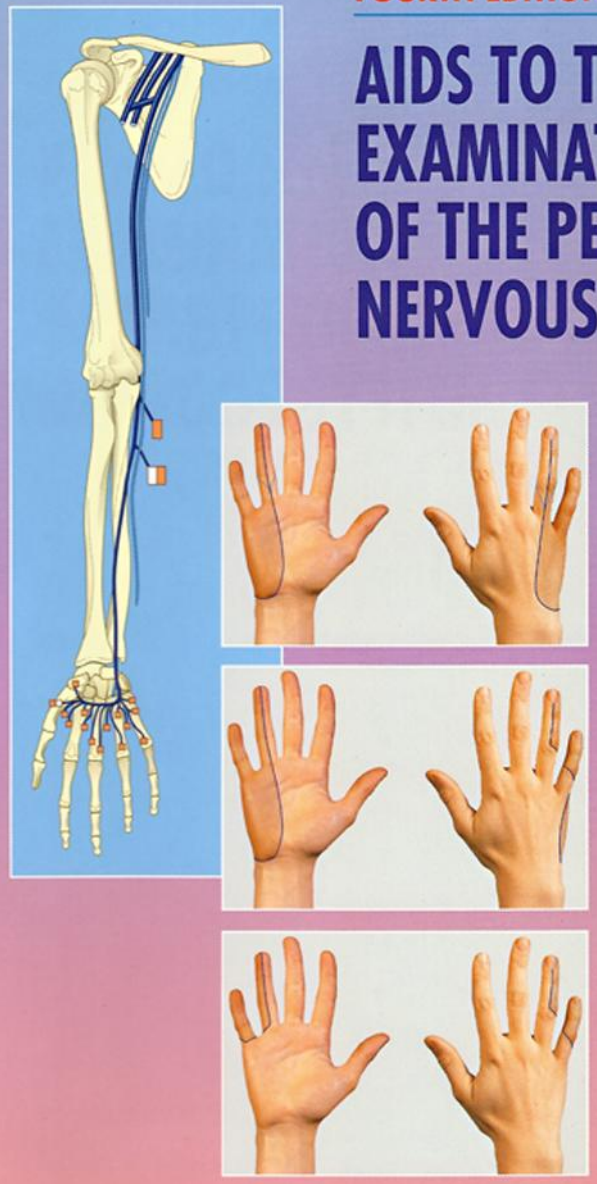
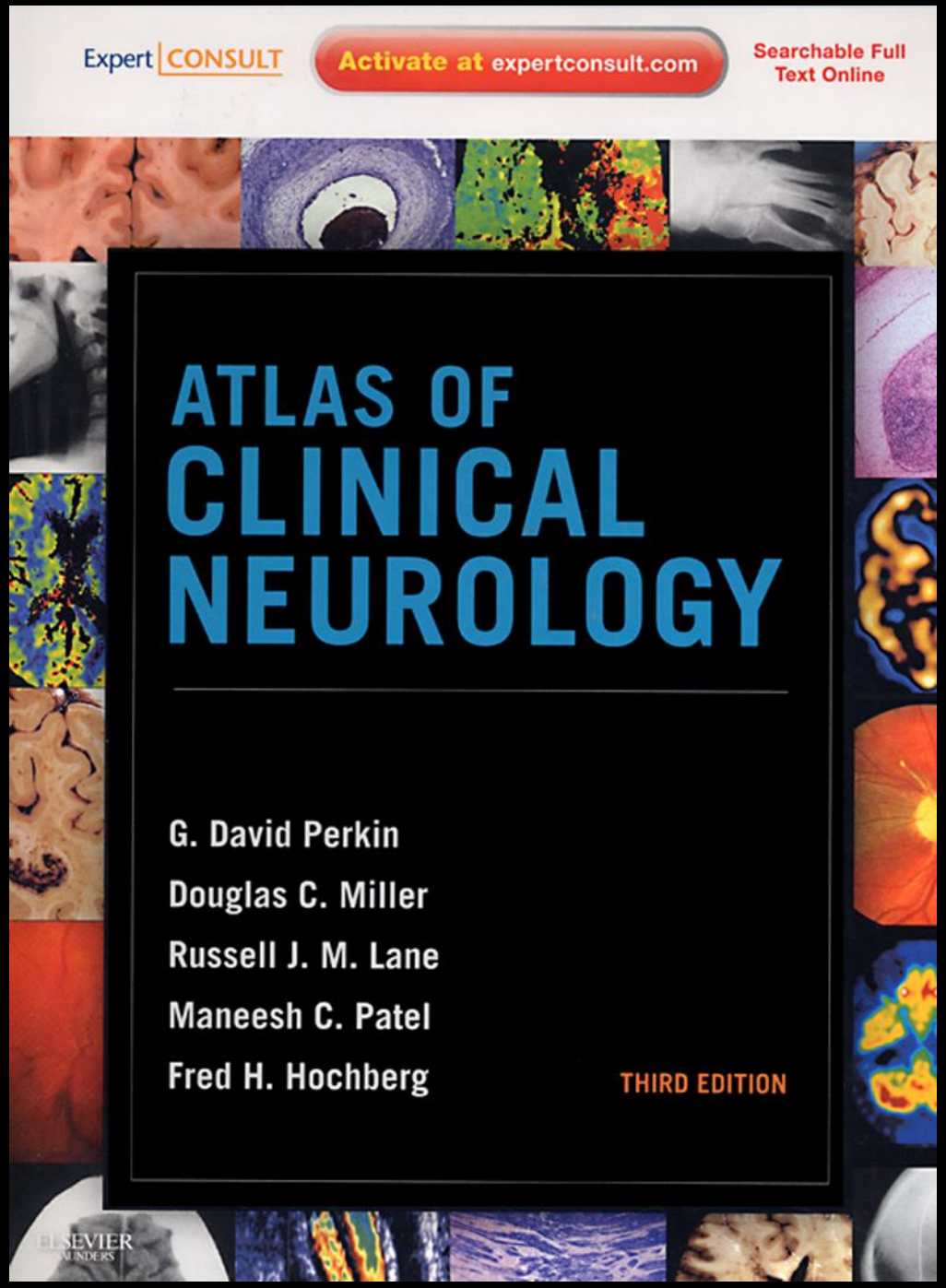
FOURTH EDITION

AIDS TO THE EXAMINATION OF THE PERIPHERAL NERVOUS SYSTEM



W. B. SAUNDERS
On behalf of the Guarantors of *Brain*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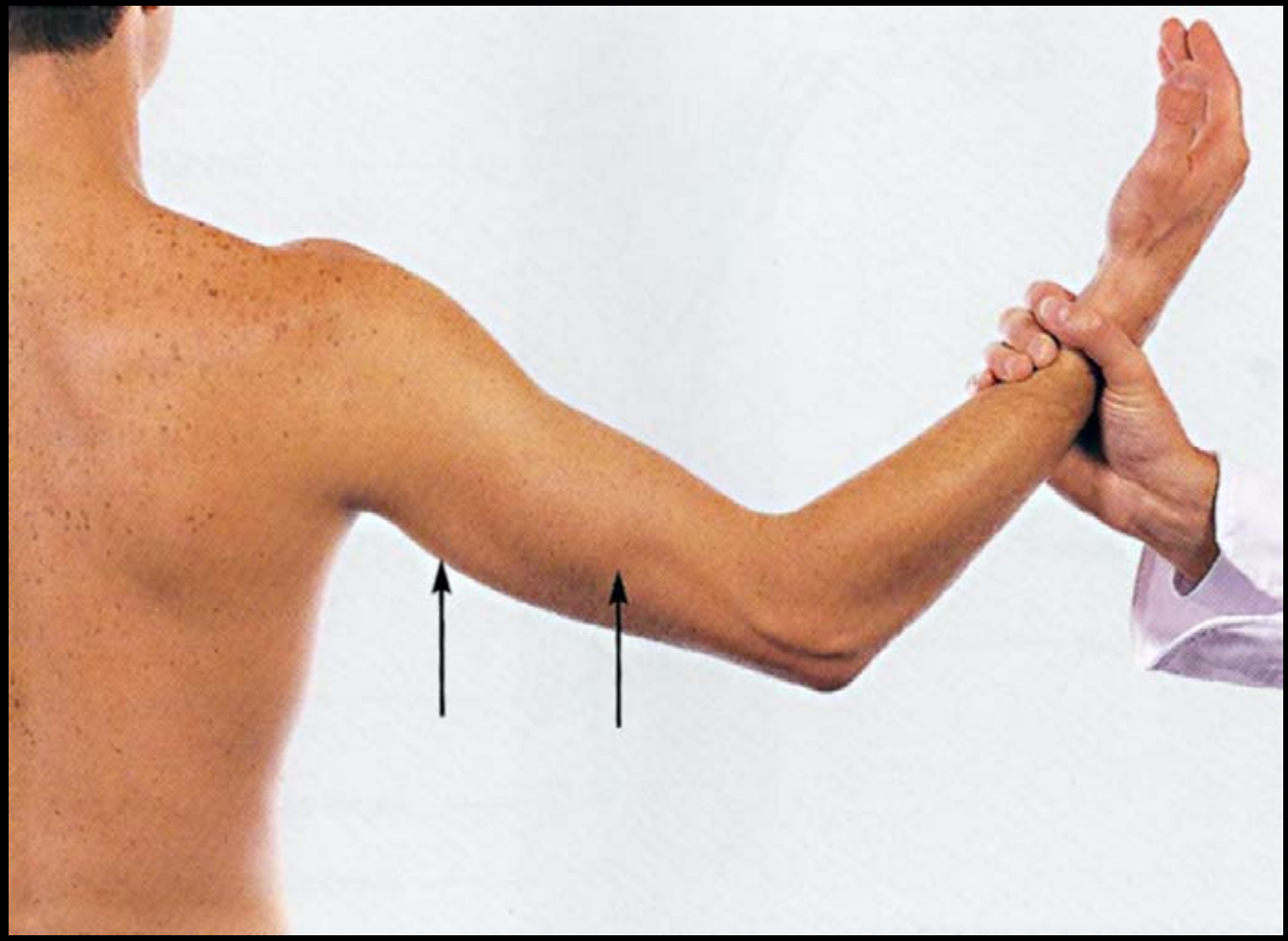
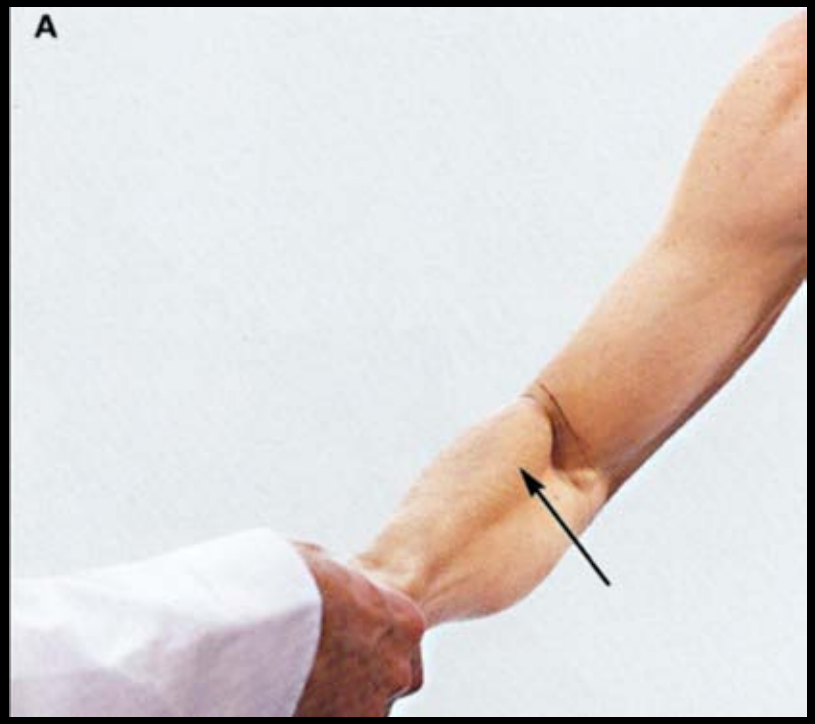
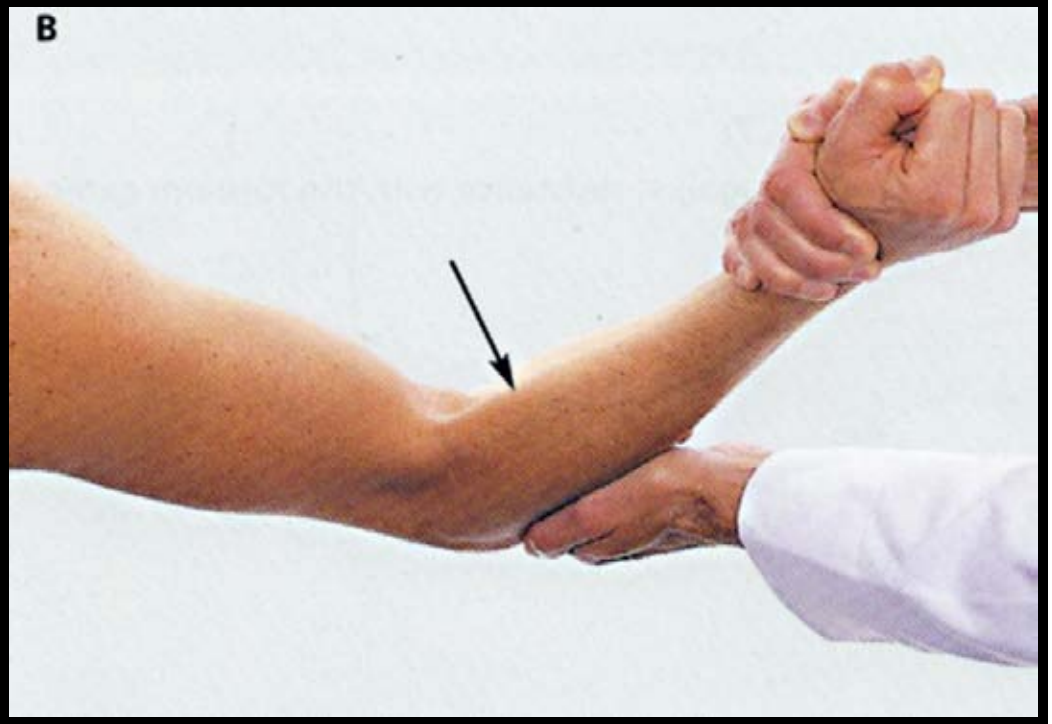
ASPECTS OF NERVE ROOT COMPRESSION DUE TO SPONDYLITIC DISEASE

