

**EMQs for
Medical Students
Volume 2
Second Edition**

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Pastes⁺

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1. THEME: CUTANEOUS INNERVATION OF THE UPPER LIMB

- A Anterior interosseus nerve
- B Axillary nerve
- C Medial cutaneous nerve of the forearm
- D Median nerve
- E Musculocutaneous nerve
- F Posterior cutaneous nerve of the arm
- G Posterior cutaneous nerve of the forearm
- H Posterior interosseus nerve
- I Radial nerve
- J Ulnar nerve

For each of the options below, identify the innervation of the skin from the above list. Each nerve may be used once, more than once or not at all.

1. Distal attachment of the deltoid muscle.
2. Medial epicondyle of the humerus.
3. Scaphoid fossa.
4. Thenar eminence.
5. Nail bed of the little finger.

2. THEME: NERVE SUPPLY OF THE MUSCLES OF THE UPPER LIMB

- A Anterior interosseus nerve
- B Axillary nerve
- C Long thoracic nerve
- D Lower subscapular nerve
- E Medial cutaneous nerve of the forearm
- F Median nerve
- G Musculocutaneous nerve
- H Posterior interosseus nerve
- I Radial nerve
- J Ulnar nerve

For each of the muscles below, identify its nerve supply from the above list. Each nerve may be used once, more than once or not at all.

- | | |
|---------------------------|--------------------------|
| 1. Teres major. | <input type="checkbox"/> |
| 2. Brachioradialis. | <input type="checkbox"/> |
| 3. Supinator. | <input type="checkbox"/> |
| 4. Flexor carpi ulnaris. | <input type="checkbox"/> |
| 5. Flexor carpi radialis. | <input type="checkbox"/> |

3. THEME: MUSCLE ATTACHMENTS OF THE FOREARM

- A Biceps
- B Brachialis
- C Brachioradialis
- D Deltoid
- E Extensor carpi radialis brevis
- F Flexor carpi ulnaris
- G Flexor digitorum profundus
- H Flexor pollicis longus
- I Pronator teres
- J Supinator
- K Triceps

For each of the bony attachments below, choose the most appropriate muscle from the above list. Each muscle may be used once, more than once or not at all.

1. Lateral supracondylar ridge of the humerus.

2. Olecranon process of the ulna.

3. Anterior aspect of the lateral epicondyle of the humerus.

4. Coronoid process of the ulna.

5. Proximal anterior surface of the radius.

4. THEME: RELATIONSHIPS OF THE UPPER LIMB

- A Anterior interosseus nerve
- B Biceps tendon
- C Brachial artery
- D Common interosseus artery
- E Median nerve
- F Posterior interosseus nerve
- G Radial artery
- H Radial nerve
- I Ulnar artery
- J Ulnar nerve

For each of the anatomical descriptions below, choose the most appropriate structure from the above list. Each structure may be used once, more than once or not at all.

1. Lies in contact with the posterior shaft of the humerus.
2. Lies in contact with the posterior surface of the medial epicondyle of the humerus.
3. Passes between the two heads of pronator teres.
4. Divides at the level of the neck of the radius.
5. Passes between the heads of the first palmar interosseus muscles.

5. THEME: CUTANEOUS INNERVATION OF THE LOWER LIMB

- A Deep peroneal (anterior tibial) nerve
- B Genitofemoral nerve
- C Intermediate cutaneous nerve of the thigh
- D Lateral cutaneous nerve of the thigh
- E Medial cutaneous nerve of the thigh
- F Posterior cutaneous nerve of the thigh
- G Posterior tibial nerve
- H Saphenous nerve
- I Superficial peroneal (musculocutaneous) nerve
- J Sural nerve

For each of the options below, identify the innervation of the skin from the above list. Each nerve may be used once, more than once or not at all.

1. Saphenous opening.
2. Greater trochanter.
3. Lower shin.
4. Lateral side of the foot.
5. Dorsal aspect of the first interdigital web.

