

Stretching and Range of Motion for People with MS

An Illustrated Manual



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National
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Stretching and Range of Motion for People with MS

An Illustrated Manual

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Introduction

Everyone with MS, regardless of your degree of ability or disability, needs regular physical activity. Lack of exercise can have health consequences, ranging from joint contractures, to heart disease to constipation. Just as important, good exercise programs may promote a sense of achievement and well-being.

This booklet focuses on the basics to move and gently stretch muscles and other soft tissues, such as tendons, on your own, at your own pace. For the purposes of this book, the familiar term “stretching” is used, though most of these exercises are, technically, range of motion activities.

Flexibility

Flexibility is stretching the muscle and tendon to its full length and moving the joint through its full range. These activities decrease muscle tightness and prevent loss of full range of motion, which may occur with decreased activity, weakness or spasticity.

With decreased flexibility, contractures may occur that can be painful and significantly limit range of motion to a joint. The lack of flexibility and normal range of motion can contribute to muscle imbalances, postural problems and asymmetries, and falls.

Flexibility stretches should be held for 30–40 seconds, as tolerated.

Balance and Coordination

Balance and coordination is improving quality, safety and efficiency of movement. You can incorporate specific arm, leg and trunk exercises to improve quality of movement and allow for less energy expenditure. You can do activities for balance and coordination on land or in the water. Yoga and Tai Chi are examples of specific activities for balance and coordination that are beneficial when done properly. Exercises can be done in 3 sets of 5 repetitions, as tolerated.

Summary of Special Terms

Your healthcare provider may use the following technical terms:

Range of motion: the extent of movement that is possible within a joint.

Passive range of motion: the extent of motion possible in a joint when moved with assistance (i.e., by a therapist, helper or a piece of machinery).

Active range of motion: the extent of movement that is possible in a joint when the person moves without assistance.

Active-assisted range of motion: the patient is doing part of the work and is being assisted by the helper.

Spasticity: a tightening or stiffness of the muscle due to increased muscle tone and exaggerated response to muscle stretch.

Joint contractures: a limitation in range of motion that impairs function of a joint.

Disuse muscle atrophy: a decrease in size—and eventually in strength—of muscle fibers that have not been contracted for a period of time.

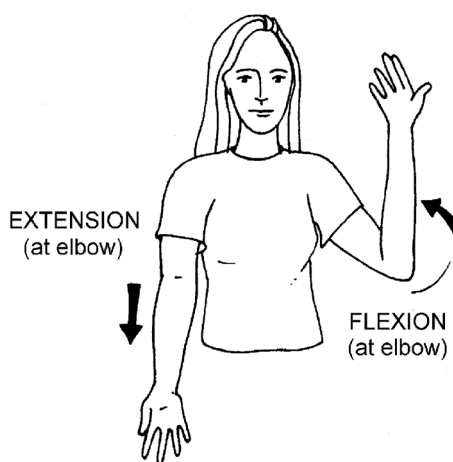
Basic Exercise Movements

Flexion

Flexion is the act of moving a joint so that your limb or trunk is bending. Usually the muscle is shortening.

Extension

Extension is the act of moving a joint so that your limb or trunk is straightening out. Usually the muscle is lengthening.

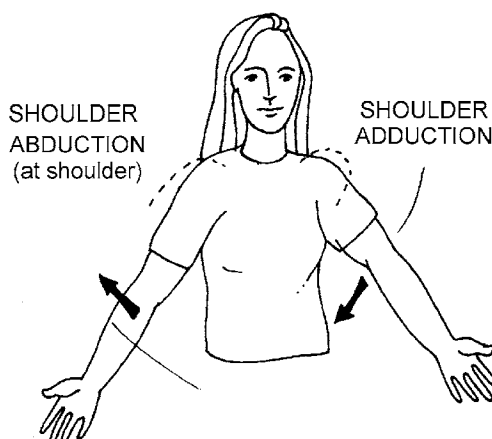


Abduction

Abduction is the act of moving a joint so that your limb is moving away from the middle of the body.

Adduction

Adduction is the act of moving a joint so that your limb is moving toward the body.



