



Low-Back Strain

DESCRIPTION

Low-back strain is an injury to the muscles and tendons of the lower back. These muscles require great force to be able to stand upright, and the forces are tremendously increased when bending at the waist, such as to pick things up from the ground.

COMMON SIGNS AND SYMPTOMS

- Pain in the back that usually affects one side, is worse with movement, and may be felt in the hip, buttocks, or back of the thigh
- Muscle spasms of the muscles in the back
- Swelling along the muscles of the back
- Loss of strength of the back muscles
- Crepitation (a crackling sound) when the muscles are touched

CAUSES

- Prolonged overuse of the muscle-tendon units in the lower back, usually from incorrect back mechanics
- Possibly, a single violent injury or force applied to the back

FACTORS THAT INCREASE RISK

- Any sport that causes twisting force on the spine or excessive bending at the waist; also, contact sports, such as football, weightlifting, bowling, golf, tennis, speed skating, racquetball, swimming, running, gymnastics, or diving
- Poor physical conditioning (strength, flexibility)
- Inadequate warm-up before practice or play
- Family history of low-back pain or disk disorders
- Previous back injury or surgery, especially fusion
- Poor mechanics with lifting, especially heavy objects
- Prolonged sitting, especially with poor mechanics

PREVENTIVE MEASURES

- Use proper mechanics when sitting or lifting, and maintain proper posture with sitting; lift using the knees and legs, do not bend at the waist.
- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning that includes maintaining an ideal body weight, cardiovascular fitness, hamstring and back flexibility, and muscle strength and endurance training.

EXPECTED OUTCOME

With appropriate conservative treatment, low-back strain is usually curable within 6 weeks.

POSSIBLE COMPLICATIONS

- Frequent recurrence of symptoms may result in a chronic problem; appropriately addressing the problem the first time decreases the frequency of recurrence.
- Chronic inflammation, scarring, and partial muscle-tendon tears may occur.
- Healing may be delayed, or symptoms may be slow to resolve.
- Prolonged disability may result.

GENERAL TREATMENT CONSIDERATIONS

The 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 consists of rest, medications, and ice to relieve pain, inflammation, and muscle spasms. As pain and spasms subside, exercises to improve strength and flexibility and education regarding 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 treatments, such as transcutaneous electronic nerve stimulation (TENS) or ultrasound. A corset or back brace (low back) may be recommended. Biofeedback and psychotherapy may also be prescribed. Prolonged bed rest is felt to do more harm than good, but proper body mechanics should be encouraged. Bending at the 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. Occasionally an injection of cortisone, with or without local anesthetics, may be administered to help relieve the pain and spasms.

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 as necessary. Use these medications only as directed, and take only as much as you need. Do not operate any heavy machinery or drive a car while on these medications.
- Oral corticosteroids may be given for pain, or injections of corticosteroids may be administered into the spot where most muscle spasms occur.

HEAT AND COLD

- Cold is used to relieve pain and reduce inflammation for acute and chronic cases. 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 numbness, weakness, or loss of bowel or bladder function.
- New, unexplained symptoms develop. Drugs used in treatment may produce side effects.

