

INFORMATION
REHABILITATION
PREVENTION
SELF ADVOCACY
RECOVERY

HOPE

A Stroke Recovery Guide



RELATIONSHIPS
MOVEMENT
RESOURCES
RELATIONSHIPS
EXERCISE

www.stroke.org



CHAPTER FOUR

Movement and Exercise

Moving around safely and easily may not be something you think about, unless you've had a stroke. Many stroke survivors have trouble moving around. These problems range from balance issues to arm or leg paralysis. As a result, about 40 percent of stroke survivors have serious falls within a year of their strokes. But, there is good news. Rehab and therapy may improve your balance and ability to move.

Movement

The most common physical effect of stroke is muscle weakness and having less control of an affected arm or leg. Survivors often work with therapists to restore strength and control through exercise programs. They also learn skills to deal with the loss of certain body movements.

Paralysis and Spasticity

Paralysis is the inability of muscle or group of muscles to move on their own. After stroke, signals from the brain to the muscles often don't work right. This is due to stroke damage to the brain. This damage can cause an arm or leg to become paralyzed and/or to develop spasticity.

Spasticity is a condition where muscles are stiff and resist being stretched. It can be found throughout the body but may be most common in the arms, fingers or legs. Depending on where it occurs, it can result in an arm being pressed against the chest, a stiff knee or a pointed foot that interferes with walking. It can also be accompanied by painful muscle spasms.

Treatment Options for Spasticity

- Treatment for spasticity is often a combination of therapy and medicine. Therapy can include range-of-motion exercises, gentle stretching, and splinting or casting.
- Medicine can treat the general effects of spasticity and act on multiple muscle groups in the body.
- Injections of botulinum toxin can prevent the release of chemicals that cause muscle contraction.
- One form of treatment involves the delivery of a drug directly into the spinal fluid using a surgically placed pump.
- Surgery is the last option to treat spasticity. It can be done on the brain or the muscles and joints. Surgery may block pain and restore some movement.

Exercise

Walking, bending and stretching are forms of exercise that can help strengthen your body and keep it flexible. Mild exercise, which should be undertaken every day, can take the form of a short walk or a simple activity like sweeping the floor. Stretching exercises, such as extending the arms or bending the torso, should be done regularly. Moving weakened or paralyzed body parts can be done while seated or lying down. Swimming is another beneficial exercise if the pool is accessible and a helper is available. Use an exercise program that is written down, with illustrations and guidelines for a helper if necessary.

Fatigue

Fatigue while exercising is to be expected. Like everyone else, you will have good and bad days. You can modify these programs to accommodate for fatigue or other conditions. Avoid overexertion and pain. However, some discomfort may be necessary to make progress.

Sample Exercise Programs

There are two exercise programs on the following pages. The first is for the person whose physical abilities have been mildly affected by the stroke. The second is for those with greater limitations. If you are not sure which one is appropriate, consult the profile that precedes each program.

All of the exercises may be performed alone if you are able to do so safely. However, for many stroke survivors, it is advisable for someone to stand nearby while an exercise session

is in progress. Your caregiver should watch for errors in judgment that could affect safety. For instance, some stroke survivors are not aware that their balance is unsteady, nor can they tell left from right. Others may have lost the ability to read the exercise instructions, or may need assistance to remember a full sequence of movements.

In general, each exercise is performed five to 10 times daily, unless otherwise directed. The exercise session should be scheduled for a time of day when you feel alert and well. You might have these ups and downs frequently. If the exercises are too tiring, divide them into two sessions – perhaps once in the morning and again in the afternoon.

Because the effects of stroke vary, it is impossible to devise a single exercise program suitable for everyone. The two programs detailed here are general and are intended to serve as a guide. You should consult an occupational therapist and/or physical therapist, who can help in selecting the specific exercises that will benefit you, and who will provide instruction for both you and your caregiver.

Resources

For referral to an occupational or physical therapist, consult your doctor or contact a home health agency, a family service agency, or the physical therapy department of your community hospital. You may also try contacting the American Occupational Therapy Association at (301) 652-2682 or the American Physical Therapy Association at (800) 999-2782 for a referral in your area.

