Skeletal & Muscular Systems. AS Chpt 1

Muscles.

- Muscle tissue
  - Like any plastic band
  - Characteristics
    - Original length elasticity
    - Reacts to stimulus (excitability)
    - Muscles contract (contractibility)
    - Apply force
    - Muscles can stretch (extensibility)
    - Single cylindrical cells
    - Several nucleoli
  - Named by:
    - Location
    - Size
    - Origin / insertion
    - No. of heads
  - Contraction
    - Shorten - concentric
    - Lengthen - eccentric
    - Tension increase - isometric
  - Fibre type
    - Slow twitch
    - Fast twitch
  - Some genetically predisp.
    - Anaerobic
    - Aerobic
  - Marathon (Paula Radcliffe)
  - Type 1 fibre
    - Lot of myoglobin
    - Well-dev. blood supply
    - High aerobic capac.
    - Slow contractile speed
  - Sprinter (Usain Bolt)
    - Few/small mitochondria
    - Make fibre for muscle contract
    - Fatigue fast
    - Contract with a force
  - Type 1 & 2a fibre.
    - Speed endurance (combination)
    - Improved economy
    - Haemoglobin
    - Recovers O2
    - Increased fuel supply
    - Lactic acid
    - Fatigue
  - Type 2a fibre
    - Less O2
    - Less economic
    - Fastest contract
    - When muscle - lower viscous resistance
    - In muscle tissue
    - From muscle tissue
    - From fast-twitch fibre.
- Skeletal muscle
  - Effects
    - Less - crowded
    - Fatigue - build up

Bone tissue

- Ossification
  - Skeletal frame
    - Made from cartilage
    - Replaced by bone
  - Process starts (diaphysis)
    - Plate of cartilage left between.
    - Then epiphysis
  - Bones grow until maturation
    - Plate
    - Growth plate
    - Elongates bone
  - Growth plate
    - Won't fuse until ossification complete
    - Young athletes can damage it while still growing
- Synovial joints
  - Condyloid
    - Wrist
  - Gliding
    - Intervertebral joints
  - Pivot
    - Atlas & axis
    - Radio ulnar
  - Ball & socket
    - Hip
    - Shoulder
  - Hinge
    - Elbow
    - Knee
    - Ankle
- Function vs. stability
  - Shoulder
    - Scapula socket (glenoid fossa)
      - Small / shallow - less stable
      - Very loose - more movement
      - Head rounded - ball-like
      - Not deep in glenoid fossa
    - Joint capsule
      - Humerus - stabilised by rotator cuff to dislocate
      - Not as strong as hip muscle
  - Hip
    - Pelvis socket - deep / unique
      - Acetabulum - adds depth - stability
      - Femur head - spherical - fits snug to acetabulum
      - Ligaments - illiofemoral - v. strong.
      - Supported by - great muscle groups e.g. gluteus maximus
      - Strong ligaments
- Features
  - Encase joint - fibrous tissue
  - Joint capsule
    - Adds stability - forms capsule
    - Of cartilage - articular discs
      - C-shaped rims - shock absorbers
      - Fills joint gaps - synovial fluid - lubricates
      - Lines joint cavs. - membrane
      - Secretes syn fluid.
      - Covers surface - articular cartilage
      - Prevents friction - size of fluid
      - Bursa - cavity containing synovial fluid
      - Ligaments - connective tissue.
      - Pads of fat - fibrous connective tissue & bone/fatty tissue - cushion
      - Bone/muscle.
  - Tendons - fibrous tissue - bone to bone.
  - Ligaments - bone
  - Between fibrous tissue & muscle.
  - Bone/muscle.