DISTRIBUTION OF TRICEPS INNERVATION
C6, C7,C8

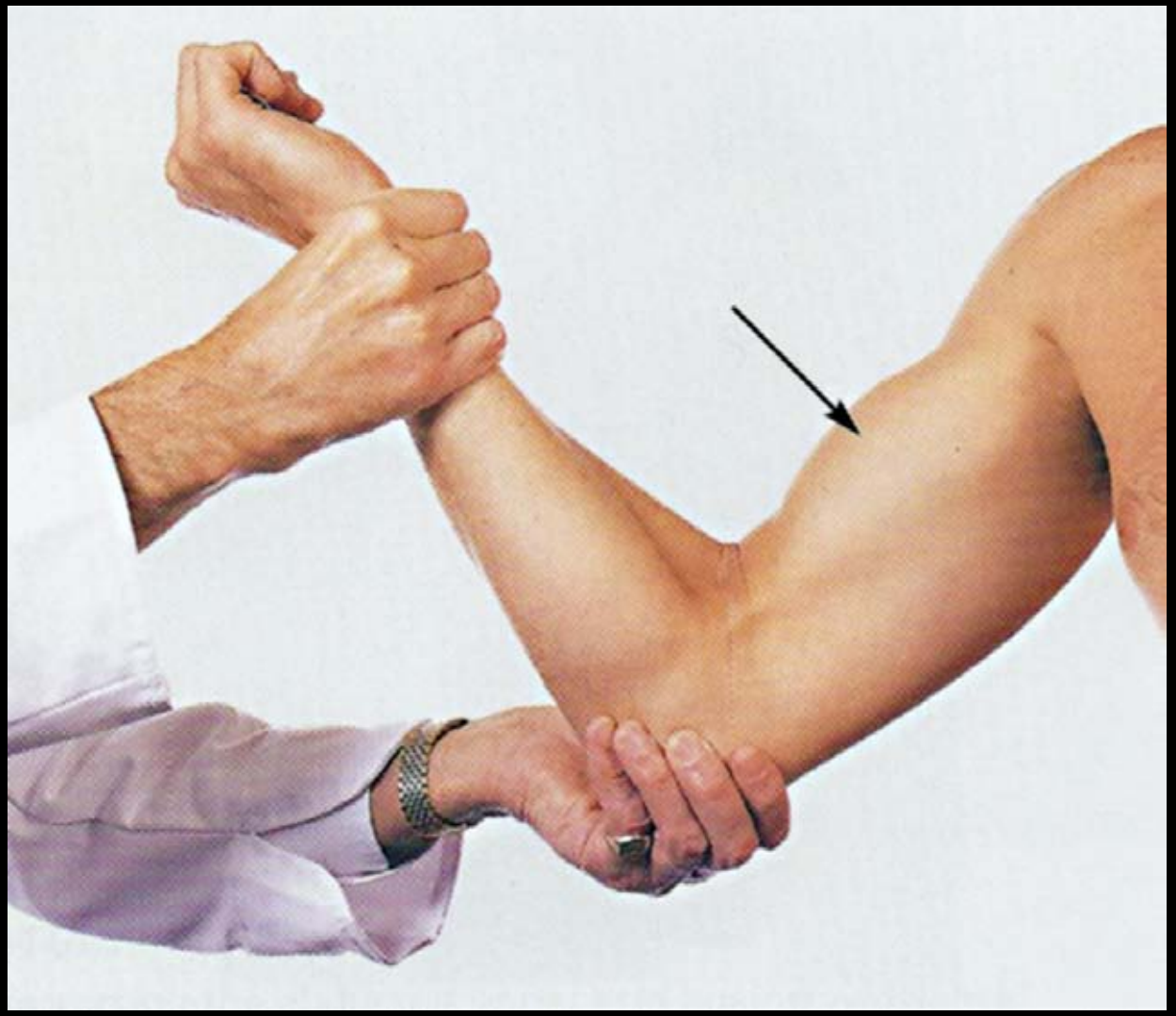


TESTING BRACHIORADIALIS
C5, C6

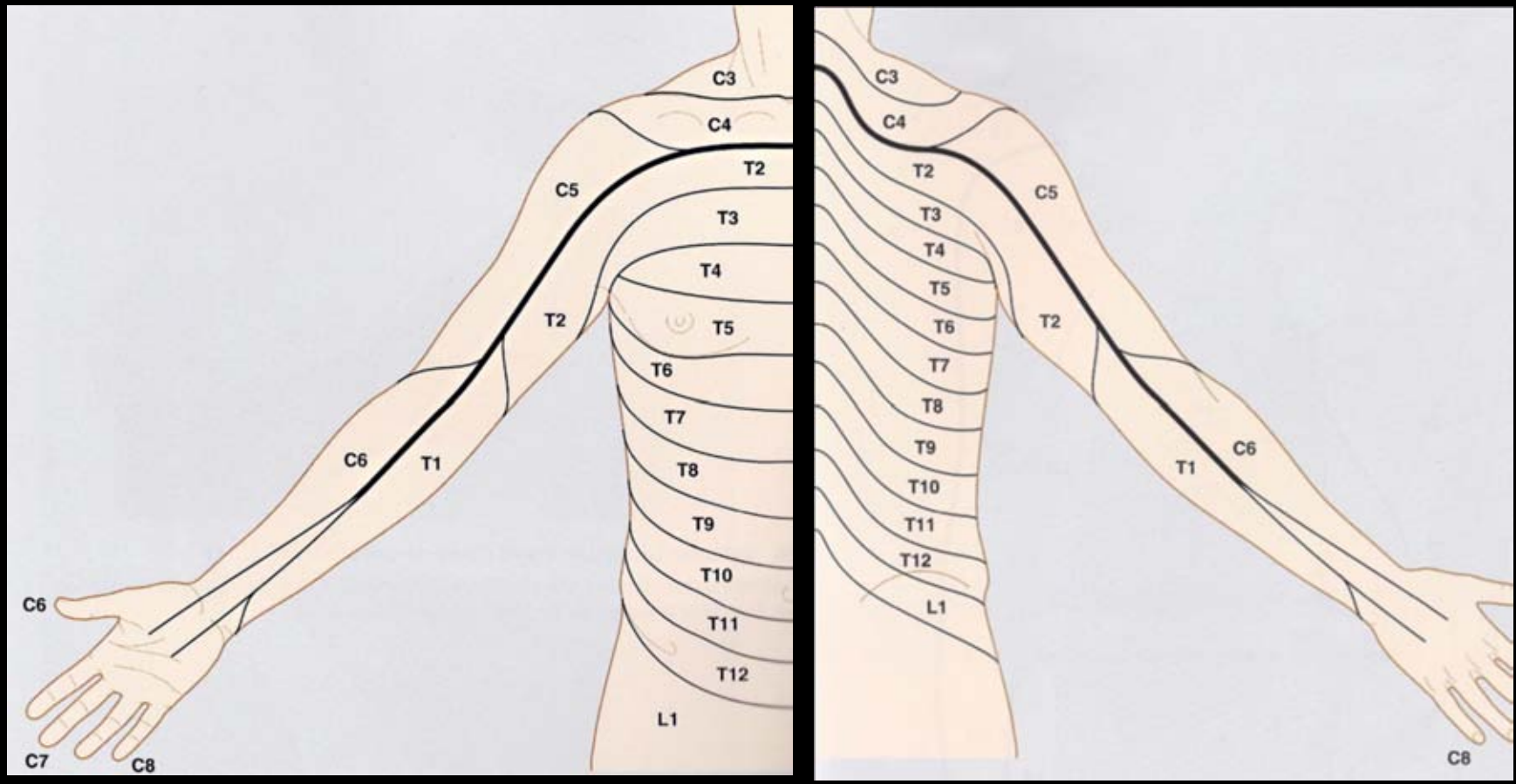




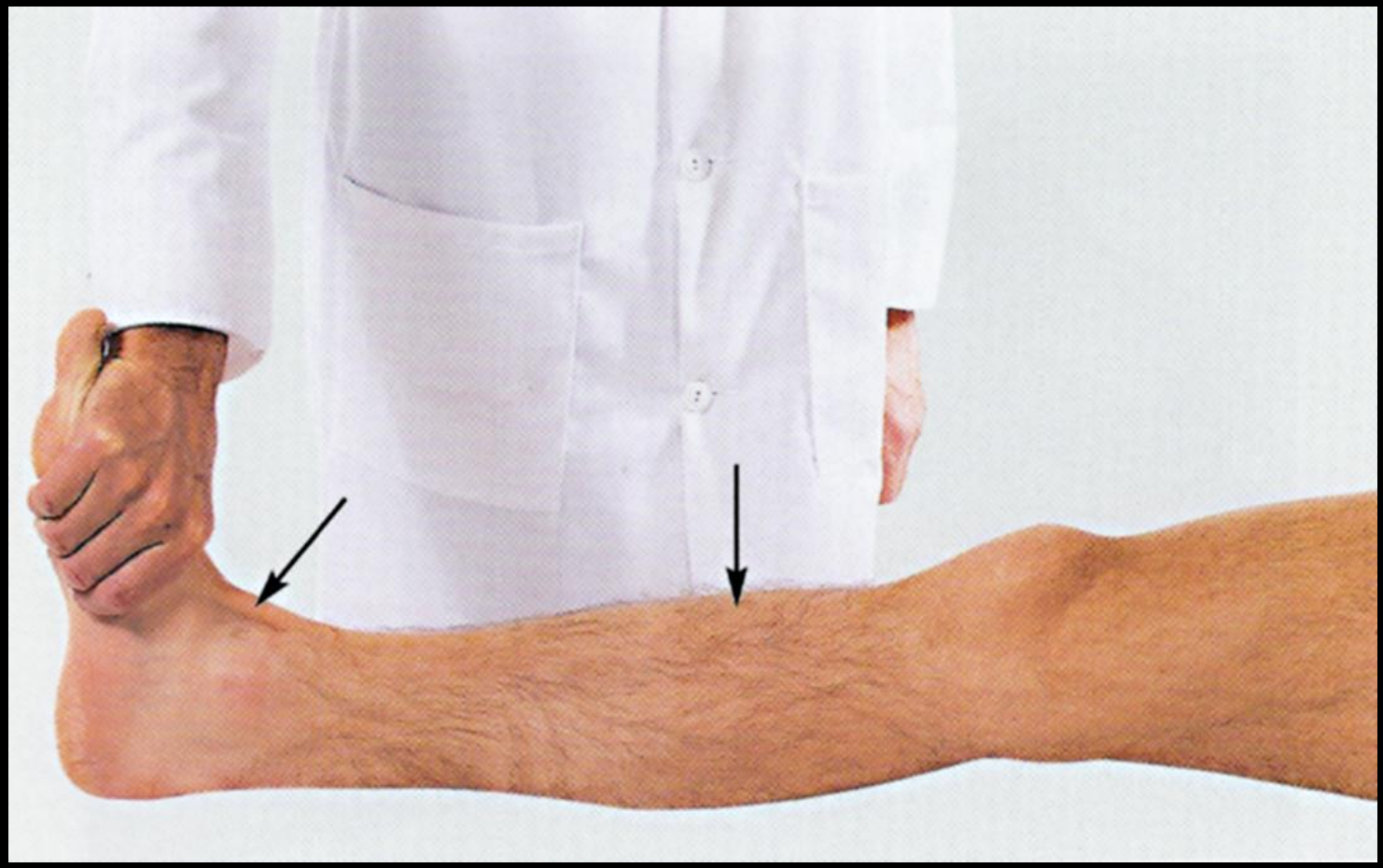
TESTING BICEPS
C5, C6



VARIABILITY IN DERMATOMAL INNERVATION OF THE FINGERS



MUSCLES PRINCIPALLY SUPPLIED BY L4
