

Recommended Preparation for Selected Physical Activities



USING THE METHODOLOGY OF DYNAMIC NEUROMUSCULAR STABILIZATION

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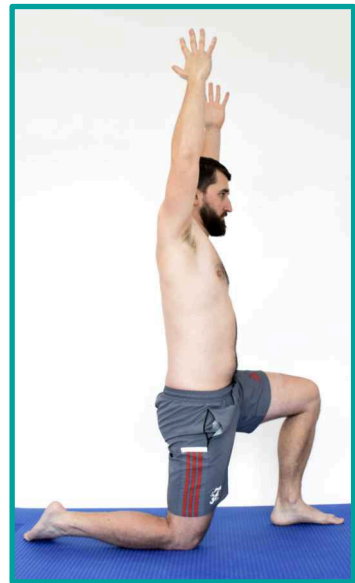
Lack of physical activity, or being sedentary, significantly increased during the COVID-19 pandemic, and a portion of the population has yet to return to sufficient levels of physical activity since then. This trend contributes to the global rise in health risks, making it essential to emphasize the importance of ensuring adequate physical activity in the general population across all age groups.

Movement is Life

It is time to change sedentary lifestyles. Physical activity helps maintain optimal body weight, improves cardiovascular fitness, and reduces the risk of lifestyle-related diseases. It also has a positive impact on mental health.

But how do we approach it correctly?

Recommendations are frequently given to move regularly and incorporate adequate physical activity into daily life. However, simply deciding to start exercising is not enough. Moving mindfully and preparing your body for the upcoming physical demands is crucial. Sudden transitions from inactivity to intensive exercise without sufficient preparation increase the risk of injury. Focusing on the quality of movement is essential to avoid pain and overloading joints or muscles.



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What Does Quality Movement Look Like?

Optimal movement begins with proper preparation, more specifically, the correct functioning of the postural system, which is responsible for maintaining a stable body position during any activity.

What Is the Postural System and Postural Training?

It is the way we stand, sit, or move. Postural function has a crucial impact on joint load and muscle function and, thus, on the risk of injury. If the trunk stabilizing system is dysfunctional (for example, due to weakened or overloaded muscles), it can lead to excessive strain on certain joints, ligaments, and muscles, resulting in pain and degenerative changes. Every athlete, whether professional or amateur, should remember that trunk stabilization is the foundation of functional limb movement. For example, in running, it is essential that the legs and arms not only perform the movement correctly but that the trunk remains stable, enabling efficient and economical athletic performance. At the same time, good stability protects joints against excessive impacts and shocks. In the case of an unstable trunk, pressure on the lower limb joints increases, which can lead to the overload of the knees, hips, or ankles.

Postural Training

Postural training focuses on improving movement patterns and preventing hypokinesia, i.e., a lack of active movement. The current trend of a sedentary lifestyle is a common cause of chronic pain, which can then cause difficulties even in performing daily activities, such as limiting household tasks. The objective of postural training is to restore body stability and strengthen key parts of the body, such as the pelvis, torso, and neck, which work together in every movement. During training, the focus is on the ideal postural stabilization technique, gradually shifting from static to dynamic stability. Training principles include, among others, avoiding exercises to the point of extreme fatigue and controlling breathing. Through postural training, we aim to build automatic movement patterns that can be used in everyday activities and sports. Postural training is not just about strengthening the body but also about the experience of movement and its return to natural form, which improves physical endurance and the range of movements we can perform. Ultimately, quality postural training enhances both the quality of life and athletic performance.

Essential Parameters of Movement: Quality, Frequency, Intensity, and Additional Recommendations

To exercise effectively, we must be able to "read our body," meaning we need to perceive movement and be able to correct mistakes during physical activity. At the same time, it is essential to maintain regularity and an appropriate level of physical activity. According to experts, adults should engage in at least 150 minutes of moderate-intensity physical activity per week, such as 30 minutes five times a week. Cardiovascular training, often referred to as "cardio," is a form of exercise aimed at improving endurance and strengthening the cardiovascular system, including the heart, blood vessels, and lungs. Cardio training increases heart rate and promotes better blood circulation, contributing to more effective oxygen delivery to muscles. Cardiovascular training improves physical fitness, helps burn fat, and positively impacts overall health. Typical forms of cardio training include running, cycling, swimming, brisk walking, rowing, or aerobic exercises. Cardio training should be combined with strength training. Strength training is a form of exercise aimed at developing muscle strength, size, and endurance through resistance, which can be body weight, various weights (dumbbells, kettlebells), resistance machines, or elastic bands. Strength training aims to gradually increase resistance or load, stimulating muscle fiber growth and strengthening skeletal muscles. Strength training brings many benefits, such as increased muscle mass, accelerated metabolism, improved bone density (which helps prevent osteoporosis), and better stability and coordination. Training may include various exercises such as squats, deadlifts, bench presses, or pull-ups and can be adapted to the individual needs and abilities of the exerciser. For all types of exercise, movement quality is crucial. Exercising less often but correctly is better than overloading the body with uncontrolled, intense activity. Attention should be given to exercise technique, proper breathing, and engaging stabilizing muscles. These principles should always be part of the training plan. Before any physical activity, preparing the body with dynamic warm-ups that activate muscles and joints is advisable. Don't forget to stretch at the end of the physical activity, which helps with recovery. Regular exercise, following the principles of quality postural stabilization, can improve athletic performance and extend the time we can engage in sports without an increased risk of injury. The following text outlines the principles of proper preparation for the most common physical activities of the general population.

