# 1000 DEPARTMENT OF LABOR

## 1300 Division of Industrial Affairs

## 1340 The Office of Workers' Compensation

### 1342 Health Care Practice Guidelines

### PART C Cumulative Trauma Disorder Medical Treatment Guidelines

**1.0 Introduction**

Pursuant to 19 **Del.C.** §2322C, health care practice guidelines have been adopted and recommended by the Health Care Advisory Panel to guide utilization of health care treatments in workers' compensation including, but not limited to, care provided for the treatment of employees by or under the supervision of a licensed health care provider, prescription drug utilization, inpatient hospitalization and length of stay, diagnostic testing, physical therapy, chiropractic care and palliative care. The health care practice guidelines apply to all treatments provided after the effective date of the regulation adopted by the Department of Labor, May 23, 2008, and regardless of the date of injury.

The guidelines are, to the extent permitted by the most current medical science or applicable science, based on well-documented scientific research concerning efficacious treatment for injuries and occupational disease. To the extent that well-documented scientific research regarding the above is not available at the time of adoption of the guidelines, or is not available at the time of any revision to the guidelines, the guidelines have been and will be based upon the best available information concerning national consensus regarding best health care practices in the relevant health care community.

The guidelines, to the extent practical and consistent with the Act, address treatment of those physical conditions which occur with the greatest frequency, or which require the most expensive treatments, for work-related injuries based upon currently available Delaware data.

Services rendered by any health care provider certified pursuant to 19 **Del.C.** §2322D(a) to provide treatment or services for injured employees shall be presumed, in the absence of contrary evidence, to be reasonable and necessary if such treatment and/or services conform to the most current version of the Delaware health care practice guidelines.

Services rendered outside the Guidelines and/or variation in treatment recommendations from the Guidelines may represent acceptable medical care, be considered reasonable and necessary treatment and, therefore, determined to be compensable, absent evidence to the contrary, and may be payable in accordance with the Fee Schedule and Statute, accordingly.

Services provided by any health care provider that is not certified pursuant to 19 **Del.C.** §2322D(a) shall not be presumed reasonable and necessary unless such services are pre-authorized by the employer or insurance carrier, subject to the exception set forth in 19 **Del.C.** §2322D(b).

Treatment of conditions unrelated to the injuries sustained in an industrial accident may be denied as unauthorized if the treatment is directed toward the non-industrial condition, unless the treatment of the unrelated injury is rendered necessary as a result of the industrial accident.

The Health Care Advisory Panel and Department of Labor recognized that acceptable medical practice may include deviations from these Guidelines, as individual cases dictate. Therefore, these Guidelines are not relevant as evidence of a provider's legal standard of professional care.

In accordance with the requirements of the Act, the development of the health care guidelines has been directed by a predominantly medical or other health professional panel, with recommendations then made to the Health Care Advisory Panel.

**2.0 General Guideline Principles**

The principles summarized in this section are key to the intended implementation of all Division of Workers' Compensation guidelines and critical to the reader's application of the guidelines in this document.

2.1 **EDUCATION** of the patient and family, as well as the employer, insurer, policy makers and the community should be emphasized in the treatment of CTD and disability. Practitioners may develop and implement an effective strategy and skills to educate patients, employers, insurance systems, policy makers and the community as a whole.

2.2 **TREATMENT PARAMATER** Time frames for specific interventions commence once treatments have been initiated, not on the date of injury. Obviously, duration will be impacted by patient compliance, comorbities and availability of services. Clinical judgment may substantiate the need to modify the total number of visits discussed in this document. The majority of injured workers with Cumulative Trauma Disorders often will achieve resolution of their condition within 6 to 36 visits (Guide To Physical Therapy Practice – Second Edition). It is anticipated that most injured workers will not require the maximum number of visits described in these guidelines. They are designed to be a ceiling and care extending beyond the maximum allowed visits may warrant utilization review.

2.3 **ACTIVE INTERVENTIONS** emphasizing patient responsibility, such as therapeutic exercise and/or functional treatment, are generally emphasized over passive modalities, especially as treatment progresses. Generally, passive interventions are viewed as a means to facilitate progress in an active rehabilitation program with concomitant attainment of objective functional gains. All rehabilitation programs must incorporate "Active Interventions" no later than three weeks after the onset of treatment. Reimbursement for passive modalities only after the first three weeks of treatment without clear evidence of Active Interventions will require supportive documentation.

2.4 **ACTIVE THERAPEUTIC EXERCISE PROGRAM** Exercise program goals should incorporate patient strength, endurance, flexibility, coordination, and education. This includes functional application in vocational or community settings

2.5 **POSITIVE PATIENT RESPONSE** results are defined primarily as functional gains that can be objectively measured. Objective functional gains include, but are not limited to, positional tolerances, range of motion, strength, endurance, activities of daily living, cognition, psychological behavior, and efficiency/velocity measures that can be quantified. Subjective reports of pain and function should be considered and given relative weight when the pain has anatomic and physiologic correlation. Anatomic correlation must be based on objective findings.

2.6 **RE-EVALUATE TREATMENT EVERY 3 TO 4 WEEKS** If a given treatment or modality is not producing positive results within 3 to 4 weeks, the treatment should be either modified or discontinued. Reconsideration of diagnosis should also occur in the event of poor response to a seemingly rational intervention.

2.7 **SURGICAL INTERVENTIONS** Surgery should be contemplated within the context of expected functional outcome and not purely for the purpose of pain relief. All operative interventions must be based upon positive correlation of clinical findings, clinical course, and diagnostic tests. A comprehensive assimilation of these factors must lead to a specific diagnosis with positive identification of pathologic conditions.

2.8 **SIX-MONTH TIME FRAME** The prognosis drops precipitously for returning an injured worker to work once he/she has been temporarily totally disabled for more than six months. The emphasis within these guidelines is to move patients along a continuum of care and return-to-work within a six-month time frame, whenever possible. It is important to note that time frames may not be pertinent to injuries that do not involve work-time loss or are not occupationally related.

2.9 **RETURN-TO-WORK** is therapeutic, assuming the work is not likely to aggravate the basic problem or increase long-term pain. The practitioner must provide specific physical limitations per the Physician's Report form. The following physical limitations should be considered and modified as recommended: lifting, pushing, pulling, crouching, walking, using stairs, bending at the waist, awkward and/or sustained postures, tolerance for sitting or standing, hot and cold environments, data entry and other repetitive motion tasks, sustained grip, tool usage and vibration factors. Even if there is residual chronic pain, return-to-work is not necessarily contraindicated.

The practitioner should understand all of the physical demands of the patient's job position before returning the patient to full duty and should receive clarification of the patient's job duties.

2.10 **DELAYED RECOVERY** Strongly consider a psychological evaluation, if not previously provided, as well as initiating interdisciplinary rehabilitation treatment and vocational goal setting, for those patients who are failing to make expected progress 6 to 12 weeks after an injury. The Division recognizes that 3 to 10% of all industrially injured patients will not recover within the time lines outlined in this document despite optimal care. Such individuals may require treatments beyond the limits discussed within this document, but such treatment will require clear documentation by the authorized treating practitioner focusing on objective functional gains afforded by further treatment and impact upon prognosis.

2.11 **GUIDELINE RECOMMENDATIONS AND INCLUSION OF MEDICAL EVIDENCE** are recommendations based on available evidence and/or consensus recommendations. When possible, guideline recommendations will note the level of evidence supporting the treatment recommendation.

All recommendations in the guideline are considered to represent reasonable care in appropriately selected cases, regardless of the level of evidence or consensus statement attached to it. Those procedures considered inappropriate, unreasonable, or unnecessary are designated in the guideline as being "not recommended."

**17 DE Reg. 322 (09/01/13)**

**3.0 Definitions and Mechanism of Injury**

Cumulative Trauma Disorders (CTDs) of the upper extremity comprise a heterogeneous group of diagnoses which include numerous specific clinical entities, including disorders of the muscles, tendons and tendon sheaths, nerve entrapment syndromes, joint disorders, and neurovascular disorders.

The terms "**cumulative trauma disorder**", "**repetitive motion syndrome**", "**repetitive strain injury**" and other similar nomenclatures are umbrella terms that are not acceptable diagnoses. The health care provider must provide specific diagnoses in order to appropriately educate, evaluate, and treat the patient. Examples include DeQuervain's tendonitis, cubital tunnel syndrome, lateral/medial epicondylitis, olecranon bursitis, and hand-arm vibration syndrome. Many patients present with more than one diagnosis, which requires thorough upper extremity and cervical evaluation by the health care provider. Furthermore, there must be a causal relationship between work activities and the diagnosis (see Initial Diagnostic Procedures). The mere presence of a diagnosis that may be associated with cumulative trauma does not presume work-relatedness unless the appropriate work exposure is present.

Mechanisms of injury for the development of CTDs remain controversial. Posture, repetition, force, vibration, cold exposure, and combinations thereof are postulated and generally accepted as risk factors for the development of CTDs. Evaluation of a CTD requires an integrated approach that incorporates ergonomics, clinical assessment, and psychosocial evaluation on a case-by-case basis.

