CLAW HAND LAB

Using an Electrical Stimulus to Cause Involuntary Muscle Contraction

**Electrical Muscle Stimulation**

* **What**: The practice of delivering electric impulses to different parts of the body, namely muscles.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Because your brain is not the primary controller, you are bypassing the central nervous system.
  + There are no psychological limits anymore; you are not held back by what you think your degrees of freedom are or how you move your muscles.
  + The signals from an external source can play with your muscles without constraints and by doing so your \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  You can also potentially \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ yourself.
  + Electric muscle stimulation is used by doctors, therapists, physical trainers, and some other professionals.
  + There are two main classes of usage:
    1. medical (or therapeutical)
    2. recreational.
* ***Muscle Injuries***

**A. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Muscles-**delayed-onset muscle soreness caused by microscopic injury to muscle tissue.

**B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Muscles-**muscle tissue that has been overstretched, and usually occurs between joints, in areas such as the thigh (i.e., a groin pull).

C. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Cramps**- an uncontrolled spasm or contraction of a muscle, Cramps can be caused by overworking a muscle or loss of electrolytes

D. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** -injury to tendons which are smaller than most muscles and located at the high-stress joints. Damage causes inflammation, causing swelling and soreness in the joint.

E. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -**"medial tibial stress syndrome” encompasses a number of different types of injuries occurring in the lower leg.

**G. Ankle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** -stretched or ruptured ligaments--tough, fibrous bands of tissue which extend from bone to bone, holding the joint together.

Activity 1: CLAW HAND

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| What Occurred: |
| EXPLAIN THE PROCESS: |

Activity 2: Tennis Ball Fatigue

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| WHAT HAPPENED: |
| WHAT HAPPENED TO YOUR HEART? |
| What would happen if your heart tired as fast as your hand? |
| Why doesn’t it?  **Short Answer**: Evolution  Your hand uses skeletal muscles and your heart is made of cardiac muscle.   * Cardiac muscle does not experience muscle fatigue * Skeletal muscles do experience muscle fatigue   **Science Answer:**   |  |  | | --- | --- | | **Skeletal Muscle** | **Cardiac Muscle** | | **⇓ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to provide energy | **⇑ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to provide energy | |  | * images.jpgNear Lungs – Extra access to O2 | |