Exercise Therapy

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Types of muscular contraction

Three Types of Muscle Contractions

Concentric contraction: The sliding of the thin filaments toward and past the thick filaments, accompanied by the formation and re-formation of cross-bridges in each sarcomere, results in the shortening of the muscle fiber and the generation of tension. The muscle fiber shortens (contracts) if enough sarcomeres actively shorten and if either or both ends of the muscle fiber are free to move. The active shortening of a muscle is called a concentric contraction or shortening contraction.

Eccentric contractions: In contrast to a shortening contraction, in which the thin filaments are pulled toward the thick filaments, the muscle may undergo an eccentric contraction, or lengthening contraction. In a lengthening contraction, the thin filaments are pulled away from the thick filaments, and cross-bridges are broken and reformed as the muscle lengthens. Tension is generated by the muscle as cross-bridges are re-formed. Eccentric contractions occur whenever a muscle actively resists motion created by an external force (such as gravity).

Isometric contraction: The muscle fiber will not change length if the force created by the cross-bridge cycling is matched by the external force. The contraction of a muscle fiber without changing length is called an isometric contraction.