

# COVID-19 Training Disruption Guide

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A free resource to help you adjust and adapt your training program and preparation strategies in light of the challenging and disruptive COVID-19 pandemic.

# Introduction

Hi, this is Tom and Emma.

Firstly, we hope you and your family are doing well in these very uncertain and worrying times.

Given many of you will be facing various training challenges given the restrictions in movement that the COVID-19 pandemic has placed upon us, including event postponement/cancellation, being forced to train indoors, having a lack of access to gym and group training facilities, etc., we felt compelled to put together a free resource with what we as coaches believe to be some useful tips and ideas on how to make the best use of this period from a training perspective.

This guide therefore provides advice on the following key topics (you can click on each to jump to the corresponding section):

- [Cancelled/postponed events](#)
- [Training indoors](#)
- [Maintaining motivation](#)
- [Strength training](#)
- [References/further reading](#)

If you have any questions or need more advice, please feel free to email us at [tom@tombell.co](mailto:tom@tombell.co) or our company's email [info@highnorth.co.uk](mailto:info@highnorth.co.uk).

Many thanks and we truly wish you all the best with your training and more importantly you and your family's health and wellbeing.

# Cancelled/Postponed Events

First off, we know first hand how hard it is when a goal you have been working towards is suddenly taken away or disrupted. What's important to remember is that your hard work up to now won't go to waste, and things will get back to normal at some point down the line. If you can, try to think of things as a positive rather than a negative - i.e. that you've been given more time to train towards your targets and a greater opportunity to lay a stronger foundation.

## **What a season normally looks like**

Under normal circumstances, we'd plan a training macrocycle so that the largest possible amount of time is dedicated to aerobic development, i.e. the building of the largest aerobic capacity or  $\dot{V}O_{2max}$  possible. That's because your aerobic fitness is the aspect of fitness component that takes the longest time to develop, and is also the biggest determinant of performance in most cycling disciplines. So, the more time you can spend on this, the better.

A few weeks out from the target race(s) we'd then transition to a 'fine tuning' phase, where we balance aspects of your aerobic fitness with your anaerobic fitness (specifically balancing your lactate threshold against your  $\dot{V}L_{max}$  or anaerobic capacity, so that they are the appropriate level for your specific race discipline).

This would typically include some short, high-intensity efforts to develop anaerobic capacity (the maximum rate at which you can turn glycogen into energy anaerobically - glycolysis - used for quick bursts of high power), alongside some work on your anaerobic endurance (ability to sustain anaerobic efforts for longer, and to repeat anaerobic efforts over and over again), as well as some specific skills training where relevant. Many of you will have been approaching that 'fine-tuning' phase in anticipation of races coming up over the next couple of months.

## **What changes to make**

So, what should you do now, given racing is likely to be at least 8-12 weeks away?

What we would recommend is returning to this foundational aerobic development phase.

This is because, as mentioned above, the more of this training you can do, the better. This is in contrast to developing your anaerobic capacity, which competes with your aerobic capacity and drives down the lactate threshold and impairs endurance performance if we develop the anaerobic capacity too much (Billat et al., 2003). This is why we wouldn't recommend extending the fine-tuning phase to include a longer period of anaerobic training.

Your aerobic fitness encompasses improvements in efficiency/economy, power at  $\dot{V}O_{2\max}$  as well as fitness relating to the lactate threshold (lower lactate production at a given power, strong ability to clear and buffer accumulated lactate, and most importantly the "performance  $\dot{V}O_2$ " - at what % of the  $\dot{V}O_{2\max}$  the lactate threshold occurs) (Jones & Carter, 2000). We want to get this performance  $\dot{V}O_2$  as high as possible before that fine-tuning phase, so that when it comes time to sharpen the anaerobic capacity and anaerobic endurance (ability to sustain the anaerobic capacity for longer and longer durations, and the ability to repeat anaerobic efforts over and over again), we have some "sliding room" for the lactate threshold to drop slightly.

Some of the ideal training methods to achieve these adaptations in our view are:

- **High intensity interval work (to develop the  $\dot{V}O_{2\max}$ ):** High intensity intervals at or close to maximum oxygen uptake levels. HR generally rises linearly with  $\dot{V}O_2$  up to MaxHR, so can be used as an indicator of what % of  $\dot{V}O_2$  you're at when performing these intervals. You should be aiming for ~92-95% of MaxHR. This type of training specifically targets adaptations to your cardiovascular system, promoting improved cardiac output (basically how much blood and therefore oxygen can be pumped to your muscles per minute), which is one of the major limiters of  $\dot{V}O_{2\max}$  (Bangsbo et al., 2006; Bassett et al., 2000).