Running and Walking

One of the first options to improve fitness and muscle mass can be brisk walking and various forms of running, depending on the individual's performance level. Those familiar with running in their youth and now, in middle or older, want to start with physical activity again. It will be easier to begin with this activity since the body “remembers” running. We recommend suitable footwear, such as running shoes. Modern Barefoot shoes are recommended only for more experienced athletes or after consulting a specialist. Especially after a long period without exercise, it is important to start gradually and allow a day of rest after training, at least for the first few weeks, so the body has time to adapt. You can vary the pace during the activity, alternating between fast and slow intervals. It's also good to include walking and running on varied terrain. Run faster uphill within your capacity, and slow down and rest when running downhill. Even if the activity is very strenuous, breathe only through your nose. Since walking and running primarily stress the lower half of the body, it is essential to include gradual warm-ups and specific preparation for these activities. Perform exercises slowly, doing 5 repetitions with a 3–10 second hold in each position. Do not exercise through pain. You may feel a stretch or activation in the targeted muscle group and pressure in the body's support segments. Here are some suitable exercises for preparation before everyday physical activities such as walking, running, cycling, and swimming. A green checkmark next to the image demonstrates correct execution, while a red cross indicates incorrect execution.

Stretching and Activation of the Pelvic Girdle Muscles

Stretching and activating muscles around the hips and pelvis is vital for proper function during walking and running. Press your right knee into the ground during the exercise as if preparing to push forward. Keep your spine straight, with your head extending out from your shoulders, forming a straight line with your spine. You should feel activation and a stretch in the front thigh and gluteal muscles of the front leg (right in the image), as well as activation in the abdominal muscles. Achieve this by shifting your weight onto both hands and the loaded (right) knee, initiating movement as if preparing to push forward. You are not actually moving forward; you are lengthening your body in a forward direction. Hold this activated position for 5–10 seconds. Then relax and repeat the exercise 3–5 times. Next, switch sides and train activation by supporting yourself on the left knee. Be sure to support yourself with the entire palms and all fingers pointing forward, ensuring your elbows are not bent but not fully extended ("locked"). Breathe evenly into your whole trunk and abdomen. Imagine you have an elastic band stretched around your chest and abdomen. As you inhale, you feel it expand in all directions. As you exhale, hold it in place so it does not collapse.



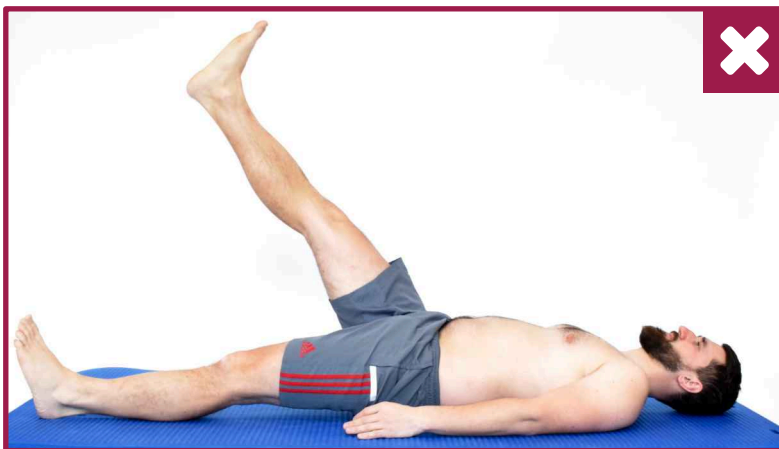
Stretching the Groin and Calf

In this exercise, start from the same initial position and follow the same principles as the previous exercise. Try to straighten the knee of the back leg. The back leg should rest on the toes, with the knee pressing upward. You should feel a stretch around the groin and calf of the back leg. Ensure your back does not arch and the pelvis does not tilt forward.



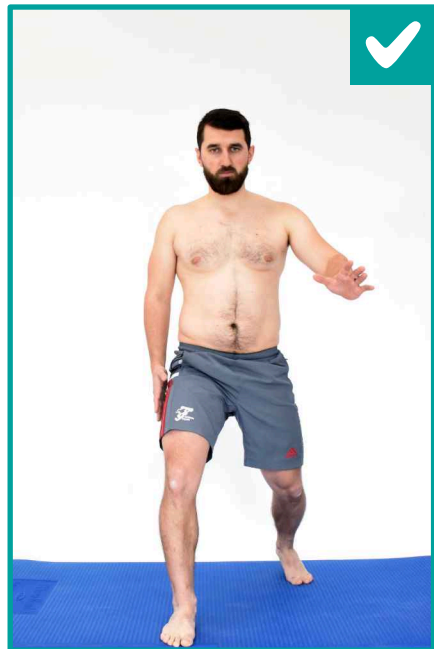
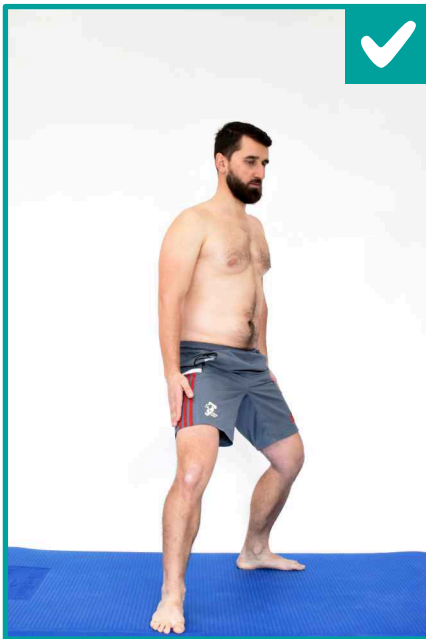
Stretching the Back of the Lower Limbs

Lie on your back without excessive arching in the lower back. The spine should remain in contact with the surface. Direct your breath into your abdomen in all directions. Imagine a stretchable band wrapped around your lower chest and abdomen, expanding evenly in all directions as you inhale. The right hip should be bent at approximately a 90-degree angle. Visualize pressing the heel of the raised leg (in the illustration, the right leg) toward the ceiling. You should feel a stretch in the right calf and the back of the thigh. Maintain the 90-degree angle at the hip joint while pressing the leg upward. Avoid errors such as straightening the knee without maintaining the 90-degree angle at the hip, lifting your lower back off the surface, or tilting your head back. Hold the position for 5–10 seconds, then relax for 5–10 seconds. Repeat the exercise 3–5 times and switch legs.

