



## Herniated Disk (Ruptured Disk)

### DESCRIPTION

*Herniation* is the term used to describe a sudden or gradual break in the supportive ligaments surrounding a spinal disk, which functions as a cushion between the bony vertebrae, the bones in the spinal column. The jellylike contents of the disk then protrude and may push on the spinal cord or nerves coming from the spinal cord, which causes symptoms. Herniation may occur in the neck and mid or lower back.

### COMMON SIGNS AND SYMPTOMS

- Pain in the back that usually affects one side, is worse with movement, and may be worse with sneezing, coughing, or straining
- Muscle spasms of the muscles in the back
- Pain, numbness, or weakness affecting one arm or leg (depending on whether injury is in the neck or low back, respectively)
- If chronic, wasting of the affected muscles
- Loss of bowel or bladder function

### CAUSES

Weakening and rupture of the disk material creates pressure on nearby spinal nerves. A ruptured disk is caused by sudden injury or chronic stress, such as from constant lifting or from obesity.

### FACTORS THAT INCREASE RISK

- Any sport in which movement causes downward or twisting pressure on the neck or spine, most commonly football, weightlifting, horseback riding or equestrian competition, bowling, tennis, jogging, track, racquetball, and gymnastics
- Poor physical conditioning (strength, flexibility)
- Inadequate warm-up before practice or play
- Family history of low back pain or disk disorders
- Previous back surgery, especially fusion
- Preexisting spondylolisthesis
- Poor mechanics with lifting
- Prolonged sitting, especially with poor mechanics

### PREVENTIVE MEASURES

- Use proper mechanics when sitting or lifting.
- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning that includes cardiovascular fitness, back and hamstring flexibility, and muscle strength and endurance training.

- Maintain an ideal body weight.
- If previously injured, avoid any vigorous physical activity that requires twisting of the body under uncontrollable conditions.

### EXPECTED OUTCOME

Most herniated disks (80%) resolve within 6 weeks with appropriate conservative treatment; however, some patients will require surgery.

### POSSIBLE COMPLICATIONS

- Permanent numbness, weakness, or paralysis and muscle wasting
- Chronic back pain
- Loss of bowel or bladder function
- Decreased sexual function
- Risks of surgery, including infection, bleeding, injury to nerves (persistent or increased numbness, weakness, or paralysis), persistent back pain, and spinal headache

### GENERAL TREATMENT CONSIDERATIONS

Injury to the back results in pain and inflammation. The pain and inflammation result in muscle spasms of the back muscles, which in turn result in more pain. Thus the initial treatment usually consists of rest, medication, and ice to relieve pain, inflammation, and muscle spasm. As pain and spasm subside, exercises to improve strength and flexibility and proper back mechanics are started. Referral to a physical therapist or athletic trainer may be recommended for these exercises, education regarding back mechanics, and possibly other therapies such as transcutaneous electronic nerve stimulation (TENS) or ultrasound. Traction (neck), a cervical collar (neck), or a corset or back brace (low back) may be recommended. Biofeedback and psychotherapy may also be recommended. Prolonged bed rest is felt to do more harm than good, but proper body mechanics should be encouraged. Bending your knees to pick things up off the ground, as opposed to bending at the waist; sleeping flat on your back on a firm mattress with a pillow under your knees; and using good posture when sitting are helpful.

Often a trial of oral steroids or epidural steroid injections, placed into the space around the lining of the spinal cord, may be attempted to reduce the inflammation around the herniated disk and inflamed nerve. For patients with loss of bowel or bladder function or persistent pain, numbness, weakness, or paralysis, surgery is often recommended to remove those portions of the disk that are pushing on the nerves or spinal cord.

