MINISTARSTVO RADA, MIROVINSKOGA SUSTAVA, OBITELJI I SOCIJALNE POLITIKE
Uprava za rad i zaštitu na radu

Josipa Nakić, PhD

OCCUPATIONAL KINESIOLOGY

Correct Posture and Movement Habits and Exercises with the Aim of Preserving the Health of the Musculoskeletal System of Administrative Workers

Europska unija
"Zajedno do fondova EU"
EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI
UČINKOVITI LJUDSKI POTENCIJALI

The project was co-financed by the European Union from the European Social Fund.

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FOREWORD

The manual presents educational material intended for students and graduate kinesiologists, occupational safety professionals, ergonomics specialists, occupational health and safety specialists, doctors, and all other professionals who participate in the occupational health and safety system of administrative workers. The main purpose of this manual is to systematically distinguish the most common incorrect and correct movement patterns when performing various work tasks at the workplace of administrative workers. The manual is also easy to understand by end users, i.e. administrative workers. One of the most significant characteristics of administrative workers' work tasks is working at the computer. Today, almost everyone works at the computer. Children in school, students, and workers work at the computer in a large number of professions. Therefore, this manual is intended for a large number of people and professions.

The occupational kinesiology exclusively promotes the daily application of natural forms of movement, i.e. functional patterns of human locomotion, because they are safe for health and economical with regard to energy consumption. Natural forms of movement such as walking, lifting, lowering, turning, sitting, getting up, etc. make up for an indispensable segment of this manual. The positions and movements described in this manual represent the application of basic movement structures of natural forms of movement in the daily life of administrative workers, pupils, students, and persons of other professions who in everyday life sit, work at a computer, rotate, get up, walk, etc.

Occupational Kinesiology – Correct Posture and Movement Habits and Exercises with the Aim of Preserving the Health of the Musculoskeletal System of Administrative Workers is based on the results of scientific researchOccupational Kinesiology – Connection of Posture and Movement Habits and Symptoms of Musculoskeletal Disorders of Administrative Workers carried out within the project Development of e-learning systems, management and monitoring of occupational safety under the European Social Fund.

This manual presents a concrete application of the blend of a scientific and professional knowledge aimed at effective primary prevention of musculoskeletal disorders caused by incorrect mechanics of movement and work of administrative workers. For details on the results of this scientific research, see Chapter 6. Results of research in the field of occupational kinesiology of administrative workers.

The most common correct and incorrect postural movements habits and exercises for effective prevention of musculoskeletal diseases in this manual are described in text, pictures, and videos. By activating links and/or scanning QR codes, it is possible to instantly display videos.

For further information, please contact the author of the Manual – Josipa Nakić, PhD at the e-mail address occupationalkinesiology2025@gmail.com.

Josipa Nakić, PhD.

CONTENTS

1. INTRODUCTION

Today, not only do we have less and less time for ourselves, but we do not have it at all anymore. We move less and less and we sit more and more. We sit at work at the computer, sit in the car, sit on the couch or armchair in the evening. The tension in the neck is increasing, our backs hurt. We have the feeling that we have fallen into a vicious circle from which there is no way out. Our body calls for change. We need to change something, but we do not know what.

The media informs us that we should buy their cream, corset, EMS and other types of devices, mattress and the like. However, all of the above relieves symptoms and does not solve the cause of pain and problems in the neck and back. We hope the doctor will recommend an instant solution through miracle pills, but they do not exist in reality.

In order to truly prevent the occurrence or progression of existing painful conditions of the musculoskeletal system in general, and thus pain in the back, neck, and shoulders, it is necessary to listen to the recommendations that come from the field of medicine, occupational health and safety, ergonomics, but also in the field of OCCUPATIONAL KINESIOLOGY.

We have the greatest impact on the health of our spine, joints, muscles, etc., and two important factors are key:

- posture while performing daily work tasks
- targeted exercise.

Correct posture while performing daily work tasks in the office is a prerequisite for a healthy spine. This manual is about a philosophy called 23:1, and it refers to the fact that 1 hour of correct physical activity per day is extremely important, but it is not enough if we work at the computer for the remaining 23 hours, maintain our posture, sit, get up, walk, lift various loads, sleep, etc. – incorrectly! Exercise is extremely important, but the effects and the best exercise programmes are lost very quickly if we do not adhere to the basics of correct body posture every day.

The best combination we can make for the health of our spine and other skeletal and articular systems and musculoskeletal and musculotendon systems is daily application of the right posture and targeted exercise. The targeted exercise shown in this manual is specifically tailored for administrative workers and aimed at ensuring the prerequisites for correct posture, and thus at the prevention of pain in the neck, back, shoulders, hips, etc. We have notice that one does not appear without the other.

There are two main goals of this manual and educational video clips. **The first goal is to show the most common types of incorrect and correct posture when moving and working in the office, as well as raising awareness of the importance of their daily application. The second goal** is to present exercises that perform the function of ensuring the prerequisites for correct sitting and movement in the office, and thus preserving and improving the health of the bones, joints and muscles of administrative workers.

2. THEORETICAL FOUNDATIONS OF CORRECT AND INCORRECT POSTURE AND MOVEMENT HABITS

Musculoskeletal and cardiovascular systems

The segment of human health that is primarily dependent on movement is divided into the health of the cardiovascular and musculoskeletal systems. For the health of the cardiovascular system, quantity of movement is important, and for the health of the musculoskeletal and skeletal and articular systems, along with quantity, the quality of movement is primarily responsible. This manual predominantly deals with the quality of movement.

Quality and quantity of movement

The quality of movement is a prerequisite for increasing the amount of movement and thus for the prevention of diseases of the cardiovascular system. For example, a person who is overweight and has low back pain should increase the amount of movement to lose a certain amount of adipose tissue. A person decides to take a walk for an hour every day. After a while, they give up because walking makes them uncomfortable, because walking makes their lower back hurt even more. Namely, their back began to hurt even more because they did not pay attention to the quality of walking. After learning the basics of correct walking, but also some other basics of correct movement, after learning how to stop mechanically damaging the spine with incorrect postures and movement, only then can that person increase the quantity of their movement, in this case the quantity of walking.

The cause of mechanical damage to the spine

Figure 1 shows how frequent incorrect sitting and working directly affect overstrain and damage to anatomical structures, i.e. to the accumulation of small mechanical damage that over time results in mechanical changes, and as a result pains appear.

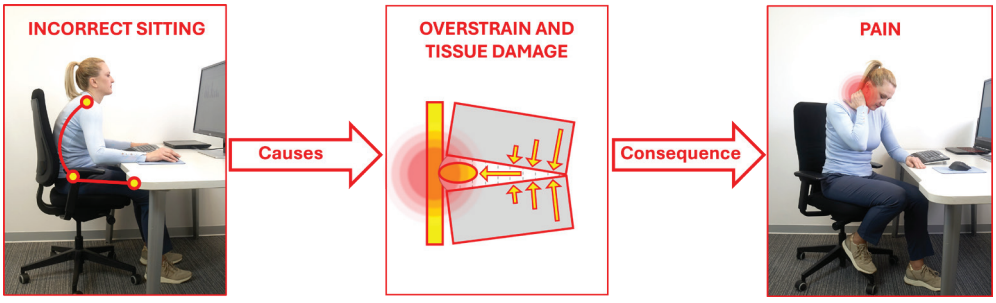


Figure 1. Incorrect posture causes overstrain and damage to anatomical structures, resulting in the appearance of pain and its progression

Posture and body movement we repeat countless times in the office every day can be correct and incorrect. Correct posture and movement are in the function of preserving and improving our health, and the continuous application of incorrect posture and movement leads to the formation

of overstrain, and consequently to mechanical damage to our bones, joints, muscles, ligaments, tendons, and nervous system. Incorrect mechanics of movement impairs the health of anatomical structures.

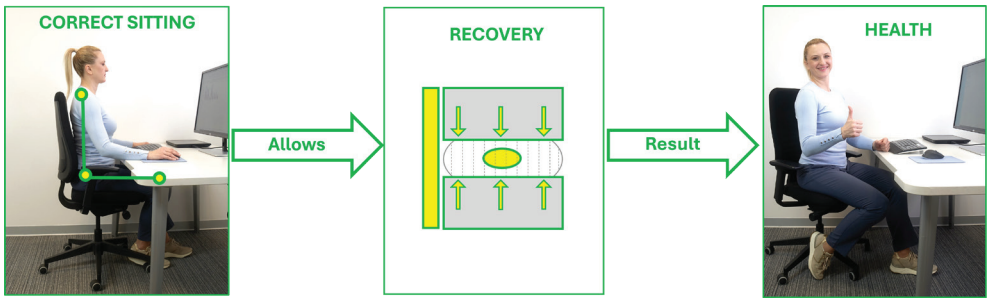


Figure 2. Correct posture can allow recovery of anatomical structures, the result of which is a reduction or cessation of pain

Figure 2 shows how correct sitting and working leads to the cessation of overstrain and tissue damage, which allows the recovery of our body, and the result is the health of bones, joints, and muscles.

Correct and incorrect movements and positions of the body

The primary characteristic of office work is repetitive movements without the application of force and constrained postures involving prolonged sitting. Prolonged sitting certainly does not affect improving fitness or physical fitness, but it is also completely wrong to say that our back hurts because we are sitting. It would be more accurate to say that our neck and back hurt because we are sitting incorrectly. In addition to sitting, there is a whole range of incorrect postures and movements that we should avoid. In this manual, we will also find information on the basics of correct sitting, bending over, handling light loads, walking, walking in heels, turning around, working at the keyboard, holding your body while using a cell phone, etc.

The importance of correct posture and movements

The importance of correct posture and movements increases in proportion to the time spent in a position, the amplitude of movement, the number of repetitions, the speed of movement, the mass of the load, previous injuries and years of life.

Time spent in a position. The longer the time to spent in an incorrect position, e.g. with your back bent, the more likely we are to experience back pain. It is not just that by sitting like that we will stretch the muscles of the back and that we will feel muscle tension that evening; the real consequences will be felt in the long term.

Amplitude of position and/or movement. The amplitude of an incorrect position of the body plays a major role in the occurrence and progression of mechanical damage and the appearance of back pain. Let us imagine ourselves sitting with a "slightly" bent back and with a "really" bent back. We conclude that the likelihood of experiencing pain, both immediate and long-term, in the back and neck increases with the greater amplitude of improper movement.

Number of repetitions. The number of repetitions does not refer to only one action, for example, lifting a piece of paper from the floor in an incorrect way, i.e. with a bent back. The importance of the number of repetitions is related to the fact that we do a large number of daily tasks incorrectly. For example, we sit incorrectly and get up with our backs bent, bend our backs when washing our hands, bend our backs when sitting and writing using a keyboard, etc. When you add up all the back bends we have done in one day, then it is no longer a negligible figure. If we add up the monthly number of back bends, then the figure is worrying. If we add the annual or ten-year number of bends, then it becomes clear that we have back problems due to accumulated small mechanical damage.

Speed of movement. The higher the speed of raising and lowering the torso in an incorrect way, i.e. with a bent back, the greater the danger of current pain. However, this current pain is not the result of that one incorrect movement with the bent back, but is the result of previously accumulated mechanical damage. That one incorrect movement, such as lifting a piece of paper off the floor, is just the straw that broke the camel's back.

Mass of cargo. Let us imagine pulling a heavy suitcase out of the back of the car after a business trip. If we pull out, drag, and lower this suitcase incorrectly, that is, with a bent back, then the greater the mass of the suitcase, the greater the probability of injury.

Previous injuries. Let us imagine a person who is completely healthy and a person who has undergone lower spinal surgery. If both people bent their backs, incorrectly pulling and lifting a heavy suitcase from the back of the car, it is logical to conclude that a person who has had lower spinal surgery is much more likely to feel pain and injure themselves.

Age. Imagine an eight-year-old child and an eighty-year-old person. Let us imagine that both people want to lift a piece of paper from the floor and that they both lift it with their backs bent, i.e. incorrectly. Which person do you think is more likely to experience back pain? Of course, the pain is more likely to be felt by the eighty-year-old. The reason for this is simple. The elderly person has long felt and has had the consequences of physiological ageing, unlike the child who has a completely healthy and young spine. Also, an elderly person already has accumulated mechanical damage due to the incorrect way of holding the body and moving, whereas a child has no such damage at all. That is why one of the goals of every parent should be the prevention of back pain in children at the earliest age, when it is desirable for children to adopt habits of correct ways of sitting, bending over, typing on a mobile phone, working with a computer mouse, etc. Likewise, no matter how many years of age we have reached at this moment, right now is the right time for us to stop the progression of mechanical damage and pain in the back, neck, shoulders, etc. and allow our joints to recover, thus ensuring more active and healthy ageing.

3. PRACTICAL PRESENTATIONS OF THE MOST COMMON MECHANISMS OF CUMULATIVE TRAUMA AND MECHANISMS OF PRESERVING THE HEALTH OF THE MUSCULOSKELETAL SYSTEM OF ADMINISTRATIVE WORKERS

Below is a text, photo, and video presentation of the 30 most common mechanisms of cumulative trauma and mechanisms of preserving the health of the musculoskeletal system. Each view has a separate link and QR code for individual video playback. Also, all 30 educational video clips have both a link and a QR code for collective playback. .

Link and QR code for collective reproduction of all 30 educational video clips on the most common mechanisms of cumulative trauma and mechanisms for preserving musculoskeletal health:

https://youtu.be/opxcN-zGqvg

3.1. Sitting down and getting up from an office chair

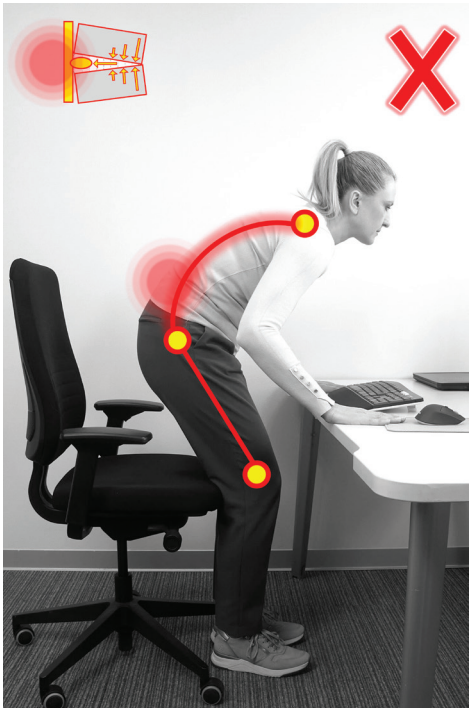


Figure 3. Incorrect sitting down and getting up from an office chair

Figure 4. Correct sitting down and getting up from an office chair

Sitting down and getting up from the office chair is something we do many times during the day. Each sitting and getting up from a chair with a flexed spine and back represents a new little mechanical damage to our backs.

This type of posture will make us feel tired when sitting down and getting up, and our muscles will be tense and painful after a working day. This way of sitting and getting out of a chair should be avoided.

The correct way to sit and get up from the office chair implies that the back is straight, that the movement of lowering the trunk is performed from the joints of the hips and that it is done softly.

Automated correct ways of sitting and getting up help prevent overstrain of anatomical structures, and the onset and progression of mechanical damage, and thus back pain.

Link and QR code for accessing the educational video clip "3.1. Sitting down and getting out of your chair."
https://youtu.be/1w9fUZzI0qA

[1] *The back is not really straight. The spine and back have their own physiological curvatures. It is just a term used to make it easier to conjure up how the back should not be emphatically bent.*

3.2. Distribution of body mass while sitting

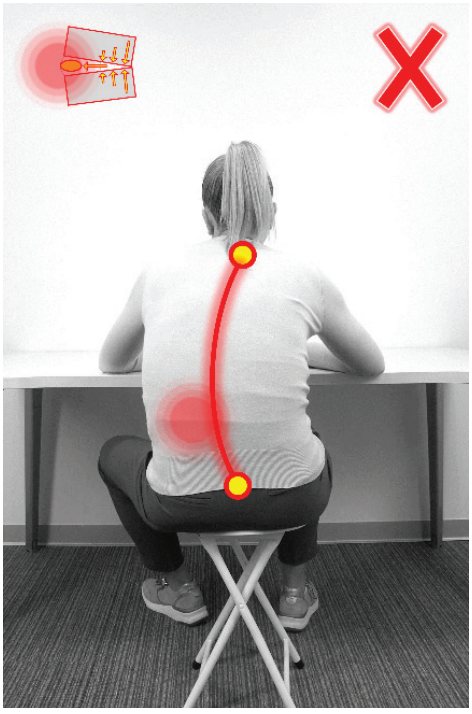


Figure 5. Uneven sitting

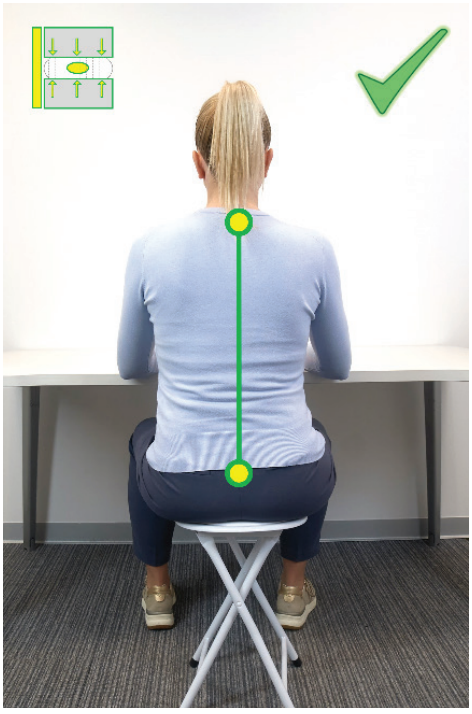


Figure 6. Even sitting

Uneven sitting is sitting in which the mass of the body is not evenly distributed across both sitting regions. Such sitting leads to an uneven load on bones, joints, muscles, tendons, ligaments, etc.

Due to this way of sitting, scoliosis can occur. Therefore, the worker should avoid the uneven distribution of body mass.

When sitting, the mass of the body should be evenly distributed over both sitting regions. It is not incorrect sometimes to burden one sitting region a little more and then another. It is incorrect when the worker sits dominantly on one side of the body.

The worker should, whenever possible, evenly distribute the mass of the body or at least change the load from one side of the body to the other.

Link and QR code for accessing the educational video clip "3.2. Distribution of body mass while sitting"

https://youtu.be/8TD0pk4Q_hw

3.3. Positions and movements of the lumbar and thoracic spine when sitting

Figure 7. Incorrect sitting

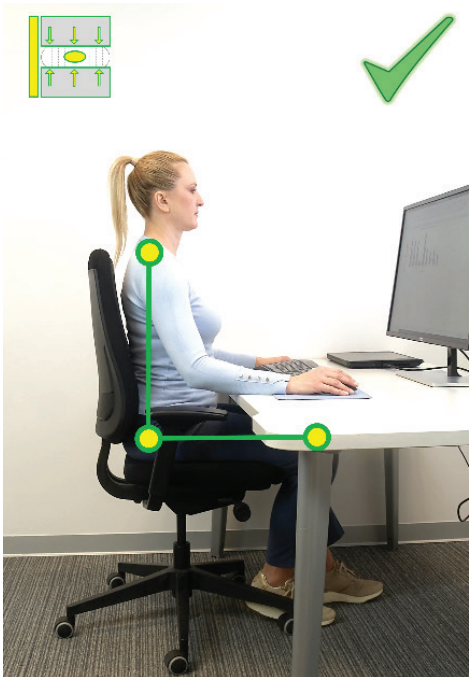


Figure 8. Correct sitting

The most common incorrect sitting is sitting with a bent spine and back. This position begins with the posterior inclination of the cruciate bone and pelvis and a levelled physiological lordosis of the lumbar spine. The joints of the spine are then in an incorrect position, the intervertebral discs are asymmetrically pressed, and their suppression toward the nerve structures of the spine occurs.

This way of sitting leads to stretching of both the muscles and ligaments of the spine, and they become loose. For this way of sitting, it can be freely said that it is the pre-exercise for *discus hernia*.

When sitting the pelvis, the sacrum and the entire spine should be aligned when viewed from the profile. The angle between the trunk and the legs should be about 90° . During correct sitting, we try to be as tall as possible. The thoracic part of the spine should be erect and "flat". The shoulder blades tend to approach and the shoulders should be in an external rotation and tend to descend.

Correct sitting ensures equal and stable intervertebral space, the pressure forces on the intervertebral discs are evenly distributed, and unnecessary stretching of the ligaments and muscles of the spine and back is prevented. This preserves the stability of the lower back.

