



amputee
coalition™



**Preventing and Caring for the
Secondary Conditions of Limb Loss**

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ABOUT THE AMPUTEE COALITION

The Amputee Coalition is a national donor-supported, nonprofit health organization serving the over 5.6 million people who have limb loss and limb difference in the United States.

For more information, please call 888-267-5669 or visit [Amputee-Coalition.org](https://www.Amputee-Coalition.org).

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● INTRODUCTION TO PREVENTING AND CARING FOR THE SECONDARY CONDITIONS OF LIMB LOSS

Martha, a lower-limb amputee, started having back problems soon after losing her leg in an accident. She routinely develops skin problems on her residual limb and is having problems with bone density and muscle loss. Due to these problems, she has stopped walking and has put on 70 extra pounds. As a result of her health and mobility problems, she is often depressed, has low self-esteem, and has been diagnosed with diabetes.

Though Martha is a fictional character, her case demonstrates some of the real problems people with limb loss face. In fact, losing a limb or limbs can be the beginning of a host of other issues, including pain, depression, low self-esteem, additional amputations, diabetes, circulatory problems, cancer, skin irritation and breakdown, back and hip problems, bone density and muscle loss, heart problems and obesity.

“To avoid many of these problems, the prosthetist must first ensure that the prosthesis is optimal in terms of fit, alignment and appropriate componentry so that the individual has the potential to return to ‘as normal a state as possible,’” says Robert Bedotto, PT, CPO.

“Unfortunately, even in a well-fitting prosthesis with the best components, activities are more difficult for people with limb loss, and the total body is affected. Therefore, as prosthetists, we have not achieved our goal simply because patients are walking well on their prosthesis and returning to a ‘normal life.’ I suggest that true rehabilitation has only just begun.”



Diabetes, Circulatory Problems and Cancer

Many of the secondary conditions that can result from limb loss are caused by a poor diet and a sedentary lifestyle. To the extent that limb loss causes an amputee to become less active, it may also increase his or her risk for these problems. It is essential, therefore, that amputees who might be prone to a sedentary lifestyle remain active through regular exercise or participation in sports programs. Many amputees participate in able-bodied exercise and sports programs, and there are numerous amputee-only programs. (For information on such programs, please contact the Amputee Coalition.)

Before beginning any new exercise program, it's important to talk with a doctor. If desired, a physical therapist (PT) who has experience with amputees can also help you design an exercise program that fits your needs.

Skin Irritation and Breakdown

For amputees who wear prostheses, the skin of the residual limb is especially susceptible to irritation, breakdown and infection as it is stretched, pulled and rubbed by the

prosthetic socket. Friction, heat, pressure, shear and moisture within the socket combine to bring about damage to the skin. As with shoes, a properly fitting prosthesis is essential to preventing this painful problem. Unfortunately, swelling, weight fluctuations and muscle changes caused by atrophy, disease and loss of soft tissue can all affect the size of the limb and the fit of the prosthesis. In fact, the volume of the limb can even change throughout the day as the amputee walks around. Although they will not solve the problem completely, a proper diet, regular exercise and the maintenance of muscle tone and weight can help minimize these fluctuations.



Skin damage also can result from the use of certain detergents to clean the residual limb and the use of certain kinds of topical medications inside the socket.

Ultimately, attention to hygiene and skin care is essential. “There are a few basic rules for skin care, the first of which is cleanliness,” says Paddy Rossbach, RN. “If you wear a prosthesis, your residual limb is encased in a completely or partially airtight socket that does not breathe or allow sweat to evaporate. Sweat is acidic and salty, and when it is allowed to dry, it forms tiny crystals (like sandpaper) on your skin. If this sweat is left on the skin and socket, bacteria can grow. If the skin is broken, infections may occur and can become severe if left untreated.” She warns: “Always consult your physician or prosthetist if sores or blisters erupt because they could lead to ulcers and serious infections. If you have diabetes or circulatory disease and have anything more than a mild rash, consult your physician immediately.”

Although cleanliness is essential, the details of how it is achieved may vary depending on your specific condition and the type of prosthesis you use. “A mild antibacterial soap is usually preferred for the residual limb, and manufacturer’s instructions should be followed for cleaning sockets or socket interfaces,” says Rossbach.

“Fungal infections occur even more frequently than bacterial infections and lead to quick skin breakdown,” explains Terrence P. Sheehan, MD, medical director for the Amputee Coalition. “Fungus loves moist, dark places like the environment inside a socket and liner, especially in people with diabetes. If you have one of these infections, see your doctor immediately.”

One thing is essential – amputees should pay attention to any pain in their residual limb. If any kind of problem is detected, it should not be ignored.

Back and Hip Problems

Back and hip problems caused by the stress and strain of walking with an improper gait, using prostheses, or using crutches are sometimes even more of a problem for amputees than other types of pain.

“Lower-limb amputation causes a change in the center of gravity, disrupting the biomechanical symmetry of the back and hips,” explains Dr. Sheehan. “The joints of the lower back and sound limb are stressed and muscles are used abnormally. This often leads to chronic pain, a propensity to repeated acute spasm and strain, and acute inflammatory processes such as bursitis.”

“These pain syndromes are not inevitable, however,” Dr. Sheehan continues. “If the amputee’s prosthesis fits well and is aligned correctly, he or she can approach the goal of a normal gait. It is also important for people with limb loss to continue the exercise and stretching that their physical therapist trains them to do,” Dr. Sheehan adds. “With a good gait pattern and regular exercise, pain can be minimized and perhaps even avoided.”