- **Long-duration rides:** This creates a metabolic environment that is optimal for the production of more mitochondria in the muscle cells (the sites at which aerobic energy production takes place), alongside improved activity of oxidative enzymes (the proteins involved in aerobic energy production) (Jones & Carter 2000; Bangsbo et al., 2006). Long durations are necessary to facilitate lots of muscle contractions, which are key signals for these adaptations. Long rides contribute both to improved  $\dot{V}O_{2\max}$ , and also increased lactate threshold and 'performance  $\dot{V}O_2$ '. That's because the primary factors affecting the amount of oxygen that can be processed at the muscles and thus the amount of lactate produced and cleared is the concentration of mitochondria and the activity of enzymes in the muscles. The more mitochondria and enzyme activity, the more energy can be derived through aerobic metabolism (and specifically fat oxidation) and thus the less lactate produced. These long rides also help develop muscular endurance and economy by delaying the point at which the efficient Type I muscles become fatigued, and by making the Type IIa muscle fibres more aerobically efficient (REF?). Obviously longer durations may be limited during this period, but do what you can to include them when possible.
- **Lactate shuttling efforts:** The lactate threshold is dependant both on the rate of lactate production, and also the rate of lactate clearance. Clearance is dictated by how effectively you can shuttle lactate to other areas of the body and how well your aerobic system can use the lactate (or pyruvate technically) as a fuel source, which is another reason why long, endurance rides are so important. To develop this shuttling ability specifically, we recommend 'over/under' efforts, which alternate between power outputs slightly above your lactate threshold (~105-110% FTP or 8/10 effort) and a little below lactate threshold (~80% FTP or 6/10 effort). Use of a 2:1 ratio for the durations of the under/over intervals is good - for example 2 minutes at 105-110% FTP followed by 1 minute at 80% FTP, and continue this for somewhere between 10-25 minutes. You should feel lactate building in your legs during the 'over' intervals, and then reduce slightly during the 'under' portions. These 'under' portions often do not provide full recovery, so your body is constantly having to work hard to clear the lactate.

- **Restricted carbohydrate availability training:** For many endurance disciplines, training with reduced glycogen availability can effectively boost the training adaptations arising from longer, lower-intensity endurance rides (Marquet et al., 2016). The mechanisms behind this are complex, but we have written a post [here](#) on why this type of training is beneficial, and another post on how to practically implement it. In brief, this type of training most commonly involves doing low-intensity training in the morning before eating or drinking anything that contains carbohydrates.

Alongside all of this, we obviously need to blend in a) recovery b) strength training (now is a good time for this, as that additional fatigue you were feeling isn't going to impact any racing) and c) specific race skills (e.g. cornering on the road, MTB technical skills etc.).

### **When to re-introduce the fine-tuning phase?**

Once things are a little clearer, and you have more of an idea when your key races might be, you can then look at returning to the fine-tuning phase. Given how uncertain things are, and that excessive anaerobic training can be detrimental, as mentioned above, we'd err on the shorter side of things with this 'fine-tuning' phase - perhaps bringing it in around 2-3 weeks before you expect your key race to be.

# Training Indoors

If you are in self-isolation or in lockdown, you might be unable to train outdoors. If you have an indoor trainer, this is obviously a great way to maintain or continue to develop your fitness. As noted previously, though, getting in some long, low intensity endurance rides is really important to keep developing your aerobic base. However, this type of riding can become pretty tedious indoors. Here are some tips to help keep these sessions interesting and productive:

- **Vary the intensity:** for example alternating between the bottom of zone 2, the top of zone 2, and the lower end of zone 3. Do this in a structured way e.g. alternating between 5-mins at 60% FTP, 2.5-mins at 70% FTP and 2.5-mins at 80% FTP (or 60%, 70%, 75% max HR for example).
- **Vary the cadence:** similar to the above, you can do this in a structured way. For added benefits, you can also align the low-cadence work with the higher-intensity portions of your ride. This low-cadence, higher power work helps build muscular endurance by demanding higher force/torque and simulates up-hill riding (REF?). So, if you were doing the workout above for example, you might combine this with 5-min at 90-100rpm, 2.5-min at 80-90rpm and 2.5-min at 60-70rpm.
- **Ride 'fasted':** in other words, include your low-intensity endurance rides in the morning, before you have eaten or drunk anything containing carbohydrates. As mentioned previously, fasted training effectively enhances the adaptations of low-intensity training, meaning you can get similar benefits with slightly less volume. For even more benefit, you could couple this with some low-cadence 'sweet-spot' intervals (85-90% FTP or 75-80% Max HR). These low-cadence efforts will be at a force/torque that's high enough to activate a higher proportion of Type IIa fibres, but still low enough to foster aerobic adaptations in those fibres. This helps with maintaining economy in later stages of a race, and also helps to reduce the production of lactate by the Type IIa fibres, helping to increase your lactate threshold.

