

# Back *to* Basics

A guide to  
back injury  
prevention  
and recovery



Workers'  
Compensation  
Board

---

Alberta



# The WCB's Direction for the Future

The WCB-Alberta sees itself as a key player in keeping Albertans working. We believe that a focus on accident prevention will lead to safer workplaces where fewer illnesses and injuries occur. When they do, we believe well-developed and managed programs and services can lessen their impact on workers, their families and their employers. Workers benefit from safer, healthier workplaces. Employers benefit from increased productivity and lower costs, enhancing their financial stability and contributing to a strong overall economy.

A strong economy invites new and growing businesses - more Albertans working.

## **WCB-Alberta Vision**

Albertans working – a safe, healthy and strong Alberta.

## **WCB-Alberta Mission Statement**

WCB-Alberta, working together with our partners, will significantly and measurably reduce the impact of workplace illness and injury on Albertans.

## A Message from the Centre of Excellence

The back is one of the most complex structures in the human body. Composed of bone, ligaments, muscles, spongy material and nerves, it is called upon to perform tremendous feats of lifting and twisting, and yet, it can be fragile and easily susceptible to injury. In fact, 17 per cent of the time lost claims accepted by the WCB in 1998 related to back injuries.

While medical science has made significant advances in the treatment of the back, the best strategy is still prevention of injury. Prevention is a primary focus of the WCB's new Centre of Excellence. As part of its five year strategic plan, 1999-2003, the WCB through its Centre of Excellence, will research, develop and disseminate best practices in the area of injury prevention and disability management. The strategic plan is concerned overall with reducing the financial and human impact of work-related injury and illness on Albertans. By finding and implementing best practices in the prevention and management of workplace injury, we are partnering with Alberta workers and employers to reach this important goal.

The Centre of Excellence is pleased to present this booklet as one of the WCB's initial efforts to directly reduce injuries through prevention. This booklet will help you to understand the mechanics of the back, the causes of back pain and show you some easy preventative strategies that will assist you to keep your back healthy.

Please join the WCB in reducing workplace injury in Alberta by getting "back to basics".

**Douglas R. Mah**  
Executive Lead,  
Centre of Excellence

# Table of Contents

Introduction	4
The Structure of the Back	5
Causes of Back Pain	8
Spinal Disc Injury	10
Practice Good Posture	11
Bending, Lifting and Carrying	16
Exercises for your Back	18
Injury Prevention and Recovery Tips	30
Back to Basics Evaluation Form	31
Back to Basics Order Form	32

©1999 by the Workers' Compensation Board - Alberta. All Right Reserved. This booklet is protected by copyright. No part may be duplicated or reproduced in any manner without prior consent from the WCB-Alberta.

This publication is based on *Back Talk* published by the WCB-B.C. and *Back to Basics* published by WCB-Manitoba and is used with their permission.

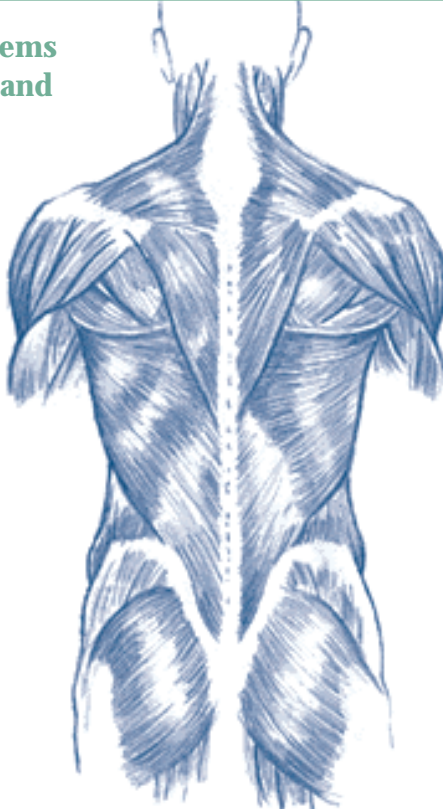
## Introduction

**T**he lower portion of your back experiences more physical stress than any other part of your body. It's also the strongest part of your body. It's important to know what kinds of exertion create too much load on your low back, and how you can use good lifting and carrying techniques to reduce the chance of injury.

Most low back complaints result from simple strains that can heal within two to six weeks if proper treatment is applied. If recovery takes longer than this it's often due to fear of the outcome of an injury, or misunderstanding about how to treat it.

This booklet has been prepared to help you understand how the back works, to provide tips on what you can do to avoid injury and to show you how to care for your back during recovery.

