

# Stretching for People with MS

AN ILLUSTRATED MANUAL



**MICHELLE  
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**National  
Multiple Sclerosis  
Society**



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## AN ILLUSTRATED MANUAL

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Special thanks to Susan Kushner, MS, PT; Cindy Hugos, MS, PT; Cindy Gackle, OTR/L, MSCS; and Brian Hutchinson, PT, MSCS; for their valuable assistance.

Drawings by iMageWorx. Some of these drawings originally appeared in **Multiple Sclerosis: A Self-Care Guide to Wellness**, published in 1998 by Paralyzed Veterans of America, Inc. They are reproduced here with the kind permission of PVA, Inc. Additional images produced by Nicola Fester, 2011.

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# General Introduction

Everyone with MS, regardless of his or her degree of ability or disability, needs regular physical activity. Lack of exercise has serious health consequences, ranging from joint contractures, to heart disease to constipation. Just as important, good exercise programs not only prevent problems, they 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. Shown are exercises that can be done sitting or on your bed. In addition to the four categories of exercise defined below, everyone also needs relaxation. Exercise can be broken down into five categories, one of which is relaxation. All are important to people with MS.

## 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. Hold stretches for 30–40 seconds, as tolerated.

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.

## Strengthening

Strengthening is increasing the force or power of the muscle. Strength can be increased by lifting a limb up against gravity, lifting weights, or by working against resistance such as weights, machines, rubber tubing, or even water. Strengthening exercises can help reduce fatigue. Exercises can be done in 3 sets of 3–5 repetitions, more if tolerated.

## Cardiovascular Fitness

Improving cardiovascular fitness helps to increase the amount of exercise and activity one can do, thereby helping to manage weight and blood lipid (i.e., cholesterol and triglyceride) levels. Aerobic exercise makes lungs and all muscles work harder, building endurance and reducing the risk of heart disease. Walking, swimming, or using a stationary bike are forms of endurance activities. Adaptive sports may also be possible. You may want to discuss your aerobic options with a knowledgeable physical therapist.

General guidelines for aerobic activity are for 15–20 minutes a day, 4–5 times a week. If that is not possible, any amount of activity is better than none. It can also be broken up into several shorter bouts throughout the day.

## Balance & Coordination

Balance and coordination is improving quality, safety and efficiency of movement. Specific arm, leg and trunk exercises can be incorporated to improve the quality of movement and allow for less energy expenditure to occur. Activities for balance and coordination can be done 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. Can be done in 3 sets of 5 repetitions, as tolerated.

## Relaxation

Relaxation is taking action to reduce physical and mental stress and tension. Relaxation can simply mean stopping and taking a deep breath or sitting while listening to soft music or doing yoga. Structured relaxation techniques can reduce fatigue from an exercise session or help manage a stressful day. The National MS Society's booklet "Taming Stress in MS" contains directions for several kinds of structured relaxation exercises.

# Summary of Special Terms

Your physician or physical therapist may use the following technical terms:

## Range of Motion

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

## Passive Range of Motion

Passive range of motion is 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

Active range of motion is 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

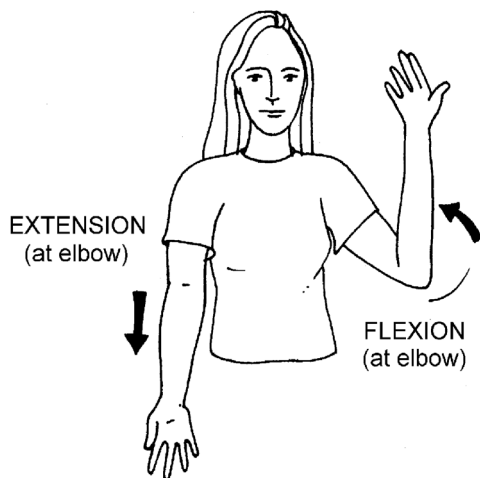
Spasticity is tightening or stiffness of the muscle due to increased muscle tone and exaggerated response to muscle stretch.

## Joint Contractures

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

## Disuse Muscle Atrophy

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



## Basic Exercise Movements

See descriptions below.

