Axillary Lymph Nodes

The axillary lymph nodes (20 to 30 in number) drain

- ✓ All lymphatics from the upper limb
- ✓ The lower neck
- ✓ The chest
- ✓ Approximately 75% of the mammary gland
- ✓ The upper anterolateral abdominal wall (above the level of the umbilicus)
- ✓ The back (down as far as the level of the iliac crests)

The lymph nodes are arranged in five groups.

1. **Anterior (pectoral) group:**
   - Lying along the lower border of the pectoralis minor along the course of the lateral thoracic vessels.
   - Receive lymph vessels from the lateral quadrants of the breast and superficial vessels from the anterolateral abdominal wall above the level of the umbilicus.
2. **Posterior (subscapular) group:**
   - Lying in front of the subscapularis muscle in association with the subscapular vessels.
   - Receive superficial lymph vessels from the back (down as far as the level of the iliac crests), the shoulder, and the lower neck.
3. **Lateral (humeral) group:**
   - Lying along the medial side of the axillary vein.
   - Receive most of the lymph vessels of the upper limb (except those superficial vessels draining the lateral side which are drained by infraclavicular nodes).
4. **Central group:**
   - Lying in the center of the axilla in the axillary fat.
   - Receive lymph from the above three groups.
5. **Apical group:**
   - Lying at the apex of the axilla at the lateral border of the 1st rib.
   - Receive the efferent lymph vessels from all the other axillary nodes.

Infraclavicular (deltopectoral) group:

- These nodes are not strictly axillary nodes because they are located outside the axilla. They lie in the groove between the deltoid and pectoralis major muscles.
- Receive superficial lymph vessels from the lateral side of the hand, forearm, and arm.

The apical nodes drain into the **subclavian lymph trunk**.

On the left side, this trunk drains into the **thoracic duct**; on the right side, it drains into the **right lymph trunk**. Alternatively, the lymph trunks may drain directly into one of the large veins at the root of the neck.

Assistant Professor Dr. Mohammed Hussein
MBChB–MSc–PhD–MRCPCH–DCH (UK)

BRACHIAL PLEXUS

The brachial plexus is a somatic nerve plexus formed by the anterior rami of C5 to T1. It originates in the neck, passes laterally and inferiorly over the first rib, and enters the axilla (Figure 1).

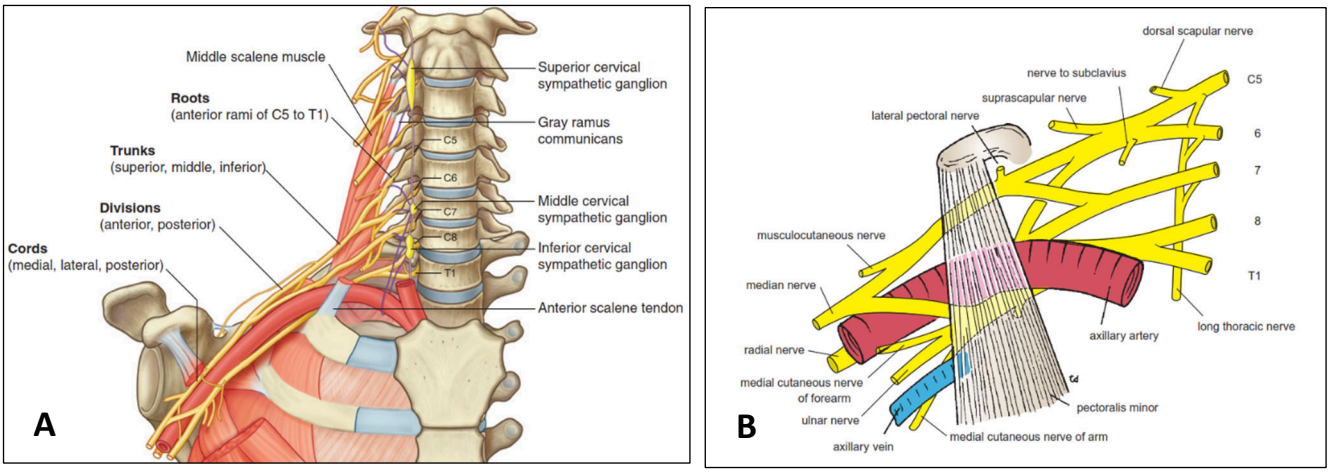

Fig. 1. Brachial plexus. A. Major components in the neck and axilla, B. Relations to the axillary artery and vein.

