FIG. 4-1. Sclerotomes.

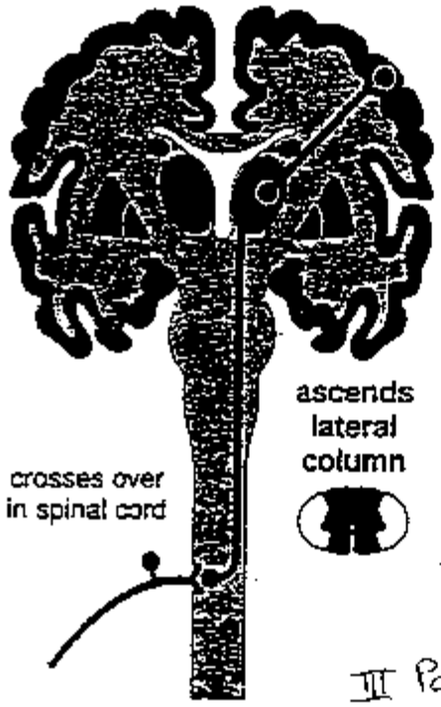
matic tissues (fascia, ligaments, capsules, and connective tissue) that are innervated by the same segmental spinal nerve. These areas have been mapped by Inman and Saunders[39] and are shown in Figure 4-1. Note that they do not correspond exactly to dermatomes (Figs. 4-2 and 4-3). When a tissue of a particular sclerotome is irritated, the patient may perceive the resulting pain as arising from any or all of the tissues innervated by the same segmental nerve. This is a result of the lack of precision in central neural connections and is not related to abnormal impulses "spreading down a nerve." In other words, the "problem" is central, not peripheral, and there is nothing wrong with most of the area from which pain seems to arise. Furthermore, it is crucial to realize that radiating pain does not necessarily imply nerve irritation.

Thus, patients with supraspinatus tendinitis often have pain referred down the lateral aspect of the arm and forearm to the wrist; disk protrusions may cause pain to radiate into a limb without nerve-root pressure; and trochanteric bursitis is often mistaken for L5 nerve-root irritation or is diagnosed as fasciitis of the iliotibial band. Again, the clinical implications of referred pain cannot be overemphasized and must be appreciated by the clinician seeing patients with musculoskeletal disorders.

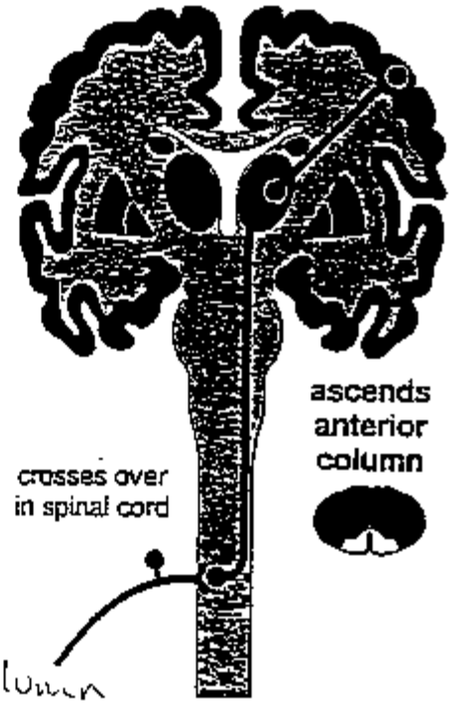
FIG. 4-2. Dermatomes of the head and neck.

SENSORY PATHWAYS

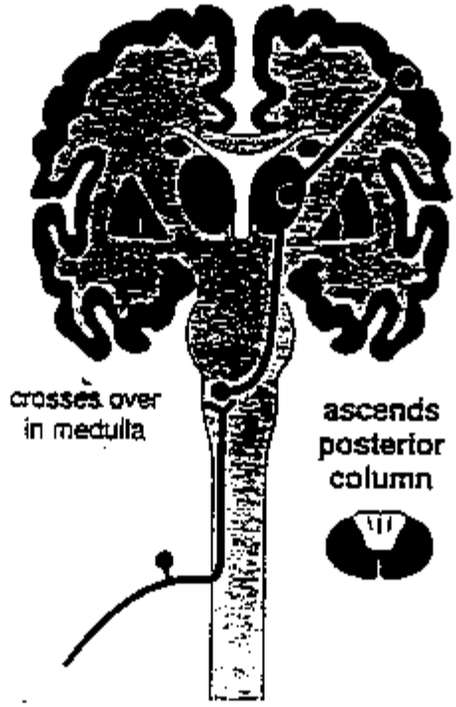
I- Lateral Spinothalamic
pain & temperature