**4.0 Initial Diagnostic Procedures**

History and physical examination (Hx & PE) are generally accepted, well-established and widely used procedures which establish the foundation/basis for and dictate all other diagnostic and therapeutic procedures. When findings of clinical evaluations and those of other diagnostic procedures do not complement each other, the objective clinical findings should have preference.

4.1 **HISTORY** Should inquire about the following issues, where relevant, and document pertinent positives and negatives where appropriate. In evaluating potential CTDs, the following actions should be taken:

4.1.1 **Description of Symptoms:**

4.1.1.1 Onset: date of onset, sudden vs. gradual;

4.1.1.2 Nature of Symptoms: pain, numbness, weakness, swelling, stiffness, temperature change, color change;

4.1.1.3 Intensity: pain scale (0 = no pain, and 10 = worst imaginable pain) may be used.

4.1.1.4 Location and Radiation: use of a pain diagram is encouraged for characterizing sensory symptoms; use comprehensive diagrams and do not use limited diagrams depicting only the hand or arm, as it is important to solicit the reporting of more proximal symptoms;

4.1.1.5 Provocative and Alleviating Factors (occupational and non-occupational): Attempt to identify the specific physical factors that are aggravating or alleviating the problem;

4.1.1.6 Sleep disturbances;

4.1.1.7 Other associated signs and symptoms noted by the injured worker;

4.1.2 **Identification of Occupational Risk Factors:** Job title alone is not sufficient information. The clinician is responsible for documenting specific information regarding repetition, force and other risk factors, as listed in the Risk Factors Associated with Cumulative Trauma Table. A job site evaluation may be required.

4.1.3 **Demographics: age, hand dominance, gender, etc.**

4.1.4 **Past Medical History and Review of Systems:**

4.1.4.1 Past injury/symptoms involving the upper extremities, trunk and cervical spine;

4.1.4.2 Past work-related injury or occupational disease;

4.1.4.3 Past personal injury or disease that resulted in temporary or permanent job limitation;

4.1.4.4 Medical conditions associated with CTD - A study of work-related upper extremity disorder patients showed a 30% prevalence of co-existing disease. Medical conditions commonly occurring with CTD include:

4.1.4.4.1 Pregnancy,

4.1.4.4.2 Arthropathies including connective tissue disorders, rheumatoid arthritis, systemic lupus erythematosus, gout, osteoarthritis and spondyloarthropathy,

4.1.4.4.3 Amyloidosis,

4.1.4.4.4 Hypothyroidism, especially in older females,

4.1.4.4.5 Diabetes mellitus, including family history or gestational diabetes,

4.1.4.4.6 Acromegaly,

4.1.4.4.7 Use of corticosteroids.

4.1.5 **Activities of Daily Living (ADLs):** ADLs include such activities as self care and personal hygiene, communication, ambulation, attaining all normal living postures, travel, non-specialized hand activities, sexual function, sleep, and social and recreational activities. Specific movements in this category include pinching or grasping keys/pens/other small objects, grasping telephone receivers or cups or other similar-sized objects, and opening jars. The quality of these activities is judged by their independence, appropriateness, and effectiveness. Assess not simply the number of restricted activities but the overall degree of restriction or combination of restrictions.

4.1.6 other avocational activities that might contribute to or be impacted by CTD development. Activities such as hand-operated video games, crocheting/needlepoint, home computer operation, golf, tennis, and gardening are included in this category.

4.1.7 **Social History:** Exercise habits, alcohol consumption, and psychosocial factors.

4.2 **PHYSICAL EXAMINATION** The evaluation of any upper extremity complaint should begin at the neck and upper back and then proceed down to the fingers and include the contralateral region. It should include evaluation of vascular and neurologic status, and describe any dystrophic changes or variation in skin color or turgor.

**Table 1: Physical Examination Findings Reference Table**

| DIAGNOSIS | SYMPTOMS | SIGNS |
|---|---|---|
| DeQuervain's Tenosynovitis | Pain and swelling in the anatomical snuffbox; pain radiating into the hand and forearm; pain worsened by thumb abduction and/or extension. | Pain worsened by active thumb abduction and/or extension; crepitus along the radial forearm; positive Finkelstein's. |
| Extensor Tendinous Disorders | Pain localized to the affected tendon(s); pain worsened by active and/or resisted wrist or finger extension. | Swelling along the dorsal aspects of the hand/wrist/ forearm, and pain with active and/or resisted wrist/ digit extension, or creaking/crepitus with wrist extension. |
| Flexor Tendinous Disorders | Pain localized to the affected tendons; pain in the affected tendons associated with wrist flexion and ulnar deviation, especially against resistance. | Pain with wrist/digit flexion and ulnar deviation, or crepitus with active motion of the flexor tendons. |
| Lateral Epicondylitis | Lateral elbow pain exacerbated by repetitive wrist motions; pain emanating from the lateral aspect of the elbow. | Pain localized to lateral epicondyle with resisted wrist extension and/or resisted supination. |
| Medial Epicondylitis | Pain emanating from the medial elbow; mild grip weakness; medial elbow pain exacerbated by repetitive wrist motions. | Pain localized to the medial epicondyle with resisted wrist flexion and resisted pronation. |

| | | |
|---|---|---|
| Cubital tunnel syndrome | Activity-related pain/paresthesias involving the 4th and 5th fingers coupled with pain in the medial aspect of the elbow; pain/ paresthesias worse at night; decreased sensation of the 5th finger and ulnar half of the ring finger (including dorsum 5th finger); progressive inability to separate fingers; loss of power grip and dexterity; atrophy/weakness of the ulnar intrinsic hand muscles (late sign). | Diminished sensation of the fifth and ulnar half of the ring fingers; elbow flexion/ulnar compression test; Tinels' sign between olecranon process and medial epicondyle; Later stages manifested by intrinsic atrophy and ulnar innervated intrinsic weakness. Specific physical signs include clawing of the ulnar 2 digits (Benediction posture), ulnar drift of the 5th finger (Wartenberg's sign), or flexion at the thumb IP joint during pinch (Froment's sign). |
| Hand-Arm Vibration Syndrome | Pain/paresthesias in the digits; blanching of the digits; cold intolerance; tenderness/swelling of the digits/hand/forearm; muscle weakness of the hand; joint pains in hand/wrist/elbow/neck/ shoulders; trophic skin changes and cyanotic color in hand/digits. | Sensory deficits in the digits/hand; blanching of digits; swelling of the digits/hand/forearm; muscle weakness of the hand; arthropathy at the hand/wrist/elbow; trophic skin changes and cyanotic color in hand/ digits. |
| Guyon Canal (Tunnel) Syndrome | Numbness/tingling in ulnar nerve distribution distal to wrist. | Positive Tinel's at hook of hamate. Numbness or paresthesias of the palmar surface of the ring and small fingers. Later stages may affect ulnar innervated intrinsic muscle strength. |
| Pronator Syndrome | Pain/numbness/tingling in median nerve distribution distal to elbow. | Tingling in median nerve distribution on resisted pronation with elbow flexed at $90^{o}$<br><br>Tenderness or Tinel's at the proximal edge of the pronator teres muscle over the median nerve. |
| Radial Tunnel Syndrome | Numbness/tingling or pain in the lateral posterior forearm. | Tenderness over the radial nerve near the proximal edge of the supinator muscle. Rarely, paresthesias in the radial nerve distribution or weakness of thumb or finger extension. |

4.3 **PAIN BEHAVIOR EVALUATION**

4.3.1 Evaluate the patient's overall pain behavior. The behavior should be consistent with the current pain levels reported by the patient.

4.3.2 Use a measurement tool to quantify and/or qualify pain. Reference the pain scale (0-10) with the worst pain imaginable being the top end of the scale (10) and/or other pain scales such as the Visual Analog Scale, Pain Drawing, Neck Disability Index, or McGill Pain Questionnaire.

4.4 **RISK FACTORS** A critical review of epidemiologic literature identifies a number of physical exposures associated with CTDs. Physical exposures considered risk factors include: repetition, force, vibration, pinching and gripping, and cold environment. When workers are exposed to several risk factors simultaneously, there is an increased likelihood of a CTD. Not all risk factors have been extensively studied. Exposure to cold environment, for example, was not examined independently; however, there is good evidence that combined with other risk factors, cold environment increases the likelihood of a CTD. The table at the end of this section entitled, "Risk Factors Associated CTDs," summarizes the results of currently available literature.

No single epidemiologic study will fulfill all criteria for causality. The clinician must recognize that currently available epidemiologic data is based on population results, and that individual variability lies outside the scope of these studies. Many published studies are limited in design and methodology, and, thus, preclude conclusive results. Most studies' limitations tend to attenuate, rather than inflate, associations between workplace exposures and CTDs.

Many specific disorders, such as ulnar neuropathy (at the elbow and wrist) and pronator teres syndrome, have not been studied sufficiently to formulate evidence statements regarding causality. Based on the present understanding of mechanism of injury and utilizing the rationale of analogy, it is generally accepted that these disorders are similar to other CTDs at the elbow and wrist and are susceptible to the same risk factors. No studies examined the relationship between the development of ganglion cysts and work activities; however, work activities may aggravate existing ganglion cysts. It is generally accepted that keyboarding less than four hours per day is unlikely to be associated with a CTD when no other risk factors are present. It remains unclear how computer mouse use affects CTDs. The posture involved in mouse use should always be evaluated when assessing risk factors.

