Clinical Approach to Compression & Entrapment Neuropathies

Dr. John Stewart

Lions Gate Hospital, Emeritus Professor - McGill University,
Clinical Associate Professor - University of British Columbia,
Canada

john.stewart@telus.net

Vancouver – where the mountains meet the sea

Disclosures: None

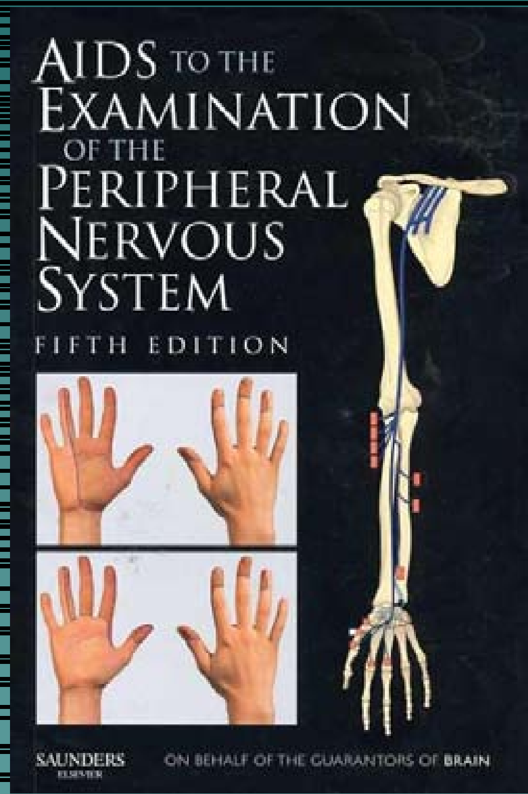
Learning Objectives

- Symptoms & signs
- Pain, dermatomes, myotomes
- Examination and localization
- Nerve fascicles and clinical implications

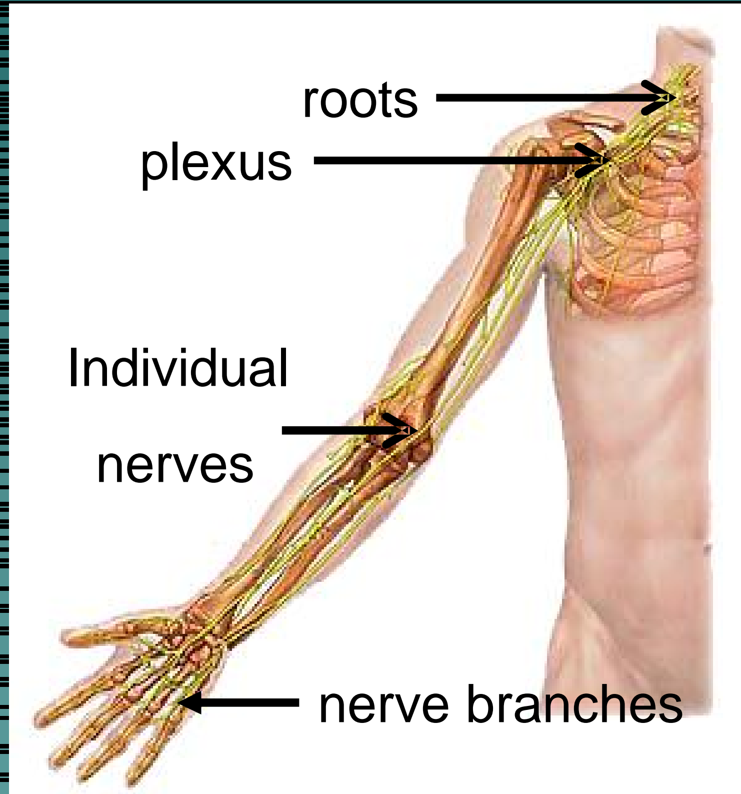
Localization: classic approach

Where is the neuropathy?

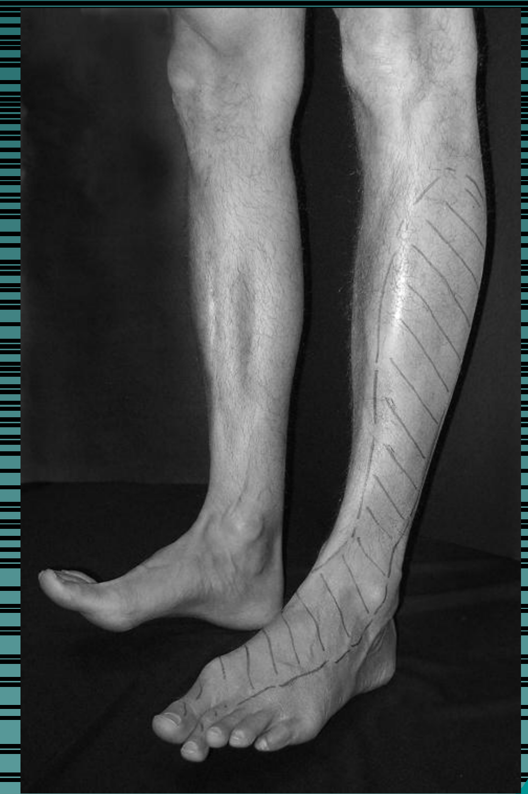
Think anatomy



Think proximal - distal



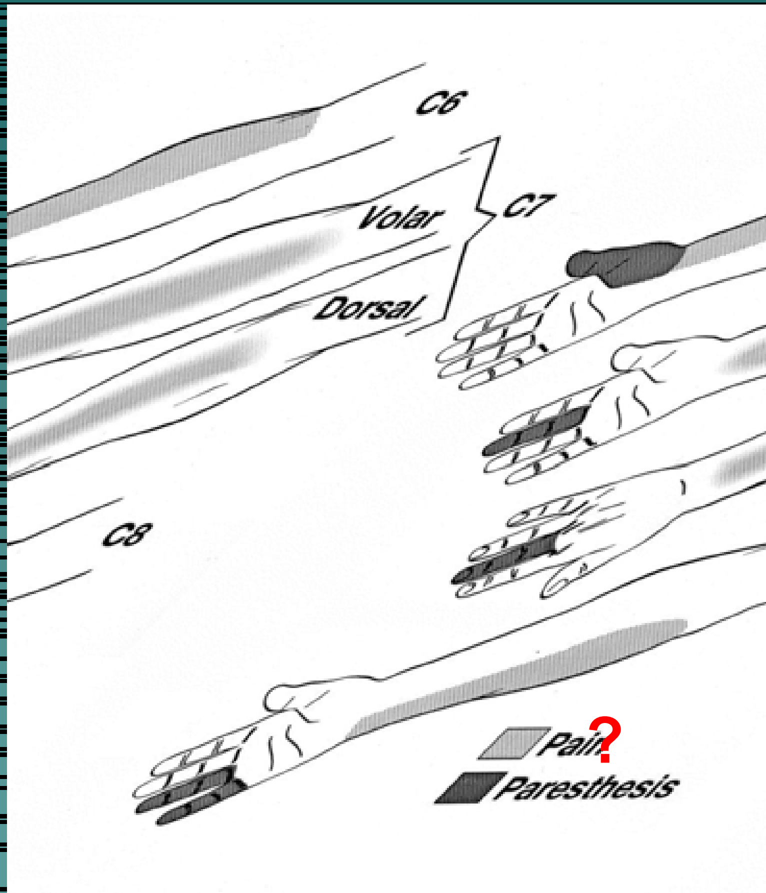
Root, plexus, sciatic or peroneal nerve?

