

What You Need to Know About Low Back Pain

*for information on this and
other injuries, see our web site at
www.vanderbiltorthopaedics.com*



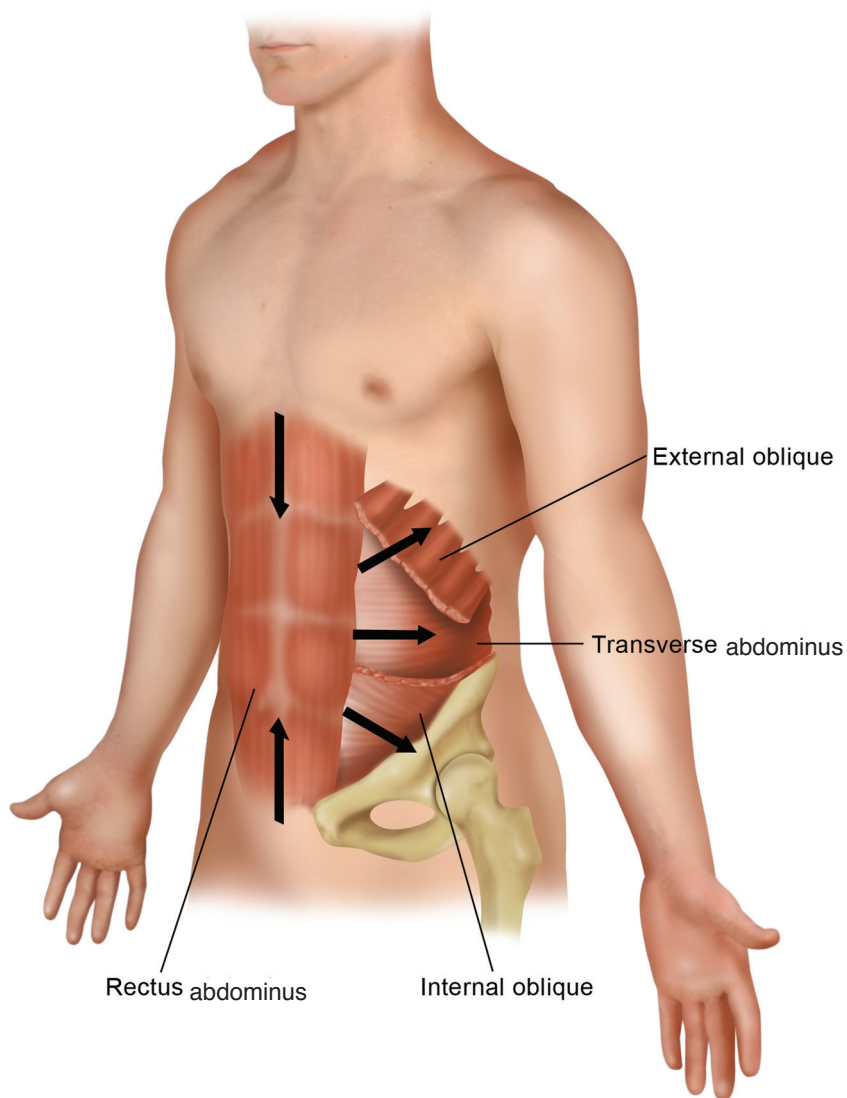
Vanderbilt Orthopaedic Institute

Table of Contents

What are “Core Muscles”?	2
A Healthy Lumbar Spine	3
What is Low Back Pain?	4
Rehabilitation	6
Stages of Rehabilitation	7
Pain Management	8
Heat/Ice	
What is TENS?	
What is Ultrasound?	
Posture and Body Mechanics	9
Home Exercise Programs	10

What are "Core Muscles"?

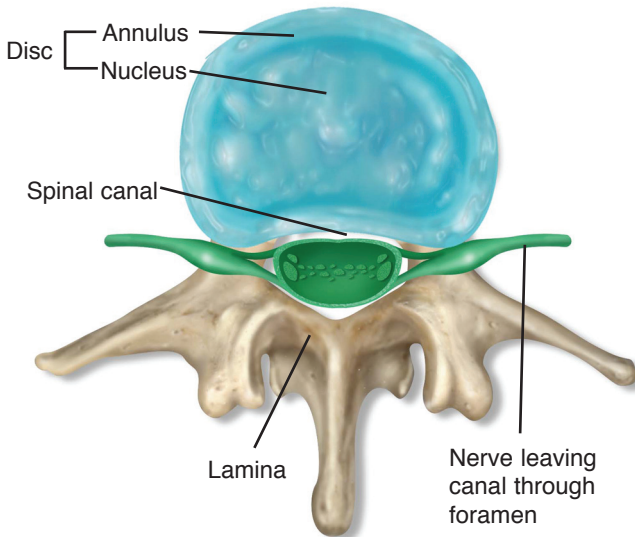
The core muscles include: stomach, lower back and upper back muscles. Below is a picture of the stomach muscles.