### Muscle systems of the back and buttocks



# The Structure of the Back

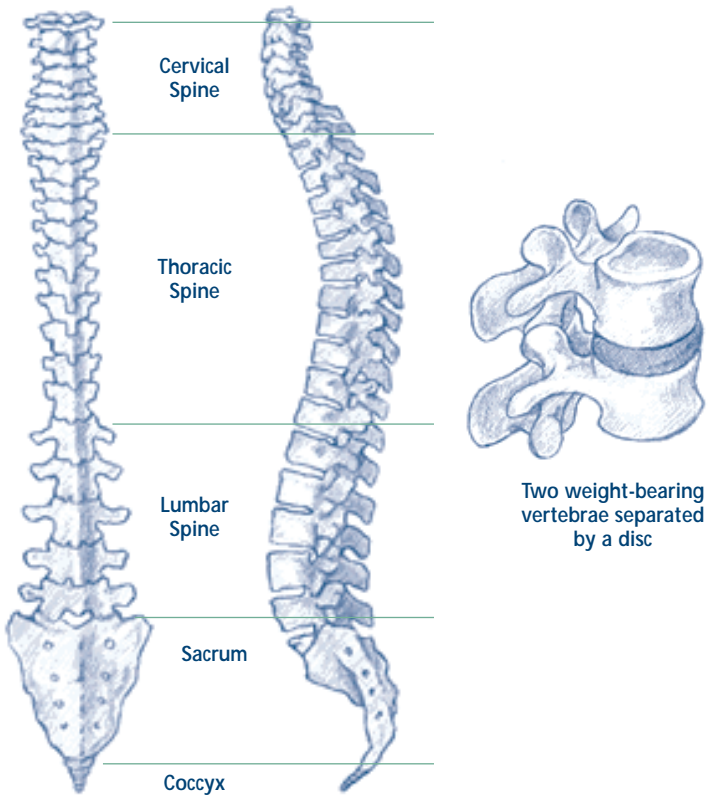
**W**hen we talk about your back, we are really referring to your spinal column. Your spine's job is to:

- support your upper body and head
- increase the flexibility of your body
- protect your spinal cord

The six primary components of your spinal column are:

- vertebrae
- spinal nerves
- facet joints
- ligaments
- discs
- muscles

## Back and side view of the spine



**Vertebrae** – The spine is made up of 24 segments called vertebrae. They are stacked one on top of the other and are separated by shock-absorbing discs.

The spine is divided into five distinct sections: the neck with seven vertebrae; the chest with 12 vertebrae, two ribs attached to each; the low back, or lumbar area, with five vertebrae; the sacrum, comprised of five fused vertebrae; and the coccyx, or tailbone, with three very small fused vertebrae.

**Facet Joints** – Facet joints connect one vertebra to its neighbour, allowing them to move on each other, and ensuring that your back doesn't bend or twist further than it should.

**Discs** – Between each set of vertebrae is a cushioning disc. They are made up of a strong outer sac that is filled with a soft jelly-like substance. Each disc is firmly attached to the vertebra above and below it. Discs can withstand a lot of compression, but excessive force can cause ruptures which cause the jelly-like substance to leak out of the enclosing sac.

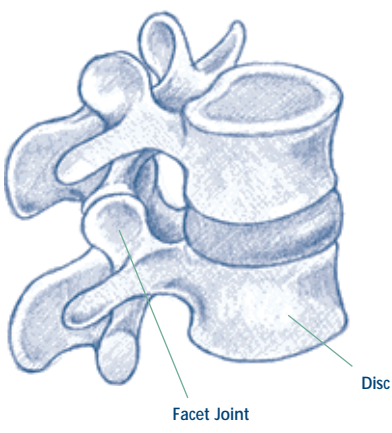
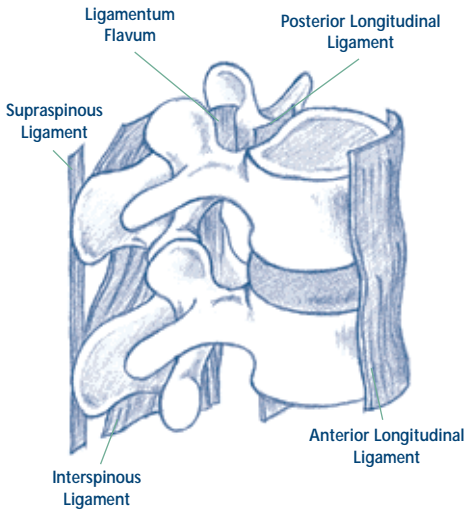
**Spinal Nerves** – Spinal nerves branch out from the spinal cord between each two vertebrae and are connected to the muscles, discs and vertebrae. They carry commands to the various organs and muscles, but also deliver messages about touch, temperature and pain to the spinal cord and brain. If a damaged disc in your lower back pinches one of these nerves you may feel pain in your back and legs or weakness in your legs.

