

Running is often considered the oldest sport in existence.

The desire to travel from point A to point B as fast as possible has been a long-standing challenge for athletes, and remains the primary goal for many recreational and competitive runners. Physiologically, running is a pre-programmed neuromuscular movement pattern which controls the manner in which we move. This pattern is usually learned early in life, and is continually refined to adapt to our activity levels and actions.

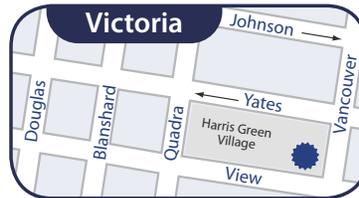
By simply stepping out the door and running on a regular basis, our movement patterns become more efficient, improving our running economy and generating improvements such as lower fatigue levels and faster speeds. This improvement in skill, combined with the cardiovascular and muscular benefits of running, are the factors that drive performance enhancement. As we improve, though, we continually uncover questions about our gains.

- Is running a **learned skill**?
- Can we consciously **improve our running style**, and will this make us run faster?
- Can we **decrease the likelihood** of our bodies becoming injured?
- Is there a **direct relationship between technique**, injury prevention, conditioning, and performance?

The resounding answer to all of these questions is yes. Most important to note is that technique, strength and conditioning, and injury prevention are very strongly associated. Work in any of these areas will have a positive influence on the others, and enhanced performance, whether it appears as faster times or lower fatigue levels, is the net benefit.

ABOUT FRONTRUNNERS

Fronrunners Footwear are locally owned and operated running and lifestyle stores. Fronrunners has been a fixture in the Island community since 1988. The staff at Fronrunners are dedicated to fitting your feet with the right shoe for you and for your activity. **The Fronrunners staff are runners and triathletes, knowledgeable about their sport and the active lifestyle on Vancouver Island.**



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GUIDE SERIES

Injury Prevention



Stop before you start, learn how to prevent long-term injuries.

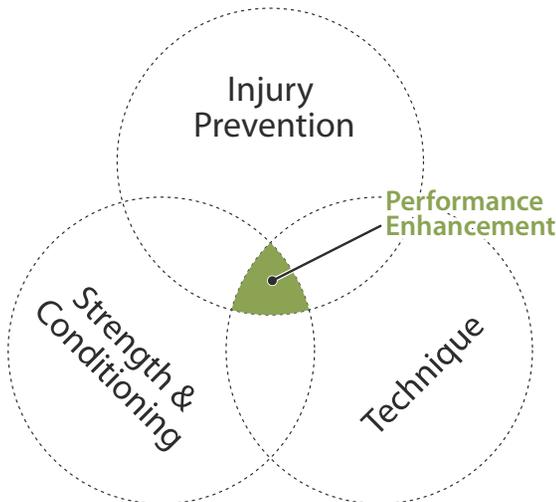




TECHNIQUE AS INJURY PREVENTION

At any training volume and on any surface, running is a sport that involves a great deal of impact. The repetitive motion of running places a substantial net stress on the feet, legs, and hips, which may predispose an athlete to injury. Because of this, **technique plays a key role in injury prevention.** Two predominant factors in both injury prevention and performance enhancement are stride length and stride frequency.

Optimal stride length can be described as the stride length at which oxygen consumption is lowest. In a trained athlete with ideal strength and mobility, optimal stride length is usually achieved subconsciously. However, many runners have tight or weak muscles which restrict movement and negatively affect length of stride. Stride rate also has an **optimal range, outside of which we are at risk for injury and/or performance inhibition.** Both stride length and rate will vary depending on the runner's size, body mechanics, strength and flexibility levels, state of fatigue, and running speed, which makes it difficult to cite generic numbers for all runners to aim for. However, the most common problem for runners in this area is the tendency to overstride, resulting in the runner taking too few steps, thus increasing ground contact time and the likelihood of injury.



Achieving & maintaining balance is an important aspect of maximizing performance.



TECHNIQUE CHECKLIST

- **Head:** Neutral spine—head held up and looking forward, not down
- **Shoulders:** Relaxed, shoulders back. Shoulders held directly above the hips
- **Arms:** Bent at about 90°, hands relaxed
- **Hips:** Bellybutton drawn in, butt tucked under. No notable lower spine flexion/extension during the gait cycle.
- **Legs & Feet:** Footstrike directly under center of gravity, not in front of it. Footstrike should remain natural (don't force a forefoot strike if you are a heel striker), but with optimal stride length and frequency, and at faster speeds, strike should occur towards the midfoot or even forefoot as opposed to the heel.

STRENGTH & CONDITIONING AS INJURY PREVENTION

Because running primarily uses the legs for movement, runners often mistakenly train only their lower bodies. The overlooked fact here is that when the foot hits the ground, the pivot point for the lever system is actually the pelvis and the lumbar spine. Walking a few steps with both hands placed on your lower back will demonstrate the lumbar muscles' role in spinal stabilization. Additionally, anyone who has tried to run without moving their arms knows that they play a large role in speed generation and balance.

WHY CORE TRAINING?

Core training has become a significant trend in the fitness world, but many athletes use it blindly without fully understanding why. In most activities, maintaining a neutral spine (the normal curve of your back), is the most efficient and powerful way to perform. For runners, this means being able to utilize your arms and legs without energy-wasting torso movements. The muscles involved in spinal stabilization are not the external "moving" muscles; rather they are the internal "holding" muscles. **The Frontrunners Core Training brochure is a great starting point for core activation and stabilization exercises.**



Regular core exercises will lead to increased strength & efficiency for training.

BAREFOOT EXERCISE?

The legs and feet, for obvious reasons, should also not be overlooked in muscle strengthening. Although **proper footwear is an absolute necessity for any runner**, the extra support provided by shoes (and orthotics, for those who wear them) allows some of the foot, ankle, and leg stabilizer muscles to weaken. Exercises such as one foot balances (with eyes closed), one and two foot toe raises, and even just walking, all done barefoot, can help keep legs, ankles, and feet strong and injury free.

No running program is complete without a strengthening component to re-balance the muscles that are required for proper run technique, yet aren't necessarily challenged as much as the prime movers during running. One of the predominant causes of running injuries, or any overuse injury, is muscular imbalance. Put simply, the muscles we use a lot get stronger, and the ones we use little get weaker. Cross-training and general weight training exercises are valuable ways to non-specifically re-balance muscle groups. A better option is to have a health-care professional perform a comprehensive assessment, and from that assessment, create a customized strength and flexibility program. **Ask around to find a qualified Physiotherapist, Chiropractor, Kinesiologist, or other medical professional who has experience working with runners.**