6. THEME: NERVE SUPPLY OF THE MUSCLES OF THE LOWER LIMB

- A Deep peroneal (anterior tibial) nerve
- B Common peroneal (lateral popliteal) nerve
- C Femoral nerve
- D Inferior gluteal nerve
- E Medial plantar nerve
- F Obturator nerve
- G Sciatic nerve
- H Superficial peroneal (musculocutaneous) nerve
- I Sural nerve
- J Tibial (posterior tibial) nerve

For each of the muscles below, identify its nerve supply from the above list. Each nerve may be used once, more than once or not at all.

- | | |
|-------------------------------|--------------------------|
| 1. Adductor longus. | <input type="checkbox"/> |
| 2. Biceps. | <input type="checkbox"/> |
| 3. Extensor digitorum longus. | <input type="checkbox"/> |
| 4. Peroneus brevis. | <input type="checkbox"/> |
| 5. Tibialis posterior. | <input type="checkbox"/> |

7. THEME: RELATIONSHIPS OF THE LOWER LIMB

- A Anterior tibial artery
- B Common peroneal nerve
- C Femoral artery
- D Femoral nerve
- E Great saphenous vein
- F Peroneal artery
- G Posterior tibial artery
- H Sciatic nerve
- I Small saphenous vein
- J Tibial nerve

For each of the anatomical descriptions below, choose the most appropriate structure from the above list. Each structure may be used once, more than once or not at all.

1. Passes through the saphenous opening in the fascia lata.
2. Passes through the opening in the adductor magnus tendon.
3. Is closely related to the lateral aspect of the neck of the fibula.
4. Lies medial to the talus.
5. Lies anterior to the lateral malleolus.

8. THEME: MUSCLE ATTACHMENTS OF THE LOWER LIMB

- A Adductor longus
- B Adductor magnus
- C Biceps femoris
- D Peroneus brevis
- E Peroneus longus
- F Rectus femoris
- G Semimembranosus
- H Soleus
- I Tibialis anterior
- J Tibialis posterior

For each of the bony attachments below, choose the most appropriate muscle from the above list. Each muscle may be used once, more than once or not at all.

1. The anterior inferior iliac spine.
2. The body of the pubis.
3. The head of the fibula.
4. The medial cuneiform bone.
5. The styloid process of the fifth metatarsal.

9. THEME: COMPLICATIONS OF FRACTURES

- A Algodystrophy (Sudeck's atrophy)
- B Avascular necrosis
- C Compartment syndrome
- D Delayed union
- E Malunion
- F Nerve injury
- G Non-union
- H Myositis ossificans
- I Osteoarthritis
- J Vascular injury

The patients below have all sustained injuries resulting in fractures. Please select the most likely fracture complication from the above list. Each complication may be used once, more than once or not at all.

1. A 10-year-old child fell onto her outstretched hand 6 hours ago. The child is complaining of severe pain that was initially in the elbow but is now more severe in the forearm. Both areas are swollen and tender. Examination reveals a palpable rapid pulse, but decreased sensation in the hand with reduced capillary return.
2. A 36-year-old computer programmer fell onto his outstretched hand and subsequently developed a painful wrist. An initial visit to the Emergency Department resulted in a normal radiograph and his discharge. He was still complaining of pain 10 months later, however, and again attended the Emergency Department. A further radiograph was performed and the attending Emergency Department officer informed him that he had an 'abnormal extra bone in the wrist'.
3. A 27-year-old footballer had a marked deformity of the knee after a hard tackle. He subsequently attended the Emergency Department, where the deformity was immediately reduced by the orthopaedic team. He still has marked swelling and pain of the knee, but also now has reduced sensation on the dorsum of the foot, with an associated foot drop. The foot pulses are present.
4. A 60-year-old woman falls on her outstretched hand. There is tenderness and a deformity at the wrist, in which the hand is displaced backwards and over to the radial side. Three months later she complains of continuous burning pain and swelling in the hand.
5. A 56-year-old violinist tripped and suffered an injury to his right wrist. He subsequently underwent operative treatment for a comminuted fracture of the distal radius and ulna. The outcome of surgery was said to be satisfactory and he returned to concert performance 6 months later. Four years later he complains of increasing pain and swelling in the wrist and becomes unable to continue in his career.