The parts of the brachial plexus, from medial to lateral, are **roots**, **trunks**, **divisions**, and **cords**.

The roots of C5 and 6 unite to form the **upper trunk**, the C7 root continues as the **middle trunk**, and the roots of C8 and T1 unite to form the **lower trunk**.

Each trunk then divides into **anterior** and **posterior divisions**. The anterior divisions of the upper and middle trunks unite to form the **lateral cord**, the anterior division of the lower trunk continues as the **medial cord**, and the posterior divisions of all three trunks join to form the **posterior cord**.

The roots, trunks, and divisions of the brachial plexus reside in the lower part of the posterior triangle of the neck, while the cords become arranged around the axillary artery in the axilla. Here, the brachial plexus and the axillary artery and vein are enclosed in the axillary sheath.

Generally, nerves associated with the anterior compartments of the upper limb arise from the medial and lateral cords and nerves associated with the posterior compartments originate from the posterior cord.

The branches of the different parts of the brachial plexus (Figure 2) are as follows:

- **Roots**
  - Dorsal scapular nerve (C5)
  - Long thoracic nerve (C5, 6, 7)
- **Upper trunk**
  - Suprascapular nerve (C5, 6)
  - Nerve to subclavius (C5, 6)
- **Lateral cord**
  - Lateral pectoral nerve (C5, 6, 7)
  - Musculocutaneous nerve (C5, 6, 7)
  - Lateral root of median nerve (C5, 6, 7)
- **Medial cord**
  - Medial pectoral nerve (C8; T1)
  - Medial cutaneous nerve of arm (C8; T1)
  - Medial cutaneous nerve of forearm (C8; T1)
  - Ulnar nerve (C8; T1)
  - Medial root of median nerve (C8; T1)
- **Posterior cord**
  - Upper subscapular nerve (C5, 6)
  - Lower subscapular nerve (C5, 6)
  - Thoracodorsal nerve (C6, 7, 8)
  - Axillary nerve (C5, 6)
  - Radial nerve (C5, 6, 7, 8; T1)