Link and QR code for accessing the educational video clip "3.3. Positions and movements of the lumbar and thoracic spine when sitting"
https://youtu.be/yKA0CUgjgII

[1] *The angle between the trunk and legs when sitting does not necessarily have to be 90°. This angle can be both larger and smaller, but it is important that the pelvis and spine are aligned when viewed from the profile. The literature most often mentions that the angle between the trunk and the legs should be 90° because the seat of office chairs is usually horizontally placed.*

3.4. Positions and movements of the lumbar and thoracic spine while reaching during sitting

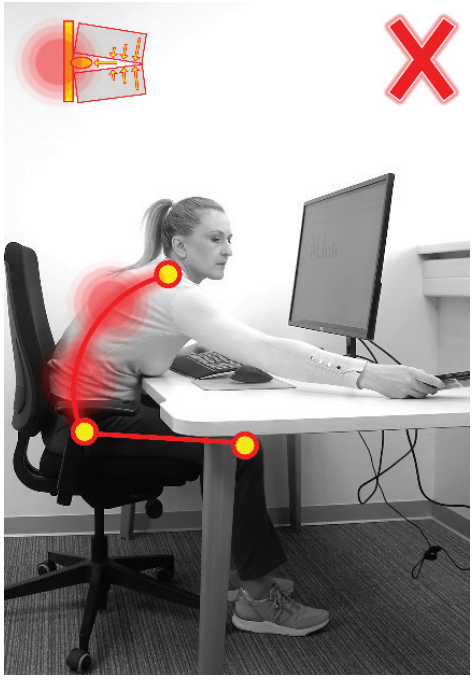


Figure 9. Incorrect retrieval of objects

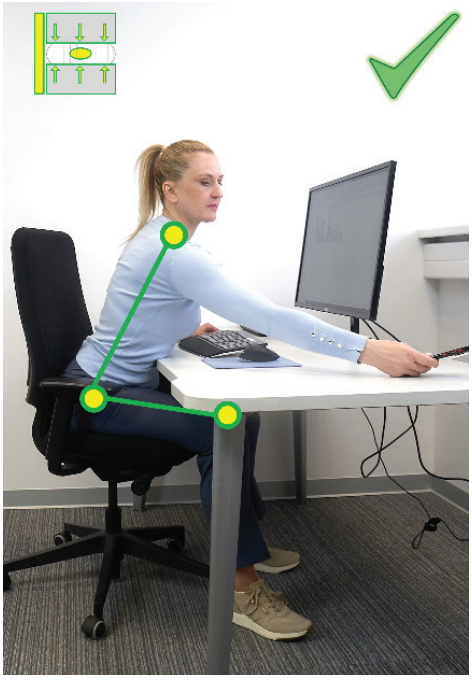


Figure 10. Incorrect retrieval of objects

When sitting and retrieving a distant object, the lumbar and thoracic spine often flex. With continuous flexing the spine, over time, the ligaments of the spine become stretched. Over time, these ligaments can become irreversibly stretched, and the spine itself asymmetrically "loose".

The intervertebral discs are asymmetrically pushed towards the nerve structures in the spinal canal, which can cause pain not only in the lower back area, but also radiating pain down the leg.

Any flexion of the trunk and head forward from the sitting position should be done from the hip joints, i.e. the axis of rotation of the trunk relative to the legs is in the joints of the hips.

The lumbar part of the spine leans forward along with the sacrum and pelvis, but for the entire time of flexing and lowering they remain stationary. In this way, all joints and all muscles do their functions, i.e. functions for which they are dominantly created. This is a mechanism of preserving the health of the lower back.

Link and QR code for accessing the educational video clip "3.4. Positions and movements of the lumbar and thoracic spine when retrieving while sitting"

https://youtu.be/DOI97S8G0ok

3.5. Rotation of the lumbar spine around longitudinal axis while sitting

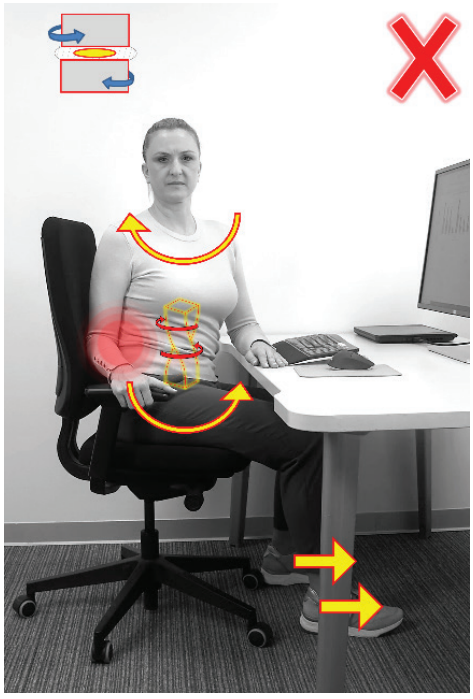


Figure 11. Incorrect rotation of the body

Figure 12. Correct rotation of the body

During sitting and working, the worker rotates around a large number of times a day. It is incorrect when the legs remain "glued" to the floor, and the trunk rotates. Then there is a rotation of the lumbar part of the spine around its axis. The lumbar part of the spine is not built for rotations around its axis.

Due to continuous and long-term application of such incorrect movement, various mechanical damage to the anatomical structures of the lumbar spine can occur.

The correct way of rotation refers to rotating the whole body, and not only to rotating the trunk with the axis of rotation in the lumbar part of the spine. The first rule is that the rotation begins with the legs and the entire body rotates.

The basic function of the lumbar part of the spine is the transfer of forces, not the place of movement. The lumbar part of the spine should be stable and without rotations around its axis. Think about all the situations in which you rotate the lumbar part of the spine around its axis every day!

Link and QR code for accessing the educational video clip "3.5. Rotation of the lumbar spine around longitudinal axis while sitting"
https://youtu.be/f9TOhUBIlW0

3.6. Rotation and avoidance of rotation of the thoracic spine from a sitting position

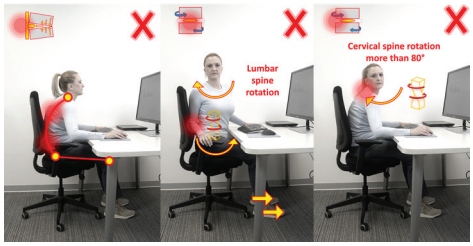


Figure 13. Avoiding rotation of the thoracic part of the spine

Figure 14. Rotation of the thoracic part of the spine

In situations where the worker needs to turn sideways during sitting, two most common incorrect (compensatory) movements occur:

- The first incorrect movement refers to the rotation of the lumbar part of the spine around its axis
- The second incorrect movement refers to the rotation of the cervical spine around its axis by more than 80°.

Incorrect movements occur as a result of the absence of correct movement, which is the rotation of the thoracic part of the spine around its axis.

There are two correct movements of turning around its axis:

- The first correct movement is when the rotation begins with the legs, as described in the previous example
- Another correct movement is the rotation of the thoracic part of the spine around its axis by 35° to 40° to one side and to the other.

Rotation can also begin with the legs, and continue with the thoracic part of the spine. Rotation of the thoracic part of the spine around its axis is possible only when the trunk is erect, i.e. when it tends to elongate.

Link and QR code for accessing the educational video clip "3.6. Rotation and avoidance of rotation of the thoracic spine from a sitting position"
https://youtu.be/0Sca5XNV9As

3.7. Rotation and flexion of the lumbar part of the spine while sitting

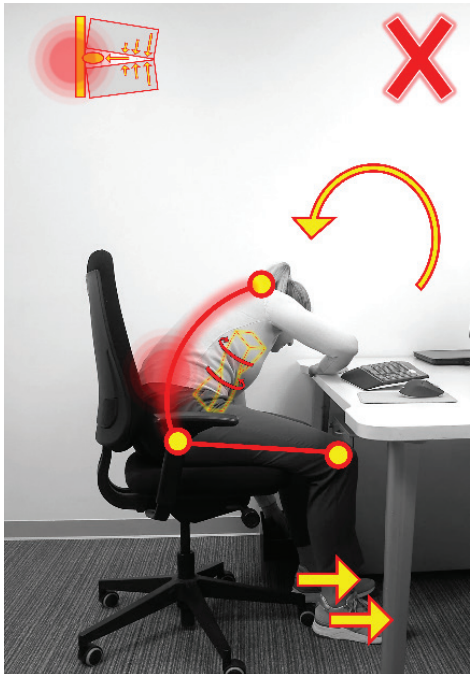


Figure 15. Rotation and flexion of the lumbar part of the spine

Figure 16. Avoidance of rotation and flexion of the lumbar spine

In the previous examples, the first two mechanisms of lower back injury are explained. The first mechanism is flexion, and the second is the rotation of the lumbar part of the spine. The third injury mechanism, which is also the most dangerous, is a combination of the first two mechanisms of injury. It consists of simultaneous flexion and rotation of the lumbar part of the spine. This injury mechanism occurs when a worker bends down and rotates to do something.

This movement can be said to be the most dangerous movement for a lower back injury.

In sedentary workplaces, the worker bends down and rotates a large number of times a day to perform a work task. This movement of trunk flexion and rotation can be done in a correct and incorrect way. When correctly leaning and rotating the body, the lumbar part of the spine must remain in a neutral position, rotation begins with the legs, the trunk leans forward from the hip joints. In this way, the intervertebral space is preserved, and thus the intervertebral discs.

This is a correct movement that preserves the health of bones, joints and muscles, and especially the health and functionality of the lower back.

Link and QR code for accessing the educational video clip "3.7. Rotation and flexion of the lumbar part of the spine while sitting"
https://youtu.be/v5-WCZGfxJA

3.8. Support for the lower back while sitting

We have all heard how good it is to have back support while sitting. In principle, this is true, but it will also not suit everyone. It depends on a number of factors. If our office chair already has a built-in support for the lower back, then we may not need additional support. Also, the position and height of support is not the same for all people. The fact that someone has a chair and some back support does not necessarily mean that it will suit them.

The decision on how to set up our office chair is made by ourselves, based on our sense of comfort. Our sense of comfort most often depends on our postural characteristics, primarily on the position of the pelvis. If we look at a person from a profile then his pelvic position may have an anterior slope, posterior slope or neutral position. Look at yourself in the mirror from the profile and assess what position of the pelvis you have.

The front inclination of the pelvis is most often suited to back support, which is raised slightly higher. In fact, it is a support for the part of the spine at the transition from the lower part to the thoracic part of the spine (lumbo-thoracic part).

Figure 17. Front tilt of the pelvis and seating

Figure 18. Rear tilt of the pelvis and sitting

People who have a posterior pelvic tilt are most often suited to a back support that is slightly lower. It is a support just for the lower part of the spine and back (lumbar or lumbar part).

People who have a neutral pelvic position can place support lower or higher, depending on how they are comfortable.

Figure 19. Neutral pelvic position and seating

Link and QR code for accessing the educational video clip "3.8. Support for the lower back while sitting"

https://youtu.be/WacrNBinHAg

3.9. Positions and movements of the cervical spine while sitting

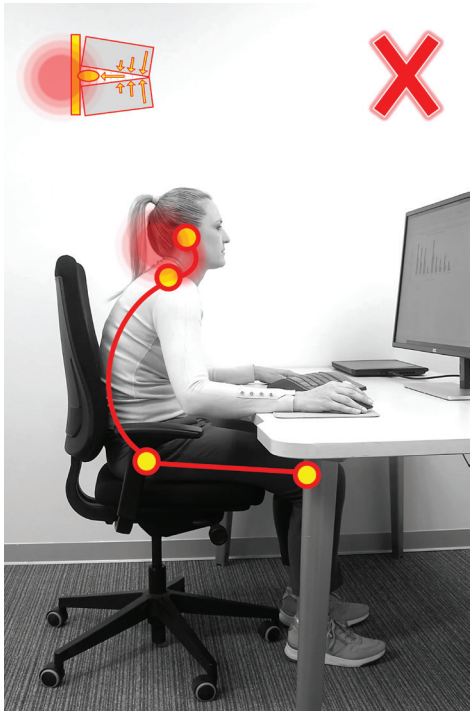


Figure 20. Incorrect position of the cervical spine

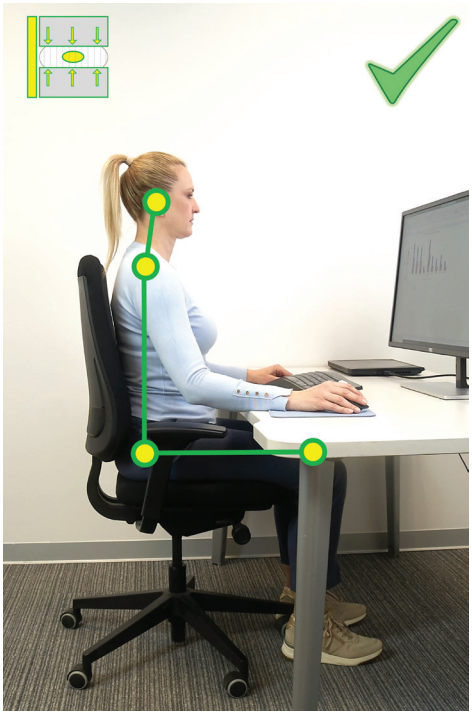


Figure 21. Correct position of the cervical spine

A particularly dangerous and very common incorrect position that we take and retain while working at the computer is the protruding of the head and neck forward *(forward neck posture)*. This is the position of the neck, which is most often the result of bent backs, and we have a bent back because our pelvis and cruciate bone are in the posterior slope. It all starts from the hips.

The consequence of this way of sitting and this position of the cervical spine can be a disruption of the normal functioning of the circulatory system. Because of all this, we may experience weakness, dizziness, blurred vision, etc.

The correct position of the neck and head during computer work implies that the cervical spine is in the extension of the thoracic part of the spine. It is said that the chin is directed toward the chest and the head is back. The pelvis and spine should be in the same plane. The thoracic part of the spine should have its natural curvature. Any flexion of the trunk, forward or backward, should happen in the hip joints.

This is a position that allows the normal functioning of the circulatory system in the neck and head area and reduces muscle tension in the neck, shoulders and arms.

Link and QR code for accessing the educational video clip "3.9. Positions and movements of the cervical spine while sitting"

https://youtu.be/HR5eFoRLtTc

3.10. Rotation of the cervical spine

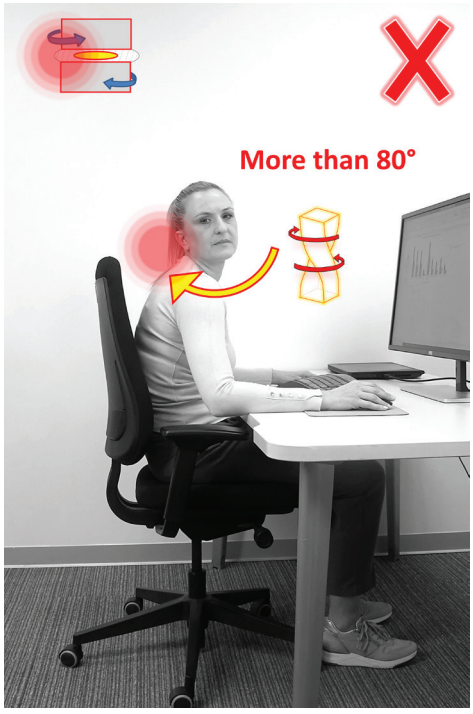


Figure 22. Incorrect rotation of the cervical spine

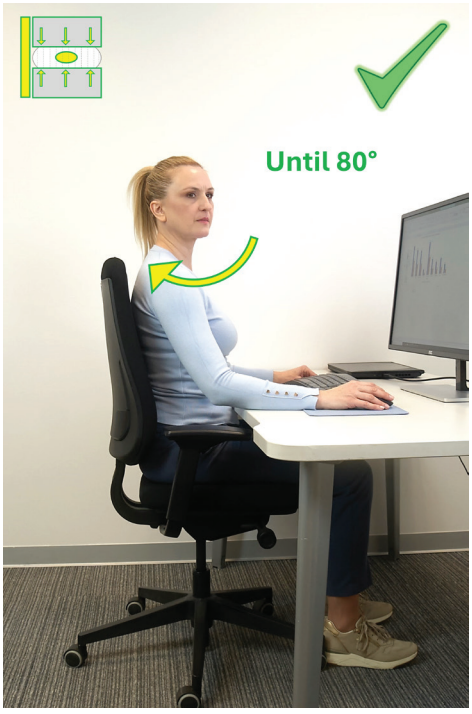


Figure 23. Correct rotation of the cervical spine

It is incorrect to rotate your head to one side or the other by more than 80°. This is a situation that happens, for example, when someone enters our office. In this situation, it is especially dangerous for this rotation to always happen towards the same side because mechanical damage caused by repeated repetition always occurs on the same side.

It is especially dangerous to perform rotations of the cervical spine and head from the position of their pronounced protruding. For example, we sit at the computer, our back is bent, our neck and head are protruding forward, someone enters the office and we rotate only the cervical part of the spine from this position. It is a movement that can directly impact the work of the circulatory system of the cervical spine.

The cervical spine is made for rotations, but these rotations to one side or the other can extend up to 80°. If we need to rotate, i.e. to direct the view extending to a little more than 80°, then it is recommended to turn from the thoracic part of the spine. Also, it is recommended to avoid rotations that o always occur on the same side.

We already know that the protruding of the head and neck is not something that contributes to the health of our cervical spine. Any rotation of the cervical spine should be only from a neutral position, i.e. position in which "the head is back and the chin is directed toward the chest". Also, it is recommended to rotate not only the cervical but also the cervical and thoracic part of the spine together.

Link and QR code for accessing the educational video clip "3.10. Rotation of the cervical spine"

https://youtu.be/kmPMGjz6DY8

3.11. Lateral tilting of the head and cervical spine

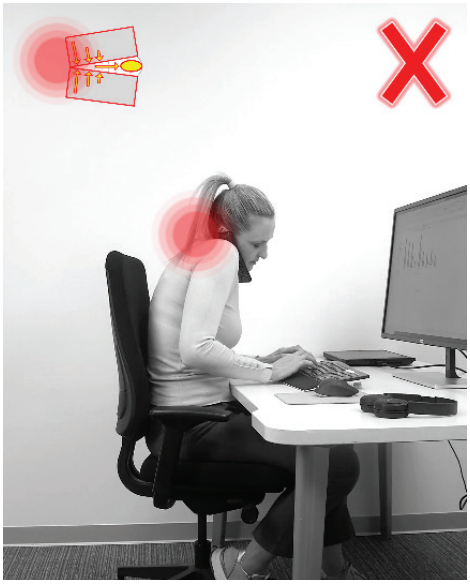


Figure 24. Incorrect – Lateral tilting of the head and cervical spine

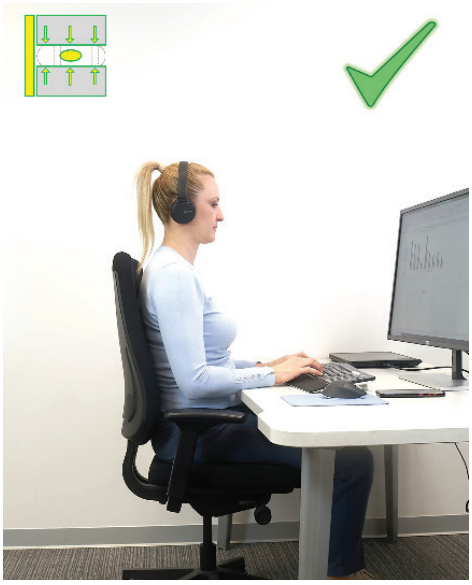


Figure 25. Correct – Avoid lateral tilting of the head and cervical spine

During sitting and working, the worker often tilts their head left or right. For example, these are situations that happen when we talk on the phone, and we hold the phone with our head and shoulder.

There are three most common mistakes:

- The first mistake is when tilting is done on an angle larger than 45°.
- The second mistake is one-sidedness, i.e. when the worker, due to the nature of the work, tilts their head constantly to the same side. Then there is an asymmetry in the mobility of the head and cervical spine.
- The third mistake is when tilting is done from the position of pronounced protrusion of the head and neck because then there is a risk of disrupting the normal functioning of the circulatory system.

We do not feel the consequences of such and similar situations when we are 25 or 30 years old, we feel the consequences from the age of 40 onwards, and some feel them even earlier.

It is correct to avoid the movement of tilting the head left or right. There are two ways to avoid lateral tilts of the head and neck during simultaneous actions of talking on the phone and working on a computer:

- The phone is held by the hand, not the shoulder and ear.
- The person uses headphones and thus avoids the movements of tilting the neck and head.

The movement of lateral tilting of the neck and head is not inherently incorrect, however, there are three rules:

- The first rule is that the maximum amplitude of movement in one side or the other is at most 45°.
- The second rule is that the head should be tilted left-right only when the neck and head are in the upright i.e. the correct position
- The third rule in performing this movement in symmetry.