10. THEME: UPPER LIMB INJURIES

- A** Acromioclavicular joint dislocation
- B** Colles' fracture
- C** Dislocated shoulder
- D** Fracture of the clavicle
- E** Fracture of the proximal humerus
- F** Fracture of the radial head
- G** Fracture of the shaft of the humerus
- H** Scaphoid fracture
- I** Smith's fracture
- J** Supracondylar fracture of the humerus

The patients below have all fallen, injuring their upper limb. Please select the most appropriate fracture or dislocation from the above list. Each injury may be used once, more than once or not at all.

1. A 20-year-old man falls on his backward-stretching hand. He is supporting his arm with his opposite hand. The lateral outline of the shoulder is flattened and a small bulge is seen and felt just below the clavicle. There is a small area of anaesthesia over the distal attachment of the deltoid muscle.
2. A 70-year-old woman falls on her elbow. She has marked bruising and tenderness of the upper arm. Neurovascular examination reveals a wrist drop.
3. A 24-year-old man presents 3 months after spraining his wrist, when he fell on his outstretched hand. He complains of persistent pain and weakness in the wrist.
4. A 10-year-old child fell onto his outstretched hand 30 minutes ago. The child is complaining of severe pain in the elbow, which is very swollen and tender. Examination reveals an absent radial pulse.
5. A 31-year-old merchant banker fell from his horse onto his outstretched hand while hunting in Kent. He attends the Emergency Department the following day complaining of pain and decreased movement of the elbow. A radiograph of the elbow was reported as showing an effusion of the elbow joint with a 'fat pad sign' but no obvious fracture. Several weeks later the patient continues to complain of loss of extension at the elbow.

ANSWERS TO CHAPTER – MUSCULOSKELETAL

3

1. CUTANEOUS INNERVATION OF THE UPPER LIMB

1. **B – Axillary nerve**

The upper lateral cutaneous nerve of the arm supplying the skin over deltoid is a branch of the axillary nerve. The axillary nerve can be damaged in dislocation of the shoulder joint and fractures of the surgical neck of the humerus. Immediately post-injury, the sensory loss is easier to assess than paralysis of the deltoid muscle.

2. **C – Medial cutaneous nerve of the forearm**

The medial cutaneous nerve of the forearm pierces the deep fascia in the mid upper arm with the basilic vein, and supplies the skin over the medial aspect of lower arm and forearm to the wrist.

3. **I – Radial nerve**

The radial nerve passes under cover of the brachioradialis in the forearm and crosses the scaphoid fossa. It innervates the skin over the posterior aspect of the hand, and the lateral two and a half digits, as far as the nail bed.

4. **D – Median nerve**

The median nerve supplies the lateral palm and skin over the anterior aspect, the tip and the nail bed of the lateral two and a half digits.

5. **J – Ulnar nerve**

The ulnar nerve supplies the anterior and posterior aspects of the medial side of the hand, and the palmar one and a half, and dorsal three and a half fingers, through its palmar and dorsal branches.

The anterior and posterior interosseus nerves are deeply placed in the forearm and have no cutaneous innervation. The musculocutaneous nerve pierces the deep fascia on the lateral side of the biceps tendon to become the lateral cutaneous nerve of the forearm, supplying the lateral skin down to the wrist. The posterior cutaneous nerves of the arm and forearm supply the posterior aspect of the upper limb from the axilla to the wrist. They are branches of the radial nerve arising respectively in the axilla and over the radial groove of the humerus.

2. NERVE SUPPLY OF THE MUSCLES OF THE UPPER LIMB

1. **D – Lower subscapular nerve**

The lower subscapular nerve also supplies the subscapularis muscle.

2. I – Radial nerve

After piercing the lateral intermuscular septum, the radial nerve also supplies the extensor carpi radialis longus and brevis, before dividing into the posterior interosseus nerve and the radial cutaneous nerve. The latter passes distally deep to the brachioradialis muscle.

3. H – Posterior interosseus nerve

The posterior interosseus nerve passes between the heads of the supinator muscle and supplies the deep extensor muscles of the forearm.

