

Kinesiology Midterm Study Guide

Compare (what is similar) and contrast (what is different) the anatomical and mechanical characteristics of bone with tendons/ligaments.

- Tendons connect muscles to bones
- Ligaments connect bone to bone

Tendons	Ligaments
Tolerates tremendous tensile forces	Resists tensile loads
Flexibility	Flexibility
Does not tolerate compression and sheer forces	Strong and extensible
Ruptures at 8% of elongation	Allows movement but provides resistance for forces
	Ruptures at 8% of elongation

Factors affecting tendons and ligaments

Factor	Mechanism
Aging and maturation	H ₂ O, stiffness, tensile strength reduced
Pregnancy	Increased laxity
Training	Increase tensile strength
Immobilization	Decrease tensile strength
Temperature of tissue	High temperature tightens/ shortens fibers
Diabetes	Rate of joint stiffness, capsulitis
Corticosteroids	Inhibits collagen synthesis, tensile strength reduced
Non-steroidal anti-inflammatory drugs (NSAIDs)	Rate of collagen production and tensile strength
Tissue grafting	Some stiffness can not be achieved close with patellar tendon

Describe the characteristics of a synovial joint; list and describe the 6 types providing a common example for each.

Synovial joint- freely movable

Joint type	Description	Location	Movements/ Examples
Gliding / Plane	<ul style="list-style-type: none"> • Nonaxial-motion occurs in a plane but not around an axis. • Articulating surfaces flat or slightly curved; • Motion is translation <p>These joints only allow sliding or gliding motions.</p>	<ul style="list-style-type: none"> • Intercarpal joints of the wrist • Facet joints • Scapula 	<p>Elevation Shrugging of shoulders to elevate scapula. Bones in wrist and ankles move by gliding against one another</p> <p>Gliding movement at the wrist waving or moving wrist side to side</p>
Hinge	<p>Uniaxial Able to flex and extend only in one plane</p>	<p>Elbow Knee TRUE ANKLE</p>	<p>Flexion and extension</p> <p>Example: Bicep curl flexion moving upward and extension downward motion. TRUE ANKLE- Plantarflexion- pressing down on gas pedal dorsiflexion – taking foot off of the pedal</p>
Saddle	<p>Biaxial</p> <p>Joint in which each bone surface is saddle-shaped (concave on one axis and convex on the perpendicular axis).</p>	<ul style="list-style-type: none"> • sternoclavicular (SC) joint • trapeziometacarpal (first carpal) 	<p>Flexion Extension Abduction Adduction</p> <p>Example: moving thumb side to side Moving thumb to pinky finger</p>
Condylloid/ Ellipsoid	<p>Biaxial/ circumduction</p> <p>an oval convex surface of one bone articulates with an elliptical depression of another.</p>	<ul style="list-style-type: none"> • Radialcarpal joint • Metacarpophalangeal joints 	<p>Flexion Extension Abduction Adduction</p> <p>Example: moving index finger side to side</p>

Ball and socket	Multiaxial/ triaxial head of one bone fits into cuplike depression of another	<ul style="list-style-type: none"> Shoulder (GH) joint Hip Joint 	Circumduction Abduction Adduction Flexion Extension Rotation Example: swinging arms and legs in many directions
Pivot	Unaxial Joint in which a projection of one bone fits into a ringlike ligament of another, allowing one bone to rotate on its longitudinal axis.	Cervical vertebra (c1 and c2) Radial ulna joint	<ul style="list-style-type: none"> Rotation- of one bone around another Example: (Top of the neck- atlas and axis bones) moving your head as if your saying no

Describe the types of mechanical stresses and provide a practical example of how each could occur to a bone or ligament.

Tension - Tensile loading can cause a pulling apart of the bone. Equal and opposite forces are applied away from the surface of the structure. Bone withstands greater stress in tension than in shear.

Example: pulling tendon of biceps, throwing a baseball