

# ERGONOMICS AND DRIVING



## TABLE OF CONTENTS

Is driving really bad for you? _____	1
Typical problems from frequent driving _____	1
Who is at risk? _____	1
Long term sitting _____	1
Whole-body vibration _____	2
How can you avoid the health hazards of driving? Safety tips _____	2
References _____	3

## IS DRIVING REALLY BAD FOR YOU?

It wouldn't seem that sitting in a moving vehicle would be hazardous to your health, but think...

- After a long drive to the cottage, are you stiff as soon as you get out of the car?
- Does your whole body feel exhausted after driving the truck all day?
- Is lifting suitcases from the trunk of your taxi harder on your back after driving your fare across town?
- Do you feel like you need a couple of minutes to stretch out your back after driving the forklift for the whole afternoon?
- Are your neck and shoulders sore after long drives?

These are symptoms you would feel from exposure to the ergonomic risk factors of driving. If you work in a job where driving a vehicle is a major activity, you are encountering these risk factors every day. If you do not protect yourself, the health of your spine could deteriorate, possibly leading to chronic back pain in later months or years. This pamphlet informs you of the ergonomic risks from driving, and provides you with a few simple but important safety tips to help keep you healthy.

## TYPICAL PROBLEMS FROM FREQUENT DRIVING

- Neck, back and shoulder pain
- Cramps, pressure points and poor circulation in the legs and buttocks
- Immediately after driving, there is an increased chance of low back injury from lifting
- Long-term potential for degeneration of spinal discs and disc herniation

## WHO IS AT RISK?

- Truck Drivers
- Ambulance Drivers
- Heavy Equipment Operators
- Taxi and Limousine Drivers
- Bus Drivers

- Forklift Operators
- Farmers (*driving tractors and combines*)
- Delivery people and Courier Service people
- Traveling Sales people
- Weekly Cottage-goers
- Anyone who drives for long periods of time on a regular basis

Chronic back and neck injuries from driving are caused by TWO MAIN RISK FACTORS:

- Sitting for long periods of time
- Whole-body vibration

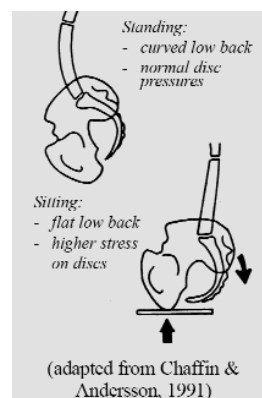
When acting together, they create a considerable risk of chronic back injury!

## LONG TERM SITTING

When you sit, your pelvis rolls backward and the small of your back flattens out. This increases the pressure in the discs of the spine. (*In this position, the discs are less prepared to handle the vibrations from your car or truck.*)

Ligaments in your back help to hold the spine together as you move. These ligaments will stretch and slacken if you sit down for a long time. After standing up, they remain slack for a while and cannot support the spine as they normally do.

If your seat is not correctly adjusted, you could develop pressure points in the buttocks and back of the legs, and muscle strain in the low back.



Continuous upper back and neck muscle work is often required to hold the head in position, especially if vibration is present. Continuous muscle activity can lead to muscle strain.

Holding a foot pedal down over a long period of time may cause stiffness and spasm in the legs and low back.

## WHOLE-BODY VIBRATION

Bumps in the road cause up-and-down vibration of your automobile or truck frame along the length of your spine.

Every object has a “resonant frequency” (*the body’s is 3-5 Hz*).

Vibration from the road is often in the body’s resonant frequency range. Exposure to vibration at the resonant frequency increases the risk of injury.

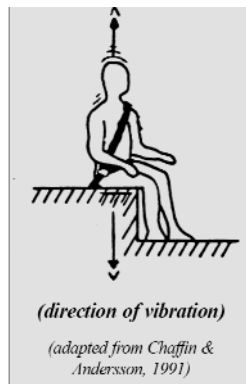
Whole-body vibration stimulates bursts of back muscle activity. This causes neck and back muscles to tire more quickly, and decreases the support these muscles can give to the spine. Even if the muscles are working very lightly, activity for an extended time without rest will lead to fatigue and increase the risk of back injury.

Long term exposure to whole body vibration is a common way to herniate a disc in your back. The increased disc pressure from sitting speeds up this process.

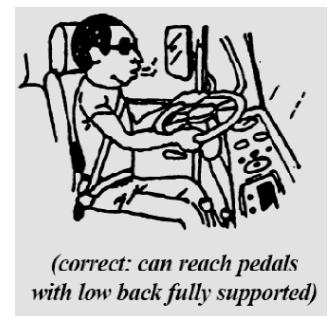
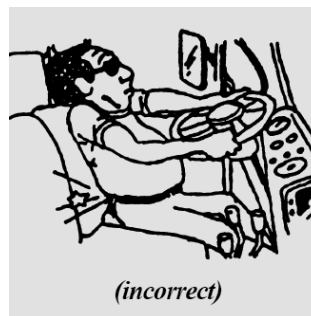
The International Organization of Standardization (ISO) has produced recommended limits for human exposure to whole-body vibration. Assessments can be performed to determine if your vehicle is within these safe standards.

