Limb loss is a physical and psychological trauma that has a profound influence on the life of an amputee. Providing comprehensive rehabilitation services and programs to individuals recovering from amputation is, therefore, a complex process. It is generally recognized that a multidisciplinary team approach is required to address the individual’s functional, emotional, social and psychological needs.

St. John’s Rehabilitation Hospital, Toronto, Canada, is a leader in rehabilitation programs for individuals recovering from amputations, burns, multiple trauma injuries, complex orthopedic conditions, organ transplants, stroke and heart surgery. Amputee patients receive therapy from a team of professionals, including a physical therapist, occupational therapist, psychologist, social worker, nurse and other medical specialists. In the past few years, however, it was recognized that there was a missing element in the rehabilitation services being provided. In response to this need, massage therapy was integrated into the amputee rehabilitation programs to provide the “missing link.”

What Is Massage Therapy?
Massage therapy is used to prevent and treat physical dysfunction and pain through applying various manual techniques to the soft tissues of the body (muscles, connective tissue) and joints. It is recognized as a noninvasive therapy, which, when applied by a trained licensed massage therapist, can have a number of highly beneficial effects.

What Are the Benefits of Massage Therapy?
Massage therapy is supported by research to have a number of interrelated physical and psychological benefits, many of which are frequently indicated as rehabilitation goals. These benefits include:

- Reduced swelling
- Increased circulation
- Less muscle stiffness
- Reduced scar tissue tightness
- Reduced spasms
- Increased muscle length
- Less pain
- Decreased anxiety and stress
- Longer sleep
- Increased relaxation.

Common Amputee Conditions Treatable by Massage Therapy
Every amputee is unique in his or her history and particular symptoms, depending on a variety of factors, such as age, health status, cause of amputation and current stage of rehabilitation. A massage therapist takes the patient’s full history, assessment findings, and rehabilitation goals into account before discussing the appropriate treatment plan with the patient. A trained massage therapist with a thorough knowledge of anatomy and physiology can improve any of the following conditions commonly experienced by amputees.

Phantom Pain. Phantom pain is unique to amputees. It is the subjective sensation of pain, not arising from an external stimulus, felt in the part of the limb that is no longer there. Research suggests that 70 to 80 percent of amputees experience phantom pain. Most report it immediately after surgery, although studies indicate that 40 percent may experience phantom pain a year or more afterward. Phantom pain has been described using a variety of terms, including burning, stabbing, twisting, cramping, crushing and throbbing.
Massage treatment has had varying results in reducing reported phantom pain. For some, it has been a great source of relief; for others, it has had little effect. It is often cited in amputee rehabilitation textbooks that noninvasive techniques such as massage therapy increase sensory input from the residual limb that may override the brain's perception of pain, providing temporary or partial relief of phantom pain. How this is achieved depends on each individual and the massage therapist's ability to locate areas where the patient reports a change in the level of pain. Treatment may consist of directly massaging the end of the residual limb or the muscle and soft tissues above the amputated area. A more general massage approach may also be appropriate, with the goal being to reduce stress and anxiety, which are recognized as increasing the intensity or frequency of pain.

**Residual Limb Pain.** Residual limb pain is the pain felt in the remaining portion of the affected limb after amputation. The causes of residual limb pain are numerous and include tissue damage during surgery, poor prosthetic fit, an unprotected neuroma, rubbing of the skin, and joint dysfunctions. Additional causes or contributing factors are swelling, poor circulation, adhered scars, muscle spasms or referred pain (pain felt in an area of the body that is not the actual source of the pain). All of these can be effectively treated with massage therapy.

**Hypersensitivity.** Many amputees have highly sensitive residual limbs that cause discomfort and pain and limit their ability to use their affected limb. Massage therapy is an effective method of reducing hypersensitivity and its associated pain and discomfort.

**Muscle Tightness, Stiffness and Spasms.** Amputees often experience pain in muscles and joints that are not directly associated with the area of amputation. These areas are called compensatory structures because they are required to perform additional functions to compensate for limitations resulting from the amputation. This imbalance in muscle activity often results in muscular tightness, stiffness and spasms, which may be manifested in the following ways:

- **Upper-extremity amputees often develop carpal tunnel or related symptoms in their unaffected hand due to their increased dependence on it to do everything they used to do with their other hand.**
- **In lower-extremity amputees, weight distribution during standing and walking is often shifted to the unaffected leg, and alterations in posture and biomechanics are very common. As a result, lower-extremity amputees often suffer from persistent low-back pain.**
- **Development of muscle tightness and spasms with the use of prostheses is very common due to the demands placed on the muscles to perform new activities and to carry the added weight of the prosthesis.**
- **During recovery from amputation, muscles and joints may be kept in one position to ensure wound closure or healing of bones. This can result in contractures (permanent tightening or shortening of muscles, which causes stiffness of the involved joints). Contractures occur frequently in joints above an amputation site, restricting the range of motion and potentially leading to complications such as gait deviation, poor prosthetic fit and the inability to use a prosthesis.**
- **Headaches are a very common symptom reported by amputees and can be caused by such things as medication side-effects, poor sleep, stress, dehydration, or referred pain resulting from muscle tightness at “trigger points” in the head, neck and shoulder muscles. By decreasing the muscle tightness and related soft-tissue restrictions through massage therapy, headache symptoms can be managed or eliminated.**

