NEUROLOGICAL PROBLEMS OF THE SHOULDER : CLINICAL NEUROPHYSIOLOGY

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Clinical Neurophysiology

- Overview of Techniques of Assessment
- Clinical Objectives of Nerve Conduction Studies /EMG tests
- Approach to Neurophysiological assessment of shoulder disorders
- Interpretation of Report /Results

Clinical Neurophysiology

- A diagnostic specialty
- Electro-diagnosis – diagnosis of peripheral nervous system disorders
- Techniques –
    A. Nerve Conduction Studies
    B. EMG - Electromyography

Clinical Neurophysiology

- NERVE CONDUCTION STUDIES – study of electrically evoked responses from peripheral nerves
  - Sensory Nerve Conduction
  - Motor Nerve Conduction

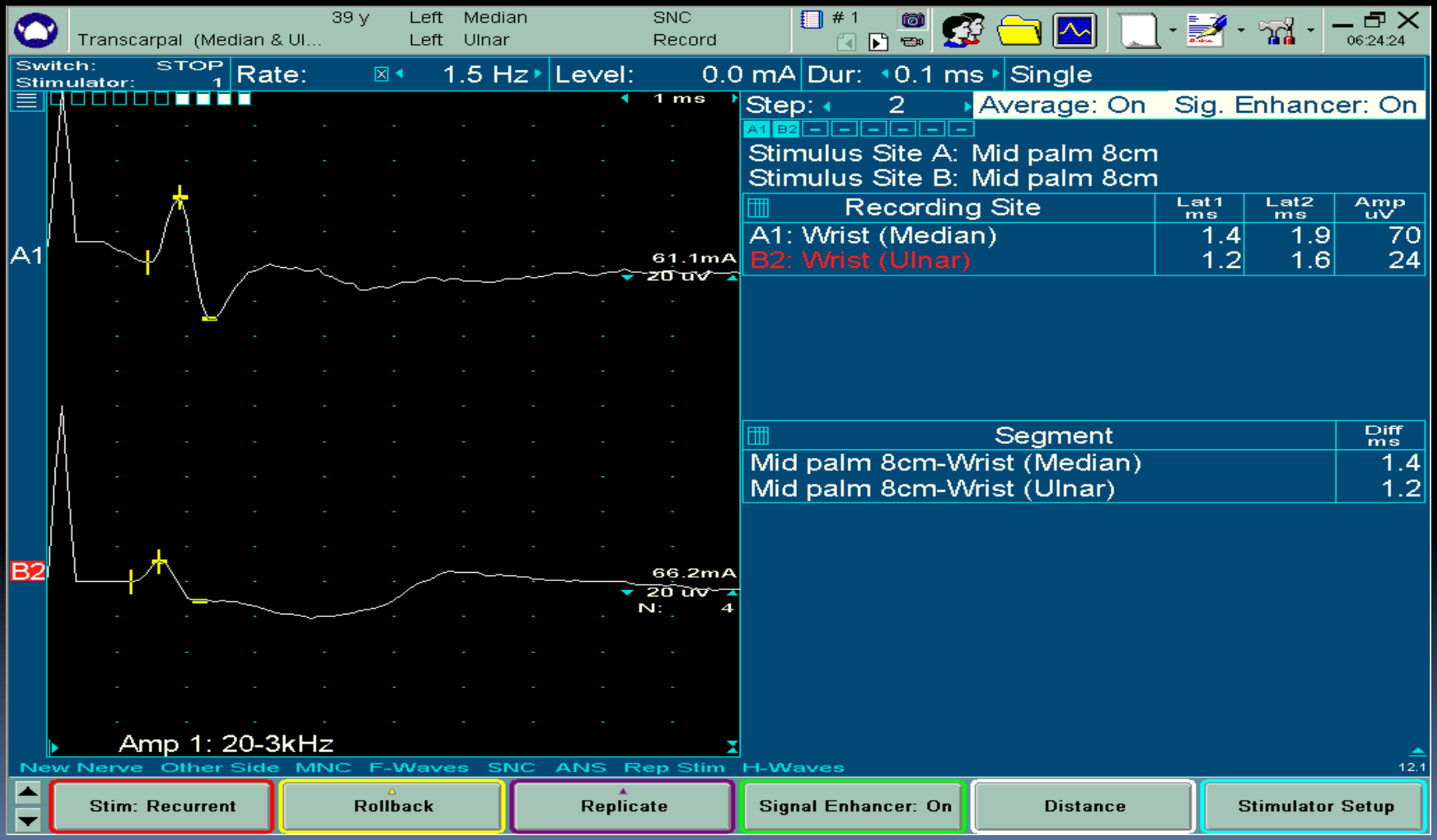
* ELECTROMYOGRAPHY

NERVE CONDUCTION STUDIES

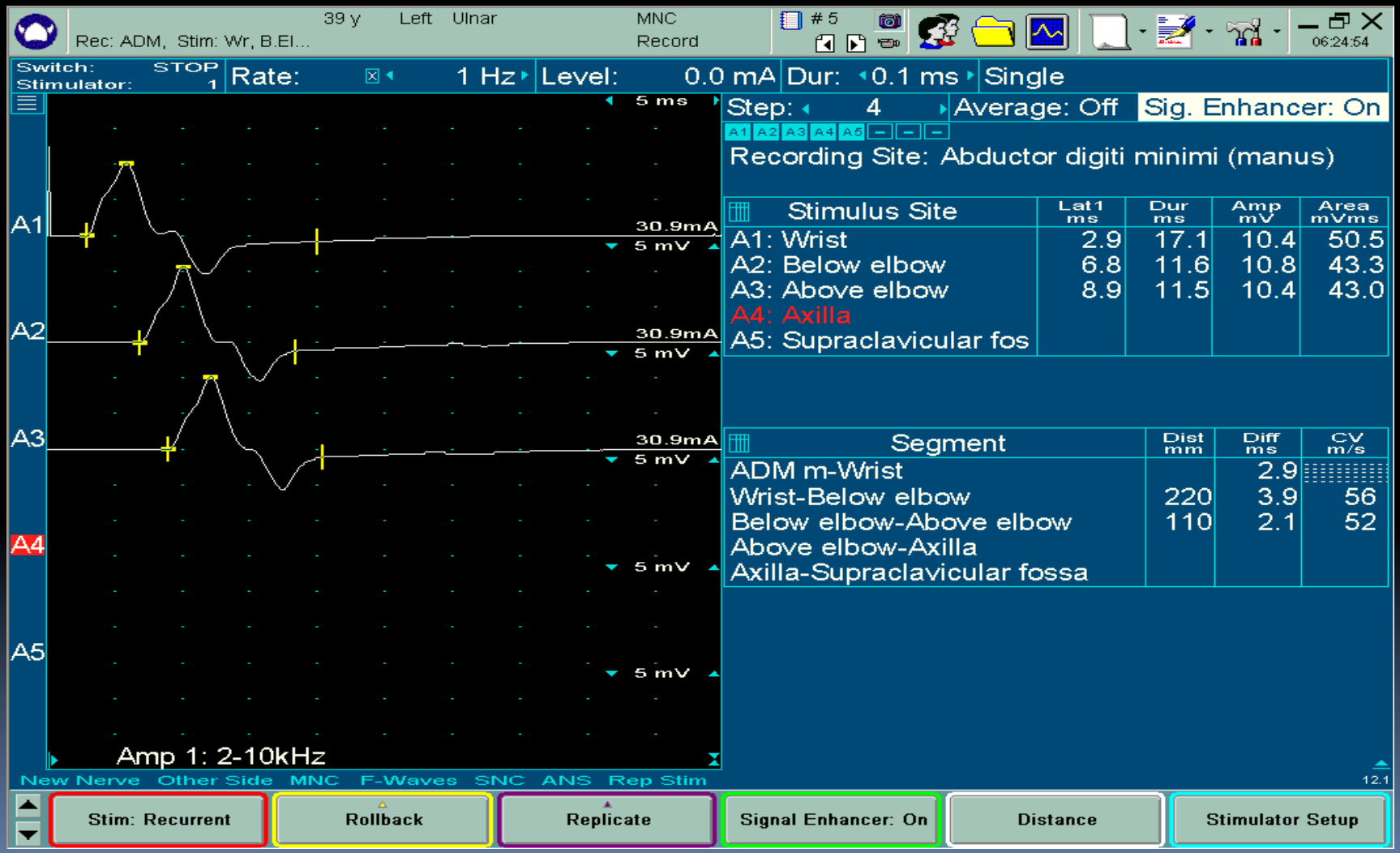
- Nerves Accessible for Stimulation – e.g. Median and Ulnar nerves in upper limbs
- Technical criteria – limb temperature, oedema
- Physiological factors – age
- Underlying general medical conditions –

