

The Runner's Guide to Cross Training

by Bryan Whitesides MPT, OCS



Introduction

Running is a physically demanding sport. Researchers have estimated that 37 to 56% of regularly training runners sustain an injury each year. Many athletes find that alternating other forms of aerobic exercise into their routine allows them to train at greater volumes or intensities without getting injured. Once an injury has occurred cross training allows the athlete to maintain or even improve their performance during recovery.

Ed Eyestone, two time U.S. Olympic Marathoner, sustained a stress fracture in his foot during the cross country season of his senior year in High School. Determined to compete in the state cross country championships Ed took his training to the pool. In the pool Ed was able to run without pain. His foot healed while the intense workouts improved his fitness level. Ed won the state cross country championship that year only having run once prior in a qualifying race. He would later publish research on water running, verifying the benefit of alternate forms of exercise on running performance.



For beginning runners cross training is a tremendous way to more quickly improve your fitness level without over straining your muscles and bones. Three days of the week you could run and on the other days cross train. As your body accommodates to the stress of running decrease the number of cross training sessions. If you are training in a gym you could run more frequently and divide your training time with cross training. For example, you could run ten minutes and cycle or use the elliptical for 20 minutes. Everyone is unique – find the blend that is right for you.

More competitive runners may want to supplement their program with cross training to enhance performance and prevent injury. There is limited research describing which modes of cross training actually improve running performance. In one study, beginning runners were able to improve running performance (race times) by training on a stairstepper instead of running. Most studies on cross training have demonstrated improvements in the body's ability to use oxygen (VO₂ Max) but not necessarily improved running performance (race times). Research on cycling and swimming has demonstrated enhanced running performance when athletes have added these modes of exercise, at high intensities, to an existing training program.

If you are currently injured and want to use cross training to maintain your fitness level and enhance healing it is essential that the mode of exercise be pain free. More severe injuries will only allow you to train in the pool whereas other injuries may allow you to train on an elliptical without pain. You may want to seek the guidance of an experienced physical therapist or coach to help you with this decision. In general, you can continue with the same amount of training as well as the same intensity just in a different form. Remember to keep it pain free.

The following sections will provide you with information on the most common modes of aerobic cross training.

Cycling

With the advent of “Spin Classes” stationary cycling can actually be quite fun. If you are training on your own you might have to be creative to prevent stationary burnout. High quality stationary cycle trainers are getting cheaper like the one below by Stamina. Another option is to use a wind trainer - which you mount your current bike to for a great stationary workout.



Road or mountain biking are great ways to enjoy the outdoors but if you are not accustomed to this type of training it may be more difficult to maintain a target training level. A [heart rate monitor](#) can be helpful to stay in the training range you are shooting for. Cycling does not challenge your heart rate as much as running will so if you are not using a heart rate monitor you will need to go a little harder to get the same cardiovascular workout.

If you are recovering from an injury, consider keeping the resistance lighter to avoid strain on your knees. Your seat position should be such that your knee is slightly bent when your foot is at the furthest point of the down stroke (many bike stores can set you up with an optimum fit). Try to keep the knees in line with the feet; a slight circular deviation is normal. Cadence should be between 70 and 100 revolutions per minute depending on your cycling experience.



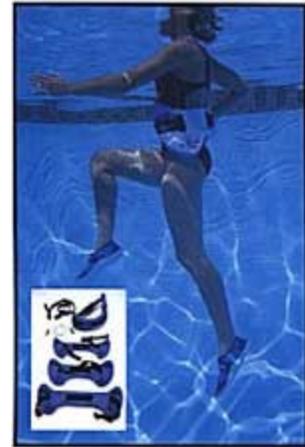
If your body doesn't tolerate additional run training then supplemental cycle training can provide improvements similar to additional running. Researchers at Purdue University reported that well trained runners improved their 5K times by supplementing their running program with vigorous cycling. Participants in the experimental group maintained their current running program and added two sessions of intervals performed on a stationary cycle and one session of moderate cycling for sixty minutes. After six weeks of supplemental training (additional running or cycling) both groups had similar improvements in 5K performances.