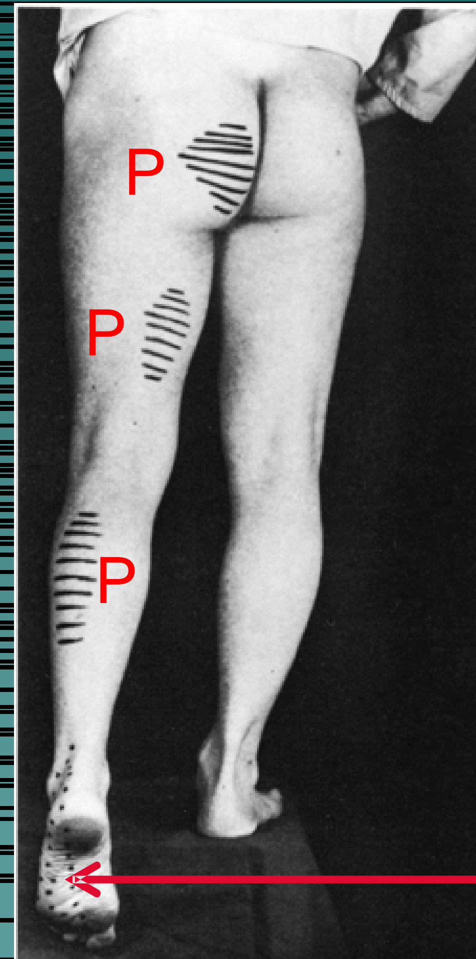


Pain & localization

- Pain from a nerve lesion (neuropathic pain) versus musculoskeletal pain
- Pain associated with paresthesias = neuropathic pain
- Neuropathic pain & non-painful paresthesias often localize to within dermatomes or sensory territory of a nerve
- Musculoskeletal pain can be referred far down a limb and less specifically localizing

Pain vs. paresthesias in radiculopathies



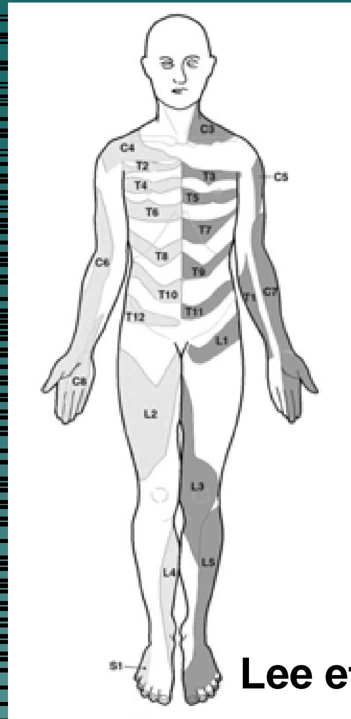


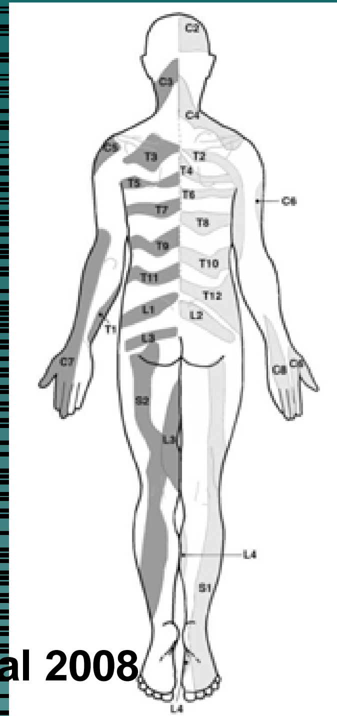
S1 radiculopathy

P = pain

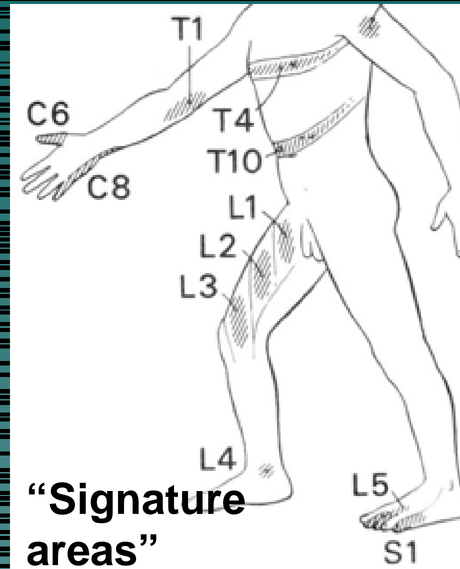
paresthesias

Dermatomes and “Signature areas”

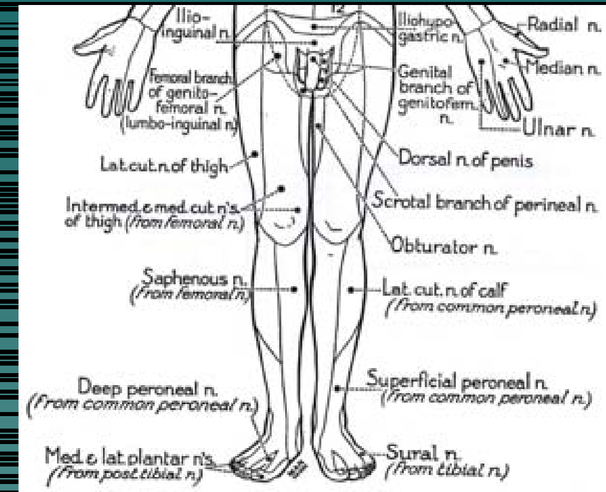




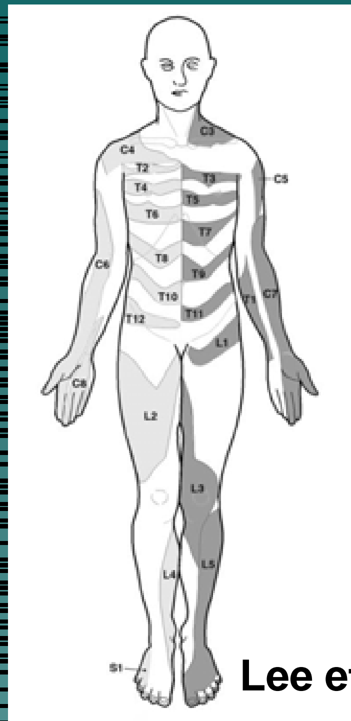
Lee et al 2008

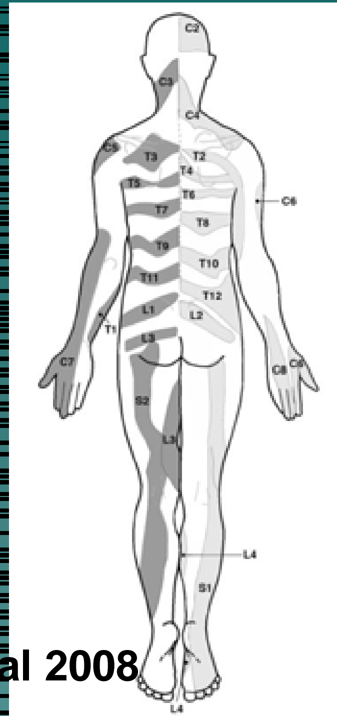


“Signature areas”



