RULE 17, EXHIBIT 1

Low Back Pain

Medical Treatment Guidelines

Revised: September 29, 2005

Effective: January 1, 2006

Adopted: March 24, 1993	Effective: April 30, 1993
Revised: March 11, 1994	Effective: April 30, 1994
Revised: January 9, 1995	Effective: March 2, 1995
Revised: January 1, 1998	Effective: March 15, 1998
Revised: October 4, 2001	Effective: December 1, 2001

Presented by:

State of Colorado

Department of Labor and Employment
DIVISION OF WORKERS' COMPENSATION

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DEPARTMENT OF LABOR AND EMPLOYMENT

Division of Workers' Compensation
CCR 1101-3
RULE 17, EXHIBIT 1

LOW BACK PAIN MEDICAL TREATMENT GUIDELINES

A. INTRODUCTION

This document has been prepared by the Colorado Department of Labor and Employment, Division of Workers' Compensation (Division) and should be interpreted within the context of guidelines for physicians/providers treating individuals qualifying under Colorado's Workers' Compensation Act as injured workers with low back pain.

Although the primary purpose of this document is advisory and educational, these guidelines are enforceable under the Workers' Compensation Rules of Procedure, 7 CCR 1101-3. The Division recognizes that acceptable medical practice may include deviations from these guidelines, as individual cases dictate. Therefore, these guidelines are not relevant as evidence of a provider's legal standard of professional care.

To properly utilize this document, the reader should not skip nor overlook any sections.

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B. GENERAL GUIDELINE PRINCIPLES

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

1. **APPLICATION OF GUIDELINES** The Division provides procedures to implement medical treatment guidelines and to foster communication to resolve disputes among the provider, payer and patient through the Worker's Compensation Rules of Procedure. In lieu of more costly litigation, parties may wish to seek administrative dispute resolution services through the Division or the office of administrative courts.

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 low back pain and disability. Currently, practitioners often think of education last, after medications, manual therapy, and surgery. Practitioners must develop and implement an effective strategy and skills to educate patients, employers, insurance systems, policy makers and the community as a whole. An education-based paradigm should always start with inexpensive communication providing reassuring information to the patient. More in-depth education currently exists within a treatment regime employing functional restorative and innovative programs of prevention and rehabilitation. No treatment plan is complete without addressing 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. **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 (ROM), 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-EVALUATE TREATMENT EVERY 3 TO 4 WEEKS** If a given treatment or modality is not producing positive results within 3 to 4 weeks, the treatment should be either modified or discontinued. Reconsideration of diagnosis should also occur in the event of poor response to a seemingly rational intervention.

8. **SURGICAL INTERVENTIONS** 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 physical limitations and the patient should never be released to "sedentary" or "light duty." The following physical limitations should be considered and modified as recommended: lifting, pushing, pulling, crouching, walking, using stairs, bending at the waist, awkward and/or sustained postures, tolerance for sitting or standing, hot and cold environments, data entry and other repetitive motion tasks, sustained grip, tool usage and vibration factors. Even if there is residual chronic pain, return-to-work is not necessarily contraindicated.

    The practitioner should understand all of the physical demands of the patient's job position before returning the patient to full duty and should request clarification of the patient's job duties. Clarification should be obtained from the employer or, if necessary, including, but not limited to, an occupational health nurse, occupational therapist, 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 Division 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** 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 or consensus statement attached to it. Those procedures considered inappropriate, unreasonable, or unnecessary are designated in the guideline as being "not recommended."

13. **CARE BEYOND MAXIMUM MEDICAL IMPROVEMENT (MMI)** should be declared when a patient's condition has plateaued to the point where the authorized treating physician no longer believes further medical intervention is likely to result in improved function. However, some patients may require treatment after MMI has been declared in order to maintain their functional state. The recommendations in this guideline are for pre-MMI care and are not intended to limit post-MMI treatment.

The remainder of this document should be interpreted within the parameters of these guideline principles that may lead to more optimal medical and functional outcomes for injured workers.

C. INITIAL DIAGNOSTIC PROCEDURES

The Division 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, that should be utilized when initially diagnosing a work-related low back pain complaint, are listed below.

1. **HISTORY-TAKING AND PHYSICAL EXAMINATION (Hx & PE)** are generally accepted, well-established and widely used procedures that establish the foundation/basis for and dictates subsequent stages of diagnostic and therapeutic procedures. When findings of clinical evaluations and those of other diagnostic procedures are not complementing each other, the objective clinical findings should have preference. The medical records should reasonably document the following.

   a. **History of Present Injury:**

      i. Mechanism of injury. This includes details of symptom onset and progression;

      ii. Relationship to work. This includes a statement of the probability that the illness or injury is work-related;

      iii. Location of pain, nature of symptoms, and alleviating/exacerbating factors (e.g., sitting tolerance);

      iv. Presence of lower extremity numbness, weakness, or paresthesias, especially if precipitated by coughing or sneezing;

      v. Alteration in bowel, bladder, or sexual function;

      vi. Prior occupational and non-occupational injuries to the same area including specific prior treatment, chronic or recurrent symptoms, and any functional limitations; and

      vii. Ability to perform job duties and activities of daily living.

   b. **Past History:**

      i. Past medical includes neoplasm, gout, arthritis, hypertension, kidney stones, and diabetes;

      ii. Review of systems includes symptoms of rheumatologic, neurologic, endocrine, neoplastic, infectious, and other systemic diseases;

      iii. Smoking history; and

      iv. Vocational and recreational pursuits.

   c. **Physical Examination:** should include accepted tests and exam techniques applicable to the area being examined, including:

      i. General inspection, including stance and gait;

ii. Visual inspection;

iii. Palpation;

iv. Lumbar range of motion, quality of motion, and presence of muscle spasm. Motion evaluation of specific joints may be indicated;

v. Nerve tension testing;

vi. Sensory and motor examination of the lower extremities with specific nerve root focus;

vii. Deep tendon reflexes with or without Babinski's;

viii. If applicable to injury, anal sphincter tone and/or perianal sensation; and

ix. If applicable, abdominal examination, vascular examination, circumferential lower extremity measurements, or evaluation of hip or other lower extremity abnormalities.

2. **RADIOGRAPHIC IMAGING** of the lumbosacral spine is a generally accepted, well-established and widely used diagnostic procedure when specific indications based on history and/or physical examination are present. It should not be routinely performed. The mechanism of injury and specific indications for the radiograph should be listed on the request form to aid the radiologist and x-ray technician. Suggested indications include:

a. History of significant trauma, especially blunt trauma or fall from a height;

b. Age over 55 years;

c. Unexplained or persistent low back pain for at least 6 weeks or that is worse with rest;

d. Localized pain, fever, constitutional symptoms, or history or exam suggestive of intravenous drug abuse, prolonged steroid use, or osteomyelitis;

e. Suspected lesion in the lumbosacral spine as a part of a systemic illness such as a rheumatic/rheumatoid disorder or endocrinopathy. Suspected lesions may require special views;

f. Past medical history suggestive of pre-existing spinal disease, spinal instrumentation, or tumor; and

g. Roentgenographic evaluation may be appropriate before high-velocity/low amplitude manipulation or Grade IV to V mobilization.

3. **LABORATORY TESTING** Laboratory tests are generally accepted well-established and widely used procedures. They are, however, rarely indicated at the time of initial evaluation, unless there is suspicion of systemic illness, infection, neoplasia, or underlying rheumatologic disorder, connective tissue disorder, or based on history and/or physical examination. Laboratory tests can provide useful diagnostic information. Tests include, but are not limited to:

a. Complete blood count (CBC) with differential can detect infection, blood dyscrasias, and medication side effects;

b. 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;

c. Serum calcium, phosphorous, uric acid, alkaline phosphatase, and acid phosphatase can detect metabolic bone disease;

d. Urinalysis for bacteria (usually with culture and sensitivity), calcium, phosphorus, hydroxyproline, or hematuria; and

e. Liver and kidney function may be performed for prolonged anti-inflammatory use or other medications requiring monitoring.

D. FOLLOW-UP DIAGNOSTIC IMAGING AND TESTING PROCEDURES

One diagnostic imaging procedure may provide the same or distinctive information as obtained by other procedures. Therefore, prudent choice of procedure(s) for a single diagnostic procedure, a complementary procedure in combination with other procedures(s), or a proper sequential order in multiple procedures will ensure maximum diagnostic accuracy; minimize adverse effect to patients and cost effectiveness by avoiding duplication or redundancy.

All diagnostic imaging procedures have a significant percentage of specificity and sensitivity for various diagnoses. None is specifically characteristic of a certain diagnosis. Clinical information obtained by history taking and physical examination should be the basis for selection and interpretation of imaging procedure results.

Magnetic resonance imaging (MRI), myelography, or Computed Axial Tomography (CT) scanning following myelography may provide useful information for many spinal disorders. When a diagnostic procedure, in conjunction with clinical information, can provide sufficient information to establish an accurate diagnosis, the second diagnostic procedure will become a redundant procedure. At the same time, a subsequent diagnostic procedure can be a complementary diagnostic procedure if the first or preceding procedures, in conjunction with clinical information, cannot provide an accurate diagnosis. Usually, preference of a procedure over others depends upon availability, a patient's tolerance and/or the treating practitioner's familiarity with the procedure.

