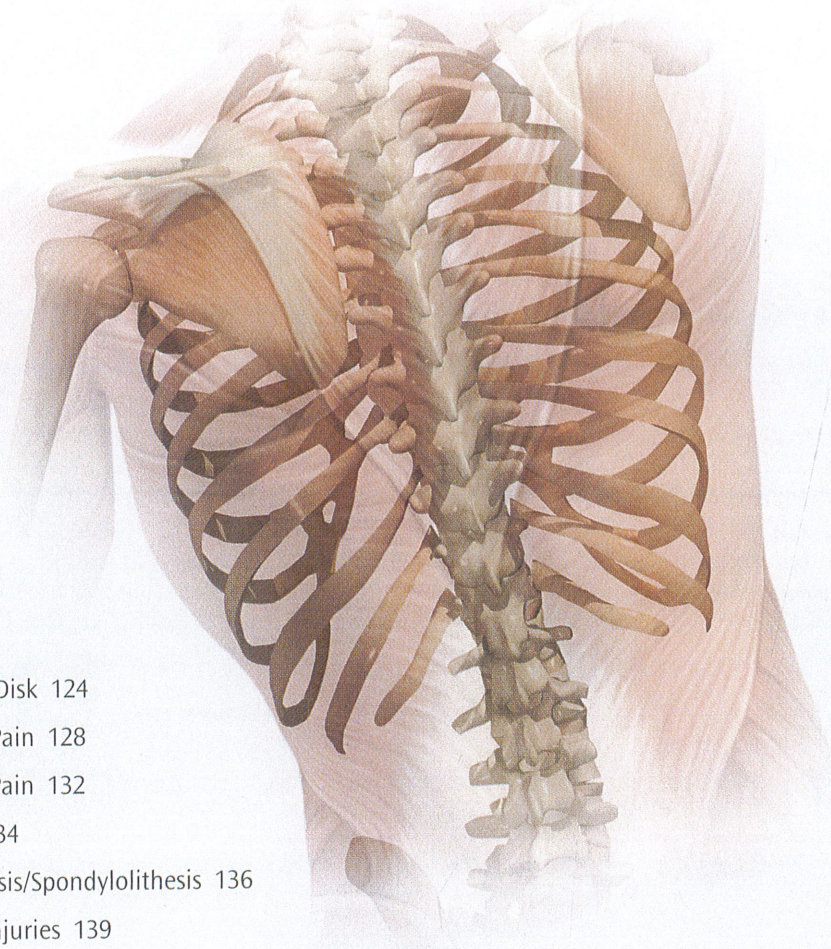
# PART 6

# *The Back*





# HERNIATED DISK

## What is a herniated disk?

A herniated disk is a disk that has bulged out from its proper place in your back. Disks are small, circular cushions between the bones of the spine (vertebrae). Normally, disks act as shock absorbers to cushion your vertebrae from each other as you move. A herniated disk may press on nearby nerves and cause severe pain.

## How does it occur?

When a disk is damaged, the soft rubbery center of the disk squeezes out through a weak point in the hard outer layer. A disk may be damaged by:

- a fall or accident
- repeated straining of your back
- a sudden strenuous action such as lifting a heavy weight or twisting violently

A herniated disk may also happen spontaneously without any specific injury.

## What are the symptoms?

If your herniated disk is in your back, your symptoms may develop gradually or begin suddenly. Symptoms include:

- back pain
- numbness, tingling, pain, or weakness in one or both legs (this is called sciatica)
- changes in bladder and bowel habits.

Symptoms of a herniated disk in your neck may also develop gradually or suddenly. You may wake up and feel a sudden aching. Or you may have a twisted neck that you cannot straighten without extreme pain. You may also have numbness, tingling, or weakness in one or both arms.

## How is it diagnosed?

Your healthcare provider will review your symptoms and ask about the history of your pain. Then he or she will examine your spine and test the movement and reflexes in your arms and legs. Your provider may want you to have one or more of the following tests:

- X-rays of your spine
- magnetic resonance imaging, also called MRI (an image of your spine and herniated disk generated by sound waves)
- CT scan (computerized X-ray images of your spine)
- electromyography (tests of electrical activity in your muscles)
- myelography (injection of dye into the fluid around the spinal cord that can be seen on X-rays)
- diskography (injection of dye into a disk and X-rays taken)

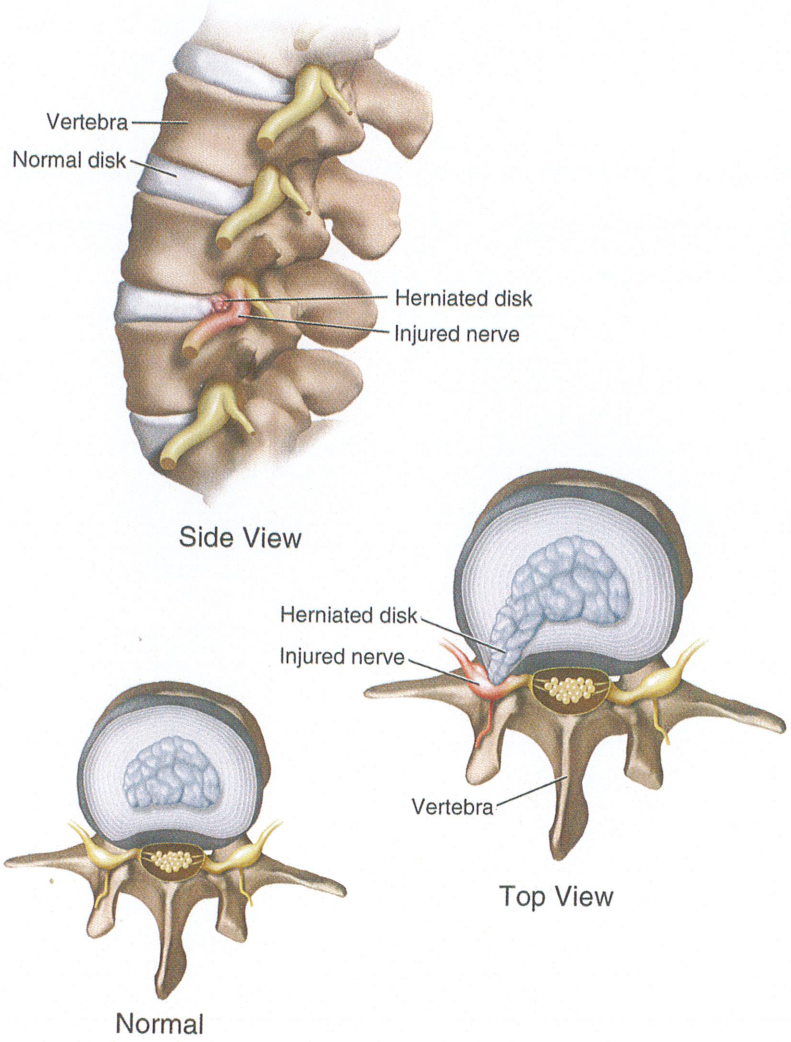
## How is it treated?

In most cases, treatment without surgery will relieve your pain.

For a herniated disk in your back, your healthcare provider may recommend bed rest for 1 to 2 days. You may lie flat on your back on a firm mattress or on an ordinary bed with a stiff board under the mattress.



## HERNIATED DISK



Your provider may suggest putting a pillow under your knees when you lie on your back. You may also lie on your belly with a pillow under your chest or on your side with a pillow between your legs. Use the position that is most comfortable for you.

Other treatments your provider may recommend for your back are:

- anti-inflammatory drugs
- prescription pain relievers
- muscle relaxants
- hot or cold packs
- traction
- back massage
- physical therapy
- steroid injections into the space near the herniated disk to control pain and inflammation

Treatment for a herniated disk in your neck may include:

- hot or cold packs
- anti-inflammatory drugs
- muscle relaxants
- prescription pain relievers
- a neck collar or neck brace to relieve muscle spasms
- neck and shoulder massage
- traction, which is the process of putting bones or muscles under tension with a system of weights and pulleys to keep them from moving or to relieve pressure on them

As your pain lessens, your healthcare provider will want you to begin a physical therapy program in which you will do exercises to strengthen your back muscles and joints. Stabilization exercises are also used to treat herniated disks. This therapy involves learning how to control the movement of your spine in all recreation and work activities.

