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Cross Training for Runners
A Practical Guide

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This guide is a combination of multiple cross training methods, apparatus, and workouts designed to provide flexibility and variety to your cross training regimen.

I've done my best to support and discuss both the benefits and negatives of each cross training method so you can approach your workouts with the knowledge that the hard work is paying off.

Cross training can be tough, especially when you're injured or want to be increasing your volume faster. By providing a variety of workouts and implementing some unique and challenging combinations, you'll emerge from your injury with minimal fitness loss.

If you're cross training to increase your fitness without risking injury, these workouts will challenge your aerobic system without the typical pounding associated with running.

My favorite quote that gets me in the pool or on the bike on even the most challenging cross training workout is from Muhammad Ali:

"The fight is won or lost far away from witnesses - behind the lines, in the gym and out there on the road, long before I dance under those lights."

Enjoy the workouts, and please let me know if you have any questions.

Aqua Jogging

Aqua jogging is a form of deep water running that closely mimics the actual running movement. Your feet don't actually touch the bottom of the pool, so it is zero impact and safe for almost any type of injury.

In my experience, the only time to avoid aqua jogging is when you have a hip flexor injury, which can be aggravated by the increased resistance of the water as you bring your leg up.

Because aqua jogging closely mimics natural running form, it provides a neuromuscular workout that, in addition to aerobic benefits, helps keep the running specific muscles active. The same can't be said for biking and swimming.

The only downside to aqua jogging is that you need a pool that is deep enough to run in without touching the bottom. If you're lucky enough to have access to a pool of this size, aqua jogging should be your first cross training choice.

How to aqua jog

Good aqua jogging form should imitate your running style fairly closely. You'll want to submerse yourself in the deep end of the pool and use an aqua jogging vest if you're a beginner or not a good swimmer. The vest is a nice tool, but once you get the form down, it isn't necessary.

The key to good aqua jogging form is to keep your upper body straight and to not lean forward too much, which is a little different than your normal running posture. You should practice using a higher knee lift and a more compact back kick compared to running on dry land. This will allow you to remain upright and also enable you to perform harder sprinting activities.

The benefits of aqua jogging

Studies have shown that aqua jogging can enable a well-trained runner to maintain running fitness for up to 4-6 weeks.

In one study, a group of ten runners trained exclusively with deep water running for four weeks and compared 5km race times pre deep water running and post deep water running. The researchers found no statistical difference in 5k time or other markers for performance, such as submaximal oxygen consumption or lactate threshold.

In a second study, researchers measured the effects of aqua jogging over a six week period. This time, 16 runners were separated into two groups – one who did aqua jogging workouts and the other who did over land running. Using the same training intensities and durations, the researchers found no difference between the groups in maximal blood glucose, blood lactate, and body composition.

Finally, research has also demonstrated that aqua jogging can be used as a recovery tool to facilitate the repair of damaged muscles after hard workouts. These findings make aqua jogging an important recovery tool in addition to be an optimal cross training method.

Also of note, elevating your heart rate in the pool will be more difficult than on dry land. Since your cells are 65-95% water, blood circulates better when submerged, which means your heart does not need to pump as hard to circulate oxygen. So, benefits from pool running must come from a constant, steady effort or intervals.

Sample workouts

Rest = No jogging, just rest in the water

Easy = 65-75% of Maximum Heart rate. Basically a typical easy/recovery run effort

Medium = 87-92% of maximum heart rate. What you would consider a hard tempo run effort; comfortably hard.

Hard = 95-100% of maximum heart rate. All out sprints.

Easy

Easy pool running should only be used as warm-up for harder aqua jogging workouts, a recovery tool between hard workouts, or to simulate longer training runs.

You can perform easy pool running just like you would perform easy running on dry land, there is nothing fancy about it. You should try to maintain a heart rate that is 65-75% of your maximum heart rate.

