

Complex Regional Pain Syndrome

Montana Utilization and Treatment Guidelines

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**Presented by:
State of Montana**

**Department of Labor and Industry
EMPLOYMENT RELATIONS DIVISION**



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B. General Guideline Principles

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

1. APPLICATION OF GUIDELINES The Department provides procedures to implement medical treatment guidelines and to foster communication to resolve disputes among the providers, payers, and patients through the Administrative Rules of Montana. In lieu of more costly litigation, parties may wish to request an independent medical review from the Department's Medical Director prior to submitting a Petition for a Workers' Compensation Mediation Conference.

2. EDUCATION of the patient and family, as well as the employer, insurer, policy makers and the community should be the primary emphasis in the treatment of complex regional pain syndrome pain and disability. An education-based paradigm should start with communication providing reassuring information to the patient. A more in-depth education within a treatment regime employing functional restorative and innovative programs of prevention and rehabilitation is optimal. A treatment plan should address issues of individual and/or group patient education as a means of facilitating self-management of symptoms and prevention.

3. TREATMENT PARAMETER DURATION 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, as well as availability of services. Clinical judgment may substantiate the need to accelerate or decelerate the time frames discussed in this document.

4. 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.

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

6. FUNCTIONAL IMPROVEMENT GOALS should be consistently addressed. 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.

7. RE-EVALUATION 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.

8. SURGICAL INTERVENTIONS Surgery should be contemplated within the context of expected functional outcome and not purely for the purpose of pain relief. The concept of “cure” with respect to surgical treatment by itself is generally a misnomer. 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.

9. 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.

10. 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 written physical limitations and the patient should be released to return to work with specific physical activity limitations clearly spelled out per the specific job requirement. Release to “sedentary” or “light duty” is not a specific physical limitation. The following physical limitations should be considered and modified as recommended: lifting, pushing, pulling, crouching, walking, using stairs, overhead work, 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 consider all of the physical demands of the patient’s job position before returning the patient to full duty and should request clarification of the patient’s job duties. Clarification should be obtained from the employer or, if necessary, including, but not limited to, a health care professional with experience in ergonomics, an occupational health nurse, a physical therapist, an occupational therapist, a vocational rehabilitation specialist, or an industrial hygienist.

11. 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 Department recognizes that 3 to 10% of all industrially injured patients will not recover within the timelines 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.

12. GUIDELINE RECOMMENDATIONS AND INCLUSION OF MEDICAL EVIDENCE Guidelines are recommendations based on available evidence and/or consensus recommendations. When possible, guideline recommendations will note the level of evidence

supporting the treatment recommendation. When interpreting medical evidence statements in the guideline, the following apply:

Consensus means the opinion of experienced professionals based on general medical principles.

Consensus recommendations are designated in the guideline as “*generally well accepted*,” “*generally accepted*,” “*acceptable*,” or “*well-established*.”

“*Some*” means the recommendation considered at least one adequate scientific study, which reported that a treatment was effective.

“*Good*” means the recommendation considered the availability of multiple adequate scientific studies or at least one relevant high-quality scientific study, which reported that a treatment was effective.

“*Strong*” means the recommendation considered the availability of multiple relevant and high quality scientific studies, which arrived at similar conclusions about the effectiveness of a treatment.

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

13. TREATMENT OF PRE-EXISTING CONDITIONS that preexisted the work injury/disease will need to be managed under two circumstances: (a) A preexisting condition exacerbated by a work injury/disease should be treated until the patient has returned to their prior level of functioning or MMI; and (b) A preexisting condition not directly caused by a work injury/disease but which may prevent recovery from that injury should be treated until its negative impact has been controlled. The focus of treatment should remain on the work injury/disease.

C. Introduction to Complex Regional Pain Syndrome

Complex Regional Pain Syndrome (CRPS Types I and II) describes painful syndromes, which were formerly referred to as Reflex Sympathetic Dystrophy (RSD) and causalgia. CRPS conditions usually follow injury that appears regionally and have a distal predominance of abnormal findings, exceeding the expected clinical course of the inciting event in both magnitude and duration and often resulting in significant impairment of limb function.

CRPS-I (RSD) is a syndrome that usually develops after an initiating noxious event, is not limited to the distribution of a single peripheral nerve, and is apparently disproportionate to the inciting event. It is associated at some point with evidence of edema, changes in skin, blood flow, abnormal sudomotor activity in the region of the pain, allodynia or hyperalgesia. The site is usually in the distal aspect of an affected extremity or with a distal to proximal gradient. The peripheral nervous system and possibly the central nervous system are involved.

CRPS-II (Causalgia) is the presence of burning pain, allodynia, and hyperpathia usually in the hand or foot after partial injury to a nerve or one of its major branches. Pain is within the distribution of the damaged nerve but not generally confined to a single nerve.

Stages seen in CRPS-I are not absolute and in fact, may not all be observed in any single patient. In some patients, stages may be missed or the patient may remain for long periods of time in one stage.

Stage 1 – Acute (Hyperemic)

Starts at the time of injury or even weeks later. Associated with spontaneous pain, aching, burning. Typically restricted to the distal extremity. Hyperpathia, allodynia, hypoesthesia or hyperesthesia may be present. Initially, hair and nail growth may be increased but later decrease. Skin may be warm or cold.

Stage 2 – Dystrophic (Ischemic)

Spontaneous burning and/or aching pain, more pronounced hyperpathia and or allodynia. Signs of chronic sympathetic over activity include (a) reduced blood flow; (b) sudomotor changes; (c) increased edema; (d) cyanotic skin; (e) muscle wasting; (f) decreased hair and nail growth; and (g) osteoporosis.

Stage 3 – Atrophic

Signs and symptoms of this stage include (a) pain may be less prominent; (b) decreased hyperpathia and/or allodynia; (c) reduction in blood flow; (d) skin temperature and sweating may be increased or decreased; (e) irreversible trophic changes in skin and integument; and (f) pronounced muscle atrophy with contractures.

D. Definitions

1. After sensation – Refers to the abnormal persistence of a sensory perception, provoked by a stimulus even though the stimulus has ceased.
2. Allodynia – Pain due to a non-noxious stimulus that does not normally provoke pain.
Mechanical Allodynia – Refers to the abnormal perception of pain from usually non-painful mechanical stimulation.
Static Mechanical Allodynia – Refers to pain obtained by applying a single stimulus such as light pressure to a defined area.
Dynamic Mechanical Allodynia – Obtained by moving the stimulus such as a brush or cotton tip across the abnormal hypersensitive area.
Thermal Allodynia – Refers to the abnormal sensation of pain from usually non-painful thermal stimulation such as cold or warmth.
3. Central Pain – Pain initiated or caused by a primary lesion or dysfunction in the central nervous system (CNS).
4. Central Sensitization – The experience of pain evoked by the excitation of non-nociceptive neurons or of nerve fibers that normally relay non-painful sensations to the spinal cord. This result when non-nociceptive afferent neurons act on a sensitized CNS.
5. Dystonia – State of abnormal (hypo or hyper) tonicity in any of the tissues.
6. Hyperalgesia – Refers to an exaggerated pain response from a usually painful stimulation.
7. Hyperemia – Presence of increased blood in a part or organ.
8. Hyperesthesia (Positive Sensory Phenomenon) – Includes allodynia, hyperalgesia, and hyperpathia. Elicited by light touch, pin-prick, cold, warm vibration, joint position sensation or two-point discrimination, which is perceived as increased or more.
9. Hyperpathia – Refers to an abnormally painful and exaggerated reaction to stimulus, especially to a repetitive stimulus, in a patient who perceives the stimulus as less intense because of an increased threshold.
10. Hypoesthesia – (also hypesthesia), diminished sensitivity to stimulation.
11. Pain Behavior – The nonverbal actions (such as grimacing, groaning, limping, using visible pain relieving or support devices and requisition of pain medications, among others) that are outward manifestations of pain, and through which a person may communicate that pain is being experienced.
12. Sudomotor Changes – Alteration in function of sweat glands; sweat output may increase or decrease due to changes in autonomic input to the gland.
13. Sympathetically Maintained Pain (SMP) – A pain that is maintained by sympathetic efferent innervations or by circulating catecholamines.

14. Trophic Changes – Tissue alterations due to interruption of nerve or blood supply; may include changes in hair growth and texture of skin.

15. Vasomotor Changes – Alteration in regulation of dilation or constriction of blood vessels.

E. Initial Evaluation

All potential pain generators should be thoroughly investigated by complete neurological and musculoskeletal exam and diagnostic procedures. Because CRPS-I is commonly associated with other injuries, it is essential that all related diagnoses are defined and treated. These disturbances are typically restricted to one extremity, usually distally, but are variable in their expression.

E.1 History and Physical Examination

The history and physical exam establish the basis for subsequent diagnostic and therapeutic procedures. When clinical evaluation findings do not complement the findings of other diagnostic procedures, clinical findings should have preference. Before the diagnosis of CRPS-I or CRPS-II is established, an experienced practitioner must perform a detailed neurological and musculoskeletal exam to exclude other potentially treatable pain generators or neurological lesions.

E.1.a Medical History

As in other fields of medicine, a thorough patient history is an important part of the evaluation of pain. In taking such a history, factors influencing a patients' current status can be made clear and taken into account when planning diagnostic evaluation and treatment. History should ascertain the following elements:

i. Causality: How did this injury occur? Was the problem initiated by a work-related injury or exposure?

ii. Presenting symptoms:

1. Severe, generally unremitting burning and/or aching pain, and/or allodynia;
2. Swelling of the involved area;
3. Changes in skin color;
4. Asymmetry in nail and/or hair growth;
5. Abnormal sweat patterns of the involved extremity;
6. Dystonia; and/or
7. Subjective temperature changes of the affected area.

E.1.b Pain History

The patient's description of and response to pain is one of the key elements in treatment. Characterization of the patient's pain and of the patient's response to pain is one of the key elements in treatment.

1. Site of Pain – localization and distribution of the pain help determine the type of pain the patient has (i.e., central versus peripheral).
2. Pain Drawing/Visual Analog Scale (VAS)
3. Duration
4. Place of onset
5. Pain Characteristics – time of pain occurrence as well as intensity, quality and radiation give clues to the diagnosis and potential treatment.
6. Response of Pain to Activity
7. Associated Symptoms – Does the patient have numbness or paresthesia, dysesthesia, weakness, bowel or bladder dysfunction, decreased temperature, increased sweating, cyanosis or edema? Is there local tenderness, allodynia, hyperesthesia or hyperalgesia?

E.1.c Substance Use/Abuse

1. Alcohol use
2. Smoking History
3. History of drug use and abuse.
4. Caffeine or caffeine-containing beverages.

E.1.d Other Factors Affecting Treatment Outcome

1. Compensation/Disability/Litigation
2. Treatment Expectations – What does the patient expect from treatment: complete relief of pain or reduction to a more tolerable level?

E.1.e Medical Management History

Refer to the Department's Chronic Pain Disorder Medical Treatment Guideline's for detailed elements when performing a review of prior medical management. In addition, history may include:

1. Chronological review of medical records including previous medical evaluations and response to treatment interventions;
2. History of diagnostic tests and results including but not limited to any response to sympathetic nerve blocks, results of general laboratory studies, EMG and nerve conduction studies, radiological examinations, including triple phase bone scan or thermography with autonomic stress testing.

