

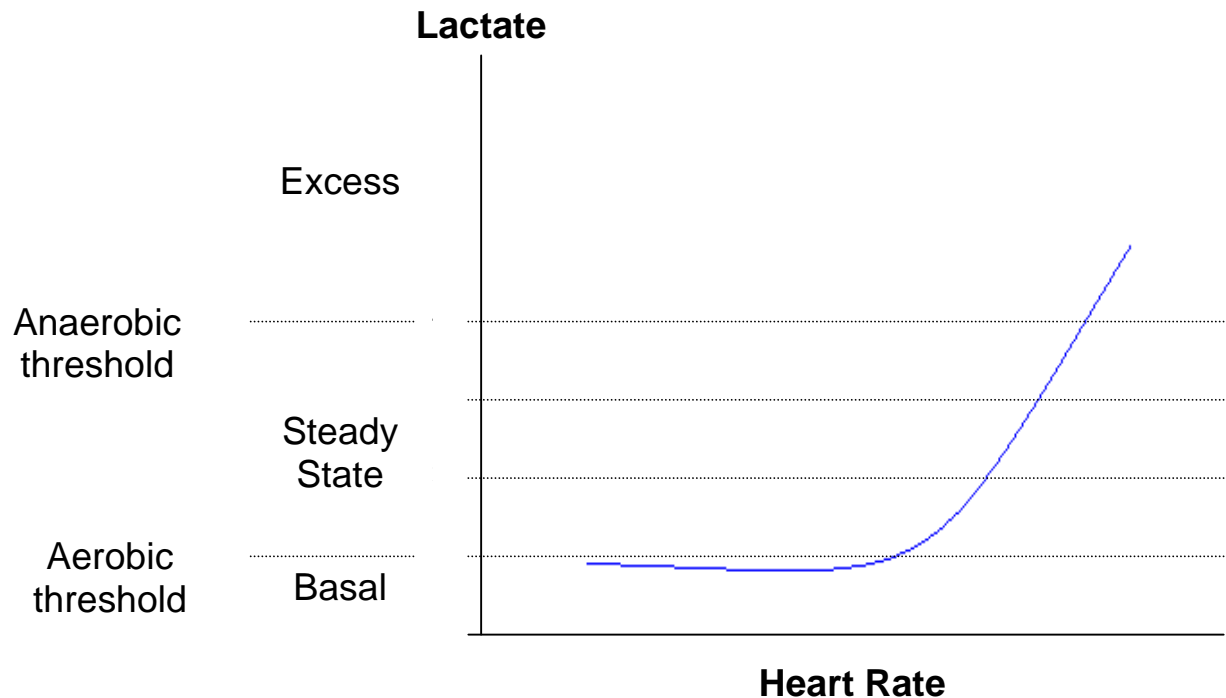
What does orienteering involve ?

- Long races
 - » Endurance
- Uneven surfaces - requires strong stabilising muscles
- Unpredictable firmness - requires long/short application of force.
 - » Strength
- Uneven, Unpredictable surfaces give constantly varying demands around the steady state.
 - » Recovery

