CALISTHENICS

Calisthenics are an integral part of a well-rounded physical fitness program because they develop both muscular and aerobic endurance. They are used to warm up and limber the body for sports activities or weight-resistant training and also for cooling down afterward. Calisthenics are low-resistance, high-repetition training.

Individuals can test their level of fitness with push-ups, toe touches, knee-bends, or sit-ups. Beginners will find that more than just a few repetitions require a combination of strength and muscular endurance. Certain calisthenics are helpful in training for particular sports. For example, push-ups develop the upper body endurance needed for rowing.

Special equipment is not necessary and the exercises allow for concentration on particular areas of the body. The calisthenics selected for this book can be adapted to the special needs and capabilities of most people with lower limb loss.

Supplements

Stair climbing and jumping rope are not considered to be calisthenics but may supplement a calisthenics routine.

Conventional stair climbing can be practiced by those people with lower limb loss who are skilled in using their prosthesis. The hand rail may be used occasionally for balance, but this should not detract from the workout. Computerized stationary climbers such as the StairMaster® are excellent for aerobic training, and provide a good workout for the legs. Hand rails are used for maintaining balance.* The Versa Climber is a ladder-like stationary climbing device that works the upper and lower body while training the cardiovascular system.

Many athletes jump rope as part of their warm-up and cool-down routines. A person with a lower limb amputation may jump rope with or without a prosthesis. Jumping rope develops strength, coordination, and endurance in the sound limb, but it can be difficult to master jumping alternately on each leg because of the impact on the residual limb. Landing on two legs creates less stress on both legs. When jumping without a prosthesis, great stress is placed on the sound limb. The stress can be lessened by jumping on a large mat, an impact-resistant floor, grass, or other forgiving surface.

A person with a lower limb amputation should not use stair climbing or jumping rope exclusively to achieve aerobic fitness. They should be considered only as supplemental activities to warm-up or cool-down exercise. Begin with 10 to 15 seconds of exercise and rest 30 seconds to 1 minute between sets. Gradually build up to three 1-minute sets.

* Users are cautioned not to grip the hand rails tightly. A recent study reported deep palmar branch ulnar neuropathy in two subjects as a result of excessive pressure to the palms while using the StairMaster. (Alvin Glass, “StairMaster Syndrome: A Deep Palmar Branch Ulnar Neuropathy.” Archives of Physical Medicine in Rehabilitation, 70(11): A-89 [Abstract], October 1989.)
Stair climbing  Many people go out of their way to avoid climbing stairs; however, with the advent of computerized machines that can vary resistance, this aerobic exercise is gaining popularity at many health clubs. Greg Mannino works out against a high setting of resistance.

Jumping rope  This is a simple way to work the cardiovascular system. A person wearing a prosthesis or jumping without it should jump rope only in brief intervals as part of a warm-up or cool-down routine.
## CALISTHENICS ROUTINE

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OPTIONS: Jumping rope, stair climbing
EXERCISE 1. JUMPING JACKS

PURPOSE
Warm-up and/or cool-down exercise for the entire body.

PROCEDURE
- Begin by standing with feet together and hands at sides.
- Simultaneously bring your hands together directly above your head, jump, and split both legs wider than shoulder-width, as shown in photo.
- Without stopping, jump both legs back together and bring arms down to the sides of the body.
- Gradually work up to at least 20 repetitions.

MODIFICATIONS
If jumping on the residual limb causes pain, simply favor the sound side. A flexible AK brim or a CAT/CAM or Narrow M/L Socket will provide stability and comfort. BK-level individuals who experience discomfort may require socket modifications.

NOTE
Almost all the jumping and push-off is done by the sound leg. The side with the prosthesis must keep pace; move the leg away from the midline and back again to where the heels are nearly touching in a fluid motion.
EXERCISE 2. NECK ROLLS

PURPOSE
Stretches and exercises the neck muscles.

PROCEDURE (CLOCKWISE ROTATION)
- Bend the neck until the chin touches the chest.
- Roll the head to the right until the right ear touches the right shoulder.
- Roll the head back, bringing the chin up as far as possible.
- Roll the head to the left until the left ear touches the left shoulder.
- Repeat steps 1 through 4.
- Rest (20-30 seconds); then perform the exercise in two counter-clockwise rotations.
  Fifteen to 20 repetitions are recommended for each rotation sequence.

MODIFICATIONS
None.

This is a preliminary exercise. It may be done while standing or seated.
EXERCISE 3. FREE-HAND NECK RESISTANCE

PURPOSE
Develops strength in the neck muscles. This exercise is often used as a warm-up for weightlifting exercise.

PROCEDURE: FRONT
- As shown in the photo, interlock fingers and place both hands against the forehead.
  - Push the hands and head against each other.
  - Start with the head back and push forward.

PROCEDURE: BACK
- Interlock fingers and place both hands on the back of the head. Again push the hands against the head.
  - Start with the head forward and push backward.

PROCEDURE: SIDES
- As shown in the photo, place the right palm against the right side of the head.
  - Start with the head on the left shoulder and push it against the hand as the hand resists.
    - Continue until the head is resting on the right shoulder.
  - Do the same with the left hand on the left side of the head.
  - Repeat the entire sequence (front to back to sides) 15 to 20 times.

MODIFICATIONS
None.

Samantha Ellis and Greg Mannino demonstrate front resistance.

Ellis and Mannino demonstrate side resistance.
EXERCISE 4. ARM CIRCLES

PURPOSE
Exercises the shoulders, arms, and the upper back.

PROCEDURE
- Stand with the feet shoulder-width apart and arms full length at each side. Bring both arms to shoulder height, as shown, and move them in a small circular motion.
- Begin by circling forward for 15 to 20 repetitions, then circle the arms backward for 15 to 20 repetitions.
- Bring both arms down to the sides of the body and relax for about 10 seconds before beginning a second set of the exercise.
- Vary the size of the circles from small to large and increase the speed. This will assist in limbering the shoulders and upper back.