If you continue to have symptoms, you may need to have surgery. However, most people who have herniated disks do not need surgery.

## How long will the effects of a herniated disk last?

The initial intense pain should go away within a few weeks, but some pain may remain for a few months. You may be prone to backaches throughout your life and therefore must remember to protect your spine when lifting or being physically active.

If the weakness and numbness in your legs continue or if you lose control of your bowel or bladder function, contact your healthcare provider immediately.

## How can I take care of myself?

Practice correct posture when you are walking, sitting, standing, lying down, or working.

When lifting heavy objects, don't bend over from your waist. Kneel or squat down by the object, while keeping your back as straight as possible. Use your thigh muscles to do the lifting. Avoid twisting.

When you stand, always stand up straight with your shoulders back, abdomen in, and the small of the back flat. When standing for long periods, move around frequently and shift your weight from one foot to another while standing as straight as possible.

When you sit, have your feet flat on the floor or elevated. Get up every 20 minutes or so and stretch. Sit in a chair that has good back support.

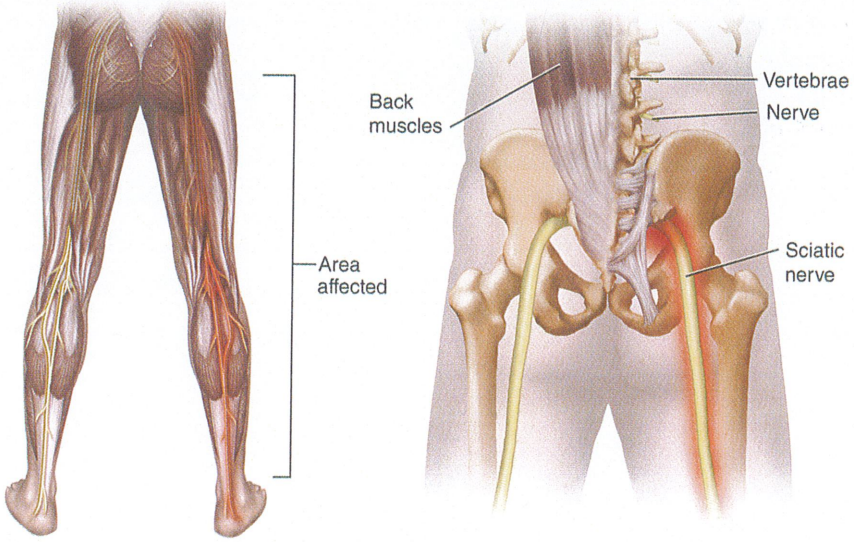
Sleep on a firm mattress or one with a bed board under it. Lie on your side with your knees bent or on your back with a small pillow under your head and another pillow under your knees.

## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which



### SCIATICA



could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport will be determined by how soon your herniated disk recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

It is important that your herniated disk has fully recovered before you return to any strenuous activity and that you have been seen by your healthcare provider. You must be able to perform all of your rehabilitation exercises without pain. You must have full range of motion of your back and neck and have no shooting pain into your legs or arms. You must be able to run, jump, and twist without any pain.

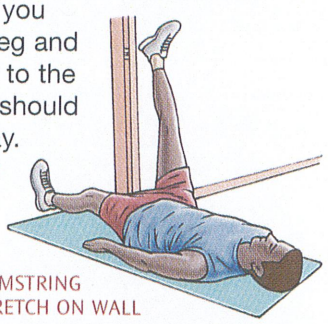
## What can be done to help prevent a herniated disk?

Herniated disks can often be prevented by keeping your weight down, eating a proper diet, and exercising to keep your muscles firm. Strong, flexible muscles can stabilize your spine and protect it from injury. This includes keeping your stomach muscles strong. Walking and swimming are two good exercises for strengthening and protecting your spine.

# HERNIATED DISK REHABILITATION EXERCISES



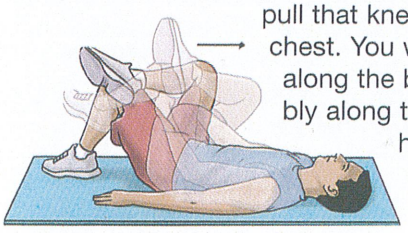
***1. HAMSTRING STRETCH ON WALL:*** Lie on your back with your buttocks close to a doorway, and extend your legs straight out in front of you along the floor. Raise one leg and rest it against the wall next to the door frame. Your other leg should extend through the doorway. You should feel a stretch in the back of your thigh. Hold this position for 15 to 30 seconds. Repeat 3 times.



HAMSTRING STRETCH ON WALL

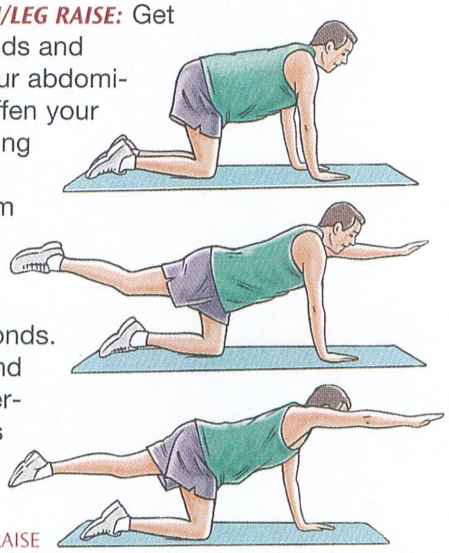
Now do the same stretch using your other leg.

***2. GLUTEAL STRETCH:*** Lying on your back with both knees bent, rest the ankle of one leg over the knee of your other leg. Grasp the thigh of the bottom leg and pull that knee toward your chest. You will feel a stretch along the buttocks and possibly along the outside of your hip on the top leg. Hold this for 15 to 30 seconds. Repeat 3 times.



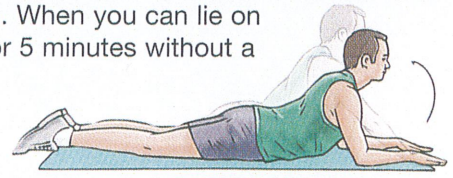
GLUTEAL STRETCH

***3. QUADRUPED ARM/LEG RAISE:*** Get down on your hands and knees. Tighten your abdominal muscles to stiffen your spine. While keeping your abdominals tight, raise one arm and the opposite leg away from you. Hold this position for 5 seconds. Lower your arm and leg slowly and alternate sides. Do this 10 times on each side.



QUADRUPED ARM/LEG RAISE

***4. EXTENSION EXERCISE:*** Lie face down on the floor for 5 minutes. If this hurts too much, lie face down with a pillow under your stomach. This should relieve your leg or back pain. When you can lie on your stomach for 5 minutes without a pillow, then you can continue with the rest of this exercise.

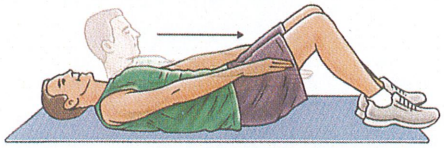


EXTENSION EXERCISE

After lying on your stomach for 5 minutes, prop yourself up on your elbows for another 5 minutes. Lie flat again for 1 minute, then press down on your hands and extend your elbows while keeping your hips flat on the floor. Hold for 1 second and lower yourself to the floor. Repeat 10 times. Do 4 sets. Rest for 2 minutes between sets. You should have no pain in your legs when you do this, but it is normal to feel pain in your lower back. Do this several times a day.

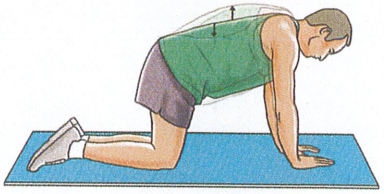
Do the following, partial curl exercises only when you no longer have pain in your buttocks or legs.