Link and QR code for accessing the educational video clip "3.11. Lateral tilts of the head and cervical spine"

https://youtu.be/og119XogguE

3.12. Position of the upper arms and body in relation to the height of the chair

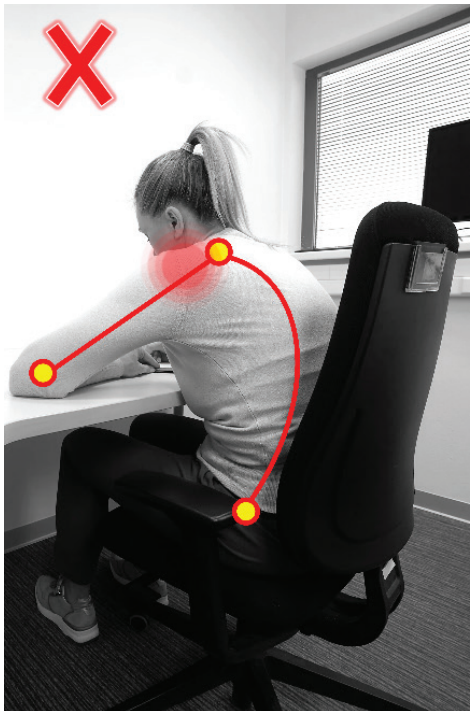


Figure 26. Incorrect position of the upper arms

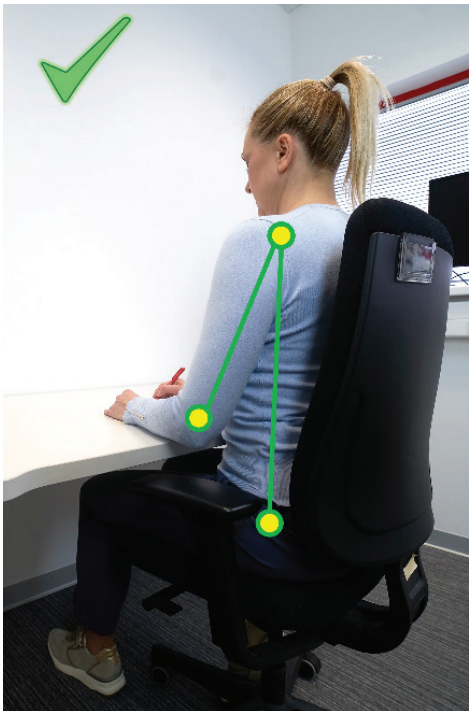


Figure 27. Correct position of the upper arms

It is incorrect if the height of the chair on which we sit is set too low. Such a position forces us to significantly move the upper arms away from the body. Then there is an activation of the shoulder muscles that should not occur. Muscle tension arises in the shoulders, upper back and neck.

The chair should not be placed too high either. Then there is a back flexion, lifting and internal rotation of the shoulders, and the cervical spine and head causally protrude forward.

The height of the chair should be set to the height in which our forearms are level with the table. This is a position where the upper arms can be next to the body and the shoulders relaxed. The correctly adjusted height of the chair allows significantly less muscle fatigue.

The optimally placed height of the chair provides the prerequisites for achieving the upright posture of the trunk and cervical spine, as well as external rotation of the shoulders. The position of one part of the body affects the position of the other part of the body, and it is of utmost importance to take into account all factors that can affect postural and movement habits during office work.

Link and QR code for accessing the educational video clip "3.12. Position of the upper arms and body in relation to the height of the chair"

https://youtu.be/JoRP0xqVpcA

3.13. Positions and movements of the forearms and hands while working on the keyboard

Figure 28. Incorrect position of forearms and hands

Figure 29. Correct position of the forearms and hands

When working on the keyboard, any pronounced internal rotation of the forearms and hands should be avoided.

Their internal rotation is most often due to the internal rotation of the shoulders and bent back. We notice how the positions and movements of one part of the body are inevitably reflected in the positions and movements of another part of the body. This is called the domino effect.

When working on the keyboard, forearms and hands should strive for the position of semi-external rotation.

In order for the forearms and hands to be in the position of semi-external rotation, the thoracic part of the spine should be erect, and the shoulders should strive for the position of external rotation.

Figure 30. The correct position of the forearms and hands when working on a split keyboard.

Figure 31. Split keyboard

External semi-rotation of the forearms can also be achieved by using an ergonomic so-called split keyboard. This position of the forearm and fist in everyday work on the keyboard can be an effective measure of prevention of carpal tunnel syndrome.

Link and QR code for accessing the educational video clip "3.13. Positions and movements of the forearms and hands while working on the keyboard"

https://youtu.be/YFnpNUx5f3U

3.14. Positions and movements of the forearm and hand while working with the computer mouse

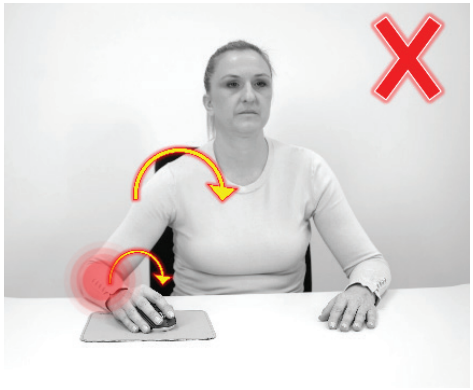


Figure 32. Incorrect position of the forearm and hand while working with the computer mouse

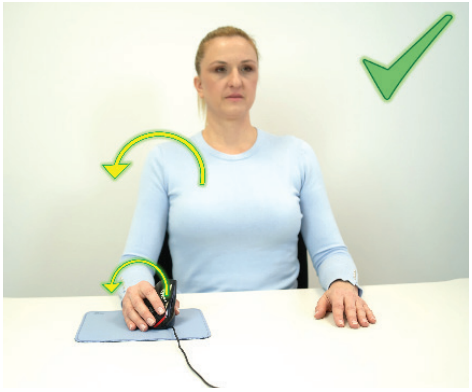


Figure 33. Correct position of the forearm and hand while working with the computer mouse

While sitting and working with the mouse, the forearm should not be in the position of internal rotation. This is the position that the worker also occupies as a result of the internal rotation of the shoulder. It is a position in which the transverse carpal ligament is shortened, and the shorter it is, the greater the pressure on the nerve n. medianus . In situations where the worker has problems, and even before the problem with the carpal tunnel develops, it is necessary to ergonomically adjust the workplace.

The picture shows an example of using an ergonomic mouse that makes it easier to achieve and retain the semi-external position of the forearm. Upright sitting, straight back and external shoulder rotation are important for effectively maintaining this position. This position of the forearm and hand in daily work with the mouse can be an effective measure in the prevention of carpal tunnel syndrome.

Link and QR code for accessing the educational video clip "3.14. Positions and movements of the forearm and hand while working with the computer mouse"

https://youtu.be/SpYa1_4X5l4

3.15. Positions and movements of arms and legs during informal sitting

Figure 34. Incorrect position of the arms and legs when sitting informally

Figure 35. Correct position of the arms and legs when sitting informally

It is necessary to avoid sitting cross-legged as it can lead to:

- Posterior inclination of the sacral bone and pelvis
- Flexion of the lower spine
- Pushing the intervertebral discs towards the nerve structures
- Damage to peripheral nerves
- Increases in blood pressure and disruption of normal blood circulation
- Varicose veins
- Muscular imbalance
- Imbalance in the length and tension of the ligaments of the posterior and anterior spine

It is necessary to avoid sitting or standing with your arms crossed as it can lead to:

- Bent (kyphotic) upper body posture
- Internal rotation of the shoulder
- Forward protruding neck and head
- Muscular imbalance
- Imbalance in the length and tension of the ligaments of the thoracic part of the spine, shoulders and neck.

Crossed arms and legs when sitting as well as crossed arms when standing represent potential mechanisms of injury to our locomotor system. Here we talk about the so-called silent and gradual mechanisms of injury to the skeletal and articular systems , musculoskeletal and tendon and nervous systems.

It is not incorrect to sometimes cross your arms and/or legs, but it is incorrect to do it daily, often and continuously. Our body has the ability to adapt. When we continuously stretch some muscles, tendons and ligaments, they become irreversibly stretched over time. Stretched muscles, tendons and ligaments lead to looseness i.e. instability of our locomotor system.

On the one hand, we talk about how we need to work on strengthening muscles, improving balance and stability, while, on the other hand, by careless posture, we directly do "exercises" for muscle looseness, exercises for unnecessary joint mobility, which directly affects the reduction of the overall balance and stability of the body.

Link and QR code for accessing the educational video clip "3.15. Positions and movements of arms and legs during informal sitting"

https://youtu.be/McSVTlzWBWQ

3.16. Positions and movements of the body while using a mobile phone in a sitting position

Figure 36. Incorrect body positions and movements of the body while using a mobile phone in a sitting position

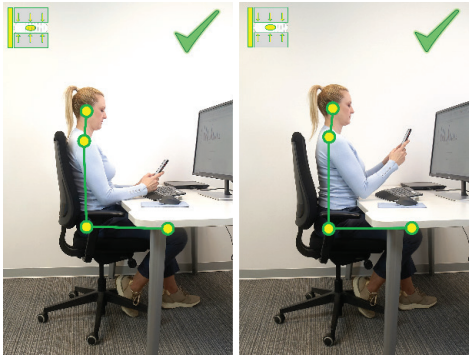


Figure 37. Correct body positions and movements of the body while using a mobile phone in a sitting position

The most common incorrect postures and body movements while sitting and using a mobile phone relate to:

- Mobile phone near the stomach
- Pronounced flexion of the spine
- Protruding of the neck and head forward
- Shoulders raised and in the position of internal rotation
- Blades spaced and raised.

This position of the back directly affects the appearance of muscle tension and pain in the neck and back.

The correct positions and movements of the body during the use of the mobile phone from the sitting position are:

- Mobile phone at breast level
- The spine should be erect
- The neck and head are in the extension of the spine
- Shoulders lowered and in the position of external rotation
- Shoulder blades tend to approach and lower.

The longer the time we spend with a cell phone in our hands, the greater the importance of correct postures and body movements during its use.

Link and QR code for accessing the educational video clip "3.16. Positions and movements of the body while using a mobile phone in a sitting position"

https://youtu.be/e2bwf3IWHUo

3.17. Positions and movements of the body while using a mobile phone in a standing position

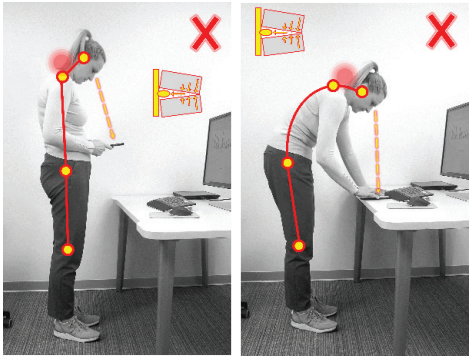


Figure 38. Incorrect positions of the body when using a cell phone

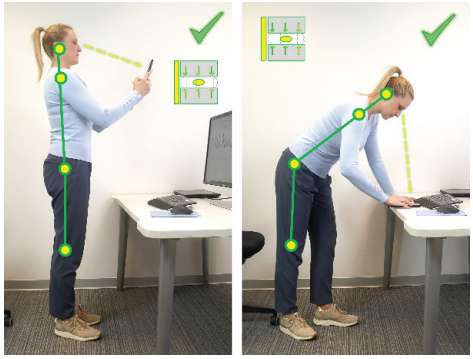


Figure 39. Correct positions of the body when using a cell phone

When using a cell phone from a standing position, the most common mistake is the pronounced bending of the head and neck forward. Then there is a pronounced crease of the cervical part of the spine. The repetition of this movement eventually leads to the emergence of the so-called *text neck*. This is the position of the neck when writing text, i.e. generally when using a cell phone or reading. If the spine is in an incorrect position, it bends when using a cell phone. Any deviation of the position of the lumbar, thoracic and cervical spine from the normal position leads to overstrain and degenerative changes, pain and problems with other parts of the locomotor system.

The cervical part of the spine during standing dominantly should be in a neutral position and have its normal physiological curvature. It is said that it is correct when "the head is back and the chin is directed toward the chest" i.e. that "the cervical spine is in the extension of the thoracic part of the spine".

A prerequisite for the cervical spine to be in the correct position is the correct position of the thoracic and lumbar part of the spine. Any leaning forward by flexing the spine should be maximally avoided. Trunk flexion from the position of standing is done from the joints of the hips, and not by flexing the spine.

Link and QR code for accessing the educational video clip "3.17. Positions and movements of the body while using a mobile phone in a standing position"
https://youtu.be/AadARwydRy8

3.18. Positions and movements of the lumbar and thoracic spine when leaning over the table while standing

When performing various tasks by the table from a standing position, we often need to flex the trunk. Any trunk flexion should be correct both in dynamic and static situations.
Positions and movements of the lumbar and thoracic spine when leaning over the table while standing

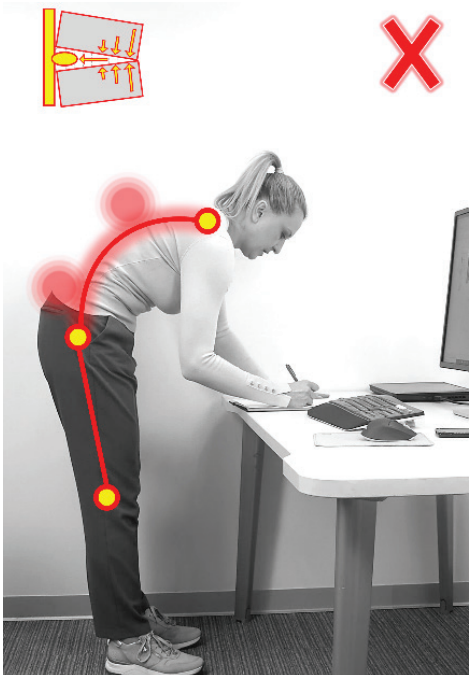


Figure 40. Incorrect position of the body when leaning from a standing position

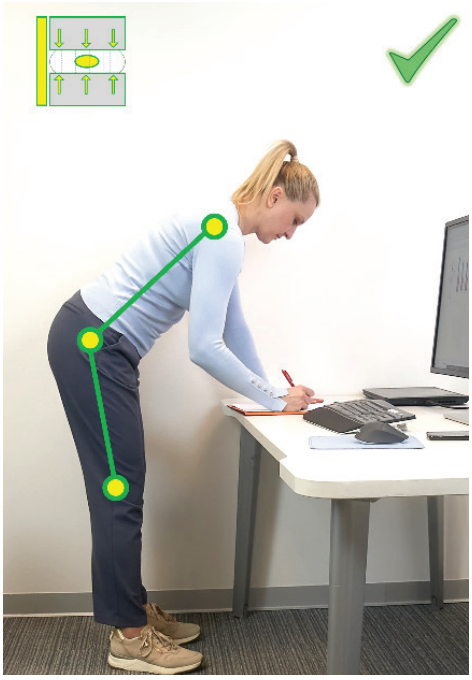


Figure 41. Correct position of the body when leaning from a standing position

From a standing position, we often lean over the table to just write something, just look at something else on the monitor, etc. The most common mistake is flexing the spine.

This is a position that we usually keep for a very short time, so we think it does not matter what our body position is. This is a movement that, in combination with numerous other back bends, strongly contributes to the onset of overstrain syndrome and mechanical damage to the spine, and thus pain in the back and neck, muscle tension, fatigue, etc. Back pain develops exactly in this way, step by step.

When flexing the trunk forward, the movement is done from the hip joints. The back should be straight, and the cervical spine in the extension of the spine.

Flexion of the trunk forward is an action we perform countless times a day, both in the workplace and in private life. This is perhaps the most important movement that needs to be adopted. When we do this movement correctly, then it can be seen as an exercise to strengthen the back muscles, and when done incorrectly, it can be seen as the cause of weak back muscles and a loose spine prone to injury.

Link and QR code for accessing the educational video clip "3.18. Positions and movements of the lumbar and thoracic part of the spine when leaning over the table while standing"
https://youtu.be/PPOeqMzdzS0

3.19. Squat and its variants when lifting objects from the floor

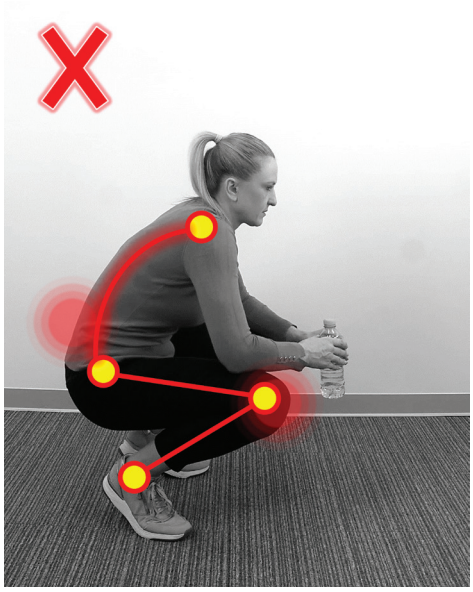


Figure 42. Incorrect squat

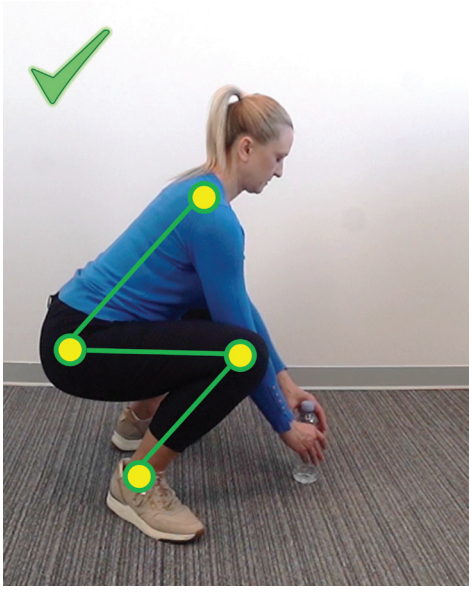


Figure 43. Correct squatting

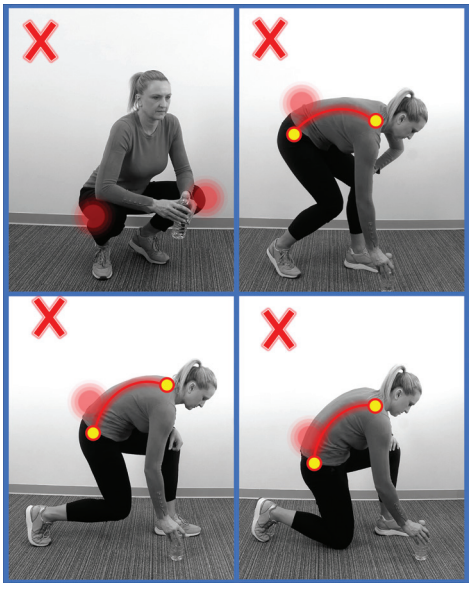


Figure 44. Variants of incorrect squats

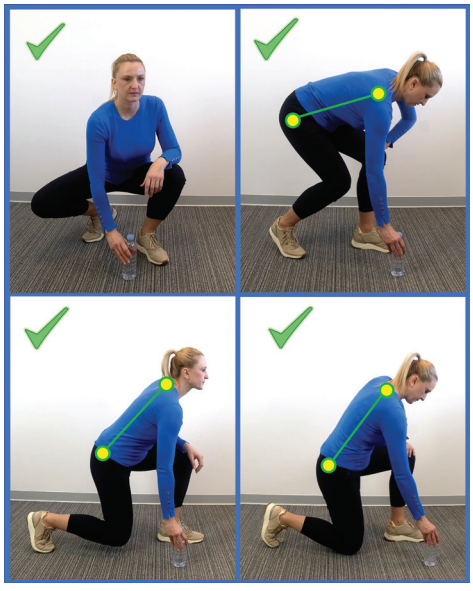


Figure 45. Variants of correct squats

During work, situations often occur when we need to take something or lower ourselves to a lower level or floor. Then we often do squats. Squats can be done correctly and incorrectly. There are a number of different techniques and ways in which squats can be done.

Some of the most important characteristics of incorrect squatting are when:

- there is a posterior inclination of the pelvis and flexion of the spine
- the mass of the body is at the front of the foot
- the heels are not on the floor
- there is a significant compression of the knee joint.

We can squat in the office for the purpose of raising and lowering items to lower levels or the floor. There are a number of different squatting techniques, and important and common to all is the correct performance.

Some of the most important features of the correct way of performing squats are:

- the pelvis and spine are in the same plane
- body mass is on the heel or on the full foot (one or both, depending on the technique)
- the heels are on the floor
- knee joints do not tolerate significant compression.

