EMPLOYEE HANDOUT

PATIENT HANDLING SAFETY

Employer: __________________________

Trainer: ____________________________

Employee: __________________________

Date: ______________________________

Chapter 7  Patient Handling Safety
Introduction

Suppose you’re looking for a job, just something to do on your off-hours, to earn a little extra money. You see an advertisement for warehouse workers—no special skills or education required, decent pay—but you have to be able to lift 50 pounds, over and over again. In many industries, the requirement that workers be able to lift 50 pounds puts the job into a “heavy labor” category. Workers are expected to be in good physical condition and do physically demanding work.

Now, think about what you do as a health care worker. Was “must be able to lift 50 pounds” part of the job description when you were hired? But, how much lifting do you do each day, and how much weight is involved? If you are lifting, repositioning, transferring, or assisting people who are sick, weak, or physically disabled, then you are probably doing some pretty heavy work yourself. After all, most human beings over the age of eight weight more than 50 pounds. So, is it any wonder, then, that back injuries are four times more common in health care jobs than in other professions? Or, that injuries caused by patient handling are common and can be career-ending injuries for nurses and other valuable health care personnel?

The greatest risk of occupational back injuries is to nurses, nurses’ aides, attendants, and orderlies. Common risk factors include lifting and positioning patients, static and awkward postures, and repetitive movements. Other vulnerable health care employees (not an exhaustive list) include the following:

- **Dentists and Dental Hygienists:** Studies suggest that as many as 50% of dentists and dental hygienists suffer from back pain at some point in their careers. In addition, such injuries tend to be serious. Dental workers who suffer a work-related musculo-skeletal disorder (MSD), most commonly a back injury, lose an average of 93 days of work. Injuries to dentists and dental hygienists tend to result from sustained awkward postures, rather than from patient lifting and repositioning activities.

- **Home Health Workers:** One study found that 63% of injuries to home health workers resulted from overexertion or falls and that 63% of the permanent partial disability workers’ compensation awards made to these employees were back-related.

- **Firefighters, Paramedics, and EMTs:** Available data suggests that nearly 40% of injuries to firefighters, paramedics, and EMTs are sprains, strains, and other MSDs, including back injuries. Firefighters and other emergency responders often face ergonomic stressors that differ from those faced by other health care employees. These unique stressors include temperature extremes, whole-body vibration, and the use of powered heavy equipment.
• **Sonographers:** According to a study conducted by the Society of Diagnostic Medical Sonography, many sonographers begin to experience pain from MSDs within five years of entering the profession. One in five will suffer a career-ending musculoskeletal injury.

That’s the bad news. The good news is that you can limit your chances of suffering injuries caused by patient handling in several ways. First, you can identify important risk factors for patient handling MSDs (see Sections 7.12 – 7.14). Second, you can learn about safe patient handling practices and techniques, including assistive devices that are available to you, and lift teams (see Sections 7.15 and 7.16). Third, you can use proper body mechanics and strengthening and stretching exercises to help protect yourself (see Sections 7.17 – 7.19). Finally, if you do hurt yourself, you can minimize your problems and speed your recovery by recognizing symptoms and getting prompt medical treatments (see Sections 7.20 – 7.24).

## 7.11 Anatomy of the Back, Neck, and Shoulders

The central structure of the back is the spine. It supports and moves the entire back. It also houses the spinal cord. This cord contains the nerves that enable our brains to “talk to” our other body parts, such as our arms and legs. The spinal cord is surrounded by 24 bony structures called the vertebrae. These are the main support structures of the spine and also help to protect its nerves from injury.

There are 7 vertebrae in the upper (cervical) part of the back. These are your neck bones. Just below the neck are the 12 middle (thoracic) vertebrae. Below that are the 5 lower (lumbar) vertebrae. Just below the lumbar area is the sacrum, a collection of 5 bones above the coccyx or tailbone. The lower or lumbar area is the part of the back that is subject to the most stress. For this reason, it’s also the part that is most likely to be injured.

Between the vertebrae are some of the most important parts of the back: the donut-shaped spinal discs. These discs have a hard, fibrous outside and a softer, gelatin-like center. They function as “shock absorbers” to cushion stress on the spine. When overburdened, these discs may bulge or rupture and put pressure on one or more nerves (see Section 7.22). This can cause pain to radiate into a distant body part, such as a leg or foot.

