

For the SMA Community

At-Home Physical Therapy Exercises for Spinal Muscular Atrophy



Table of Contents

Introduction 2

Stretches for All Functional Abilities..... 3

Exercises for Non-sitters..... 12

Exercises for Sitters..... 15

Exercises for Walkers..... 26

Developmental Exercises..... 35

Before Starting a Physical Therapy Program

A physical therapy program should only be undertaken in consultation with a qualified healthcare provider. Please consult with your healthcare provider before starting this program to ensure that the program is appropriate for you and that you are aware of any reasons (contraindications) you shouldn't start this program and any factors that might require special precautions.

Contraindications:

- Fracture (obtain clearance from physician before beginning exercises)
- Recent surgery (obtain clearance from surgeon before beginning exercises)
- Activity limitations specified by medical provider

Precautions:

- Caregiver supervision/assistance required for safety
- Pain (stop activity and speak with medical provider)
- Fatigue (if not on disease-modifying agent)
- Orthotics and braces should be worn as indicated for specific exercises

Definition

Anti-gravity: decreasing the effect of gravity by supporting the body part in a suspended position to allow more independent movement through a greater range of motion

Equipment list

The following are optional pieces of equipment that are depicted in the exercises throughout this resource.

Non-sitters:

- Universal exercise unit (UEU)
- Overhead frame for springs and slings
- PVC pipes for building frame

- Springs (bungee cords)

- Slings
- Straps

Sitters:

- Motivating toy/object

Walkers:

- Resistance bands
- TheraPutty®
- Slant board
- Ankle weights
- Adjustable step

Developmental:

- Therapy ball
- Cube chair

Introduction

This resource describes possible physical therapy exercises for children and adults with spinal muscular atrophy (SMA). The exercises are arranged by functional ability and are designed to be at the appropriate level to provide strengthening benefits for each group. At higher levels of functional ability, individuals may also do exercises in other groups. For example, individuals who can sit can also do exercises for non-sitters, and individuals who can walk can do exercises for sitters and non-sitters.

The stretching program provided is appropriate for individuals with SMA at all functional levels.

For all exercises, use the rate of perceived exertion (RPE) scale from 0-10 to determine when to take rest breaks:

- 0 indicates no tiredness at all
- 5 indicates moderate tiredness
- 10 indicates extreme tiredness

For all exercises, stay below 5-6 on the RPE scale. If the individual reaches 5-6 before completing the recommended duration or number of repetitions for an exercise, stop and rest.

Do not overtire the individual with exercises.

Stretches for All Functional Abilities

The following stretches can be used for individuals of all ages. The stretches can be performed lying down or sitting in a wheelchair in a partially reclined position. Each stretch should be performed with a 20-30 second hold, five days per week.

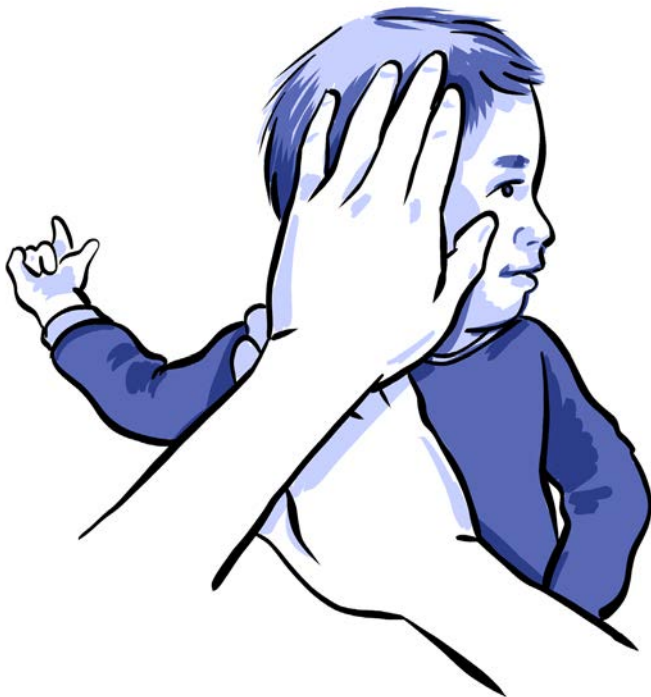
Neck

Cervical rotation

INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand on their chest to stabilize their trunk.
3. Place the other hand on the side of their face (hand over ear).
4. Turn their head all the way to one side until you feel resistance.

Tips: Perform the stretch gently.



Cervical lateral flexion

INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand on their shoulder to stabilize their trunk.
3. Place the other hand on the top of their head.
4. Bring their ear toward the shoulder away from your stabilizing hand until you feel resistance.

Tips: Perform the stretch gently. Make sure their nose is pointing toward the ceiling.

Arms



Shoulder flexion

INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand at their elbow and the other hand near their shoulder.
3. Bring their arm up toward the ceiling and then overhead.

Tips: Keep their palm turned toward their body.

Shoulder abduction

INSTRUCTIONS

1. Position the individual on their side.
2. Place one hand at their elbow and the other hand near their shoulder.
3. Bring their arm up toward the ceiling and then overhead.

Tips: Keep their palm turned away from their body.

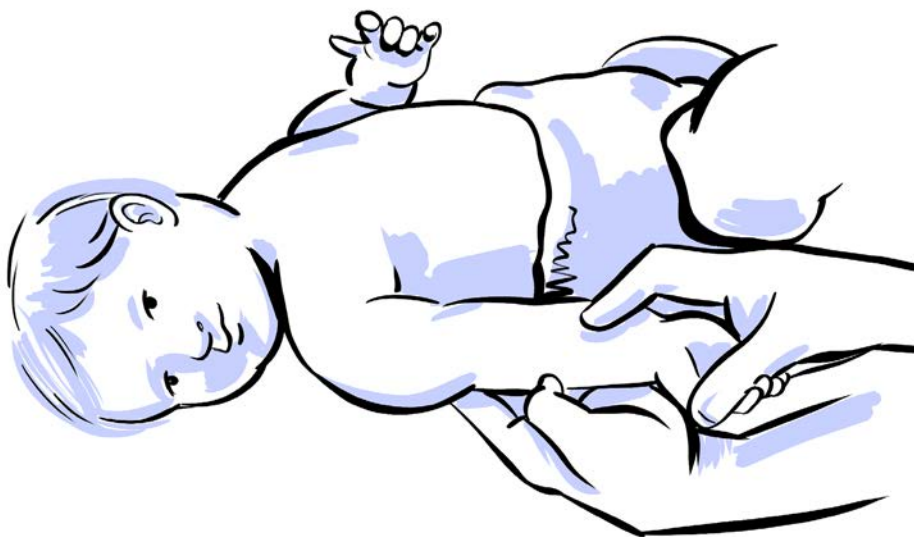


Shoulder external rotation

INSTRUCTIONS

1. Position the individual on their back.
2. Bring their arm out to the side, with their elbow in line with their shoulder.
3. Bend their elbow to 90 degrees, bringing their hand toward the ceiling.
4. Place one hand on their shoulder and the other hand on their forearm.
5. Rotate their shoulder so their palm faces the ceiling.

Tips: Keep their elbow in line with their shoulder.



Elbow extension

INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand on their upper arm and the other hand on their lower arm.
3. Straighten their elbow.

Tips: Keep their palm up toward the ceiling.

Forearm supination

INSTRUCTIONS

1. Position the individual on their back or sitting.
2. Place one hand on their upper arm and the other hand in their hand.
3. Turn their palm toward their face.

Tips: Keep their elbow bent to 90 degrees.



Wrist extension

INSTRUCTIONS

1. Position the individual on their back or sitting.
2. Bend their elbow to 90 degrees, keeping their upper arm down.
3. Place one hand on their lower arm and the other hand in their hand.
4. Bend their wrist so that the palm faces toward the ceiling.



Finger extension

INSTRUCTIONS

1. Position the individual on their back or sitting.
2. Place one hand on their wrist and the other hand on the inside of their fingers.
3. Straighten their fingers, opening the hand.

Tips: You may be able to perform this stretch with four fingers at once on a small person, or you may need to stretch one finger at a time on a larger person.

Thumb extension

INSTRUCTIONS

1. Position the individual on their back or sitting.
2. Place one hand on their hand and use your other hand to hold their thumb.
3. Bring the thumb out to the side.

Tips: Make sure to move the entire thumb, not just the tip.



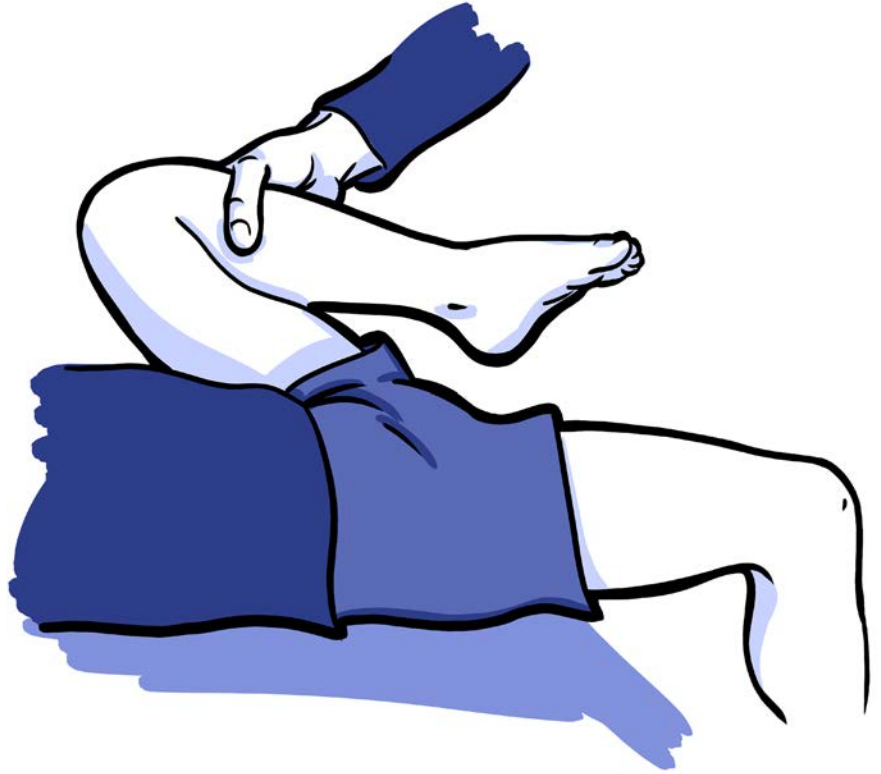
Legs

Hip flexion

INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand on their lower leg and use the other hand to stabilize their other leg.
3. Bring their knee in toward their chest.

Tips: Keep their knee pointed toward their head; do not allow their leg to fall out to the side.

