

## The Implications Of Amputees Being Overweight

*Translated into plain language by Helen Osborne of Health Literacy Consulting. Original article by by Jason T. Kahle, CPO, LPO, and M. Jason Highsmith, DPT, CP, FAAOP. Edited for Australian readers by Geoff Hill.*

Obesity is on the rise in Australia. The Australian Institute of Health and Welfare state that almost 60% of adults are overweight or obese and 20% are obese. The highest obesity rate is found in 55- 64 year olds. In the past people tended to lose weight in their 50's and 60's. Now people are gaining weight in this age group, with the highest incidence of obesity being in the 55-64 year age group. Older Australians are now 6-7kg (or a whole stone in the old money) heavier than they were 20 years ago.

The health risks associated with being overweight are well known and include risk of heart attack, diabetes, stroke etc. As prosthetists, we believe it is important to talk with overweight or obese patients about the need to lose weight. We feel strongly about this because weight gain affects amputees in particular ways in addition to the usual health risks. These include skeletal problems, component choices and socket fit.

### Problems

Being overweight can affect your health. Here are two common problems:

- Orthopaedic problems. Being overweight puts extra stress on knees, hips and other joints. This stress can then cause pain and chronic osteoarthritis. People of all ages, even those who are fairly young, might need joint replacements. This is a concern for overweight amputees as well. They might need hip or knee replacements on the opposite (contralateral) side from their amputation if their weight adds too much stress when standing, turning and climbing stairs.
- Cardiovascular (heart) problems. When people are overweight, their hearts need to work even harder to circulate blood throughout the body. This means it takes extra energy for overweight people to move, walk and exercise. Lower extremity amputees already spend extra energy when walking. There is an even bigger burden to the heart when they are overweight.

Overweight amputees have fewer choices for prosthetic components.

Prosthetic feet and knees are made and tested for a person's activity level and weight. Here are some ways that weight can affect the choice of prosthetic feet:

- Amputees at healthy weights have about 150 versions of feet to choose from.
- People who weigh more than 100kg have about 75 options to choose from.
- People who weigh more than 125 kg have about 30 to 40 choices.

- People who weigh more than 136 kg only have about 10 feet to choose from. These few choices may cost a lot because most of them must be custom made.

**Being overweight affects socket fit.**

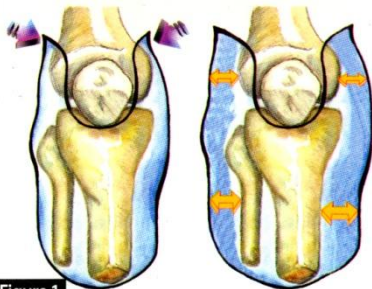
The socket (interface) is the most important part of any prosthesis. It helps with control, support (how your body rests on the residual limb) and stability (how you walk). Sockets fit best when people have firm tissues. This is like building a house on stone compared to mud - it works best with a solid foundation. But when people are overweight or obese, it is hard to use the firm tissue beneath fatty tissue.

**Here are some ways this affects socket fit:**

- Supracondylar suspension (a way to anchor prostheses by placing pressure above a joint) may not be able to be used when a person has obese thighs. This is because the pressure needed to hold the prosthesis on can be so painful that it would affect a person’s control or break their skin. (Figure 1)
- Ischial containment (socket cupping the lower pelvic bone) is hard because too much fatty tissue would prevent part of the bony lock needed for pelvic control.(Figure 2)

This could lead to poor gait (walking) and problems with socket fit and may damage the joints.

Being overweight means less options for socket design and suspension.



**Figure 1**

The transtibial socket on the left shows how the intimate relationship between the socket and the anatomy provides a “bony lock.” The socket on the right shows that when someone is obese, there is more room between the socket and the anatomy, reducing support and stability.

For instance:

- People who are overweight might only be able to have a pin system suspension. This is because suspension sleeves are hard to don and doff when people weigh too much.

- People cannot use cuff straps if there is too much fatty tissue on the bony anatomy (bones) to obtain good purchase.
- Thermoplastics (which many prosthetists prefer) may not be an option for people who are overweight. This is because thermoplastics are not strong enough to withstand the extra force of too much weight. Sockets need to be thicker and therefore are heavier.

What you can do?

### Lose weight

Some amputees wonder if losing weight causes even more socket fitting problems. The answer is yes, but the benefits far outweigh any risks or problems. Here is a reason why: most prosthetists use modular components (parts that can be changed). This means that your prosthetist can change the socket while you can keep your foot and knee (if you are an above-knee amputee). If you lose a lot of weight, your prosthetist may have more prosthetic options to choose from. For instance, you may now be able to choose feet (or other prosthetic parts) that improve the quality of your life.