## MEDICATION

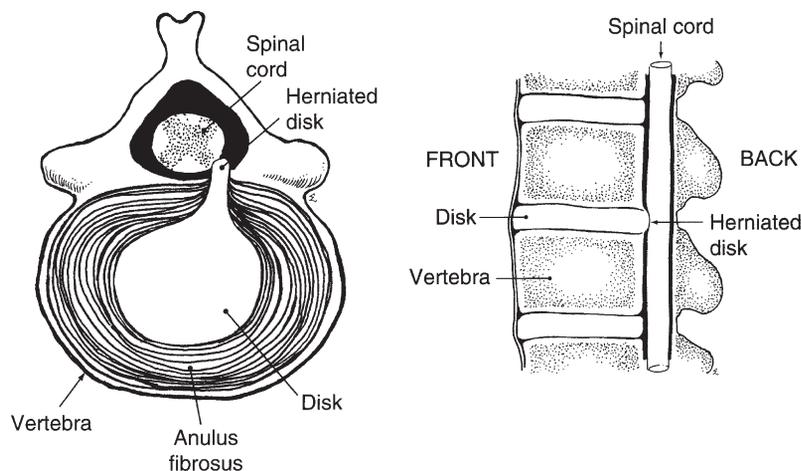
- Nonsteroidal antiinflammatory medications, such as aspirin and ibuprofen (do not take for 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician, and contact your doctor immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Topical analgesic ointments may be of benefit.
- Pain relievers and muscle relaxers may be prescribed. Use these only as directed, and do not use any heavy machinery or drive a car while taking these medications.
- Injections of corticosteroids into the epidural space may be given to reduce inflammation, although they are not usually given for acute injuries.
- Oral steroids may be given to reduce inflammation, although they are not usually given for acute injuries.

## HEAT AND COLD

- Cold is used to relieve pain and reduce inflammation. It should be applied for 10 to 15 minutes every 2 to 3 hours as needed and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

## WHEN TO CALL YOUR DOCTOR

- Symptoms get worse or do not improve in 2 to 4 weeks despite treatment.
- You develop loss of bowel or bladder function.
- New, unexplained symptoms develop. Drugs used in treatment may produce side effects.



**FIGURE 1** From Economou SG, Economou TS: *Instructions for surgery patients*, Philadelphia, 1998, W.B. Saunders, p 317.

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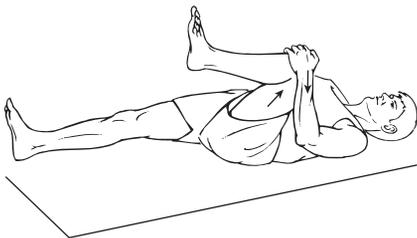
### RANGE OF MOTION AND STRETCHING EXERCISES

Herniated Disk

The exact range of motion and stretching exercises appropriate for you usually need to be determined on an individual basis. Some individuals respond better to flexion (pulling your knees to your chest), whereas others respond better to extension (placing an arch in your back). *The key point to remember is that if any exercise (range of motion, stretching, or strengthening) causes pain to radiate away from your back and toward your buttocks or legs, you should stop immediately.* The purpose of these exercises is to begin to decrease the intensity and the size of the area of your pain.

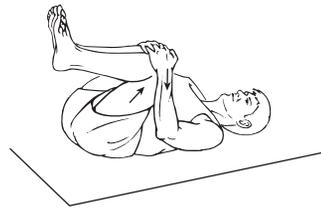
These are some of the initial exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or your symptoms resolve. *The specific exercises that are appropriate for you must be specified by your physician, physical therapist, or athletic trainer before you start them.* Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt.



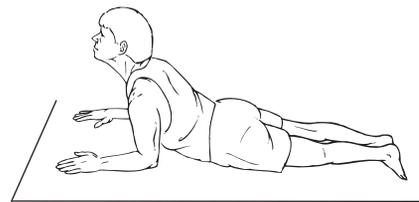
#### RANGE OF MOTION • Single Knee to Chest

1. Lie on your back with both legs flat on the floor.
2. Bring one knee up toward your chest, keeping the other leg flat on the floor.
3. Grasp your raised knee with both hands, and pull it gently toward your chest.
4. Repeat with the opposite side.
5. Repeat this exercise \_\_\_ times, \_\_\_ times per day. Hold each repetition for \_\_\_ seconds.



