

EDUCATION PROGRAM

**PAIN FREE PROJECT
ID 101133560**



CONTENT

Introduction of the PAINFREE project	2
Back pain overview	3
Ergonomics on the workplace	4
Practice guideline	6

Introduction of the PAINFREE project

“PAINFREE” project is developed in the framework of the European Erasmus+ Sport Program and will address the widespread problem of musculoskeletal pain among the population and its incidence in the workplace at European level.

All participating organizations share the view that one of the main priorities of European economies is to promote the health and well-being of their citizens.

PROJECT OBJECTIVES

The main objective of the project is to encourage a healthy lifestyle in the workplace through the promotion of physical exercise and sport.

Other intermediate objectives:

- ✓ To identify existing knowledge about back pain and improve the understanding of its origins, causes and effects.
- ✓ To develop an innovative method for prevention and self-care of back pain.

The long-term objective is to promote healthy and healthful working environments and to reduce disorders associated with musculoskeletal diseases and their incidence in absenteeism at European level, which entails significant costs for workers and companies.

This project has been funded with support from the European Union.

DURATION

January 2024 to December 2025

BENEFICIARIES

The direct beneficiaries of the project are:

- Working people and entrepreneurs, who will benefit directly from the activities and results of the project.
- Professionals related to health and sport: sports instructors and trainers, doctors, physiotherapists, experts in occupational risk prevention and other professionals who will contribute their knowledge to the project development process.

Back pain overview

Back pain, particularly low back pain, is the leading cause of global disability, impacting 619 million people in 2020. By 2050, this number is expected to reach 843 million. Back pain affects individuals of all ages, reducing quality of life, work productivity, and physical capabilities. Chronic cases often lead to significant socio-economic consequences:

- 44% of sufferers stop working.
- 30% reduce mobility or abandon sports.
- 55% report sexual health problems.

Back pain often stems from poor posture, repetitive movements, or stress. Women are disproportionately affected due to anatomical and functional differences.

Effective Prevention and Treatment Strategies

Prevention

1. **Primary Prevention:** Focuses on education about ergonomics, posture, and physical activity, alongside workplace adjustments (e.g., proper desks, regular breaks).
2. **Secondary Prevention:** Includes personalized rehabilitation programs using physiotherapy, manual therapy, and psychological support.

Treatment Approaches

1. **Muscle Strengthening (Effectiveness: 60–70%):** Core-strengthening exercises stabilize the spine and reduce pressure on intervertebral discs.
2. **Physical Therapy (Effectiveness: 50–70%):** Combines tailored exercises and techniques to alleviate inflammation and improve mobility.

3. **Ergonomic Adjustments (Effectiveness: 40–60%)**: Enhancing workplace setups reduces spinal strain and pain.
4. **Stretching and Yoga (Effectiveness: 40–60%)**: Increases flexibility, reduces tension, and improves recovery.
5. **Massage (Effectiveness: 30–50%)**: Relieves muscle tension and improves circulation for short-term relief.
6. **Inversion Therapy (Effectiveness: 30–50%)**: Decompresses the spine using gravity, offering temporary relief.

Socio-Economic Impact and the Need for Prevention

Back pain, prevalent among 30–50-year-olds, is a costly socio-economic challenge. For example, in the UK, back pain caused 46.5 million lost workdays in 1991, costing over £1 billion. Prevention through early diagnosis, ergonomic education, and tailored treatments can mitigate these impacts and improve quality of life.

Conclusion

The PAIN-FREE project emphasizes the importance of prevention and tailored interventions to combat back pain. Combining physical activity, innovative therapies, and workplace ergonomics can significantly reduce the burden of musculoskeletal disorders, benefiting individuals and society.

Ergonomics on the workplace

Ergonomics is an interdisciplinary field dedicated to understanding and optimizing the interactions between individuals and their work environments. It encompasses a holistic approach to work design, addressing physical, cognitive social, organizational, and environmental dimensions.

Some of the **objectives of work ergonomics** are the following ones:

- Enhancing human well-being within occupational settings
- Identifying and mitigating workplace hazards to ensure safety and efficiency
- Tailoring jobs and work environments to align with individual capabilities and limitations
- Minimizing work-related injuries and disorders, both physical and psychological
- Reducing economic burdens associated with workplace injuries, absenteeism, and decreased productivity
- Optimizing job performance by improving operational efficiency and promoting safer practices

Types of work ergonomics:

- Cognitive ergonomics: Mental processes such as: perception, memory, reasoning, and motor responses, focusing on their influence on human-system interactions.
- Physical ergonomics: It focuses on the physiological and biomechanical attributes of workers, aiming to enhance physical comfort, reduce strain and improve workplace design
- Environmental ergonomics: Addresses external physical factors within the workplace and their impact on safety, productivity and comfort.

