An overview of the anatomy of the canine forelimb.

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Original photos courtesy of Mary Ferguson

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Lateral View of Shoulder and Brachial Region.

1. Supraspinatus
2. Spine of Scapula
3. Infraspinatus
4 and 4’. Deltoids
5. Teres Major
6, 6’ and 6”. Triceps
7. Biceps Brachii
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Innervation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supraspinatus</td>
<td>Supraspinous Fossa</td>
<td>Greater Tubercle</td>
<td>Suprascapular Nerve</td>
<td>Extend &amp; Stabilise Shoulder Joint</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>Infraspinous Fossa</td>
<td>Greater Tubercle</td>
<td>Suprascapular Nerve</td>
<td>Stabilise Shoulder Joint</td>
</tr>
<tr>
<td>Deltoids</td>
<td>Scapula Spine and Acromion</td>
<td>Deltoid Tuberosity</td>
<td>Axillary Nerve</td>
<td>Flex Shoulder Joint</td>
</tr>
<tr>
<td>Teres Major</td>
<td>Caudal Border of Scapula</td>
<td>Teres Major Tuberosity</td>
<td>Axillary Nerve</td>
<td>Flex Shoulder Joint</td>
</tr>
<tr>
<td>Triceps</td>
<td>Caudal Border of Scapula and Tricipital Crest</td>
<td>Olecranon</td>
<td>Radial Nerve</td>
<td>Flex Shoulder Joint &amp; Extend Elbow Joint</td>
</tr>
<tr>
<td>Biceps Brachii</td>
<td>Supraglenoid Tubercle</td>
<td>Radial Tuberosity</td>
<td>Musculocutaneous Nerve</td>
<td>Extend Shoulder Joint &amp; Flex Elbow Joint</td>
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There are no strong ligaments present in the shoulder joint, but the tendons of insertion of the supraspinatus and infraspinatus act to prevent dislocation of this joint. Damage to the suprascapular nerve which innervates these muscles causes them to atrophy giving rise to the clinical condition known as ‘Sweeney’ where the scapular spine becomes prominent. This condition is most frequently seen in the horse. Notice the prominent scapular spine of the horse in the following video.

http://www.youtube.com/watch?v=qepjRAQBGoE

In the dog, the triceps actually has four heads; lateral, medial, long and accessory. All come together to insert on the olecranon of the ulna.
Lateral view of Shoulder and Brachial Region.

The Deltoids have been removed.

1. Supraspinatus
2. Infraspinatus
3. Teres Major
4. Lateral Head of Triceps
5. Long Head of Triceps
Medial View of Shoulder and Brachial Region.

1. Subscapularis
2. Teres Major
3. Part of Brachial Plexus
4. Biceps Brachii
5. Long Head of Triceps
6. Medial Head of Triceps
The Brachial Plexus gives rise to the nerves of the forelimb.

It is formed from contributions of the spinal nerves C6, C7, C8, T1 and T2. In some individuals the spinal nerves at either end of the series may not contribute.

The Brachial Plexus is located just cranial to the first rib and on the medial aspect of the shoulder joint.
1. Supraspinatus
2. Spine of Scapula
3. Infraspinatus
4. Teres Major
5. Brachialis
6. Radial Nerve
In the last image the biceps, triceps and deltoids have been removed.

We can now see the small brachialis muscle. This muscle originates on the caudal aspect of the humerus and curves around to insert on the cranial aspect of the radius. It is innervated by the musculocutaneous nerve and acts as a flexor of the elbow joint.

The radial nerve can also be seen in the previous image traveling from a medial to lateral position.
Cranial aspect of the Antebrachium

1. Ulnaris Lateralis
2. Lateral Digital Extensor
3. Common Digital Extensor
4. Extensor Carpi Radialis
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<tr>
<td>Ulnaris Lateralis</td>
<td>Lateral Epicondyle of Humerus</td>
<td>Accessory Carpal Bone and most Lateral Metacarpal</td>
<td>Radial Nerve</td>
<td>Can both flex and extend the Carpal Joint</td>
</tr>
<tr>
<td>Lateral Digital Extensor</td>
<td>Lateral Epicondyle of Humerus</td>
<td>Proximal Phalanx of Digits 4 and 5</td>
<td>Radial Nerve</td>
<td>Extend Carpal Joint and Digits</td>
</tr>
<tr>
<td>Common Digital Extensor</td>
<td>Lateral Epicondyle of Humerus</td>
<td>Extensor Process of Distal Phalanx of Digits 2, 3, 4 and 5</td>
<td>Radial Nerve</td>
<td>Extend Carpal Joint and Digits</td>
</tr>
<tr>
<td>Extensor Carpi Radialis</td>
<td>Lateral Epicondyle of Humerus</td>
<td>Metacarpals 2 &amp; 3</td>
<td>Radial Nerve</td>
<td>Extend Carpal Joint</td>
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Notice how the four muscles shown in the previous picture which are located on the cranial aspect of the antebrachium, all originate from the lateral epicondyle of the humerus and are all innervated by the radial nerve.

