

## **AMA National Championships, Adelaide 2009: Coaching Forum**

**Topic:** Moving out of the comfort zone - training to develop and maintain speed endurance. A look at some of the things that influence the race speed that we can maintain and what we can do to maximise that speed.

### **“First law” of training**

The body responds to demand and does so quite specifically.

### **Simple physics**

Speed = stride rate x stride length

With increasing age, both decrease, but the decrease is most marked with stride length.

### **Factors that influence age related decrease in stride length:**

- smaller range of leg motion at the hip
- less heel lift at the mid-support phase of the stride
- less elasticity in muscles and connective tissue
- decrease in muscle mass in main driving muscles

### **What to do?**

Generally, look to strengthen the legs in a running-like action.

- step-ups on to a box or bench that is about knee height
- lunges
- single leg squats
- single leg heel drop/raises
- plyometric exercises - hopping, skipping, bounding
- stair bounding
- short hills sprints

The sprints and plyometric exercises will also help to keep stride rate high. Focus on smooth fast running in the sprints and try to minimise the time your feet are in contact with the ground.

## Training for 5k/10k

Running a fast distance race involves maximising the input of the physiological systems that contribute to that motion. In a short presentation it is only possible to touch on a few things that may help a runner achieve a race goal.

We are creatures with a subconscious tendency towards increased comfort. Training to run well involves improving physiological things like biomechanics and energy systems output, but it also requires developing the ability to tolerate discomfort.

Incorporate sessions in training that require running repetitions of set distances at specific race paces – paces that are a bit faster than, but close to your best race paces. The aim is to imprint those paces as “comfortable” (a relative term) paces that you can maintain for the race duration.

Improving the efficiency with which your muscles generate power is an obvious target for training. Training sessions that improve **lactate threshold speed** will help improve 5 and 10k race times. The lactate threshold is that speed at which the lactate concentration in the blood starts to rise rapidly. Lactate is a by-product of anaerobic energy production. If it is escaping into the blood, it can't immediately be used as a fuel in aerobic energy production in muscle cells. Improving aerobic energy production in muscle cells will assist in increasing running speed at lactate threshold. The muscle cell chemistry involved is interesting, but that can be skipped over for now.

A related property is **running economy**. Essentially, this is a measure of the amount of oxygen a runner needs to sustain a given running speed. Running at a speed over the lactate threshold incurs an oxygen “debt”. As the “debt” rises energy production efficiency in the muscles decreases and running speed decreases.

Because the body responds to demand, if we want to improve something, we need to plan a session that places a demand on the system we want to improve.

## Suggestions

1. Incorporate sprint sessions in your distance training program. Why?

- Every race speed you run is a fraction (less than one) of your running maximum speed.
- Sprinting forces your brain to recruit muscle fibres as efficiently as possible. This carries over to slower race speeds and hence to running economy.
- Sprinting requires maximal recruitment of muscle fibres including those that are not recruited by lower demand sessions, with a consequent training effect on those fibres.

2. Run sessions that involve an accumulating oxygen debt to place demand on the capacity of muscles to cope with these conditions. Example: 200m reps @ 800m pace with decreasing recovery times.

3. Run sessions that boost the capacity of muscle fibres to generate energy aerobically. Example: 10-15 x 300m reps @ 3k race pace, 30sec recoveries

4. A final few thoughts. There is no real distinction between “mind” and “matter”. What we categorise as “mind” is a function of the physiological structure of the brain - just patterns in the grey stuff. If you want an improved mental approach to racing, you have to race regularly and train the brain to accept the discomfort that comes with racing and coping with other runners who have their own race plans. Run 3000m and 5000m races regularly and try different race strategies. Focus on such things as: pre-race warmup activities; pace judgement; fast/moderate start; fast finish.

Set race goals that are demanding, but achievable so that when you do achieve a goal you think of it as a form of winning. Success sets the brain up to continue in that manner.