MODIFICATION
This exercise may be performed while either standing or sitting.

Ellis and Mannino perform this exercise as a warm-up for the shoulders, upper back, and arms.
EXERCISE 5. ALTERNATING TOE TOUCHES WITH BAR

PURPOSE
Warm-up and cool-down exercise for muscles of the upper body, shoulders, arms, abdominal muscles, and the hamstrings. The bar helps to keep the shoulders straight while performing this exercise.

PROCEDURE
- Place a bar (about 36 inches in length) on the shoulders and hold it on both ends as shown in the photo.
- Bend from the waist, keeping the torso approximately parallel to the floor. (Try not to bend the knees.)
- Twist the body in a smooth motion so that the left hand touches the right foot, as shown. The right arm will be extended in the air.
- Raise to an upright position and repeat for the other side.
- Fifteen to 20 repetitions are recommended.
- Suggested sequence:
  - Toe touch left hand to right foot.
  - Upright.
  - Toe touch right hand to left foot.
  - Upright.
  - Repeat the sequence 15 to 20 times.

MODIFICATIONS
The anterior brim of an AK socket may impair one from touching the floor. A flexible brim and Narrow M/L socket can help.

This exercise may be carried out in the sitting position, which increases trunk stability and decreases back stress.

CAUTION
Stretch gradually, do not bounce. Bouncing may stretch the muscles too far and possibly cause injury.

Warm-up and cool-down exercise that helps develop muscle tone on the waistline and upper body, including increased flexibility of the back.
EXERCISE 6. TRUNK TWISTS

PURPOSE
Helps develop muscle tone on the waistline and upper body, including increased flexibility of the neck.

PROCEDURE
- Keep the feet planted on the floor and spaced a bit wider than the shoulders.
- Raise both arms to chest height, keeping the elbows slightly bent.
- Twist side to side from the waist, as shown in the photo. Try to rotate far enough so that each shoulder reaches at least the midline of the body.
- Twist on both sides 15 to 20 times.

VARIATION
- Place a bar (about 36 inches in length) on the shoulders and hold it at both ends.
- Keeping both feet on the floor with knees straight but relaxed keep hips still and twist from the waist to each side, as shown in the photo.

MODIFICATION
This exercise may be performed from a seated position.

CAUTION
Stretch gradually, do not bounce. Bouncing may stretch the muscles too far and possibly cause injury.

Ellis and Mannino twist from side to side in a rotary motion.

Mannino demonstrates a variation using a shoulder bar.
EXERCISE 7. ABDUCTOR/ADDUCTOR LEG RAISE

PURPOSE
Works the muscles of the inner thigh and outer thigh, which, when strengthened, improve balance and control while walking and in other ambulatory activities.

PROCEDURE 1: ABDUCTORS
- Lie on one side with one arm holding the head up and the other resting at the waist (beginners may use this arm as additional support by placing the palm of the hand on the floor).
- Keeping both legs straight, raise the top leg about 12 to 15 inches from the floor, as demonstrated in the top and middle photos.
- Hold at the high position for a few seconds before lowering the leg.
- Raise the leg up only high enough to maintain tension on the abductors, as seen in the photo.
- Fifteen to 20 repetitions are recommended.

NOTE
In the middle photo, Linda Pedersen demonstrates a wide range of motion to include a stretch in the exercise. However, the tension on the abductors is no longer effective at this height.

PROCEDURE 2: ADDUCTORS
- Lift the bottom leg in front of the other leg, as shown in the photo. (You will not be able to raise it as high as you were able to raise the top leg.)
- Hold the high position for a few seconds before lowering the leg.
- Fifteen to 20 repetitions are recommended.

MODIFICATION
Manually lock the knee for AK prostheses.
Mannino works the abductor thigh muscles.

Pedersen strengthens the hip abductors with a scissors-type stretch added to the exercise.

Mannino works the adductor thigh muscles.
EXERCISE 8. PRONE LEG EXTENSION

PURPOSE
Develops the hamstring and gluteal muscles.

PROCEDURE
- Lie on the floor in a prone position.
- Alternate raising one leg at a time by extending from the hip. Keep both legs as straight as possible.
- Bring each leg up as high as possible in order to gain the full benefit from the exercise before lowering the leg.
- Work each leg separately doing 15 to 20 repetitions per set, then switch legs. No rest is necessary between sets.

VARIATION
Hold the fully raised position for a few seconds, contracting the muscles of the hamstring and gluteus. Then lower the leg slowly to the floor.

MODIFICATIONS
This exercise may be performed with or without the prosthesis. However, the prosthesis provides more weight resistance, thus working the muscles harder.

CAUTION
Low back hypertension against resistance can cause undue stress to the spine. Observe caution; do not strain this area.
EXERCISE 9. STANDING ONE-LEGGED TOE RAISE

PURPOSE
Develops strength and definition in the gastrocnemius/soleus muscles.

PROCEDURE
- Stand with your feet close together. Hold onto a support with one or both hands.
- Raise up on your toes on the sound side as shown in the photo. Hold the position at the top for a few seconds before lowering the heel.
- Perform this exercise in a slow, controlled motion.
- For full calf development use three positions:
  - Point toes straight ahead to work calf muscle in general.
  - Point toes inward to work outer calf specifically.
  - Point toes outward to work inner calf specifically.
  - Fifteen to 20 repetitions are recommended.

VARIATION
For a greater range of motion, stand on a raised step with your heel off the edge so that it may be lowered further. The standing toe raise may also be done while using barbells.

The toes are pointed inward, working the outer calf.