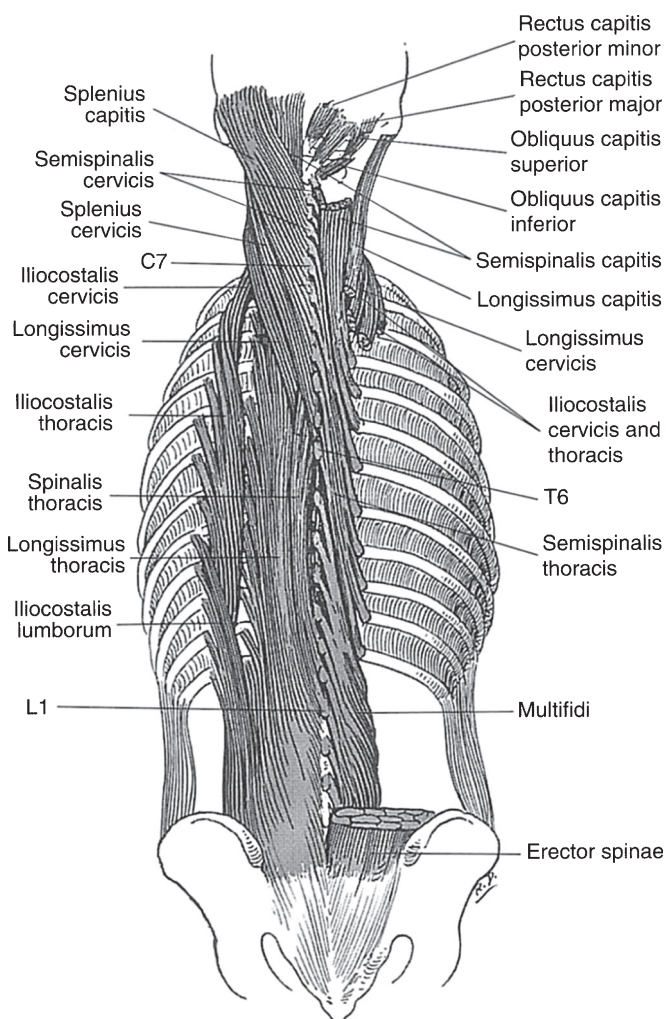


FIGURE 1 From Jenkins DB: *Hollinshead's functional anatomy of the limbs and back*, ed 6, Philadelphia, 1991, W.B. Saunders, p 193.

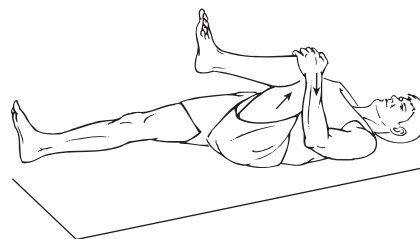
RANGE OF MOTION AND STRETCHING EXERCISES

Low-Back Strain

The exact range of motion and stretching exercises appropriate for you should be determined on an individual basis. Some individuals respond better to flexion, such as pulling your knees to your chest, whereas others respond better to extension, such as arching 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, *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 use to start your rehabilitation program, until you see your physician, physical therapist, or athletic trainer again, or until your symptoms resolve. Flexion and extension exercises are presented. *The specific exercises that are appropriate for you must be specified by your physician, physical therapist, or athletic trainer before you start.* Please remember:

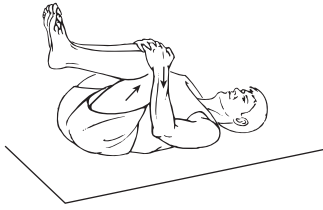
- Flexible tissue is more tolerant of the stresses placed on it.
- A *gentle* stretching sensation should be felt.
- If pain or other symptoms radiate away from the back toward the buttocks or legs, *stop the exercises immediately*.



RANGE OF MOTION • Lumbar Flexion

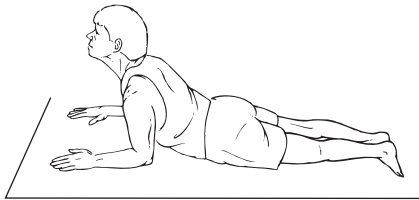
1. Lie on your back with both legs flat on the floor.
2. Bend one hip and knee up toward your chest.
3. Grasp your knee with your hands and pull it gently toward your chest, keeping the other leg flat on the floor.
4. Repeat with the opposite leg.
5. Repeat this exercise ____ times, ____ times per day.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

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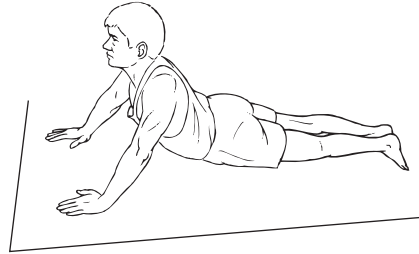
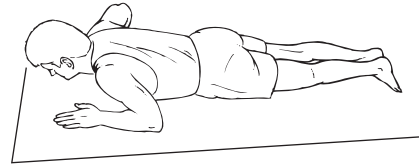
RANGE OF MOTION • Lumbar Flexion