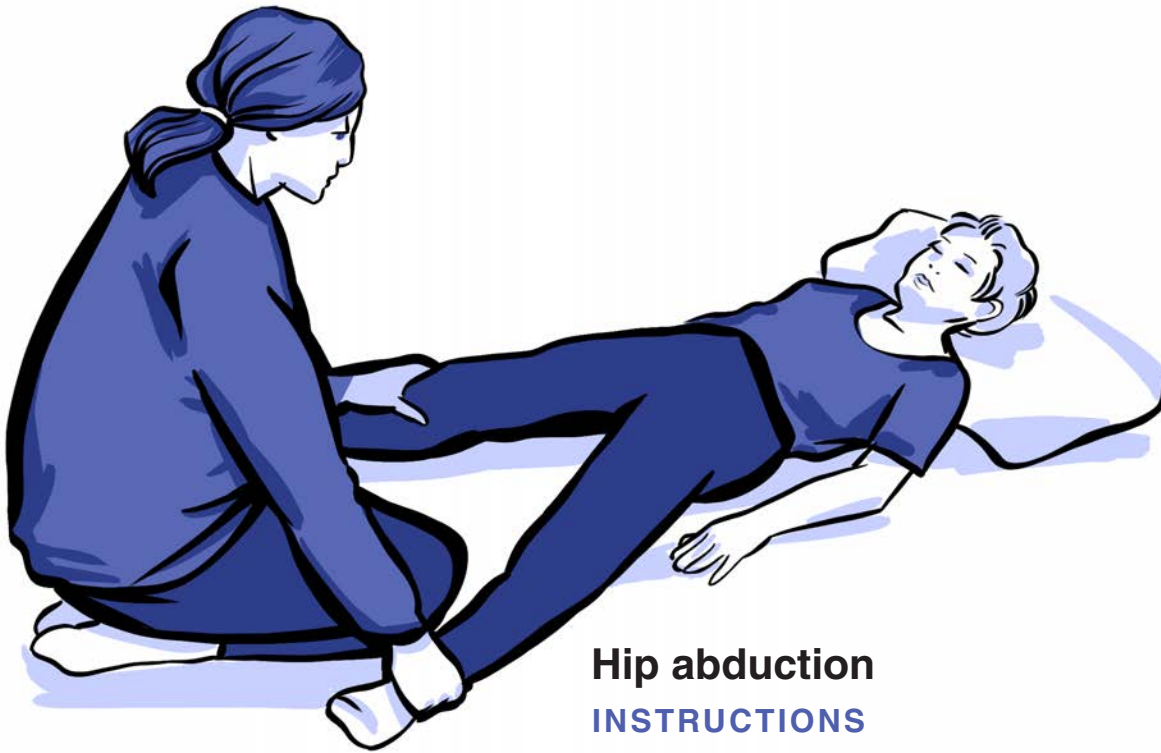


Hip extension

INSTRUCTIONS

1. Position the individual on their side.
2. Place one hand on their hip and use the other hand to support their top leg.
3. Bring their top leg backward, keeping the knee bent.

Tips: To make sure the individual does not roll backward, keep their hips and shoulders aligned. This stretch also can be performed with the individual lying on their stomach. This stretch cannot be performed in a wheelchair.



Hip abduction INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand under their ankle and use the other hand to stabilize their other leg.
3. Bring their leg out to the side, keeping the knee straight.

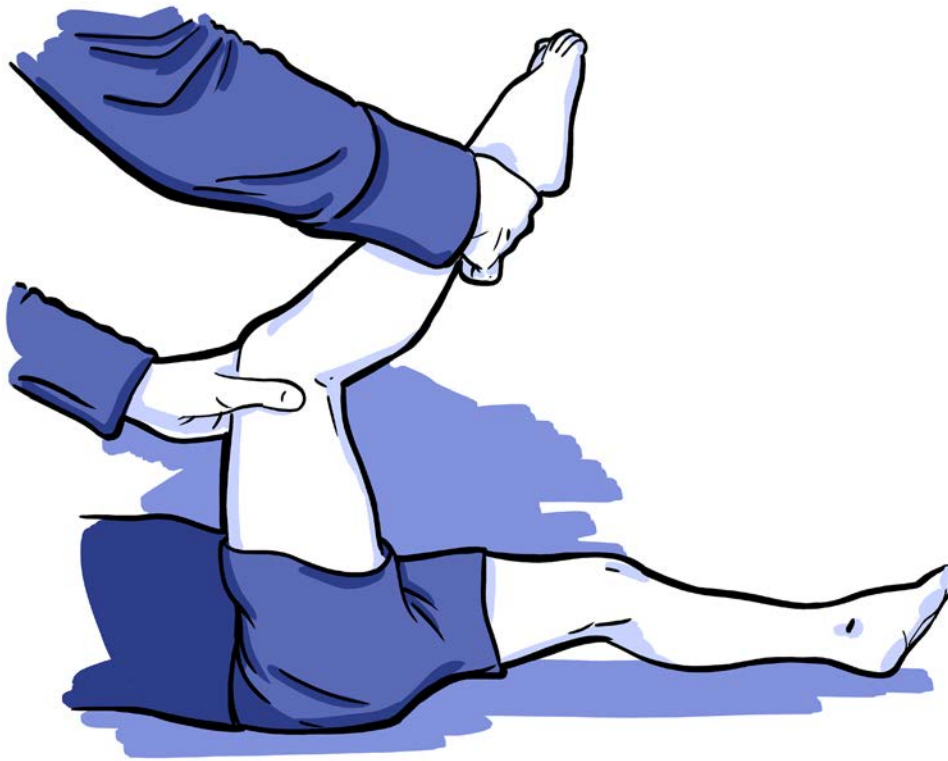
Tips: Keep the knee and toes pointed up toward the ceiling.

Hip adduction INSTRUCTIONS

1. Position the individual on their back.
2. Place one hand under their knee and the other hand under their ankle.
3. Bring their leg across the opposite leg.

Tips: Keep the knee and toes pointed up toward the ceiling.





Knee extension

INSTRUCTIONS

1. Position the individual lying on their back.
2. Place one hand under their knee and the other hand under their ankle.
3. Bring their knee toward their chest until the hip is at a 90-degree angle.
4. Bring their foot up toward the ceiling, straightening the knee.

Tips: Keep their toes pointed up toward the ceiling.

Knee flexion

INSTRUCTIONS

1. Position the individual lying on their stomach.
2. Place one hand under their ankle and use the other hand to stabilize their trunk.
3. Bring their foot toward their buttocks, bending the knee.

Tips: Keep their leg in line with their body. This stretch also can be performed with the individual lying on their side.





Ankle dorsiflexion

INSTRUCTIONS

1. Position the individual lying on their back.
2. Place one hand under their heel and use the other hand to stabilize their lower leg.
3. Use your forearm to bring their foot back toward their leg, keeping the knee straight.

Tips: Keep their toes pointed up toward the ceiling.

Ankle dorsiflexion option for standers

Equipment needed: Wall and slant board or stair/step

INSTRUCTIONS

Calf stretch without slant board

1. Stand in front of a wall or sturdy object.
2. Step forward with one foot, keeping your toes pointing straight forward.
3. Keep your back leg straight throughout the stretch.
4. Lean forward toward the wall and support yourself with your arms as you allow your front knee to bend until you feel a gentle stretch along the back of your leg.
5. Move closer or farther away from the wall to control the stretch.

Calf stretch with slant board

6. Place the slant board in front of a wall or sturdy object.
7. Carefully step onto the slant board.
8. Focus on keeping your knees straight and heels down. If this is difficult, move back to make the incline less steep.
9. You should feel a gentle stretch along the backs of your legs.

Tips: Lean forward toward the support surface to increase the stretch.



Calf stretch with slant board

Contractures

Please speak with your local physical therapist about additional options for contracture management, including but not limited to: orthotics/bracing, positioning program, and use of a stander.

Exercises for Non-sitters



The anti-gravity exercises for non-sitters use a frame made of PVC pipes or a sturdy infant play gym, straps, and bungee cords. If this equipment is not available, you can provide the anti-gravity positioning with your hands.

Anti-gravity head movement

INSTRUCTIONS

1. Place the individual on their back.
2. Support the back of their head with a sling attached to a strap on the frame or your hands.
3. Encourage them to move their head side to side (ear to shoulder).

Alternative position 1: Lying on side with hand or strap support at side of head. Encourage head movement forward and backward.

Alternative position 2: Lying on stomach with slight elevation on pillow or wedge, and hand or strap placement on forehead. Encourage lifting head.

Duration: Allow the individual to move in the anti-gravity position for 2-3 minutes with intermittent rest breaks.

Tips: Do not use trunk orthosis. Help the individual move their head if they do not have the strength to do it independently.

Arm snow angels (shoulder abduction and adduction)

INSTRUCTIONS

1. Position the individual on their back.
2. Place a sling or your hand under their upper arm/ elbow to support the arm. (If using your hands, perform one side at a time.)
3. Encourage the individual to bring their hands up toward their head in an arching motion with straight elbows.
4. Bring their arms back to the start position with their arms at their sides.

Duration: 2 sets of 8-10 repetitions on each arm. Take a break for at least 1 minute between sets.

Tips: Keep elbows straight to optimize shoulder girdle strength. Ensure that their clothing or the surface is not creating resistance, and adjust as needed.

Anti-gravity elbow flexion and extension

INSTRUCTIONS

1. Position the individual lying partially on their side.
2. Place rolled towels or blankets behind their shoulder and buttocks to prevent rolling backward.
3. Place slings at the upper arm and forearm of the top arm. (If they are lying on their right side, the left arm is in the slings.) If you don't have slings, use your hands at these positions.
4. Encourage the individual to bring their hand toward their mouth, and then back to their thigh.

Duration: 2 sets of 8-10 repetitions on each arm. Take a break for at least 1 minute between sets.

Anti-gravity wrist flexion and extension

INSTRUCTIONS

1. Place the individual on their back.
2. Place a sling or your hand under their forearm to support the arm. Ensure their thumb is pointing toward the ceiling.
3. Encourage the individual to bring their hand up and down toward an object. Hanging a lightweight bell or tying a balloon to the wrist can be a great motivator.

Duration: 2 sets of 8-10 repetitions on each arm. Take a break for at least 1 minute between sets.

Leg snow angels (hip abduction and adduction)

INSTRUCTIONS

1. Place the individual on their back.
2. Place slings or your hands under their thighs and lower legs to support the legs. (If using your hands, perform one side at a time.)
3. Encourage the individual to bring their legs out toward the side in an arching motion with straight knees.
4. Bring their legs back to the middle.

Duration: 2 sets of 8-10 repetitions on each leg. Take a break for at least 1 minute between sets.

Tips: Ensure that their clothing or the surface is not creating resistance, and adjust as needed.

Anti-gravity knee flexion and extension

INSTRUCTIONS

1. Position the individual partially lying on their side.
2. Place rolled towels or blankets behind their shoulder and buttocks to prevent rolling backward.
3. Place slings at the upper thigh and lower leg of the top leg. (If they are lying on their right side, the left leg is in the slings.) If you don't have slings, use your hands at these positions.
4. Encourage the individual to kick their leg forward and backward.

Duration: 2 sets of 8-10 repetitions on each leg. Take a break for at least 1 minute between sets.

Tips: Encourage the individual to straighten their knee as much as possible.