II- Anterior Spinothalamic
touch & pressure
tickle & itch



III Posterior Column Pathways
vibration
kinesthesia
stereognosis
proprioception
discriminative touch
weight discrimination



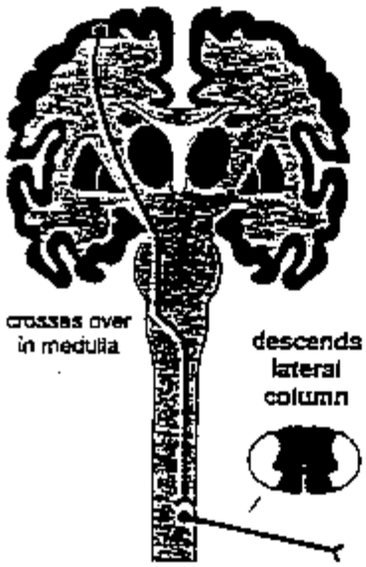
IV -
Spinocerebellar
collateral OFF
1st order neuron
synapses in PGH
2nd order goes
to cerebellum.
→ proprioception
→ cerebellum
adjusts balance
posture & muscle
coordination

MOTOR PATHWAYS

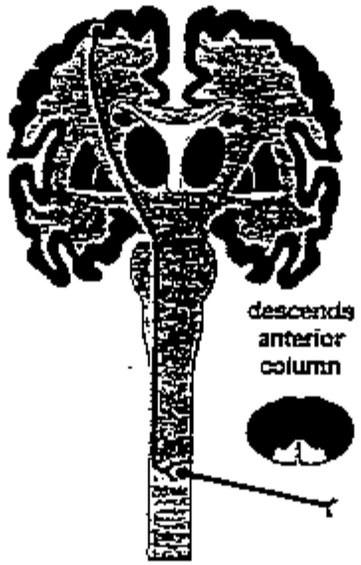
Direct (Pyramidal) Pathways :

Voluntary Control of Skeletal Muscles

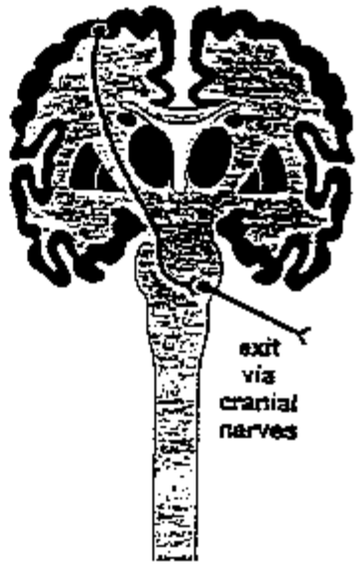
to distal extremities



to neck & shoulders



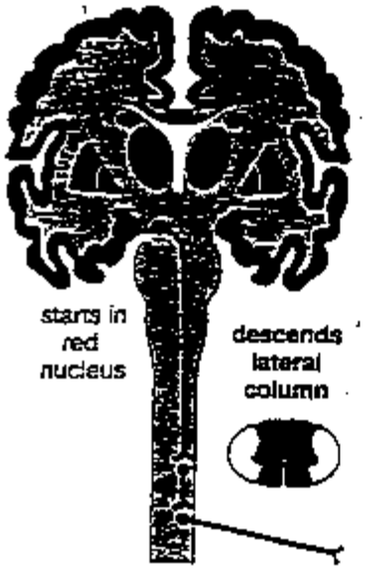
to head & neck



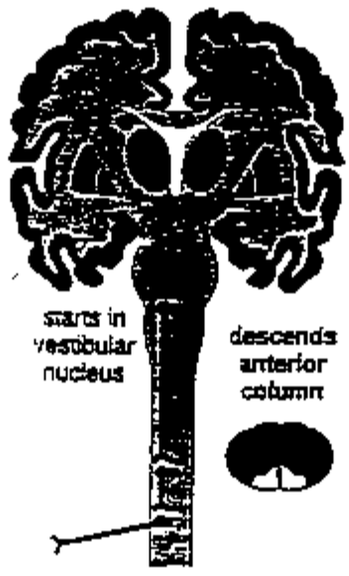
Indirect (Extrapyramidal) Pathways :