Studies measured posture, repetition, and force in variable manners. In general, jobs that require less than 50% of maximum voluntary contractile strength for the individual are not considered “high force.” Likewise, jobs with wrist postures less than or equal to $25^{o}$ flexion or extension, or ulnar deviation less than or equal to $10^{o}$ are not likely to cause posture problems.

These guidelines are based on current epidemiologic knowledge. As with any scientific work, the guidelines are expected to change with advancing knowledge. The clinician should remain flexible and consider new information revealed in future studies.

**Table 2: Risk Factors Associated with Cumulative Trauma**

| Diagnosis | Strong evidence | Good evidence | Some evidence | Insufficient or conflicting evidence |
|---|---|---|---|---|
| Elbow Musculoskeletal Disorders (Epicondylitis) | Combination high force and high repetition (Exposures were based on EMG data, observation or video analysis of job tasks, or categorization by job title. Observed movements include repeated extension, flexion, pronation and supination. Repetition work cycles less than 30 sec. or greater than 50% of cycle time performing same task, and number of items assembled in one hour). | High force alone | | Repetition alone, extreme wrist posture. |

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|---|---|---|---|---|
| Wrist Tendonitis, including DeQuervain's Tenosynovitis | Combination of risk factors: High repetition, forceful hand/wrist exertions, extreme wrist postures (Assessed by direct observation, EMG, and video analysis. One study measured time spent in deviated wrist posture). | Repetition, (as previously defined), not including keyboarding or force independently | Posture | |
| Trigger Finger | | | Forceful grip (Holding tools, knives. Assessed by direct observation and video analysis). | |

**5.0 Follow-Up Diagnostic Imagining and Testing Procedures**

5.1 **ELECTRODIAGNOSTIC (EDX) STUDIES**

5.1.1 Electrodiagnostic (EDX) studies are well-established and widely accepted for evaluation of patients suspected of having peripheral nerve pathology. Studies may confirm the diagnosis or direct the examiner to alternative disorders. Studies may require clinical correlation due to the occurrence of false positive and false negative results. Symptoms of peripheral nerve pathology may occur with normal EDX studies, especially early in the clinical course. Findings include fibrillations, fasciculations, neurogenic recruitment, and polyphasic units (reinnervation).

5.1.2 To assure accurate testing, temperature should be maintained at 30-34C preferably recorded from the hand/digits. For temperature below 30C the hand should be warmed.

5.1.3 All studies must include normative values for their laboratories.

5.2 **IMAGING STUDIES**

5.2.1 **Radiographic Imaging:** Not generally required for most CTD diagnoses. However, it may be necessary to rule out other pathology in the cervical spine, shoulder, elbow, wrist, or hand. Wrist and elbow radiographs would detect degenerative joint disease, particularly scapholunate dissociation and thumb carpometacarpal abnormalities which occasionally occur with CTD.

5.2.2 **MRI:** May show increased T2-weighted signal intensity of the common extensor tendon in lateral epicondylitis, but this finding has commonly been found in the asymptomatic contralateral elbow and may not be sufficiently specific to warrant the use of MRI as a diagnostic test for epicondylitis. Its routine use for CTD is not recommended.

5.3 **ADJUNCTIVE TESTING**

5.3.1 **Personality/Psychological/Psychosocial Evaluations:** are generally accepted and well-established diagnostic procedures with selective use in the CTD population, but have more widespread use in sub-acute and chronic pain populations.

Diagnostic testing procedures may be useful for patients with symptoms of depression, delayed recovery, chronic pain, recurrent painful conditions, disability problems, and for pre-operative evaluation as well as a possible predictive value for post-operative response. Psychological testing should provide differentiation between pre-existing depression versus injury-caused depression, as well as post-traumatic stress disorder.

Formal psychological or psychosocial evaluation should be performed on patients not making expected progress within 6-12 weeks following injury and whose subjective symptoms do not correlate with objective signs and tests. In addition to the customary initial exam, the evaluation of the injured worker should specifically address the following areas:

5.3.1.1 Employment history;

5.3.1.2 Interpersonal relationships — both social and work;

5.3.1.3 Leisure activities;

5.3.1.4 Current perception of the medical system;

5.3.1.5 Results of current treatment;

5.3.1.6 Perceived locus of control; and

5.3.1.7 Childhood history, including abuse and family history of disability.

Results should provide clinicians with a better understanding of the patient, thus allowing for more effective rehabilitation. The evaluation will determine the need for further psychosocial interventions, and in those cases, a Diagnostic Statistical Manual for Mental Disorders (DSM) diagnosis should be determined and documented. An individual with a Ph.D., PsyD, or Psychiatric MD/DO credentials may perform initial evaluations, which are generally completed within one to two hours. When issues of chronic pain are identified, the evaluation should be more extensive and follow testing procedures as outlined in the Division's Chronic Pain Disorder Medical Treatment Guidelines.

- Frequency: One time visit for evaluation. If psychometric testing is indicated as a portion of the initial evaluation, time for such testing should not exceed an additional two hours of professional time.

5.3.2 **Laboratory Tests:** Generally accepted, well-established and widely used procedures. Patients should be carefully screened at the initial exam for signs or symptoms of diabetes, hypothyroidism, arthritis, and related inflammatory diseases. The presence of concurrent disease does not negate work-relatedness of any specific case. In one study of patients with cumulative trauma disorder other than Carpal Tunnel Syndrome, seen by specialists, 3% of patients were diagnosed with diabetes, 6% with hypothyroidism, and 9% with chronic inflammatory disease including spondyloarthropathy, arthritis, and systemic lupus erythematosis. Up to two thirds of the patients were not aware of their concurrent disease. When a patient's history and physical examination suggest infection, metabolic or endocrinologic disorders, tumorous conditions, systemic musculoskeletal disorders (e.g., rheumatoid arthritis or ankylosing spondylitis), or problems potentially related to medication (e.g., renal disease and nonsteroidal anti-inflammatory medications), then laboratory tests, including, but not limited to, the following can provide useful diagnostic information:

5.3.2.1 Serum rheumatoid factor, Antinuclear Antigen (ANA), Human Leukocyte Antigen (HLA)-B27 titre for rheumatoid work-up;

5.3.2.2 Thyroid stimulating hormone (TSH) for hypothyroidism;

5.3.2.3 Fasting glucose - recommended for obese men and women over 40 years of age, patients with a history of family diabetes, those from high risk ethnic groups, and with a previous history of impaired glucose tolerance. A fasting blood glucose greater than 125mg/dl is diagnostic for diabetes. Urine dipstick positive for glucose is a specific but not sensitive screening test. Quantitative urine glucose is sensitive and specific in high risk populations;

5.3.2.4 Serum protein electrophoresis;

5.3.2.5 Sedimentation rate and C-Reactive Protein are nonspecific, but elevated in infection, neoplastic conditions and rheumatoid arthritis;

5.3.2.6 Serum calcium, phosphorus, uric acid, alkaline and acid phosphatase for metabolic, endocrine and neo-plastic conditions;

5.3.2.7 complete blood count (CBC), liver and kidney function profiles for metabolic or endocrine disorders or for adverse effects of various medications;

5.3.2.8 Bacteriological (microorganism) work-up for wound, blood and tissue.

The Division recommends the above diagnostic procedures be considered, at least initially, the responsibility of the workers' compensation carrier to ensure that an accurate diagnosis and treatment plan can be established. Laboratory testing may be required periodically to monitor patients on chronic medications.

5.3.3 **Pinch and Grip Strength Measurements:** May be accepted as a diagnostic tool for CTD. Strength is defined as the muscle force exerted by a muscle or group of muscles to overcome a resistance under a specific set of circumstances. Pain, the perception of pain secondary to abnormal sensory feedback, and/ or the presence of abnormal sensory feedback affecting the sensation of the power used in grip/pinch may cause a decrease in the force exerted. When a bell-shaped curve is present, these measures provide a method for quantifying strength that can be used to follow a patient's progress and to assess response to therapy. In the absence of a bell-shaped curve, clinical reassessment is indicated.

5.3.4 **Quantitative Sensory Testing (QST):** May be used as a screening tool in clinical settings pre-and post-operatively. Results of tests and measurements of sensory integrity are integrated with the history and review of systems findings and the results of other tests and measures. QST tests the entire sensory pathway, limiting its ability to localize a deficit precisely. It depends on the patient's report of perception and may not be objective. Cutaneous conditions may alter sensory thresholds.

5.3.4.1 Threshold tests measure topognosis, the ability to exactly localize a cutaneous sensation, and pallesthesia, the ability to detect mechanical sensation using vibration discrimination testing (quickly adapting fibers); and/or Semmes-Wienstein monofilament testing (slowly adapting fibers);

5.3.4.2 Density Tests also measure topognosis and pallesthesia using static two-point discrimination (slowly adapting fibers); and/or moving two-point discrimination (quickly adapting fibers).

**6.0 Therapeutic Procedures – Non-Operative**

Before initiation of any therapeutic procedure, the authorized treating provider, employer and insurer must consider these important issues in the care of the injured worker.