***5. PARTIAL CURL:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your stomach muscles and flatten your back against the floor. Tuck your chin to your chest. With your hands stretched out in front of you, curl your upper body forward until your shoulders clear the floor. Hold this position for 3 seconds. Don't hold your breath. It helps to breathe out as you lift your shoulders up. Relax. Repeat 10 times. Build to 3 sets of 10. To challenge yourself, clasp your hands behind your head and keep your elbows out to the side.



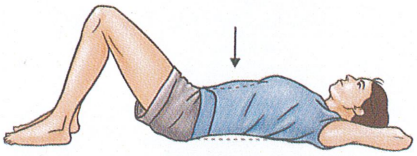
PARTIAL CURL

***6. CAT AND CAMEL:*** Get down on your hands and knees. Let your stomach sag, allowing your back to curve downward. Hold this position for 5 seconds. Then arch your back and hold for 5 seconds. Do 3 sets of 10.



CAT AND CAMEL

***7. PELVIC TILT:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Hold this position for 5 seconds, then relax. Do 3 sets of 10.



PELVIC TILT

If you have a herniated disk, you should limit driving and other sitting activities to no more than 30 minutes at a time. Walking is also good exercise for you.

BACK

# LOW BACK PAIN

## What is low back pain?

Low back pain is pain and stiffness in the lower back. It is one of the most common reasons people miss work.

## How does it occur?

Low back pain is usually caused when a ligament or muscle holding a vertebra in its proper position is strained. Vertebrae are bones that make up the spinal column through which the spinal cord passes. When these muscles or ligaments become weak, the spine loses its stability, resulting in pain. Because nerves reach all parts of the body from the spinal cord, back problems can lead to pain or weakness in almost any part of the body.

Low back pain can occur if your job involves lifting and carrying heavy objects, or if you spend a lot of time sitting or standing in one position or bending over. It can be caused by a fall or by unusually strenuous exercise. It can be brought on by the tension and stress that cause headaches in some people. It can even be brought on by violent sneezing or coughing.

People who are overweight may have low back pain because of the added stress on their back.

Back pain may occur when the muscles, joints, bones, and connective tissues of the back become inflamed as a result of an infection or an immune system problem. Arthritic disorders as well as some congenital and degenerative conditions may cause back pain.

Back pain accompanied by loss of bladder or bowel control, difficulty in moving your legs, or numbness or tingling in your arms or legs may indicate an injury to your spine and nerves, which requires immediate medical treatment.

## What are the symptoms?

Symptoms include:

- pain in the back or legs
- stiffness and limited motion

The pain may be continuous or may occur only in certain positions. It may be aggravated by coughing, sneezing, bending, twisting, or straining during a bowel movement. The pain may occur in only one spot or may spread to other areas, most commonly down the buttocks and into the back of the thigh.

A low back strain typically does not produce pain past the knee into the calf or foot. Tingling or numbness in the calf or foot may indicate a herniated disk or pinched nerve.

Be sure to see your healthcare provider if:

- you have weakness in your leg, especially if you cannot lift your foot, because this may be a sign of nerve damage
- you have new bowel or bladder problems as well as back pain, which may be a sign of severe injury to your spinal cord
- you have pain that gets worse despite treatment

## How is it diagnosed?

Your healthcare provider will review your medical history and examine you. He or she may order X-rays. In certain situations a myelogram, CT scan, or MRI may be ordered.

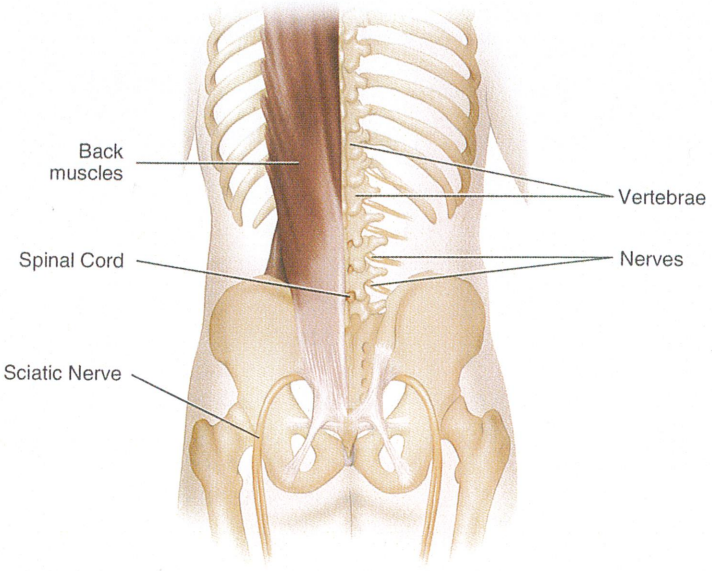
## How is it treated?

The early stages of back pain with muscle spasms should be treated with ice packs for 20 to 30 minutes every 4 to 6 hours for the first 2 to 3 days. You may lie on a frozen gel pack, crushed ice, or a bag of frozen peas.

The following are ways to treat low back pain:

- After the initial injury, applying heat from a heating pad or hot water bottle.
- Resting in bed on a firm mattress. Often it helps to lie on your back with your knees raised. However,

### LOW BACK PAIN



some people prefer to lie on their side with their knees bent.

- Taking aspirin, ibuprofen, or other anti-inflammatory medications; muscle relaxants; or other pain medications if recommended by your healthcare provider (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval).
- Having your back massaged by a trained person.
- Having traction, if recommended by your provider.
- Wearing a belt or corset to support your back.
- Talking with a counselor, if your back pain is related to tension caused by emotional problems.
- Beginning a program of physical therapy, or exercising on your own. Begin a regular exercise program to gently stretch and strengthen your muscles as soon as you can. Your healthcare provider or physical therapist can recommend exercises that will not only help you feel better but will strengthen your muscles and help avoid back trouble later.

When the pain subsides, ask your healthcare provider about starting an exercise program such as the following:

- Exercise moderately every day, using stretching and warm-up exercises suggested by your provider or physical therapist.
- Exercise vigorously for about 30 minutes two or three times a week by walking, swimming, using a stationary bicycle, or doing low-impact aerobics.
- Participating regularly in an exercise program will not only help your back, it will also help keep you healthier overall.

## How long will the effects last?

The effects of back pain last as long as the cause exists or until your body recovers from the strain, usually a day or two but sometimes weeks.

## How can I take care of myself?

In addition to the treatment described above, keep in mind these suggestions:

- Use an electric heating pad on a low setting (or a hot water bottle wrapped in a towel to avoid burning yourself) for 20 to 30 minutes. Don't let the heating pad get too hot, and don't fall asleep with it. You could get a burn.
- Try putting an ice pack wrapped in a towel on your back for 20 minutes, one to four times a day. Set an alarm to avoid frostbite from using the ice pack too long.
- Put a pillow under your knees when you are lying down.
- Sleep without a pillow under your head.
- Lose weight if you are overweight.
- Practice good posture. Stand with your head up, shoulders straight, chest forward, weight balanced evenly on both feet, and pelvis tucked in.

Pain is the best way to judge the pace you should set in increasing your activity and exercise. Minor discomfort, stiffness, soreness, and mild aches need not interfere with activity. However, limit your activities temporarily if:

- your symptoms return
- the pain increases when you are more active
- the pain increases within 24 hours after a new or higher level of activity

## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport will be determined by how soon your back recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

It is important that you have fully recovered from your low back pain before you return to your sport or any strenuous activity. You must be able to have the same range of motion that you had before your injury. You must be able to run, jump and twist without pain.

## What can I do to help prevent low back pain?

You can reduce the strain on your back by doing the following:

- Don't push with your arms when you move a heavy object. Turn around and push backwards so the strain is taken by your legs.
- Whenever you sit, sit in a straight-backed chair and hold your spine against the back of the chair.
- Bend your knees and hips and keep your back straight when you lift a heavy object.
- Avoid lifting heavy objects higher than your waist.
- Hold packages you carry close to your body, with your arms bent.

