



with the aim of preventing back pain



ANGELIKA BRNADA, DIRECTOR OF THE SD&HSE

In collaboration with Assist. Prof. Josipa Nakić, PhD, from the University of Zagreb, Faculty of Kinesiology, as a part of the ZDRAVLJE+ (HEALTH+) project, we have launched the "MOVEMENTS THAT MAKE CHANGES" campaign. Our intention is to inform our employees on the correct performance of movements and correct movement in general, and to create the habit of their everyday application, both at the workplace and in everyday life.

For this campaign, we have selected workplaces where employees work on computers, manually handle different loads or use personal or freight vehicles. An overview of correct and incorrect movements in general has been presented in a collection of five brochures that are the basis for the practical part of trainings for employees and occupational safety specialists under the mentorship of Assist. Prof. Josipa Nakić, PhD. The aforementioned training will be used as a model for further informing the employees by our occupational health and safety experts.

Developing the awareness and competence of INA Group employees for correct performance of movements and correct movement in general, in addition to contributing to health benefits and working capacity, as well as increasing the employee satisfaction at the workplace, is also aimed at reducing the number of workrelated injuries, the frequency and duration of sick leave and employee fluctuations.

We invite all INA Group employees to actively engage in this campaign and thereby personally contribute to the creation of **"Healthy Workplaces for All Ages".**





ASSIST. PROF. JOSIPA NAKIĆ, PHD



Spine problems and back pain have become a global problem today. By inertia, the culprit for our pain are most often activities such as long-term sitting or excessive physical work. However, the real culprit for such health problems is not the activity itself, but the manner of performing certain movements, as well as posture during a certain activity.

Movement mechanics have the most significant effect on spinal health. Incorrect movement mechanics during our performance of everyday activities significantly contribute to the accumulation of mechanical damages, and consequently the onset of pain.

The natural aging process combined with incorrect movement mechanics are elements that strongly affect the progression of mechanical damage to the spine. Natural aging mechanisms can hardly be affected. However, we can always create the habit of personal correction and, with the everyday application of correct movement mechanics, positively affect the health of our spine.

This campaign aims to emphasize the importance of avoiding the basic mechanisms of the occurrence of injuries and the importance of the application of correct movement mechanics, with the aim of preserving the health of the spine both in the workplace and in everyday life.





INTRODUCTION

"EXERCISING AT THE OFFICE WITH THE AIM OF PREVENTING BACK PAIN" is a program designed for everyone performing office jobs every day and experiencing great static strain on a daily basis. The consequences of long-term static sitting positions, and in particular the incorrect ones, can be: muscular atrophy, strained and/or shortened ligaments, tendons and muscles, loss of water from the intervertebral disks and their thinning and displacement, damage to the cartilage of small joints, changes in the relationship between the vertebrae, damage to the sacroiliac joint, reduced flexibility, occurrence of osteophytes, and the like.

All the above deformations can lead to the occurrence of various degenerative diseases and back pain.

In order to prevent the occurrence and progression of back pain, we must follow the following four rules:

- Move correctly in everyday life
- Correct sitting position
- Exercise regularly
- Correct sleeping position

The contents of this exercise program relate to the biggest problems of the modern sedentary lifestyle, i.e. bent back, lowered shoulders, and forward head protrusion.

This exercise program is functional and has a direct impact on correct posture and correct movement exercise habits.





exercising at the office

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EXERCISE PROGRAM CHARACTERISTICS



If we divided the classical training system into phases, it would consist of the following phases:

1) Stability and mobility

2) Strength

3) Power.

The strength and power are phases mostly applied when working with athletes. Our exercise program deals with the first phase, i.e. stability and mobility. Stability consists of: joint stabilization, balance, working on intramuscular coordination and muscular endurance. After stability exercises, stretching exercises are performed with the aim of achieving optimal mobility and flexibility, i.e. relief and relaxation.



For a healthy spine of an office worker, it is not important how much weight he/she can manually carry (strength) nor how fast he/she can manually lift a heavy load (power).

Exercise program for healthy spines of office workers has to be aimed at providing preconditions for 8 hours of correct sitting position, correct movement, facilitating correct posture and reducing the likelihood of falling and injuries as much as possible.

Stability is most endangered during years of static office work.

Our exercise program consists of two basic sets of exercises. The first sets of exercises are stability exercises, while the second sets are mobility exercises, i.e. stretching exercises.