TIBIALIS ANTERIOR

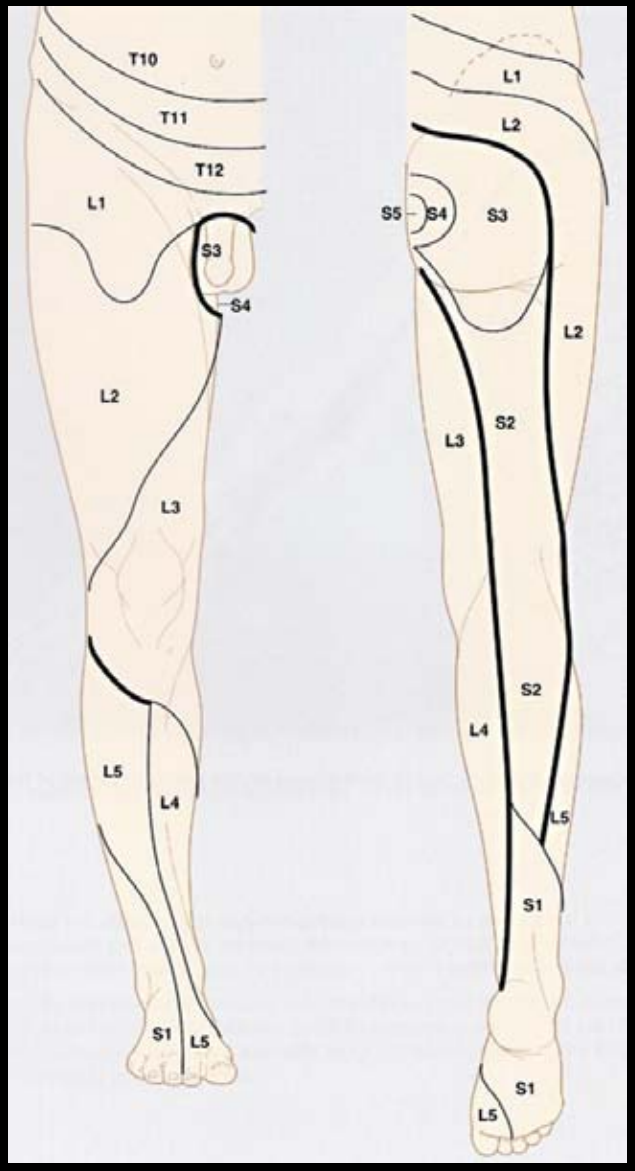


MUSCLES PRINCIPALLY SUPPLIED BY L5

EXTENSOR DIGITORUM LONGUS

EXTENSOR HALLUCIS LONGUS

LOWER LIMB DERMATOMES



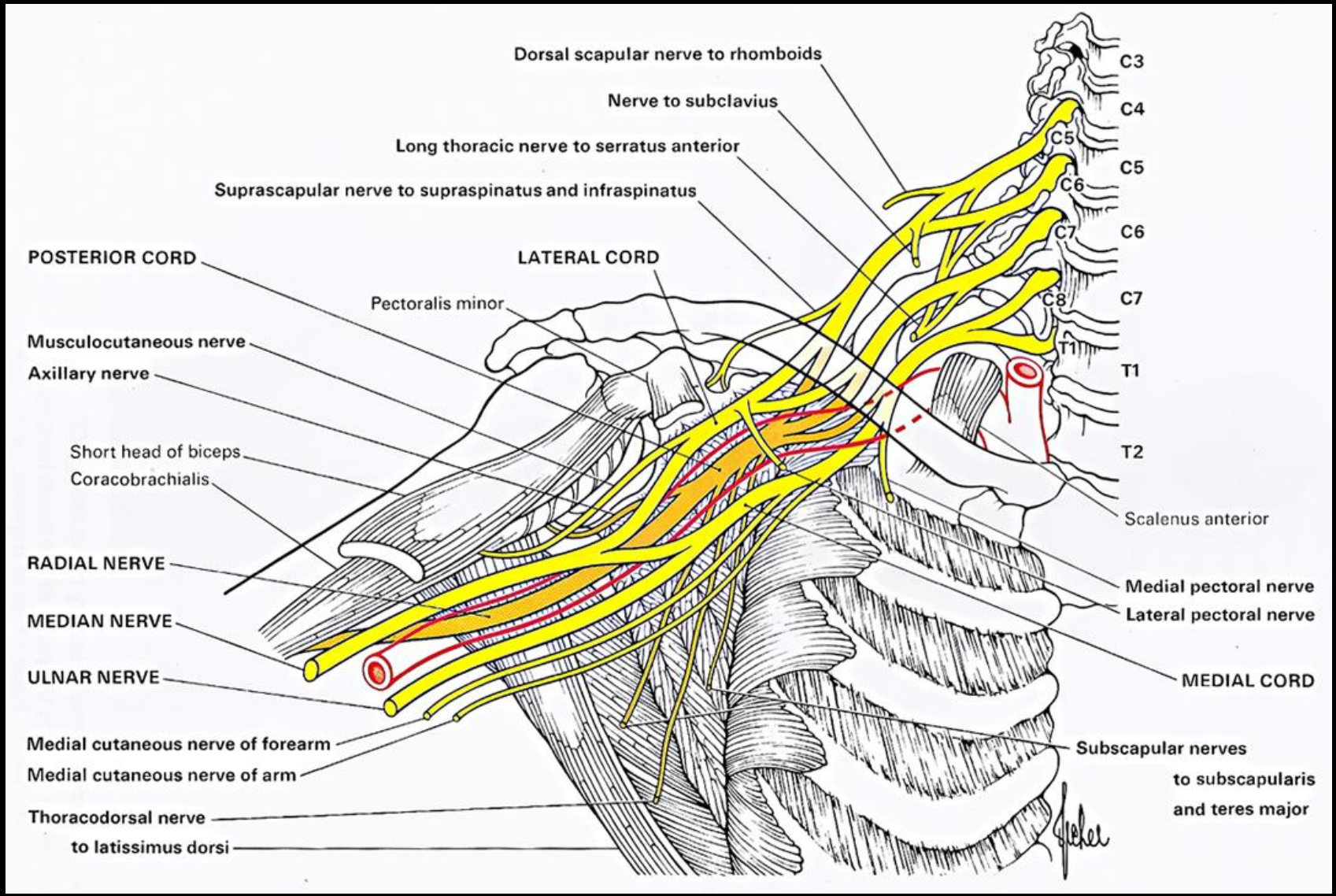
THORACIC OUTLET SYNDROME

GILLIATT R.W; LE QUESNE, P.M; LOGUE, V & SUMNER A.J.