- Use a footrest for one foot when you stand or sit in one spot for a long time. This keeps your back straight.
- Bend your knees when you bend over.
- Sit close to the pedals when you drive and use your seat belt and a hard backrest or pillow.
- Lie on your side with your knees bent when you sleep or rest. It may help to put a pillow between your knees.
- Put a pillow under your knees when you sleep on your back.
- Raise the foot of the bed 8 inches to discourage sleeping on your stomach unless you have other problems that require that you keep your head elevated.

To rest your back, hold each of these positions for 5 minutes or longer:

- Lie on your back, bend your knees, and put pillows under your knees.
- Lie on your back, put a pillow under your neck, bend your knees to a 90-degree angle, and put your lower legs and feet on a chair.
- Lie on your back, bend your knees, and bring one knee up to your chest and hold it there. Repeat with the other knee, then bring both knees to your chest. When holding your knee to your chest, grab your thigh rather than your lower leg to avoid over flexing your knee.

## LOW BACK PAIN EXERCISES

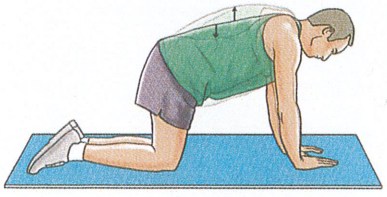


***1. STANDING HAMSTRING STRETCH:*** Place the heel of your leg on a stool about 15 inches high. Keep your knee straight. Lean forward, bending at the hips until you feel a mild stretch in the back of your thigh. Make sure you do not roll your shoulders and bend at the waist when doing this or you will stretch your lower back instead. Hold the stretch for 15 to 30 seconds. Repeat 3 times for each leg.

STANDING HAMSTRING STRETCH

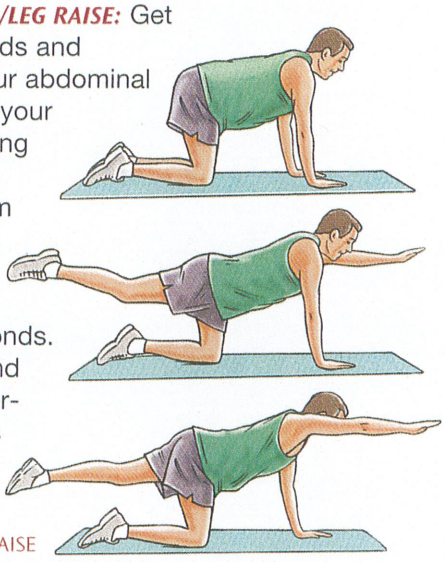
Repeat the same stretch on your other leg.

***2. CAT AND CAMEL:*** Get down on your hands and knees. Let your stomach sag, allowing your back to curve downward. Hold this position for 5 seconds. Then arch your back and hold for 5 seconds. Do 3 sets of 10.



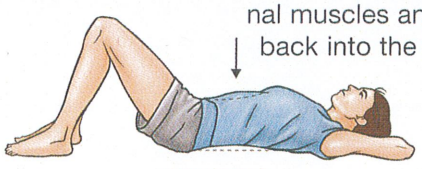
CAT AND CAMEL

***3. QUADRUPED ARM/LEG RAISE:*** Get down on your hands and knees. Tighten your abdominal muscles to stiffen your spine. While keeping your abdominals tight, raise one arm and the opposite leg away from you. Hold this position for 5 seconds. Lower your arm and leg slowly and alternate sides. Do this 10 times on each side.



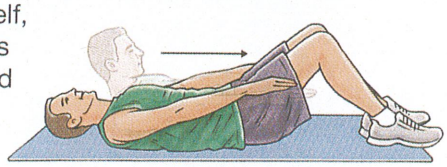
QUADRUPED ARM/LEG RAISE

***4. PELVIC TILT:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Hold this position for 5 seconds, then relax. Do 3 sets of 10.



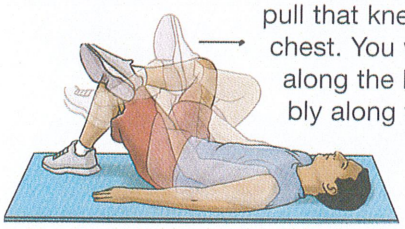
PELVIC TILT

***5. PARTIAL CURL:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your stomach muscles and flatten your back against the floor. Tuck your chin to your chest. With your hands stretched out in front of you, curl your upper body forward until your shoulders clear the floor. Hold this position for 3 seconds. Don't hold your breath. It helps to breathe out as you lift your shoulders up. Relax. Repeat 10 times. Build to 3 sets of 10. To challenge yourself, clasp your hands behind your head and keep your elbows out to the side.



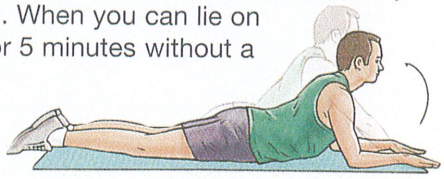
PARTIAL CURL

***6. GLUTEAL STRETCH:*** Lying on your back with both knees bent, rest the ankle of one leg over the knee of your other leg. Grasp the thigh of the bottom leg and pull that knee toward your chest. You will feel a stretch along the buttocks and possibly along the outside of your hip on the top leg. Hold this for 15 to 30 seconds. Repeat 3 times.



GLUTEAL STRETCH

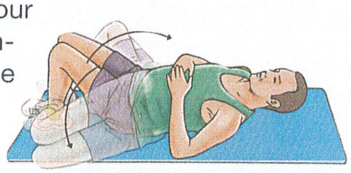
***7. EXTENSION EXERCISE:*** Lie face down on the floor for 5 minutes. If this hurts too much, lie face down with a pillow under your stomach. This should relieve your leg or back pain. When you can lie on your stomach for 5 minutes without a pillow, then you can continue with the rest of this exercise.



EXTENSION EXERCISE

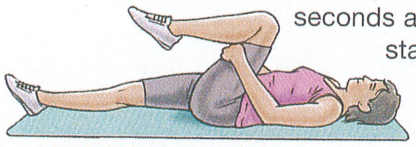
After lying on your stomach for 5 minutes, prop yourself up on your elbows for another 5 minutes. Lie flat again for 1 minute, then press down on your hands and extend your elbows while keeping your hips flat on the floor. Hold for 1 second and lower yourself to the floor. Repeat 10 times. Do 4 sets. Rest for 2 minutes between sets. You should have no pain in your legs when you do this, but it is normal to feel pain in your lower back. Do this several times a day.

***8. LOWER TRUNK ROTATION:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Keeping your shoulders down flat, gently rotate your legs to one side, then to the other side as far as you can. Repeat 10 to 20 times.



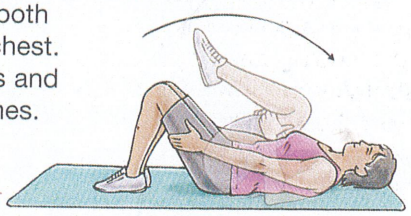
LOWER TRUNK ROTATION

***9. SINGLE KNEE TO CHEST STRETCH:*** Lie on your back with your legs straight out in front of you. Bring one knee up to your chest and grasp the back of your thigh. Pull your knee toward your chest, stretching your buttock muscle. Hold this position for 15 to 30 seconds and return to the starting position. Repeat 3 times on each side.



SINGLE KNEE TO CHEST STRETCH

***10. DOUBLE KNEE TO CHEST:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Pull both knees up to your chest. Hold for 5 seconds and repeat 10 to 20 times.



DOUBLE KNEE TO CHEST

# SACROILIAC PAIN

## What is the sacroiliac joint?

The sacroiliac joint is the part of your lower back made up of the sacrum (the bony structure above your tailbone and below your lower vertebrae) and the top part (iliac) of your pelvis. It is the part of the low back just behind your waist. You have right and left sacroiliac joints. Ligaments hold these bones in place.