Precautions

1. Wear clothing that doesn't restrict movement.
2. Be sure the room temperature is comfortably cool. Consider a fan, air conditioner or open window. If you are especially heat-sensitive, consider a cool shower or a 10-minute soak in a cool tub before exercising. (Start with lukewarm water, slowly adding cooler water until the water feels like a cool swimming pool.) Or experiment with cooling headbands, vests or neck wraps.
3. Don't force any movement that causes pain or increases spasticity. Some feeling of stretch is fine; pain, numbness or tingling are not. If pain occurs, stop. Check with your health care professional before trying that move again. If discomfort occurs, cut back to a motion that's easier.
4. Go slowly. All movements should be done evenly, allowing the muscles time to respond to the stretch by relaxing. Moving quickly can increase spasticity or stiffness. Hold each stretch for 30–40 seconds at the comfortable far end of your range. It may help to count out loud or use a timer. Then gently return to the starting position.
5. Progress as tolerated while always listening to your body. And remember, your body will vary from day-to-day. The idea is to increase the range of pain-free motion. Therefore, it's important to distinguish between pain and the feeling of stretch. Stretch is okay; pain is not.
6. If one side is weaker, use the stronger side to move the weaker side. A physical therapist should be able to help you with technique and positioning. A family member or partner may be able to help you with stretching. It is important that the support partner knows what they are doing when assisting, otherwise they may be at risk of injuring you or themselves.
7. Some exercises in this booklet are appropriate for people who can sit safely without support on the edge of a bed or chair. **If you have any balance problems or unsteadiness, do not do these exercises without first consulting your healthcare provider.**
8. Remember to breathe evenly and relax the face throughout each movement. There's a tendency to grimace or hold the breath during an unusual movement.
9. Avoid overexertion. Include rest periods, and sip cool water to prevent overheating or dehydration.
10. Vertigo is dizziness or a "spinning of the room" sensation. If any movement makes you dizzy, light-headed or nauseated, stop immediately and check with your healthcare provider.

11. Lhermitte's sign is a tingling or electric shock-like sensation in the spine or limbs upon bending the neck, which sometimes occurs in MS. If you feel this sensation, discontinue the exercise and check with your healthcare provider.
12. Experiment with times of day. Some people find early morning best; some find it helpful to break exercise sessions into two parts: one in the morning and the other in the afternoon or evening.
13. If you experience spasticity, incorporate the tips that are below for increased success with your stretching program.

Positioning for Managing Spasticity

Spasticity

Spasticity can be defined as a tightening or stiffness of the muscle due to increased muscle tone, and is often made worse when muscles are quickly stretched or moved. It can be one of the most common and frustrating symptoms of MS and can interfere with normal functioning. It can also greatly increase fatigue. However, exercise, properly done, is vital in managing spasticity.

The following tips may prove helpful:

- Avoid positions that make your spasticity worse.
- Daily stretching of muscles to their full length will help you manage the tightness of spasticity and allow for optimal movement.
- Moving a spastic muscle to a new position may result in an increase in spasticity. If this happens, allow a few minutes for the muscles to relax.
- When exercising, try to keep your head straight (not tilted to one side).
- If you are using a spasticity-reducing drug, time exercise to begin approximately one hour after taking the medication.
- Your spasticity-reducing drug dose should be checked frequently, as spasticity changes.
- Sudden changes in spasticity may occur in the presence of infections, skin sores or even tight shoes or clothing.

Positions Seen with Spasticity and Ways to Decrease Spasticity

You may want to refrain from active exercises that accentuate a position associated with any spasticity you experience. For example, if you have extensor spasticity, refrain from doing the active exercises that straighten the hip and knee to the extent that it sets off the spasticity.

The positions that follow are designed to decrease your spasticity. If they do not, consult your healthcare provider.

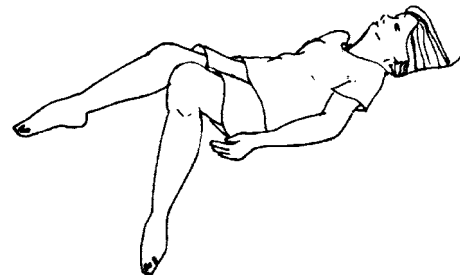
Spasticity Positions

These are positions that the body tends to move towards when spasticity is dominant.

Flexor spasticity

Common in people with multiple sclerosis. The hips and knees are maintained in a bent position with hips turned inward.

Less frequently, hips and knees are turned outward. Knees are bent in a flexed position and feet tend to point in a downward direction.



Extensor spasticity

The hips and knees are maintained in a straightened position, and the legs are very close together or crossed over, with the feet in a downward position.

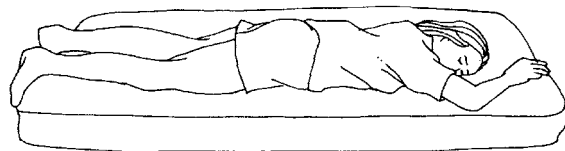


Positioning for Managing Spasticity

Positioning Your Body to Reduce Spasticity

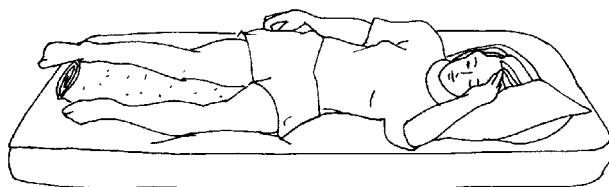
Lying on your stomach (prone position)

This is an excellent position to try if you have spastic hip and knee flexors. Give yourself a few minutes to allow your hip muscles to relax in this new position. If able, let toes and foot hang over edge of bed to allow a neutral ankle position. As your hips relax, so will your calf muscles.