1. **IMAGING STUDIES** are generally accepted, well-established and widely used diagnostic procedures. When indicated, imaging studies can be utilized for further evaluation of the low back, based upon the mechanism of injury, symptoms, and patient history. Prudent choice of a single diagnostic procedure, a complementary combination of procedures, or a proper sequential order of complementary procedures will help ensure maximum diagnostic accuracy and minimize adverse effect to the patient. When the findings of the diagnostic imaging and testing procedures are not consistent with the clinical examination, the clinical findings should have preference. The studies below are listed in frequency of use, not importance:

    a. **Magnetic Resonance Imaging (MRI):** is rarely indicated in patients with non-traumatic acute low back pain with no neuropathic signs or symptoms. It is generally the first follow-up imaging study in individuals who respond poorly to proper initial conservative care. MRI is useful in suspected nerve root compression, myelopathy, masses, infections, metastatic disease, disc herniation, annular tear, and cord contusion. It is contraindicated in patients with certain implants.

    In general, the high field, conventional, MRI provides better resolution. A lower field scan may be indicated when a patient cannot fit into a high field scanner or who is too claustrophobic despite sedation. Inadequate resolution on the first scan may require a second MRI using a different technique. All questions in this regard should be discussed with the MRI center and/or radiologist.

    b. **Computed Axial Tomography (CT):** provides excellent visualization of bone and is used to further evaluate bony masses and suspected fractures not clearly identified on radiographic evaluation. It may sometimes be done as a complement to MRI scanning to better delineate bony osteophyte formation in

the neural foramen. Instrument-scatter reduction software provides better resolution when metallic artifact is of concern.

c. **Lineal Tomography:** is infrequently used, yet may be helpful in the evaluation of bone surfaces, bony fusion, or pseudoarthrosis.

d. **Bone Scan (Radioisotope Bone Scanning):** is generally accepted, well-established, and widely used. Bone scanning is more sensitive but less specific than MRI. ^{99M}Technecium diphosphonate uptake reflects osteoblastic activity and may be useful in metastatic/primary bone tumors, stress fractures, osteomyelitis, and inflammatory lesions, but cannot distinguish between these entities.

e. **Myelography:** is the injection of radiopaque material into the spinal subarachnoid space with x-rays then taken to define anatomy. It may be used as a pre-surgical diagnostic procedure to obtain accurate information of characteristics, location, and spatial relationships among soft tissue and bony structures. Myelography is an invasive procedure with complications including nausea, vomiting, headache, convulsion, arachnoiditis, cerebral-spinal fluid (CSF) leakage, allergic reactions, bleeding, and infection. Therefore, myelography should only be considered when CT and MRI are unavailable, for morbidly obese or multiple-operated patients, and when other tests prove non-diagnostic in the surgical candidate. The use of small needles and a less toxic, water-soluble, nonionic contrast is preferred.

f. **CT Myelogram:** provides more detailed information about relationships between neural elements and surrounding anatomy and is appropriate in patients with multiple prior operations or tumorous conditions.

g. **Electrodiagnostic Studies/Nerve Conduction Velocities (EMG/NCV):** include, but are not limited to, electromyography (EMG) and nerve conduction studies (NCS). These are generally accepted, well-established, and widely used diagnostic procedures. Electrodiagnostic studies may be useful in the evaluation of patients with suspected radiculopathy.

h. **Other Radionuclide Scanning:** Indium and gallium scans are generally accepted, well-established, and widely used procedures usually to help diagnose lesions seen on other diagnostic imaging studies. ^{67}Gallium citrate scans are used to localize tumor, infection, and abcesses. ^{111}Indium-labeled leukocyte scanning is utilized for localization of infection or inflammation.

2. **OTHER TESTS** The following studies are listed by frequency of use, not importance:

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

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

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

i. Employment history;

ii. Interpersonal relationships — both social and work;

iii. Leisure activities;

iv. Current perception of the medical system;

v. Results of current treatment;

vi. Perceived locus of control; and

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

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

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

b. **Electrodiagnostic Testing:** Electrodiagnostic tests include, but are not limited to, Electromyography (EMG), Nerve Conduction Studies (NCS), and Somatosensory Evoked Potentials (SSEP). These are generally accepted, well-established and widely used diagnostic procedures. The SSEP study, although it is generally accepted, has limited use. Electrodiagnostic studies may be useful for patients with suspected neural involvement whose symptoms are persistent or unresponsive to initial conservative treatments. They are used to differentiate peripheral neural deficits from radicular and spinal cord neural deficits and to rule out concomitant myopathy. Current Perception Threshold Evaluation (CPT) may be useful as a screening tool, but its diagnostic efficacy in the evaluation of industrial low back pain has not been determined.

In general, these diagnostic procedures are complementary to imaging procedures such as CT, MRI, and/or myelography or diagnostic injection procedures. Electrodiagnostic studies may provide useful, correlative neuropathophysiological information that would be otherwise unobtainable from the standard radiologic studies discussed above.

c. **Injections — Diagnostic:**

i. Description — Diagnostic spinal injections are generally accepted, well-established procedures. These injections may be useful for localizing the source of pain, and may have added therapeutic value when combined with injection of therapeutic medication(s). 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 indicating strong suspicion for pathologic condition(s) and the source of pain symptoms.

The interpretation of the test result is primarily based upon pain response. The diagnostic significance of the test result should be evaluated in conjunction with clinical information and the results of other diagnostic procedures. Injections with local anesthetics of differing duration are required to confirm the diagnosis of pain. In some cases, injections at multiple levels may be required to accurately diagnose low back pain. Refer to “Injections – Therapeutic” for information on specific injections.

ii. Special Requirements for Diagnostic Injections — Since fluoroscopic, arthrographic and/or CT guidance during procedures is required to document technique and needle placement an experienced physician should perform the procedure. The subspecialty disciplines of the physicians may be varied, including, but not limited to: anesthesiology, radiology, surgery, or physiatry. 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.

iii. Complications — General complications of diagnostic injections may include transient neurapraxia, nerve injury, infection, headache, urinary retention, and vasovagal effects, as well as epidural hematoma, permanent neurologic damage, dural perforation and CSF leakage, and spinal meningeal abscess. Permanent paresis, anaphylaxis and arachnoiditis have been rarely reported with the use of epidural steroids.

iv. 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: (a) allergy to contrast, (b) poorly controlled Diabetes Mellitus or hypertension, (c) aspirin/antiplatelet therapy (drug may be held for 3 days prior to injection), and (d) shellfish allergy, if contrast to be used.

v. Specific Diagnostic Injections — In general, relief should last for at least the duration of the local anesthetic used and give significant relief of pain. Refer to “Injections – Therapeutic” for information on specific therapeutic injections.

A) Medial Branch Blocks are primarily diagnostic injections, used to determine whether a patient is a candidate for facet rhizotomy.

B) Transforaminal injections are useful in identifying spinal pathology and can require repeat injections at multiple levels. When used for diagnosis, small amounts of local anesthetic (with or without steroid) up to a total volume of 1.0 to 1.5 cc should be used to determine the level of nerve root irritation. The relief should last for at least the duration of the local anesthetic used and give significant relief of pain.

d. <u>Discography:</u>

i. Description — Discography is a generally accepted, well-established invasive diagnostic procedure to identify a discogenic source of pain for patients who are surgical candidates. Discography should only be performed by physicians who are experienced and have been proctored in the technique.

ii. Indications — Discography may be indicated when a patient has a history of unremitting low back pain of greater than three months duration, with or without leg pain, which has been unresponsive to all conservative interventions. A patient who does not desire surgical intervention is not a candidate for an invasive non-therapeutic intervention, such as provocative discography.

Discography may prove useful for the evaluation of the pre-surgical spine, such as pseudoarthrosis, discogenic pain at levels above or below a prior spinal fusion, annular tear, or internal disc disruption. Discography is not useful in previously operated discs. In addition, discography may prove useful in evaluation of the number of lumbar spine levels that might require fusion. It has also been utilized to differentiate organic from psychogenic factors. CT-Discography provides further detailed information about morphological abnormalities of the disc and possible lateral disc herniations.

iii. Preconditions for provocative discography include:

A) A patient with unremitting back and/or leg pain greater than 3 months duration in whom conservative treatment has been unsuccessful and in whom the specific diagnosis of the pain generator has not been made apparent on the basis of other noninvasive imaging studies (e.g., MRI, CT, plain films, etc.) and in whom a psychosocial evaluation has been considered.

B) Patients who are considered surgical candidates (e.g., symptoms are of sufficient magnitude and the patient has been informed of the possible surgical options that may be available based upon the results of discography). Discography should never be the sole indication for surgery.

C) Informed consent regarding the risks and potential diagnostic benefits of discography has been obtained.

iv. Complications — Complications include, but are not limited to, discitis, nerve damage, chemical meningitis, pain exacerbation and anaphylaxis may occur with discography. Therefore, prior to consideration of discography, the patient should undergo other diagnostic modalities in an effort to define the etiology of the patient's complaint including psychological screening, myelography, CT and MRI.

v. Contraindications — Contraindications for provocative discography may include: (a) active infection of any type or continuing antibiotic treatment for infection; and/or (b) bleeding diathesis or pharmaceutical anticoagulation with warfarin, etc.; and/or (c) significant spinal stenosis at the level being studied as visualized by MRI, myelography or CT scan; and/or (d) presence of clinical myelopathy; and/or (e) effacement of the cord, thecal sac or circumferential absence of epidural fat; and (f) known allergic reactions.

vi. Special Considerations:

A) Discography should not be done by the treating surgeon, and the procedure should be carried out by an experienced individual who has received specialized training in the technique of provocative discography.

B) Discography should be performed in a blinded format that avoids leading the patient with anticipated responses. The procedure should always include one or more disc levels thought to be normal or non-painful in order to serve as an internal control. The patient should not know what level is being injected in order to avoid spurious results.