- **Split training:** if you want to get a long ride in, it's totally fine to break this up e.g. into 1.5H in the morning and 1-1.5H in the afternoon, or perhaps a 2-2.5H ride with a short break in between to grab a snack, do some core exercises etc.
- **Make use of indoor training platforms** such as Zwift, which can add a social aspect to indoor training with group rides and virtual races. If anyone is interested in some groups rides with us, we can look to set that up, ride together and chat within Zwift.
- **Be careful with intensity:** Intensifying training is tempting when volume is restricted and is a common pitfall when having to train more indoors. However, a shorter, harder ride is not a direct substitute for a longer, lower-intensity ride because the metabolic environment is quite different (fat oxidation will be reduced, and lactate production will be higher). That's not to say shorter, harder rides do not have their place within a training plan. But they will not bring about the same training adaptations as a longer, lower-intensity ride. It is important to use a balance of lower and higher intensity and key to understand that simply intensifying what would have been a lower intensity ride will not enhance the adaptations.



# Maintaining Motivation

With racing probably being pushed back towards the end of this year, this creates a very long stint of training.

A key thing to ensure is that you can maintain training motivation up to the beginning of the race season.

Here are some tips to help maintain motivation, and some things to consider:

- **Consider taking a short training break:** think seriously about whether you feel you can continue with your previous training load for a few more months without being mentally burnt out by the time race season comes. If several more months of aerobic development training seems like a daunting prospect, then we'd encourage you to take a bit of a training break for a week or so. This might be some time totally off the bike, or just a period of a week or so where you just ride as you feel, without much planning or structure. The main purpose of this is to give you a mental break from training so that you are eager to get back to it by the end of that break.
- **Use testing and virtual racing:** Having some interim markers of training progress is really important, not only to ensure that your training is effective, but also to help maintain motivation. You could plan in some testing (we recommend a power profile test including 1-min, 5-min and 20-min maximal efforts on separate days) every ~8 weeks. Or use virtual racing e.g. on Zwift to see whether you can hit some power PRs. This is also a good time to test to find out where you are physically right now, and ensure things like training zones are correct and to give you a better idea of where to place the focus of your training over the next few weeks.

# Strength Training

Strength training is important for several reasons (Blagrove et al., 2018). First, it can help improve form and reduce injury risk. Second, it can help improve economy, meaning the amount of fuel and oxygen you need to produce a certain power is reduced. Generally speaking, for strength improvements, you want to include strength training at least twice per week. If you find yourself with a lot of spare time, you could increase this to 3-4 times per week, but the volume of strength training should not be introduced so quickly that it compromises bike training or risks injury.

As gym facilities in many countries are now closed, here are some tips on how you can continue to include strength training within your plan with limited home equipment.

- **Body weight training routines** can really help improve form and correct any imbalances in muscle activation. We recommend activities such as the plank, side plank dips, single leg hip bridges, glute activation exercises (e.g. clam shells), single and straight leg calf-raises. Plyometrics, which can be done on a set of stairs, small walls etc are certainly good strength-based activities to include to help maintain explosivity and apply loading stresses to your bones to help improve density. Do two to three sets of each, aiming to go close to fatigue in the last set. Write down how many reps you achieved, so you can track progress.
- **Include some weighted exercises using heavy objects around your home.** A rucksack full of books can provide some reasonable weight, allowing you to do things like weighted squats and lunges. Again, aim for three sets of each exercise. Generally speaking, you'd be looking to use a weight where you can complete around 6-8 reps max. However, if using equipment around the home, this might not be possible, so just work with what you've got. Again, you should be aiming to go close to fatigue in the last set.

- **Take the opportunity to include more mobility and balance work.** As this does not require equipment, it's a great addition to your plan. This might include traditional stretching and rolling (if you don't have a foam roller, you can use e.g. a hard ball or a frozen bottle of water). Following some online yoga classes would also be a great addition to your training. By doing different yoga exercises, you may be able to identify imbalances you had not previously known about. Balance work can be as simple as standing on one leg. This can progress to balancing with your eyes closed, or including some active movements such as reaching down to pick an object up from the floor while balancing on one leg.

# References/Further Reading

Finally, if you find yourself with some additional time available, now is a good time to learn a bit more about training theory and physiology. We've included some useful references below as a starting point, which support a lot of what we have written about above.

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