Because all of these extensor muscle are innervated by the radial nerve, if it is damaged or severed by trauma etc. at a point proximal to where it innervates the muscles the clinical condition known as ‘knuckling’ can be seen. The dog tends to walk with the dorsal aspect of the paw in contact with the ground due to the inability to extend the carpal joint.
The following is a link to a youtube video of a dog with damage to the left radial nerve. Notice the ‘knuckling’ gait as the dog is unable to extend the carpus.

http://www.youtube.com/watch?v=RBK8VYERry8
A sesamoid bone is a very small bone which develops in the tendon of a muscle as it crosses a joint.

A sesamoid bone is found in each of the 4 tendons of insertion of the common digital extensor. Remember the common digital extensor inserts onto the distal phalanx of digits 2, 3, 4 and 5 so it must have 4 tendons of insertion. These sesamoid bones are known as the dorsal sesamoids and are located dorsal to the metacarpophalangeal joints.
On the ventral aspect of metacarpals 2, 3, 4 and 5 we also see the interosseous muscles. The tendons of the interosseous muscles of each metacarpal contain two sesamoid bones. These are also found at the metacarpophalangeal joints but on the ventral aspect and are known as the proximal sesamoids.

So digits 2, 3, 4 and 5 each contain a total of three sesamoid bones at the metacarpophalangeal joint, one dorsal sesamoid and two proximal sesamoids.

Can you spot any of the sesamoid bones in this radiograph?
The most medial digit, digit 1, is different from the other four.

It only has two phalanges, the other digits have three.

It has one sesamoid bone, a proximal sesamoid on the ventral aspect of its metacarpophalangeal joint. Another small sesamoid bone can be found in the tendon of insertion of the abductor pollicus longus muscles which acts on digit 1. This sesamoid bone may be seen approximately between the two rows of carpal bones on the medial side.
Cranial aspect of the Antebrachium

1. Ulnaris Lateralis
2. Lateral Digital Extensor
3. Common Digital Extensor
4. Extensor Carpi Radialis
Caudal aspect of the Antebrachium

1. Superficial Digital Flexor
2. Flexor Carpi Radialis
3. Flexor Carpi Ulnaris
1. Superficial Digital Flexor (moved aside)
2. Deep Digital Flexor
3. Flexor Carpi Radialis
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<tr>
<td>Superficial Digital Flexor</td>
<td>Medial Epicondyle of Humerus</td>
<td>Palmer aspect of Middle Phalanx of Digits 2, 3, 4 &amp; 5</td>
<td>Median and Ulnar Nerves</td>
<td>Flex Digits and Carpal Joint</td>
</tr>
<tr>
<td>Deep Digital Flexor</td>
<td>Medial Epicondyle of Humerus and caudal-medial aspect of Radius and Ulna</td>
<td>Palmer aspect of Distal Phalanx of Digits 2, 3, 4 &amp; 5</td>
<td>Median and Ulnar Nerves</td>
<td>Flex Digits and Carpal Joint</td>
</tr>
<tr>
<td>Flexor Carpi Ulnaris</td>
<td>Medial Epicondyle of Humerus</td>
<td>Accessory Carpal bone</td>
<td>Median and Ulnar Nerves</td>
<td>Flex Carpal Joint</td>
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<tr>
<td>Flexor Carpi Radialis</td>
<td>Medial Epicondyle of Humerus</td>
<td>Metacarpals 2 and 3</td>
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Notice that all of the flexor muscle shown in the previous picture, which lie on the caudal aspect of the antebrachium, originate from the medial epicondyle of the humerus and are innervated by the median and ulnar nerves.

The deep digital flexor of the dog has three heads, thus its three places of origin as seen in the previous table. The heads deep digital flexor can be found deep to the superficial digital flexor.
Between the prongs of the forceps lies the flexor retinaculum, a thickening of the deep fascia found on the caudal aspect of the paw. It act to give support to the flexor tendons.

An extensor retinaculum can be seen on the dorsal aspect of the paw.