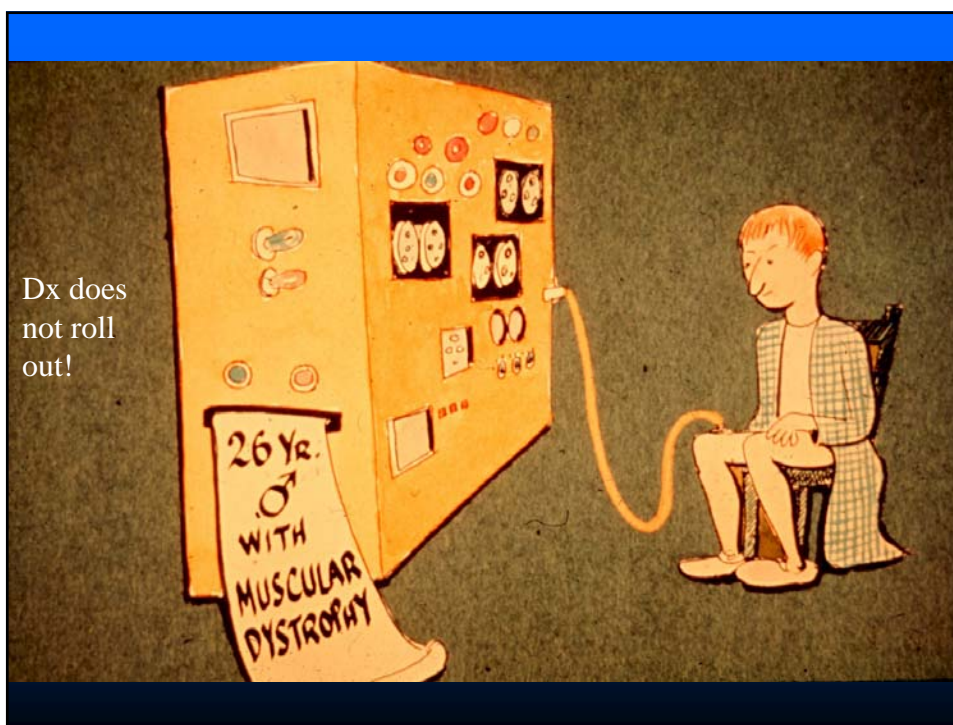


REPORTING THE EDX

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Purpose of report

- Info to referring physician
- Record of MD/patient contact (\$\$\$)
 - Check the codes (especially NCV)
- Data – for later interpretation, research
- For the central patient record

Reporting EDX

- Summarize the neurophysiologic data
- ***Translate to a probable clinical diagnosis***
- Suggest further procedures
 - Imaging
 - Repeat electrodiagnostic exam
 - “tincture of time”
 - It’s OK to say “I don’t know”

TERMINOLOGY

BE PRECISE AND CORRECT AND
AVOID JARGON

Eg. Giant MUP, denervation etc.

Terminology

- Use specific values
 - Amplitudes – uV; MV
 - Durations – milliseconds
 - # of phases
 - Stability
- Never use “disease” descriptives
 - *Neuropathic*
 - *Myopathic*
 - *Myotonic*

LIMB vs extremity

- Latest edition of Stedman Medical Dictionary –
 - Extremity is “end of an elongated structure”
 - ***“INCORRECTLY USED to mean limb”***
 - Upper limb – arm, forearm, hand
 - Lower limb – thigh, leg, foot

•“Interference” pattern

- A poor term – originally to describe a full (normal) contraction on the oscilloscope screen
- Best to use – **“recruitment”**
 - **Full**
 - **Incomplete – fire rapidly**
 - **Poor effort, not rapid firing**

Describe MUP's

- Characterize by amplitude, duration, phases and stability
- **NEVER** use diagnostic terms to describe MUP's
- Eg.
 - Myopathic, neuropathic, etc.

“Denervation” potential

- **Never** use this term (implies a pathologic state)
 - It is incorrect to conclude that a fibrillation is a muscle fiber that is **denervated!**
 - Many other states in which a spontaneous discharge of a single muscle fiber potential can occur
 - » Muscular dystrophy (hyperirritable membrane)
 - » Polymyositis
 - » Myotonia
 - » End plate spikes

“the numbers”

- Meters/second – nearest single digit 64 – not 63.8
- Latencies – one decimal place eg 3.5(3.459 absurd)
- Amplitudes – SNAP nearest 10 uV; CMAP nearest 1 mV
- Measurement – best is within 4-5 mm
 - Ergo - .5/30 cm is 1 part in 60 accuracy (52 M/S is best) not 52.4 M/S

What should we send to referring physician?