Benefits of correct work ergonomics

- Safeguarding health and safety
- Enhancing operational efficiency and productivity
- Facilitating technological integration
- Decreasing absenteeism and associated costs
- Boosting employee morale and satisfaction
- Fostering motivation and engagement

Correct ergonomic work environment design

- *Physical workload*: The physical demands of the job should align with the individual worker's capabilities
- *Environmental stressors*: Consideration of external conditions such as noise, lighting and temperature
- *Work methods and pacing*: Balancing task execution methods and work speed
- *Postural dynamics*: Addressing body positions, repetitive movements and physical exertion
- *Spatial arrangement*: Ensuring adequate space for comfortable and efficient movement
- *Equipment and tool placement*: Designing controls

Practice guideline

This practical resource section offers a series of exercises designed to help reduce back pain and improve daily quality of life. Inspired by primary prevention approaches, it provides concrete solutions to strengthen, stretch, and mobilize various parts of the body.

Here, you will find exercises focusing on :

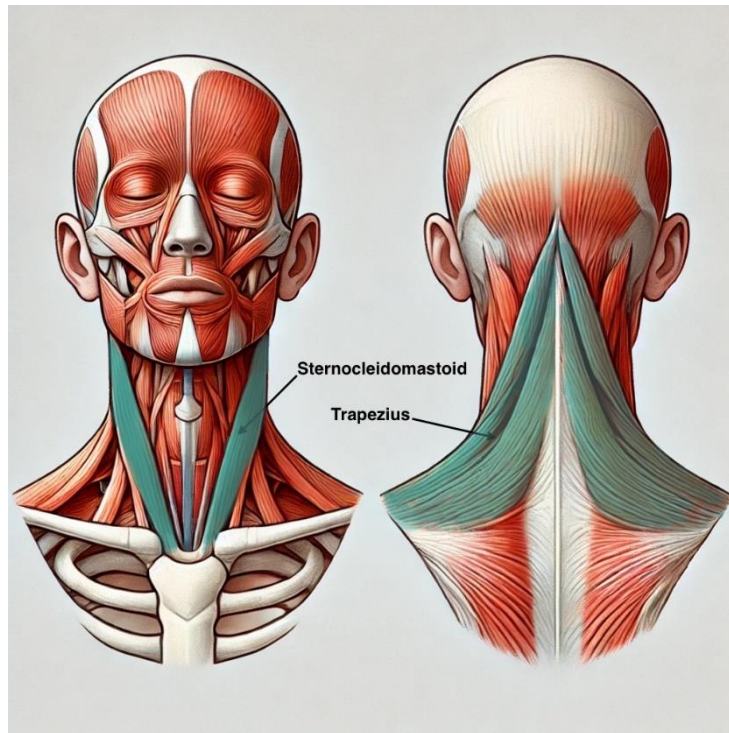
- Muscle strengthening, to stabilize the spine and reduce excessive strain.
- Stretching, essential for maintaining flexibility and preventing muscle imbalances.
- Mobility, which enhances movement fluidity and reduces joint stiffness.

This integrated approach will guide you towards better back pain management and help you develop an effective and sustainable maintenance routine for your health. Whether you are a beginner or accustomed to physical activity, these exercises can be tailored to your level and specific needs.

Content

Head (Neck).....	7
Upper back.....	11
Middle Back.....	15
Abdominal.....	19
Lower Back.....	22
Lower limb muscles.....	26

Head (Neck)



The **sterno-cleido-mastoid** and **trapezius** muscles are the main subcutaneous muscles involved in the movements of bending, tilting and rotating the head. Although many deeper muscles contribute to the maintenance and stability of the cervical region.

By mobilizing sterno-cleido-mastoids and trapezius, the deepest are also called upon

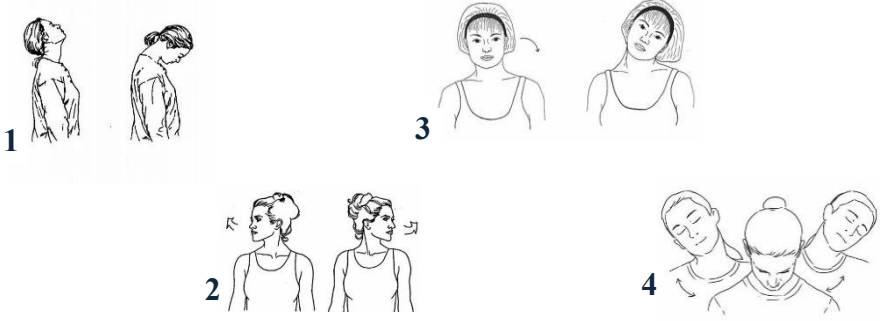
To relieve this area of pain, you can do :

Mobility : the ability of the joints to perform movements in their full range without restriction or pain.







Stretching : These are movements that lengthen the muscles to improve flexibility and reduce tension.

Strengthening : These are exercises that aim to make the muscles stronger and more resistant.

