



Healthy Living for Amputees: Addressing the Physical Realities of an Upper Limb Amputation

The one thing that we know as amputees is that our amputation(s) has an effect on all areas of our lives. In this document, we highlight many of the *physical* ways amputation impacts our lives and present some solutions to help deal with these realities. The following list is not an exhaustive one, but it does cover many key areas:

- Getting the Most From an Artificial Arm
- Overuse or Repetitive Strain Injuries
- The Importance of Weight Control
- The Importance of Physical Exercise
- Perspiration – No Sweat!
- Caring for Your Residual Limb – Skin Care and Hygiene
- Pain and Phantom Limbs
- Back Concerns and Care

Not all these issues will impact the lives of all amputees. Some may never be an issue for you. It is our goal here to ensure you are well informed of all the issues in order to be able to live as healthy, productive, and limitless life as possible.

Getting the Most From an Artificial Arm

It is important for amputees who are fitted with upper limb prostheses, and their parents, to know that an amputee does not immediately know how to use a prosthesis to its ultimate benefit for all

tasks. Learning to get the most from an artificial arm takes practice, and the parents of young amputees need to work with them to help teach them what they can do with a prosthesis.

When it comes to upper limb prostheses, amputees need to see that the prosthesis is providing actual functional benefit to them, or else they will not perceive any value in wearing a prosthesis and they will reject the fitting. This is different for users of artificial legs because the benefit of walking with a lower limb prosthesis – to get you from point A to point B – is obvious. This is not necessarily the case with upper limb prostheses right away. For some, who like to wear a prosthesis primarily for cosmetic reasons, the functional aspect will not be as imperative. However, young children do need to have that sense of the device actually being useful to them.



The fitting of an upper limb prosthesis involves a clinic team. Once the prosthetist has provided the fitting, the amputee begins work with an occupational therapist (OT). The OT teaches the amputee how the prosthesis can function for many basic tasks and later more advanced ones. We also suggest that whenever possible, the parents consult with the OT to come up with activities and tasks that parents and the child can work on at home to encourage use of the artificial limb. For example, simple tasks such as holding food or a toy in the terminal device will impress upon the child the benefits of including the artificial hand in daily activities.

It is important to remember that no upper limb prosthesis available comes close to replacing the function of a sound hand. The prosthesis serves as a “helper” – never as a dominant hand unless it is a case of bilateral upper limb amputation – and the amputee must learn to use the prosthesis in that helping way.

Generally, amputees who are first fitted with an artificial arm need to build up tolerance to wearing the prosthesis. Oftentimes, the amputee will start out by wearing the limb for short periods of time, or for certain activities. Wearing time is gradually increased. As already mentioned, the benefits of the artificial limb must become evident for the amputee to continue to wear it. If there are no real benefits to wearing the artificial limb, there is a greater likelihood the amputee will reject it.



Overuse or Repetitive Strain Injuries

For upper limb amputees, overuse or repetitive strain injuries may become an issue. For the single arm amputee, it is very obvious that the amputee will use the remaining sound hand so much more. Because the sound hand does more work, it is understandable that over time the amputee *might* develop overuse problems.

A common overuse injury, and one we know of amputees requiring treatment for, is carpal tunnel syndrome. The Mayo Clinic Health Letter describes Carpal Tunnel Syndrome in this way:

“The carpal tunnel is a passageway under the carpal ligament that contains the median nerve and tendons that bend your fingers. Prolonged flexion or extension of your wrists can cause swelling of membrane linings around tendons. Swelling reduces the size of the carpal tunnel and compresses the median nerve. The result is numbness, tingling or pain in your wrist, fingers or forearm.”

Treating an overuse injury can be as easy as taking over-the-counter pain relievers and stopping for rest at the first sign of pain. The further an injury progresses, the more aggressive the care. Treatment can include applying heat or cold, taking non-





steroidal anti-inflammatory drugs or prescribed medications or corticosteroid injections, stopping an activity, immobilizing the injured area with a splint, physical therapy, and surgery as a last resort. Diagnosis and treatment, of course, always begins with a doctor.