As with any exercise program, consult with your doctor and/or therapist before beginning this program. If any exercises are too difficult and cause pain or increased stiffness in your limbs, do not do them.

Exercise Program I

For those mildly affected by stroke

Profile

If you were mildly affected by stroke, you may still have some degree of weakness in the affected arm and leg, but generally have some ability to control your movements. You may also have some obvious stiffness or muscle spasms, particularly with fatigue or stress.

You may be able to walk without someone's assistance, but may use a walker, cane or brace. For managing longer distances or uneven terrain, you may require some minimal assistance from another person, a more supportive walking aid or a wheelchair.

Abnormalities may be present when you walk, but may be corrected by exercise and by fitting shoes with lifts or wedges. A prescription for these shoe modifications can be obtained from a doctor following evaluation by a physical therapist. You can usually use the stairs with or without handrails, with a helper close by or with very minimal assistance.

Clothing that does not restrict movement is appropriate for exercising. It is not necessary to wear shorts, such as those shown in the illustrations. Leisure clothing such as sweat suits or jogging suits is appropriate. Sturdy, well-constructed shoes with non-skid soles, such as athletic shoes, are recommended at all times. It is important that your foot on the affected side be checked periodically for reddened areas, pressure marks, swelling or blisters – especially when there is poor sensation or a lack of sensation. Reddened areas and pressure marks should be reported to a doctor or physical therapist.

The following exercises can help you:

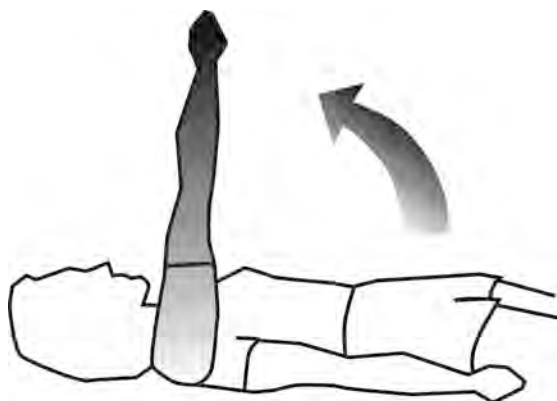
- Require less assistance for stair climbing
- Move more steadily when you walk
- Improve balance and endurance
- Strengthen and refine movement patterns
- Improve the coordination and speed of movement necessary for fine motor skills, such as fastening buttons or tying shoelaces.

Note: In the illustrations that follow, non-shaded areas show body position at the beginning of the exercise. Shaded areas show body position at the end of the exercise. Arrows show the direction of movement. Also, the word “floor” has been used to simplify the instructions; the exercises can be performed on the floor, on a firm mattress, or on any appropriate supportive surface.

Exercise 1

To strengthen the muscles that stabilize the shoulder

- a. Lie on your back with your arms resting at your sides.
- b. Keep your elbow straight, lift your affected arm to shoulder level with your hand pointing to the ceiling.

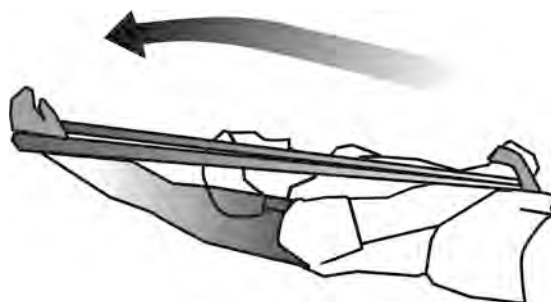


- c. Raise your hand toward the ceiling, lifting your shoulder blade from the floor.
- d. Hold for three to five seconds, and then relax, allowing your shoulder blade to return to the floor.
- e. Slowly repeat the reaching motion several times.
- f. Lower your arm to rest by your side.

Exercise 2

To strengthen the shoulder muscles as well as those which straighten the elbow

- a. Lying on your back, grasp one end of an elasticized band* in each hand with enough tension to provide light resistance to the exercise, but without causing undue strain.
- b. To start, place both hands alongside the unaffected hip, keeping your elbows as straight as possible.
- c. Move your affected arm upward in a diagonal direction, reaching out to the side, above your head, keeping your elbow straight**. Your unaffected arm should remain at your side throughout the exercise.
- d. During the exercise, stretch the band so that it provides resistance.