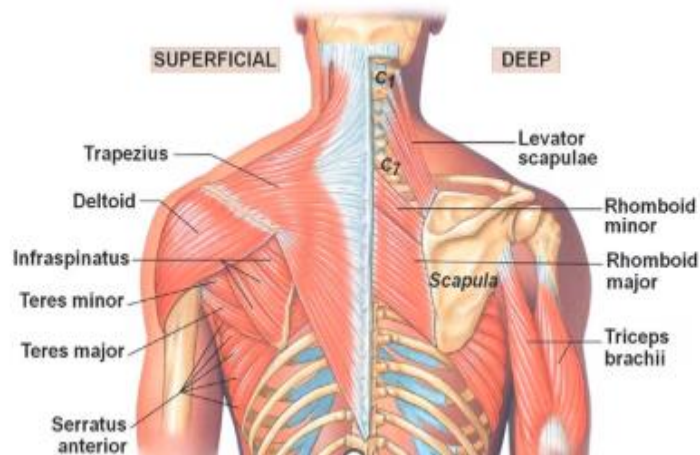
Here are some exercises you can do as needed to mobilize this area.

<p style="text-align: center;">Mobility (Neck)</p>	
EXERCICE	
EQUIPMENT	No equipment required
HOW	<ul style="list-style-type: none"> - Standing or sitting, I have a straight back and my arms are along the body. I move my head up and down - Standing or sitting, I have a straight back and my arms are along the body. I move my head from right to left (I try to look behind me) - Standing or sitting, I have a straight back and my arms are along the body. I let my head fall from right to left while being relaxed. - Standing or sitting, I have a straight back and arms along the body. I circle my head. (right then left) <p style="text-align: center;">For each exercise you can perform between 5 and 10 movements</p>
WHY	<p>For example, when we sit in front of our computer or look at our phone, we either hold our head in the same position lying down or repeat the same movements throughout the day.</p> <p>This habit can cause neck pain or reduce the joint amplitude. So to engage your cervical, you can integrate these movements regularly in daily life, at work, at home at any moment (to start your day etc.)</p>
BENEFITS	<p>These movements of mobility allow on the one hand to prevent pain related to the neck and other part to relax while maintaining flexibility of the neck.</p>

<p style="text-align: center;">Stretching (Neck)</p>	
EXERCICE	
EQUIPMENT	<p>Chair is an option</p>
HOW	<ul style="list-style-type: none"> - Standing or sitting, I have a straight back. Cross your fingers together to support your head. Gently pull your head forward while remaining relaxed. stop moving when the stretching behind the neck becomes unenjoyable. - Standing or sitting, I have a straight back. Cross your fingers together to support your head. Gently pull your head back while remaining relaxed. You can remove the support from your hands if you want to accentuate the stretching of the front of the neck. - Standing or sitting, I have a straight back. Place left hand on right side of head and slowly bring head to left shoulder. inversely for right hand. <p style="text-align: center;">Do this movement between 1 and 3 times, for at least 20 seconds</p>
WHY	<p>For example, a person who regularly engages in intense physical activities such as running or cycling and experiences pain or stiffness in the neck due to tension in the neck muscles. These tensions may result from poor posture during exercise or muscle imbalance.</p>
BENEFITS	<p>Regular neck stretches can help relieve tension, improve flexibility and reduce pain, preventing or alleviating the ailments associated with prolonged posture.</p>

Strengthening (Neck)	
EXERCICE	     
EQUIPMENT	Elastic and chair are an option
HOW	<ul style="list-style-type: none"> - Standing or sitting, I have a straight back. Place the palm of your right or left hand on your forehead. Then, apply forward pressure with your hand while simultaneously pushing forward with your head to create resistance. Hold the resistance for 2-3 secondes. - Standing or sitting, I have a straight back. Cross your hands behind your head. Then, apply forward pressure with your hands while simultaneously pushing backward with your head to create resistance. Hold the resistance for 2-3 secondes. - Standing or sitting, I have a straight back. I try to keep my head straight throughout the exercise. Place the palm of your right hand on the right side of your head. Then, apply pressure inward with your hand while simultaneously pushing outward with your head to create resistance. Hold the resistance for 2-3 secondes. - Do the same with your left hand. <p>You control the pressure of your hands to adjust the resistance during the exercise. If needed, you can increase the resistance by using resistance bands. And you can also work in dynamic contraction while using a chair. For example, you can perform 2 to 5 sets of 5 repetitions. 2-3 seconds holding the position.</p>
WHY	<p>For example, a construction painter or an electrician working on ceilings. These professions require constantly looking up to paint or install lights, and then looking down to grab tools or check plans. These repeated movements put a lot of strain on the neck muscles, which can lead to pain or muscle tension if these muscles are not properly strengthened and flexible.</p>
BENEFITS	<p>For this audience, it improves stability and reduces muscle fatigue, thus preventing chronic pain and injuries related to prolonged postures. By strengthening this area, muscle imbalances are corrected, posture is improved, and muscle endurance is increased, allowing for prolonged efforts while reducing the risk of tension and discomfort. These benefits lead to better efficiency and long-term well-being.</p>

Upper back



The upper back is composed of muscles such as the **rhomboids**, **trapezius**, and **levator scapulae**, which play key roles in the movement, stability, and support of the shoulder girdle and spine. These muscles are crucial for actions such as shrugging, retracting the scapula, and stabilizing the upper spine during various movements.

Although deeper muscles also contribute to the strength and stability of the upper back, it's important to focus on mobilizing the more superficial muscles for immediate relief.


