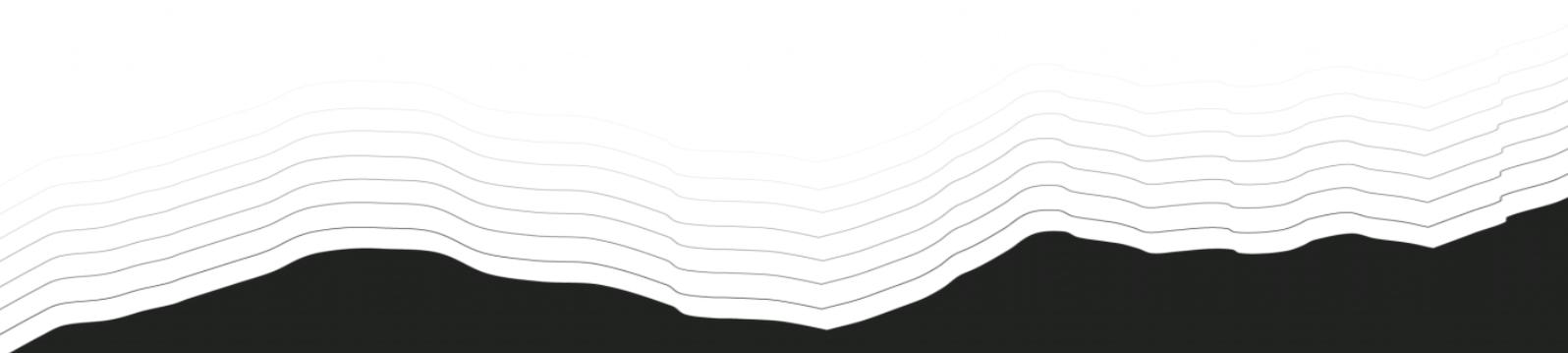


Preparing To Cycle At High Altitude

The Guide



High Altitude

Congratulations on signing up for your adventure with PJAMM cycling! Regardless of whether this is your first time heading to altitude, or you are a seasoned pro, returning for another adventure, altitude presents a challenge unlike any others. We've put together this guide exclusively for PJAMM cycling to help you understand more about altitude, how it can affect you, and what you can do about it.

The Challenge of Altitude

As you ascend higher and higher, the air becomes thinner and thinner

Crucially, the availability of oxygen drops. At 6000 m the available oxygen drops to less than half that at sea level, so your body has to work harder to maintain the supply. It kicks in almost immediately to increase the flow of oxygen from the air into your lungs and to then pump that oxygen around the body. You'll notice that even riding at relatively low intensity quickly starts to elevate your heart rate and breathing above that you'd expect at sea level. Even at relatively modest altitudes ~3000 m, some riders may see their heart rate 20 bpm higher at a given power output, and experience around a 10% drop in threshold power. As you head up higher, these effects become more extreme.

Altitude can cause some serious difficulties

While your body does its best to adapt to the low oxygen, or hypoxic, environment in which you find yourself, sometimes it struggles to keep up. People who are susceptible to the altitude may develop acute mountain sickness (AMS), otherwise known as altitude sickness. AMS can develop with exposure to anything over about 2000 m, and is classed as a progressive syndrome which moves from mild, through moderate to severe symptoms:

Mild AMS: characterised as a headache plus one other symptom from fatigue, nausea or loss of appetite, dizziness, pins and needles, or sleep disturbance.

Moderate AMS: a persistence or worsening of mild symptoms. For example a headache that is not eased by hydration or pain relief medication, nausea that becomes vomiting, increasing weakness or fatigue, and potentially decreased co-ordination

Severe AMS: shortness of breath at rest, inability to walk, and decreasing mental status

As with many things in life, prevention is better than cure. Aim to track any symptoms that develop and remain in communication with your guides. Severe AMS is associated with high altitude edema, which means fluid build up in the brain and/or lungs. These are life threatening conditions, of which it's important to be aware.

Managing Yourself At Altitude

Manage Your Effort

Greater effort demands a higher oxygen consumption from the muscles. When the supply of oxygen is limited, we want to keep the demand as low as possible, so keep the intensity low! This isn't the Tour de France; you don't win any prizes for getting into camp first, and the journey is one to be enjoyed, not rushed!

Dehydration

Adequate hydration is essential in day to day life, and even more so at high altitude.

One unexpected side effect of altitude is its diuretic effect. In short, a bi-product of the acclimatisation process is a substance called bicarbonate, which is filtered from the blood by the kidneys and must be excreted from urine. At the same time, the body thickens the blood to increase oxygen carrying capacity per litre of blood, again contributing to the urine. Therefore, you are losing significant volumes of precious water at high altitude.

How much hydration? Well we recommend 3-4 litres (7-9 pints) per day at altitude. Adding an electrolyte tablet to your water will help with water retention and replace some of the lost salts.

Nutrition

It's not unusual for people to lose their appetite at high altitude, partly due to the influence on altitude on hunger hormones, but also as a result of developing AMS symptoms. You'll have a greater reliance on carbohydrates than at sea level, so do factor that into your overall nutrition strategy. It should go without saying that you should definitely not try anything for the first time on the ride!

Preparation For Altitude

Specific Adaptation To Imposed Demands

The body adapts to stresses imposed on it. In preparation for the ride, hopefully you've been ramping up your time on the bike to get the legs ready! Well, sure enough, when comes to preparing for altitude, getting exposure to high altitude is the best preparation.

Altitude is a stress, and when exposed, the body will adapt. We call that adaptation process acclimation, and when it comes to altitude it's all about improving the body's efficiency with oxygen.

With modern technologies, it is straightforward to acclimatise ahead of your trip, either in the comfort of your own home or at a specialist facility such as The Altitude Centre. Acclimation relies on short exposures to low oxygen environments, for which we use a hypoxic generator; a device that takes air from the room, removes oxygen from it, and allows you to breath that low oxygen air. There are three main methods we can use to do that:

Intermittent Hypoxic Exposure (IHE)



Short exposures to very high altitudes in interval style (e.g. 5 min 'on' 5 min 'off' at >4000 m). No exercise required, train at your desk or while relaxing!

Exercise at Altitude



Training at lower altitudes ~3000 m can give you bigger bang for your training buck. Low intensity but riding at high altitudes >3000 m can be the most specific acclimation work we can do

Sleep at Altitude



Sleep at altitude to accumulate the maximum possible time at altitude before departure.

How Will I Respond?

Everyone responds differently to altitude. Both the scientific research and our 20+ years experience show that no other factors like fitness or age correlate to altitude tolerance.

Fortunately, it is possible to predict your response to altitude from a series of simple but effective tests using simulated altitude. Our sport scientists have developed a battery of testing, analysing your response to short exposures to varying altitudes both at rest and during exercise, to understand the likelihood of someone developing altitude sickness. Whatever the results, we can then work with you to put a plan of action in place to overcome any susceptibilities, or maximise a natural aptitude for altitude to ensure you enjoy your ride! The full consultation can be undertaken on site at The Altitude Centre London, or remotely from the comfort of your own home, with generators supplied by local partners.

Training For Altitude

Our team of sport scientists have worked with thousands of clients across a range of sports, to prepare fully for their adventures at high altitude. From full training plans including bike, gym and acclimation work, through to specific pre-acclimation plans, we've seen the success that comes from proper preparation. Not sure where to start on your acclimation, or looking at building your training plan for the mountains? Following your consultation we can work with you on bespoke acclimation and fitness preparation to get you ready to head up high.