Dermatomes and “Signature areas”





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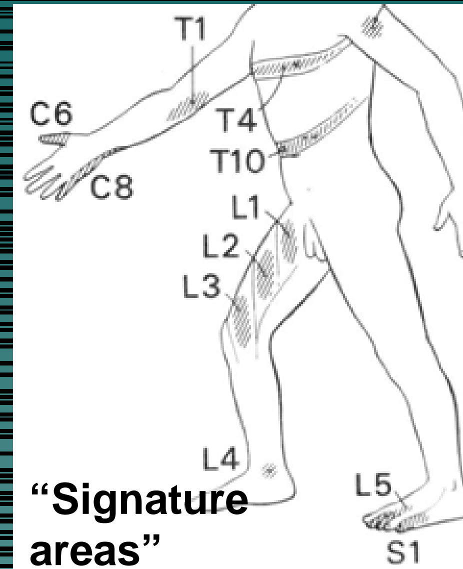
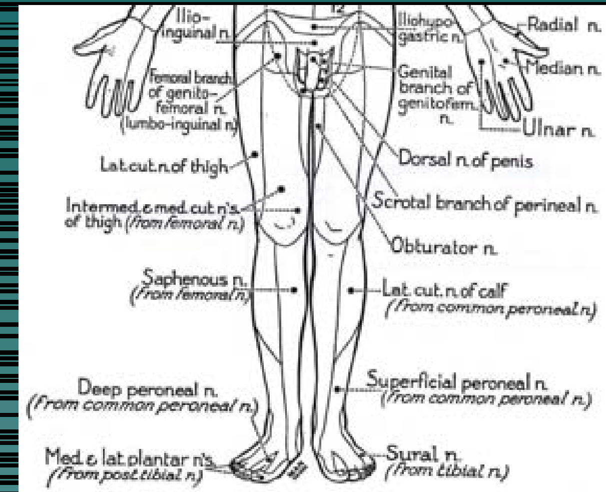
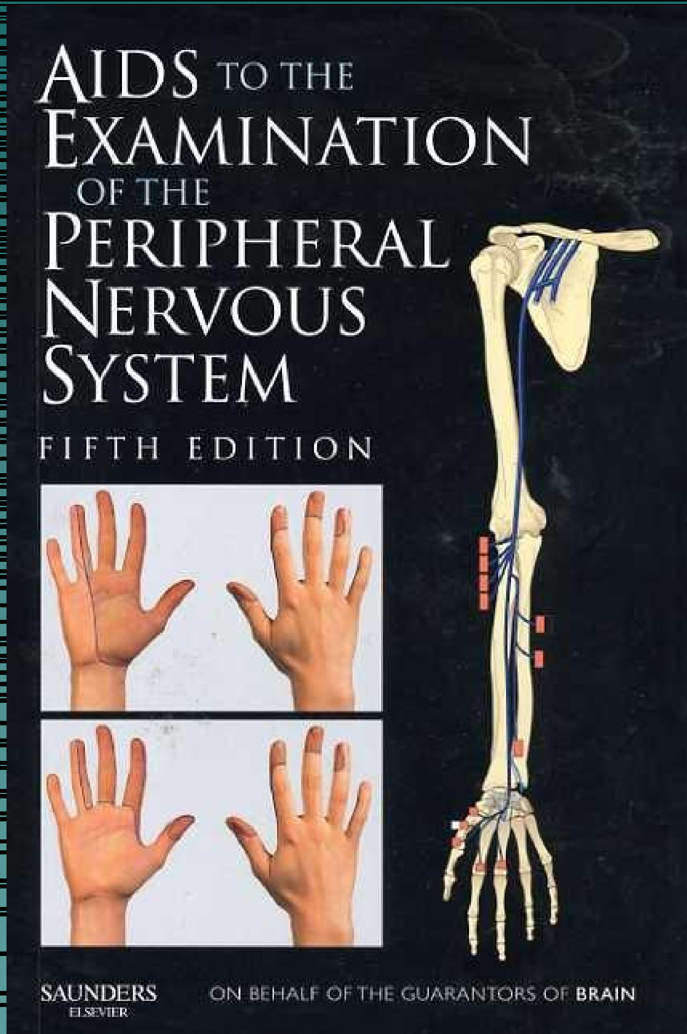




- Sensory distributions of roots and nerves highly variable
- Sensory abnormalities are at the ends of the root or nerve areas
- Accurate localization of paresthesias/numbness, then search for this on examination: **much better than pain for localization**

Myotomes



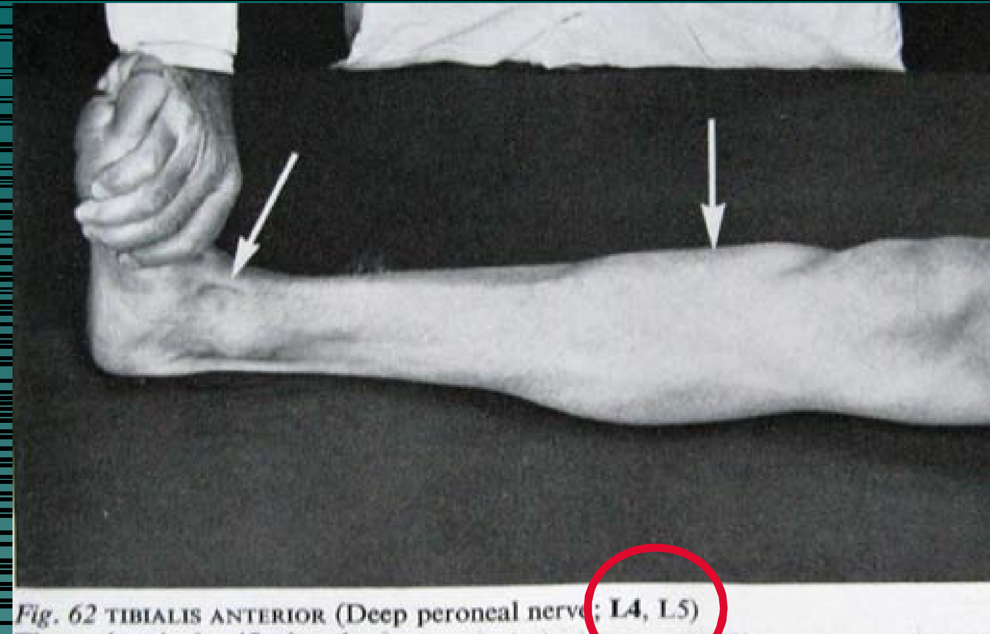


Fig. 62 TIBIALIS ANTERIOR (Deep peroneal nerve; L4, L5)

How do they know this?

