GUIDELINES FOR TREATMENT OF

THE CERVICAL SPINE

developed and adopted by the

PHYSICIAN ADVISORY COMMITTEE

Adopted by the Administrator of the Oklahoma Workers' Compensation Court

Effective XXXX, XX, 2008

INTRODUCTION

BACKGROUND: The Physician Advisory Committee (PAC), a statutorily created advisory body to the Oklahoma Workers' Compensation Court, has been directed by Oklahoma Statute to develop and recommend treatment guidelines for injured Oklahoma workers. The PAC is composed of nine members; three appointed by the Governor, three appointed by the President Pro Tempore of the State Senate, and three appointed by the Speaker of the Oklahoma House of Representatives. By statute, the Governor's appointees must include a doctor of medicine and surgery, a family practitioner in a rural community of the state, and an osteopathic physician; the President Pro Tempore's appointees must include a doctor of medicine and surgery, a doctor of medicine or an osteopathic physician, and a podiatric physician; and the Speaker's appointees must include an osteopathic physician, a doctor of medicine or an osteopathic physician, and a chiropractic physician.

DEVELOPMENT OF THE GUIDELINES: The Committee received input from a wide variety of sources including employers, insurance carriers, and health care providers. Appropriate scientific literature has been reviewed. The Occupational Medicine Practice Guidelines promulgated by the American College of Occupational and Environmental Medicine and the Official Disability Guidelines published by the Work Loss Data institute, and practice parameters of the American Academy of Orthopaedic Surgeons were reviewed. Treatment protocols from Colorado, Washington, Minnesota, California, Rhode Island, and West Virginia were also utilized.

APPLICATION OF THE GUIDELINES: These treatment guidelines should not be construed as including all proper methods of care or excluding other acceptable methods of care which are based upon nationally accepted practice standards.

For injury or illness treated under the Oklahoma Workers' Compensation Act, compliance with these treatment guidelines is mandatory and an employer or insurer for an employer is not required to pay for treatment which is not in compliance with the treatment guidelines, unless prior authorization is received. If prior authorization is refused, independent review may be obtained under court procedures.

Authorization for treatment may not be denied on the sole basis the treatment is not addressed by these guidelines if it is documented to be based upon nationally accepted practice standards.

These guidelines do not affect any determination of liability for an injury under the Oklahoma Workers' Compensation Act, 85 O.S., Section 1, et seq., and are not intended to expand or restrict a health care provider's scope of practice under any other statutes.

I. THERAPEUTIC PROCEDURES – NON-OPERATIVE

A. Background

1. This treatment guideline for the diagnosis and conservative treatment of neck pain is a consensus document based on nationally accepted practice standards and is not a scientific treatise on the subject.
2. It is understood that a certain number of injured employees treated under this guideline will require continued care that may transition to other treatment guidelines.

3. This treatment guideline is meant to cover the majority of tests and treatments for injured workers with low back pain. However, it is expected that up to 10% of cases may fall outside these treatment guidelines and require review on a case-by-case basis.

4. Although the primary purpose of this document is advisory and educational, these guidelines are enforceable under Title 85, Section 201.1 (B) (5). The Physician Advisory Committee recognizes that acceptable medical practice may include deviations from these treatment guidelines as individual cases dictate. Therefore, these guidelines are not relevant as evidence of a provider's legal standard of care.

5. It is anticipated that these Guidelines will only be applicable for no more than six months following the index injury.

6. The natural history of neck pain is such that within three months of the index injury, 90% of all injured workers should no longer require active medical treatment.

B General Principles

1. Treatment Parameter Duration. Time frames for specific interventions begin once specific treatment has been initiated and not on the date of injury.

2. Active interventions. Active interventions (therapeutic exercise and/or functional treatment) are emphasized over passive modalities, especially as treatment progresses. Generally, passive interventions are viewed as a means to facilitate the transition to an active rehabilitation program.

