

## Effective Training for a Grueling Race

by Drew Roberson

If you're such a glutton for punishment that you want to run the 400m dash, then you're going to need to know how to train for it. If the sight of grown men vomiting at the finish line excites you, then enter the next 400 in your area, but please take some measures to lessen your pain. Although the quarter mile will never be an easy event, science and proper training can get you physically prepared for the task at hand.

A Finnish study, cited in Owen Anderson's Running Research News, identified the two major energy sources for running the 400. Anderson states, "As you plan your workouts, remember that muscles have two key ways to obtain energy during a 400: (1) Creatine phosphate itself generates energy, and (2) Glucose breaks down to form lactic acid." The study also showed creatine phosphate is depleted by almost fifty percent after only 100 meters and then slowly depletes almost completely by 400 meters. Creatine phosphate levels do not return to normal levels for a full eight minutes following the race. Therefore, it would make sense for 400 runners to do repeat 100s almost all out with five to eight minute recoveries. These jaunts will increase the muscles' ability to use creatine.

Since the discovery that lactic acid levels were highest at about 300 meters, Anderson concluded that 300s, "do a fantastic job of maximizing muscles' ability to break down glucose. "200 meter sprints, however, were found to be inefficient for 400 training. The levels of creatine phosphate had already dropped in half at 100 meters, and the rate of glycolysis didn't reach its peak until 300 meters. Unfortunately, 400 intervals with only three minutes rest (a workout only a complete masochist would enjoy) were found to be the best workout to build up muscular tolerance to acidity. Intervals over 400m were shown to be ineffective because creatine phosphate levels were too low for any real benefit.

I hope that all of this hasn't confused you. In essence the Finn's research helped Anderson conclude that a good 400 training program needs the following:

1. 100s run at close to full speed with full recoveries (5-8 minutes)
2. 300s run at close to full speed with full recoveries (8 minutes or longer)
3. 400s run at close to full speed with short recoveries (3 minutes)

These guidelines offer quarter milers a scientific road map to design an effective workout program, but it is not written in stone anywhere that you should only run 100s, 300s and 400s while training. I briefly trained with the Santa Monica Track Club in college, and still incorporate workouts learned from Joe Douglas, the Santa Monica Track Club head coach, and John Smith, the UCLA head coach. They taught me to run 350s for time and then add 7 seconds early in the season and 6 seconds late in the season to get my equivalent 400 time. This technique allows you to run more relaxed in training, since you don't have the final painful 50 meters of the 400 looming in the back of your mind.

Over the past few years I have consulted with Brooks Johnson, the former US Olympic coach, whose training philosophies almost mirror Owen Anderson's. In a nutshell Johnson's sprint theories are the following:

1. Speed is a runner's greatest asset and should be trained from day one. Athletes need to train at speeds faster than race pace, so that race pace becomes their "comfort zone." Two speed workouts per week are recommended for 400 runners. Example: (6X30m w/370 walk/jog rec.)
2. Train to increase your lactic acid tolerance and base twice a week. Example: (6X300 in sets of 2 with a quick 100m jog recovery. Allow full recovery between sets.)
3. The oxygen system should be trained once per week. Example: (20 minute easy jog followed by 20 minutes of easy form strides)
4. Athletes should take two days off per week to allow their bodies to fully recuperate from training.

The conclusions of the Finnish study dovetail with the proven training techniques of the four coaches quoted here. With the resources available, you should be able to construct a solid training program. I have constructed a few sample weekly programs below to get you started.

#### Early Season

- Mon 3-4 X 300 w/full rec.
- Tue 7-8 X 100 w/full rec.
- Wed 20 minute easy jog w/20 minutes of easy strides
- Thu rest

- Fri 6 X 30 w/370 jog rec. & 3 X 100 w/300 jog rec.
- Sat 2 sets of 300-jog-100-300 or 3-4 X 350 w/3 min. rec.
- Sun rest

#### Mid Season (lacking speed)

- Mon 2 sets of 300-100jog-300
- Tue 8-10 X 100 w/5 min. rec.
- Wed 20 min. easy jog w/20 min. of easy strides
- Thu 6-12 X 30m w/370 jog or walk rec.
- Fre rest
- Sat race
- Sun rest

#### Mid Season (lacking stamina)

- Mon 2 sets of 300-100jog-300
- Tue 8-10 X 100 w/5 min. rec.
- Wed 20 min. easy jog w/20 min. of strides
- Thu 2-3 X 350 w/3 min. rec.
- Fri rest
- Sat race
- Sun rest

#### Peaking Season

- Mon 2 sets of 300-100jog-300 or 3X 350 w/3 min. rec.
- Tue 20 min. easy jog w/20 min. of strides
- Wed 3-4 X 150 w/full rec.
- Thr 6 X 30 w/370 walk rec.
- Fri rest
- Sat race
- Sun rest

### **References**

Anderson, O., Ph.D. (1992). Step by Step Through 400 Meters: Understanding the process can help your training and racing. Running Research News, Volume 8, Number 6, 5-7.

Johnson, B. (1995) Coaches Notebook.