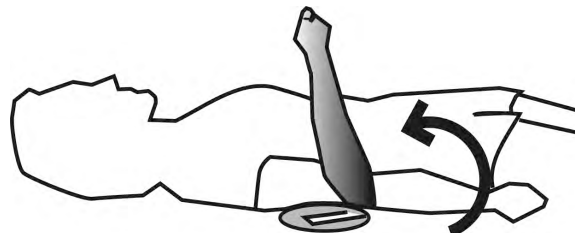
*Elasticized bands are marketed as Theraband. They are available in varying strengths (color-coded) to provide progressive resistance. Initially, a three or four foot length band – perhaps with the ends knotted together to improve grip – is sufficient for the exercise. To increase resistance as strength improves, the next density of Theraband can be purchased, or two or more bands of the original density can be used at once. Theraband can be obtained from a medical supply company. Similar elastic bands or cords are also available at many sporting goods stores where exercise equipment is sold.

**If it is too difficult to keep the elbow straight, the exercise can be done with the elbow bent. If you cannot grip with your hand, a loop can be tied at the end to slip your hand partially through the loop, leaving the thumb out to “catch” the loop during upward movement.

Exercise 3

To strengthen the muscles which straighten the elbow

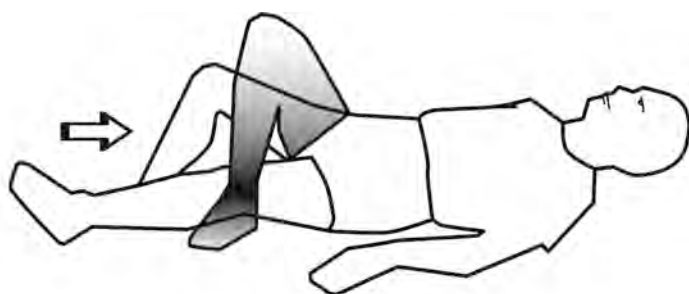
- Lie on your back with your arms resting at your sides and a rolled towel under the affected elbow.
- Bend affected elbow and move your hand up toward your shoulder. Keep your elbow resting on the towel.
- Hold for a few seconds.
- Straighten your elbow and hold.
- Slowly repeat several times.



Note: Try not to let the hand roll in towards your mid-section/stomach.

Exercise 4

To improve hip control in preparation for walking activities



- Start with your unaffected leg flat on the floor and your affected leg bent.
- Lift your affected foot and cross your affected leg over the other leg.
- Lift your affected foot and un-cross, resuming the position of step b.
- Repeat the crossing and un-crossing motion several times.

Exercise 5

To enhance hip and knee control

- Start with your knees bent, feet resting on the floor.
- Slowly slide the heel of your affected leg down so that the leg straightens.
- Slowly bring the heel of your affected leg along the floor, returning to the starting position. Keep your heel in contact with the floor throughout the exercise.



Note: Your foot will slide more smoothly if you do this exercise without shoes.

Exercise 6

To improve control of knee motions for walking

- Lie on your unaffected side with the bottom knee bent for stability and your affected arm placed in front for support.
- Starting with your affected leg straight, bend your affected knee, bringing the heel toward your buttocks, then return to the straightened position.
- Concentrate on bending and straightening your knee while keeping your hip straight.



Exercise 7

To improve weight shift and control for proper walking technique



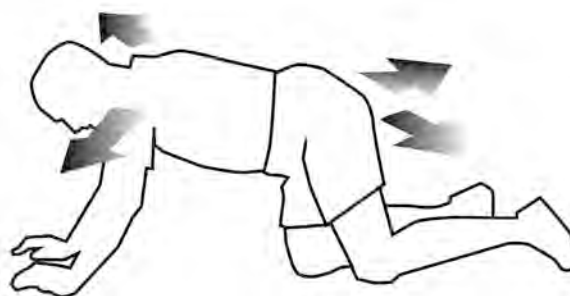
- Start with your knees bent, feet flat on the floor and knees close together.
- Lift your hips from the floor and keep them raised in the air.
- Slowly twist your hips side to side. Return to center and lower your hips to the floor.
- Rest. Repeat motion.

