



# ULTRA SPORTS SCIENCE

## Cardio-respiratory problems in ultra sports

### For athletes and coaches

The cardio-respiratory system is essential in sports. In ultra endurance sports, this requires numerous adaptations depending on the environmental conditions.

So, it's about being able to adapt but above all to check before that the cardio-respiratory system works well.

If there is an uncomfortable feeling of breathing during sport, it is necessary to consult with a healthcare provider.

There is often an imbalance between oxygen demand during exercise and the body's response to it.

So, when this discomfort (also called dyspnea) occurs during exercise, we must assess for a cardiac or respiratory problem.

Breathing problems during exercise mean abnormal tolerance to exercise. The type of exercise, its intensity, the conditions under which it is carried out are important to know (cold, heat, humidity, altitude).

Look for accompanying signs such as:

- a cough, which may appear during or after exercise
- abnormal breathing effort: feeling of lack of air
- pain (chest pain, feeling of chest constriction)
- palpitations or a feeling of heart rhythm disturbances
- sensations of legs weakness
- visual disturbances
- discomfort or loss of consciousness

In fact, exercise dyspnea may be linked to the transport of oxygen in the body: the respiratory system, oxygen transport system in the blood (anemia), i.e. the cardiovascular system (heart and blood vessels) or muscles and the energy system at the cellular level.

Often dyspnea originates from a pathology of the respiratory tract: asthma and bronchoconstriction induced by exercise are frequent.

It is therefore necessary to consult a healthcare provider to know if the dysfunction is of cardiac or respiratory origin.

In the case of exercise-induced asthma:

Use your reliever/ preventetice inhaler (e.g. Salbutamol) approximately 10 minutes before exercise

- Stop as soon as signs of an asthma attack appear and have your inhalers available
- Warn those around you of the possibility of asthma attacks and have your inhaler in your sports bag or with you.
- Be careful in temperatures below freezing or dry heat as these can often induce asthma attacks
- Be aware of current anti-doping rules and consult with your sports physician, especially if you get increasing symptoms, shortness of breath or cough during or after exercise.

**Attention** : In addition to an examination and a full clinical examination, it is sometimes necessary to practice an effort test to ensure that there is no abnormality in the cardio-respiratory equipment during intense exercise. Indeed, this test is carried out with an ECG at rest which is now compulsory in some countries.

This is true for athletes with heavy training loads, but also for athletes over 40 years. This test then consists in recording an exercise electrocardiogram coupled or not with a measurement of the maximum oxygen consumption (VO<sub>2</sub>max.)

**Coaches: this helps the athlete to orient their training in a scientific and rational way.**

Exercise tests (VO<sub>2</sub>max tests or lactate tests) allow to measure different thresholds (ventilatory or lactate thresholds), heart rate and can give valuable training advice.

**What types of sport can be analysed with these tests?**

Almost all sports such as cycling, cross-country running, triathlon, cross-country skiing...) and so-called mixed sports (collective sports of large and small fields, racket sports, combat sports, mechanical sports ...)