A Healthy Lumbar Spine

The lumbar spine consists of the 5 lower vertebrae in your back. The vertebrae are the bones that make up the spine. Each vertebrae is separated by soft pads of tissue called discs. These discs act as shock absorbers between each vertebrae. Each disc contains two parts, a soft gel-like substance called the nucleus, and a tough outer band called the annulus. The spinal canal, which contains the spinal cord, is a tunnel that runs through each vertebrae. The nerves are able to exit the canal through the foramen. The foramen is the opening between the vertebrae on each side of the spinal canal.

Top view of a vertebra



What is Low Back Pain?

Low Back Pain can result from many conditions including the following:

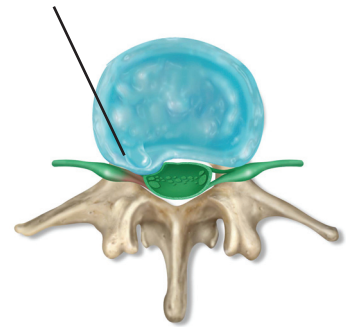
Disc Problems:

Degenerative Disc Disease (DDD):

In degenerative disc disease, the discs flatten over a period of time. This causes the vertebrae to get closer together and begin to touch. The nerves between the vertebrae, which are running through a canal or open area, may become pinched. Pain, numbness, and/or weakness in the legs could occur when the spinal cord or nerve roots are affected by the pressure. This happens because the messages sent from the brain to the rest of the body are interrupted.

When a *BULGING DISC* occurs, the pressure does not actually cause the nucleus to physically rupture through the annulus. The disc may *STILL* put pressure on the spinal canal or nerve roots. This may also cause back and leg pain.

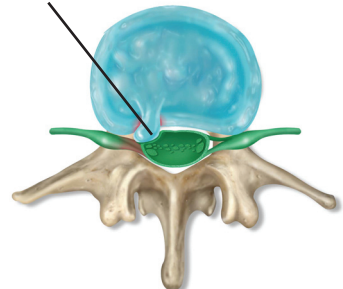
Nucleus
pushing
outward



A contained herniated disk

A *HERNIATED DISC* occurs when either the annulus tears or the nucleus ruptures through the annulus. When this happens, the nucleus tissue is forced out of position. Because there is limited space between the vertebrae, the herniated disc puts pressure on the spinal cord or the nerve roots. This could cause back and leg pain.

Torn
annulus



An extruded herniated disk

Low Back pain

Other Degenerative Problems

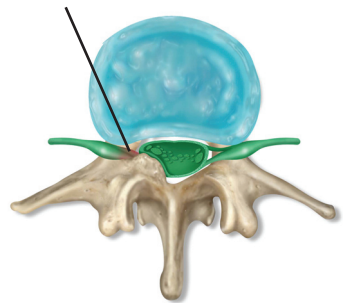
Degenerative Joint Disease (DJD):

Degenerative Joint Disease can occur throughout the body. It is a process in which the protective layer that surrounds bone wears down over time. Over time bones rub against each other, which can result in further damage to bones and pain.

Stenosis:

Spinal stenosis is the narrowing of the spinal canal or intervertebral foramina. Stenosis can result from too much bone or thickened ligaments which narrow the space around the spinal cord and nerves. This puts pressure on the spinal cord or nerves and may cause symptoms in your back and leg. You may feel pain, burning, tingling or numbness.

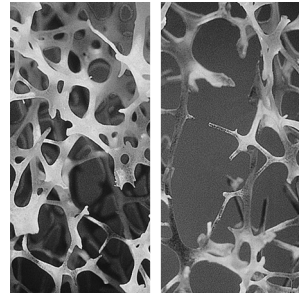
Spinal
Stenosis



An example of spinal stenosis

Osteoporosis:

Osteoporosis is a disease that causes bones to become thin, weak and easy to break. It can be caused by family history, diet, medications and lack of physical activity.



normal

osteoporosis

Nerve Problems

Sciatica:

Sciatica is the irritation of the sciatic nerve, a large nerve which exits the spine in the lower back. The sciatic nerve controls the muscles and sensation in the back of the thigh and below the knee.

Rehabilitation

Your Initial Physical Therapy Visit

Your first physical therapy visit will be for an evaluation with a physical therapist (PT). The PT will ask you for information about your past medical history as well as your present injury. After taking your history, the PT will evaluate the motion of your back, the motion and strength of your legs, the strength of your stomach and lower back muscles, and any problems with walking you may have. The PT will evaluate repeated motions in order to determine which position makes you feel better or worse. Once these measurements are taken, the PT will explain and demonstrate exercises for your back that you will perform at home and when you come to therapy. The PT will let you know how often to perform your exercises at home and how many times per week you will need to come to therapy.