This information is not meant to alarm the upper limb amputee, but rather encourage the amputee to consider how to help alleviate extra strain on the sound limb. Amputees can use other devices, such as a prosthetic device or daily living aids, to help with certain tasks, and even develop other techniques for certain tasks so the sound hand does not have to do everything. All of these ways of “helping” the sound hand can potentially add up to enough relief to prevent overuse injuries.

In *Reintegration and Adjustment As Seen by the Amputee*, Cliff Chadderton sums it up like this:

“A long time study of these problems by The War Amps indicates that while the development of such after-effects is inevitable, it can be slowed, and possibly the effect can be lessened, if the amputee, and those responsible for his/her care, will take necessary precautions to ensure he/she has a properly fitting prosthesis [and] it goes without saying that if the amputee can initiate and maintain a program of physical exercise, designed to develop the non-amputated part of the body and the inter-related muscles, ligaments and tendons, the incapacity of such sequelae can be minimized.”

The Importance of Weight Control

In determining the appropriate weight goal for an amputee, usual weight-to-height ratios do not apply because an artificial limb actually weighs less than a human limb. Besides the simple fact that it is overall a good health practice, maintaining a healthy weight is of additional importance for amputees who wear prostheses. A change in weight of just five lb. can make an artificial limb uncomfortable to wear. A change in weight of ten lb. or even less can mean a new socket is needed. Doctors and dietitians agree that the best way to get to and maintain a healthy weight is to eat well-balanced meals and to exercise regularly.

The Importance of Physical Exercise

Everyone should get physical exercise, but why is it particularly important for amputees to exercise regularly? Simply put – because amputees use more energy in day-to-day activities and they need strong muscles to tolerate the weight of a prosthesis and to operate it.

Amputees need a combination of *strength* training and *cardio-vascular* training. Strength training builds up your muscles while cardio-vascular training helps you use oxygen better and improves your heart and lungs. There are countless programs, books and resources on exercise that can be applied to amputees. Amputees develop unique ways to take part in exercise programs or sports – working with therabands or weights is a good way to strength train, while activities like swimming, cycling, running or even walking provide good cardio-vascular training.

Perspiration – No Sweat!

Perspiration is the way the body controls its temperature. Doing any activity uses a certain amount of energy. This energy creates heat in the

body. This heat escapes the body as perspiration. Once the body perspires, air circulates over the body cooling it and drying up the perspiration.

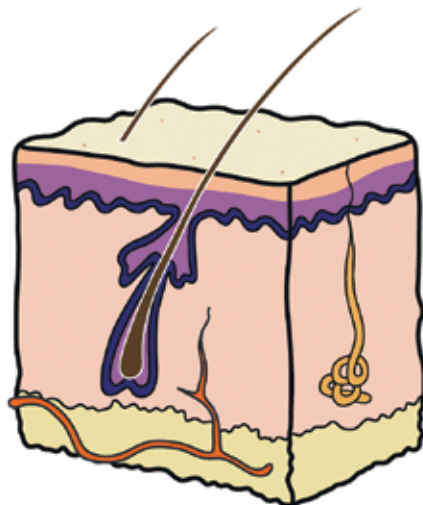
It is regularly observed that amputees seem to perspire more than people without amputations. The reasons for this are numerous:

- Amputees have less skin surface – skin partially controls body temperature as it is the means of perspiration leaving the body, and because the amputee has less skin surface, the remaining skin surface compensates by perspiring more. This is particularly evident with amputees missing several limbs.
- The residual limb is enclosed in a prosthetic socket so the perspiration that results cannot get exposure to air to dry and evaporate so it rests in the socket against the skin.
- Socks or crutches even hinder the release of perspiration in the areas of your large sweat glands under the arms.

Perspiration can lead to problems such as general discomfort, skin abrasions from pistoning inside a perspiration-soaked socket, bacteria growth, and odour.

There are steps amputees can take to limit and control the effects of perspiration (more on this under *Caring for Your Residual Limb – Skin Care and Hygiene*):

- Clean the residual limb and socket.
- Certain properties of residual limb or stump socks can help. The different types of fabrics that socks are made of provide different benefits. A few particular materials are: Silicones, which provide good cushioning



of the residual limb and may help control perspiration; Coolmax fabric by Dupont, which provides a cooling effect by wicking the perspiration away from the skin (it's used in some socks by most prosthetic companies now); X-static material is made with a layer of pure silver which naturally inhibits the growth of bacteria. Whatever kind you use, using clean socks every day and even changing them during the day if necessary will help.