3. Medications, including prescription, over-the-counter and herbal/dietary supplements.
4. Review of Systems Check List – Determine if there is any interplay between the pain complaint and other medical conditions.
5. Psychosocial Functioning - Determine if the following are present: current symptoms of depression or anxiety, evidence of stressors in the workplace or at home, and past history of psychological problems. It is recommended that patients diagnosed with CRPS be referred for a psychosocial evaluation. All patients with CRPS have Chronic Pain, and are likely to suffer psychosocial consequences.
6. Pre-existing Conditions – Treatment of these conditions is appropriate when the preexisting condition affects recovery from chronic pain.

E.1.f Physical Examination

Physical Examination should include examination techniques applicable to those portions of the body in which the patient is experiencing subjective symptomatology and should include:

1. Inspection – Changes in appearance of the involved area, to include trophic changes, changes in hair and nail growth, muscular atrophy, changes in skin turgor, swelling and color changes.
2. Temperature Evaluation – Palpable temperature changes may not be detectable in early disease stages, and the examiner will generally only be able to appreciate significant temperature variations. Thermography, or other objective testing may be necessary to display temperature asymmetries.
3. Motor Evaluation – Involuntary movements, dystonia or muscle weakness in the involved limb(s).
4. Sensory Evaluation – A detailed sensory examination is crucial in evaluating a patient with chronic pain complaints. Presence of allodynia. Anatomic pattern of any associated sensory abnormalities to light touch, deep touch, pain and thermal stimulation. Quantitative sensory testing may be useful.
5. Musculoskeletal Evaluation – Presence of associated myofascial problems, such as contractures, ROM or trigger points.
6. Evaluation of Nonphysiologic Findings – Determine the presence of the following: Variabilities on formal exam including variable sensory exam, inconsistent tenderness, and or swelling secondary to extrinsic sources; Inconsistencies between formal exam and observed abilities of range of motion, motor strength, gait and cognitive/emotional state; and/or, observation of consistencies between pain behavior, affect and verbal pain rating, and affect and physical re-examination.

F. Diagnostic Procedures

The Department recommends the following 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. Standard procedures are listed below in order of their suggested usefulness. In addition, it is recommended that all patients diagnosed with CRPS have a full psychosocial evaluation.

F.1 Diagnostic Imaging

Diagnostic imaging is a generally accepted, well-established, and widely used diagnostic procedure when specific indications, based on history and physical examination, are present. Physicians should refer to individual Department guidelines for specific information about specific testing procedures.

a. Plain Film Radiography:

Description - A radiological finding in CRPS may be unilateral osteoporosis; however, osteoporosis may be absent in many cases. In CRPS-I, the osteoporosis may be rapid in progression. The disorder typically affects the distal part of an extremity such as a hand or foot, yet intermediate joints such as the knee or elbow may be involved.

Results - The radiological appearance of osteoporosis has been characterized as spotty or patchy. Although CRPS-I may exist in the absence of osteoporosis, the diagnosis of CRPS-I cannot be made solely on the basis of radiographic appearance or the osteoporosis alone.

b. Triple Phase Bone Scan:

Description - Radionuclide imaging scintigraphy employing radio-pharmaceutical technetium coupled to a phosphate complex has been used to help facilitate the diagnosis of CRPS-1. It was hoped that a three-phase radionuclide study would be selective in the face of demineralization of the bone as seen in CRPS-I. However there are many different types of conditions that can produce osteoporosis and a triple-phase bone scan does not distinguish between the causes of bone demineralization.

Results - Clinical information can be derived from each of the three phases of the bone scan following injection. In the early course of CRPS-I, there is an increased uptake seen during Phase 1. However, in the late course of the disease process, there can actually be a decreased uptake seen. In Phase 2, which reflects the soft tissue vascularity, an increased diffuse uptake may be appreciated during the early course of CRPS-I. During Phase 3, one will see a diffuse uptake of multiple bone involvement of the involved limb, reflecting the bone turnover secondary to osteoporosis. Negative bone scans may be found in up to 40 percent of patients clinically diagnosed with CRPS-I; however when positive it may help to confirm the diagnosis of CRPS-I.

F.2 Injections - Diagnostic Sympathetic

Description — Diagnostic sympathetic injections are generally accepted procedures to aid in the diagnosis of CRPS I & II and SMP. Sympathetic blocks lack specificity for CRPS I & II. Each diagnostic injection has inherent risk and risk versus benefit should always be evaluated when considering injection therapy. Since these procedures are invasive, less invasive or non-invasive procedures should be considered first. Selection of patients, choice of procedure, and localization of the level for injection should be determined by clinical information.

Special Considerations – Injections with local anesthetics of differing duration are required to confirm a diagnosis. In some cases, injections at multiple levels may be required to accurately diagnose pain. Refer to “Injections – Therapeutic” for information on specific injections.

Since fluoroscopic and/or CT guidance during procedures is recommended to document technique and needle placement, an experienced physician should perform the procedure. The practitioner should have experience in ongoing injection training workshops provided by organizations such as the International Spinal Injection Society (ISIS) and be knowledgeable in radiation safety. In addition, practitioners should obtain fluoroscopy training and radiation safety credentialing from their Departments of Radiology, as applicable.

Complications – Complications may include transient neurapraxia, nerve injury, inadvertent spinal injection, infection, venous or arterial vertebral puncture, laryngeal paralysis, respiratory arrest, vasovagal effects, as well as permanent neurological damage.

Contraindications – Absolute contraindications of diagnostic injections include: (a) bacterial infection – systemic or localized to region of injection, (b) bleeding diatheses, (c) hematological conditions, and (d) possible pregnancy. Relative contraindications of diagnostic injections may include: aspirin/antiplatelet therapy (drug may be held for at least 3 days prior to injection).

Test Results – The interpretation of the test result is primarily based upon pain relief of 50 percent or greater. The diagnostic significance of the test result should be evaluated in conjunction with clinical information and further information can be obtained from functional reassessment performed by physical and/or occupational therapy or from results of other diagnostic procedures following a successful block.

Local anesthetics of different durations of action should be considered and could take the place of doing a "placebo" block (i.e. - procaine, lidocaine, marcaine). Pain relief should be at least 50 percent or greater for the duration of the local anesthetic. It should be noted that with CRPS-I it is not unusual for the relief to last longer than the duration of the local anesthetic. If a placebo block is done, the needle should not be placed down to the sympathetic chain nor should an injection of saline be done around the sympathetic chain. Contact with the sympathetic nerves by a needle or pressure on the chain by saline can cause a temporary sympathetic block and give a false positive placebo test. A "sham block" would be preferable to see if the patient is a placebo responder. Additionally, patients with definite CRPS-I can also be placebo responders. The fact that the patient responds positively to a placebo does not mean that he/she does not have CRPS-1. It merely means that the patient is a placebo responder. This increases the value of doing another confirmatory test.

a. Stellate Ganglion Block: For diagnosis and treatment of sympathetic pain involving the face, head, neck, and upper extremities secondary to CRPS-I and II. This block is commonly used for differential diagnosis and is the preferred treatment of CRPS-I pain involving the upper extremity.

For diagnostic testing, use three blocks over a 3-14 day period. For a positive response, pain relief should be 50% or greater for the duration of the local anesthetic and pain relief should be associated with functional improvement.

b. Lumbar Sympathetic Block: Useful for diagnosis and treatment of pain of the pelvis and lower extremity secondary to CRPS-I and II. This block is commonly used for differential diagnosis and is the preferred treatment of sympathetic pain involving the lower extremity. For diagnostic testing, use three blocks over a 3-14 day period. For a positive response, pain relief should be 50% or greater for the duration of the local anesthetic and pain relief should be associated with functional improvement.

c. Phentolamine Infusion Test: An intravenous infusion of phentolamine, an alpha 2 blocker, which results in generalized systemic sympatholysis. The infusion begins with intravenous saline for placebo control. For a positive response, pain relief should be 50 percent or greater and associated with functional improvement. This test aids in the diagnosis of Sympathetically Maintained Pain.

F.3 Thermography (Infrared Stress Thermography)

Description – A generally accepted procedure with some evidence to support its limited use. Infrared thermography may be useful for patients with suspected CRPS-I and II, and SMP. Thermography can distinguish abnormal thermal asymmetry of 1.0 degree Celsius which is not distinguishable upon physical examination. It may also be useful in cases of suspected small caliber fiber neuropathy and to evaluate patient response to sympatholytic interventions.

Special Considerations – The practitioner who supervises and interprets the thermographic evaluation shall follow recognized protocols and be board certified by one of the examining boards of the American Academy of Medical Infrared Imaging, American Academy of Thermology, or American Chiropractic College of Thermology.

Medications with anticholinergic activity (tricyclics, cyclobenzaprine, antiemetics, antipsychotics) may interfere with autonomic testing. The pre-testing protocol which includes cessation of specific medications therapy must be followed for accurate test results. Results of autonomic testing may be affected by peripheral polyneuropathy, radiculopathy or peripheral nerve injury, peripheral vascular disease, generalized autonomic failure, or by Shy-Drager syndrome.

Thermographic Tests – Functional autonomic stress testing may include any of the following methods:

1. Cold Water Stress Test (Cold Pressor Test): Paroxysmal cooling is strongly suggestive of vasomotor instability.

2. Warm Water Stress Test: Paroxysmal warming is strongly suggestive of vasomotor instability.

F.4 Autonomic Test Battery

Description – Resting skin temperature (RST), resting sweat output (RSO), and quantitative sudomotor axon reflex test (QSART) are a recently developed test battery with some evidence to support its limited use in the diagnosis of CRPS-I. Prior authorization is required.

Special Considerations - Medications with anticholinergic activity (tricyclics, cyclobenzaprine, antiemetics, antipsychotics) may interfere with autonomic testing. Results of autonomic testing may be affected by peripheral polyneuropathy, radiculopathy or peripheral nerve injury, peripheral vascular disease, generalized autonomic failure, or by Shy-Drager syndrome.

Test Battery –These tests measure asymmetries in physiologic manifestations of autonomic activity between an affected limb and an unaffected contralateral limb. Skin temperature reflects vasomotor activity and sweat output measures sudomotor activity. The results of the three test components must be combined and scored. The battery of tests must include a measurement of each component (RST, RSO, and QSART).

1. Infrared Resting Skin Temperature (RST): Provides thermographic measurements between the affected and unaffected limb. Generally, a 1° Celsius difference is significant.
2. Resting Sweat Output (RSO): Measures an increase or reduction of 50 percent between the affected and unaffected limb.
3. Quantitative Sudomotor Axon Reflex Test (QSART): Measures the sweat output elicited by iontophoretic application of acetylcholine. An increase or reduction of 50 percent between the affected and unaffected limb is significant.