First, patients undergoing therapeutic procedure(s) should be released or returned to modified or restricted duty during their rehabilitation at the earliest appropriate time. Refer to "Return-to-Work" in this section for detailed information.

Second, cessation and/or review of treatment modalities should be undertaken when no further significant subjective or objective improvement in the patient's condition is noted. If patients are not responding within the recommended duration periods, alternative treatment interventions, further diagnostic studies or consultations should be pursued.

Third, providers should provide and document education to the patient. No treatment plan is complete without addressing issues of individual and/or group patient education as a means of facilitating self-management of symptoms.

Last, formal psychological or psychosocial screening should be performed on patients not making expected progress within 6 to 12 weeks following injury and whose subjective symptoms do not correlate with objective signs and tests.

In cases where a patient is unable to attend an outpatient center, home therapy may be necessary. Home therapy may include active and passive therapeutic procedures as well as other modalities to assist in alleviating pain, swelling, and abnormal muscle tone. Home therapy is usually of short duration and continues until the patient is able to tolerate coming to an outpatient center.

The following procedures are listed in alphabetical order.

6.1 **ACUPUNCTURE** is an accepted and widely used procedure for the relief of pain and inflammation. There is some scientific evidence to support its use. The exact mode of action is only partially understood. Western medicine studies suggest that acupuncture stimulates the nervous system at the level of the brain, promotes deep relaxation, and affects the release of neurotransmitters. Acupuncture is commonly used as an alternative or in addition to traditional Western pharmaceuticals. While it is commonly used when pain medication is reduced or not tolerated, it may be used as an adjunct to physical rehabilitation and/or surgical intervention to hasten the return of functional activity. Acupuncture should be performed by MD, DO, DC with appropriate training; or a licensed acupuncturist.

6.1.1 **Acupuncture:** is the insertion and removal of filiform needles to stimulate acupoints (acupuncture points). Needles may be inserted, manipulated and retained for a period of time. Acupuncture can be used to reduce pain and inflammation, and to increase blood flow to an area and increase range of motion. Indications include joint pain, joint stiffness, soft tissue pain and inflammation, paresthesia, post-surgical pain relief, muscle spasm, and scar tissue pain.

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Course duration: 14 treatments

6.1.2 **Acupuncture with Electrical Stimulation:** is the use of electrical current (micro- amperage or milli-amperage) on the needles at the acupuncture site. It is used to increase effectiveness of the needles by continuous stimulation of the acupoint. Physiological effects (depending on location and settings) can include endorphin release for pain relief, reduction of inflammation, increased blood circulation, analgesia through interruption of pain stimulus, and muscle relaxation.

It is indicated to treat chronic pain conditions, radiating pain along a nerve pathway, muscle spasm, inflammation, scar tissue pain, and pain located in multiple sites.

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Course duration: 14 treatments

6.1.3 **Other Acupuncture Modalities:** Acupuncture treatment is based on individual patient needs and therefore treatment may include a combination of procedures to enhance treatment effect. Other procedures may include the use of heat, soft tissue manipulation/massage, and exercise.

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Course duration: 14 treatments

Any of the above acupuncture treatments may extend longer if objective functional gains can be documented or when symptomatic benefits facilitate progression in the patient's treatment program. Treatment beyond 14 sessions (1 course) may be documented with respect to need and ability to facilitate positive symptomatic or functional gains.

6.2 **BIOFEEDBACK** is a form of behavioral medicine that helps patients learn self-awareness and self-regulation skills for the purpose of gaining greater control of their physiology, such as muscle activity, brain waves, and measures of autonomic nervous system activity. Electronic instrumentation is used to monitor the targeted physiology and then displayed or fed back to the patient visually, auditorially, or tactilely, with coaching by a biofeedback specialist. Biofeedback is provided by clinicians certified in biofeedback and/or who have documented specialized education, advanced training, or direct or supervised experience qualifying them to provide the specialized treatment needed (e.g., surface EMG, EEG, or other).

Treatment is individualized to the patient's work-related diagnosis and needs. Home practice of skills is required for mastery and may be facilitated by the use of home training tapes. The ultimate goal in biofeedback treatment is normalizing the physiology to the pre-injury status to the extent possible and involves transfer of learned skills to the workplace and daily life. Candidates for biofeedback therapy or training must be motivated to learn and practice biofeedback and self-regulation techniques.

Indications for biofeedback include individuals who are suffering from musculoskeletal injury where muscle dysfunction or other physiological indicators of excessive or prolonged stress response affects and/or delays recovery. Other applications include training to improve self-management of emotional stress/pain responses such as anxiety, depression, anger, sleep disturbance, and other central and autonomic nervous system imbalances. Biofeedback is often utilized along with other treatment modalities.

- Time to produce effect: 3 to 4 sessions
- Frequency: 1 to 2 times per week
- Maximum duration: 10 to 12 sessions. Treatment beyond 12 sessions must be documented with respect to need, expectation, and ability to facilitate positive symptomatic or functional gains.

6.3 **INJECTIONS – THERAPEUTIC** are generally accepted, well-established procedures that may play a significant role in the treatment of patients with upper extremity pain or pathology. Therapeutic injections involve the delivery of anesthetic and/or anti-inflammatory medications to the painful structure. Therapeutic injections have many potential benefits. Ideally, a therapeutic injection will: (a) reduce inflammation in a specific target area; (b) relieve secondary muscle spasm; and (c) diminish pain and support therapy directed to functional recovery. Diagnostic and therapeutic injections should be used early and selectively to establish a diagnosis and support rehabilitation. If injections are overused or used outside the context of a monitored rehabilitation program, they may be of significantly less value.

6.3.1 **Steroid Injections:** may provide both diagnostic and therapeutic value in treating a variety of upper extremity cumulative trauma disorders. These include neuropathies, tendonitis or bursitis about the elbow, wrist, or hand. In contrast, there is no evidence to support their therapeutic use in other upper extremity compressive neuropathies; however, it is a widely accepted procedure.

Steroid injections provide a potent anti-inflammatory effect, which is usually short term in duration, lasting weeks or months. Injections should always be used as an adjunctive treatment in the context of a physical exercise and rehabilitation program.

For epicondylitis, there is good evidence that although steroid injections with physical therapy may provide short-term symptomatic relief, there is no benefit over placebo injections at 6 months. A program of physical rehabilitation in combination with judicious use of anti-inflammatory medications should be the core treatment for epicondylitis.

When performing tendon injections, the risk of tendon rupture should be discussed with the patient and the need for temporary restricted duty emphasized.

Contraindications: General contraindications include local or systemic infection, bleeding disorders, and allergy to medications used.

Local Steroid Injections:

- Time to produce effect: 3 days
- Frequency: monthly
- Maximum duration: 3 injections

6.3.2 **Trigger Point Injections:** are generally accepted, although used infrequently in uncomplicated cases. They may, however, be used to relieve myofascial pain and facilitate active therapy and stretching of the affected areas, and as an adjunctive treatment in combination with other treatment modalities, such as functional restoration programs, including stretching therapeutic exercise. Trigger point injections should be utilized primarily for the purpose of facilitating functional progress. The Division does not recommend their routine use in the treatment of upper extremity injuries.

- Time to produce effect: Local anesthetic 30 minutes; 24 to 48 hours for no anesthesia.
- Frequency: Weekly. Suggest no more than 4 injection sites per session per week to avoid significant post-injection soreness.
- Maximum duration: 8 weeks. Occasional patients may require 2 to 4 repetitions of trigger point injection series over a 1 to 2 year period.

6.3.3 Other Injections: Some early evidence exists to support Autologous Blood Injection may be used for medial/lateral epicondylitis. This can be repeated for a total of 2-3 injections given roughly 6 weeks apart.

6.4 **JOB SITE ALTERATION** Early evaluation and training of body mechanics and other ergonomic factors are essential for every injured worker and should be done by a qualified individual. In some cases, this requires a job site evaluation. Some evidence supports alteration of the work site in the early treatment of Cumulative Trauma Disorder. There is no single factor or combination of factors that is proven to prevent or ameliorate CTD, but a combination of ergonomic and psychosocial factors are generally considered to be important. Physical factors that may be considered include use of force, repetition, awkward positions, upper extremity vibration, cold environment, and contact pressure on the nerve. Psychosocial factors to be considered include pacing, degree of control over job duties, perception of job stress, and supervisory support.

The job analysis and modification should include input from the employee, employer, and ergonomist or other professional familiar with work place evaluation. The employee must be observed performing all job functions in order for the job site analysis to be valid. Periodic follow-up is recommended to evaluate effectiveness of the intervention and need for additional ergonomic changes.

6.4.1 **Ergonomic changes:** should be made to modify the hazards identified. In addition, workers should be counseled to vary tasks throughout the day whenever possible. OSHA suggests that workers who perform repetitive tasks, including keyboarding, take 15-30 second breaks every 10 to 20 minutes, or 5-minute breaks every hour. Mini breaks should include stretching exercises.

6.4.2 **Interventions:** should consider engineering controls, e.g., mechanizing the task, changing the tool used, or adjusting the job site; or administrative controls, e.g., adjusting the time an individual performs the task.