C) Sterile technique should be utilized.

D) Judicious use of sedation during the procedure is acceptable and represents the most common practice nationally at the current time and is recommended by most experts in the field.

E) CT or MRI must have established spinal dimensions and ruled out spinal stenosis.

F) Intradiscal injection of local anesthetic should be carried out after the provocative portion of the examination and the patient’s response.

G) It is recommended that a post-discogram CT be considered as it frequently provides additional useful information about disc morphology or other pathology.

vii. Reporting of Discography — In addition to a narrative report, the discography report should contain a standardized classification of (a) disc morphology and (b) the pain response. Both results should be clearly separated in the report from the narrative portion. Asymptomatic annular tears are common and the concordant pain response is an essential finding for a positive discogram. Alternative reporting

techniques using pressure monitors are being investigated and may prove useful in identifying patients with discogenic pain.

Caution should be used when interpreting results from discography. In one study of patients without lumbar pathology, 10% of pain free patients experienced pain with discography and 83% of patients with somatization disorder experienced pain with lumbar discography.

A) Reporting disc morphology as visualized by the post-injection CT scan (when available) should follow the Modified Dallas Discogram Scale where:

Grade 0 = Normal Nucleus

Grade 1 = Annular tear confined to inner one-third of annulus fibrosis.

Grade 2 = Annular tear extending to the middle third of the annulus fibrosis.

Grade 3 = Annular tear extending to the outer one-third of the annulus fibrosis.

Grade 4 = A grade 3 tear plus dissection within the outer annulus to involve more than 30° of the disc circumference.

Grade 5 = Full thickness tear with extra-annular leakage of contrast, either focal or diffuse.

B) Reporting of pain response should be according to the modified Aprill Scheme. In this scheme, codes are assigned a response during the initial injection ("P" provocative response) and the response to an injection of the local anesthetic ("R" response) where:

P_0 = No Pain

P_1 = Procedural pain, or pain that is non-concordant with the patient's familiar pain

P_2 = Concordant pain

R_0 = No pain relief with injection of local anesthetic

R_1 = Partial relief

R_2 = Complete relief

N = Nondiagnostic, nonphysiologic injection. The final category of "N" is suggested when the discographer concludes that the provocative portion of the injection is nondiagnostic. For example, a patient with a morphologically normal disc who responds when typical pain is reproduced is considered to have

a non-diagnostic or nonphysiologic response. Other circumstances may occur that cause the discographer to conclude that the provocative portion of the injection is invalid. The category "N" should be used for these situations.

- ❖ Time to produce effect: Immediate
- ❖
- ❖ Frequency: One time only
- ❖ Optimal duration: One time
- ❖ Maximum duration: Repeat discography is rarely indicated.

e. **Thermography:** is an accepted and established procedure, but has limited use as a diagnostic test for low back pain. It may be used to diagnose regional pain disorders and in these cases, refer to Division's Complex Regional Pain Syndrome/Reflex Sympathetic Dystrophy Medical Treatment Guidelines.

3. **SPECIAL TESTS** are generally well-accepted tests and are performed as part of a skilled assessment of the patients' capacity to return to work, his/her strength capacities, and physical work demand classifications and tolerance.

a. **Computer-Enhanced Evaluations:** may include isotonic, isometric, isokinetic and/or isoinertial measurement of movement, range of motion, endurance or strength. Values obtained can include degrees of motion, torque forces, pressures or resistance. Indications include determining validity of effort, effectiveness of treatment and demonstrated motivation. These evaluations should not be used alone to determine return to work restrictions.

- ❖ Frequency: One time for evaluation. Can monitor improvements in strength every 3 to 4 weeks up to a total of 6 evaluations.

b. **Functional Capacity Evaluation (FCE):** is a comprehensive or modified evaluation of the various aspects of function as they relate to the worker's ability to return to work. Areas such as endurance, lifting (dynamic and static), postural tolerance, specific range of motion, coordination and strength, worker habits, employability and financial status, as well as psychosocial aspects of competitive employment may be evaluated. Components of this evaluation may include: (a) musculoskeletal screen; (b) cardiovascular profile/aerobic capacity; (c) coordination; (d) lift/carrying analysis; (e) job-specific activity tolerance; (f) maximum voluntary effort; (g) pain assessment/psychological screening; and (h) non-material and material handling activities.

- ❖ Frequency: Can be used initially to determine baseline status. Additional evaluations can be performed to monitor and assess progress and aid in determining the endpoint for treatment.

c. **Job site Evaluation:** is a comprehensive analysis of the physical, mental and sensory components of a specific job. These components may include, but are not limited to: (a) postural tolerance (static and dynamic); (b) aerobic

requirements; (c) range of motion; (d) torque/force; (e) lifting/carrying; (f) cognitive demands; (g) social interactions; (h) visual perceptual; (i) environmental requirements of a job; (j) repetitiveness; and (k) essential functions of a job. Job descriptions provided by the employer are helpful but should not be used as a substitute for direct observation.

- ❖ Frequency: One time with additional visits as needed for follow-up per job site.

d. **Vocational Assessment:** Once an authorized practitioner has reasonably determined and objectively documented that a patient will not be able to return to his/her former employment and can reasonably prognosticate final restrictions, implementation of a timely vocational assessment can be performed. The vocational assessment should provide valuable guidance in the determination of future rehabilitation program goals. It should clarify rehabilitation goals, which optimize both patient motivation and utilization of rehabilitation resources. If prognosis for return to former occupation is determined to be poor, except in the most extenuating circumstances, vocational assessment should be implemented within 3 to 12 months post-injury. Declaration of Maximum Medical Improvement should not be delayed solely due to lack of attainment of a vocational assessment.

- ❖ Frequency: One time with additional visits as needed for follow-up.

e. **Work Tolerance Screening:** is a determination of an individual's tolerance for performing a specific job as based on a job activity or task. It may include a test or procedure to specifically identify and quantify work-relevant cardiovascular, physical fitness and postural tolerance. It may also address ergonomic issues affecting the patient's return-to-work potential. May be used when a full Functional Capacity Evaluation is not indicated.

- ❖ Frequency: One time for evaluation. May monitor improvements in strength every 3 to 4 weeks up to a total of 6 evaluations.

E. THERAPEUTIC PROCEDURES — NON-OPERATIVE

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

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

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

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

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

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

Non-operative treatment procedures for low back pain can be divided into two groups: conservative care and rehabilitation. Conservative care is treatment applied to a problem in which spontaneous improvement is expected in 90% of the cases within three months. It is usually provided during the tissue-healing phase and lasts no more than six months, and often considerably less. Rehabilitation is treatment applied to a more chronic and complex problem in a patient with de-conditioning and disability. It is provided during the period after tissue healing to obtain maximal medical recovery. 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.

The following procedures are listed in alphabetical order.

1. **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. The exact mode of action is only partially understood. Western medicine studies suggest that acupuncture stimulates the nervous system at the level of the brain, promotes deep relaxation, and affects the release of neurotransmitters. Acupuncture is commonly used as an alternative or in addition to traditional Western pharmaceuticals. While it is commonly used when pain medication is reduced or not tolerated, it may be used as an adjunct to physical rehabilitation and/or surgical intervention to hasten the return of functional activity. Acupuncture should be performed by credentialed practitioners.

a. **Acupuncture:** is the insertion and removal of filiform needles to stimulate acupoints (acupuncture points). Needles may be inserted, manipulated, and

retained for a period of time. Acupuncture can be used to reduce pain, reduce inflammation, increase blood flow, increase range of motion, decrease the side effect of medication-induced nausea, promote relaxation in an anxious patient, and reduce muscle spasm.

Indications include joint pain, joint stiffness, soft tissue pain and inflammation, paresthesia, post-surgical pain relief, muscle spasm, and scar tissue pain.

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Optimum duration: 1 to 2 months
- Maximum duration: 14 treatments

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

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

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Optimum duration: 1 to 2 months
- Maximum duration: 14 treatments

c. **Other Acupuncture Modalities:** Acupuncture treatment is based on individual patient needs and therefore treatment may include a combination of procedures to enhance treatment effect. Other procedures may include the use of heat, soft tissue manipulation/massage, and exercise. Refer to Active Therapy (Therapeutic Exercise) and Passive Therapy sections (Massage and Superficial Heat and Cold Therapy) for a description of these adjunctive acupuncture modalities.

- Time to produce effect: 3 to 6 treatments
- Frequency: 1 to 3 times per week
- Optimum duration: 1 to 2 months
- Maximum duration: 14 treatments

Any of the above acupuncture treatments may extend longer if objective functional gains can be documented or when symptomatic benefits facilitate progression in the patient's treatment program. Treatment beyond 14 treatments must be documented with respect to need and ability to facilitate positive symptomatic or functional gains. Such care should be re-evaluated and documented with each series of treatments.

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

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

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

- Time to produce effect: 3 to 4 sessions
- Frequency: 1 to 2 times per week
- Optimum duration: 5 to 6 sessions
- Maximum duration: 10 to 12 sessions. Treatment beyond 12 sessions must be documented with respect to need, expectation, and ability to facilitate positive symptomatic or functional gains.