### Flexion

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

### Extension

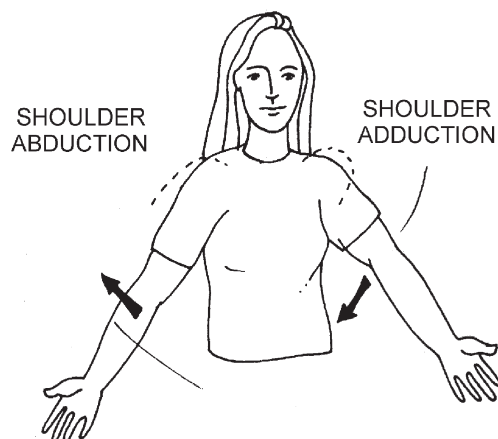
Extension is the act of moving a joint so that your limb or trunk is straightening out. Usually the muscle is lengthening.

### 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.



# 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 to manage the tightness of spasticity, and allow for optimal movement.
  - Keep in mind that 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 antispastic 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 & Ways to Decrease Spasticity

Keep in mind that you 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.

It is important to remember that the positions in this section are designed to decrease your spasticity. If they do not, consult your physician or physical therapist.



# Spasticity Positions

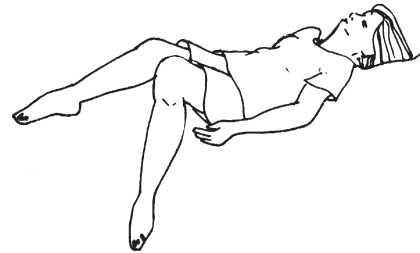
These are positions that the body tends to move towards when spasticity is dominant.

## Flexor Spasticity

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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

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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.



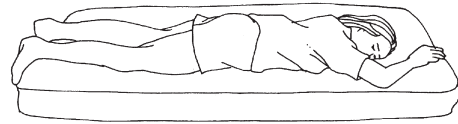
# Positioning for Managing Spasticity

## Positioning Your Body to Reduce Spasticity

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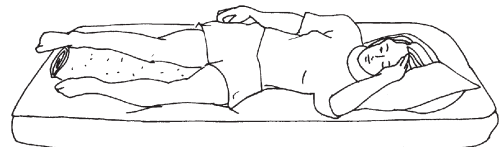
### Lying On Your Stomach (Prone Position)

This is an excellent position to try if you have spastic hip and knee flexors. Remember, 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.



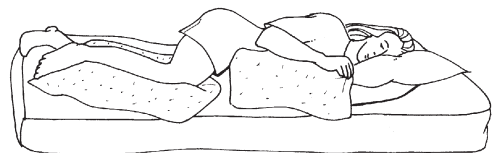
### Lying Face Up or in 3/4 Position

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)

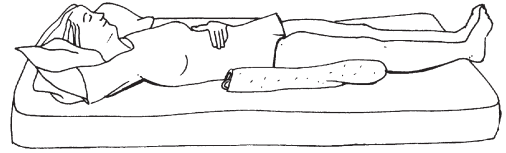
This is an excellent position if your hips and knees are prone to extensor spasticity. On your side, bend the knee of your top leg and let the knee of your bottom leg be straight. You can also put a rolled pillow or towel between your legs.



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### Correcting Hip Turn Out

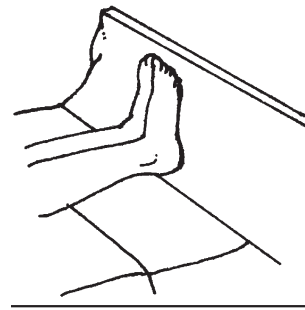
If your hips and knees assume a “frog like” position due to spasticity, try lying on your back. Place the end of a pillow, or a large beach towel, under your upper thigh (hip to knee). Roll the towel or pillow so that your hips and knees align themselves. Knees should be pointed toward the ceiling.



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### Correcting Foot Turn Down

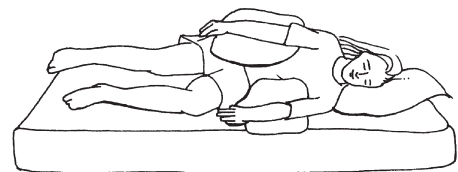
If your ankles and feet turn in a downward position, you want to try to position your ankles and feet in a neutral position — that is, with your toes pointed up toward the ceiling. The easiest way to achieve this is to place your feet against a padded footboard. If your bed does not have a footboard,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



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### 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.