**Ligaments** – Bands of tough tissue, called ligaments, encase the spinal column and connect the vertebrae to one another. Along with the facet joints, ligaments help to keep the vertebrae in position and help to prevent damage by stabilizing the spine and limiting its movement.

**Muscles** – The muscles in your back, abdomen and buttocks help to keep the spine aligned. They can also help to maintain good posture. Muscles and ligaments that are over-stretched or strained can cause pain in the low back and buttocks.

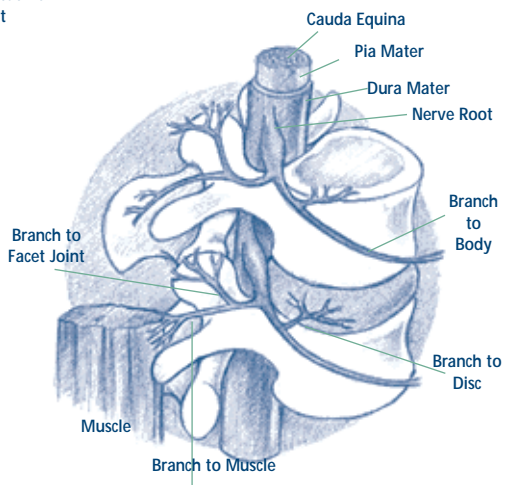
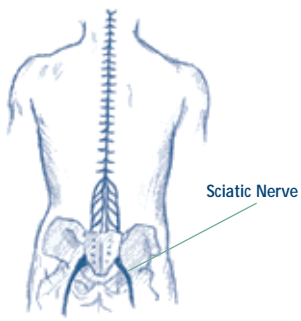


## Ligaments



## Spinal Cord

The spinal cord runs from the brain to the level of the second lumbar vertebra. The spinal nerves join to form the sciatic nerve.



## Causes of Back Pain

**M**ost minor back pain occurs when muscles and/or ligaments are overused or over-stretched. Proper care and treatment will generally result in complete recovery within a few weeks with no permanent damage.

Irritation of the facet joints is a secondary cause of back pain. Facet joint injury can generally be prevented if you are careful not to twist your back while lifting heavy articles.

**Muscles** – Sudden, unfamiliar or unexpected movement is what most often causes muscle injury. Injury is more likely if:

- the muscle has been weakened by inactivity
- the muscle has not been warmed up and stretched before activity
- the muscle has become fatigued through a repetitive motion or by being held in a fixed position for too long

**Ligaments** – Ligaments are injured in the same way as muscles. Sudden movements can cause injury by over-stretching the ligament, as can incorrect body posture or maintaining a fixed body position for too long.

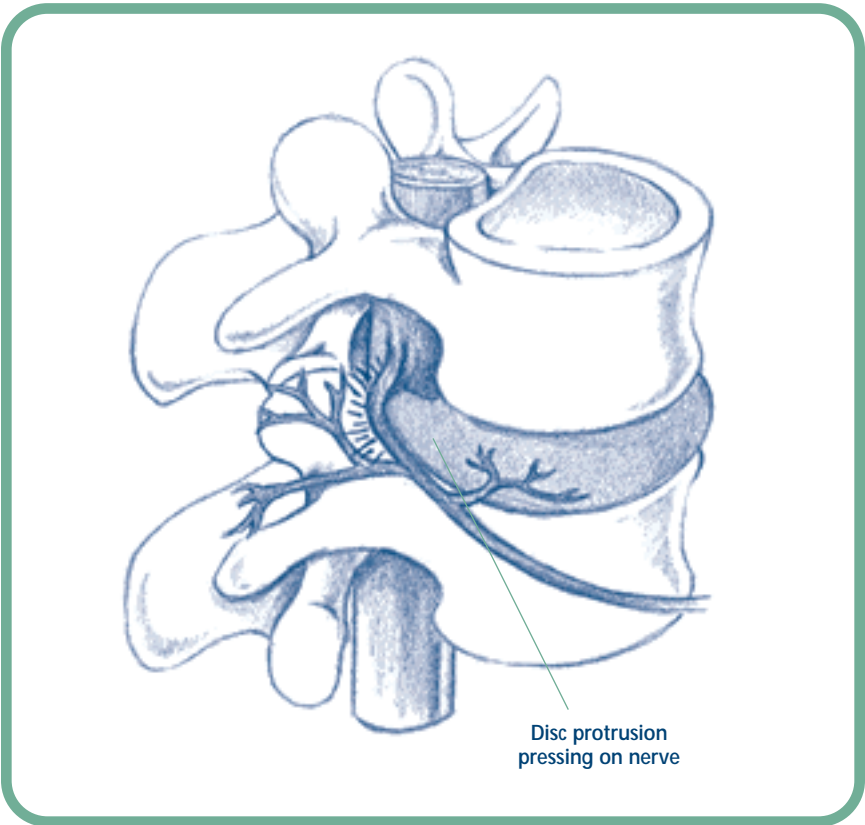
**Facet Joints** – Situations such as unexpectedly twisting your back can cause one or more facet joints to become irritated and painful.