F.5 Other Diagnostic Tests not Specific for CRPS

The following tests and procedures are not used to establish the diagnosis of CRPS but may provide additional information. The following are listed in alphabetical order.

a. Electrodiagnostic Procedures: Electromyography (EMG) and Nerve Conduction Studies (NCS) are generally accepted, well-established and widely used for localizing the source of the neurological symptoms and establishing the diagnosis of focal nerve entrapments, such as carpal tunnel syndrome or radiculopathy, which may contribute to or coexist with CRPS II (causalgia). Traditional electrodiagnosis includes nerve conduction studies, late responses, (F-Wave, H-reflex) and electromyographic assessment of muscles with needle electrode examination. As CRPS II occurs after partial injury to a nerve, the diagnosis of the initial nerve injury can be made by electrodiagnostic studies. The later development of sympathetically mediated symptomatology however, has no pathognomonic pattern of abnormality on EMG/NCS. When issues of diagnosis are in doubt, a referral or consultation with a physiatrist or neurologist trained in electrodiagnosis is appropriate.

b. Laboratory Tests: are generally accepted well-established and widely used procedures and can provide useful diagnostic and monitoring information. They may be used when there is suspicion of systemic illness, infection, neoplasia, or underlying rheumatologic disorder, connective tissue disorder, or based on history and/or physical examination. Tests include, but are not limited to:

1. Complete Blood Count (CBC) with differential can detect infection, blood dyscrasias, and medication side effects;
2. Erythrocyte sedimentation rate, rheumatoid factor, antinuclear antigen (ANA), human leukocyte antigen (HLA), and C-reactive protein can be used to detect evidence of a rheumatologic, infection, or connective tissue disorder, serum protein electrophoresis;
3. Thyroid, glucose and other tests to detect endocrine disorders;
4. Serum calcium, phosphorous, uric acid, alkaline phosphatase, and acid phosphatase can detect metabolic bone disease;
5. Urinalysis for calcium, phosphorus, hydroxyproline, or hematuria;
6. Liver and kidney function may be performed for baseline testing and monitoring of medications; and
7. Toxicology Screen and/or Blood Alcohol Level if suspected drug or alcohol abuse.

c. Peripheral Blood Flow (Laser Doppler or Xenon Clearance Techniques): This is currently being evaluated as a diagnostic procedure in CRPS-I and is not recommended by the Department at this time.

d. Personality/Psychosocial/Psychological Evaluation: Psychosocial assessment requires consideration of variations in pain experience and expression because of numerous factors. Psychometric Testing is a valuable component of a consultation to assist the physician in making a more effective treatment plan. There is strong evidence that psychometric testing provides unique and useful information, and that the validity of such tests is comparable to the validity of medical tests. All patients who are diagnosed as having chronic pain should be referred for a Psychosocial Evaluation as well as concomitant interdisciplinary rehabilitation treatment whenever appropriate.

i. Qualifications

A) A psychologist with a PhD, PsyD, EdD credentials, or a physician with Psychiatric MD/DO credentials may perform the initial comprehensive evaluations. It is preferable that these professionals have experience in diagnosing and treating chronic pain disorders in injured workers.

B) Psychometric tests may be administered by psychologists with a PhD, PsyD, or EdD, or by physicians with appropriate training.

ii. Clinical Evaluation – All chronic pain patients should have a clinical evaluation that addresses the following areas:

A) History of Injury – The history of the injury should be reported in the patient’s words or using similar terminology. Caution must be exercised when using translators.

1. Nature of injury
2. Psychosocial circumstances of the injury
3. Current symptomatic complaints
4. Extent of medical corroboration
5. Treatment received and results
6. Compliance with treatment
7. Coping strategies used, including perceived locus of control
8. Perception of medical system and employer
9. History of response to prescription medications

B) Health History

1. Nature of injury
2. Medical history
3. Psychiatric history
4. History of alcohol or substance abuse
5. Activities of daily living
6. Mental status exam
7. Previous injuries, including disability, impairment, and compensation

C) Psychosocial history

1. Childhood history, including abuse
2. Educational history
3. Family history, including disability
4. Marital history and other significant adulthood activities and events

5. Legal history, including criminal and civil litigation
6. Employment and military history
7. Signs of pre-injury psychological dysfunction
8. Current interpersonal relations, support, living situation
9. Financial history

D) Psychological test results, if performed

E) Danger to self or others.

F) Current psychiatric diagnosis consistent with the standards of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM).

G) Pre-existing psychiatric conditions. Treatment of these conditions is appropriate when the preexisting condition affects recovery from chronic pain.

H) Causality (to address medically probable cause and effect, distinguishing pre-existing psychological symptoms, traits and vulnerabilities from current symptoms).

I) Treatment recommendations with respect to specific goals, frequency, timeframes, and expected outcomes.

iii. Tests of Psychological Functioning

Psychometric Testing is a valuable component of a consultation to assist the physician in making a more effective treatment plan. Psychometric testing is useful in the assessment of mental conditions, pain conditions, cognitive functioning, treatment planning, vocational planning and evaluation of treatment effectiveness. There is no general agreement as to which standardized psychometric tests should be specifically recommended for psychological evaluations of chronic pain conditions. It is appropriate for the mental health provider to use their discretion and administer selective psychometric tests within their expertise and within standards of care in the community. Some of these tests are available in Spanish and other languages, and many are written at a 6th grade reading level.

e. Special Tests: tests are generally well-accepted tests and are performed as part of a skilled assessment of the patients' capacity to return to work, strength capacity, and or physical work demands classifications and tolerance. Tests include Computer-Enhanced Evaluations, Functional Capacity Evaluation (FCE), Jobsite Evaluation, Vocational Assessment, and Work Tolerance Screening. Refer to the Department's Chronic Pain Medical Treatment Guidelines for detailed information and frequency of each special testing procedure.

G. Diagnosis of CRPS

G.1 Diagnostic Components of CRPS-I (RSD)

a. Subjective Complaints: Complaint of pain, usually burning or aching pain and out of proportion to identified pathology. May be sharp, or lancinating. Frequently is present without provocation or movement.

b. Physical Findings:

1. Swelling, generally unilateral and variable in presentation.
2. Vasomotor signs – Unilateral. Initial extremity warming early on, coldness of extremity as condition progresses. Discoloration of skin usually darker blue or purple, may be mottled, may be paler.
3. Sudomotor sign – Increased sweating of the involved extremity.
4. Trophic Changes – Coarse, thick hair, later may be sparse; nails brittle, ridged, may grow faster initially, later grow more slowly; skin is smooth, shiny; digits tapered (pencil pointing); joints stiff with decreased ROM; muscle wasting; motor disturbances; increased physiological tremor, dystonia.

c. Diagnostic Testing Procedures:

1. X-rays of both extremities;
2. Triple Phase Bone Scan;
3. Sympathetic Blocks;
4. Infrared Thermogram;
5. Autonomic Test Battery

G.2 Diagnostic Criteria for CRPS

a. CRPS-I (RSD):

1. Patient complains of pain, usually diffuse burning or aching;
2. Patient has physical findings on examination of at least vasomotor and/or sudomotor signs. Allodynia and/or trophic changes add strength to the diagnosis of CRPS-I; and
3. At least two diagnostic testing procedures are positive. Even the most sensitive tests can have false negatives. The patient can still have CRPS-I, if clinical signs are strongly

present. In patients with continued signs and symptoms of CRPS-I, further diagnostic testing may be appropriate.

b. CRPS-II (causalgia):

1. Patient complains of pain;
2. Documentation of peripheral nerve injury with pain initially in the distribution of the injured nerve;
3. Patient has physical findings on examination of at least vasomotor and/or sudomotor signs. Allodynia and/or trophic changes add strength to the diagnosis of CRPS-II; and
4. At least two diagnostic testing procedures are positive. Even the most sensitive tests can have false negatives. The patient can still have CRPS-II, if clinical signs are strongly present. In patients with continued signs and symptoms of CRPS-II, further diagnostic testing may be appropriate.

c. Sympathetically Mediated Pain (SMP):

1. Patient complains of pain;
2. Usually does not have clinically detectable vasomotor or sudomotor signs; and
3. Has pain relief with sympathetic blocks.

d. Not CRPS:

1. Patient complains of pain;
2. May or may not have vasomotor or sudomotor signs;
3. No relief with sympathetic blocks; and
4. No more than one other diagnostic test procedure is positive.

H. Therapeutic Procedures - Non-Operative

Non-operative therapeutic rehabilitation is applied to patients with CRPS or SMP who experience chronic and complex problems of de-conditioning and functional disability. Treatment modalities may be utilized sequentially or concomitantly depending on chronicity and complexity of the problem, and treatment plans should always be based on a diagnosis utilizing appropriate diagnostic procedures.

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

a. 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 H.12 Return-to-Work for detailed information.

b. Reassessment of the patient's status in terms of functional improvement should be documented after each treatment. If patients are not responding within the recommended time periods, alternative treatment interventions, further diagnostic studies or consultations should be pursued. Continued treatment should be monitored using objective measures such as:

- Return to work or maintaining work status.
- Fewer restrictions at work or performing or limitations in activities of daily living (ADL).
- Decrease in usage of medications.
- Measurable functional gains, such as increased range of motion or documented increase in strength.

c. Clinicians 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.

d. Psychological or psychosocial screening should be performed on all chronic pain patients.

The following procedures are listed in alphabetical order.

H.1 Acupuncture

Acupuncture is an accepted and widely used procedure for the relief of pain and inflammation and there is some scientific evidence to support its use. Credentialed practitioners must perform acupuncture evaluations, with experience in evaluation and treatment of chronic pain patients. 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. It is commonly used when pain medication is

reduced or not tolerated. It may be used as an adjunct to physical rehabilitation, surgical intervention, and or as part of multidisciplinary treatment to hasten the return of functional activity. Acupuncture should be performed by licensed practitioners.

Refer to the Department's Chronic Pain Medical Treatment guideline's for detailed information on acupuncture and timeframe parameters.

H.2 Biofeedback

Biofeedback is a generally well-accepted form of behavioral medicine that helps patients learn self-awareness and self-regulation skills for the purpose of gaining greater control of their physiology. Biofeedback treatment is intended to assist patients in managing stress-related psychophysiological reactions that may arise as a reaction to organic pain, or which may cause pain. The biofeedback specialist may utilize a variety of interventions for teaching physiological self-management. Biological feedback may then be provided through mechanisms ranging from simple devices to electronic instrumentation, and displayed or fed back to the patient visually, auditorially, or tactilely. This enables the patient to identify and refine effective interventions.

The application of biofeedback to patients with CRPS is not well researched. However, based on CRPS symptomology, temperature or skin conductance feedback modalities may be of particular interest. Refer to the Department's Chronic Pain Medical Treatment Guideline's for detailed information on biofeedback and time parameters.

H.3 Complementary Alternative Medicine (CAM)

Complementary Alternative Medicine (CAM) is a term used to describe a broad range of treatment modalities, a number of which are generally accepted and supported by some scientific evidence, and others which still remain outside the generally accepted practice of conventional Western Medicine. In many of these approaches, there is attention given to the relationship between physical, emotional, and spiritual well-being. While CAM may be performed by a myriad of both licensed and non-licensed health practitioners with training in one or more forms of therapy, credentialed practitioners should be used when available or applicable.

Refer to the Department's Chronic Pain Medical Treatment guideline's for detailed information on CAM and timeframe parameters.