# Some Precautions, Both Obvious & Not So Obvious

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 physician or 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 to injuring the patient or themselves.
7. 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.
8. Avoid overexertion. Include rest periods, and sip cool water to prevent overheating or dehydration.
9. 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.
10. If you experience spasticity, incorporate the tips on pages 4–7 for increased success with your stretching program.

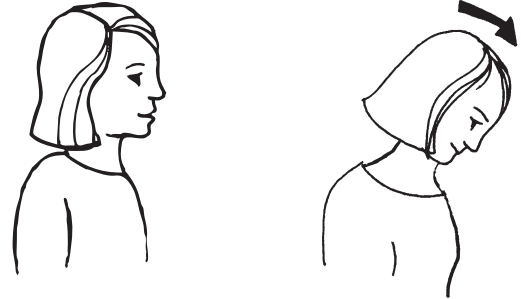
# Head & Neck Exercises

Be sure to read the cautions below before doing head and neck exercises.

## Flexion

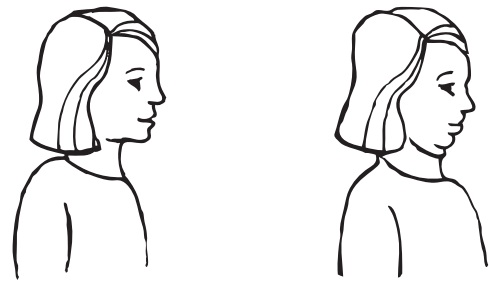
### Head Nod

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.



## CAUTION: HEAD & NECK EXERCISES

### Vertigo

This is dizziness or a “spinning of the room” sensation. If this movement makes you dizzy, light-headed, or nauseated, stop immediately and check with your physician.

### Lhermitte’s Sign

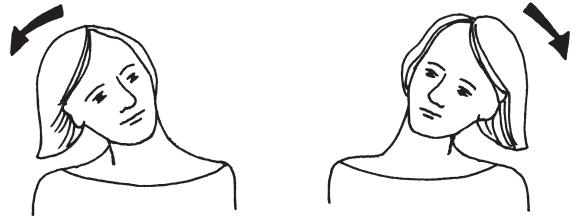
This is a tingling or electric shock-like sensation in the spine or limbs upon bending the neck, which sometimes occurs in MS. If you feel this sensation, discontinue this exercise and check with your physician.

**Be sure to read the cautions on page 9 before doing head and neck exercises.**

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### Lateral Flexion

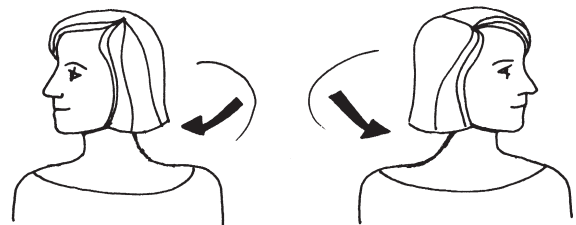
Bend head so that ear is moved toward shoulder. Move slowly to each side 2–3 times.



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### Cervical Rotation

Turn head to look over shoulder.  
Turn slowly to each side 2–3 times.



# Shoulder Exercises

## Shoulder Flexion

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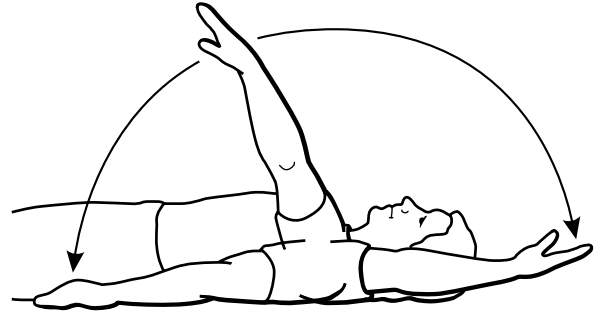
### Starting Position

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 for one deep in and out breath.

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

Repeat exercise with other arm.



