JOINTS

= articulation
arthro - = joint
arthrits
arthroscopic surgery
allows movement between bones

classification

by structural tissue

fibrous joint fibrous c.t.
cartilaginous joint cartilage
synovial joint synovial membrane

by function - amount of movement

synarthrosis no movement
amphiarthrosis little movement
diarthrosis freely moving

classification by structure

fibrous joint

sutures synarthrosis cranial bones
syndesmosis amphiarthrosis tibia – fibula
gomphosis synarthrosis teeth in bone
cartilaginous joint

symphysis amphiarthrosis pubic symphysis
synchondrosis synarthrosis manubrium-1\textsuperscript{st} rib

synovial joint all diarthroses

ball and socket
hip ; shoulder
hinge elbow ; knee ; ankle ;
interphalangeal
pivot atlas - axis ; radius - ulna
condyloid occipital - C1 ; TMJ ;
radius - carpal
plane carpals ; tarsals ;
intervertebral facets
saddle 1\textsuperscript{st} metacarpal - carpal

Synovial joints

fibrous capsule dense irregular c.t.
continuous with periosteum
synovial membrane lines fibrous capsule
secretes synovial fluid
synovial cavity joint cavity
synovial fluid lubricant
nourishes articular cartilage
articular capsule fibrous capsule +synovial membrane
articular cartilage ends of epiphysis
smooth surface to cushion bone
joint reinforcements

ligaments dense regular c.t. bone – bone
resist movement
tendons dense regular c.t. bone – muscle
aid movement
articular discs = meniscus
fibrocartilage w/in joint cavity
bursa fluid-filled sacs
between tendons and bone

muscle support

ROM = Ranges of Motion

flexion / extension most joints
lateral flexion vertebra
rotations vertebra; hip ; shoulder
abduction / adduction hip ; shoulder
circumduction hip ; shoulder
supination / pronation forearm; foot
opposition thumb to fingertips
dorsiflexion / plantarflexion ankle
inversion / eversion foot
elevation / depression shoulder ; TMJ
protraction / retraction shoulder ; TMJ

ROM

flexion decrease angle between bones
bend joint (usually anteriorly)
extension increase angle between bones
straighten joint
lateral flexion decrease angle laterally
rotation bone turns around another

more ROM

abduction away from the midline
adduction toward the midline
pronation palm down plantar down
supination palm up plantar up
circumduction combination of actions (shoulder)
opposition thumb to fingertips

even more ROM

dorsiflexion decrease angle of ankle, anteriorly
plantarflex decrease angle of ankle, posteriorly
inversion ankle supination + internal rotation
eversion ankle pronation + external rotation

Elevation raise
Depression lower
Protraction forward
Retraction back
knee

largest joint
femur – tibia hinge
meniscus medial and lateral
fibrocartilage stabilize femoral condyles

intracapsular ligaments
  anterior cruciate ligament
  posterior cruciate ligament
extracapsular ligaments
  tibial and fibular collateral ligaments
  patellar ligament

= coxal joint ball and socket
femur head - acetabulum
acetabular labrum fibrocartilage ring
ligaments
  iliofemoral ligament
  pubofemoral ligament
  ischiofemoral ligament
  ligamentum teres head of femur to acetabulum

= glenohumeral joint
glenoid labrum fibrocartilage deepens the glenoid cavity
ligaments
  coracohumeral ligament
  glenohumeral ligament
acromioclavicular (A-C) joint ligament.

shoulder joint

elbow joint

humero-ulnar joint hinge
ligaments
  radial collateral
  ulnar collateral
radial-ulnar joint pivot
  radial head to ulna
  anular ligament

wrist joint

radio-carpal joint condyloid
  radius - scaphoid + lunate
intercarpal joints gliding

ankle

talocrural joint = talus - tibia/fibula hinge
subtalar joint talus - calcaneus
intertarsal joints inversion / eversion
ligaments
  medial (deltoid) ligament
  lateral ligament
**Intervertebral Articulations**

- Articular processes (facets)
- Synovial joints
- Superior articular process
- Inferior articular process
- Intervertebral disc (IVD) cartilaginous joint
- Same # as vertebra above
- Nucleus pulposus (NP)
  - Internal gel / water
  - Supports vertebral bodies
- Anulus fibrosus
  - External ring around NP
  - Fibrocartilage

- "Herniated disc"

**Other Joints**

- Temporomandibular (TMJ) has a meniscus
- Carpal – Metacarpal
- Tarsal - Metatarsal
- Metacarpal – Phalangeal
- Interphalangeal
  - PIP (proximal interphalangeal joint)
  - DIP (distal interphalangeal joint)

**What Could Go Wrong?**

- Sprain
- Dislocation
- Arthritis
  - Osteoarthritis
  - Rheumatoid Arthritis
- CTS (Carpal Tunnel Syndrome)
- HNP (Herniated Nucleus Pulposus)