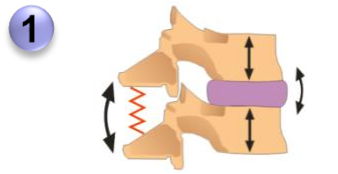


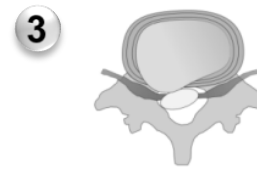
Effects of physical loads on health



Introduction: physiology



Physical fatigue



Musculoskeletal injuries



Recommendations

If you use **suitable techniques and procedures**, you will avoid back problems and injuries

Vertebral column

The vertebral column is the main structure that **supports the body**. It is **strong** and **flexible**.

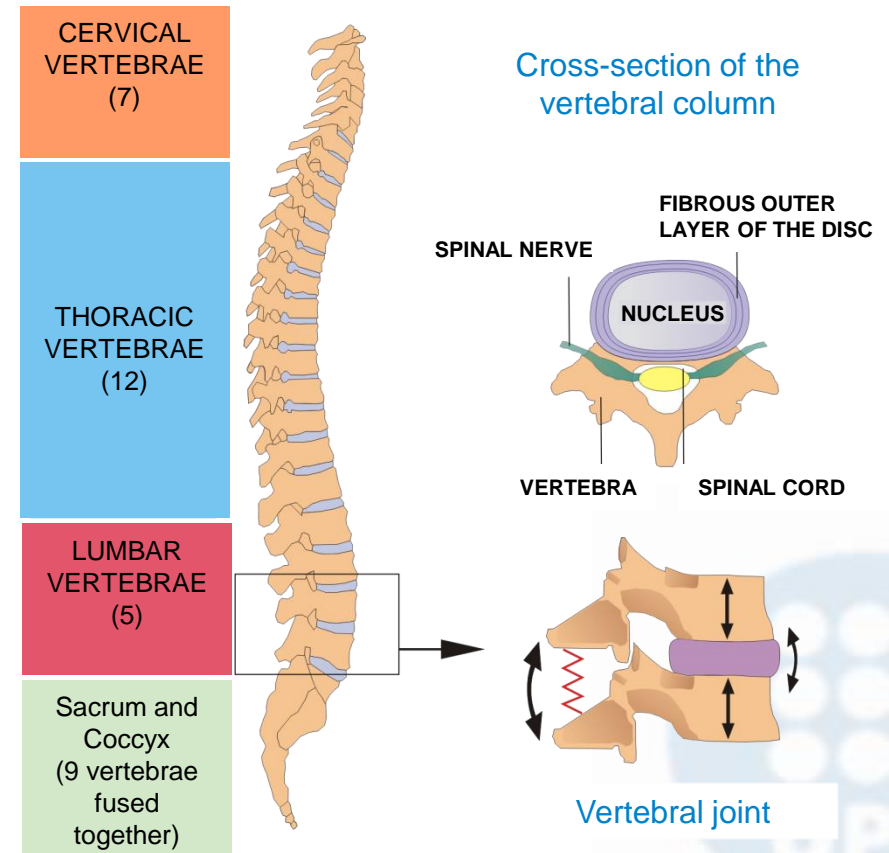
It keeps the head and torso straight and enables the neck and back to bend and turn.

The vertebral column has 33 bones (**vertebrae**). Between each pair of mobile vertebrae is an **intervertebral disc** (a cushion of strong, fibrous cartilage that can be flattened slightly to absorb impacts and movements).

The strong ligaments and muscles surrounding the column stabilise the vertebrae and help to control movement. The vertebral column **protects the spinal cord** and spinal nerve roots come out from spaces between vertebrae.

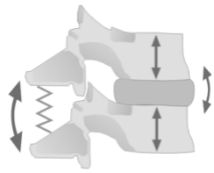
Why do we get backache?

- Due to the adoption of **awkward postures** (excessive flexions, inclinations or rotations)
- Due to **exerting ourselves beyond** our capacity (overexertion).
- Due to a **lack of good posture habits**



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Recommendations

Physical fatigue is a reduction of functional capacity in a healthy person, as a result of a specific activity

Physical load

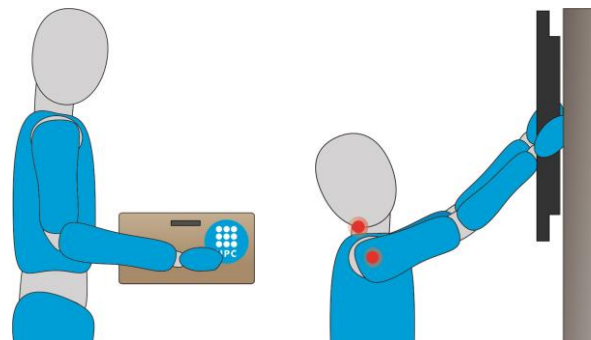
The **degree** of physical load depends mainly on:

- The **type of task** to undertake (static or dynamic tasks).
- The **intensity of the tasks** (pace, frequency, effort., etc.)
- **Individual characteristics** of the worker (sex, age, training, muscle mass)

If the work load is not constantly greater than the physical capacity of the worker, the body will adapt and recover after rest.