Subconscious Control of Skeletal Muscles

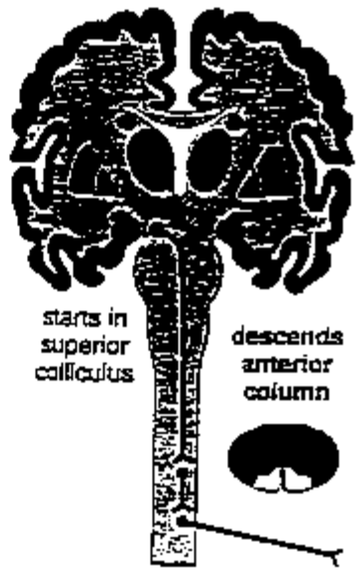
precise movements



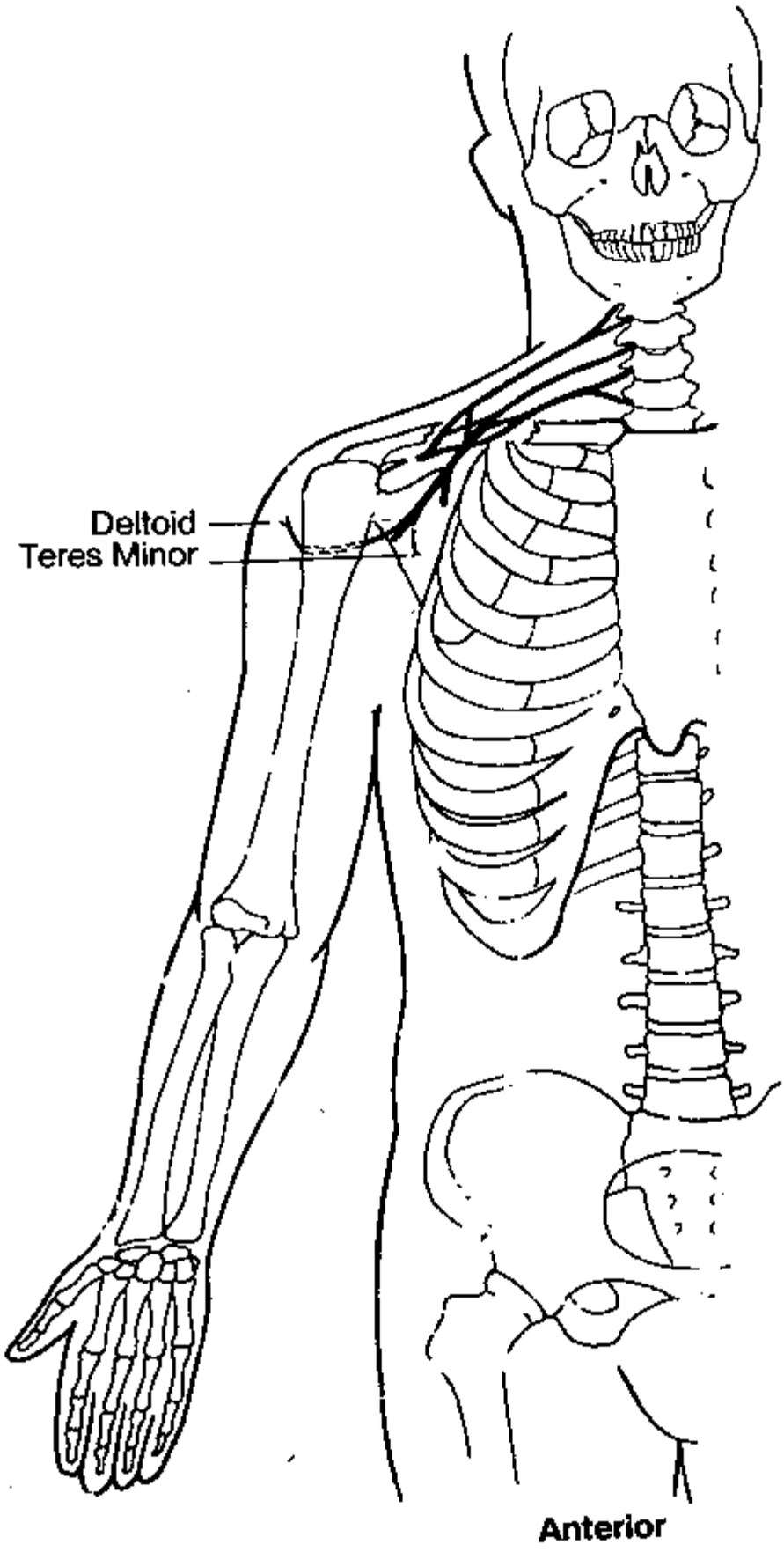
balance



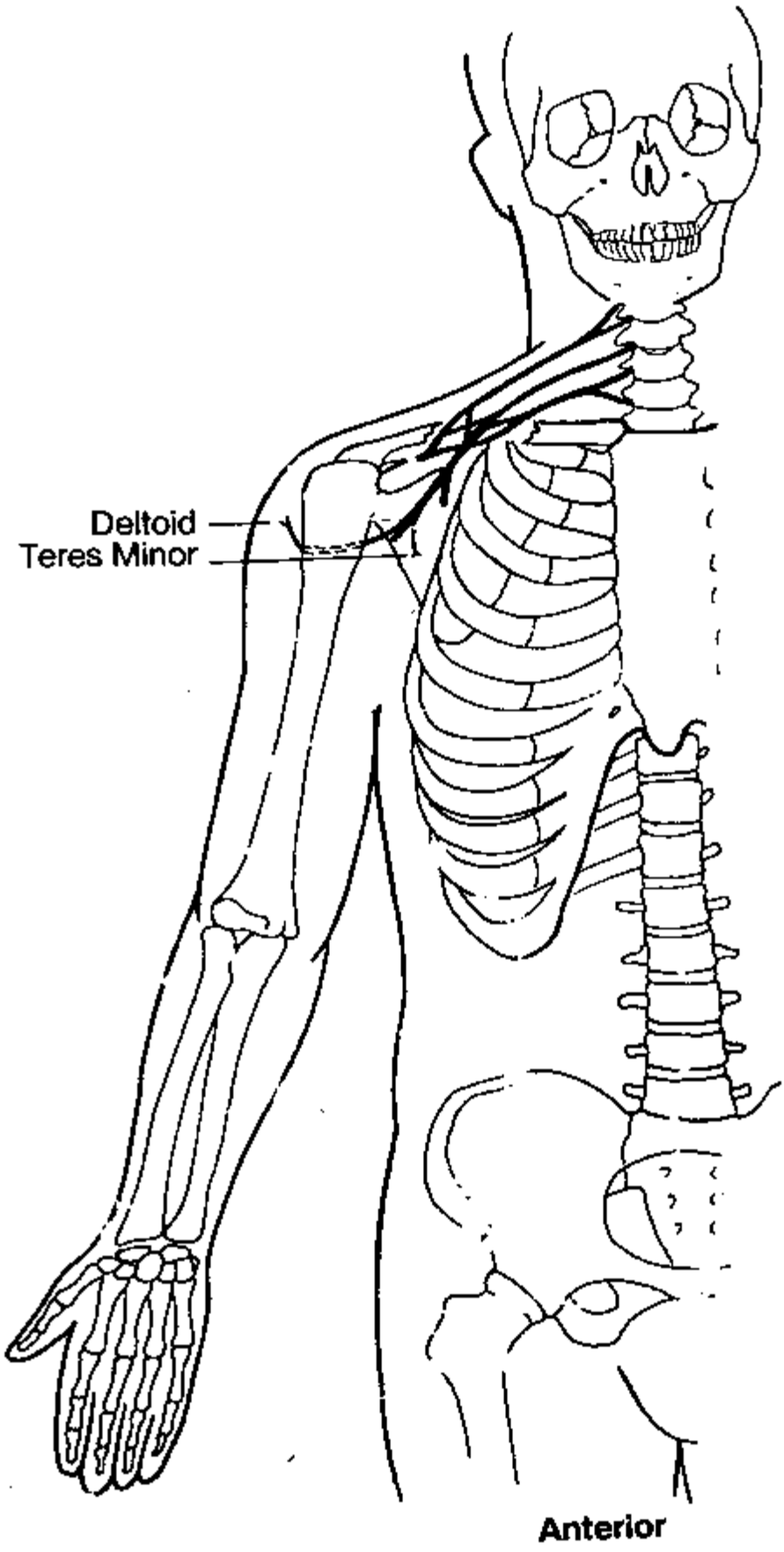