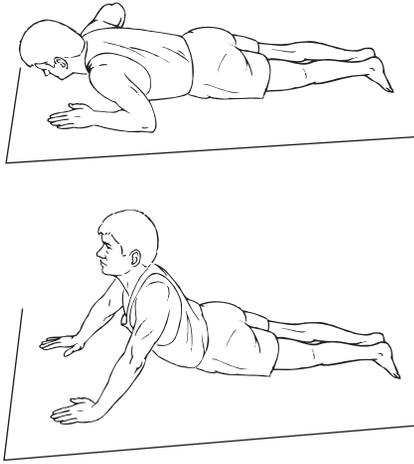
#### RANGE OF MOTION • Double Knee to Chest

1. Lie on your back with both legs flat on the floor.
2. Bring one knee up toward your chest and then the other.
3. Grasp your knees with your hands and pull them gently toward your chest.
4. Hold this stretch for \_\_\_ seconds.
5. Release one knee, allow the leg to return to the floor, then release the other.
6. Repeat this exercise \_\_\_ times, \_\_\_ times per day.



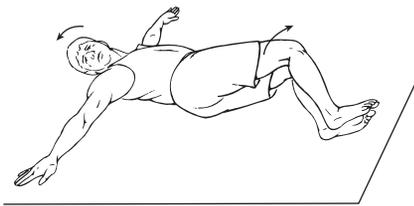
#### RANGE OF MOTION • Lumbar Spine Extension

1. Lie on your stomach on the floor.
2. Place your arms under you, and prop yourself up on your elbows as shown.
3. Allow your back to relax and sag. Hold this position for \_\_\_ seconds.
4. Return to the starting position, lying on your stomach, flat on the floor.
5. Repeat this exercise \_\_\_ times, \_\_\_ times per day.



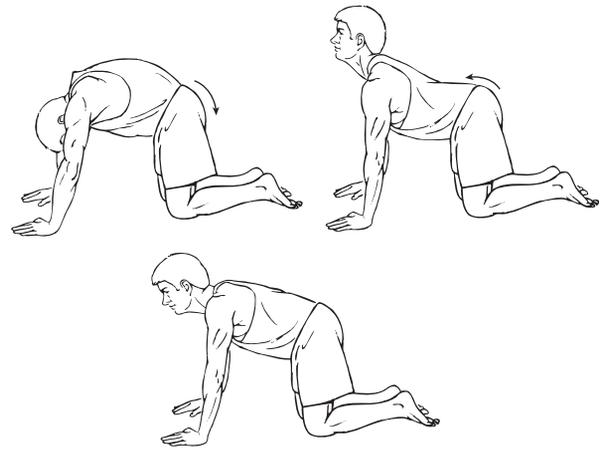
### RANGE OF MOTION • Lumbar Spine Extension

1. Lie on your stomach on the floor as shown.
2. Place your palms flat on the floor and push down on your hands, straightening out your arms and putting an arch in your back.
3. Straighten your elbows fully, and keep your hips on the floor. If you are unable to fully straighten your elbows while keeping your back relaxed, place your hands farther out in front of you and try again.
4. Return to the starting position.
5. Repeat this exercise \_\_\_ times, \_\_\_ times per day. Hold each repetition for \_\_\_ seconds.



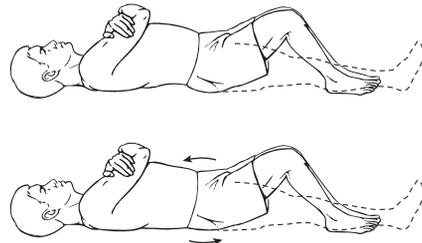
### RANGE OF MOTION • Hip Rotation

1. Lie on your back with your hips and knees bent, feet flat on the floor. Keep your arms out at your sides and your shoulders flat on the floor.
2. Rotate your hips and knees to one side as far as you can, keeping your arms and shoulders flat on the floor. Hold this position for \_\_\_ seconds.
3. Reverse position and rotate your hips and knees to the opposite side. Hold this position for \_\_\_ seconds.
4. Repeat this exercise \_\_\_ times, \_\_\_ times per day.



