

Local physical stress (hygiene)

Local physical stress on the body is the long-term unilateral overloading of the same muscle groups. It is characteristic of activities in which it is necessary to

- develop great muscle strength,
- repeat movements in unusual positions.

Other factors that affect it include climate, vibration, tool grip and the person's work habits. In particular, repetitive local stress causes musculoskeletal disorders, i.e. diseases of tendons, tendons, muscles, joints, bones, nerves and tendon sacs. This includes, for example, carpal tunnel syndrome. Some diseases are classified as occupational diseases.

Ratings

From a hygienic point of view, the **muscle strength** and **frequency of movements** are assessed for local load.

Muscle Strength

Limits for muscle strength are expressed in **percent F_{\max}** . F_{\max} is the maximum muscle force [N] that the subject is able to achieve at the maximum effort exerted by a given muscle group in a defined working position. The maximum muscle force is individual and *depends on age and sex*. It reaches its highest values between 20 and 29 years of age. ^[1] The muscular strength of a woman is approximately 67% of that of a man. ^[1]

Muscle force can be determined for simple, repetitive activities by using strain, pressure and lever gauges (e.g. strain gauges, mortars and dynamometers). More accurate measurements are achieved using strain gauges with continuous recording. More inaccurate results are obtained using **integrated electromyography (iEMG)**, which is the most appropriate method for measuring upper limb stress. iEMG is performed using an EMG Holter device, the results of which are analysed by special software. Electrodes attached to the forearms of both hands directly sense the electrophysiological potentials of the muscle groups under investigation.

When assessing, we are guided by **permissible currency-wide values**. ^[1]

Type of work	Allowable limit	! Inadmissible limit
dynamic	30% F_{\max}	>70% F_{\max}
static	10 % F_{\max}	>45 % F_{\max}

Frequency of movements


Movement frequency dependence on % F_{\max} **Frequency of movements** must not exceed the limits of the tables for a given muscle strength per shift or shortly per minute. A simple rule of thumb is that the higher the % F_{\max} , the fewer movements can be performed. The total number of movements performed during a standard eight-hour shift must not exceed 27 000.

{ {emphasis mine} **Chart:** ' At a muscle load of 52% F_{\max} , a maximum of 2 000 movements can be performed per shift; at a load of 10% F_{\max} , 20 000 movements can be performed. |color = #e0ffff} }

Table after some values ^[1]

% F_{\max}	! Number of movements per shift	! Number of movements per minute
10	19 800	41
30	7 200	15
45	3 800	8
50	2 700	7

Assessment

 For more information see [[KSHK Local Physical Stress Assessment (http://www.khshk.cz/e-learning/kurs5/222_posuzovn_lokln_svalov_zte.html)]].

Within the framework of the hygiene limits, the assessment is mainly *excessiveness, one-sidedness and long-termness*. During the analysis of the work, we note:

- static and dynamic components of the activity,
- muscle force exerted,
- frequency of movements,
- intensity and fluidity of work,

- individual work stereotypes.

Prevention

Prevention of local muscular strain is based on recommendations for the prevention of disease from **total physical strain'** (recommendations for workplace organisation, positions, etc.). The strain should not exceed the physiological capacity of the worker or even endanger his health. Work movements should be carried out in natural paths. The energy expended on the activity should be proportional to the size of the muscle groups activated, ideally involving different muscle groups alternately. More precise movements are performed as close to the body as possible.

Links

Related articles

- Workload
- Workload and musculoskeletal disorders

External links

- KHSHK local physical stress assessment (http://www.khshk.cz/e-learning/kurs5/222_posuzovn_lokln_svalov_zte.html)

References used

- TUČEK, Milan, et al. *Hygiena a epidemiologie*. 1. edition. Prague : Univerzita Karlova v Praze, 2012. 358 pp. ISBN 978-80-246-2025-1.

References

1. TUČEK, Milan. *Hygiena a epidemiologie*. - edition. Karolinum, 2012. 358 pp. pp. 83-88. ISBN 9788024620251.