Home Exercise Program

During your first visit, your PT will give you a home exercise program which may include stretches, strengthening exercises, and tips for posture and body positioning. They will discuss with you how, when, and how often to perform these activities.

In many cases, you will be given written pictures and instructions for these exercises.

As your therapy continues, you may be given new activities which will build on or replace your original program. It is very important that you follow all instructions, as your home exercise program is an important piece of your overall therapy.

Your Next Physical Therapy Visit

Your second and following visit to physical therapy may be with the PT and/or an athletic trainer. They will guide you through the proper stages of your rehabilitation process by advancing your exercise program until you are released from physical therapy.

Stages of Rehabilitation

STAGE 1 GOALS:

- Decrease pain
- Decrease inflammation
- Increase lumbar spine range of motion in all directions

STAGE 2 GOALS:

- Increase lumbar spine range of motion in all directions
- Increase strength of abdominal muscles and core stabilizers
- Increase knowledge and performance of proper body mechanics and correct posture

STAGE 3 GOALS:

- Increase muscle endurance of abdominals and core stabilizers
- Increase ability to perform higher level functional activities, including job tasks and/or sports

The time frame for moving through the stages of rehabilitation will not be the same for everyone. We all heal at different rates and not every injury is the same. While certain movements and activities can increase our pain levels, it is important that you try to remain active. Inactivity can lead to muscle weakness and increased muscular stiffness which can hinder progress in therapy. You are encouraged to find activities, such as walking or riding a stationary bicycle, which will allow you to exercise on a regular basis. Your therapist/athletic trainer will help you choose an activity that is right for you.

AT DISCHARGE FROM PHYSICAL THERAPY:

When you are discharged from physical therapy you will understand what you need to do in terms of exercise and correcting postures to keep your back healthy.

You will know self-treatment skills to reduce the reoccurrence of your back pain.

It is important for you to be involved in some form of fitness to ensure good physical health. Your therapist/athletic trainer will ask you to consider a lifestyle of organized physical activity to help prevent future injuries.

Pain Management & Self Care

Your therapist may choose to use modalities to address your pain. The following are descriptions of modalities and their purpose.

WHEN SHOULD I USE ICE AND HEAT?

Ice is generally used directly following an injury or surgery. Ice can be used to limit or reduce the amount of inflammation caused by the injury, and is also effective to control pain and reduce muscle spasm.

Heat/hot packs may also be used in healing. The increased temperature accelerates the rate at which blood and nutrients are delivered. Heat is effective in controlling pain and reducing muscle spasm. It may be used prior to rehabilitation activities as it decreases muscle tightness.

Your therapist may recommend trying both ice and heat to see which is more effective in treating and controlling your individual symptoms.

WHAT IS A TENS UNIT?

TENS stands for Transcutaneous Electrical Nerve Stimulator, a small and portable device which runs on a 9 volt battery. It may be used for several purposes including: reducing swelling, decreasing muscle spasms and controlling pain. TENS is a form of electrical stimulation used to control pain by blocking your brain's ability to receive and recognize pain signals. It also increases the release of endorphans, natural pain killers produced by the human body.

WHAT IS ULTRASOUND?

Ultrasound waves are sound waves that produce heat in soft tissues. Ultrasound provides the same benefit as hot packs, but is even more effective in treating deeper tissues. The ultrasound waves used in therapy are not as strong as those used for diagnosis of tumor or pregnancy. The patient should experience only the gentlest feeling of warmth during treatment.

Bad Posture Can Cause Back Pain

GOOD HABITS TO KEEP A HEALTHY BACK



When standing for a long period of time in one position you may start to feel pressure/pain in your back. To relieve these symptoms, stand with one foot on a stool and alternate your foot at least every five to ten minutes. This will take the pressure off your spine. Tighten your stomach muscles. Wearing low heels, if possible, helps your back too.

While sitting, always sit straight and have your back supported with a well-padded seat. Do not sit in a slouch position. Have your knees level with or higher than your hips. Driving can be very tedious, particularly if driving for



long periods of time. Adjust your seat where your feet can reach the pedals without stretching. Get up, stretch, and move around if you have to sit in one position for more than 30 minutes at a time.



The best way to rest your back is by sleeping or lying down. Always sleep on a firm mattress. Sleeping on your side is the best position for your back. Bend your knees slightly or have a pillow between your legs. If lying on your back, do so with your knees or legs raised.