Sudden movements may not allow muscles to have time to contract enough in order to protect the spine. Injury may also occur when muscle contraction isn't coordinated. If the force is dramatic, ligaments may also be injured. Slipping and falling may produce similar results because the same factors are in effect.

Pay attention to aches and pains; they are warning signals that your muscles are tired, sometimes from being held in one position for too long. Changing your position will allow your muscles to relax. It's always best to stretch in the opposite direction of your work posture or to change position before you experience aches and pains.



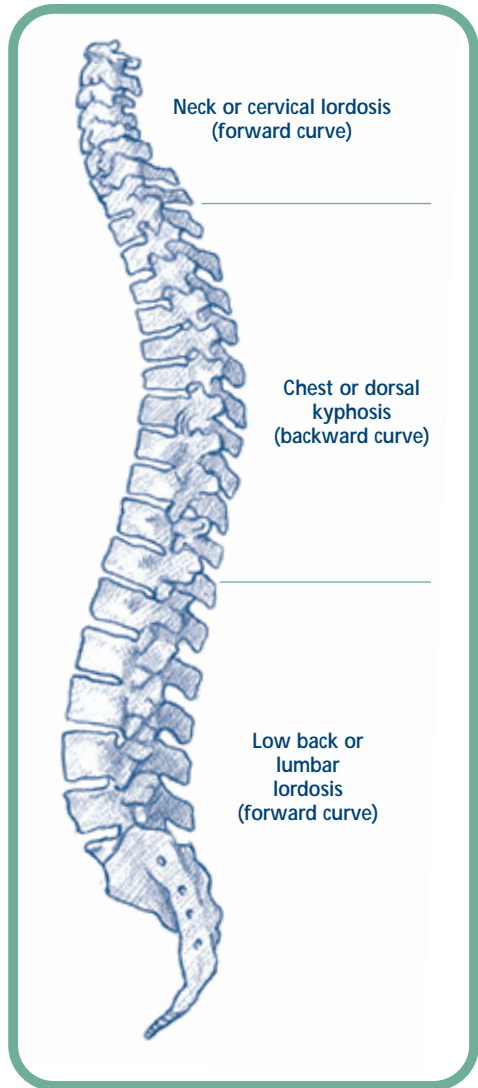


Disc protrusion  
pressing on nerve

**M**ost back problems result from injured muscles or ligaments, or occasionally, joints – not from disc injuries. If a disc is strained beyond its limit, though, the outer casing can tear or rupture causing the inner substance to seep out. If this substance presses on a spinal nerve, you may feel pain or tingling in the leg. This leg pain is known as “sciatica.” All but the most severe disc problems recover without surgery.

## Practice Good Posture

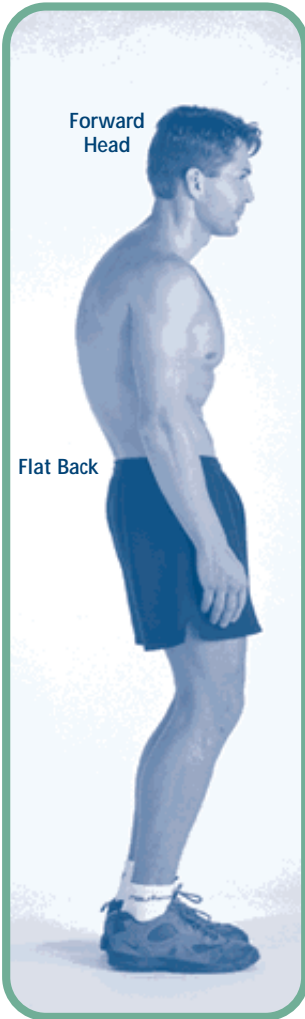
**A** normal, healthy spine looks like a double S, with two curves to the front and one to the back. These curves are in balance and support the head on a pillar. A decrease in the curves – “flat back” – or an increase – “sway back” – causes the spine to become unbalanced. Either of these situations causes the muscles, ligaments and joints to work harder in supporting the head and body, resulting in fatigue and discomfort.