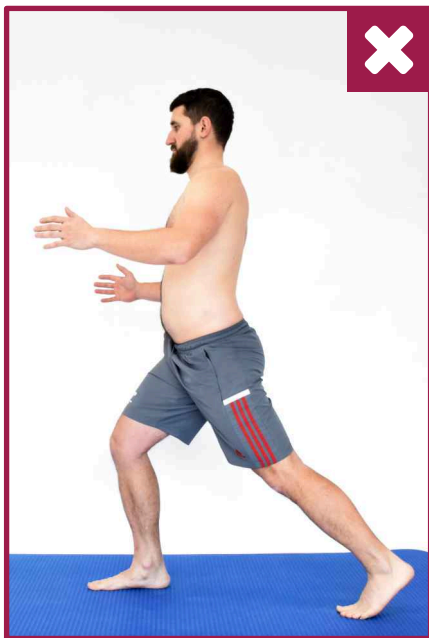
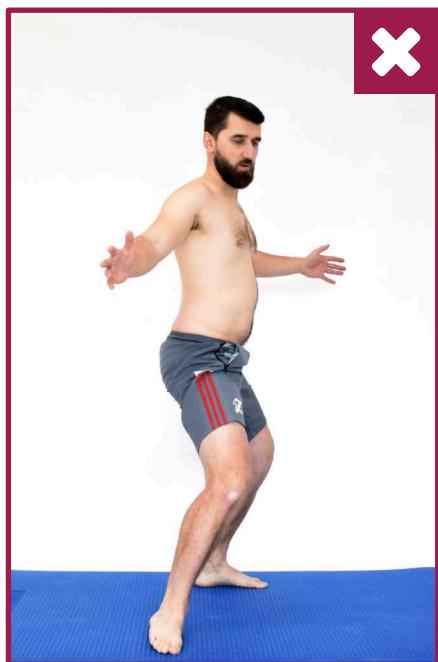


Stretching and Activation of Hip Joint Internal and External Rotators

The weight is primarily on the front leg. The sole of the front foot should be fully grounded. With a straight back, rotate the entire torso and rear leg around the hip of the front leg (in the illustration, the right hip) — the rear leg pivots on the toes. During forward pelvic rotation, you should feel a stretch in the gluteal muscles on the right side. During backward rotation, you should feel a stretch on the inner side of the right thigh. The torso remains upright without tilting to either side. Imagine the pelvis and torso rotating above the right hip as if on a pivot. Hold each end position, i.e., the phase of maximum forward and backward rotation, for at least 5 seconds, preferably 10. Repeat the forward and backward rotations 3–5 times, then switch legs.



An error occurs if the lumbar spine arches excessively during rotation, the front knee moves side to side, or the sole of the front foot is not fully grounded.

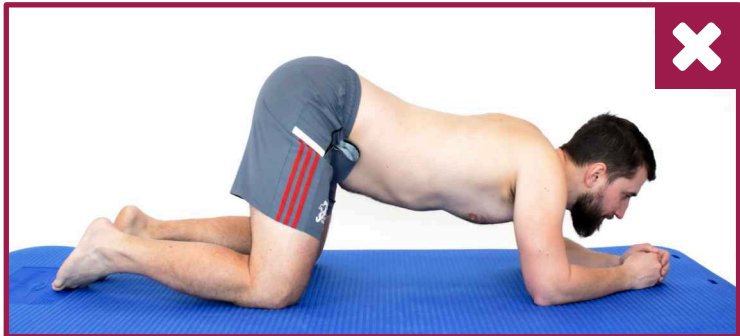
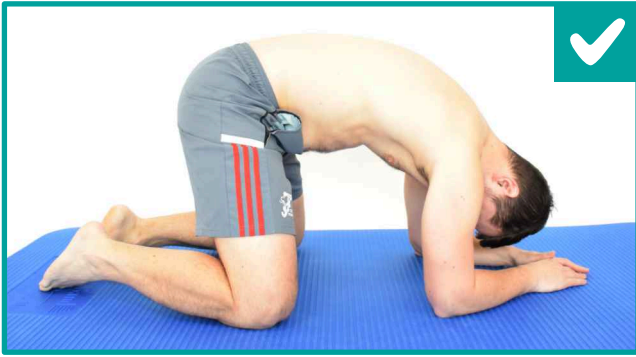


Cycling

Cycling or using a stationary bike is another suitable activity. The movement is simple and controlled, without jolts or abrupt changes in direction. It is well-tolerated even by individuals with degenerative changes, injuries, or post-surgical recovery who need to regain muscle strength. If you choose a suitable route without steep hills or an appropriate program on a stationary bike, cycling can also be suitable for individuals with various cardiovascular or respiratory conditions. During cycling, try to breathe through your nose with your mouth gently closed if the intensity allows. The sole of your foot should be positioned on the pedal so that the ball of the foot, not the toes, bears the weight. Adjust the saddle so the leg remains slightly bent at the knee (approximately 20 degrees) when the pedal is at the bottom and is flat. To avoid improper extension of the cervical spine and excessive hip flexion, commonly strained areas in cyclists, it is advisable to have the handlebars higher and closer to the saddle (a shorter and raised stem). While this is less aerodynamic, it allows the spine to stay upright, which prevents back and hip pain. The pedaling cadence should be at least 60 revolutions per minute (60–90). Cycling is highly recommended, but since it is performed in a seated position—a posture much of the population spends most of their day in—it is essential to compensate for this position appropriately. Focus on stretching the hips, improving thoracic mobility, and loosening the shoulders. If you have any medical conditions or musculoskeletal issues, it is always advisable to consult a specialist. Before cycling (or using a stationary bike), gradual warm-ups and exercises targeting specific body areas are essential. Perform exercises slowly, in a controlled manner, without excessive force. Hold each exercise for 10 seconds and repeat 3–5 times. Never exercise through pain. During workouts, you may feel stretching, muscle activity, and loading of the body's support segments, but no pain.

