

2017 Ohio Association of Track and Cross
Country Coaches Clinic

Top 7 Lessons For Coaching Runners

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Lesson #1:

*Run for gold by training the lactate
threshold.*

The lactate threshold (LT) is the best physiological predictor of distance running performance. It demarcates the transition between running that is almost purely aerobic & running that includes significant oxygen-independent (anaerobic) metabolism. It represents the fastest speed runners can sustain aerobically. LT runs raise LT to a faster speed, allowing runners to run faster before they fatigue. The longer the race, the more important LT training becomes.

LT Pace

- Slower/recreational runners:
 - 10-15 sec/mile slower than 5K race pace (or ~10K race pace)
 - 75-80% max HR
- Highly-trained/competitive runners:
 - 25-30 sec/mile slower than 5K race pace (or 15-20 sec/mile or slower than 10K race pace)
 - 85-90% max HR
- Subjectively feel “comfortably hard”

Types of LT Workouts

Continuous LT Runs

3-4 miles up to 7-8 miles (or ~45 min)

LT Intervals

intervals @ LT pace with short rest periods
4 x 1 mile @ LT pace w/ 1 min rest

LT+ Intervals

short intervals @ slightly faster than LT pace with very short rest periods
2 sets of 4 x 1,000 meters @ 10 sec/mile faster than LT pace w/ 45 sec rest & 2 min rest between sets

LT/LSD Combo Run

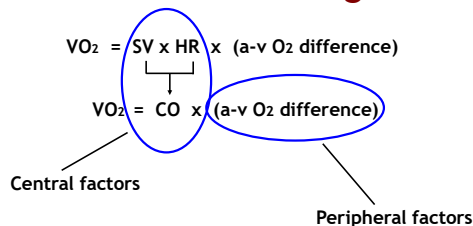
medium-long runs with portion @ LT pace
12-16 miles w/ last 2-4 miles @ LT pace
2 miles + 3 miles @ LT pace + 6 miles + 3 miles @ LT pace

Lesson #2:

*To prevent runners’ fitness levels from
waning, ramp up the intensity with
VO₂max training.*

VO₂max is the second major player of running performance. While increasing runners’ weekly running volume will increase their VO₂max if they currently run less than 40-50 miles per week, interval training (w/3-5 min bouts @ 95-100% VO₂max) is most potent stimulus to increase it, especially for trained runners.

VO₂max Training



- Mileage targets peripheral factors
- Interval training targets central factors

VO₂max Pace

- Running speed that elicits VO₂max
- Fastest speed that can be maintained for ~7-10 min
- 95-100% max HR
- Slower/recreational runners:
 - 1 to 1½-mile race pace
- Highly-trained/competitive runners:
 - 2-mile race pace

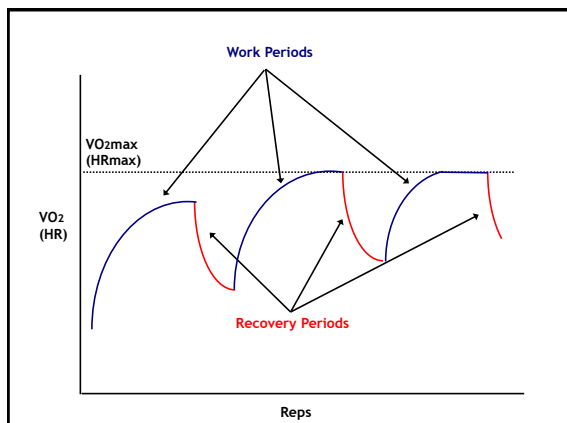
VO₂max Interval Workouts

- 4 x 1,000 meters @ VO₂max pace with a 1:≤1 work:rest ratio
- 6 x 800 meters @ VO₂max pace with a 1:≤1 work:rest ratio
- 16 x 400 meters @ VO₂max pace with a 1:<1 work:rest ratio

If you can run 1½ miles in 10:00 (=6:40 mile pace):

- 4 x 1,000 meters in 4:10 with 3:00 jog recovery
- 6 x 800 meters in 3:20 with 2:30-3:00 jog recovery
- 16 x 400 meters in 1:40 with :50 jog recovery

Although tempting to run faster when intervals are shorter, pace should be same for all 3 workouts since goal is same – to improve VO₂max. As runners progress, make workouts harder by adding more reps or decreasing recovery intervals rather than by running faster. Only increase speed of work periods once races have shown that the runner is indeed faster.