WASTING OF THE HAND ASSOCIATED WITH A CERVICAL RIB OR BAND

JOURNAL OF NEUROLOGY, NEUROSURGERY AND PSYCHIATRY
1970; 33: 615-24

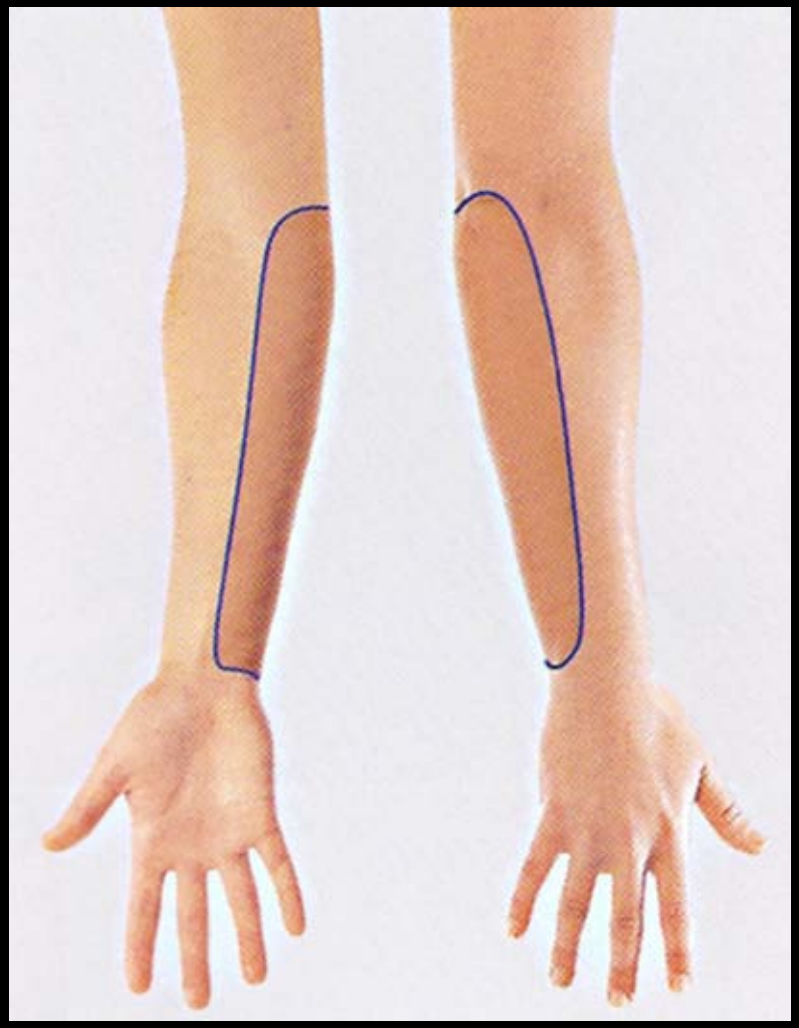
THE RELEVANT ANATOMY



THE THORACIC OUTLET SYNDROME RESULTS FROM STRETCHING OF THE LOWER TRUNK OF THE BRACHIAL PLEXUS (OR ITS CONSTITUENT ROOTS) BY A CERVICAL RIB OR FIBROUS BAND PASSING FROM THE C7 TRANSVERSE PROCESS TO THE FIRST RIB

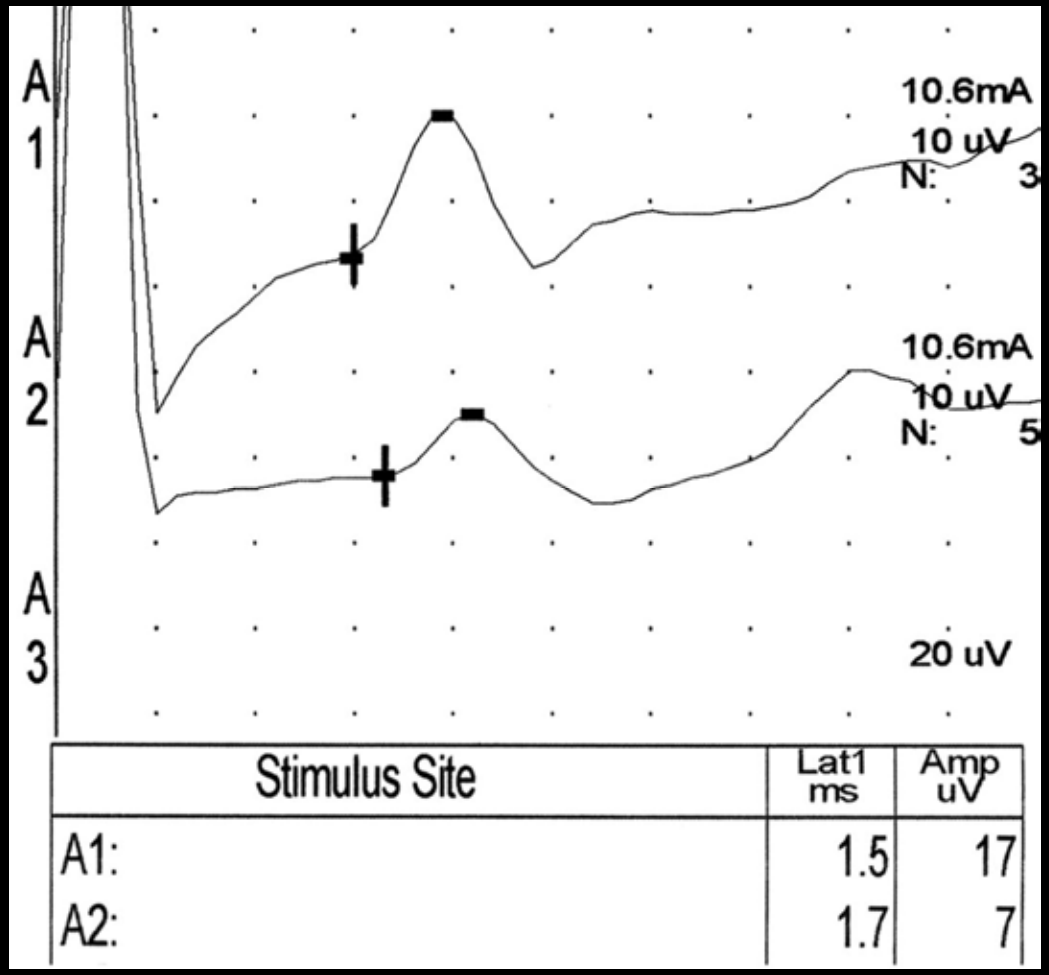
THE SMALL HAND MUSCLE WEAKNESS AND WASTING WHICH EVENTUALLY DEVELOP PREDOMINANTLY AFFECT THE THENAR EMINENCE

DISTRIBUTION OF SENSORY CHANGE WITH INVOLVEMENT OF THE MEDIAL CUTANEOUS NERVE OF THE FOREARM



RADIOLOGY – BEAKING OF THE C7 TRANSVERSE PROCESS RATHER THAN A CERVICAL RIB

ELECTROPHYSIOLOGY. RECORDING OF MEDIAL CUTANEOUS NERVE OF FOREARM S.A.P



Stimulus Site	Lat1 ms	Amp uV
A1:	1.5	17
A2:	1.7	7

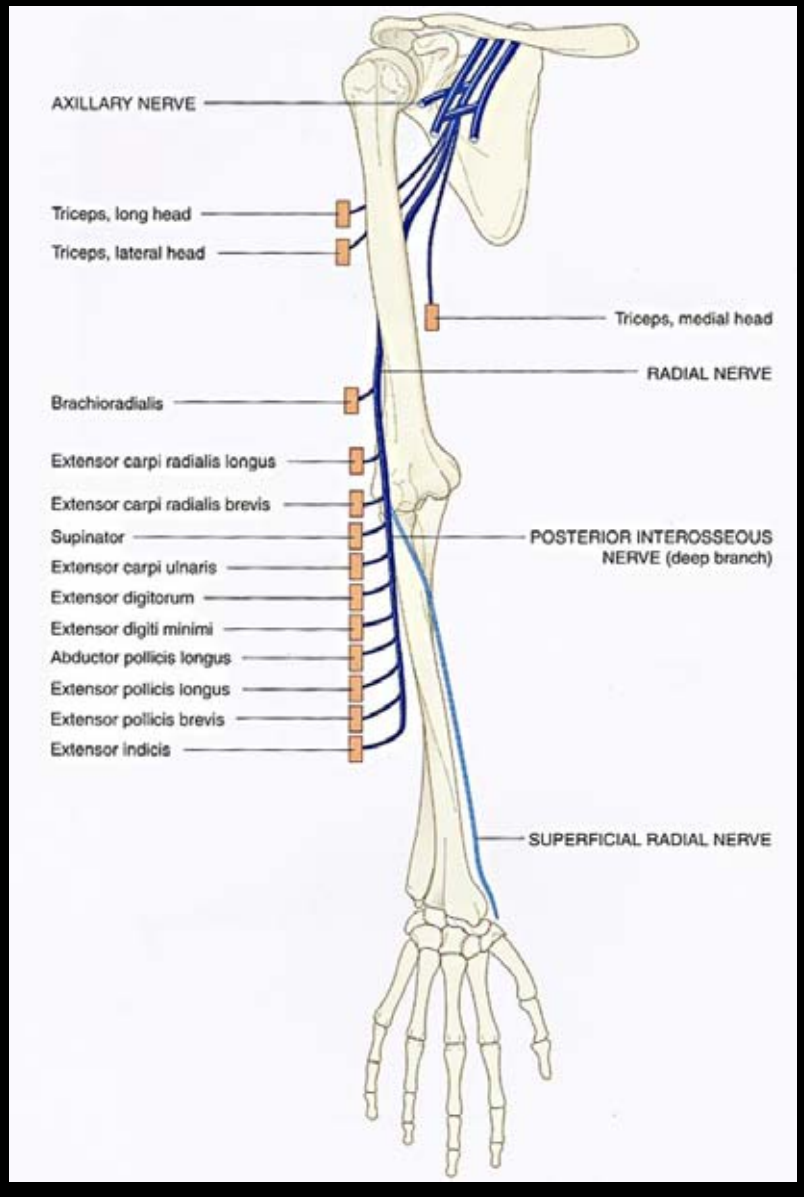
Depressed medial cutaneous nerve of forearm sensory action potential in thoracic outlet syndrome.
Normal (upper) and depressed (lower) potential.