To relieve this area of pain, you can do :


Mobility : The ability of the upper back joints to move freely within their full range of motion without pain or restriction.

Stretching : These movements help to lengthen the muscles, improving flexibility and reducing tension in the upper back area.

Strengthening : Exercises that target the muscles in the upper back, helping to improve strength and resilience, thereby reducing the risk of muscle strain.

Here are some exercises you can do as needed to mobilize this area.

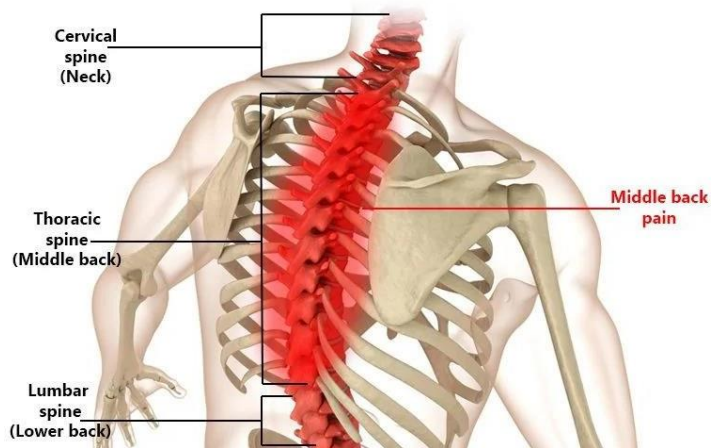
Mobility (Shoulder Rotation)	
EXERCICE	
EQUIPMENT	No equipment required
HOW	<ul style="list-style-type: none"> - Stand or sit with a straight back and your arms along the body. - Slowly rotate your shoulders forward in a circular motion, as large a circle as you can comfortably manage. - After a few rotations, reverse the direction and rotate your shoulders backward. - Perform 5 to 10 rotations in each direction.
WHY	<p>The shoulders often become stiff from long periods of sitting, poor posture, or repetitive movements (like typing or desk work). This exercise helps improve the range of motion in the shoulder joint, reduces stiffness, and promotes flexibility in the upper back and shoulders.</p>
BENEFITS	<p>These mobility exercises help relieve shoulder stiffness, prevent pain, and improve overall shoulder flexibility. Regular movement like this keeps the shoulder joints fluid, helping to reduce the likelihood of chronic shoulder pain.</p>

Stretching (Upper Back Stretch)	
EXERCICE	
EQUIPMENT	A chair (optional)
HOW	<ul style="list-style-type: none"> - Sit or stand with a straight back. - Extend your arms forward and interlace your fingers. - Push your hands away from your body while rounding your upper back. - Hold the stretch for 20-30 seconds, then relax. - Perform this 2-3 times.
WHY	This stretch is particularly beneficial for those who spend a lot of time sitting in front of a screen or doing repetitive upper body movements. It targets the upper back, shoulders, and neck, helping alleviate tightness and prevent discomfort.
BENEFITS	Regular upper back stretching can help reduce tension, improve posture, and alleviate discomfort in the shoulders and neck. This reduces the risk of developing musculoskeletal disorders due to poor posture.

Strengthening (Scapular Retraction)	
EXERCICE	
EQUIPMENT	Elastic band or resistance bands (optional)
HOW	<ul style="list-style-type: none"> - Stand or sit with a straight back. - Hold a resistance band with both hands or, if you prefer, no equipment at all. - Pull your elbows back, squeezing your shoulder blades together. - Hold the retracted position for 2-3 seconds and release. - Repeat for 5-10 repetitions.
WHY	Scapular retraction strengthens the muscles between the shoulder blades, which are crucial for good posture and upper back stability. This exercise is particularly beneficial for individuals who spend long hours sitting or looking forward.
BENEFITS	This exercise strengthens the upper back muscles, improving posture and reducing the risk of upper back and shoulder pain. It helps prevent muscle imbalances by engaging the muscles that support the shoulders and upper spine.

Middle Back

MIDDLE BACK PAIN



Middle back image

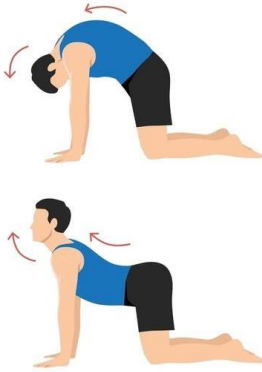
The middle back (thoracic spine) is key to spinal stability, posture, and movement. Poor mobility in this area can lead to stiffness and back pain. Strengthening, mobilizing, and stretching the thoracic spine can help prevent discomfort and improve function.

