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Physiology of Endurance Running Webinar FAQs

1. What would eventually cause fatigue in the longer events, where you are below your Lactate Turnpoint, with no build-up of waste products?

   In the longer events, major factors are glycogen depletion and muscle damage. Your lactate threshold and lactate turnpoint can also reduce with fatigue and so this can become a factor.

2. Should younger athletes also be doing training sessions in zones 3, 4, 5 and 6?

   Both younger and less fit athletes should prioritise training in zones 5 and 6. This is because they are not conditioned enough to handle the larger volumes that are associated with sessions in zones 3 and 4. Running technique will likely deteriorate (leading to injury risk) and recovery times will be excessive. Alternatively, Zone 5 and 6 sessions will allow the athlete to practice good mechanics, while also getting a good training stimulus without the risk of excessive volume.

3. Should physiological principles be the predominant driver of training in adolescents?

   In younger athletes, as with runners of all ages, physiology isn't the only determinant of training. Training enjoyment is a massive factor and one of the aims of every training programme should be for it to be fun. Younger athletes will also need to spend time learning how to run with good mechanics and so drills and strides are very important. Learning how to race is another often-forgotten skill. However, physiology is always going to be very important, regardless of who the athlete is.

4. Any advice on correlating effort on road, trail, mud and hills?

   With the above conditions, running pace no longer provides you with an accurate representation of how hard you are working. This is where listening to your body can be an important skill. For newer athletes are less in tune with their body, or for those who used to running exclusively on flat roads, a heart rate monitor can be a useful tool to help judge your effort level.

5. Are the VO2max levels on a running watch accurate enough to use?

   The VO2max numbers produced by Garmin and other running watches tend to be reasonably accurate (plus or minus 5%). However, this is still enough to make a big difference in terms of a performance context. The only way to get a true value is to get tested in the lab.

6. What is Vvo2max?

   VVO2max is the speed that is associated with your VO2max. In other words, it is the slowest speed that will quickly see your oxygen consumption increase up to maximum levels. It normally corelates with the speed that you can sustain for around 5 to 8 minutes in an all-out effort. Training at, or close to, this intensity is an effective way to improve your VO2max. Your VVO2max is also affected by your running economy, as an athlete who improves their economy with no change in VO2max will still have an increased VVO2max

7. Will your HR get affected by the environmental conditions?

   Although HR monitoring can be a useful too, yes, it is affected by other factors in addition to intensity. These include things such as heat, humidity and altitude which will cause HR to increase. Dehydration and adrenaline will also cause HR to be higher than would be expected.

8. Would you recommend HIIT classes?

   Unless you are injured, and so can't run, I would avoid including HIIT classes within a running programme if running performance is the primary aim. This is because, like zone 3, 4, 5 and 6 intensities, they will be quite stressful and so will interrupt the recovery from the running-specific sessions. If there is more of a strength focus, for example during circuit training, then this may be an appropriate training tool and help towards overall conditioning.

9. Training volume was stated as being the biggest predictor of performance. Is this applicable to both junior and senior athletes?

   I would say that training volume is probably still the biggest predictor of performance in junior athletes, but that does not mean that junior athletes should be doing high volumes. Long-term development should be the goal, and excessive training volumes in developing athletes will likely lead to injury or the neglection of speed development.

10. What are your views on fasted training?

    There is good evidence to support using fasted runs as a training tool, especially for those who are preparing for the longer distance. However, you shouldn't fast before every run. If you are going to do a high intensity session, then being well fuelled will allow for much better quality.

11. How would you measure heart rate max in a field setting in order to establish training zones?

Firstly, the only way you can truly identify your training zones is through a test in the lab. However, for most people, this is not practical. You can get an estimate of your training zones in a field setting. First you must calculate heart rate max, either by wearing a HR monitor in a race or time trial of between 4 and 15 minutes in duration. The following estimates can then be used to identify your zones:

Zone Estimates	
Zone	**%HR Max**
Z1	<68%
Z2	68-78%
Z3	78-87%
Z4	87-93%
Z5	94-100%

12. Is the 80% Z1 and Z2 theory also relevant for teenage athletes who are concentrating on 800m to 5km cross country?

For athletes who have gone through puberty, the evidence suggests that most of the training should still be at easy Z1 and Z2 intensities. If an athlete does eventually become an 800m specialist, then the balance may tip more in favour of high intensity training. However, while athletes are developing, they should look to become well-rounded, which means including a good amount of easy running.

13. How should athletes change their training with the lack of races for the foreseeable future?

I recommend that runners return to a base-phase period of training, with the hope that there will be a XC season in the autumn. What this will look like will probably depends upon the development stage of the athlete. For younger and less well-trained runners, I would recommend slowly building up the Z1 and Z2 volume with a small amount of Z6 work to help develop speed, power and running mechanics. More experienced runners can also include Z4 sessions. Your training should also look to be sustainable, with your body not being put under too much stress.

14. Should you do more Z1 or Z2 runs on your easy days?

With regards to Z2 runs, yes, you will get a bit more benefit than running in Z1, but then you also risk going in to Z3 which will become much more stressful and so affect recovery. It can also become quite hard work if you are always running in Z2. Although lactate may not have gone above baseline, there is still going to be a greater cost in terms of glycogen depletion and muscle damage compared to running in Z1.