POSTERIOR INTEROSSEOUS N. PALSY

THE NERVE IS SUSCEPTIBLE TO ENTRAPMENT AS IT PASES THROUGH THE SUPINATOR MUSCLE, IMMEDIATELY BELOW THE TIP OF THE LATERAL EPICONDYLE.

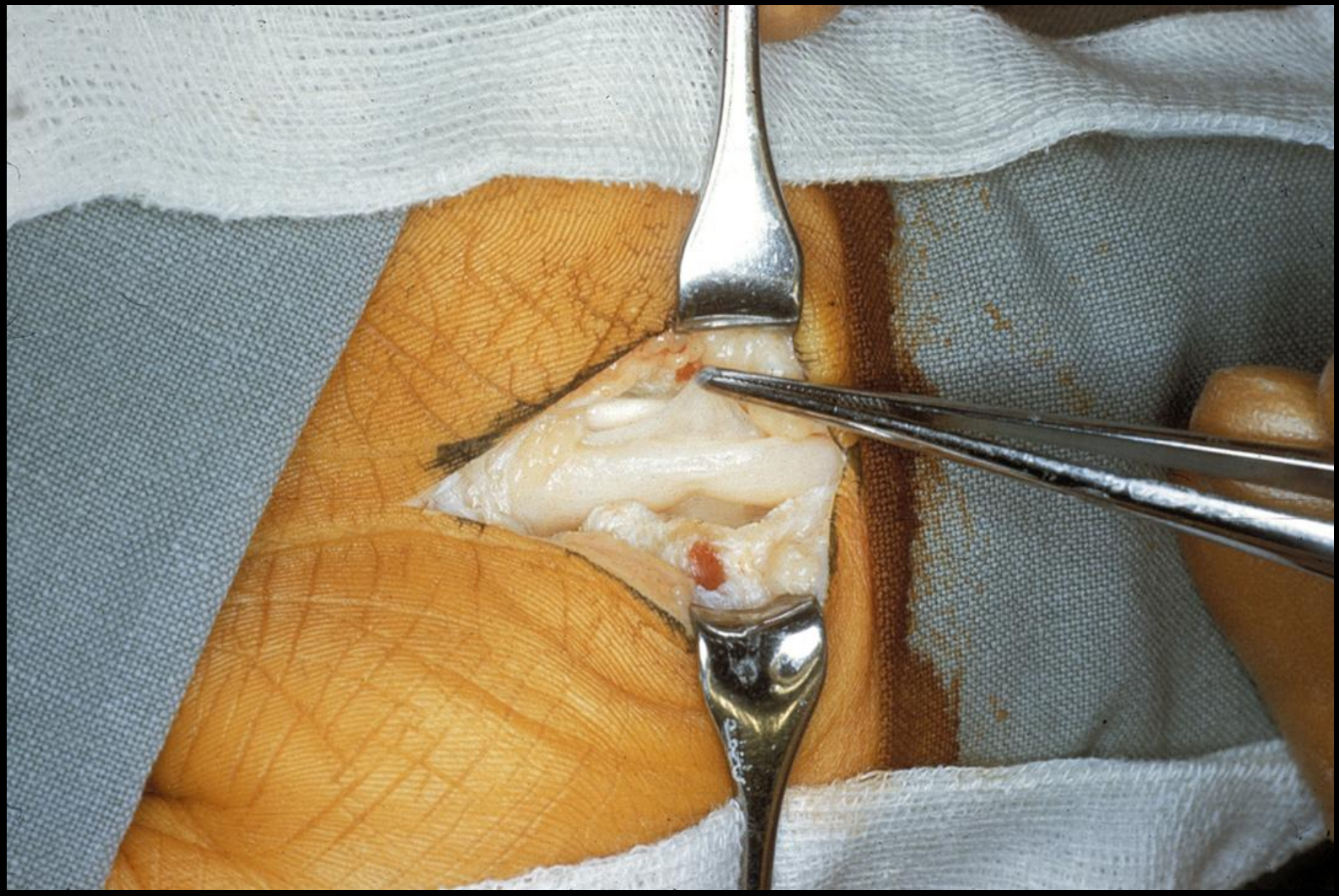
WEAKNESS OF EXTENSORS OF WRIST, FINGERS AND THUMB, BUT RELATIVE SPARING OF RADIAL EXTENSORS

RADIAL NERVE DISTRIBUTION



POSTERIOR INTEROSSEOUS PALSY RADIAL DEVIATION DURING ATTEMPTED DORSIFLEXION OF THE WRIST

CARPAL TUNNEL SYNDROME



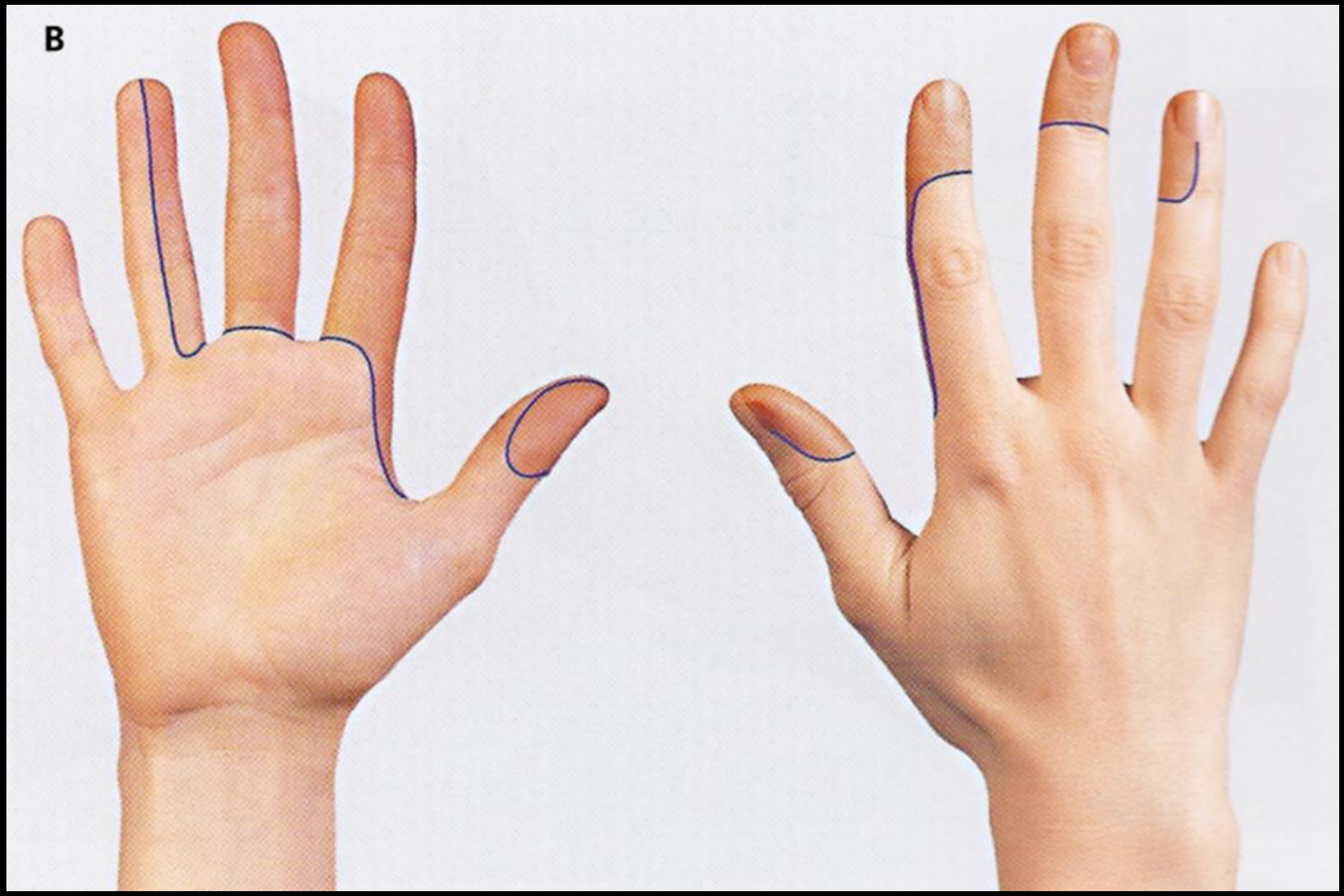
CARPAL TUNNEL SYNDROME

NOCTURNAL PAIN, NUMBNESS AND PARAESTHESIAE CHARACTERISTIC. THE SYMPTOMS, INCLUDING THOSE OF NUMBNESS AND PARAESTHESIAE, ARE OFTEN DIFFUSELY DISTRIBUTED IN THE HAND

CARPAL TUNNEL SYNDROME

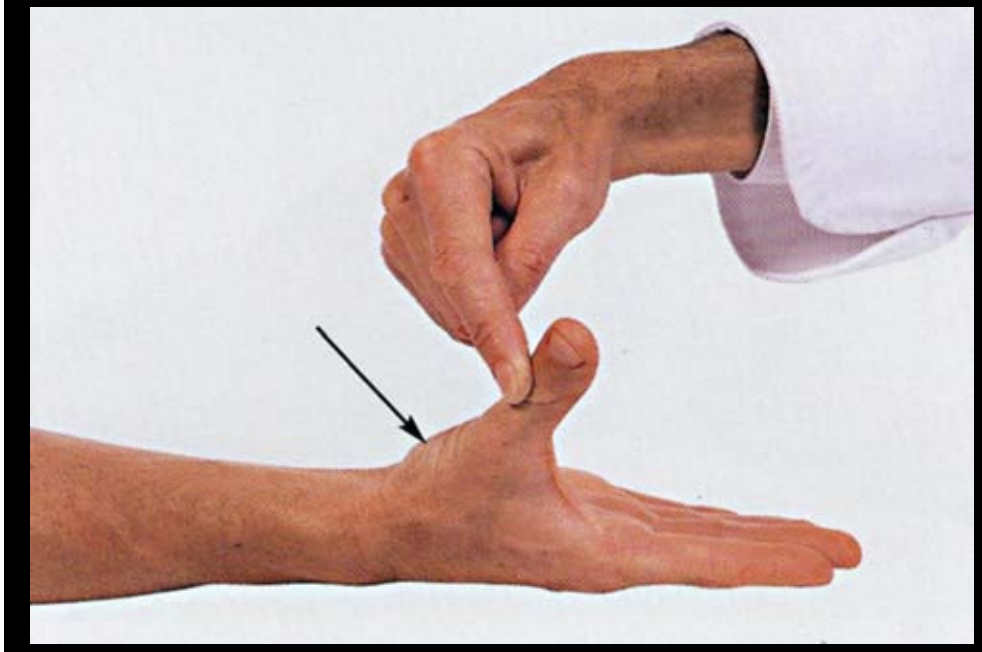
- SENSORY SIGNS OFTEN SUBTLE, E.G.
- ALTERED 2 POINT DISCRIMINATION