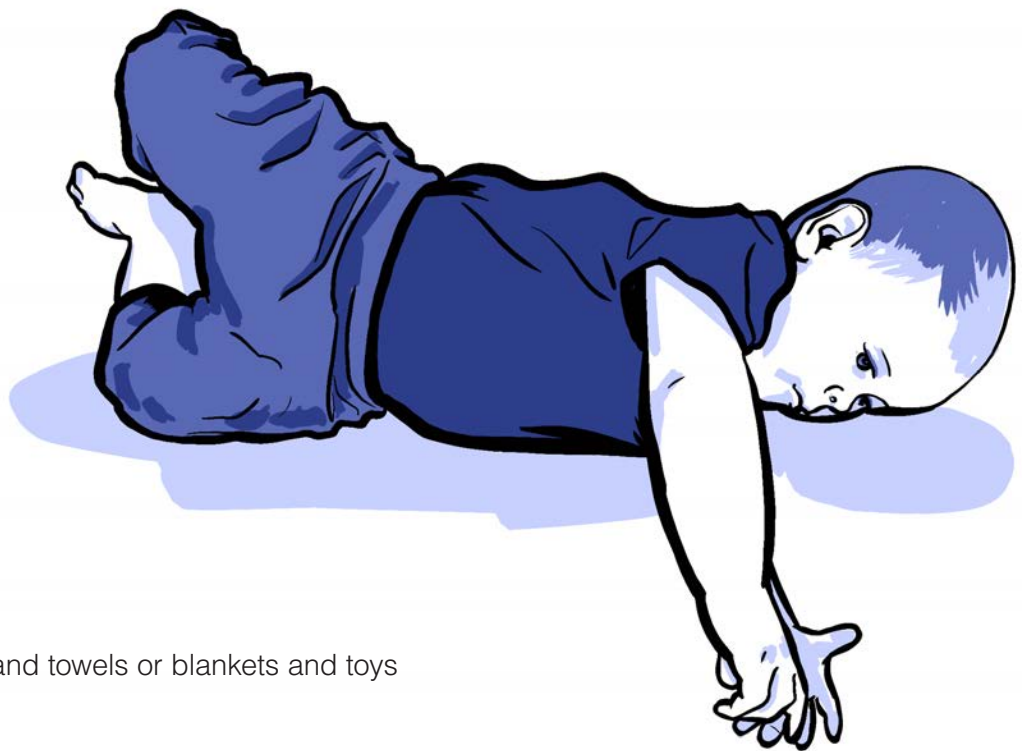
Anti-gravity ankle dorsiflexion and plantarflexion

INSTRUCTIONS

1. Place the individual on their back.
2. Place slings or your hands under their thighs and lower legs to support the legs, but make sure to have the legs externally rotated (in a “frog leg” position) to optimize the ankle position. (If using your hands, perform one side at a time.)
3. Encourage the individual to kick their feet up and down.

Duration: 2 sets of 8-10 repetitions on each leg. Take a break for at least 1 minute between sets.

Tips: Decrease the degree of the frog leg position if the individual has known hip dislocations.



Trunk rotation

Equipment needed: Rolled hand towels or blankets and toys

INSTRUCTIONS

1. Position the individual lying partially on their side.
2. Place rolled towels or blankets behind their shoulder and buttocks to prevent rolling backward.
3. Place a toy in front of them, slightly out of reach.
4. Encourage them to reach for the toy. Bring their hand back to their side and allow them to reach for the toy again. It is OK if they start to roll to get the toy — this means they are engaging their core.

Duration: 3-5 minutes on each side.

Tips: Do not use trunk orthosis. Place the individual's head on a pillow only if needed. Help them reach and rotate their body if they do not have the strength to do it independently.

Exercises for Sitters

If the individual cannot perform an exercise through the full range of motion, help them with it. Allow them to do the exercises as independently as possible and only assist as needed. Progressions should be performed when the individual is able to perform the initial exercise with correct form and no assistance.

**Indicates a modification to perform the exercise in a wheelchair.*

Neck exercise

Cervical rotation

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise seated upright in the wheelchair.

1. Position the individual sitting on the floor, with support for their trunk if needed.
2. Encourage them to turn their head side to side.

Duration: Repeat 10 times to each side.

Tips: Use a toy to encourage the individual to turn their head side to side.

Trunk exercises

Forward reaching

Equipment needed: Small chair or step stool, toy

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair reclined 25%. Try to maintain an upright posture without resting against back of chair.

Initial

1. Position the individual sitting on the floor. If the individual is unable to comfortably sit on the floor due to muscle tightness, position them in a supported sitting position on a couch or bed.
2. Encourage them to reach forward to get a toy.

3. Return to the upright position.
4. Start with the toy elevated above the floor and progress to placing the toy on the floor.

Progression

5. Position the individual sitting on a small chair or step stool that allows them to rest their feet on the floor.
6. Encourage them to reach forward to get a toy.
7. Return to the upright position.
8. Start with the toy elevated above the floor and progress to placing the toy on the floor.

Duration: Repeat 10 times.

Tips: Provide support for the trunk as needed.



Reaching to the side

Equipment needed: Small chair or step stool, toy

INSTRUCTIONS

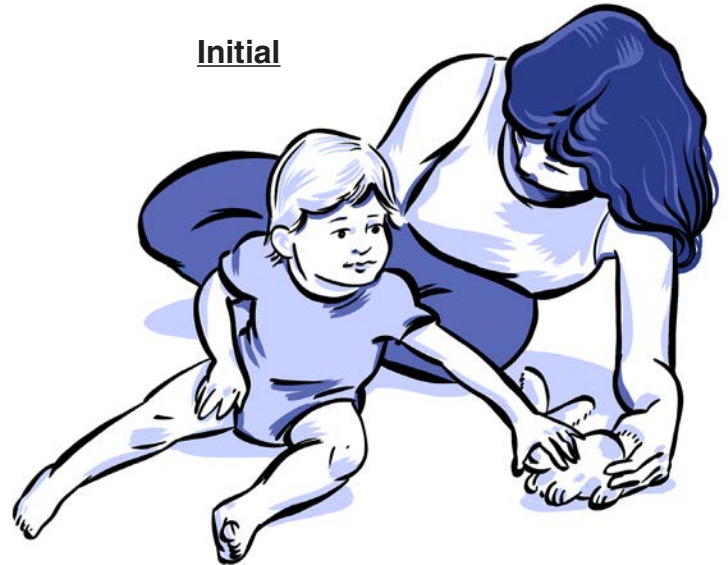
*Wheelchair alternative: Perform the exercise with the wheelchair reclined 25%. Try to maintain an upright posture without resting against back of chair.

Initial

1. Position the individual sitting on the floor. If the individual is unable to comfortably sit on the floor due to muscle tightness, position them in a supported sitting position on a couch or bed.
2. Encourage them to reach sideways to get a toy.
3. Return to the upright position.

Progression

4. Position the individual sitting on a small chair or step stool that allows them to rest their feet on



the floor.

5. Encourage them to reach sideways to get a toy.
6. Return to the upright position.

Duration: Repeat 10 times.

Tips: Provide support for the trunk as needed.

Sitting with rotation

Equipment needed: Small chair or step stool, toy

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair reclined 25%. Try to maintain an upright posture without resting against back of chair.

Initial

1. Position the individual sitting on the floor. If the individual is unable to comfortably sit on the floor due to muscle tightness, position them in a supported sitting position on a couch or bed.
2. Encourage them to reach one hand across their body to get a toy.
3. Return to the upright position.
4. Progress from propping on the opposite hand to reaching without propping.

Progression

5. Position the individual sitting on a small chair



or step stool that allows them to rest their feet on the floor.

6. Encourage them to reach one hand across the body to get a toy.
7. Return to the upright position.

Duration: Repeat 10 times.

Tips: Provide support for the trunk as needed.

Arm exercises

Shoulder flexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercises with the wheelchair reclined 75%-100%.

Initial

1. Position the individual lying on their side.
2. Encourage them to reach their hand in front of their body and then overhead.
3. Return to the starting position.



Initial



Progression 1

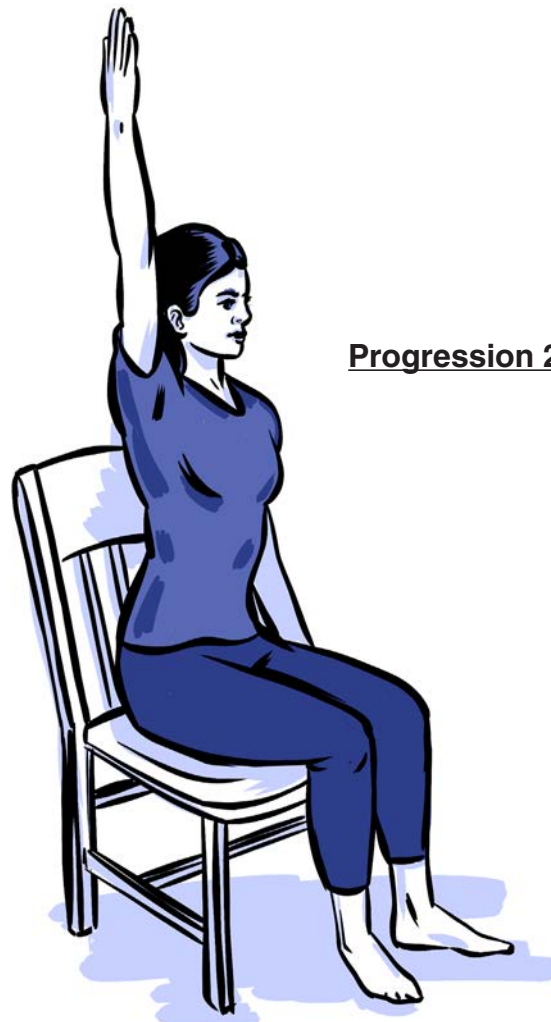
4. Position the individual on their back.
5. Encourage them to reach their hand up toward the ceiling and then overhead.
6. Return to the starting position.

Progression 2

7. Position the individual sitting on the floor or in a chair.
8. Encourage them to reach forward and then overhead.
9. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Use a toy to motivate the individual to reach. Make sure their elbow is straight. Support their arm at the wrist if they need assistance to complete the movement.



Progression 2

Shoulder abduction

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair reclined 75%-100%.

Initial

1. Position the individual on their back.
2. Encourage them to reach their hand out to the side and then overhead, sliding their arm along the floor.
3. Return to the starting position.

Progression 1

4. Position the individual lying on their side.
5. Encourage them to reach their hand up toward the ceiling and then overhead.
6. Return to the starting position.

Progression 2

7. Position the individual sitting on the floor or in a chair.

8. Encourage them to reach out to the side and then overhead.
9. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Use a toy to motivate the individual to reach. Make sure their elbow is straight. Support their arm at the wrist if they need assistance to complete the movement.

Initial



Progression 1



Shoulder rotation

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright.

Initial

1. Position the individual on their back with their elbow level with their shoulder.
2. Help the individual bend their elbow with their hand pointing up toward the ceiling.
3. Encourage the individual to move the back of their hand toward the floor, keeping the elbow bent.
4. Encourage the individual to bring their hand up toward the ceiling and then down toward the floor, keeping the elbow bent.
5. Stabilize their upper arm on the floor so it remains at the level of the shoulder throughout.