3. Positive Patient Response. These results are defined primarily as functional gains that can be objectively measured, such as positional tolerances, range of motion, strength, endurance, ADL, cognition, psychological behavior, and efficiency/velocity measurements. Subjective reports of pain and function should be considered and given relative weight when the pain has an anatomic and/or physiological basis. All findings must be based on objective medical evidence.

4. Re-evaluate Response to Treatment at least every 3-4 weeks. If a given treatment is not producing the desired effect with three to four weeks, the treatment should either be modified or discontinued. If a rational intervention fails to produce the desired effect, the diagnosis of the condition under treatment should be re-considered.

5. Surgical Interventions. Surgical Interventions for neck pain are covered in a companion treatment guideline.

6. Six-month time frame. As many studies have documented, the prognosis of an injured employee returning to work drops precipitously after the employee 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 before the six-month mark, whenever possible. It is important to note that these time frames may not be pertinent for injuries that do not involve work-time loss or are not occupationally-related.

7. Return-to-work. Work is therapeutic, assuming that the work is not likely to aggravate the basic problem or increase long-term pain. Even if there is residual chronic pain, return to work is not necessarily contraindicated.

8. Delayed Recovery. The Physician Advisory Committee recognizes that 3-10% of all industrially injured patients will not recover within 6-12 weeks of the index injury. Such individuals may require treatment beyond the limits discussed within this document, but such treatment will require clear documentation by the treating physician focusing on objective functional gains afforded by further treatment and its impact on prognosis.

9. Guideline Recommendations and Inclusion of Medical Evidence. All recommendations in this treatment guideline are considered to represent reasonable care in appropriately selected cases, regardless of the level of evidence attached to it. Those procedures considered inappropriate, unreasonable, or unnecessary are designated in the treatment guideline as "not recommended".

10. Care Beyond MMI. MMI should be declared by the treating physician when the patient's

condition has plateaued to the point that further medical intervention is unlikely to result in improved functional outcome. However, some patients may require treatment after MMI has been reached in order to maintain their functional state. The recommendations in this treatment guideline are for pre-MMI care and are not intended to limit post-MMI treatment.

C Initial Diagnostic Evaluation

1. History
2. Physical Examination
3. Routine xrays of the Cervical Spine
4. Laboratory Testing. Various laboratory tests may be indicated when the claimant's history suggests either an infectious, metabolic, endocrinologic, neoplastic, or system rheumatic disease. The tests are too numerous to list, but should be accompanied by an explanation by the treating physician of the indication for the procedure.

D. Advanced Diagnostic Imaging and Testing Procedures

Limitations: No test shall be repeated more frequently than every six months without prior authorization.

1. Imaging Studies
   a. MRI Scan. This is the imaging study of choice for most abnormalities of the cervical spine.
   b. CT scan. This test is useful for evaluating the status of fusions, bony abnormalities, and suspected fractures.
   c. Myelography
   d. CT/Myelogram
   e. Radioisotope Bone Scan. This test is useful in the diagnosis of bone tumors, stress fractures, osteomyelitis, and various inflammatory lesions. The scan is highly specific, but never very sensitive.
   f. Indium/Gallium Scanning. Not routinely used, but may be helpful in the diagnosis of tumors, infections, or abscesses.
2. Other Tests
   a. Personality/Psychological/Psychosocial Evaluation
   b. Electrodiagnostic Studies/Nerve Conduction Velocities
   c. Diagnostic Injections. Include, but not limited to the following:
      (1) Medial Branch Blocks
      (2) Intra-articular facet injections
      (3) Atlanto-axial and atlanto-occipital injections
   e. Discography
3. Special Tests
   a. Functional Capacity Evaluation
   b. Jobsite Evaluation
   c. Vocational Assessment
   d. Work Tolerance Screening
4. Not Recommended
   a. Thermography

b. Surface EMG

c. Current Perception Threshold Evaluation

d. Somatosensory Evoked Potential.

