

Benefits of Performance Testing to Athletes

When an athlete participates in an aerobic profile, lactate threshold or VO₂ max test, it allows the coach to peel back the layers of an athlete and get a specific idea of the physiological strengths and weakness of that athlete at that point in time.

Understanding the athletes aerobic capacity, aerobic threshold, lactate and anaerobic thresholds and their efficiency at important sub-maximal running paces will allow their coach to develop a periodized training program to improve weakness in areas critical to the athletes competitive goals while validating strengths of the athlete that can be employed in training to boost confidence and fitness.

The aerobic profile test also serves as another critical and objective piece of data in conjunction with race performances, to evaluate the progress of the athlete towards their end goals in the coaches eyes.

Performance testing will provide details on the following areas:

-Determination of athletes aerobic capacity: This important physiological benchmark indicates a 'natural selection' for endurance sports that can be useful to ensure appropriate goal setting by the coach and athlete. Although the value obtained in a test for an athletes vo₂ max is a popular one among athletes, its important to remember that it is one of many factors at play that indicated improvement in training and performance. The test providers would like to point out that parameters like aerobic and lactate thresholds are often more responsive to training and may be more indicative of performance when assessed across groups with similar values for aerobic capacity.

-Estimation of the aerobic threshold: The aerobic threshold is a term used by some scientists and coaches to identify the initial net accumulation of lactate in the blood stream at sub maximal levels, indicating a greater contribution of the energetic demands of exercise coming from anaerobic pathways that cannot be oxidized. This is useful to the coach in gaining insight into the speed the athlete can run while using predominately fat as the main fuel source. This pace is indicative of the athletes overall endurance and may be directly related to their specific running speed for a marathon or during half and full Ironman triathlon's.

-Estimation of the lactate threshold: (defined as OBLA) The lactate threshold is a popular term often misused to estimate the running speed at which the blood lactate begins accumulating at an exponential rate. This pace is therefore illustrative of one that can be maintained for 45 min to 1 hour in athletes with appropriate endurance training. The running speed at lactate threshold has been shown to be predictive of performance in running events from the 5,000m to the marathon.

-Determination of the anaerobic threshold: The anaerobic threshold is the point at which the respiratory exchange ratio (ratio of CO₂ and O₂) indicates that 100% of energy for that activity is being provided by carbohydrates.

-Analysis of running efficiency: the energetic cost of running at the 4-5 sub-maximal

steady states is expressed as a percentage of maximal oxygen consumption. When athletes are tested at regular intervals (8-12 weeks) this becomes an excellent tool for determination of improvement in overall and specific running efficiency, a factor predictive of success in recreational and competitive athletes.

-Recommendation on training paces for key training zones with heart rate ranges: Utilizing the details from the test outcome listed above, coaches and athletes will receive training paces for key zones. The paces are as follows:

Recovery- optimal lower end running pace to improve aerobic power and the power that can be obtained from predominately fat as a source of energy.

Moderate aerobic- optimal higher end running pace for improvement of aerobic power and power from fat fuel source.

Marathon pace- recommended marathon pace for those athletes that are or will be training to compete in a marathon in the near future.

Stamina- lower end pace to improve the running speed at lactate threshold by improving the lactate shuttling of the body.

Stamina +- higher end pace to improve running speed at lactate threshold and the aerobic metabolism in the body.

Max VO₂- pace predictive of 100% of velocity at max vo₂ for the enhancement of the oxygen transport and utilization in the body.

When an athlete undergoes an initial performance test like the aerobic profile test, she is establishing a baseline for testing that will be most useful as a means of predicting her strengths and weakness as well as the appropriate running paces for the key energy zones to be trained for her goal event. The details of the testing information are best used by an experienced self coached athlete or preferably a coach to develop a systematic approach to her training where periods can be developed to emphasize key training components. The PACE lab can match athletes with outside coaches in the running community that can use the interpretation of the testing data provided by the test providers to develop a well rounded program to enable the athlete to realize their goals in running.

List of Portland area running coaches with descriptions of their experience and areas of expertise.