- Some mainly L4
- Some mainly L5
- Some a mix of both

Conclusion: Myotomes are quite variable

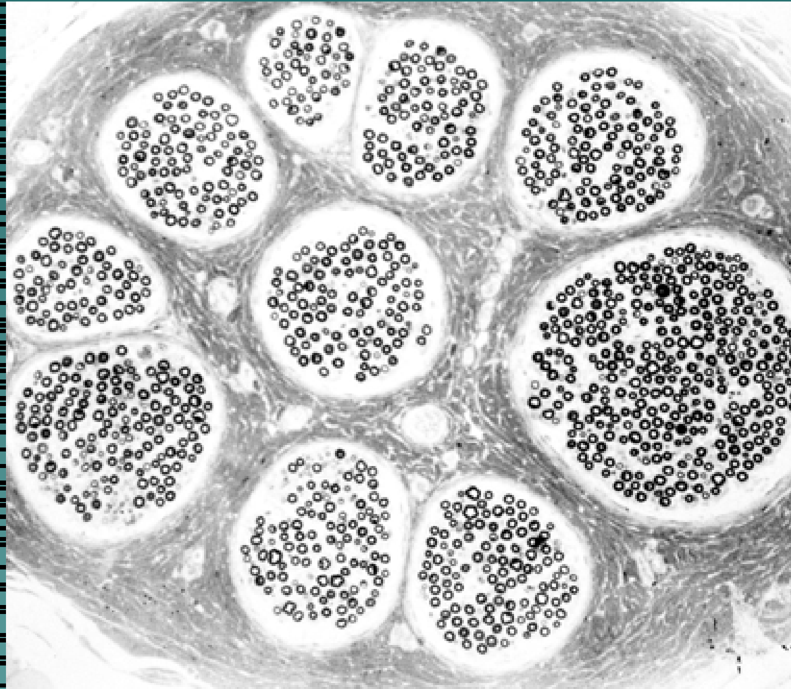
Examination of Nerves

- Tender +/- Tinel's sign:
- Useful if nerve very tender
- Useful if not tender cf. normal nerve

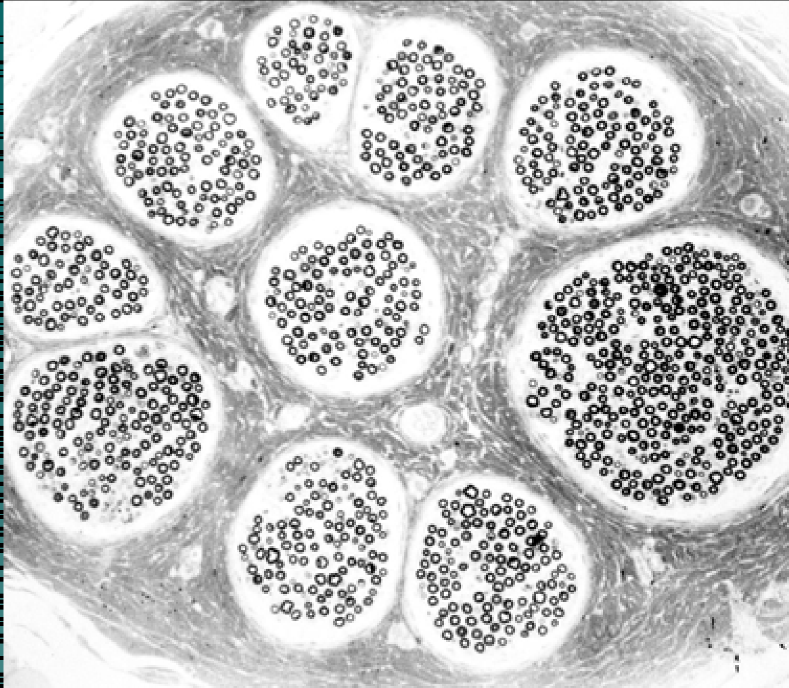
Ulnar & peroneal nerves

Tinel and Phalen signs:
Useless in CTS

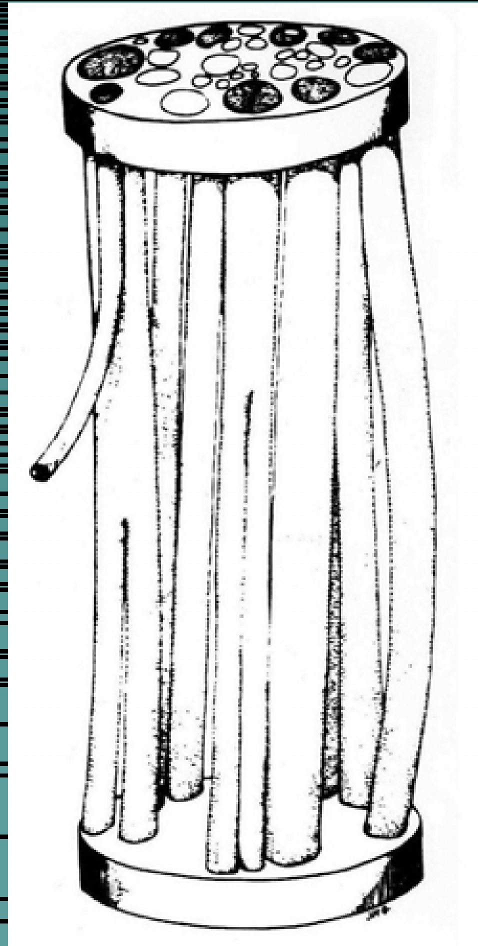
Most important of all



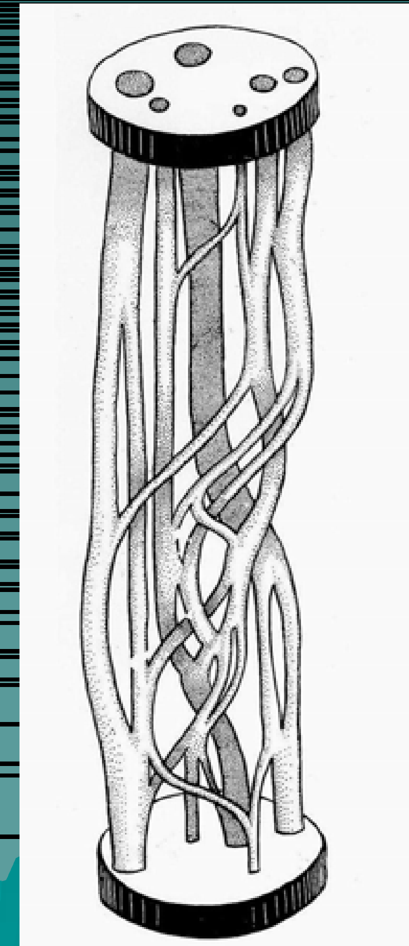
nerve fascicles



cable?



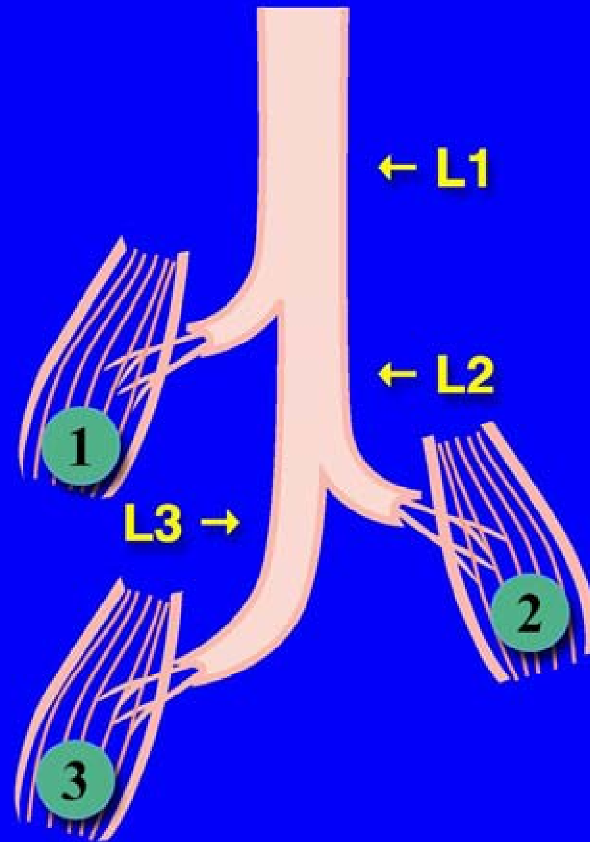
plexiform?