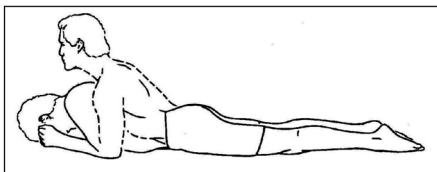
Always apply proper lifting techniques. When lifting an object, make sure you are facing the object you intend to pick up. **NEVER LIFT FROM YOUR BACK!** Have your knees slightly bent and apart. Hold the object close to your body, keeping your back straight and let your legs do the lifting. Do not twist your body to set down or pick up the object, turn your whole body to do so. If the box you are to pick up is too big, always get help. ***This may SAVE your back.***

If the object is light enough to pick up with one hand, you can bend over to reach it and pick it up, using a motion that mimics a golfer getting his golf ball out of the hole. Reach with one hand and lift the opposite leg, keeping it in line with your back.

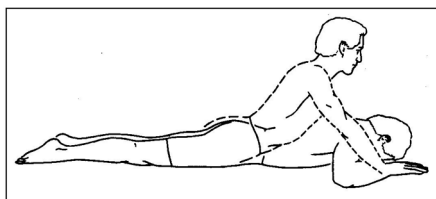


Your therapist may prescribe extension, flexion or stabilization exercises as part of your home exercise program.

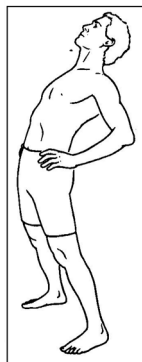
Extension Exercises:



Prone propping: Lie on your stomach and prop up on your elbows keeping your hips on the ground. Hold 30-60 seconds, set of 10 repetitions _____ times a day.

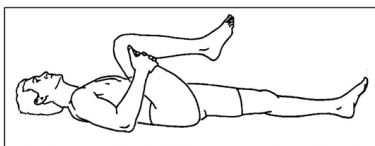


Prone press-ups: Lay on your stomach and perform a push up keeping your hips on the ground. Perform a set of 10 repetitions _____ times a day.

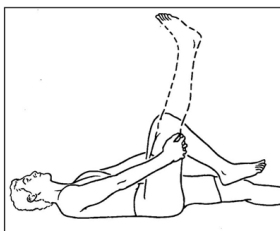


Standing extensions: When sitting for long periods of time, get up and extend backwards for 10 repetitions throughout the day.

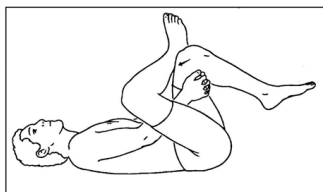
Flexion Exercises:



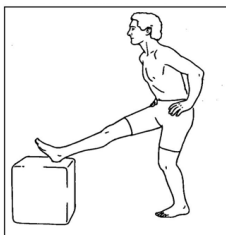
Single/Double knee to chest: Lift your knee to chest and hold 10 seconds for 10 repetitions. You can also do both knees at the same time. Do this _____ times a day.



Hamstring stretch: Bend your thigh and place hands behind knee, slowly straighten the knee and hold 10 seconds. Do this _____ times a day.

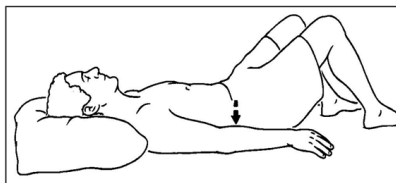


Piriformis stretch: Cross your leg over the other and pull the bottom leg toward you. Hold 10 seconds. Do this _____ times a day.

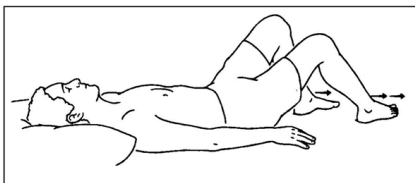


Standing hamstring stretch: Place your leg up on a chair and gently bend forward at the waist. Hold 30 seconds. Do this _____ times a day.

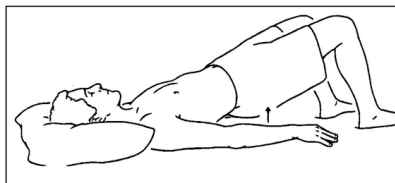
Stabilization Exercises



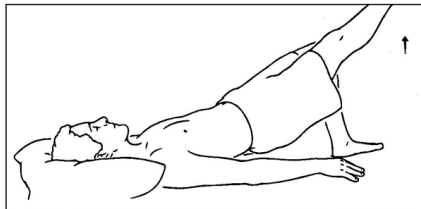
Kegel: Tighten the muscles that control urine, tuck your tummy up/under your ribs, squeeze your buttocks and squeeze a pillow between your knees. Hold for 5 sec. Repeat 30 times, 1 time a day.



Posterior pelvic tilt (PPT) with walkout: Keep stomach tight/back from arching as you let the legs walkout. Do 3 sets of 10, _____ times a day.



PPT with bridge: Keep stomach tight as you lift your hips off the table. Do 3 sets of 10 reps, _____ times a day.



PPT with bridge and straight leg raise: Stomach tight, lift your hips, then straighten one leg at a time. Do 3 sets of 10 reps, _____ times a day.