



Virtual Learning

Medical Interventions

Prosthetic Limbs

April 23, 2020



Medical Interventions

Lesson: April 23, 2020

Objective/Learning Target:

Recognize that artificial limbs are built to allow patients who have suffered from the loss of a limb to regain lost function.
Describe how myoelectric prosthetic limbs work. (3.3.3)



Let's Get Started:

1. Review the muscles of the arm, the forearm, wrist, palm, and digits at the the [Get Body Smart website](#).
2. Watch [this video](#) that explains how modern prosthetic hands can use sensation.



Lesson Activity

Read [this](#) article on prosthetic limbs and then answer the following questions.

1. Why are prosthetic limbs valuable for the patient?
2. What are some factors that make the design of a prosthetic limb for humans a difficult task?
3. How have myoelectric control and targeted muscle reinnervation revolutionized prosthetic limb technology?
4. Explain how myoelectric arms are controlled by the patient.



Lesson Activity - **Answers**

Read [this](#) article on prosthetic limbs and then answer the following questions.

1. Allows the restoration of capabilities lost to amputees
2. Each prosthetic must be custom built for the patient, many joints/bones/muscles in limbs that have very specific movements/functions
3. patient can obtain a prosthetic that acts like an actual limb that moves the way that the brain would tell a normal limb to move
4. uses rechargeable battery to power small electric motors that move the prosthetic, muscle contracts creating a small electrical signal (EMG), electrode is attached to skin to record signal then signal amplified/processed by a controller that switches the motors on or off to produce movement



Practice

Indicate whether the following statements are true or false for [myoelectric prosthetics](#). If false, explain why.

1. Myoelectric prosthetics are powered internally.
2. Speed and strength of movements can be controlled by varying muscle intensity.
3. You can swim and take a shower with a myoelectric prosthesis.
4. Recreating a human hand is an easy task.
5. Myoelectric prosthetics are designed to mimic human anatomy and motion.



Practice - **Answers**

Indicate whether the following statements are true or false for [myoelectric prosthetics](#).
If false, explain why.

1. False- powered externally
2. True
3. False- it is not safe with an external power source
4. False- the human hand is one of the most complex parts of the body
5. True



Additional Practice/Resources

1. View this website and videos to learn more about [neuroprosthetics](#) and the future of the field. Compare these with modern prosthetics and those from the past.
2. View this website to learn about more [specialized prosthetics](#) including from a tattoo artist and drummer.
3. Try building your own functioning prosthetic limb from household supplies.