MEDIAN SENSORY CHANGES



RELEVANT TESTABLE MUSCLES

APB



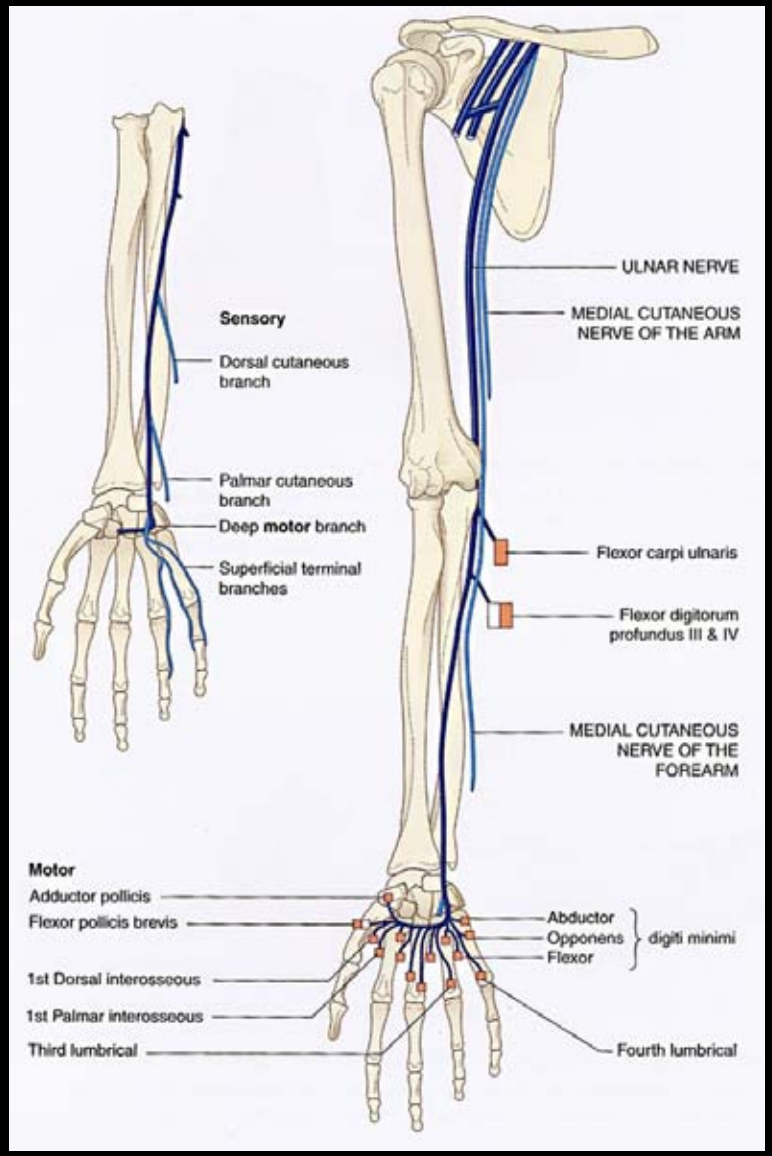
OPPONENS

CARPAL TUNNEL SYNDROME

THENAR EMINENCE

OPPONENS

ULNAR NERVE LESIONS



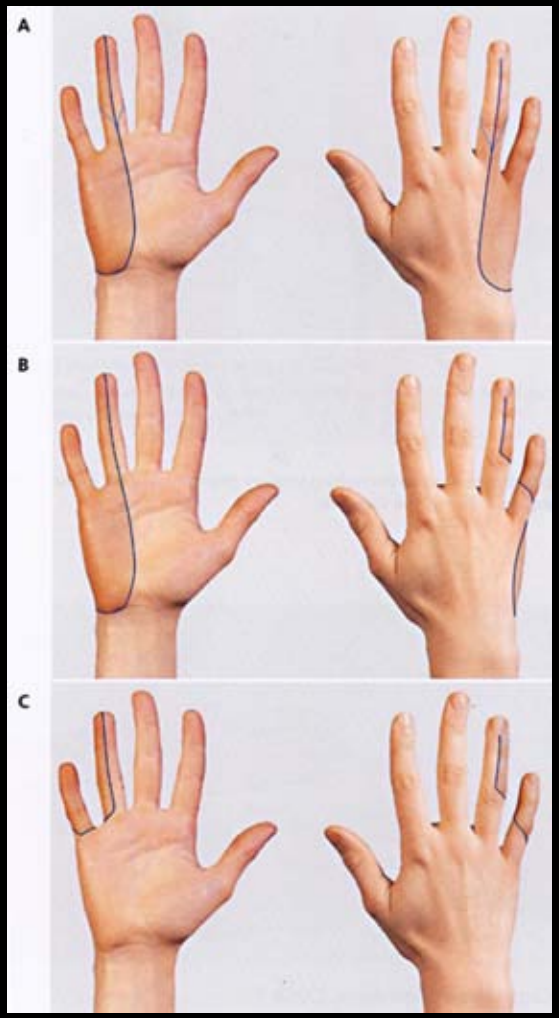
ULNAR NERVE LESIONS

DISTRIBUTION OF SENSORY LOSS

A. ABOVE ORIGIN OF DORSAL CUTANEOUS BRANCH

B. BELOW ORIGIN OF DORSAL CUTANEOUS BRANCH AND ABOVE ORIGIN OF PALMAR BRANCH

C. BELOW ORIGIN OF PALMAR BRANCH



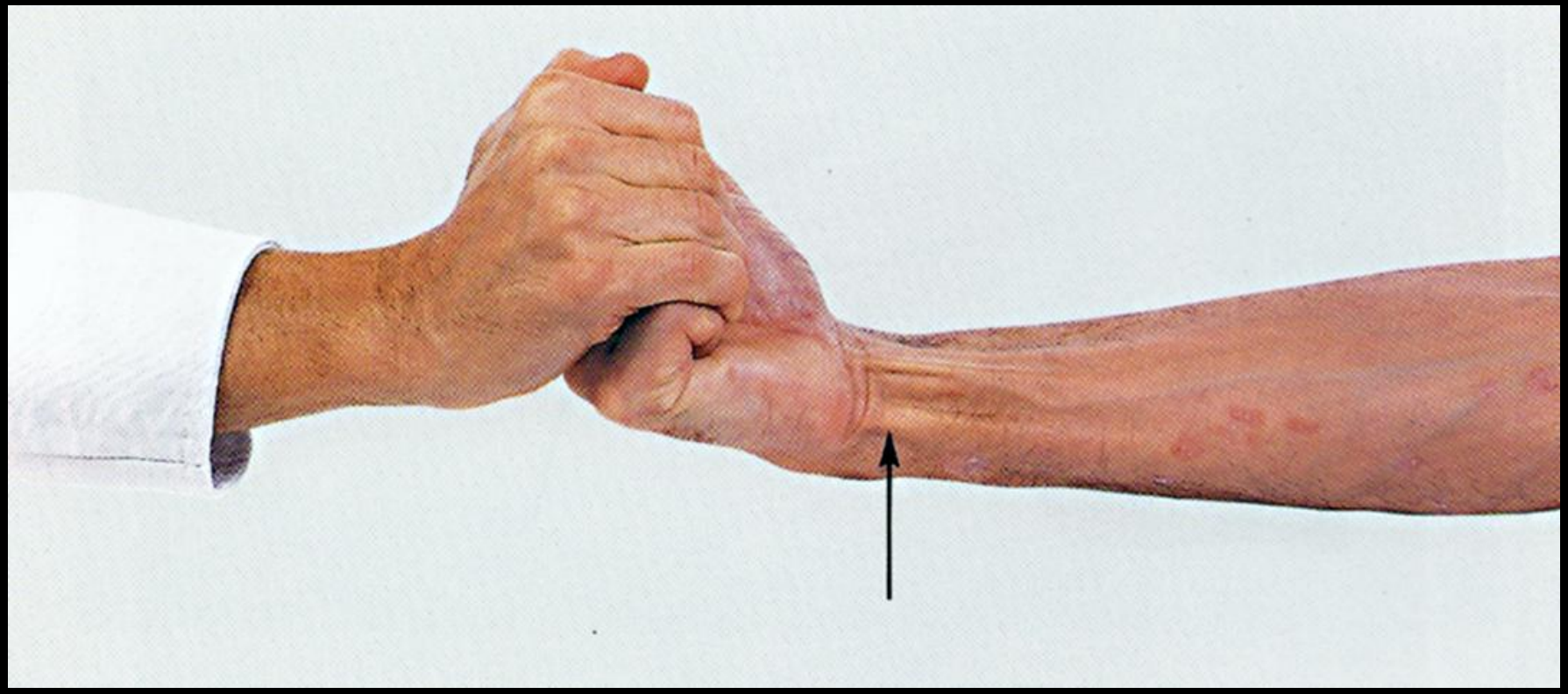
ULNAR NERVE LESIONS

VAST MAJORITY AT LEVEL OF ELBOW EITHER – TRAUMA IN EPICONDYLAR GROOVE OR COMPRESSION BY APONEUROSIS OF FLEXOR CARPI ULNARIS (CUBITAL TUNNEL SYNDROME)