Note: May be used in suspected cases of spinal stenosis or myelopathy. (ref: ACOEM Occupational Medicine Practice Guidelines, p.182)

e. Large-Array Surface Electromyography

f. Surface EMG in combination with range of motion and/or Functional Capacity Evaluation

E. Therapeutic Procedures

1. Acupuncture
2. Biofeedback
3. Therapeutic Spinal Injections

Limitation: No more than three injections of a single, specific type are allowed during a one year period without prior approval.

a. Cervical epidural steroid injection

b. Zygoapophyseal (Facet) Injections

c. Facet Rhizotomoy (Radio Frequency Medial Branch Neurectomy)

d. Occipital Nerve Block

e. Trigger Point Injections

F. Not Recommended

1. Prolotherapy/Sclerotherapy

G. Medications

1. Acetaminophen
2. Muscle Relaxants
3. Narcotics. The use of narcotic medication is not recommended beyond two weeks unless clinically indicated.
4. Non-steroidal anti-inflammatory medication (NSAIDs). There is no evidence that these medications modify the natural history of the disease.
5. Oral Steroids
6. Psychotropic/Anti-anxiety/Anti-depressant/Hypnotic Agents
7. Tramadol
8. Topical Drug Delivery sytems

H. Occupational Rehabilitation Programs

1. Work Conditioning
2. Work Simulation
3. Work Hardening

I. Orthotics

1. Cervical collars. There is no evidence that the use of a cervical collar promotes healing from a cervical strain. Their use in other situations may be indicated.

J. Personality/Psychological/Psychosocial Intervention

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 selected patients, longer supervised treatment may be required and if further counseling beyond 3 months is indicated, documentation is required addressing which issues are pre-existing, causative, or aggravated, as well as a realistic functional prognosis by the treating physician at no less than every 4-6 weeks during treatment.

K. Therapy-Passive (Modalities)

The Maximum Duration for all Physical Therapy-type treatments is 18 sessions unless prior approval is obtained.

Unlisted procedures require prior authorization to proceed.

1. Listed Procedures.
    a. Electrical Stimulation
    b. Infrared Therapy
    c. Iontophoresis
    d. Manipulation. On-going treatment beyond 18 visits may be appropriate if there is a demonstrated, continual improvement and active care components are clearly a part of the treatment plan. If no improvement is noted, consideration should be given for a referral to an allopathic or osteopathic specialist.
    e. Massage
    f. Joint Mobilization
    g. Soft Tissue Mobilization
    h. Superficial Heat and Cold Therapy
    i. Short-Wave Diathermy
    j. Manual Traction
    k. Mechanical Traction
    l. Transcutaneous Electrical Nerve Stimulation
    m. Ultrasound
2. Not Recommended
    a. Vertebral Axial Decompression (VAX-D)
    b. Best rest for more than 2 days.

L. Therapy - Active

The Maximum Duration for all Physical Therapy-type treatments is 18 sessions unless prior approval is obtained.

Unlisted procedures require prior authorization to proceed.

1. Listed Procedures.
    a. Activities of Daily Living
    b. Functional Activities
    c. Functional Electrical Stimulation

d. Cervical-Lumbar Stabilization

e. Neuromuscular Re-education

f. Therapeutic Exercise

II. THERAPEUTIC PROCEDURES — OPERATIVE

All operative interventions should be based on a positive correlation with clinical findings, the natural history of the disease, the clinical course, and diagnostic tests. A comprehensive assimilation of these factors should have led to a specific diagnosis with positive identification of the pathologic condition(s). It is imperative for the clinician to rule out non-physiologic modifiers of pain presentation, or non-operative conditions mimicking radiculopathy or instability (peripheral compressive neuropathy, chronic soft tissue injuries, and psychological conditions), prior to consideration of elective surgical intervention. Early intervention may be required in acute incapacitating pain or in the presence of progressive neurological deficits. Patients who are not candidates for or refuse surgical treatment should be treated with non-operative therapy as indicated.

