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NOTICE OF INDEPENDENT REVIEW DECISION

DATE OF REVIEW:
Aug/06/2010

IRO CASE #:

DESCRIPTION OF THE SERVICE OR SERVICES IN DISPUTE:
EMG/NCV Bilateral Upper Extremity

DESCRIPTION OF THE QUALIFICATIONS FOR EACH PHYSICIAN OR OTHER HEALTH CARE PROVIDER WHO REVIEWED THE DECISION:
MD, Board Certified in Physical Medicine and Rehabilitation
Board Certified in Electrodiagnostic Medicine

REVIEW OUTCOME:
Upon independent review, the reviewer finds that the previous adverse determination/adverse determinations should be:
[X] Upheld (Agree)
[ ] Overturned (Disagree)
[ ] Partially Overturned (Agree in part/Disagree in part)

INFORMATION PROVIDED TO THE IRO FOR REVIEW
ODG-TWC Elbow; Neck and Upper Back
, 6/15/10, 7/9/10
Activity Notes 2/25/10, 7/19/10
Injury Clinic 3/11/10, 6/10/10, 6/15/10
D.O. 3/11/10 to 4/8/10
DTI 6/3/10
D.O. 5/17/10

PATIENT CLINICAL HISTORY SUMMARY
This is a man who described left upper extremity symptoms after lifting multiple mattresses on xx/xx/xx. The replicated reports describe an xray of some shoulder arthritis. There was reported tingling below the elbow, but not entering the hand. He reportedly had weak grasp. The examinations described loss of joint motion. Tendinitis (6/16/10) was mentioned. There was no report of any local neurological findings, such as tenderness, sensory exam, reflexes, etc. The possibility of neuropathic entrapment was mentioned, but not identified.

ANALYSIS AND EXPLANATION OF THE DECISION INCLUDING CLINICAL BASIS, FINDINGS AND CONCLUSIONS USED TO SUPPORT THE DECISION
There was no description of what nerve involvement was considered. This includes named nerve patterns or root involvement. The symptoms are limited to the forearm. It is unclear if the medial or lateral antebrachial nerves are compressed. The therapists identified trigger points and tendonitis. The ODG addresses electrodiagnostic studies of cervical radiculopathy, TOS, CTS, and nerve involvement after forearm fractures. None of these appear applicable. There is no clinical information to justify a variance from the ODG. The reviewer finds no medical necessity for EMG/NCV Bilateral Upper Extremity.

Electrodiagnostic testing for TOS (thoracic outlet syndrome)

Recommended as indicated below. Electrodiagnostic testing is reliable for the diagnosis of TOS. It helps localize and quantify a lesion in the brachial plexus. It is also important to rule out other segmental or systemic neuropathies. Thoracic outlet syndrome (TOS) refers to compression of the neurovascular structures at the superior aperture of the thorax. It represents a constellation of symptoms. The cause, diagnosis, and treatment are controversial. In most cases, the physical examination findings are completely normal. Other times, the examination is difficult because the patient may guard the extremity and exhibit giveaway-type weakness. (Tolson, 2004) See also Surgery for thoracic outlet syndrome

Criteria for Electrodiagnostic Testing for Neurogenic Thoracic Outlet Syndrome

All 3 of the following criteria must be found in the affected limbs

1. Amplitude of median motor response is reduced, And
2. Amplitude of ulnar sensory response is reduced, And
3. Needle exam shows denervation in muscles innervated by lower trunk of brachial plexus

Details Regarding the Above Noted Criteria

Criterion #1: Using standard surface electrodes with active pick up over the abductor pollicis brevis, the amplitude of the median motor response on the affected side should be less than 50% of that obtained on the unaffected side

Criterion #2: Using standard ring electrodes on the fifth digit, the ulnar sensory amplitude on the affected side should be less than 60% of the amplitude on the unaffected side

Criterion #3: a) Muscles innervated by the lower trunk of the brachial plexus include the abductor pollicis brevis, pronator quadratus, flexor pollicis longus, first dorsal interosseous, abductor digiti minimi, flexor carpi ulnaris, extensor pollicis brevis, and extensor indicis; b) EMG abnormalities in TOS are most commonly seen in median and ulnar innervated intrinsic muscles of the hand -- especially the abductor pollicis brevis; c) Positive waves and fibrillations may be found, but chronic denervation changes are more common -- that is, increased motor unit amplitude, increased motor unit duration, and decreased recruitment with rapid firing of motor units are activated