H.4 Disturbances of Sleep

Disturbances of Sleep are common in chronic pain. Although primary insomnia may accompany pain as an independent comorbid 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 chronic pain 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:

1. Maintaining a regular sleep schedule, retiring and rising at approximately the same time on weekdays and weekends.
2. Avoiding daytime napping.
3. Avoiding caffeinated beverages after lunchtime
4. Making the bedroom quiet and comfortable, eliminating disruptive lights, sounds television sets, and keeping a bedroom temperature of about 65°F.
5. Avoiding alcohol or nicotine within two hours of bedtime.
6. Avoiding large meals within two hours of bedtime.
7. Exercising vigorously during the day, but not within two hours of bedtime, since this may raise core temperature and activate the nervous system.
8. h. Associating the bed with sleep and sexual activity only, using other parts of the home for television, reading and talking on the telephone.
9. i. Leaving the bedroom when unable to sleep for more than 20 minutes, retuning to the bedroom when ready to sleep again.

These modifications should be undertaken before sleeping medication is prescribed.

H.5 External Irradiation for Sympathectomy

External Irradiation for Sympathectomy is a non-invasive means to produce sympathectomy for patients with CRPS, but has adverse effects and is moderate to high cost. There is some evidence against using External Irradiation for Sympathectomy for treatment of CRPS and therefore it is not recommended.

H.6 Injections - Therapeutic

When considering the use of injections in CRPS management, the treating physician must carefully consider the inherent risks and benefits. First, it is understood that these injections are seldom meant to be “curative” but may have diagnostic or prognostic qualities and when used for therapeutic purposes they are employed in conjunction with other treatment modalities for maximum benefit. Second, education of the patient should include the proposed goals of the injections, expected gains, risks or complications, and alternative treatment. Lastly, reassessment of the patient’s status in terms of functional improvement should be documented after each

injection and/or series of injections. Any continued use of injections should be monitored using objective measures such as:

1. Return to work or maintaining work status.
2. Fewer restrictions at work or when performing activities of daily living (ADL).
3. Decrease in usage of medications.
4. Measurable functional gains, such as increased range of motion or documented increase in strength.

Visual analog scales (VAS) provide important subjective data but are not an appropriate measure of function.

The physician must be aware of the possible placebo effect as well as the long-term effects of injections related to the patient's physical and mental status. Strict adherence to contraindications, both absolute and relative, may prevent potential complications. Subjecting the patient to potential risks, i.e., needle trauma, infection, nerve injury, or systemic effects of local anesthetics and corticosteroids, must be considered before the patient consents to such procedures.

H.6.a Sympathetic Injections

Description – Sympathetic injections are generally accepted, well-established procedures and may be used for sympathetically mediated pain as well as CRPS when functional progress as described below is attained. They include stellate ganglion blocks, lumbar sympathetic, and intravenous regional (Bier) blocks. Regional blocks frequently use bretylium with additional agents (narcotics and or anti-inflammatory drugs). There is some evidence that bretylium reduces pain intensity. It is recommended that all patients receiving therapeutic blocks participate in an appropriate exercise program that may include a functionally directed rehabilitation program.

Indications – Pain relief and functional improvement from previous diagnostic or therapeutic blocks.

Special Considerations – Except for Bier blocks, fluoroscopic and/or CT guidance during procedures is recommended to document technique and needle placement; an experienced physician should perform the procedure. The practitioner should participate in ongoing injection training workshops provided by organizations such as the International Spinal Injection Society (ISIS) and be knowledgeable in radiation safety. In addition, practitioners should obtain fluoroscopy training and radiation safety credentialing from their Departments of Radiology, as applicable.

Complications – Complications may include transient neurapraxia, nerve injury, inadvertent spinal injection, infection, venous or arterial vertebral puncture, laryngeal paralysis, respiratory arrest, vasovagal effects, as well as permanent neurologic damage.

Contraindications – Absolute contraindications of therapeutic injections include: (a) bacterial

infection – systemic or localized to region of injection, (b) bleeding diatheses, (c) hematological conditions, and (d) possible pregnancy. Relative contraindications of therapeutic injections may include: aspirin/antiplatelet therapy (drug may be held for at least 3 days prior to injection).

Treatment Parameters – To be effective as a treatment modality, the patient should be making measurable progress in their rehabilitation program and should be achieving an increasing or sustained duration of relief between blocks. If appropriate outcomes are not achieved, changes in treatment should be undertaken.

- Time to produce effect: 1 to 3 blocks
- Frequency: Variable, depending upon duration of pain relief and functional gains. During the first two weeks of treatment, blocks may be provided every 3 to 5 days, based on patient response. After the first two weeks, blocks may be given weekly with tapering for a maximum of 7 injections over 6 weeks.
- Optimum duration: 3 months.
- Maximum duration: 3 to 4 months for initial treatment. For the use of blocks during maintenance care, refer to the Maintenance Care section for treatment parameters.

H.6.b Trigger Point Injections

May be appropriate when myofascial trigger points are present on examination. Refer to chronic pain guidelines for treatment parameters.

H.6.c Peripheral Nerve Blocks

May be appropriate when peripheral nerve pathology is identified. Refer to chronic pain guidelines for treatment parameters.

H.6.d Bier Blocks

Description – Bier blocks provide intravenous regional anesthesia to an affected limb. A bier block is administered using a special double-cuffed tourniquet. Bier blocks have used guanethidine, phentolamine, bretylium, methylprednisolone, local anesthetic with or without corticosteroid, and reserpine to treat CRPS.

Indications – Bier blocks using guanethidine (strong evidence against), or methylprednisolone (limited evidence against) are not recommended for treatment of CRPS. Bier blocks using bretylium are recommended by limited evidence for treatment of severe cases of CRPS: Severe CRPS that has not responded or is inadequately controlled with NSAIDs, active exercise, physical therapy/occupational therapy, and bisphosphonates. It may be reasonable to attempt control with clonidine, anti-convulsants, tricyclic anti-depressants and hyperbaric oxygen prior to consideration of bretylium. Should be performed as an adjunct to improve physical capabilities through a functional restoration program.

Complications – Over-weakening of injected muscles, allergic reaction to medications. Rare systemic effects include flu-like syndrome, weakening of distant muscle. There is an increased risk of systemic effects in patients with motor neuropathy or disorders of the neuromuscular junction.

- Time to produce effect: 24 to 72 hours post injection with peak effect by 4 to 6 weeks.
- Additional blockades should be based on objective evidence of improvement.

H.6.e Intravenous lidocaine

May be used as a prognostic indicator for the use of mexilitine. It is infrequently used as a therapeutic treatment.

H.6.f Intravenous Clonidine

Intravenous regional anesthesia with clonidine for administration prior to surgery to prevent recurrence of CRPS in patients who have previously had CRPS. It may also be considered in patients undergoing surgery who are considered at increased risk for CRPS.

H.6.g NSAIDs

NSAIDs are recommended as intravenous adjuncts for regional blockades that also include lidocaine and clonidine for treatment of CRPS.

H.7 Interdisciplinary Rehabilitation Programs

Interdisciplinary Rehabilitation Programs are the gold standard of treatment for individuals with chronic pain who have not responded to less intensive modes of treatment. In addition, there are current studies to support the use of pain programs.

These programs should assess the impact of pain and suffering on the patient's medical, physical, psychological, social, and/or vocational functioning. In general, interdisciplinary programs deal with irreversible, painful musculoskeletal, neurological, and other chronic painful disorders and psychological issues, including drug dependence, high levels of stress and anxiety, failed surgery and pre-existing or latent psychopathology. The number of professions involved in the team in chronic pain program may vary due to the complexity of the needs of the person served. The Department recommends consideration of referral to an interdisciplinary program within 6 months post-injury in patients with delayed recovery unless surgical interventions or other medical complications intervene.

Chronic pain patients need to be treated as outpatients within a continuum of treatment intensity. Outpatient chronic pain programs are available with services provided by a coordinated interdisciplinary team within the same facility (formal) or as coordinated by the authorized treating physician (informal). Formal programs are able to provide coordinated, high intensity level of services and are recommended for most chronic pain patients who have received multiple therapies during acute management, especially patients with greater levels of perceived

disability, dysfunction, de-conditioning and psychological involvement. Informal programs offer a lesser intensity of service and may be considered for patients who are currently employed, those who cannot attend all day programs, those with language barriers, or those living in areas not offering formal programs. An informal interdisciplinary program is one in which the authorized treating physician coordinates all aspects of care.

Refer to the Department's Chronic Pain Medical Treatment Guidelines for detailed information about these programs and timeframe parameters. Before treatment has been initiated, the patient, physician, and insurer should agree on treatment approach, methods and goals. Generally the type of outpatient program needed will depend on the degree of impact the pain has had on the patient's medical, physical, psychological, social and/or vocational functioning.

Inpatient Pain Rehabilitation Programs are rarely needed but may be necessary for certain patients. Refer to the Department's Chronic Pain Medical Treatment Guideline for detailed conditions that may require inpatient pain rehabilitation.

Outpatient interdisciplinary pain programs, whether formal or informal, should be comprised of the following dimensions:

a. Communication: To ensure positive functional outcomes, communication between the patient, insurer, and all professionals involved must be coordinated and consistent. Any exchange of information must be provided to all professionals, including the patient. Care decisions would be communicated to all.

b. Documentation: Thorough documentation by all professionals involved and or discussions with the patient, it should be clear that functional goals are being actively pursued and measured on a regular basis to determine their achievement or need for modification.

c. Treatment Modalities: Use of modalities may be necessary early in the process to facilitate compliance with and tolerance to therapeutic exercise, physical conditioning, and increasing functional activities. Active treatments should be emphasized over passive treatments. Active treatments should encourage self-coping skills and management of pain, which can be continued independently at home or at work. Treatments that can foster a sense of dependency by the patient on the caregiver should be avoided. Treatment length should be decided based upon observed functional improvement. For a complete list of Active and Passive Therapies, refer to the Section H.13 and 14. All treatment timeframes may be extended based upon the patient's positive functional improvement.

d. Therapeutic Exercise Programs: There is strong evidence that these programs, including aerobic conditioning and strengthening, are superior to treatment programs that do not include exercise. There is no sufficient evidence to support the recommendation of any particular exercise regimen over any other exercise regimen. A therapeutic exercise program should be initiated at the start of any treatment rehabilitation. Such programs should emphasize education, independence, and the importance of an on-going exercise regime.

e. Return-to-Work: The authorized treating physician should continually evaluate the patient

for their potential to return to work. When return to work is an option, it may be appropriate to implement a Work Hardening Program (as described in this section). For patients currently employed, efforts should be aimed at keeping them employed. For more specific information regarding return to work, refer to the Return-to-Work section in this guideline.

f. Patient Education: Patients with pain need to re-establish a healthy balance in lifestyle. All providers should educate patients on how to overcome barriers to resuming daily activity, including pain management, decreased energy levels, financial constraints, decreased physical ability and change in family dynamics.

g. Psychosocial Evaluation and Treatment: should be initiated, if not previously done. Providers of care should have a thorough understanding of the patient's personality profile; especially if dependency issues are involved. Psychosocial treatment may enhance the patient's ability to participate in pain treatment rehabilitation, manage stress, and increase their problem-solving and self-management skills.

h. Vocational Assistance: can define future employment opportunities or assist patients in obtaining future employment. Refer to Section H.12 Return to Work section for detailed information.

H.8 Medications

There is no single formula for pharmacological treatment of patients with chronic nonmalignant pain. 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. Appropriate application of pharmacological agents depends on the patient's age, past history (including history of substance abuse), drug allergies, and the nature of all medical problems. It is incumbent upon the physician to thoroughly understand pharmacological principles when dealing with the different drug families and their respective side effect, bioavailability profiles and primary reason for each medication's usage.