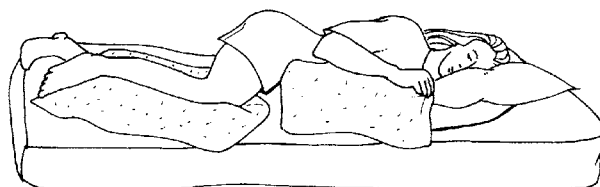
Lying face up or in 3/4 position

If your knees tend to roll inward, try placing a rolled pillow or towel between your knees. Again, allow time for your legs to accommodate and relax in the new position for a few minutes. Pillows under the knees only reinforce the knee flexion and should be avoided.



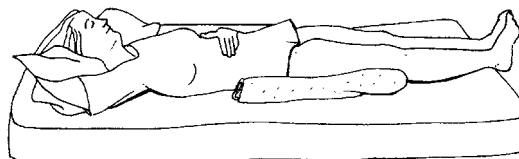
Lying on your side (side-lying)

This is an excellent position if your hips and knees are prone to extensor spasticity. On your side, bend the knee of your top leg and let the knee of your bottom leg be straight. You can also put a rolled pillow or towel between your legs.



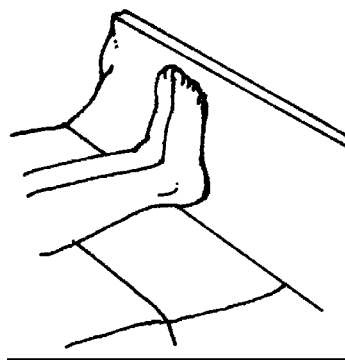
Correcting hip turn out

If your hips and knees assume a “frog like” position due to spasticity, try lying on your back. Place the end of a pillow, or a large beach towel, under your upper thigh (hip to knee). Roll the towel or pillow so that your hips and knees align themselves. Knees should be pointed toward the ceiling.



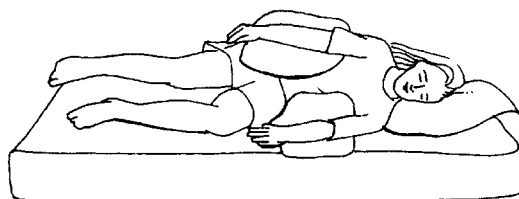
Correcting foot turn down

If your ankles and feet turn in a downward position, try to position your ankles and feet in a neutral position—that is, with your toes pointed up toward the ceiling. The easiest way to achieve this is to place your feet against a padded footboard. If your bed does not have a footboard, bracing or other orthotic measures may be needed. There are good resting ankle splints on the market. Talk to your healthcare provider about options.



Correcting bent elbows

If your elbows tend to bend, and your arms remain close to your body, try lying down with your arms out alongside your body, on pillows, and your hands positioned palms down.



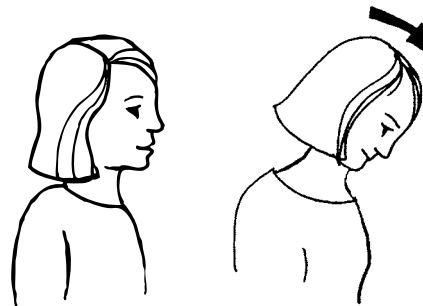
Head and Neck Exercises

Be sure to read the precautions on page 3 before doing these exercises.

Flexion

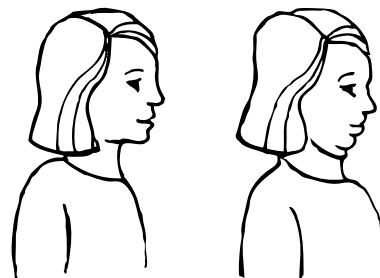
Head nod

Look forward, then down to the floor. Hold 30–40 seconds, then look forward again slowly, as if nodding head. Repeat 2–3 times.



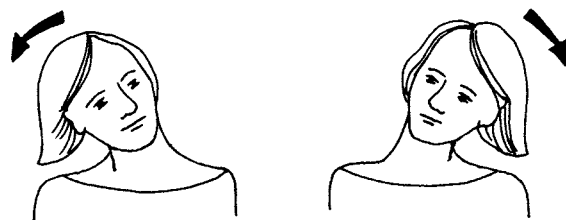
Chin tuck

Look forward and keep head level as you gently push head back on the neck as if making a double chin. Hold 30–40 seconds. Repeat 2–3 times.



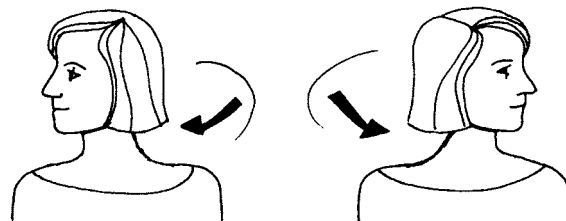
Lateral flexion

Bend head so that ear is moved toward shoulder. Hold 30–40 seconds. Repeat 2–3 times on each side.