head movements



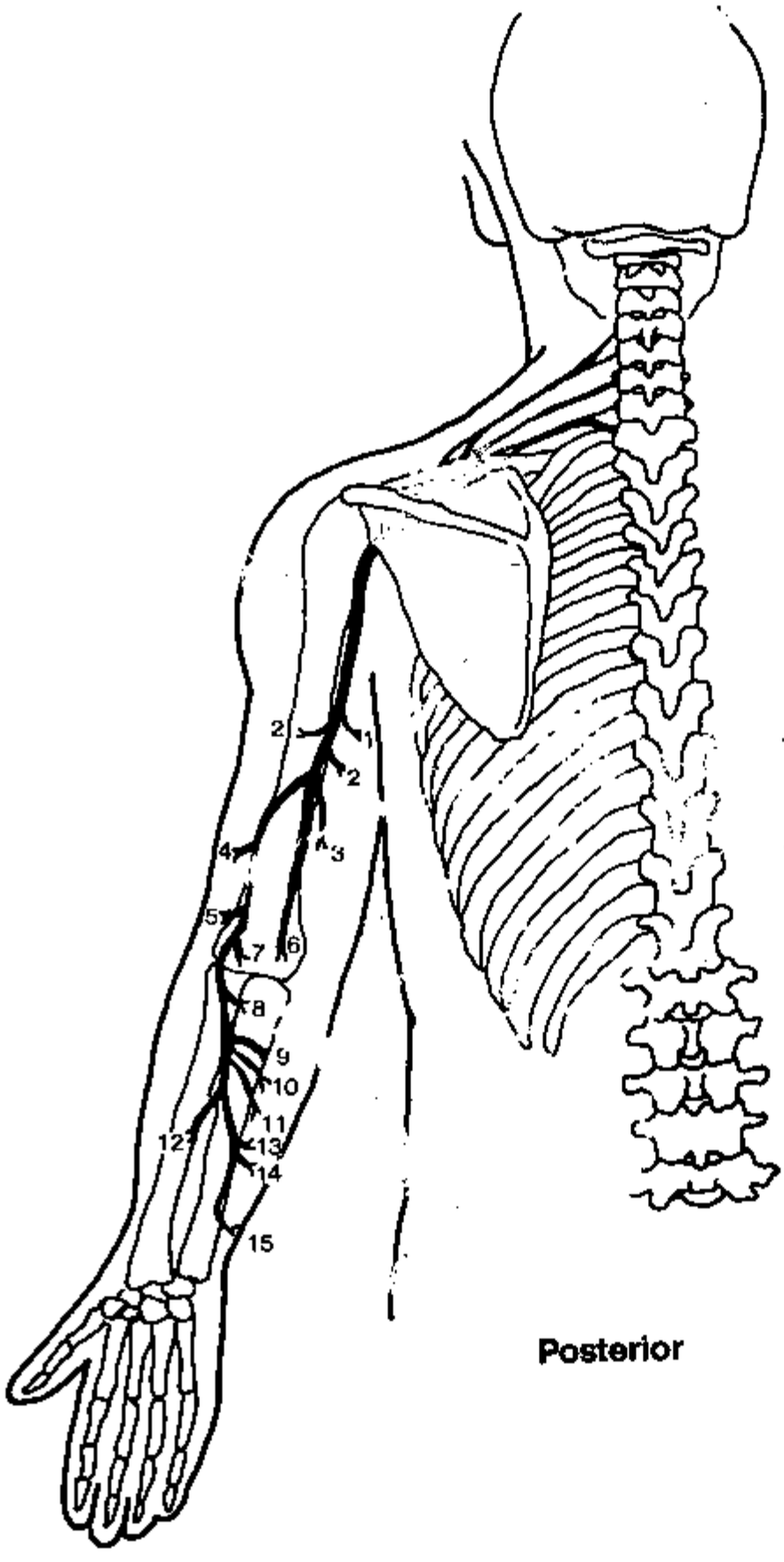
Axillary (Circumflex) Nerve



Axillary (Circumflex) Nerve



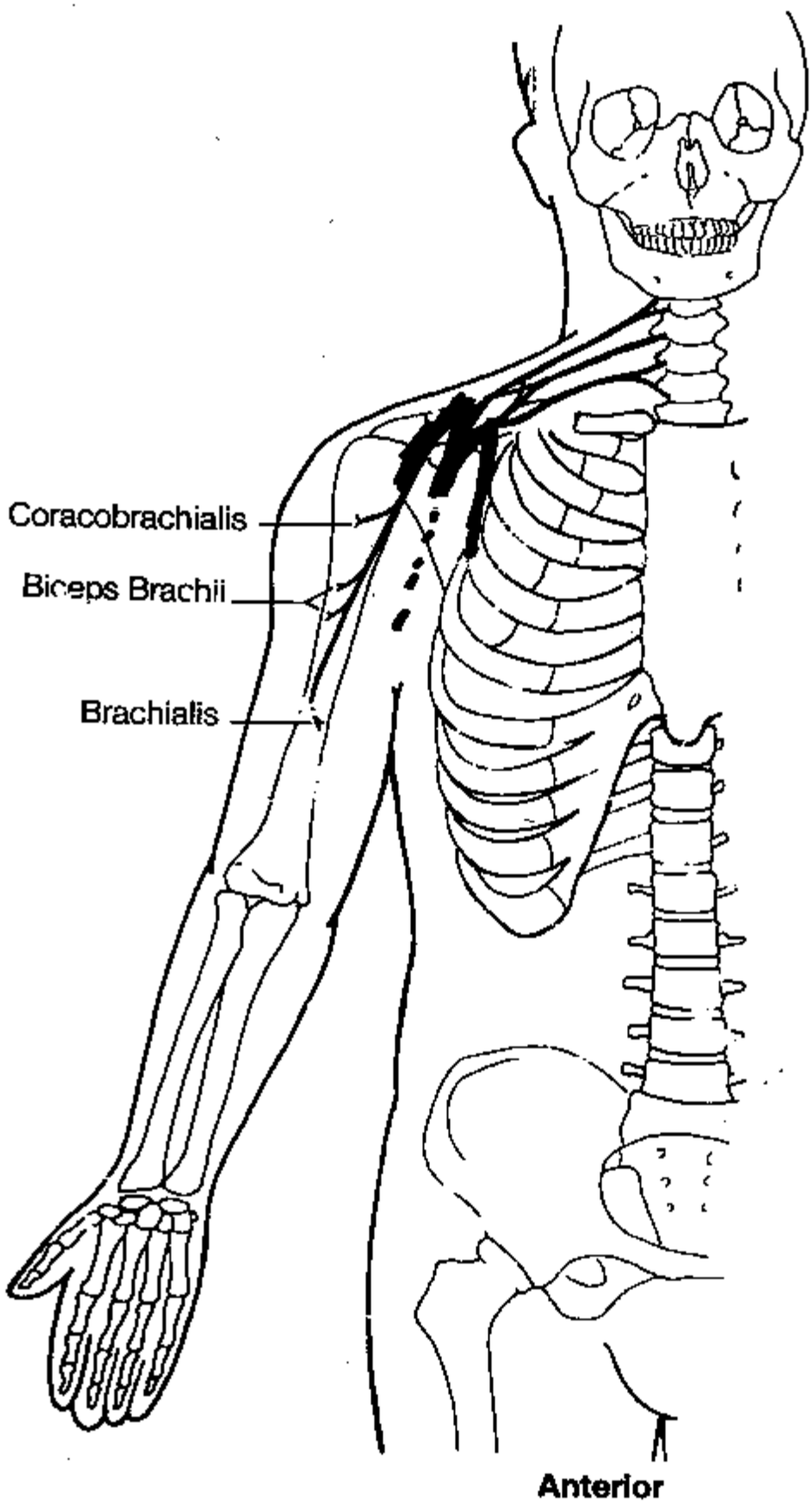
Radial Nerve



1. Triceps brachii (long head)
2. Triceps brachii (lateral head)
3. Triceps brachii (medial head)
4. Brachioradialis
5. Extensor carpi radialis longus
6. Anconeus
7. Extensor carpi radialis brevis
8. Supinator
9. Extensor digitorum
10. Extensor digiti minimi
11. Extensor carpi ulnaris
12. Abductor pollicis longus
13. Extensor pollicis brevis
14. Extensor pollicis longus
15. Extensor indicis