### RANGE OF MOTION • Lumbar Spine Stretch

1. Position yourself on your hands and knees as shown.
2. Tighten your stomach muscles and tuck your pelvis under, arching your back as shown in the diagram. Hold this position for \_\_\_ seconds.
3. Tighten your back muscles, rotating your buttocks up and allowing your back to arch and sag as shown. Hold this position for \_\_\_ seconds.
4. Find a neutral position. Tighten your stomach and back muscles, and hold this position for \_\_\_ seconds.
5. Repeat this exercise \_\_\_ times, \_\_\_ times per day.



### RANGE OF MOTION • Lumbar Spine Flexion

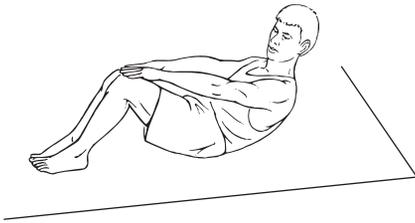
1. Lie on the floor as shown. You may do this exercise with your knees bent or straight, but it is harder with the knees straight.
2. Tighten your stomach and buttocks and push back flat onto the floor (if you do this properly, your pelvis will rotate in the direction shown in the diagram). Hold each repetition for \_\_\_ seconds.
3. Repeat this exercise \_\_\_ times, \_\_\_ times per day. Count out loud, and do not hold your breath.

### STRENGTHENING EXERCISES

#### Herniated Disk

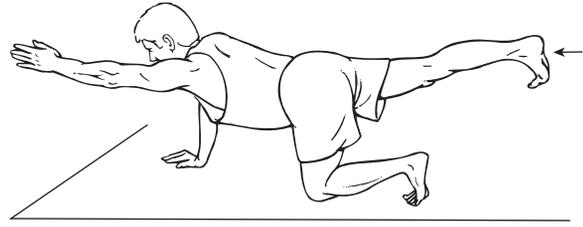
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or your symptoms resolve. Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.
- If pain or other symptoms radiate away from the back toward the buttocks or legs, stop the exercises immediately.



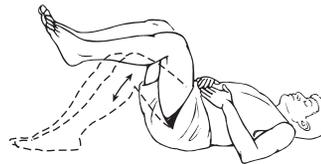
#### STRENGTH • Partial Sit-ups

1. Lie flat on your back with your hands resting on your thighs.
2. Tuck your chin to your chest, and *slowly* sit up until you touch the top of your knees.
3. Hold this position for a count of \_\_\_\_ Count out loud, and do not hold your breath.
4. *Slowly* return to the starting position.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.



#### STRENGTH • Quadruped Lift

1. Position yourself on your hands and knees.
2. Keep your back flat and parallel to the floor. Do not allow it to arch or move during this exercise.
3. Lift your left arm up to shoulder height. Hold this position and lift your right leg to the same height.
4. Balance and hold this position for \_\_\_\_ seconds. Count out loud, and do not hold your breath.
5. Return to the starting position, and repeat with the opposite arm and leg.
6. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.



#### STRENGTH • Double-Leg Hold

1. Lie on your back with your hips and knees bent.
2. Bend your legs and hips toward you as shown.
3. Tighten your stomach muscles, and press your back flat into the floor.
4. While keeping your back flat on the floor, *slowly* let your legs back down. When you feel your back start to arch, stop and hold that position. Count out loud to \_\_\_\_ and do not hold your breath.
5. Return to the starting position.
6. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.



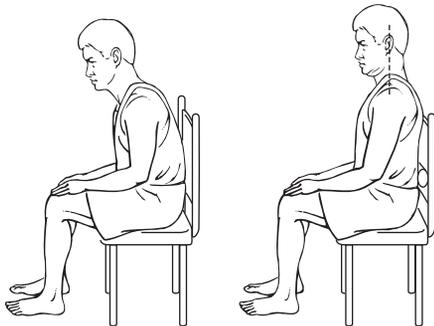
### RESTING POSITIONS

Sleep or rest on a firm surface, and find a comfortable position. The most commonly suggested positions are a side-lying position with a pillow between your knees or on your back with a pillow under your knees.



### LIFTING

Do not round out your back when lifting any object. You should make sure that you bend your knees, and attempt to maintain a normal curve in your spine.