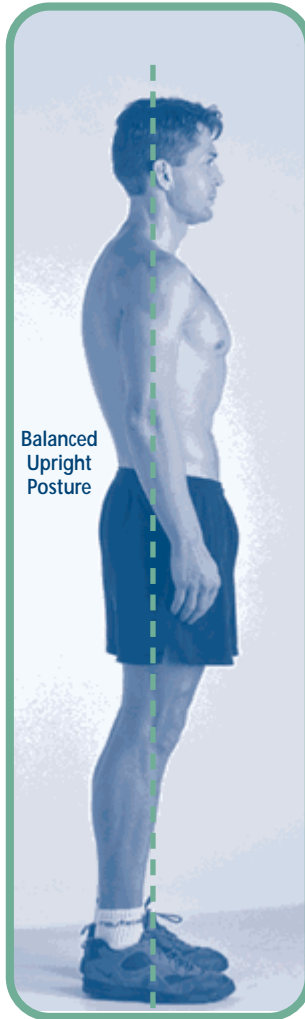
# Good Standing Posture

**W**hen standing, hold your body so that the top of your head, the centre of your torso and the bottoms of your feet create a straight vertical line.

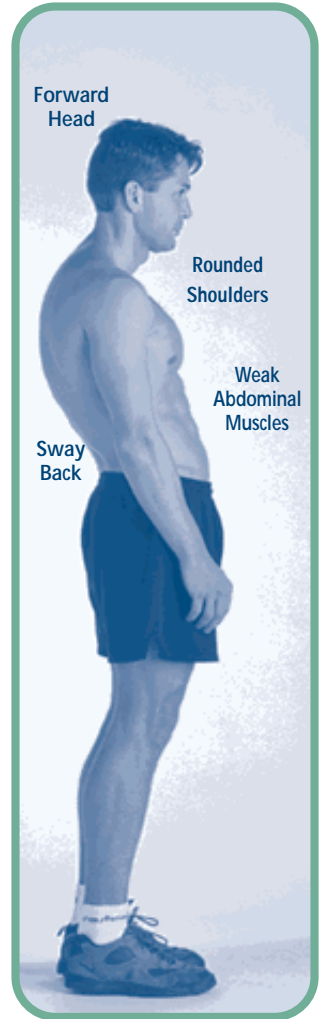
Poor Posture



Good Posture



Poor Posture



Try not to keep your body in any one position for too long. Periodically adjust your body to prevent fatigue by doing one of the following things:

- place one foot on a 15 - 20 cm (6 - 8") elevation – a box, block, step or pile of books
- crouch from time to time
- if you've been leaning forward, stretch and bend backwards
- if you've been standing in one position, move your feet



# Good Sitting Posture

**M**any jobs today involve long periods of sitting, so poor sitting posture is a potential problem for many of us.

Poor seating can cause the pelvis to tilt; this flattens the lower back which can cause pain and discomfort. A well-designed chair, a back support or even a pillow can correct this problem. When sitting correctly, the pelvis is in a neutral position; that is, it is supported along its natural curve allowing the muscles to relax.



Position the height of the seat so that your knees are level with or higher than your hips. If you sit at a keyboard, try to place your reference material at eye level so that you don't have to look down or lean over.

Sitting puts a greater load on the lower back than either standing or walking. To relieve this load, stretch or get up and walk around several times throughout the day.





## Good Lying Posture

**M**aintaining good posture when you sleep is just as important as when you stand or sit. If you experience low back pain when you lie on your back with your legs straight, try bending your knees and supporting them with a pillow.

To relieve a backache lie on your side with your knees and hips bent. If you bend only your top leg, place a pillow under that knee to prevent twisting of your back.

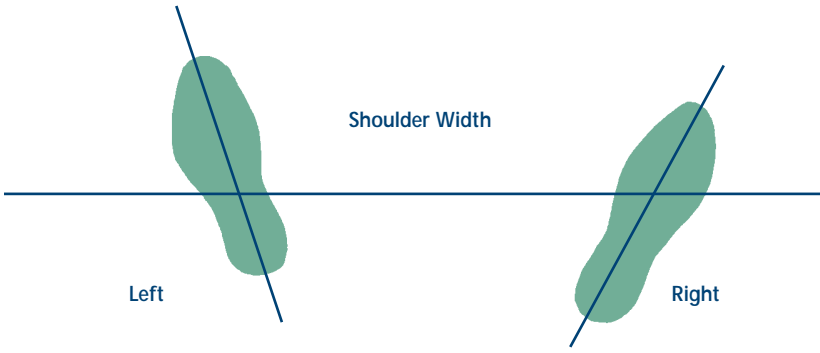
It's important to sleep on a good-quality mattress – one that allows you to get a refreshing rest. If you have a sore back, try different types of sleeping surfaces – another mattress, a foam pad on the floor, or a waterbed – to see if any of these offer relief.