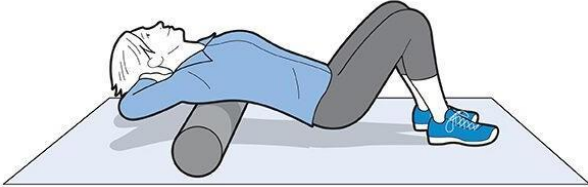
To relieve this area of pain, you can do:

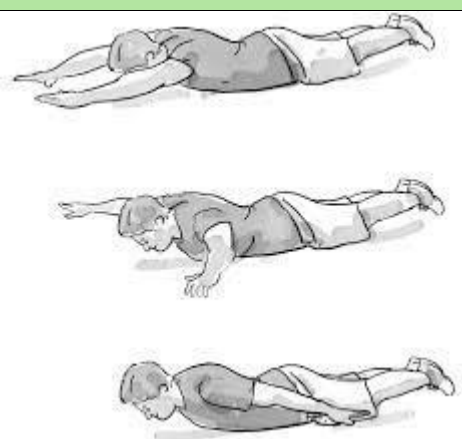
Mobility : The middle back's ability to move freely without pain is essential for posture and spinal health. Maintaining good thoracic mobility helps prevent stiffness and compensatory strain on the lower back and neck.

Stretching : Stretching the middle back muscles helps release tension, improve flexibility, and enhance spinal movement. Targeting the thoracic spine, shoulders, and surrounding muscles can significantly reduce discomfort.

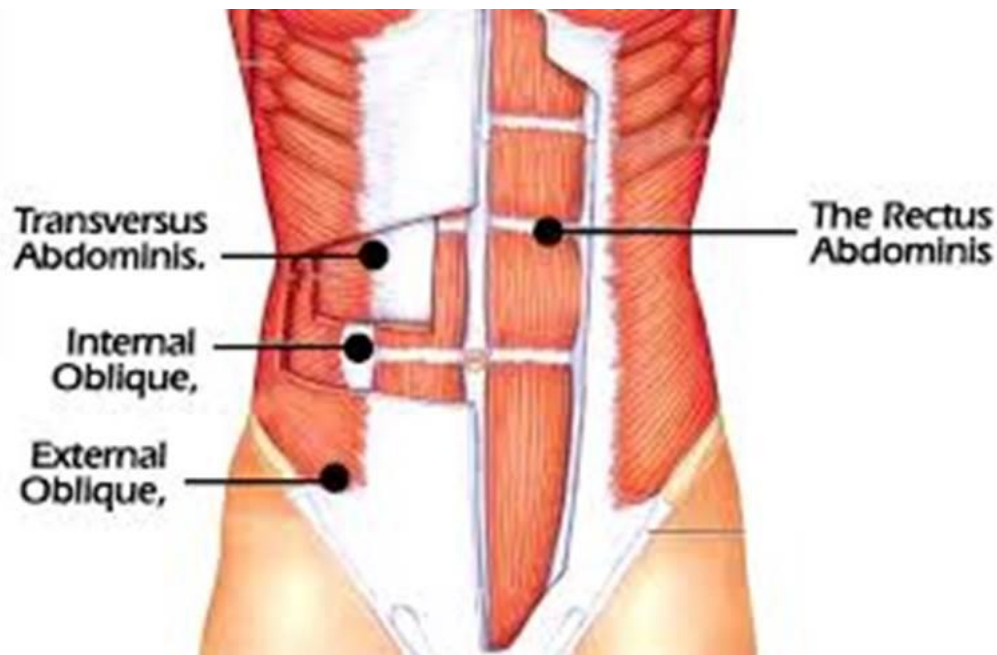
Strengthening : Strengthening the muscles around the middle back improves posture, stability, and resilience. A strong thoracic region supports the spine, reduces stress on the lower back, and prevents muscle imbalances that lead to pain.

<p style="text-align: center;">Mobility (Middle back)</p>	
EXERCICE	
EQUIPMENT	<p>No equipment required</p>
HOW	<ul style="list-style-type: none"> - Start on all fours, with hands under the shoulders and knees under hips. - Inhale, arch your back, lift your head and tailbone (Cow Pose). - Exhale, round your spine, tuck your chin and pelvis (Cat Pose). - Repeat 10 slow reps, focusing on controlled movement.
WHY	<p>Encourages spinal mobility by alternating between flexion and extension, helping to loosen up stiffness in the thoracic spine.</p>
BENEFITS	<ul style="list-style-type: none"> - Improves flexibility and posture. - Reduces tension in the spine. - Enhances coordination between the upper and lower back. - Promotes relaxation and spinal health.

<p style="text-align: center;">Stretching (Middle back)</p>	
EXERCICE	
EQUIPMENT	Foam Roller
HOW	<ul style="list-style-type: none"> - Sit on the floor and place a foam roller horizontally under your upper back. - Lie back onto the roller with your knees bent and feet flat on the ground. - Support your head with your hands and gently arch your upper back over the roller. - Hold for 15–30 seconds, breathing deeply. - Repeat 3–4 times, rolling slightly up and down if comfortable.
WHY	This stretch counteracts poor posture and thoracic stiffness , helping to restore natural spinal curvature by allowing controlled extension.
BENEFITS	<ul style="list-style-type: none"> - Improves thoracic spine mobility. - Reduces tension in the middle back and shoulders. - Helps correct forward-hunched posture. - Alleviates discomfort from prolonged sitting or desk work.