  e.g. . Diabetes

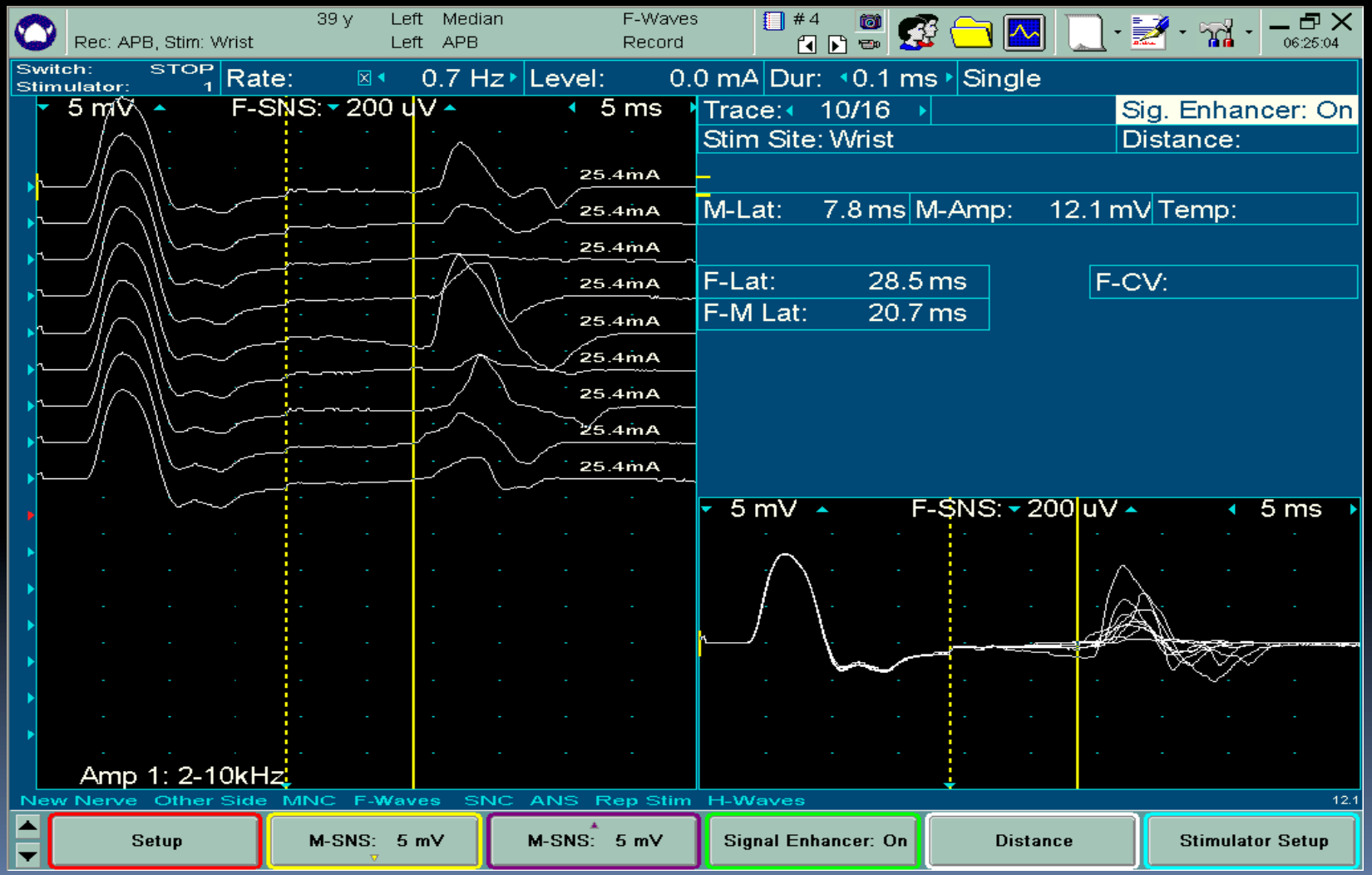
Sensory Nerve Conduction



Motor Nerve Conduction



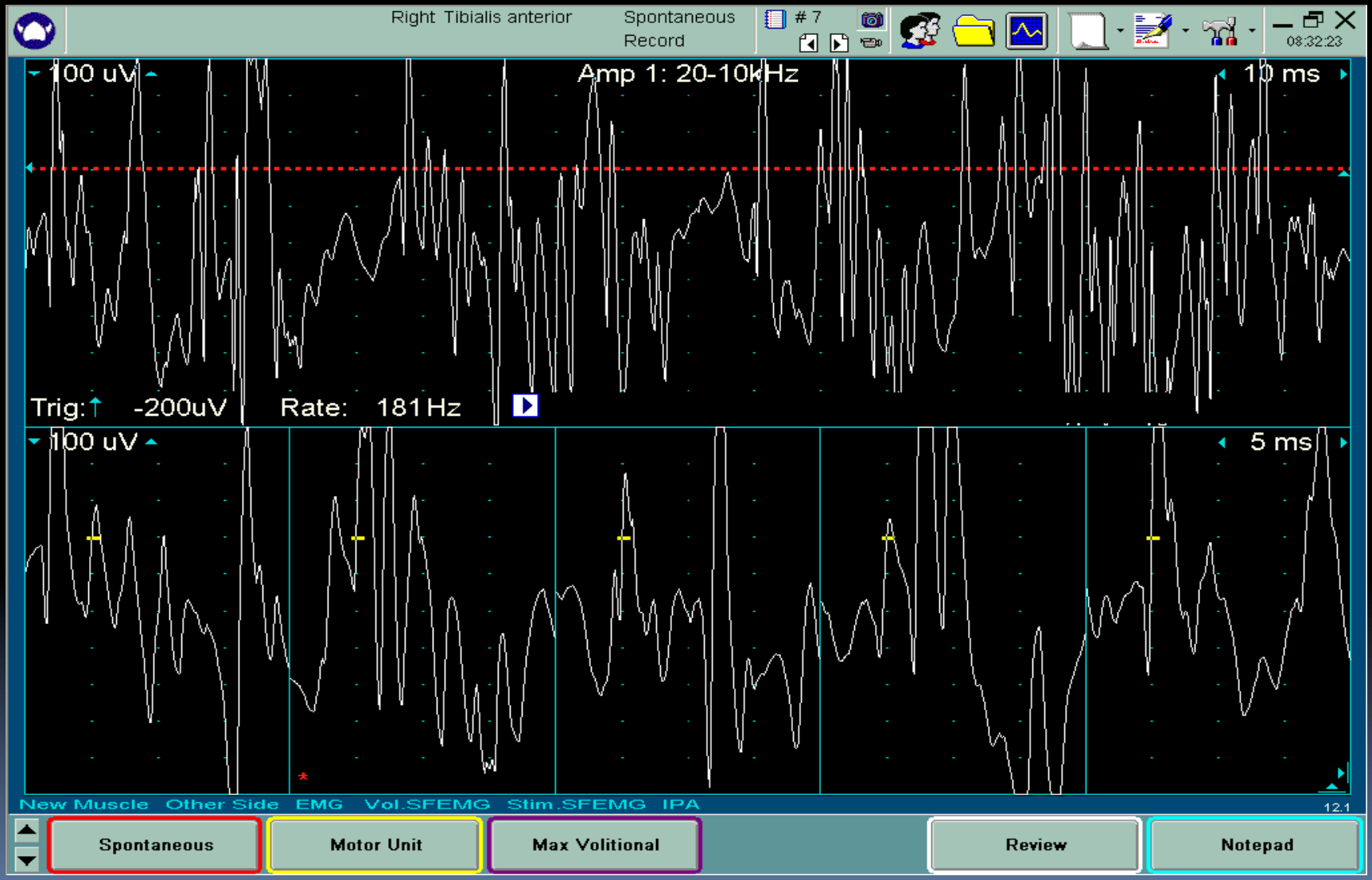
F Wave studies



EMG - Electromyography

- Study of the normal electrical activity within a muscle using a needle electrode.
- Normal muscle – silent at rest. Voluntary effort - Normal pattern of motor unit activation