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.

In situations requiring the possible need for re-surgery, a second opinion may be necessary. Psychological evaluation is strongly encouraged when surgery is being performed for isolated axial pain to determine if the patient will likely benefit from the treatment.

Interdisciplinary interventions should be strongly considered post-operatively in patients not making functional progress within expected time frames.

Return to work activity restrictions should be specific. Most cervical 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.

A. ACUTE FRACTURES & DISLOCATIONS Decisions regarding the need for surgery in acute traumatic injury will depend on the specific injury type and possibility of long-term neurologic damage. Acute disc herniations may occur in the presence of traumatic injury.

1. Halo Immobilization:

a. Description — Intervention that restricts flexion-extension motion. Halo vest will provide significant but not complete rotational control and is the most effective device for treating unstable injuries to the cervical spine.

b. Complications — May include pin infection, pin loosening, and palsy of the sixth cranial nerve.

c. Surgical Indications — Cervical fractures requiring the need for nearly complete restriction of rotational control, and to prevent graft dislodgment, spine mal-alignment, or pseudarthrosis. Decision for use of halo is at the discretion of the surgeon based upon the patients' specific injury. Not indicated for unstable skull fractures or if skin overlying pin sites is traumatized.

d. Operative Treatment — Placement of the pins and apparatus.

e. Post-Operative Therapy — Traction may be required for re-alignment and or fracture reduction (amount to be determined by surgeon), active and/or passive therapy, pin care.

2. Anterior or Posterior Decompression with Fusion:

a. Description — To provide relief of pressure on the cervical spinal cord and nerve roots, and alignment and stabilization of the spine. May involve the use of bone grafts, sometimes combined with metal devices, to produce a rigid connection between two or more adjacent vertebrae.

b. Complications — Instrumentation failure such as screw loosening, plate failure, or dislodgement (more common in posterior instrumentation), bone graft donor site pain, in-hospital mortality, deep wound infection, superficial infection, graft extrusion, cerebral spinal fluid (CSF) leak, laryngeal nerve damage (anterior approach), and iatrogenic kyphosis.

c. Surgical Indications — When a significant or progressive neurological deficit exists in the presence of spinal canal compromise. Whether early decompression and reduction of neural structures enhances neurological recovery continues to be debated. Currently, a reasonable approach would be to treat non-progressive neurological deficits on a semi-urgent basis, when the patient's systemic condition is medically stable.

d. Operative Treatment — Both anterior and posterior surgical decompression of the cervical spine are widely accepted. The approach is guided by location of the compressive pathology as well as the presence of other concomitant injuries. Posterior stabilization and fusion alone may be indicated for patients who have been realigned with traction and do not have significant canal compromise. The anterior approach is acceptable if there is disc and/or vertebral body anteriorly compromising the canal**.** The posterior approach may be indicated in radiculopathy in the absence of myelopathy and with evidence of pseudarthrosis on radiographs, or if the compression pathology is arising posteriorly.

The number of levels involved in the fracture pattern determines the choice between the use of wire techniques versus spinal plates. In injuries treated with an anterior decompression procedure, anterior bone grafting alone does not provide immediate internal fixation and an anterior cervical plate is significantly beneficial. Patients who undergo surgery for significant fracture dislocations of the spine (three level injury) with canal compromise are best managed with anterior cervical decompression, fusion, and plating but in some cases posterior stabilization and fusion are also considered.