### PROPER SITTING POSTURE

Do not slouch. Sit with a small rolled-up towel, foam cushion, or pillow in your low-back area, just above your belt. Sit with your buttocks all the way back in the chair.

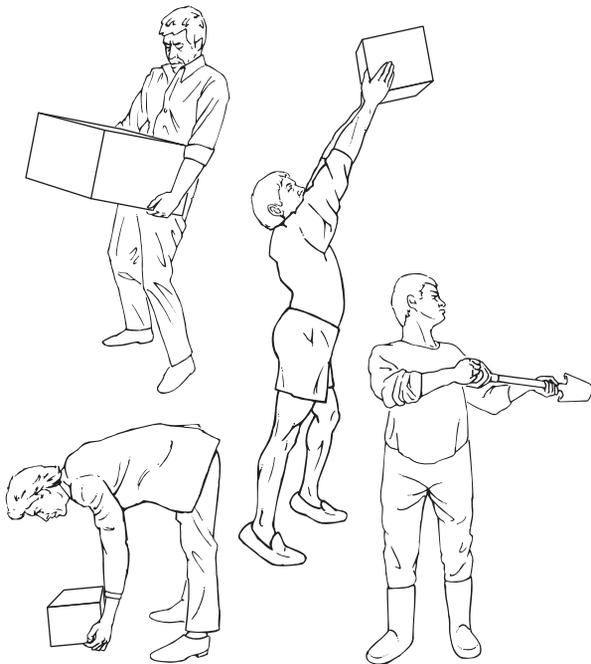
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**CORRECT LIFTING TECHNIQUES****DO:**

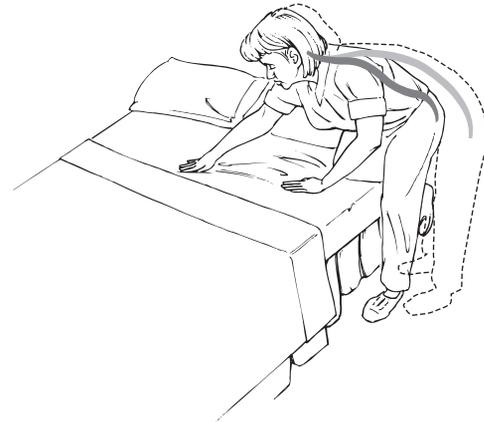
- Lift with your legs, and keep your back straight.
- Use a footstool for objects that need to be placed or retrieved from high locations.
- Use two people for lifting heavy or awkward objects.

**PROLONGED STANDING IN SLIGHT FLEXION**

When you must stand in a position that requires a prolonged period of time in slight flexion, consider finding a footstool or other object to place one foot on. This will minimize the load on your back.

**INCORRECT LIFTING TECHNIQUES****DO NOT:**

- Lift with your legs straight and your back bent.
- Lift objects that are too heavy over your head.
- Lift and twist at the same time.
- Lift an object that is too heavy or awkwardly shaped without help.

**PROLONGED ACTIVITY  
IN A FLEXED POSITION**

Try to avoid doing any activity in a flexed position for a prolonged period of time. Put one leg up if possible, which will minimize the stress on your back.



### CORRECT STANDING POSTURES

Stand upright and erect whenever possible. You should attempt to keep a normal spinal posture when doing any activity.



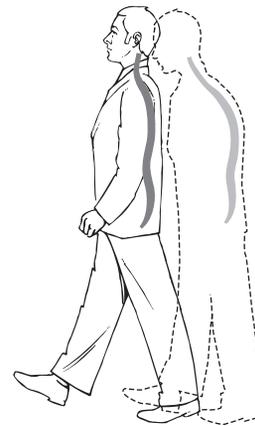
### INCORRECT STANDING POSTURES

Do not slouch or maintain flexed standing postures for prolonged periods of time.



### CORRECT SITTING POSTURES

Sit erect. Use a lumbar roll, cushion, or pillow and a chair that has a high enough back to support your back up to your shoulder blades.



### SLOUCHING

Avoid slouching when you walk or stand. Stand up straight, and walk erect and tall.

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### INCORRECT SITTING POSTURES

Do not slouch or slump. Maintain a proper position in the chair.