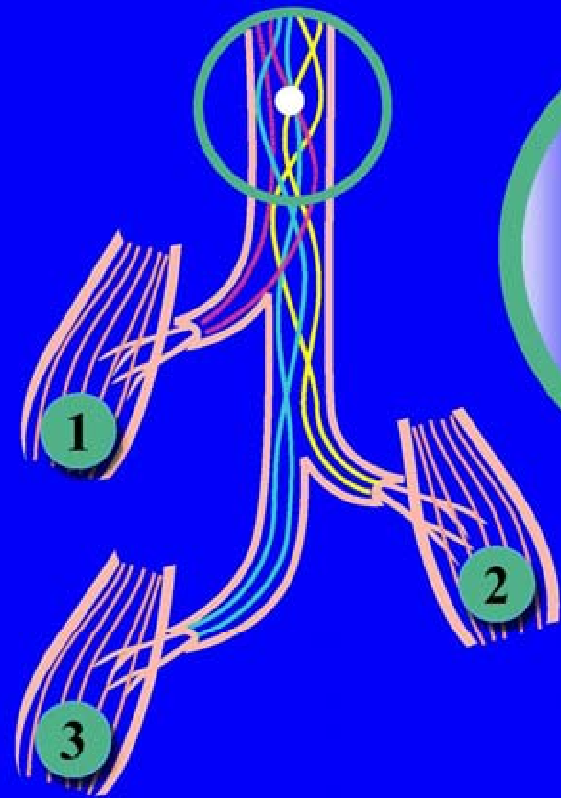
So what?!

Here's what…..

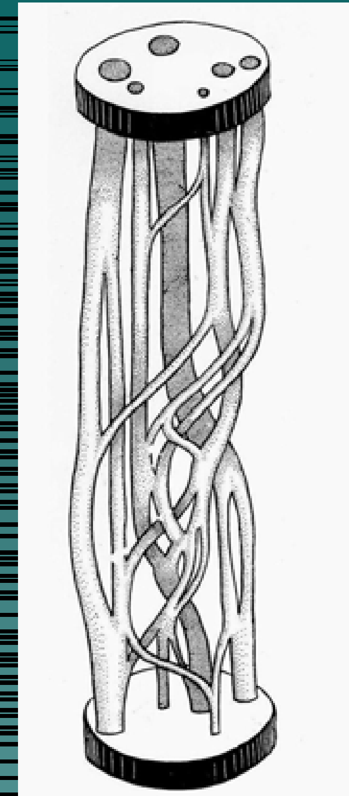
Normal process of localizing a nerve lesion



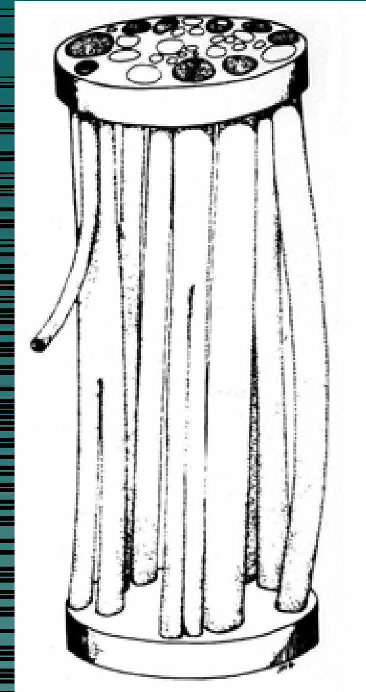
Partial nerve lesion if fascicles are **plexiform**