4. J – Ulnar nerve

The ulnar nerve enters the forearm between the heads of flexor carpi ulnaris. It also supplies the medial half of flexor digitorum profundus, the hypothenar and interosseus muscles, the medial two lumbricals and the adductor pollicis muscle.

5. F – Median nerve

The median nerve passes between the heads of the pronator teres and deep to the flexor digitorum sublimus in the forearm. It supplies these muscles, together with flexor carpi radialis, palmaris longus, the thenar muscles except adductor pollicis, and the lateral two lumbricals.

The anterior interosseus nerve is a branch of the median nerve and supplies flexor pollicis longus, half of flexor digitorum profundus and pronator quadratus. The axillary nerve supplies deltoid and teres minor muscles, and the lateral aspect of the upper arm over the deltoid muscle. The long thoracic nerve supplies serratus anterior and the musculocutaneous nerve supplies brachialis, biceps and coracobrachialis before becoming the lateral cutaneous nerve of the forearm. The medial cutaneous nerve of the forearm passes through the deep fascia with the basilic vein to supply the medial aspect of the lower arm and forearm to the wrist.

3. MUSCLE ATTACHMENTS OF THE FOREARM**1. C – Brachioradialis**

The distal attachment of the brachioradialis is to the lateral aspect of the lower end of the radius. The muscle flexes the elbow joint most effectively in mid-pronation.

2. K – Triceps

The three heads of the triceps converge onto a common tendon. The muscle is a powerful extensor of the elbow joint.

3. E – Extensor carpi radialis brevis

The extensor carpi radialis longus is attached to the adjacent supracondylar ridge. The extensor carpi radialis longus and brevis are attached distally to the second and third metacarpal bones. They extend the wrist and, with flexor carpi radialis, also abduct the joint.

4. B – Brachialis

The proximal attachment of the brachialis is to the lower anterior surface of the humerus. The muscle is a powerful flexor of the elbow joint.

5. J – Supinator

The proximal attachment of the two heads of the supinator are to the lateral epicondyle of the humerus and the supinator crest of the ulna, adjacent to the trochlear notch. The supinator is a powerful supinator of the forearm.

The biceps is attached proximally to the scapula, by the long head to the supraglenoid tubercle and by the short head to the tip of the coracoid process. The common tendon is attached to the radial tuberosity. The biceps is a powerful supinator and flexes the elbow most effectively with the forearms supinated.

Deltoid passes from an extensive attachment on the anterior aspect of the clavicle and the spine of the scapula, to the lateral aspect of the mid-humerus. The deltoid is the main adductor of the shoulder joint.

The flexor carpi ulnaris has humeral and ulnar heads, bridging over the ulnar nerve; the tendon is attached to the pisiform bone. Flexor carpi ulnaris is a flexor and adductor of the wrist joint.

Flexor digitorum profundus has an extensive attachment to the anterior aspect of the ulna and adjacent interosseus membrane. Its tendons pass to the base of the distal phalanges of the fingers.

Flexor pollicis longus is attached proximally to the anterior radius and adjacent interosseus membrane, the tendon passing to the base of the distal phalanx of the thumb. The muscle flexes the metacarpal, phalangeal and interphalangeal joints of the thumb.

Pronator teres has humeral and ulnar heads that converge, the distal attachment being to the lateral aspect of the mid-radius. The muscle pronates the forearm and is a weak flexor of the elbow.

4. RELATIONSHIPS OF THE UPPER LIMB

1. H – Radial nerve

The radial nerve lies in the radial groove before piercing the lateral intermuscular septum to lie deep to the brachioradialis muscle. It can be damaged by mid-shaft fractures.

2. J – Ulnar nerve

The ulnar nerve then passes deep to the flexor carpi ulnaris, to lie on the flexor digitorum profundus. It is palpable subcutaneously behind the medial epicondyle and can be traumatised at this point.

3. E – Median nerve

In contrast, the ulnar artery passes deep to both heads.

4. C – Brachial artery

The brachial artery lies in the groove between the biceps and brachialis muscles in the arm and divides into the ulnar and radial arteries.