Notes: The electromyographer should rule out neuropathic conditions that might mimic TOS, specifically cervical radiculopathy, carpal tunnel syndrome, ulnar neuropathy and polyneuropathy. (Washington, 2002)

Electrodiagnostic studies (EDS)

Recommended as an option after closed fractures of distal radius & ulna if necessary to assess nerve injury. (Bienek, 2006) Electrodiagnostic testing includes testing for nerve conduction velocities (NCV), and possibly the addition of electromyography (EMG). For more information, see the Carpal Tunnel Syndrome chapter

Electromyography (EMG)

See Electrodiagnostic studies (EDS).

Electrodiagnostic studies (EDS)

Recommended in patients with clinical signs of CTS who may be candidates for surgery. Electrodiagnostic testing includes testing for nerve conduction velocities (NCV), but the addition of electromyography (EMG) is not generally necessary. See also Nerve conduction studies (NCS) and Electromyography (EMG). In general, carpal tunnel syndrome should be proved by positive findings on clinical examination and should be supported by nerve conduction tests before surgery is undertaken. Mild CTS with normal electrodiagnostic studies (EDS) exists, but moderate or severe CTS with normal EDS is very rare. Positive

EDS in asymptomatic individuals is not CTS. Studies have not shown portable nerve conduction devices to be effective. Appropriate electrodiagnostic studies (EDS) include nerve conduction studies (NCS). In more difficult cases, electromyography (EMG) may be helpful. NCS and EMG may confirm the diagnosis of carpal tunnel syndrome but may be normal in early or mild cases of CTS. If the EDS are negative, tests may be repeated later in the course of treatment. (Various references listed under “Detection of Neurologic Abnormalities”) (Smith, 2002) (Jablecki2, 2002) (AHRQ, 2003) (Podnar, 2005) (Lew, 2005) (Schrijver, 2005) (Sheu, 2006) Poor overlap between various screening procedures warns against the use of electrodiagnostic findings alone without also considering the symptom presentation. (Homan, 1999) A large cohort study showed that over one third of patients undergoing CTR may have had an inappropriate electrodiagnostic workup before the surgery. (Storm, 2005) Despite the fact that electrodiagnostic testing is considered by many to be the “gold standard” for the diagnosis of CTS, some studies have suggested that it not be a requirement. According to one systematic review, “in cases of clear-cut clinical CTS, electrodiagnosis is not warranted either as a diagnostic test, where clinical symptoms are well defined, or as a predictive indicator of surgical outcome, but it may still be useful in cases where the clinical diagnosis is not clear.” (Jordan, 2002) Regarding preplacement nerve testing for CTS, not hiring workers with abnormal post-offer preplacement median nerve tests to reduce costs of work-related CTS is not a cost-effective strategy for employers. (Franzblau, 2004) NC-stat technology cannot be recommended for screening or diagnosis of CTS in an industrial population. (Katz, 2006) For more information see NC-stat nerve conduction studies. There is concordance between the results of EDS and the initial diagnostic hypothesis only 40% of the time, confirming the usefulness of EDS. (Cocito, 2006) In using demographic and clinical data to identify the clinical pattern that predicts the diagnosis of CTS, the best pattern associated with the diagnosis was the presence of paresthesias or pain in at least 2 of the first 4 digits in association with one of the following: female gender, symptoms worsening at night or on awakening, a BMI >/=30, thenar atrophy, or other sign (Tinel's, Phalen's, or Reversed Phalen's signs). However, the clinical picture alone in the workers’ compensation case, without neurophysiologic studies, may not be sufficient to correctly predict the diagnosis of CTS. (Gomes, 2006) This study used the CTS-6 assessment tool along with a comprehensive history and physical examination in diagnosing CTS, and conluded that in unambiguous cases of CTS, electrodiagnostic testing would not be warranted if its sole purpose is to confirm the diagnosis of CTS. As such, its value in this situation is not only to confirm a physician's suspicion of CTS, but also to quantify and stratify the severity of the condition. (Graham, 2008) See also Multiple extremity testing. Note: ODG recommends that NCS should be done to support the diagnosis of CTS prior to surgery in workers’ compensation cases. If an individual has appropriate responses to treatment (i.e. injections, modification of activities, meds) but still has symptoms with normal NCS, surgery may be appropriate on a case-by-case basis and reasonable documentation by the treating physician