Stationary cycling can allow you to decrease your running distance during a recovery period and still maintain fitness. Researchers conducted a study on collegiate female cross-country runners during their recuperative phase of training. The “run training” group continued their weekly running volume at a decreased intensity. The “cycle training” group decreased their mileage 50% and cycled for the equivalent amount of time and at the same reduced intensity. After five weeks both groups performed a 3,000 meter race. The “run training” group slowed 9 seconds and the “cycle training” group slowed 22 seconds. The ability to use oxygen (VO2 Max) was unchanged between the groups. The time difference between the two groups was small enough that the researchers concluded that cycling could be an effective mode of training during the recuperative phase, especially when the benefit of reduced muscle and bone strain is considered.

Deep Water Running

Deep water running is usually performed in the deep end of a swimming pool. A [flotation belt](#) can make it easier keep you upright and afloat. The belt allows you to focus on moving in a pattern similar to running, instead of how to keep your head above water. Interval training helps to break up the monotony of water running. Try three to four minute intervals of intense running followed by one to three minutes of rest.

The two studies conducted on deep water running showed that runners could maintain, but not improve running performance by training in the pool. Researcher at the University of Toledo, Ohio, tested competitive distance runners before and after four weeks of only deep water running. These athletes were able to maintain their 5K performance without running on land. Ed Eyestone, US Marathon Olympian, compared deep water running, cycling, and run training on run performance. After a six week period these “well trained” athletes maintained their 2 mile run time despite mode of training.



Shallow Water Running

Shallow water running is performed on a treadmill in waist deep water. Researchers have recently demonstrated that runners have a greater aerobic response in shallow water running than in deep water running. It is thought that the deep water running limits the amount of air you are able to bring into your lungs due to compress from the chest deep water. For those of you lucky enough to have a shallow water running station in your community it is definitely worth a try.

If you are an experienced swimmer and have access to a pool then swimming is a great alternative. You'll get a whole body workout and easily elevate your heart rate with minimal stress on the legs. Some less experienced swimmers get frustrated with stroke or breathing technique and may prefer deep water running or the use of [swim aids](#).

Swimming

For those who have gotten injured as they increase their mileage, supplementing your running program with swimming can improve your running times without the additional impact. Research conducted by the Milwaukee Heart Institute compared supplemental swimming to supplemental running. Participants increased their normal training by 10%, either more running or more swimming. After eight weeks both groups improved their 2 mile run times, although the run group was slightly faster.



Stairstepper

A stairstepper can provide you with a grueling workout at a fraction of the impact of running. As you observe others you will quickly notice a variety of styles. Choose a speed that you can move smoothly with the pedals. Don't try to force the pedals down or have it set so fast that you are at the bottom of the machine. Step height should be comfortable. Don't feel like you have to take large steps, or take such small steps that your knees barely bend.

Stairstepper training is the only mode of cross training I have been able to find in the medical research that actually improves running times without increasing the overall amount of training. Researchers compared "physically active" college age women who trained only on a stairstepper to a group that ran. After nine weeks of training four days per week, beginning at thirty minutes and increasing to forty five minutes, the running group improved 11% and the stairstepper group improved 8% on a 1.5 mile run. It must be noted that the participants in this study were "physically active college women," as opposed to the competitive distance runners in the swimming, cycling, and deep water running studies.

Elliptical Trainer

Elliptical trainers are my personal favorite because of the similarity to running and ease of use. There are several brands, each with a slightly different design. You may want to check out a few health clubs to find a model that feels comfortable for you.

Two studies have evaluated training on ellipticals and found the improvement in the ability to use oxygen (VO2 Max) to be similar to running and stairstepper training. However, the effect on running performance (race times) has not been tested.

My wife has been using the Schwinn 430 for the past 6 months (she really works it hard five days per week). It is priced much less than most ellipticals and so far has been durable and reliable. We tried an Ironman before this unit and were very disappointed.



