



## **HumanMotion** STRENGTH + CONDITIONING

### The Benefits of Strength Training for Snowshoe Racing

By Carmen Bott MSc. C.S.C.S.

[www.humanmotion.ca](http://www.humanmotion.ca)

And the controversy continues . . . . Is it or is it not effective for endurance athletes to add strength training to their training programs? Numerous studies have shown differing results, however the consensus seems to be leading to numerous benefits from the addition of strength training.

Strength, as defined by the N.A.S.M.<sup>1</sup> is “the ability of the nervous system to exert internal force against an external resistance”. Stronger muscles tend to be more resistant to fatigue and injury and all things being equal, the stronger athlete will always prevail. The purpose of strength training for the endurance athlete is to develop an ability to produce greater amounts of sustainable power. The bottom line is that any strength training program must result in the athlete producing power outputs at or below lactate threshold that are a greater and greater percentage of VO<sub>2</sub> max. Different training sessions are prescribed to overload the different energy systems furthering the goal of higher maximum sustained power. For example, if during a long duration, tempo, snowshoe run (65-75% of VO<sub>2</sub> max) the athlete is able to produce a greater amount of average power without exceeding the prescribed intensity; the athlete will receive a greater overload during the same duration of time. This increased average power output allows the athlete to receive a greater overload and subsequently greater adaptation. *Properly managed strength training programs allow the athlete to generate higher levels of sustainable power throughout sport specific training sessions.*

Poorly prescribed strength training protocols, following a bodybuilding or fitness-physique paradigm leans more toward hypertrophy (muscle growth), which can produce lower performance for endurance athletes. This is caused because as muscle tissue is added the percentage of capillary dense and mitochondria rich muscle is diminished. In other words this muscle has not been endurance trained. Most endurance sport performance is driven by the ability to sustain

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<sup>1</sup> National Academy of Sports Medicine (USA)

maximum power but some (OK – A LOT!) of resistance programs are mistakenly hypertrophy (muscle size) driven.

## **HOW IS AN EFFECTIVE STRENGTH TRAINING PROGRAM PRESCRIBED FOR THE SNOWSHOE RUNNER?**

The ability to sustain power at the highest percentage of VO<sub>2</sub> max is typically the major contributor to success in endurance events. It is with this in mind that a resistance training program should be developed. Therefore the goal of the resistance training should not necessarily be absolute strength but how added strength can help the athlete in producing greater sustainable power sport specifically. Let me explain using a road cyclist as an example . . .

A cyclist is doing an interval session. In that session, he completes 9600 watts of total power output. If the athlete (through strength training) can produce a 15% increase in power, then the total overload is increased to 11,040 watts during the session. The effect then snowballs... During longer, tempo rides the same athlete is able to produce greater average watts at a lower percentage of maximum wattage. Over time this ability to incrementally increase power output at lower than maximum levels is a huge advantage for an elite endurance athlete's efficient production of sustainable power. Efficiency in oxygen utilization by longer duration stress at 60-80% of VO<sub>2</sub> max is where a large percentage of an endurance athlete's gains are made. This is evidenced by the ability of older athletes to be at world-class levels of performance in endurance sports. The body will adapt to these greater overloads after a period of time and the athlete will see the increased performance results be cause of the increased overload and subsequent adaptation.<sup>2</sup>

### Benefits of Strength Training

As we mentioned above, there are myriad benefits to this phase of the strength & conditioning program. These include , but are not limited to :

- Injury resistance
- Increased force development
- Increased capacity for power
- Improved muscle recruitment and motor programming – which me we use the muscles in the way they are supposed to be used.

In order to get an individual program just for you, you need to get evaluated by a professional first. A strength and conditioning specialist can work together with your coach to develop a program that is right for you. Individual programs can take into account your personal training schedule, injury history, and goals. Make sure to seek out someone who is qualified.

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<sup>2</sup> Titan Sports Performance Center, California

**“Birddog with One Arm Row”**

*from HUMAN MOTION’S DIGITAL VIDEO CLIP LIBRARY*

Set-up: Kneel on all fours on a bench. Lift the left leg up and lengthen it straight out. Pull the transverse abdominus (core) in and keep your hips square to the bench. Balance on the left palm and grasp a dumbbell in your right hand (start light!)



Execution: While maintaining your hips square to the bench and your neck in a neutral position, perform a row with the right arm. Pull the shoulderblade towards the midline of the upper back and keep the dumbbell close to your body



Carmen's tips: Perform this exercise for 2 sets of PERFECT TECHNIQUE reps, somewhere between 6 and 12. Keep the tempo slow and controlled and focus on maintaining balance, core engagement and a full range of motion through the shoulder. When you change sides, go slow as your brain will have to make a big "recruitment" adjustment and I don't want to be blamed for any embarrassing wipe-outs in the gym!

Carmen can be reached via email at [Carmen@humanmotion.ca](mailto:Carmen@humanmotion.ca). her team of physiologists, therapists and coaches offer group classes all year round for endurance athletes. Look for Human Motion's online strength training programs for distance runner at [www.humanmotion.ca](http://www.humanmotion.ca).

*Photos courtesy, of Audrey Berg shot on location at Target Health Services in Vancouver.*