

General Notes

Levers:

Class 1

- > The fulcrum is in the middle of the effort and the load
ie: Head

Class 2

- > The load is the middle between the fulcrum and the effort
ie: Gastro/Heel

Class 3 (Most common in human body)

- > The effort is in the middle between the fulcrum and the load
ie: bicep
- A.) Fulcrum: The point at which the lever rotates
- B.) Effort: The force applied to the lever
- C.) Load: The force applied by the lever to move the load

Muscle advantage and disadvantage:

*Generally defined by muscle length and velocity (changes angle, insertion)

- >The longer the moment arm, the bigger mechanical disadvantage

Class 1: Either advantage or disadvantage

Class 2: Mechanical advantage (M_m is > than M_r)*

Class 3: Mechanical disadvantage ($M_m < M_r$)

* M_m =moment arm of muscle, M_r =moment arm of resistance

How is strength defined? Isometric, Isokinetic, Isotonic

How is power define? Isotonic

Biomechanical factors of Strength

1. Neural recruitment

- >How many?
- >Size? 'Orderly recruitment'

2. Muscle CSA

- >Muscle cross-section area
- >*Not volume, but real estate
- >Length

3. Arrangement of Fibers

- >Angle
- *Pennate: Stronger, slower
- *Parallel: Weaker, faster

4. Muscle Length

- > @Rest, @ Contraction, @ Stretch
- >SFT, Myosin/Actin availability

5. Joint Angle

- >Moment arm will change
- >Mechanical advantage/disadvantage
- 6. Muscle Contraction Velocity (Common Sense)
 - >Maximum force produced
 - Fast movement= Low force
 - Slow movement= High force
- 7. Strength:Mass (Common sense p.2)
- 8. Body Size
 - >Mass reduced=Same density
 - ie: Nickel in blender
- 9. Physiological Explanations
 - >Cross-Bridge
 - >ATP use
 - >H⁺ accumulation