Control of chronic non-malignant pain is expected to involve the use of medication. Strategies for pharmacological control of pain cannot be precisely specified in advance. Rather, drug treatment requires close monitoring of the patient's response to therapy, flexibility on the part of the prescriber, and a willingness to change treatment when circumstances change. Many of the drugs discussed in the medication section were licensed for indications other than analgesia, but are effective in the control of many types of chronic pain.

All medications should be given an appropriate trial in order to test for therapeutic effect. Trials of medication requiring specific therapeutic drug levels may take several months to achieve, depending upon the half-life of the drug. It is recommended that patients with CRPS be maintained on drugs that have the least serious side effects. For example, patients need to be tried or continued on acetaminophen and or antidepressant medications whenever feasible as part of their overall treatment for chronic pain. It is recommended that use of opioid analgesic and sedative hypnotic medications in chronic pain patients be used in a very limited manner, with total elimination desirable whenever clinically feasible.

For the clinician to interpret the following material, it should be noted that: (1) drug profiles listed are not complete; (2) dosing of drugs will depend upon the specific drug, especially for off-label use; and (3) not all drugs within each class are listed, and other drugs within the class may be appropriate. Clinicians should refer to informational texts or consult a pharmacist before prescribing unfamiliar medications or when there is a concern regarding drug interactions.

The following drug classes are listed in alphabetical order, not in order of suggested use.

H.8.a Anticonvulsants

Although the mechanism of action of anticonvulsant drugs in neuropathic pain states remains to be fully defined, they appear to act as nonselective sodium channel blocking agents. A large variety of sodium channels are present in nervous tissue, and some of these are important mediators of nociception, as they are found primarily in unmyelinated fibers and their density increases following nerve injury. While the pharmacodynamic effects of the various anticonvulsant drugs are similar, the pharmacokinetic effects differ significantly. Carbamazepine has important effects as an inducer of hepatic enzymes and may influence the metabolism of other drugs enough to present problems in patients taking more than one drug. Gabapentin and oxcarbazepine, by contrast, are relatively non-significant enzyme inducers, creating fewer drug interactions. Because anticonvulsant drugs may have more problematic side-effect profiles, their use should usually be deferred until antidepressant drugs have failed to relieve pain.

i. Gabapentin (Neurontin)

1. Description – Structurally related to gamma aminobutyric acid (GABA) but does not interact with GABA receptors.
2. Indications – Neuropathic pain.
3. Relative Contraindications – Renal insufficiency.
4. Dosing and Time to Therapeutic Effect – Dosage may be increased over several days.
5. Major Side Effects – Confusion, sedation.
6. Drug Interactions – Oral contraceptives, cimetidine, antacids.
7. Recommended Laboratory Monitoring – Renal function.

H.8.b Antidepressants

Antidepressants are classified into a number of categories based on their chemical structure and their effects on neurotransmitter systems. Their effects on depression are attributed to their actions on disposition of norepinephrine and serotonin at the level of the synapse; although these synaptic actions are immediate, the symptomatic response in depression is delayed by several weeks. When used for chronic pain, the effects may in part arise from treatment of underlying depression, but may also involve additional neuromodulatory effects on endogenous opioid

systems, raising pain thresholds at the level of the spinal cord.

Pain responses may occur at lower drug doses with shorter times to symptomatic response than are observed when the same compounds are used in the treatment of mood disorders.

Neuropathic pain, diabetic neuropathy, post-herpetic neuralgia, and cancer-related pain may respond to antidepressant doses low enough to avoid adverse effects that often complicate the treatment of depression.

i. Tricyclics (e.g., amitriptyline [Elavil], nortriptyline [Pamelor, Aventyl], doxepin [Sinequan, Adapin])

1. Description – Serotonergics, typically tricyclic antidepressants (TCAs), are utilized for their serotonergic properties as increasing CNS serotonergic tone can help decrease pain perception in non-antidepressant dosages. Amitriptyline is known for its ability to repair Stage 4 sleep architecture, a frequent problem found in chronic pain patients and to treat depression, frequently associated with chronic pain.
2. Indications – Chronic musculoskeletal and/or neuropathic pain, insomnia. Second line drug treatment for depression.
3. Major Contraindications – Cardiac disease or dysrhythmia, glaucoma, prostatic hypertrophy, seizures, suicide risk.
4. Dosing and Time to Therapeutic Effect – Varies by specific tricyclic. Low dosages are commonly used for chronic pain and/or insomnia.
5. Major Side Effects – Anticholinergic side effects including, but not limited to, dry mouth, sedation, orthostatic hypotension, cardiac arrhythmia, weight gain.
6. Drug Interactions – Tramadol (may cause seizures), Clonidine, cimetidine, sympathomimetics, valproic acid, warfarin, carbamazepine, bupropion, anticholinergics, quinolones.
7. Recommended Laboratory Monitoring – Renal and hepatic function. Electrocardiogram (EKG) for those on high dosages or with cardiac risk.

ii. Duloxetine

- Description: duloxetine is often placed in the SSRI class of medications, but duloxetine is a mixed norepinephrine and serotonin inhibitors. Duloxetine is the newest of these medications with a mechanism of action that is thought to be more similar to that of TCAs. Duloxetine has been approved for management of painful diabetic peripheral neuropathy. May be moderately costly.
- Indications – for limited use in select patients with CRPS who failed multiple other modalities including trials of tricyclic anti-depressants, anti-convulsant agents, and

NSAIDs. Duloxetine should be considered a third-line agent. Sedation is a common side effect.

H.8.c Bisphosphonates

i Description – class of pharmaceutical agents that reduce osteoclastic activity in bone, resulting in net gain of bone mass.

ii Indications – Bisphosphonates are strongly recommended for patients with CRPS after NSAIDs and physical therapy interventions have been trialed. Bisphosphonates are not recommended for patients with any chronic pain conditions other than CRPS

iii Dosing and Time to Therapeutic Effect – Taken in oral or parenteral formulations. Duration for CRPS patients may be indefinite, although most do not require indefinite treatment as the condition usually gradually improves or in some cases resolves spontaneously

iv Major Side Effects – Adverse effects include gastritis, reflux esophagitis (can be severe and erosive causing stricture and achalasia), and osteonecrosis of the jaw (uncommon).

H.8.d Calcitonin

i Description – Calcitonin, the lesser known of the thyroid's two main hormones, is secreted by parafollicular cells, and is involved in increasing calcium uptake from the GI tract while also decreasing bone resorption. It is also thought to have anti-nociceptive effects that have not been well elucidated. The salmon calcitonin formulation that is nasally inhaled has been most used due to ease of administration and longer half-life than human calcitonin.

ii Indications – Calcitonin has some evidence recommending it as an option for CRPS patients who have inadequate symptom relief with NSAIDs, corticosteroids, active physical and/or occupational therapy, and bisphosphonates.

iii Dosing and Time to Therapeutic Effect – Parenteral administration may be preferred based on information suggesting less benefit with intranasal administration. Duration of use for CRPS patients may be indefinite, although most do not require this as the condition usually improves or resolves spontaneously

iv Major Side Effects – Adverse effects are relatively rare and include nausea, vomiting, decreased appetite, abdominal pain, injection site reactions, nasal symptoms, rhinitis, sinusitis, anaphylaxis, bronchospasm, hypersensitivity reactions, osteogenic sarcoma, and hypocalcemic tetany.

H.8.e Hypnotics and Sedatives

Sedative and hypnotic drugs decrease activity, induce drowsiness, and moderate agitation. Many drugs produce these effects incidental to their usual intended effects, similar to the side effects of many antihistamines and antidepressants. Due to the habit-forming potential of the benzodiazepines and other drugs found in this class, they are not routinely recommended but

may be useful in some patients with chronic pain.

Most insomnia in chronic pain patients should be managed primarily through behavioral interventions with medications as secondary measures (refer to Section H.4 “Disturbances of Sleep” section).

i. Zaleplon (Sonata)

1. Description – A nonbenzodiazepine hypnotic.
2. Indications – Insomnia.
3. Dosing and Time to Therapeutic Effect – Time of onset is 30 to 60 minutes. Due to rapid elimination, may be taken as little as 4 hours before awakening.
4. Major Side Effects – Dizziness, dose-related amnesia.
5. Drug Interactions – Increases sedative effect of other CNS depressant drugs. Use low dose if on cimetidine.
6. Recommended Laboratory Monitoring – Hepatic function.

ii. Zolpidem (Ambien)

1. Description – A nonbenzodiazepine hypnotic, which does not appear to cause rebound insomnia. It has little respiratory depression and insignificant anxiolytic or muscle relaxant activity.
2. Indications – Short-term use for insomnia
3. Time to Produce Therapeutic Effect – Onset of action is 30 to 60 minutes
4. Major Side Effects – Dizziness, dose-related amnesia.
5. Drug Interactions – Increases sedative effect of other CNS depressant drugs.
6. Recommended Laboratory Monitoring – Hepatic function.

H.8.f Opioids

Opioids are the most powerful analgesics. Their use in acute pain and moderate to severe cancer pain is well accepted. Their use in chronic nonmalignant pain, however, is fraught with controversy and lack of scientific research.

Opioids include some of the oldest and most effective drugs used in the control of severe pain. The discovery of opioid receptors and their endogenous peptide ligands has led to an understanding of effects at the binding sites of these naturally occurring substances. Most of their analgesic effects have been attributed to their modification of activity in pain pathways within

the central nervous system; however, it has become evident that they also are active in the peripheral nervous system. Activation of receptors on the peripheral terminals of primary afferent nerves can mediate antinociceptive effects, including inhibition of neuronal excitability and release of inflammatory peptides. Some of their undesirable effects on inhibiting gastrointestinal motility are peripherally mediated by receptors in the bowel wall.

The central nervous system actions of these drugs account for much of their analgesic effect and for many of their other actions, such as respiratory depression, drowsiness, mental clouding, reward effects, and habit formation. With respect to the latter, it is crucial to distinguish between three distinct phenomena: tolerance, dependence, and addiction.

Tolerance refers to a state of adaptation in which exposure to a drug over time causes higher doses of that drug to be required in order to produce the same physiologic effect.

Dependence refers to a set of disturbances in body homeostasis that leads to withdrawal symptoms, which can be produced with abrupt discontinuation, rapid reduction, decreasing blood levels, and /or by administration of an antagonist.

Addiction is a primary, chronic, neurobiologic disease, with genetic, psychological, and environmental factors influencing its development and manifestations. It is a behavioral pattern of drug craving and seeking which leads to a preoccupation with drug procurement and use.

Tolerance and dependence are physiological phenomena, are expected with the continued administration of opioids, and should not deter physicians from their appropriate use.

The use of opioids is well accepted in treating cancer pain, where nociceptive mechanisms are generally present due to ongoing tissue destruction, expected survival may be short, and symptomatic relief is emphasized more than functional outcomes. In chronic non-malignant pain, by contrast, tissue destruction has generally ceased, meaning that central and neuropathic mechanisms frequently overshadow nociceptive processes. Expected survival in chronic pain is relatively long and return to a high level of function is a major goal of treatment. Therefore, approaches to pain developed in the context of malignant pain may not be transferable to chronic non-malignant pain.