6.4.3 **Seating** Description: The following description may aid in evaluating seated work positions: The head should incline only slightly forward, and if a monitor is used, there should be 18-24 inches of viewing distance with no glare. Arms should rest naturally, with forearms parallel to the floor, elbows at the sides, and wrists straight or minimally extended. The back must be properly supported by a chair, which allows change in position and backrest adjustment. There must be good knee and legroom, with the feet resting comfortably on the floor or footrest. Tools should be within easy reach, and twisting or bending should be avoided.

6.4.4 **Job Hazard Checklist:** The following Table 4 is adopted from Washington State's job hazard checklist, and may be used as a generally accepted guide for identifying job duties which may pose ergonomic hazards. The fact that an ergonomic hazard exists at a specific job, or is suggested in the table, does not establish a causal relationship between the job and the individual with a musculoskeletal injury. However, when an individual has a work-related injury and ergonomic hazards exist that affect the injury, appropriate job modifications should be made. Proper correction of hazards may prevent future injuries to others, as well as aid in the recovery of the injured worker.

**Table 4: Identifying Job Duties Which May Pose Ergonomic Hazards**

| Type of Job Duty | Hours per Day |
|---|---|
| Pinching an unsupported object(s) weighing 2 lbs or more per hand, or pinching with a force of 4 lbs or more per hand (comparable to pinching a half a ream of paper):<br><br>1. Highly repetitive motion<br>2. Palmar flexion greater than 30 degrees, dorsiflexion greater than 45 degrees, or radial deviation greater than 30 degrees<br>----------<br>3. No other risk factors | More than 3 hours total/ day<br><br>More than 4 hours total/ day |
| Gripping an unsupported object(s) weighing 10 lbs or more/hand, or gripping with a force of 10 lbs or more/hand (comparable to clamping light duty automotive jumper cables onto a battery): *Handles should be rounded and soft, with at least 1-2.5" in diameter grips at least 5" long.<br>1. Highly repetitive motion<br>2. Palmar flexion greater than 30 degrees, dorsiflexion greater than 45 degrees, or radial deviation greater than 30 degrees<br>----------<br>3. No other risk factors | More than 3 hours total/ day<br><br>More than 4 hours total/ day |
| Repetitive Motion (using the same motion with little or no variation every few seconds) excluding keying activities:<br>1. High, forceful exertions with the hands, with palmar flexion greater than 30 degrees, dorsiflexion greater than 45 degrees, or radial deviation greater than 30 degrees<br>----------<br>2. No other risk factors | More than 2 hours total/ day<br><br>More than 6 hours total/ day |
| Intensive Keying:<br>1. Palmar flexion greater than 30 degrees, dorsiflexion greater than 45 degrees, or radial deviation greater than 30 degrees<br>----------<br>2. No other risk factors | More than 4 hours total/ day<br><br>More than 7 hours total/ day |
| Repeated Impact:<br>1. Using the hand (heel/base of palm) as a hammer more than once/minute | More than 2 hours total/ day |
| Vibration:<br>Two determinants of the tolerability of segmental vibration of the hand are the frequency and the acceleration of the motion of the vibrating tool, with lower frequencies being more poorly tolerated at a given level of imposed acceleration, expressed below in multiples of the acceleration due to gravity (10m/sec./sec.).<br>1. Frequency range 8-15 Hz and acceleration 6 g<br>2. Frequency range 80 Hz and acceleration 40 g<br>3. Frequency range 250 Hz and acceleration 250 g<br>----------<br>4. Frequency range 8-15 Hz and acceleration 1.5 g<br>5. Frequency range 80 Hz and acceleration 6 g<br>6. Frequency range 250 Hz and acceleration 20 g | More than 30 minutes at a time<br><br>----------<br>More than 4 hours at a time |

6.5 **MEDICATIONS** Medication use in the treatment of CTD is appropriate for controlling acute and chronic pain and inflammation. Use of medications will vary widely due to the spectrum of injuries from simple strains to

post-surgical analgesia. A thorough medication history, including use of alternative and over the counter medications, should be performed at the time of the initial visit and updated periodically.

Acetaminophen is an effective and safe initial analgesic. Nonsteroidal anti-inflammatory drugs (NSAIDs) are useful in the treatment of inflammation, and for pain control. Pain is subjective in nature and should be evaluated using a scale to rate effectiveness of the analgesic in terms of functional gain. Other medications, including antidepressants, may be useful in selected patients with chronic pain (Refer to the Division's Chronic Pain Guidelines). Narcotics are rarely indicated for treatment of upper extremity CTDs, and they should be primarily reserved for the treatment of acute severe pain for a limited time on a case-by-case basis. Topical agents may be beneficial in the management of localized upper extremity pain.

The following are listed in alphabetical order:

6.5.1 **Acetaminophen:** is an effective analgesic with antipyretic but not anti-inflammatory activity. Acetaminophen is generally well tolerated, causes little or no gastrointestinal irritation and is not associated with ulcer formation. Acetaminophen has been associated with liver toxicity in doses over 10 gm/day or in chronic alcohol use.

6.5.2 **Minor Tranquilizer/Muscle Relaxants:** are appropriate for muscle spasm, mild pain and sleep disorders.

6.5.3 **Narcotics:** medications should be prescribed with strict time, quantity and duration guidelines, and with definitive cessation parameters. Adverse effects include respiratory depression, impaired alertness, and the development of physical and psychological dependence.

- treatment.

6.5.4 **Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)):** are useful for pain and inflammation. In mild cases, they may be the only drugs required for analgesia. There are several classes of NSAIDs, and the response of the individual injured worker to a specific medication is unpredictable. For this reason, a range of NSAIDs may be tried in each case with the most effective preparation being continued. Patients should be closely monitored for adverse reactions. The US Food and Drug Administration advises that many NSAIDs may cause an increased risk of serious cardiovascular thrombotic events, myocardial infraction, and stroke, which can be fatal. Naproxen sodium does not appear to be associated with increased risk of vascular events. Administration of proton pump inhibitors, histamine 2 blockers, or prostaglandin analog misoprostol along with these NSAIDs may reduce the risk of duodenal and gastric ulceration but do not impact possible cardiovascular complications. Due to the cross-reactivity between aspirin and NSAIDs, NSAIDs should not be used in aspirin-sensitive patients, and should be used with caution in all asthma patients. NSAIDs may be associated with abnormal renal function, including renal failure, as well as, abnormal liver function. Certain NSAIDs may have interactions with various other medications. Individuals may have adverse events not listed above. Intervals for metabolic screening are dependent upon the patient's age, general health status and should be within parameters listed for each specific medication. Complete Blood Count (CBC) and liver and renal function should be monitored at least every six months in patients on chronic NSAIDs and initially when indicated.

6.5.4.1 Non-selective Nonsteroidal Anti-Inflammatory Drugs –

Includes NSAIDs and acetylsalicylic acid (aspirin). Serious GI toxicity, such as bleeding, perforation, and ulceration can occur at any time, with or without warning symptoms in patients treated with traditional NSAIDs. Physicians should inform patients about the signs and/or symptoms of serious gastrointestinal toxicity and what steps to take if they occur. Anaphylactoid reactions may occur in patients taking NSAIDs. NSAIDs may interfere with platelet function. Fluid retention and edema have been observed in some patients taking NSAIDs.

6.5.4.2 Selective Cyclo-oxygenase-2 (COX-2) Inhibitors –

COX-2 inhibitors are more recent NSAIDs and differ in adverse side effect profiles from the traditional NSAIDs. The major advantages of selective COX-2 inhibitors over traditional NSAIDs are that they have less gastrointestinal toxicity and no platelet effects. COX-2 inhibitors can worsen renal function in patients with renal insufficiency, thus renal function may need monitoring.

COX-2 inhibitors should not be first-line for low risk patients who will be using an NSAID short-term but are indicated in select patients for whom traditional NSAIDs are not tolerated. Serious upper GI adverse events can occur even in asymptomatic patients. Patients at high risk for GI bleed include those who use alcohol, smoke, are older than 65, take corticosteroids or anti-coagulants, or have a longer duration of therapy. Celecoxib is contraindicated in sulfanilamide allergic patients.

6.5.5 **Psychotropic/Anti-anxiety/Hypnotic Agents:** may be useful for treatment of mild and chronic pain, dysesthesias, sleep disorders, and depression. Antidepressant medications, such as tricyclics and

Selective Serotonin Reuptake Inhibitors (SSRIs), are useful for affective disorders and chronic pain management. Tricyclic antidepressant agents, in low dose, are useful for chronic pain but have more frequent side effects.

Anti-anxiety medications are best used for short-term treatment (i.e., less than 6 months). Accompanying sleep disorders are best treated with sedating antidepressants prior to bedtime. Frequently, combinations of the above agents are useful. As a general rule, physicians should assess the patient for a prior history of substance abuse or depression prior to prescribing any of these agents.

6.5.6 **Tramadol:** is useful in relief of upper extremity pain and has been shown to provide pain relief equivalent to that of commonly prescribed narcotics. Although Tramadol may cause impaired alertness, it is generally well tolerated, does not cause gastrointestinal ulceration, or exacerbate hypertension or congestive heart failure. Tramadol should be used cautiously in patients who have a history of seizures or who are taking medication that may lower the seizure threshold, such as monoamine oxidase (MAO) inhibiters, SSRIs, and tricyclic antidepressants. This medication has physically addictive properties and withdrawal may follow abrupt discontinuation. It is not recommended for those with prior opioid addiction.