## How does sacroiliac joint pain occur?

Some possible causes of sacroiliac pain include:

- activities that involve twisting, bending, or heavy lifting (for example, swinging a golf club or shoveling)
- a fall or a direct blow to the area
- imbalance of the muscles around your hip or pelvis from one leg being shorter or longer than the other
- poor posture
- ligaments in the sacroiliac joint that are too loose

## What are the symptoms?

Symptoms can include:

- pain in the sacroiliac area of the low back
- trouble bending or twisting your low back
- pain after sitting for a long time
- stiffness in the low back, hip, or leg
- a feeling of being "out of alignment"

## How is it diagnosed?

Your provider will ask about your health history and examine your back, pelvis, hips, and legs. You may need an X-ray, or in some cases a CT scan or an MRI. These tests are done to check for other causes of pain.

## How is it treated?

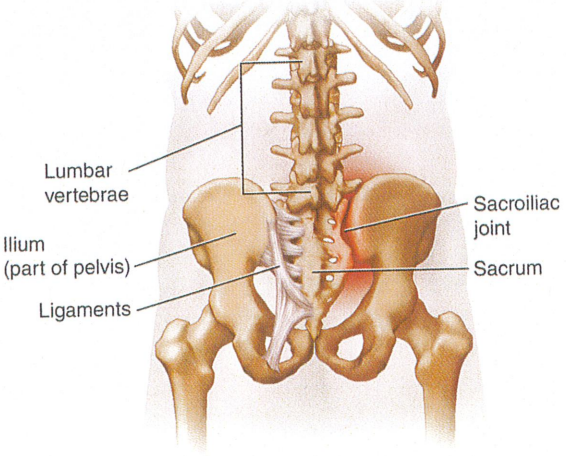
For the first 2 to 3 days you should treat the area with ice packs for 20 to 30 minutes every 4 to 6 hours. You may use a frozen gel pack, crushed ice, or a bag of frozen peas. After icing for a few days, you may start to use moist heat to help loosen up a stiff sacroiliac joint and the muscles of your lower back.

Other treatments may include:

- anti-inflammatory medicine, muscle relaxants, or other medicine (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval)
- exercises
- massage to your low back and sacroiliac joint
- physical therapy
- mobilization of the sacroiliac joint (a physical therapist, chiropractor, or a physician trained in manipulative medicine may do this. It is done by applying force across the joint and helping put the joint in better alignment)
- an insert for your shoe if your legs are different lengths
- a sacroiliac belt, which helps support the joint
- a cortisone shot into the sacroiliac joint to reduce pain and swelling

## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport or activity will be determined by how soon your sacroiliac joint recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.



It is important that you have fully recovered from your sacroiliac pain before you return to your sport or any strenuous activity. You must be able to have the same range of motion that you had before the injury. You must be able to twist, bend, run and jump without pain.

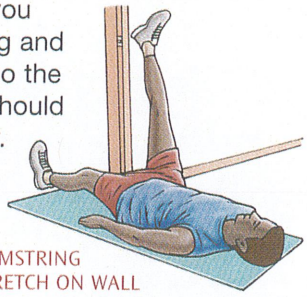
## How is sacroiliac pain prevented?

Be sure that you have warmed up and done proper stretching exercises before participating in sports or other activities. Try not to twist when you are lifting heavy objects.

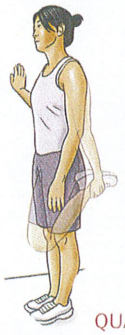
# SACROILIAC PAIN REHABILITATION EXERCISES

These exercises are designed to gently move your sacroiliac joint. Do not do these exercises if they cause any pain or discomfort. If your pain continues see your healthcare provider or physical therapist as soon as possible.

***1. HAMSTRING STRETCH ON WALL:*** Lie on your back with your buttocks close to a doorway, and extend your legs straight out in front of you along the floor. Raise one leg and rest it against the wall next to the door frame. Your other leg should extend through the doorway. You should feel a stretch in the back of your thigh. Hold this position for 15 to 30 seconds. Repeat 3 times.



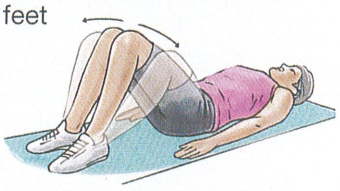
HAMSTRING STRETCH ON WALL



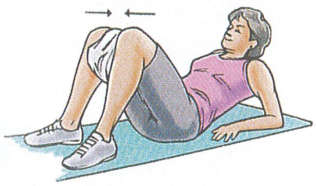
***2. QUADRICEPS STRETCH:*** Stand an arm's length away from the wall, facing straight ahead. Brace yourself by keeping one hand against the wall. With your other hand, grasp the ankle of the opposite leg and pull your heel toward your buttocks. Don't arch or twist your back. Keep your knees together. Hold this stretch for 15 to 30 seconds. Repeat 3 times on each side.

QUADRICEPS STRETCH

***3. HIP ADDUCTOR STRETCH:*** Lie on your back, bend your knees, and put your feet flat on the floor. Gently spread your knees apart, stretching the muscles on the inside of your thigh. Hold this for 15 to 30 seconds. Repeat 3 times.



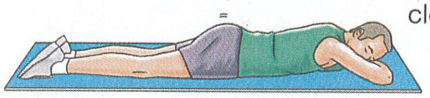
HIP ADDUCTOR STRETCH



ISOMETRIC HIP ADDUCTION

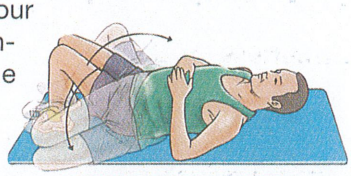
***4. ISOMETRIC HIP ADDUCTION:*** Sit with your knees bent 90° with a pillow placed between your knees and your feet flat on the floor. Squeeze the pillow for 5 seconds and then relax. Do 3 sets of 10.

***5. GLUTEAL SETS:*** Lie on your stomach with your legs straight out behind you. Squeeze your buttock muscles together and hold for 5 seconds. Release. Do 3 sets of 10.



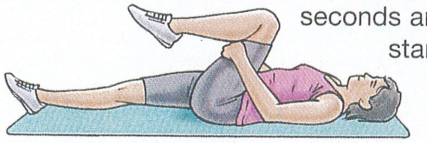
GLUTEAL SETS

***6. LOWER TRUNK ROTATION:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Keeping your shoulders down flat, gently rotate your legs to one side, then to the other side as far as you can. Repeat 10 to 20 times.



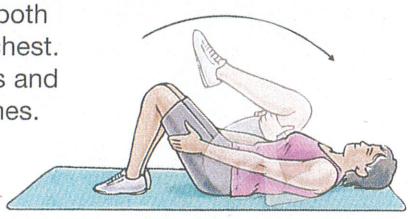
LOWER TRUNK ROTATION

***7. SINGLE KNEE TO CHEST STRETCH:*** Lie on your back with your legs straight out in front of you. Bring one knee up to your chest and grasp the back of your thigh. Pull your knee toward your chest, stretching your buttock muscle. Hold this position for 15 to 30 seconds and return to the starting position. Repeat 3 times on each side.



SINGLE KNEE TO CHEST STRETCH

***8. DOUBLE KNEE TO CHEST:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Pull both knees up to your chest. Hold for 5 seconds and repeat 10 to 20 times.



DOUBLE KNEE TO CHEST

# SCOLIOSIS

## What is scoliosis?

Scoliosis means that the spine curves from side to side rather than being straight down the back. The spine is made of bones called vertebrae that normally stack one on top of the other in a straight line. The bones in the upper back are called thoracic vertebrae. This is the most common site for scoliosis. The bones in the lower back are called lumbar vertebrae. Scoliosis occurs less often in the lumbar vertebrae.

Scoliosis develops gradually. Scoliosis is usually noticed just before or during puberty when a child goes through a growth spurt. Females get scoliosis more often than males. Often parents do not notice the gradual changes caused by scoliosis. The curvature is usually discovered by a healthcare provider. Occasionally, scoliosis is diagnosed during infancy and is treated sooner.

## What is the cause?

There are many causes of scoliosis. Sometimes vertebrae are incompletely formed or misshapen. Sometimes people who have legs of different lengths develop a curvature of the spine. Other times, diseases cause scoliosis.