Initial



Progression

Progression

6. Position the individual lying on their side with their upper arm resting against their trunk and their palm resting on their stomach.
7. Encourage the individual to reach their hand up toward the ceiling, keeping their elbow bent and their upper arm against their trunk.
8. Return to the starting position with their elbow bent and their hand on their stomach.

Duration: Repeat 10 times with each arm.

Tips: Use a toy to motivate the individual to reach. Make sure their elbow is bent. Support their arm at the wrist if they need assistance to complete movement.

Elbow flexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and arm propped on a counter or table.



Initial

Initial

1. Position the individual sitting with their arm resting on a surface at shoulder level.



Progression 1

2. Begin with the elbow straight.
3. Encourage them to slide their hand along the surface toward their chest, bending their elbow.
4. Return to the starting position.

Progression 1

5. Position the individual on their back with their arm straight by their side.
6. Encourage them to bring their hand toward their chest or mouth, bending their elbow.
7. Return to the starting position.

Progression 2

8. Position the individual sitting with their arm resting down by their side.
9. Encourage the individual to bring their hand toward their mouth, bending their elbow.
10. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Use a food to encourage the individual to bring their hand to their mouth while sitting. Support their arm at the wrist if they need assistance to complete movement.

Elbow extension

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and arm propped on a counter or table.

Initial

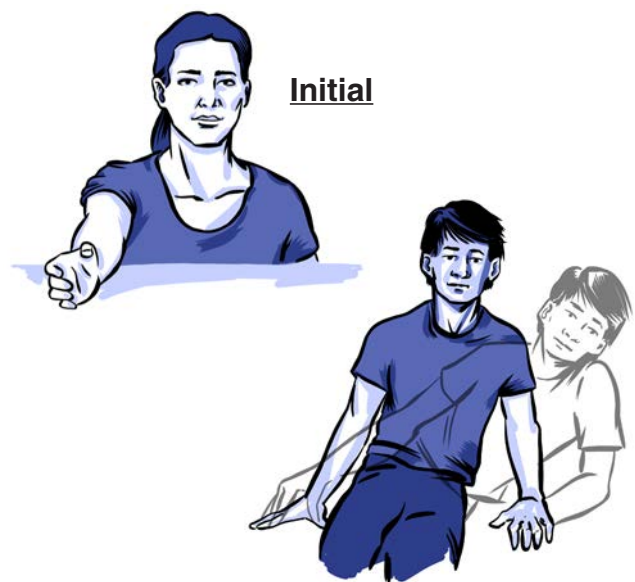
1. Position the individual sitting with their arm resting on a surface at shoulder level.
2. Begin with the elbow bent.
3. Encourage them to slide their hand along the surface away from their body, straightening their elbow.
4. Return to the starting position.

Progression

5. Position the individual sitting on the floor or a bench, leaning to one side, supported on their forearm.
6. Encourage the individual to push through their hand, straightening the elbow to sit upright.
7. Return to the starting position.

Duration: Repeat 10 times with each arm.

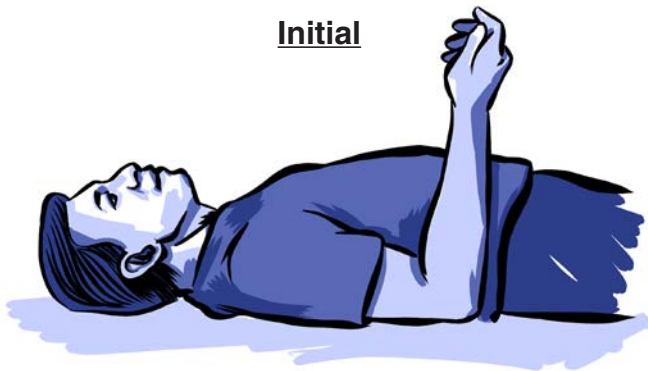
Tips: Help the individual keep their hand on the floor and straighten their elbow as needed.



Initial

Progression

Initial



Forearm supination

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and arm propped on a counter or table.

Initial

1. Position the individual on their back with their upper arm by their side, elbow bent, and hand up toward the ceiling, turned away from face.
2. Encourage them to turn their hand toward their face, keeping their upper arm still on the floor.
3. Return to the starting position.

Progression

4. Position the individual sitting with their arm resting on a surface, palm facing down.
5. Encourage them to turn their hand up toward the ceiling, keeping their upper arm still.
6. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Support their wrist to keep the elbow bent as needed.

Forearm pronation

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and arm propped on a counter or table.

Initial

1. Position the individual on their back with their upper arm by their side, their elbow bent, and their hand up toward the ceiling, turned toward their face.
2. Encourage the individual to turn their hand away from their face, keeping their upper arm still on the floor.
3. Return to the starting position.

Progression

4. Position the individual sitting with their arm resting on a surface, palm facing toward the ceiling.

Initial



5. Encourage the individual to turn their palm down toward the surface, keeping their upper arm still.
6. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Support their wrist to keep the elbow bent as needed.

Wrist flexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and their arm propped on a counter or table.

Initial

1. Position the individual on their back with their arm out to the side and their palm facing toward their body.
2. Encourage them to bend their wrist, bringing their hand toward their body.
3. Return to the starting position.

Progression

4. Position the individual sitting with their arm resting on a surface, palm facing up.
5. Encourage them to bend their wrist, bringing their hand toward their face.
6. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Stabilize the upper and lower arm to ensure that the movement is only coming from the wrist.



Initial



Wrist extension

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright and their arm propped on a counter or table.

Initial

1. Position the individual on their back with their arm out to the side, palm facing toward their body.
2. Encourage them to bend their wrist, bringing their hand away from their body.

3. Return to the starting position.

Progression

4. Position the individual sitting with their arm resting on a surface, palm facing down.
5. Encourage them to bend their wrist, bringing the back of their hand toward their face.
6. Return to the starting position.

Duration: Repeat 10 times with each arm.

Tips: Stabilize the upper and lower arm to ensure that the movement is only coming from the wrist.



Initial



Finger extension

INSTRUCTIONS

Initial

1. Position the individual on their back or sitting.
2. Have them close their hand in a fist, or as close to a fist as they can. Hold for 3 seconds.

3. Encourage them to open their hand, fully straightening their fingers. Hold for 3 seconds.

Alternative

4. Position the individual with their palm down on a flat surface.

5. Encourage them to lift their fingers up off the surface, keeping them straight. Hold for 3 seconds.

6. Relax and repeat.

Duration: Repeat 5-10 times, 3 times a day.

Leg Exercises

Hip flexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair reclined 75%-100%.

Initial

1. Position the individual lying on their side with straight legs.
2. Encourage them to bend their hip and bring their knee toward their chest.
3. Return to the starting position.

Progression

4. Position the individual on their back with straight legs.

Initial



5. Encourage them to bend their hip and bring their knee toward their chest.
6. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Support the individual's knee and ankle to assist with the movement as needed.

Hip extension

INSTRUCTIONS

Initial

1. Position the individual lying on their side with straight legs.
2. Encourage them to bring their leg backward.
3. Stabilize their trunk to ensure they do not roll back.
4. Return to the starting position.

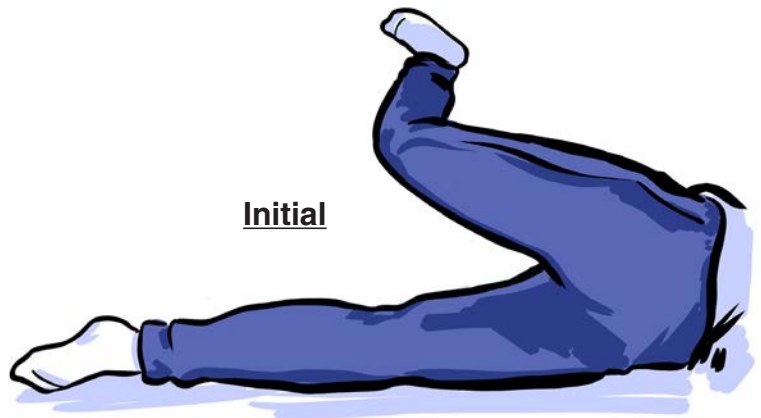
Progression

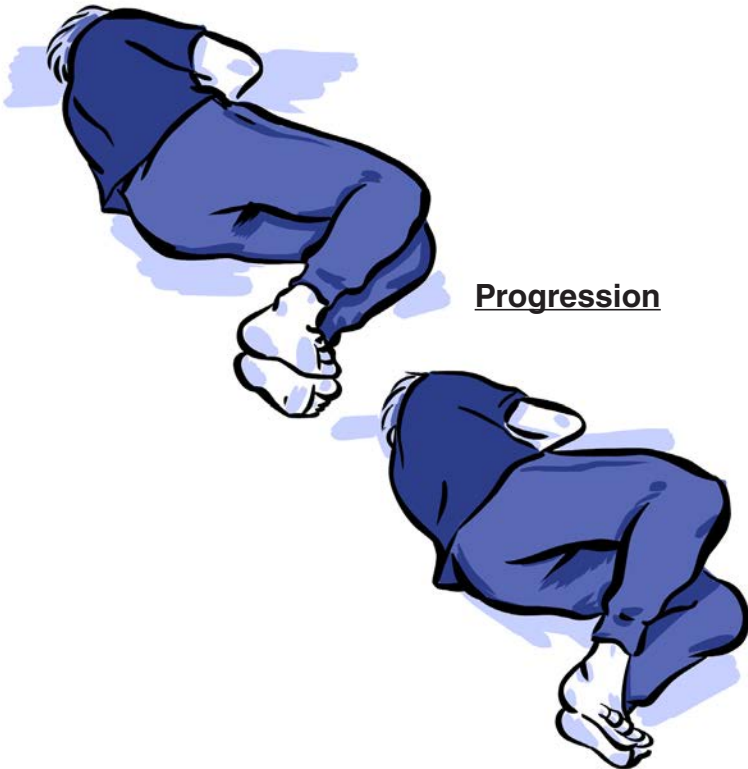
5. Position the individual on their back with their knees bent and feet on the floor.
6. Encourage them to lift their hips up toward the ceiling.
7. Maintain the position for 3-5 seconds as able.
8. Support them at the hips as needed.
9. Return to the starting position.

Duration: Repeat 10 times.

Tips: Support the individual's knee and ankle to assist with the movement as needed.

Initial





Hip abduction

INSTRUCTIONS

Initial

1. Position the individual on their back with straight legs.
2. Encourage them to bring one leg out to the side, keeping their knees straight.
3. Return to the starting position.

Progression

4. Position the individual lying on their side with knees bent and feet together.
5. Encourage them to lift their top knee up toward the ceiling, keeping their feet together.
6. Maintain the position for 3-5 seconds as able.
7. Stabilize their trunk to ensure they do not roll back.
8. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Support the individual's knee and ankle to assist with the movement as needed.



Hip adduction

INSTRUCTIONS

Initial

1. Position the individual on their back with one leg out to the side, legs straight.
2. Encourage them to bring the leg in toward the opposite leg, keeping their knees straight.
3. Return to starting position.