Medium

1. 10 min easy w/u, 1:00 hard, 30 sec easy, 1:30 hard, 30 sec easy, 2:00 hard,
30 sec easy (continue building up until 5:00, and then come back down by 30 second intervals) 10 min easy c/d

2. 10 min easy w/u, 1min medium, 1 min sprint, 30 sec hands in air (keep moving your legs in the running motion, but put your hand above your head), 1 min rest – repeat 10-15 times. 10 min easy c/d

3. 10 min easy w/u, 30sec sprint, 30sec medium, 30sec sprint, 30sec medium – 30 rest, Repeat 12-15 times, 10 min easy c/d

4. 10 min easy w/u, 10 sec medium, 10 second sprint, 10 second easy, 20 sec medium, 20 sec sprint, 20 sec easy, 30 sec medium, 30 sec sprint, 30 sec easy, repeat up to 70 seconds and the back down, 10 min easy c/d

Hard

One of the difficulties of cross training is replicating those truly lung-busting, difficult workouts. With the pool, I've actually found a very nice trick to help make pool running as hard as any track workout you might do. If you're going to be pool running quite a bit due to injury or limited training volume, invest in a bungee cord designed for sprinters.

Tie one end of the resistance band to a sturdy object (pole, lifeguard stand, pool ladder) and bring the other into the water with you. Put the strap around your waist and aqua jog away from your starting point. You'll begin to notice the bungee tighten and resist against you (depending on the length of your pool, you may need to wrap the bungee around the supporting object or tie it in knots to make it shorter to feel resistance).

Spend a few moments testing yourself to see how far you can pull the bungee. This is a great challenge and a fun way to compete with yourself during an otherwise boring cross training activity.

Finally, pick a point on the pool wall or side of the pool that you feel stretches to bungee to a very hard sprint that you could maintain for 60-90 seconds. This will be your "sprint" marker that you'll use on sprint intervals. Likewise, find a point that feels like the end of a hard tempo run. Mark this spot as your "medium" interval distance. Now, when you complete the hard workouts, you can use these reference points to ensure that you maintain a very hard effort.

1. 10 min easy w/u, 90 sec easy (slowly moving out and stretching the bungee), 2 min medium, 1 min sprint, 1 min rest (let the bungee pull you back – this is kind of fun) x 10, 10 min easy c/d

2. 10 min easy w/u, 90 sec easy, 5 min medium (focus and concentrate, just like during the hard part of a race), 30 sec sprint, 2 min rest, x 4, 10 min easy c/d

3. 10 min easy w/u, 90 sec easy, 2 min sprint, 90 sec rest x 12, 10 min easy c/d

I guarantee that with the bungee, you'll get your heart rate through the roof and push the limits of your VO2 max.

Biking

Stationary cycling is one of the most common cross training activities. While the pedal movements on a bike do not simulate the running motion, the bike does enable you to get your heart rate high and sweat quite a bit, which provides a great psychological boost. Moreover, almost every gym has them and I've found a few unique ways to simulate hill repeats.

Unfortunately, there haven't been many studies conducted on the effectiveness of cycling as a cross training method as it relates to running. This is mostly due to the close approximation of cycling and running to triathlons.

For runners, biking is a great cross training tool to recover from hard workouts, mainly because it circulates lots of blood through the lower limbs and there is very little impact. Plus, it provides a good sweat and it's easy to get your heart rate up. For injured runners, it can be a good change of pace, a nice psychological boost and, if your injury allows, can help simulate some hill running.

Sample workouts

Easy = 65-75% of maximum Heart rate. During a typical easy run, you would have a stride rate that is equivalent to a cadence that is 83-88 rpm (rotations per minute) on a stationary bike. So, for easy bike sessions and breaks between intervals, lower the resistance on the bike so you can maintain a rhythm between 80 and 90 rpm. Remember, each bike will have a resistance level that correlates with a different effort, so test each one to see what level works best for you.

Easy biking sessions should be used as recovery between hard workouts or general maintenance. In general, you should replicate your time running on an average easy day with time on the bike. So, if your normal easy day is 45-50 minutes, than you would bike for 45-50 minutes.

