Objectives

- Describe the major anatomical landmarks of the arm, including bones and anatomical spaces.
- Differentiate between dermatomes and cutaneous innervation patterns.
- Illustrate the compartments of the upper limb as formed by the deep fascia; describe the innervation of each compartment, including spinal segments of each nerve.
- Locate and describe the proximal and distal attachments of individual muscles; identify and compare the functions of the muscles in each of the compartments.
- Describe the vascular patterns and major arteries and veins; describe the anastomoses around each joint; contrast the functions of the superficial vs. deep veins.
- Describe the relationship of the nerves in the arm to other local structures.
- Define the boundaries and describe the components of the cubital fossa.

Bones and Spaces of the Upper Extremity
Bones of the Shoulder and Arm

Go to LUMEN LEARN ‘EM Bone Box

Cutaneous Nerves
Dermatomes

Anterior Posterior

C6: Lateral Arm, Forearm & Thumb
C7: Back of Arm, Back of Forearm, 2nd & 3rd digits
C8: Medial Arm, Forearm & Hypothenar

Fascial Compartments of the Arm

Anterior Compartment
- Musculocutaneous n.
- Lateral intermuscular septum
- Biceps brachii m. - long head
- Brachialis m.
- Median n.
- Ulnar n.
- Radial n.

Posterior Compartment
- Triceps brachii m. - long head
- Triceps brachii m. - medial head
- Triceps brachii m. - lateral head
- Biceps brachii tendon

Muscles of the Anterior Arm

- Biceps brachii
  - Long head
  - Short head
- Brachialis
- Coracobrachialis

The tendon of the long head of the biceps runs over the head of the humerus in a synovial sheath that follows the tendon as far as the surgical neck. The tendon is held in place in the inter-tubercular groove by the transverse humeral ligament and the tendon of the pectoralis major m.
Muscles of the Anterior Arm

- **Biceps brachii**
  - Long head
  - Short head

- **Brachialis**
  - Tendon to Ulna

- **Coracobrachialis**
  - (Short head of biceps is superficial to this)

Muscles of the Posterior Arm

- **Triceps muscle**
  - Long head
  - Lateral head
  - Medial head

- The long head is the least active of the three, and aids primarily in extending the arm.
- The medial head is the workhorse of forearm extension (actually deep to lateral head).
- The lateral head is typically the strongest generator of force, but functions primarily against active resistance (not during passive motions).
**Muscles of the Posterior Arm**

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment (Origin)</th>
<th>Distal Attachment (Insertion)</th>
<th>Innervation</th>
<th>Line of Action</th>
<th>Muscle Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biceps brachii</strong></td>
<td>Long head: supraglenoid tubercle of scapula</td>
<td>Medial head: flexor of carpal tunnel</td>
<td>Musculocutaneous nerve (C5, C6)</td>
<td>Flexes and supinates forearm</td>
<td>Arm; Anterior</td>
</tr>
<tr>
<td></td>
<td>Short head: tip of coracoid process of scapula</td>
<td>Radial tuberosity, fascia of forearm</td>
<td></td>
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</tr>
<tr>
<td><strong>Brachialis</strong></td>
<td>Medial half of anterior surface of humerus</td>
<td>Coracoid process and tuberosity of ulna</td>
<td>Musculocutaneous nerve and radial nerve (C7)</td>
<td>Flexes forearm</td>
<td>Arm; Anterior</td>
</tr>
<tr>
<td><strong>Coracobrachialis</strong></td>
<td>Tip of coracoid process of scapula</td>
<td>Middle third of medial surface of humerus</td>
<td>Musculocutaneous nerve</td>
<td>Flexes and adducts arm at shoulder</td>
<td>Arm; Anterior</td>
</tr>
<tr>
<td><strong>Anconeus</strong></td>
<td>Posterior surface of lateral epicondyle of humerus</td>
<td>Lateral surface of olecranon and posterior proximal ulna</td>
<td>Radial nerve (C5–T1)</td>
<td>Assists triceps in extending elbow</td>
<td>Arm; Posterior</td>
</tr>
<tr>
<td><strong>Triceps brachii</strong></td>
<td>Long head: infraglenoid tubercle of scapula</td>
<td>Lateral head: upper half of posterior humerus</td>
<td>Radial nerve</td>
<td>Extends forearm; long head stabilizes head of abducted humerus and extends and adducts arm at shoulder</td>
<td>Arm; Posterior</td>
</tr>
<tr>
<td></td>
<td>Medial head: distal 2/3 of medial and posterior humerus</td>
<td>Medial surface of pronator muscles</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Superficial & Deep Veins**