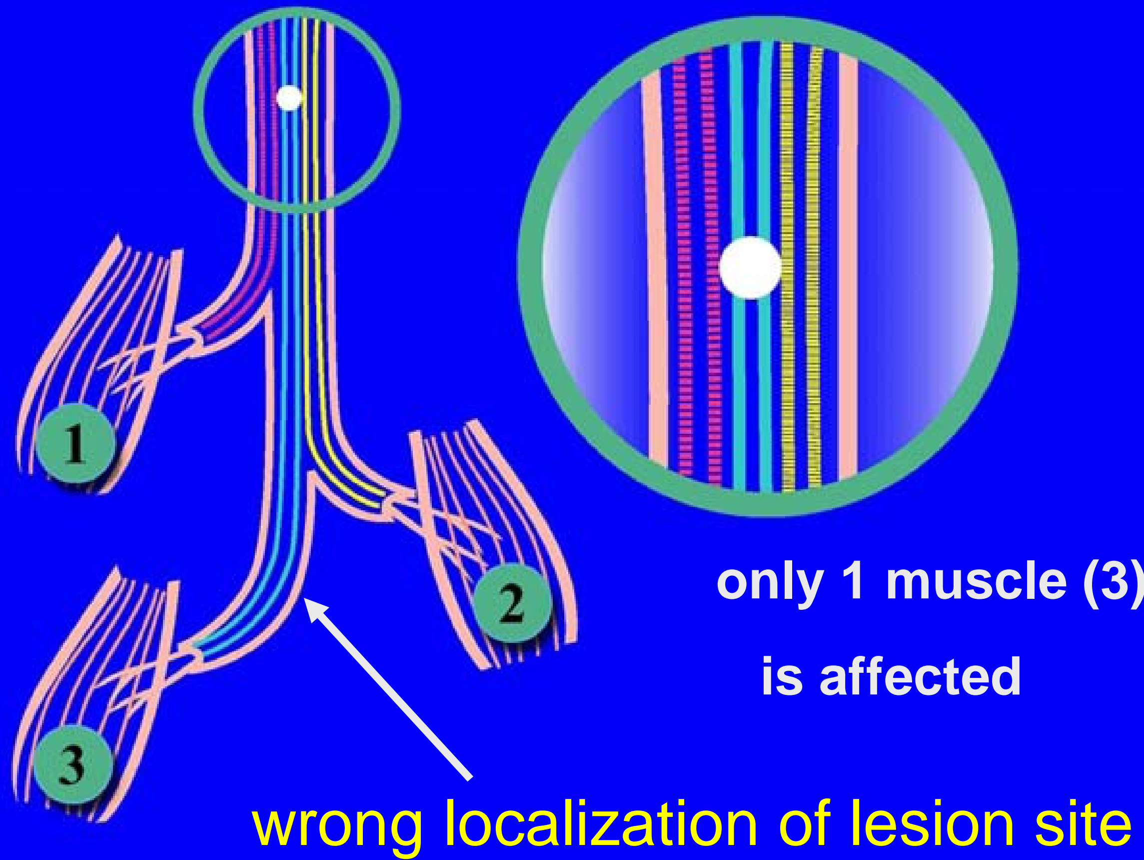


all 3 muscles equally affected



Partial nerve lesion if fascicles are **cable**



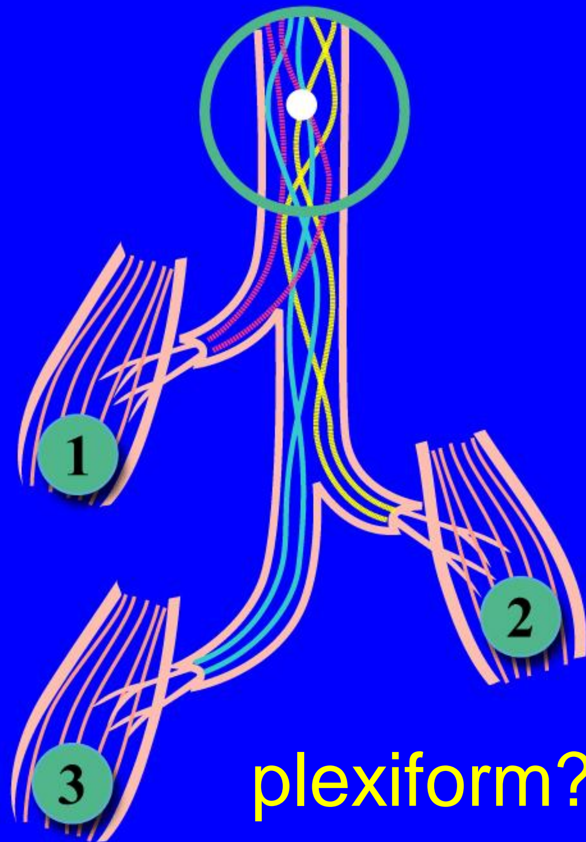


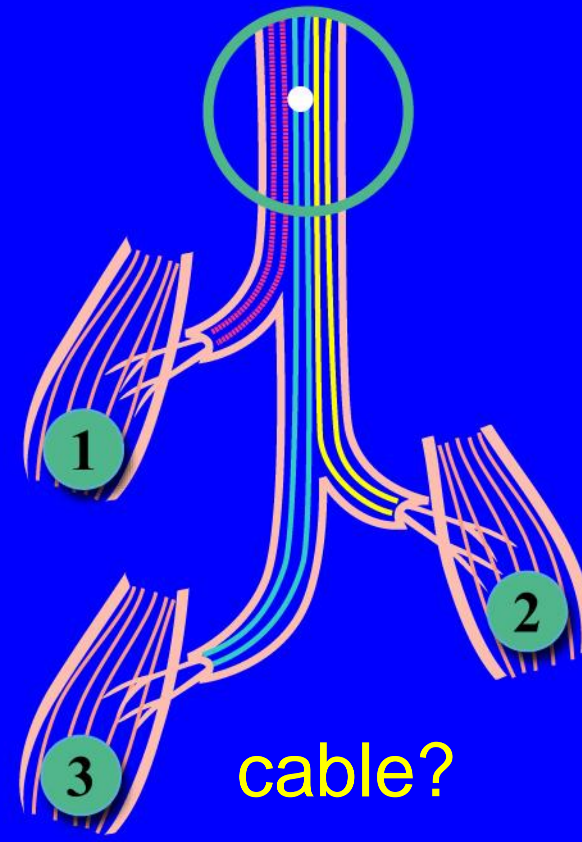
only 1 muscle (3)

is affected

wrong localization of lesion site

So which is it?





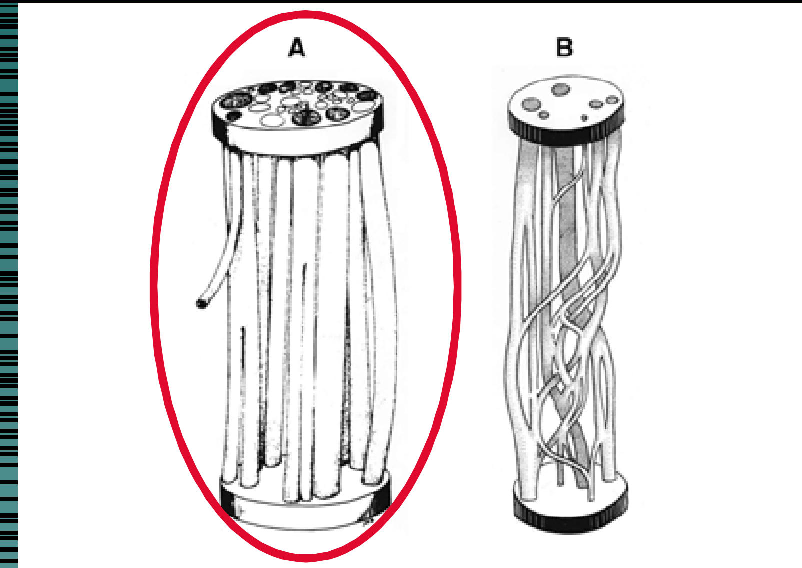
Many studies show cable structure

Animals:

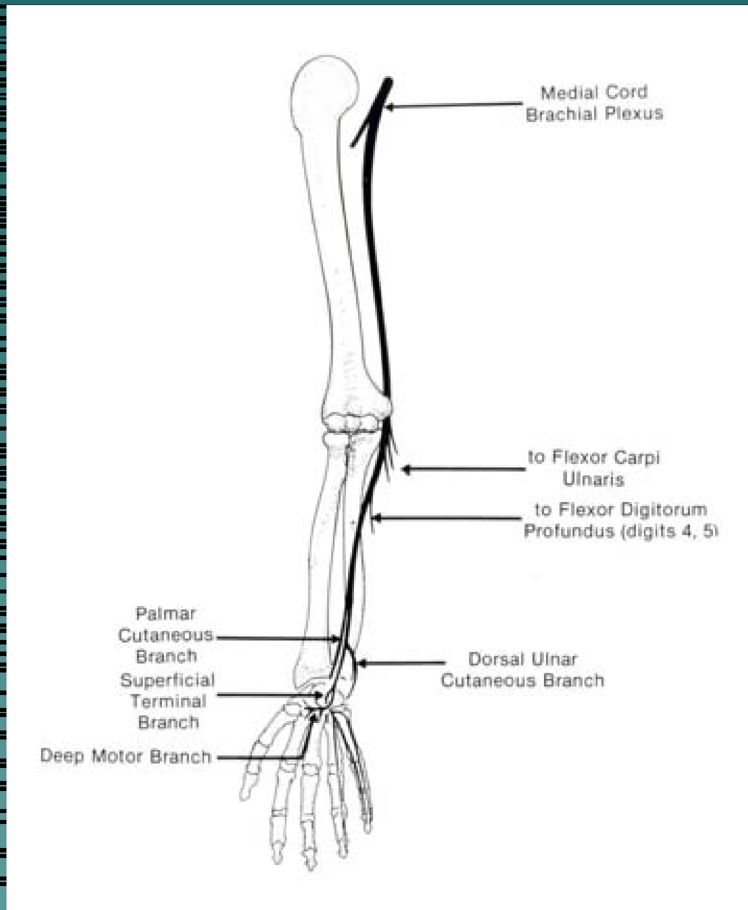
- Tracer injections into fascicles
- Stimulation experiments
- Degeneration experiments