Link and QR code for accessing the educational video clip "3.19. Squat and its variants when lifting objects off the floor"
https://youtu.be/Dn7gwv-QSMQ

3.20. Deadlift and its variants when lifting objects from the floor

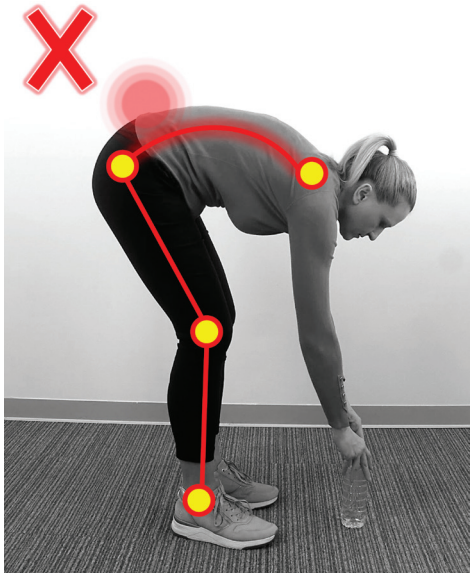


Figure 46. Incorrect deadlift

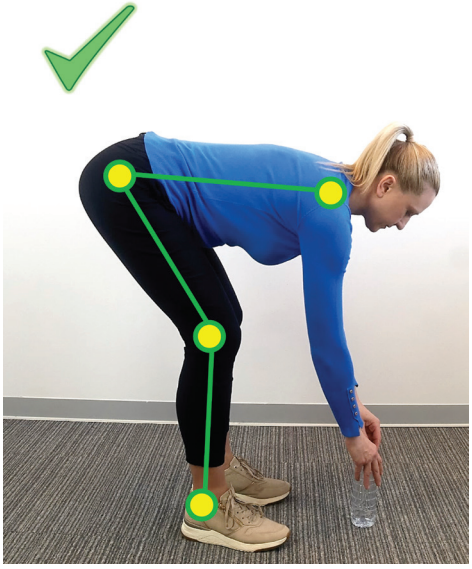


Figure 47. Correct deadlift

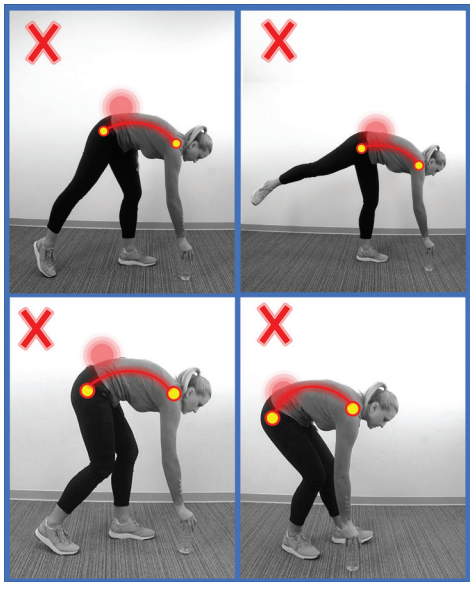


Figure 48. Variants of incorrect deadlifts

Figure 49. Variants of correct deadlifts

Incorrect deadlift is primarily related to flexion the spine. The name for such a deadlift is *"stoop lift"*. With incorrect handling of loads with the "stoop lift" technique, the risk of injury and back pain increases with an increase in the number of repetitions, weight of the load, speed and amplitude of movements, as well as with an increase in the time spent in this incorrect position. There are a number of different techniques and ways in which deadlifting can be done.

Some of the most important features of incorrect deadlift techniques are:

- Posterior tilt of the pelvis and bending of the spine
- Lower legs lean forward
- Buckling of the cervical spine
- Non-use of hips
- Not using the muscles of the gluteus.

Incorrect deadlift technique is also characterized by unnecessary and very dangerous stretching of the ligaments and muscles of the back, as a result of which the spine and back become unstable. Instability is especially true of the lower back.

Correct deadlifting is primarily related to a flat back. When flexing the trunk forward, the back should be straight, and the spine retain its normal physiological curvature. The axis of rotation is in the joints of the hips. This movement characterizes the functionality of the movement, i.e. each bone articular system does exactly the functions for which it was created.

Some of the most important features of correct deadlift techniques are:

- The sacral bone, pelvis and spine are in the same plane
- Lower legs are vertical
- The cervical part of the spine is in the extension of the thoracic part of the spine
- The movement of the fold of the trunk takes place dominantly in the hip joints, and only a small part in the knee joints.
- The muscles that do this movement are the muscles of the gluteus and the back of the thigh.

Regardless of the mass of the load, the number of repetitions, speed and amplitude of movement, the probability of injury is significantly lower when the movement is done in a correct way from the point of view of posture, than when done incorrectly.

Link and QR code for accessing the educational video clip "3.20. Deadlift and its variants when lifting objects off the floor"
https://youtu.be/DWb9prDHdLQ

3.21. Rotation of the body from a standing position

During standing, the worker rotates a large number of times a day to perform a work task. This rotation movement can be done in a correct and incorrect way.

Figure 50. Incorrect rotation of the body from a standing position

Incorrect rotation movement refers primarily to the rotation of the lumbar part of the spine around its axis. It is incorrect when the body is rotated, for the feet to remain "glued" to the floor, and the trunk rotates because then all rotation usually takes place in the lumbar part of the spine.

During the rotation of the lumbar part of the spine around its axis, compression, irritation and wear of the cartilage tissue of the small joints of the spine, stretching and loosening of the ligaments of the lumbar part of the spine, compression and suppression of the intervertebral discs, etc., occurs, and all of the above "results" in the so-called loose lower back.

Link and QR code for accessing the educational video clip "3.21. Rotation of the body from a standing position"

https://youtu.be/Ahzwy6bKZV0

Figure 51. Correct rotation of the body from a standing position

The correct mode of rotation refers to the simultaneous beginning of rotation of both the upper and lower body, and not rotating only the upper body with the axis of rotation in the lower back.

The first rule is that the rotation begins with the legs. At the same time, the legs, pelvis and trunk are rotated. In other words, rotation is done from the legs, not from the lumbar part of the spine. In such situations, only rotation of the thoracic part of the spine is allowed and desirable. In this manner, the health of the lower back is preserved.

3.22. Rotation and flexion of the lumbar spine during standing

While standing and performing a work task, the worker often leans and rotates. This movement of trunk flexion and rotation can be done in a correct and incorrect way.

Figure 52. Incorrect - rotation and spina flexion from standing

Incorrect movement of rotation and flexion of the trunk is primarily related to the simultaneous flexion and rotation of the lumbar part of the spine.

This is a particularly dangerous movement in which there is an asymmetric pressure and suppression of the intervertebral discs towards the nerve structures while reducing the intervertebral space.

This is perhaps the most dangerous mechanism for the lumbar part of the spine.

Figure 53. Correct - rotation and hip flexion from standing

When correctly leaning and rotating the body, the lumbar part of the spine must remain in a neutral position, rotation begins with the legs, the trunk leans forward from the hip joints.

In this way, the intervertebral space is preserved, and thus the intervertebral discs.

In this case, each skeletal and articular systems and musculoskeletal-tendon system does those functions for which it was created, i.e. this is a functional movement that preserves the health of the movement system.

Link and QR code for accessing the educational video clip "3.22. Rotation and flexion of the lumbar spine during standing"

https://youtu.be/Wf-Uq-lKFMc

3.23. Instability of the lumbar and cervical spine when raising the arms above the level of the head

Figure 54. Incorrect – unstable lumbar and cervical spine

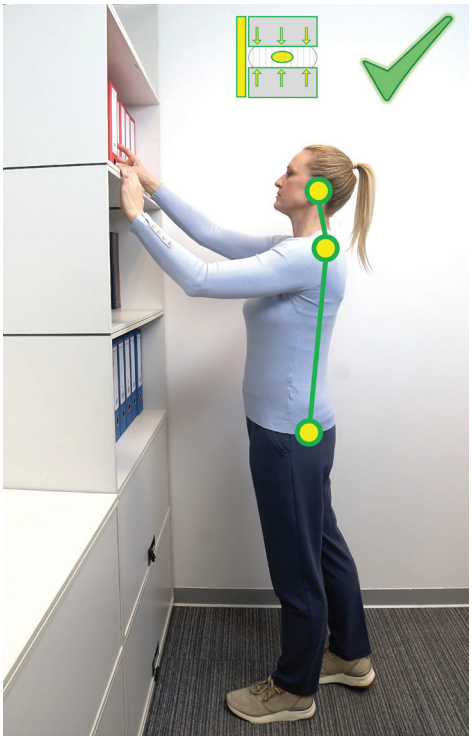


Figure 55. Correct – stable lumbar and cervical spine

When raising the arms above the level of the head, and due to insufficient mobility in the joints of the shoulders, chest part of the spine and hips, compensatory movements often occur in the lumbar and cervical part of the spine.

Compensatory movements are related to:

- buckling of the lumbar part of the spine
- buckling of the cervical part of the spine.

The lower the mobility in the joints of the shoulders, thoracic part of the spine and hips, the greater the compensation in the lumbar and cervical part of the spine.

When raising the arms above the level of the head, it is important to prevent the need for compensatory movements in the lumbar and cervical spine by contracting the abdominal muscles.

The shoulders, thoracic spine and hips most often lack mobility, which is very important for the correct and safe way of raising arms and objects above head level.

The exercise program in this manual also treats the mobility of the shoulders, thoracic spine and hips.

Link and QR code for accessing the educational video clip "3.23. Instability of the lumbar and cervical spine when raising the arms above head level"

https://youtu.be/o5Jppmbvb7I

3.24. Carrying a bag on your shoulder

Figure 56. Carrying a bag incorrectly

Figure 57. Carrying a bag correctly

The backpacks and bags we carried during school have now been replaced by bags, laptop bags, etc. We carry something with us all our lives. A large number of us have carried these bags on one shoulder and always on the same shoulder. Carrying a bag on one shoulder is not necessarily bad and incorrect, the bad and incorrect part about it is that it was always one and the same shoulder.

The consequences of this can be:

- that the shoulder we predominantly carry the bag on is higher than the other
- scoliosis (spinal distortion seen from behind)
- Muscular imbalance between the left and right sides of the body
- muscle tension.

No matter what kind of bag we carry, let us often change the arm or shoulder on which we carry it, even when the bag is very light:

- When we carry a bag on one shoulder, we remember to move it to the other shoulder.
- When we carry a bag crossed over our chests, we need to change sides from time to time.
- When we carry the bag in our hands, we need to regularly change hands.

Think about how you carry your bag. Do you always carry it in the same hand and on the same shoulder?

If you have noticed that one side is more dominant for you, then try to change that. Try to motivate yourself to carry the bag on your other shoulder or in your other hand for a while.

Link and QR code for accessing the educational video clip "3.24. Carrying a bag on your shoulder"
https://youtu.be/NrPpOqS467w

3.25. Standing

Standing can be seen as a daily activity that can potentially lead to the occurrence of degenerative changes, but also as a preventive activity that leads to the preservation and improvement of the health of our bones, joints and muscles.

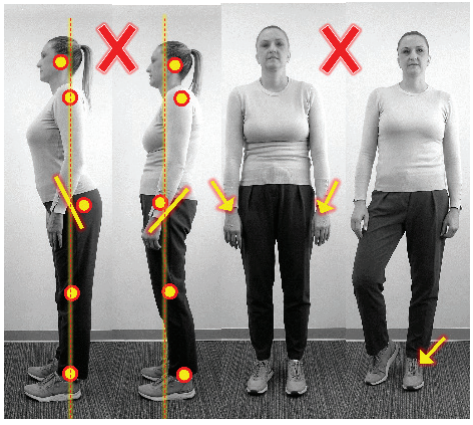


Figure 58. Incorrect standing positions

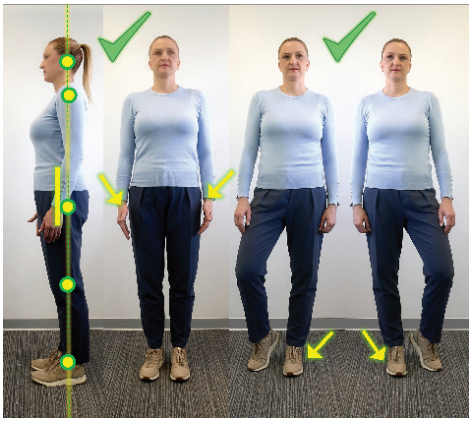


Figure 59. Correct standing positions

When standing incorrectly, the ears, shoulder, hip, knee, and ankle, viewed from the profile, are not in the same vertical position.

Incorrect standing is also called passive standing. The main characteristic of incorrect standing is muscle relaxation. All the mass of the body is then on the joints and ligaments. Passive standing leads to the emphasis of compensatory zones, so in people with the frontal inclination of the pelvis, the so-called lumbar lordosis is emphasized. In people with a posterior pelvic inclination, the so-called swaying posture may occur, which consequently leads to shortening and tension of the gluteus muscles, backs of thighs, shortness and tension of the pectoral muscles and neck muscles.

- It is incorrect when the backs of hands are facing forward.
- It is incorrect to predominantly put one's weight on one leg when standing.

When standing correctly, the ear, shoulder, hip, knee and ankle, viewed from the profile, are in the same vertical position.

Correct standing is also called active standing. The main characteristic of correct standing is muscle activity. With the help of muscles, the skeletal and articular systems the body is maintained in neutral, i.e. a physiological position in which, observed from the profile, the ear, shoulder, hip, knee and ankle are in the same vertical.
People with an anterior pelvic inclination should activate the muscles of the gluteus and place themselves in a neutral position. People with a posterior pelvic inclination should activate the hip flexor muscles and place themselves in a neutral position. People with a neutral pelvic position should remain in this position.

- It is correct when the backs of the hands are facing the outside and the palms are facing the body.
- It is correct to evenly distribute the mass of the body on both legs. Also, it is correct to sometimes stand on one leg and then on the other.

Link and QR code for accessing the educational video clip "3.25. Standing"
https://youtu.be/hGo4VZVJi9I

3.26. Walking

Walking can be seen as a daily physical activity that we use when arriving and leaving work, but also during working hours. It is an excellent physical activity for both cardiovascular health and the health of the skeletal and articular systems as well as the musculoskeletal tendon systems. In order to be able to increase the quantity of movement, we need to make sure that our spine is in a neutral position. Only correct posture when walking provides the prerequisites for preserving and improving the health of our bones, joints and muscles.

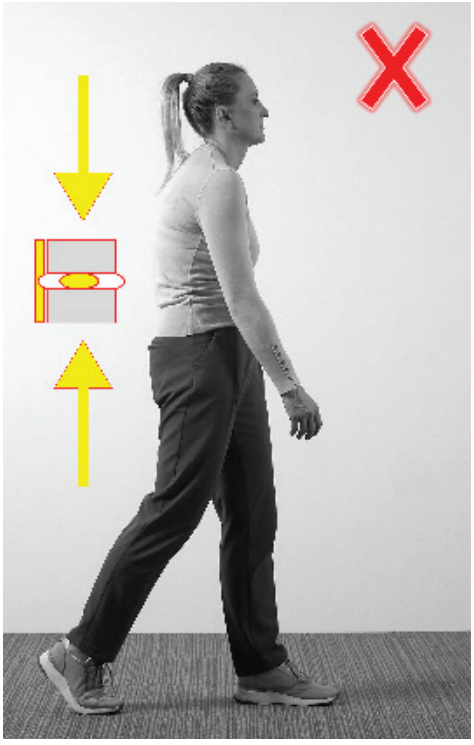


Figure 60. Incorrect walking

1. The most common mistake when walking is when there is compression of the spine, and we become shorter than our normal height.
2. The thoracic part of the spine should not be bent forward.
3. The neck and head should not be pronounced forward.
4. The gaze should not be directed to the floor in front of you.
5. The shoulder blades should not be spaced and raised.

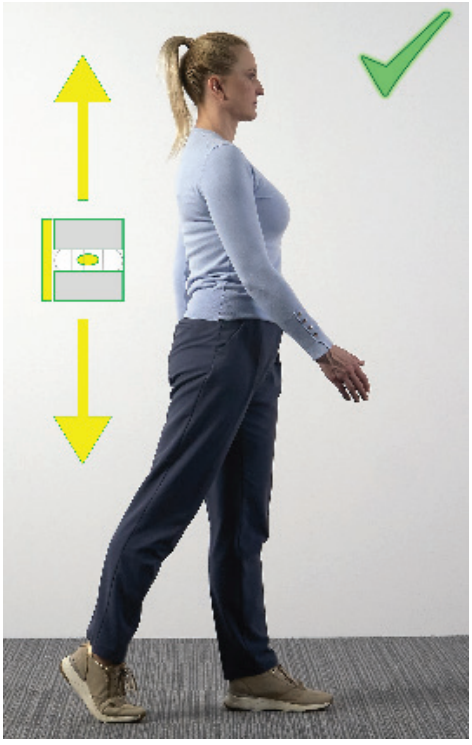


Figure 61. Correct walking

1. When walking, we should strive to be as tall as tall as possible. The thoracic part of the spine should be erect, i.e. have its own physiological curvature.
2. The thoracic part of the spine should be erect, i.e. have its own physiological curvature.
3. The cervical spine should be in the extension of the thoracic part of the spine. It is said that this is a position in which the head is back and the chin is directed toward the chest.
4. It is correct when the gaze is directed 5 m in front of you and down.
5. Shoulder blades should strive towards each other and descend.

6. The shoulders should not be raised and in the position of internal rotation.
7. It is incorrect when the backs of hands are turned forward and the palms are back.
8. It is incorrect when people whose posture is characterized by the posterior slope of the pelvis during walking emphasize this posterior slope even more strongly. It is incorrect when people whose posture is characterized by the front slope of the pelvis during walking emphasize this front slope even more strongly. People with a normal pelvic position should not imitate the front nor back slope of the pelvis.
9. Inactivity and relaxation of the gluteus muscles when walking contributes to the overall passivity and relaxation of the musculoskeletal system. This may not necessarily be bad for our health, but it is certainly not as effective for balance, intermuscular coordination, muscle endurance, etc., as when we try to maintain an active position of the muscular system during walking.
10. The relaxation of the abdominal muscles during walking also contributes to the overall passivity of our body.
11. It is incorrect when we walk "pulling" our feet behind us, when we drag our feet on the floor. In fact, it is one of the most common reasons for tripping and falling.
12. It is incorrect when we take long steps because it only emphasizes compensatory movements.
13. It is wrong if there is no adequate handwork during the walk.
14. It is incorrect if during the walk you feel that your lower back (the lumbar part of the spine) is rotating around its axis.
15. It is incorrect if during walking there is no rotation of the thoracic part of the spine around its axis.

6. Shoulders should be lowered and tend to the position of external rotation.
7. It is correct when the backs of hands are facing the outside and the palms are facing the body.
8. People with the back inclination of the pelvis during walking should imitate people with the front slope of the pelvis, i.e. push the pelvis and hips back. People with the frontal inclination of the pelvis during walking should imitate people with the back inclination of the pelvis, i.e. push the pelvis and hips forward. People with a normal pelvic position still need to continue retaining such a centred position.
9. To make walking even more effective we can alternately do contractions of the gluteus muscles of the leg on which we step. After we step forward and as soon as we step on it, we consciously squeeze the muscles of the gluteus of that leg. Repeat the same with the other leg and repeat cyclically.
10. During walking, it is necessary to do slight contractions of the muscles of the lower abdomen. Simultaneous muscle contraction of the lower abdomen and alternating contractions of the gluteus muscles contributes to the overall stability of the trunk.
11. When walking, it is important to lift your legs from the floor. The crease in the hip, knee and ankle must be more pronounced. If we walk like that, we are less likely to fall. This is a particularly important measure for prevention of falls in old age.
12. The steps should be shorter, but the frequency of the steps may be higher.
13. During the walk, it is very important that the arm movements are coordinated: the opposite arm - the opposite leg. Over time, it is necessary to strive for the ranges of hand swing movements to increase.
14. The lower back (the lumbar part of the spine) during walking should be stable and firm. This is achieved by gently activating the muscles of the lower abdomen. This is the activation you would make if you expected a slight blow in the lower abdomen area i.e. under the belly button.
15. During walking, the thoracic part of the spine should rotate around its axis.

Link and QR code for accessing the educational video clip "3.26. Walking"
https://youtu.be/egBrQqNJmX4

3.27. Walking in high heels

Walking in high heels is not just walking, it is a skill, the art of controlling forces when moving the centre of gravity of a body in conditions of a reduced supporting surface.

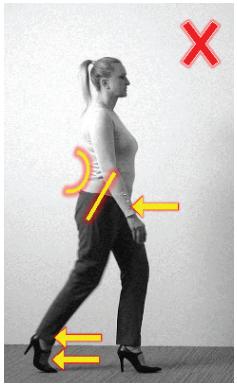


Figure 62. Incorrect walking in high heels

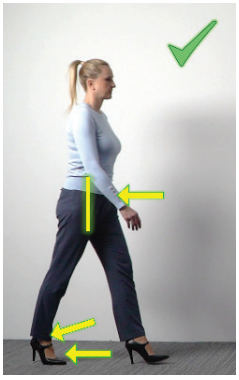


Figure 63. Correct walking in high heels

In situations where we do not have a sufficient range of motion in the joints of the hips, ankles and feet, there is a "strange" way of walking, compensation, an increase in the curvature of the spine, etc., and thus the progression of mechanical damage.
Such "problems" are most often experienced by women with anterior pelvic inclination and pronounced lumbar lordosis.
One of the consequences of years of wearing heels is the shortening of the muscles of the calf and Achilles tendon, which can consequently interfere with the normal way of walking in flat footwear.

