Running-Specific Circuit Drills

The Final Frontier in the Quest for PRs

By Nicole Hunt  As featured in the March 2009 issue of Running Times Magazine

Who among us runners has not drooled over the delicious successes of recent record-setting and medal-winning American athletes who are coached by the likes of John Cook, Terrence Mahon and Alberto Salazar? We see images of those speedsters in magazines, on TV and the Web, and we wonder, "How do they do it? How do they continually produce those huge, lifetime bests when their previous records were already spectacular and unbelievable? And how do they look so good, almost effortless, while doing so?"

In this article, I will help you discover and implement a form of training that supplies part of the answer. It's been scientifically proven to increase strength, speed and power, prevent injuries, elevate endurance performance and ultimately help you become the fastest runner you can be. This training modality is instrumental in the coaching systems of Cook, Mahon and Salazar and the training of many world-class runners from around the globe, including Kenyans and Ethiopians. I have incorporated this type of training into the workouts of athletes I have coached, and almost all have set lifetime, age-group or course-specific PRs.

This training method uses running-specific circuit conditioning drills, which target a broad range of physical adaptations, including general strengthening, dynamic stretching, total core conditioning and explosive running.

What's the Science?

Many studies have shown that general strengthening, core conditioning and explosive running drills improve running performance. Consider a recent study completed by Dr. Philo Saunders and his Australian coworkers and reported in the Journal of Strength and Conditioning Research. It focused on fast middle- and long-distance runners, with VO2 max values into the 70s and 3K times of about 8:30. All 15 of the test subjects competed at a national level, and six had also competed at an international level.

The 15 runners were randomly assigned for nine weeks to either a control group, who did running only, or to a running plus explosive-training group. Before the study, both groups were already performing high-level training, including three weekly interval sessions as part of 60 total miles of running. As a result, they had pretty much maxed out improvements in running economy through the traditional types of stimuli.

The exciting results showed that the explosive-running group improved their average running economy by 4 percent, and they also increased overall muscle power. The control group, in contrast, failed to improve either variable. A 4 percent improvement in running economy is huge. For example, a 3-hour marathoner who improved her economy (and therefore lowered her oxygen cost at race pace) by 4 percent could lower her time by 7 minutes!

Anecdotally, but more personally, I can attest that many of the recreational runners I coach have seen dramatic improvements since adding regular drills to their programs. Dave Stauffer set lifetime PRs for 400m (72.5) and 800m (2:45) at age 59 after adapting to the new training. At the other end of the spectrum, Debbie Gibson chopped 13 minutes off her half marathon best by running 1:32 at age 42, and Richard Engel set a 6-minute marathon PR of 3:02 despite being in his 50s. I am convinced by the research and my runners' successes that running-specific circuit training supplies a missing element in many non-elites' programs.

More Benefits of Running-Specific Drills

In addition to enhanced running economy, there are several other compelling reasons to use running-specific drills:

1. Injury Prevention: Focus on running-specific general strengthening drills early in your season to help correct muscular imbalances, improve balance, increase lower back stability and general range of motion, all of which make your running more smooth, strong and efficient, helping you avoid common running injuries. Most modern coaches agree that building a stronger body through running-specific activities lowers your risk of injury.

2. Superior Warm-up and Flexibility: When compared with static stretching, which involves reaching forward to a point of tension and then holding, dynamic drills are a superior warming and loosening tool to prepare you for training and racing. Specific dynamic running drills mimic running form, using momentum and strength to propel the muscle into an exaggerated range of motion that also produces event-specific warming and stretching. Dynamic running drills also increase blood flow to the muscles and they fire up the nervous system, while static stretching may actually reduce performance by decreasing leg power, according to a study reported in the Journal of Strength and Conditioning Research in September.