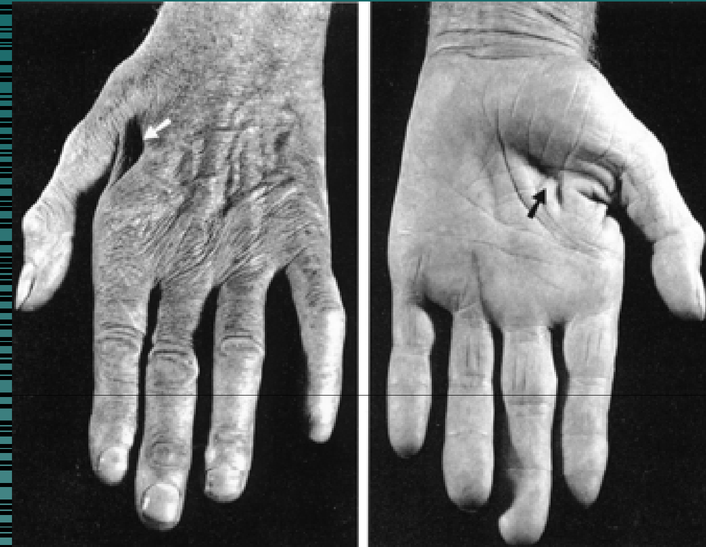
Humans:

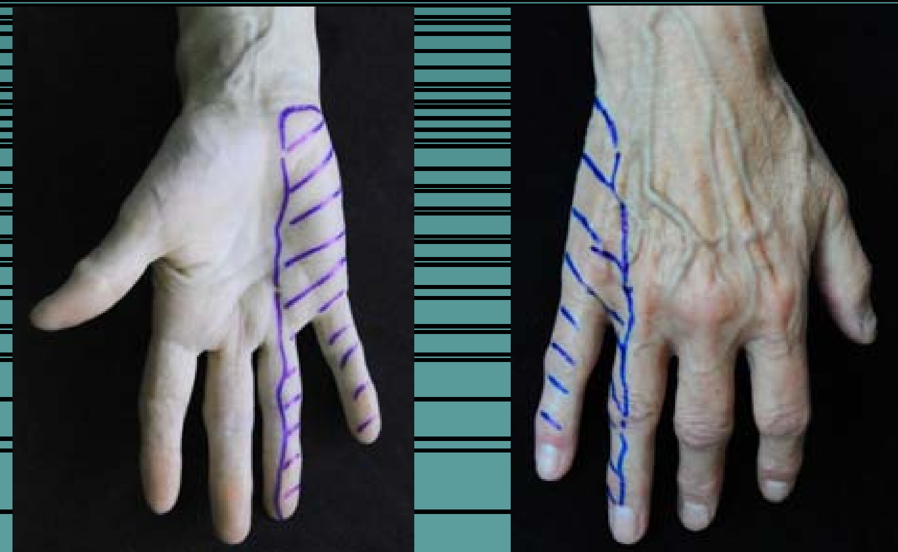
- Careful clinical & electrodiagnostic studies in focal neuropathies
- Microneurography
- MRI showing fascicular lesions



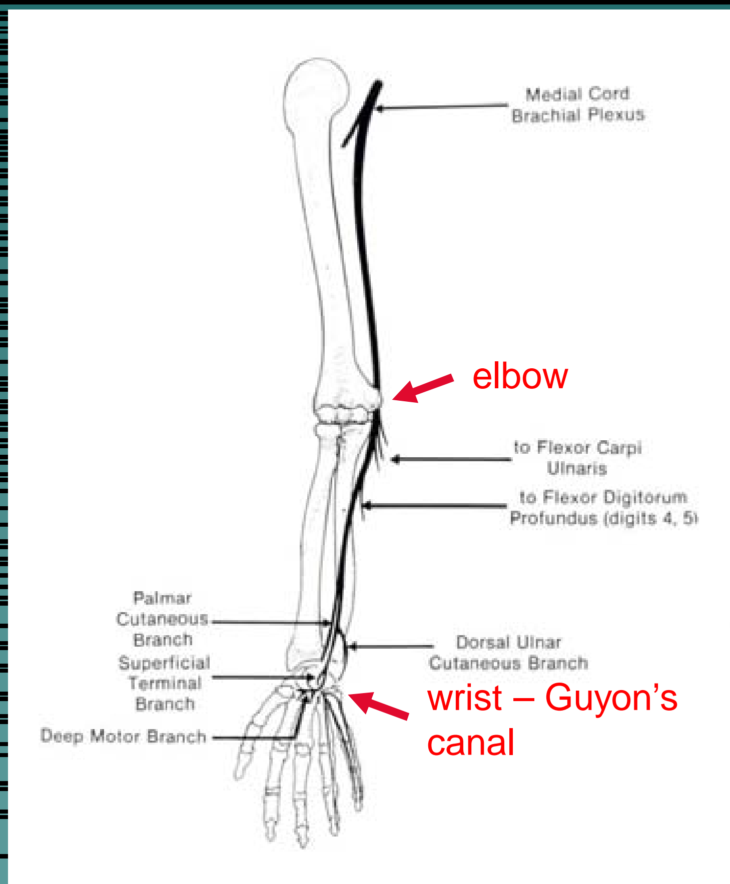
1 clinical example: ulnar neuropathy at elbow