Progression

4. Position the individual on their back with bent knees out to the sides and their feet together.
5. Encourage them to lift one knee up toward the ceiling, keeping their knees bent.
6. Maintain the position for 3-5 seconds as able.
7. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Support the individual's knee and ankle to assist with the movement as needed.

Knee flexion

INSTRUCTIONS

Initial

1. Position the individual on their side with their top knee bent in front of body and their bottom leg straight in line with their body.
2. Encourage them to bend their bottom knee, bringing their heel toward their buttocks.
3. Return to the starting position.

Progression 1

4. Position the individual on their back with straight legs.
5. Encourage them to bend one knee, sliding their heel along the surface.
6. Help them keep their knee pointed up toward the ceiling.
7. Return to the starting position.

Initial



Progression 2

8. Position the individual on their stomach with their legs straight.
9. Encourage them to bend one knee, bringing their heel toward their buttocks.
10. Help them keep their foot pointed up toward the ceiling.
11. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Support the individual's knee and ankle to assist with the movement as needed.

Progression



Knee extension

Equipment needed: Bolster or rolled towel

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright.

Initial

1. Position the individual on their side with their knees bent.
2. Encourage them to straighten their top leg, kicking their foot forward.
3. Return to the starting position.

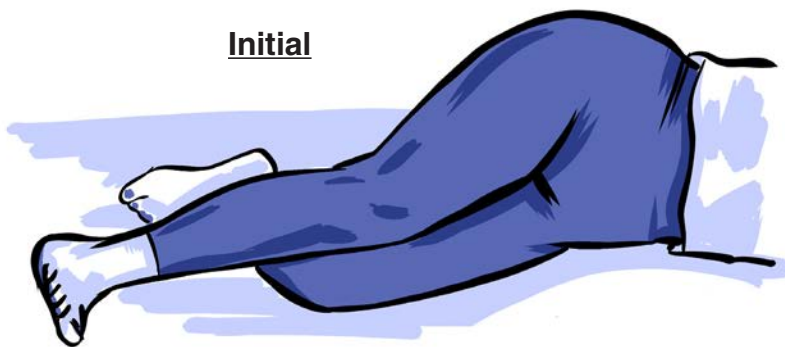
Progression

4. Position the individual on their back with a bolster or towel roll under their knees and their feet resting on the floor.
5. Encourage them to straighten one knee, bringing their foot up toward the ceiling.
6. Hold the position for 3-5 seconds as able.
7. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Support the individual at the knee and ankle to facilitate movement as needed.

Initial



Ankle dorsiflexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright.

Initial

1. Position the individual on their side with their bottom leg bent and top leg straight.
2. Encourage them to pull their toes up toward their face, sliding their big toe along the floor.
3. Return to the starting position.

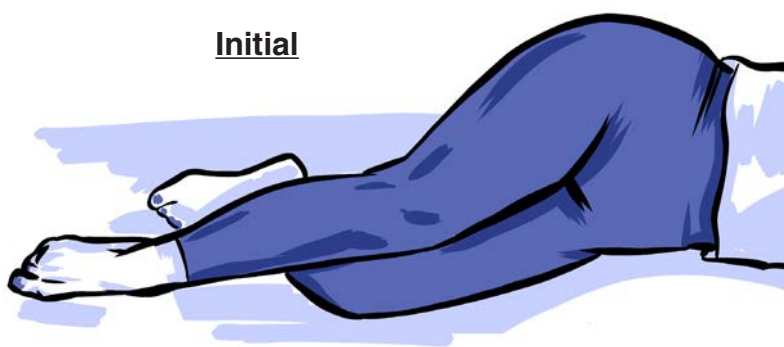
Progression

4. Position the individual on their back with their legs straight.
5. Encourage them to pull their toes up toward their face.
6. Return to the starting position.

Duration: Repeat 10 times with each leg.

Tips: Stabilize the individual's leg to ensure the movement is at the ankle only.

Initial



Ankle plantarflexion

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair upright.

Initial

1. Position the individual on their side with their bottom leg bent and top leg straight.
2. Encourage them to point their toes, sliding their big toe along the floor.
3. Return to the starting position.

Progression

4. Position the individual on their stomach with their legs straight.
5. Encourage them to point their toes up toward the ceiling.
6. Return to the starting position.

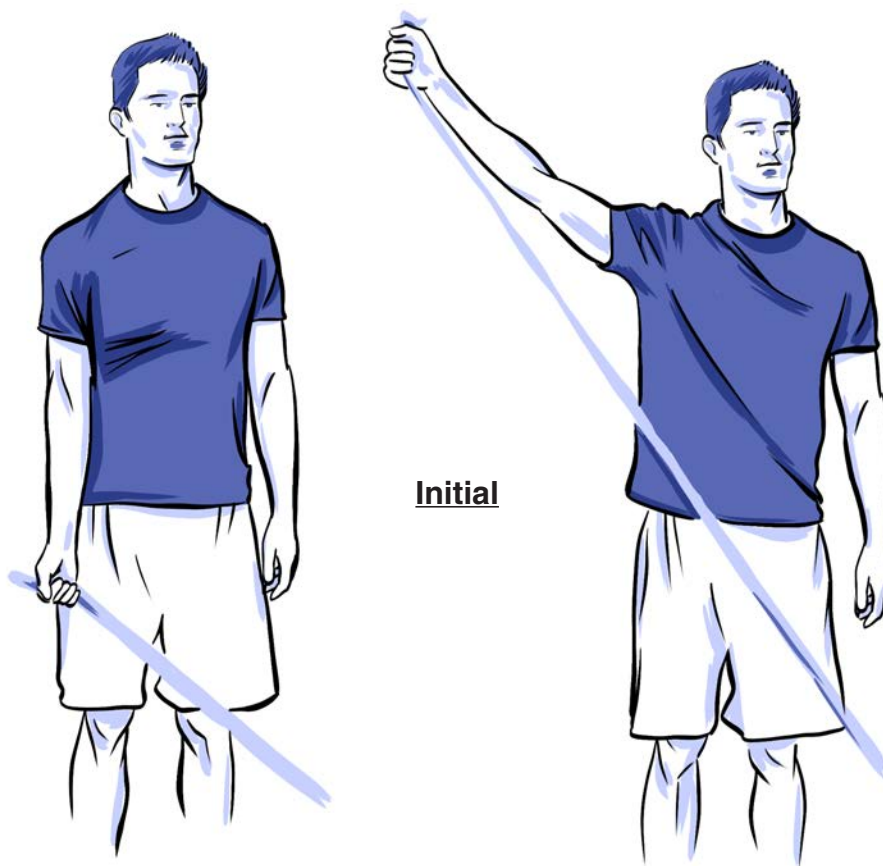
Duration: Repeat 10 times with each leg.

Tips: Stabilize the individual's leg to ensure the movement is at the ankle only.

Exercises for Walkers

Arm exercises

The following arm exercises can be performed with an exercise band, light weights (1-5 pounds), or a household item such as a can of beans or water bottle.



Shoulder abduction and adduction

INSTRUCTIONS

Initial

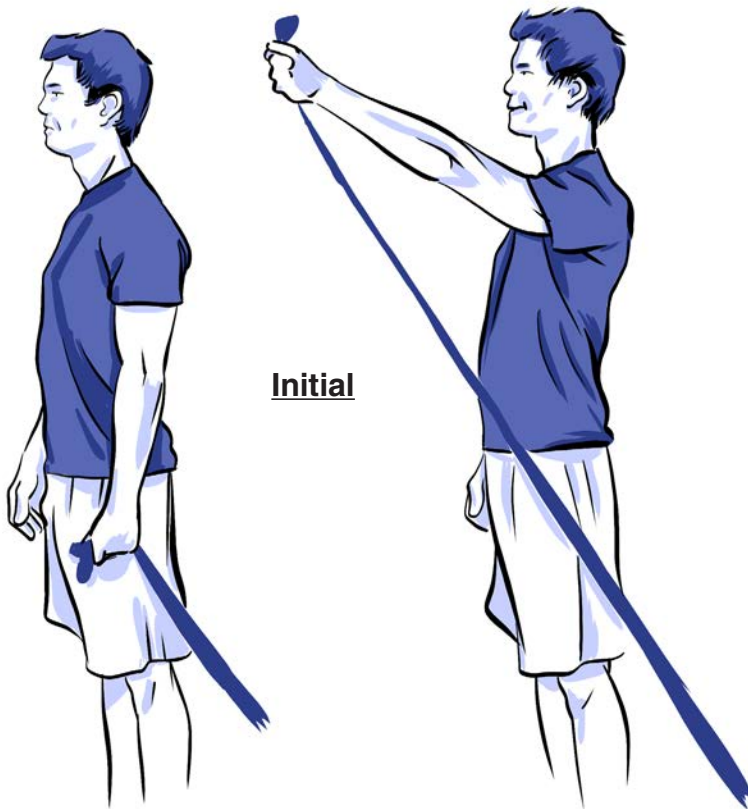
1. While holding an exercise band or household object at your side, bring your arm out to the side, keeping your elbow straight.
2. Slowly return your arm to the starting position.

Progression

3. Increase the amount of weight or resistance on the exercise band.

Duration: Repeat 10 times with each arm, holding for 1-3 seconds at the top each time.

Tips: Keep your elbow straight and bring your arm directly out to the side, not in front.



Shoulder flexion

INSTRUCTIONS

Initial

1. While holding an elastic band or household object at your side, bring your arm up in front, keeping your elbow straight.
2. Slowly return your arm to the starting position.

Progression

3. Increase the amount of weight or resistance on the exercise band.

Duration: Repeat 10 times on each arm, holding at the top for 1-3 seconds each time.

Tips: Keep your elbow straight.

Shoulder extension

INSTRUCTIONS

Initial

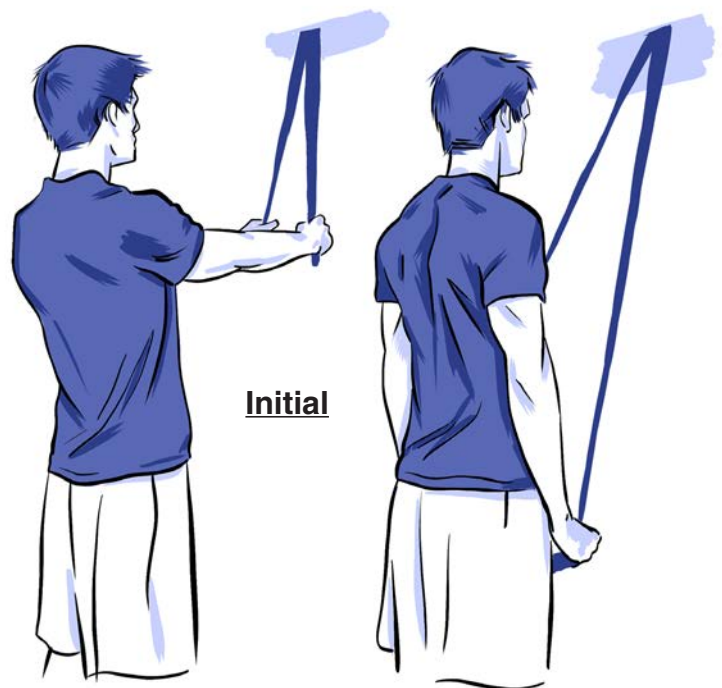
1. Hold an elastic band or household item with both arms in front of you and your elbows straight.
2. Pull the band downward and back toward your sides.
3. Slowly return your arms to the starting position.