2.1 STABILITY

The stability program consists of beginner and advanced level. The beginner level is performed without equipment. At the advanced level, some exercises are performed with an elastic rubber band. Also, some exercises are the same for the beginner and advanced level. After a certain period of time (about a month), each person switches from unloaded exercises to exercises with an elastic rubber band, in accordance with their individual abilities.

2.1.1 INITIAL AND BASIC POSITION IN STABILITY EXERCISES

All stability exercises begin with the initial position and continue through the basic position.



INITIAL POSITION

The initial position is the position in which the person stands in the neutral position of the pelvis and the spine with legs spread to the width of the hips.

BASIC POSITION

The basic position is the position in which the person performs unilateral flexion of the hip and knee joints from the standing position. The basic position is the position that "forces" the spine, and especially its lumbar part, to be in a neutral position, i.e. in the individually maximum possible neutral position. The compression is centered and optimized.

BASIC POSITION





2.2. MOBILITY - STRETCHING

After stabilization exercises, stretching exercises are performed. The stretching exercise program before us has an individualized approach. It takes the postural characteristics of the pelvis into account.

There are three basic postural characteristics of the pelvis:

- Anterior tilt,
- Posterior tilt,
- Neutral pelvic position.

Different stretching exercises of the central part of the body suit each of the above three postural characteristics.



NOTES

OFFICE AND YOUR OWN HOME

Stability and mobility exercises can be performed at the office and at your own home.

- The office when exercising at the office, we will perform one session of 10 stability exercises throughout the day. We perform the exercises when we feel the need to move. In this way we interrupt the continuity of static loads. After that, a session of stretching exercises is performed.
- At home when we are performing exercises at home, we will perform 3 to 5 sets of stability exercises per day. The last sets is followed by stretching exercises.
- A safe space has to be provided for exercising.

PAIN

If we feel uncomfortable pain at any moment, we have to stop exercising and contact our doctor. However, the pain we will probably feel is a pleasant pain caused by fatigue during exercise. Also, an untrained person can feel pain similar to muscle inflammation a day after exercising. This is a normal occurrence, i.e. a sign that we have activated muscles that have not been very active until now. The intensity of exercise then has to be reduced. It is recommended that the exercises be performed throughout the day, not necessarily all at once. The important thing is that we perform them, regardless of where - at the office or at home.





EXERCISE PROGRAM

4.1. STABILITY

Stability exercises are performed in a series. This means that exercise no. 1 is performed first, then exercise number 2, etc., up to exercise no. 10. The number of repetitions is 12 to 20, however, depending on our abilities, the number of repetitions may be smaller, for example, only 4 to 6 repetitions per exercise. The rest between exercises should last as long as the exercise. The break between series is two to five minutes.

At the beginning of exercising, for example for the first month, we only exercise at the beginner level. Later, we move on to an advanced level, at which some exercises are performed with rubber bands.





STABILITY EXERCISE 1 Basic position + arms overhead (shoulder flexion)

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

In the initial standing and basic position, we slowly raise our arms diagonally upwards. We raise our arms to the level we can without twitching. After that, we return to the initial standing position. The exercise is performed with alternating lifting of the legs (unilateral hip flexion). At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.





STABILITY EXERCISE 2 Basic position + arms overhead + forward bend (hip hinge)

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

Starting from the position of exercise one, we lower the core and arms as shown in the picture. We straighten up with exercise no. one and return to the initial standing position.

The exercise is performed with alternating lifting of the legs. At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.



STABILITY EXERCISE 3 Basic position + outer shoulder rotation

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

In the initial standing and basic position, we place upper arms next to the body, and the forearms straight in front of us. Starting from that position, we spread the forearms as shown in the picture, slowly and without twitching. After that, we return to the initial standing position.

The exercise is performed with alternating lifting of the legs. At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.



STABILITY EXERCISE 4 Basic position + outer shoulder rotation + forward bend

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

Starting from the position of exercise no. three, we lower the core as shown in the picture. We straighten up and return to the initial standing position.

The exercise is performed with alternating lifting of the legs. At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.





STABILITY EXERCISE 5 Basic position + arms backwards (shoulder extension)

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

In the initial standing and basic position, the arms are positioned next to the body. The task is to slightly push the arms behind the body simultaneously with alternating lifting of the leg, as shown in the picture. Return to the initial position.

At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.



STABILITY EXERCISE 6 Basic position + arms backwards + forward bend

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

Starting from the position of exercise five, we lower the core as shown in the picture. We straighten up and return to the initial standing position with arms placed next to our body.