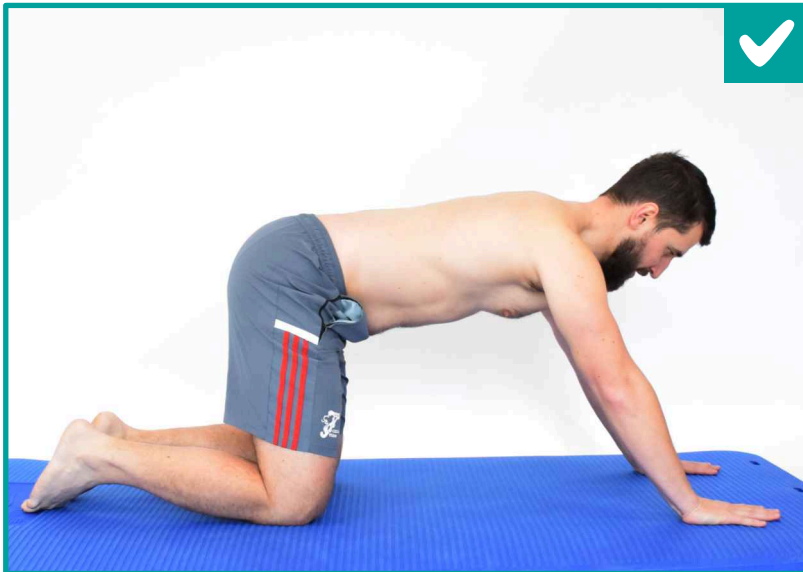
Exercise on All Fours: Arching and Stretching

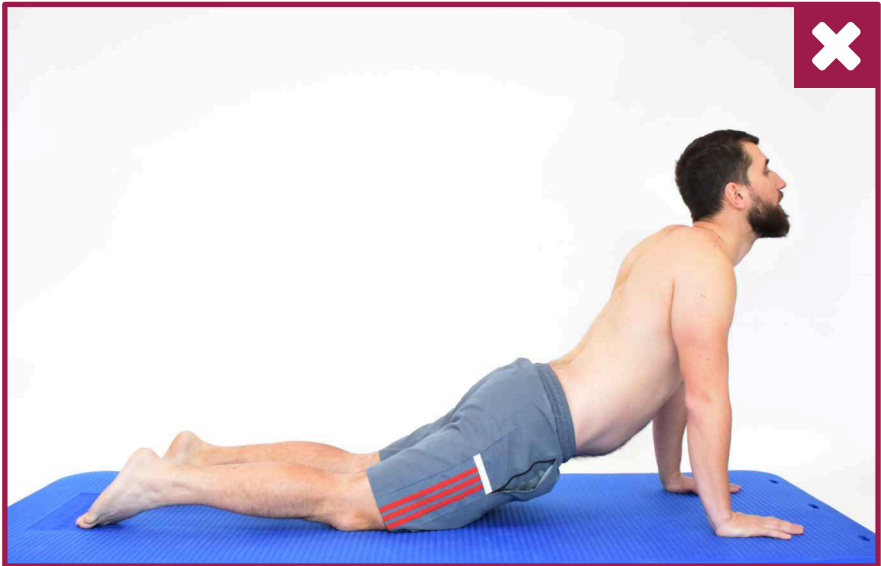
In this exercise, arch your back as much as possible, then try to straighten your chest area downward and forward while stretching your arms out in front of you. You should feel pressure and stretching between the shoulder blades, stretching around the shoulders, and stretching of the chest muscles. Stretch your back into a "plank" position, feeling the spine straighten. Extend your head forward. The lumbar and cervical spine should not arch, and the head should not tilt back.



Exercise in All-Fours Position: Forward Rocking

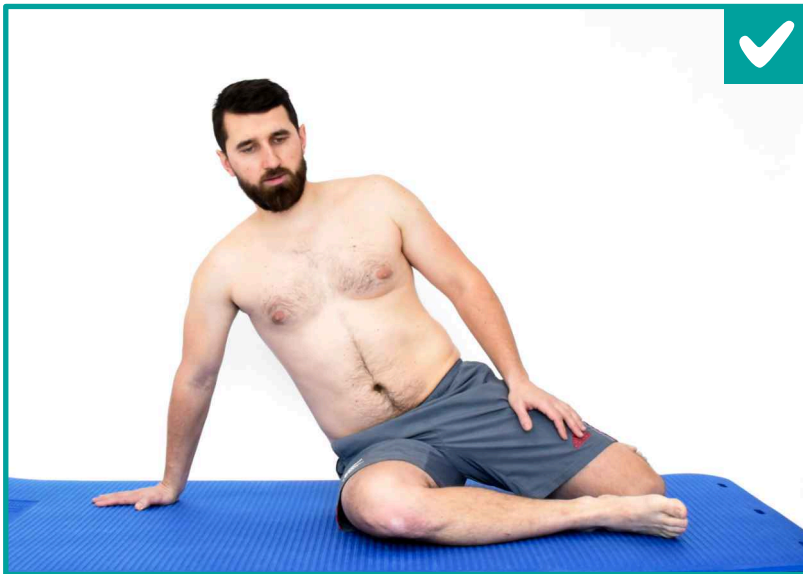
From the all-fours position, shift your pelvis and torso forward until your spine and thighs form a straight line. You should feel abdominal muscle activation and a stretch around the groin area. Support yourself on your entire palms and all fingers pointing forward, pressing your hands into the surface. Hold the final position for at least 5 seconds, preferably 10, and breathe deeply into your chest and abdomen as if expanding a stretchable band wrapped around your torso in all directions (360 degrees). Direct your breath into the "lower abdomen," above the groin, as well as backward and to the sides, into the area of the lower ribs. Avoid arching your lower back or tilting your head backward during the exercise.