3. **INJECTIONS — THERAPEUTIC**

a. **Therapeutic Spinal Injections:**

i. Description — Therapeutic spinal injections, which include epidural steroid and facet injections, are generally accepted, well-established procedures. They may be used after initial conservative treatment, such as physical and occupational therapy, medication, manual therapy, exercise, acupuncture etc., has been undertaken. Therapeutic injections should be used only after pathology has been demonstrated. Injections are invasive procedures that can cause serious complications thus clinical indications and contraindications should be closely adhered to. It

is recommended that all patients have an appropriate exercise program that may include a functionally directed rehabilitation program.

ii. Special Considerations — For all injections (excluding trigger point), fluoroscopic, arthrographic and/or CT guidance during procedures is recommended to document technique and needle placement, and should be performed by a physician experienced in the procedure. The subspecialty disciplines of the physicians may be varied, including, but not limited to: anesthesiology, radiology, surgery, or physiatry. The practitioner should participate in ongoing injection training workshops such as those sponsored by International Society for Injection Studies (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.

iii. Complications — General complications of spinal injections may include (a) transient neurapraxia, local pain, nerve injury, infection, headache, urinary retention and vasovagal effects; (b) epidural hematoma, permanent neuralgic damage, dural perforation and CSF leakage, spinal meningeal abscess; and or (c) suppression of the hypothalamic pituitary adrenal axis, which may be steroid dose dependent. Permanent paresis, anaphylaxis and arachnoiditis have been rarely reported with the use of epidural steroids.

iv. 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: (a) allergy to contrast, (b) poorly controlled Diabetes Mellitus or hypertension, aspirin/antiplatelet therapy (drug may be held for 3 days prior to injection), (d) shellfish allergy, if contrast to be used.

v. Epidural Steroid Injection (ESI)

A) Description — Epidural steroid injections are injections of corticosteroid into the epidural space. The purpose of ESI is to reduce pain and inflammation, restoring range of motion and thereby facilitating progress in more active treatment programs. ESI use three approaches: transforminal, translaminar (midline), and caudal. There is good evidence to support a preference for a transforaminal approach. The evidence also suggests that the transforaminal approach can deliver medication to the target tissue with few complications and is therefore used to identify the specific site of pathology. This is also the preferred approach for post-surgical patients.

B) Needle Placement — Spinal imaging is required for all transforaminal epidural steroid injections. Since injections performed without radiographic guidance result in an increased risk of incorrect needle placement, spinal imaging is recommended for caudal and translaminar injections if available within 30 miles of the patient's home. Contrast epidurograms allow one to verify the flow of medication into the epidural space.

C) Indications — There is some evidence that epidural steroid injections are effective for patients with radicular pain or radiculopathy (sensory or motor loss in a specific dermatome or myotome). Although there is no evidence regarding the effectiveness of ESI for non-radicular pain, it is a generally accepted intervention. Selected cases of vertebral compression fracture may be helped by ESI.

- Time to produce effect: Local anesthetic, approximately 30 minutes; corticosteroid, 48 to 72 hours for 80% of patients and 2 weeks for 20%.
- Frequency: One or more divided levels can be injected in one session. Whether injections are repeated depends upon the patient's response to the previous injection session. Subsequent injection sessions may occur after 1 to 2 weeks if patient response has been favorable. Injections can be repeated after a hiatus of three months if the patient has demonstrated functional gain and pain returns or worsens. If ESIs are repeated in the future, there should be increasing duration of relief and continued functional gain.
- Optimum duration: Usually 1 to 3 sessions of injection(s), depending upon each patient's response and functional gain.
- Maximum duration: Up to 3 to 4 sessions of injections may be done as per the patient's response to pain and function. Patients should be reassessed after each injection session.

vi. Zygoapophyseal (Facet) Injection

A) Description — Intra-articular or pericapsular injection of local anesthetic and corticosteroid. Medial branch nerve blocks are diagnostic only. There is conflicting evidence to support a long-term therapeutic effect using facet injections.

B) Indications — Facet injections may be considered in those patients whose history and examination are suggestive of a facet pain generator. Lumbar facet injections are primarily of diagnostic value. The therapeutic value of facet injections provides short-term pain relief for patients to progress through a functionally directed rehabilitation program. These injections are useful when used in conjunction with Manipulation Under Joint Anesthesia (MUJA). Facet injections determine level(s) of lumbar facet involvement and the degree of pain coming from the posterior elements. Facet injections may help determine the best therapeutic exercise approach (i.e., lumbar stabilization vs. sacroiliac stabilization).

- ❖ Time to produce effect: Approximately 30 minutes for local anesthetic; 48 to 72 hours for corticosteroid.
- ❖ Frequency: 1 to 3 sessions for each joint.
- ❖ Optimum duration: 1 to 3 sessions of injections for each joint.
- ❖ Maximum duration: 3 intra-synovial or medial branch nerve injections per joint can be done for facilitating a therapeutic exercise program.

b. <u>Facet Rhizotomy (Radio Frequency Medial Branch Neurotomy):</u>

i. Description — A procedure designed to denervate the facet joint by ablating the periarticular facet nerve branches. Percutaneous radiofrequency is the method generally used. There is good evidence to support this procedure in the cervical spine but benefits beyond one year are not yet established. Evidence in the lumbar spine is conflicting however, the procedure is generally accepted.

ii. Indications — Pain of well-documented facet origin, unresponsive to active and/or passive therapy, unresponsive to manual therapy, and in which a psychosocial evaluation has been performed. This procedure is commonly used to provide a window of pain relief allowing for participation in active therapy. All patients must have a successful response to diagnostic medial nerve branch blocks. A successful response is considered to be a 90% or greater relief of pain for the length of time appropriate to the local anesthetic used (i.e., bupivacaine greater than lidocaine). Radio-frequency rhizotomy is the procedure of choice over alcohol, phenol, or cryoablation. Precise positioning of the probe using fluoroscopic guidance is recommended since the maximum effective radius of the device is 2 milimeters.

iii. Complications — Bleeding, infection, or neural injury. The clinician must be aware of the risk of developing a deafferentation centralized pain syndrome as a complication of this and other neuroablative procedures.

iv. Post-Procedure Therapy — Active and/or passive therapy. Implementation of a gentle aerobic reconditioning program (e.g., walking) and back education within the first post-procedure week, barring complications. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be done 3 to 4 weeks post-procedure.

c. <u>Sacroiliac Joint Injection:</u>

i. Description — Injection of local anesthetic in an intra-articular fashion into the sacroiliac joint under radiographic guidance. May include the use of corticosteroids. Long-term therapeutic effect has not yet been established.

ii. Indications — Primarily diagnostic to rule out sacroiliac joint dysfunction vs. other pain generators. Intra-articular injection can be of value in diagnosing the pain generator. There should be documented relief from previously painful maneuvers (e.g., Patrick's test) on post-injection physical exam. Therapeutic response varies. Sacroiliac joint blocks may facilitate functionally directed rehabilitation program.

- ❖ Time to produce effect: Approximately 30 minutes for local anesthetic; 48 to 72 hours for corticosteroid.
- ❖ Frequency: 1 to 3 sessions of injections.
- ❖ Optimum duration: 1 to 3 sessions.
- ❖ Maximum duration: 3 sessions of injections. Once diagnosis has been documented by intrajoint injection, posterior ligament block may be as effective as intra-joint injection for therapeutic value unless the primary pain is coming from an anterior capsular pain generator.

d. <u>Trigger Point Injections:</u>

i. Description — Trigger point injection consists of dry needling or injection of local anesthetic with or without corticosteroid into highly localized, extremely sensitive bands of skeletal muscle fibers that produce local and referred pain when activated. Medication is injected in a four-quadrant manner in the area of maximum tenderness. Injection efficacy can be enhanced if injections are immediately followed by myofascial therapeutic interventions, such as vapo-coolant spray and stretch, ischemic pressure massage (myotherapy), specific soft tissue mobilization and physical modalities. The effectiveness of trigger point injection is uncertain, in part due to the difficulty of demonstrating advantages of active medication over injection of saline. Needling alone may be responsible for some of the therapeutic response.

ii. Indications — Trigger point injections may be used to relieve myofascial pain and facilitate active therapy and stretching of the affected areas. They are to be used as an adjunctive treatment in combination with other treatment modalities such as functional restoration programs. Trigger point injections should be utilized primarily for the purpose of facilitating functional progress. Patients should continue in an aggressive aerobic and stretching therapeutic exercise program as tolerated throughout the time period they are undergoing intensive myofascial interventions. Myofascial pain is often associated with other underlying structural problems and any abnormalities need to be ruled out prior to injection.

Trigger point injections are indicated in those patients where well circumscribed trigger points have been consistently observed, demonstrating a local twitch response characteristic radiation of pain pattern and local autonomic reaction, such as persistent hyperemia following palpation. Generally, these injections are not necessary unless consistently observed trigger points are not responding to specific, noninvasive, myofascial interventions within approximately a 6-week time

frame. However, trigger point injections may be occasionally effective when utilized in the patient with immediate, acute onset of low back pain.

iii. Complications — Potential but rare complications of trigger point injections include infection, pneumothorax, anaphylaxis, penetration of viscera, neurapraxia and neuropathy. If corticosteroids are injected in addition to local anesthetic, there is a risk of local myopathy developing. Severe pain on injection suggests the possibility of an intraneural injection, and the needle should be immediately repositioned.

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

e. **Prolotherapy:** also known as sclerotherapy, consists of a series of injections of hypertonic dextrose, with or without glycerine and phenol, into the ligamentous structures of the low back. Its proponents claim that the inflammatory response to the injections will recruit cytokine growth factors involved in the proliferation of connective tissue, stabilizing the ligaments of the low back when these structures have been damaged by mechanical insults.

There are conflicting studies concerning the effectiveness of prolotherapy in the low back. Lasting functional improvement has not been shown. The injections are invasive, may be painful to the patient, are not generally accepted or widely used. Therefore, the use of prolotherapy for low back pain is not recommended.

f. **Sympathetic Injections:** Refer to Division's Complex Regional Pain Syndrome/Reflex Sympathetic Dystrophy Medical Treatment Guidelines for specific information regarding the use of these injections.