In most cases, analgesic treatment should begin with acetaminophen, aspirin, and NSAIDs. While maximum efficacy is modest, they may reduce pain sufficiently to permit adequate function. When these drugs do not satisfactorily reduce pain, opioids for moderate to moderately severe pain may be added to (not substituted for) the less efficacious drugs.

Consultation or referral to a pain specialist should be considered when the pain persists but the underlying tissue pathology is minimal or absent and correlation between the original injury and the severity of impairment is not clear. Consider consultation if suffering and pain behaviors are present and the patient continues to request medication, or when standard treatment measures have not been successful or are not indicated.

i. General Indications – There must be a clear understanding that opioids are to be used for a

limited term in the first instance (see trial indications below), that their use is contingent upon certain obligations or goals being met by the patient, e.g., return to work, and the patient understands that there may be drug screening to ensure compliance.

ii. Therapeutic Trial Indications – A therapeutic trial of opioids should not be employed unless the patient has begun a rehabilitation program. Once this criterion has been met, opioids would be indicated when a patient meets the following:

1. The failure of pain management alternatives, including active therapies, cognitive behavioral therapy, pain self-management techniques, and other appropriate medical techniques.
2. Physical and psychosocial assessment, performed by two specialists with one being the authorized treating physician.
3. Informed, written, witnessed consent by the patient.
4. In addition, there should be documentation of sustained improvement of pain control and/or functional status, including return to work, with use of opioids. Frequent follow-up at least every 2 to 4 weeks may be necessary to titrate dosage and assess clinical efficacy.

iii. On-Going, Long-Term Management – Actions should include:

1. Prescriptions from a single practitioner,
2. Ongoing review and documentation of pain relief, functional status, appropriate medication use, and side effects,
3. Ongoing effort to gain improvement of social and physical function as a result of pain relief,
4. Contract detailing reasons for termination of supply, with appropriate tapering of dose,
5. Use of random drug screening, as deemed appropriate by the prescribing physician,
6. Use of more than two opioids: a long acting opioid for maintenance of pain relief and a short acting opioid for limited rescue use when pain exceeds the routine level. If more than two opioids are prescribed for long-term use of a second opinion from specialist who is Board Certified in Neurology, Psychiatry, Physical Medicine and Rehabilitation, or Anesthesiology with recognized training and/or certification in pharmacological pain management is strongly recommended,
7. Use of acetaminophen-containing medications in patients with liver disease should be limited,
8. Continuing review of overall situation with regard to nonopioid means of pain control,

9. Inpatient treatment in complex cases. Refer to Interdisciplinary Rehabilitation Programs for detailed information on in-patient criteria.

iv. Relative Contraindications – Extreme caution should be used in prescribing controlled substances for workers with one or more “relative contraindications”:

1. History of alcohol or other substance abuse, or a history of chronic, high-dose benzodiazepine use;
2. Off work for more than six months;
3. Severe personality disorder

v. General contraindications –

1. Active alcohol or other substance abuse.
2. Untreated mood or psychotic disorders (e.g., depression).
3. Decreased physical or mental function with continued opioid use.
4. Addictive behaviors. Warning signs include:
 - o Preoccupation with drugs;
 - o Refusal to participate in medication taper;
 - o Reporting that nothing but a specific opioid works;
 - o Strong preference for short-acting over long-acting opioids;
 - o Use of multiple prescribers and pharmacies;
 - o Use of street drugs or other patients drugs;
 - o Not taking medications as prescribed;
 - o Loss of medications more than once; and/or
 - o Criminal behaviors to obtain drugs, i.e., forged prescriptions.

vi. Dosing and Time to Therapeutic Effect – Oral route is the preferred route of analgesic administration because it is the most convenient and cost-effective method of administration. When patients cannot take medications orally, rectal and transdermal routes should be considered because they are also relatively noninvasive.

vii. Major Side Effects – There is great individual variation in susceptibility to opioid-induced side effects and clinicians should monitor for these potential side effects. Common initial side effects include nausea, vomiting, drowsiness, unsteadiness, and confusion. Occasional side

effects include dry mouth, sweating, pruritus, hallucinations, and myoclonus. Rare side effects include respiratory depression and psychological dependence. Constipation and nausea/vomiting are common problems associated with long-term opioid administration and should be anticipated, treated prophylactically, and monitored constantly.

viii. Drug Interactions – Patients receiving opioid agonists should not be given a mixed agonist-antagonist (pentazocine [Talwin], butorphanol [Stadol]) because doing so may precipitate a withdrawal syndrome and increase pain.

ix. Recommended Laboratory Monitoring – Primary laboratory monitoring is recommended for acetaminophen/aspirin/ibuprofen combinations (renal and liver function, blood dyscrasias). May perform urine and or blood drug screen if suspect use of other narcotics or lack of compliance with full medication regimen.

x. Patient Physician Contracts – All patients on chronic opioids should have an informed, written, witnessed consent. The contract should discuss side effects of opioids, results of use in pregnancy, inability to refill lost or missing medication, withdrawal symptoms, requirement for drug testing, and necessity of tapering.

xi. Potentiating Agents – Some medications appear to potentiate the analgesic effects of opioids. Dextromethorphan is available as a nonopioid non-prescription antitussive agent in numerous cough and cold remedies. It antagonizes n-methyl-d-aspartate receptors involved in central sensitization of pain pathways. It may exert some morphine sparing effects in patients taking morphine, but its activity as an analgesic in neuropathic pain is likely to be weak. It is well tolerated in most patients. Because the patient profiles that might predict response to dextromethorphan are undefined, its use in chronic pain must be empirically tried on an individual basis. Diphenhydramine and hydroxyzine (atarax, vistaril) are antihistamines, which act at H 1 receptors to alleviate allergic symptoms and produce somnolence. Diphenhydramine is a component of some non-prescription sleeping preparations. Their use in potentiating the effects of analgesic drugs is not clearly defined, but it may be used empirically for this purpose.

H.8.g Topical Drug Delivery

i. Description – Topical medications, such as ketamine and capsaicin, may be an alternative treatment for neuropathic disorders and is an acceptable form of treatment in selected patients although there is no literature addressing its use in patients with CRPS.

ii. Indications – Pain. Patient selection must be rigorous to select those patients with the highest probability of compliance.

iii. Dosing and Time to Therapeutic Effect – 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.

iv. Side Effects – Localized skin reactions may occur, depending on drug.

H.8.h Vitamin C

1. Indications – CRPS patients with wrist fractures, other extremity trauma, or at high risk prior to surgery (i.e., surgical release for Dupuytren’s Contracture).
2. Major Contraindications –
3. Dosing and Time to Therapeutic Effect – 500mg a day beginning on the day of the fracture or surgery and continued for 50 days.
4. Major Side Effects – vitamin C is not invasive, has low adverse effects, and is low cost
5. Drug Interactions –.
6. Recommended Laboratory Monitoring –

H.8.i Other Agents

i. Tramadol (Ultram)

1. Description – An opioid partial agonist that is generally well tolerated, does not cause GI ulceration, or exacerbate hypertension or congestive heart failure.
2. Indications – Mild to moderate pain relief. This drug has been shown to provide pain relief equivalent to that of commonly prescribed NSAIDs.
3. Contraindications – Use 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) inhibitors, selective serotonin reuptake inhibitors (SSRIs), and tricyclic antidepressants (TCAs). Not recommended in those with prior opioid addiction.
4. Side Effects – May cause impaired alertness or nausea. This medication has physically addictive properties and withdrawal may follow abrupt discontinuation.
5. Drug Interactions – Narcotics, sedating medications.
6. Recommended Laboratory Monitoring – Renal and hepatic function.

ii. Agents not listed which may be useful in the treatment of CRPS and SMP include propranolol, nifedipine and short-term oral steroids, during the acute phase of the disease. Although propranolol and nifedipine, are used in practice, at this time there is a lack of well-designed studies to support their effectiveness compared to placebo. In individual patients, they may be effective.

H.9 Orthotics/Prosthetics/Equipment

Devices and adaptive equipment may be necessary in order to reduce impairment and disability, to facilitate medical recovery, to avoid re-aggravation of the injury, and to maintain maximum

medical improvement. Refer to the Department's Chronic Pain Medical Treatment Guidelines for detailed information on Orthotics/Prosthetics/Equipment.

H.10 Patient Education

Patients should be educated on their specific injury, assessment findings, and plan of treatment and encouraged to take an active role in establishing functional outcome goals. No treatment plan is complete without addressing issues of individual and/or group patient education as a means of prolonging the beneficial effects of rehabilitation, as well as facilitating self-management of symptoms and prevention of secondary disability. There is good evidence that patient education in self-management of asthma, anticoagulation, and other diseases improves appropriate use of medications, increases patient satisfaction with care, and reduces unscheduled physician visits for dealing with complications of treatment.

Patient education is an interactive process that provides an environment where the patient not only acquires knowledge but also gains an understanding of the application of that knowledge. Therefore, patients should be able to describe and/or will need to be educated on:

1. The treatment plan;
2. Indications for and potential side effects of medications;
3. Their home exercise program;
4. Expected results of treatment;
5. Tests to be performed, the reasons for them and their results;
6. Activity restrictions and return-to-work status;
7. Home management for exacerbations of pain;
8. Procedures for seeking care for exacerbations after office hours;
9. Home self-maintenance program;
10. Patient responsibility to communicate with all medical providers and the employer; and
11. Patient responsibility to keep appointments.

Educational efforts should also extend to family and other support persons, the case manager, the insurer and the employer as indicated to optimize the understanding of the patient and the outcome. Professional translators should be provided for non-English speaking patients to assure optimum communication. All education, teaching, and instruction given to the patient should be documented in the medical record.

Effects of education weaken over time; continuing patient education sessions will be required to maximize the patient's function. The effectiveness of educational efforts can be enhanced

through attention to the learning style and receptivity of the patient. Written educational materials may reinforce and prolong the impact of verbal educational efforts. Overall, patient education should emphasize health and wellness, return to work and return to a productive life.

- Time to produce effect: Varies with individual patient
- Frequency: At each visit

H.11 Personality/Psychological/Psychosocial Intervention

Psychosocial treatment is generally accepted, well-established therapeutic and diagnostic procedure with selected use in acute pain problems, but with more widespread use in sub-acute and chronic pain populations. Psychosocial treatment is recommended as an important component in the total management of a patient with chronic pain and should be implemented as soon as the problem is identified.

Once a diagnosis consistent with the standards of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) has been determined, the patient should be evaluated for the potential need for psychiatric medications. Use of any medication to treat a diagnosed condition may be ordered by the authorized treating physician or by the consulting psychiatrist. Visits for management of psychiatric medications are medical in nature and are not a component of psychosocial treatment. Therefore, separate visits for medication management may be necessary, depending upon the patient and medications selected.

The screening or diagnostic workup should have clarified and distinguished between preexisting, aggravated, and or purely causative psychological conditions. Therapeutic and diagnostic modalities include, but are not limited to, individual counseling, and group therapy. Treatment can occur within an individualized model, a multi-disciplinary model, or within a structured pain management program.

Refer to Chronic Pain guideline for detailed information on whom may perform the service and timeframe parameters.

H.12 Restriction of Activities

Continuation of normal daily activities is the recommendation for chronic pain patients since immobility will negatively affect rehabilitation. Prolonged immobility results in a wide range of deleterious effects, such as a reduction in aerobic capacity and conditioning, loss of muscle strength and flexibility, increased segmental stiffness, promotion of bone demineralization, impaired disc nutrition, and the facilitation of the illness role.