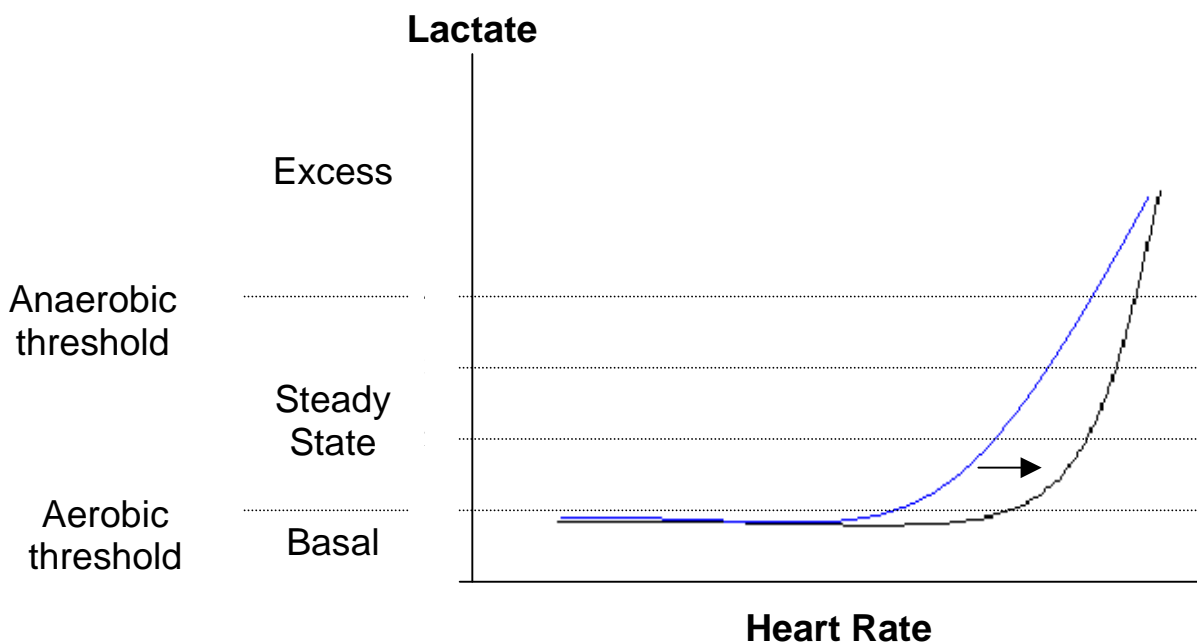
Physiology

- Energy Release
- Sugar + Oxygen =
Carbon Dioxide, Water, Energy
- Sugar + not enough oxygen =
Carbon Dioxide, Water, Energy,
and Lactate
- In orienteering responding to uneven, unpredictable surfaces generates pulses of lactate into your system.

graph of lactate against heart rate



- Long races in orienteering require
» **Endurance**
- Endurance training aims to increase the time that a given steady state effort can be maintained.
 - Run at a given speed for longer
 - Run faster for a given time.
- Any such increase in endurance capability is a result of increased Lactate handling capacity.
- This is seen in a shift right in your lactate / heart rate graph



- Uneven, Unpredictable surfaces give constantly varying demands
- Compensating for unevenness and unpredictability requires short sharp responses of extra effort.
- These compensations generate pulses of lactate.
- Lactate handling capacity is even more important to an orienteer than other endurance athletes.

What is Lactate handling capacity ?

- There are 2 ways to handle lactate
- Put up with it
Lactate or Lactic Acid - can be buffered (absorbed) by proteins and chemicals in the blood and body tissues to prevent harmful side effects. This is only ever a short-term solution.
- Get rid of it
Lactate + Oxygen = Glucose

This is the long-term solution and this process takes place in the Liver, whilst you are running.

Above your aerobic threshold the muscles generate lactate as they exercise, this lactate enters the blood and circulates to the Liver where oxygen is used to remove the lactate and re-generate glucose that can be used by the muscles.

If lactate builds up too much in your body it prevents further exercise. This is the burning sensation of a sprint.

The anaerobic threshold is the level of exercise where your Liver can no longer remove lactate as fast as your muscles produce it.

Lactate build up happens when your exercise rate exceeds your anaerobic threshold.

Training the re-cycling of lactate.

- Apply the principle of all training
Require your body to operate at the necessary levels so that it adapts to meet the demand.
- Push the limits
 - » Train your *anaerobic* threshold

Shorter high-speed, high intensity intervals at the top of your steady state zone, crossing the anaerobic threshold, will push your ability to run at the limits of your lactate handling capacity. Also, they improve the rapid recovery from high lactate levels and short-term lactate buffer capacity.

High intensity Circuit training will improve your short-term lactate buffer capacity.

- » Train in the steady state zone - above your *aerobic* threshold.

Tempo runs - extended running, 20 - 60 minutes, at the lower end of your steady state zone

Long Reps - reps over 5 minutes in the middle of your steady state zone.

Finally...

- What Training ?
- How Much Training ?

These depend on you,

- who you are.
- how far you want to go.

What training ? - Ask around, speak to coaches and team-mates for ideas and favorite sessions - try things out.

How much training ? This is individual and will depend on your fitness and extent of training background - and should be discussed with a coach.