When a cause for scoliosis cannot be found, it is called idiopathic scoliosis. In idiopathic scoliosis some of the vertebrae are rotated because the muscles attaching the vertebrae to the ribs may not be pulling with equal force. One set of rib muscles pulls harder causing the vertebrae to twist and move out of a straight line down the back. This may also cause the ribs on one side of the back to stick out more, causing a hump.

## What are the symptoms?

At first, the symptoms are painless and not always easy to recognize. If you have scoliosis, you may:

- have uneven shoulders, hips, or waist
- have a hump on one side of the back
- have one or both shoulder blades sticking out
- lean slightly to one side
- have back pain

## How is it diagnosed?

The healthcare provider will take a medical history to see if there may be a cause for the scoliosis. The provider will do a physical exam, checking the back, chest, shoulders, pelvis, legs, feet, and skin. The curve of the spine may be measured during the exam. X-rays can be taken to measure the curvature more precisely.

## How is it treated?

Your healthcare provider will suggest treatment based on your age, how much you are likely to grow, the degree and pattern of the curve, and the type of scoliosis. You may be referred to a back specialist.

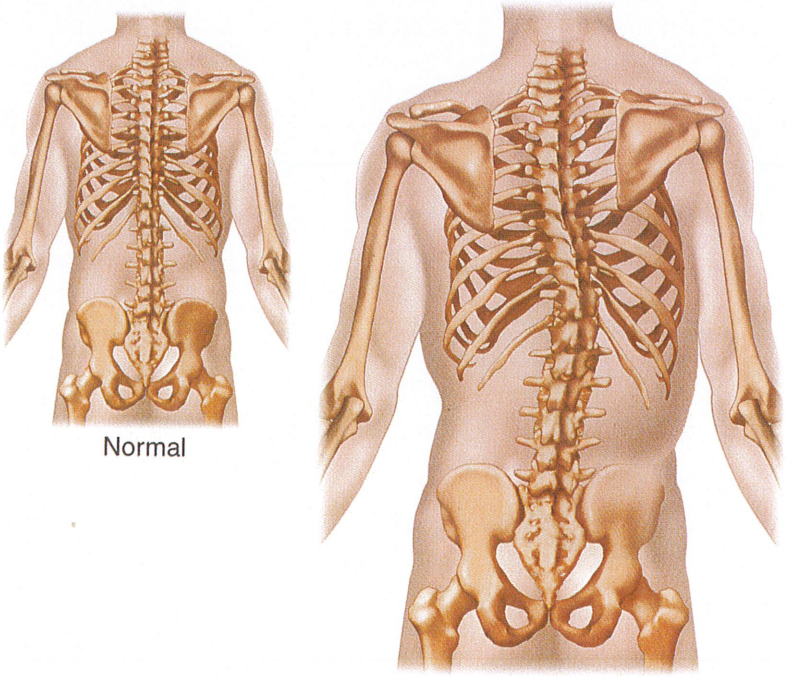
## Treatment may include:

**Observation:** You will be reexamined every 4 to 6 months if you are still growing and if you have a curvature of less than 20 to 25 degrees.

**Bracing:** Your provider may advise you to wear a brace if you are still growing and have a curvature of 25 to 40 degrees. The brace will help stop the curve from getting worse.

**Surgery:** Healthcare providers usually advise surgery if the curvature is greater than 40 degrees.

Symptoms from scoliosis may be treated with physical therapy. You may need to work on proper posture and avoid overusing your back (such as carrying a heavy backpack).



## How long will the effects last?

The curvature in the back will never go away. However, many people have no symptoms or problems from their scoliosis. When problems do occur, they will last until the symptoms are treated. How well the treatment works depends on the type of treatment and the severity of the problem.

## When can I return to my sport or activity?

Exercise will not worsen scoliosis. Sports participation will improve strength, flexibility, and fitness. If you have mild to moderate scoliosis, you can participate in most levels and types of sports. If you have had surgery for your scoliosis, you should discuss the appropriate level of participation with your surgeon. If you have back pain while playing sports, talk to your healthcare provider.

## How do I take care of myself?

Use good posture.

Exercises that keep your back strong and flexible are usually recommended. They are not proven to be effective, but are believed to be helpful.

Avoid carrying backpacks that are too heavy. Be sure to carry a backpack evenly over both shoulders, instead of slung over one shoulder.

Take frequent stretching breaks if you work at a desk or computer for long periods of time.

Stay fit and avoid becoming overweight.

# SPONDYLOLYSIS AND SPONDYLOLISTHESIS

## What are spondylolysis and spondylolisthesis?

Your lower back is called your lumbar spine. It is made up of five bones called lumbar vertebrae. The vertebrae have two major parts, a solid part called the body and a bony ring through which the lower part of the spinal cord and nerves travel. Between the bodies of the vertebrae is shock absorbing material called disks. Part of the ring of each vertebra, called the pars, touches the vertebra above it and the vertebra below it.

Spondylolysis is a condition where there is a break in one or both sides of the ring of a vertebra. Spondylolisthesis is a condition in which a break in both sides of the ring allows the body of the vertebra to slip forward. Spondylolysis and spondylolisthesis most commonly occur at the fourth or fifth lumbar vertebrae. These conditions are also called pars defects, pars stress fractures, or stress fractures.

BACK

## How does it occur?

Spondylolysis and spondylolisthesis result from repetitive extension of the back (bending backward). This causes weakness in the rings of the lumbar vertebrae, eventually leading to a break (fracture) in a ring. Less commonly, these conditions may result from an injury to the back. Some healthcare providers feel that certain people are born with weak vertebral rings.

Athletes most commonly troubled by spondylolysis or spondylolisthesis are gymnasts, dancers, and football players.

## What are the symptoms?

You may have low back pain or spasms, or you may have no symptoms at all. You may have pain all the time or only from time to time. Spondylolysis or spondylolisthesis usually do not damage the nerves.

## How is it diagnosed?

Your healthcare provider will examine your back and look for tenderness along your vertebrae or spasm in the muscles next to your vertebrae. He or she will order an X-ray, which will show a break in the ring of a vertebra or slippage of a vertebra. Your provider may order a bone scan to look for a break that has just recently occurred. A CT scan or an MRI may also be done.

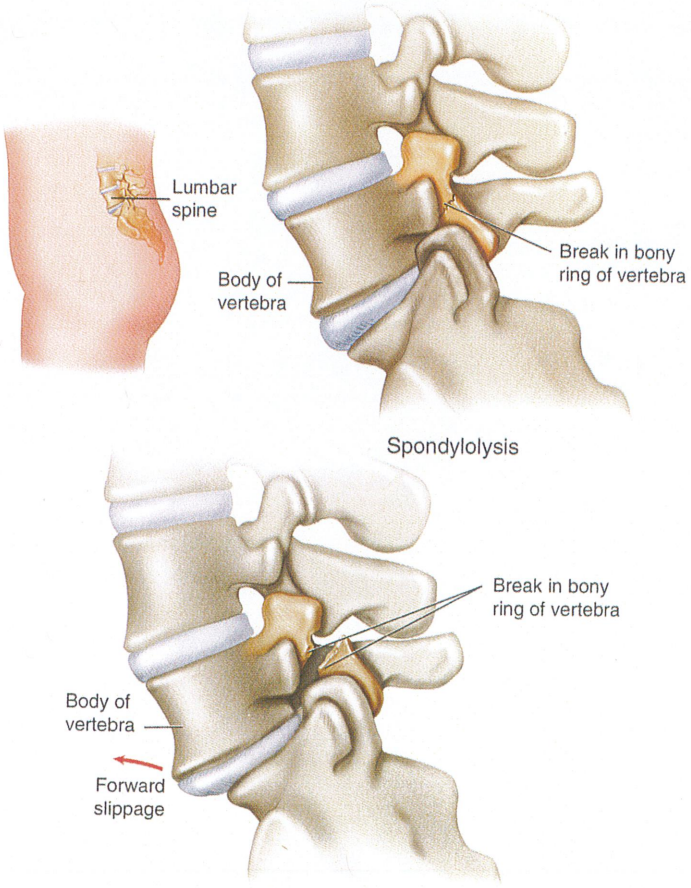
## How is it treated?