## Shoulder Abduction

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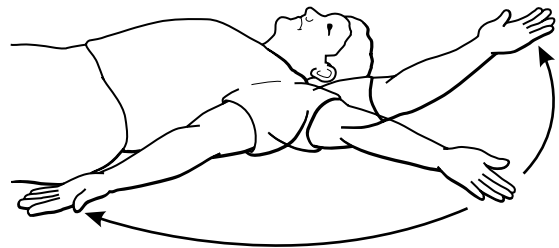
### Starting Position

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).

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

Repeat exercise with other arm.



## Shoulder Rotation

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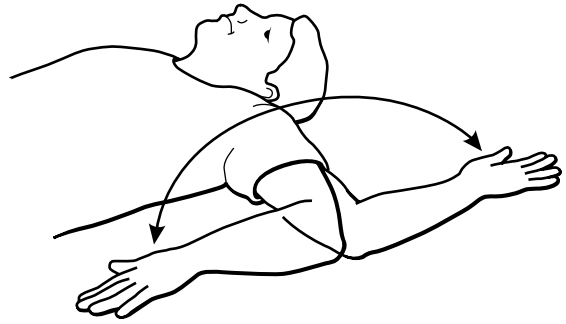
### Starting Position

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.

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

Repeat exercise with other arm.



## Shoulder Extension

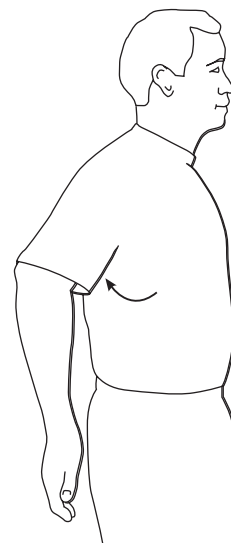
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### Starting Position

Stand or sit in a chair. Move arm straight back, as if reaching for something in your rear pocket. Allow forearm to dangle. Hold for one deep in and out breath.

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

Repeat exercise with other arm.



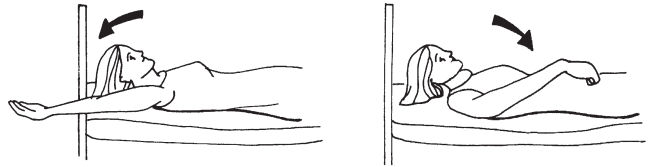


# Shoulder Range of Motion Exercises

## As a Flow (Repeat the Flow 2–3 Times on Each Side)

### Starting Position

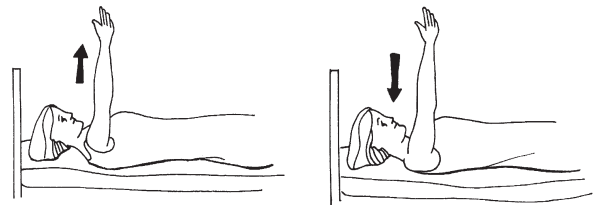
Start by lying down with arms at sides, close to the edge of the bed. Move arm overhead, as shown.



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.



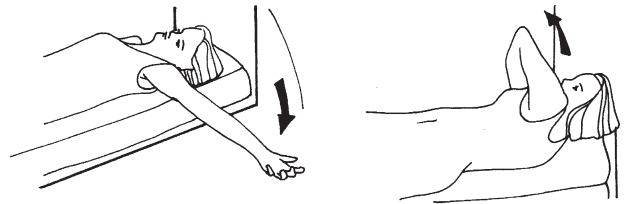
Move arm outward from the body to above the head.

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 & Forearm Exercises

## Elbow Flexion & Extension

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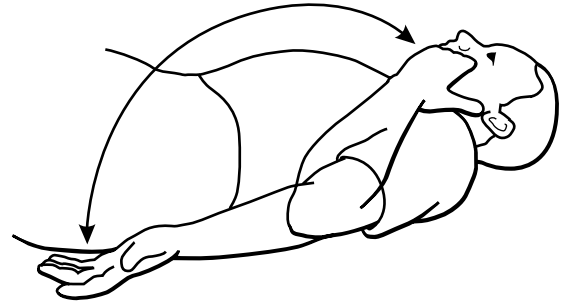
### Starting Position

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

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### 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 & Wrist Exercises

## Finger Flexion & Extension

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Bend fingers toward palm (make a fist).

