CHAPTER 8
JOINTS
CLASSIFICATION OF JOINTS
STRUCTURAL VS FUNCTIONAL
The most moveable type of joint is a …

1) Synarthrosis
2) Amphiarthrosis
3) Diarthrosis
FIBROUS JOINTS
### Figure 8.1 Fibrous joints.

<table>
<thead>
<tr>
<th>(a) Suture</th>
<th>(b) Syndesmosis</th>
<th>(c) Gomphosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Joint held together with very short, interconnecting fibers, and bone edges interlock. Found only in the skull.</strong></td>
<td><strong>Joint held together by a ligament. Fibrous tissue can vary in length, but is longer than in sutures.</strong></td>
<td><strong>“Peg in socket” fibrous joint. Periodontal ligament holds tooth in socket.</strong></td>
</tr>
</tbody>
</table>

**Suture**
- Dense fibrous connective tissue
- Suture line

**Syndesmosis**
- Fibula
- Tibia
- Ligament

**Gomphosis**
- Socket of alveolar process
- Root of tooth
- Periodontal ligament
CARTILAGINOUS JOINTS
Figure 8.2 Cartilaginous joints.

(a) Synchondroses

Bones united by hyaline cartilage

Epiphyseal plate (temporary hyaline cartilage joint)

Sternum (manubrium)
Joint between first rib and sternum (immovable)

(b) Symphyses

Bones united by fibrocartilage

Body of vertebra
Fibrocartilaginous intervertebral disc
Hyaline cartilage
Pubic symphysis
A suture joins two cranial bones via…

1) Tendons
2) Ligaments
3) Dense fibrous connective tissue
4) Hyaline cartilage
5) Fibrocartilage
SYNOVIAL JOINTS
Figure 8.3 General structure of a synovial joint.

- **Periosteum**
- **Fibrous capsule**
- **Synovial membrane**
- **Synovial cavity** (contains synovial fluid)
- **Articular (hyaline) cartilage**
- **Ligament**
- **Articular capsule**

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(a) Frontal section through the right shoulder joint
True or false: All synovial joints have bursae.

1) True
2) False
True or false: All synovial joints have articular capsules.

1) True
2) False
MOVEMENTS ALLOWED BY SYNOVIAL JOINTS
(a) Gliding movements at the wrist
Figure 8.5b  Movements allowed by synovial joints.

(b) Angular movements: flexion, extension, and hyperextension of the neck
Hyperextension
Flexion
Extension

(c) Angular movements: flexion, extension, and hyperextension of the vertebral column
Figure 8.5d  Movements allowed by synovial joints.

(d) Angular movements: flexion and extension at the shoulder and knee
(e) Angular movements: abduction, adduction, and circumduction of the upper limb at the shoulder.
Figure 8.5f Movements allowed by synovial joints.

(f) Rotation of the head, neck, and lower limb
Figure 8.6a  Special body movements.

Pronation (radius rotates over ulna)

Supination (radius and ulna are parallel)

(a) Pronation (P) and supination (S)
Figure 8.6b Special body movements.

(b) Dorsiflexion and plantar flexion
Figure 8.6c Special body movements.

(c) Inversion and eversion
(d) Protraction and retraction

Protraction of mandible

Retraction of mandible
Figure 8.6e  Special body movements.

(e) Elevation and depression
Figure 8.6f Special body movements.

(f) Opposition
Turning your palms face down is ________.

1) Rotation
2) Circumduction
3) Pronation
4) Supination
Bending your knee is an example of ________.

1) Flexion
2) Extension
3) Dorsiflexion
4) Plantar flexion
TYPES OF SYNOVIAL JOINTS
Figure 8.7a Types of synovial joints.

- **a** Plane joint (intercarpal joint)

- Nonaxial
- Uniaxial
- Biaxial
- Multiaxial
Figure 8.7b Types of synovial joints.

- **b** Hinge joint (elbow joint)
Figure 8.7c  Types of synovial joints.

- **c** Pivot joint (proximal radioulnar joint)
Figure 8.7d  Types of synovial joints.

Condyloid joint  (metacarpophalangeal joint)
Figure 8.7e Types of synovial joints.

Saddle joint (carpometacarpal joint of thumb)
Figure 8.7f Types of synovial joints.

Ball-and-socket joint (shoulder joint)
Which of the following joints produces multiaxial movement?

1) Gliding joint
2) Saddle joint
3) Condyloid joint
4) Ball-and-socket joint
JOINT INJURIES:
FOCUS ON THE KNEE
Figure 8.8a The knee joint.

(a) Sagittal section through the right knee joint
Figure 8.8b The knee joint.

(b) Superior view of the right tibia in the knee joint, showing the menisci and cruciate ligaments
Figure 8.8c  The knee joint.

Quadriceps femoris muscle

Tendon of quadriceps femoris muscle

Patella

Lateral patellar retinaculum

Fibular collateral ligament

Fibula

Medial patellar retinaculum

Tibial collateral ligament

Patellar ligament

Tibia

(c) Anterior view of right knee
Figure 8.8d  The knee joint.

(d) Posterior view of the joint capsule, including ligaments
(e) Anterior view of flexed knee, showing the cruciate ligaments (articular capsule removed, and quadriceps tendon cut and reflected distally)
(f) Photograph of an opened knee joint; view similar to (e)
Figure 8.9  A common knee injury.

- Lateral
- Medial

- Hockey puck
- Patella (outline)
- Tibial collateral ligament (torn)
- Medial meniscus (torn)
- Anterior cruciate ligament (torn)
A meniscus is…

1) A pad of fibrocartilage between bones
2) The same as articular cartilage
3) Found in all synovial joints
4) All of the above
DEGENERATIVE JOINT CONDITIONS
Figure 8.15 X ray of a hand deformed by rheumatoid arthritis.
The progressive joint disease due to autoimmune reaction is...

1) Paget’s Disease
2) Osteoarthritis
3) Rheumatoid arthritis
4) Tendonitis