- EMG abnormalities – Neurogenic V Myopathic
- Neurogenic EMG changes – delayed – 2-3 weeks following injury.
- Acute vs. Chronic denervation

EMG


Right Tibialis anterior
Spontaneous
Record
7
08:32:23
100 uV
Amp 1: 20-10kHz
10 ms
Trig: -200uV
Rate: 181 Hz
100 uV
5 ms
New Muscle
Other Side
EMG
Vol.SFEMG
Stim.SFEMG
IPA
12.1
Spontaneous
Motor Unit
Max Volitional
Review
Notepad

Nerve Conduction Studies and EMG – Clinical Objectives

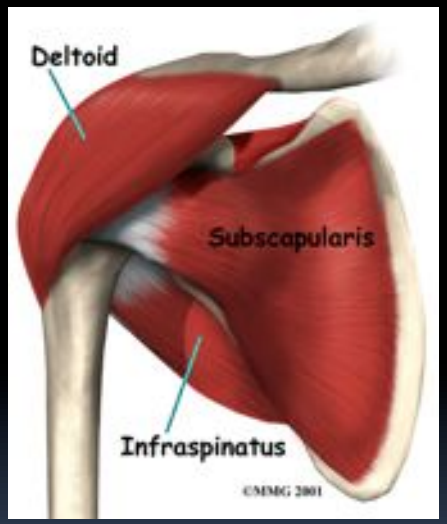
- Localisation
- Characterisation
- Quantification
- Prognosis

Neurodiagnostic assessment

- An extension of clinical assessment
- Clinical hypothesis important – detailed clinical history and examination findings
- Neurophysiological abnormalities interpreted in the context of clinical picture