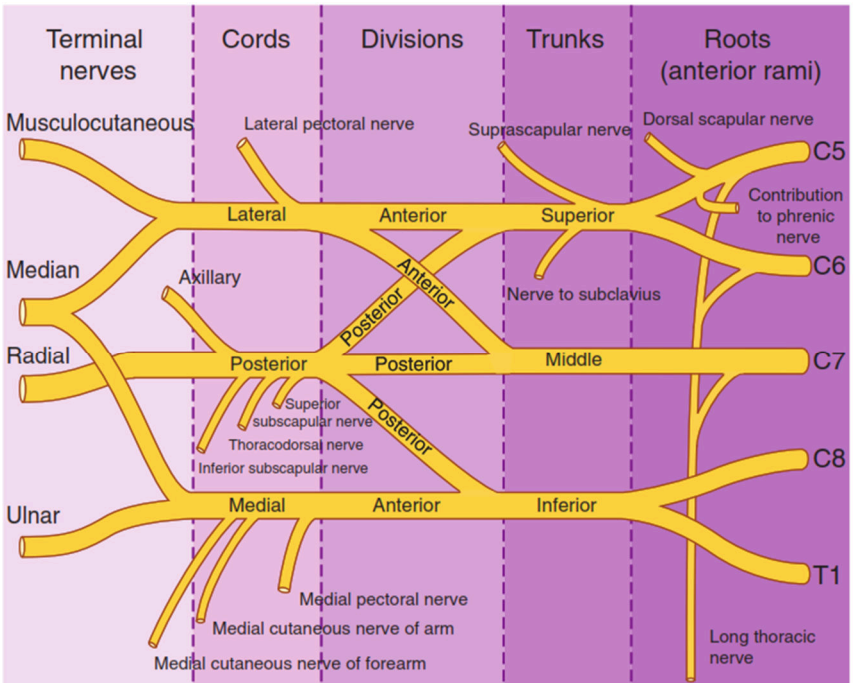

Fig. 2. Schematic representations showing branches of the brachial plexus

Summary of the Branches of the Brachial Plexus and their Distribution

Origin	Branch	Distribution
C5 root	**Dorsal scapular**	Rhomboid major, rhomboid minor
C5-C7 roots	**Long thoracic**	Serratus anterior
Upper trunk	**Suprascapular**	Supraspinatus, infraspinatus
Upper trunk	**Nerve to subclavius**	Subclavius
Lateral cord	**Lateral pectoral**	Pectoralis major
Lateral cord	**Musculocutaneous**	All muscles in the anterior compartment of arm Skin on the lateral side of the forearm
Medial cord	**Medial pectoral**	Pectoralis major, pectoralis minor
Medial cord	**Medial cutaneous of arm**	Skin on the medial side of distal one-third of arm
Medial cord	**Medial cutaneous of forearm**	Skin on the medial side of the forearm
Medial cord	**Ulnar**	All intrinsic muscles of the hand (except three thenar muscles and two lateral lumbricals); also flexor carpi ulnaris and the medial half of flexor digitorum profundus in the forearm Skin over the palmar surface of the medial one-half digits and associated palm and wrist, and skin over the dorsal surface of the medial one-half digits
Medial and lateral cords	**Median**	All muscles in the anterior compartment of the forearm (except flexor carpi ulnaris and medial half of flexor digitorum profundus), three thenar muscles of the thumb and two lateral lumbrical muscles Skin over the palmar surface of the lateral three and one-half digits and over the lateral side of the palm and middle of the wrist
Posterior cord	**Superior subscapular**	Subscapularis
Posterior cord	**Inferior subscapular**	Subscapularis, teres major
Posterior cord	**Thoracodorsal**	Latissimus dorsi
Posterior cord	**Axillary**	Deltoid, teres minor Skin over upper lateral part of arm
Posterior cord	**Radial**	All muscles in the posterior compartments of arm and forearm Skin on the posterior aspects of the arm and forearm, the lower lateral surface of the arm, and the dorsal lateral surface of the hand

Branches of the Brachial Plexus Found in the Axilla

- **The nerve to the subclavius** supplies the subclavius muscle. It is important clinically because it may give a contribution (C5) to the phrenic nerve; this branch, when present, is referred to as the *accessory phrenic nerve*.
- T**he long thoracic nerve** arises from the roots of the brachial plexus in the neck and enters the axilla by passing down over the lateral border of the 1st rib behind the axillary vessels and brachial plexus. It descends over the lateral surface of the serratus anterior, which it supplies.
- **The lateral pectoral nerve** arises from the lateral cord of the brachial plexus and supplies the pectoralis major muscle.
- **The musculocutaneous nerve** arises from the lateral cord of the brachial plexus, supplies the coracobrachialis muscle, and leaves the axilla by piercing that muscle (Figure 3).
- **The lateral root of the median nerve** is the direct continuation of the lateral cord of the brachial plexus. It is joined by the medial root to form the median nerve trunk, and this passes downward on the lateral side of the axillary artery. The median nerve gives off no branches in the axilla (A summary of the complete distribution of the median nerve is given in Figure 3).
- **The medial pectoral nerve** arises from the medial cord of the brachial plexus, supplies and pierces the pectoralis minor muscle, and supplies the pectoralis major muscle.
- **The medial cutaneous nerve of the arm** (T1) arises from the medial cord of the brachial plexus and is joined by the intercostobrachial nerve (lateral cutaneous branch of the 2nd intercostal nerve). It supplies the skin on the medial side of the arm.
- **The medial cutaneous nerve of the forearm** arises from the medial cord of the brachial plexus and descends in front of the axillary artery.
- **The ulnar nerve** (C8 and T1) arises from the medial cord of the brachial plexus and descends in the interval between the axillary artery and vein. The ulnar nerve gives off no branches in the axilla (A summary of the complete distribution of the ulnar nerve is given in Figure 4).
- **The medial root of the median nerve** arises from the medial cord of the brachial plexus and crosses in front of the third part of the axillary artery to join the lateral root of the median nerve.
- **The upper and lower subscapular nerves** arise from the posterior cord of the brachial plexus and supply the upper and lower parts of the subscapularis muscle. In addition, the lower subscapular nerve supplies the teres muscle.
- **The thoracodorsal nerve** arises from the posterior cord of the brachial plexus and runs downward to supply the latissimus dorsi muscle.
- **The axillary nerve** is one of the terminal branches of the posterior cord of the brachial plexus. It turns backwards and passes through the quadrangular space. Having given off a branch to the shoulder joint, it divides into anterior and posterior branches.
- **The radial nerve** is the largest branch of the brachial plexus and lies behind the axillary artery. It gives off branches to the long and the medial heads of the triceps and the posterior cutaneous nerve of the arm. The latter branch is distributed to the skin on the middle of the back of the arm (A summary of the complete distribution of the radial nerve is given in Figure 5).