Although back problems in amputees are not always related to their gait or their prosthesis, it is important that PTs and prosthetists deal with any such problems that they can alleviate through proper prosthetic fit, more appropriate components, or gait training. In addition, the patient should learn about good body mechanics to avoid as many problems as possible. A physiatrist and a chiropractor can help.

“Many patients don’t understand why their backs hurt,” explains Bill Sheppard, DC, a chiropractor and belowknee amputee. “X-rays sometimes show misalignment of their back, and usually one side is rather high or rather low because of the improper fit of the prosthesis or just simply because their stump has shrunk or increased in girth. This can easily change the God-given anatomical leg length of the amputee, resulting in improper biomechanics and eventually back pain.

“Medicine can only do so much, and you can’t take it for long periods of time,” Dr. Sheppard explains. “Chiropractors understand human biomechanics and concentrate on healing the body naturally with techniques like stretching, muscle-strengthening and spinal alignment.” These are a good addition to medicine, Dr. Sheehan notes.

Dr. Sheppard also uses modalities such as electrical stimulation, heat therapy, traction and spinal adjustments to take pressure off of disks and nerves and to relax muscles. He also suggests some nutritional supplements such as glucosamine sulfate and omega-3 fatty acids, which he says can help with lower back pain, help regenerate cartilage, lubricate joints and help with inflammation.

The most important thing above medicine, chiropractics and physical therapy, Dr. Sheppard stresses, is general health. “A lot

of people just don't know how to exercise properly," he explains. Although he helps patients devise exercise regimens, he says the hardest thing is getting them to follow them.

Bone Density and Muscle Loss

Bone density and muscle loss can be problems for anyone who is inactive. "After amputation, there are specific muscles that remain but are not used as they had been. This disuse of the muscle leads to shrinkage," explains Dr. Sheehan. "The bone also needs to be stimulated, such as when the muscle pulls on the bone or when we bear weight through the bone. If this does not happen, the bone gets thin (osteoporosis) from 'disuse.'"

There are specific bone scans and X-rays that are used to evaluate a person's osteoporosis, and specific medications and nutritional supplements that are currently recommended for it. The primary care physician, the physiatrist and the physical therapist can be especially helpful with these issues, but the best solution is to avoid the problems altogether if possible.

Sufficient exercise is one component of the solution, explains Bedotto, and proper technique and frequency are important.

"One of the best ways to develop strong bones is to do weight-resistance training," Dr. Sheppard says. "Not only can weight training help amputees build up their general health, it also can help them build up their self-esteem and body image. Weight training just makes everything better."

Heart Problems

Because amputees generally use more energy to walk than those who don't require assistive devices, good overall physical health is essential for them.

For some amputees, the problem is even more severe, explains Dr. Sheehan. "For many amputees, loss of a limb is part of a larger problem with the blood vessels, including the blood vessels to the other major structures like the heart. If the heart is not functioning well, all efforts will take more energy and the stress of ambulating with a limb difference can exacerbate the heart problems."

The primary care physician, the cardiologist, the physiatrist and the PT can help with these issues through assessment, proper medication and physical training to help the amputee develop the stamina needed to handle the added strain of walking with assistive devices.

Obesity

“Obesity in America is probably the most serious health hazard we face, and the most costly,” says Bedotto. “Hip and back problems, cardiac problems, diabetes and various other problems are all affected by obesity and, in some cases, obesity may even be their cause.”

“If the amputation has led to decreased activity, weight gain often follows,” says Dr. Sheehan. “The obesity causes further stress to the heart and other systems, and weight gain changes the custom fit of the prosthesis.”

Diet and exercise are, of course, the main solutions to this problem – but it is a vicious cycle. Weight gain exacerbates existing problems and causes new problems, making it more difficult for the amputee to exercise and leading to even more weight gain.

Amputees must take the condition seriously and should, if necessary, seek the help of a nutritionist, primary care physician and physical therapist.

Medication Side-Effects and Reactions

Amputees with these additional problems also may end up having to take a lot of

medications. In addition to side-effect risks, some medicines may cause harm when used together or even when certain foods or herbs are used along with them. Eating something as seemingly innocuous as onions can be hazardous if one is taking blood-thinning medication. Some combinations can even be fatal. Unfortunately, the pharmacist and the doctor often have no warning that the patient is at risk because they don’t usually know what the patient eats and drinks or what herbs and supplements he or she is taking.

To avoid any of these potential dangers, patients should be proactive and ask their pharmacists about any side-effects and interactions of the medications they are taking.

Prevention and the Rehabilitation Team

“Prevention is the key to good health and longevity and also is the most economical in the long run,” says Bedotto. “For every dollar spent on rehabilitation, there is a tremendous savings not only in dollars but in human suffering.”

To prevent or repair most of the secondary conditions caused by limb loss, patients need to be aware of the risks and work with their

rehabilitation team to address each of them, explains Dr. Sheehan. “First and foremost is education of the amputee and their significant supports. It is in this collaboration with the amputee that proper care of the body, such as

training with the physical therapist, treatment by the physician, and strong communication with the prosthetist, can lead to maximizing functional outcomes.”

Note: This article is intended for educational purposes only. For specific advice regarding your health, you should contact a doctor or other appropriate medical professionals.

For more information on the secondary health conditions of limb loss and how to prevent or treat them, call the Amputee Coalition at 888/267-5669 or visit amputee-coalition.org.

The Amputee Coalition’s quarterly magazine, inMotion, often includes information on secondary conditions related to amputation. To receive a free subscription to the magazine, call 888/267-5669 or visit amputee-coalition.org.

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