

## When to Replace a Prosthesis

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In order for an individual living with a limb difference or amputation to return to their family and/or workplace, they must be accurately fit with a prosthesis that matches their own anatomy; one that is constructed in such a way as to maximize their current or potential physical needs and activity level.

Each amputee has unique needs, from the baby born with a limb deficiency to the teenager having an amputation for cancer, or the senior losing a limb because of vascular insufficiency or diabetes. However, one thing they all have in common is the need to be as active as possible, as it is well documented that people living a sedentary lifestyle are at risk for a range of secondary conditions (obesity, diabetes, the loss of another limb, cardiovascular disease, depression, and some other forms of cancer) that will cost the health system far more than the provision of well-fitting, well-constructed, functional prostheses.

Unfortunately, the human body rarely maintains exactly the same shape. Weight and/or muscle mass is gained or lost, and children just grow. However, plastic, carbon and steel do not change, nor do they last forever. They have to be changed or replaced on a regular basis if the amputee is to remain a functioning member of society. Prosthetics is a very specialized field. Practitioners need mechanical and engineering knowledge so that they can build the devices, a thorough knowledge of anatomy and physiology so that they can understand how the device will work in conjunction with the human body, and fit it to each individual's musculoskeletal system; and they must have a basic knowledge of gait analysis and gait training.

The following guidelines are an aid to determining when a prosthesis should be replaced:

- The amputee's weight is no longer within the range of safety of the components.
- The components are no longer working to the specifications of the manufacturer.
- The individual's activity level is no longer compatible with the components used, such that they are increasing the individual's net energy cost rather than decreasing it.
- A specific component/module needs replacing, but the replacement is not compatible with the rest of the existing components.
- So many changes/alterations have been made to materials that their structural integrity has been compromised.
- It is impossible to increase/decrease the size of the socket and or frame without rebuilding the whole prosthesis.

In addition, if the prosthesis is modular, individual components should be replaced for the same reasons. The socket, the single most important part of a prosthesis, which consists of a flexible socket, a rigid frame and/or a socket interface, should be replaced for the following reasons:



- The size and/or shape does not allow for weight bearing on the anatomically correct areas-this can either be because the socket is too big, too small or of an incorrect shape, which can lead to painful end-bearing or hammocking; this in turn may lead to verrucous hyperplasia and, in some instances, cellulites and systemic infection.
- The materials have been manipulated (shrunk or stretched) to where the structural integrity of the materials has been compromised beyond the safety level.
- The materials have cracked or broken.
- The materials are not strong enough to bear the weight of the individual.
- Suction suspension cannot be maintained due to a leak/breakdown in structural integrity.
- Proper hygiene cannot be maintained.