The back also contains many soft tissues, including muscles, ligaments, and tendons. The muscles, which are the most flexible of the soft tissues, provide most of the body’s power. The tendons connect our muscles to our bones. Even though tendons are classified as soft tissues, they are actually tough, fibrous cords. Ligaments are even tougher and denser than tendons. Ligaments need to be especially strong, since they make up the joints.
These are the places where bones connect to other bones. Injuries to these various soft tissues (muscles, tendons, and ligaments) are the most common cause of back problems (see Section 7.21).

The shoulder is a ball-and-socket type joint, with the ball of the humerus (upper arm bone) fitting into a circular depression in the scapula (shoulder blade). Unlike your hip joint, the shoulder is not a complete ball-and-socket joint with the head of the humerus enclosed within the scapula. Instead, the point of contact more closely resembles a golf ball sitting on a tee. The shoulder joint is the most mobile joint in your body, enabling your arm to move and rotate inward, outward, forward, and backward. Several different tendons, cushioned by bursae (fluid sacs), are attached to the bones in the shoulder. Because of its structure, the shoulder is an unstable joint, and it is easily injured by misuse or overuse.

As we age, our bodies tend to lose strength and agility. Older workers are especially susceptible to back and shoulder problems. They may suffer from “osteoarthritis” (degeneration of the cartilage that cushions the joints), “osteoporosis” (porous and brittle bones), or “degenerative disc disease” (severe disc deterioration). Any of these conditions will make a worker more vulnerable to incurring or aggravating an injury while on the job.

7.12 Major Stresses to the Back, Neck, and Shoulders

The back, especially the lower back, plays a primary role in supporting the weight of the body. Even when we are simply sitting or standing, the back is under pressure. In addition, several activities maximize the stress on the back. The National Institute of Occupational Safety and Health (NIOSH) has identified several risk factors for back injuries:

- heavy physical work
- lifting and forceful movements
- bending and twisting, especially if done frequently or repetitively
- whole-body vibration (e.g., what a truck driver experiences in his or her vehicle)

A separate set of risk factors involves the physical condition of the worker. Inadequate exercise and excessive weight can significantly increase the possibility of suffering a back injury.

For health care workers, it is important to understand the cumulative nature of these exposures. Although patient handling may be only part of your job, exposures to all of these stressors can combine to cause injuries.
Ergonomic neck injuries can be related to bending and awkward postures. But, for caregivers, neck injuries may also be the result of heavy physical work that the human neck was never meant to do. For example, when helping a patient from a sitting position to a standing position, how many caregivers have told the patient, “Put your arms around my neck,” effectively allowing the patient to “hang” his or her weight on the caregiver’s vulnerable neck?

The shoulder joint is vulnerable to many of the same types of stressors as the back. Heavy physical work, naturally, increases the risk of injury, as do lifting and forceful movements. In particular, shoulder injuries occur when work is performed at some distance from the body, requiring the worker to frequently reach forward or overhead. One example would be a nurse who is frequently required to reset or adjust monitoring equipment for multiple patients that is mounted above shoulder level.

### 7.13 Dangers of Patient Lifting

By far, the health care provider’s most back-stressing tasks are activities involving patient lifting, moving, and repositioning. Health care workers who must lift, move, and reposition patients need to be especially careful to protect their backs from injury. In its *Ergonomics for the Prevention of Musculoskeletal Disorders: Guidelines for Nursing Homes*, published in 2003, OSHA recommends that employers:

- **minimize all manual resident lifting; and**
- **eliminate manual lifting whenever possible.**

Though this advice is directed specifically at nursing home employers, it can be applied in other settings where the lifting and repositioning of human beings is part of the job. Hospitals, emergency response personnel, and even morticians can protect their backs by minimizing or eliminating manual lifting.

Lifting, repositioning, and transferring patients can create ergonomic hazards for workers. The type of handling activity affects the amount of weight the health care workers must lift and also the positioning of the health care worker during the activity, as follows:

- **Lifting:** When a patient cannot bear any of his or her own weight while being moved from one surface to another (for example, when unconscious patients must be moved from a stretcher to a bed), the patient must be lifted. That is, the health care workers support the patient’s entire weight.
• **Repositioning:** Patients who require support to change position on the same surface (for example, a patient who must be helped from lying to sitting, or when a patient’s hips must be raised to insert a bedpan), must be “repositioned.” The health care worker supports part of the patient’s weight but may be required to assume an awkward posture (i.e., bending or reaching) to do so.

• **Transferring:** Patients who can bear some of their own weight on at least one arm or leg while moving from one surface to another (for example, patients who require support to move from lying in bed to standing or who require help moving from one chair to another) will need help “transferring.” Again, health care workers bear only part of the patient’s weight, but these activities carry a risk of fall for both the patient and the caregivers, along with the creation of dangerous “save the patient” situations for caregivers.