- Some amputees find removing the artificial limb part way through the day to clean the socket and residual limb helps prevent sores. This is because perspiration build-up in the socket causes the residual limb to piston in the socket leading to friction and thus sores.
- There are a large number of over-the-counter products that can be used to help control perspiration – some amputees use an antiperspirant on the residual limb – some of the ones mentioned to us include: Secret Platinum, Pure & Natural Crystal Deodorant Stone, Drysol (a behind-the-counter product). Some products like AXE deodorant, Right Guard Extreme and Adidas spray or gel are preferred for their ease of handling. Dehydral is an antiperspirant/antibacterial cream. Some prosthetic companies have their own products to address this issue, such as the ALPS spray.
- For severe cases of hyperhidrosis (extreme perspiration), a Drionic unit may be used. It is an electronic device that gives small electrical shocks to the skin to close up perspiration ducts. Botox injections in problem areas may also be suggested, which will disrupt nerve signals to the sweat glands.

Products to specifically address odour associated with perspiration build-up in prosthetic sockets include:

- ProstheCare spray – by Cascade Orthopedic Supply, available through your prosthetic centre
- Benefect spray – by Sensible Life Products

- Xzuber cream – by JMG Products
- Natural Liquid body Powder (goes on as a lotion and dries as a powder) – by Trulife Limited, available through your prosthetic centre

Caring for Your Residual Limb – Skin Care and Hygiene

Occasional skin problems on the residual limb are a part of life for amputees who wear prosthetic devices. Skin problems can result for several reasons:

- Perspiration builds up in the socket which causes friction, and that friction leads to abrasions.
- Prosthetic sockets apply pressure that the skin was just not biologically designed to tolerate, so the pressure, friction and shear forces break down the skin.
- The moist, warm environment of a prosthetic socket is a perfect breeding ground for bacteria which cause skin problems.
- Sockets are made from plastics, resins, and other materials that might cause skin irritations or allergic reactions.

The skin usually fights bacteria through normal drying of perspiration by the air and from acids that the oil glands secrete. The normal drying action is prohibited when the residual limb is enclosed in an airless socket. Moisture gets trapped inside and some bacteria actually grow more rapidly in such moist environments.

Some problems amputees experience are edema (swelling), dermatitis, cysts, folliculitis, fungal infections, eczema, scars and ulcers.

There are many lotions and creams to address minor skin irritations and abrasions. Some simply help *moisturize and condition* the residual limb and protect it from irritation:

- Creams and lotions with vitamins A and E – available at your drugstore
- Uremol (with urea as the active ingredient) – available at your drugstore
- Wellskin Moisturizer – available at your drugstore
- ALPS Moisturizer or Prosthetic Ointment (with vitamins A and D) – by ALPS South Corporation, available through your prosthetic centre
- Easy Donn (with conditioners and essential oils) – by Cascade Orthopedic Supply, available through your prosthetic centre
- EDAP (only available through prosthetic centres) contains vitamins A, E and D; ADAPTSKIN, a product made by an amputee from his personal experience – by Adaptlabs



Many products have medicinal or antibiotic properties to help heal sores or abrasions. The first four bulleted items refer to over-the-counter products available at drugstores:

- Bactroban, Polysporin or Ozonol
- Products containing Aloe Vera
- Gold Bond medicated powder contains zinc oxide, talc, and menthol
- An antihistamine cream can relieve a pink rash that usually results from heat and moisture over the residual limb
- Products by prosthetic manufacturers such as Derma Repair by Otto Bock Healthcare – available through your prosthetic centre

- Prescription products (e.g., Lotriderm that contains the healing agent Betamethasone) – requires a doctor's prescription

Products that protect areas against friction and shield blisters or abrasions while they heal include:

- Mineral or baby oil around and under the edge of the liner – available at your drugstore
- Derma Prevent (a lubricant which dries on the skin to provide an invisible layer of protection) – by Otto Bock Healthcare, available through your prosthetic centre
- ALPS Skin Lotion (a silicone lubricant) – by ALPS South Corporation, available through your prosthetic centre
- ChafeZone (a stick product similar to a deodorant stick) – available through SportMeds Inc.
- Second Skin (medicated gel sheets which are covered by adhesive) – by Spenco, available at drugstores or sporting goods stores
- OpSite and Cica-Care (gel sheets which are covered by adhesive) – by Smith+Nephew, available through your prosthetic centre

For serious or persistent skin problems, it is important to always consult a doctor.