Oblique Sitting

Support yourself on the outer side of your thigh and glute (in the illustration, the right lower limb) and on your hand (right hand), positioned in line with the supporting hip joint. During this exercise, try to rotate your torso forward as much as possible until you are also supported by your other hand. Lengthen your neck, pulling your head away from your shoulders. Keep your back straight in the initial position and throughout the entire phase of trunk rotation. Draw your shoulders down away from your ears. Actively press the front knee into the surface. You should feel pressure and stretch in the thoracic spine and the gluteal area of the supporting (right) leg. In the final position, with support on both hands, hold for 5–10 seconds, then slowly and in a controlled manner, return to the starting position. Repeat the exercise 3–5 times, then switch sides.

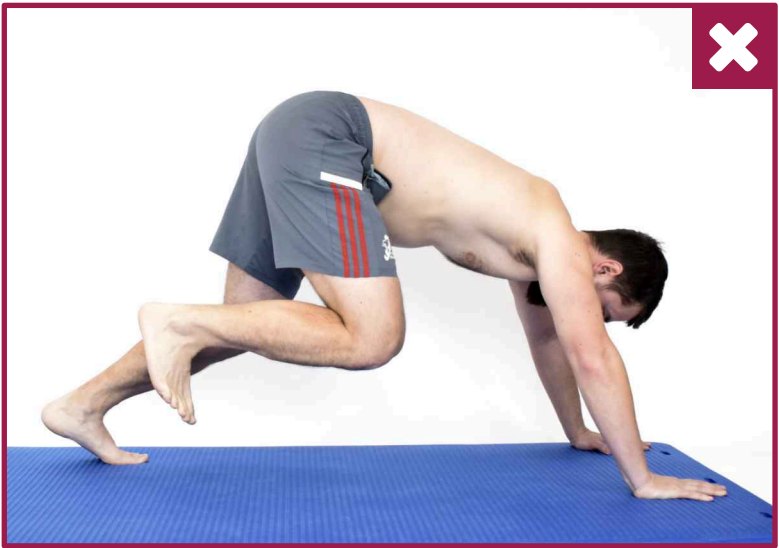
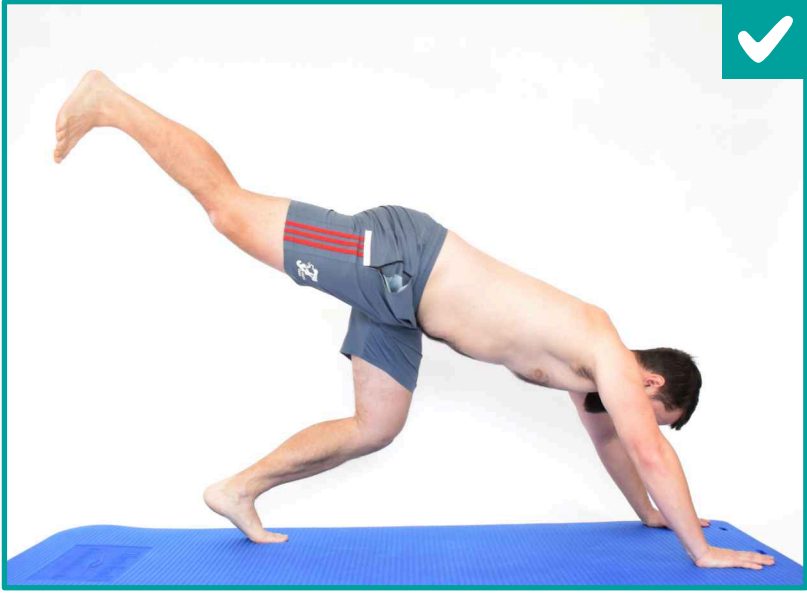




Bear Position

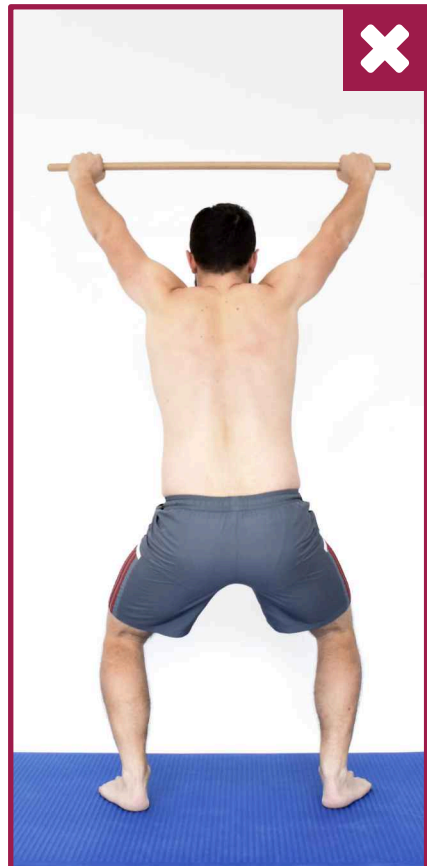
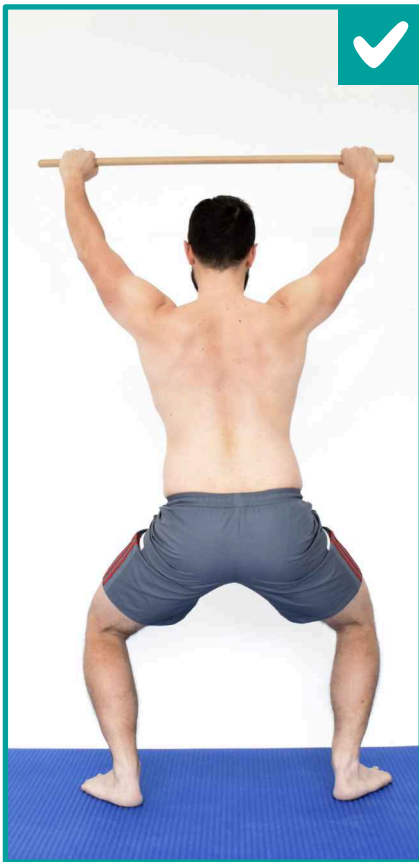
In the bear position, aim to straighten your thoracic spine and align the entire spine. Extend your head away from your shoulders and alternately extend each leg backward as far as possible toward the ceiling. Keep your back straight throughout the movement. You should feel pressure around the thoracic spine, a stretch in the groin of the extending leg, and activation of the abdomen, glutes, and upper limbs bilaterally. Support yourself with your entire palms and fingers pointing forward. Draw your shoulders down away from your ears. Breathe deeply into your chest and abdomen. While extending your leg, be mindful not to tilt your entire body to the side. Your back must remain straight, "like a plank," throughout the exercise.