5. G – Radial artery

The radial artery lies on the flexor pollicis longus and pronator quadratus in the forearm before passing lateral to the wrist in the floor of the anatomical snuff box.

5. CUTANEOUS INNERVATION OF THE LOWER LIMB**1. B – Genitofemoral nerve**

The genitofemoral nerve supplies the skin over the femoral triangle through its femoral branch. Below this, the anterior and medial aspects of the thigh are supplied by the medial and intermediate cutaneous branches of the femoral nerve.

2. D – Lateral cutaneous nerve of the thigh

The lateral cutaneous nerve of the thigh passes deep to the lateral aspect of the inguinal ligament, piercing the deep fascia 4–5 cm below the anterior superior iliac spine. It divides into anterior and posterior branches, which supply the lateral aspect of the thigh. The nerve can be entrapped within the inguinal ligament, producing a painful syndrome known as ‘meralgia paraesthetica’.

3. I – Superficial peroneal (musculocutaneous) nerve

The superficial peroneal nerve is a terminal branch of the common peroneal nerve. Its cutaneous termination supplies the skin over the anterior ankle, dorsum of the foot, and the adjacent sides of the second and third, and third and fourth toes.

4. J – Sural nerve

The sural nerve, with a variable contribution from the sural communicating nerve, supplies the lower lateral part of the back of the leg, the lateral border of the foot and the lateral side of the little toe.

5. A – Deep peroneal (anterior tibial) nerve

The superficial peroneal is a terminal branch of the common peroneal nerve. Its cutaneous distribution is limited to the adjacent sides of the great and second toes.

The posterocutaneous nerve of the thigh supplies the lower buttock and the posterior aspect of the thigh, the popliteal fossa and proximal calf.

The posterior tibial nerve supplies the skin over the sole through the cutaneous branches of its lateral and medial plantar terminal branches. The cutaneous nerves correspond to the distribution of the ulnar and median nerves of the hands, supplying the nail beds as well as the plantar aspects of the toes.

The saphenous nerve is a branch of the femoral nerve. It pierces the deep fascia in the lower medial thigh to pass distally with the great saphenous vein. It is distributed to the skin of the medial side of the leg and foot. The nerve can be damaged during surgery on the great saphenous vein.

6. NERVE SUPPLY OF THE MUSCLES OF THE LOWER LIMB

1. F – Obturator nerve

The obturator nerve also supplies obturator externus and adductor brevis, and occasionally pectineus and adductor magnus, the latter also receiving a contribution from the sciatic nerve, being developmentally a part of the hamstring complex.

2. G – Sciatic nerve

The sciatic nerve usually supplies biceps, semitendinosus, semimembranosus and the ischial part of adductor magnus, before dividing into its tibial and common peroneal components. If there is a high division, biceps receives contributions from both tributaries.

3. A – Deep peroneal (anterior tibial) nerve

The deep peroneal nerve also gives muscular branches to tibialis anterior, extensor digitorum longus and peroneus tertius.

4. H – Superficial peroneal (musculocutaneous) nerve

The superficial peroneal nerve supplies both peroneus longus and brevis.

5. J – Tibial (posterior tibial) nerve

The tibial nerve supplies the muscles of the posterior aspect of the lower leg before dividing into medial and lateral plantar nerves. The muscles it innervates include gastrocnemius, plantaris, soleus, popliteus, flexor digitorum longus and flexor hallucis.

The common peroneal nerve is one of the terminal divisions of the sciatic nerve and can supply some of the hamstring muscles if the sciatic nerve divides proximally. The nerve divides into deep and superficial peroneal nerves, but has no direct muscular branches. Damage to the nerve adjacent to the neck of the fibula causes foot drop.

The femoral nerve is the largest branch of the lumbar plexus. In the abdomen, it supplies branches to the iliacus and pectineus; in the thigh, it supplies the sartorius and quadriceps femoris muscles.

The inferior gluteal nerve supplies gluteus maximus; the medial plantar nerve supplies the adductor hallucis, flexor digitorum brevis, flexor hallucis brevis, and the first lumbrical.