In addition to the above factors, some patient factors can also increase the health care worker’s risk of injury. Such patient factors include:

• the patient’s **level of physical function** because patients with poor balance, limited vision, muscle weakness, or unstable gait are more likely to fall;

• the patient’s **level of cognitive function** because patients who cannot understand instructions given to them may do unexpected things during handling activities, which creates unanticipated risks to health care personnel; and

• the patient’s **level of behavioral function** because patients who are combative or uncooperative increase the risk of injury to health care workers.

### 7.14 Patient Assessment and Patient Care Plans

One of the first steps you can take to reduce the risk to your back whenever you perform patient lifting is to assess the needs of the patient. The procedure must be made safe for both the health care worker and the patient while maximizing the patient’s comfort and independence. To do this, you must consider:

• **Environmental Factors:** Consider any features in the patient care environment that may affect the activity. For example:
  - Are there furnishings, equipment, or other items anywhere along the route the patient must take that could be moved or removed to make the environment safer?
  - Is the lighting adequate?
  - Is the environment noisy, making communication between staff and patient difficult?
  - Is the environment cold, reducing tactile sensitivity and grip strength?
• **Patient Factors**  The amount and type of assistance required will depend upon several patient-related factors. For example:
  - Can the patient physically assist in his or her own movement and repositioning? If so, to what degree?
  - How much weight can the patient bear on his or her legs? On his or her arms?
  - Does the patient understand what is required? Can he or she cooperate?
  - How large and how heavy is the patient? What is the patient’s body mass index?
  - Does assistive equipment need to be rated for bariatric patients?
  - How does the patient’s medical condition affect how he or she should be lifted? For example, is the patient’s mobility affected by pain; joint replacement or amputation; stoma, tubes, splints, or other medical appliances; wounds or fractures; unstable spine, osteoporosis, postural hypotension, or other back or spinal problems; paralysis, muscle weakness, or spasms; or seizure disorder?
  - What is the effect of the lift activity on the patient’s sense of dignity?
  - What type of transfer is being performed (i.e., is it a lift, a reposition, or a transfer)?

Based on the answers to the questions above, you can determine whether mechanical assistance can be used to minimize or eliminate manual lifting or whether more than one staffer should be present for the lift.

**Patient Care Plans**

A patient’s care plan, which is part of the patient’s chart, includes a lot of important information about what the patient’s care is supposed to accomplish and how. For example, is the patient’s care intended to be curative, or only palliative? The amount of assistance a patient needs or should receive can easily be incorporated into patient care plans. For example, if the goal is to return the patient to full function, then the amount of assistance provided may need to be minimized. If the goal is to make the patient as comfortable as possible, then the amount of assistance offered might be greater than the patient actually “needs.” In addition, care plans can indicate how much assistance the patient needs based on the type of activity—the patient may need assistance transferring from the bed to the bath, for example, but require only supervision while bathing. The care plan can also indicate whether the patient has any limitations (hearing impairment requiring hearing aids, for example) that would affect a health care worker’s ability to assist the individual.
7.15  Assistive Devices

Assistive devices can be used to minimize the risk of injury to both patients and health care workers. The type of assistive device will depend upon the factors found in the patient assessment (i.e., the patient factors), as well as the specifics of the lift itself. Assistive devices provide varying levels of help, depending upon the needs of the patient.

Devices for Patients Who Can Bear Little to No Weight

The following assistive devices are useful for patients who can bear little to no weight:

- **Mechanical Whole Body Lifts**: When a patient is unable to bear weight or unable to bear weight consistently, the patient’s entire weight must be supported during transfer from one location to another. On the care plan, the patient will probably be rated as “totally dependent” or “requires total assistance.” Whole-body lifts carry the patient bodily from one location to another. They may be track (ceiling) mounted or fully portable.

- **Friction-Reducing Equipment**: These assistive devices are used when a patient who cannot bear his or her own weight is transferred between two horizontal surfaces (for example, from a bed to a gurney) in a supine position. They may also be used when a patient is repositioned in bed. Transfer boards, slider boards, sliding sheets, rollers, and sometimes soaker pads or bed pads can all reduce friction and provide a firm handhold for employees, decreasing the risk of injury to both the worker and the patient. Multiple devices may be used in combination. Use of these devices may require more than one worker.