Correct walking in heels requires a slightly larger range of motion in the joints of the hips, ankles and feet. These ranges of motion can be achieved by stretching.

Below is a suggestion of a few exercises that are in the function of facilitating walking in high heels. Gently stretch to the limit of pain and hold for about 10 seconds.

Figure 64. Stretching the hip flexors.

Figure 65. Stretching the muscles of the front of the thigh

Figure 66. Stretching the muscles of the foot and increasing mobility in the ankle

Figure 67. Stretching of the calf muscles and Achilles tendon

Link and QR code for accessing the educational video clip "3.27. Walking in high heels"
https://youtu.be/A8w0rG2_3mQ

3.28. Working from home – Adjusting the height of the kitchen chair and table

Just as it is necessary to ergonomically adjust your place of work in your office to yourself, it is equally important to adjust your place of work when working from home. When working from home and using a laptop, it would be ideal to have your own desk, work chair, separate monitor, keyboard and mouse. If we do not have any of the above, then it is necessary to make some corrections to our place of work at home.

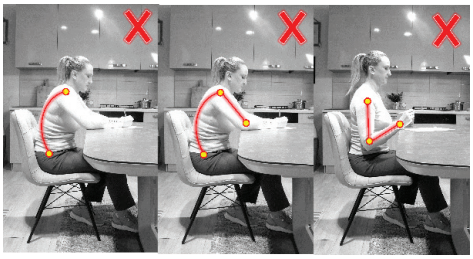


Figure 68. Kitchen chair too low

Figure 69. Kitchen chair of optimal height

It is incorrect when the height of the kitchen chair is not adjusted to our body height and the height of the kitchen table for working at the computer.

The most common mistake is that the height of the chair is set too low. The following occurs:

- Significant forward flexion of the trunk
- Significant movement of the upper arms from the body
- The angle between the upper arms and forearms is less than 90 °.

All of the above leads to unnecessary and significant fatigue of the muscles of the shoulders, upper back and neck.

When sitting on the kitchen chair and working at the kitchen table, the height of the chair needs to be adjusted to our body height and the height of the kitchen table.

We can adjust the height of the chair with the help of additional pillows. The following occurs:

- Trunk is perpendicular to the floor
- Upper arms are next to the body
- The forearms are horizontal, they are level with the table, and the angle between the upper arms and forearms is about 90 °.

By correctly adjusting the height of the chair and sitting correctly, we eliminate the causes of mechanical damage to the spine, shoulders, elbows, etc.

Link and QR code for accessing the educational video clip "3.28. Working from home - adjusting the height of the kitchen chair and table"

https://youtu.be/SvFVPjnH5gE

3.29. Working from home – The influence of the position of the laptop screen on the position of the body

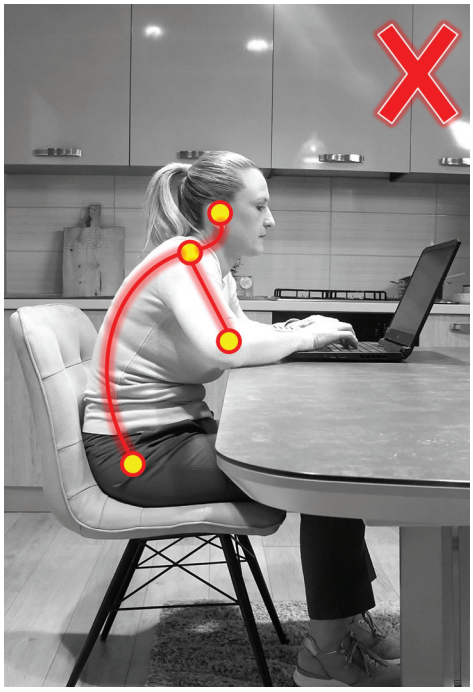


Figure 70. Screen height set too low

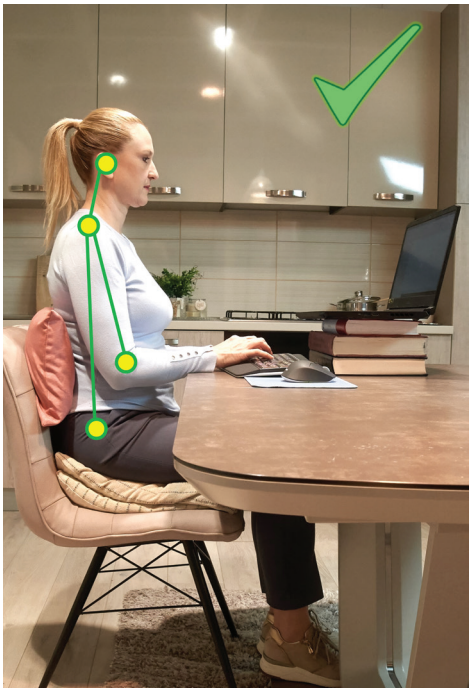


Figure 71. Screen height elevated with the help of books

Working with a laptop, and without an additional monitor and keyboard, should be understood as working on an auxiliary tool for everyday work.

In addition to the fact that the laptop has a relatively small screen, the biggest ergonomic disadvantage of it is its height. When the laptop is placed on the table, the top edge of the screen is well below the level of the worker's eyes. In this situation, the worker tries to be level with the monitor and then the back bends, with the head and neck protruding forward.

The correct height of the laptop screen can be achieved by placing an elevation under the computer, for example, several books.

The upper edge of the laptop screen should be at eye level. It is a position that allows the worker to have his head and neck in a natural position, for his upper arms to be next to the body, forearms horizontal, for the shoulders and shoulder blades to do a slight external rotation. The thoracic part of the spine is as erect as possible, and the pelvis and spine, seen from the profile, are in the same, vertical plane.

The disadvantage of this position of the laptop is the lack of a keyboard. In other words, this position of the laptop can only be used when we have an additional keyboard and an additional mouse.

Link and QR code for accessing the educational video clip "3.29. Working from home - the impact of the position of the laptop screen on the position of the body "
https://youtu.be/LUErIAk6dio

3.30. Working from home – laptop screen position in a situation where we do not have an additional keyboard and mouse

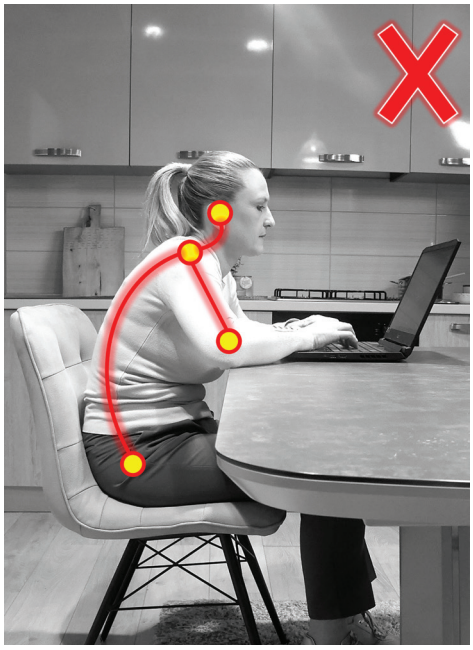


Figure 72. Screen height set too low

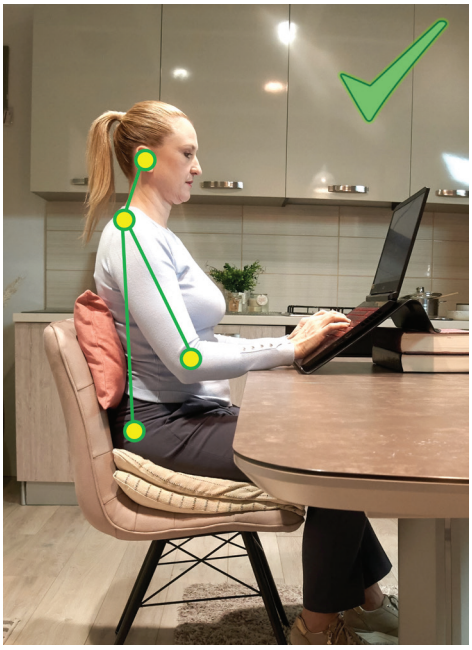


Figure 73. Screen height elevated with stand and books

As in the previous example, it is incorrect when the laptop is on the table because then the height of the computer screen is set very low.

This position of the laptop allows the use of the keyboard and mouse of the laptop itself, but the position of the screen is extremely incorrectly set.

Working in such conditions inevitably leads to significantly greater fatigue of the neck, back and shoulders.

In a situation when we need to work with a laptop, and we do not have an additional keyboard and mouse, as well as an additional monitor, the position of the laptop can be adjusted to be in an oblique direction with the help of a stand, several books or some other elevation.

In this way, the height of the screen is almost optimal, and the position of the keyboard is satisfactory. The position of the neck and head is significantly better than the situation when the laptop is on a flat surface, i.e. on the table. The upper arms can still be close to the body, thereby reducing the load on the shoulders and neck. The disadvantage of this position of the laptop is that the crease in the wrists is slightly larger than the desirable one.

This position of the laptop can be said to represent something like an intermediate solution.

Poveznica i QR kod za reprodukciju edukacijskog video isječka „3.30. Rad od kuće - Položaj ekrana prijenosnog računala u situaciji kad nemamo dodatnu tipkovnicu i miš“

https://youtu.be/Bvk52yDYvH8

4. EXERCISES FOR CORRECT POSTURE

4.1. Theoretical foundations

Age

With age, there is a decrease in bone density, the amount of muscle mass, the proportion of collagen in muscles and tendons, as well as a weakening of balance, weakening of intermuscular coordination, etc. All this is part of physiological aging i.e. the natural process of ageing. However, do we know that with correct daily movement and appropriate physical activity we can delay and slow down the natural aging process of the body?!

Physical activity

And did we know that correct physical activity does not necessarily have to be classic exercise? Did we know that going to the countryside, picking apples, tidying up an apartment, putting laundry on the dryer, washing dishes, ironing, vacuuming, painting walls, dressing and carrying a small child, etc. is also exercise? Our backs do not hurt because we were picking up a small child, our backs hurt because we were doing this incorrectly! Our backs do not hurt primarily because we are sitting, our backs hurt because we are sitting incorrectly! We should see our every movement as an exercise. Our every move should be functional, performed correctly from the point of view of posture i.e. using natural forms of movement.

Function of this exercise program

This exercise program is primarily aimed at ensuring the prerequisites for preserving and improving the health of the musculoskeletal and skeletal and articular systems through stability and mobility exercises. The exercise program is not in the function of achieving a greater amount of muscle mass, it is also not in the function of reducing the amount of adipose tissue. The exercise program is in the function of achieving that movement becomes a pleasure again, not a discomfort as it is now. We do not like to move because movement is uncomfortable for us, and movement is uncomfortable because we move incorrectly. When we dislike something, we find countless reasons not to do it. Are we all not familiar with this sentence: Oh, I just don't have time for myself; everything hurts, and I really don't have time for fitness. But is that really the case? Do we have time for coffee with friends? Do we have time for a movie? Do we have time for the things we love? Of course, we do! Likewise, when moving starts to give us pleasure again, when we realize that the health of our bones, joints and muscles is in our hands, when we start moving correctly in the workplace and in everyday life, when our backs finally stop hurting, then we will move more, then we will enjoy moving again, just as we enjoyed it when we were children.

Correct posture and exercise

That is exactly what this exercise program is for. This exercise program is aimed at achieving optimal balance in mobility and ensuring other prerequisites for correct posture.

This exercise program achieves the following:

- It affects stability and its components. The balance of administrative workers is particularly at risk, which is why this exercise program is particularly emphasized.
- Treats increasing mobility i.e. mobility in precisely defined articular systems, those that are critical in administrative workers and crucial for achieving and maintaining correct positions and movements, i.e. for correct body posture and movement.
- It also works to stimulate circulation, which slows down with prolonged sitting.
- It acts on the formation of synovial fluid that "lubricates" the joints.
- It activates the exchange of water and nutrients in the "nucleus pulposus"[1], which directly affects the health of the intervertebral disc, and thus the preservation of the intervertebral space, which is necessary to prevent the occurrence of mechanical damage to the spine and its constituent parts.

This exercise program is specific because it primarily treats the quality rather than the quantity of exercises. The most important movement of this program is the so-called hip hinge . Hip hinge is an essential human movement, the king of movements, the Holy Grail of a healthy spine. It is a movement that, when learned, preserves the health of the spine. It is a movement that prevents overstrain and mechanical damage to the spine.

Hip hinge

It is a movement we need to use during trunk flexion. It is a movement that allows the lowering and flexion of the trunk with a straight back, and the axis of rotation is in the joints of the hips. Best of all, with this movement, we activate the gluteus muscles every time we lean in this manner. Hip hinge is a movement used in a large number of exercises. In the "deadlift" exercise, hip hinge is the main movement.

If there was only one movement technique someone learned and applied every day, then it should be the hip hinge. If all people performed the trunk flexion this way instead of flexing the trunk with a bent back, there is a high probability that the number and intensity of musculoskeletal problems in the lower back area, but also in other parts of the body, would significantly lower.

[1] Nucleus pulposus is a central gelatinous mass located in the middle of the anulus fibrosus. It is an intervertebral disc whose basic function is to be a shock absorber. With age, these shock absorbers are thinned out because hydrophilic proteins deteriorate and the bond between the vertebrae gradually changes, which affects the changing of the overall statics of our organism. People who exercise greatly contribute to the artificial way of "pumping" discs, i.e. exercise promotes the exchange of water and nutrients in "shock absorbers", thereby extending their lifespan. [3] „Hip hinge" je engleski naziv za pokret spuštanja trupa koji se prvenstveno odvija iz zglobova kukova. To je pokret u kojem kuk služi kao spojnica, što bi bio direktan prijevod s engleskog. Budući da u hrvatskom jeziku ne postoji službeni termin za ovaj pokret, on će se u priručniku i dalje zvati „hip hinge".

[2] Hip hinge" is the term describing the trunk descent movement that primarily takes place from the hip joints. This is a movement in which the hip serves as a hinge.

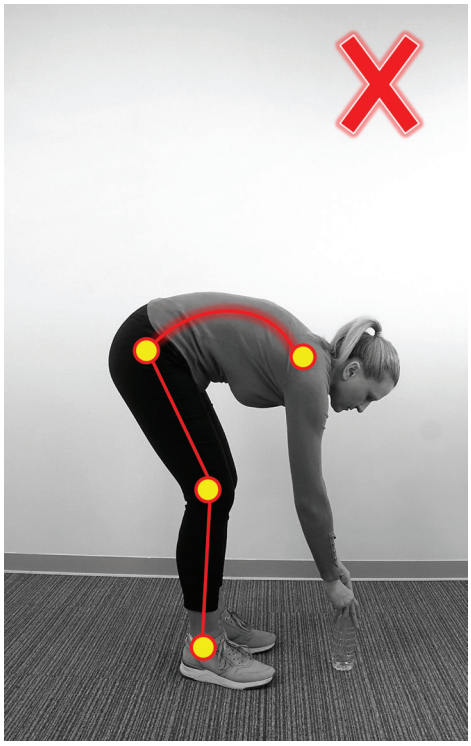


Figure 74. Incorrect hip hinge, stoop lift, lifting with spine flexion

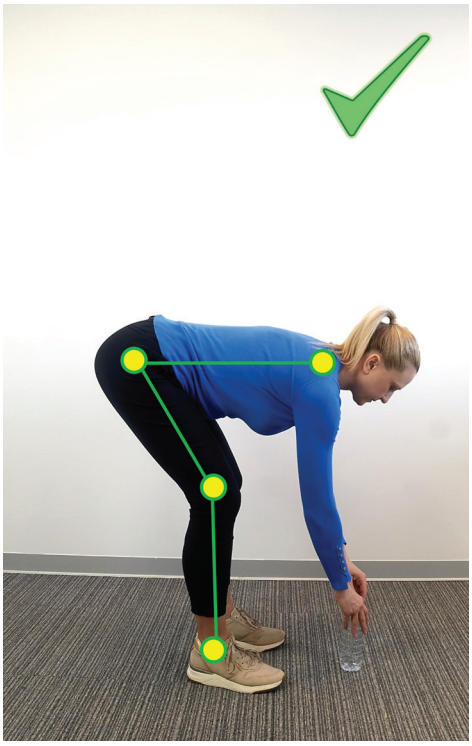


Figure 75. Correct hip hinge, dead lift

Link and QR code for accessing the educational video clip „ Hip hinge"
https://youtu.be/08rs6PTXwTE

Classic training system

If we were to divide the classic training system into phases, those would be the following:

1) stability and mobility

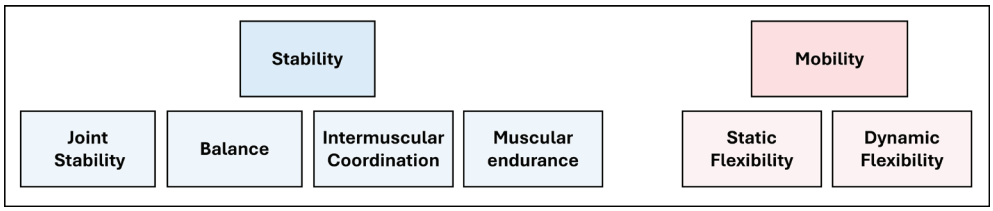
2) quality

3) strength.

Strength and are phases that are mostly done with athletes or recreational athletes in fitness. This exercise program primarily focuses on the first stage of exercise, which is stability and mobility.

Exercises for correct posture

This exercise program is called "Exercises for correct posture" because proper posture is its most important function and ultimate goal. Exercises for correct posture" is an exercise program that focuses on the first stage, i.e. stability and mobility, which is necessary for correct posture. Stability consists of: stabilization of joints, balance, work on intermuscular coordination and muscular endurance. Mobility or motility consists of static and dynamic stretching exercises. The program is designed to ensure improvement of stability through simple exercises and work on optimizing mobility, all with the aim of ensuring the prerequisites for correct posture of administrative workers.



Exercise recommendation

The recommendation for exercise is that we need to get up, walk, do a few exercises every time we feel the need to move, when we feel that we have "stiffened". It is recommended that these complexes of exercises be done in the office, but if we do not have the conditions for exercise in the workplace, you can also do them at home. Also, not all exercises necessarily need to be performed at once, but partially, when during the working day you feel the need for movement and physical activity.

Exercise program, number of exercises per week, series and repetitions

This program consists of two sets of different exercises. Both sets of exercises consist of 10 dynamic exercises and 10 static exercises. The first set of exercises is basic and the second is advanced. Initially, a basic set of exercises is continuously performed, and after some time it moves on to an advanced one.

The number of repetitions at the beginning is 10, and later it can be up to 20. At the beginning, one series per day is performed done, and later up to 3 series. Regardless of these recommendations, everyone should exercise according to their current physical abilities and state of fitness.

It is recommended that the exercises be done every day. Likewise, someone will be able to exercise every day, and for someone, one or two workouts a week will represent an effort. We are all different and we are all at different degrees of fitness. Adapt your exercise to yourself. If you have any further questions, seek the advice of a kinesiologist.

4.2. Practical representations of exercises

Notes before starting exercise:

- *Exercises may be done exclusively in the space that allows it, and primarily taking safety into account.*
- *If you are not sure that you can do an exercise, then do not do it and seek the advice of a kinesiologist.*
- *If for any reason you do not feel well, do not exercise.*
- *If you experience unpleasant pain at any time during exercise, stop exercising and see your doctor.*
- *During the performance of all the exercises, we strive to be as tall as possible, we strive to elongate the body. The chin is directed toward the chest and the head is back.*
- *Stretches are done to the limit of light productive pain.*

4.2.1. Basic exercise program

Below is an overview of 20 basic program exercises. Each exercise has a separate link and QR code for individual playback.

All exercises have both a link and a QR code for shared playback:

Link and QR code for joint reproduction of all exercises of the basic program.
https://youtu.be/qR1ZV_1rlKA

Figure 76. Front thrust

1. Front thrust

PURPOSE: Functional activation of the shoulder muscles.

DESCRIPTION: From the initial position with the palms facing obliquely inwards, thrusts are made upwards. We are simulating a big ball being lifted. There are 10 repetitions.