Straighten fingers.

Repeat 2–3 times.

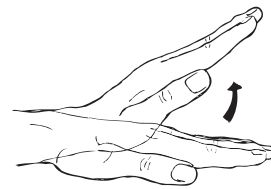


## Exercise Modification for Weakened Finger Extensors

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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.



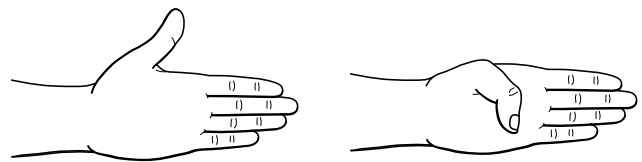
## Thumb Abduction & Adduction

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Bend thumb at all joints.

Straighten thumb.

Repeat 2–3 times.



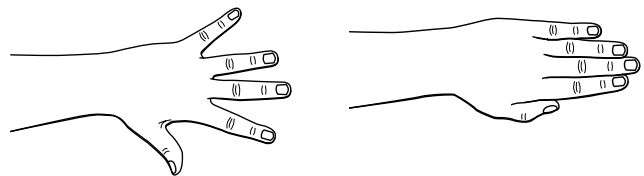
## Finger Abduction & Adduction

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Move fingers apart (spread fingers).

Move fingers together.

Repeat 2–3 times.



## Thumb Flexion & Extension

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

Return thumb to position along side of first finger.

Repeat 2–3 times.



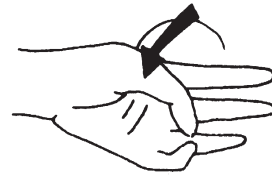
## Thumb Opposition

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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

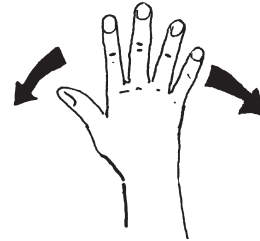
To improve finger coordination, try playing cards, board games, building models or doing crafts. Consider other functional activities such as typing drills, sorting nuts and bolts, or organizing “junk drawers” at home.

## Wrist Lateral Flexion

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

Repeat 2–3 times.



## Wrist Flexion & Extension

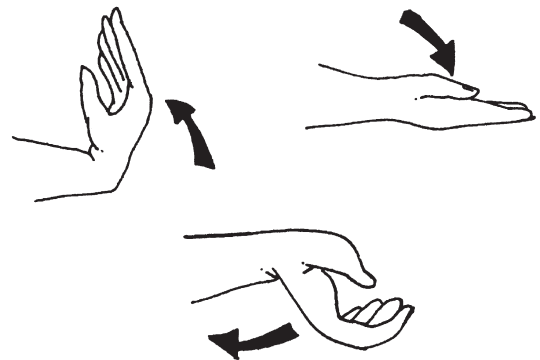
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Bend wrist so that palm is toward forearm.

Straighten from bent position to neutral position.

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

Repeat 2–3 times.



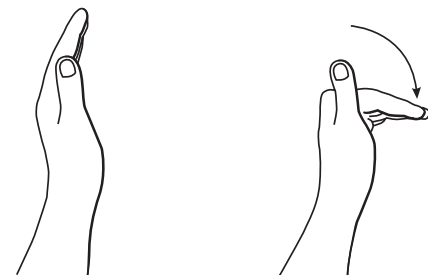
## Knuckle Flexion & Extension

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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.



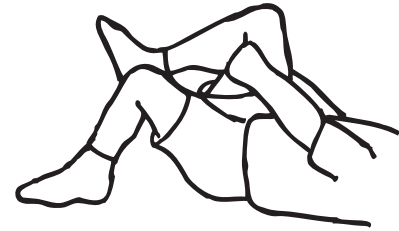
# Trunk & Hip Exercises

## Single Knee to Chest

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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

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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.

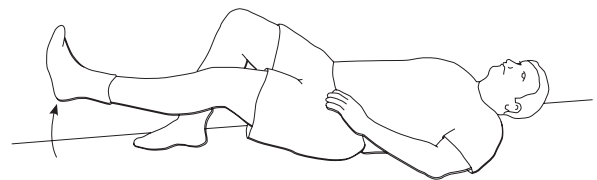


## Single Straight Leg Raise

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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.