The sural nerve is sensory and has no muscle innervation.

7. RELATIONSHIPS OF THE LOWER LIMB

1. E – Great saphenous vein

The great saphenous vein is formed on the medial aspect of the dorsum of the foot and passes along the medial aspect of the leg and thigh. After passing through the saphenous opening, it joins the femoral vein. The small saphenous vein passes behind the lateral malleolus and along the middle of the calf to pierce the popliteal fossa and join the popliteal vein.

2. C – Femoral artery

The femoral artery is formed at the mid-inguinal point. It passes distally through the femoral triangle and through the subsartorial canal. It becomes the popliteal artery as it passes with its vein through the hiatus in adductor magnus. The femoral nerve lies lateral to the artery as it emerges from under the inguinal ligament.

3. B – Common peroneal nerve

The sciatic nerve leaves the pelvis through the greater sciatic notch, and injections into the gluteus maximus muscle must be aimed upwards and laterally to avoid damaging the nerve at this point. It divides into tibial and common peroneal nerves in the mid thigh and these diverge in the popliteal fossa. The common peroneal nerve is palpable and at risk of injury as it crosses the fibula to divide into superficial and deep peroneal nerves, respectively supplying the peroneal and anterior crural muscles. The tibial nerve supplies the superficial and deep muscles of the posterior aspect of the lower leg.

4. G – Posterior tibial artery

The popliteal artery passes deep to the heads of the gastrocnemius muscle. The anterior tibial branch passes over the interosseus membrane into the anterior compartment. It becomes the dorsalis pedis as it crosses the ankle joint midway between the two malleoli and is palpable at this site. The dorsalis pedis artery is also palpable as it crosses the tarsus in the direction of the first digital web. The posterior tibial artery gives off the peroneal branch and then passes between the superficial and deep posterior muscles of the calf. It is palpable behind the tibia and over the talus as it passes into the foot.

5. F – Peroneal artery

The peroneal artery passes through the lateral compartment of the lower leg. It can become prominent if the anterior or posterior tibial arteries are congenitally small or diseased. It is then palpable anterior to the lateral malleolus.

8. MUSCLE ATTACHMENTS OF THE LOWER LIMB

1. F – Rectus femoris

The rectus femoris with the vastus medialis, intermedius and lateralis make up the quadriceps femoris, which is the powerful knee extensor muscle, making up the bulk of the anterior thigh. The other three muscles gain extensive attachments from the shaft of the femur and all four are attached to the patella and thence by the patellar tendon to the tibial tubercle.

2. A – Adductor longus

The adductors longus, brevis and magnus gain attachment to the pubic bone, but the adductor magnus, which is developmentally also part of the hamstring muscle group, is also attached to the ischial tuberosity. Distally, the three muscles are attached to the medial side of the femur, the adductor magnus by an extensive expansion down to the adductor tubercle on the medial condyle. These muscles are adductors of the hip joint.

3. C – Biceps femoris

The biceps femoris, like the semimembranosus, is attached proximally to the ischial tuberosity. It also has a femoral head. The semimembranosus is attached distally to the medial tibial condyle. The two muscles are powerful knee flexors.

4. I – Tibialis anterior

The tibialis anterior has an extensive proximal attachment to the shaft of the tibia and distally is attached to the medial and inferior aspect of the medial cuneiform and adjacent first metatarsal. It dorsiflects the ankle and helps to maintain the medial longitudinal arch of the foot.

5. D – Peroneus brevis

The peronei longus and brevis are attached proximally along the lateral aspect of the fibula. Distally, the peroneus longus passes under the foot to be attached to the medial cuneiform and first metatarsal. The muscles evert the foot and the peroneus longus also helps maintain the lateral longitudinal arch of the foot.

The soleus, with the gastrocnemius muscle, forms the prominence of the calf. The soleus has tibial and fibular heads and the two muscles have a common tendo calcaneus. They are powerful plantarflexors of the ankle. Tibialis posterior is attached proximally to the posterior aspect of the tibia and adjacent interosseus membrane. It passes around the medial malleolus to be attached to the tubercle of the navicular bone. The muscle is the main invertor of the foot and assists in plantarflexion.