Note: This exercise may be difficult for some stroke survivors and it may worsen back problems. Do not do it if you experience pain.

Exercise 8

To improve balance, weight shift and control to prepare for walking activities

- The starting position is on your hands and knees. Weight should be evenly distributed on both arms and both legs.
- Rock in a diagonal direction back toward your right heel as far as possible, then as far forward toward your left hand as possible.
- Repeat motion several times, slowly rocking as far as possible in each direction.



- d. Return to center.
- e. Rock in a diagonal direction toward your right hand. Move as far back as possible in each direction slowly.

Note: For safety, an assistant may be nearby to prevent loss of balance. This position may not be appropriate or safe for elderly stroke survivors. Consult your doctor and/or physical therapist before attempting this exercise.

Exercise 9

To simulate proper weight shift and knee control necessary for walking



- a. Stand with your unaffected side next to a countertop or other firm surface. Rest your unaffected arm on the surface for support.
- b. Lift your unaffected foot from the floor so that you are standing on your affected leg.
- c. Slowly bend and straighten the leg on which you are standing through a small range of motion. Try to move smoothly, not allowing your knee to buckle when you bend, or to snap back when you straighten.
- d. Repeat the knee bending and straightening several times, slowly.

Exercise 10

To simulate proper weight shift while strengthening hip and pelvis muscles

- a. Stand facing a countertop or other firm surface for support.
- b. Shift your weight onto your right leg and lift your knee straight.
- c. Return to center with both feet on the floor.
- d. Shift your weight onto your left leg and lift your right leg out to the side keeping your back and knee straight.
- e. Repeat several times, alternating lifts.



Exercise Program II

For the person moderately affected by stroke

Profile

If you were moderately affected by your stroke, you may use a wheelchair most of the time. You are probably able to walk – at least around the house – with the aid of another person or by using a walking aid. A short leg brace may be needed to help control foot drop or inward turning of the foot. A sling may be used to help the arm and aid in shoulder positioning for controlling pain. Your affected arm and leg may be stiff or may assume a spastic posture that is difficult to control. The toe may turn inward or the foot may drag. When walking, you may “lead” with the unaffected side, leaving the other side behind. Often there are balance problems and difficulty shifting weight toward the affected side.

Clothing that does not restrict movement is appropriate for exercising. It is not necessary to wear shorts, such as those shown in the illustrations. Leisure clothing such as sweat suits or jogging suits is appropriate. Sturdy, well-constructed shoes with non-skid soles, such as athletic shoes, are recommended at all times. It is important that your foot on the affected side be checked periodically for reddened areas, pressure marks, swelling or blisters – especially when there is poor sensation or a lack of sensation. Reddened areas and pressure marks should be reported to a doctor or physical therapist.

The purpose of this exercise program is to:

- Promote flexibility and relaxation of muscles on the affected side
- Help return to more normal movement
- Improve balance and coordination
- Decrease pain and stiffness
- Maintain range of motion in the affected arm and leg

For the Stroke Survivor

Begin with exercises done lying on your back, and then move on to those performed lying on your unaffected side, then sitting, and then standing. Make sure that the surface on which you lie is firm and provides good support. Take your time when you exercise. Don't rush the movements or strain to complete them.

Note: In the illustrations that follow, non-shaded areas show body position at the beginning of the exercise. Shaded areas show body position at the end of the exercise. Arrows show the direction of movement. In addition, the word “floor” has been used to simplify the instructions; the exercises can be performed on the floor, on a firm mattress or on any appropriate supporting surface.

For the Helper

There may be no need to assist the stroke survivor in the exercises, but you should be nearby during the exercise session. If the survivor has difficulty reading or remembering the sequence of movements, you can hold the illustration up to where it can be seen or repeat the instructions one by one. You can also offer physical assistance and encouragement when needed.