Link and QR code for accessing the video clip 1. Front thrust
https://youtu.be/3o44FvPNu7k

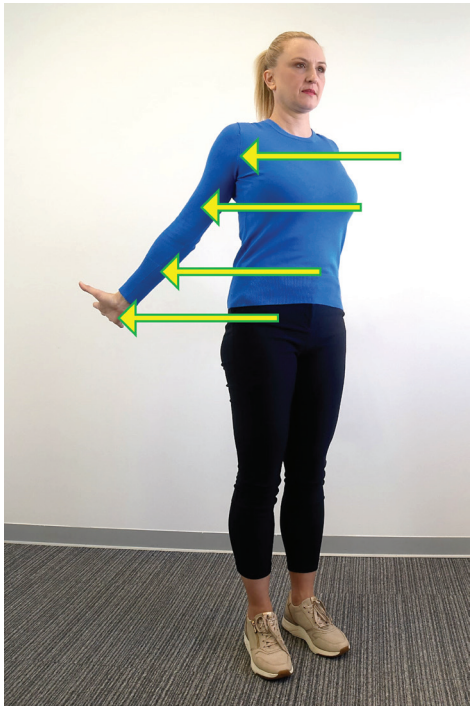


Figure 77. Stretching the pectoral muscles and muscles of the front shoulder

2. Stretching the pectoral muscles and muscles of the front shoulder

PURPOSE: Static stretching of the pectoral muscles and muscles of the front shoulder.

DESCRIPTION: Place your hands behind your body until you feel a slight stretch. Palms forward and down. Hold for 10 seconds.

Link and QR code for accessing the video clip 2. Stretching the pectoral muscles and muscles of the front shoulder
https://youtu.be/cEpdNdQlTWM

Figure 78. Lateral circular shoulder rotations back and down

3. Lateral circular shoulder rotations back and down

PURPOSE: shoulder mobility in the direction of external rotation and activation of the muscles surrounding the shoulders.

DESCRIPTION: From the starting position with the palms facing towards the body make circular rotations backwards and downwards. During the performance of this exercise, it is necessary to activate the muscles of the lower abdomen to stabilize the trunk. There are 10 repetitions.

Link and QR code for accessing the video clip 3. Lateral circular shoulder rotations back and down
https://youtu.be/Ij9Ni0_Vjys

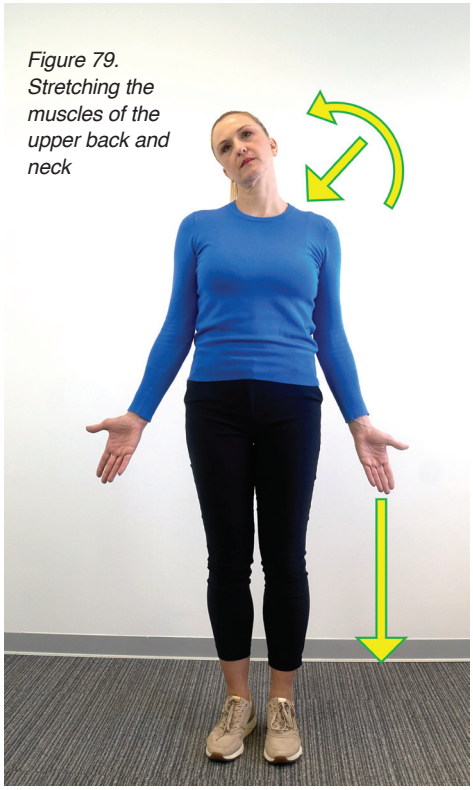


Figure 79. Stretching the muscles of the upper back and neck

4. Stretching the muscles of the upper back and neck

PURPOSE: Stretching the muscles of the upper back and neck.

NOTE: The goal of the exercise is not to bring the head closer to the shoulder, but to lower the shoulder as low as possible.

DESCRIPTION: Tilt your head to one side up to a maximum of 40°, push your arms down and back, palms forward, shoulder tends to external rotation. Hold for 10 seconds on each side.

Link and QR code for accessing the video clip 4. Stretching the muscles of the upper back and neck

https://youtu.be/bQYMX-AKe_I

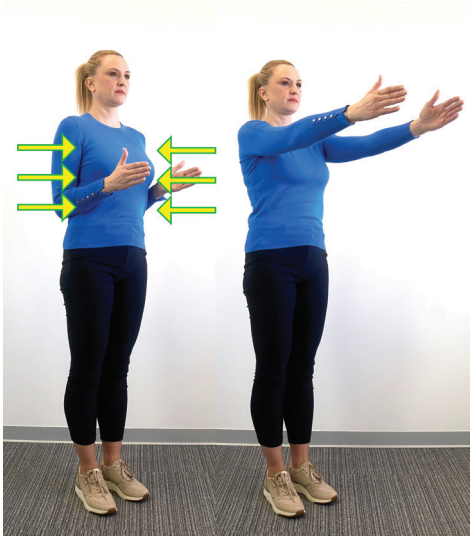


Figure 80. Upper arms and elbows alongside the body

5. Upper arms and elbows alongside the body

PURPOSE: Optimization of the mobility of the thoracic spine, activation of the pectoral muscles, lower part of the trapezoidal muscle and large muscle of the middle part of the back.

DESCRIPTION: From the starting position with horizontally positioned upper arms, forearms and palms inwards, gently press the sides of the trunk with elbows and upper arms. Shoulders gently push down and back. Do 10 repetitions with a one second hold.

Link and QR code for accessing the video clip 5. Upper arms and elbows alongside the body

https://youtu.be/Q4qvwbk_FPg

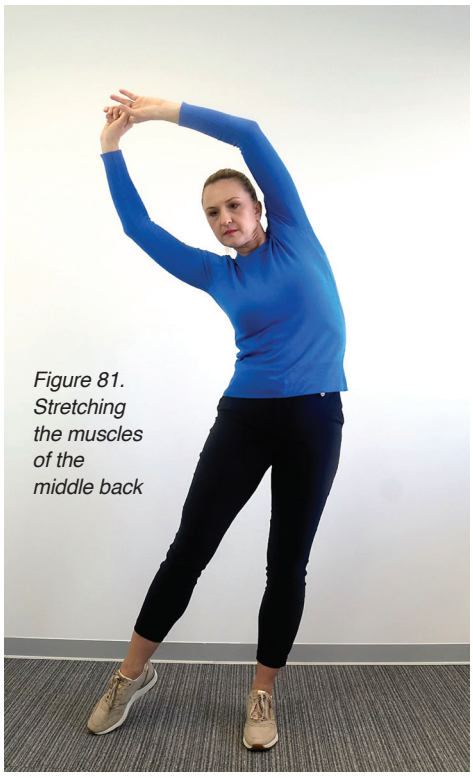


Figure 81. Stretching the muscles of the middle back

6. Stretching the muscles of the middle back

PURPOSE: Static stretching of the large back muscle and the muscles of the side of the trunk.

DESCRIPTION: From the starting position with one hand grasping the other hand perform a slight flexion of the trunk. The position is held for 10 seconds on each side.

Link and QR code for accessing the video clip 6. Stretching the muscles of the middle back
https://youtu.be/QtYi4on0_7A

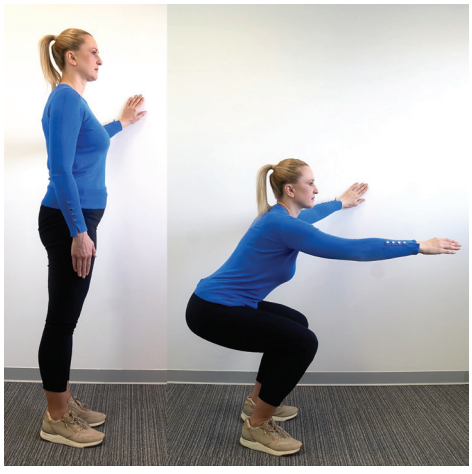


Figure 82. Parallel squat holding on to a firm support

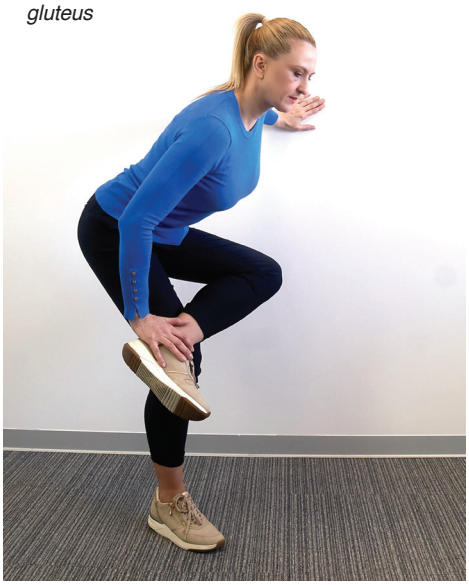
7. Parallel squat holding on to a firm support

PURPOSE: Functional mobility of the joints of the hips and ankles, activation of the muscles of the front of thighs and muscles of the gluteus, intermuscular coordination.

DESCRIPTION: From the starting position in which we cling to the wall or some other solid support make a quarter squat or parallel squat, depending on your hip mobility. The hand is in front of the body, the mass of the body is fully on the feet, the back is as upright and straight as possible. The exercise is repeated 10 times.

Link and QR code for accessing the video clip 7. Parallel squat holding on to a firm support
https://youtu.be/Su1-D6egjHQ

Figure 83. Stretching the muscles of the gluteus



8. Stretching the muscles of the gluteus

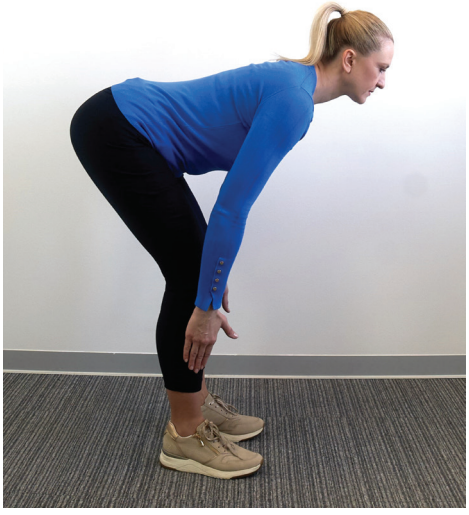
PURPOSE: Mobility in the hip joints and stretching of the gluteus muscles.

DESCRIPTION: From a standing or sitting position we put the lower leg of one on the thigh of the other leg. We gently lower the trunk to the sensation of a slight stretching of the gluteus muscles. Hold for 10 seconds.

NOTE: When doing this exercise from a standing position, we must support ourselves on a wall, table or other stable object.

Link and QR code for accessing the video clip 8. Stretching the muscles of the gluteus
https://youtu.be/2dtPb57NbBI

Figure 84. Deadlift



9. Deadlift

PURPOSE: Functional mobility of the hip joints, hamstrings and gluteus activation, intermuscular coordination.

DESCRIPTION: From the standing position we push the hips back. The back is straight, and the movement simultaneously takes place in the joints of the hips and knees. The lower legs remain vertical and motionless. The shoulders do the outer rotation, the shoulder blades tend to connect, and the palms and forearms are turned inward.

Link and QR code for accessing the video clip 9. Deadlift
https://youtu.be/rKUQmA9J2bs

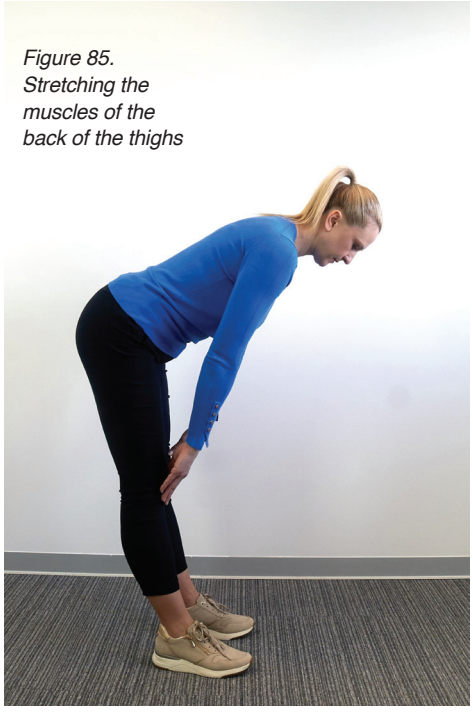


Figure 85. Stretching the muscles of the back of the thighs

10. Stretching the muscles of the backs of thighs

PURPOSE: Stretching the hamstrings.

DESCRIPTION: From a standing position, we gently flex the trunk forward as in the picture. The trunk should be flat. The axis of rotation is in the hips and knees. We stretch to the sensation of a slight stretching of the muscles of the backs of thighs. Hold the end position for 10 seconds.

Link and QR code for accessing the video clip 10. Stretching the muscles of the backs of thighs
https://youtu.be/h0eUcz7taE0

Figure 86. Lifts onto the balls of the feet

11. Lifts onto the balls of the feet

PURPOSE: Activation of calf muscles, intermuscular coordination.

DESCRIPTION: From the starting position clinging to the wall lift onto the balls of your feet. Return to the starting position.

Link and QR code for accessing the video clip 11. Lifts onto the balls of the feet
https://youtu.be/xlRmsVh524k

Figure 87. Stretching the muscles of the calf

12. Stretching the muscles of the calf

PURPOSE: Stretching the calf muscles

DESCRIPTION: From the standing position we put our hands on the wall. One leg is in front and the other is behind. The foot of the leg that is behind should be on the floor. We stretch to a slight sensation of stretching the calf muscles and the Achilles tendon of the leg that is behind. Hold each leg for 10 seconds.

Link and QR code for accessing the video clip 12. Stretching the muscles of the calf

https://youtu.be/cNGvuq5hbew

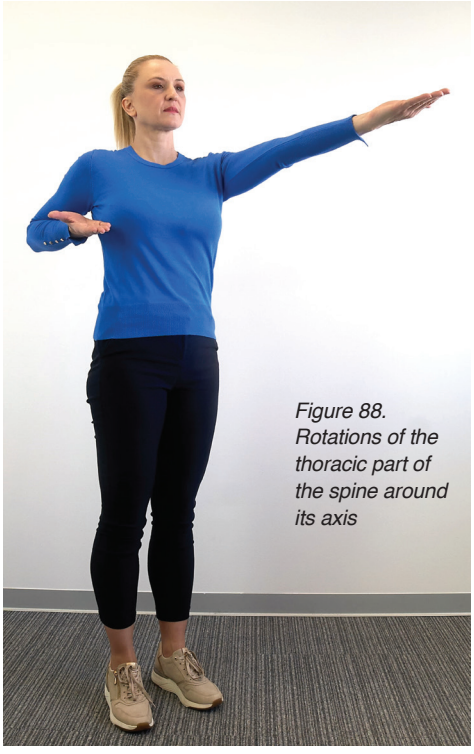


Figure 88. Rotations of the thoracic part of the spine around its axis

13. Rotations of the thoracic part of the spine around its axis

PURPOSE: mobility of the shoulder and thoracic spine around its axis, activation of the muscles of the hands and forearms, intermuscular coordination.

DESCRIPTION: From the starting position in which the upper arms are next to the body, the fold in the elbows and the palms is facing upwards – stretch one (Fig. 2) and the other hand (Fig. 3) forward. The goal is to rotate the thoracic part of the spine around its axis. The exercise is done 20 times alternating between arms.

NOTE: With this exercise, rotations in the lumbar spine, i.e. in the lower back.

Link and QR code for accessing the video clip 13. Rotations of the thoracic part of the spine around its axis

https://youtu.be/vXgKmDFWX_Q

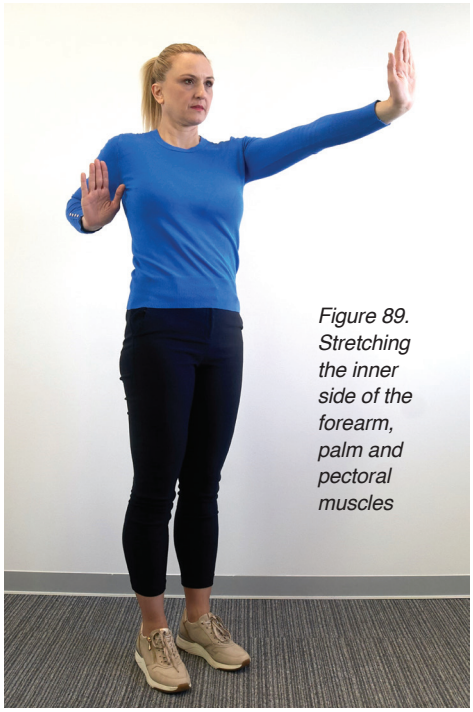


Figure 89. Stretching the inner side of the forearm, palm and pectoral muscles

14. Stretching the inner side of the forearm, palm and pectoral muscles

PURPOSE: Stretching the inner side of the forearm and palm, stretching the pectoral muscles, increasing the mobility of the thoracic part of the spine around its axis.

DESCRIPTION: From the starting position stretch out your hand in front of you, palm vertical (as if we want to tell someone STOP). The other hand is next to the shoulder as in the picture. Hold each hand for 10 seconds.

Link and QR code for accessing the video clip 14. Stretching the inner side of the forearm, palm and pectoral muscles

https://youtu.be/KOiu2fU8MMk

15. "Breaststroke swimming" with palms forward

PURPOSE: Dynamic stretching of the pectoral muscles and muscles of the inner side of the upper arm and forearm, mobility of the shoulder and thoracic spine, activation of the shoulder and arm muscles, and intermuscular coordination.

DESCRIPTION: From the starting position one, move over to positions two and three, reach the starting-end position of one, as in Figures 1 to 3. The hand remains open. Exercise is a simulation of breaststroke swimming with palms forward. There are 10 repetitions.

Figure 90. Breaststroke with palms forward

Link and QR code for accessing the video clip 15. "Breaststroke swimming" with palms forward

https://youtu.be/_voxSbyxyi4

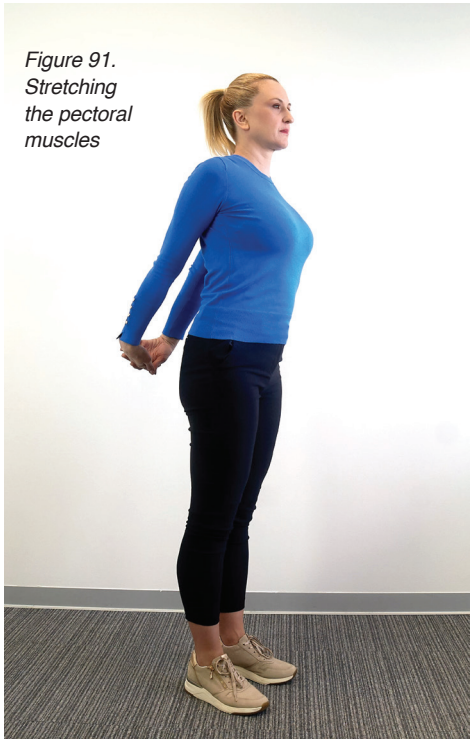


Figure 91. Stretching the pectoral muscles

16. Stretching the pectoral muscles

PURPOSE: Static stretching of the chest and front shoulder muscles, mobility of the thoracic spine.

DESCRIPTION: Connect your hands behind you as shown in the picture. Keep in a position where we feel a slight stretching of the pectoral muscles and muscles at the front of the shoulder. Hold for 10 seconds.

Link and QR code for accessing the video clip 16. Stretching the pectoral muscles

https://youtu.be/ex9jQVUbLKQ

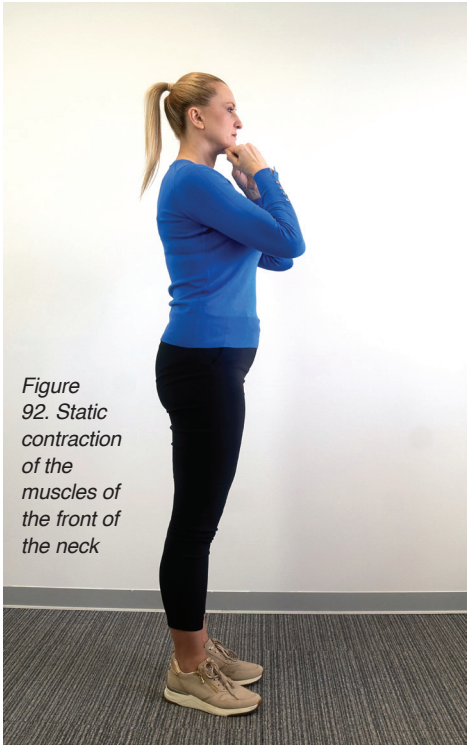


Figure 92. Static contraction of the muscles of the front of the neck

17. Static contraction of the muscles of the front of the neck

PURPOSE: Static activation of deep neck muscles.

DESCRIPTION: From the starting position in which the head is back and the chin is directed toward the chest, we put our hands under the chin. The task is to try to push your hand down with your chin as if we wanted to "nod affirmatively", while the hand resists this movement. The static contraction lasts for 10 seconds.

