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Your race pace is the speed you plan to run throughout the duration of a race. Without a proper strategy in place you run the risk of going too slow and not running at your full potential. Or running too hard and burning out halfway through. Obviously this pace will vary depending on the distance of the event. Your 5/10km pace will be a lot faster than your half/full marathon pace. One of the biggest issues on race day is knowing what pace you should hold for the duration of the event. This pace can be estimated for specific distances by your training performance. How to calculate race pace There are different methods you can utilise to calculate your race pace. Even if you think you already know your own race pace, it's worth trying these methods. You might be able to run faster than you think! Find a baseline First of all, you want to find a baseline running pace. This will provide you with a measurement of your current ability. It also allows you to assess and track your performance. The easiest way of finding this pace is by completing a 5km and tracking the average pace or the pace of your last kilometre. If completing a 5km is your goal, run one mile and use this as your baseline performance. Use online calculators Once you have a baseline pace you can predict your race pace using online calculators. The online calculators will give you a very broad range of times to meet. Alternatively, to find your 10km pace you should add 20-30s onto your 5km pace. And add 20-30s onto your 10km pace to find your half-marathon pace. Image by Nike These methods have no real scientific backing. They are used to give you a ballpark figure on what pace may be best, based on your current performance. It can then be a bit of trial and error to find a pace that feels challenging but sustainable. Incorporating tempo sessions into your training will paint a clearer picture of what pace is going to be most beneficial for your ability. Energy availability: the physiological aspect of your race pace I think it is important to highlight some key physiological terms alongside providing some key information on energy processes within the body before we get into the bulk of the article. Aerobic capacity: Your body's ability to consume, transport and utilise oxygen to fuel exercise. Lactate threshold: The exercise intensity where your blood concentration of lactic acid/lactate is produced faster than it can be utilised. The key sources of energy Your body will utilise energy through oxidative metabolism (aerobic pathways) during easy exercise intensity, predominantly utilising fats as a fuel. As the intensity increases, the aerobic pathways alone cannot keep up with the energy demand. Your body will additionally fuel the exercise through carbohydrates and anaerobic pathways, called anaerobic glycolysis. This is where the body's energy molecule (adenosine triphosphate or ATP) is produced in the absence of oxygen. During glycolysis, the body will also produce a substance called pyruvate and hydrogen ions. Due to the influx of hydrogen ions the muscles become increasingly acidic. This is the burning sensation we feel during intense exercise. Without oxygen, pyruvate binds to the leftover hydrogen ions creating a substance called lactate. The lactate is then either oxidised to provide energy or removed from the muscle to reduce the acidity of the cells. This allows us to exercise for longer. Once we hit an intensity where we cannot remove enough lactate from the muscles, we will need to reduce the intensity to be able to continue exercising. The impact of lactate on your speed It is important to highlight the role of lactate here. The build-up of lactate is not the cause for pain when exercising. It is essentially used as a buffering tool to stop the muscles becoming too acidic so we can exercise at greater intensities for longer. Even when the lactate is successfully removed from the muscles, it is then transported to muscles which have oxygen available so it can be broken down by the aerobic pathways and used as energy again. Being able to utilise and buffer lactate more efficiently will have huge benefits on your race pace. I realise this section is quite heavy on physiology, but it will allow you to paint a clearer picture when we go into exercise intensities. Tempo vs. Interval Training Ultimately, all the training you do is to improve your 'race pace'. There are several different training methods you can utilise to promote specific physiological adaptations which can improve your speed endurance, aerobic capacity, lactate threshold, and mental capacity. Interval training and tempo sessions have proven to progress your 'race pace' most efficiently. To understand the different benefits of these sessions, we need to highlight the physiological adaptations brought about by working at these intensities. Interval Training Interval sessions are when you repetitively produce intense, hard efforts followed by periods of easy recovery. These sessions stress both the aerobic and anaerobic energy systems, as you deplete your muscle glycogen stores during the short bursts, with the aerobic energy system refuelling the muscles by converting stored carbohydrate back into energy using oxygen. The intervals will be at intensities greater than your anaerobic threshold and last for