Hang

The hang is a suitable compensatory activity. It stretches the entire spine and provides decompression. A supported hang using the lower limbs is easier. Grab a sturdy bar with your hands and hang downward into a deep squat. The soles of your feet should be fully grounded. Draw your shoulders downward, and keep your shoulder blades wide and flat against your ribcage (not protruding). Extend your head away from your shoulders as if preparing to do a pull-up. Breathe proportionally into your lower ribcage and abdomen (360 degrees).

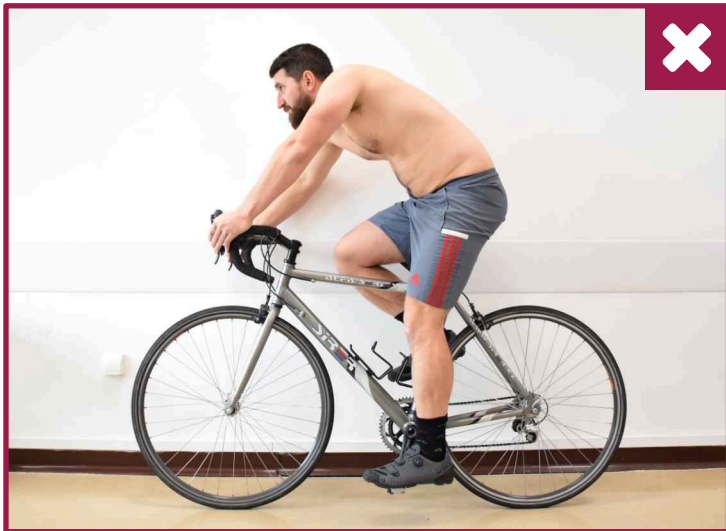


If you have sufficient strength and mobility in your shoulder joints, you can perform a hang without leg support while adhering to the same principles.



Cycling Posture

While cycling, extend your head away from your shoulders to align it with your spine. Avoid tilting your head backward. Pressing into the handlebars, draw your shoulders away from your ears, and keep your back straight or slightly and smoothly curved. During the ride, the pelvis and torso should not sway excessively from side to side. Keep your shoulders and neck relaxed, and direct your breath into your abdomen and lower ribcage.



Swimming

Swimming is a physical activity that engages the entire body while being buoyant in water. It eliminates impact, making it joint-friendly and suitable after injuries or for individuals with degenerative changes in the musculoskeletal system. However, swimming can be demanding regarding range of motion, particularly in the hip and shoulder joints. The breaststroke style requires good hip joint mobility, while freestyle and backstroke demand sufficient mobility in the shoulder joints. The breaststroke technique can easily strain the cervical and lumbar spine areas. Alternating styles is recommended. As with any physical activity, proper preparation for swimming is important to mitigate potential negative impacts. Focus mainly on thoracic, hip, and shoulder mobility. Patients with any medical conditions or musculoskeletal issues should always consult a specialist. Preparation should include gradual warm-ups and exercises targeting specific body parts. Perform the exercises slowly and in a controlled manner. Repeat each exercise 3–5 times, holding the position for 5–10 seconds. You should feel stretching, pressure, or muscle activation during the exercises but no pain.

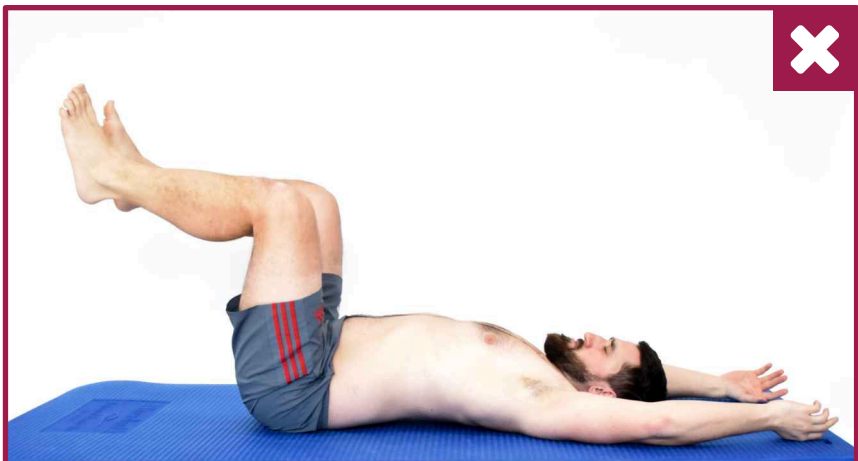
Exercise in Prone Position

Support yourself on your forearms and the pubic area. Extend your head forward and away, keeping your neck neutral without tilting it backward. Raise your head just enough to align it with your spine. Rest on your pelvis (pubic bone), not your navel. Direct your breath proportionally into your abdomen and lower ribcage, and draw your shoulders away from your ears. Avoid excessive arching in the lower back and cervical spine. Instead, aim to straighten the thoracic region, activating the muscles between the shoulder blades and the abdominal muscles.



