

Florida State Cross Country

Lactate Threshold Training

- FSU coach Bob Braman



Lactic Threshold Training

Definition: Physiologist Jack Daniels describes it as training **comfortably hard** to improve endurance. He says the appropriate pace is 88% of the runner's VO₂ Max or about 25-30 seconds/mile slower than current 5k race pace.

Considerations:

- 1) **Current Race Pace** -- consider the conditions
- 2) **Threshold Range** -- most effective = 30 seconds
- 3) **Ineffective Range** -- too fast or too slow
- 4) **Length of Tempo** -- 1 ½ to 2 times race distance
- 5) **Age/Experience of the Runner**
- 6) **Length of the Season** -- how many macrocycle weeks
- 7) **Race Distance** -- 5k distance works best
- 8) **Psychological Factors**
- 9) **Weather Conditions**
- 10) **Training Venues**

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Lactate Threshold Training vs. Interval Training Considerations

- 1) **Age/Experience of the Runner:** Lactate Threshold workouts are typically Tempo Runs (runs longer than race distance at 20-25 sec/mile slower than current 5k pace). Young runners often struggle with Tempo runs and might be more capable of handling Interval workouts that include periods of rest. This must be considered when implementing Lactate Threshold workouts.
- 2) **Length of the Season:** If there is an adequate time to go through a progression of phases of training, then a Lactate Threshold phase of training has an equal value to an Interval phase. The strength that can be gained through a 6-week phase of training emphasizing LT development can be invaluable in maintaining fitness throughout a long season. Further, the body can adapt to Interval training better after a phase of LT training (if follows a better progression).
- 3) **Length of Target Race:** While Lactate Threshold training can be valuable from 800m events to Marathons, its value varies from distance to distance. When considering how much Interval training and how much Lactate Threshold training to do, the race distance is a key consideration. One may want to do a greater percentage of Interval training for 1500m + 800m, than for races 3000m and up.
- 4) **Athlete's Ability to Recover:** Young runners have difficulty recovering from quality Lactate Threshold workouts. They tend to be tougher than Intervals, both physically and mentally. They also can turn into deterioration sessions, which is practicing failing. Always weigh the benefit vs the risk when implementing.
- 5) **Psychological Factors:** The above mentioned possibility of rehearsing failing in workouts (Tempos for example) might have a lingering effect upon the athlete's confidence. Coaches need to work on both the runners' strengths and weaknesses during the training process. I've found that you can challenge their weaknesses during the earlier phases of training better than if you do so later in the process. One doesn't want to have athletes struggle in training if races are at hand. Once the competitive season begins a coach should feed the runner more training that goes toward their strengths. How this fits in the Lactate vs. Interval puzzle will, again, vary from athlete to athlete.
- 6) **Weather Conditions:** At Florida State we can successfully do extended Lactate Threshold workouts in our Track-preparation macrocycle because of two factors. First, the weather is incredible so the wear-down effect is lessened. And second, we have more weeks to dedicate towards LT training than we do in Cross Country preparation. Similarly, we have to be careful as to how long and hard we can go in LT workouts during early cross country season where humidity is a factor.
- 7) **Training Venues:** When you're doing extended Lactate Threshold workouts the running surface becomes an important factor. If you're blessed to have soft-surface training venues of several miles then you'll be able to do more LT work.

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LT Games for 5k Racing

Young runners can benefit from the strength gained from Lactic Threshold training. The benefits can come in the form of sustaining pace longer in races, as well as sustaining one's ability to do work over a longer season.

Tempo runs and Cruise intervals raise the lactic threshold by lowering the pace at which one becomes lactic. (Daniels) These are but two workouts that runners can do to improve LT. You can achieve the same effect by varying recoveries and changing paces within workouts in many different ways. Young runners will thrive on variety. It's up to the coach to implement the right sessions, and determine the right volume + pace for each runner.

LT Workout Volume: Daniels says 10% of athlete's weekly mileage; goal would be to equal or exceed race distance (1 ½ to 2 times race distance ideally)

Tempo Runs: 3-5 miles of hard running at 30 sec/mile slower than 5k race pace

Pick-up Runs: Tempo runs starting 40-45 sec/mile slower than 5k pace and finishing 20-25 sec/mile slower (also known as Progression Runs)

Steady State Runs: Soft Tempo (about 40 secs slower than 5k pace)

Cruise Miles: Mile repeats broken up by one minute recovery time

Dellinger Miles: Alternating paces each mile between Hard and Easy

Alternate Miles: Same as Dellinger but 3 gears, going Hard-Easy-Medium

In and Out 800's: Same principle as Dellinger miles but every 800 meters

Alternate 800's: Same as above but 3- gear alternating every 800 meters

70-90 Drill: Alternating 400's between current Mile and current 5k tempo pace

Crazy 200's: 3-Man Relay where recovery is the distance across the infield

Fartlek: Tempo distance but surges to race pace and floats to Steady State pace

3-2-1: Coach Ennis' 3-Mile/2-Mile/Mile starting Tempo pace ending race pace

Coe - Middle Distance LT : 11 repeats with equal distance recov (100-200)

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Sample Workouts for LT Games

These workouts are all designed for a runner with a 6:00/mile current 5k race pace

Paces Chart: Upper Zone LT = 6:15-20 Tempo = 6:30 Steady State = 6:40-45 Aerobic=7:30

Tempo Run: 4 miles at a steady 6:30 pace; 26 minutes total time

Pick-Up Run: 4 miles going: 6:40-6:35-6:30-6:25; 26:10 total time; similar effect

Progressions Run: 5 miles going: 6:55-6:45-6:40-6:35-6:30; longer run, similar effect

Steady State Run: 5 miles at a Steady 6:45 pace; longer run, transition to LT sessions

Cruise Miles: 5 x Mile at 6:20 pace (upper LT zone) with 90 sec to 2 min active recov
5 x Mile at 6:30 pace (strict LT pace) with 60 second recoveries

Dellinger Miles: 5 miles: 6:15-7:15-6:15-7:15-6:15 (average is slightly above LT pace)
Hard= halfway between LT and 5k pace Easy=Aerobic pace

Alternate Miles: 5-6 miles going: 6:15-7:15-6:45-6:15-7:15 (6:45)
Hard-Easy-Medium-Hard-Easy (Medium)

In and Out 800's: 4 miles alternating 800's (Hard-Easy or Upper Zone LT-Aerobic)
3:10--3:35 (the average is above LT pace); 27 minute 4-miler

70-90 Drill: 3 miles of alternating 400's between Mile pace and Steady State pace
30 second gap for float lap; Upper LT Zone effect; transition to Intervals
6 x 400 on float recoveries; 400m paces = 1:20-150's (6:20 miles); 19:00 total time
Add additional 400's to progress the session (perhaps 8 x 400's followed by floats)

Crazy 200's: 8 x 200's ; each runner runs 200m at mile pace and walks across to start
800m jog or 5 minute set break; 2-3 sets; mix it up to meet 5k needs

3-2-1: 3 miles Tempo—5 min jog—2 miles Upper Zone—5 min jog—1 Mile 5k pace
19:30---12:30—6:00

Fartlek: Surges of 300-500m at 5k pace, followed by floats of equal or longer distance
at Steady State pace; Most effective when using minutes