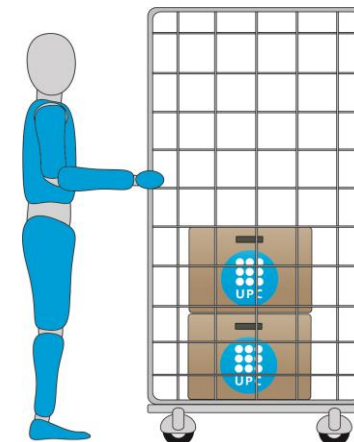
Situations that could cause physical fatigue

Static muscle work: when the muscle is tensed for a prolonged period of time without making any movements. Under these conditions, **muscle will get fatigued quickly.**



Examples of static muscle work: the same position is maintained for a long period of time

Dynamic muscle work: the muscle is contracted and relaxed periodically during the tasks.

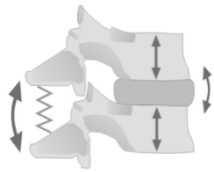


Moving from one place to another walking and pushing a trolley



Effects of physical loads on health

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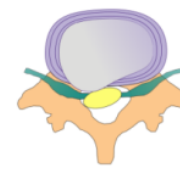
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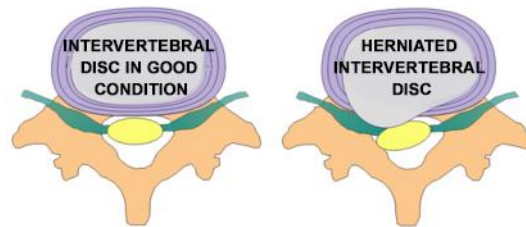
The adoption of **awkward postures** and continuous **overexertion** may cause **injuries** that tend to be located in the lumbar region

Slipped disc

Discs that separate the vertebrae have a hard outer layer and a pulpy nucleus.

The adoption of awkward postures (flexions, rotations, inclinations) or overexertion can **break the outer layer of the discs, which leads to protrusion of some of the disc's inner material**. The herniated protrusion can press on the closest spinal nerve root.

Symptoms: pain, muscle spasms and rigidity in the affected area.

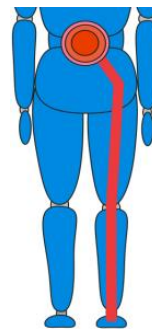


Cross-section of the vertebral column

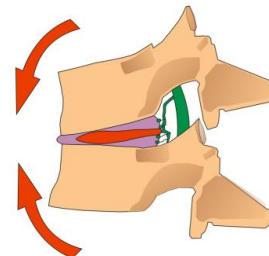
Sciatica

Pressure **on the sciatic nerve roots** causes pain in the buttocks and the back of the leg.

The sciatic nerve is the longest nerve in the body, and pressure on its roots may cause pain that can irradiate along the entire leg. In severe cases, the pain may be accompanied by weakening of the leg muscles.



Pain radiating down the leg to the foot (buttocks, thigh and foot)

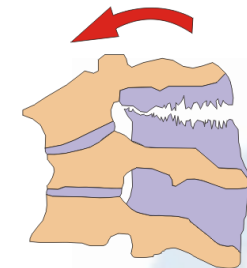


If the nucleus is moved backwards it presses on the sciatic nerve

Torn ligaments

Excessive **compression, torsion or flexion**, beyond the normal range of movement of the spine **can cause torn ligaments**.

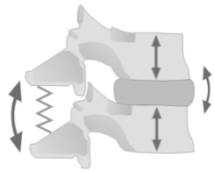
If ligaments tear during extreme flexion or torsion, they threaten the stability of the vertebral column and cause a permanent injury in the spinal cord or the nerves.



Torn ligaments due to flexion of the back

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To avoid **adverse effects on health**, follow these **recommendations**

RECOMMENDATIONS

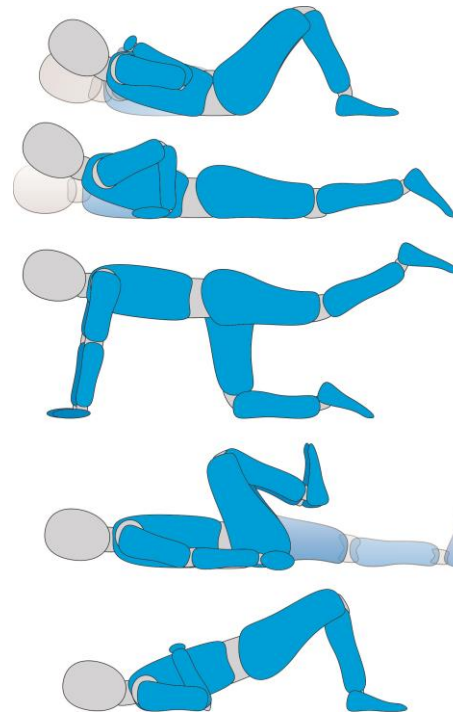
1. Try to keep your **back straight and your head up** throughout the day.

2. **Do not adopt unsuitable postures.** These include excessive flexions, inclinations or rotations.

3. Try to use **the strength of your leg muscles** to lift, never your back.

4. **Do not bend your body forward without bending your legs.**

5. **Do not handle weights that are beyond your physical capacity.**



Examples of exercises to strengthen the lumbar region

6. In a static position, try to **put one foot in front of the other or support one foot on a surface so that you can alternate between your two legs.**

7. **Sit properly.** Adjust your chair so that your back is well-supported.

8. **Do exercise regularly.** Your muscle system will help you to keep your back stable (particularly your abdominal region and lower back).

9. Do exercises that help you to **strengthen the abdominal and lumbar regions.**

10. Use a medium firm **mattress** and try to sleep face up or on your side with your legs bent.