- Median cubital v.
- Basilic v.
- Superficial Veins
- Deep Veins
**Arterial Supply: Axillary & Brachial Arteries**

**Elbow anastomoses**

**Arterial Supply: Axillary & Brachial Arteries**

- Brachial a.
- Ulnar a.
- Radial a.
- Profunda brachii a.
  - Anterior branch of profunda brachii a.
  - Radial collateral branch of profunda brachii a.
  - Inferior ulnar collateral a.
  - Superior ulnar collateral a.
  - Brachial a.
  - Radial recurrent profunda brachii a.
  - Anterior ulnar recurrent profunda brachii a.
  - Posterior ulnar recurrent profunda brachii a.
  - Common Interosseous a.
  - Posterior interosseous a.
  - Anterior interosseous a.
  - Ulnar a.
  - Radial a.

**Nerves of the Arm**

- Musculocutaneous – anterior compartment
- Radial – posterior compartment (not shown)
- Ulnar – No branches in arm
- Median – No branches in arm

Go to LUMEN LEARN ‘EM Arteries Page
Musculocutaneous (C5-C7):
1. Pierces the coracobrachialis muscle; innervates the coracobrachialis, biceps, and brachialis muscles.
2. Injury causes loss of flexion of the elbow, although not complete due to brachioradialis and flexor forearm muscles.
3. Continues as the lateral antebrachial cutaneous nerve.

Radial (C5-C8, T1):
1. Passes in the radial groove on the back of the humerus with the deep brachial artery (profunda brachii a.), pierces the lateral intermuscular septum, and divides into superficial and deep branches in front of the lateral epicondyle.
2. In the arm, gives branches to triceps, brachioradialis, and supplies the skin of the posterior arm & forearm.

Ulnar (C8, T1):
1. No branches in the arm.
Median (C5-C8, T1):
1. No branches in the arm.
2. Passes through the cubital fossa deep to the bicipital aponeurosis.
Cubital Fossa
A triangular-shaped, fat-filled depression of the anterior elbow.

Superficial veins – ideal place for drawing blood.

Cubital Fossa - Superficial
Boundaries:
- **Superior** - an imaginary line connecting the medial and lateral epicondyles
- **Medial** - the forearm flexors originating from the medial epicondyle (Pronator teres m.)
- **Lateral** - the forearm extensors originating from the lateral epicondyle (Brachioradialis m.)
- **Floor** - brachialis and supinator mm.
- **Roof** - brachial and antebrachial fascia and reinforced by the bicipital aponeurosis, which serves to protect the deep arteries and nerves in the area.

Cubital Fossa - Deep
Contents:
- Terminal part of the brachial artery
  - Branches into the ulnar and radial arteries
- Deep veins in the area
- Tendon of the biceps brachii m.
- Median n.
- Radial n.
  - In the fossa branches into superficial and deep radial nerves
Insight from Calvin

Make sure you get in the lab and observe!
And give dissection a try!

I LOVE the pool.

Click on a colored structure to identify

- Pectoralis major
- Biceps tendon
- Long head of biceps
- Brachialis
- Bicipital aponeurosis
- Transverse humeral ligament
- Tendon of long head of biceps
- Tendon of short head of biceps
- Coracobrachialis
- Musculocutaneous n.
- Lateral antebrachial cutaneous n.