researchers instructed the volunteers, who would perform four eight-minute trials of snow shoveling on a paved asphalt surface, to imagine that they were getting paid for the amount of shoveling they did but that it was not a contest. They were to clear the snow from the pavement as quickly as possible without straining or becoming unusually tired, weakened or out of breath. They could take breaks as necessary during the trial and had a ten-minute rest break between trials.

The only constraint on shoveling technique was that the subjects lift and throw the snow rather than push it.

Researchers found that when people use a bent-shaft snow shovel they bend forward approximately 16% less than they do with a straight shaft shovel. Thus the force exerted on the lower back may be reduced by up to 13%. Additionally researchers observed a statistically significant 3% drop in heart rate - or four beats per minute - when the volunteers used the bent-shaft shovel.

The results revealed a significant difference in trunk flexion and lateral bending angles between shaft configurations. On average, the volunteers bent at a 49.2 degree angle for the straight shaft and a 41.4 degree angle for the bent shaft.

Of the two shaft configurations, the bent-shaft shovel was preferred by six of the ten volunteers. "The recommendation of a bent-shaft snow shovel seems warranted, based on the ergonomic principle of reducing spinal compression and trunk bending," said Raymond McGorry, a researcher at the Liberty Mutual Research Center. "Use of a bent-shaft snow shovel may also lead to a lower cardiovascular workload."

Recognized throughout the world, The Liberty Mutual Research Center for Safety and Health is an occupational health and safety research facility which continually contributes to the reduction of workplace injury and illness and work-related disability. The Research Center does not conduct product-specific research or give product endorsements.

Liberty Mutual

Call your Liberty Rep, Steve Kosydar, at 630-250-7100, ext. 56599