Cervical rotation

Turn head to look over shoulder. Hold 30–40 seconds. Repeat 2–3 times on each side.



Shoulder Exercises

Be sure to read the precautions on page 3 before doing these exercises.

Shoulder flexion

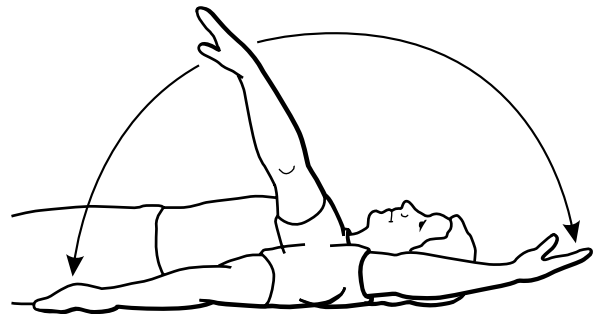
Starting position

Lie on your back or sitting in a chair with arms at your sides, thumb side up.

Raise one arm up over your head (as if raising your hand in class), keeping elbow and forearm straight. Hold 30–40 seconds.

Return arm to starting position and repeat 2–3 times.

Repeat exercise with other arm.



Shoulder abduction

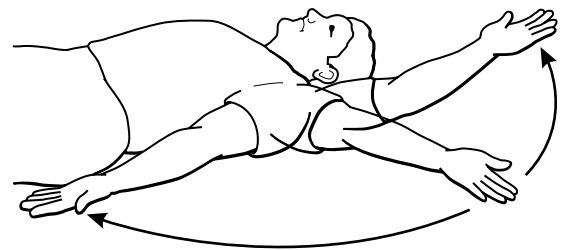
Starting position

Lie on your back or sitting in a chair with arms at your sides. Turn your palms up.

Bring one arm out to the side and smoothly up to the side of your head (as if doing a one armed jumping jack or snow angel). Hold 30–40 seconds.

Return arm to starting position and repeat 2–3 times.

Repeat exercise with other arm.



Shoulder rotation

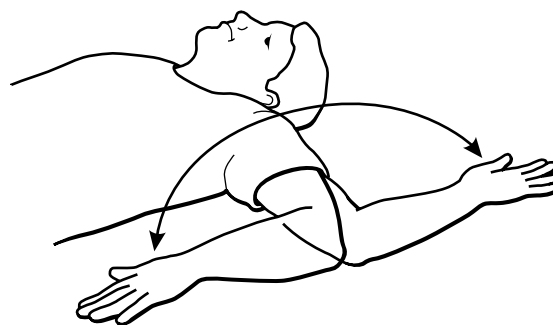
Starting position

Lie on your back or sit on chair with arm out at your side and your elbow bent at a 90 degree angle. Turn your palm down. If you are unable to position your arm at a 90 degree angle because of decreased range of motion or pain, then position at an angle which is comfortable, and/or use a pillow underneath your arm for support if on a bed.

Raise your forearm up and over until the back of your palm touches the bed. Hold 30–40 seconds.

Gently return forearm to starting position, palm down on the bed. Repeat 2–3 times.

Repeat exercise with other arm.



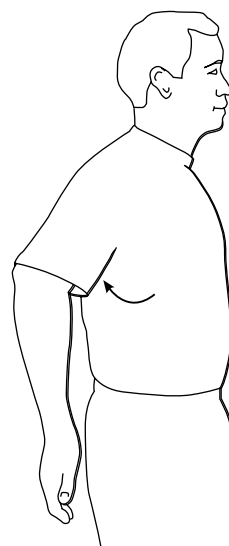
Shoulder extension

Starting position

Stand or sit in a chair. Move arm straight back, as if reaching for something in your rear pocket. Allow forearm to dangle. Hold 30–40 seconds.

Return arm to starting position. Repeat 2–3 times.

Repeat exercise with other arm.



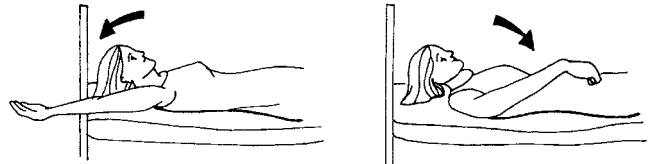
Shoulder Range of Motion Exercises

Be sure to read the precautions on page 3 before doing these exercises.

As a flow (repeat the flow 2–3 times on each side)

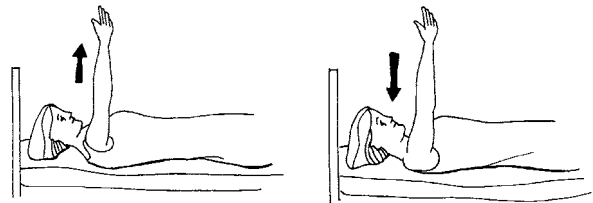
Starting position

Start by lying down with arms at sides, close to the edge of the bed. Move arm overhead, as shown.



