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## Types of Muscle Contractions

- A muscle fiber generates tension through actin and myosin cross-bridge cycling.
- While under tension, the muscle may lengthen, shorten, or remain the same.
  - **Concentric Contraction:** A type of isotonic muscle contraction in which the muscles shorten while generating force, overcoming resistance.
    - **Example:** when lifting a heavy weight, a concentric contraction of the biceps would cause the arm to bend at the elbow, lifting the weight towards the shoulder.
  - **Eccentric Contraction:** An isotonic muscle contraction that results in lengthening the muscle while the muscle continues to generate force. Resistance is greater than the force generated.
    - **Example:** controlled lowering of a heavy weight
  - **Isometric Contraction:** Generate force without changing the length of the muscle (no movement)
    - This type of contraction is common in the muscles of the hand and forearm, responsible for grip.
      - Using the example from above, the muscle contraction required to grip the heavy object, but not move the object, would be isometric.
    - **Example:** Make a fist. Now squeeze your fist tighter. You can feel the muscles in your forearm and wrist tighten (contract), however you did not make a noted movement.