Exercise 1

To enhance shoulder motion and possibly prevent shoulder pain



- Lie on your back on a firm bed. Interlace your fingers with your hands resting on your stomach.
- Slowly raise your arms to shoulder level, keeping your elbows straight.
- Return your hands to resting position on your stomach.

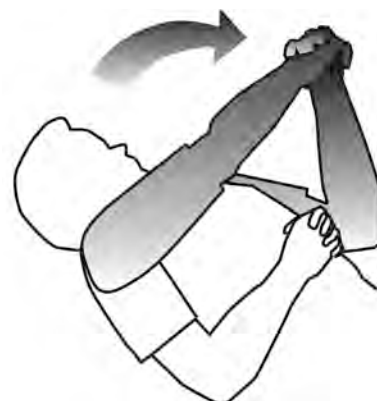
Note: If pain occurs, it may be reduced by working within the range of motion that is relatively pain-free, then going up to the point where pain is felt. The arm should not be forced if pain is excessive, but effort should be made to daily increase the range of pain-free motion.

Exercise 2

To maintain shoulder motion

(may be useful for someone who has difficulty rolling over in bed)

- Lie on your back on a firm bed. Interlace your fingers, with your hands resting on your stomach.
- Slowly raise your hands directly over your chest, straightening your elbows.
- Slowly move your hands to one side and then the other.
- When all repetitions have been completed, bend your elbows and return your hands to resting position on your stomach.



Note: If shoulder pain occurs, move only to the point where it begins to hurt. If the pain continues, don't do this exercise.

Exercise 3

To promote motion in the pelvis, hip and knee

(Can help to reduce stiffness and is also useful for rolling over and moving in bed)

- Lie on your back on a firm bed. Keep your interlaced fingers resting on your stomach.
- Bend your knees and put your feet flat on the bed.
- Holding your knees tightly together, slowly move them as far to the right as possible. Return to center.
- Slowly move your knees as far as possible to the left, still keeping them together. Return to center.

Note: The helper may provide assistance or verbal cues to help you keep your knees together during this exercise.



Exercise 4

To improve motion at the hip and knee, simulating the movements needed for walking

(Can be useful when moving toward the edge of the bed before coming to a sitting position)



- Lie on your unaffected side, with your legs together.
- Bend and move your affected knee as far as possible toward your chest. You may need your helper's assistance to support the leg you're exercising.
- Return to starting position.

Exercise 5

To strengthen the muscles that straighten the elbow

(Necessary for getting up from a lying position)

- Sitting on a firm mattress or sofa, put your affected forearm flat on the surface with your palm facing down if possible. You may want to place a firm pillow under your elbow.
- Slowly lean your weight onto your bent elbow. You may need your helper's assistance to maintain your balance.

- c. Push your hand down against the support surface, straightening your elbow and sitting more upright. (Assistance may be required to prevent sudden elbow collapse).
- d. Slowly allow your elbow to bend, returning your forearm to the support surface.
- e. Work back and forth between the two extremes (completely bent or completely straight) in a slow, rhythmical manner.

Note: This exercise should not be performed if your shoulder is not yet stable and/or will not support your upper body weight. Consult your doctor and/or physical therapist before attempting this exercise.



Exercise 6

To reduce stiffness in the trunk and promote the body rotation needed for walking



- a. Sit on a firm straight chair with both feet flat on the floor. If necessary, a firm mattress, sofa, or wheelchair may be used.
- b. Interlace your fingers.
- c. Bend forward and reach with your hands toward the outside of your right foot, rotating your trunk.
- d. Move your hands upward in a diagonal direction toward your left shoulder, keeping your elbows as straight as possible.
- e. Repeat the motions, moving your hands from your left foot to your right shoulder.