It is necessary to determine the possible cause of muscular restrictions and reported pain to develop an appropriate treatment plan. The massage therapy treatment may consist of trigger point therapy, joint mobilization, and specific massage techniques to address areas of sensitivity and its associated pain and discomfort. The massage therapy plan. The massage therapy treatment may consist of trigger point therapy, joint mobilization, and specific massage techniques to address areas of sensitivity and its associated pain and discomfort.

**Scar Tissue.** Many amputees have scar tissue in the affected limb associated with surgery or the original injury. Scar tissue is tougher, less elastic and often thicker than normal skin and muscle. Due to its restrictive characteristics, scar tissue can have a negative effect on adjacent tissue, resulting in stiffness and/or pain. Itching and sensitivity of scar tissue is also common and can interfere with wearing a prosthesis or reduce the range of motion of affected joints. Scar tissue massage is highly recommended to reduce tightness, stiffness, pain and itching and to increase the range of motion of affected and surrounding joints.

**Swelling.** Swelling (edema) in the residual limb is common, especially after surgery.
drastic atmospheric pressure changes, or wearing a prosthesis for a prolonged period. The swelling, caused by excess fluid, can exert pressure on internal structures, resulting in tingling, numbness or pain. Swelling can also alter the fit of a person’s prosthesis and limit his or her ability to wear a prosthesis comfortably. A massage therapist can apply specific techniques that effectively reduce swelling, such as manual lymphatic drainage (a specialized form of very light massage that helps to move fluid from the end of the limb toward the trunk of the body).

**Poor Blood Circulation.** Good blood circulation is very important since it is the source of nutrients (food and oxygen) to all tissues. Amputation results in reduced use of the directly affected muscles and a consequent loss of “muscle pump” action that helps blood flow in and out of the area. Poor circulation also results in a cold residual limb, which is often associated with pain and increased phantom pain. Massage therapy is recognized for its ability to increase local circulation in the area being massaged.

**Massage Therapy: Beneficial for Mind and Body at Any Stage**

Massage therapy can be of great benefit to amputees, whether as a preventive or maintenance measure or as an integral element in the various phases of rehabilitation. It is highly recommended that amputees receive massage therapy in conjunction with beginning prosthetic training and ongoing prosthetic use. This can help prevent muscle strain, tightness and related pain symptoms that may develop due to alterations in posture and biomechanics and the new demands placed on the muscles directly and indirectly involved.

Massage therapy can produce short-term or long-term relief from a variety of symptoms. It is important to stress that even short-term relief can have a huge positive effect psychologically. A number of studies suggest that massage therapy is also highly effective in reducing stress and anxiety and in increasing sleep duration—all important factors that can affect an amputee’s quality of life.

**Related Resources**

- American Massage Therapy Association
  www.amtamassage.org
- Canadian Massage Therapist Alliance
  www.cmta.ca/index.htm
- Harvard Medical School Division for Research and Education in Complementary and Integrative Medical Therapies
  www.osher.hms.harvard.edu
- International Massage Association
  www.imagroup.com
- National Certification Board for Therapeutic Massage and Bodywork
  www.ncbtmb.com
- Touch Research Institutes
  www.miami.edu/touch-research

**About the Author**

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Upon completing her BS in Biology from the University of Ottawa and further studies overseas, Anna Kania completed the Massage Therapy Diploma Program in Toronto, Canada. She currently works at St. John’s Rehabilitation Hospital as a (Registered) Massage Therapist as part of a multidisciplinary team in the treatment of complex trauma patients, amputees and burn survivors. Kania actively shares and promotes her passion about the value of integrating massage therapy into healthcare and rehabilitation programs. You may reach her by e-mail at akania@stjohnsrehab.com or call 416/226-6780, ext. 7058.

American Massage Therapy Association
www.amtamassage.org

Canadian Massage Therapist Alliance
www.cmta.ca/index.htm

Harvard Medical School Division for Research and Education in Complementary and Integrative Medical Therapies
www.osher.hms.harvard.edu

International Massage Association
www.imagroup.com

National Certification Board for Therapeutic Massage and Bodywork
www.ncbtmb.com

Touch Research Institutes
www.miami.edu/touch-research