

OUTDOOR PHYSICAL ACTIVITIES AND ERGONOMICS ASPECTS

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Abstract: in this article we will try to look at ergonomics from the point of view of enthusiasts of outdoor life and thus brings this multidisciplinary field closer to the general public. Natural principles are based on diversity, the abilities of an individual or a group which creates a certain form of balance. It's similar in ergonomics. The main purpose of ergonomics is to create optimal conditions for effective human performance including but not only in the work environment. A popular motto of ergonomists is the slogan "we create work and life well-being"

Key words: ergonomics and physical activities, optimal performance, physical and mental well-being

Introduction:

Each of us encounters ergonomic elements practically daily at work and during activities at home or in the outdoors. Ergonomics is a field that is therefore much closer to us than we think and affects a wide range of our daily activities. Proper arrangement of the workplace on the production line or the office, suitable design of a kitchen unit, adequate training methods, better movement stereotypes, physical and mental well-being are examples of ergonomic elements and parameters from our everyday life.

1. Ergonomics and physiology of physical activities

Anyone who has ever worked with their hands knows very well that with a blunt ax, a bad screwdriver or bent over a low work bench, they will soon get tired and will definitely feel uncomfortable after a short period of time. It is often said that ergonomics is actually a flash of common sense. Just think a little, prepare suitable tools and equipment, adapt the workplace or space for the activity and everything will go much better. It is similar with activities in outdoor life such as, orienteering. Orienteering runners need to be in optimal physical and mental condition in order to perform effectively in accordance with their abilities, given terrain, weather and other conditions.

If we look at orienteering from an ergonomics point of view, we need to influence the following key parameters for optimal performance and enjoyment of this and other sport activities:

- 1) overall physical condition (cardiovascular and respiratory performance, metabolic and energy expenditure, ability to adapt to a variety of conditions, quality of regeneration, etc.)
- 2) locomotive skills: running technique, endurance, speed, coordination, flexibility
- 3) mental abilities: preparation for optimal performance, concentration, reading of maps, speed and quality of decision-making, memory
- 4) equipment: running shoes, special clothing, compass, chip, description of controls, quality of maps
- 5) track length, terrain and meteorological conditions

Using modern technology (load ergometry and spirometry, sports testers, Myontec EMG, etc.) we can measure, analyze and, based on the results, improve the training plan, develop motor skills and create conditions for the enjoyment of outdoor activities.

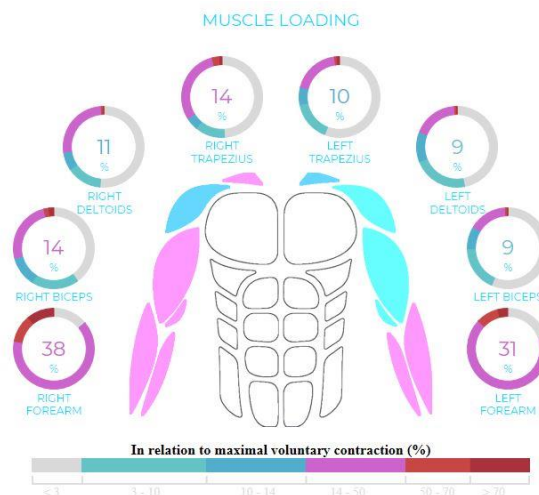
2. Modern technology and their contributions to optimal performance

Modern technology has long been a part of our lives, which is sometimes certainly detrimental, but it certainly has a number of benefits for the evaluation of ergonomic and physiological parameters. We will show the possibilities of using Myontec EMG Muscle Activity Measuring Technology for the analysis of muscle activity and efficiency while running.



As part of the cooperation between the Czech Ergonomic Society, the Center for Applied Ergonomics and the WOC 2021 organizational team, we are preparing a pilot project with the aim of testing the effectiveness of muscle work in performance and elite orienteering runners. Using Myontec EMG SMART Clothing, we will analyze muscle activity, strength, endurance and efficiency, first while running in optimal conditions, i.e. on an athletic track and then in the forest and mountain terrain.

Based on the results, we will be able to define critical points not only in muscle workload and flexibility, but also in the coordination of movements and running techniques. We expect that the obtained results will subsequently help coaches and orienteering representatives of the Czech Republic to improve the quality of training, eliminate negative impacts on health and achieve excellent performance.



Giant. 1. Myontec EMG measurement - example of the result

Conclusion:

Ergonomics as a scientific discipline as well as a certain amount of common sense helps us to develop abilities, to create optimal conditions for any given activities, improve our health and well-being.

The abilities of any individual, outdoor conditions, the balance between these and the required performance are crucial for the enjoyment of their chosen outdoor activities. If the mountaineer or athlete, for example, are not in optimal condition both mentally and physically or the outdoor conditions and equipment are not suitable for the required activity, then his performance will decline and in most cases will have a negative impact on their health. On the other hand, a person in excellent condition, with quality equipment and under suitable conditions is able to deliver optimal performance for an extended period of time with a "smile on their lips" and fully enjoy their chosen activity, and this is the basic goal of ergonomics.