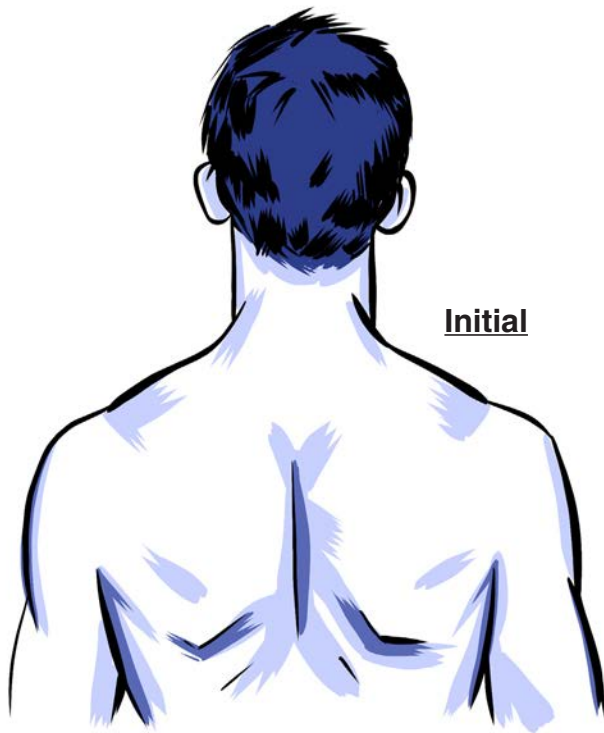
Progression

4. Increase the resistance on the exercise band.

Duration: Repeat 10 times on each arm, holding at the bottom for 1-3 seconds.

Tips: Keep your elbows straight.





Shoulder girdle stability: scapular squeezes

Equipment needed: Exercise band or hand towel

INSTRUCTIONS

Initial

1. Move your shoulder blades back and down.
2. Hold, then relax.

Progression

3. Hold an exercise band or hand towel with both hands at shoulder height.
4. With your elbows straight, pull the band or towel apart while focusing on squeezing shoulder blades together.

Duration: Repeat 10 times, hold hands apart for 3-5 seconds each time.

Tips: Focus on squeezing an imaginary pen along your spine.

Elbow flexion

INSTRUCTIONS

Initial

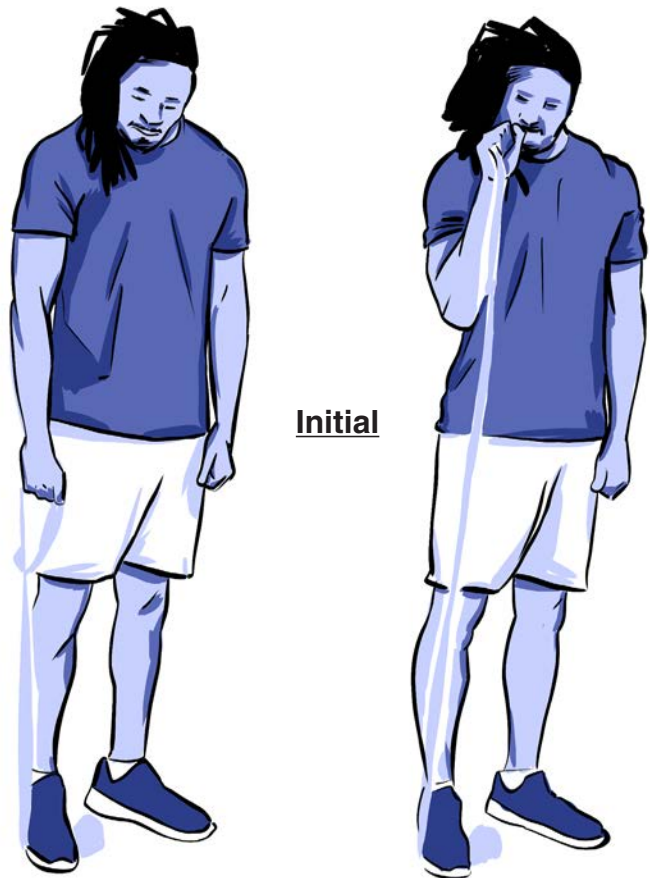
1. Place one end of an exercise band under your foot. Holding the other end, bend your elbow and bring your hand toward your shoulder, keeping the elbow at your side.
2. Slowly return your arm to the starting position.

Progression

3. Increase the amount of weight amount or resistance on the exercise band.

Duration: Repeat 10 times, holding at the bottom for 3-5 seconds each time.

Tips: Ensure slow, controlled movements in both directions.



Elbow extension

INSTRUCTIONS

Initial

1. Start with your elbow bent, holding an elastic band or household item near your face.
2. Pull the elastic band downward as you straighten your elbow.
3. Slowly return your arm to the starting position.

Progression

4. Increase the amount of weight or resistance on the exercise band.

Duration: Repeat 10 times on each arm, holding at the top for 3-5 seconds each time.

Tips: Make sure the elbow remains by your side throughout.



Wrist supination and pronation

Equipment needed: Light weight (1-5 pounds) or household item such as a hammer, can of beans, or water bottle

INSTRUCTIONS

Initial

1. Hold the weight or object in your hand with your forearm supported on a flat surface.
2. Slowly lower the weight/object toward the inside and then outside of the body, moving with control.

Progression

3. Increase the amount of weight.

Duration: Repeat 10 times in each direction, holding 1-3 seconds on each side.

Tips: Move slowly and focus on a full range of motion in each direction.

Grip strengthening

Equipment needed: Tennis ball, therapy putty, or table/counter

INSTRUCTIONS

Initial

1. Hold a tennis ball in your hand or hold the edge of a table.
2. Squeeze for 5 seconds and release.

Progression

3. Increase the resistance with therapy putty.

Duration: Repeat 10 times with each hand.

Tips: Substitute therapy putty for a ball if it is available.



Initial



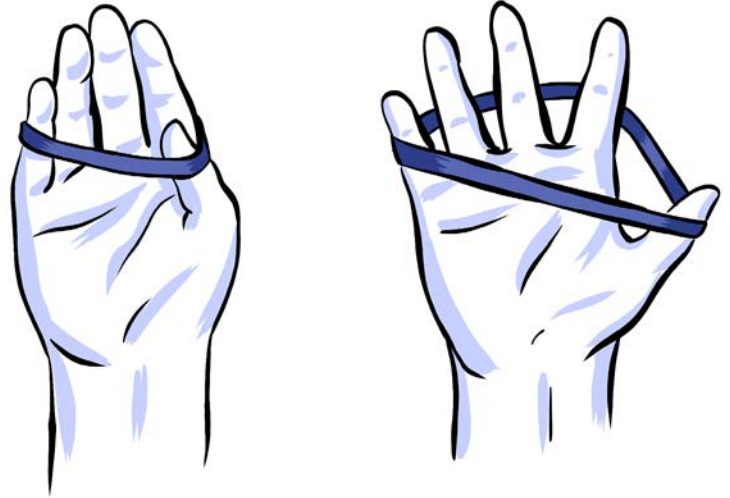
Finger extension

Equipment needed: rubber band

INSTRUCTIONS

1. Have the individual keep their fingers close together, and place a rubber band around the middle of their fingers.
2. Encourage them to stretch their hand open, keeping their fingers straight. Hold for 3 seconds, then relax.

Duration: Repeat 5-10 times, 3 times a day.



Hip flexion (marching)

Equipment needed: Light ankle weights (1-5 pounds) or shoes

INSTRUCTIONS

Initial

1. While seated, lift one foot off the ground, keeping the knee bent.
2. Lower the foot back down with control.
3. Repeat on the opposite leg.
4. Continue alternating legs.

Progression

5. Increase the amount of weight.

Duration: Repeat 10 times on each side, holding the leg up for 1-3 seconds each time.

Tips: Do not use your back or trunk muscles by moving your body or using your arms to assist. If you are unable to lift the legs high, focus on activating the hip muscles.



Initial

Leg exercises

Hip extension (clam shells)

Equipment needed: Exercise band

INSTRUCTIONS

Initial

1. While lying on your side with your knees bent, raise the top knee while keeping your feet together.
2. Lower the leg with control.

Progression

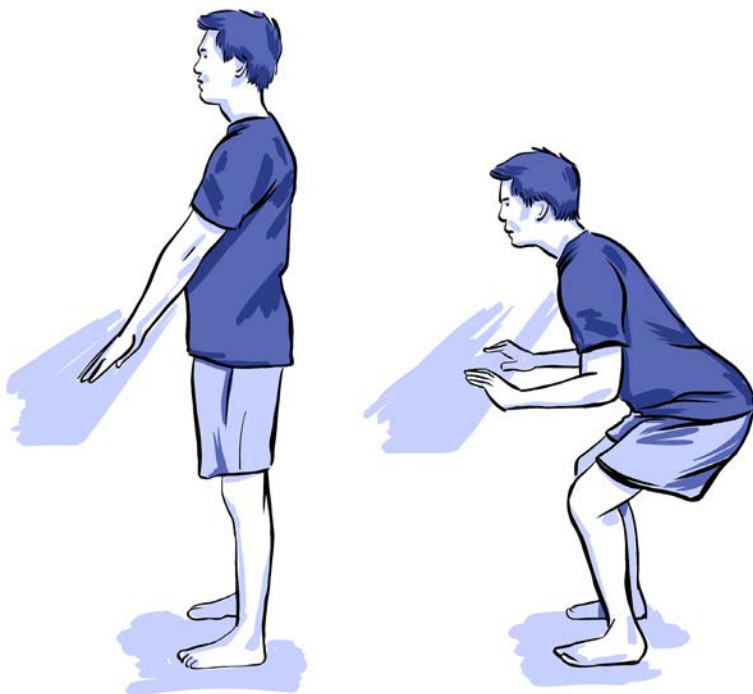
3. Place an exercise band around the knees to increase resistance.

Duration: Repeat 10 times on each side, holding at the top for 3-5 seconds each time.

Tips: Do not let your pelvis roll back during the lifting movement.



Initial



Knee extension and flexion (squats)

Equipment needed: Stable support surface, such as a table

INSTRUCTIONS

1. Stand with your feet shoulder width apart in front of a support surface.
2. Bend your knees and lower your body towards the floor. Your body weight should mostly be directed through your heels.
3. Return to a standing position.

Duration: Repeat 10 times.

Tips: If you are concerned about your knees buckling, perform the exercise over a chair so you can sit if your knees buckle. Your knees should bend in line with the second toe and not

Active ankle dorsiflexion

Equipment needed: Exercise band

INSTRUCTIONS

Initial

1. Sit upright on a chair, in a wheelchair, or on the floor.
2. Point your toes up toward your head, and then return to the starting position.