9. COMPLICATIONS OF FRACTURES

1. C – Compartment syndrome

This patient has a supracondylar fracture of the humerus with secondary compartment syndrome. This injury is confined to childhood, when it is quite common. The humeral fracture is just above the condyles and the distal fragment is pushed and tilted backwards. While the great danger of supracondylar fracture is direct primary injury to the brachial artery, when peripheral ischaemia can be immediate and severe, more commonly forearm oedema and an increasing compartment pressure lead to necrosis of muscle and nerve, due to severe ischaemia. The clinical features are those of ischaemia (pain, paraesthesiae, pallor, paralysis and pulselessness) but, commonly, severe pain and swelling are the only features present and the presence of a pulse (as in this case) does not exclude the diagnosis.

2. G – Non-union

This patient has a fracture of the scaphoid which has been missed at his first hospital visit because the radiograph appeared normal, as is sometimes be the case in the initial stages of this injury. The fracture has subsequently failed to unite because of continued movement at the fracture line. This might have been prevented by immobilisation of the fracture at the initial visit, when it should have been suspected on the basis of the mechanism of injury and clinical examination. A second radiograph at 2 weeks confirms the fracture in most cases.

3. F – Nerve injury

This footballer has a fracture dislocation of the knee, which was reduced in the Emergency Department. This serious injury has a high association with vascular and nerve injuries. In this case there is no vascular injury, but the foot pulses should always be checked. The neurological injury is an injury of the common peroneal nerve. This nerve supplies motor fibres to the anterior and peroneal muscle compartments of the

lower leg (dorsiflexion and eversion of the foot) and sensory fibres to the skin of the lower leg and the dorsum of the foot.

4. A – Algodystrophy (Sudeck's atrophy)

This patient has a Colles' fracture (transverse fracture of the distal radius with dorsal displacement of the distal fragment) and Sudeck's reflex sympathetic dystrophy. This is an extremely disabling condition in which the hand becomes painful, stiff and hyper-sensitive, resisting all forms of treatment for months. The condition is usually seen in the hand or the foot, often after relatively trivial injury. With prolonged physiotherapy there is usually steady, albeit slow recovery.

5. I – Osteoarthritis

The long timescale after the injury with initial recovery suggests this common complication of fractures. Osteoarthritis commonly occurs when fractures disrupt the normal smooth articulation of synovial joints by altering the contour of articulating surfaces (eg intra-articular fractures). The wrist is a common site for such problems, which can have devastating consequences in terms of the patient's occupation (as in this case).

10. UPPER LIMB INJURIES

1. C – Dislocated shoulder

This patient has a dislocated shoulder. The history of the injury and squaring of the outline of the shoulder is characteristic. The diagnosis is further supported by the finding of neuropraxia of the axillary nerve: this injury is not uncommon and usually recovers spontaneously in a few weeks.

2. G – Fracture of the shaft of the humerus

This fracture is common in the elderly. The extensive bruising is characteristic. The diagnosis is supported in this case by the finding of wrist drop, which has been caused by a radial nerve injury where it lies in the spiral groove of the humerus. In closed injuries the nerve is seldom divided and the wrist can be splinted while the injury recovers.

3. H – Scaphoid fracture

This patient has a scaphoid fracture and avascular necrosis of the scaphoid bone. The injury is caused by a fall onto the dorsiflexed hand. The appearance can be deceptively normal and is sometimes dismissed by patients (and occasionally by clinicians) as a sprained wrist. The classic clinical feature is of fullness and tenderness in the anatomical snuffbox (the depression on the dorsolateral wrist formed by the extensor and abductor tendons to the thumb). If immobilisation is not adequate, the proximal fragment of the scaphoid can necrose and cause persistent pain and weakness of the wrist.

4. J – Supracondylar fracture of the humerus

This injury is confined to childhood, when it is quite common. The humerus fractures just above the condyles and the distal fragment is pushed and tilted backwards. The great danger of supracondylar fracture is direct primary injury to the brachial artery, leading to immediate and severe peripheral ischaemia, as in this case.