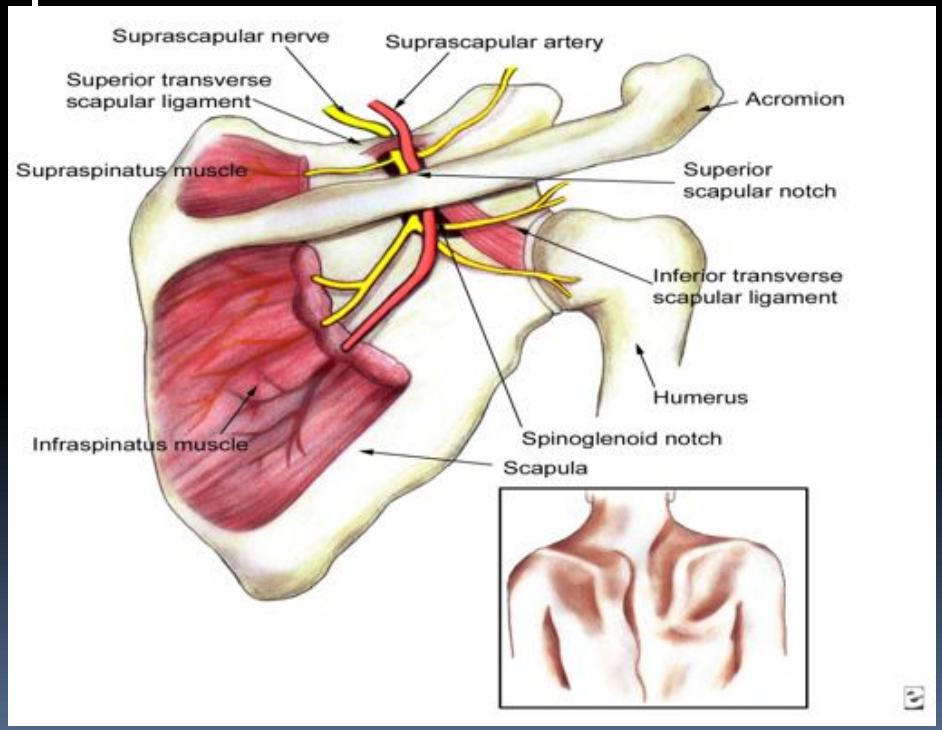
Neurological Problems of the Shoulder - Diagnosis