- A lot of numbers with “normals” included?
 - I say NO! (*Pt is his/her own control*)
 - Eg. Reference data could be within normal range BUT pt’s values are **abnormal**
 - » Median nerve latency 4.1 ms CMAP 5 mV but proximal CV is 60 M/S; ulnar CMAP is 10 mV!
 - » Median SNAP at wrist stimulation is 25 uV BUT midpalm stim (7 cm) is 65 uV (nl = >20 uV)
 - » (range: Med N lat (3.7+/- .3)<4.3ms; CMAP 5-20 MV)

Step I “muscle at rest”

- Report fasciculation potentials, they are identified by irregular and slow firing rate
 - Classified by shape
 - » I Simple II Complex – polyphasic or grouped
- Report - Single muscle fiber AP's
 - fibrillation potentials; positive waves – Report - *intensity* and *distribution*
 - Watch screen for 1 minute at least!!! For fasciculations!

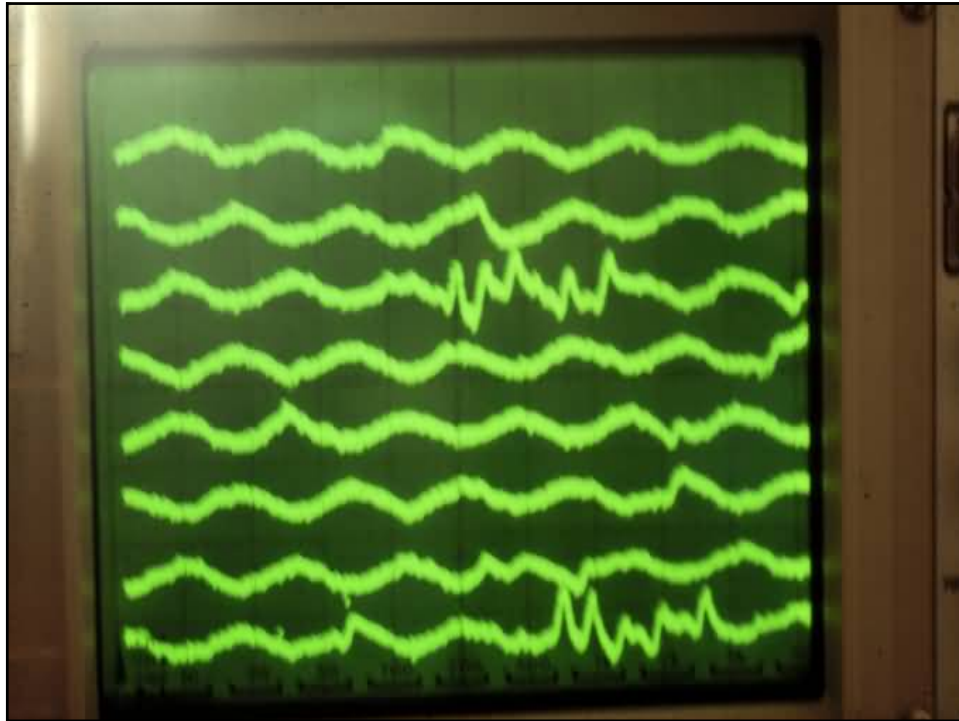
Grouped discharges

I Fasciculations –

Myokymic discharges are *spontaneous* activations of groups of MU's

II Grouped discharges under *voluntary* control can also occur when myelin is defective

- *Both of above occur when myelin is not an effective insulation from neighboring axons which activate neighboring axons – ‘ephapsis’*



Step II - moving the needle

- What happens *after needle stops moving*
 - Here is where you report “positive waves and also if you stimulate them – fibrillation potentials ‘grade 2 intensity’
 - Report *decreased* “insertional activity” when edema, fibrosis etc. is present
 - ***NB. Do NOT report ‘INCREASED’ unless the diagnosis is Pompe disease, myotonia or acute polymyositis***