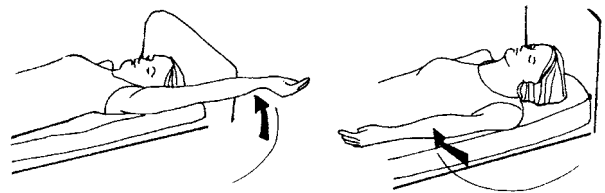
Return arm to start position (arm straight).

With arm at shoulder height, reach for the ceiling, lifting the shoulder off the bed.



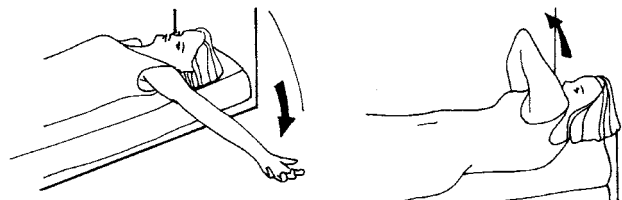
Draw arm and shoulder back until shoulder is flat on the bed. Then press shoulder into bed for one breath in and out and relax.

Move arm outward from the body to above the head.



Return arm to start position (arm straight).

With arm extended outward at shoulder height, move arm down toward the floor as far as possible. Return arm to start position.



Extend arm outward at shoulder height. Move arm across body, lifting shoulder off the bed. Return to starting position, with both arms straight.

Repeat all the above with other arm.

Elbow and Forearm Exercises

Be sure to read the precautions on page 3 before doing these exercises.

Elbow flexion and extension

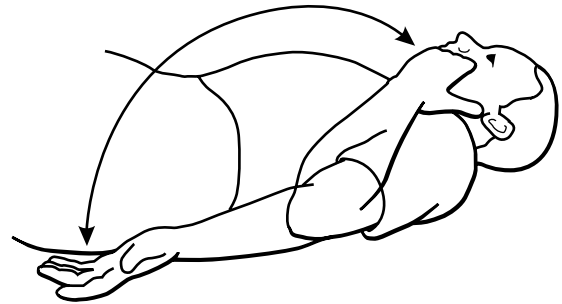
Starting position

Lie on bed, mat or sit on chair, arms at side and palms up.

Keeping elbow on bed, mat or at side and bring hand as close to the shoulder as possible. Hold 30–40 seconds.

Return to start position.

Repeat 2–3 times on each side.



Forearm rotation

Starting position

Lie on back with arms at your sides, palms turned toward body. Or sit at a table, with forearm resting on the table.

Raise forearm straight up. If lying down, keep elbow and upper arm on the bed.

Gently rotate hand, palm toward your face, and palm away from your face.

Repeat 2–3 times.

Repeat exercise with other arm.



Hand and Wrist Range of Motion Exercises

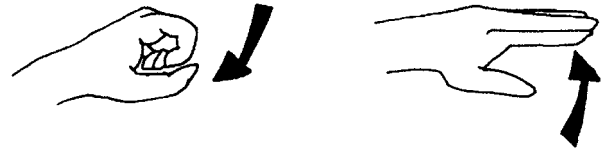
Be sure to read the precautions on page 3 before doing these exercises.

Finger flexion and extension

Bend fingers toward palm (make a fist).

Straighten fingers.

Repeat 2–3 times.



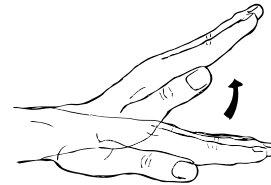
Exercise modification for weakened finger extensors

Pre-position hand with fingers extended straight on table or lap.

Lift whole hand with fingers extended.

Hold a few seconds.

Relax. Repeat 2–3 times.

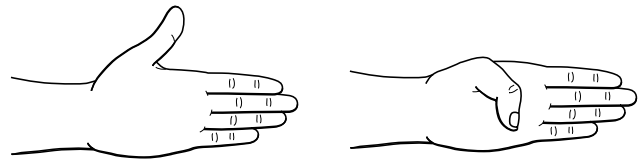


Thumb abduction and adduction

Bend thumb at all joints.

Straighten thumb.

Repeat 2–3 times.

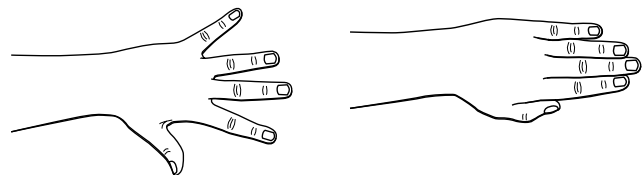


Finger abduction and adduction

Move fingers apart (spread fingers).

Move fingers together.

Repeat 2–3 times.

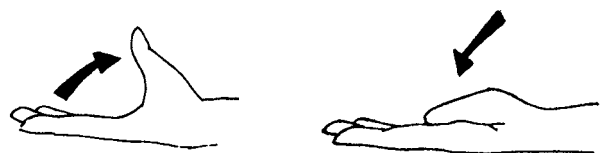


Thumb flexion and extension

With palm up, move thumb up and away from palm.