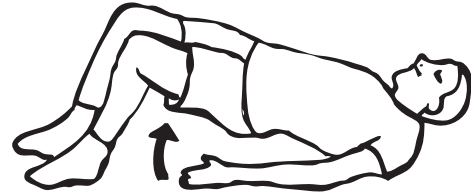
**Be sure to read the caution below before doing these exercises.**

## Bridging

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Lying on bed with both knees bent, feet on bed and arms at side, 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.



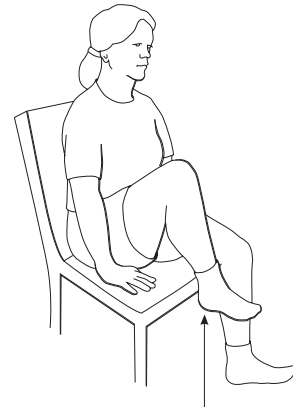
## Hip Flexion or March

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### Starting position

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.



## NOTE

If an exercise is too hard, or you are straining to do it, discontinue it. Move with smooth/gentle motions up and down. Try not to jerk or pull up fast.

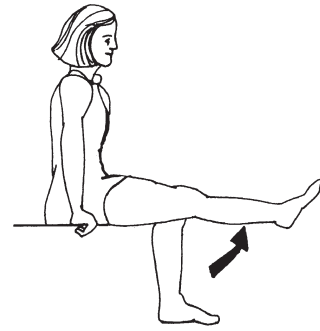
**Be sure to read the caution below before doing these exercises.**

### **Knee Extension or Kick**

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

Repeat 2–3 times per leg.

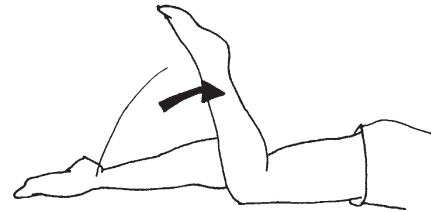


### **Knee Flexion**

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

Repeat 2–3 times per leg.



### **NOTE**

If an exercise is too hard, or you are straining to do it, discontinue it. Move with smooth/gentle motions up and down. Try not to jerk or pull up fast.



## Hip Extension

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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.



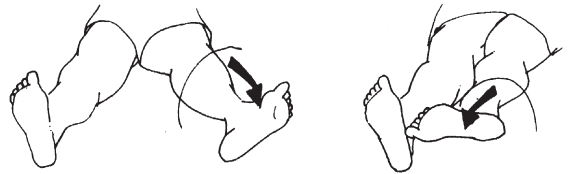
## Hip Rotation

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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.

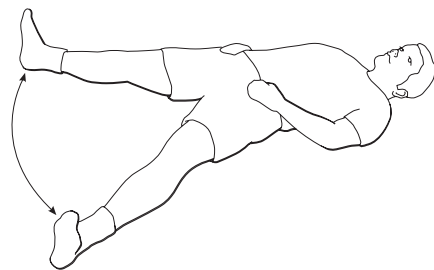


## Hip Abduction & Adduction

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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 & Foot Exercises

## Ankle Dorsi Flexion & Plantar Flexion

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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.



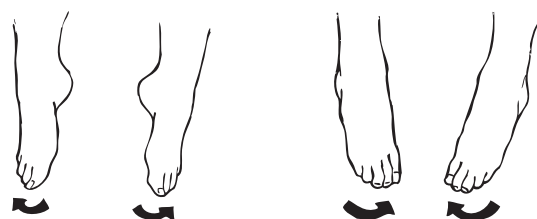
## Ankle Eversion & Inversion

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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.



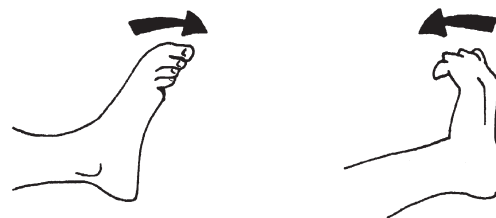
## Toe Flexion & Extension

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Bend toes toward ball of foot.