6.5.7 **Topical Drug Delivery:** may be an alternative treatment for localized musculoskeletal disorders and is an acceptable form of treatment in selected patients although there is no scientific evidence to support its use. It is necessary that all topical agents be used with strict instructions for application as well as maximum number of applications per day to obtain the desired benefit and avoid potential toxicity. As with all medications, patient selection must be rigorous to choose those patients with the highest probability of compliance. Refer to “Iontophoresis” in the Passive Therapy section for information regarding topical iontophoretic agents.

6.6 **OCCUPATIONAL REHABILITATION PROGRAMS**

6.6.1 **Non-Interdisciplinary:** These programs are work-related, outcome-focused, individualized treatment programs. Objectives of the program include, but are not limited to, improvement of cardiopulmonary and neuromusculoskeletal functions (strength, endurance, movement, flexibility, stability, and motor control functions), patient education, and symptom relief. The goal is for patients to gain full or optimal function and return-to-work. The service may include the time-limited use of passive modalities with progression to achieve treatment and/or simulated/real work.

6.6.1.1 Work Conditioning/Simulation

This program may begin once a patient is out of the acute phase of injury and will be able to tolerate this program.

These programs are usually initiated after the acute phase has been completed and offered at any time throughout the recovery phase. Work conditioning should be initiated when imminent return of a patient to modified or full duty is not an option, but the prognosis for returning the patient to work at completion of the program is at least fair to good.

The need for work place simulation should be based upon the results of a Functional Capacity Evaluation and/or Jobsite Analysis.

- Length of visit: 1 to 4 hours per day.
- Frequency: 2 to 5 visits per week
- Maximum duration: 8 weeks. Participation in a program beyond six weeks must be documented with respect to need and the ability to facilitate positive symptomatic or functional gains.

6.6.1.2 Work Hardening

Work Hardening is an interdisciplinary program addressing a patient’s employability and return to work. It includes a progressive increase in the number of hours per day that a patient completes work simulation tasks until the patient can tolerate a full workday. This is accomplished by addressing the medical, psychological, behavioral, physical, functional, and vocational components of employability and return-to-work.

This can include a highly structured program involving a team approach or can involve any of the components thereof. The interdisciplinary team should, at a minimum, be comprised of a qualified medical director who is board certified with documented training in occupational rehabilitation; team physicians having experience in occupational rehabilitation; occupational therapist; physical therapist; case manager; and psychologist. As appropriate, the team may also include: chiropractor, RN, vocational specialist or Certified Biofeedback Therapist.

- Length of visit: Up to 8 hours/day
- Frequency: 2 to 5 visits per week
- Maximum duration: 8 weeks. Participation in a program beyond six weeks must be documented with respect to need and the ability to facilitate positive symptomatic or functional gains.

6.7 **PATIENT EDUCATION** No treatment plan is complete without addressing issues of individual patient and/or group education as a means of prolonging the beneficial effects of treatment, as well as facilitating self-management of symptoms and injury prevention. The patient should take an active role in the establishment of functional outcome goals, and should be educated on his or her specific injury, assessment findings, and plan of treatment. Education and instruction in proper body mechanics and posture, positions to avoid task/tool adaptation, self-care for exacerbation of symptoms, and home exercise/task adaptation should also be addressed.

6.8 **RETURN-TO-WORK** is therapeutic, assuming the work is not likely to aggravate the basic problem or increase long-term pain. The practitioner must provide specific physical limitations per the Physician's Form. The following physical limitations should be considered and modified as recommended: lifting, pushing, pulling, crouching, walking, using stairs, bending at the waist, awkward and/or sustained postures, tolerance for sitting or standing, hot and cold environments, data entry and other repetitive motion tasks, sustained grip, tool usage and vibration factors. Even if there is residual chronic pain, return-to-work is not necessarily contraindicated.

The practitioner should understand all of the physical demands of the patient's job position before returning the patient to full duty and should receive clarification of the patient's job duties. Clarification must be provided by the employer or, if necessary, including, but not limited to, an occupational health nurse, occupational therapist, vocational rehabilitation specialist, or an industrial hygienist.

6.9 **SLEEP DISTURBANCES** are a common secondary symptom of CTD. Although primary insomnia may accompany pain as an independent co-morbid condition, it more commonly occurs, secondary to the pain condition itself. Exacerbations of pain often are accompanied by exacerbations of insomnia; the reverse can also occur. Sleep laboratory studies have shown disturbances of sleep architecture in pain patients. Loss of deep slow-wave sleep and increase in light sleep occur and sleep efficiency, the proportion of time in bed spent asleep, is decreased. These changes are associated with patient reports of non-restorative sleep.

Many affected patients develop behavioral habits that exacerbate and maintain sleep disturbances. Excessive time in bed, irregular sleep routine, napping, low activity, and worrying in bed are all maladaptive responses that can arise in the absence of any psychopathology. There is some evidence that behavioral modification, such as patient education and group or individual counseling, can be effective in reversing the effects of insomnia. Behavioral modifications are easily implemented and can include:

6.9.1 Maintaining a regular sleep schedule, retiring and rising at approximately the same time on weekdays and weekends.

6.9.2 Avoiding daytime napping.

6.9.3 Avoiding caffeinated beverages after lunchtime

6.9.4 Making the bedroom quiet and comfortable, eliminating disruptive lights, sounds, television sets, and keeping a bedroom temperature of about 65°F.

6.9.5 Avoiding alcohol or nicotine within two hours of bedtime.

6.9.6 Avoiding large meals within two hours of bedtime.

6.9.7 Exercising vigorously during the day, but not within two hours of bedtime, since this may raise core temperature and activate the nervous system.

6.9.8 Associating the bed with sleep and sexual activity only, using other parts of the home for television, reading and talking on the telephone.

6.9.9 Leaving the bedroom when unable to sleep for more than 20 minutes, returning to the bedroom when ready to sleep again.

These modifications should be undertaken before sleeping medication is prescribed for long term use.

6.10 **THERAPY–PASSIVE** includes those treatment modalities that do not require energy expenditure on the part of the patient. They are principally effective during the early phases of treatment and are directed at controlling symptoms such as pain, inflammation and swelling and to improve the rate of healing soft tissue injuries. They should be used in adjunct with active therapies to help control swelling, pain and inflammation during the rehabilitation process. They may be used intermittently as a therapist deems appropriate or regularly if there are specific goals with objectively measured functional improvements during treatment.

6.10.1 **Electrical Stimulation (Unattended and Attended):** once applied, requires minimal on-site supervision by the physician or non-physician provider. Indications include pain, inflammation, muscle spasm, atrophy, and decreased circulation.

6.10.2 **Extracorporeal shock wave treatment:** Consists of the application of pulses of high pressure sound to soft tissues, similar to lithotriptors. It has been investigated for its effectiveness in the treatment of lateral epicondylitis. It has not been shown to have an advantage over other conservative treatments and remains investigational. It is not recommended.

6.10.3 **Iontophoresis:** is the transfer of medication, including, but not limited to, steroidal anti-inflammatories and anesthetics, through the use of electrical stimulation. Indications include pain (Lidocaine), inflammation (hydrocortisone, salicylate), edema (mecholyl, hyaluronidase, salicylate), ischemia (magnesium, mecholyl, iodine), muscle spasm (magnesium, calcium), calcific deposits (acetate), scars and keloids (chlorine, iodine, acetate).

6.10.4 **Laser irradiation:** Consists of the external application of an array of visible and infrared wavelengths to soft tissues. Time and frequency dependent on severity and chronicity of problem.

6.10.5 **Manual Therapy Techniques:** are passive interventions in which the providers use his or her hands to administer skilled movements designed to modulate pain; increase joint range of motion; reduce/eliminate soft tissue swelling, inflammation, or restriction; induce relaxation; and improve contractile and non-contractile tissue extensibility. These techniques are applied only after a thorough examination is performed to identify those for whom manual therapy would be contraindicated or for whom manual therapy must be applied with caution.

6.10.5.1 **Manipulation:** is generally accepted, well-established and widely used therapeutic intervention for low back pain. Manipulative Treatment (not therapy) is defined as the therapeutic application of manually guided forces by an operator to improve physiologic function and/or support homeostasis that has been altered by the injury or occupational disease, and has associated clinical significance.

High velocity, low amplitude (HVLA) technique, chiropractic manipulation, osteopathic manipulation, muscle energy techniques, counter strain, and non-force techniques are all types of manipulative treatment. This may be applied by osteopathic physicians (D.O.), chiropractors (D.C.), properly trained physical therapists (P.T.), or properly trained medical physicians. Under these different types of manipulation exist many subsets of different techniques that can be described as

6.10.5.1.1 direct- a forceful engagement of a restrictive/pathologic barrier,

6.10.5.1.2 indirect- a gentle/non-forceful disengagement of a restrictive/pathologic barrier,

6.10.5.1.3 the patient actively assists in the treatment and

6.10.5.1.4 the patient relaxing, allowing the practitioner to move the body tissues.