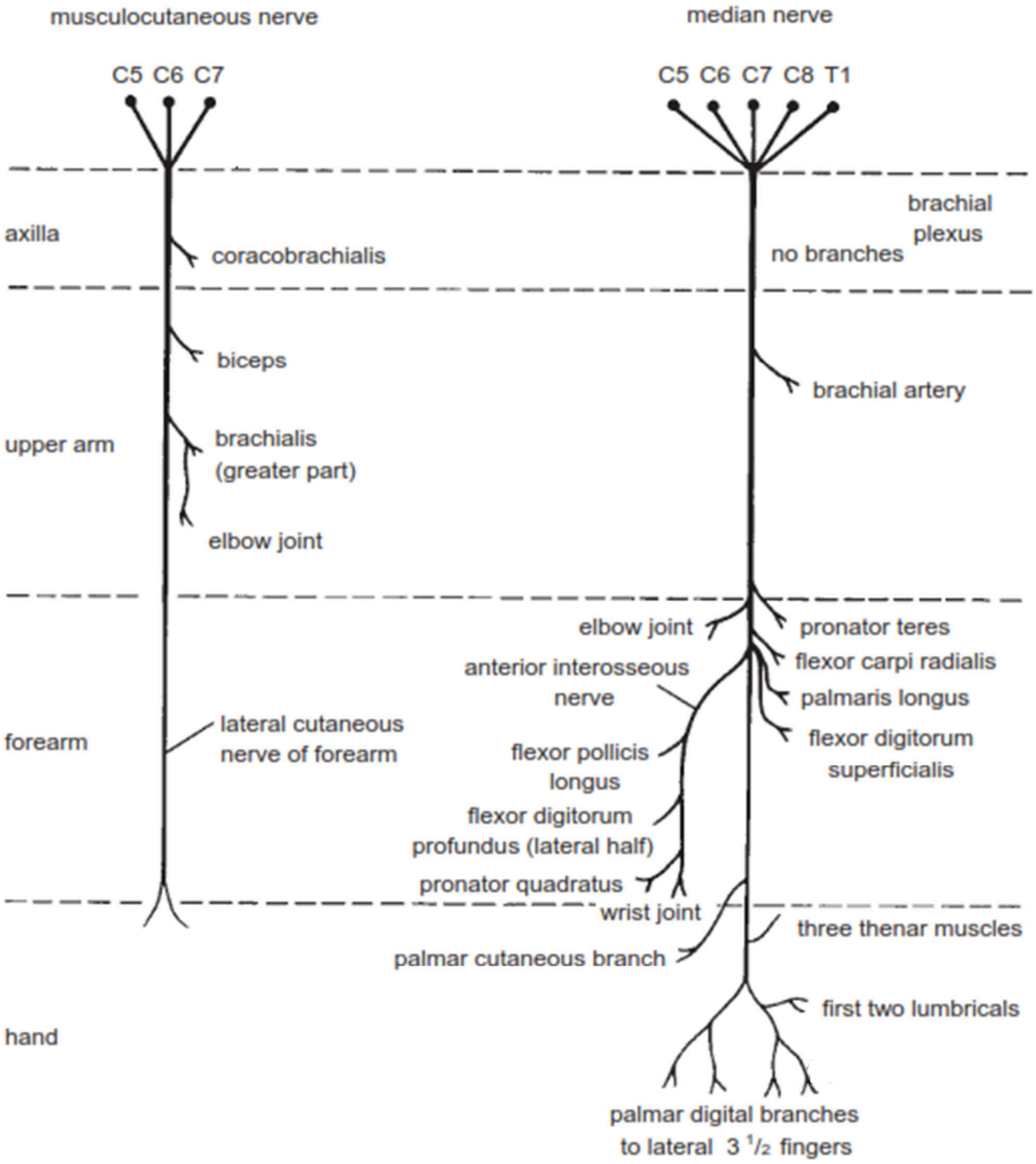

Fig. 3: Summary of the main branches of the musculocutaneous and median nerves