3. Improved Running Form: Many runners have running form defects, such as forward lean, poor leg extension, outward turning of the feet, heel striking or overstriding. Done properly, running drills isolate and correct inefficient movements of your running stride, thus teaching your nervous system to signal correct mechanics.
4. Increased Power: Power is derived from the ability to perform a movement with strength and speed. There are two ways to increase your speed -- increasing leg turnover or increasing stride length (not to be confused with hyper-extended footplants that create overstriding and braking). Running-specific circuits, including general strengthening, fast running, and explosive running drills, increase your natural stride length by peaking propulsive leg thrust. Stride rate may be improved by stimulating your neuromuscular system to coordinate movement with less energy and oxygen burned. Quick and powerful foot strikes make you fast and efficient by minimizing your ground contact time.

First I describe the various drills that I will refer to in each circuit. In the following pages are three running-specific drill circuits. If you've never done this type of training, start with the first set, which focuses on building general strength. Although many of the runners I coach switch from one circuit set to another as their competitive year progresses, you will definitely see benefits even if you never move beyond the general strength circuit. Click on the related link at the bottom of the page to see me doing each circuit.

General Exercises

Push-ups: Be certain your lower back does not slouch. Hold your belly button in.

Single-leg squats: Support your weight with your left foot and place your right foot back with toes lightly resting on an 8-inch step. All of your weight should be directed through the middle-to-ball of your left foot. Now, bend your left leg and lower your body until your left knee reaches an angle of 45 to 90 degrees. Then, return to the starting position. Repeat, 1 second up/1 second down with good form, for 30 seconds on left leg, then duplicate with right leg.

Squat thrusts: Get into push-up position, quickly jump knees toward chest and, without pause, jump-straighten legs back into push-up position.

Supermans (photo 1): Lie prone and lift arms and legs simultaneously.

Calf raise: Support weight with toes on step, then raise heels, striving for maximum height.

Tricep bench dips (photo 2): Position hands shoulder-width apart, palms on a bench. Move feet out in front so that body weight is supported by straightened arms. Slowly lower body down, keeping elbows tucked into your sides. Once your upper arms are parallel to the floor, slowly press off with your hands and push yourself back up to the starting position, squeezing your triceps.

Walking lunges (photo 3): Take the basic lunge and add a walk: stepping forward one leg at a time, land on heel then forefoot. Lower body by flexing knee and hip of front leg until knee of rear leg is almost in contact with floor. Stand on forward leg with assistance of rear leg. Lunge forward with opposite leg. Repeat by alternating lunges with opposite leg.

Feet-elevated push-ups: Elevate feet on a bench and do a push-up.

RELATED ARTICLE

A Video Guide to Running-Specific Drills
Elite mountain runner and coach Nicole Hunt demonstrates how to do her drill circuits
Drill Exercises

Quick skips with leg extension (photo 4): Skip forward and fully extend each lead knee as you lift it to its highest point, while simultaneously thrusting your bottom leg upward. **Butt kicks (photo 5):** Move forward while lifting heel to butt with knee up high at 90-degree angle.

**Bleacher bounds:** Bound up the bleacher stairs.

Tuck jumps (photo 6): Stand with feet shoulder-width apart and head and shoulders up. Explode upward, striving to jump straight up as high as you can while bringing knees toward chest. No rest. Repeat.

Split scissor jumps (photo 7): Stand with one foot in front of the other with one shoe-length apart between feet. Jump as high as possible, switching legs in air. Minimize ground contact time.

**One-legged hops:** Hop on one leg, concentrating on distance, not height.

**Speed bounds:** Different from classical bounding. Bound with longer than normal strides while maintaining high speed. Concentrate on distance, not height.

**Dynamic step-ups:** Place dominant foot on a box, creating a 90-degree knee bend. Use the same leg to thrust yourself explosively up into the air as high as possible. After landing back on the box, immediately switch legs and repeat the same movement.

General Strength

Begin your training season at least 20 weeks prior to your goal race with an eight-week phase of general strengthening (GS) circuits. Working on general strength initially is important to ward off potential injury before doing any explosive exercise, and enhanced strength will also help you reap increased benefits from your next training phase. Perform GS circuits with resistance exercises for your legs, upper body and core, two to three times per week.