At the beginner level, the exercise is performed without equipment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.



STABILITY EXERCISE 7 Basic position + rotation of the thoracic spine

BEGINNER LEVEL



DESCRIPTION OF THE STABILITY EXERCISE

In the initial standing and basic position, we place the arms at the shoulder level, as shown in the picture. The task is to rotate the core from that position to one side by applying the principle of opposite arm - opposite leg. Return to the initial position.

The exercise is performed with alternating lifting of the legs. At the beginner level, the exercise is performed without equip-ment, and at the advanced level, the exercise is performed with a rubber band, as shown in the picture.





STABILITY EXERCISE 8 Marching

BEGINNER LEVEL (on the full foot)



DESCRIPTION OF THE STABILITY EXERCISE

This exercise is called marching because it is similar to the marching of soldiers.

We alternately raise the opposite arm - opposite leg, as shown in the pictures.

At the beginner level, the exercise is performed on the full foot, and at the advanced level, we raise to our toes as shown in the pictures.

ADVANCED LEVEL (on toes)



STABILITY EXERCISE 9

Helicopter

STABILITY EXERCISE 10

Basic position + head backwards - chin to the chest



VRIJEDI ZA POČETNU I NAPREDNU RAZINU

DESCRIPTION OF THE STABILITY EXERCISE 9

From the final position of the previous exercise, i.e. marching, we lower the core. The exercise is performed alternately. This exercise is performed in the same manner at the beginner and advanced level.

DESCRIPTION OF THE STABILITY EXERCISE 10

In the initial standing and basic position, we slightly push the head backwards, while simultaneously placing the chin on the chest. During the exercise, we touch the chin with our hand only to be aware of the position of the head and the chin. We do not push the head with the hand.



4.2. STRETCHING EXERCISES

We hold each static stretching exercise position for as many seconds as we are old. We stretch to the limit of pain and without forcing. This is the so-called pleasant pain, a slight feeling of tension. The same number of series of stretching exercises is performed as the number of stabilization series, at least one series.

The stretching exercises are specially combined to act on those muscle groups that are usually shortened in office workers.

STRETCHING EXERCISE 1

Stretching the small extensor muscles of the head.



DESCRIPTION OF THE STRETCHING EXERCISE 1

Place hands overhead, as shown in the picture. Slightly push head backwards, while simultaneously placing the chin on the chest.

Note: Do not pull the head with the arm.

DESCRIPTION OF THE STRETCHING EXERCISE 2

From the standing or sitting position, we place the right arm over our head, as shown in the picture. The exercise is performed by slightly pushing the left arm downwards.

Note: Do not pull the head with the arm towards the shoulder!

VALID FOR THE BEGINNER AND ADVANCED LEVEL

STRETCHING EXERCISE 2

Stretching the muscles of the neck and upper back.





STRETCHING EXERCISE 3

Stretching the muscles of the lower part of the forearm.

STRETCHING EXERCISE 4

Stretching the muscles of the upper part of the forearm.

VALID FOR THE BEGINNER AND ADVANCED LEVEL



DESCRIPTION OF THE STRETCHING EXERCISE 3

From the standing or sitting position, we stretch out the arms in front of us. With the left arm, we stretch the muscles of the lower side of the right forearm, as shown in the picture. Hold the end position. Switch arms.

DESCRIPTION OF THE STRETCHING EXERCISE 4

From the standing or sitting position, we stretch out our arms in front of us. With the left arm, we stretch the muscles of the upper side of the right forearm, as shown in the picture. Hold the end position. Switch arms.



STRETCHING EXERCISE 5

Stretching the chest muscles and the muscles of the inner upper arm

STRETCHING EXERCISE 6

Stretching the middle part of the back

VALID FOR THE BEGINNER AND ADVANCED LEVEL



DESCRIPTION OF THE STRETCHING EXERCISE 5

In the sitting or standing position, slightly push the arms behind the body. The palms are facing down. Make sure your shoulders do not move upwards. Hold the end position.

DESCRIPTION OF THE STRETCHING EXERCISE 6

In the sitting or standing position, grab the left arm elbow with the right hand and slightly pull towards the middle. Hold the end position. The exercise is performed on both sides.





STRETCHING EXERCISE 7.1 Stretching the flexor muscle in the hip joint.