HAND APPEARANCE

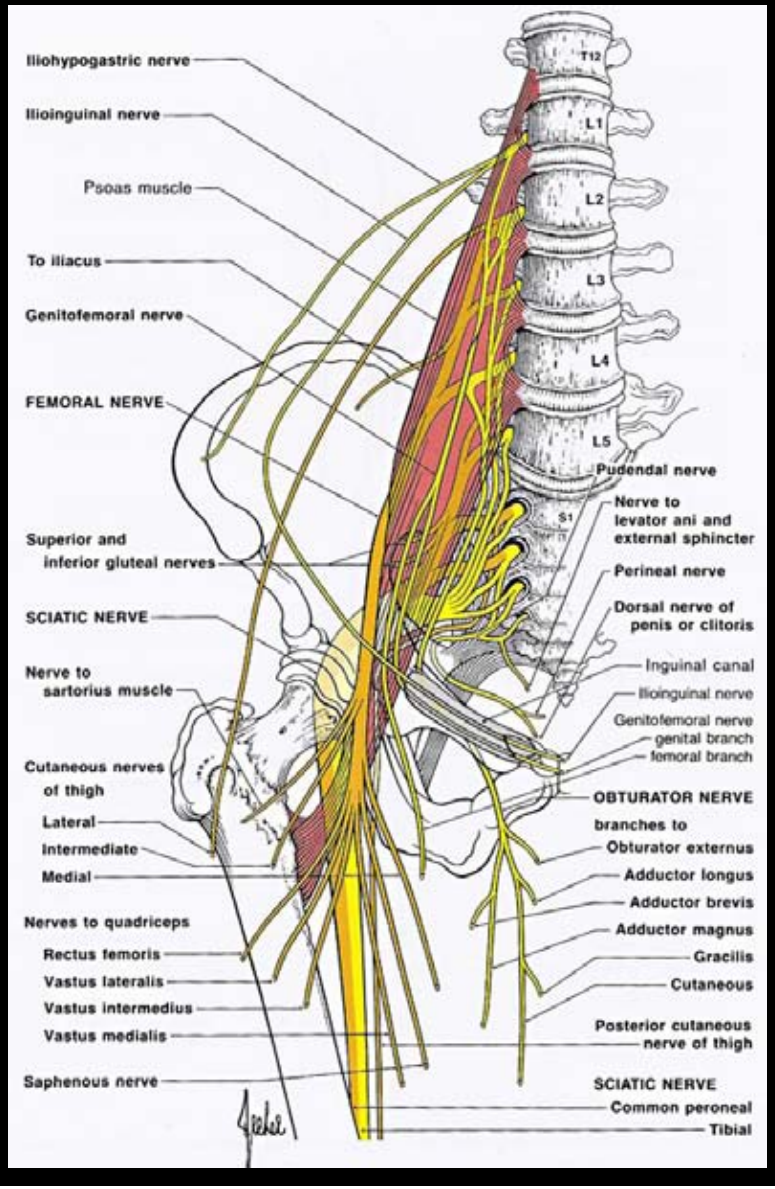
FROMENT'S SIGN

TESTING THE LONG FLEXORS
FLEXOR CARPI ULNARIS

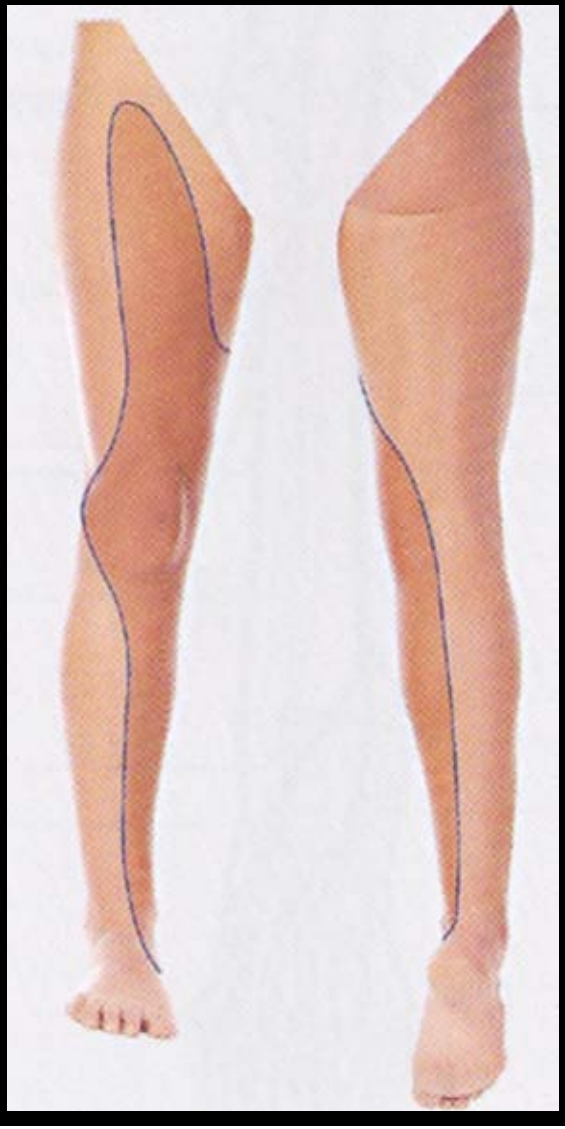


TESTING THE LONG FLEXORS
FLEXOR DIGITORUM PROFUNDUS
IV . V

FEMORAL NEUROPATHY

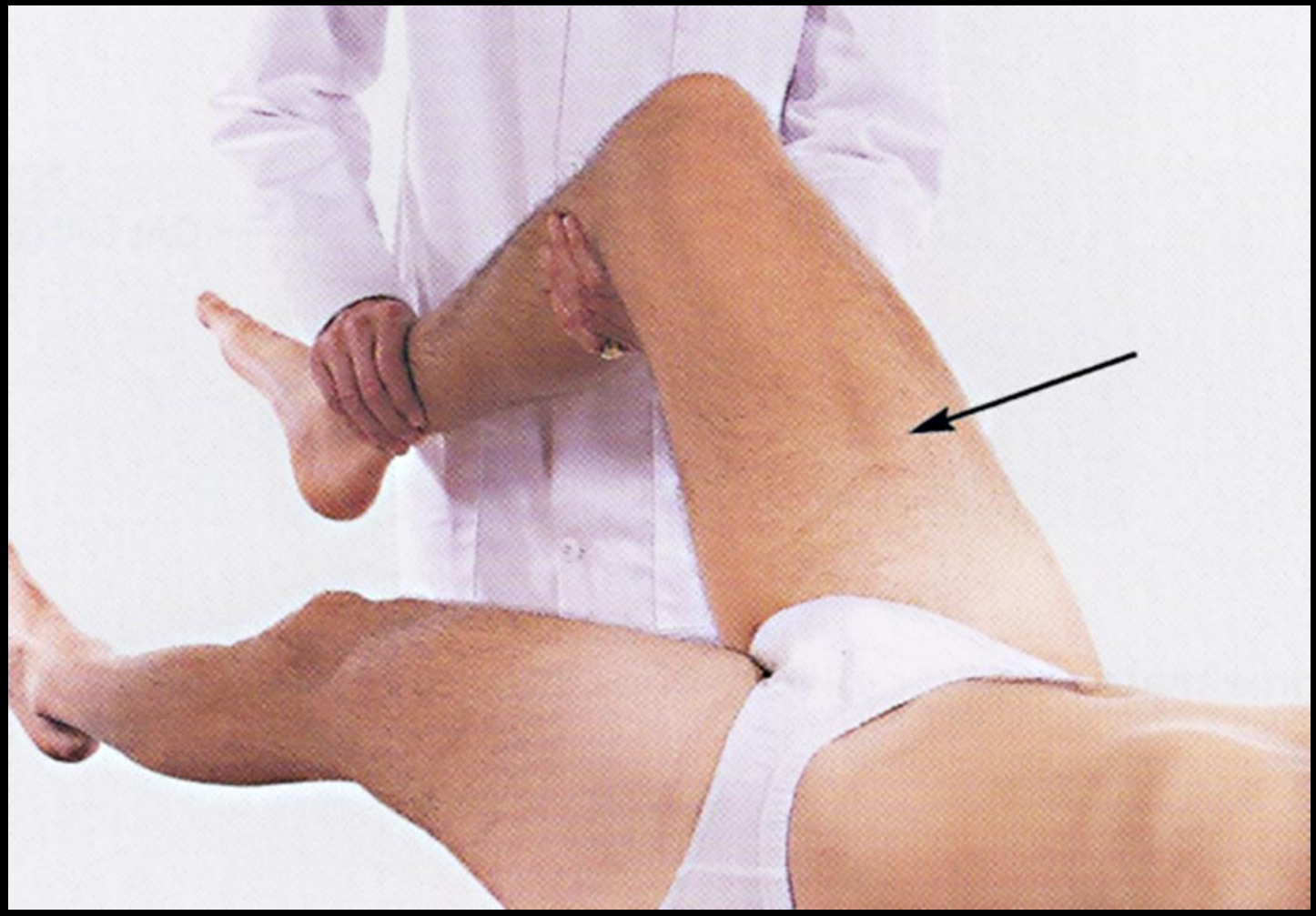


FEMORAL NEUROPATHY SENSORY CHANGES



FEMORAL NEUROPATHY

TESTING QUADRICEPS – TO DETECT SLIGHT WEAKNESS. THE LEG SHOULD BE FULLY FLEXED AT THE KNEE



LATERAL POPLITEAL N LESIONS. TYPICALLY EXTENSOR HALLUCIS LONGUS IS THE MOST AFFECTED MUSCLE

LATERAL POPLITEAL N LESIONS. TESTING EXTENSOR HALLUCIS LONGUS

LATERAL POPLITEAL N LESIONS. SENSORY CHANGES

RELATIVE FREQUENCY OF THE MONONEUROPATHIES AND PLEXOPATHIES (BASED ON 4,000 SUCCESSIVE OUTPATIENT REFERRALS)

CARPAL TUNNEL SYNDROME	70
MEDIAN N. LESION AT ELBOW	1
UNLAR N. LESION AT ELBOW	40
DISTAL ULNAR N. LESION (HAND)	1
RADIAL N. LESION	5
BRACHIAL PLEXOPATHY	6
CERVICAL RIB SYNDROME	1
SCIATIC N. LESION	2
FEMORAL N. LESION	0
MERALGIA PARAESTHETICA	18
LATERAL POPLITEAL N. LESION	10
TARSAL TUNNEL SYNDROME	1

ASPECTS OF SPINAL CORD DISORDERS

- PAIN
  - LOCAL PAIN AT SITE OF LESION. PAIN SENSITIVE STRUCTURES – BONE AND LIGAMENTS EXCEPT LIGAMENTUM FLAVUM. MOST INTENSE OVER VERTEBRAL COLUMN AT SITE OF LESION.