Injury Potentials

- These occur when needle electrode disrupts the muscle cell membranes
- This is usually referred to as “insertional activity”
 - Improper to say “increased”
 - » Insertional activity duration can vary from 50 ms to >350 ms depending on needle movement
 - » ***NB. note what happens AFTER needle movement stops***

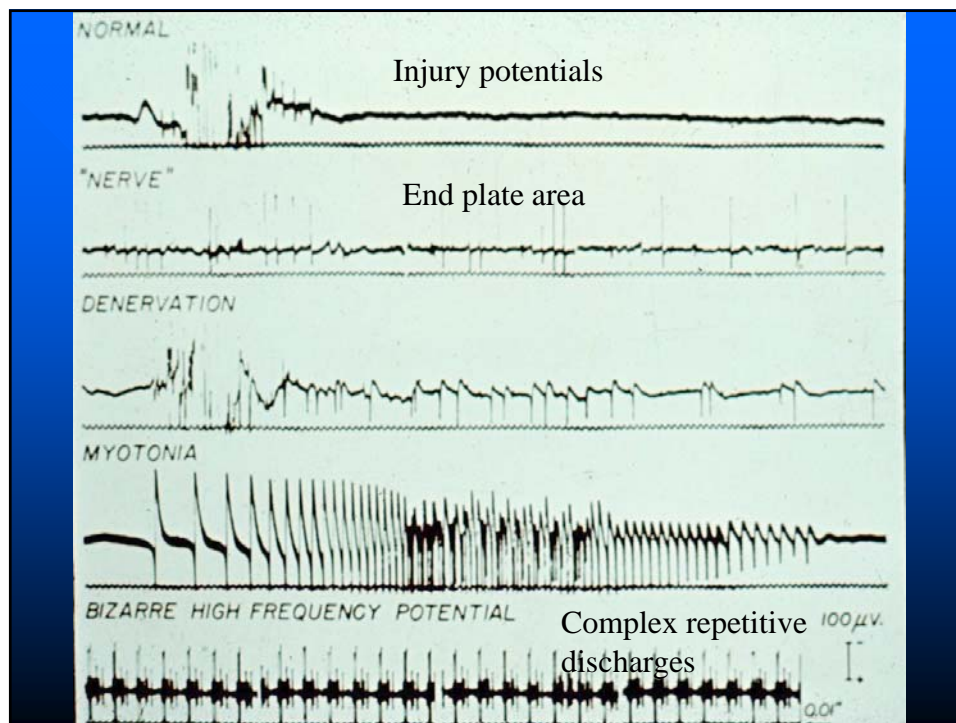
Membrane instability or positive waves and fibrillation potentials

