Reading: Version 1: Effect of Resistance Exercise on Muscles

Resistance exercise is the kind of movement that causes muscles to contract against a force or weight. Resistance exercise has been shown to build muscle mass. This type of exercise causes damage to the muscle fibers. Then the body repairs those fibers, which can increase their thickness and length.

The lengthening of muscles under a load, such as lowering a heavy weight or walking downhill, is the type of resistance exercise that has been shown to damage muscle fibers. During any contact force, the objects experience forces of equal strength. The muscle fibers share the load of this tension (the stress or strain of being stretched tight) with other nearby fibers. However, intense exercise can cause so much tension on these strands of myosin and actin that there is no more overlap on some of them.[1] Tears may occur in the structures that hold them together and allow them to contract.[2] When the tension is released, the myosin and actin strands may not be able to return to their normal function--they have been too disrupted and can no longer line up correctly.[1] These injuries to the muscle fibers can cause some of those cells to die, which leads to possible swelling and soreness after this kind of intense exercise.[1, 2]

After the muscles have been injured by resistance exercise, they begin to repair themselves. The body makes new cells to do this, and those new cells attach to the damaged parts of the fibers.[3] This addition to the muscle fibers can make them thicker (increasing the area of the cells) and/or longer (by adding sections to the myosin and actin strands).[4]

References

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