Inline Skating

Inline skating is a great way to enjoy training outside if you have an area and climate conducive to this type of training. The forceful push outward is a tremendous way to strengthen the gluteals, which helps with many injuries. Using a heart rate monitor can help you maintain your target training level if you are on varied terrain.

Research conducted at the University of Wisconsin compared heart rate and oxygen use during inline skating and treadmill running. They concluded that the two activities had similar heart rate and oxygen use patterns.

Remember to wear appropriate safety gear (helmet, wrist and knee pads). Unpredictable tumbles can ruin the day.



Cross Country Skiing

Cross training doesn't get much better than this - high altitude training, whole body workout, low impact, and beautiful terrain. The motion of cross country skiing, both classic and skating, is great for strengthening of the gluteals. Strengthening of the gluteals has been shown to improve knee pain and IT Band Syndrome.

Don't forget mountain safety, conditions can change rapidly and even experienced skiers can find themselves in danger. Be prepared.

The research available on cross country skiing has demonstrated similar improvements in the ability to use oxygen (VO2 Max) compared to running. I have not been able to find a study that has investigated the effect of cross country skiing on running performance (race times).



Snowshoeing



Snowshoe running has experienced an explosion in popularity over the past few years. You can enjoy a vigorous workout or bask in beauty and solitude. The soft surface minimizes impact and develops strength in the leg muscles. Snowshoe engineering has improved substantially making snow shoe running much more enjoyable. As with cross country skiing, don't forget mountain safety, be prepared for adverse conditions.

I have not been able to find research comparing snowshoeing to running. If you are running with snowshoes the training effect should be very similar to running. Since you can not run as fast on snowshoes, race times would probably not improve. However, snowshoeing would be a tremendous way to improve strength, power and overall fitness while minimizing impact and enjoying the beauty of the mountains. If you are recovering from an ankle, achilles tendon or knee injury you may want to stay on groomed paths to limit the side to side motion that occurs when breaking trails in fresh snow.

Backward Walking

Backward walking is most safely performed on a treadmill and can be quite helpful for runner's knee. Start out slow until you get the feel for backward walking. Try not to hold on to the rails or only hold lightly. Keep your first few sessions shorter until your calves get accustomed to this workout. You will probably find that increasing the treadmill elevation to 8-14% and the speed to a brisk or very brisk walk will give you a good workout. Dr. Timothy Flynn (physical therapist and runner) contributed to much of the research on backward walking.

Backward walking was initially used as a method of training for people with runner's knees. The biomechanics of backward walking were found to put less pressure on the kneecap yet provide a good strengthening response for the quadriceps. You may feel out of place doing this at a gym, but you will soon find several people asking what you are up to and you may notice others joining in. Researchers have evaluated heart rate and oxygen use during backward walking and found it to be similar to running.



Bench Stepping

Step aerobics classes are popular at health clubs and can be a social outlet for those who enjoy group exercise. As runners we tend to move in just one direction. A step aerobics class will have you moving in a varieties of patterns and work muscles that may get neglected with running. There is a moderate amount of impact with these classes (this will vary with instructors), which may not make it the best choice for some injuries.

A study conducted at Auburn University reported that bench stepping resulted in similar improvements in the ability to use oxygen (VO2 Max) as running. The unique aspect of this study was that they compared injuries between the two groups. Step aerobic exercisers reported more injuries that caused pain only while bench stepping, whereas runners reported slightly more injuries that continued to hurt after running.



About the Author

Bryan and his wife Leanne have each been running for over twenty five years. They founded *The Injured Runner* to help runners overcome injuries and enhance their enjoyment of running. Bryan graduated from Baylor University with a Master of Physical Therapy degree and has specialized in orthopedic and sports medicine. He currently practices at Soar Physical Therapy in Grand Junction, Colorado.

For information on the treatment and prevention of running related injuries visit:

www.injuredrunner.com.