Recombinant Human Bone Morphogenetic Protein (rhBMP-2) is a member of a family of cytokines capable of inducing bone formation. It is produced from genetically modified cell lines using molecular cloning techniques. Use of rhBMP-2 in the cervical spine may carry a risk of swelling and ectopic bone formation which can encroach on neurovascular structures and on the esophagus. As of the date of adoption the FDA had not approved its use in the cervical spine. At the time of this guideline, cervical application of rhBMP-2 is investigational and remains outside the purview of the guidelines. If the FDA approves its use in the cervical spine, prior authorization is required. The patient must meet all indications on the device manufacturer's list and have no contraindications.

e. Post-Operative Treatment — Cervical bracing may be appropriate (usually 6-12 weeks with fusion). Home programs with instruction in ADLs, sitting, posture, and a daily walking program should be an early part of the rehabilitation process. Referral to a formal rehabilitation program, with emphasis on cervical, scapular, and thoracic strengthening, and restoration of ROM, is appropriate once the fusion is solid and without complication. Active treatment, which patients should have had prior to surgery, will frequently require a repeat of the sessions previously ordered. The goals of the therapy program should include instruction in a long-term home-based exercise program.

B. DISC HERNIATION AND OTHER CERVICAL CONDITIONS Operative treatment is indicated only when the natural history of an operatively treatable problem is better than the natural history of the problem without operative treatment. All patients being considered for surgical intervention should undergo a comprehensive neuromuscular examination to identify pain generators that may respond to nonsurgical techniques or may be refractory to surgical intervention. Timely decision making for operative intervention is critical to avoid deconditioning, and increased disability of the cervical spine.

General Recommendations — There is some evidence to suggest that recovery from cervical radiculopathy in patients without clinical signs of spinal cord compression at one year is similar with one-level fusion, physical therapy, or rigid cervical collar use. For patients with whiplash injury, there is no evidence of any beneficial effect of operative treatment.

If cervical fusion is being considered, it is recommended that the injured worker refrain from smoking for at least six weeks prior to surgery and during the time of healing. Because smokers have a higher risk of non-union and higher post-operative costs, it is recommended that insurers cover a smoking cessation program peri-operatively.

General Indications for Surgery — Operative intervention should be considered and a consultation obtained when improvement of symptoms has plateaued and the residual symptoms of pain and functional disability are unacceptable at the end of six weeks of treatment, or at the end of longer duration of non-operative intervention for debilitated patients with complex problems. Choice of hardware instrumentation is based on anatomy, the patient's pathology, and surgeon's experience and preference.

1. Specific Indications include:

   a. For Patients with Myelopathy: immediate surgical evaluation and treatment is indicated.

   b. For Patients with Cervical Radiculopathy:

      (1) Early intervention may be required for acute incapacitating pain or in the presence of progressive neurological deficits.

      (2) Persistent or recurrent arm pain with functional limitations, unresponsive to conservative treatment after six weeks; or

      (3) Progressive functional neurological deficit; or

      (4) Static neurological deficit associated with significant radicular pain; and

      (5) Confirmatory imaging studies consistent with clinical findings.

c. For Patients with Persistent Non-radicular Cervical Pain: in the absence of a radiculopathy, it is recommended that a decisive commitment to surgical or nonsurgical interventions be made within 4 to 5 months following injury. The effectiveness of three-level cervical fusion for non-radicular pain has not been established. In patients with non-radicular cervical pain for whom fusion is being considered, required pre-operative indications include all of the following:

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

(a) 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 active treatment, or at the end of longer duration of non-operative programs for debilitated patients with complex problems; and/or

(b) Frequent recurrences of symptoms cause serious functional limitations even if a non-operative active treatment program provides satisfactory relief of symptoms, and restoration of function on each recurrence.

(c) Mere passage of time with poorly guided treatment is not considered an active treatment program.

(2) All pain generators are adequately defined and treated; and

(3) All physical medicine and manual therapy interventions are completed; and

(4) X-ray, MRI, or CT/discography demonstrating disc pathology or spinal instability; and

(4) Spine pathology limited to two levels; and

(5) Psychosocial evaluation for confounding issues addressed.

(6) 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. Because smokers have a higher risk of non-union and higher post-operative costs, it is recommended that insurers cover a smoking cessation program peri-operatively.

b. Surgical Procedures include:

i. Cervical Discectomy with or without Fusion:

A) Description — Procedure to relieve pressure on one or more nerve roots or spinal cord. It may be performed with or without the use of a microscope.