VALID FOR THE BEGINNER AND ADVANCED LEVEL

This stretching exercise is performed only by persons that have **ANTERIOR PELVIC TILT**



DESCRIPTION OF THE STRETCHING EXERCISE 7.1

In the standing position, we make a step forward. The hands are placed on the hips. We slightly push the hips forward until we feel slight stretching of the flexor muscle in the hip joint. Hold the end position. Switch the legs.



STRETCHING EXERCISE 7.2 Stretching the gluteal muscles

VALID FOR THE BEGINNER AND ADVANCED LEVEL

This stretching exercise is performed only by persons that have **POSTERIOR PELVIC TILT**



DESCRIPTION OF THE STRETCHING EXERCISE 7.2

In the standing or sitting position, we place the right lover leg on the left lower leg. We slowly lower the core until we feel slight stretching of the gluteal muscles. Hold.

Note: When performing this exercise in the standing position, we have to hold onto a wall, table, or a different stable object.





STRETCHING EXERCISE 7.3 Stretching the flexor muscle in the hip joints and the gluteal muscles

VALID FOR THE BEGINNER AND ADVANCED LEVEL

Persons that have the **NORMAL NEUTRAL PELVIC POSITION** perform both stretching exercises



DESCRIPTION OF THE STRETCHING EXERCISE 7.3

See the previous description of stretching exercises for the flexor muscle in the hip joints and the gluteal muscles.





STRETCHING EXERCISE 8.1 Stretching the muscles of the front of the thigh (quadriceps)

VALID FOR THE BEGINNER AND ADVANCED LEVEL

This stretching exercise is performed only by persons that have **ANTERIOR PELVIC TILT**



DESCRIPTION OF THE STRETCHING EXERCISE 8.1

In the standing position, we hold onto a wall, table, or a different stable object. With the left hand, we grab the left leg foot, as shown in the picture. We try to approach the right leg knee with the left leg knee. Hold.

Note: When performing this exercise, the body can be in a slight forward bend. The curvature of the lower back must not increase.



STRETCHING EXERCISE 8.2 Stretching the back of the thigh (hamstrings)

VALID FOR THE BEGINNER AND ADVANCED LEVEL

This stretching exercise is performed only by persons that have **POSTERIOR PELVIC TILT**



DESCRIPTION OF THE STRETCHING EXERCISE 8.2

From the standing position, we slowly descent into a forward bend, as shown in the picture. The core has to be straight. The axis of rotation is in the hips. We stretch until we feel slight stretching of the muscles on the back of the thigh. Hold the end position.





STRETCHING EXERCISE 8.3 Stretching the muscles of the front and back of the thigh.

VALID FOR THE BEGINNER AND ADVANCED LEVEL

Persons that have the **NORMAL NEUTRAL PELVIC POSITION** perform both stretching exercises



DESCRIPTION OF THE STRETCHING EXERCISE 8.3

See the previous description of stretching exercises for the front and back of the thigh.





STRETCHING EXERCISE 9

Stretching the calf muscle and the Achilles tendon

STRETCHING EXERCISE 10

Stretching the foot muscles

VALID FOR THE BEGINNER AND ADVANCED LEVEL



DESCRIPTION OF THE STRETCHING EXERCISE 9

From the standing position, we place our hands on the wall. One leg is in the front, and the other is in the back. We make a slight bend in the knee of the leg that is in the back, in this case the right leg. The right foot must be on the floor. We stretch until we feel slight stretching of the calf muscle and the Achilles tendon. Note: This exercise is ideal for women who often wear high heels. Due to frequent walking in high heels, shortening of the calf muscle and the Achilles tendon occurs, so it is necessary to

DESCRIPTION OF THE STRETCHING EXERCISE 10

stretch them.

In the standing position, we place our hands on the wall. One leg is in the front, and the other is in the back. We bend the foot as shown in the picture. We will feel the stretching of the foot muscles. We hold the foot in the position where we feel a slight feeling of stretching of the foot muscles. Switch the legs.



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CONCLUSION

What we all know is that we do not want a doctor to tell us that degenerative changes have occurred in our spine, that they are the cause of our pain and that the pain will increase with time.

What we do not know is that these damages could be prevented, that we can still stop their progression and allow the body to try to regenerate itself.

With this exercise program, we will accustom our body to correct posture and learn how to alleviate muscular imbalance largely present in people who suffer from back pain by correct exercising.

Message from the author

By regular exercising, we ensure preconditions for excellent postural and movement habits, thus directly influencing the reduction of the risk of occurrence of various deformities and preventing back pain.



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