



# Keep Moving: *Advanced Exercises for People With Lower- Extremity Amputations*

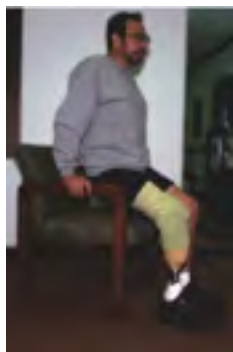
by Melissa Wolff-Burke, EdD, PT, ATC, and Elizabeth Cole, PT

**T**he previous article discussed exercises to help you maintain the range of motion (ROM) in your limbs and back and help you get moving again after an amputation. Many of those activities can be made more challenging by adding weight, not using any object for support, standing instead of sitting, or even standing on one leg. If you have already mastered those activities, you can keep moving by trying the following advanced exercises.

As always, please be sure to check with your physician or physical therapist before beginning any exercises. Your fitness level, your general health, and the condition of your residual limb will all play a role in how rigorously you can exercise. A qualified health professional can teach you how to stay within your target heart range.

## **Strength Exercises**

Strength is needed in each leg, your arms and your trunk (stomach and back). In addition to your legs, your stomach and back muscles play a crucial role in standing and moving. If your trunk is not strong, it will not be able to hold up to the demands you make on it all day every day.



### **Seated push up**

Place a stable chair against a wall to prevent it from tipping over. While sitting in the chair, place your hands on the armrests. Push down into the armrests to raise your hips one to two inches off of the seat and then rest. To make this more difficult, lift one leg.

### **Partial squats**

Hold onto a sturdy piece of furniture or the kitchen sink. Place even weight onto both legs, and simply squat as if you are sitting on a very tall stool. You're not working toward a full squat. Do this 10 times. Exercising the muscles of your thighs will make it easier to sit and rise from a chair.



### **Wall squat (More advanced)**

Stand with your back against the wall beside a sturdy piece of furniture in case additional support is needed. Slowly slide your body down the wall until your knees are slightly bent. To make this exercise more difficult, slide a little lower down the wall or do this on one leg. You can stand on your intact leg or your prosthetic leg. Hold this position for five to 30 seconds. Be sure to breathe the entire time you perform this exercise. Holding your breath is bad for your heart and your hemorrhoids! If your amputation is above the knee, you will need to do this exercise on your intact leg only since most prosthetic knees will not support your weight if there is too much bend in the knee.



### **Pelvic tilt**

While on your back, with or without your prosthesis, bend both hips and knees to 90 degrees. Place your hands on your thighs just above your knees, and flatten the small of your back

by pressing down with your stomach muscles. Do not allow your thighs to move. Hold this position for two to three seconds while breathing normally. This exercise strengthens the abdominal muscle (stomach).

You can make this exercise more difficult by lifting your head.



### ***Balance Exercises***

One of the most difficult rehabilitation activities is retraining you and your brain to accept weight into the socket of your prosthesis. To use your prosthesis and its foot and knee components to their fullest advantage, however, you must put all of your weight into the socket and use all of your leg muscles to control it. Though it will be difficult to learn to use your remaining leg muscles to balance on each leg while standing and walking, it will pay off in a smoother, less tiring gait.

### **Even weight bearing**

While standing in line, shaving, or brushing your teeth, think about how much weight you have on each leg. Do you stand with most of your weight on your unaffected leg? Many people with an amputation shift all of their weight onto the unaffected leg and use the prosthesis only as a perch. Stand with your weight evenly on both legs while performing one typical daily task, such as talking on the telephone. By increasing your awareness and changing this one simple habit, you can improve your balance on a daily basis.

### **All fours**

While on your hands and knees, begin by raising one arm in front of you. Put your arm down. Now try to raise a leg behind you. When you can do this with ease, raise your opposite arm and leg together, hold them for two to three seconds while breathing, and relax. Then switch sides. Keep your eyes down so that you don't strain your neck, and keep your back flat.



### **Kick ball**

Practice this fun exercise with a friend. While you are up against a wall or using a chair, alternate kicking a ball with one leg and then the other. Quickly changing the leg that you kick with will help improve your balance and coordination.

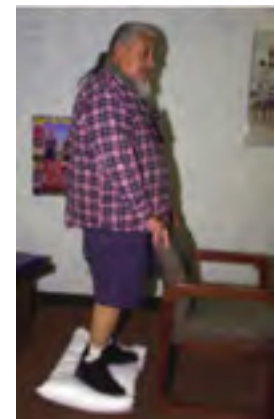
### **Hip lift**

If you don't use a prosthesis, or when you are not wearing one, be aware of how you hold your hip. If you tend to slouch, tighten the muscles of your standing leg to even out your hips.



### **Uneven surfaces**

A good way to work on your balance is to make the surface on which you are standing uneven. Place a pillow or cushion on a carpet and stand on it. You might want to rest your hands on a table top. For safety, be sure the pillow is on carpet and not a slick surface. Sway back and forth slightly or reach for something on the counter. You will need to tighten the muscles of your residual limb inside the prosthetic socket.



### ***Agility Exercises***

Once you have mastered balance activities, you will find that you are moving more easily. It is also likely that you will be doing more, and you may find that you occasionally need to move faster, slower, backwards or sideways. By practicing the following exercises and varying the speed and step length, you will improve your agility and accomplish tasks with more confidence.

## Braiding

Using the back of your couch for balance assistance, take a few steps to one side crossing your prosthetic leg in front of and then behind your unaffected leg. Stand as straight as you can and try to use your hands for balance only. If your amputation is above the knee, be sure to take small steps ensuring that you don't put too much weight on the toe of your prosthesis, which could cause the knee to bend.



## Circle

Walk around a chair in each direction.

## Ball toss

Do this exercise with a friend. If you are using a prosthesis and really want to challenge your balance, stand up to catch the ball. If you are not using a prosthesis or are just beginning this exercise, sit while you catch the ball. This exercise requires strength, coordination, balance and agility, and it's fun!



## Endurance Exercises

You have already been improving your endurance by working on your range of motion, strength, balance and agility. Every time you do an extra repetition, use a heavier weight, or spend more time exercising, you are improving your endurance. To focus more on endurance, you simply need to work a little harder and a little longer at the things you have already been doing. You might also add an aerobic activity. If you have access to a stationary bike, a treadmill, a rower or a pool, you can use it to improve your endurance. And, of course, there is always just plain walking. It is a good idea to seek the assistance of a health professional to determine your current level of fitness and your target heart rate (THR). You don't want to stress your heart too much or too little. Once you learn your THR and how to take your pulse, you will be able to do effective endurance activities with confidence.

## Stationary bike

If you have a stationary bike, get on it! Stop using it as a clothes rack. You can ride a bike with one leg. It would, however, help to have a strap to hold your foot in place. If you cannot get on your bike, how about placing it on a table top, sitting behind the table, and moving the pedals with your hands?

## Conclusion

If you are interested in doing more exercise or have specific concerns, a physical therapist who has experience working with people with amputations can help you. If, on the other hand, your needs are more general and you would like to exercise at home, several books and videos can be purchased through the ACA to help you.

If you can set a goal, break it down into small bits, and make exercise a part of your daily plan, you will find that it becomes a good habit. Set aside some time each day to work on one of these activities, get a friend to join you, play some music and have some fun. Applaud your efforts, great and small, and you will keep moving. ❖