When the proper diagnosis is made and coupled with the appropriate technique, manipulation has no contraindications and can be applied to all tissues of the body. Pre-treatment assessment should be performed as part of each manipulative treatment visit to ensure that the correct diagnosis and correct treatment is employed.

High velocity, low amplitude (HVLA) manipulation is performed by taking a joint to its end range of motion and moving the articulation into the zone of accessory joint movement, well within the limits of anatomical integrity. Indications for manipulation include joint pain, decreased joint motion, and joint adhesions. Contraindications to HVLA manipulation include joint instability, fractures, severe osteoporosis, infection, metastatic cancer, active inflammatory arthritides, aortic aneurysm, and signs of progressive neurologic deficits.

- Time to produce effect for all types of manipulative treatment: 1 to 6 treatments.
- Frequency: Up to 3 times per week for the first 4 weeks as indicated by the severity of involvement and the desired effect, then up to 2 treatments per week for the next 4 weeks. For further treatments, twice per week or less to maintain function.
- Maximum duration: 30 visits. Extended durations of care beyond what is considered “maximum” may be necessary in cases of re-injury, interrupted continuity of care, exacerbation of symptoms, and in those patients with comorbidities. Refer to the Chronic Pain Guidelines for care beyond 6 months.

The combination of 97140 plus either CMT or OMT code is equal to one visit when performed on the same day. Any combination of manual therapeutic intervention exceeding 30 visits (not units) need to go to UR.

6.10.5.2 **Mobilization (Joint) /Manipulation**

Mobilization is passive movement involving oscillatory motions to the involved joints. The passive mobility is performed in a graded manner (I, II, III, IV, or V), which depicts the speed of the maneuver. It may include skilled manual joint tissue stretching. Indications include the need to improve joint play, improve intracapsular arthrokinematics, or reduce pain associated with tissue impingement.

- Time to produce effect: 4 to 6 treatments
- Frequency: 2 to 3 times per week
- Maximum duration: 30 visits (CPT codes 97124 and 97140 can not exceed 30 visits in combination).

6.10.5.3 **Mobilization (Soft Tissue)**

Mobilization of soft tissue is the skilled application of manual techniques designed to normalize movement patterns through the reduction of soft tissue pain and restrictions. Indications include muscle spasm around a joint, trigger points, adhesions, and neural compression.

**Nerve Gliding:** consist of a series of flexion and extension movements of the hand, wrist, elbow, shoulder, and neck that produce tension and longitudinal movement along the length of the median and other nerves of the upper extremity. These exercises are based on the principle that the tissues of the peripheral nervous system are designed for movement, and that tension and glide (excursion) of nerves may have an effect on neurophysiology through alterations in vascular and axoplasmic flow. Biomechanical principles have been more thoroughly studied than clinical outcomes. Nerve gliding performed on a patient by the clinician should be reinforced by patient performance of similar techniques as part of a home exercise program at least twice per day.

- Time to produce effect: 4 to 6 treatments
- Frequency: 2 to 3 times per week
- Maximum duration: 30 visits (CPT codes 97124 and 97140 cannot exceed 30 visits in combination).

6.10.6 **Massage:** Manual or Mechanical - Massage is manipulation of soft tissue with broad ranging relaxation and circulatory benefits. This may include stimulation of acupuncture points and acupuncture channels (acupressure), application of suction cups and techniques that include pressing, lifting, rubbing, pinching of soft tissues by or with the practitioners' hands. Indications include edema, muscle spasm, adhesions, the need to improve peripheral circulation and range of motion, or to increase muscle relaxation and flexibility prior to exercise.

- Time to produce effect: Immediate.
- Frequency: 1 to 3 times per week
- Maximum duration: 12 visits (CPT codes 97124 and 97140 cannot exceed 30 visits in combination).

6.10.7 **Orthotics/Immobilization with Splinting:** is a generally accepted, well-established and widely used therapeutic procedure. Splints may be effective when worn at night or during portions of the day, depending on activities. Splints should be loose and soft enough to maintain comfort while supporting the involved joint in a relatively neutral position. Splint comfort is critical and may affect compliance. Although off-the-shelf splints are usually sufficient, custom thermoplastic splints may provide better fit for certain patients.

Splints may be effective when worn at night or during portions of the day, depending on activities; however, splint use is rarely mandatory. Providers should be aware that over-usage is counterproductive, and counsel patients to minimize daytime splint use in order avoid detrimental effects, such as, stiffness and dependency over time.

- Time to produce effect: 1-4 weeks
- Frequency: Daytime intermittent or night use, depending on symptoms and activities.
- Maximum duration: 2 to 4 months. If symptoms persist, consideration should be given to further diagnostic studies or to other treatment options.

6.10.8 **Superficial Heat and Cold Therapy:** are thermal agents applied in various manners that lowers or raises the body tissue temperature for the reduction of pain, inflammation, and/or effusion resulting from injury or

induced by exercise. Includes application of heat just above the surface of the skin at acupuncture points. Indications include acute pain, edema and hemorrhage, need to increase pain threshold, reduce muscle spasm and promote stretching/flexibility. Cold and heat packs can be used at home as an extension of therapy in the clinic setting.

- Time to produce effect: Immediate
- Frequency: 2 to 5 times per week (clinic). Home treatment as needed.
- Maximum duration: 12 visits with maximum visit 1 per day. If symptoms persist, consideration should be given to further diagnostic studies or other treatment options.

6.10.9 **Ultrasound:** uses sonic generators to deliver acoustic energy for therapeutic thermal and/or nonthermal soft tissue effects. Indications include scar tissue, adhesions, collagen fiber and muscle spasm, and to improve muscle tissue extensibility and soft tissue healing. Ultrasound with electrical stimulation is concurrent delivery of electrical energy that involves dispersive electrode placement. Indications include muscle spasm, scar tissue, pain modulation and muscle facilitation. Phonophoresis is the transfer of medication to the target tissue to control inflammation and pain through the use of sonic generators. These topical medications include, but are not limited to, steroidal anti-inflammatory and anesthetics.

- Time to produce effect: 4 to 8 treatments
- Frequency: 2-3 times per week
- Maximum duration: 18 visits

6.11 **THERAPY–ACTIVE** therapies are based on the philosophy that therapeutic exercise and/or activity are beneficial for restoring flexibility, strength, endurance, function, range of motion, and alleviating discomfort. Active therapy requires an internal effort by the individual to complete a specific exercise or task, and thus assists in developing skills promoting independence to allow self-care after discharge. This form of therapy requires supervision from a therapist or medical provider such as verbal, visual, and/or tactile instructions. At times a provider may help stabilize the patient or guide the movement pattern but the energy required to complete the task is predominately executed by the patient.

Patients should be instructed to continue active therapies at home as an extension of the treatment process in order to maintain improvement levels. Home exercise can include exercise with or without mechanical assistance or resistance and functional activities with assistive devices.

Interventions are selected based on the complexity of the presenting dysfunction with ongoing examination, evaluation and modification of the plan of care as improvement or lack thereof occurs. Change and/or discontinuation of an intervention should occur if there is attainment of expected goals/outcome, lack of progress, lack of tolerance and/or lack of motivation. Passive interventions/modalities may only be used as adjuncts to the active program.

6.11.1 **Activities of Daily Living:** Supervised instruction, active-assisted training, and/or adaptation of activities or equipment to improve a person's capacity in normal daily living activities such as self-care, work re-integration training, homemaking, and driving.

- Time to produce effect: 4 to 5 treatments
- Maximum of 10 sessions

6.11.2 **Aquatic Therapy:** is a well-accepted treatment which consists of the therapeutic use of aquatic immersion for therapeutic exercise to promote strengthening, core stabilization, endurance, range of motion, flexibility, body mechanics, and pain management. Aquatic therapy includes the implementation of active therapeutic procedures in a swimming or therapeutic pool. The water provides a buoyancy force that lessens the amount of force gravity applies to the body. The decreased gravity effect allows the patient to have a mechanical advantage and more likely have a successful trial of therapeutic exercise. The therapy may be indicated for individuals who:

- cannot tolerate active land-based or full-weight bearing therapeutic procedures
- require increased support in the presence of proprioceptive deficit;
- are at risk of compression fracture due to decreased bone density;
- have symptoms that are exacerbated in a dry environment;
- would have a higher probability of meeting active therapeutic goals than in a land-based environment.

The pool should be large enough to allow full extremity range of motion and fully erect posture. Aquatic vests, belts and other devices can be used to provide stability, balance, buoyancy, and resistance.

- Time to produce effect: 4 to 5 treatments
- Frequency: 3 to 5 times per week

- Maximum duration: 24 visits

A self-directed program is recommended after the supervised aquatics program has been established, or, alternatively a transition to a land-based environment exercise program.

6.11.3 **Functional Activities:** are the use of therapeutic activity to enhance mobility, body mechanics, employability, coordination, and sensory motor integration.

