

TECHNIQUES FOR SAFE ENTERING AND EXITING A VEHICLE WEIGHING OVER 2.5 t

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 work-related 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.

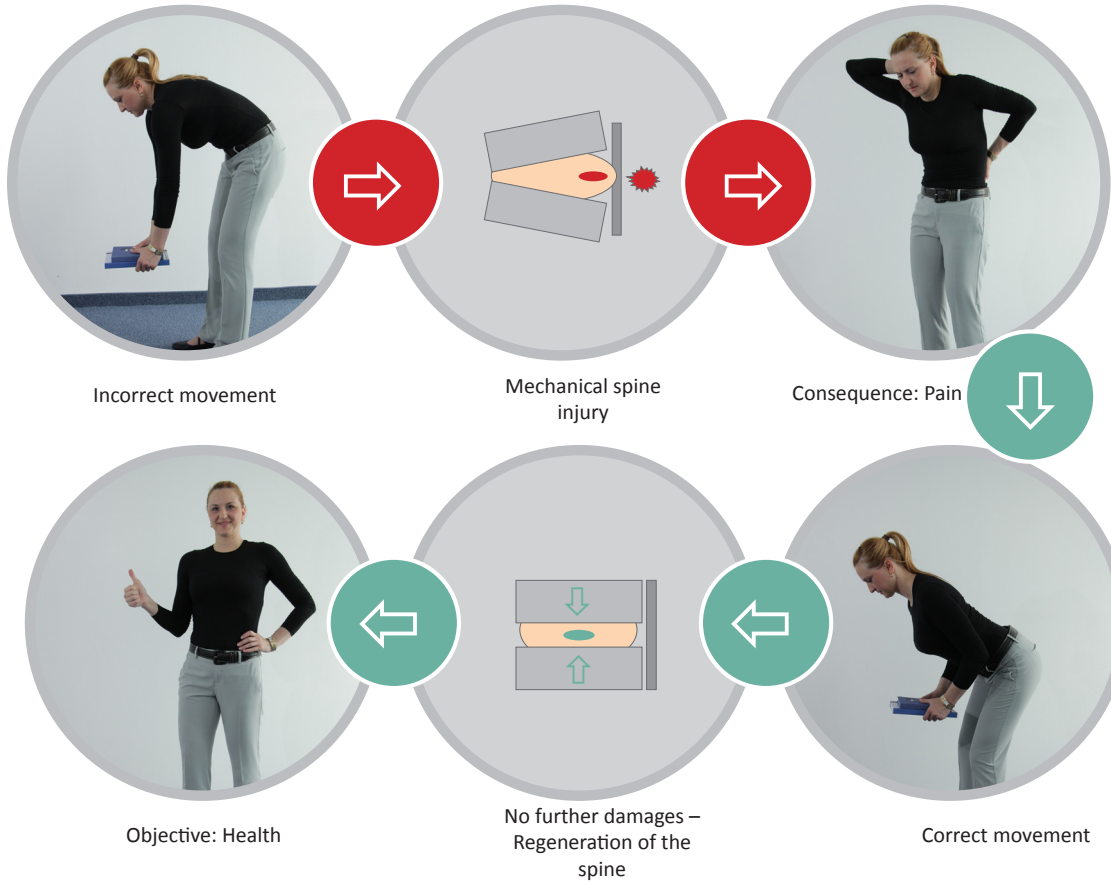
The natural aging process combined with incorrect movement mechanics are elements that strongly affect the progression of mechanical damage to the spine. Natural aging mechanisms can hardly be affected. However, we can always create the habit of personal correction and, with the everyday application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

When entering and exiting a vehicle weighing over 2.5 t, injuries may occur that are most frequently the result of:

- **Acute trauma** – Traumas that occur when the driver slips, trips and falls. Cuts, straining, contusions, bone fracture and the like may occur. The driver can injure his foot, ankle, knee, wrist, elbow, back, shoulder, hip or head.
- **Gradual trauma** – Traumas that occur for years as a result of accumulation of small mechanical damages.



1.

ACUTE TRAUMA: SLIPS, TRIPS AND FALLS

In order to avoid slipping and falling when entering or exiting a vehicle, we must adhere to several rules:

- **Three supporting contact surfaces** - when entering and exiting a vehicle, at each moment we must be in contact with at least three points (anchorage and grip) in the vehicle - handrail, steps, steering wheel (picture below).



CORRECT ENTERING A VEHICLE

- **Hands are free.** When entering and exiting a vehicle, the hands have to be free.

If we are holding something in our hands, we have to put it down before entering or exiting a vehicle (pictures below).



INCORRECT

Hands are not free.



CORRECT

Hands are free.

- **Look down before exiting a vehicle.** Before exiting a vehicle, it is mandatory to check the floor, i.e. the area you will step on (whether it is uneven, frozen etc.), with the aim of reducing the likelihood of slipping and falling.
- **It is prohibited to jump out of a vehicle.** The vehicle is exited in the same manner it is entered, with the help of three supporting contact surfaces, slowly and carefully.
- **Muscle stretching.** Before exiting a vehicle, it is mandatory to stretch leg muscles.



**STRETCHING THE LEG MUSCLES
BEFORE EXITING A VEHICLE**

2.

CUMULATIVE TRAUMA

Gradual trauma, the accumulation of small mechanical damage, as well as gradual occurrence of back pain may occur due to incorrect posture when entering and exiting a vehicle, and due to years of incorrect posture and movement habits during sitting while driving.

Incorrect and correct posture when entering and exiting a vehicle weighing over 2.5 t

In addition to the rules for the safe entering and exiting a vehicle aimed at preventing acute injuries, there are rules for the safe entering and exiting a vehicle aimed at preventing injuries that occur gradually. It is the accumulation of small mechanical damages that ultimately results in spinal deformations and pain. By applying the correct posture when entering and exiting a vehicle, mechanical damages can significantly be prevented.