- Nerve Injuries –
  Axillary Nerve – Weakness and Wasting of Deltoid



Shoulder – Nerve Injuries

* Suprascapular Nerve – Supraspinatus / Infraspinatus affected

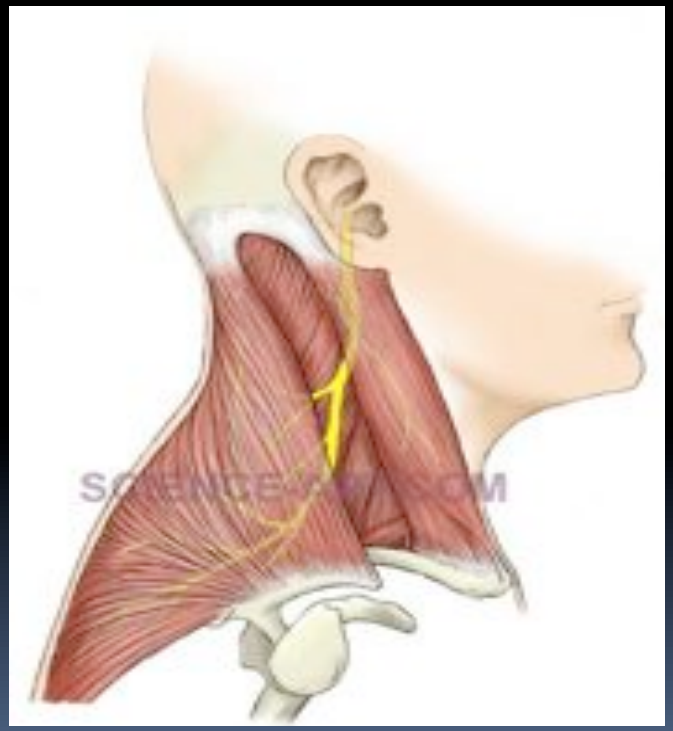


Shoulder – Nerve Injuries

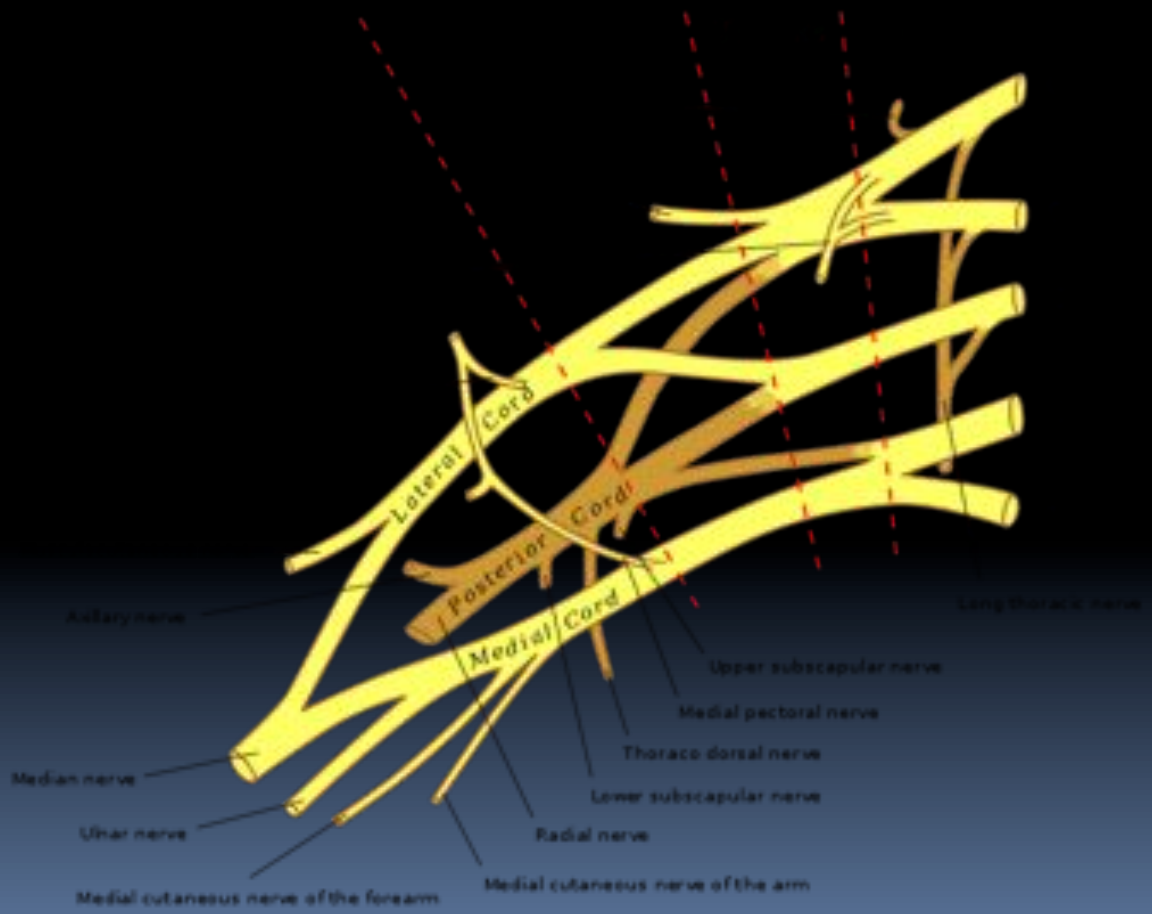
* Long thoracic Nerve – Serratus anterior

