I realise that save for all but the most ardent afficionado an inch by inch discussion of the components of the peripheral nervous system can rapidly induce somnolence. To avoid raking up memories of afternoon snoozes in the back seats of the anatomy lecture theatre I will focus on those nerves that commonly present with entrapment syndromes or as a result of trauma. In any discussion of the clinical anatomy of the peripheral nervous system it is hard to avoid dwelling a great deal on the median nerve. Carpal tunnel syndrome is by far the commonest peripheral entrapment neuropathy, roughly 3% of women and 1% of men will develop carpal tunnel syndrome at some stage. In the catchment area for our neurophysiology service that is roughly 10,000 patients. 

Anatomy
The median receives fibres from C6, C7, C8 and T1 roots. It may sometimes contain C5 fibres. It is formed in the axilla by a branch each from the medial and lateral chords of the brachial plexus, which arise on either side of the axillary artery and fuse to form the nerve anterior to the artery. In the arm it is closely related to the brachial artery. (ACNR vol1, issue 2, pp24-25). There is not much action in the arm otherwise as the median nerve has no branches above the cubital fossa. The nerve enters the cubital fossa lateral to the brachial artery. In the arm it is closely related to the brachial artery. 

The median nerve trunk in the forearm
- Branches to Pronator Teres, Flexor Carpi Radialis, Flexor Digi
torum Superficialis, Anterior Interosseus Nerve, Flexor Pollices Longus, Flexor Digi
torum Profundus, Pronator Quadratus
- Thenar Eminence
- Lateral 2 Lumbricals

Table 1

<table>
<thead>
<tr>
<th>Median Nerve Trunk In the Forearm</th>
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<tbody>
<tr>
<td>Pronator Teres</td>
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<td>Flexor Carpi Radialis</td>
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| Flexor Digi
torum Superficialis           |
| Anterior Interosseus Nerve        |
| Flexor Pollices Longus            |
| Flexor Digi
torum Profundus           |
| Pronator Quadratus                |
| Hand                              |
| Thenar Eminence                   |
| Lateral 2 Lumbricals              |

Entrapment syndromes
There are three well described entrapment syndromes involving the median nerve or its branches, namely carpal tunnel syndrome, pronator teres syndrome and anterior interosseous syndrome.

Carpal Tunnel Syndrome
Carpal tunnel syndrome due to compression of the median nerve in the carpal tunnel syndrome, commonly presents with sensory disturbance and pain in the hand. I have found that one of the most useful diagnostic clues is the presence of sensory symptoms at night time relieved by changing hand posture. It is also worth remembering that carpal tunnel syndrome can sometimes present with symptoms in an ulnar or radial nerve distribution. In my opinion clinical testing with Tinel’s sign adds little to a good history. There are as many ways of testing electrophysiologically for carpal tunnel syndrome as there are neurophysiologists, my own preference is to compare median sensory conduction velocity across wrist with ulnar velocity. This should be supported by measurement of motor conduction across the wrist and motor conduction in the forearm segment.

Anterior Interosseus Nerve Palsy
There are a number of causes described for anterior interosseus nerve palsy. These include fractures of the radius midshaft, excessive exercise or penetrating injuries to the forearm although many cases may be idiopathic. Selective involvement of the anterior interosseus nerve may be seen in brachial neuritis. It presents principally as weakness of the index finger and thumb. On clinical examination this is best observed by observing the pinch attitude of the thumb and index finger. Neurophysiological evaluation should include motor and sensory studies of the median nerve to exclude median nerve trunk involvement. Needle EMG should be performed on flexor pollicis longus and compared with a muscle innervated in the forearm by the median nerve trunk, flexor digitorum superficialis is usually the easiest.

Pronator Syndrome
This is due to compression of the median nerve as it passes through pronator teres. Classically it presents with pain on the
volar surface of the forearm following prolonged pronation of
the forearm. Often there are no signs and neurophysiological
evaluation is normal. It may also be difficult to distinguish from
carpal tunnel syndrome. Useful clues however are dyæsthesia
in the ‘palmar triangle’ and replication of symptoms by pro-
longed pronation. Sometimes nerve conduction studies in
severe cases may demonstrate focal slowing of median motor
conduction in the forearm segment.

Other Causes of Median Neuropathy
Compression of the median nerve at the elbow can result from
a supracondylar ligament (Ligament of Struthers), compression
in the forearm can occur in the proximal arch of the flexor dig-
itorum superficialis. Trauma can obviously occur to the nerve
anywhere along its course. Types of injury can include penet-
trating injuries in the axilla and fracture to the shaft of the
humerus. Acute compression can occur as a result of bleeding
into the forearm or the placement of A/V fistulas in dialysis.
Neurophysiologically these are confirmed by demonstrating
slowing of conduction across the site of injury or compression
and neuropathic features on EMG on those muscles supplied
by branches given off below the site of injury or compression.

Figure 1: Set up for Median motor study, electrodes are placed
over the abductor pollicis brevis (APB), the nerve is stimulated
at the wrist and elbow (green markers).

Figure 2: Set up for median sensory study, digital nerves are
stimulated with ring electrodes and the response is recorded
radial to the palmaris tendon.

Figure 3: Median motor study in carpal tunnel syndrome, medi-
an motor conduction is delayed across the carpal tunnel, note
the difference in latency between the distal median motor study
and the normal distal ulnar study, median conduction in the
forearm is within normal limits.

Figure 4: Median sensory study in carpal tunnel syndrome,
note the slowing and the reduction in amplitude in the medi-
an sensory action potential compared with the normal ulnar
sensory action potential.

Figure 5: Four sites of median nerve entrapment, 1 Ligament of
Struthers, 2 Pronator Teres, 3 Anterior interosseous nerve, 4
Carpal Tunnel.