

# The prevention of accidents in extreme sports

## *Prevención de accidentes en deportes extremos*

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The practice of physical activity, as well as participation in competitive sports, right up to the highest level of competition, offers considerable health benefits. However, these athletes may also face a risk of sustaining injuries and illnesses of varying degrees of severity, including the sudden death of the athlete or a fatal accident.

Serious injuries that could affect the CNS are relatively frequent in some competitive sports, including American football, rugby, ice hockey, boxing and wrestling.

All these sports are governed by regulations that include rules of the game, sports materials, safety protections on the playing field and specific accessories directed at the prevention of injuries, such as helmets, mouthguards, eye protection, gloves, wrist guards, elbow guards, ankle guards and special footwear. Furthermore, all teams are required to be supervised by a doctor who will monitor the athletes' state of health, supervise injuries, the duration of sick leave due to injury, and the moment when the athletes restart training and competitions.

These sports have a known and controlled risk of injuries and accidents and the rules of the game are progressively modified in order to guarantee the safety of the athletes.

However, other types of sports are now becoming increasingly popular, grouped under the term extreme or adventure sports. These extreme sports, which present some important differences when compared to traditional ones, include land sports such as snowboarding, Alpine skiing, sport climbing, skateboarding, mountain biking and ultra-endurance races, air sports such as bungee jumping, parachuting, hang gliding, and base jumping, and water sports such as scuba diving, white-water rafting and surfing.

All are considered to be high-risk, extremely dangerous sports due to the inhospitable environments and conditions in which they are

practised. Although some are already organised, most are performed in adverse environmental conditions with no regulations or medical supervision, despite the high risk of serious injury and even death.

For these athletes, the risk represents a physical and mental challenge that brings pleasure and satisfaction and involves a physical and emotional release. All these sports are having a major social impact and the number of participants has been steadily increasing over the last few years.

Most of these activities are practised at high speed, great heights or extreme temperatures, involving a real or perceived risk and requiring a high level of physical strength, leading to the overload of many organs and systems. These athletes are required to exert full concentration given that a single mistake in some activities, which can occur in a fraction of a second, could be fatal.

The type and severity of injuries and accidents in extreme sports can vary considerably, depending on the sport in question and on many other circumstances that have received little scientific analysis to date. Minor injuries frequently occur when practising these sports, although there is still a risk of more serious injuries. Fractures, sprains and muscle injuries caused by falls, direct impact, etc. are more frequent than when practising traditional sports.

Injuries to the head and neck, which frequently lead to cranioencephalic trauma (CET) or spinal injuries are of greatest concern due to their consequences in the short and long term. Although existing studies show that the risk of head and neck injuries, and also the percentage of fatal accidents is low, the number of serious injuries sustained during the practice of extreme sports has been increasing in the last few decades as these sports become more popular. The injury mechanisms for all these sports are less well-known than for traditional sports due to the fact that

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there are no reliable records. Injuries are generally a result of human mistakes made either by novices or by experts taking extreme risks.

Many of these athletes depend on sponsors to earn their living with their sport and this has a great bearing on increased risk in order to obtain some impressive images. If it were possible to change this situation, then the risk of serious accidents would decrease.

## What can be done to reduce the risk of accidents in extreme sports?

From a medical point of view, all these sports carry a greater risk of serious injury than traditional sports, given that the athletes may be affected by the heat, cold, deep waters or great heights and, although there are few serious scientific studies to support this, CET is known to be more frequent than in traditional sports.

Until now, medical services have paid little attention to all these sports and there are but few well-designed scientific investigations of related injuries. In general, sports medicine specialists have very little training in the risks involved in the practice of extreme and adventure sports, although there is some specific training in some countries. In order to provide good medical care, it is necessary to understand the health risks faced by the athletes participating in these sports.

The health of these athletes can be seriously at risk during the rescue operation, therefore the doctor assisting the injured athlete must be trained to deal with accidents of this nature.

The factors causing injuries in extreme sports depend on many variables and it is only possible to act on those variables that are controllable. Thus, the introduction of a series of safety measures in these sports would prevent many injuries and accidents.

While in other types of sport an accident or mistake may cause an injury, in extreme sports it could prove fatal.

In order to better prevent injuries caused by the practice of sports of this nature, the doctors responsible for these patients must have a sound understanding of the sports in question, the environment in which they are practised, environmental factors, materials used, training methodology and many other aspects such as psychological factors and potential trauma mechanisms. It is also extremely important to understand the motivations of these athletes and to have specific training in order to offer them individualised medical care.

There is a need to implement effective prevention schemes for all these sports. Among the accident prevention measures for extreme sports, consideration should be given to the following:

- Mandatory sports medical examination for anyone practising extreme sports, assessing the ability of each athlete for the specific sport in question.
- It is also important to improve the quality of the risk assessment of each sport and to make individual assessments.
- Control the nutrition and dietary supplements based on the energy needs of these athletes.
- Establish age limits for practising these sports.
- Monitor symptoms of fatigue and overtraining given that these increase the risk of accidents.
- Participants in extreme sports must have suitable physical preparation and training.
- Conduct psychological work on those obsessed with the need for risk.
- With regard to the strategy to prevent serious or fatal accidents, sportswear must be considered as well as the use of protective equipment such as helmets, gloves and joint protectors, given that the margins of error in all these sports are very small.
- For mountain and snow sports, it is very important to monitor the environmental variables (weather conditions) and to take them into account when planning the activity.
- Use of the social media to improve the dissemination of injury prevention mechanisms, to ensure that these athletes are more aware of the risk and how to prevent accidents.
- The establishment of specific locations and spaces to practice the different types of extreme sports would also considerably improve accident prevention, taking account of the possibilities of evacuation and the action of the medical services.

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## Índice

Foreward  
Presentación  
1. Introducción  
2. Valoración muscular  
3. Valoración del metabolismo anaeróbico  
4. Valoración del metabolismo aeróbico  
5. Valoración cardiovascular  
6. Valoración respiratoria  
7. Supuestos prácticos  
Índice de autores



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## Índice

Introducción  
1. Actividad mioeléctrica  
2. Componentes del electrocardiograma  
3. Crecimientos y sobrecargas  
4. Modificaciones de la secuencia de activación  
5. La isquemia y otros indicadores de la repolarización  
6. Las arritmias  
7. Los registros ECG de los deportistas  
8. Términos y abreviaturas  
9. Notas personales

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