Medium = 87-92% of maximum heart rate. This is what you would consider a hard tempo run effort; comfortably hard. Maintain 85-90 rpm, but increase resistance to increase heart rate and effort to appropriate levels.

1. 10 min easy w/u, 8 x 3 min hard w/2 min easy, 10 min easy c/d

2. 10 min easy w/u, 10 min medium, 2min easy (x 4), 10 min easy c/d

3. 10 min easy w/u, 5 min medium, 2 min hard, 2min easy (x 7), 10 min easy c/d

Hard = 95-100% of maximum heart rate. This would be considered a VO2max or speed workout type effort. Again, maintain 85-90 rpm and increase the resistance to achieve desired effort level.

You can also use very high resistance, which will force you to stand on the pedals and push hard (think the Alps during the Tour de France). The rpm's will be lower (55-65 rpm), but you'll simulate hill running and build muscle strength. Make sure this doesn't aggravate any injuries.

1. 10 min easy w/u, 10 x 2 min hard (stand on pedals at high resistance), 2 min easy, 10 min easy c/d

2. 10 min easy w/u, 10 min medium, 5 min hard, 2 min hard (stand on pedals at high resistance), 5 min easy (x2), 5 min easy c/d

Elliptical Training

Obviously, there is no exact substitute for running, but elliptical training can provide some fitness benefits for injured runners or those that need to cross train to supplement mileage.

While direct comparisons between elliptical training and running are limited in scientific research, I did uncover some data about how elliptical training and running compare.

Oxygen consumption and energy expenditure

In one study, researchers compared oxygen consumption, energy expenditure, and heart rate on a treadmill versus an elliptical when exercising at the same effort (perceived level of exertion).

The results indicated that while heart rate was slightly higher on the elliptical, oxygen consumption and energy expenditure were similar on both machines. As such, the researchers concluded that:

"During a cross training or noncompetition-specific training phase, an elliptical device is an acceptable alternative to a treadmill."

Heart rate on elliptical versus running

A 2004 study reviewed the apparent differences in heart rate on the treadmill compared to the elliptical machine. While the researchers did not find the same elevated heart rate levels seen in the previously mentioned study, they did find that:

"The rating of perceived exertion (RPE) was the same in the chest and actually more intense for the legs on the elliptical compared to the treadmill (presumably from the incline).

As such, the researchers concluded that using RPE as a measurement of effort on the elliptical can produce fitness results similar to running.

Metabolic and cardio-respiratory

Finally, another study compared metabolic and cardio-respiratory improvements following a 12-week training program using and elliptical trainer versus a treadmill.

The researchers found that when training volumes and intensities were equivalent on the treadmill and elliptical, physiological adaptations remained relatively the same.

So, will an elliptical help maintain running fitness?

The results of these limited studies suggests that **while the elliptical is not a perfect substitution for running, it will allow you to maintain fitness during time off from training.**

The only potential drawback to the elliptical machine for injured runners is that it can still aggravate some injuries, despite the lack of impact. Such injuries include stress fractures, achilles injuries, and the IT band. So, be careful and listen to your body when on the elliptical.

Sample elliptical workouts

Easy elliptical workouts

Should be performed between 65-75 percent of maximum heart rate.

During a typical easy run, you would have a stride rate that is equivalent to a cadence that is 90 rpm (rotations per minute) on an elliptical. So, for easy elliptical sessions and breaks between intervals, lower the resistance and incline on the elliptical so you can maintain a rhythm of 90 rpm.

As a note, some elliptical machines measure stride rate, which measures both legs, so the stride rate would 180.

Easy elliptical sessions should be used for recovery between hard workouts (just like you need in running) or general maintenance if you're not injured and using the elliptical to supplement mileage.

In general, you should replicate your time running on an average easy day with time on the elliptical.

So, if your normal easy run is 45-50 minutes, then you would use an elliptical for 45-50 minutes.

I prefer a lower incline since it more closely mimics the running motion.

Medium effort elliptical workouts

Medium elliptical workout should be 87-92 percent of the maximum heart rate. This is what you would consider a hard tempo run effort or comfortably hard.