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



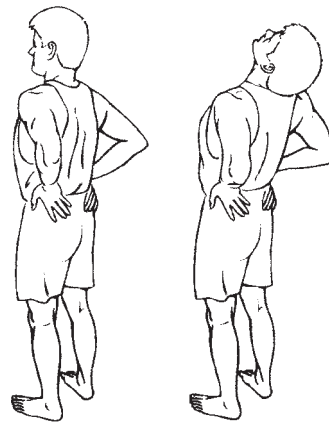
RANGE OF MOTION • Lumbar Extension

1. Lie on your stomach on the floor.
2. Place your arms underneath 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 on the floor.
5. Repeat this exercise ____ times, ____ times per day.



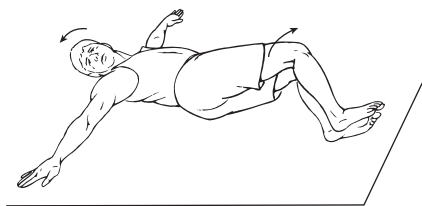
RANGE OF MOTION • Lumbar Extension

1. Lie on your stomach on the floor as shown in the picture.
2. Place your palms flat on the floor. Push down on your hands, straightening out your arms and putting an arch in your back. Straighten your elbows fully, keeping your hips on the floor.
3. Return to the starting position. 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. Repeat this exercise ____ times, ____ times per day. Hold each repetition for ____ seconds.



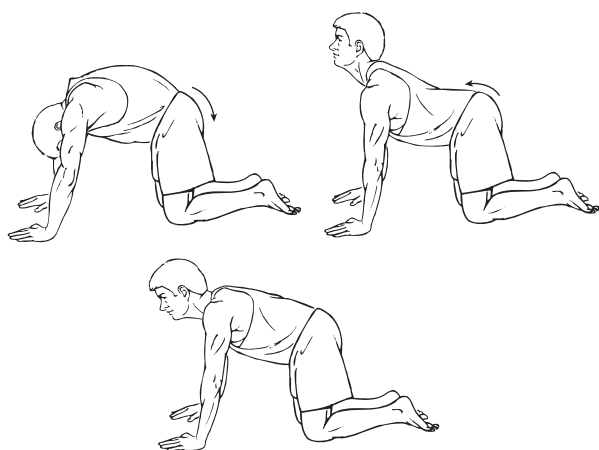
RANGE OF MOTION • Lumbar Extension

1. Stand erect and place your hands on the back of your buttocks as shown.
2. Bend backwards until you feel a gentle stretch in your back. Return to the starting position. Hold each repetition for ____ seconds.
3. Repeat this exercise ____ times, ____ times per day.



RANGE OF MOTION • Lumbar Rotation

1. Lie on your back with your hips and knees bent and your feet flat on the floor. Your arms should be out at your sides, and your shoulders should be 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.



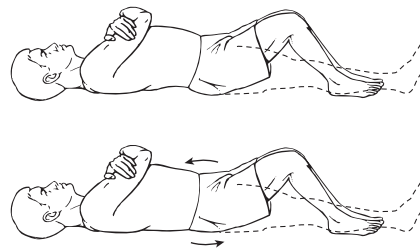
FLEXIBILITY • Lumbar Stretch

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, and tighten your stomach and back muscles. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.

STRENGTHENING EXERCISES Low-Back Strain

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

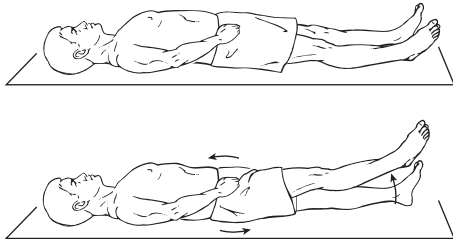
- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise under their guidance, gradually increasing the number of repetitions and weight used.
- If pain or other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



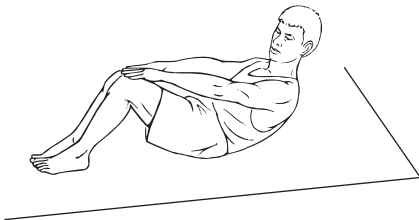
STRENGTH • Pelvic Tilt

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 buttock muscles, 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.