4. **MEDICATIONS** use in the treatment of low back injuries is appropriate for controlling acute and chronic pain and inflammation. Use of medications will vary widely due to the spectrum of injuries from simple strains to post-surgical healing. All drugs should be used according to patient needs. 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.

Nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen are useful in the treatment of inflammation. These same medications can be used for pain control.

Narcotic medications should be prescribed with strict time, quantity, and duration guidelines, and with definitive cessation parameters. Pain is subjective in nature and should be evaluated using a scale to rate effectiveness of the narcotic prescribed. Other medications, including antidepressants, may be useful in selected patients with chronic pain. Tramadol, a centrally acting non-narcotic, can be useful to provide pain relief.

Other medications, including antidepressants, may be useful in selected patients with chronic pain.

Topical agents may be beneficial in the management of localized low back pain.

The following are listed in alphabetical order:

a. **Acetaminophen:** is an effective analgesic with antipyretic but not anti-inflammatory activity. Acetaminophen is generally well tolerated, causes little or no gastrointestinal irritation, and is not associated with ulcer formation. Acetaminophen has been associated with liver toxicity in overdose situations or in chronic alcohol use.

- Optimum duration: 7 to 10 days.
- Maximum duration: Chronic use as indicated on a case-by-case basis.

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

- Optimum duration: 1 week.
- Maximum duration: 4 weeks.

c. **Narcotics:** should be primarily reserved for the treatment of severe low back pain. There are circumstances where prolonged use of narcotics is justified based upon specific diagnosis, and in these cases, it should be documented and justified. In mild to moderate cases of low back pain, narcotic medication should be used cautiously on a case-by-case basis. Adverse effects include respiratory depression, the development of physical and psychological dependence, and impaired alertness.

- Optimum duration: 3 to 7 days.
- Maximum duration: 2 weeks. Use beyond two weeks is acceptable in appropriate cases.

d. **Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):** are useful for pain and inflammation. In mild cases, they may be the only drugs required for analgesia. There are several classes of NSAIDs, and the response of the individual injured worker to a specific medication is unpredictable. For this reason, a range of NSAIDs may be tried in each case with the most effective preparation being continued. Patients should be closely monitored for adverse reactions. Intervals for metabolic screening are dependent upon the patient's age, general health status and should be within parameters listed for each specific medication. Liver and renal function should be monitored at least every six months in patients on chronic NSAIDs.

i. Selective Nonsteroidal Anti-Inflammatory Drugs

Includes NSAIDs and acetylsalicylic acid (aspirin). Serious GI toxicity, such as bleeding, perforation, and ulceration can occur at any time, with or without warning symptoms in patients treated with traditional NSAIDs.

Physicians should inform patients about the signs and/or symptoms of serious gastrointestinal toxicity and what steps to take if they occur. Anaphylactoid reactions may occur in patients taking NSAIDs. NSAIDs may interfere with platelet function. Fluid retention and edema have been observed in some patients taking NSAIDs.

Due to the cross-reactivity between aspirin and NSAIDs, NSAIDs should not be used in aspirin-sensitive patients, and should be used with caution in all asthma patients. NSAIDs are associated with abnormal renal function, including renal failure, as well as abnormal liver function. Certain NSAIDs may have interactions with various other medications. Individuals may have adverse events not listed above.

- ❖ Optimal duration: 1 week
- ❖ Maximum duration: 1 year

ii. Selective Cyclo-oxygenase-2 (COX-2) Inhibitors

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

COX-2 inhibitors should not be first-line for low risk patients who will be using an NSAID short term but are indicated in select patients whom traditional NSAIDs are not tolerated or in certain high-risk patients. Patients most at risk of having a complication from traditional NSAIDs include patients with a prior history of peptic ulcer disease, gastrointestinal bleeding, gastrointestinal perforation, or hemophilia, as well as patients with thrombocytopenia or systemic anticoagulation. Celecoxib is FDA approved for osteoarthritis and rheumatoid arthritis. Rofecoxib is FDA approved for acute pain and osteoarthritis. Celecoxib is contraindicated in sulfonamide allergic patients.

- ❖ Optimal duration: 7 to 10 days
- ❖ Maximum duration: Chronic use is appropriate in individual cases.

e. **Oral Steroids:** have limited use but are accepted in cases requiring potent anti-inflammatory drug effect. They have no proven benefit for patients with low back pain with or without radiculopathy and are not recommended unless spinal cord compression is suspected. The risks of permanent neurological damage from acute spinal cord compression generally outweigh the risks of pharmacologic side effects of steroids in an emergent situation.

f. **Psychotropic/Anti-anxiety/Hypnotic Agents:** may be useful for treatment of mild and chronic pain, dysesthesias, sleep disorders, and depression. Antidepressant medications, such as tricyclics and Selective Serotonin Reuptake Inhibitors (SSRIs), are useful for affective disorder and chronic pain

management. Tricyclic antidepressant agents, in low dose, are useful for chronic pain but have more frequent side effects.

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

- ❖ Optimum duration: 1 to 6 months.
- ❖ Maximum duration: 6 to 12 months, with monitoring.

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

- ❖ Optimum duration: 3 to 7 days.
- ❖ Maximum duration: 2 weeks. Use beyond 2 weeks is acceptable in appropriate cases.

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

5. OCCUPATIONAL REHABILITATION PROGRAMS

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

i. Work Conditioning

These programs are usually initiated once reconditioning has been completed but may be offered at any time throughout the recovery

phase. It should be initiated when imminent return of a patient to modified or full duty is not an option, but the prognosis for returning the patient to work at completion of the program is at least fair to good.

- ❖ Length of visit: 1 to 2 hours per day.
- ❖ Frequency: 2 to 5 visits per week
- ❖ Optimum duration: 2 to 4 weeks
- ❖ Maximum duration: 6 weeks. Participation in a program beyond six weeks must be documented with respect to need and the ability to facilitate positive symptomatic or functional gains.

ii. Work Simulation

Work simulation is a program where an individual completes specific work-related tasks for a particular job and return to work. Use of this program is appropriate when modified duty can only be partially accommodated in the work place, when modified duty in the work place is unavailable, or when the patient requires more structured supervision. The need for work place simulation should be based upon the results of a Functional Capacity Evaluation and/or Job site Analysis.

- ❖ Length of visit: 2 to 6 hours per day
- ❖ Frequency: 2 to 5 visits per week
- ❖ Optimum duration: 2 to 4 weeks
- ❖ Maximum duration: 6 weeks. Participation in a program beyond six weeks must be documented with respect to need and the ability to facilitate positive symptomatic or functional gains.

b. **Interdisciplinary:** programs are characterized by a variety of disciplines that participate in the assessment, planning, and/or implementation of an injured workers program with the goal for patients to gain full or optimal function and return to work. There should be close interaction and integration among the disciplines to ensure that all members of the team interact to achieve team goals. These programs are for patients with greater levels of perceived disability, dysfunction, de-conditioning and psychological involvement. For patients with chronic pain, refer to Division's Chronic Pain Disorder Medical Treatment Guidelines.

i. Work Hardening

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

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

- ❖ Length of visit: Up to 8 hours/day
- ❖ Frequency: 2 to 5 visits per week
- ❖ Optimum duration: 2 to 4 weeks
- ❖ Maximum duration: 6 weeks. Participation in a program beyond six weeks must be documented with respect to need and the ability to facilitate positive symptomatic or functional gains.

ii. Spinal Cord Programs

Spinal Cord Systems of Care provide coordinated, case-managed, and integrated service for people with spinal cord dysfunction, whether due to trauma or disease. The system includes an inpatient component in an organization licensed as a hospital and an outpatient component. Each component endorses the active participation and choice of the persons served throughout the entire program. The Spinal Cord System of Care also provides or formally links with key components of care that address the lifelong needs of the persons served.

This can include a highly structured program involving a team approach or can involve any of the components thereof. The interdisciplinary team should, at a minimum, be comprised of a qualified medical director who is board certified and trained in rehabilitation, a case manager, occupational therapy, physical therapy, psychologist, rehabilitation RN and MD, and therapeutic recreation specialist. As appropriate, the team may also include: rehabilitation counselor, respiratory therapist, social worker, or speech-language pathologist.

Timeframe durations for any spinal cord program should be determined based upon the extent of the patient's injury and at the discretion of the rehabilitation physician in charge.

6. ORTHOTICS

a. **Foot Orthoses:** and inserts are a recognized and accepted intervention for spinal disorders that are due to aggravated mechanical abnormalities, such as leg length discrepancy, scoliosis, or lower extremity misalignment. Shoe insoles or inserts may be effective for patients with acute low back problems who stand for prolonged periods of time.

b. **Lumbosacral Bracing:** Rigid bracing devices are well accepted and commonly used for post-fusion, scoliosis, and vertebral fractures.

Lumbar support devices include backrests for chairs and car seats. Lumbar supports may provide symptomatic relief of pain and movement reduction in cases of chronic low back problems.

Lumbar corsets and back belts may be useful in some cases. They are an accepted treatment with limited application yet there is insufficient evidence to support the effectiveness of their use. The injured worker should be advised of the potential harm from using a lumbar support for a period of time greater than that which is prescribed. Harmful effects include de-conditioning of the trunk musculature, skin irritation, and general discomfort.

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

   - Time to produce effect: Varies with individual patient
   - Frequency: Should occur at every visit.