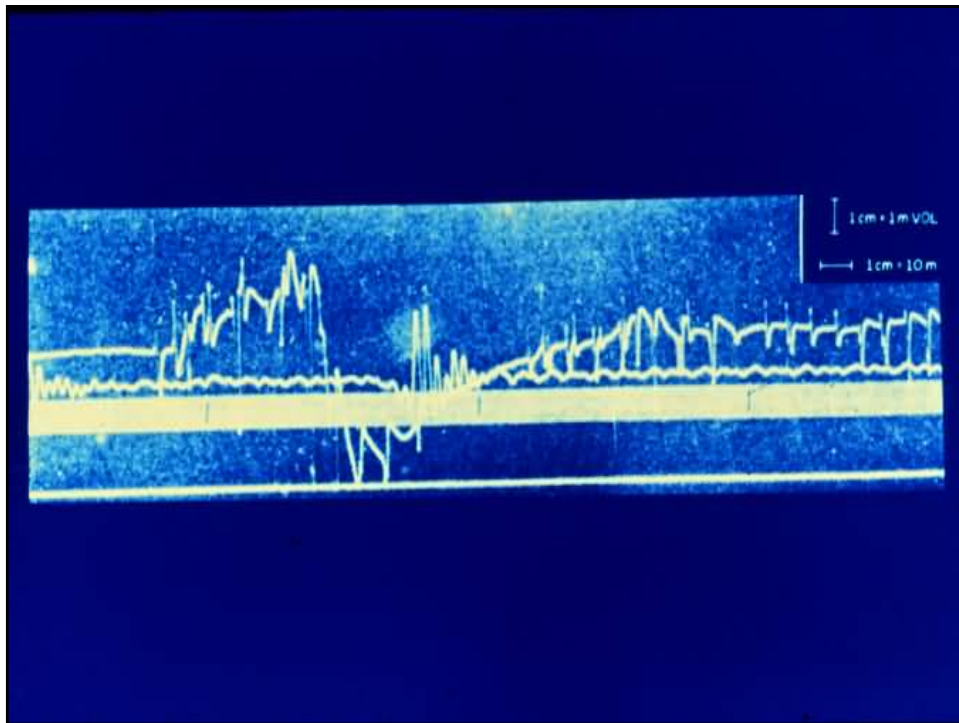
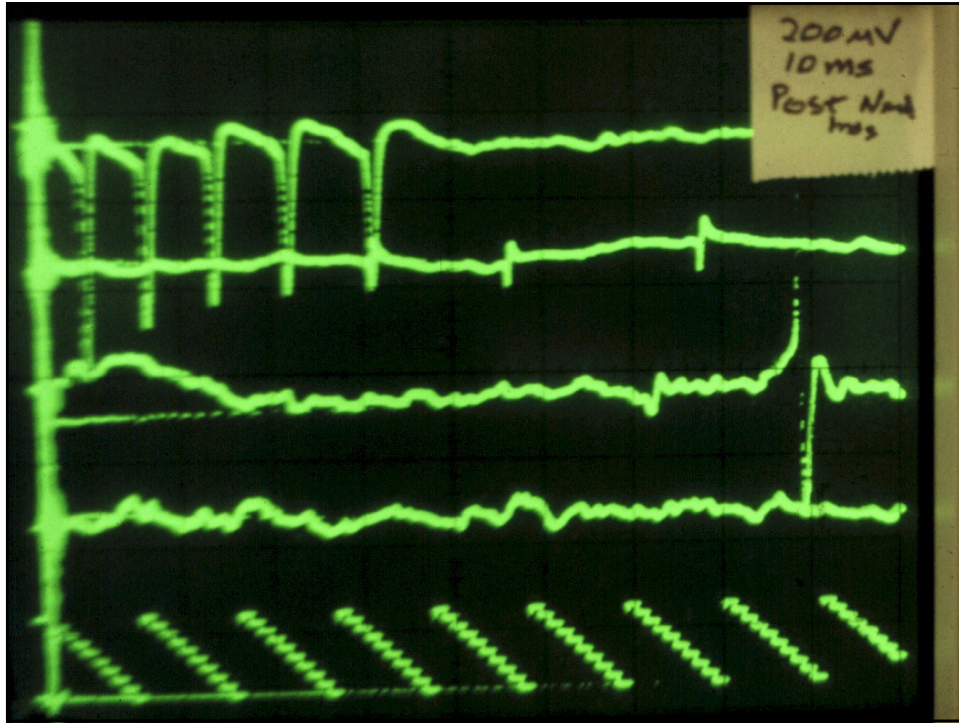
(not in endplate area)

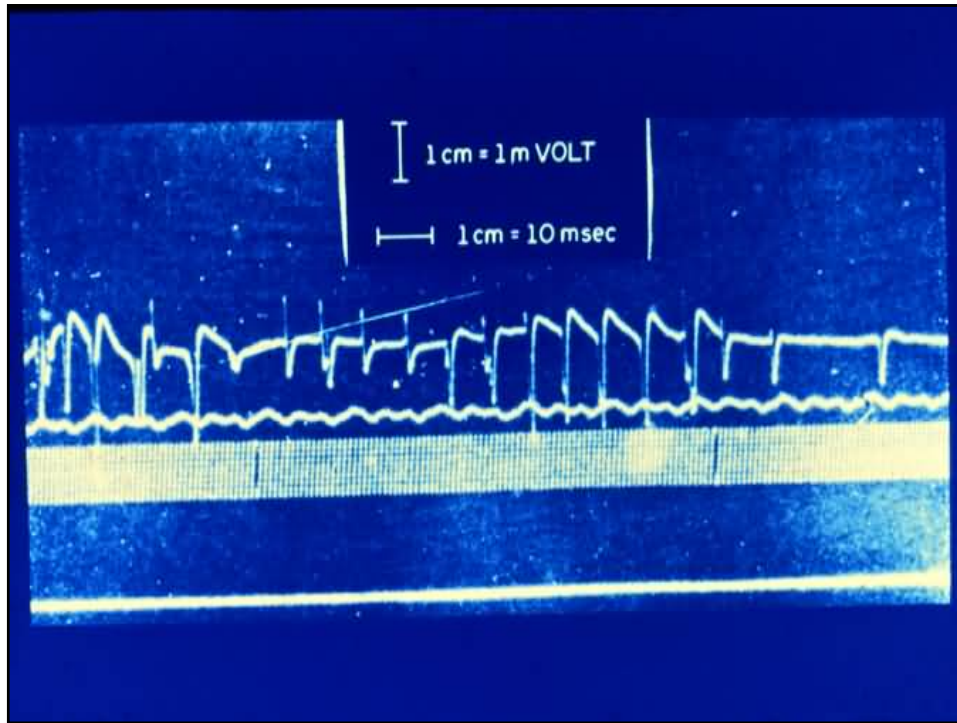
- Stable – move needle: electrical activity occurs; stops when needle stops
- Slightly unstable – ***disrupt - a few positive waves appear as the minimal instability of the muscle cell membrane persists as cell membrane depolarizes two or three times after the disruption***
- Moderate unstable – ***few fibs; more pw's***
- ***Severe instability*** – many fibs; 4+ pw
 - ***NB. PW > FIBS !!***