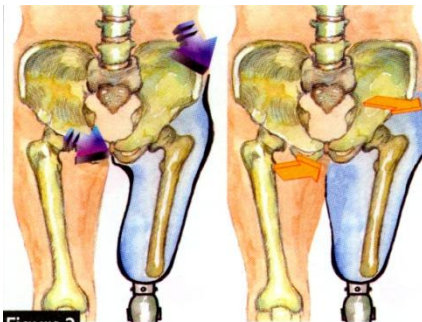


Figure 2

The transfemoral socket on the left shows how the intimate relationship between the socket and the anatomy will provide a "bony lock." The socket on the right shows that when someone is obese, there is more room between the socket and the anatomy. It also makes it extremely difficult to fit a transfemoral socket because of interference from the contralateral (opposite) side. This causes a loss of support and instability.

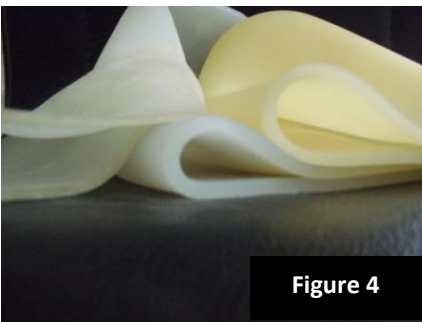
## **Increase your activity level**

To lose weight, you must burn more calories than you take in. Almost always this means going on a diet and increasing your activity level. (Table 1)

- Talk with your doctor before you go on a diet or increase your activity level. You and your doctor can select a program that is right for you.
- Find out if you need a special type of diet because of diabetes, high blood pressure, peripheral vascular disease or other health problems.
- Burn calories through exercise. We know exercise is extra hard to do when you are an amputee. It is even more difficult when you are overweight or obese. But you have to start somewhere. Talk with your doctor or prosthetist about exercises that do not take a lot of effort or put too much stress on your body and residual limb. (Figure 3)
- Work with your prosthetist. He or she can be a guide as you lose weight.

### **Here are some ideas your prosthetist might suggest:**

- Increase sock ply. This is a low-cost, quick, and easy way to solve socket problems when you lose weight.



## Table 1

### Premise

**Calories Ingested + Activity Level (Calories Expended)**  
**= Change in Body Mass**

### Scenario 1

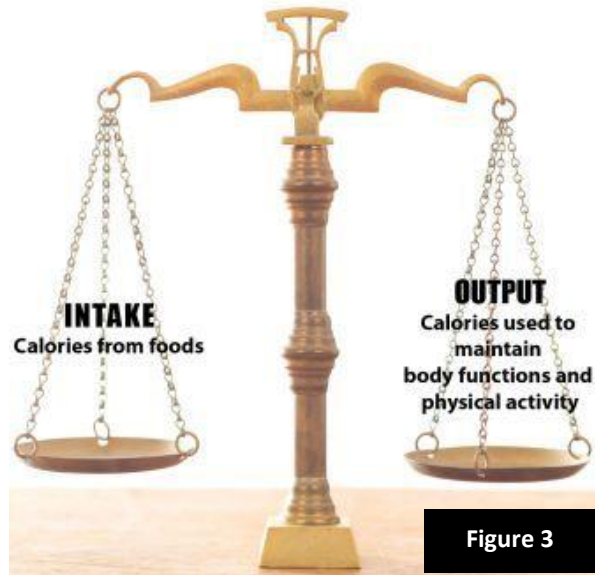
**Calories in > Calories Expended**  
**= in Body Mass (Weight gain)**

### Scenario 2

**Calories in < Calories Expended**  
**= in Body Mass (Weight Loss)**

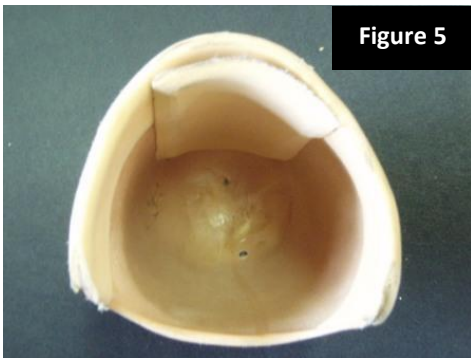
### Scenario 3

**Calories in = Calories Expended**  
**= No Change in Body Mass**



- Various thicknesses of Gel liners can be used as you lose weight. The more you lose a thicker liner can be used to replace a thinner one. (Figure 4)

- Use a thicker liner. You can start over with thin, low ply socks and work back up to thicker socks as needed.



- Pad the socket to make up for volume (weight) loss until your volume has stabilized and a new socket can be made. (Figure 5)

**Get started today by talking with your prosthetist or other healthcare provider. Work together to set goals. Yes, you can start changing your life one calorie, one step, and one day at a time!**

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