Devices for Patients Who Can Bear Some Weight but Have Trouble Transitioning, Transferring, or Ambulating

The following assistive devices can be use for patients who can bear some weight, or who have some upper-body strength, but have trouble transitioning, transferring, or ambulating:

- **Convertible Chairs, Lift Chairs, and Lift Cushions**: Convertible chairs (sometimes called geri chairs or cardiac chairs) may be configured as wheelchairs, enabling the patient to be transferred from one area to another, or converted to beds, allowing the patient to be transferred in a supine position. (Note: These are sometimes used in combination with friction-reducing equipment.) They can also be used as an intermediate step in helping patients with some weight-bearing ability into standing. Lift chairs typically do
not lie flat for supine transfer, although they may recline. Instead, lift chairs help patients transition from sitting to standing. Lift cushions, which can be placed in standard chairs, can do the same.

- **Powered Sit-to-Stand or Standing Assist Devices:** For patients who can bear some weight but have difficulty changing positions, powered sit-to-stand or standing assist devices can be used to help them transfer from a bed to a chair or from a chair to a toilet or shower chair. Unlike a lift chair or lift cushion, these devices do not raise the patient into standing from behind and underneath. Instead, such devices enable the patient to grasp a handhold in front and use their arms to pull to standing.

- **Transfer Boards:** These simple boards, with or without a sliding seat, help patients transfer from one seated position to another (for example, from a wheelchair to a toilet seat or to a car). To use this device, a patient must have good sitting balance. Transfer boards may be used in combination with transfer belts.

- **Transfer Belts, Walking Belts, and Gait Belts:** These belts can be worn by the patient to provide a secure grip for health care workers assisting with balance. They can also be used to help a patient transition from sitting to standing, or to provide assistance to patients who have fallen and need help to get back up.

- **Transfer Poles and Grab Bars:** Installed in bathrooms, near beds, and in areas where patients need a sturdy handhold, transfer poles and grab bars enable patients to use their own upper-body strength to assist when transitioning from lying down to sitting, sitting to standing, or standing to sitting.

- **Trapeze Bars, Hand Blocks, and Bed Ladders:** These devices help patients in beds transition to sitting, as follows:
  - Hand blocks are placed on the bed surface.
  - Trapeze bars are mounted overhead.
  - Bed ladders are mounted to the foot of the bed.

Notice that many of these devices are designed either to give the patient a handhold, so that the patient can use his or her arms and upper-body strength to assist with transitions and balance, at a reduced risk to the caregiver; or to provide the caregiver with a handhold for doing the same. Love handles notwithstanding, human beings don’t come with handgrips, and it can sometimes be dangerous to the patient for a caregiver to grab, hold, or apply pressure directly to the body, as well as being less secure for both patient and caregiver. Devices that were intended to improve caregiver safety thus also become devices to improve patient safety.
Other devices function to reduce the distance through which a patient must transition, or to reduce the number of transfers that must be made. These devices include:

- **Raised Toilet Seats and Portable Commodes**: Plastic risers placed on toilet bowls reduce the distance patients must raise and lower themselves. Portable commodes reduce the transfer distance for toileting and may reduce the number of transfers needed.

- **Shower Chairs and Shower Stretchers**: Specially equipped showers can accommodate chairs and stretchers that are designed to enable patients to be bathed while seated in the chair or lying on the stretcher. This reduces the number of transfers required to get a patient from the bed to the shower.

- **Wheelchair Scales**: Wheelchair scales allow a patient to be rolled onto the scale in a wheelchair so that the patient does not have to transfer in order to be weighed.

**Devices That Enable Caregivers to Work Within Their Ergonomic “Comfort Zones”**

Ergonomically speaking, it is better to perform work between waist and shoulder height, and best if you can perform standing work at a level that allows your elbows to be flexed comfortably, without requiring you to bend your back or reach from the shoulder. Assistive devices such as **height-adjustable beds, chairs, stretchers, and bathtubs** allow health care workers to adjust the patient care environment so that this is possible. These devices let the health care worker place the patient at a height that is safe and convenient for providing care. The height can be adjusted to enable different caregivers to work safely or to allow different operations to be performed safely. For example, a nursing home resident might need to be at a different height for an aide to comfortably assist him with a bedpan than he would need to be for the same aide to comb the patient’s hair or help him shave.