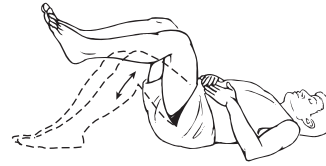
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**STRENGTH • Pelvic Tilt and Stationary Leg Lifts**

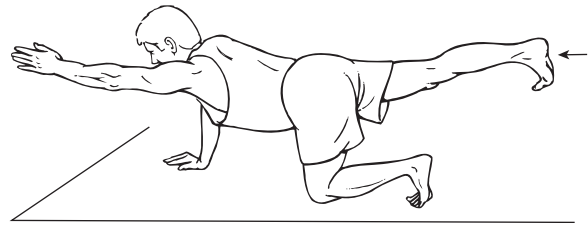
1. Lie on the floor as shown. You may do this exercise with your knees bent or straight, but it is harder with the knees straight.
2. Tighten your stomach and buttock muscles, and push back flat onto the floor. If you do this properly, your pelvis will rotate in the direction shown in the diagram.
3. While keeping your back flat on the floor, slowly lift one leg off the floor 6 inches while keeping your knee straight. Count out loud to ____, and do not let your back arch.
4. Repeat with the opposite leg.
5. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Partial Sit-ups**

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

**STRENGTH • Double-Leg Hold**

1. Lie on your back with your hips and knees bent toward you as shown.
2. Tighten your stomach muscles, and press your back flat into the floor.
3. 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.
4. Return to the starting position.
5. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Quadruped Lift**

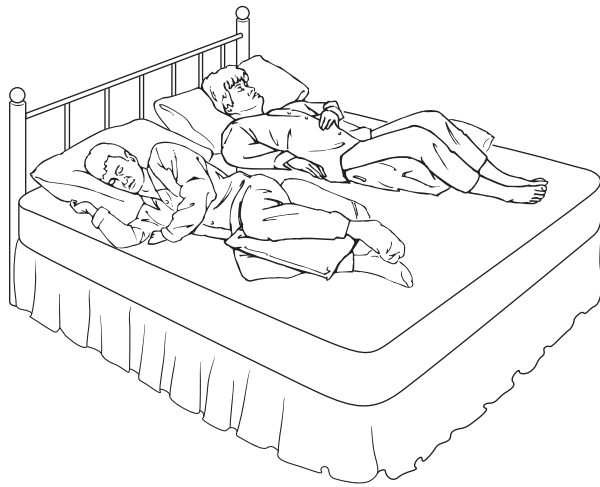
1. Position yourself on your hands and knees.
2. Keep your back flat and parallel to the floor. *Do not allow it to arch or move during this exercise.*
3. Lift your *left* arm up to shoulder height. Hold this position and lift your *right* leg to the same height.
4. Balance and hold this position for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

POSTURE AND BODY MECHANICS CONSIDERATIONS

Low-Back Strain

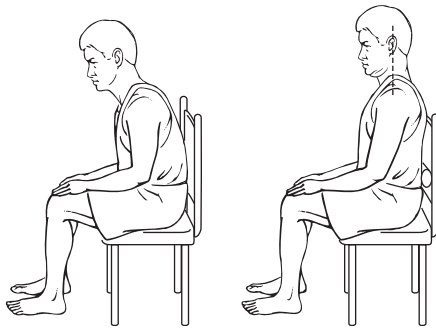
Maintaining the most appropriate posture and using correct body mechanics can have a significant effect on back pain. The following are basic suggestions regarding proper posture and body mechanics. These should be specifically discussed with your physician, physical therapist, or athletic trainer. Please remember:

- Good posture minimizes the stress and strain on any portion of your spine.
- Incorporate these posture principles into all of your daily and recreational activities.