Maintain 90 rpm, but increase the resistance or the incline to elevate your heart rate and effort to appropriate levels.

Medium elliptical sessions are great for runners who are injury prone and want to perform more intense workouts, but can't add the volume to their training without getting injured. They are also good as "maintenance" days for injured runners.

The workouts will help keep your heart rate up, but aren't so killer that you can't perform them daily.

To make the workouts longer or shorter, simply adjust the number of repetitions.

1. 10 mins easy w/u, 6 x 5 mins hard, 3 mins easy, 5 mins easy c/d

2. 10min easy w/u, 1,2.3,4.5,6,5,4,3,2,1 minutes hard w/2min easy btwn all, 5 min easy c/d

3. 10 min easy w/u, 1 min medium, 1 min hard, 1 min medium, 1 min hard, 1 min easy (x6), 5 min easy c/d

4. 10 min easy w/u, 1:00 hard, 30 sec easy, 30 sec hard:, 30 sec easy, 2:00 hard, :30 easy (continue building up until 5:00, and then come back down by :30 second intervals) 10 min easy c/d

Hard Elliptical workouts

95-100% of maximum heart rate. This would be considered a VO2max or speed workout type effort. Again, maintain 90 rpm and increase the resistance to achieve desired effort level.

Hard efforts are great for the inured runner who needs to maintain fitness and train to get back in shape fast. You should two or three of these hard workouts per week.

1. 10 min easy w/u, 20 min medium pace, 3 x 3 mins hard w/90 sec easy, 5 min c/d

2. 10 min easy w/u, start at level 1 and increase resistance every 4 minutes for 35-40 minutes, 5 min c/d (this is a simulated hill workout)

3. 10 min easy w/u, 5 min medium, 2 min hard, 5 min medium, 2min hard, 2 min easy, (x 3), 5 min easy c/d

Swimming

Breaking up the monotony of training or hitting the pool for a zero impact activity makes swimming an important cross training method.

While swimming relies primarily on the upper body for power, it efficiently challenges both aerobic endurance and VO2max, making it a very hard workout. Moreover, it challenges different systems, which can be a great change of pace for runners looking to become better all-around athletes.

For injured runners, it may be their only cross training choice because they require zero impact and lack the deep water necessary for aqua jogging.

Studies have shown that swimming elicits significant increases in VO2max and aerobic endurance. Unfortunately, that fitness does not translate directly to improved running performance. Because specificity and neurological/skeletal training are important factors in running fitness, studies find that no changes to specific running fitness were found after 10 weeks of swimming, despite other positive physiological adaptations.

This doesn't mean swimming is a bad cross training choice for runners. Instead, I suggest that swimming be used as a supplemental cross training activity, combined with other methods, to be most effective.

Sample workouts

Easy - Easy swimming sessions should be used as recovery between hard workouts or general maintenance. In general, swimming for 20-40 minutes is considered a good workout, unless you are an experienced or advanced swimmer. Heart rates during swimming are difficult to monitor because breathing patterns are altered and the being in the water decreased heart rate naturally. However, during easy swims, you should concentrate on an effort level that is equivalent to your typical easy runs.

Medium – Adding workouts to your swims can help break up the monotony and add in a level of VO2 max training. Some examples are:

1. 5 min easy w/u, 200m, 1min rest, 4 x (4 x 50 w/20 sec rest and 45sec between sets), 200m, 5 min easy c/d

2. 5 min easy w/u, 400m, 1 min rest, 2 x 200m w/20 sec rest, 4 x 100m w/15sec rest, 8 x 50m w/10 sec rest, 12 x 25m w/5sec rest, 5 min easy c/d

3. 5 min easy w/u, 800m, 1min rest, 8x100m w/20sec rest, 400m, 30sec rest, 8x50m w/10sec rest, 200m, 5 min easy c/d

4. 5 min easy w/u, 2 x 250m w/2min rest, 150m, 30sec rest, 200m, 30 sec rest, 8 x 25m w/10 sec rest, 300m, 5min easy c/d