

"The Knowledgeable Prosthetic Limb User: Treatment Techniques for Occupational Therapists."

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The most important skill an occupational therapist can give an adult upper extremity prosthetic user is the confidence that the prosthetic limb can help them efficiently perform any task they encounter. Ultimately, the client will decide how they wish to use his or her new prosthetic limb, but for a brief time the occupational therapist plays an important role in educating and coaching the client. It is the therapist's role to expose clients to the full range of methods that they can use their new arm for functional tasks and to facilitate good problem solving skills. Having limited treatment time, it is crucial that treatment is efficient and focused on what will benefit the client most. When someone is learning a new skill, he or she tends to seek as much assistance as available and transitioning someone to independent analysis and refinement of performance is challenging. Clients who demonstrate good problem solving skills and understand task demands are more inclined to translate these clinical skills into functional tasks and fully integrate the prosthetic limb into their daily lives.

People who use prosthetic limbs have unique desires for the use of their devices. Some clients state cosmetics as a primary concern and may tend to keep it out sight as much as possible, while some want to perform as many tasks as possible with their prosthesis. Therapy needs to be client based and the use of the prosthetic limb needs to fulfill what they desire the limb to help them accomplish. It is very important that all patients be exposed to advanced prosthetic limb skills early in therapy because they may limit their potential use of device without this exposure. The new prosthetic limb users need to have knowledge of advanced skills of the prosthetic limb, as their demands may change in the future. The prosthetic limb user will need to adapt to new tasks with the prosthetic device throughout his or her life. As upper limb prosthetics advance, it is instrumental that the knowledge of the client advances as well. The occupational therapist needs to assist these clients in developing comprehensive knowledge of the device and independent problem solving skills as devices change and clients' needs change. Balancing user demands and knowledge of prosthetic limbs is vital to successful integration of the prosthetic limb throughout the client's lifetime as needs and activities change.

Education is essential early in pre-prosthetic training. The client needs to have a realistic understanding of what his or her prosthetic limb will be able to perform and how it works. Myoboy from Otto Bock is an excellent tool to build the muscle coordination skills of the client initially. It also provides many opportunities to educate the client and integrate him or her into understanding the operation of the prosthetic limb. A therapist can have the client palpate for contractions and try various types of contractions. This also facilitates the client reintegrating the amputated and painful limb into his or her body scheme. Wound care, desensitization, strengthening of proximal joints and scar massage also assist the client in becoming comfortable with the newly altered limb. The client should be encouraged have knowledge of where his or her best myosites are located, and what level of amplification is working best for them. This is an excellent time to educate the client about the components of the prosthesis. The therapist needs to be mindful of the client's threshold for education as they may not be ready emotionally after sustaining this type of traumatic injury. The therapist does not want a client to interpret prosthetic training as an emotionally difficult experience. Training needs to be balanced given mental availability of the client while demonstrating the advantages of use of a prosthetic limb. Given more knowledge of the prosthetic limb allows the client to become more comfortable with the device and orients them into problem solving role.

Initial training with an upper body prosthetic limb should provide the right amount of physical challenge and problem solving challenge. Any time a person is going through learning new coordinated movement, he or she tend to seek out support and numerous cues to perform new tasks appropriately. For example, one does not usually learn a to salsa dance in one day and he or she tends to seek out ways to have more support before they dance before a crowd. Some clients may need continuous step by step instructions, but the real challenge for the therapist is to find ways that clients can safely problem solve on their own without becoming overwhelmed. This facilitation of independent problem solving assists the client in achieving some comfort with experimentation and gain confidence in the use of his or her prosthetic limb. Repetitive simple grasp and release tasks or rote exercises are great ways to assist a client in gaining some confidence with the device. This is the time to begin addressing the components of good prosthetic limb use, including prepositioning the terminal device and incorporating normal quality of motion and body mechanics. Occasional challenges can help them begin to take ownership of the function of the prosthetic. For example, asking the client to find all of the ways the prosthetic limb can be used to assist him or her in opening a

plastic bottle. Quizzing a client is a good way to facilitate problem solving, ensure retention and assist the client in active use of the vocabulary of prosthetics. As a client's skill progresses the therapist should attempt to limit cues to facilitate independent performance and problem solving of tasks outside of the clinic.

As a client becomes more confident and comfortable with the use of his or her prosthetic limb, therapy can become more challenging. Stimulating analysis of tasks is important in this stage. Stimulating the client's need to anticipate positional changes while completing a task with finesse is also important here. A good question to ask is, how many different methods can you find to use the prosthetic limb in this task, and discuss what method works the best for them. For example, asking the client to find as many ways as possible of holding a fork with a sensor hand while cutting. The goal of this is to build the client's repertoire of skills with the prosthetic limb, it may not be the most effective way at present but that skill may be utilized in a different task in the future. Unilateral performance with the prosthetic limb is a pathway to this creative independent use, although maybe more time consuming, it improves the client's skill and dexterity with the prosthetic limb. For example, assembling legos without use of the unaffected side is a way to increase light touch and gentle manipulation. Other questions include; what terminal device is best suited for this task? Would a different type of object be better or worse, such as opening a glass or plastic bottle? Activities that are relevant and meaningful to clients are valuable therapeutic tools in this stage as clients find new ways to integrate the prosthetic limb into meaningful tasks of their life. Talking through the steps of a novel task is possible here too, such as describing the steps he or she would perform to start and operate a weed wacker. Even if the item is not available in the clinic it fosters the anticipation and fluid problem solving necessary for successful and timely integration of the prosthetic limb into an activity. Clients need to be familiar with minor adjustments and repairs of their prosthetic limb and how to adapt and overcome when a device prevents them from completing a task or when the device inevitably fails. There are many ways to stimulate patients to achieve more problem solving abilities and skills with their prosthetic device.

The client will also benefit from education in adapting the task or terminal device to accomplish certain tasks. Occupational therapists have a comprehensive knowledge of this and there are a number of common items that the patient could benefit from knowing how to use. Attaching loops of fabric to items can assist in performance with terminal devices. Having velcro strapping available can

improve the control of objects. Non-slip material can assist the patient in a variety of tasks. Creating a groove by building up material on an object can improve grip control of a slippery object. Splinting material is excellent for adapting the terminal device or the object. For example, splinting material can be molded to wrap around a joystick on an Xbox controller to extend it or create a surface more compatible with a terminal device. Adapting individual specialty sporting terminal devices is also important to ensure best performance. The more adaptable clients can be with tasks, the more likely they will achieve success in physical tasks that may improve their quality of life and comfort level with dealing with physical challenges.

People who suffer from limb loss will have many of challenges both physical and emotional throughout their lifetime, and they rely on prosthetists and occupational therapists to set them up for success with the use of their prosthetic limb. These clients need to be empowered to find what works for them the best and assisted in developing advanced skills with their prosthetics. Clients with a comprehensive knowledge and improved ability to problem solve activities will be prepared to take on new challenges with their prosthetic limbs. It is the role of the occupational therapist to help these clients find these pathways to success and ease their return to a productive life. Clients who demonstrate comprehensive problem solving skills increase their chances of comfortably integrating their prosthetic limb into daily life.