

SIMSBURY CROSS COUNTRY

THE SPEEDS OF DISTANCE TRAINING

Often athletes simply do workouts without ever understanding why they are doing them (except that the coach told them to do them; which is, as we all know a good enough reason!!). However, I would like my athletes to understand why you do different workouts as well as completing them.

- **LSD or LONG STEADY DISTANCE:** the easiest to understand for a distance runner as long steady distance builds endurance and should form the bulk of distance training. This type of workout is accomplished as a continuous aerobic run (CAR) of set time or distance run at the aerobic threshold, about 75-80% Max Heart Rate or 70% of $v\text{VO}_2$ Max (velocity at VO_2 Max pace). Physiological adaptation to endurance training accomplishes:
 1. Increased fat utilization at a given pace. This is sometimes considered as a glycogen sparing adaptation, as the more fat used as an energy source the less glycogen (muscle carbohydrate) is metabolized.
 2. Promotes increased glycogen storage
 3. Increased capillary density and promotes growth of capillaries within the muscle tissue
 4. Encourages enlargement of slow-twitch muscle fibers, which translates into increased endurance.
- **REPS or REPETITIONS:** also what I have called in the past *aerobic intervals*. Reps are relatively short distances (usually less than 800m) run at present maximum velocity for that distance accompanied by long rests. Rep training enhances running economy--how economically you consume oxygen while you exercise. While a portion of running economy is definitely linked to inherited traits, another component is the individual's biomechanics. Reps are designed:
 1. To enhance the biomechanics of running.
 2. As an introduction to pace work.
 2. Run as short intervals of fast but controlled running with a walk/jog recovery until you are ready to do another running interval (usually a rep workout might be 10 x 400m).
- **LACTATE THRESHOLD or LT:** your lactate threshold is the running speed at which you begin to accumulate serum lactate or lactic acid within the running muscles and blood. Your cellular metabolism can no longer clear the lactic acid as fast as it is being produced. As you accumulate excess lactate, your running speed begins to slow due to acidosis in the muscle cells. There are many different workouts for LT runs but they may be classified in three categories: tempo runs, LT intervals and LT hills. All are designed to bring your pulse rate to 88-92% of your MHR and keep it

there for the duration of the exercise. The speed of this workout is also about 85-90% of $v\text{VO}_2$ Max. The benefits of this category of workout are:

1. Increased number and size of mitochondria—the aerobic ATP or energy-producing cell structures or organelles.
2. Increased muscle capillarity
3. Increased myoglobin (muscle cell hemoglobin, oxygen-carrying molecules)

- **INTERVAL or VO_2 MAX TRAINING:** VO_2 max is your aerobic capacity or the ability of your body to pump large amounts of oxygen-rich blood to working muscles and use it. Distance runners all want high VO_2 max values which would translate into faster running speeds aerobically before the accumulation of lactic acid. The greatest stimulus to VO_2 max comes by training at an intensity of 95-100% of your current $v\text{VO}_2$ max, which is usually your running speed for 3000-5000 meters. The primary effect of this kind of training is to increase the stroke volume of your heart--the amount of blood that your heart delivers to the body per contraction. Intervals are usually kept between 800-3200 meters and rests are usually kept to 50-100% of interval time or until the heart rate lowers to 65% of MHR.
 - **Intervals**—technically any running broken into separate bouts of run and rest qualifies as interval training. This term is usually meant to refer to anaerobic workouts of VO_2 Max or special endurance workouts.
 - **Special Endurance 1**—150-300 meters usually run at 95% of max effort ($v\text{VO}_2$ Max)
 - **Special Endurance 2**—300-600 meters usually run at 92% of max effort ($v\text{VO}_2$ Max)
- **RECOVERY**--easy running at about the aerobic threshold or just a bit faster 70-75% of MHR (70-75% of $v\text{VO}_2$ Max) and customarily of shorter duration; however at a minimum these runs should be at least 20minutes.
- **SPEED**—pure speed work involves running short distances at a pace that is faster than rep pace and should be as close to 100% effort as possible. The intent is to increase pace to maximum velocity which is achieved in about 25-30 meters and cannot be sustained longer than 60 meters. Heart rate is not used to measure the intensity of this workout because it takes too long to get the heart rate up to an accurate measuring point. Speed workouts may encompass distances of up to 60 meters usually involving full rest between efforts. The benefits of this workout are in the recruitment and stimulation of fast-twitch muscle fibers. This training is the least important in the development of the distance athlete.