Return thumb to position along side of first finger.

Repeat 2–3 times.

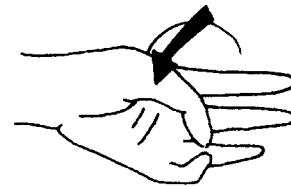


Thumb opposition

Move thumb out and around to touch little finger.

For additional coordination exercise, touch thumb to each fingertip, starting with the little finger, alternating ring, middle and index fingers.

Repeat 2–3 times.



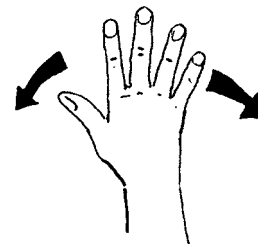
SUGGESTION

To improve finger coordination, try playing cards, board games, building models or doing crafts. Consider other functional activities such as typing drills, sorting nuts and bolts or organizing “junk drawers” at home.

Wrist lateral flexion

With hand out flat, keeping arm still, move hand first to the left, then to the right.

Repeat 2–3 times.



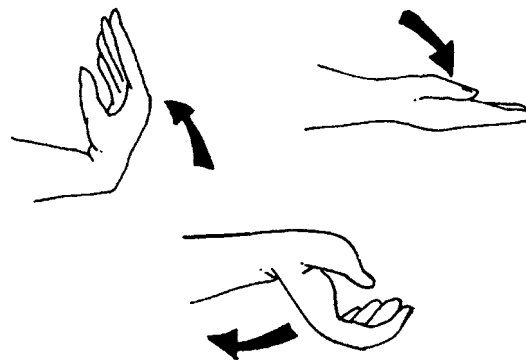
Wrist flexion and extension

Bend wrist so that palm is toward forearm.

Straighten from bent position to neutral position.

Move hand so that back of hand is moved toward forearm.

Repeat 2–3 times.

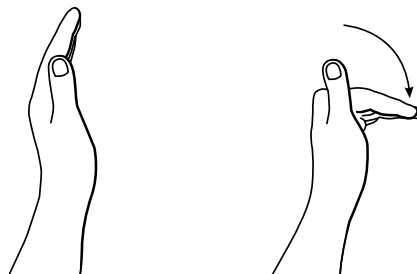


Knuckle flexion and extension

Start with arm and wrist in a comfortable neutral position, fingers pointing to the ceiling.

Bend the fingers at the large knuckles (keeping the other joints straight), making a table-top with your hand. Then straighten. Try to keep the wrist straight instead of relaxed.

Repeat 2–3 times.



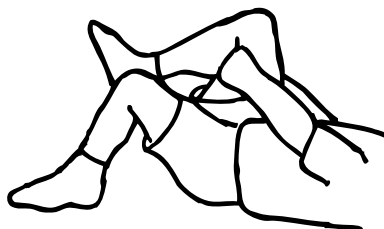
Trunk, Hip and Hamstring Exercises

Be sure to read the precautions on page 3 before doing these exercises.

Single knee to chest

Lying on back on bed, set one foot on bed with knee bent and gently pull other knee toward chest. If this is too much of a challenge, try using a belt or a rolled towel behind knee and pull in gently.

Hold for 30–40 seconds. Repeat 2–3 times per leg.



Low trunk rotation

Lying on back with knees bent and feet flat, slowly lower knees from side to side. The goal is to stretch the trunk and hips, not to touch the knees to the floor or bed.

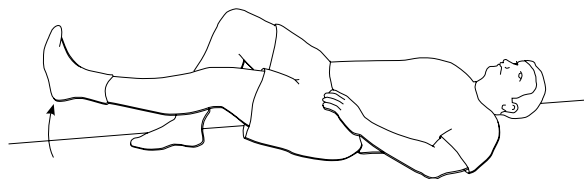
Hold for 30–40 seconds. Repeat 2–3 times per leg.



Single straight leg raise

Bend one leg at the knee, keeping the foot flat on the mat. Slowly move the other leg up 6–10 inches off the mat without bending the knee. Lower slowly. Repeat 2–3 times per leg.

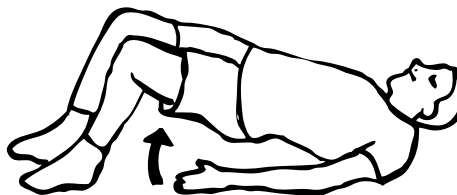
Note: If lower back is very weak, slide hands, palms down, under the small of the back before lifting the leg.



Bridging

Lying on bed with both knees bent, feet on bed and arms at side, squeezing your buttocks, slowly lift hips up toward ceiling and set down. Do not arch back as this could cause pain.