<p style="text-align: center;">Stretching (Middle back)</p>	
EXERCICE	
EQUIPMENT	None
HOW	<ul style="list-style-type: none"> - Lie face-down on the floor with arms extended in front of you. - Lift your arms slightly off the ground and move them in a wide arc to your sides, like making a snow angel. - Slowly bring them back to the starting position. - Repeat 10–12 times in a controlled motion.
WHY	Strengthens the mid-back muscles (rhomboids, traps) which support posture and reduce strain on the lower back.
BENEFITS	<ul style="list-style-type: none"> - Builds endurance in postural muscles. - Enhances spinal stability and reduces back pain. - Prevents muscle imbalances caused by prolonged sitting. - Supports a healthy, upright posture.

Abdominal



Abdominal muscles

The abdominal muscles, also known as the soft abdominal wall, are made up of four different muscles located on both the left and right sides of the body; Musculus rectus abdominis, musculus obliquus abdominis externus and internus and musculus transversus abdominis.

Among other things, these muscles are responsible for trunk flexion, trunk rotation and trunk lateroflexion.

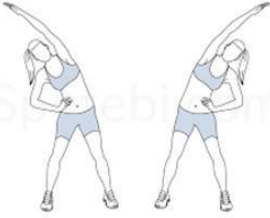

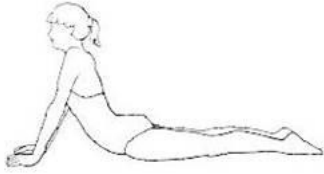
To relieve this area of pain, you can do :




Mobility : The ability of the joints to perform movements in their full range without restriction or pain.

Stretching : These are movements that lengthen the muscles to improve flexibility and reduce tension.

Strengthening : These are exercises that aims to make the muscles stronger and more resistant.

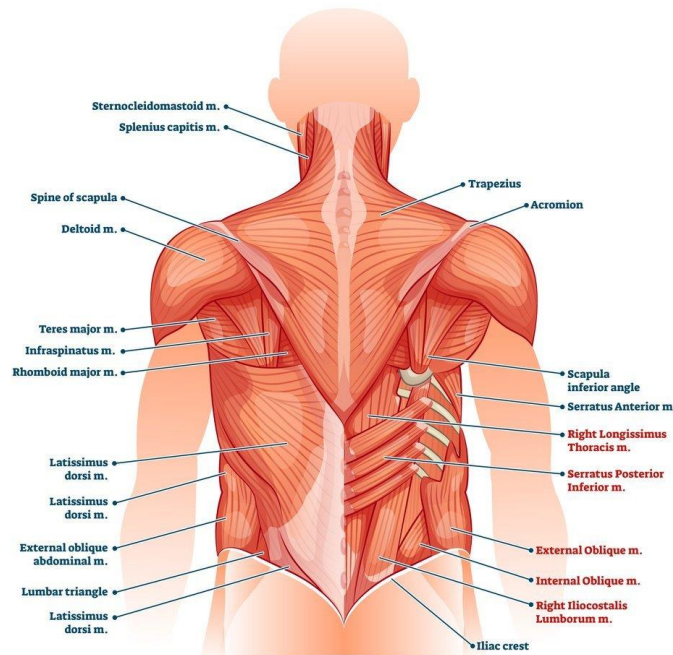
Here are some exercises you can do as needed to mobilize this area.

<p style="text-align: center;">Mobility (Abdominal)</p>	
EXERCICE	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>1</p>  </div> <div style="text-align: center;"> <p>2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;"> <p>3</p>  </div>
EQUIPMENT	No equipment required
HOW	<ul style="list-style-type: none"> - We are in an upright position, one arm is above the head, other arm on the side, and flexing the torso side (to the point of pain), the knees are in extension -return to the starting position. - We are in a quadruped position with a straight back. From this position, we raise and lower our lower back. The hands on our thighs must not move. - The starting position is lying on your stomach, with your palms resting on the floor under your shoulders. From this position, lift your upper body into the air (trying to reach a position with maximum extension of your elbows). <p>For each exercise you can perform between 5 and 10 movements</p>
WHY	<p>For example, when we sit in front of our computer or look at our phone, we either hold our head in the same position lying down or repeat the same movements throughout the day. This habit can cause neck pain or reduce the joint amplitude. So to engage your cervical, you can integrate these movements regularly in daily life, at work, at home at any moment (to start your day etc.)</p>
BENEFITS	<p>These movements of mobility allow on the one hand to prevent pain related to the neck and other part to relax while maintaining flexibility of the neck.</p>

<p style="text-align: center;">Stretching (Abdominal)</p>	
EXERCICE	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>3</p> </div>
EQUIPMENT	<p>Chair and swiss ball</p>
HOW	<ul style="list-style-type: none"> - In a standing position, hands on hips and at the same time push the pelvis forward and the torso back. - We sit on a chair, our legs are at a right angle, and our hands are behind our head. From this position, we move our torso backwards. - Starting position - The torso is on the ball, the knees are bent, the feet are on the floor and the palms are on the back of the head. - From this position, we stretch the torso over the ball and down. <p>Each exercise for 20 – 30 seconds.</p>
WHY	<p>For example, when sitting for long periods of time, the abdominal muscles can be shortened and the back muscles stretched. In order to mobilize the torso, it is necessary to regularly integrate these movements into daily life, at work or at home at any time (to start the day, etc.).</p>
BENEFITS	<p>These and similar exercises increase the mobility of the torso, which can lead to a reduction in pain and the return of more normal function of the abdominal muscles and spinal joints.</p>

Lower Back

LOWER BACK MUSCLES



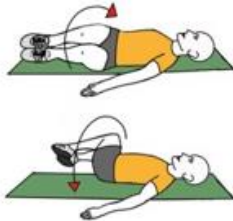
Muscles like the erector spinae, multifidus, quadratus lumborum, and iliopsoas make up the lower back and are essential for maintaining posture, supporting the spine, and allowing movement. These muscles are necessary for movements such as: stabilization, rotation, and bending the body.