Protocols for electrodiagnostic studies: The American Association of Electrodiagnostic Medicine, American Academy of Neurology, and the American Academy of Physical Medicine and Rehabilitation have jointly published their practice parameter for electrodiagnostic studies in carpal tunnel syndrome. In patients with suspected CTS, the following EDX studies are recommended:

(1) Perform a median sensory NCS across the wrist with a conduction distance of 13 to 14 cm. If the result is abnormal, compare the result of the median sensory NCS to the result of a sensory NCS of one other adjacent sensory nerve in the symptomatic limb

(2) If the initial median sensory NCS across the wrist has a conduction distance greater than 8 cm and the result is normal, one of the following additional studies is recommended

(a) Comparison of median sensory or mixed nerve conduction across the wrist over a short (7 to 8 cm) conduction distance with ulnar sensory nerve conduction across the wrist over the same short (7 to 8 cm) conduction distance, or

(b) Comparison of median sensory conduction across the wrist with radial or ulnar sensory conduction across the wrist in the same limb, or

(c) Comparison of median sensory or mixed nerve conduction through the carpal tunnel to sensory or mixed NCSs of proximal (forearm) or distal (digit) segments of the median nerve in the same limb. (Jablecki, 2002) (Chang, 2006)

Minimum Standards for electrodiagnostic studies: The American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM) recommends the following minimum standards

(1) EDX testing should be medically indicated.

(2) Testing should be performed using EDX equipment that provides assessment of all parameters of the recorded signals. Studies performed with devices designed only for "screening purposes" rather than diagnosis are not acceptable.

(3) The number of tests performed should be the minimum needed to establish an accurate diagnosis.

(4) NCSs (Nerve conduction studies) should be either (a) performed directly by a physician or (b) performed by a trained individual under the direct supervision of a physician. Direct supervision means that the physician is in close physical proximity to the EDX laboratory while testing is underway, is immediately available to provide the trained individual with assistance and direction, and is responsible for selecting the appropriate NCSs to be performed.

(5) EMGs (Electromyography - needle not surface) must be performed by a physician specially trained in electrodiagnostic medicine, as these tests are simultaneously performed and interpreted.

(6) It is appropriate for only 1 attending physician to perform or supervise all of the components of the electrodiagnostic testing (e.g., history taking, physical evaluation, supervision and/or performance of the electrodiagnostic test, and interpretation) for a given patient and for all the testing to occur on the same date of service. The reporting of NCS and EMG study results should be integrated into a unifying diagnostic impression.

(7) In contrast, dissociation of NCS and EMG results into separate reports is inappropriate unless specifically explained by the physician. Performance and/or interpretation of NCSs separately from that of the needle EMG component of the test should clearly be the exception (e.g. when testing an acute nerve injury) rather than an established practice pattern for a given practitioner. (AANEM, 2009

Electromyography (EMG)

Recommended only in cases where diagnosis is difficult with nerve conduction studies (NCS). In more difficult cases, needle electromyography (EMG) may be helpful as part of electrodiagnostic studies which include nerve conduction studies (NCS). There are situations in which both electromyography and nerve conduction studies need to be accomplished, such as when defining whether neuropathy is of demyelinating or axonal type. Seldom is it required that both studies be accomplished in straightforward condition of median and ulnar neuropathies or peroneal nerve compression neuropathies. Electromyographic examinations should be done by physicians. (Utah, 2006) Surface EMG is not recommended. See Electrodiagnostic studies.

Neck

Electrodiagnostic studies (EDS)

See Nerve conduction studies (NCS) and Electromyography (EMG)

Electromyography (EMG)

Recommended (needle, not surface) as an option in selected cases. The American Association of Electrodiagnostic Medicine conducted a review on electrodiagnosis in relation to cervical radiculopathy and concluded that the test was moderately sensitive (50%-71%) and highly specific (65%-85%). (AAEM, 1999) EMG findings may not be predictive of surgical outcome in cervical surgery, and patients may still benefit from surgery even in the absence of EMG findings of nerve root impingement. This is in stark contrast to the lumbar spine where EMG findings have been shown to be highly correlative with symptoms

Positive diagnosis of radiculopathy: Requires the identification of neurogenic abnormalities in two or more muscles that share the same nerve root innervation but differ in their peripheral nerve supply.

