







Body 4: Connective

Basic Facts About Connective Tissues: Ligaments, Tendons, Cartilage and Fascia




Ligaments

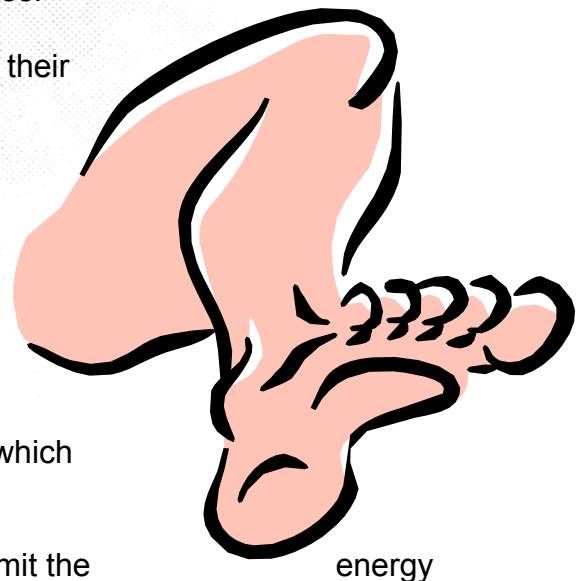
-  Ligaments are tough, inelastic, connective tissue joining bone to bone.
-  Ligaments limit the range of motion at a joint while providing joint stability.
-  Ligaments that have been stretched/ damaged (sprained) result in a less stable joint that is prone to further injury. Some form of therapy or surgery may be required to repair damaged ligaments.

Aquafitness and Ligaments

-  Reduced joint loading and impact means the opportunity for 'ligament injury' is greatly reduced in the water.
-  The knee joint is particularly vulnerable to injury in various sports and activities on land. This is due to the extreme forces it endures as well as the unhealthy angle of some of those forces.
-  Instructors teaching on deck must protect their knees from impact and ligament strain by using safe leadership skills and proper equipment and attire.

Basic Facts About Tendons

-  Tendons are thick, dense connective tissues attaching muscle to bone.
-  Tendons are a continuation of the fascia which surrounds muscle.
-  Tendons are relatively inelastic and transmit the





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of muscle action to bone thereby facilitating skeletal support and movement.

Aquafitness and Tendons

- Suspended aquafitness activities reduce gravitational load on the tendons.
- During 'propulsive or vigorous light bounce' activities in chest deep water, tendons of the legs and feet can experience large forces during take off an landing.
- Toe-ball-heel landings assist in shock absorption, reducing rapid stretch of the Achilles Tendon. It is important that:
 - Instructors must teach this toe-ball-heel landing technique to participants and give reminder cues throughout the class.
 - During tempo movements, there may not be time to execute toe-ball-heel landings. Therefore, it is important to intersperse 1/2 tempo and 1/4 tempo moves, with tempo movements. This will reduce the length of time spent on the balls of the feet and facilitate proper shock absorption with proper landing technique.

Basic Facts About Cartilage





- This resilient, rubbery material covers the 'articular' (where bones meet each other) surfaces of bone.
- Cartilage provides protection, shock absorption and smooth articulation to the bones it covers.
- Diseases such as osteoarthritis can result in damaged, ineffective joint cartilage. This leads to pain, swelling, decreased ROM; range of motion (lack of mobility and joint function).

Aquafitness and Cartilage







Handout



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-  Buoyancy reduces gravitational forces and joint loading in water, this in turn, protects the cartilage.
-  There is reduced shock and friction in the joints during aquafitness compared to land fitness.
-  Aquafitness is an ideal exercise environment for arthritic or injured joints.
-  Aquafitness, Water Running and other Water Exercise activities can be used as cross training for elite athletes to reduce the joint stress often involved in land training. Joint pain and injury is less likely to occur and interfere with competition schedules.

Basic Facts About Fascia

-  Fascia is a fibrous membrane that envelops, supports and separates bundles of muscle fibres.
-  Fascia transmits the energy of muscle action to the tendon and bone.
-  Fascia maintains the structural integrity of muscle fibres
-  Muscle fascia is targeted for lengthening during flexibility stretches.

Aquafitness and Muscle Fascia

-  Aquafitness places less stress on muscle fascia than does land exercise.
-  The deep stretching required to lengthen muscle fascia is difficult to perform in the pool. Such stretching often requires gravity or a resistive surface to assist in lengthening the muscle fascia.