## HOW CAN YOU AVOID THE HEALTH HAZARDS OF DRIVING? SAFETY TIPS

- Literature suggests that if possible, the back of your seat should be tilted at 110 degrees from your legs (*i.e. the seat pan*) to reduce disc pressure and relax the back muscles.
- Keep your suspension system in good working order! You may also want to add extra padding over your seat to absorb vibration.



- Adjust your seat and steering wheel properly. Make sure you can press the pedals without moving your low back forward off the back of the seat.
- Use a lumbar support. Even a properly-placed rolled-up towel will suffice.
- If possible, tilt your seat a notch or two back and forth every 20-30 minutes. This alters the direction of vibration on your body. But stay high enough to see the road!
- Avoid slouching! Here’s a tip: don’t adjust your rear or side view mirrors unless you have changed the tilt in your seat.
- If you can, take regular rest/stretch breaks. Only 5 minutes per hour will suffice!
- Within reasonable limits, shift positions regularly while driving.
- People who work in driving occupations are often inactive and could gain weight. Being overweight increases the chance of injuring your low back. Find active forms of recreation to keep fit in your personal time.



### NOTICE

Avoid lifting immediately after driving! Your muscles are tired, your ligaments are stretched, and the discs in your spine are at risk of injury. Give yourself one or two minutes to stretch and rest before trying to lift anything

## REFERENCES

- Andersson, G.B.J., Ortengren, R., Nachemson, A. and Elfstrom, G. *Lumbar disc pressure and myoelectric back muscle activity during sitting. Studies on an experimental chair.* Scandinavian Journal of Rehabilitation and Medicine. 3: 104-114 (1974).
- Boshuizen, H.C., Bongers, P.M., and Hulshof, C.T. *Self-reported back pain in fork-lift truck and freight-container tractor drivers exposed to whole-body vibration.* Spine. 17(1): 59-65 (1992).
- Bovenzy, M. and Zadini, A. *Self-reported low back symptoms in urban bus drivers exposed to whole-body vibration.* Spine. 17(9): 1048-1059 (1992).
- Chaffin, Don B. and Andersson, Gunnar B.J. *Occupational Biomechanics; Second Edition.* John Wiley & Sons, Inc. New York, 1991.
- Damkot, D.K., Pope, M.H., Lord, J. and Frymoyer, J.W. *The relationship between work history, work environment and low-back pain in men.* Spine. 9(4): 395-399 (1984).
- Hulshof, C. and van Zanten, B.V. *Whole-body vibration and lowback pain. A review of epidemiologic studies.* International Archives of Occupational and Environmental Health. 59(3): 205-220 (1987).
- International Standard ISO 2631/1-1985, *Evaluation of human exposure to whole body vibration.* International Organization for Standardization. (1985).
- Masset, D. and Malchaire, J. *Low back pain. Epidemiologic aspects and work-related factors in the steel industry.* Spine. 19(2): 143-146 (1994).
- Pope, M.H. and Novotny, J.E. *Spinal biomechanics. Journal of Biomechanical Engineering.* 115(4B): 569-574 (1993).
- Wilder, D.G., Pope, M.H. and Frymoyer, J.W. *The biomechanics of lumbar disc herniation and the effect of overload and instability.* Journal of Spine Disorders. 1(1): 16-32 (1988).

## OHCOW OFFICES

If you need further assistance, call the Occupational Health Clinic for Ontario Workers Inc. Closest to you.

### HAMILTON

848 Main Street East  
Hamilton, ON  
L8M 1L9  
(905)-549-2552  
Toll Free: 1-800-263-2129  
Fax: (905)-549-7993  
E-mail: [hamilton@ohcow.on.ca](mailto:hamilton@ohcow.on.ca)

### SARNIA-LAMBTON CLINIC

171 Kendall Street  
Point Edward, ON  
N7V 4G6  
(519)-337-4627  
Fax: (519)-337-9442  
E-mail: [sarnia@ohcow.on.ca](mailto:sarnia@ohcow.on.ca)

### SUDBURY

1300 Paris St.  
Suite 4  
Sudbury, ON  
P3E 3A3  
(705)-523-2330  
Toll Free: 1-800-461-7120  
Fax: (705)-523-2606  
E-mail: [sudbury@ohcow.on.ca](mailto:sudbury@ohcow.on.ca)

### TORONTO

970 Lawrence Ave. West  
Main Floor  
Toronto, ON  
M6A 3B6  
(416)-449-0009  
Toll Free: 1-888-596-3800  
Fax: (416) 449-7772  
E-mail: [toronto@ohcow.on.ca](mailto:toronto@ohcow.on.ca)

### WINDSOR

3129 Marentette Avenue  
Unit #1  
Windsor, ON  
N9A 4N1  
(519)-973-4800  
Toll Free: 1-800-565-3185  
Fax: (519)-973-1906  
E-mail: [windsor@ohcow.on.ca](mailto:windsor@ohcow.on.ca)

### PROVINCIAL OFFICE

15 Gervais Drive  
Suite 601  
Don Mills, ON  
M3C 1Y8  
(416)-443-6320  
Fax: (416)-443-6323  
Toll Free : 1-877-817-0336  
E-mail: [info@ohcow.on.ca](mailto:info@ohcow.on.ca)

Every effort has been made to ensure the accuracy of the information in this workbook.  
OHCOW assumes no responsibility for how this information is used.

Revised 2005