## Bending, Lifting and Carrying

**B**y always following these rules, you'll prevent injury to your back.  
When lifting or carrying objects (even light ones):

- place your feet shoulder-width apart for good balance
- bend your knees
- keep the load close to the centre of your body
- lift gradually and smoothly, without jerking
- pivot with your feet, don't twist your back while lifting
- coordinate your lift when working with a partner





## Exercises for your Back

**T**o have a healthy back, it's important to build strong, flexible muscles that support the spinal column and maintain good posture. Weak or tight muscles make back injury more likely and recovery more difficult. Exercise and stretching are the only ways to keep your muscles healthy.

Regular exercise will:

- build strength and endurance for better spinal column support and posture
- stretch muscles that may be shortened and that are therefore causing imbalances
- maintain joint mobility

## Some Thoughts About Exercise

**T**he exercises on the following pages are designed to improve and maintain the overall fitness of your back. They are not intended as substitutes where professional care would serve you better. If you are under the care of a healthcare professional, do the exercises that have been recommended to you.

- Exercises One through Six are stretching exercises and should always be done before Exercises Seven through Eleven, which are strengthening exercises
- Start with five repetitions of each exercise
- Progress gradually over time to 15 repetitions of each exercise, using your own careful judgement
- Set aside a minimum of 20 minutes daily for exercise
- If exercising results in pain that lasts longer than 15 minutes, alter your exercise program or reduce the frequency



## 1. Pelvic Tilt

**L**ie on your back with your knees bent, your feet flat on the floor and your arms at your sides. Flatten the small of your back against the floor by tightening your stomach muscles, but without pushing down with your feet. Hold this position for five seconds, then slowly relax.

## 2. Knee to Chest

**T**ake the same position as with Exercise One, grasp your thigh behind your right knee and gently pull your knee toward your right shoulder. Hold for five seconds, then return to the starting position and repeat with the left leg. Alternate legs.





### 3. Lumbar Rotation

**S**tart in the same position as with Exercise One. Keep your knees together and roll them to one side as far as possible without lifting your shoulders from the floor. Hold for five seconds, then return to the starting position and roll your knees in the other direction.

## 4. Hump and Hollow

**W**ith your hands and knees squarely on the floor, relax your abdomen and let your back sag downward. Hold for five seconds, then hump your back upward, hold for five seconds, then return to the original position.





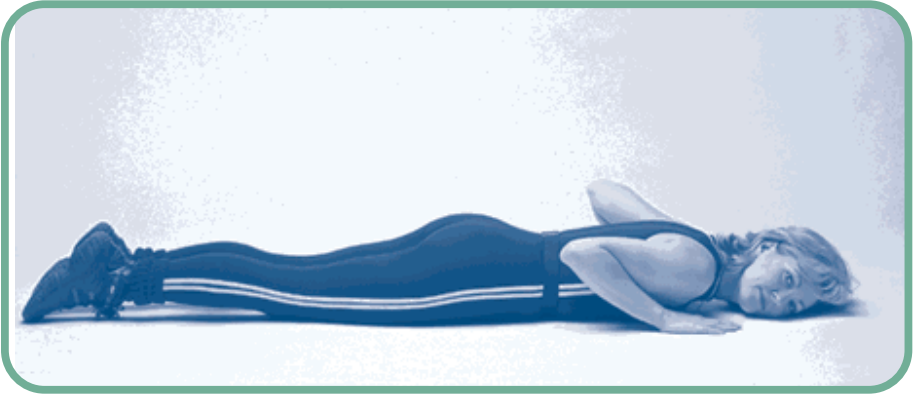


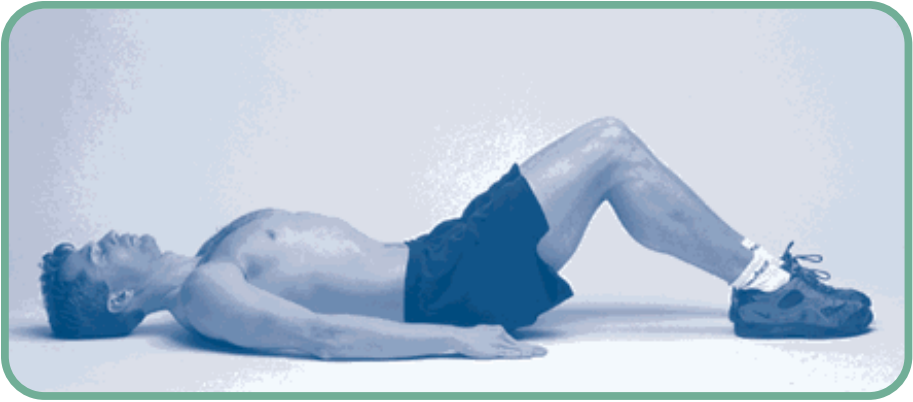
## 5. Side Bend

**P**lace your feet shoulder-width apart. Drop your head and shoulder to the right while sliding your hand down the outside of your leg, slowly bending sideways as far as you can. Hold for five seconds, return to the starting position and repeat on the other side.