For short-term periods of pain your healthcare provider may prescribe anti-inflammatory medicine or other pain medicine (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval). You should place ice packs on your back for 20 to 30 minutes every 3 to 4 hours for 2 to 3 days or until the pain goes away.

You can participate in your sport or activity as long as you do not have pain. You may need to change your sport or activity to one that does not involve bending backwards (hyperextending the back).

If your healthcare provider thinks the break is new and that the bones could heal, he or she may recommend wearing a brace for 1 to 3 months. Severe cases of spondylolisthesis may require surgery.

### SPONDYLOLYSIS AND SPONDYLOLISTHESIS



Spondylolysis and spondylolisthesis are chronic problems. It is very important to keep your back in the best possible physical condition. Do not become overweight.

## When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport will be determined by how soon your back recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

It is important that you have fully recovered from your back pain before you return to your sport or any strenuous activity. You must be able to have the same range of motion that you had before your injury. You must be able to run, jump and twist without pain.

## How can I prevent spondylolysis and spondylolisthesis?

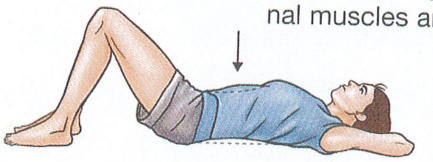
You can best prevent these conditions by having strong back and abdominal muscles and by avoiding being overweight. If you have spondylolysis you may be able to prevent progression to spondylolisthesis by doing back exercises and by avoiding forced back extension activities, such as might occur during tackling in football.

# SPONDYLOLYSIS AND SPONDYLOLISTHESIS REHABILITATION EXERCISES

It is important to have strong abdominal muscles when the structures of your spine are weakened. These exercises help build strong stomach muscles.



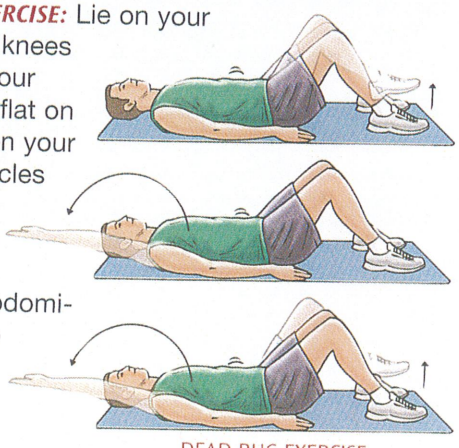
***1. PELVIC TILT:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Hold this position for 5 seconds, then relax. Do 3 sets of 10.



PELVIC TILT

As the pelvic tilt becomes easier, you can progress to an exercise called the dead bug.

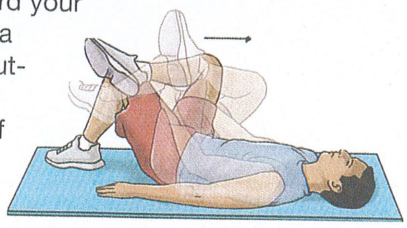
***2. DEAD BUG EXERCISE:*** Lie on your back with your knees bent, arms at your sides, and feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. While keeping your abdominals tight, lift up one leg several inches off the floor, hold for 5 seconds, then lower it.



DEAD BUG EXERCISE

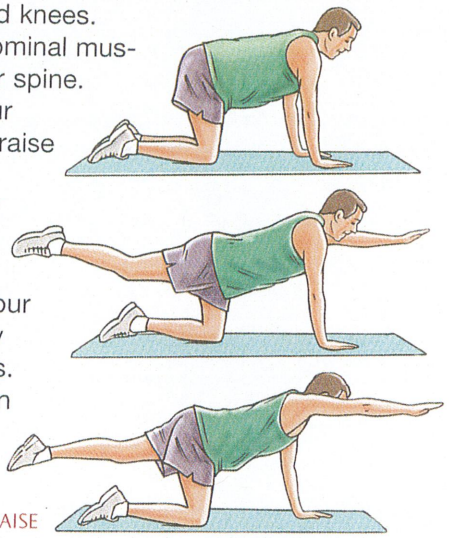
Repeat this exercise with the opposite leg. Then lift your arm over your head, hold for 5 seconds, then lower it. Repeat with the opposite arm. Do 5 repetitions with each leg and arm. Once this exercise becomes easy, raise one leg and the opposite arm together. Hold for 5 seconds. Lower your arm and leg and raise the opposite arm and leg up and hold for 5 seconds. Do 3 sets of 5.

***3. GLUTEAL STRETCH:*** Lying on your back with both knees bent, rest the ankle of one leg over the knee of your other leg. Grasp the thigh of the bottom leg and pull that knee toward your chest. You will feel a stretch along the buttocks and possibly along the outside of your hip on the top leg. Hold this for 15 to 30 seconds. Repeat 3 times.



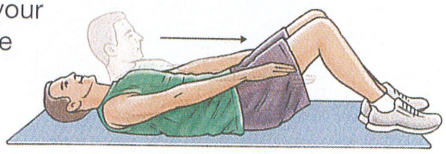
GLUTEAL STRETCH

***4. QUADRUPED ARM/LEG RAISE:*** Get down on your hands and knees. Tighten your abdominal muscles to stiffen your spine. While keeping your abdominals tight, raise one arm and the opposite leg away from you. Hold this position for 5 seconds. Lower your arm and leg slowly and alternate sides. Do this 10 times on each side.



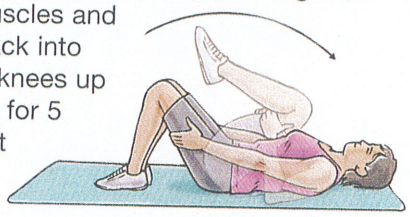
QUADRUPED ARM/LEG RAISE

***5. PARTIAL CURL:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your stomach muscles and flatten your back against the floor. Tuck your chin to your chest. With your hands stretched out in front of you, curl your upper body forward until your shoulders clear the floor. Hold this position for 3 seconds. Don't hold your breath. It helps to breathe out as you lift your shoulders up. Relax. Repeat 10 times. Build to 3 sets of 10. To challenge yourself, clasp your hands behind your head and keep your elbows out to the side.



PARTIAL CURL

***6. DOUBLE KNEE TO CHEST:*** Lie on your back with your knees bent and your feet flat on the floor. Tighten your abdominal muscles and push your lower back into the floor. Pull both knees up to your chest. Hold for 5 seconds and repeat 10 to 20 times.



DOUBLE KNEE TO CHEST

BACK

# TAILBONE INJURIES

## What is a tailbone injury?

Your tailbone (coccyx) is actually made up of several bones that are located at the end of your lower back. Tailbones can be bruised or broken.

## How does it occur?

A tailbone injury usually occurs from a direct fall onto the coccyx.

## What are the symptoms?

Your tailbone is very tender. You have pain when you are sitting. You may also have pain when you walk and when you have a bowel movement.

## How is it diagnosed?

Your healthcare provider will review your symptoms and examine your back and tailbone. He or she may order an X-ray to see if your tailbone is broken.

## How is it treated?

An injured tailbone needs time to heal. A bruised tailbone may take several days to several weeks to completely heal. A fractured tailbone takes 4 to 6 weeks to heal. In either case, people sometimes have pain for a long time.

While your tailbone injury is healing it is very important to use a doughnut cushion when you are sitting. A doughnut cushion may be purchased at a medical supply house or you may use a child's swimming inner tube.

You should place an ice pack on your tailbone for 20 to 30 minutes every 3 to 4 hours for 2 to 3 days or until the pain goes away. Your healthcare provider may prescribe an anti-inflammatory or pain medicines (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval).

It is important to avoid constipation while your tailbone is healing. Drink plenty of fluids and increase the amount of fiber in your diet.

## When can I return to my normal activities?

You can return to your normal activities when your pain has improved and you are able to sit, bend, and walk without significant pain.

## How can I prevent tailbone injuries?

Most tailbone injuries are caused by accidents that cannot be prevented. In some contact sports such as football or hockey, it is important to wear protective equipment.