Link and QR code for accessing the video clip 17. Static contraction of the muscles of the front of the neck

https://youtu.be/20UplZIIXww

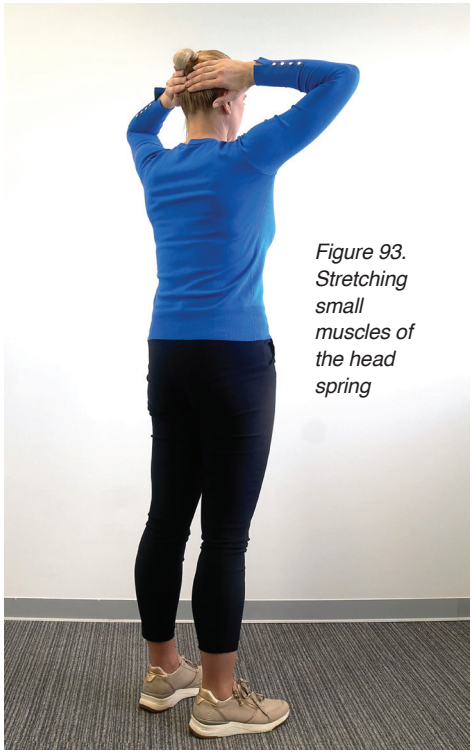


Figure 93. Stretching small muscles of the head spring

18. Stretching small muscles of the head spring

PURPOSE: Static stretching of small muscles of the head spring.

DESCRIPTION: From a position where the head is back, chin is directed toward the chest and arms behind the head we do a slight push of the head backwards while the arms provide resistance. Isometrically, we stretch the small muscles that connect the back of the skull to the first and second cervical vertebrae. Hold for 10 seconds.

Link and QR code for accessing the video clip 18. Stretching small muscles of the head spring
https://youtu.be/tP85jNVWRPs

Figure 94. Lifting the opposite arm and opposite leg while holding on to the wall

19. Lifting the opposite arm and opposite leg while holding on to the wall

PURPOSE: mobility of the shoulder and thoracic spine, activation of hip flexor muscles and of the tibialis anterior muscle, intermuscular coordination.

DESCRIPTION: From the starting position, lift the opposite leg and the opposite arm at the same time. Hold on to a wall or other solid support for safety. The foot of the raised leg should be horizontal to the ground. There are 10 repetitions for one side and 10 repetitions for the other side.

Link and QR code for accessing the video clip 19. Lifting the opposite arm and opposite leg while holding on to the wall
https://youtu.be/gfqserdHr88

Figure 95. Stretching the hip flexors

20. Stretching the hip flexors

PURPOSE: Static stretching of the hip flexors.

DESCRIPTION: From a standing position we take a step forward. Hands are on the hips. We activate the muscles of the lower abdomen and gently push the hips forward to the sensation of slight stretching of the flexor muscles in the hip joint. Hold the end position for 10 seconds. Change legs.

Link and QR code for accessing the video clip 20. Stretching the hip flexors

https://youtu.be/-GW_daKW-Is

4.22. Advanced program

Below is an overview of 20 advanced programme exercises. Each exercise has a separate link and QR code for individual playback.

All exercises have both a link and a QR code for collective playback:

Link to play all advanced program exercises.
https://youtu.be/XN7tDNwQ2ho

1. Front shoulder press with unilateral hip flexion

Figure 96. Front thrust with knee lift

PURPOSE: Functional activation of shoulder, trunk and leg muscles, intermuscular coordination and balance, activation of hip flexor muscles, activation of muscles in charge of lifting the feet, stabilization of ankle, knee, hip and lumbar spine joints.

DESCRIPTION: From the starting position with palms facing inside, perform the front shoulder press. Simultaneously with the thrusts of the hands alternately raises one knee and the other. The foot of the raised leg should be horizontal to the ground. There are 10 repetitions.

Link and QR code for accessing the video clip 1. Front shoulder press with unilateral hip flexion
https://youtu.be/JMMKiwYSU4k

2. Stretching the pectoral muscles and muscles of the front shoulder

Figure 97. Stretching the pectoral muscles and muscles of the front shoulder

PURPOSE: Static stretching of the pectoral muscles and muscles of the front shoulder.

DESCRIPTION: Stand against a wall, door or other stable object, place your hands as shown in the picture until a slight stretch is felt. Hold each side for 10 seconds.

Link and QR code for accessing the video clip 2. Stretching the pectoral muscles and muscles of the front shoulder
https://youtu.be/04_FFmyIchM

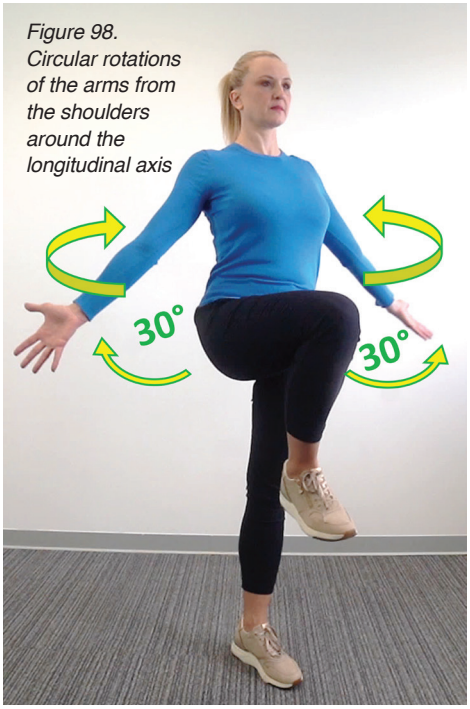


Figure 98. Circular rotations of the arms from the shoulders around the longitudinal axis

3. Circular rotations of the arms from the shoulders around the longitudinal axis

PURPOSE: shoulder mobility, dynamic stretching of the muscles on the inner side of the upper arm and forearm, intermuscular coordination and balance, activation of the hip flexor muscles, activation of the foot elevator muscles, stabilization of the ankle, knee, hip joints, and lumbar spine.

DESCRIPTION: From the starting position with palms facing forward, perform external circular rotations of the arms from the shoulders. The maximum distance of the arms from the body is 30°. Simultaneously with the external circular rotations, alternate lifting of one leg and then the other is performed. The foot of the lifted leg should be horizontal to the ground. Perform 10 circular rotations.

Link and QR code for accessing the video clip 3. Circular rotations of the arms from the shoulders around the longitudinal axis

https://youtu.be/H8ytV5ND3Jk

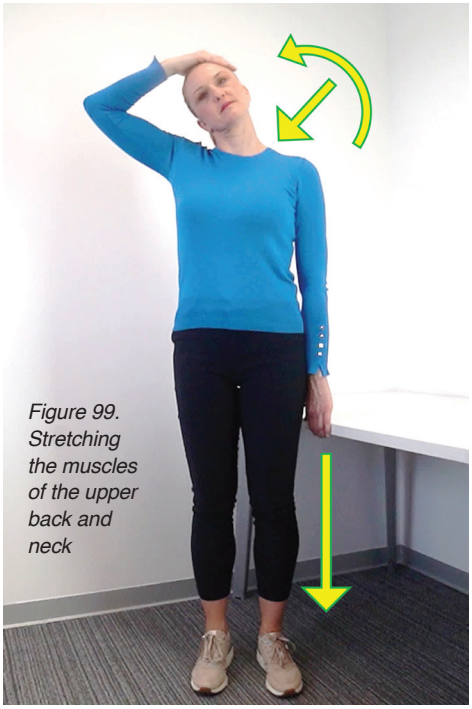


Figure 99. Stretching the muscles of the upper back and neck

4. Stretching the muscles of the upper back and neck

PURPOSE: Static stretching of the upper back and neck muscles.

NOTE: The goal of the exercise is not to bring the head closer to the shoulder, but to lower the shoulder as much as possible.

DESCRIPTION: Tilt your head to one side up to 40°, with the palm of one hand grasp the table or other firm support. We simulate raising the table to increase the stretching of the upper back and neck muscles.

HOLD: 10 seconds each side.

Link and QR code for accessing the video clip 4. Stretching the muscles of the upper back and neck

https://youtu.be/zpOGxKCskJQ

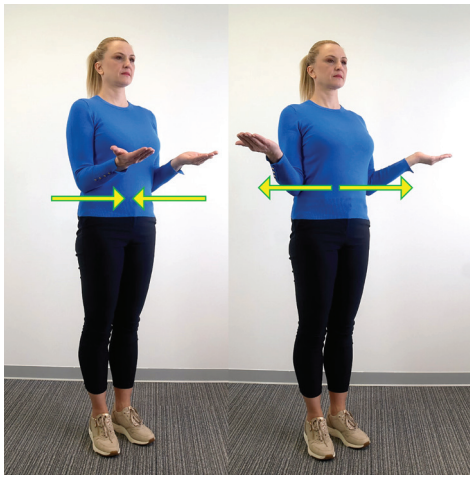


Figure 100. Connecting shoulder blades, displacement of palms and forearms

5. Connecting shoulder blades, displacement of palms and forearms

PURPOSE: Mobility of the shoulder and thoracic spine, activation of the muscles of the shoulder blades, intermuscular coordination.

DESCRIPTION: From the starting position with horizontally placed forearms and palms facing upwards, connect the shoulder blades and move the palms and forearms. There are 10 repetitions.

Link and QR code for accessing the video clip 5. Connecting shoulder blades, displacement of palms and forearms

https://youtu.be/biH6NRLydcA

Figure 101. Stretching the muscles of the middle, back and sides of the trunk

6. Stretching the muscles of the middle, back and sides of the trunk

PURPOSE: Stretching the large back muscle and the muscles of the side of the trunk.

DESCRIPTION: From the starting position perform a lateral flexion of the trunk as shown in the photo. The position is held for 10 seconds on one side and 10 seconds on the other side.

Link and QR code for accessing the video clip 6. Stretching the muscles of the middle, back and sides of the trunk

https://youtu.be/i0BPLVAaAWE

Figure 102. Parallel squat

7. Parallel squat

PURPOSE: Functional mobility of the joints of the hips and ankles, activation of the muscles of the front of the thighs and muscles of the gluteus, intermuscular coordination.

DESCRIPTION: From the starting position in which the feet are shoulder-width apart and the toes of the feet are facing outwards, perform a squat to the parallel position of the thighs and floor. It is important that the back remains straight. The axis of rotation is in the joints of the hips. Hands are in front of the body. The entire mass of the body is on the feet. Return to the starting position. The exercise is repeated 10 times.

Link and QR code for accessing the video clip 7. Parallel squat
https://youtu.be/6c4plgkywJs

Figure 103. Stretching the gluteus muscles

8. Stretching the gluteus muscles

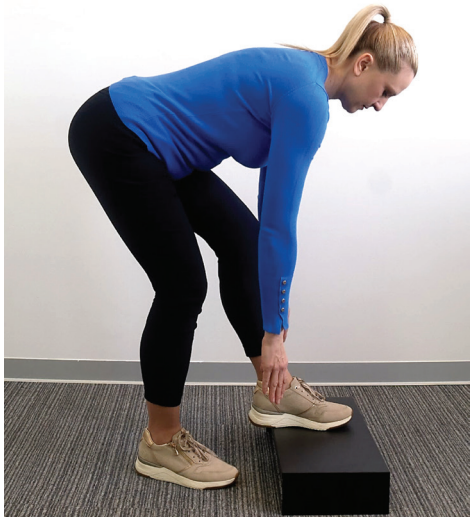
PURPOSE: Static stretching of the gluteus muscles.

DESCRIPTION: From a standing position, leaning against the wall, perform a single-leg bend until you feel a light stretch in the gluteal muscles. Hold the position for 10 seconds on each leg.

NOTE: For safety reasons, we do this exercise by leaning against the wall. If for any reason you cannot perform this exercise safely and without the risk of losing balance, do not do it.

Link and QR code for accessing the video clip 8. Stretching the gluteus muscles
https://youtu.be/_uagcEnKYi0

Figure 104. Single-legged deadlift - variant



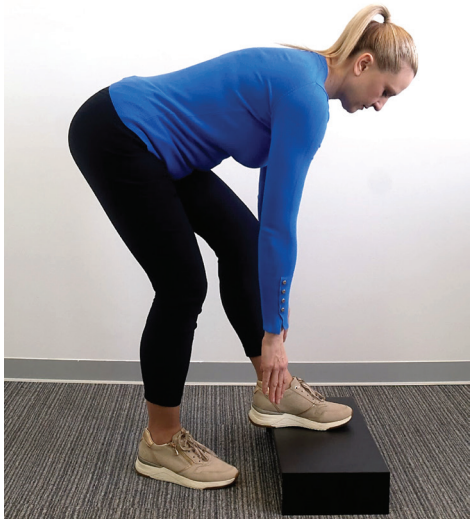
9. Single-legged deadlift - variant

PURPOSE: Functional mobility in hip joints, activation of the hamstrings and gluteal muscles, intermuscular coordination.

DESCRIPTION: From a standing position, raise one leg to an elevated surface. Flex the torso forward, pushing the hips backwards. The back is straight and the movement simultaneously takes place at the joints of the hips and knees. The lower legs remain vertical and motionless. The shoulders do the outer rotation, the shoulder blades tend to connect, and the palms and forearms turn inward. There are 10 repetitions.

Link and QR code for accessing the video clip 9. Single-legged deadlift - variant
https://youtu.be/N5UTMDRQtzQ

Figure 105. Stretching the hamstring muscles



10. Stretching the hamstring muscles

PURPOSE: Stretching the hamstring muscles.

DESCRIPTION: From a standing position, raise one leg. Flex the torso forward. The flexion occurs simultaneously in the joints of the hips and knees. We push the hips back to the feeling of slight stretching of the muscles of backs of thighs. The back is straight. The lower legs remain vertical and motionless. We hold the stretched position for 10 seconds for each leg.

Link and QR code for accessing the video clip 10. Stretching the hamstring muscles
https://youtu.be/Aksga9Sfggg

Figure 106. Lifts onto the front of the foot and onto the heel

11. Lifts onto the front of the foot and onto the heel

PURPOSE: activation of the muscles of the front and back of the lower legs, intermuscular coordination.

DESCRIPTION: From the starting position, raise yourself onto the front of the foot. Return to the starting position and lift the front of the foot off the floor. There are 10 repetitions.

Link and QR code for accessing the video clip 11. Lifts onto the front of the foot and onto the heel

https://youtu.be/2Wm7NI2-QBs

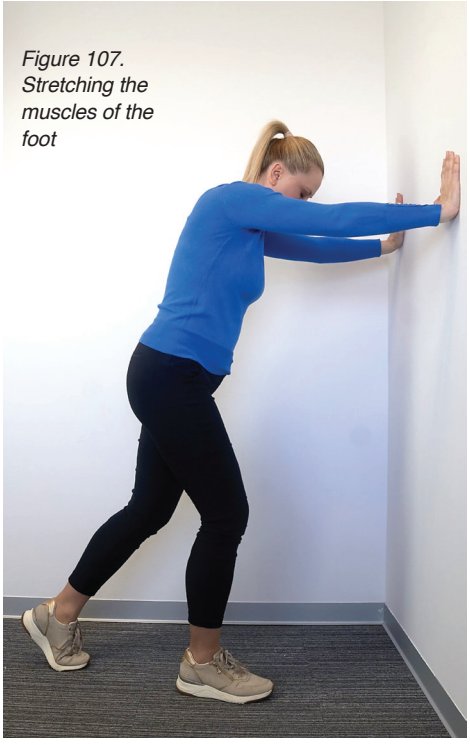


Figure 107. Stretching the muscles of the foot

12. Stretching the muscles of the foot

PURPOSE: Stretching the muscles of the foot.

DESCRIPTION: From a standing position, put your hands on the wall. One leg is in front and the other is behind. Perform a flexion of the foot as shown in the picture. We will feel the stretching of the muscles of the foot. Hold the position until there is a slight sensation of stretching in the muscles of the foot. We repeat and put the leg that was behind in front and the other one behind.

Link and QR code for accessing the video clip 12. Stretching the muscles of the foot

https://youtu.be/lWkK1rx2Kuc

Figure 108. Unilateral leg lifts with palms joined together

13. Unilateral leg lifts with palms joined together

PURPOSE: Activation of chest and shoulder muscles, hip flexor muscles and tibialis anterior muscle, stabilisation of ankle joints, knees, hips and lumbar spine, mobility of the thoracic spine, intermuscular coordination.

DESCRIPTION: In the starting position, place palms together. From the starting position, lift your hands to the level of the face while continuously pressing the palms. Simultaneously, with lifting the arms and pressing the palms, perform alternating lifts of one leg and the other. The foot of the raised leg should be horizontal to the ground. There are 10 lifts of hands and legs together.

Link and QR code for accessing the video clip 13. Unilateral leg lifts with palms joined together
https://youtu.be/hGcC7mD2Q7o

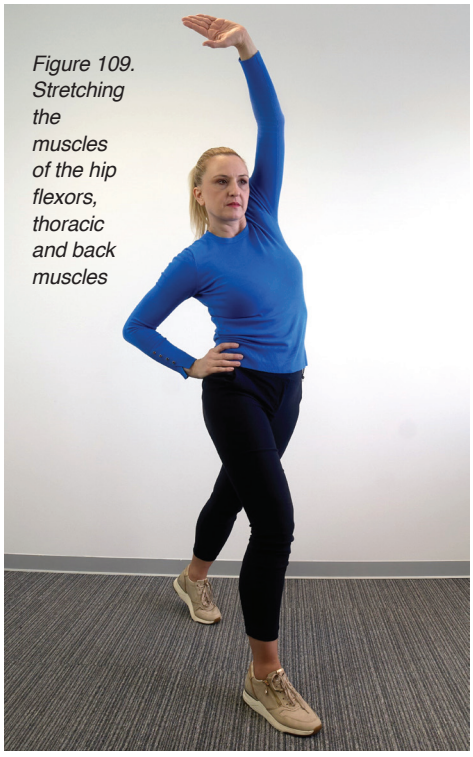


Figure 109. Stretching the muscles of the hip flexors, thoracic and back muscles

14. Stretching the muscles of the hip flexors, thoracic and back muscles

PURPOSE: Stretching the hip flexors, thoracic and back muscles.

DESCRIPTION: From a standing position, we take a step forward, hands on hips. We gently push the hips forward to the sensation of slight stretching of the flexor muscles in the hip joint. We raise the arm of the leg that is behind and stretch the sides of the trunk. Hold the end position for 10 seconds. Repeat with the changed position of the legs.

Link and QR code for accessing the video clip 14. Stretching the muscles of the hip flexors, thoracic and back muscles
https://youtu.be/7xk0ZTJIJqw

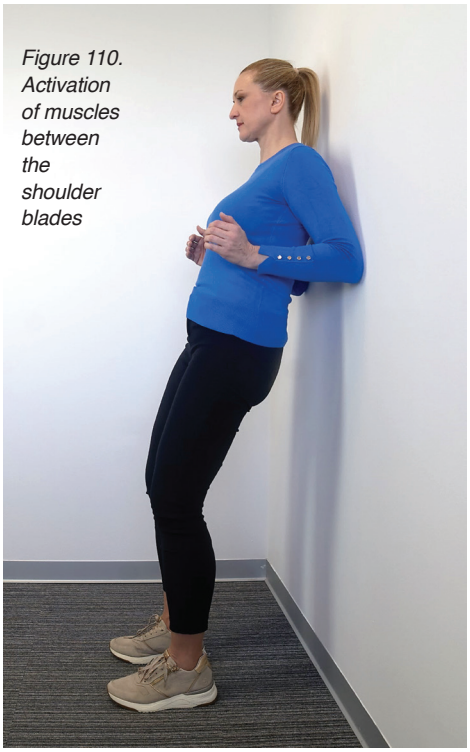


Figure 110. Activation of muscles between the shoulder blades

15. Activation of muscles between the shoulder blades

PURPOSE: Activation of the muscles of the shoulder blades, activation of the muscles of the trunk.

DESCRIPTION: We stand in front of a wall, one foot apart from it. Lean against the wall flexing the elbows. With the help of the upper arms and the shoulders, we lift the trunk and body away from the wall. The exercise is done in 10 repetitions.

Link and QR code for accessing the video clip 15. Activation of muscles between the shoulder blades

https://youtu.be/J7nfNV64DDg

Figure 111. Stretching the pectoral muscles

16. Stretching the pectoral muscles

PURPOSE: Static stretching of the pectoral muscles.

DESCRIPTION: Stand against a wall, door, or other stable object and place your hands as shown in the picture until a slight stretch is felt. Hold each side for 10 seconds.

Link and QR code for accessing the video clip 16. Stretching the pectoral muscles

https://youtu.be/JqMQ5VlPKWo

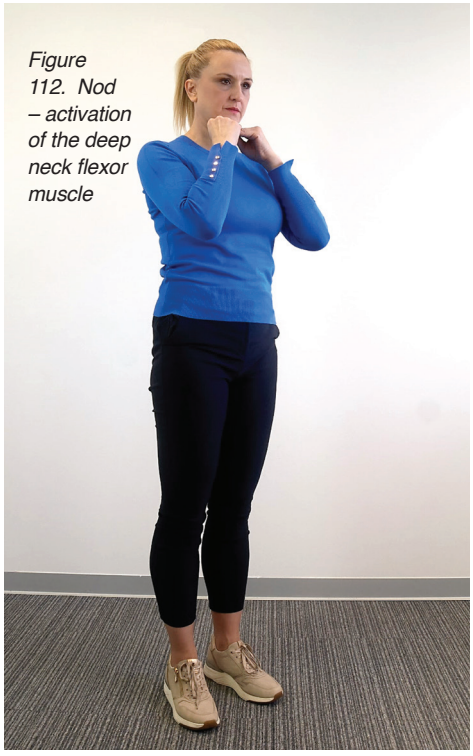


Figure 112. Nod – activation of the deep neck flexor muscle

17. Nodding – activation of the deep neck flexor muscle

PURPOSE: Activation of the deep neck flexor muscle.