- PAIN
  - MAY SPREAD TO PARAVERTEBRAL AREAS
  - CERVICAL VERTERAL PAIN MAY SPREAD TO SHOULDERS
  - LUMBAR VERTEBRAL PAIN MAY SPREAD TO HIPS

PAIN

- WITH PROCESS WITHIN SPINAL CANAL, RADICULAR PAIN RARELY SEEN WITHOUT LOCAL PAIN. PARAESTHESIAE HAVE GREATER LOCALIZING VALUE THAN RADICULAR PAIN

DIFFUSE ACHING OR BURNING OCC. SEEN WITH SPINAL CORD DISEASE. MOST FREQUENT WITH SPINAL CORD INJURY - USUALLY LATE. TYPICALLY IN BUTTOCKS, FEET AND LEGS REGARDLESS OF SITE OF INJURY. ASSOCIATED WITH IMPAIRMENT OF PAIN PERCEPTION

ASPECTS OF SPINAL CORD DISEASE

- MOTOR ABNORMALITIES
  - DETECTABLE WEAKNESS SUGGESTS CESSATION OF FUNCTION OF MORE THAN 50% OF DESCENDING MOTOR PATHWAYS OR MORE THAN 50% OF ANTERIOR HORN CELLS

ANTERIOR HORN CELL LESIONS

FASCICULATION PROMINENT WITH CERVICAL CORD LESIONS AT ALMOST ANY LEVEL. FASCICULATION IN INTRINSIC HAND MUSCLES WELL RECOGNISED IN LESIONS ABOVE THE LOWER CERVICAL SEGMENTS

CAUDA EQUINA LESIONS/LUMBAR SPINAL CORD LESIONS LESS LIKELY TO PRODUCE ATROPHY AND FASCICULATION COMPARED TO CERVICAL LESIONS

SPINAL CORD DISEASE

- SENSORY ABNORMALITIES
  - PARAESTHESIAE OF NERVE ROOT ORIGIN TEND TO BE MOST EVIDENT IN THE DISTAL DISTRIBUTION OF THE DERMATOME. COMPRESSIVE LESIONS OF THE UPPER CERVICAL CORD CAN CAUSE PARAESTHESIAE CONFINED TO THE HANDS

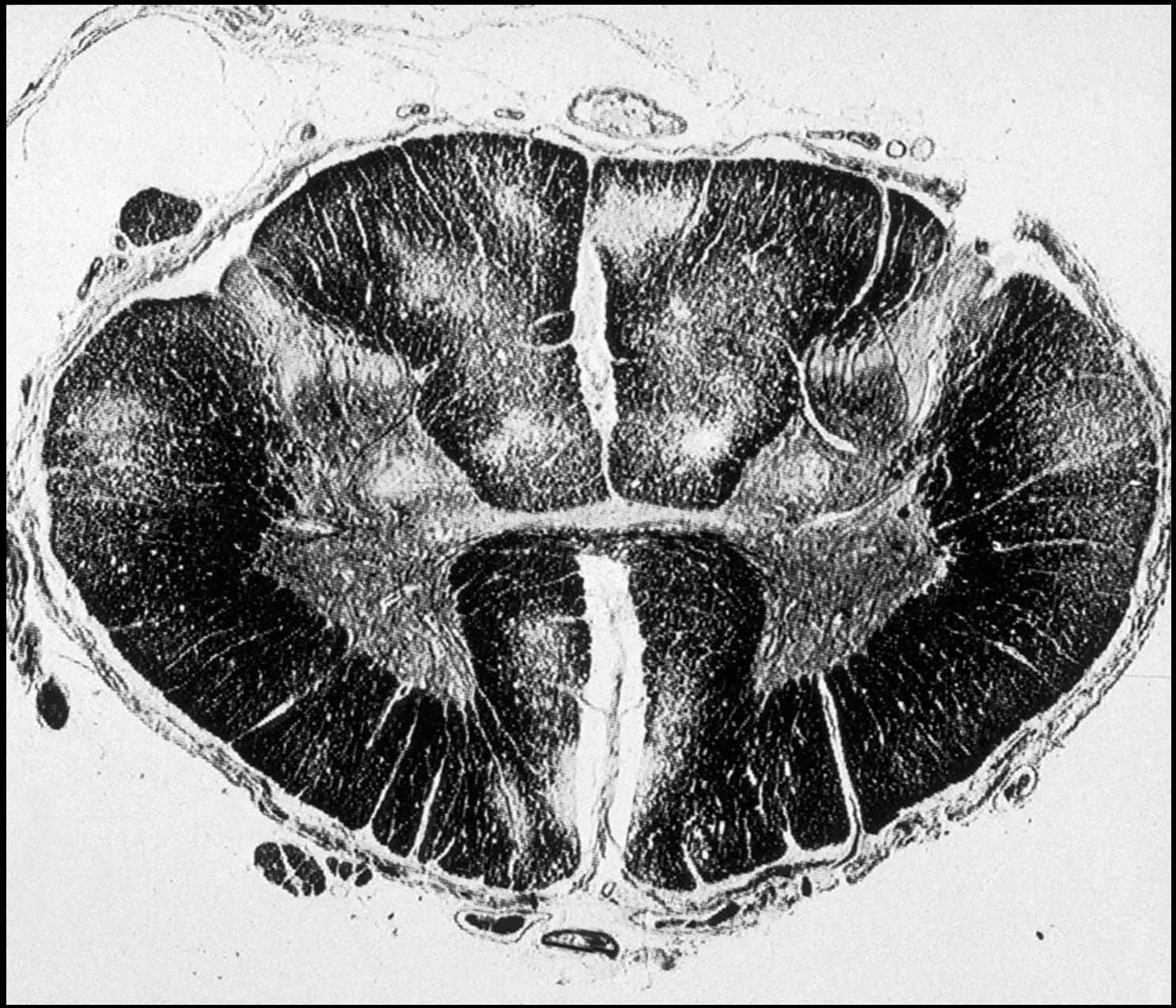
LHERMITTE’S SIGN

TYPICALLY INTO SPINE. SOMETIMES INTO LEGS, LESS OFTEN INTO ARMS
RARELY DESCRIBED WITH UPPER THORACIC LESIONS.

NEGATIVE SENSORY SYMPTOMS – E.G. NUMBNESS OR DEADNESS INDICATIVE OF DORSAL COLUMN LESION. NOT PRESENT AFTER ANTEROLATERAL CORDOTOMY OR IN PATIENTS WITH A BROWN – SEQUARD SYNDROME ON THE ANALGESIC SIDE

SENSORY FINDINGS SUGGESTIVE OF SPINAL CORD OR CAUDA EQUINA LESION

A. LOSS OF POSITION AND VIBRATION SENSE IN FEET WITH PRESERVED ANKLE JERKS (DORSAL CORD SYNDROME)



B. BILATERAL LOSS OF POSITION AND VIBRATION SENSE IN FEET WITH PINPRICK LEVEL ON ABDOMEN OR CHEST (THORACIC CORD LESION)

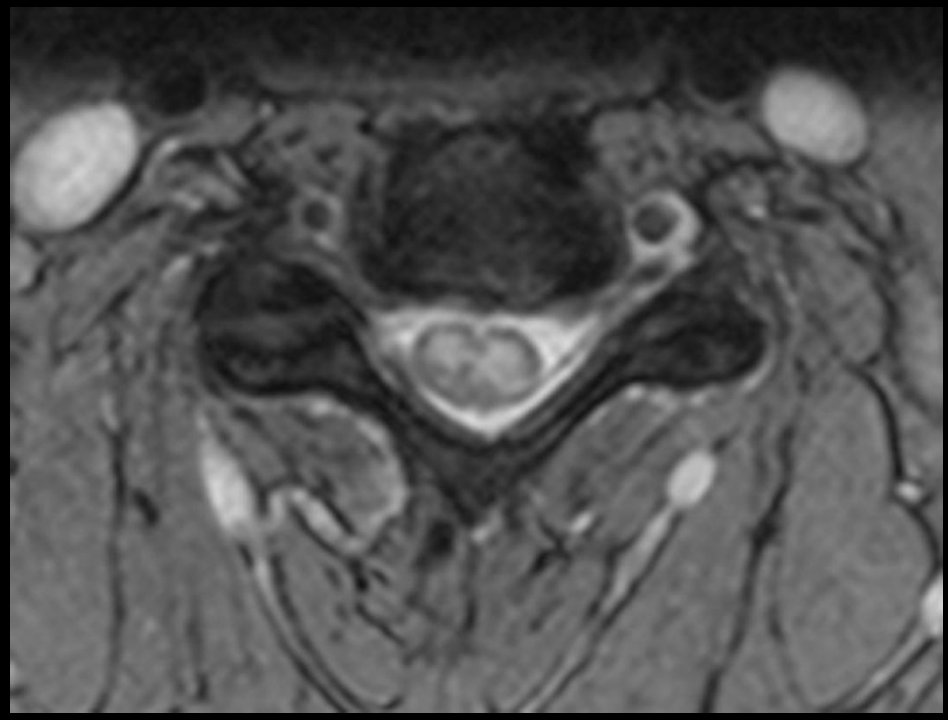
C. BILATERAL SEGMENTAL SENSORY LOSS I.E. SENSORY LOSS IN HANDS AND FOREARMS, WITH NORMAL SENSATION IN LEGS TRUNK, UPPER ARMS AND NECK. (CENTRAL CORD SYNDROME)

D. LOSS OF PINPRICK SENSATION ON ONE SIDE OF THE BODY WITH LOSS OF POSITION AND VIBRATION SENSE ON THE OTHER (BROWN-SEQUARD)

E. LOSS OF PINPRICK SENSATION OVER THE LEGS AND TRUNK WITH NORMAL SENSATION PERI-ANALLY (INTRAMEDULLARY OR ANTERIOR EXTRA-MEDULLARY COMPRESSION OF THE SPINAL CORD)

F. LOSS OF PINPRICK SENSATION IN PERIANAL AREA AND IN THE UPPER PART OF BOTH POSTERIOR THIGHS (CONUS MEDULLARIS OR L5 – S1 CAUDA EQUINA LESION)

G. LOSS OF PINPRICK SENSATION ON THE LEGS AND TRUNK WITH NORMAL POSITION AND VIBRATION SENSE IN THE TOES AND FINGERS (ANTERIOR CORD SYNDROME)



ABNORMALITIES OF REFLEXES AND MUSCLE TONE

RAPIDLY EVOLVING LESIONS PRODUCE SPINAL SHOCK – AREFLEXIA, ATONIA AND ABSENT PLANTAR RESPONSES. TENDON REFLEXES AND MUSCLE TONE DO NOT RETURN FOR WEEKS.

HYSTERICAL PARAPLEGIA (CHARCOT)

(a) UNTENABLE PATTERN OF SENSORY LOSS

(b) NORMAL TENDON REFLEXES AND PLANTAR RESPONSES

(c) NORMAL BOWEL AND BLADDER FUNCTION

DIAGNOSIS SHOULD NEVER BE MADE ON THE BASIS OF PSYCHOLOGICAL CRITERIA ALONE