



Improving Running Performance with Cross Training

Running participation in the United States continues to climb, with more than 70% growth in the past decade, according to Running USA's 2014 State of the Sport - Part II: Running Industry Report. Correspondingly, increasing interest exists surrounding training, injury prevention, nutrition and optimizing performance.

Regarding training, the exercise physiology principle of Specific Adaptations to Imposed Demand (S.A.I.D.) indicates that the body adapts to the specific stresses imposed on it; so to become a better runner, one must train by running.¹ But some runners may take this to an extreme – along with a “more is better” mindset, making logging miles paramount, often to the exclusion of any other type of exercise.

S.A.I.D. and specificity of training are indeed physiological realities; therefore consistent running workouts are necessary for enhanced conditioning and improved performance. And clearly, for many dedicated runners, the only workout that counts is hitting the pavement.

However, excessive running also can have negative physiological results, such as overtraining, which causes high resting heart rate, chronic fatigue, performance declines and more.² In addition, individuals who consistently run many miles are at risk of overuse injuries, which are the most common afflictions of runners and include stress fractures, shin splints, iliotibial band syndrome, patellofemoral stress syndrome and plantar fasciitis.³ Approximately 50-75% of all running injuries are overuse injuries due to the constant repetition of the same movement.⁴

Finally, because running primarily uses the lower-body muscles, runners can suffer muscle imbalances, such as upper-body weakness, deficiencies in hip strength and quadriceps dominance, where the quads are significantly stronger than the opposing muscle group, the hamstrings.⁵ Muscular imbalances, which lead to a chain of dysfunction and compensation, also can predispose individuals to injuries.⁶

With the evolution of sports science and research studies, the practice of runners only running as a strict training protocol is no longer recommended. Increasing evidence points to the value of building a

strong foundation for the body and improving all the components of fitness – such as muscular strength and endurance and flexibility – to enhance running ability.⁷ While running is still critical to improving, it is not solely the best way to excel in the sport.

Cross training is a comprehensive approach to physiological conditioning and adds valuable variety that helps reduce susceptibility to overuse injuries.⁸ It also provides a way for runners to engage in active recovery, where they take a day off of accumulating miles but still work the body. Furthermore, injured runners can find a way to maintain fitness by doing cross training during the rehabilitation period.

Cross training can take a variety of formats, including strength training, flexibility work, cycling, swimming, using an elliptical or rower and more. Runners looking to find the greatest return for investment on their running performance should incorporate strength and flexibility workouts.

Strength Training for Runners

Runners may eschew strength training for fear of developing bulky muscles that might add weight and slow them down. However, when performed properly, strength training has been shown to benefit runners with:

- Greater running economy – moving faster over the same distance with less effort^{9,10}
- Higher oxygen use efficiency – as much as 8%, which translates to more speed and endurance and faster race times¹⁰
- Improved endurance¹¹
- Stronger joints and greater bone density – better able to tolerate the impact of running
- Leaner body composition – less body fat can eliminate drag
- Lower risk of injury¹²
- Enhanced endocrine and immune function – which can be compromised by endurance training¹³

For best results, runners should incorporate a variety of tools, including free weights, resistance bands and body weight exercises to train more functionally – using multi-muscle, multi-joint, multi-planar compound movements such as squats with overhead presses, lunges with lateral raises and planks with rows.¹⁴ This will help train the core, balance and stability as well.

Runners typically have weak hips, which can lead to injuries, so emphasizing the abductors, adductors and glutes also can help running performance.¹⁵

The core helps support proper posture and stabilize the spine when running, and must not be neglected.¹⁶ While functional movements can include the core, it is still important for runners to specifically target the rectus abdominus, transverse abdominus, internal and external obliques and erector spinae.

Runners also may want to incorporate plyometric training, which includes explosive power moves with lighter weights and faster motion to train the neuromuscular and elastic properties of the muscles. Plyometric training has been shown to improve running economy by as much as 8%, and speed by 3.1%.¹⁷

Specific training recommendations vary, but to improve running performance, runners should emphasize muscular endurance, which means using weights that cause muscle fatigue after 8-15 repetitions, performing 1-3 sets, two to three times weekly.¹⁸ Some experts recommend running and strength training on separate days, while others suggest lifting weights after a run. Ultimately, the training schedule should be determined by what works best for the runner in terms of consistency and results.

The Role of Flexibility

Flexibility is defined as the range of motion around a joint, and improves mobility and freedom of movement. It is integral to runners' training programs because it helps counter the muscle shortening and tightness that occur as a result of repeated running. Dynamically stretching also can relieve muscle tension and may potentially decrease the risk of injury. Plus, it simply feels great to loosen up after a long run with some targeted stretches.

Although the research on the value of stretching for

running economy and injury prevention has been inconclusive, active range of motion and dynamic flexibility (as opposed to static stretching) can help with recovery by increasing blood flow to tight areas and helping to work out scar tissue adhesions.¹⁹

While yoga can certainly help with flexibility and be a supplement to a runner's regimen, it is important for runners to stretch regularly, typically after runs and/or between workouts. Targeted muscles include the hamstrings, quadriceps, glutes, hips/piriformis/IT band, hip flexors, lower back and calves.

A Simple Solution

Today, runners have a valuable tool that enables them to easily incorporate cross training into their running programs. The Zero Runner from Octane Fitness replicates real running motion, but *without any impact*. Its unique, independent hip and knee joints facilitate freedom of movement and enable runners to use their natural gait, just like running outside. Therefore, runners benefit from specificity of training but without any stress to the joints.

In addition to helping to reduce overuse injuries, promote active recovery and extend a runner's career, the Zero Runner, in conjunction with the free SmartLink™ app from Octane Fitness, is equipped with CROSS CiRCUIT®, a scientifically-based conditioning regimen that combines alternating intervals of cardio on the Zero Runner with strength and flexibility exercises adjacent to the machine. Runners can choose from a full menu of exercises, which can be performed using body weight, Octane's Powerbands or dumbbells. Throughout the workout, the machine prompts runners at predetermined intervals to either run or perform the strength or flexibility exercises.

In addition, SmartLink adds even more cross training variety. When downloaded to an iPad®, SmartLink connects to the Zero Runner and lets runners choose from a variety of programs, such as core strength, plyometrics, upper-body and yoga. Designed with input from exercise physiologists, athletic trainers and physical therapists, CROSS CiRCUIT routines aim to help runners target weak links to improve strength and flexibility for enhanced overall performance.

Plus, with the convenience of CROSS CiRCUIT and SmartLink, and the ability to incorporate cross training directly into running workouts, runners now no longer have to search in magazines, books or online

to determine what exercises to do. CROSS CiRCUIT and SmartLink offer efficiency and effectiveness for runners.

Furthermore, engaging in cardio and strength training in a circuit (alternating intervals) has been proven to be advantageous for maintaining cardiovascular improvements, including VO2 max and anaerobic threshold.²⁰

Fueling An Addiction

Many runners describe themselves as addicts when it comes to their favorite activity, willing to do whatever it takes to enhance performance and enjoyment of their sport. With the Zero Runner, CROSS CiRCUIT and SmartLink, excelling in running by adding cross training is now convenient, efficient and effective.

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