**7.16 Lift Teams**

Some health care environments, typically hospitals and skilled nursing care facilities, have addressed the problem of safe patient handling by creating “lift teams.” Lift teams are typically two-person teams with special training in manual patient handling and lift/transfer assistance devices. Lift teams help with lifting and repositioning immobile patients. Because of the highly physical nature of the job, team members are often chosen for high levels of physical fitness.
Lift teams have been shown to reduce the risk of musculoskeletal disorders (MSDs) among nursing staff, aides, and orderlies, as well as substantially increasing the productivity of caregiving staff. In some facilities, the lift team’s role has grown to encompass not just lifting but even repositioning and ambulation assistance to the point that some lift teams are now called “patient mobility teams” and are involved from the outset in a patient’s rehabilitation, helping patients to achieve the highest level of independent mobility. This is another example of a worker safety initiative that proved to have real benefits for patients, too.

Lift teams may be trained and designated to work specific units within a health care facility (for example, critical care and other units where high numbers of MSDs occur). Or, lift teams may “float” by providing assistance throughout the entire facility. If lift teams are available in your facility, you will need to know:

- how to evaluate patients’ needs;
- when lift team services are appropriate;
- the availability of the lift team, including when lifts must be scheduled in advance; and
- how to summon the lift team (i.e., cell phone, pager, beeper, messages transmitted through the nursing desk, etc.).

7.17 Proper Body Mechanics

Even if adequate staffing, lift teams, and other measures are available and widely used in your workplace, you may still find yourself subjected to ergonomic stress. Maybe your lift teams only work certain units where injury rates are high; maybe assistive devices are not always available at peak times. To protect yourself in situations where you do have to perform manual patient handling activities, make sure that you do not increase your risk of injury. Know how your body was designed to work best, and try to work within those limits.

To minimize your risk of injury from patient handling activities or any lifting, carrying, and moving activities, follow these guidelines:

- Minimize the distance that must be traveled.
- Get assistance from co-workers.
- Use proper lifting techniques, as follows:
  - Bend at the knees, not at the waist.
  - Lift with your legs, not your back.
  - Keep your head high and your chin tucked in.
- Keep the weight you are lifting close to your body.
- Keep your back straight.
- Create a balanced base of support by using one foot ahead and one foot behind to get the weight in close.
- Push rather than pull (for example, wheelchairs and stretchers).
- **Don’t** twist your back while lifting. Keep your shoulders in line with your hips, and pivot with your whole body.
- **Don’t** move the load away from your body to put it down.
- **Don’t** bend forward at the waist or lift with the back flexed.
- **Don’t** remain in the same position for a long period.

### 7.18 Body Strengthening and Stretching Exercises

Poor physical condition and excessive body weight can greatly increase the risk of a back injury by stressing the lower back and increasing its curvature. Strong abdominal and back muscles, on the other hand, help to support the body and prevent back injuries. People who play sports without proper conditioning are much more likely to get injured. The same principle applies to workers and their jobs. Even if you have assistive devices and lift teams available, you may still be at risk of injury, especially if your physical conditioning is poor.

We have many different muscle groups to support the spine and to help us move. These muscles include extensors, which straighten the back; flexors, which bend and support the spine; and obliques or rotators, which rotate the spine and help maintain proper posture. The weaker these muscles, the greater the stress on the tendons, ligaments, spinal discs, and other supportive structures of the back.

Strengthening exercises may be especially beneficial for the body’s joints (where the ligaments attach bones to other bones, including the shoulder). As we age, the ligaments in our joints tend to degenerate. This condition is known as “osteoarthritis” (see Section 7.23). By strengthening our muscles, we provide more support for our joints and reduce the risk of both osteoarthritis and of injury.

Relatively little effort is required to toughen your back and reduce your risk of injury. As little as 15 minutes a week of strengthening exercises can dramatically reduce your risk. Considering the pain and aggravation from even one back injury, the returns on such a small investment are usually well worth the effort.
The use of stretching exercises is another effective way to reduce back, neck, and shoulder injuries. Our muscles, tendons, and joints need to warm up before they work out. The amount of stretching needed tends to increase as we age, as our strength and flexibility decrease.

7.19 Illustrated Examples of Back Exercises

Which strengthening and stretching exercises are best depends on your own individual condition. Everyone’s needs and abilities are unique. You should customize your own program only after you have received advice from experienced experts. Orthopedists, sports physicians, and physical therapists can help you to develop an appropriate program.

Examples of various exercises for strengthening the low back are set forth below. The drawings and explanatory text are from the American Academy of Orthopaedic Surgeons’ patient education website (Your Orthopedic Connection – http://orthoinfo.aaos.org). They have been reprinted with the Academy’s permission.