INJURY POTENTIALS

- Insertional activity (injury potentials) in EMG
- Johnson, EW Braddom, R & Watson, R 1971
- Kugelberg, J & Petersen, I:
•J Neurol, Neurosurg, Psychiat. 1949. 12:268







Step III – minimal contraction

- Examine amplitude, duration, recruitment, number of phases, *stability*
- Recruitment frequency
 - NB. Suspect myopathy if you cannot get a single MU on the screen at 10 ms/cm

Step IV – maximal contraction

- Use a *single* joint muscle
- Audio cue will be best for duration; envelope for amplitude
- Note the rate of firing – cannot say “reduced” unless firing rapidly
- A grade of 4 will have 40 – 50% of MU’s gone; grade of 3 will have only 10% of MU’s functioning

Step V – distribution of abnormality

- Keep anatomy chart or book nearby
- Head is counted as 1 limb – generalized – must have abnormalities in 3 or more limbs
- Be patient BUT do not over-interpret

terminology

- Never say – “denervation potential”
 - Fibrillation potentials are ***not only present*** in denervated states, BUT ALSO IN eg.
 - » Active polymyositis
 - » 1st 3 weeks of CVA
 - » Myasthenia gravis
 - » SCI – in lower limbs during spinal shock
 - » Etc.

WORDS TO AVOID

- *‘Denervation’ potential*
- *Giant MUP*
- *Myopathic –neuropathic MUP*
- *Bizarre high frequency potentials*
- ***Increased insertional activity (use only with acute polymyositis, myotonia etc)***

Never use this

- Clinical correlation is suggested
- Clinical correlation is suggested
- Clinical correlation is suggested
 - *Code for “I don’t know”*
 - *NB EDX is an edx CONSULTATION*

EDX EXAMINATION & Reporting

- EDX is a *medical consultation*
- *Treat it as such!!!!*

Common errors

- Using “increased insertional activity” and then 0 positive waves = abnormality
- Incomplete EDX eg. dx: radiculopathy w/o exploring posterior primary rami distribution
- Incompatible ‘numbers’ – amplitudes & CV
- Over-interpretation of minor abnormalities
- Mis-interpretation of EDX data

EDX vs IMAGING

- These are COMPLEMENTARY not substitutive diagnostic tests
 - EDX is *neurophysiologic & functional*
 - IMAGING is *STRUCTURAL!*

Bottom line

Summarize the neurophysiologic abnormalities

Translate into a clinical diagnosis!

“median neuropathy at wrist” (is this a clinical diagnosis?)

