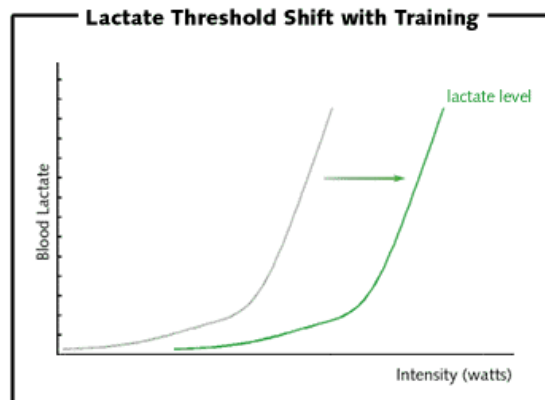


OA/UNE Human Performance Lab

Why test your Lactate Threshold?

The **lactate threshold (LT)** is the most useful test that an endurance athlete can undertake. It is the exercise intensity at which lactic acid starts to build up in the blood. This happens when one shifts from aerobic to anaerobic metabolism which produces lactic acid faster than it can be removed. This point is sometimes referred to as the onset of blood lactate accumulation (OBLA). When exercising below the LT intensity any lactate produced by the muscles is removed by the body without it building up. Exercising above the LT results in accumulation of lactic and ensuing muscle fatigue and performance decline.

The lactate threshold is quite useful for setting exercise intensity for training and racing in endurance sports. While VO_{2max} is relatively fixed, focused training can improve performance by shifting the lactate threshold as a *percentage* of VO_{2max} . Thus, for a given lactate level one can increase the intensity of their effort which equals going faster.



Testing your lactate threshold involves a treadmill or cycle ergometer Ramp Test. This test progressively increases the intensity (speed or power) at set intervals and measures your lactate level at each intensity level. This involves taking blood samples (a simple pinprick to the finger).

Using this data, personalized training zones can be determined to guide you in your training. Data includes Heart Rate and cycling Power or running Speed.



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Zone 1: Recovery

Also known as: Overdistance
Intensity: Very Low
% Lactate Threshold: 65%-84%
% VO2 Max: 55%-65%
% Max Heart Rate: 60%-70%
RPE Scale: 6-9

Used for: These are the easiest workouts, used to promote recovery after harder workouts. It is also generally the intensity level used during the recovery period of interval work and long slow distance (LSD) runs.

Zone 2: Endurance

Also known as: Extensive Endurance
Intensity: Moderate
% Lactate Threshold: 85%-91%
% VO2 Max: 66%-75%
% Max Heart Rate: 71%-75%
RPE Scale: 10-12

Used for: Used for long, endurance workouts and easy speed workout; builds and maintains aerobic endurance.

Zone 3: Lactate Threshold

Also known as: Intensive Endurance
Intensity: Moderate Plus
% Lactate Threshold: 92%-95%
% VO2 Max: 76%-80%
% Max Heart Rate: 76%-80%
RPE Scale: 13-14

Used for: Used for Tempo workouts, training in Zone 3 is usually done in the preparation and base phases. Generally, in the later phases you want to bump up to Zone 4.

Zone 4: VO2 Max Intervals

Also known as: Anaerobic Threshold, Race/Pace
Intensity: Race/Pace
% Lactate Threshold: 96%-100%
% VO2 Max: 81%-90%
% Max Heart Rate: 81%-90%
RPE Scale: 15-16

Used for: Intervals, hill work, and tempo work. Intervals in this zone generally have work-to-rest ratio of 3:1 or 4:1. Training at or slightly below your Lactate Threshold (a.k.a. Anaerobic Threshold) helps your body learn to "recycle" the lactic acid during high intensity work.



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Zone 5a: Threshold Endurance

Also known as: Superthreshold
% Lactate Threshold: 100%-102%
% VO2 Max: 91%-93%
% Max Heart Rate: 91%-93%
RPE Scale: 17

Used for: Intervals, hill work, and tempo work; typically used after some Zone 4 time has already been done. Zone 5 workouts are very short because it is difficult to maintain this level for any length of time.

Zone 5b: Anaerobic Endurance

Also known as: Speed Endurance
% Lactate Threshold: 103%-105%
% VO2 Max: 94%-98%
% Max Heart Rate: 94%-98%
RPE Scale: 18-19

Used for: Intervals and hill work to improve anaerobic endurance. Intervals in this zone generally have work-to-rest ratio of 1:1, for example, a 20 second sprint followed by 20 seconds of easy recovery (Zone 1).

Zone 5c: Anaerobic Capacity

Also known as: Power
% Lactate Threshold: 106%+
% VO2 Max: 98%-100%
% Max Heart Rate: 98%-100%
RPE Scale: 20

Used for: Short-term Sprinting. Intervals in this zone have a work to rest ratio of 1:2 or more.