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

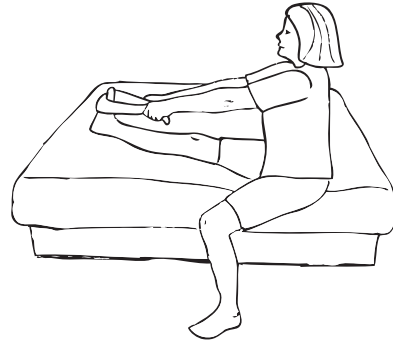
Hold 3–5 seconds, being careful not to cause a spasm. Repeat 2–3 times.



## Heel Cord Stretch

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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.



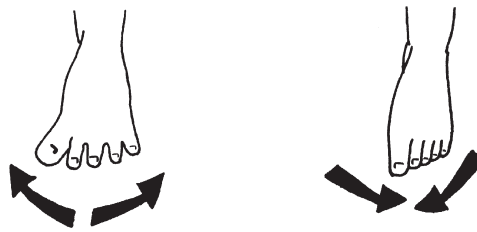
## Toe Abduction & Adduction

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Move toes apart.

Move toes together.

Repeat 2–3 times.

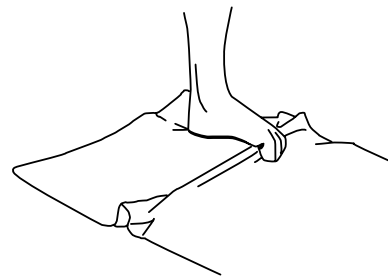


## Toe Exercise

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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.

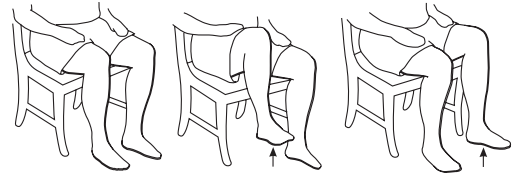


# Sitting Coordination & Balance Exercises

Be sure to read the caution below before doing coordination and balance exercises.

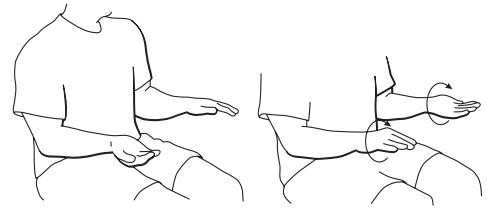
## Exercise 1

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.



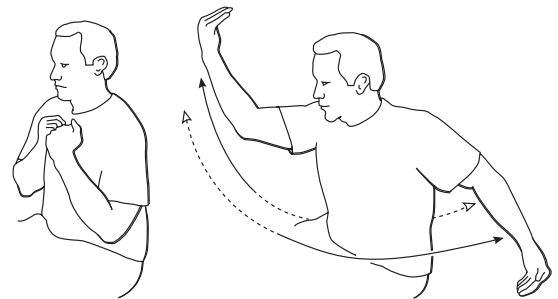
## Exercise 2

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.



### CAUTION

These exercises 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 physician/physical therapist.





The National Multiple Sclerosis Society (“Society”) is proud to be a source of information on multiple sclerosis related topics. The information provided is based on professional advice, published experience, and expert opinion, but does not constitute medical or legal advice. For specific medical advice, consult a qualified physician. For specific legal advice, consult a qualified attorney.

The Society does not endorse products, services or manufacturers. Such names appear here solely because they are considered helpful information. The Society assumes no liability for the recipient’s use of any product or service mentioned. The Society does not independently verify whether the information provided by each service provider is accurate. The Society undertakes no responsibility to verify whether the service provider is appropriately licensed and certified and has applicable insurance coverage.

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 National MS Society at [nationalMSSociety.org](https://www.nationalmssociety.org) or 1-800-344-4867.

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

## Other popular resources include:

- Exercise as Part of Everyday Life
- Taming Stress in Multiple Sclerosis
- Managing MS Through Rehabilitation
- Living with MS

**The National MS Society's mission is for people affected by MS to live their best lives as we stop MS in its tracks, restore what has been lost and end MS forever. To fulfill this mission, the Society funds cutting-edge research, drives change through advocacy, facilitates professional education, collaborates with MS organizations around the world, and provides services designed to help people with MS and their families move their lives forward.**



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