Patients should be educated to the detrimental effects of immobility versus the efficacious use of rest periods. Adequate rest allows the patient to comply with active treatment and benefit from the rehabilitation program. In addition, complete work cessation should be avoided, if possible, since it often further aggravates the pain presentation and promotes disability. Modified return to work is almost always more efficacious and rarely contraindicated in the vast majority of injured workers with chronic pain.

H.13 Return to Work

Return to Work is one of the major components in chronic pain management. Return to work is a subject that should be addressed by each workers' compensation provider at the first meeting with the injured employee, and be updated at each additional visit. A return to work format should be part of a company's health plan, knowing that return to work can decrease anxiety, reduce the possibility of depression, and reconnect the worker with society.

Because a prolonged period of time off work will decrease the likelihood of return to work, the first weeks of treatment are crucial in preventing and/or reversing chronicity and disability mindset. In complex cases, experienced nurse case managers may be required to assist in return to work. Other services, including psychological evaluation and/or treatment and vocational assistance should be employed.

The following should be considered when attempting to return an injured worker with chronic pain to work.

H.13.a Job History Interview

The authorized treating physician should perform a job history interview at the time of the initial evaluation and before any plan of treatment is established. Documentation should include the workers' job demands, stressors, duties of current job, and duties of job at the time of the initial injury. In addition, cognitive and social issues should be identified and treatment of these issues should be incorporated into the plan of care.

H.13.b Coordination of Care

Management of the case is a significant part of return to work and may be the responsibility of the authorized treating physician, occupational health nurse, risk manager, or others. Case management is a method of communication between the primary provider, referral providers, insurer, employer and employee. Because case management may be coordinated by a variety of professionals, the case manager should be identified in the medical record.

H.13.c Communication

Communication is essential between the patient, authorized treating physician, employer and insurer. Employers should be contacted to verify employment status, job duties and demands, and policies regarding injured workers. In addition, availability of temporary and permanent restrictions, for what duration, as well as other placement options should be discussed and documented.

H.13.d Establishment of a Return-To-Work Status

Return to work for persons with chronic pain should be thought of as therapeutic, assuming that work is not likely to aggravate the basic problem or increase the discomfort. In most cases of chronic pain, the worker may not be currently working or even employed. The goal of return to

work would be to implement a plan of care to return the worker to any level of employment with the current employer or to return them to any type of new employment.

H.13.e Establishment of Activity Level Restrictions

A formal job description for the injured/ill employee who is employed is necessary to identify physical demands at work and assist in the creation of modified duty. A jobsite evaluation may be utilized to identify tasks such as pushing, pulling, lifting, reaching above shoulder level, grasping, pinching, sitting, standing, posture, ambulatory distance and terrain, and if applicable, environment for temperature, air flow, noise and the number of hours that may be worked per day. Work restrictions assigned by the authorized treating physician may be temporary or permanent. The case manager should continue to seek out modified work until restrictions become less cumbersome or as the worker's condition improves or deteriorates.

H.13.f Rehabilitation and Return to Work

As part of rehabilitation, every attempt should be made to simulate work activities so that the authorized treating physician may promote adequate job performance. The use of ergonomic or adaptive equipment, therapeutic breaks, and interventional modalities at work may be necessary to maintain employment.

H.13.g Vocational Assistance

Formal vocational assistance is a generally accepted intervention and can assist disabled persons to return to viable employment. Assisting patients to identify vocational goals will facilitate medical recovery and aid in the maintenance of MMI by (1) increasing motivation towards treatment and (2) alleviating the patient's emotional distress. Chronic pain patients will benefit most if vocational assistance is provided during the interdisciplinary rehabilitation phase of treatment. To assess the patient's vocational capacity, a vocational assessment may be utilized to identify rehabilitation program goals, as well as optimize both patient motivation and utilization of rehabilitation resources.

Employers and employees of small businesses who are diagnosed with chronic pain may not be able to perform any jobs for which openings exist. Temporary employees may fill those slots while the employee functionally improves. Some small businesses hire other workers and if the injured employee returns to the job, the supervisor/owner may have an extra employee. To avoid this, it is suggested that case managers be accessed through their insurer or third party insurers. Case managers may assist with resolution of these problems, as well as assist in finding modified job tasks, or find jobs with reduced hours, etc., depending upon company philosophy and employee needs.

Employers and employees of mid-sized and large businesses are encouraged by the Department to identify modified work within the company that may be available to injured workers with chronic pain who are returning to work with temporary or permanent restrictions. To assist with temporary or permanent placement of the injured worker, it is suggested that a program be implemented that allows the case manager to access descriptions of all jobs within the organization.

H.14 Therapy - Active

Active therapy is based on the philosophy that therapeutic exercise and/or activity are beneficial for restoring flexibility, strength, endurance, function, range of motion, and can alleviate discomfort.

Active therapy requires an internal effort by the individual to complete a specific exercise or task. This form of therapy requires supervision from a therapist or medical provider such as verbal, visual and/or tactile instruction(s). Active therapy is intended to promote independence and self-reliance in managing the physical pain as well as to improve the functional status in regard to the specific diagnosis and general conditioning and well-being. 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.

Since CRPS and SMP patients frequently have additional myofascial pain generators, other active therapies not listed may be used in treatment. Refer to the Department's Chronic Pain Medical Treatment Guideline for therapies and timeframe parameters not listed. The following active therapies are listed in alphabetical order:

H.14.a Activities of Daily Living (ADL)

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

- Time to produce effect: 4 to 5 treatments
- Frequency: 3 to 5 times per week
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 weeks

H.14.b Aquatic Therapy

Aquatic Therapy is the implementation of active therapeutic procedures (individual or group) in a swimming or therapeutic pool heated to 88-92 degrees. The water provides a buoyancy force that lessens the amount of force gravity applies to the body, and the pool should be large enough to allow full extremity range of motion and full erect posture. The decreased gravity effect allows the patient to have a mechanical advantage increases the likelihood of successful therapeutic exercise. Multiple limb involvement, weight bearing problems, and vasomotor abnormalities are frequently treated with water exercise. Indications for individuals who may not tolerate active land-based or full weight bearing therapeutic procedures or who require

augmentation or other therapy. Aquatic vests, belts and other devices can be used to provide stability, balance, buoyancy, and resistance.

- Time to produce effect: 5 to 10 sessions
- Frequency: 1 to 3 times per week
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 Weeks. Multiple limb involvement may require longer intervention.

H.14.c Gait Training

Indications include the need to promote normal gait pattern with assistive devices and/or to reduce risk of fall or loss of balance. This may include instruction in safety and proper use of assistive devices and gait instruction on uneven surfaces and steps (with or without railings).

- Time to produce effect: 1 to 6 sessions
- Frequency: 1 to 3 times per week
- Optimum duration: 2 weeks. Could be needed intermittently as changes in functional status occur.
- Maximum duration: 1 month.

H.14.d Motor Imagery Program (“Mirror Therapy”)

Motor Imagery Program (“Mirror Therapy”) involves the use of a mirror inside a box to provide visual input from the unaffected hand when moving the affected hand (or foot). In addition to CRPS, this therapy has been used in the rehabilitation of patients with phantom pain and residual pain from cerebrovascular accidents. Mirror therapy is recommended as an option for highly motivated patients with severe and some moderate cases of CRPS who are willing to comply with the treatment.

- Time to produce effect: 6 to 8 treatments
- Frequency: 3 times per week plus home exercises requiring 10 minutes of each waking hour
- Optimum duration: 6 to 8 weeks
- Maximum duration: with ongoing improvements, additional treatments to continue therapy would be indicated in 2-3 week intervals providing continuing objective evidence of ongoing improvement.

H.14.e Neuromuscular Re-education

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: 6 treatments
- Frequency: 1 to 3 times per week
- Optimum duration: 4 to 8 weeks
- Maximum Duration: 8 to 12 weeks

H.14.f Stress Loading

Stress loading is considered a reflex and sensory integration technique involving the application of a compressive load and a carry load. It is carried out in a consistent, progressive manner and integrated as part of a home program. Use of this technique may increase symptoms initially, but symptoms generally subside with program consistency.

- Time to produce effect: 3 weeks
- Frequency: 2 to 3 times per week.
- Optimum duration: 4 to 6 weeks and concurrent with an active daily home exercise program.
- Maximum Duration: 6 to 10 weeks

H.14.g Therapeutic Exercise

Therapeutic Exercise with or without mechanical assistance or resistance, may include isoinertial, isotonic, isometric and isokinetic types of exercises. Stress loading exercises are recommended. 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. This can also include, alternative and complementary exercise movement therapy. Therapeutic exercise programs should be tissue specific to the injury and address general functional deficits as identified in the diagnosis and clinical assessment. Patients should be instructed in and receive a home exercise program that progresses as their functional status improves. Upon discharge, the patient would be independent in the performance of the home exercise program and would have been educated in the importance of continuing such a program. Educational goals would be to

maintain or further improve function and to minimize the risk for aggravation of symptoms in the future.

- Time to produce effect: 3 weeks
- Frequency: 1 to 3 times per week
- Optimum duration: 4 to 8 weeks and concurrent with an active daily home exercise program.
- Maximum Duration: 8 to 12 weeks of therapist oversight. Home exercise should continue indefinitely.

H.15 Therapy - Passive

Most of the following passive therapies and modalities are generally accepted methods of care for a variety of work-related injuries. Passive therapy 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 adjunctively 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.

Factors such as exacerbation of symptoms, re-injury, interrupted continuity of care, and comorbidities may extend durations of care. Having specific goals with objectively measured functional improvement during treatment can support extended durations of care. It is recommended that if after 6 to 8 visits no treatment effect is observed, alternative treatment interventions, further diagnostic studies or further consultations should be pursued.

Since CRPS and SMP patients frequently have additional myofascial pain generators, other passive therapies not listed may be used in treatment. Refer to the Department's Chronic Pain Disorder Medical Treatment Guideline's for therapies and timeframe parameters not listed. The following passive therapies are listed in alphabetical order:

H.15.a Continuous Passive Motion (CPM)

Continuous Passive Motion (CPM) is rarely indicated in CRPS but may occasionally be warranted if the patient shows signs of contracture despite active therapy.

- Time to produce effect: 4 to 6 treatments
- Frequency: Varies, between 2 to 3 times per day and 1 time per week.
- Optimum duration: 4 treatments

- Maximum duration: 6 treatments. Provide home unit with improvement.

H.15.b Fluidotherapy

Used primarily for desensitization and to facilitate increased active range of motion. Thermal heat conduction and convection is advantageous for vasodilation, muscle relaxation, and preparation for stress and activity (exercise).

- Time to produce effect: 3 treatments
- Frequency: 3 times per week
- Optimum duration: 2 months
- Maximum duration: 2 months as a primary therapy or intermittently as an adjunct therapy to other procedures.

H.15.c Orthotics/Splinting

Static splinting is discouraged. Dynamic splinting may occasionally be useful in controlling proximal hypertonicity or for other concurrent pain generators.