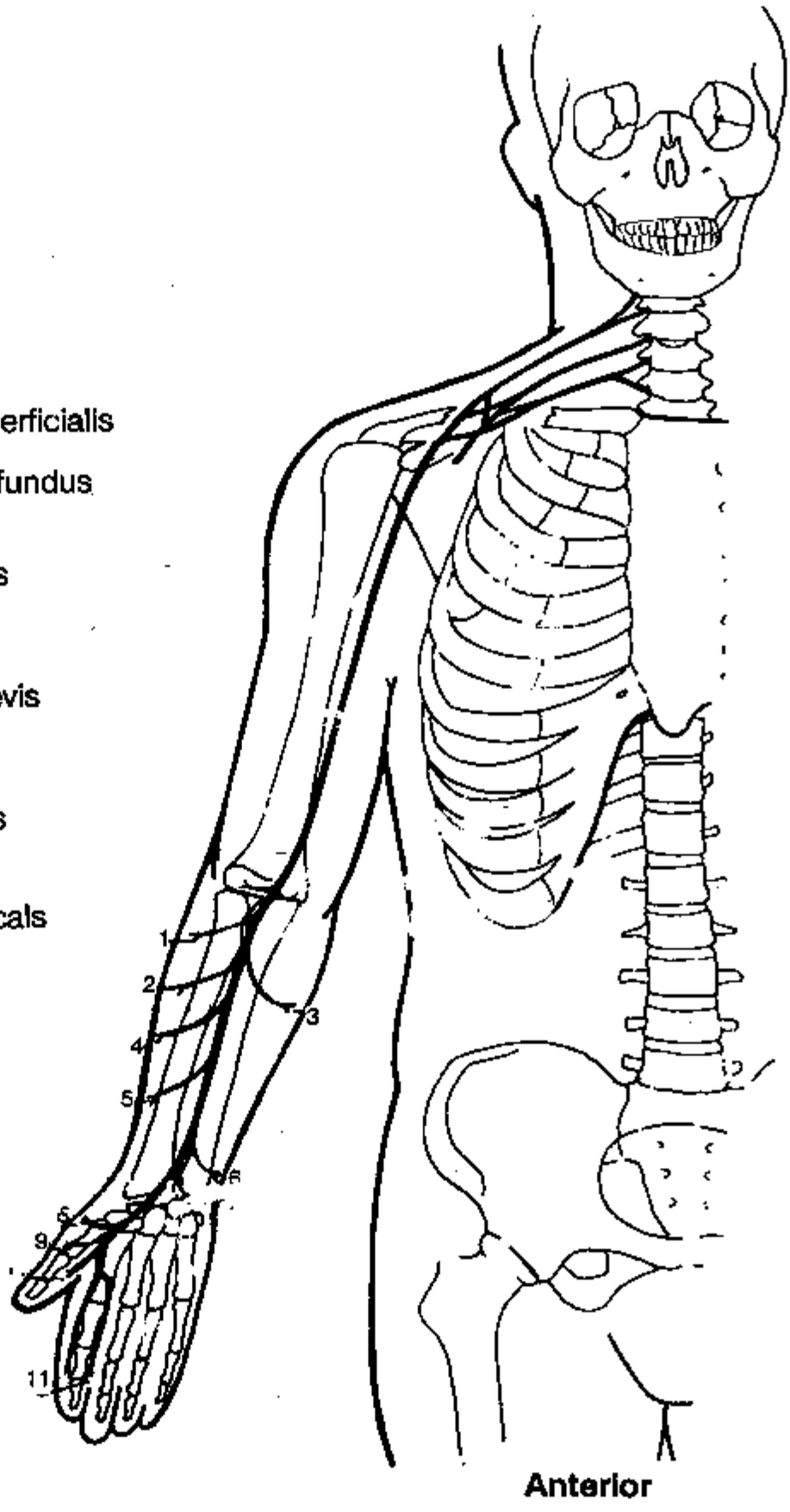
Posterior

Musculocutaneous Nerve

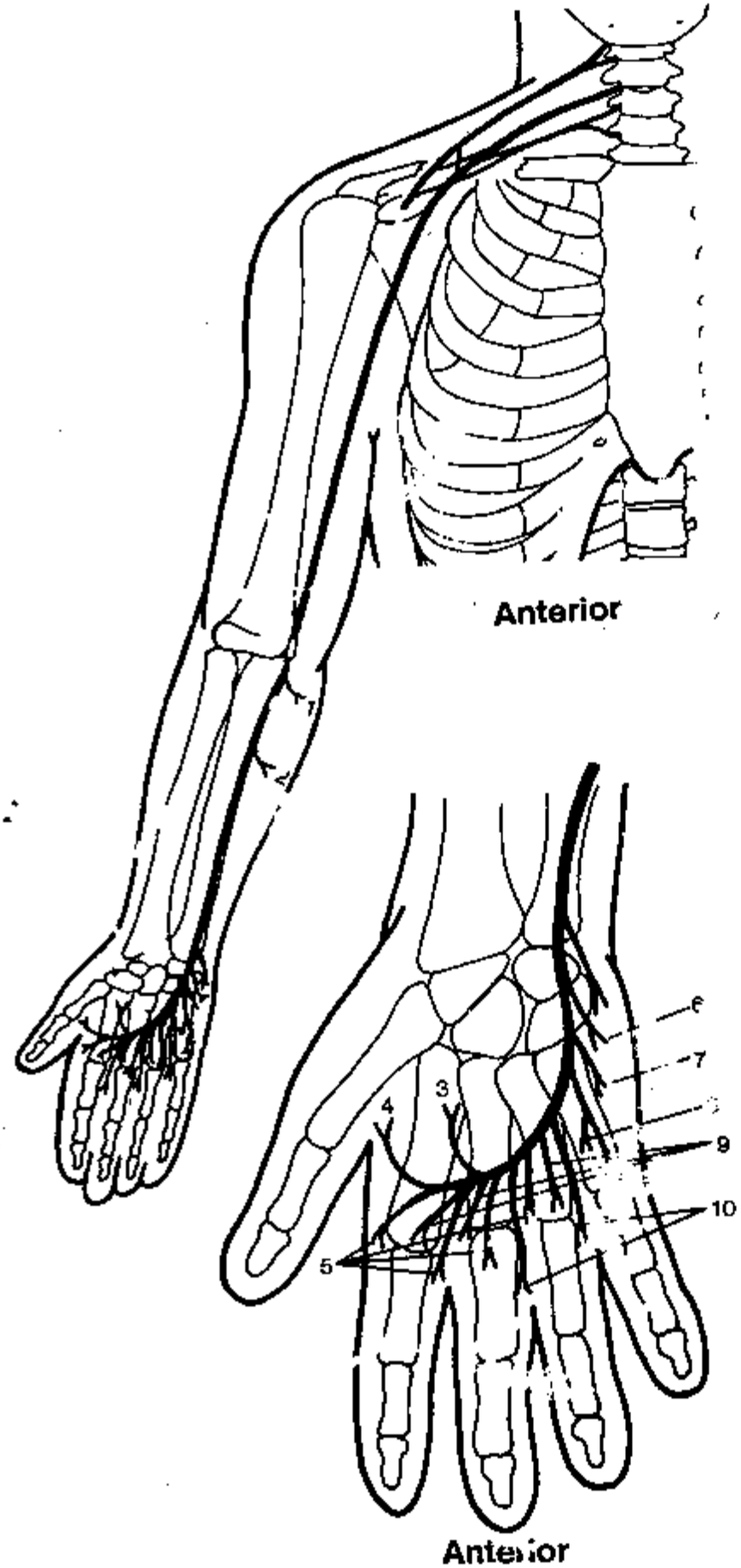


Median Nerve

1. Pronator teres
2. Flexor carpi radialis
3. Palmaris longus
4. Flexor digitorum superficialis
5. Flexor digitorum profundus (radial 2 fingers)
6. Flexor pollicis longus
7. Pronator quadratus
8. Abductor pollicis brevis
9. Opponens pollicis
10. Flexor pollicis brevis (superficial head)
11. 1st and 2nd lumbricals



Ulnar Nerve



1. Flexor carpi ulnaris
2. Flexor digitorum profundus (medial 2)
3. Adductor pollicis
4. Flexor pollicis brevis (deep head)
5. Palmar interossei (3)
6. Abductor digiti minimi
7. Opponens digiti minimi
8. Flexor digiti minimi
9. Dorsal interossei (4)
10. 3rd and 4th lumbricals