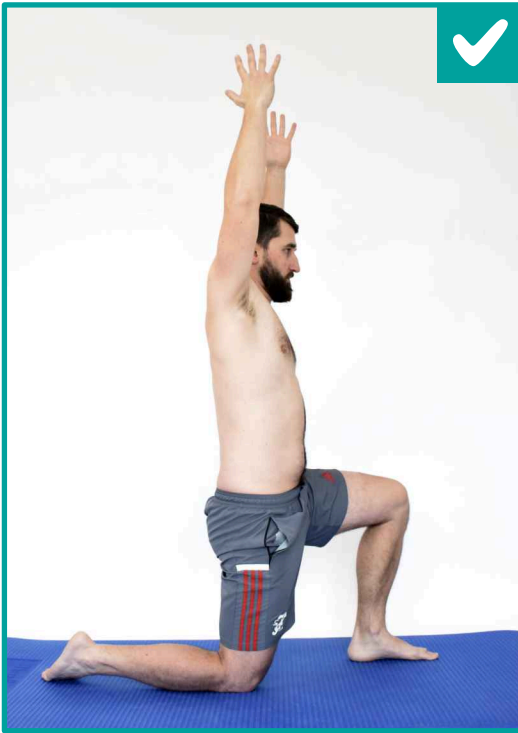
Exercise in the Supine Position

Lie on your back without arching your lower back. Your spine should remain in contact with the surface but not press forcefully into it. Bend your hips and knees to approximately a 90-degree angle. Raise your arms as far as possible overhead without arching your back or losing contact with the surface. Draw your shoulders away from your ears. You should feel a stretch in your shoulders, chest muscles, and thoracic spine while engaging your abdominal muscles.



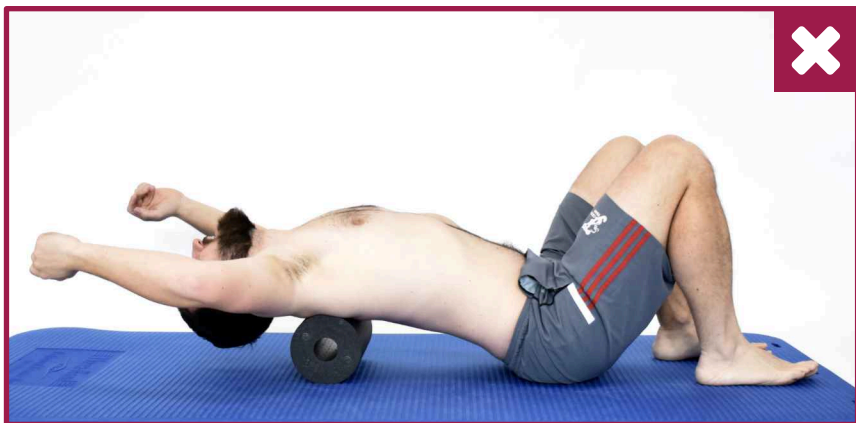
High ½ kneeling

In this position, distribute your weight evenly on both legs. Push your pelvis forward while raising your arms overhead. Extend your head away from your shoulders without tilting it backward. Focus on pushing the groin of the kneeling leg forward, not the navel. Avoid arching your lower back; keep your spine straight. You should feel a stretch in the groin of the kneeling leg, shoulder joints, and chest muscles. Hold the position for 5–10 seconds, then relax. Repeat the exercise at least two more times. Afterward, switch legs and perform the same exercise with support on the opposite knee and leg.



Thoracic Spine Mobilization

For thoracic spine mobilization, you can use a foam roller. Place it under the mid-thoracic spine and symmetrically support yourself with both soles flat on the ground. Keep your pelvis lifted above the surface. Hold this position for a few seconds, then slightly move the roller up or down, gradually stretching the entire thoracic spine. Focus on ensuring the extension comes from the thoracic spine, not the lumbar spine. Keep your abdominal muscles engaged and your pelvis elevated throughout the exercise to achieve this. You should feel a stretch or pressure in the chest area and a stretch around the shoulders and chest muscles.



Functional Capacity

During sports activities, we sometimes exceed our functional threshold, a state in which we can no longer maintain an ideal posture and quality of movement, and our joints lose optimal muscular control. Poor postural control can cause pain and dysfunction in the musculoskeletal system, leading to the situation where "the more we exercise, the more it hurts."

When the muscular system, guided by the central nervous system, fails to keep the joints in optimal positions under load, repetitive improper movement can overburden passive structures such as ligaments, discs, cartilage, menisci, and other tissues, leading to irreversible degenerative changes.

Training for optimal motor control is crucial for maintaining the longevity of the musculoskeletal system. It is not just about how much we exercise but also about the quality of exercise—whether we can control our movements, identify errors, and correct them ourselves. Warm-ups or specific preparations for a particular sport are designed for this purpose. Above, we provide examples of suitable exercises before walking, running, cycling, and swimming.

Similarly, customized exercise routines can be created for other types of physical activities. Maintaining ideal muscle function during sports is much more challenging, as muscles must facilitate movement and protect the joints through balanced activity. Sports often demand maximum range of motion, speed, strength, or endurance.

When demands become too high, we exceed our functional threshold and adopt suboptimal stabilization strategies. Some muscles become overactive, others underactive, and joints move into positions where they are overburdened.

Each individual has a unique functional capacity zone, where movement quality is sufficient and the risk of overload or injury is low. Above the functional capacity zone is the overload zone, where movements can still be performed but with poor quality, risking degenerative changes and making injuries more likely.

Beyond the overload zone lies the threshold of absolute exhaustion, at which point the body can no longer perform the movement and must stop the activity.