- Time to produce effect: 1 week
- Frequency: varies depending upon application
- Optimum duration: 1 month
- Maximum duration: 2 months

H.15.d Paraffin Bath

Indications include the need to enhance collagen extensibility before stretching, reduce muscle guarding, and to prepare for functional restoration activities.

- Time to produce effect: 1 to 2 treatments
- Frequency: 1 to 3 times per week as an adjunct treatment to other procedures. May use daily if available at home
- Optimum duration: 2 weeks
- Maximum duration: 3 to 4 weeks. If effective, purchase home unit.

H.15.e Desensitization

Desensitization is accomplished through sensory integration techniques. Concurrent desensitization techniques are generally accepted as a treatment for CRPS. Home techniques

using soft cloths of various textures, massage, and vibrators may be beneficial in reducing allodynia and similar sensory abnormalities.

- Time to produce effect: 6 treatments
- Frequency: 3 times per week and concurrent with home exercise program
- Optimum duration: 3 weeks with reinforcement of home program
- Maximum duration: 1 month.

H.15.f Superficial Heat Therapy

Superficial heat is a thermal agent applied to raise the body tissue temperature. It is indicated before exercise to elevate the pain threshold, alleviate muscle spasm, and promote increased movement. Heat packs can be used at home as an extension of therapy in the clinic setting.

- Time to produce effect: Immediate
- Frequency: 1 to 3 times per week
- Optimum duration: 2 weeks as primary or intermittently as an adjunct to other therapeutic procedures
- Maximum duration: 2 weeks. Home use as a primary modality may continue at the providers' discretion.

I. Therapeutic Procedures - Operative

When considering operative intervention in chronic pain management, the treating physician must carefully consider the inherent risk and benefit of the procedure. All operative intervention should be based on a positive correlation with clinical findings, the clinical course, and diagnostic tests. A comprehensive assessment of these factors should have led to a specific diagnosis with positive identification of the pathologic condition(s).

Surgical procedures are seldom meant to be curative and would be employed in conjunction with other treatment modalities for maximum functional benefit. Functional benefit should be objectively measured and includes the following:

- Return to work or maintaining work status
- Fewer restrictions at work or performing activities of daily living (ADL).
- Decrease in usage of medications
- Measurable functional gains, such as increased range of motion or documented increase in strength.

Education of the patient should include the proposed goals of the surgery, expected gains, risks or complications, and alternative treatment.

1. INTRATHECAL DRUG DELIVERY This mode of therapy delivers small doses of medications directly into the cerebrospinal fluid. Refer to the Chronic Pain Guideline for detailed information and recommendations for its use in CRPS patients with chronic pain.

2. NEUROSTIMULATION is the delivery of low-voltage electrical stimulation to the spinal cord or peripheral nerves to inhibit or block the sensation of pain. Refer to the Chronic Pain Guideline for detailed information and recommendations for its use in CRPS patients with chronic pain.

3. SYMPATHECTOMY

Description – Destruction of part of the sympathetic nervous system, which is not generally accepted or widely used. Long-term success with this pain relief treatment is poor. This procedure requires prior authorization.

Indications – Single extremity CRPS-I or SMP; distal pain only (should not be done if the proximal extremity is involved). Local anesthetic Stellate Ganglion Block or Lumbar Sympathetic Block consistently gives 90 to 100 percent relief each time a technically good block is performed (with measured rise in temperature). The procedure may be considered for individuals who have limited duration of relief from blocks. Permanent neurological complications are common.

J. Maintenance Management

Successful management of chronic pain conditions results in fewer relapses requiring intense medical care. Failure to address long-term management as part of the overall treatment program may lead to higher costs and greater dependence on the health care system. Management of CRPS and SMP continues after the patient has met the definition of maximum medical improvement (MMI). MMI is declared when a patient's condition has plateaued and the authorized treating physician believes no further medical intervention is likely to result in improved function. When the patient has reached MMI, a physician must describe in detail the maintenance treatment.

Maintenance care in CRPS and SMP requires a close working relationship between the carrier, the providers, and the patient. Providers and patients have an obligation to design a cost effective, medically appropriate program that is predictable and allows the carrier to set aside appropriate reserves. Carriers and adjusters have an obligation to assure that medical providers can plan medically appropriate programs. A designated primary physician for maintenance team management is recommended.

Maintenance Care will be based on principles of patient self-management. When developing a maintenance plan of care, the patient, physician and insurer should attempt to meet the following goals:

- Maximal independence will be achieved through the use of home exercise programs or exercise programs requiring special facilities (e.g., pool, health club) and educational programs;
- Modalities will emphasize self management and self-applied treatment;
- Management of pain or injury exacerbations will emphasize initiation of active therapy techniques and may occasionally require anesthetic injection blocks.
- Dependence on treatment provided by practitioners other than the authorized treating physician will be minimized;
- Periodic reassessment of the patient's condition will occur as appropriate.
- Patients will understand that failure to comply with the elements of the self-management program or therapeutic plan of care may affect consideration of other interventions.

Specific Maintenance Interventions and Parameters

J.1 Home Exercise programs and Exercise Equipment

Most patients have the ability to participate in a home exercise program after completion of a supervised exercise rehabilitation program. Programs should incorporate an exercise prescription including the continuation of an age-adjusted and diagnosis-specific program for aerobic

conditioning, flexibility, stabilization, and strength. Some patients may benefit from the purchase or rental of equipment to maintain a home exercise program. Determination for the need of home equipment should be based on medical necessity to maintain MMI, compliance with an independent exercise program, and reasonable cost. Before the purchase or long-term rental of equipment, the patient should be able to demonstrate the proper use and effectiveness of the equipment. Effectiveness of equipment should be evaluated on its ability to improve or maintain functional areas related to activities of daily living or work activity. Occasionally, compliance evaluations may be made through a 4-week membership at a facility offering similar equipment. Home exercise programs are most effective when done 3 to 5 times a week.

J.2 Exercise Programs Requiring Special Facilities

Some patients may have higher compliance with an independent exercise program at a health club versus participation in a home program. All exercise programs completed through a health club facility should focus on the same parameters of an age-adjusted and diagnosis-specific program for aerobic conditioning, flexibility, stabilization, and strength. Selection of health club facilities should be limited to those able to track attendance and utilization, and provide records available for physician and insurer review. Prior to purchasing a membership, a therapist and or exercise specialist who has treated the patient may visit the facility with the patient to assure proper use of the equipment.

- Frequency: 2 to 3 times per week.
- Optimal Duration: 1 to 3 months.
- Maximum Maintenance duration: 3 months. Continuation beyond 3 months should be based on functional benefit and patient compliance. Health club membership should not extend beyond 3 months if attendance drops below 2 times per week on a regular basis.

J.3 Patient Education Management

Educational classes, sessions, or programs may be necessary to reinforce self-management techniques. This may be performed as formal or informal programs, either group or individual.

- Maintenance duration: 2 to 6 educational sessions during one 12-month period.

J.4 Psychological Management

An ideal maintenance program will emphasize management options implemented in the following order: (a) individual self-management (pain control, relaxation and stress management, etc.), (b) group counseling, (c) individual counseling by a psychologist or psychiatrist and (d) in-patient treatment. Aggravation of the injury may require more intense psychological treatment to restore the patient to baseline. In those cases, use treatments and timeframe parameters listed in the Biofeedback and Psychological Evaluation or Intervention sections.

- Maintenance duration: 6 to 10 visits during one 12-month period.

J.5 Non-narcotic Medication Management

In some cases, self-management of pain and injury exacerbations can be handled with medications, such as those listed in Section H.7, Medication Section. Physicians must follow patients who are on any chronic medication or prescription regimen for efficacy and side effects. Laboratory or other testing may be appropriate to monitor medication effects on organ function.

- Maintenance duration: Usually, four medication reviews within a 12-month period. Frequency depends on the medications prescribed. Laboratory and other monitoring as appropriate.

J.6 Narcotic Medication Management

As compared with other pain syndromes, there may be a role for chronic augmentation of the maintenance program with narcotic medications. In selected cases, scheduled medications may prove to be the most cost effective means of insuring the highest function and quality of life; however, inappropriate selection of these patients may result in a high degree of iatrogenic illness. A patient should have met the criteria in opioids section of these guidelines before beginning maintenance narcotics. Laboratory or other testing may be appropriate to monitor medication effects on organ function. The following management is suggested for maintenance narcotics:

1. The medications should be clearly linked to improvement of function, not just pain control. All follow up visits should document the patient's ability to perform routine functions satisfactorily. Examples include the abilities to: perform work tasks, drive safely, pay bills or perform basic math operations, remain alert for 10 hours, or participate in normal family and social activities. If the patient is not maintaining reasonable levels of activity the patient should usually be tapered from the narcotic and tried on a different long-acting opioid.
2. A low dose narcotic medication regimen should be defined, which may minimally increase or decrease over time. Dosages will need to be adjusted based on side effects of the medication and objective function of the patient. A patient may frequently be maintained on additional non-narcotic medications to control side effects, treat mood disorders, or control neuropathic pain; however, only one long-acting narcotic and one short-acting narcotic for rescue use should be prescribed in most cases.
3. All patients on chronic narcotic medication dosages need to sign an appropriate narcotic contract with their physician for prescribing the narcotics.
4. The patient must understand that continuation of the medication is contingent on their cooperation with the maintenance program. Use of non-prescribed drugs may result in tapering of the medication. The clinician may order random drug testing when deemed appropriate to monitor medication compliance.
5. Patients on chronic narcotic medication dosages must receive them through one prescribing physician.

- Maintenance duration: Up to 12 visits within a 12-month period to review the narcotic plan. Laboratory and other monitoring as appropriate.

J.7 Therapy Management

Some treatment may be helpful on a continued basis during maintenance care if the therapy maintains objective function and decreases medication use. Aggravation of the injury may require intensive treatment to get the patient back to baseline. In those cases, treatments and timeframe parameters listed in Section H, 13 and 14, Active and Passive Therapy.

- Active Therapy, Acupuncture, and Manipulation maintenance duration: 10 visits in a 12-month period.

J.8 Injection Therapy

a. Sympathetic Blocks: These injections are considered appropriate if they maintain or increase function for a minimum of 4 to 8 weeks. Maintenance blocks are usually combined with and enhanced by the appropriate neuropharmacological medication(s) and other care. It is anticipated that the frequency of the maintenance blocks may increase in the cold winter months or with stress.

- Maintenance duration: Not to exceed 6 to 8 blocks in a 12-month period for a single extremity and to be separated by no less than 4-week intervals. Increased frequency may need to be considered for multiple extremity involvement or for acute recurrences of pain and symptoms. For treatment of acute exacerbations, consider 2 to 6 blocks with a short time interval between blocks.

b. Trigger Point Injections: These injections may occasionally be necessary to maintain function in those with myofascial problems.

- Maintenance duration: Not more than 4 injections per session not to exceed 3 to 6 sessions per 12-month period.

J.9 Purchase or Rental of Durable Medical Equipment

It is recognized that some patients may require ongoing use of self-directed modalities for the purpose of maintaining function and or analgesic effect. Purchase or rental of modality based equipment should be done only if the assessment by the physician and or therapist has determined the effectiveness, compliance, and improved or maintained function by its application. It is generally felt that large expense purchases such as spas, whirlpools, and special mattresses are not necessary to maintain function beyond the areas listed above.

- Maintenance duration: Not to exceed 3 months for rental equipment. Purchase if effective.