## 6. Prone Trunk Extension

**L**ie on your stomach with your hands positioned at your shoulders. Push up with your hands using your arm muscles. Allow your stomach muscles to relax and your back to sag. Be careful not to bend back too far. Hold for five seconds and return to the starting position.





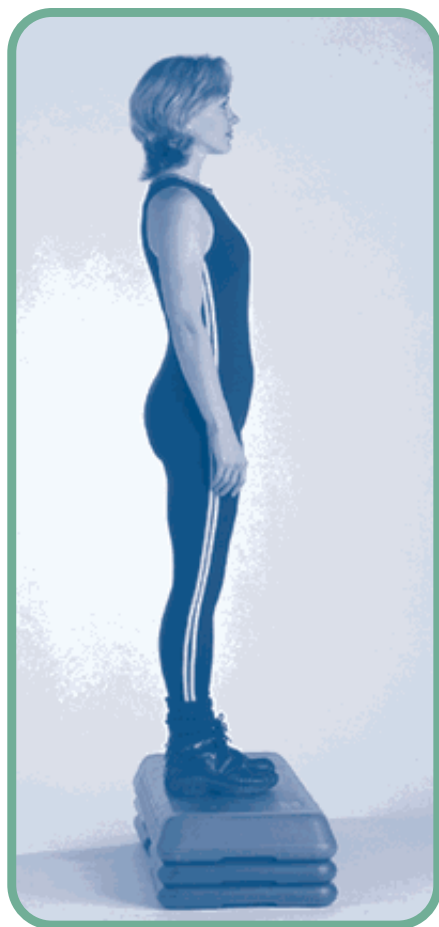
## 7. The Bridge

**S**tart in the same position as with Exercise One. With your knees slightly parted, slowly raise your buttocks from the floor, keeping your stomach tight and your abdomen in line with your thighs. Hold for five seconds and return to the starting position.

## 8. Wall Squat

**L**ean against a smooth wall with your feet pointing straight ahead and your heels about 45 cm (18") from the wall. Slowly slide down the wall until your knees are bent to 90°. Hold for five seconds, then slowly slide back up. As you become stronger, increase the time that you hold the squat.



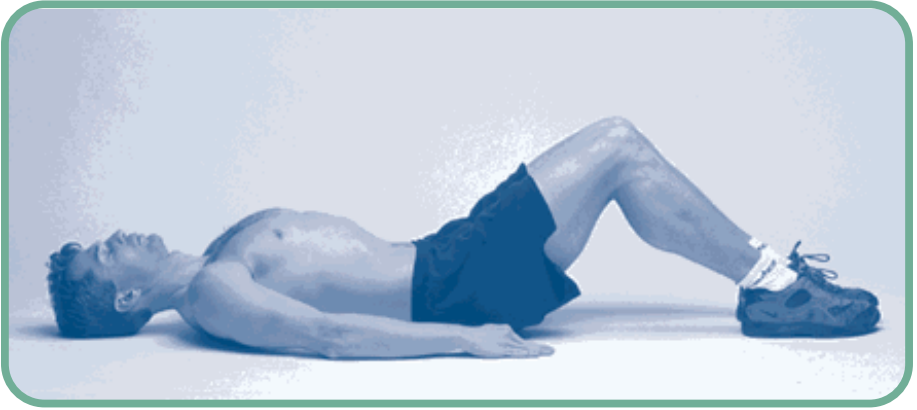


## 9. Step-Ups

**S**tand facing a 30 – 45 cm (12”-18”) step stool. Step onto the stool, starting with your left foot. Slowly step down, starting with your right foot. Start the next set with your right foot.

## 10. Partial Sit-Up

**D**o the Pelvic Tilt (Exercise One). Tuck your chin into your chest. While holding this position, raise your head and shoulders up until your shoulder blades are off the floor. Hold briefly before returning to the starting position.





## 11. Rotational Sit-Up

**D**o the Pelvic Tilt (Exercise One). Keeping your hips flat on the floor, rotate your upper body onto your left shoulder. Keeping your chin tucked in, curl your head and right shoulder upward by stretching out your arms and hands toward your left knee. Hold briefly before returning to the starting position. Alternate to the right side.