LOW BACK PAIN EXERCISE GUIDE

Regular exercises to restore the strength of your back and a gradual return to everyday activities are important for your full recovery. Your orthopaedic surgeon and physical therapist may recommend that you exercise 10 to 30 minutes a day 1 to 3 times a day during your early recovery. They may suggest some of the following exercises. This guide can help you better understand your exercise and activity program, which should be supervised by your therapist and orthopaedic surgeon.

Initial Exercise Program

Ankle Pumps

1. Lie on your back.
2. Move ankles up and down. Repeat 10 times.
3. Repeat 10 times.

Heel Slides

1. Lie on your back.
2. Slowly bend and straighten knee.
3. Repeat 10 times.

Chapter 7 Patient Handling Safety
Abdominal Contraction
1. Lie on your back with knees bent and hands resting below ribs.
2. Tighten abdominal muscles to squeeze ribs down toward back.
3. Be sure not to hold breath.
4. Hold 5 seconds.
5. Relax.
6. Repeat 10 times.

Wall Squats
1. Stand with back leaning against wall.
2. Walk feet 12 inches in front of body.
3. Keep abdominal muscles tight while slowly bending both knees 45 degrees.
4. Hold 5 seconds.
5. Slowly return to upright position.
6. Repeat 10 times.

Heel Raises
1. Stand with weight even on both feet.
2. Slowly raise heels up and down.
3. Repeat 10 times.

Straight Leg Raises
1. Lie on your back with one leg straight and one knee bent.
2. Tighten abdominal muscles to stabilize low back.
3. Slowly lift leg straight up about 6 to 12 inches and hold 1 to 5 seconds.
4. Lower leg slowly.
5. Repeat 10 times.
Intermediate Exercise Program

**Single Knee to Chest Stretch**
1. Lie on your back with both knees bent.
2. Hold thigh behind knee and bring one knee up to chest.
3. Hold 20 seconds.
4. Relax.
5. Repeat 5 times on each side.

**Hamstring Stretch**
1. Lie on your back with legs bent.
2. Hold one thigh behind knee.
3. Slowly straighten knee until a stretch is felt in back of thigh.
4. Hold 20 seconds.
5. Relax.
6. Repeat 5 times on each side.

**Lumbar Stabilization Exercises With Swiss Ball**

Abdominal muscles must remain contracted during each exercise (see Abdominal Contraction). Perform each exercise for 60 seconds. The farther the ball is from your body, the harder the exercise.

**Lying on Floor**
1. Lie on your back with knees bent and calves resting on ball.
2. Slowly raise arm over head and lower arm, alternating right and left sides.
3. Slowly straighten one knee and relax, alternating right and left sides.
4. Slowly straighten one knee and raise opposite arm over head. Alternate opposite arms and legs.
5. Slowly “walk” ball forward and backward with legs.
**Sitting on Ball**

1. Sit on ball with hips and knees bent 90° and feet resting on floor.
2. Slowly raise arm over head and lower arm, alternating right and left sides.
3. Slowly raise and lower heel, alternating right and left sides.
4. Slowly raise one heel and raise opposite arm over head. Alternate opposite arm and heel.
5. Marching: Slowly raise one foot 2 inches from floor, alternating right and left sides.

**Standing**

1. Stand with ball between your low back and wall.
2. Slowly bend knees 45° to 90°. Hold 5 seconds. Straighten knees.
3. Slowly bend knees 45° to 90° while raising both arms over head.

**Lying on Ball**

1. Lie on your stomach over ball
2. Slowly raise alternate arms over head.
3. Slowly raise alternate legs 2 to 4 inches from floor.
4. Combine 1 and 2, alternating opposite arms and legs.
5. Bend one knee. Slowly lift this leg up, alternating right and left legs.

**NOTE: Be careful not to arch your low back!**
Advanced Exercise Program

Hip Flexor Stretch
1. Lie on your back near edge of bed, holding knees to chest.
2. Slowly lower one leg down, keeping knee bent, until a stretch is felt across top of the hip/thigh.
3. Hold 20 seconds.
4. Relax.
5. Repeat 5 times on each side.

Piriformis Stretch
1. Lie on back with both knees bent.
2. Cross one leg on top of the other.
3. Pull opposite knee to chest until a stretch is felt in the buttock/hip area.
4. Hold 20 seconds.
5. Relax.
6. Repeat 5 times each side.

Lumbar Stabilization Exercise With Swiss Ball
1. Lie on stomach over ball.
2. “Walk” hands out in front of ball until ball is under legs. Reverse to starting position.
3. “Walk” hands out in front of ball until ball is under legs and slowly raise alternating arms over head.