8. **PERSONALITY/PSYCHOLOGICAL/PSYCHOSOCIAL INTERVENTION** Psychosocial treatment is generally accepted, widely used, and well-established intervention. This group of therapeutic and diagnostic modalities includes, but is not limited to, individual counseling, group therapy, stress management, psychosocial crises intervention, hypnosis and meditation. Any screening or diagnostic workup should clarify and distinguish between preexisting versus aggravated versus purely causative psychological conditions. Psychosocial intervention is recommended as an important component in the total management program that should be implemented as soon as the problem is identified. This can be used alone or in conjunction with other treatment modalities. Providers treating patients with chronic pain should refer to Division's Chronic Pain Disorder Medical Treatment Guidelines.

   - Time to produce effect: 2 to 4 weeks.
   - Frequency: 1 to 3 times weekly for the first 4 weeks (excluding hospitalization, if required), decreasing to 1 to 2 times per week for the second month. Thereafter, 2 to 4 times monthly.
   - Optimum duration: 6 weeks to 3 months
   - Maximum duration: 3 to 12 months. Counseling is not intended to delay but to enhance functional recovery. For select patients, longer supervised treatment may required and if further counseling beyond 3 months is indicated, documentation addressing which pertinent issues are pre-existing versus aggravated versus causative, as well as projecting a realistic functional prognosis, should be provided by the authorized treating provider every 4 to 6 weeks during treatment.

9. **RESTRICTION OF ACTIVITIES** Continuation of normal daily activities is the recommendation for acute and chronic low back pain without neurologic symptoms.

There is good evidence against the use of bed rest in cases without neurologic symptoms. Bed rest may lead to de-conditioning and impair rehabilitation. Complete work cessation should be avoided, if possible, since it often further aggravates the pain presentation. Modified return-to-work is almost always more efficacious and rarely contraindicated in the vast majority of injured workers with low back pain.

10. **RETURN-TO-WORK** Early return-to-work should be a prime goal in treating occupational injuries given the poor return-to-work prognosis for an injured worker who has been out of work for more than six months. It is imperative that the patient be educated regarding the benefits of return-to-work, restrictions, and follow-up if problems arise. When attempting to return a patient to work after a specific injury, clear objective restrictions of activity level should be made. An accurate job description may be necessary to assist the physician in making return-to-work recommendations.

Return-to-work is defined as any work or duty that the patient is able to perform safely, and it may not be the patient's regular work. Due to the large spectrum of injuries of varying severity and varying physical demands in the work place, it is not possible to make specific return-to-work guidelines for each injury. Therefore, the Division recommends the following:

a. **Establishment of a Return-To-Work Status:** Ascertaining a return-to-work status is part of medical care, should be included in the treatment and rehabilitation plan, and addressed at every visit. A description of daily activity limitations is part of any treatment plan and should be the basis for restriction of work activities. In most non-surgical cases, the patient should be able to return to work in some capacity or in an alternate position consistent with medical treatment within several days unless there are extenuating circumstances. Injuries requiring more than two weeks off work should be thoroughly documented.

b. **Establishment of Activity Level Restrictions:** Communication is essential between the patient, employer, and provider to determine appropriate restrictions and return-to-work dates. It is the responsibility of the physician to provide clear concise restrictions, and it the employer's responsibility to determine if temporary duties can be provided within the restrictions. For low back pain injuries, the following should be addressed when describing the patient's activity level:

- Lower body postures such as squatting, kneeling, crawling, stooping, or climbing should include duration and frequency.
- Ambulatory level for distance, frequency, and terrain should be specified.
- Standing duration and frequency with regard to balance issues.
- Use of adaptive devices or equipment for proper office ergonomics to enhance capacities can be included.

c. **Compliance with Activity Restrictions:** In some cases, compliance with restriction of activity levels may require a complete job site evaluation, a functional capacity evaluation (FCE) or other special testing. Refer to the "Special Tests" section of this guideline.

11. **THERAPY—ACTIVE** The following active therapies have some evidence to support their use and are widely used and accepted methods of care for a variety of work-related injuries. They are 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). At times, the 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.

The following active therapies are listed in alphabetical order:

a. **Activities of Daily Living (ADL):** is 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

b. **Aquatic Therapy:** Aquatic therapy is the implementation of active therapeutic procedures in a swimming or therapeutic pool. The water provides a buoyancy force that lessens the amount of force gravity applies to the body. The decreased gravity effect allows the patient to have a mechanical advantage and more likely have a successful trial of therapeutic exercise. Aquatic vests or belts can be used to provide stability and balance in the water. Indications are for individuals who cannot tolerate active land-based or full-weight bearing therapeutic procedures. The pool should be large enough to allow full extremity range of motion and fully erect posture. Aquatic vests, belts and other devices and be used to provide stability, balance, buoyancy, and resistance.

- 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

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

- Time to produce effect: 4 to 5 treatments

- Frequency: 3 to 5 times per week
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 weeks

d. **Functional Electrical Stimulation:** is the application of electrical current to elicit involuntary or assisted contractions of atrophied and/or impaired muscles. Indications include muscle atrophy, weakness, and sluggish muscle contraction secondary to pain, injury, neuromuscular dysfunction, peripheral nerve lesion, or radicular symptoms.

- Time to produce effect: 2 to 6 treatments
- Frequency: 3 times per week
- Optimum duration: 8 weeks.
- Maximum duration: 8 weeks. If beneficial, provide with home unit.

e. **Lumbar Stabilization:** is a therapeutic program whose goal is to strengthen the spine in its neural and anatomic position. The stabilization is dynamic which allows whole body movements while maintaining a stabilized spine. It is the ability to move and function normally through postures and activities without creating undue vertebral stress.

- Time to produce effect: 4 to 8 treatments
- Frequency: 3 to 5 times per week
- Optimum duration: 4 to 8 weeks
- Maximum duration: 8 weeks

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

- Time to produce effect: 2 to 6 treatments
- Frequency: 3 times per week
- Optimum duration: 4 to 8 weeks
- Maximum duration: 8 weeks

g. **Therapeutic Exercise:** with or without mechanical assistance or resistance, may include isoinertial, isotonic, isometric and isokinetic types of exercises.

Indications include the need for cardiovascular fitness, reduced edema, improved muscle strength, improved connective tissue strength and integrity, increased bone density, promotion of circulation to enhance soft tissue healing, improvement of muscle recruitment, increased range of motion and are used to promote normal movement patterns. Can also include complementary/alternative exercise movement therapy.

- ❖ Time to produce effect: 2 to 6 treatments
- ❖ Frequency: 3 to 5 times per week
- ❖ Optimum duration: 4 to 8 weeks
- ❖ Maximum duration: 8 weeks

12. **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 use 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.

While protocols for specific diagnoses and post-surgical conditions may warrant durations of treatment beyond those listed as "maximum," factors such as exacerbation of symptoms, re-injury, interrupted continuity of care, and co-morbidities 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.

The following passive therapies are listed in alphabetical order:

a. **Electrical Stimulation (Unattended):** once applied, requires minimal on-site supervision by the physical or nonphysical provider. Indications include pain, inflammation, muscle spasm, atrophy, decreased circulation, and the need for osteogenic stimulation.

- ❖ Time to produce effect: 2 to 4 treatments
- ❖ Frequency: Varies, depending upon indication, between 2 to 3 times/day to 1 time/week. Provide home unit if frequent use.
- ❖ Optimum duration: 1 to 3 months
- ❖ Maximum duration: 3 months

b. **Infrared Therapy:** is a radiant form of heat application. Indications include the need to elevate the pain threshold before exercise and to alleviate muscle spasm to promote increased movement.

- Time to produce effect: 2 to 4 treatments
- Frequency: 3 to 5 times per week
- Optimum duration: 3 weeks as primary, or intermittently as an adjunct to other therapeutic procedures up to 2 months.
- Maximum duration: 2 months

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

- Time to produce effect: 1 to 4 treatments
- Frequency: 3 times per week with at least 48 hours between treatments
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 weeks

d. **Manipulation:** is a generally accepted, well-established and widely used therapeutic intervention for low back pain. Manipulation can include high velocity, low amplitude (HVLA) technique, chiropractic manipulation, osteopathic manipulation, muscle energy techniques, and non-force techniques. It is performed by taking a joint to its end range of motion and moving the articulation into the zone of accessory joint movement, well within the limits of anatomical integrity.

There is good scientific evidence to suggest that manipulation can be helpful for patients with acute low back pain problems without radiculopathy when used within the first 4 to 6 weeks of symptoms. Although the evidence for sub-acute and chronic low back pain and low back pain with radiculopathy is less convincing, it is a generally accepted and well-established intervention for these conditions. Indications for manipulation include joint pain, decreased joint motion, and joint adhesions. Contraindications include joint instability, fractures, severe osteoporosis, infection, metastatic cancer, active inflammatory arthridites, aortic aneurysm, and signs of progressive neurologic deficits.

- Time to produce effect: 1 to 6 treatments.
- Frequency: 1 to 5 times per week for the first 2 weeks as indicated by the severity of involvement and the desired effect, then 2 to 3 treatments per week for the next 4 weeks, then 1 to 2 treatments per week for the next 6 weeks.

- Optimum duration: 8 to 12 weeks
- Maximum duration: 3 months. Extended durations of care beyond what is considered "maximum" may be necessary in cases of re-injury, interrupted continuity of care, exacerbation of symptoms, and in those patients with co-morbidities. Care beyond 3 months is indicated for certain chronic syndromes in which manipulation is helpful in improving function, decreasing pain and improving quality of life. Such care should be re-evaluated and documented on a monthly basis. Treatment may include visits 2 times a month through the 7th month post-injury, then on a monthly basis thereafter through the 10th month post-injury. Care beyond the 10th month should be reviewed and allowed on a case-by-case basis according to the unique needs of the patient with chronic and/or permanent injury.