"The Rock" below is an example of a GS circuit. You can do it at a track, in a gym or in any flat outdoor setting. No special equipment is necessary.

For all the exercises below, even though I've given a suggested time, stop when you fatigue and lose good form. (For example, if you start slouching on push-ups.)

Warm up with 15-30 minutes of easy to moderate running. Then:

**Run a 15- to 25-second stride**

30 seconds of push-ups
1 minute continuous and fast body weight single-leg squats (30 seconds each leg)

**Run a 15- to 25-second stride**

5-50 reps squat thrusts
1 minute abdominal exercise of your choice

**Run a 15- to 25-second stride**

1 minute continuous and fast single-leg body weight step-ups (30 seconds each leg)
30 -60 seconds of Supermans

**Run a 15- to 25-second stride**

15-second calf raises each leg
30-60 seconds triceps bench dips

**Run a 15- to 25-second stride**

1 minute of walking lunges
30 seconds feet-elevated push-ups

**Run a 15- to 25-second stride**

Repeat steps 2 through 16 (for two circuits in all)

Cool down with 10-30 minutes of easy running.
Stepping into the Hills

After you complete at least eight weeks of general strengthening circuits, the next cycle of training will be hill drill circuits. The added stress of working against gravity will increase your strength gains.

The hill drill circuit below is modified from Owen Anderson’s hill drill circuit program (Running Research News, May 2005).

Everest Hill Drill Circuit

Do all drills up a hill with a 5-15 percent grade, twice a week, for six to eight weeks on a forgiving surface like grass or a dirt road. Begin with one set and work up to three sets of each exercise. Suggested distances are for advanced runners. Run easily back down while allowing your body to re-prime after each repetition.

**Spring bounce up a hill for 50-100m.** Begin by running the uphill stretch “springing up on your toes, not running but bouncing” as coaching legend Arthur Lydiard put it. Take very short, springy steps, landing in the midfoot area with each contact and springing upward after impact.

*Skip on the balls of your feet for 50-100m up a hill*, using very quick leg action. Minimize the amount of time your feet contact the ground.

*Perform 20-30 seconds of fast high knees up a hill* with easy jog down rests. Think “thigh up, toe up.”

*Perform 20-30 seconds of butt kick runs* (snap heels to butt) up a hill with easy jog down rests.

*Hop up a hill for 15m on one foot*, aiming for height, not distance, then switch legs.

*Hop up a hill for 15m on one foot*, aiming for distance, not height, then switch legs.

*Do 30 seconds of speed bounding*: bound with longer strides and high speed. Concentrate on distance, not height. Note: This is different than classical bounding.

Finishing Touches

Do explosive running drills during the final six to eight weeks before your goal race. Perform these drills two to three times per week before a hard workout on a surface like a gym floor, firm grass, or dirt trail. Maintain proper running form with head up and eyes looking forward. Minimize ground contact time -- think quick and light on your feet.

My “Antelope Explosion” circuit outlined here is just one combination of the myriad of running-specific explosive exercises an imaginative runner could perform. Your body will quickly adapt to a repeated training stress, so changing the content of your circuit exercises every eight weeks is important to continually stimulate the nervous system.

"Antelope Explosion" Running Drills

After a thorough warm-up perform these drills:

25m quick skips with leg extension
25m butt kicks
15- to 25-second stride
3x25m fast high knees (facing forward, left, then right)
15- to 25-second stride
25-40 bleacher bounds
6-10 reps tuck jumps
15- to 25-second stride
20-50 squat thrusts
6-10 split scissor jumps
15- to 25-second stride
25m one-legged hops
15- to 25-second stride
25m speed bounds
10-20 dynamic step-ups
15- to 25-second stride

Complete one circuit the first week, then two times through the circuit thereafter.

[Click HERE](link) for videos of author Nicole Hunt performing these three drill circuits.