

# Secondary Conditions Related to Prosthetic Users and Ten Steps to Reduce the Risk of Injury

by Robert Gailey, PhD, PT

The majority of people with limb loss or deficiency have an active and satisfying quality of life. Approximately 68 to 88 percent of amputees wear a prosthesis at least 7 hours a day to aid in mobility and performing everyday activities. The vast majority of amputees who use a prosthesis tend to walk with at least one deviation or problem as a result of improper prosthetic fit or alignment, lack of proper gait training, development of poor habits or compensation for a physical limitation. As a result, an increased load or weight is often placed on the intact limb due to the altered walking pattern, which in turn often causes discomfort or pain in the joints and may result in some form of degenerative joint disease or disability. Three of the most common secondary complications in lower-limb amputees due to compensatory and/or altered stresses are osteoarthritis, osteoporosis and back pain.



Osteoarthritis is the most common form of arthritis. It causes pain, swelling and reduced motion in the joints as the result of a breakdown of the cartilage in the joints. Cartilage is the slippery, shock-absorbing padding that covers the end of the bones in the joint. About 20 percent of the general population has osteoarthritis of the knee or hip due to age, excess weight or joint injuries. Research indicates that 40 percent of people with a single below-knee amputation have osteoarthritis in the sound (intact) knee. Even worse, 60 to 75 percent of people with an above-knee amputation have osteoarthritis in the sound knee. A recent study reported that 80 percent of people who have used a prosthesis for more than 45 years will have knee pain. Osteoarthritis in the sound side hip occurred in about 45 percent of below-knee amputees and 73 percent of above-knee amputees within an average of 47 years after the amputation. An average of 18 percent of all amputees had osteoarthritis in the amputated side hip.

Osteoporosis is a condition where bone density is decreased, increasing the risk of fractures. In the general population, 10 million people have osteoporosis and another 34 million people are at risk – 68 percent of these combined groups are women. Risk factors include family history, gender (women are at greater risk), age, low calcium, smoking and not getting enough physical activity. For people with limb loss, the reduction in weight-bearing through the bones on the amputated side limb becomes an additional risk factor. In fact, 80 to 90 percent of all long-term prosthetic users have a reduction of approximately 30 percent in bone density in the amputated side hip. There appears to be a relationship between amputees' age at the time of amputation and the time they were examined by the doctor. However, there was no correlation to bone density with residual limb length or the length of time after amputation. Additionally, no research suggests that people with limb loss experience a greater number of hip fractures than the general population.

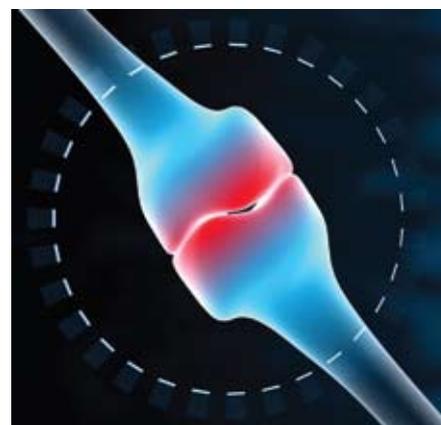
Low back pain is very common in the general population. It is estimated that 70 to 85 percent of all people experience back pain at some point during their life, and 15 to 45 per-

cent report having back pain each year severe enough to prevent normal activity. People with limb loss have been found to have significantly more low back pain. Approximately 50 to 60 percent of amputees will have moderate to severe back pain. The majority of people with limb loss experience back pain within 2 years after their amputation.

Although the information presented in this article may suggest that the loss of a limb will result in a lifetime of medical problems, studies show that the majority of amputees who lose a limb early in life go on to live long and productive lives. The new generation of people with limb loss positively appears to have higher expectations concerning their performance of daily tasks and recreational activities. They want to work, play and live life without limitations, enjoying the benefits that can come with increased activity, such as better general health and overall well-being. However, as activity increases and is sustained over time, there should be a concern for long-term effects to the body. For example, will amputees who are more active during their youth and early adulthood pay the price in later years with respect to increased risk of degenerative joint changes to the sound limb, the remaining joints of the amputated limb, or the spine? Although the risk of degenerative joint disease and low back pain does increase after amputation, there is little evidence to suggest that the amount or type of activity increases the risk of secondary conditions after amputation. Therefore, it is suggested that prevention is the best treatment for those who will be using a prosthesis for many years. The 10 steps listed on this page are suggestions that you may follow to help reduce the risk of complications related to limb loss. ■

### 10 Steps to Reduce the Risk of Injury

- 1) Be sure that your prosthesis fits correctly at all times.
- 2) Be sure that your prosthesis and sound limb are of equal height; avoid having your prosthesis shortened.
- 3) Walk with an equal width of walking base and don't favor your sound leg.
- 4) Avoid hopping excessively on your sound



limb when not using your prosthesis. Use crutches around the house when not wearing your prosthesis.

- 5) Stand with equal weight distributed between limbs; avoid favoring your sound limb.
- 6) Maintain good posture while sitting or standing.
- 7) If pain is present, use a cane to reduce excessive stress to the knee or back.
- 8) Maintain a nutritious diet and retain your appropriate body weight.
- 9) Exercise regularly, incorporating a strengthening, stretching and cardiovascular endurance program, with your doctor's permission
- 10) Maintain a regular appointment schedule with your doctor, prosthetist and physical therapist.

### Related Resources

#### Arthritis Types – Overview

[www.cdc.gov/arthritis/arthritis/osteoarthritis.htm](http://www.cdc.gov/arthritis/arthritis/osteoarthritis.htm)

#### Bone Health and Osteoporosis

#### Chapter 4: The Frequency of Bone Disease

[www.surgeongeneral.gov/library/bonehealth/chapter\\_4.html](http://www.surgeongeneral.gov/library/bonehealth/chapter_4.html)

### About the Author



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