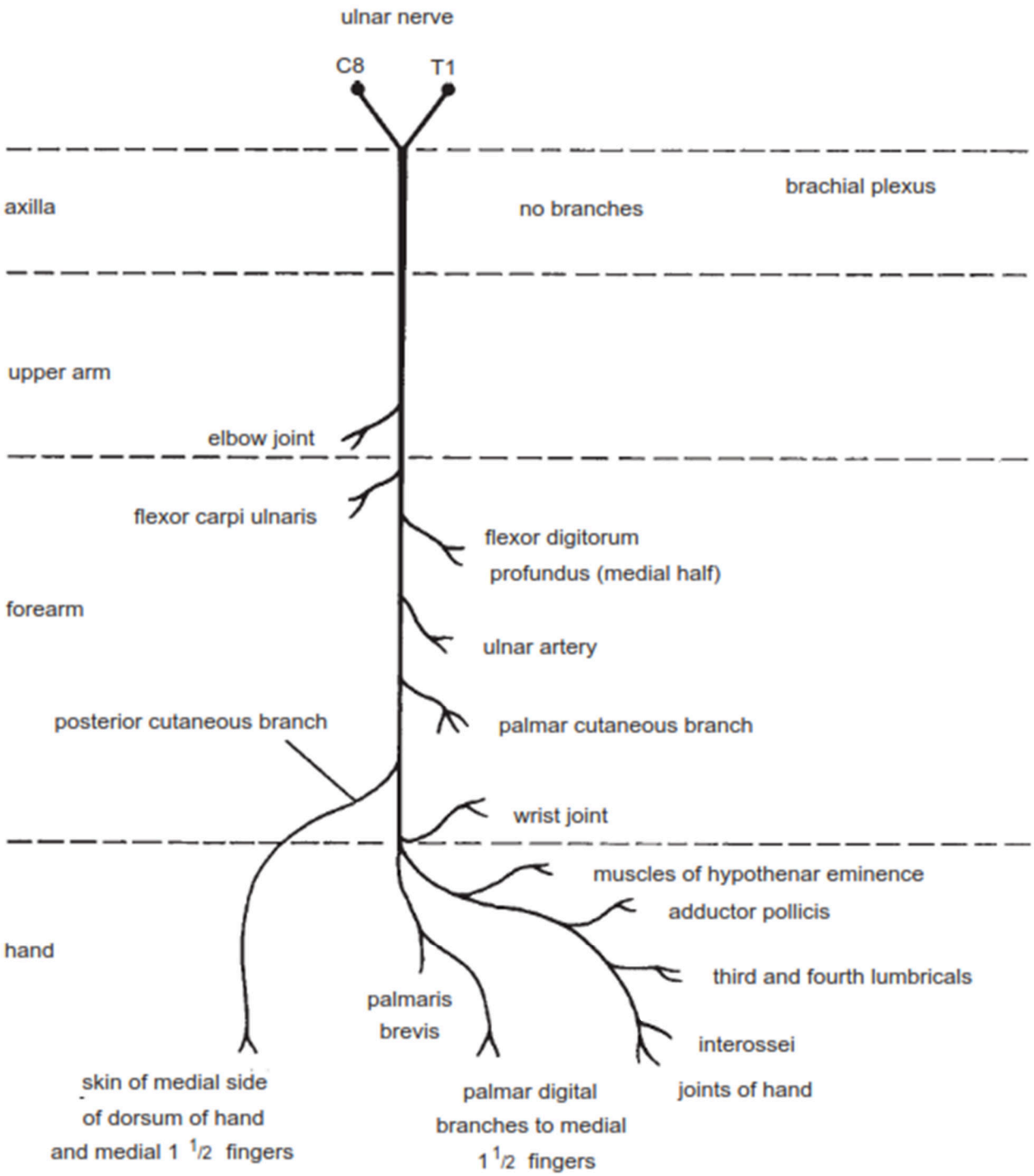

Fig. 4: Summary of the main branches of the ulnar nerve

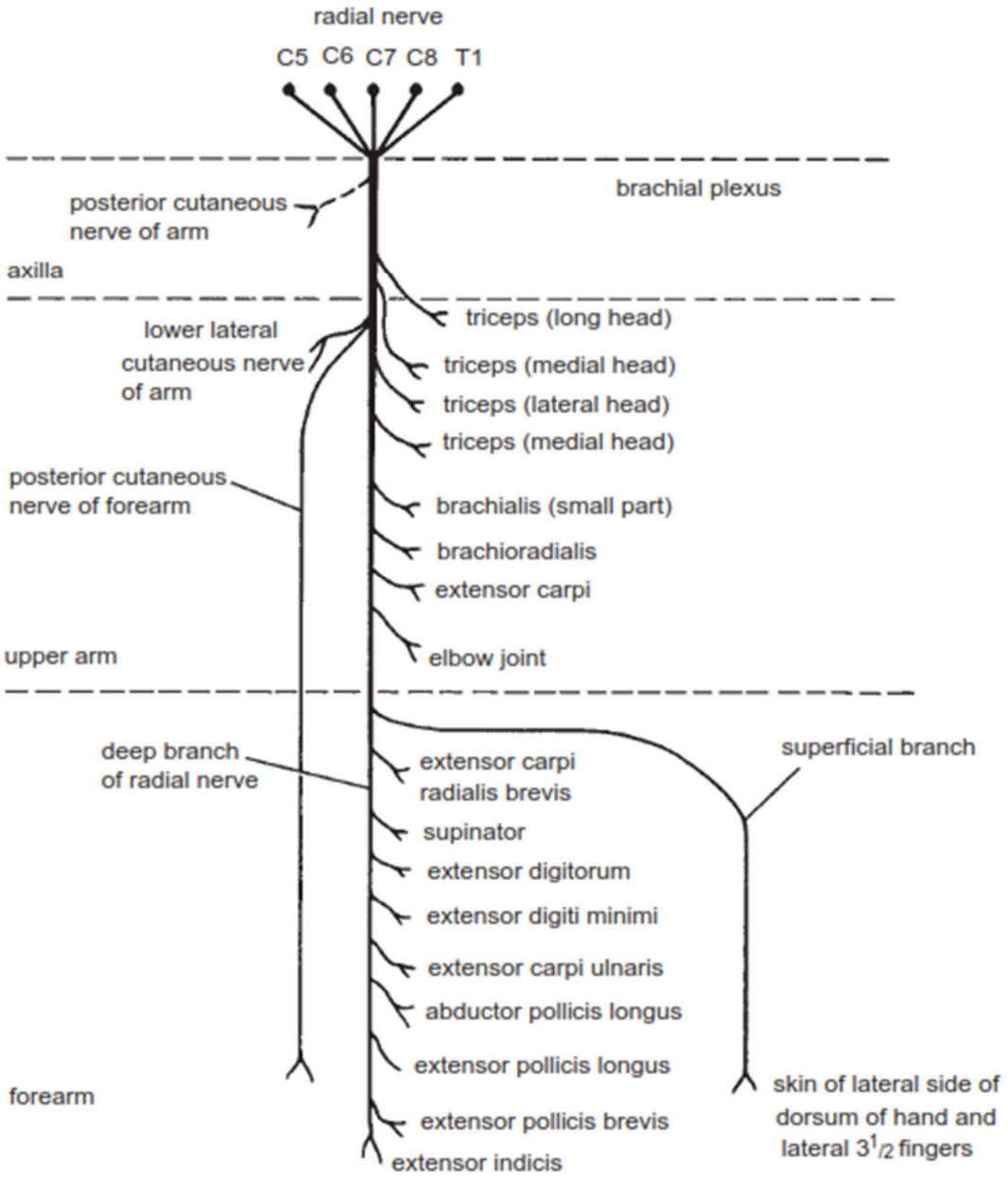

Fig. 5: Summary of the main branches of the radial nerve

References:
Gray's Anatomy for Students - 4th Edition
Snell clinical anatomy by regions - 9th Edition