Progression

3. Sit upright on chair, in a wheelchair, or on the floor.
4. Secure an exercise band around a chair leg or a table leg in front of you, or have a caregiver assist by holding the band. Wrap the free end of the band around one foot.
5. Point your toes up toward your head and then return to the starting position.

Duration: 3 sets of 10 flexes on each foot.



Initial



Progression

Ankle circles

INSTRUCTIONS

1. While seated, lift one foot off the ground.
2. Turn the ankle slowly in circles, 10 times clockwise and 10 times counterclockwise.
3. Move just your foot and ankle, not your leg.

Duration: Repeat 5 times, 3 times a day.



Step up

Equipment needed:

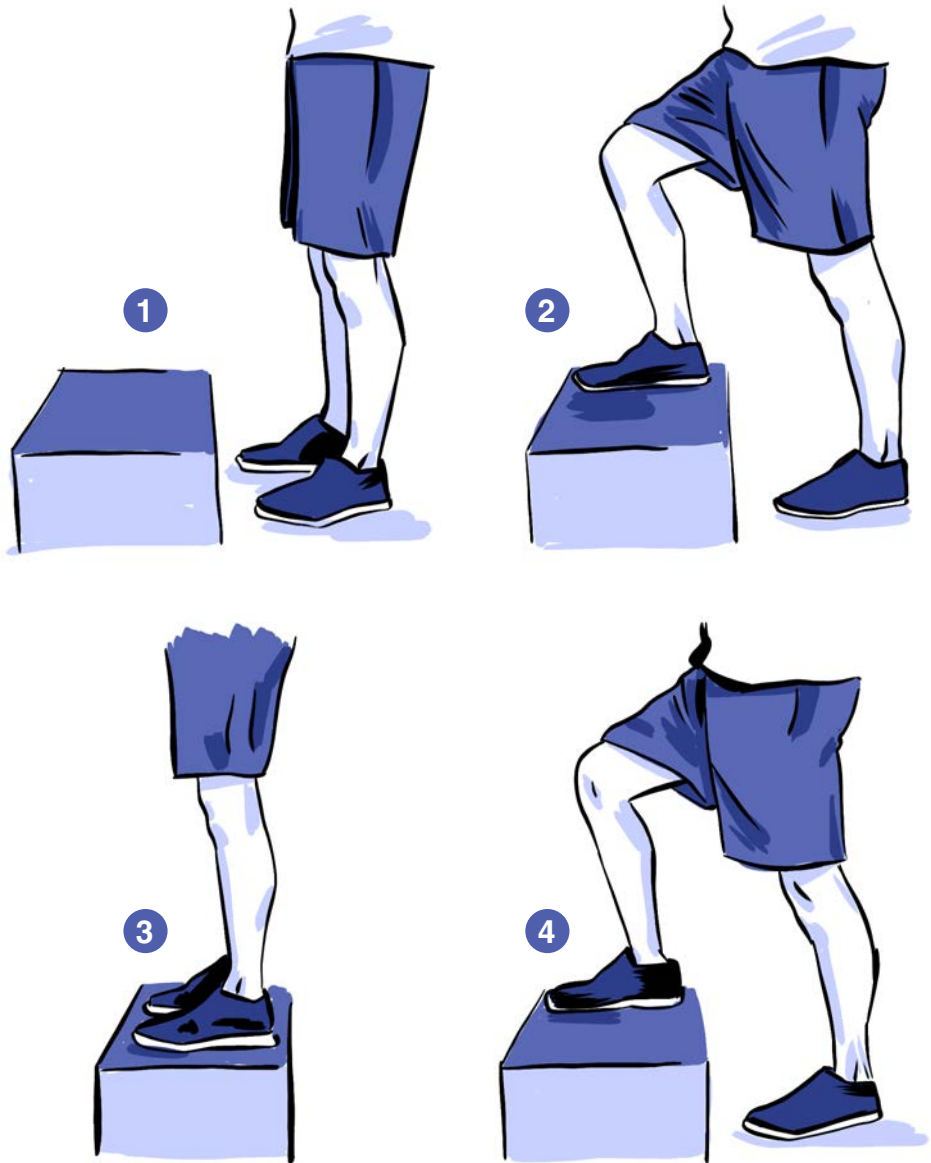
Stair with a handrail or small step stool

INSTRUCTIONS

1. Stand in front of a stair or step stool with both feet on the floor.
2. Step onto the stair with one leg then the other.
3. Once both feet are on the stair, step down backward with the opposite leg first.
4. Repeat, starting with the opposite leg.

Duration: Repeat 10 times.

Tips: Hold onto a stair handrail or wall for balance.



Floor to stand or fall recovery

Equipment needed: Open area large enough to roll, couch or sturdy piece of furniture

INSTRUCTIONS

1. Lie on your back on the floor.
2. Move from your back to sitting and then from sitting to a crawling position.
3. Move from tall kneeling to standing position, holding onto a piece of furniture if necessary.

Duration: Repeat 5 times.

Tips: Have a caregiver close by to help as needed.

Trunk exercise

Core strengthening in quadruped

INSTRUCTIONS

Initial

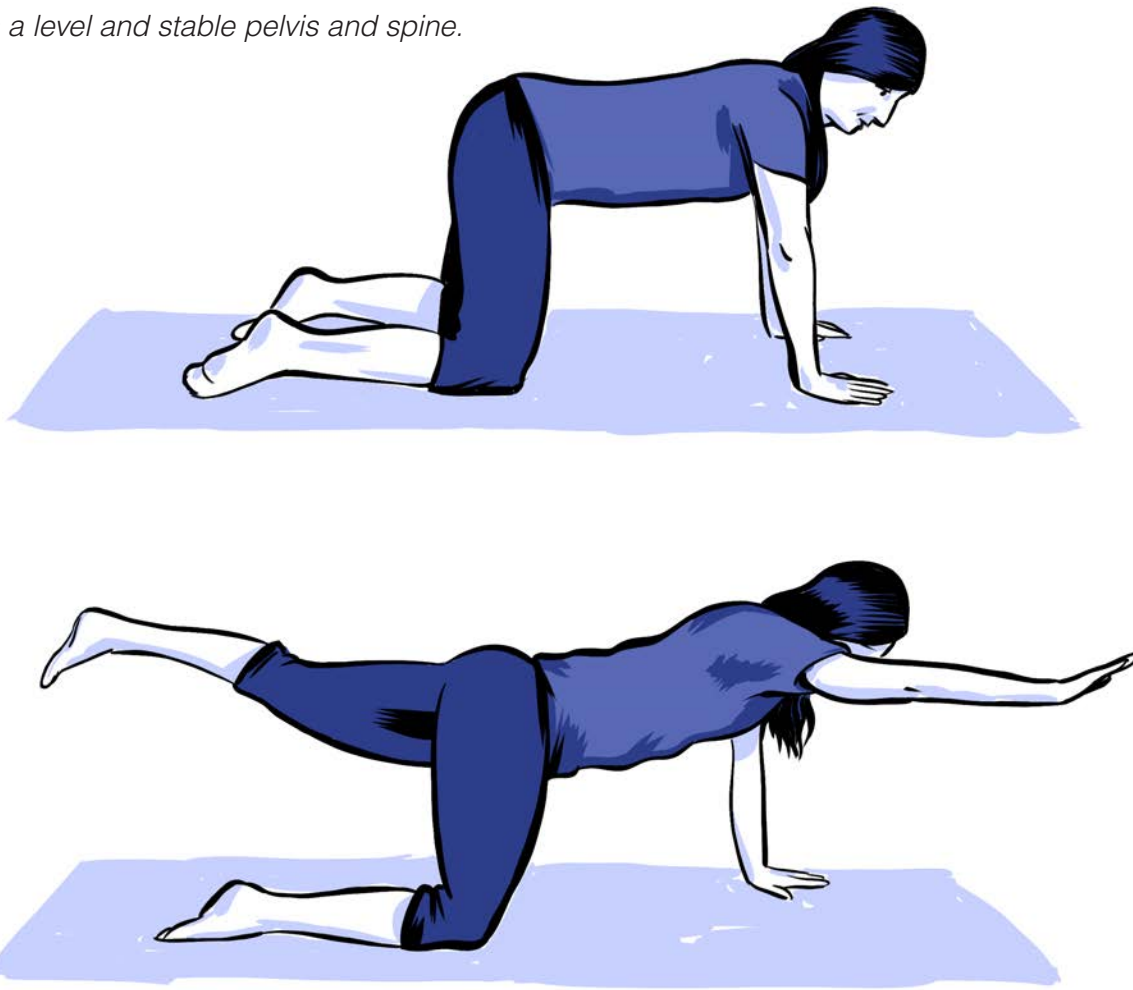
1. While in a crawling position, brace your abdominal muscles.
2. Slowly lift an arm up toward your ear.
3. Lower the arm down to the floor and repeat on the opposite side.

Progression

4. Lift the opposite leg and arm at the same time. The hip will move into hip extension.
5. Lower the arm and leg and repeat on the opposite side.

Duration: Repeat 10 times on each side, holding at the top for 3-5 seconds each time.

Tips: Maintain a level and stable pelvis and spine.



Progression

Developmental Exercises

Developmental progression is unique for each child. Please focus on the developmental exercises in this section that are most consistent with your child's functional abilities.

Tummy time

Equipment needed: Therapy ball, wedge pillow, breast feeding pillow, standard pillow, or rolled towel

INSTRUCTIONS

*Wheelchair alternative: The individual leans forward and props their arms on a counter.

1. Position the individual on their stomach on a therapy ball, pillow, or rolled towel.
2. Position their arms with palms flat on the surface near their face, elbows tucked into their sides, to allow them to push through their hands.
3. Position their legs with heels facing the ceiling to promote straight legs. (Limit the amount of frog leg position.)
4. Help the individual lift their head above the surface.
5. Start the individual in a more vertical position and progress to a more horizontal position to increase the difficulty.



Duration: Tummy time is critical for head control and shoulder girdle strengthening. If the individual doesn't like tummy time, start with 30 seconds, even if they are crying. Gradually increase to 5 minutes over time.

Tips: Do not use trunk orthosis during tummy time. Use toys or your face/voice to encourage them to spend more time in this position. If they can lift and rotate their head on their own, progress to having them lie on a flat surface. Do not leave the individual unattended during tummy time. They should not sleep in this position.



Tummy time with head turns

INSTRUCTIONS

1. Position the individual on their stomach on the floor.
2. Make sure their elbows are beneath their shoulders, so the individual is propped on their forearms.
3. Encourage them to lift their head and to turn it side to side.

Initial



Side lying with head righting

INSTRUCTIONS

*Wheelchair alternative: Sit upright in the wheelchair and bring the ear toward the shoulder.

Initial

1. Position the individual lying on their side.
2. Use your hands to stabilize their trunk to help them maintain the side-lying position.
3. Encourage them to lift their head off the floor.

Progression

4. Hold the individual facing away from you, with support for their trunk.
5. Slowly lean them to the side, tilting their trunk away from vertical.
6. Encourage them to lift their head, moving their ear toward their upper shoulder.

Duration: 2-3 sets of 2-3 minutes on each side.

Tips: Help the individual with the motion of lifting their head if needed.