- Time to produce effect: 4 to 5 treatments
- Frequency: 3 to 5 times per week
- Maximum duration: 24 visits

Total number of visit 97110 and 97530 should not exceed 36 visits without pre-authorization

6.11.4 **Neuromuscular Re-education:** is the skilled application of exercise with manual, mechanical, or electrical facilitation to enhance strength, movement patterns, neuromuscular response, proprioception, kinesthetic sense, coordination education of movement, balance, and posture. Indications include the need to promote neuromuscular responses through carefully timed proprioceptive stimuli, to elicit and improve motor activity in patterns similar to normal neurologically developed sequences, and improve neuromotor response with independent control.

- Time to produce effect: 2 to 6 treatments
- Frequency: 3-5 times per week
- Maximum duration: 24 visits

6.11.5 **Proper Work Techniques:** Please refer to the “Job Site Evaluation” and “Job Site Alteration” sections of these guidelines.

6.11.6 **Therapeutic Exercise:** with or without mechanical assistance or resistance may include isoinertial, isotonic, isometric and isokinetic types of exercises. Indications include the need for cardiovascular fitness, reduced edema, improved muscle strength, improved connective tissue strength and integrity, increased bone density, promotion of circulation to enhance soft tissue healing, improvement of muscle recruitment, increased range of motion, and are used to promote normal movement patterns. Can also include complementary/alternative exercise movement therapy.

- Time to produce effect: 2 to 6 treatments
- Frequency: 3 to 5 times per week
- Maximum duration: 36 visits

Total number of visit 97110 and 97530 should not exceed 36 visits without pre-authorization

6.12 **RESTRICTION OF ACTIVITIES** Continuation of normal daily activities is the recommendation for Cumulative Trauma Disorders with or without neurologic symptoms. Complete work cessation should be avoided, if possible, since it often further aggravates the pain presentation. Modified return-to-work is almost always more efficacious and rarely contraindicated in the vast majority of injured workers with CTD.

6.13 **VOCATIONAL REHABILITATION** is a generally accepted intervention. Initiation of vocational rehabilitation requires adequate evaluation of patients for quantification of highest functional level, motivation, and achievement of maximum medical improvement. Vocational rehabilitation may be as simple as returning to the original job or as complicated as being retrained for a new occupation.

**17 DE Reg. 322 (09/01/13)**

**7.0 Operative Treatment**

**THE FOLLOWING SURGICAL GUIDELINES ARE NOT INTENDED TO REPLACE THE SURGEON’S JUDGMENT.**

Operative treatment may be indicated when the individual component diagnoses that make up CTD prove unresponsive to the full complement of non-operative options, including job site analysis and modification. Physical exam findings should be well localized and consistent with the diagnosis. Severe neurologic findings are an exception to these indications, and may suggest earlier surgical intervention. Surgical results must anticipate objective functional gains and improved activities of daily living.

Surgery in CTD usually falls into two broad categories: peripheral nerve decompression and muscle or tendon sheath release or debridement. The treating surgeon must determine the appropriate procedure and timing for the individual case. The most common surgical procedures that are performed in CTD patients are listed below; other procedures may be indicated in certain cases.

Since CTD often involves several areas in an upper extremity, surgical treatment of one problem should be performed in conjunction with conservative treatment of other problems in the upper extremity.

7.1 **PERIPHERAL NERVE DECOMPRESSION** Surgery may be considered when findings on history and physical exam correlate specifically with the diagnosis being considered. Subjective complaints should be localized and appropriate to the diagnosis, neurologic complaints should be consistent with the nerve distribution in question, and physical exam findings should correlate with the history. Surgery may be considered as an initial therapy in situations where there is clinical and/or electrodiagnostic evidence of severe or progressive neuropathy. Objective evidence should be present in all cases in which surgery is contemplated. Objective evidence may include: electrodiagnostic (EDX) studies, diagnostic peripheral nerve block which eradicates the majority of the patient's symptoms, or a motor deficit commensurate with the suspected neurologic lesion. Refer to Physical Examination Findings (section D.2, physical examination) for objective diagnostic findings. Job modification should be considered prior to surgery. Refer to the "Job Site Alteration" section for additional information on job modification.

When no objective evidence is present and the patient continues to have signs and symptoms consistent with the diagnosis after six months of conservative treatment including a psychological evaluation, a second opinion should be obtained before operative treatment is considered.

Specific procedures and their indications are outlined below:

7.1.1 **Median Nerve Decompression at the Wrist (carpal tunnel release):** Please refer to the Division's, Carpal Tunnel Syndrome Medical Treatment Guidelines.

7.1.2 **Median Nerve Decompression in the Forearm (pronator teres or flexor digitorum superficialis release):** Please refer to Physical Examination Findings Table (section D.2, physical examination) Electrodiagnostic (EDX) studies may show delayed median nerve conduction in the forearm. If nerve conduction velocity is normal with suggestive clinical findings, the study may be repeated after a 3-6 month period of continued conservative treatment. If the study is still normal, the decision on treatment is made on the consistency of clinical findings and the factors noted above.

7.1.3 **Ulnar Nerve Decompression at the Wrist (ulnar tunnel release or Guyon's canal release)** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination) Electrodiagnostic testing may confirm the diagnosis and differentiate from ulnar entrapment neuropathy at the elbow.

7.1.4 **Ulnar Nerve Decompression/Transposition at the Elbow:** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination) Electrodiagnostic studies (EDX) may indicate an ulnar neuropathy at the elbow. In general, patients with minimal symptoms or without objective findings of weakness tend to respond better to conservative treatment than patients with measurable pinch or grip strength weakness. If objective findings persist despite conservative treatment, surgical options include: simple decompression, medial epicondylectomy with decompression, anterior subcutaneous transfer, and submuscular or intramuscular transfer.

7.1.5 **Sensory Nerve Decompression at the Wrist:** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination) of these guidelines. Electrodiagnostic (EDX) studies can be useful in establishing a diagnosis but negative studies do not exclude the diagnosis

7.1.6 **Radial Nerve Decompression at the Elbow:** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination) Electrodiagnostic (EDX) studies are helpful when positive, but negative studies do not exclude the diagnosis.

7.1.7 **Thoracic Outlet Syndrome:** Please refer to the Division's Thoracic Outlet Syndrome Medical Treatment Guidelines.

7.2 **TENDON DECOMPRESSION OR DEBRIDEMENT** Surgery may be considered when several months of appropriate treatment have failed, and findings on history and physical exam correlate specifically with the diagnosis being considered. Subjective complaints should be localized and appropriate to the diagnosis, and physical exam findings should correlate with the history. Refer to the Physical Examination Findings Table (section D.2, physical examination). Job modification should be considered prior to surgery. Refer to Job Site Alteration (Section F.4) for additional information on job modification.

Specific procedures and their indications are outlined below:

7.2.1 **Subacromial Decompression:** Please refer to the Division's Shoulder Injury Medical Treatment Guidelines.

7.2.2 **Medial or Lateral Epicondyle Release/Debridement:** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination). It is generally accepted that 80% of cases improve with conservative therapy. Intermittent discomfort may recur over six months to one year after initial conservative treatment. Surgery should only be performed to achieve functional gains on those with

significant ongoing impaired activities of daily living. X-rays may be normal or demonstrate spur formation over the involved epicondyle.

7.2.3 **First Extensor Compartment Release (de Quervain's Tenosynovitis):** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination). Surgery should be performed to achieve functional gains on those with significant ongoing impaired activities of daily living.

7.2.4 **Trigger Finger/Thumb Release:** Please refer to Physical Examination Findings Reference Table (section D.2, physical examination). Surgery should be performed to achieve functional gains on those with significant ongoing impaired activities of daily living.

7.3 **CONSIDERATIONS FOR POST-OPERATIVE THERAPY**

7.3.1 **Immobilization:** Controlled mobilization, and/or formal physical/occupational therapy should begin as soon as possible following surgery at the discretion of the treating surgeon. Final decisions regarding the need for splinting post-operatively should be left to the discretion of the treating physician based upon his/her understanding of the surgical technique used and the specific conditions of the patient.

7.3.2 **Home Program:** It is generally accepted that all patients should receive a home therapy protocol involving stretching, ROM, scar care, and resistive exercises. Once they have been cleared for increased activity by the surgeon, patients should be encouraged to use the hand as much as possible for daily activities, allowing pain to guide their level of activity.

7.3.3 **Supervised Therapy Program:** may be helpful in patients who do not show functional improvements post-operatively or in patients with heavy or repetitive job activities. The therapy program may include some of the generally accepted elements of soft tissue healing and return to function:

7.3.3.1 Soft tissue healing/remodeling:

May be used after the incision has healed. It may include any of the following: evaluation, whirlpool, electrical stimulation, soft tissue mobilization, scar compression pad, heat/cold application, splinting or edema control may be used as indicated. Following wound healing, ultrasound and iontophoresis with sodium chloride (NaCl) may be considered for soft tissue remodeling. Diathermy is not an acceptable adjunct.

7.3.3.2 Return to function:

Range of motion and stretching exercises, strengthening, activity of daily living adaptations, joint protection instruction, posture/body mechanics education. Job site modifications may be indicated.

- Time to produce effect: 2-4 weeks
- Frequency: 2-5 times/week
- Maximum duration: 36 visits

**11 DE Reg. 1661 (06/01/08)**
**12 DE Reg. 67 (07/01/08)**