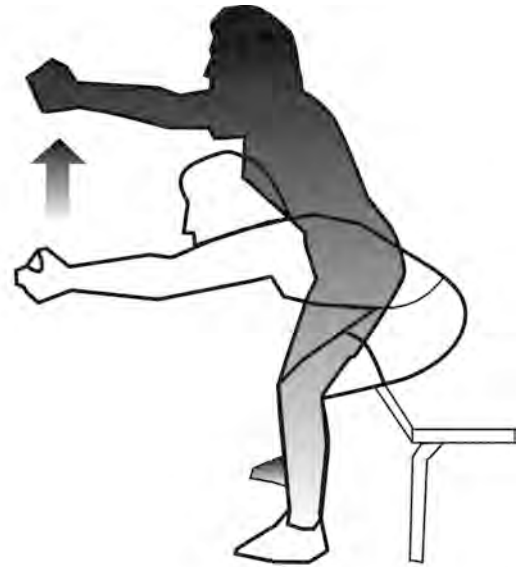
Note: Only individuals with good balance who can sit fairly independently should do this exercise. If balance is impaired, an assistant may stand in front, guiding the arms through the motions.

Exercise 7

Movements needed to rise from a sitting position

- Sit on a firm chair that has been placed against the wall to prevent slipping.
- Interlace your fingers. Reach forward with your hands.
- With your feet slightly apart and your hips at the edge of the seat, lean forward, lifting your hips up slightly from the seat.
- Slowly return to sitting.

Note: In a progression of the exercise, try to rise to a complete standing position (see step C) and return to sitting. However, this should only be done by someone with good balance who can come to a standing position safely.



Exercise 8

To maintain the ankle motion needed for walking

(also maintains motion at the wrist and elbow)



- Stand at arm's length from the wall, knees straight, feet planted slightly apart and flat on the floor with equal weight on both feet.
- With your unaffected hand, hold your affected hand in place against the wall at chest level.
- Slowly bend your elbows, leaning into the wall. This places a stretch on the back of your lower legs. Keep your heels on the floor.
- Straighten your elbows, pushing your body away from the wall.

Note: If the stroke survivor's affected arm is very involved, he or she may find this exercise too difficult. Consult your doctor and/or physical therapist before attempting this exercise.

Getting Up from a Fall

Before attempting to help a person stand up after a fall, make sure he/she has not been injured. If there are any cuts, bruises or painful areas, make the person comfortable on the floor while you get help. Do not attempt to move the individual until help arrives.

Most falls, however, do not result in injury. The illustrations that follow outline a recommended method for getting from the floor onto a chair. The individual who has fallen may need assistance, but should be able to rise using this technique.



Step 1

Assume a side-sitting position with the unaffected side close to a heavy chair or other object that will not move.



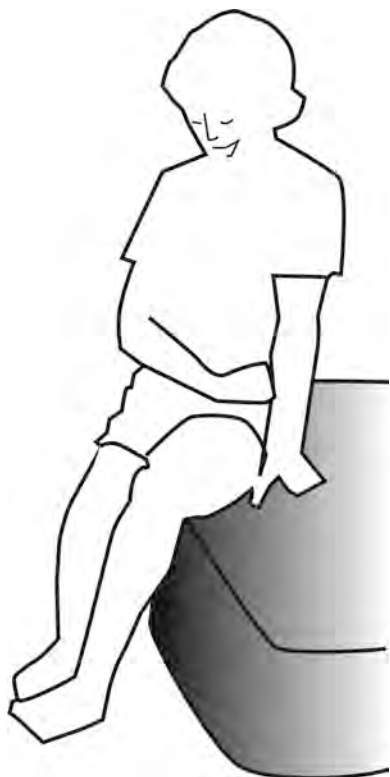
Step 2

Place the unaffected forearm on the seat of the chair and lean on the elbow or hand. Shift weight forward onto your knees and lift your hips until you are in a kneeling position.



Step 3

Supporting yourself with your unaffected arm, bring your unaffected foot forward and place it flat on the floor. Some assistance may be required to keep the affected limb in the kneeling position while placing the unaffected one in the position illustrated.



Step 4

Lift yourself up by pushing with your unaffected arm and leg. Twist your hips toward the chair and sit on the seat.

NOTES

[illegible]

[illegible]

**Join National Stroke Association
in the fight against stroke.**

SPONSORED BY
Boehringer Ingelheim Pharmaceuticals, Inc.



1-800-STROKES • 1-800-787-6537

www.stroke.org