Facilitated rolling

Equipment needed: Toys or mirror

INSTRUCTIONS

1. Place the individual on their back.
2. Help them roll to the right side by placing a toy or mirror out of their reach and bringing their left leg across their body.
3. Facilitate rolling until they are nearly fully on their stomach.
4. Allow them to play with the toy.
5. Bring the toy over their head, encouraging them to follow it with their eyes and head.
6. Help them roll to the starting position on their back by bringing the left leg back.

7. Repeat to the left side.

Duration: Perform while the individual is actively engaged in the activity, with a goal of 3-5 times in each direction.

Tips: Do not use trunk orthosis while rolling. Help the individual move their head if necessary.

Pull to sit (cervical flexion)

INSTRUCTIONS

*Wheelchair alternative: Perform the exercise with the wheelchair reclined 50%.

1. Position the individual on their back on the floor.
2. Place your hands at their upper back to support the trunk.
3. Slowly raise them into a sitting position.
4. The individual should tuck their chin to lift their head during the transition.

Duration: Repeat 10 times.

Tips: If the individual cannot lift their head independently, use your fingers to support their



head. Never allow their head to remain on the floor while pulling them to sitting position.



Supine to sit

INSTRUCTIONS

1. Position the individual on their back.
2. Encourage them to roll toward one side, pushing through their bottom arm into a sitting position.
3. Help them by placing one hand on their top hip and one hand under their trunk.

Duration: Repeat 5 times on each side.

Tips: Help the individual lean forward throughout the transition to sitting.

*Alternative: The individual may roll from back to belly, transition onto their hands and knees, and then walk their hands back into a sitting position.

Sit to prone

INSTRUCTIONS

1. Position the individual sitting.
2. Encourage them to shift their weight to one side, placing their hands to the side on the floor.
3. Help them slowly lower onto their stomach.

Duration: Repeat 5 times on each side.

Tips: Help the individual lean forward throughout the transition.



Sit to quadruped

INSTRUCTIONS

1. Position the individual sitting.
2. Encourage them to shift their weight to one side, placing their hands to the side on the floor.
3. Help them lift their buttocks, moving onto their hands and knees.

Duration: Repeat 5 times on each side.

Tips: Support the individual's trunk and buttocks throughout transition as needed.

Quadruped

INSTRUCTIONS

1. Position the individual on their hands and knees over your leg.
2. Make sure their knees are beneath their hips and their hands are beneath their shoulders.

Duration: Repeat 5 times on each side. Hold for 10-60 seconds as able.

Tips: Support the individual's trunk and buttocks as needed. Use a mirror to motivate individual to lift their head.



Creeping

INSTRUCTIONS

1. Position the individual on their hands and knees.
2. Encourage them to crawl forward toward a toy, moving one arm and leg at a time.

Duration: Progress creeping distance as able.

Tips: Support the individual's trunk or help them move their legs as needed.





Side sitting

INSTRUCTIONS

1. Position the individual sitting with both knees pointing toward the same side.
2. Help them prop themselves with one hand on the floor.

Duration: 2-3 times on each side for 2-3 minutes each.

Tips: Support the individual's trunk as needed and help them keep their elbow extended.

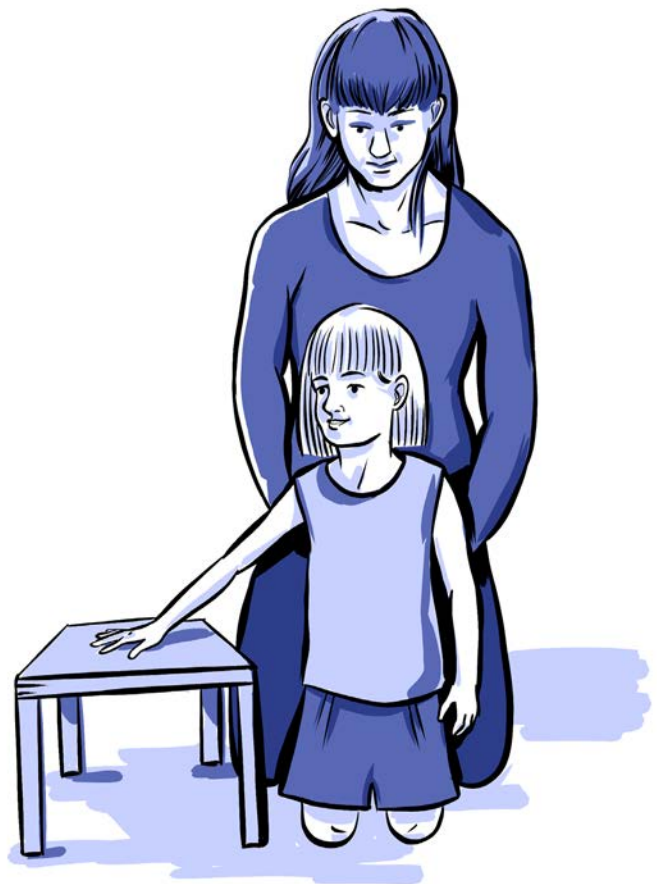
Side sit to tall kneel

INSTRUCTIONS

1. Position the individual sitting with both their knees pointing toward the same side and their hands on the floor (side sitting).
2. Encourage them to transition to a tall kneeling position.
3. Return to the starting position.

Duration: Repeat 5 times on each side.

Tips: Support the individual's trunk and buttocks throughout the transition as needed.





Tall kneeling

INSTRUCTIONS

Initial

1. Position the individual in a tall kneeling position.
2. Help them straighten their hips as much as possible.

Progression

3. Position the individual in a low kneeling position with their buttocks resting on their heels.
4. Encourage them to lift their buttocks above their heels to transition into a tall kneeling position.
5. Help them straighten their hips as much as possible.

Duration: 2-3 times for 1-2 minutes each.

Tips: Support the individual's trunk and buttocks as needed.

Sit to stand

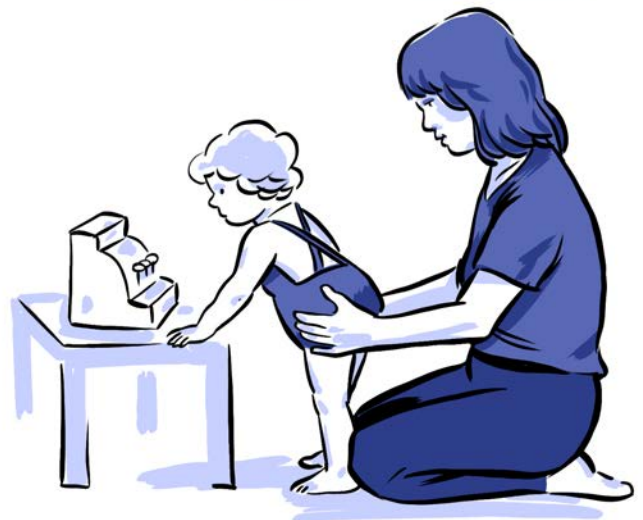
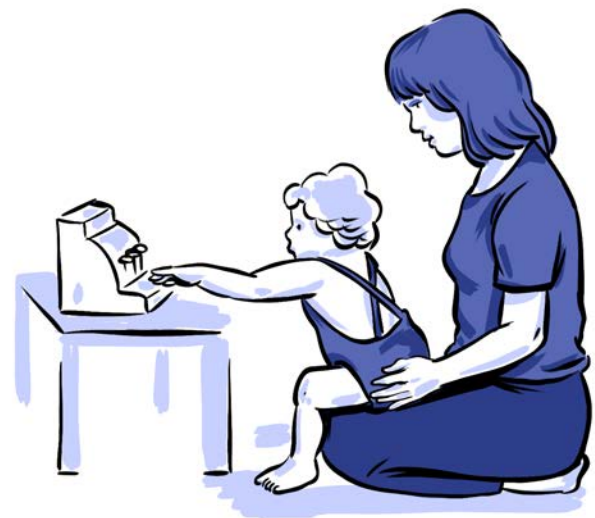
Equipment needed: Small chair or stool

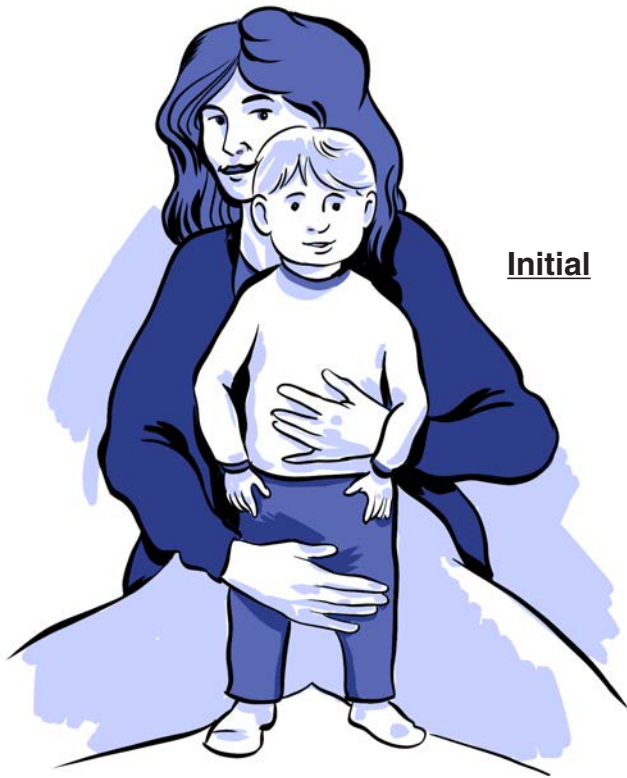
INSTRUCTIONS

1. Position the individual sitting on a caregiver's lap or chair/stool with their feet on the floor.
2. Encourage them to place their hands on the table and transition to standing.
3. Help them straighten their hips as much as possible.

Duration: Repeat 10 times.

Tips: Perform the exercise with orthotics on. Help the individual lean forward throughout the transition. Support their hips and trunk as needed.





Initial

Supported standing

INSTRUCTIONS

Initial

1. Position the individual standing with their back against a seated caregiver.
2. Place one hand at their trunk and one hand in front of their knees to help them maintain a standing position.

Progression

3. Position the individual standing.
4. Help them straighten their hips and knees as much as possible.

Duration: 2-3 times for 1-2 minutes each.

Tips: Perform the exercise with orthotics on. Make sure the knees are not hyperextended.

Cruising

Equipment needed: Support surface, such as a couch or low table

INSTRUCTIONS

1. Position the individual standing, facing the support surface.
2. Encourage them to step one leg out to the side and then bring the other leg to it.
3. Help them shift their weight onto the non-stepping leg as needed.

Duration: Repeat 5 steps to each side, 5 times.

Tips: Perform the exercise with orthotics on. Make sure their knees are not hyperextended. Keep their trunk facing the support surface.



For more information on SMA or to find a physical therapist near you, contact the MDA Resource Center at 833-ASK-MDA1 (275-6321).

This resource was developed with the expertise and knowledge of Kara Arps, pediatric physical therapist at Monroe Carell Jr. Children's Hospital at Vanderbilt, and Meghan Moore Burk, physical therapist at Children's Hospital Colorado.