Lesson #3:

To meet runners' physiological needs, run workouts at the correct speeds.

Each workout has a correct speed associated with it to optimize training. If run too slow, runners won't improve the physiological variable they're trying to train. If too fast, they'll add unnecessary fatigue without extra benefit. The goal of training is to obtain the greatest benefit while incurring the least amount of stress, so runners should run as slow as they can while still obtaining the desired result.

Lesson #4:

Before picking up the pace, have a solid aerobic base.

Distance running is a volume-dependent sport, with physiological adaptations resulting from time spent running. Aerobic running increases number of red blood cells & hemoglobin, giving blood vessels greater oxygen-carrying capability; increases muscle capillary volume, providing more oxygen to muscles; & increases mitochondrial volume & number of aerobic enzymes, allowing for greater use of oxygen. The more runners attend to these qualities of aerobic metabolism, the more they'll ultimately get from their subsequent interval training.

Lesson #5:

Refuel immediately, maximize recovery.

Two important fuels to replenish after training are carbohydrates & protein. Endurance performance is strongly influenced by amount of muscle glycogen, with intense endurance exercise decreasing muscle glycogen content. Recovery is closely linked to replenishment of carbohydrates, with glycogen resynthesis most rapid if carbs are consumed immediately after workout. Protein rebuilds skeletal muscle fibers that have been damaged from training.

Lesson #6:

Run through town, put dumbbells down.

There is little evidence that weight training improves distance running performance. Distance running is primarily limited by the delivery and use of oxygen. There are no studies proving that weight training increases the supply of oxygen to and use by muscles, which is largely dictated by the amount of blood pumped by your heart per minute (cardiac output), the amount of RBCs & hemoglobin in your blood, and your muscles' capillary and mitochondrial densities.

However, when done to increase power, weight training can improve running economy...

Lesson #6 (cont.):

Weight training is not necessary unless

- 1) runners have either already maximized their running training by increasing both mileage & intensity
- 2) they cannot handle physical stress of running more miles
- 3) they have reached their genetic limit for adaptation to their running training

A 25-minute 5K runner is better served by improving the cardiovascular & metabolic parameters associated with endurance than by weight training.

Lesson #7:

To run your best race, run even or negative pace.

The best way to run a race is by starting out at the pace that can be maintained the entire race, with second half equal to or slightly faster than first half (negative splits). The faster runners run the first mile, the more they rely on anaerobic metabolism, which is accompanied by muscle & blood acidosis & accumulation of metabolites that cause fatigue. Running time cannot be put in the bank. Runners' workouts are invaluable for providing knowledge of their fitness levels and for predicting their average race paces.

How Not to Get Injured

- Increase mileage by no more than 1 mile/day/week. If you currently run 20 miles in 4 days/week, run no more than 24 miles next week by adding 1 mile to each of the 4 days. Do not run 24 miles next week by adding all 4 miles to only 1 day of running. Highly-trained runners can get away with adding more miles more quickly, especially if they have experience running more miles.
- Run same mileage for 3-4 weeks before increasing it. Give legs a chance to adapt to each level of running before increasing the level.
- Back off training by about 1/3 for 1 recovery week before increasing training load. If you have been running 30 miles/week for 3 weeks, back off to 20 miles for 1 week before increasing above 30 miles for next week.

How Not to Get Injured

- Never increase volume & intensity at same time. When you begin to include speedwork, either drop overall mileage for week or maintain mileage from where it was prior to adding speedwork. Never add more miles to week at same time as introducing speedwork.
- Alternate hard and easy days. Every day you run hard, follow it with at least one day of easy running. And make sure your easy days are easy. Don't run hard more than two to three days per week.

How Not to Get Injured

- Get adequate recovery. All adaptations from training occur during recovery from training, not during training itself. The older you are, the more time you need to recover from training, so the longer you need before increasing volume & intensity. Young runners can get away with training mistakes; older runners cannot.
- Reduce pronation. Because overpronation is a common cause of many running-related injuries, try to reduce any pronation that is more than normal.
 - Wear correct shoes for you.
 - Stay away from cambered roads (especially in gutter near curb), which increase ankle pronation of outside foot.
 - Strengthen calves, which helps stabilize lower leg when it lands on ground.