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

- Time to produce effect: Immediate
- Frequency: 1 to 2 times per week
- Optimum duration: 6 weeks
- Maximum duration: 2 months

f. **Mobilization (Joint):** is passive movement involving oscillatory motions to the vertebral segment(s). The passive mobility is performed in a graded manner (I, II, III, IV, or V), which depicts the speed of the maneuver. It may include skilled manual joint tissue stretching. Indications include the need to improve joint play, segmental alignment, improve intracapsular arthrokinematics, or reduce pain associated with tissue impingement. Contraindications include joint instability, fractures, severe osteoporosis, infection, metastatic cancer, active inflammatory arthridities, aortic aneurysm, and signs of progressive neurologic deficits.

- Time to produce effect: 6 to 9 treatments
- Frequency: 3 times per week
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 weeks

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

- Time to produce effect: 2 to 3 weeks
- Frequency: 2 to 3 times per week
- Optimum duration: 4 to 6 weeks
- Maximum duration: 6 weeks

h. **Superficial Heat and Cold Therapy:** are thermal agents applied in various manners that lowers or raises the body tissue temperature for the reduction of pain, inflammation, and/or effusion resulting from injury or induced by exercise. Includes application of heat just above the surface of the skin at acupuncture points. Indications include acute pain, edema and hemorrhage, need to increase pain threshold, reduce muscle spasm and promote stretching/flexibility. Cold and heat packs can be used at home as an extension of therapy in the clinic setting.

- Time to produce effect: Immediate
- Frequency: 2 to 5 times per week
- Optimum duration: 3 weeks as primary or intermittently as an adjunct to other therapeutic procedures up to 2 months
- Maximum duration: 2 months

i. **Short-Wave Diathermy:** involves the use of equipment that exposes soft tissue to a magnetic or electrical field. Indications include enhanced collagen extensibility before stretching, reduced muscle guarding, reduced inflammatory response, and enhanced re-absorption of hemorrhage/hematoma or edema.

- Time to produce effect: 2 to 4 treatments
- Frequency: 2 to 3 times per week up to 3 weeks
- Optimum duration: 3 to 5 weeks
- Maximum duration: 5 weeks

j. **Traction—Manual:** is an integral part of manual manipulation or joint mobilization. Indications include decreased joint space, muscle spasm around joints, and the need for increased synovial nutrition and response. Manual traction is contraindicated in patients with tumor, infection, fracture, or fracture dislocation.

- Time to produce effect: 1 to 3 sessions
- Frequency: 2 to 3 times per week
- Optimum duration: 30 days
- Maximum duration: 1 month

k. **Traction—Mechanical:** is indicated for decreased joint space, muscle spasm around joints, and the need for increased synovial nutrition and response. Traction modalities are contraindicated in patients with tumor, infections, fracture, or fracture dislocation. Nonoscillating inversion traction methods are contraindicated in patients with glaucoma or hypertension. A home lumbar traction unit can be purchased if therapy proves effective.

- Time to produce effect: 1 to 3 sessions up to 30 minutes. If response is negative after 3 treatments, discontinue this modality.
- Frequency: 2 to 3 times per week
- Optimum duration: 4 week
- Maximum duration: 1 month

l. **Transcutaneous Electrical Nerve Stimulation (TENS):** TENS should include least one instructional session for proper application and use. Indications include muscle spasm, atrophy, and decreased circulation and pain control. Minimal TENS unit parameters should include pulse rate, pulse width and amplitude modulation.

- Time to produce effect: Immediate.
- Frequency: Variable.
- Optimum duration: 3 sessions
- Maximum duration: 3 sessions. If beneficial, provide with home unit or purchase if effective.

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

- Time to produce effect: 6 to 15 treatments
- Frequency: 3 times per week
- Optimum duration: 4 to 8 weeks
- Maximum duration: 2 months

n. **Vertebral Axial Decompression (VAX-D):** a registered trademark for a motorized traction table used to stretch the lower back, is an acronym for vertebral axial decompression. The patient lies prone on the table in a pelvic

harness for 30 to 45 minutes while alternating cycles of stretching and relaxation are applied. The table has Food and Drug Administration (FDA) approval as a traction device, but no studies have shown any advantage of vertebral axial decompression over ordinary manual therapy for low back pain and it has not been shown to treat conditions associated with herniated discs.

The evidence in support of vertebral axial decompression is insufficient to support its use in low back injuries. Proponents of this therapy may submit supporting evidence to the Division if they believe that claims of its effectiveness can be supported by well-designed studies. Vertebral axial decompression for treatment of low back injuries is not recommended.

o. **Whirlpool/Hubbard Tank:** is conductive exposure to water at temperatures that best elicits the desired effect (cold vs. heat). It generally includes massage by water propelled by a turbine or Jacuzzi jet system and has the same thermal effects as hot packs if higher than tissue temperature. It has the same thermal effects as cold application if comparable temperature water used. Indications include the need for analgesia, relaxing muscle spasm, reducing joint stiffness, and facilitating and preparing for exercise.

- Time to produce effect: 2 to 4 treatments
- Frequency: 3 to 5 times per week
- Optimum duration: 3 weeks as primary, or intermittently as an adjunct to other therapeutic procedures up to 2 months
- Maximum duration: 2 months

13. **VOCATIONAL REHABILITATION** is a generally accepted intervention, but Colorado limits its use as a result of Senate Bill 87-79. Initiation of vocational rehabilitation requires adequate evaluation of patients for quantification highest functional level, motivation, and achievement of maximum medical improvement. Vocational rehabilitation may be as simple as returning to the original job or as complicated as being retrained for a new occupation.

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F. THERAPEUTIC PROCEDURES — OPERATIVE

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 condition(s). It is imperative to rule out non-physiologic modifiers of pain presentation or non-operative conditions mimicking radiculopathy or instability (e.g., peripheral neuropathy, piriformis syndrome, myofascial pain, scleratogenous or sympathetically mediated pain syndromes, sacroiliac dysfunction, psychological conditions, etc.) prior to consideration of elective surgical intervention.

In addition, operative treatment is indicated when the natural history of surgically treated lesions is better than the natural history for non-operatively treated lesions. All patients being considered for surgical intervention should first undergo a comprehensive neuromusculoskeletal examination to identify mechanical pain generators that may respond to non-surgical techniques or may be refractory to surgical intervention.

While sufficient time allowances for non-operative treatment are required to determine the natural cause and response to non-operative treatment of low back pain disorders, timely decision making for operative intervention is critical to avoid de-conditioning and increased disability (exclusive of "emergent" or urgent pathology such as cauda equina syndrome or associated rapidly progressive neurologic loss).

In general, if the program of non-operative treatment fails, operative treatment is indicated when:

- Improvement of the symptoms has plateaued and the residual symptoms of pain and functional disability are unacceptable at the end of 6 to 12 weeks of treatment, or at the end of longer duration of non-operative programs for debilitated patients with complex problems; and/or

- Frequent recurrences of symptoms cause serious functional limitations even if a non-operative treatment program provides satisfactory relief of symptoms, and restoration of function on each recurrence. Mere passage of time with poorly guided treatment is not considered an active treatment program.

Surgical workup and implementation for simple decompression of patients with herniated nucleus pulposus and sciatica should occur within 6 to 12 weeks after injury at the latest, within the above stated contingencies. For patients with true, refractory mechanical low back pain in whom fusion is being considered, it is recommended that a decisive commitment to surgical or non-surgical interventions occur within 5 months following injury, at the latest.

Re-operation is indicated only when the functional outcome following the re-operation is expected to be better, within a reasonable degree of certainty, than the outcome of other non-invasive or less invasive treatment procedures. “Functional outcomes” refers to the patient’s ability to improve functional tolerances such as sitting, standing, walking, strength, endurance, and/or vocational status. While timely surgical decision-making is critical to avoid de-conditioning and increased disability, a time limited trial of reconditioning should be tried prior to re-operation. Re-operation has a high rate of complications and failure and may lead to disproportionately increased disability.

Structured rehabilitation interventions should be strongly considered post-operative in any patient not making expected functional progress within three weeks post-operative.

Return to work restrictions should be specific according to the recommendation in the section "Return to Work" under Therapeutic Procedures – Non-Operative. Most non-fusion surgical patients can return to a limited level of duty between 3 to 6 weeks. Full activity is generally achieved between 6 weeks to 6 months depending on the procedure and healing of the individual.

1. DISCECTOMY

a. **Description:** To enter into and partially remove the disc.

b. **Complications:** Includes, but are not limited to, nerve damage, wrong level operation, spinal fluid leakage, infection, and hemorrhage.

c. **Surgical Indications:** To include all of the following: Primary radicular symptoms, radiculopathy on exam, correlating imaging study, and failure of non-surgical care. There is limited evidence that surgery provides initial improvement in symptoms although most lumbar discs resolve naturally with time.

d. **Operative Treatment:** Laminotomy, partial discectomy, and root decompression.

e. **Post-Operative Therapy:** Active and/or passive therapy. Implementation of a gentle aerobic reconditioning program (e.g., walking) and back education within the first post-operative week, barring complications. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be considered 3 to 4 weeks post-op.