# UPPER BACK PAIN

## What is upper back pain?

Your upper back is also called your thoracic back, the part of the back where the ribs attach. Upper back pain is pain between your neck and your low back.

## How does it occur?

The bones in your back are called vertebrae. Back pain is usually caused when ligaments or muscles attaching to the vertebrae are injured. Upper back pain can come from a twisting motion, poor posture, overuse, or an injury such as a fall or car accident. It is very common for someone to injure their upper back when carrying objects, throwing, bending or twisting. Sitting at a desk for a prolonged time can cause upper back muscles to tighten and become stiff. Upper back pain can come even come from vigorous coughing or sneezing.

Sometimes upper back pain is caused by scoliosis, a curve in the spine that has developed during the adolescent growth period. In scoliosis there is usually an imbalance of the muscles of the upper back.



## What are the symptoms?

Symptoms of upper back pain may include:

- pain in the upper back
- muscle spasms
- pain when you take a deep breath
- pain when your back is touched or when you move
- pain when you move your shoulders or bend your neck forward

## How is it diagnosed?

Your provider will take your history, review your symptoms and examine your back.

## How is it treated?

The early stages of back pain with muscle spasms should be treated with ice packs for 20 to 30 minutes every 4 to 6 hours for the first 2 to 3 days. You may use a frozen gel pack, crushed ice, or a bag of frozen peas. After you have iced for 2 to 3 days, you may start to use moist heat to help loosen up stiff muscles.

Your provider may prescribe an anti-inflammatory medicine, muscle relaxants, or other medicine (adults aged 65 years and older should not take non-steroidal anti-inflammatory medicine for more than 7 days without their healthcare provider's approval). Massage to the inflamed muscles will help. Your provider will recommend exercises to help your back.

## When can I return to my sport or activity?

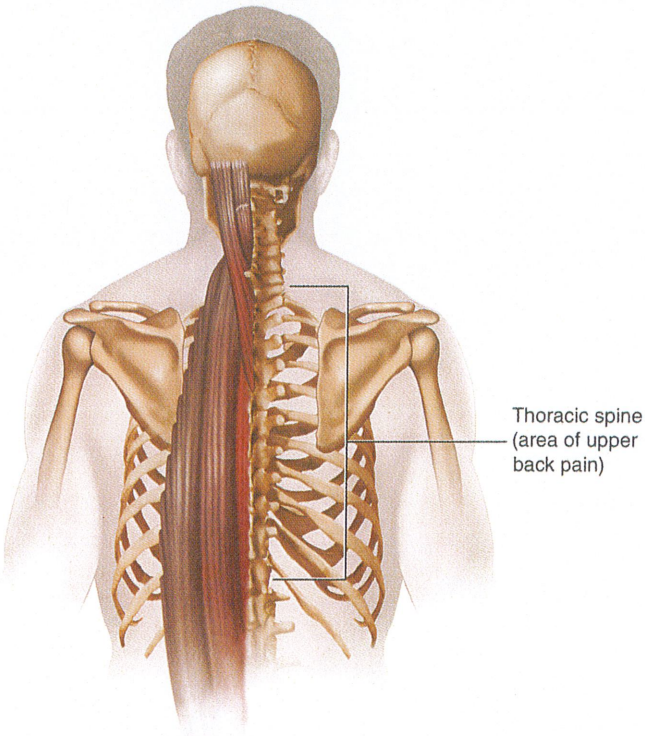
The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your sport or activity will be determined by how soon your back recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

It is important that you have fully recovered from your upper back pain before you return to your sport or strenuous activity. You must be able to have the same range of motion that you had before the injury. You must be able to run, lift, jump and twist without pain.

## What can I do to prevent upper back pain?

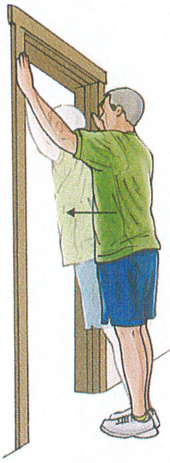
Be sure that you have warmed up and have done proper stretching exercises before your activity. Try not to twist when you are lifting heavy objects. If you are at a desk for a long period of time be sure to take frequent breaks to stretch you back.

### UPPER BACK PAIN



# UPPER BACK PAIN REHABILITATION EXERCISES

You may do all of these exercises right away.

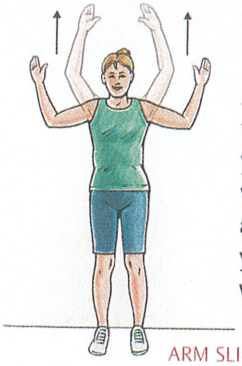


***1. PECTORALIS STRETCH:*** Stand in a doorway or corner with both arms on the wall slightly above your head. Slowly lean forward until you feel a stretch in the front of your shoulders. Hold 15 to 30 seconds. Repeat 3 times.

PECTORALIS STRETCH

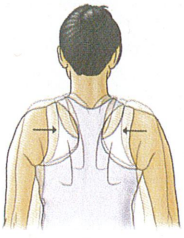
***2. THORACIC EXTENSION:*** While sitting in a chair, clasp both arms behind your head. Gently arch backward and look up toward the ceiling. Repeat 10 times. Do this several times per day.

THORACIC EXTENSION



***3. ARM SLIDE ON WALL:*** Sit or stand with your back against a wall and your elbows and wrists against the wall. Slowly slide your arms upward as high as you can while keeping your elbows and wrists against the wall. Do 3 sets of 10.

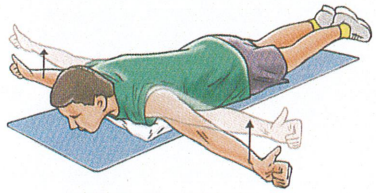
ARM SLIDE ON WALL



***4. SCAPULAR SQUEEZE:*** While sitting or standing with your arms by your sides, squeeze your shoulder blades together and hold for 5 seconds. Do 3 sets of 10.

SCAPULAR SQUEEZE

***5. MID-TRAP EXERCISE:*** Lie on your stomach on a firm surface and place a folded pillow underneath your chest. Place your arms out straight to your sides with your elbows straight and thumbs toward the ceiling. Slowly raise your arms toward the ceiling as you squeeze your shoulder blades together. Lower slowly. Do 3 sets of 15. Progress to holding soup cans or small weights in your hands.

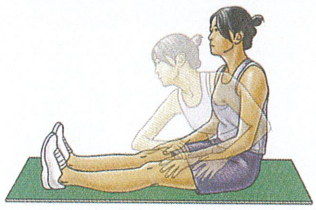


MID-TRAP EXERCISE

***6. THORACIC STRETCH:*** Sit on the floor with your legs out straight in front of you. Hold your mid-thighs with your hands. Curl you head and neck toward your belly button. Hold for a count of 15. Repeat 3 times.

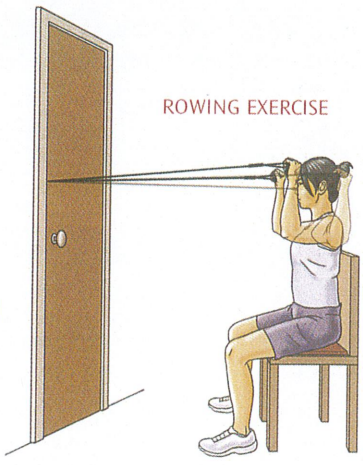
THORACIC STRETCH

***7. THORACIC SIDE STRETCH:*** To stretch your right upper back, point your right elbow and shoulders forward while twisting your trunk to the left. Hold for a count of 15. Repeat 3 times. To stretch your left upper back, point your left elbow and shoulder forward while twisting your trunk to the right. Hold for a count of 10. Repeat 3 times.



THORACIC SIDE STRETCH

***8. ROWING EXERCISE:*** Tie a piece of elastic tubing around an immovable object and grasp the ends in each hand. Keep your forearms vertical and your elbows at shoulder level and bent to 90 degrees. Pull backward on the band and squeeze your shoulder blades together. Repeat 10 times. Do 3 sets.



ROWING EXERCISE