Shoulder – Nerve Injuries

* Accessory Nerve – Trapezius



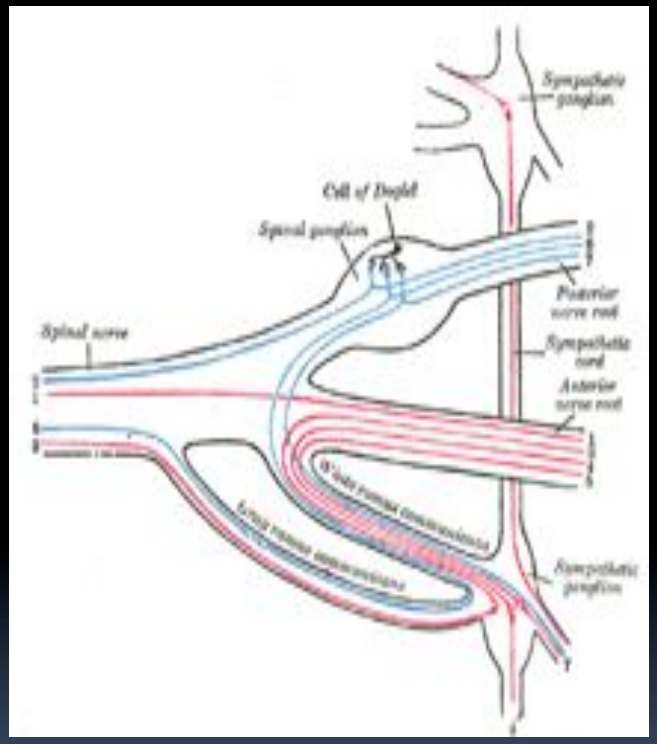
Shoulder Injuries – Brachial Plexus

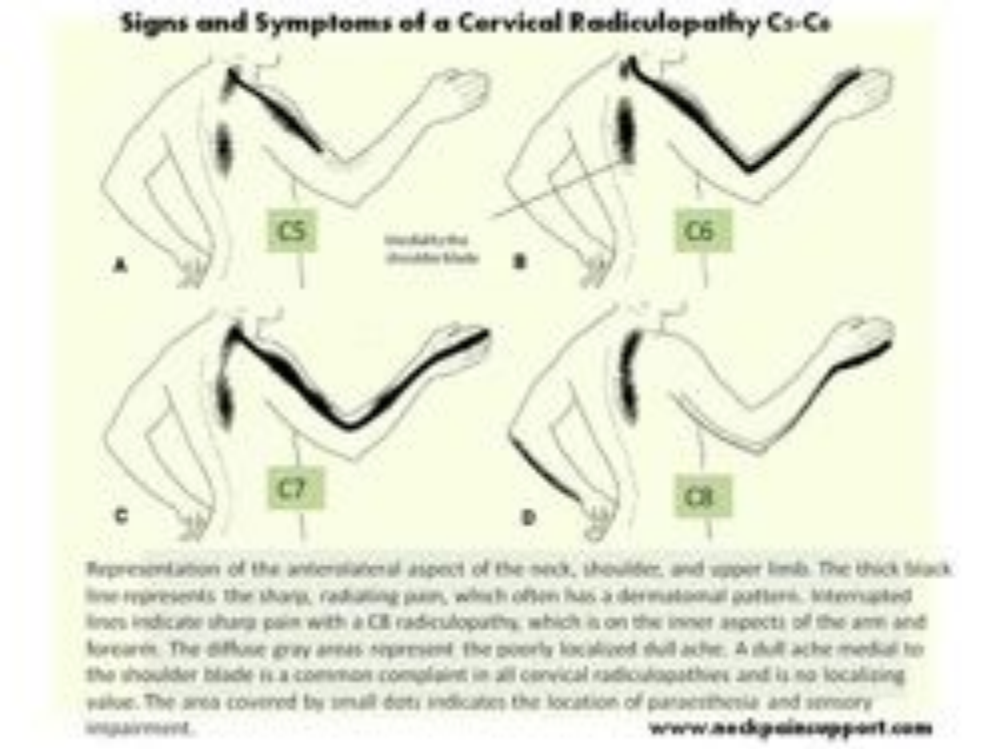


Neuralgic Amyotrophy

- Disorder of unknown aetiology
- Severe shoulder /scapular pain
- Later – weakness and wasting
- Patterns of involvement– variable
- Diagnosis – clinical features + Neurophysiology

Cervical Radiculopathy – C5/6 root lesions





The Nerve Conduction Studies / EMG Report

- Localisation – a. Is the problem neurogenic?

  b. If so, what level e.g. Pre-ganglionic v Post-ganglionic
- Characterisation /Quantification of abnormalities
- Prognosis – e.g. Evidence of neural continuity

  Reinnervation patterns

Discussion with Neurophysiologist

Thank you