2. CHEMONUCLEOLYSIS

a. **Description:** Injection of a proteolytic enzyme into the disc to obtain an enzymatic degradation of the nucleus pulposus.

b. **Complications:** Includes, but are not limited to, severe adverse reaction, neurologic complications including transverse myelitis, infection and back muscle spasm.

c. **Surgical Indications:** To include all of the following: Primary radicular symptoms, radiculopathy on exam, correlating imaging study, and failure of non-surgical care. There is some evidence to support the use of chemonucleolysis over no treatment. However, more patients require second surgeries after this procedure than after a discectomy. The failure rate of chemonucleolysis is higher than the failure rate of discectomy.

d. **Operative Treatment:** Injection of a proteolytic enzyme into the disc to obtain an enzymatic degradation of the nucleus pulposus. Physicians trained in chemonucleolysis and with extensive experience performing the procedure should only perform chemonucleolysis.

e. **Post-Operative Therapy:** Active and/or passive therapy. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be considered 3 to 4 weeks post-op.

3. PERCUTANEOUS DISCECTOMY (NUCLECTOMY) OR LASER DISCECTOMY

a. **Description:** An invasive operative procedure to accomplish partial removal of the disc through a trocar under imaging control.

b. **Complications:** Include, but are not limited to, injuries to the nerve or vessel, infection, and hematoma.

c. **Surgical Indications:** Percutaneous discectomy is indicated in cases with suspected septic discitis in order to obtain diagnostic tissue. These procedures may be used in the presence of septic discitis for the following: Primary radicular symptoms, radiculopathy on exam, correlating imaging study, and failure of non-surgical care. The procedure has limited application for non-septic cases due to lack of evidence to support long-term improvement.

d. **Operative Treatment:** Partial discectomy & root decompression. If unsuccessful, open laminectomy should be strongly considered within 2 weeks post-discectomy.

e. **Post-Operative Therapy:** Active and/or passive therapy. Implementation of a gentle aerobic reconditioning program (e.g., walking) and back education within the first post-operative week, barring complications. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be considered 3 to 4 weeks post-op.

4. LAMINOTOMY/LAMINECTOMY/FORAMENOTOMY/FACETECTOMY

a. **Description:** They provide access to produce neural decompression by partial or total removal of various parts of vertebral bone.

b. **Complications:** Include but are not limited to, nerve injury, post-surgical instability, CSF leakage and infection.

c. **Surgical Indications:** To include all of the following: Primary radicular symptoms, radiculopathy on exam, correlating imaging study, and failure of non-surgical care.

d. **Operative Treatment:** Laminotomy, partial discectomy & root decompression.

e. **Post-Operative Therapy:** Active and/or passive therapy. Implementation of a gentle aerobic reconditioning program (e.g., walking) and back education within the first post-operative week, barring complications. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be considered 3 to 4 weeks post-op.

5. SPINAL FUSION

a. **Description:** Use of bone grafts, sometimes combined with metal devices, to produce a rigid connection between two or more adjacent vertebrae.

b. **Complications:** Instrumentation failure, bone graft donor site pain, in-hospital mortality, deep wound infection, superficial infection, graft extrusion.

c. **Surgical Indications:** A timely decision-making process is recommended when considering patients for possible fusion. There is no good evidence from controlled trials that spinal fusion alone is effective for treatment of any type of acute low back problem, in the absence of spinal fracture or dislocation. For chronic low back problems, fusion should not be considered within the first 3 months of symptoms, except for fracture or dislocation. Indications for spinal fusion may include:

i. Neural arch defect – Spondylolytic spondylolisthesis, congenital unilateral neural arch hypoplasia.

ii. Segmental Instability - Excessive motion, as in degenerative spondylolisthesis, surgically induced segmental instability.

iii. Primary Mechanical Back Pain/Functional Spinal Unit Failure - Multiple pain generators objectively involving two or more of the following: (a) internal disc disruption (poor success rate if more than one disc involved), (b) painful motion segment, as in annular tears, (c) disc resorption, (d) facet syndrome, and or (e) ligamentous tear.

iv. Revision surgery for failed previous operation(s) if significant functional gains are anticipated. Revision surgery for purposes of pain relief must be approached with extreme caution due to the less than 50% success rate reported in medical literature.

v. Infection, tumor, or deformity of the lumbosacral spine that cause intractable pain, neurological deficit and/or functional disability.

d. **Pre-Operative Surgical Indications:** Required pre-operative clinical surgical indications for spinal fusion include all of the following:

i. All pain generators are identified and treated; and

ii. All physical medicine and manual therapy interventions are completed; and

iii. X-ray, MRI, or CT/Discography demonstrating disc pathology or spinal instability; and

iv. Spine pathology limited to two levels; and

v. Psychosocial screen with confounding issues addressed.

vi. For any potential fusion surgery, it is recommended that the injured worker refrain from smoking for at least six weeks prior to surgery and during the period of fusion healing.

e. **Operative Therapy:** Operative procedures may include: a) Intertransverse Fusion; b) Anterior Fusion – generally used for component of discogenic pain where there is no significant radicular component requiring decompression; c) Posterior Interbody Fusion – generally used for component of discogenic pain where posterior decompression for radicular symptoms also performed; or d)

Anterior/posterior (360°) Fusion – most commonly seen in unstable or potentially unstable situations or non-union of a previous fusion.

f. **Post-Operative Therapy:** Active and/or passive therapy. Implementation of a gentle aerobic reconditioning program (e.g., walking) and back education within the first post-operative week, barring complications. Instruction and participation in a long-term home-based program of ROM, strengthening, endurance and stability exercises should be done once fusion is solid (generally 6 weeks to 6 months post-op).

g. **Return to Work:** Barring complications, patients responding favorably to spinal fusion may be able to return to sedentary-to-light work within 6 to 12 weeks post-operatively, light-to-medium work within 6 to 9 months post-operatively and medium-to-medium/heavy work within 6 to 12 months post-operatively. Patients requiring fusion whose previous occupation involved heavy-to-very-heavy labor should be considered for vocational assessment as soon as reasonable restrictions can be predicted. As previously noted, the practitioner must release the patient with specific physical restrictions and should obtain a clear job description from the employer, if necessary. Once an injured worker is off work greater than 6 months, the functional prognosis with or without fusion becomes guarded for that individual.

6. SACROILIAC JOINT FUSION

a. **Description:** Use of bone grafts, sometimes combined with metal devices, to produce a rigid connection between two or more adjacent vertebrae providing symptomatic instability as a part of major pelvic ring disruption.

b. **Complications:** Instrumentation failure, bone graft donor site pain, in-hospital mortality, deep infection, superficial infection, and graft extrusion.

c. **Surgical Indications:** This procedure has limited use in minor trauma and would be considered only on an individual case-by-case basis. In patients with typical mechanical low back pain, this procedure is considered to be under investigation in Colorado. Until the efficacy of this procedure for mechanical low back pain is determined by an independent valid prospective outcome study, this procedure is not recommended for mechanical low back pain.

7. IMPLANTABLE SPINAL CORD STIMULATORS are reserved for those low back pain patients with pain of greater than 6 months duration who have not responded to the standard non-operative or operative interventions previously discussed within this document. Refer to Division's Chronic Pain Disorder Medical Treatment Guidelines.

8. INTRADISCAL ELECTROTHERMAL ANNULOPLASTY (IDEA)

a. **Description:** An outpatient non-operative procedure. A wire is guided into the identified painful disc using fluoroscopy. The wire is then heated within the disc. The goal of the procedure is to burn the nerves and to tighten the injured tissue within the disc. Physicians performing this procedure must have been trained in the procedure and have performed at least 25 prior discograms. Prior authorization is required for IDEA.

b. **Complications:** Complications include, but are not limited to, discitis, nerve damage, pain exacerbation, and anaphylaxis.

c. **Surgical Indications:** Failure of conservative therapy including physical therapy, medication management, or therapeutic injections. Indications may include those with chronic low back pain, disc related back pain, or pain lasting greater than 6 months. There is some evidence to support this procedure. It continues to be investigational and cannot be generally recommended. Controlled trials are currently in progress, but results will not be published in the immediate future so functional benefit beyond 12 months is unknown. Only patients who meet the following should be considered, including:

i. All pain generators are identified and treated; and

ii. All physical medicine and manual therapy interventions are completed; and

iii. X-ray, MRI, or CT/Discography demonstrating disc pathology; and

iv. Spine pathology limited to two levels; and

v. Psychosocial screen with confounding issues addressed.

vi. For any potential surgery, it is recommended that the injured worker refrain from smoking for at least six weeks prior to surgery and during the period of healing.

Additionally, the candidate must meet the following criteria:

i. Age not above 60 or under 18; and

ii. Normal neurological exam; and

iii. No evidence of nerve root compression on MRI; and

iv. Concordant pain reproduction with provocative discography at less than 1ml dye volume (low pressure); and

v. Functionally limiting low back for at least 6 months; and

vi. No evidence of inflammatory arthritis, spinal conditions mimicking low back pain, moderate to severe spinal stenosis, spinal instability, disc herniation, or medical or metabolic diseases precluding follow-up rehabilitation; and

vii. The height of the disc must be sufficient to permit maneuvering of the thermal wire; and

viii. Previous IDEA within the last 6 months.

d. **Operative Treatment:** A wire is guided into the identified painful disc using fluoroscopy and then the wire is heated within the disc.

e. **Post-Procedure Therapy:** Active and/or passive therapy. Some cases may require epidural injection after the procedure has been performed. Rehabilitation may take as long as 6 months and include stretching during the first month, floor exercises in the second month, 3 to 5 consecutive months of progressive exercise program, and sport activities in the 5th and 6th months as tolerated.

f. **Return to Work:** Barring complications, may be able to return to limited duty after one week. Zero to 10 pounds lifting for first 6 weeks post-procedure. May return to medium work category (20 to 50 pounds per DOT standards) at 3 months or more.