B) Complications — May include strut graft dislodgment (multi-level decompression), infection, hemorrhage, CSF leak, hematoma, catastrophic spinal cord injury causing varying degrees of

paralysis, pseudarthrosis, in-hospital mortality, non-union of fusion, donor site pain (autograft only). Anterior approach: permanent or transient dysphonia, permanent or transitory dysphagia, denervation, esophageal perforation, and airway obstruction.

C) Surgical Indications — Radiculopathy from ruptured disc or spondylosis, spinal instability, or patients with non-radicular neck pain meeting fusion criteria. There is no evidence that discectomy with fusion versus discectomy without fusion has superior long-term results. Discectomy alone is generally considered in patients with pure radicular symptoms from their herniated disc and who have sufficiently large foramen that disc space collapse is unlikely to further compromise the nerve root. Failure rates increase with disease at more than two levels.

D) Operative Treatment — Cervical plating may be used to prevent graft dislodgment especially for multi-level disease.

Recombinant Human Bone Morphogenetic Protein (rhBMP-2) is a member of a family of cytokines capable of inducing bone formation. It is produced from genetically modified cell lines using molecular cloning techniques. Use of rhBMP-2 in the cervical spine may carry a risk of swelling and ectopic bone formation which can encroach on neurovascular structures and on the esophagus. As of the date of adoption the FDA has not approved its use in the cervical spine. At the time of this guideline, cervical application of rhBMP-2 is investigational and remains outside the purview of the guidelines. If the FDA approves its use in the cervical spine, prior authorization is required. The patient must meet all indications on the device manufacturer's list and have no contraindications.

E) Post-Operative Therapy — Cervical bracing may be appropriate (usually 6 - 12 weeks with fusion). Home programs with instruction in ADLs, sitting, posture, and a daily walking program should be an early part of the rehabilitation process. Referral to a formal rehabilitation program, with emphasis on cervical, scapular, and thoracic strengthening and restoration of ROM is appropriate, once fusion is solid and without complication. Active treatment, which patients should have had prior to surgery, will frequently require a repeat of the sessions previously ordered. The goals of the therapy program should include instruction in a long-term home-based exercise program. (Refer to Section E. 11, Active Therapy).

ii. Cervical Corpectomy:

A) Description — Removal of a portion or the entire vertebral body from the front of the spine. May also include removal of the adjacent discs. Usually involves fusion.

B) Complications — May include strut graft dislodgment (multi-level decompression), infection, hemorrhage, CSF leak, hematoma, catastrophic spinal cord injury causing varying degrees of paralysis, pseudarthrosis, in-hospital mortality, non-union of

fusion, donor site pain (autograft only). Anterior approach: permanent or transient dysphonia, permanent or transitory dysphagia, denervation, esophageal perforation, and airway obstruction.

C) Surgical Indications — Single or two-level spinal stenosis, spondylolisthesis, or severe kyphosis, with cord compression.

D) Operative Treatment — Neural decompression, fusion with instrumentation, or halo vest placement to maintain cervical position. Hemicorpectomy may be done when only a portion of the vertebral body needs to be resected. Allografts may be used for single bone graft fusion; however, autografts are generally preferable for multi-level fusions unless a large strut graft is required.

E) Post-Operative Therapy — Dependent upon number of vertebral bodies involved, healing time may be longer than discectomy. Halo vest care is required. Home programs with instruction in ADLs, sitting, posture, and a daily walking program should be an early part of the rehabilitation process. Referral to a formal rehabilitation program with emphasis on cervical, scapular, and thoracic strengthening is appropriate for most patients once the cervical spine is deemed stable and without complication. The goals of the therapy program should include instruction in a long-term home-based exercise program. (Refer to Section E. 11, Active Therapy).

iii. Cervical Laminectomy with or without Foraminotomy or Fusion:

A) Description — Surgical removal of the posterior portion of a vertebrae in order to gain access to the spinal cord or nerve roots.