Timing: Timing is important as nerve root compression will reflect as positive if active changes are occurring. Changes of denervation develop within the first to third week after compression (fibrillations and positive sharp waves develop first in the paraspinals at 7-10 days and in the limb muscles at 2-3 weeks), and reinervation is found at about 3-6 months.

Acute findings: Identification of fibrillation potentials in dennervated muscles with normal motor unit action potentials (usually within 6 months of symptoms: may disappear within 6 weeks in the paraspinals and persist for up to 1-2 years in distal limbs)

Chronic findings: Findings of motor unit action potentials with increased duration and phases that represent reinnervation. With time these become broad, large and polyphasic and may persist for years.

Anatomy: The test primarily evaluates ventral (anterior) root function (motor) and may be negative if there is dorsal root compression (sensory) only. Only C4-8 and T1 in the neck region have limb representation that can be tested electrodiagnostically. The anatomic basis for this lies in the fact that the cervical nerve roots have a motor and a sensory component. It is possible to impinge the sensory component with a herniated disc or bone spur and not affect the motor component. As a result, the patient may report radicular pain that correlates to the MRI without having EMG evidence of motor loss.

Paraspinal fibrillation potentials: May be seen in normal individuals and are nonspecific for etiology. The presence of these alone is insufficient to make a diagnosis of radiculopathy and they may be absent when there is a diagnosis of radiculopathy secondary to sampling error, timing, or because they were spared. They may support a diagnosis of radiculopathy when corresponding abnormalities are present in the limb muscles

Indications when particularly helpful: EMG may be helpful for patients with double crush phenomenon, in particular, when there is evidence of possible metabolic pathology such as neuropathy secondary to diabetes or thyroid disease, or evidence of peripheral compression such as carpal tunnel syndrome.

H-reflex: Technically difficult to perform in the upper extremity but can be derived from the median nerve. The test is not specific for etiology and may be difficult to obtain in obese patients or those older than 60 years of age.

(Negrin, 1991) (Alrawi, 2006) (Ashkan, 2002) (Nardin, 1999) (Tsao, 2007) See Discectomy-laminectomy-laminoplasty. (Surface EMG and F-wave tests are not very specific and therefore are not recommended. For more information on surface EMG, see the Low Back Chapter.)

Nerve conduction studies (NCS)

Not recommended. There is minimal justification for performing nerve conduction studies when a patient is presumed to have symptoms on the basis of radiculopathy. (Utah, 2006)

See also the Carpal Tunnel Syndrome Chapter for more details on NCS. Studies have not shown portable nerve conduction devices to be effective.

A DESCRIPTION AND THE SOURCE OF THE SCREENING CRITERIA OR OTHER CLINICAL BASIS USED TO MAKE THE DECISION

[ ] ACOEM-AMERICA COLLEGE OF OCCUPATIONAL & ENVIRONMENTAL MEDICINE UM KNOWLEDGEBASE

[ ] AHCPR-AGENCY FOR HEALTHCARE RESEARCH & QUALITY GUIDELINES

[ ] DWC-DIVISION OF WORKERS COMPENSATION POLICIES OR GUIDELINES

[ ] EUROPEAN GUIDELINES FOR MANAGEMENT OF CHRONIC LOW BACK PAIN

[ ] INTERQUAL CRITERIA

[X] MEDICAL JUDGEMENT, CLINICAL EXPERIENCE AND EXPERTISE IN ACCORDANCE WITH ACCEPTED MEDICAL STANDARDS

[ ] MERCY CENTER CONSENSUS CONFERENCE GUIDELINES

[ ] MILLIMAN CARE GUIDELINES

[X] ODG-OFFICIAL DISABILITY GUIDELINES & TREATMENT GUIDELINES

[ ] PRESSLEY REED, THE MEDICAL DISABILITY ADVISOR

[ ] TEXAS GUIDELINES FOR CHIROPRACTIC QUALITY ASSURANCE & PRACTICE PARAMETERS

[ ] TEXAS TACADA GUIDELINES

[ ] TMF SCREENING CRITERIA MANUAL

[ ] PEER REVIEWED NATIONALLY ACCEPTED MEDICAL LITERATURE (PROVIDE A DESCRIPTION)

[ ] OTHER EVIDENCE BASED, SCIENTIFICALLY VALID, OUTCOME FOCUSED GUIDELINES (PROVIDE A DESCRIPTION)