Taking care of your residual limb and socket of your artificial limb is a daily requirement for all amputees. As the saying goes – an ounce of prevention is worth a pound of cure.

Cleaning tips for the amputee's residual limb and socket:

- Clean the residual limb thoroughly with mild soap and warm water daily; rinse well as a soapy film can irritate the skin. Some amputees like to use cleaning products like Tersaseptic, pHisoderm, Cetaphil, Spectro Derm – available at your drugstore.
- For the residual limb or prosthetic socket or liner, some prosthetic companies have their own products or cleaning systems, such as

Otto Bock's Derma Skin Care, Ossur's Iceross Clean and Simple, or Centri's Cleani-Stub disposable wipes – available from your prosthetic centre.

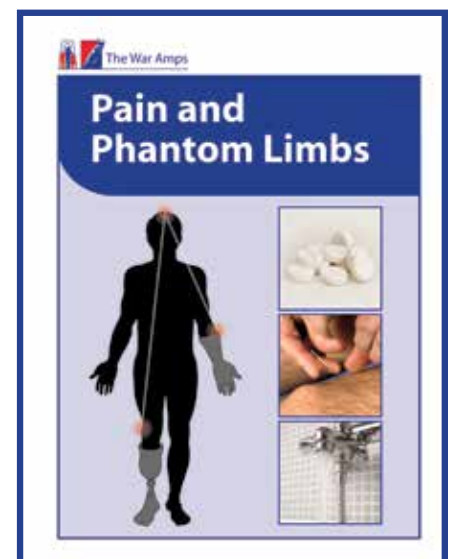
- Wash at night preferably – this gives the residual limb and socket plenty of time to dry completely – any residual moisture that is not quite dry can cause tackiness between the socket and skin, and the resulting friction can cause abrasions.
- In the case of socket liners, having two will allow you to use one while the other is left to air dry for use the next day.
- Change stump socks daily and more often if the weather and perspiration issues warrant it.

The items mentioned in this section are simply many of the products amputees have told us they use. This is not an exhaustive list of what is or can be used by amputees.

Pain and Phantom Limbs

The reality of life for amputees, certainly for those who use a prosthesis, is that there will sometimes be pain. It may be felt as residual limb pain, phantom limb pain, back pain (see more below) and pain in the other remaining limb.

When it comes to the implications for amputees, much has been written on the topic of pain. We have compiled material into a booklet called *Pain and Phantom Limbs* which is available through the National Amputee Centre.



Back Concerns and Care

For the upper limb amputee, with high level upper limb amputation(s), consideration must be given to the spine. An imbalance in weight in the body occurs because there is less weight on the side of the amputation and this imbalance may cause the spine to curve in the direction of the amputation. Because there is a much lesser weight imbalance between the two sides of the body, this issue does not pose concern for the amputee, for example, missing just a small part of the arm.

One above elbow amputee was diagnosed with scoliosis and was subsequently fitted with a special socket with a compartment at the end to which sand could be added by the prosthetist to increase the weight of the socket over time. The result of this particular case was that the extra weight on that side of the body helped to counteract the scoliosis and the amputee also became accustomed to wearing a socket and eventually chose to use a functional prosthesis.

It is a very simple matter that the amputee's spine be checked regularly by the doctor to ensure no problems are developing with curvatures, which most doctors generally do par course. Exercises that strengthen back muscles can be a part of any exercise routine, especially as we get older and may become less active.



More information on these topics and others can be found on
The War Amps website at waramps.ca
and/or by contacting the National Amputee Centre at
nac@waramps.ca or 1 877 622-2472.

