

Electrodiagnosis Affects Diagnosis and Treatment Plans

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Introduction

- The electrodiagnostic (EDX) medical consultation is an assessment of a patient by a physician to establish an accurate diagnosis of a presenting clinical problem that suggests a neuromuscular disorder.
- The EDX physician establishes the diagnosis after performing a focused review of the symptoms and physical exam, and electrophysiologic evaluation of selected functions of the CNS, nerve roots, peripheral nerves, neuromuscular junctions and muscles.
- When an accurate diagnosis has been made, the referring physician is able to develop the best treatment plan possible.
- Although EDX studies can help in the diagnosis and management of patients, referring physicians are sometimes hesitant to refer their patients for a study.
- The physicians often do not believe that the EDX consultation will result in a different diagnosis and therefore would not alter their management of the patient.
- There is also a belief among both physicians and patients that the EDX study is inordinately painful.
- Physicians therefore do not refer patients for EDX studies because they do not believe that the patient should undergo such a painful procedure when it will not effect how they will manage the patient.

Cost-effective Medicine

- Because in today's age of cost-effective medicine it is important to not only prove the sensitivity and reliability of a procedure, but to also prove that the information gained is clinically useful, the author and his colleagues conducted two studies.

Study One (1)

- Evaluation whether an EDX helped confirm the Dx suspected or even more importantly brought to light a Dx that had not been considered by the referring physician.
- In addition, whether the expected level of pain and anxiety correlated with the actual discomfort experienced by the patient.
- To determine whether an EDX consultation helped confirm the referring physician's suspected Dx or resulted in a new Dx that had not been considered by the referring physician, 126 patients were studied in the laboratory at Brigham and Women's Hospital at Harvard Medical School, Boston, Mass.
- Seventy-six (76/126) of the patients had abnormal studies. After the EDX consult was completed, an EDX Dx was determined utilizing the criteria in the *AAEM Guidelines in Electrodiagnostic Medicine*. This Dx was compared to the Dx of the referring physician.
- Of the 76 patients with abnormal studies, 30 (39%) had a final EDX diagnosis that was different from the referring physician's Dx. (Table 1).
- The author also looked at the specialty of the referring physicians in the study. Of the 126 patients, 82 were referred by neurologists, 16 by orthopedists, and 28 by internists and other specialists.
- **The study found that Dx's rendered by neurologists were not in agreement with the EDX Dx any more often than those Dx's made by other specialists.**

**Table 1. Summary of Abnormal EDX Studies:
Comparison of Referral and Electrophysiological Diagnosis**

Referring Dx	N	EDX	C	DC
Carpal Tunnel Syndrome	13	CTS	9	
		Cerv Rad.		4
Polyneuropathy	12	PolyNeur.	10	
		L/S Neur.		2
Ulnar Neuropathy	11	Ulnar Neur.	5	
		Cerv Rad.		2
		Brach Plex		2
		CTS		2
Cervical Radiculopathy	9	Cerv Rad	6	
		Ulnar Neur		2
		M Neur Dx		1
Myopathy	8	Myopathy	3	
		Polyneuro.		3
		M Neur Dx		2
Lumbosacral Radiculopathy	8	L/S Rad	6	
		Polyneuro		2
Motor Neuron Dx	5	M Neur Dx	3	
		Brach Plex		1
		Polyneuro		1
Brachial Plexopathy	4	Brach Plex	3	
		Cerv Rad		1
Myasthenia Gravis	3	Myopathy		2
		My Gravis	1	
Peroneal Neuropathy	2	L/S Neuro		2
Radial Neuropathy	<u>1</u>	Cerv Rad		<u>1</u>
Total	76	Total	46	30

Abbreviations: C = concordant; DC = discordant, N = number of patients

Study Two (2)

- This also addressed the issue of whether the EDX diagnosis was different than the referring Dx but additionally looked at how frequently the EDX consult affected patient management.
- The second study also addressed whether the referring Dx was different than the EDX Dx. In addition, it examined whether the referring physician altered the clinical management of the patient based on the results of the

EDX consultation.

- This study included 140 consecutive patients. As in the first study, for each patient both the referring and the final EDX Dx were recorded. The clinical follow-up involved either direct contact with the referring physician or a chart review to determine what, if any, action was taken in the management of the patient as a result of the normal or abnormal EDX study. Complete follow-up was obtained on 100 patients.

Table 2. Responses Obtained From Pain Perception Survey					
	N	Men (%)		Women (%)	
Pretest Anxiety Levels					
Low	59	22	(63)	37	(57)
Medium	27	09	(26)	18	(28)
High	14	04	(11)	10	(15)
Sleep Night Before					
Yes	81				
No	19				
Test as bad as expected					
Yes	18				
No	82				
Would have test again					
Yes	93				
No	07				
*2 patients did not respond. N = Total number of patients.					

- Patients were categorized into the following groups based on the EDX results:
 1. Abnormal EDX with a change in therapy or further workup.
 2. Abnormal EDX with no change in therapy or further workup.
 3. Normal EDX with a change in therapy or further workup.
 4. Normal EDX with no change in therapy or further workup.
- Abnormal study results were obtained in 78 patients, of which 29 (37%) had an EDX Dx that was different from the referring Dx. Results from the clinical followup are shown in Table 3.
- Therapeutic changes ranged from conservative to surgical. For example,

some patients with CTS were treated with wrist splints, while others underwent surgical decompression. Patients who underwent additional workup sometimes were referred for further therapeutic interventions.

- An example of this was a patient referred for CTS who was found to have a C5-6 radiculopathy and then went on to have a MRI scan of the C-spine with subsequent surgery.
- There was one patient who was referred for CTS and the EDX was normal; the patient still underwent surgical decompression of the median nerve.

Table 3. Relationship Between EDX and Clinical Management

EDX	Number of Pt's	Change in therapy or further workup	No change in therapy or further workup
Abnormal	78	43	35
Normal	22	03	19

Conclusion

- Based on the findings of these two studies, it is clear that the EDX evaluation was often beneficial to proper patient care.
- In the two studies respectively, 39% and 37% had an entirely different EDX Dx than the referring Dx.
- The finding of an alternative Dx has significant implications for patient care.
- In addition to the Dx, the EDX study can also determine the severity of the problem.
- An EDX study is not an inexpensive test, with the cost ranging from \$180 to \$1000 depending on the extent of the study (number of limbs and nerves studied). For comparison, an MRI scan of either the cervical or lumbar spine cost approximately \$1000. Initial subspecialty consult fees are approximately \$60 to \$200 per consult.
- If the EDX consult reveals a different clinical Dx and alters patient management and avoids additional nondiagnostic studies, consults, and unsuccessful therapeutic interventions, it could be a very cost-effective tool in the early Dx and management of suspected neuromuscular disorders.

- This is crucial in the current health care environment where greater emphasis has been placed on primary care medicine and cost-effective health care.
- The primary care physicians should use EDX studies to better direct the evaluation and management of their patients in a more cost-effective manner.

References:

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- Blakeslee MA, Simmons Z, Logigian EL, Kothari MJ: Does an EDX study change clinical manag.?, abstract. *Muscle Nerve* 1996; 19(9):1225.

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