To relieve this area of pain you can do:


Mobility: The lower backs joints' capacity to move painlessly and unhindered throughout the whole range of motion. This is a crucial aspect for preserving the range of motion and voiding lower back stiffness.

Stretching: The exercise that have the objective of increasing the flexibility of the lower back, extending the muscles, and relieving the tension. Significant discomfort relief can be obtained by stretching the lower back muscles, hamstrings and hip flexors.

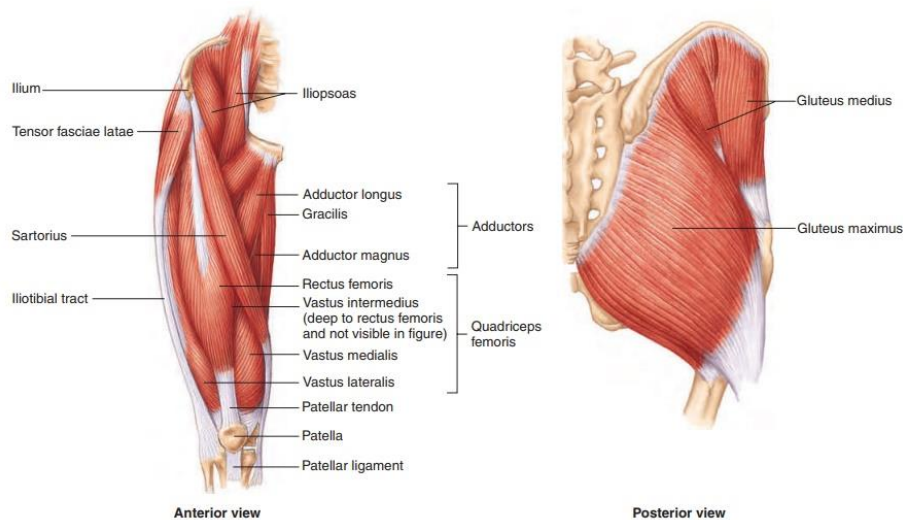
Strengthening: Activities that strengthen and increase the resilience, focusing mainly on the lower back and core muscles. In addition to improving the posture and also supporting the spine during daily activities, allowing a stronger lower back and core assistance preventing muscle strains.

<p style="text-align: center;">Mobility (Lumbar)</p>	
EXERCICE	
EQUIPMENT	<p>Only an exercise mat</p>
HOW	<ul style="list-style-type: none"> - Lie on your back on a mat or on a comfortable surface - Bend your knees and bring your feet together, keeping your heels flat on the floor - Stretch your arms out to your sides with your palms facing down for stability - Slowly turn your knees to one side, trying to bring them closer to the floor without taking your shoulder off the mat - Hold the position for a few seconds while you feel the stretch in your lower back and obliques - Return to the center with control - Repeat the movement to the opposite side
WHY	<p>This exercise is ideal for people with different types of activities, as it enables to reduce the tension or stiffness in the lower back, helping to relax and stretch the area, reducing discomfort due to muscle tension. One example is people that spend a lot of time sitting down due to work or studies, as it combats stiffness due to inactivity.</p>
BENEFITS	<p>It improves spinal mobility, relieves stiffness and lower back pain, strengthens core muscles, promotes muscle relaxation and it improves posture and balance.</p>

<p style="text-align: center;">Stretching (Lumbar)</p>	
EXERCICE	
EQUIPMENT	Only a training mat
HOW	<ul style="list-style-type: none"> - Kneel on a mat with your knees together or slightly apart. - Rest your buttocks on your heels. - Slowly lean your torso forward until your forehead is resting on the mat. - Stretch your arms forward with your palms flat on the floor or leave them relaxed at the sides of your body with your hands close to your feet.
WHY	This exercise benefits people with back pain or tension, people who spend a lot of time sitting down, as well as people with little flexibility.
BENEFITS	This exercise relieves tension in the lower back and lumbar region, promotes blood circulation, relaxes muscles after exercise and improves body posture.

Strengthening (Lumbar)	
EXERCICE	
EQUIPMENT	Only a training mat
HOW	<ul style="list-style-type: none"> - Get on the floor in a quadruped (supported on hands and knees). - Your hands should be in line with your shoulders and your knees in line with your hips - Keep your back straight and your gaze downward so as not to strain your neck. - Extension of the opposite arm and leg. - Slowly extend your right arm forward and, at the same time, stretch your left leg backwards - Hold the position for a couple of seconds - Return to starting position
WHY	This exercise benefits people who are looking to strengthen their core, with low back pain or posture problems and people with rehabilitating injuries
BENEFITS	This exercise reduces low back-pain, benefits stability and balance, increases coordination and mobility and also is a great complement for other exercises

Lower limb muscles



The exercises for low limbs collectively restore movement balance, reduce muscle imbalances, and support spinal alignment – leading to decreased lower back pain and improved functional stability in daily life.