2.1. INCORRECT AND CORRECT METHOD OF ENTERING A VEHICLE FROM THE POSTURE STANDPOINT



INCORRECT

When entering and exiting a vehicle, the back must not be bent.

CORRECT

When entering and exiting a vehicle, the back must be straight, i.e. in a neutral position.



2.2. INCORRECT AND CORRECT POSTURE DURING SITTING IN A VEHICLE WEIGHING OVER 2.5 T

During long-term sitting, the pelvis and spine must be in the correct, i.e. neutral position.



INCORRECT

- Bent back is the most frequent position of incorrect sitting directly causing mechanical damage.
- When sitting with bent back, asymmetrical stress and pressure on intervertebral discs occurs.
- Special emphasis has to be placed on the cervical spine. Forward head and neck protraction is a position that can cause weakness, dizziness, blurred vision and the like, as a result of hindered work of the circulatory system in the neck area.
- Such position can lead to the straightening of the cervical spine (forward neck posture) and other degenerative changes.



CORRECT

- Correct sitting position helps eliminate the causes of mechanical damage to the spine.
- Correct sitting position ensures equal and stable intervertebral space, the pressure forces on intervertebral discs are evenly distributed, and unnecessary stretching of back ligaments and muscles is prevented.
- During driving, the neck and the head must be in a neutral position. We say that „the head should be slowly pushed backwards, and the chin to the chest“.
- For easier holding of the correct position of the neck and the head, it is recommended to occasionally

lightly massage the muscles connecting the skull with the first and second cervical vertebrae (head extensors).

We can usually hold the correct sitting position for a short period of time, and then we relax and bend our back. This is because core muscles fatigue quickly.

That is why the vehicles are equipped with seats whose backrest can be tilted. Also, the backrest is fitted with digital air pillows



that each driver can adjust according to his/her own needs, i.e. to the position that is most comfortable for him/her. These are air supports for lower back, and they can most frequently be adjusted at two levels: upper and lower level. The adjustment of the air pillows primary depends on the postural characteristics of your pelvis.

There are three basic postural characteristics of the pelvis:

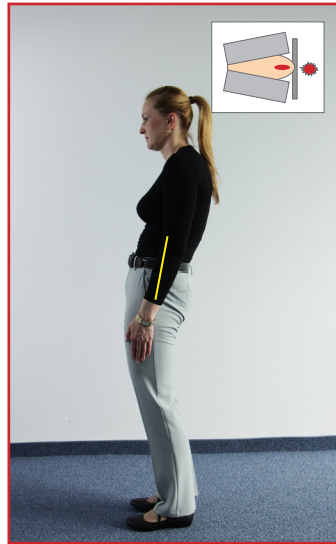
- Anterior tilt,
- Posterior tilt,
- Neutral pelvic position.

Correct sitting position, level of inflating the air pillow for the lower back and the tilt of the seat for drivers with different postural characteristics of the pelvis



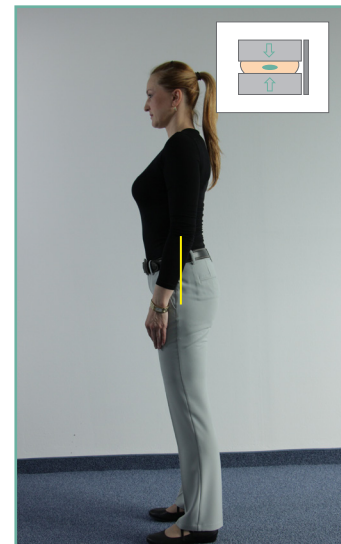
ANTERIOR PELVIC TILT

The lowest level of inflation of air pillows and the vertical position of the backrest will most often best suit drivers with anterior pelvic tilt.



POSTERIOR PELVIC TILT

The highest level of inflation of air pillows and significant tilting of the backrest backwards will most often best suit drivers with posterior pelvic tilt.



NEUTRAL PELVIC POSITION

The medium level of inflation of air pillows and moderate tilting of the backrest backwards will most often best suit drivers with neutral pelvic position.



ANTERIOR PELVIC TILT

Lowest level of inflation, the backrest almost vertical.



POSTERIOR PELVIC TILT

Highest level of inflation, the backrest tilted as far as it goes.



NEUTRAL PELVIC POSITION

Medium level of inflation, moderate tilting of the backrest.

3.

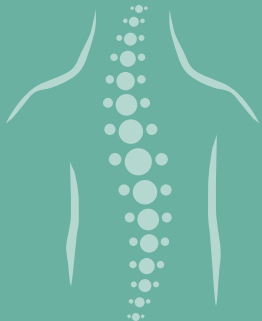
CONCLUSION

Incorrect methods of entering and exiting a vehicle can not only cause slipping and falling, but they can also cause the accumulation of small mechanical damages to the spine that will eventually result in large mechanical damage and back pain. With the correct method of entering and exiting a vehicle and correct sitting positions in the vehicle, the progression of mechanic damage is stopped and the body is allowed to regenerate itself.

Now is the time for a healthy spine!

Message from the author:

"The primary cause of back pain is not long-lasting, but incorrect long-lasting sitting at the steering wheel!"





Author: Assist. Prof. Josipa Nakić, PhD
Editor: prof. Ilijana Brkanović, MSc
Manager of the ZDRAVLJE+ (HEALTH+) project, INA d.d. SD&HSE
Photos: Ferdo Buva, INA, d.d.

Copyright © INA, d.d. All rights reserved. It is strictly prohibited to copy, redistribute, republish or modify any materials or software contained in this script, without the prior written consent of INA, d.d.

