

# Functional muscle test

According to Professor Vladimír Janda, the functional muscle test is an auxiliary examination method used primarily in rehabilitation and neurology to determine and as objectively as possible assess the muscle strength of individual muscles or muscle groups performing one movement.

## Muscle Test Principles

In an effort to objectify and classify the results of the functional muscle test as much as possible, it is necessary to respect several basic principles:

- Test full range of motion.
- Perform the entire movement smoothly, slowly, without swinging.
- Fix the patient and thus prevent synkinesis.
- When fixing, do not compress the tendon or the belly of the main muscle.
- Resistance should be perpendicular to the direction of movement at every moment of movement.
- Keep the applied resistance constant.
- Do not place resistance across two joints.
- First let the examinee demonstrate the movement, and then instruct him on the exact execution of the movement.

It is essential to follow a codified muscle test procedure to have the necessary informative value. Even so, the functional muscle test is to some extent burdened with subjective assessment. It is therefore recommended to carry out a repeated examination using a muscle test by the same worker for a better possibility of comparing the development of the disease or the effectiveness of the therapy. Testing takes place on a firm surface, preferably an examination table, and the test for each muscle or muscle group must be repeated at least three times. This way we can get a rough idea of the fatigability of the muscle.

## Muscle Test Rating

The functional muscle test has six basic grades, 0-5. In the case of a result corresponding to a transient value, we use the signs "+" and "-"

- St. 5 A muscle is able to perform a movement even against considerable resistance.
- St. 4 A muscle is able to perform a movement against moderate resistance.
- St. 3 A muscle is able to perform a movement against the action of gravity, without additional resistance.
- St. 2 A muscle is able to perform a movement only when the action of gravity is excluded.
- St. 1 The muscle is unable to perform the movement, but its twitches are visible or palpable.
- St. 0 The muscle shows no signs of contraction or twitching.

## Evaluation of Mimic Muscle Test

The functional muscle test also takes mimic muscles into account, but it is difficult to apply the evaluation levels used for the evaluation of other muscles, so it is evaluated in the same form (scale 0-5), which compares the movement performed between healthy and disabled side.

- St. 5 Without asymmetry
- St. 4 With slight asymmetry
- St. 3 Contraction about half the range of the healthy side
- St. 2 Contraction roughly a quarter of the range of the healthy side
- St. 1 Visible or palpable muscle twitch
- St. 0 No sign of contraction

## Muscle function

In order to correctly perform, read, but also understand and interpret the muscle test (and not only that), it is necessary to take into account that, although the functional muscle test is created and used as an analytical method of examining individual muscles or muscle groups, during the execution of the movement there is almost always the activation of other muscles, which we can indirectly evaluate in their function as well. According to the relationship of the muscle to the movement performed, we divide the muscles into:

- **Major muscles, agonists.** They are the main executors of the desired movement.
- **Auxiliary muscles, synergists.** They help agonists move or can partially replace them.
- **Antagonists,** i.e. muscles with the opposite function of agonists. During the examination, it is necessary to think about these as possible reasons for the limitation of movement, e.g. with contracture.
- **Fixing muscles, stabilizing.** Their function is not to perform the movement itself, but to provide the necessary background for its implementation. They stabilize the segment against which the movement is performed, the place of attachment or initiation of agonists.

- **Neutralizing muscles.** Their action neutralizes the unwanted component of the agonist's movement.

Correct function of the stabilizing muscles is absolutely crucial for the appropriate function of agonists. When they function incorrectly, the function of the agonists is also negatively affected, and the muscle may then appear weaker than it actually is. For this reason, when performing a muscle test, it is necessary to think about fixing the segments of our hands in order to reduce the influence of stabilizing muscles on the result of the examination.

## Links

## References

- KOLÁŘ, Pavel, et al. *Rehabilitation in clinical practice*. Prague: Galén, 2009. 76 pp. ISBN 978-80-7262-657-1.
- JANDA, Vladimír. *Functional muscle test*. Prague: Grada, 1996. ISBN 80-7169-208-5