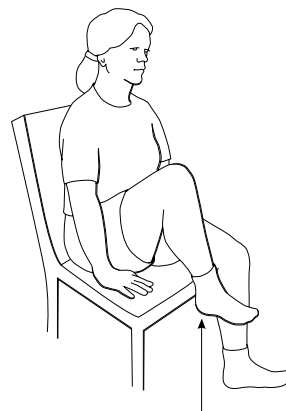
Lift up on inhale and lower on exhale. Repeat 2–3 times.



Hip flexion or march

Sit on chair or edge of bed, with feet touching floor.

Bend hip by lifting knee toward chest on inhale, then lower foot to floor on exhale. Repeat 2–3 times per leg.



Sitting hamstring stretch

Sit on chair or edge of bed, with feet touching floor.

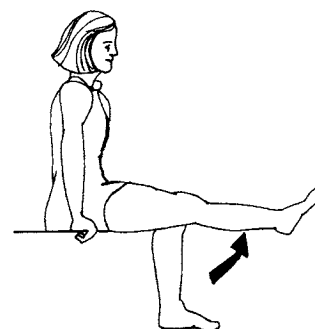
Straighten one leg with heel on floor and toes pointing up. Gently bend forward until a moderate stretch is felt. Do not overstretch or arch back as this could cause pain. Hold 30–40 seconds. Repeat 2–3 times per leg.



Knee extension or kick

Straighten knee while lifting foot up. Return slowly to a bent knee position.

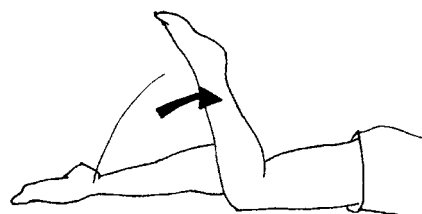
Repeat 2–3 times per leg.



Knee flexion

Lie on stomach, bend knee. Return to original position.

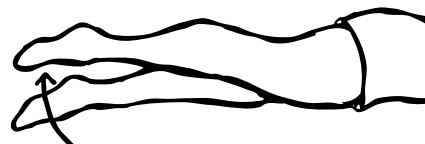
Repeat 2–3 times per leg.



Hip extension

Lie on bed face down and with knee straight. Lift entire leg up from bed 1–3 inches as you inhale and set back down on exhale. Do not lift lower body to get leg off bed.

Repeat 2–3 times per leg.

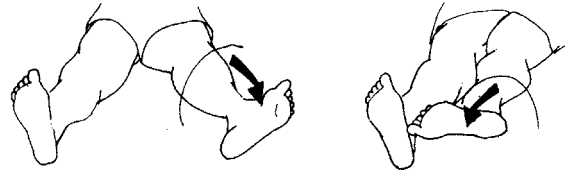


Hip rotation

Lying on your back, turn your leg out so that toes point away from your other leg.

Turn your leg so that toes point toward your other leg.

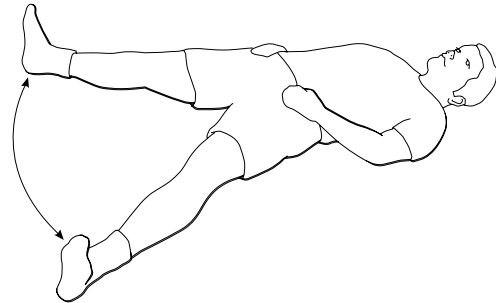
Repeat 2–3 times per leg.



Hip abduction and adduction

With legs together and straight, move legs apart from each other and return to the neutral position. Or move one leg at a time out and then back to the starting position.

Repeat 2–3 times per leg.



Ankle and Foot Exercises

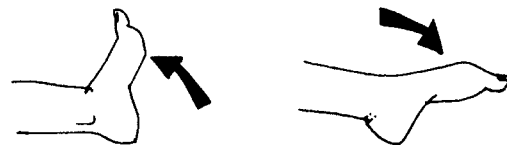
Be sure to read the precautions on page 3 before doing these exercises.

Ankle dorsi flexion and plantar flexion

Move foot up and toward the leg.

Move foot down and away from the leg.
Do this slowly. If it feels as if it may cause a muscle spasm, repeat step 1 and hold gently. Then stop.

Hold 3–5 seconds, being careful not to cause a spasm. Repeat 2–3 times.

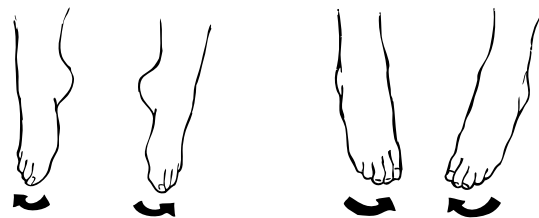


Ankle eversion and inversion

Move foot so sole is facing outward. Try to keep toes pointed upward, not down.

Move foot so sole is facing inward, then repeat, reversing direction.

Hold 3–5 seconds, being careful not to cause a spasm. Repeat 2–3 times.