# Injury Prevention and Recovery Tips

## Rest and Activity after Injuring Your Back

If you have strained your back, try taking a hot bath or shower and then doing the stretching exercises (One to Six). A couple of days – not weeks – of bed rest may be advisable if you have a very sore back. Find the most comfortable position and then apply ice, alternated with heat, for a maximum of 20 minutes each. Once the pain eases:

- do some gentle stretching
- walk around the room
- walk around the house
- walk around the block
- extend your stretching exercises a little every day
- swim and exercise your back if possible

## Diet and Your Back

Excess body weight places additional strain on the spine. If you are overweight, consider changing your eating habits. Your doctor, chiropractor or a dietitian can help you develop a diet to suit your needs.

## Some Points to Remember

- Back injuries are caused by excessive stress on the spine
- Ligaments and muscles are the tissues most likely to be injured
- Balanced posture while standing, sitting or sleeping helps to maintain a healthy back
- Stay fit and avoid overeating
- Exercise helps to prevent back injury and also speeds recovery
- Gentle exercise after a back injury is essential to recovery
- Keep a positive attitude



# Back to Basics EVALUATION FORM

*Please take a few moments to complete this evaluation form.*

## Indicate your industry:

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Forestry         | <input type="checkbox"/> Fleet               | <input type="checkbox"/> Retail              |
| <input type="checkbox"/> Health           | <input type="checkbox"/> Educational         | <input type="checkbox"/> Manufacturing       |
| <input type="checkbox"/> Municipalities   | <input type="checkbox"/> Federally Regulated | <input type="checkbox"/> Tourism/Hospitality |
| <input type="checkbox"/> Construction     | <input type="checkbox"/> Provincial/Crown    | <input type="checkbox"/> Small Business      |
| <input type="checkbox"/> General Industry | <input type="checkbox"/> Other _____         |  |

## Did you find this booklet a useful source of information?

- Yes     No

## Will you apply these principles to your day-to-day routines?

- Yes     No

## Will you encourage others to read this booklet?

- Yes     No

## Please provide us with any feedback that will help us improve the booklet:

---

---

---

---

## Other worksite injury and illness prevention topics I am interested in include:

---

---

---

---

Please fax or mail this form back to us:

Corporate Communications  
Workers' Compensation Board - Alberta  
9925 - 107 Street  
P.O. Box 2415  
Edmonton, Alberta T5J 2S5  
Fax: (780) 498-7875

***If you are ordering additional copies, please mail the evaluation form with your order.***

# Back to Basics ORDER FORM

**Yes, I would like to order additional copies of Back to Basics\*:**

1. Please send me:

\_\_\_\_\_ booklets x \$2.68 (\$2.50 each + \$.18 GST) = \$ \_\_\_\_\_  
(minimum order of 10)

*If you are an employer with a WCB account, up to 25 booklets can be sent to you free of charge. Additional copies are \$2.50 + \$.18 GST.*

\_\_\_\_\_ booklets at no charge (1-25 quantity.)

\* This booklet is available on the WCB-Alberta website - [www.wcb.ab.ca](http://www.wcb.ab.ca)

2. I'm sending a cheque with my order made payable to the Workers' Compensation Board - Alberta.

**Mailing Address:**

Corporate Communications  
Workers' Compensation Board - Alberta  
9925 - 107 Street  
P.O. Box 2415  
Edmonton, Alberta T5J 2S5

3. My Employer Services Account # is: \_\_\_\_\_

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Phone #: \_\_\_\_\_

Please allow two-four weeks for delivery.

Other worksite injury and illness prevention topics I am interested in include:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **Other worksite injury and illness prevention booklets available from WCB-Alberta**

### ***Office Ergonomics, Remembering the Basics***

– To provide a better understanding of ergonomics principles this booklet identifies symptoms and causes of discomfort, guides individuals through evaluation and adjustment of their workstations and outlines exercises designed to reduce the risk of injury.

\$2.68 per booklet (minimum order of 10)

*note: for employers with WCB accounts, up to 25 copies may be sent free of charge*

### ***Worksafe™ Best Practices, Prevention and Disability Management Programs***

– This booklet features Alberta organizations who have demonstrated positive, measurable impacts at their worksites through programs that reduce lost-time injuries and return employees to work sooner.

No charge

**Please contact Corporate Communications at (780) 498-8680 for copies of these booklets.**



**Workers'  
Compensation  
Board**

---

Alberta

\$2.50+GST



Workers'  
Compensation  
Board

---

*Alberta*