To relieve this area of pain you can do:

Mobility : to improve hip joint movement and lateral stability, reducing compensatory tension in the lower back.

Stretching : to lengthen tight posterior chain muscles that pull on the pelvis and lumbar spine, easing discomfort.

Strengthening : to build gluteal and core strength, enhance pelvic control, and offload pressure from the lumbar region.

A strong, balanced lower body plays a vital role in spinal stability, posture correction, and back pain relief. Below is a summary of the key muscle groups activated in the suggested lower limb exercises:

Gluteal Muscles

Muscles: *Gluteus maximus, gluteus medius, gluteus minimus*

Function:

- Hip extension and abduction
- Pelvic stabilization during standing and walking
- Reduced anterior pelvic tilt which often contributes to lower back stress

Hamstrings

Muscles: *Biceps femoris, semitendinosus, semimembranosus*

Function:

- Knee flexion and hip extension
- Counterbalance the hip flexors
- Their flexibility directly affects lumbar spine loading during bending and sitting

Quadriceps

Muscles: *Rectus femoris, vastus lateralis, vastus medialis, vastus intermedius*

Function:

- Knee extension and hip flexion (especially rectus femoris)
- Contributes to knee joint stability during movements like lunges

Hip Abductors

Muscles: *Gluteus medius and minimus, tensor fasciae latae*

Function:

- Lateral stability of the pelvis
- Prevents pelvic drop and compensatory lateral spinal curves when walking or standing

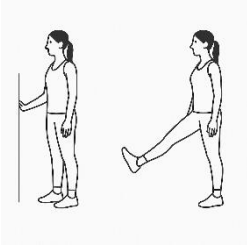
Calf Muscles

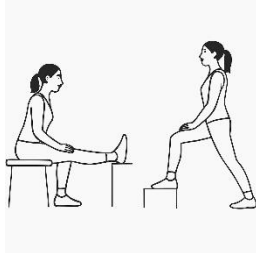
Muscles: *Gastrocnemius, soleus*

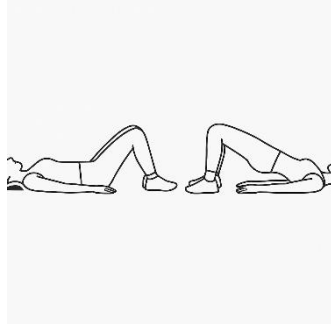
Function:

- Plantarflexion of the ankle
- Assist with balance and shock absorption
- Support upright posture and prevent overcompensation in the lumbar region

Objective: Improve lower limb mobility and stability to reduce strain on the lower back caused by prolonged sitting and poor posture. These exercises support proper pelvic alignment, encourage blood circulation, and activate key muscle groups that stabilize the lumbar spine.

<p style="text-align: center;">Mobility (Limp)</p>	
EXERCICE	
EQUIPMENT	Chair or wall for support (optional)
HOW	<ul style="list-style-type: none"> - Stand tall with feet hip-width apart. - Hold onto a chair or wall for balance. - Lift one leg out to the side without rotating the hip. - Pause briefly, then return to the start. - Repeat 10–12 reps per side.
WHY	To activate and mobilize the hip stabilizers, which are often underused during sedentary work.
BENEFITS	<ul style="list-style-type: none"> - Enhances lateral hip mobility - Improves balance and coordination - Supports pelvic alignment and lumbar spine control

<p style="text-align: center;">Stretching (Limp)</p>	
EXERCICE	
EQUIPMENT	<p>Chair, low step or bench</p>
HOW	<ul style="list-style-type: none"> - Sit at the edge of a chair with one leg extended straight forward. - Keep the heel on the ground, toes pointing up. - Gently hinge forward from the hips with a straight back. - Hold the stretch for 20–30 seconds. - Switch legs and repeat.
WHY	<p>To reduce tightness in the hamstrings, which pulls on the pelvis and affects lumbar posture.</p>
BENEFITS	<ul style="list-style-type: none"> - Increases hamstring flexibility - Decompresses the lower back - Encourages neutral spine alignment

Strengthening (Limp)	
EXERCICE	
EQUIPMENT	Exercise mat (optional resistance band for progression)
HOW	<ul style="list-style-type: none"> - Lie on your back with knees bent, feet flat. - Arms down by your sides. - Press feet into the floor and lift hips upward. - Squeeze glutes at the top, hold 3–5 sec. - Slowly lower. Repeat 10–15 times.
WHY	To strengthen the glutes and hamstrings which help stabilize the pelvis and spine during daily activity.
BENEFITS	<ul style="list-style-type: none"> - Builds core and posterior chain strength - Reduces anterior pelvic tilt - Supports lumbar spine integrity