RESTING POSITIONS

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



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.



LIFTING

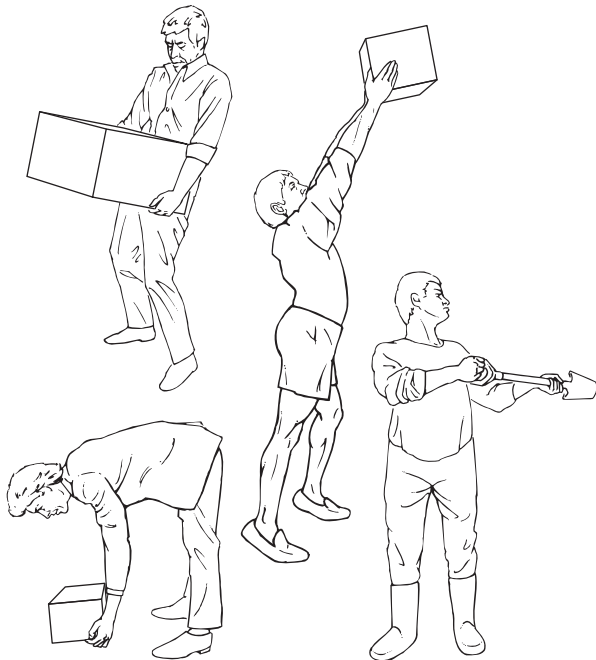
Do not round out your back when lifting any object. You should make sure that you bend your knees, and attempt to maintain a normal curve in your spine.

CORRECT LIFTING TECHNIQUES



DO

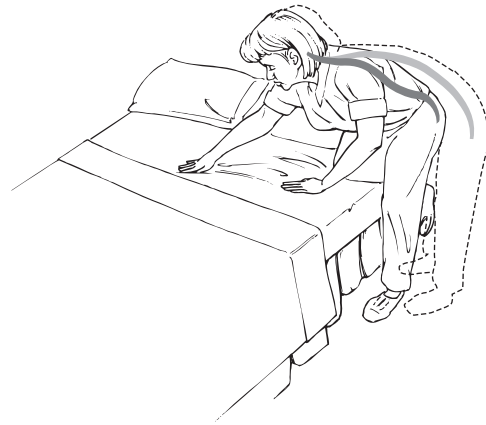
1. Lift with your legs, keeping your back straight.
2. Use a footstool for objects that need to be placed or retrieved from high locations.
3. Get help lifting heavy or awkward objects.

INCORRECT LIFTING TECHNIQUES**DO NOT**

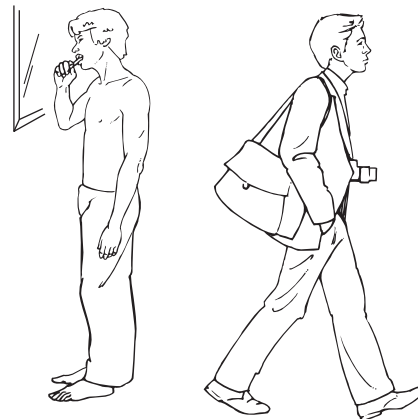
1. Do *not* lift with your legs straight and your back bent.
2. Do *not* lift objects that are too heavy over your head.
3. Do *not* lift and twist at the same time.
4. Do *not* lift an object that is too heavy or awkwardly shaped without help.

**PROLONGED STANDING IN SLIGHT FLEXION**

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

**PROLONGED ACTIVITY IN A FLEXED POSITION**

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

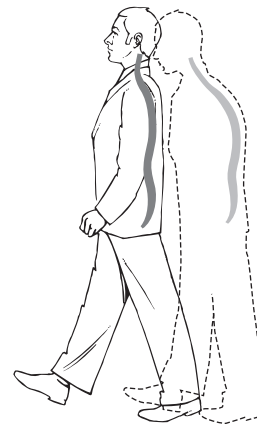
**CORRECT STANDING POSTURES**

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.



SLOUCHING

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



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.



INCORRECT SITTING POSTURES

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