B) Complications — May include perineural fibrosis, kyphosis in fractures without fusion or with failed fusion, nerve injury, post surgical instability (with foraminotomies), CSF leak, infection, in-hospital mortality, non-union of fusion, donor site pain (autograft only).

C) Surgical Indications — Neural compression.

D) Operative Treatment — Laminotomy, partial discectomy, and nerve root decompression.

E) Post-Operative Therapy — Cervical bracing may be appropriate (usually 6 to 12 weeks with fusion). Home programs with instruction in ADLs, sitting, posture, and a daily walking program should be an early part of the rehabilitation process. Referral to a formal rehabilitation program with emphasis on cervical, scapular, and thoracic strengthening and restoration of ROM is appropriate for most patients once the cervical spine is deemed stable and without complication. The goals of the therapy program should include instruction in a long-term home-based exercise program. (Refer to Section E. 11, Active Therapy).

iv. Cervical Laminoplasty:

A) Description — Technique that increases anterior or posterior dimensions of the spinal canal while leaving posterior elements partially intact. It may be performed with or without the use of a microscope.

B) Complications — Loss of cervical motion, especially extension.

C) Surgical Indications — Multi-level disease: cervical spinal stenosis or spondylitic myelopathy. Not indicated in cervical kyphosis.

D) Operative Treatment — Posterior approach, with or without instrumentation.

E) Post-Operative Therapy — May include 4 to 12 weeks of cervical bracing. Home programs with instruction in ADLs, sitting, posture, and daily walking program should be an early part of the rehabilitation process. Referral to a formal rehabilitation program with emphasis on cervical, scapular, and thoracic strengthening and restoration of ROM is appropriate once the cervical spine is stable and without complication. Active treatment which patients should have had prior to surgery will frequently require a repeat of the sessions previously ordered. The goals of the therapy program should include instruction in a long-term, home-based exercise program. (Refer to Section E. 11, Active Therapy).

v. Percutaneous Discectomy:

a) Description — An invasive operative procedure to accomplish partial removal of the disc through a needle which allows aspiration of a portion of the disc 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 only in cases of suspected septic discitis in order to obtain diagnostic tissue. The procedure is not recommended for contained disc herniations or bulges with associated radiculopathy due to lack of evidence to support long-term improvement.

d) Operative Treatment — Partial discectomy

3. **ARTIFICIAL CERVICAL DISC REPLACEMENT** involves the insertion of a prosthetic device into the cervical intervertebral space with the goal of permitting physiologic motion at the treated cervical segment. At the time of this writing, it is not recommended as it is not FDA approved and there are no studies demonstrating long-term superiority of this device over cervical fusion. If cervical artificial disc replacement becomes FDA approved, pre-authorization must be obtained to assure that the patient meets all indications (including those listed on the device manufacturer's list) and has no contraindications to the procedure.

4. **PERCUTANEOUS RADIOFREQUENCEY DISC DECOMPRESSION** of the cervical spine is an investigational procedure which introduces a 19 gauge cannula under local anesthesia and fluoroscopic guidance into the nucleus pulposus of a contained herniated disc,

using radiofrequency energy to dissolve and remove disc material. Pressure inside the disc is lowered as a result. There have been no randomized clinical trials of this procedure at this time. It is not recommended.

5. **EPIDUROSCOPY AND EPIDURAL LYSIS OF ADHESIONS** Refer to Section E. 3, Therapeutic Injections.

6. **INTRAOPERATIVE MONITORING** is a common intraoperative electrodiagnostic technique that may include somatosensory evoked potentials (SSEP), motor evoked potentials (MEP), or pedicle screw monitoring. The monitoring procedure may be used to evaluate spinal cord integrity and screw placement during the operative procedure. The use of intraoperative monitoring can be anticipated to become more common as percutaneous spinal procedures gain greater acceptance.

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