

## **Anaerobic Conditioning for Sport Performance:**

When people think of fitness and endurance, the word aerobics is most often mentioned. Aerobic fitness is important for most athletes. When tested, it is expressed as  $V_{O_2}$  max. A high  $V_{O_2}$ max contributes some endurance and between shift recovery. But it is not the most important energy system. While even some old school coaches and exercise physiologists have  $V_{O_2}$  on the brain, sprinting, speed, quickness, strength and power are all anaerobic actions. Your anaerobic energy systems fuel your most intense efforts. High speed hockey breakaways, stop-and-starts on the basketball court, open field tackles, races for loose balls, checking in lacrosse and full intensity burst to run and dive to catch a ball, all rely on anaerobic conditioning.



Not many sports are looking for athletes who can move slowly, at a continuous pace, for a long duration. In multi directional sports like rugby, lacrosse, tennis and volleyball,

success is reliant on repeated bursts of explosive power, energy consuming acceleration-deceleration sequences, and high-speed skill execution.

Your anaerobic fuel is available immediately but quickly depleted. Supra intense anaerobic conditioning is needed to extend the time the anaerobic systems can supply high-pace energy before it is depleted, and accelerate the ability to replenish this sprinting fuel. A well trained anaerobic system is also needed to handle higher levels of conditioning, producing result-oriented training that is dependent on work load and intensity.

Anaerobic conditioning is evident in high paced well run practices. In training sessions, it is most often structured as repeated sprint intervals. For example, preseason training phases are characterized by high intensity anaerobic work - speed endurance, quickness, agility, and explosive power, and presents an ideal time to ramp up anaerobic abilities.

During the off-season, I stay away from too much bike training, track running, and stairclimbing options. I recommend a shift away from these repetitive mechanics in a straight ahead path. Off-season anaerobic work is characterized by multi directional intervals, competitive and unpredictable shadowing drills, and resistance tools like parachutes and resistance harnesses that force harder efforts to run but allow for cross overs, cornering and turns, as well as backwards and lateral movement.

Long duration agility drills, high rep (30) squats, super setting lifts, circuited plyometrics, resisted follow-the-leader drills with parachutes, partner shadowing drills with lateral movement tubing, and confined space games in which players are always on-task, all contribute well to anaerobic capacity.

In-season, athletes get anaerobic conditioning within practices (and of course games if we want to be successful!) through varied movement patterns and stop-start actions. In-season, players may occasionally opt for bike training to unload from those multi directional sport demands and the overload placed on the body during repetitive direction changes. One of the reasons triathletes traditionally experience so few injuries is their cross training.

In-season or off-season, manipulating four key training variables will determine your results and progression: duration (of each sprint interval), intensity (defined by load, speed and heart rate), density (amount of active recovery between each sprint interval), and volume (total number of sprints by time).

I prescribe heavy resistance, high speed intervals to overload the legs and preferentially demand anaerobic fuel supply. Begin with six to eight 30 second intervals with a 1:4 work to rest ratio, always using active rest to recover between each sprint interval.

Progress to a one-to-one work to rest ratio before increasing sprint duration to 45 seconds at a 1:2 work to rest ratio. I also add on 60 second intervals with shortened recover phases to build lactic acid tolerance, giving players the mental ability to generate and

coordinate powerful efforts in the face of anaerobic depletion and lactate accumulation (when their legs become fatigued, heavy and sore).

Increase the intensity (i.e. resistance) of an interval; then the length of each interval while also allowing longer recover time; next make sure the speed of movement is high throughout each interval; then begin to trim down the between-sprint recovery time. This produces massive gains, after which athletes can return to the first step and take the intensity up another notch!

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