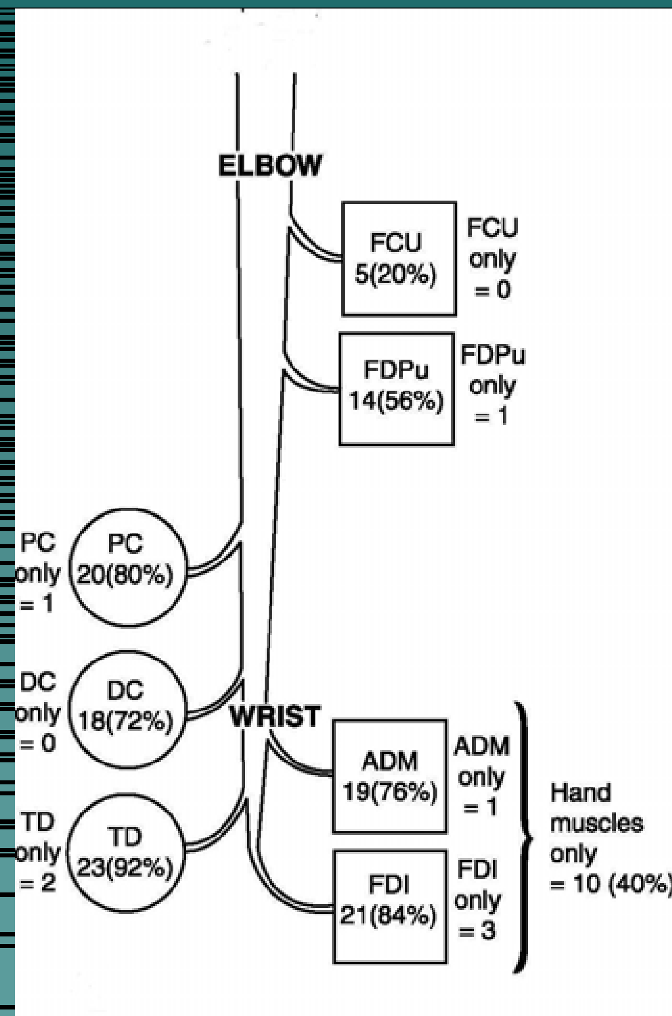


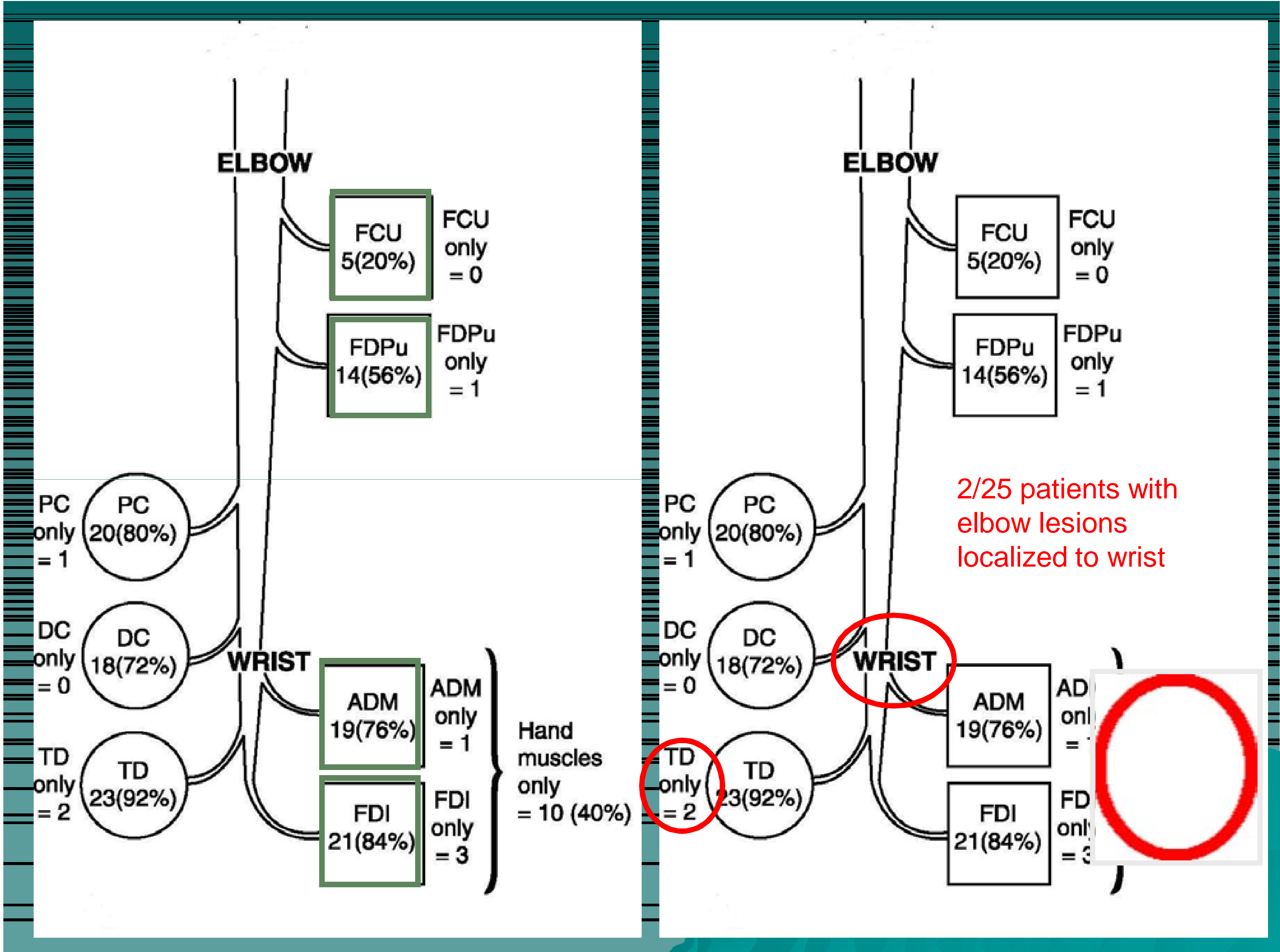
Ulnar neuropathy at elbow:
Clinical & electrodiagnostic abnormalities



25 patients with UNE's:

clinical exam




ELBOW
FCU 5(20%)
FCU only = 0
FDPu 14(56%)
FDPu only = 1
PC only = 1
PC 20(80%)
DC only = 0
DC 18(72%)
TD only = 2
TD 23(92%)
WRIST
ADM 19(76%)
ADM only = 1
FDI 21(84%)
FDI only = 3
Hand muscles only = 10 (40%)
ELBOW
FCU 5(20%)
FCU only = 0
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WRIST
ADM 19(76%)
FDI 21(84%)
2/25 patients with elbow lesions localized to wrist

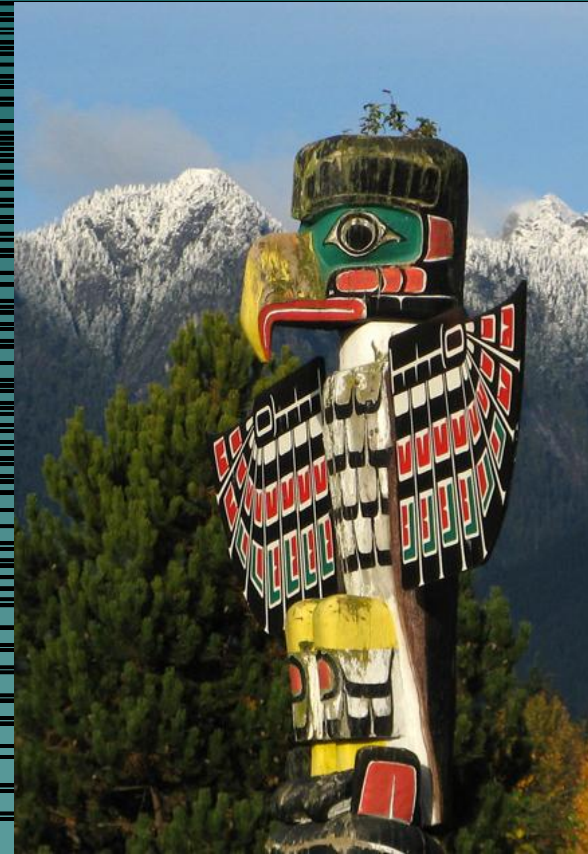
Clinical “*fascicular syndromes*”

Ulnar	Sciatic
Median	Peroneal/fibular
Radial	Tibial

Reference:

Stewart JD. Muscle Nerve 2003

Summary



Canadian totem poles

Summary

- Know the anatomy!

  But beware of anatomic variations

  And beware fascicular syndromes

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- Think proximal to distal re. site of lesion

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Summary

- Know the anatomy!
- Think proximal to distal re. site of lesion
- Non-neuropathic (musculoskeletal) pain often a poor localizing symptom
- Neuropathic pain and/or sensory symptoms and signs much more useful in localization
- Motor deficits also very useful in localization
- Selective fascicular involvement is common and will lead to mis-localization when not aware of **fascicular syndromes**

References

Key references are available on WCN website

email me for complete list john.stewart@telus.net

Key references

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