

Xtend TT Cover – a simpler way to confidence for transtibial amputees

Alicia Nordberg
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Each year, around 2250 leg amputations are performed in Sweden, and around 60 percent of them are transtibial (lower leg) amputations. In 2019, around one third of all patients that had a transtibial amputation were provided with prosthetics. This group is dominated by elderly, as diabetes with or without vascular diseases, a disease most common among the older generation, is the main reason why people have to go through an amputation. Today, a prosthesis can look however the patient wants, but the older generation typically prefers that the prosthesis is covered with a skin tone cover that mimics a real leg.

Having to go through an amputation is a very big change in a person's life and to facilitate this stage, it is imperative that the amputee feels comfortable with its prosthesis. The process of putting on a cosmesis should not be complicated and it is necessary to find a faster way to make this happen. The most commonly used cosmesis for transtibial prostheses today are foam cosmeses. However, these usually have to be glued to the prosthesis and therefore the prosthesis has to be left at the orthopaedic clinic until the glue has set. The main problem is that not all amputees can be away from their prostheses that long, both mentally and physically. A complication that can occur from being away from the prosthesis is that the amputee can get a swollen stump and that leads to the prosthesis not fitting correctly. Also, the foam usually breaks when adjustments to the prosthesis must be done and that means that the amputee must go through this process again. To facilitate this process, a concept for a new cosmetic cover is developed.

To identify the needs for this new cosmetic cover, a user study including a questionnaire and interviews was conducted. The need that was considered most important for the amputees was that they wanted to avoid going through the process of having to put on a new cover every time an adjustment must be made. In addition, they liked to see a cover that resembled a calf, that was easy to clean, and that had a low weight. The orthopaedic engineers had quite similar thoughts, but in addition, they wanted the cover to be easy to work with, to be able to fit all socket sizes, and for it to be able to be cut to a suitable length as all prostheses are different.

The needs that emerged from the user study laid as a foundation for the development of the final concept. The final concept, called Xtend TT Cover, can be seen in Figure 1 below. Xtend TT Cover is a cosmetic cover made from EVA foam and is designed for production through thermoforming. Xtend TT Cover is cost-efficient, easy to handle, it has a generic shape of a calf, it can be removed without being destroyed, and it can be mounted to the prosthesis in one sitting. All to ease the situation and for the amputee to feel more comfortable with their prosthesis, and to more easily accept this new stage in life.



Figure 1: The final concept called Xtend TT Cover.