DESCRIPTION: From the starting position in which the head is back and the chin is directed toward the chest, we put our hands under the chin. The task is to "nod affirmatively", and the palms offer resistance. Do 10 repetitions.

NOTE: Do not work with extreme amplitude of movement.

Link and QR code for accessing the video clip 17. Nodding – activation of the deep neck flexor muscle
https://youtu.be/PNuikfq0RUE

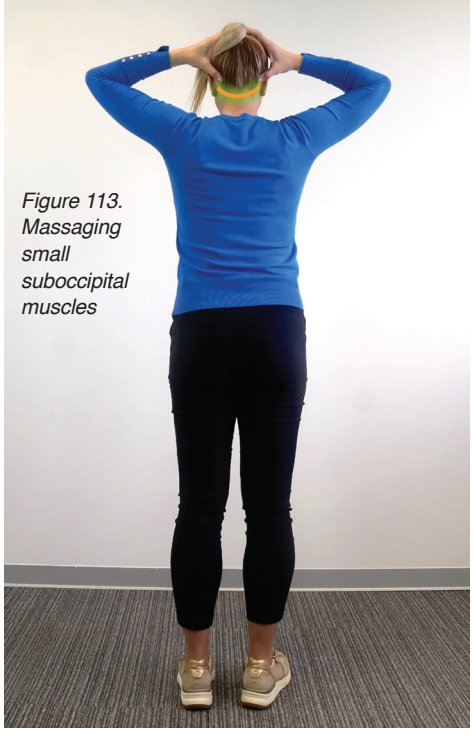


Figure 113. Massaging small suboccipital muscles

18. Massaging small suboccipital muscles

PURPOSE: Static stretching of small suboccipital muscles.

DESCRIPTION: From the position where the head is back, the chin is directed toward the chest and hands are behind the head, we do a light massage of the muscles that connect the skull with the first and second cervical vertebrae. Massage for 10 seconds.

Link and QR code for accessing the video clip 18. Massaging small suboccipital muscles
https://youtu.be/5SA7BWXuypM

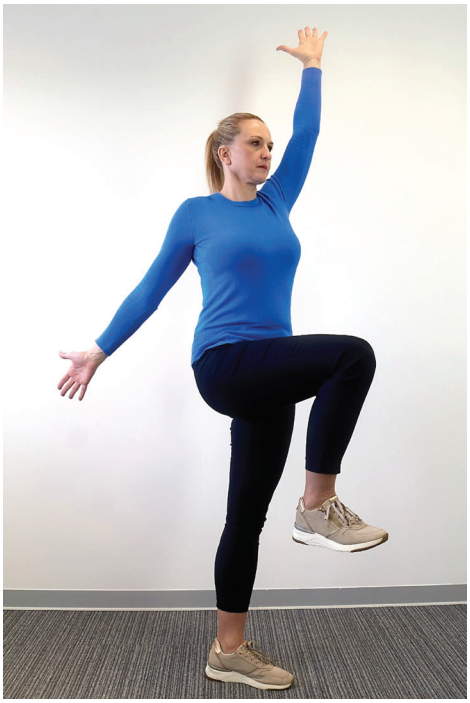


Figure 114. Opposite hand and leg

19. Opposite hand and leg

PURPOSE: Activation of the muscles in charge of lifting the foot, activation of the hip joint flexors, stabilization of the ankle, knee, hip and lumbar joints of the spine, mobility of the thoracic part of the spine, decompression of the spine, centring of the body, mobility of the shoulders, stretching of the pectoral muscle and muscles of the front shoulder, stretching of the shortened muscles of the forearm and the inner side of the upper arm, intermuscular coordination, etc.

DESCRIPTION: We alternately lift one leg and then the other, and at the same time lift the opposite arm. Do all 10 repetitions.

Link and QR code for accessing the video clip 19. Opposite hand and leg
https://youtu.be/7vu2SQui2pw

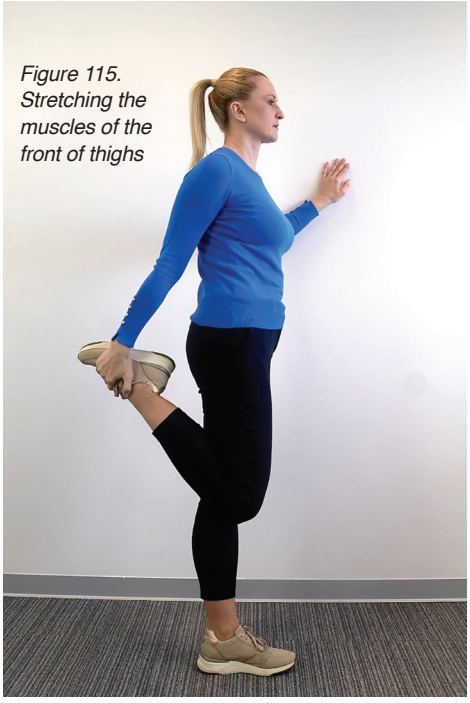


Figure 115. Stretching the muscles of the front of thighs

20. Stretching the muscles of the front of thighs

PURPOSE: Stretching the muscles of the front of thighs.

DESCRIPTION: From a standing position we hold on to a wall or some other stable object. With the left hand grasp the foot of the left leg, as shown in the picture. Try to bring the knee of the left leg closer to the knee of the right leg. Hold each leg for 10 seconds.

NOTE: When performing this exercise, the body may be slightly tilted forward. There should be no buckling of the lower back.

Link and QR code for accessing the video clip 20. Stretching the muscles of the front of thighs
https://youtu.be/sYh7ClxUCrA

4.3. The best exercise in the world for back pain

People often tell me and ask "My back hurts, can you recommend some exercise for my back! What's the best exercise for your back?" The best exercise for the back is to move correctly daily. But if I can recommend only one exercise to any of the administrative workers, then it would be this exercise: **opposite arm and leg**. It is the penultimate exercise in our advanced exercise programme.

Opposite arm and leg is perhaps the best exercise in the world for any administrative worker. It is an exercise that "forces" the pelvis and lumbar part of the spine, hips, knees, and shoulders to be in a neutral position, i.e., in as neutral position as possible. The compression is centred, i.e. aimed at the central parts of the trunk vertebrae, thus achieving evenly distributed pressure force on the intervertebral discs. This directly affects the decompression of the spine in relation to the relaxed position of the body during standing.

Exercise directly affects joint stabilisation, balance, intermuscular coordination, muscular endurance, and optimizing the critical points of mobility of our locomotor system. This exercise forces the muscles to perform the functions for which they were created.

The exercise stretches the shortened pectoral muscles, the front shoulder, the shortened muscles of the inner side muscles of the upper arms and forearms as well as the palm. It also activates muscles around the shoulder blades.

Figure 116. Opposite arm and leg

With this exercise, the thoracic part of the spine straightens and rotates around its axis, and flexion and inability to rotate around its axis are the biggest problems of the thoracic part of the spine and the frequent causes of problems with the cervical part of the spine.

Muscular atrophy and inactivity of the flexor muscles in the hip joint and the muscles in charge of lifting the foot are the reasons for insufficient lifting of the legs from the floor, which is one of the most important causes of fall in elderly people when walking or climbing stairs. This exercise has a targeted effect on the activation of flexor muscle in the hip joint and the muscles in charge of lifting the foot, which directly affects the prevention of possible falls and injuries to administrative workers in the future.

Also, if you do not get to do the suggested exercise programme during the day, then at least do this exercise. I would say "hundred a day for a healthy life." Anytime in the day when you feel the need to move, do at least this exercise, do it as many times as you can, and in an hour or two do a few repetitions again.

5. FREQUENTLY ASKED QUESTIONS

Will correct movement relieve my back pain?

If the cause of pain was mechanical damage caused by incorrect posture and movement, then consistent correct movement is likely to eliminate the pain, depending on the amount of mechanical damage and changes that we have inflicted on our bones, joints, muscles, tendons, ligaments, etc. Our body relieves mechanical damage with its ability to regenerate, but so do doctors. Doctors reduce pain with various types of therapies or surgeries, eliminate or alleviate the consequences of nonphysiological ageing and incorrect movement, but we must also do what is in our power. It is up to us to prevent the progression of the mechanical damage that our body has suffered for years with correct movement.

Expensive cream or correct movement?

An expensive cream may solve the consequences, but correct movement solves one of the causes of neck or back problems. You decide what to use. Perhaps both. Not even the best medical treatment or exercise programme in the world will completely solve our neck or back problems unless we strive to establish a correct pattern of movement.

Is this approach to treating back pain the best?

This approach to solving problems that we have with the neck, back, or some other part of the body is one of the indispensable measures of pain prevention. The only real approach to solving the problem is a multidisciplinary approach. This means that we need to listen to the instructions that come from the field of medicine, ergonomics, occupational health and safety, but also from the field of OCCUPATIONAL KINESIOLOGY.

Does this mean that if I start moving correctly, I no longer have to go to the doctor if something hurts?

No, of course, it does not mean that if something starts hurting, we do not have to go to the doctor. It is quite clear that when something hurts, we should go to the doctor.

Does this mean that if I want to avoid low back pain, I must never bend my back again?

No, of course, that does not mean we should never bend our backs again. This means that our spine should not be bent when performing daily tasks. This specifically means that we should not bend our backs in 95% of cases when we lower the trunk. Whether it is 95% or 98% of situations it is difficult to say, but it is known with certainty that bending the back and other mechanisms of injury must not dominate our movement, neither in static nor dynamic situations.

Does this mean that if I move correctly and apply this exercise programme daily, I no longer have to exercise?

No, of course not. The fact that from now on we will move correctly and do this exercise programme does not mean that we do not need to think about additional forms of exercise, for example, swimming, walking, going to the gym, etc. Exercise is carried out for a number of reasons. Exercise affects strength, power, endurance, and has an impact on cardiovascular health, etc. This manual talks about our daily posture and the way we perform daily work tasks. The health of our spine and other joints is a priority, and the proposed exercise programme is aimed at facilitating the achievement of correct posture. This manual discusses how correct ways of moving and working daily are a prerequisite to participate in other physical activities. In other words, the amount of exercise does not necessarily affect our health if we forget about the quality of movement. This manual is about philosophy 23:1. Philosophy 23:1 refers to the fact that 1 hour of correct physical activity per day is very important, but it is not enough if for the remaining 23 hours we have bad posture, sit incorrectly, lift and lower loads incorrectly. The point is not in that hour of the day that we exercise, but in the remaining 23 hours. When we exercise, we will have an instructor for that one hour of practise, and you are currently holding the instructor for the other 23 hours.

Who should I contact if something in this manual is not clear to me?

If something is not clear to you, you can contact masters of kinesiology, occupational safety experts, doctors, experts in the field of ergonomics and other experts, or the author of this manual Josipa Nakić, PhD, at the e-mail address occupationalkinesiology2025@gmail.com**.**

6. RESULTS OF RESEARCH IN THE FIELD OF OCCUPATIONAL KINESIOLOGY OF ADMINISTRATIVE WORKERS

Manual OCCUPATIONAL KINESIOLOGY - *Correct posture and movement habits and exercises with the aim of preserving the health of the musculoskeletal system of administrative workers* is based on the results of scientific research OCCUPATIONAL KINESIOLOGY- *Connection of posture and movement habits and symptoms of musculoskeletal disorders of administrative workers*, which was implemented as part of the project Development of E-learning systems, management and monitoring of occupational health and safety within the European Social Fund.

The survey was conducted on 1,307 administrative workers employed in Croatia during November 2021. The purpose of the study was to determine the relationship between work posture of administrative workers and the prevalence of MSDs symptoms. Administrative workers in Croatia who have bad work posture on a daily basis are statistically significantly more likely to have musculoskeletal disorder symptoms in the lower back, neck, shoulders, upper back, wrists / arms, hips / thighs, and knees compared to those subjects who do not have bad work posture. The results of the study showed that administrative workers in Croatia during the previous 12 months had the highest symptoms of musculoskeletal disorders in the lower back area (71.53%) and neck (69.93%), and in the shoulder area (59.83%) and upper back (56.85%). Based on the results of the research, it is assumed that incorrect mechanics of movement and work in administrative workers on average increase the risk of symptoms of musculoskeletal disorders by 3 times.

People who have symptoms of musculoskeletal disorders in the lower back area should especially pay attention to the following subchapters:

1. Distribution of body mass during sitting (3.2)
2. Positions and body movements when using a mobile phone from a sitting position (3.16)
3. Positions and movements of the lumbar and thoracic spine when retrieving while sitting (3.4)
4. Positions and movements of the lumbar and thoracic spine when sitting (3.3)
5. Position of arms and legs when sitting informally (3.15)
6. Squat and its variants during lifting objects from the floor (3.19)
7. Deadlift and its variants while lifting objects from the floor (3.20)
8. Positions and body movements when using mobile phones from a standing position (3.17)
9. Movements of the lumbar and thoracic spine when leaning over the table while standing (3.18)
10. Rotation and flexion of the lumbar spine while sitting (3.7)

People who have symptoms of musculoskeletal disorders in the neck area should especially pay attention to the subchapters:

1. Positions and movements of the lumbar and thoracic spine when sitting (3.3)
2. Distribution of body mass during sitting (3.2)
3. Positions and movements of the lumbar and thoracic spine when retrieving while sitting (3.4)
4. Lateral tilts of the head and cervical spine (3.11)
5. Position of arms and legs when sitting informally (3.15)
6. Positions and body movements when using mobile phones from a standing position (3.17)
7. Movements of the lumbar and thoracic spine when leaning over the table while standing (3.18)
8. Rotation and flexion of the lumbar spine while sitting (3.7)
9. Rotation of the lumbar spine around its axis while sitting (3.5)
10. Positions and body movements when using a mobile phone from a sitting position (3.16)
11. Squat and its variants during lifting objects from the floor (3.19)
12. Deadlift and its variants while lifting objects from the floor (3.20)

People who have symptoms of musculoskeletal disorders in the shoulder area should especially pay attention to the subchapters:

1. Positions and movements of the lumbar and thoracic spine when sitting (3.3)
2. Positions and movements of the lumbar and thoracic spine when retrieving while sitting (3.4)
3. Distribution of body mass during sitting (3.2)
4. Lateral tilts of the head and cervical spine (3.11)
5. Position of arms and legs when sitting informally (3.15)
6. Positions and body movements when using a mobile phone from a sitting position (3.16)
7. Positions and body movements when using mobile phones from a standing position (3.17)
8. Movements of the lumbar and thoracic spine when leaning over the table while standing (3.18)
9. Rotation and flexion of the lumbar spine while sitting (3.7)
10. Rotation of the lumbar spine around its axis while sitting (3.5)
11. Squat and its variants during lifting objects from the floor (3.19)
12. Deadlift and its variants while lifting objects from the floor (3.20)

People who have symptoms of musculoskeletal disorders in the upper back area should especially pay attention to the subchapters:

1. Positions and movements of the lumbar and thoracic spine when sitting (3.3)
2. Positions and movements of the lumbar and thoracic spine when retrieving while sitting (3.4)
3. Distribution of body mass during sitting (3.2)
4. Rotation and flexion of the lumbar spine while sitting (3.7)
5. Position of arms and legs when sitting informally (3.15)
6. Positions and body movements when using mobile phones from a standing position (3.17)
7. Movements of the lumbar and thoracic spine when leaning over the table while standing (3.18)
8. Squat and its variants during lifting objects from the floor (3.19)
9. Deadlift and its variants while lifting objects from the floor (3.20)
10. Positions and body movements when using a mobile phone from a sitting position (3.16)
11. Lateral tilts of the head and cervical spine (3.11)
12. Rotation of the lumbar spine around its axis while sitting (3.5)

The results of the research showed that the incorrect mechanics of movement and work in administrative workers on average increase the risk of experiencing symptoms of musculoskeletal disorders by more than 3 times. This points to the need to introduce systematic education of administrative workers about the correct and safe ways of working with the aim of reducing the prevalence of symptoms of musculoskeletal disorders and the problems and consequences they bring.

7. CONCLUSION

The natural ageing process, in combination with the incorrect mechanics of movement, is a factor that strongly influences the emergence and progression of musculoskeletal problems of administrative workers. Correct postural movement habits have a positive effect on the prevention of overstrain syndrome, degenerative changes, painful conditions, reduction of the likelihood of restoring old painful conditions, and generally preserving and improving physical health.

Things we do every day have the biggest impact on our health . Exercise is extremely important, but it is not enough if we do not adhere to the basics of correct posture. Likewise, even the best medical treatments in the world will not completely solve our musculoskeletal problems if we do not stop damaging our bones, joints, muscles, and tendons and establish the right patterns of movement.

Correct movement patterns and correct daily movements should become our lifestyle, a new form of exercise, the primary form of fitness.

If you decide to move correctly, this will be one of the most important decisions in your life. This is something you do for yourself, for your health, for the health of your spine, once and for all.

Neither ageing nor our work should necessarily be associated with pain and disease. At this time, as you study these materials, it is the right time for a change, the right time to take the health of your spine into your hands.

The purpose of this manual is easy accessibility and intelligibility of key information on correct ways of sitting and working, as well as to present some basic exercises to correct the posture and give pain relief to administrative workers in Croatia.

The most important message from the author of this manual is:

Our spine, back, neck, and shoulders do not hurt primarily because we are sitting, they hurt, in most cases, because we are sitting incorrectly!

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About the Author:

Josipa Nakić, PhD, is the founder and promoter of the field of occupational kinesiology in Croatia. Support for the development of occupational kinesiology was provided in 2019 by the Faculty of Kinesiology of the University of Zagreb, the Croatian Institute of Public Health, and the Andrija Štampar School of Public Health of the School of Medicine of the University of Zagreb, and in 2022 by the Ministry of Health (Croatia), the Croatian Institute of Public Health, and the Croatian Neurosurgical Society.

She was awarded recognition in 2023 by the Croatian scientific-professional journal "Sigurnost" for her contributions to occupational safety. In 2024, she also received an award from the Croatian Ministry of Labour, Pension System, Family, and Social Policy for her achievements in the field of occupational health and safety, as well as for her efforts in advancing the occupational safety system.

She is an active presenter and invited lecturer at numerous domestic and international conferences, seminars, and educational workshops. Having managed five projects, authored ten manuals, and published numerous scientific and professional papers in the field of occupational kinesiology, her work focuses on the primary prevention of musculoskeletal disorders associated with statodynamic efforts in the workplace.

MINISTARSTVO RADA, MIROVINSKOGA SUSTAVA, OBITELJI I SOCIJALNE POLITIKE

Uprava za rad i zaštitu na radu

Occupational Kinesiology – Correct Posture and Movement Habits and Exercises with the Aim of Preserving the Health of the Musculoskeletal System of Administrative Workers

Here is the answer to the following questions: What can I do for my workers to stop them injuring their spine? What can I do for my students to prevent the onset and progression of back, neck pain, etc., in time, while they are still young? What can I do for myself, my neck, and back to finally stop hurting? Answer: Eliminate the external mechanical cause of pain. How: Automated correct daily movement. Correct daily movement and work are the first steps in dealing with back and neck pain once and for all.

The message of the manual is intended for everyone who spends more and more time sitting each day and moving less, for those whose neck and back problems are primarily caused by prolonged sitting and working at a computer, and for anyone who wants to learn how to preserve the health of their musculoskeletal system for the future.

With the help of instructions and educational video clips from this manual, you will easily master the basics of correct movement and prevent further progression of mechanical damage to the musculoskeletal system, and thus pain, dull pain, discomfort, tension, tingling, burning, etc. In the manual you will also find a programme of exercises that is primarily aimed at ensuring the prerequisites for correct daily sitting and movement in the office and thus at the prevention of musculoskeletal disorders associated with statodinamic efforts at workplace.

The most common correct and incorrect types of posture, as well as exercises, are described textually, graphically, and by video. By activating links and/or scanning QR codes on a mobile phone, it is possible to instantly display educational video clips.

Stop the progression of work related overstrain and damage to anatomical structures, allow your body to fight for its own health.

Correct daily sitting, working at the computer and moving is the primary form of fitness and a prerequisite for a healthy spine of administrative workers!

Author

Josipa Nakić, PhD.

Europska unija "Zajedno do fondova EU"

EUROPSKI STRUKTURNI I INVESTICIJSKI FONDOVI

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