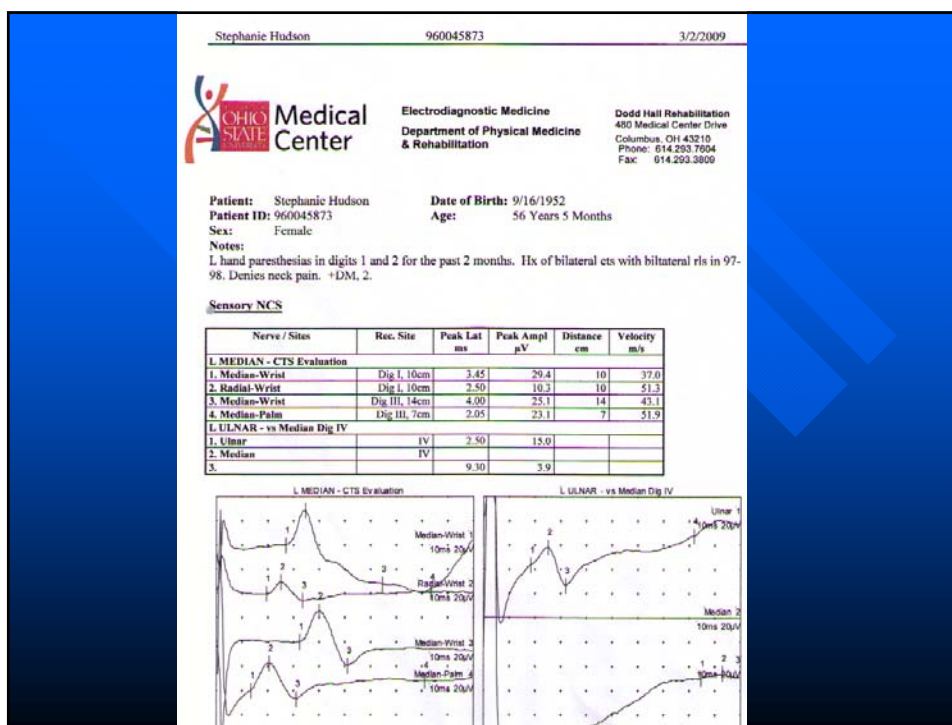
Know your referring physician

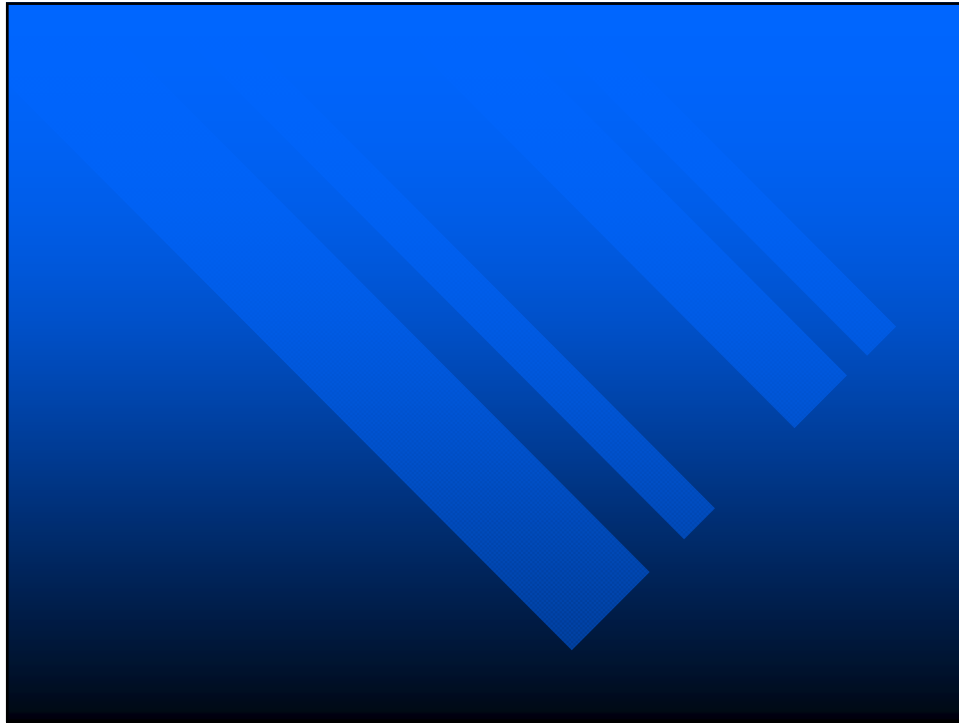
PCP – call and tell what you think

Surgeon – if question –call and /or discuss the specifics

In SE OHIO (or Iowa)

- Asking for an EMG is –
 - What can I do for the patient?
 - What is it?
 - Any other suggestions?





YOUR REPORTS

Summarized in the last page of the
handout!

Clinical Correlation is Suggested:

This is code for
"I don't know"

THE END

Be critical !!