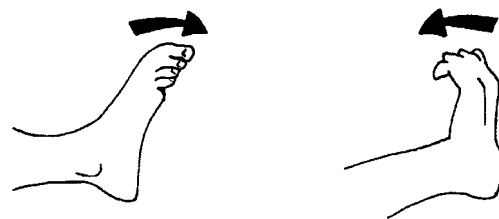


Toe flexion and extension

Bend toes toward ball of foot.

Straighten toes and pull them toward the shinbone as far as possible.

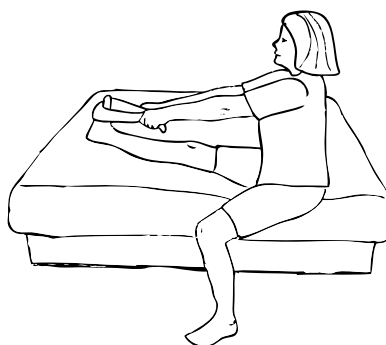
Hold 3–5 seconds, being careful not to cause a spasm. Repeat 2–3 times.



Heel cord stretch

Sit on bed or steady chair with your back straight. Let one leg hang down. Put a towel around the bottom of your active foot, lift the leg and pull on the towel with both hands.

Hold for 20–30 seconds. Repeat on other side.

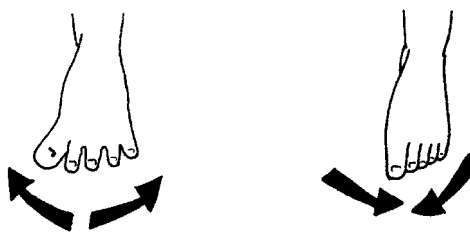


Toe abduction and adduction

Move toes apart.

Move toes together.

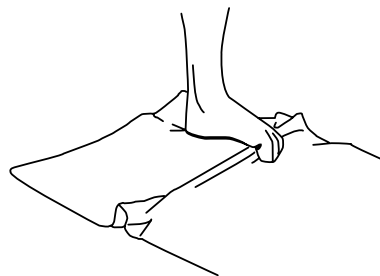
Repeat 2–3 times.



Toe exercise

To exercise the toes and foot, pick up a dry washcloth from the floor and open toes to drop it again.

Repeat 2–3 times.



Sitting Coordination and Balance Exercises

Be sure to read the precautions on page 3 before doing these exercises.

Exercise 1

Maintain your balance keeping your arms on your lap. If possible, lift up one leg, then the other, as shown. If not, slide one heel forward and back on the floor.

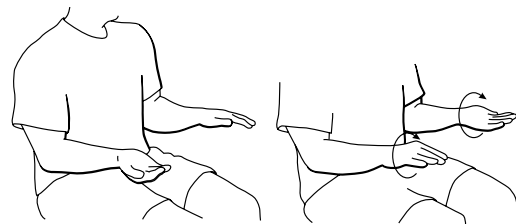
Repeat sequence 5 times.



Exercise 2

With your arms at your side and elbows bent to 90 degrees, turn right hand so that your palm faces up. Turn your left hand so that your palm faces down. Then simultaneously switch so that right-hand palm is now down and left-hand palm is up. Repeat in rapid succession.

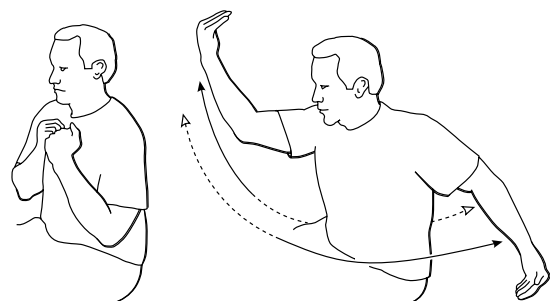
Repeat sequence 5 times.



Exercise 3

Start with both hands in the middle of your chest. Bring one arm up and forward while simultaneously stretching your other arm back. Then return to original position and repeat in opposite direction.

Repeat sequence 5 times.



The National Multiple Sclerosis Society is proud to be a source of information about multiple sclerosis. Our comments are based on professional advice, published experience and expert opinion, but do not represent individual therapeutic recommendations or prescriptions. For specific information and advice, consult your physician.

Early and ongoing treatment with an FDA- approved therapy can make a difference for people with multiple sclerosis. Learn about your options by talking to your healthcare professional and contacting the Society at [nationalMSSociety.org](https://www.nationalmssociety.org) or 1-800-344-4867.

The Society publishes many other resources about various aspects of MS. Visit [nationalMSSociety.org/brochures](https://www.nationalmssociety.org/brochures) or call 1-800-344-4867.

The Society mobilizes people and resources so that everyone affected by multiple sclerosis can live their best lives as we **stop MS in its tracks, restore what has been lost and end MS forever**. Last year, the Society invested \$60 million in MS research with more than 340 active projects around the world. Through its comprehensive nationwide network of services, the Society is focused on helping those affected by MS connect to the people, information and resources needed to live their best lives. We are united in our collective power to do something about MS now and end this disease forever. Learn more at [nationalMSSociety.org](https://www.nationalmssociety.org).



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