Aerobic Exercises

Maintain spine in neutral position while stabilizing with abdominal muscles to protect the low back during aerobic exercise.

• Stationary bike for 20 to 30 minutes.
• Treadmill for 20 to 30 minutes.

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The bad news is that back injuries, which are the most common of all musculoskeletal disorders, afflict approximately four out of every five adults. Shoulder injuries are common, too, and cause more than 13 million Americans to seek medical treatment each year. The good news is that the vast majority of back injuries fully heal in a relatively short period of time. Approximately 90% of back injuries go away within 13 weeks, and 50% go away within two weeks. Most shoulder injuries, too, heal completely with conservative treatment (i.e., nonsurgical interventions), although healing does take time. All of this depends, of course, upon getting prompt treatment and allowing adequate recovery time (see Section 7.24).

Though back and neck problems can have an almost infinite number of causes, most can be placed in one of the following basic categories:

- sprains and strains involving soft tissues, such as muscles, tendons, and ligaments (see Section 7.21)
- herniated or bulging discs (see Section 7.22)
- diseases of the back, such as osteoarthritis, rheumatoid arthritis, osteoporosis, and degenerative disc disease (see Section 7.23)

Most shoulder problems are caused by natural, age-related degeneration of the soft tissues that hold this unstable joint together. The majority of shoulder injuries occur in people over the age of 60. However, overuse can accelerate this degeneration and cause injuries, too. Common shoulder injuries include the following:

- dislocation (when the arm bone pulls out of its socket) or separation (when the shoulder blade and the collarbone pull apart) since the shoulder is the most easily dislocated joint in the body
- rotator cuff diseases and disorders, such as tendonitis, bursitis, and torn rotator cuffs
- “frozen shoulder,” which is a disorder in which the range of movement is severely restricted by pain and abnormal tissue growth within the joint
- osteoarthritis and rheumatoid arthritis (see Section 7.23)
Sprains and Strains of the Soft Tissues

Approximately 90% of all back injuries involve torn muscles or tendons (sprains) or torn ligaments (strains). Sprained muscles typically heal quite quickly. Tendons are denser and more fibrous and take longer to heal. Ligaments are the densest material of all, as they usually connect bones to other bones. Severely strained ligaments typically take the longest time to heal.

Sprains and strains can be mild (grade I), moderate (grade II), or severe (grade III). Mild or moderate symptoms generally can be treated with aspirin or other anti-inflammatory non-prescription medicines (e.g., Advil® or ibuprofen). In addition, a cold pack applied for 10 to 30 minutes within 48 hours after injury may help to reduce swelling and relieve symptoms. Once you can return to relatively normal activities, your doctor may also recommend exercises or physical therapy to complete your healing process and to teach you how to avoid a relapse.

Even severe sprains and strains usually heal completely. However, disease or damage to ligaments in joints may lead to chronic pain in extreme cases. For example, in facet joint syndrome, the joints at the back of the vertebrae become inflamed. This can cause significant pain in the back and buttocks. Severely inflamed joints can even lead to pain that radiates down the sciatic nerve into the leg (see Section 7.22).

Over half the people who suffer a sprain or strain will experience another episode of back pain within a few years. Generally, any new episode will resolve without any long-term complications. But a relapse may involve more severe symptoms or even a totally different problem. If you suffer a “flare up” of a previous back problem, keep a close eye on your condition and see a physician as needed.

Herniated or Bulging Discs

While lifting an object at work, you feel a “pop” in your lower back, like a pulled muscle. The pain is mild at first, but steadily worsens. A few days later, you feel a new sensation: a shooting pain into your leg. It hurts a lot and worsens whenever you cough, sneeze, or sit down.

The above scenario probably involves a protruding disc, the most common cause of severe back pain. Protruding discs are commonly known as herniated discs or bulging discs. When a disc “herniates,” the hard outside ruptures and the softer center spills
outside. When a disc “bulges,” the outside does not actually tear. Generally speaking, herniated discs are more serious than bulging discs. However, bulging discs also can cause severe symptoms, especially if the protrusion is large.

The vast majority of disc problems occur at the lowest two discs: the L4-L5 disc (at the bottom of the lumbar area) and the L5-S1 disc (at the junction of the lumbar area with the sacrum). Although disc problems also may occur in the cervical (upper part) of the back, they are far less common than in the lumbar area. The discs of the upper back generally suffer less stress than those of the lower back. The cervical discs also contain much less disc material than the lumbar discs. Problems with discs in the middle part of the back (thoracic area) are rarest of all. They account for less than 1% of all problem discs.