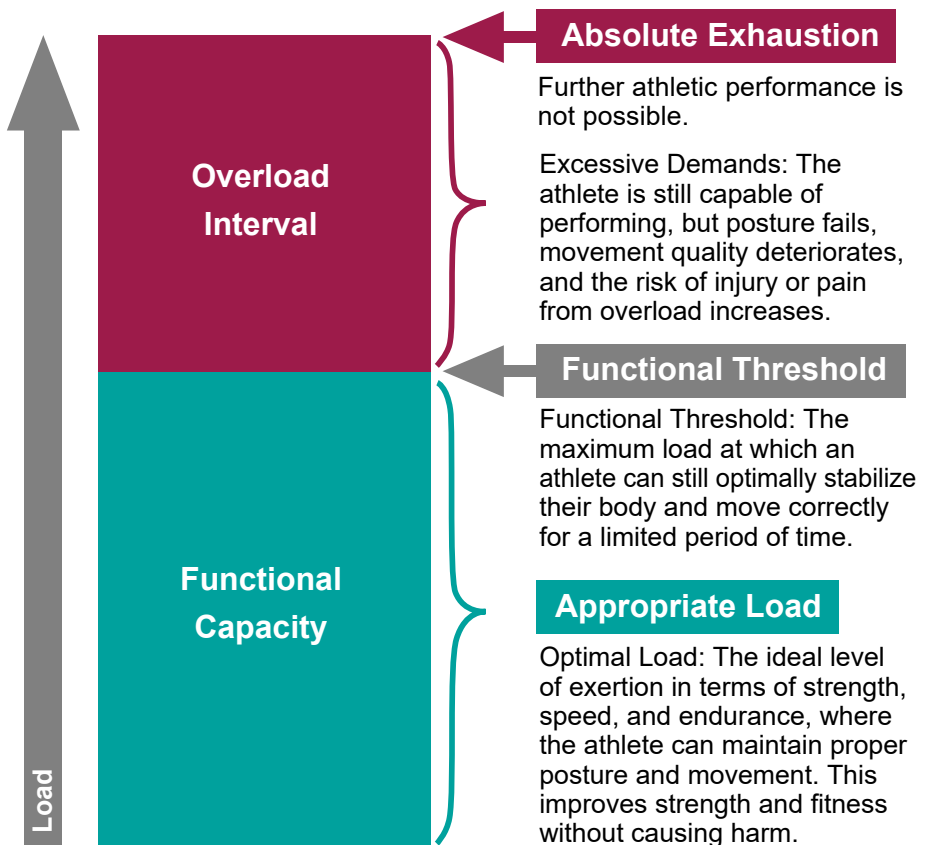
Functional capacity varies significantly between individuals. A trained athlete has different abilities than someone who trains recreationally or has not exercised for a long time.

Three main factors push us beyond our functional capacity during sports: excessive demands on strength, endurance, and speed. In professional sports, athletes often exceed their functional threshold to

achieve maximum performance "at all costs." However, during rehabilitation or training for the general population, this should be avoided or minimized. It is crucial to recognize the moment when movement quality begins to fail. At that point, we should stop, rest, correct errors, and resume with total control. Regular physical activity improves control over time, enabling us to exercise longer and more effectively. The musculoskeletal system positively adapts to the activity, expanding our functional capacity zone.

Control of movement requires full awareness. Therefore, focusing entirely on the movement and eliminating distractions, such as listening to music, spoken word, or watching videos while exercising, is essential, especially in the beginning. Activities like listening to audiobooks or watching movies during exercise should only be done once the movement becomes sufficiently automated.

It is always advisable to consult a professional (e.g., a sports coach or physiotherapist) to identify significant errors, learn to recognize them and correct them effectively.



We quickly reach the functional threshold.

When the functional threshold is exceeded, we lose quality.

When we need maximum speed



When we need maximum endurance



When we need to exert maximum strength



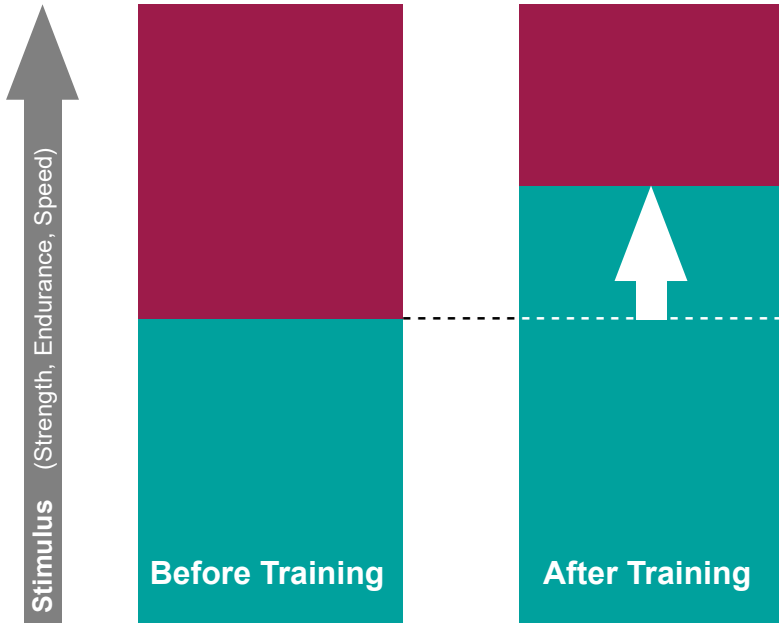
When the position is demanding and unstable



Increasing the Functional Threshold

The goal of regular training

Training focused on increasing functional capacity is essential for **injury prevention** and **maintaining performance**.



Increasing the functional threshold means the athlete must train in the functional threshold zone, stimulating the movement system to adapt. This will allow the athlete to move correctly even under higher loads.

The exercises mentioned above serve as preparation for selected physical activities. A proper warm-up also helps to increase the functional threshold, improve and enhance athletic performance, and reduce the risk of overuse and injury. Especially after the COVID-19 pandemic, when a portion of the population experienced decreased physical activity and increased hypomobility, it is important to emphasize proper body preparation for movement to minimize the risks associated with returning to an active lifestyle.

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"For patients section"

- Presently consists 31 videos
- The videos are sorted by topics
- When browsing it is possible to click on the specific topic which will quickly display selected rehabilitation technique.
- It is possible to mark selected techniques and send them to the client
- Additionally, it contains videos from DNS lectures (Miscellaneous)
- New videos will be continuously uploaded to the library

▶ **Library Structure Sample**

1 year subscription

Internet connection is required to access the videos.
Videos cannot be downloaded, only online viewing is possible using a web browser.
However, the **DNS App** allows both online and off line viewing.

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After purchase, the subscriber will be emailed a username and password to log into the library.
Electronic online version (e-pub) of exercise positions depicted on **DNS Self-treatment booklet**, **Pelvic floor exercise booklet** and **Exercise for individuals with breathing disorders booklet** available as a free bonus

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