**Symptoms**

The symptoms from protruding discs vary widely in type and severity. They may include severe backache with disabling muscle spasm or no backache at all. In addition, protruding discs often, but not always, impinge on surrounding nerves and cause pain to radiate into the leg or foot (with a lumbar disc) or arm (with a cervical disc). Medically, this problem is known as “sciatica” (if it involves the sciatic nerve that runs into the leg) or “radiculopathy” (which may refer to any nerve). The sciatic nerve, which is actually made up of five other nerves, is the longest and largest in the body.

Nerve compression from a problem disc may involve shooting pain, numbness, or tingling in the affected body part served by the nerve. Severe cases may even lead to weakness and wasting away of the surrounding muscle. An especially severe type of nerve root compression, called “cauda equina syndrome,” involves loss of bladder or bowel control, as well as weakness in both legs. Cauda equina syndrome is very serious and requires immediate medical attention.

**Diagnosis**

The diagnosis of a bulging or herniated disc involves a review of the patient’s history to detect if symptoms of a problem disc are present. Doctors often can distinguish the particular disc or discs involved by the nerve or nerves that are affected. For example, a herniation at the L4-L5 disc generally causes pain in the side of the calf and back of the thigh and may also involve sensory loss and muscular weakness in the big toe.
Many conditions other than a herniated or bulging disc may cause both backache and sciatica. For this reason, doctors may perform a variety of tests in an effort to arrive at the correct diagnosis. In the straight-leg raising test, for example, the doctor moves the leg to see if it will cause pain in the sciatic nerve. The physician may also order detailed images to see if the disc is bulging or ruptured. These include MRI (magnetic resonance imaging) and CAT (computed axial tomography) scans. An MRI or CAT scan of many healthy adults can also reveal one or more bulging discs. A disc problem is indicated only if a positive MRI or CAT scan is accompanied by pain, sciatica, or other suggestive symptoms of a problem disc.

**Prognosis**

Disc problems are often quite painful. Yet 80% of patients who suffer a herniated disc heal within 13 weeks without surgery. Typically, physicians will recommend rest, lifting and activity restrictions, non-prescription or prescription anti-inflammatory medications, and physical therapy. If the problems persist, a steroid injection into your affected disc may be the next step in treatment. If all else fails, your doctor will perform surgery to relieve the tissue irritation and nerve root compression. Such surgery generally is quite successful.

**Other Disorders and Diseases of the Back, Neck, and Shoulder**

There are many conditions besides muscles sprains, ligament strains, and bulging discs that can cause back problems. Among these conditions are:

- **Osteoarthritis**: joint pain and stiffness resulting from breakdown of cartilage in the joints (may cause or contribute to facet joint syndrome; see Section 7.21)

- **Rheumatoid Arthritis**: inflammation of the lining of many different joints in the body (affects approximately 2 million Americans versus 20 million who suffer from osteoarthritis)

- **Osteoporosis**: a reduction in the amount of bone mass, resulting in susceptibility to fractures with relatively little trauma (A calcium-deficient diet may cause or aggravate this condition.)

- **Osteophytes**: bone spurs (actually, a relatively rare source of pain)

- **Degenerative Disc Disease**: a natural process of deterioration whereby discs lose flexibility, elasticity, and shock-absorbing characteristics (Disc bulges and herniations are often considered an early phase of this disease.)
• **Spinal Tumors:** abnormal growths found on or inside the spinal column
• **Fibromyalgia:** a disorder with an unknown cause that is characterized by stiffness, muscle pain, and fatigue

The sources and severity of back, neck, and shoulder pain vary greatly. To obtain a better understanding of your problems and to expedite your recovery, visit a medical professional (see Section 7.24).

## Medical Diagnosis and Treatment

Although the vast majority of back problems quickly resolve, they can become chronic (last over six months) in 5% – 10% of cases. If your condition worsens or does not improve after several days, promptly see a doctor. He or she can help to pinpoint your condition, as well as recommend appropriate treatment options to speed your recovery.

If you are experiencing shoulder pain or pain that radiates down your arm, it is important to act quickly. Convalescence from shoulder injuries can take months. In addition to identifying and reducing the stressors that are causing your shoulder pain, your doctor will probably initially treat the shoulder with rest, ice, compression, and elevation, along with stretching and strengthening exercises.

Most importantly, follow the doctor’s advice on lifting and other activity restrictions. Torn tissues and damaged discs leave your back and shoulders vulnerable to serious additional injury. By failing to follow your doctor’s orders, you run a big risk of turning a minor, short-term problem into a major, chronic one.