Facet Joint Pathology

Indexing Metadata/Description

› **Title/condition:** Facet Joint Pathology
› **Synonyms:** Facet joint syndrome; zygapophyseal joint pathology; facet joint arthropathy
› **Anatomical location/body part affected:** Spine, specifically facet joint/s
› **Area(s) of specialty:** Orthopedic rehabilitation

**Description**

• Facet joints \(^1\)
  – Fall under the category of synovial joints
  – Also called zygapophyseal joints
• Types of facet joint pathology \(^1\)
  – Sprain
  – Trauma to the capsule
  – Degenerative joint disease/osteoarthritis
  – Rheumatoid arthritis
  – Impingement
    – Pain and spasm result upon injury to the meniscoid
    – Generally occurs when the individual completes a quick or atypical movement
    – The movement typically entails spinal flexion and rotation
  – Prevalence of facet joint pathology has been estimated to be between 15% and 45% in patients with chronic low back pain \(^2\)

› **ICD-9 codes**
  • 724.8 other symptoms referable to back [facet syndrome]

› **ICD-10 codes**
  • M24.8 other specific joint derangements, not elsewhere classified
  • M53.8 other specified dorsopathies
  • M54.5 low back pain
  • M54.8 other dorsalgia
  • optional subclassification to indicate site of involvement for M53 and M54
    – 0 multiple sites in spine
    – 5 thoracolumbar region
    – 6 lumbar region
    – 7 lumbosacral region
    – 8 sacral and sacrococcygeal region
    – 9 site unspecified

› **G-Codes**
  • **Mobility G-code set**
    – G8978, Mobility: walking & moving around functional limitation, current status, at therapy episode outset and at reporting intervals
    – G8979, Mobility: walking & moving around functional limitation; projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
    – G8980, Mobility: walking & moving around functional limitation, discharge status, at discharge from therapy or to end reporting
Changing & Maintaining Body Position G-code set
– G8981, Changing & maintaining body position functional limitation, current status, at therapy episode outset and at reporting intervals
– G8982, Changing & maintaining body position functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
– G8983, Changing & maintaining body position functional limitation, discharge status, at discharge from therapy or to end reporting

Self Care G-code set
– G8987, Self care functional limitation, current status, at therapy episode outset and at reporting intervals
– G8988, Self care functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
– G8989, Self care functional limitation, discharge status, at discharge from therapy or to end reporting

Other PT/OT Primary G-code set
– G8990, Other physical or occupational primary functional limitation, current status, at therapy episode outset and at reporting intervals
– G8991, Other physical or occupational primary functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
– G8992, Other physical or occupational primary functional limitation, discharge status, at discharge from therapy or to end reporting

Other PT/OT Subsequent G-code set
– G8993, Other physical or occupational subsequent functional limitation, current status, at therapy episode outset and at reporting intervals
– G8994, Other physical or occupational subsequent functional limitation, projected goal status, at therapy episode outset, at reporting intervals, and at discharge or to end reporting
– G8995, Other physical or occupational subsequent functional limitation, discharge status, at discharge from therapy or to end reporting

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<tr>
<td>CN</td>
<td>100 percent impaired, limited or restricted</td>
</tr>
</tbody>
</table>

Source: http://www.cms.gov

Reimbursement: No specific issues or information regarding reimbursement have been identified

Presentation/signs and symptoms
• Symptoms tend to be nonspecific and overlap with other diseases
  • Facet joint syndrome (lumbar spine)
    – Pain; pain does not typically radiate beyond the knee joint
    – Sense of achiness, which may radiate into the proximal lower extremity
    – Pain may increase with spinal extension and rotation
    – Patient may complain of “locking” in the spine during certain functional activities
  • Facet joint syndrome (cervical spine)
    – Pain in the cervical region
    – Pain may be felt in the shoulder but does not typically go beyond the elbow joint
• Patients typically do not have neurological signs and symptoms (e.g., paresthesia)\(^4,6\)
• Patients with facet joint syndrome may have tenderness over the area or experience muscle spasms\(^6\)

### Causes, Pathogenesis, & Risk Factors

#### Causes
- Correlated with facet synovitis (following trauma)\(^2\)
- Degeneration\(^5\)/repetitive strain\(^8\)
- Following whiplash injury, joint loading, capsule responses, and cellular mechanisms of nociception can most commonly produce facet-mediated pain\(^9\)

#### Pathogenesis
- Potential underlying mechanisms of facet joint syndrome
  - As people age, facet joint strength diminishes and the orientation of the joint shifts from coronal to sagittal positioning. This change in the positioning of the joint increases the risk of injury from rotational stress\(^8\)
  - The lower lumbar facet joints are burdened with the greatest strain during lateral flexion and forward flexion and as a result are at greater risk for repetitive strain, inflammation, joint hypertrophy, and osteophyte formation compared to the rest of the spine\(^8\)
  - Disc disease in the lumbar region can lead to osteoarthritic-type alterations in the affected vertebrae.\(^5,8\) The facet joints make a tripod of support with the intervertebral discs at each spinal level. As the intervertebral discs deteriorate, the facet joints are required to bear a greater load\(^10\)
  - Cadaveric and imaging studies have concluded that disc degeneration precedes facet degeneration; however, many exceptions to this view have been reported\(^21\)
    - In a study of lumbar degeneration conducted in the United States, 10-20% of individuals exhibited a pattern of isolated facet joint degeneration without substantial loss of disc height\(^21\)
    - Most frequently occurred at the L5-S1 and L4-L5 spinal levels
- Facet joint cartilage is not innervated. However, facet joint pain can arise from nociceptors within and surrounding the joint\(^22\)
  - Mechanical factors that can activate nociceptors include direct pressure on subchondral bone, capsular distension, trabecular microfractures, and synovial inflammation\(^22\)
  - These can secondarily result in reflex muscle spasm of the erector spinae, multifidi, and other paraspinal muscles\(^22\)
- Compression of a facet joint may induce local cartilage loss accompanied by increased sensitivity to mechanical stimuli and increases in inflammatory mediators\(^29\)
- Degenerative changes of facet joints include osteophyte formation, hypertrophy or the articular processes, osteosclerosis, thinning of the articular cartilage with erosions and subchondral cyst formation, joint effusion and hypertrophy or calcification of the joint capsule and ligamentum flavum. These changes may contribute to development of spinal stenosis\(^2\)

#### Risk factors
- Trauma to the musculoskeletal system that is either acute (e.g., a fall) or chronic (e.g., playing rugby) increases the risk of joint degeneration in general
- Alterations in the structural integrity of the tripod, particularly degeneration of the intervertebral disc, as well as abnormal joint alignment or loading and paraspinal muscle weakness are implicated as risk factors\(^22\)
- Obesity
- Age
  - Prevalence of lumbar facet joint pain increases with age.\(^23,24\) While a variable age-related prevalence has been demonstrated in chronic low back pain,\(^23,24\) in the cervical spine prevalence of facet joint pathology is similar in all age groups\(^23\)
- Smoking
- Poor posture
- Genetics
• Family history
• Congenital defect
• Orientation of facets
• Overuse (sport or heavy labor)

**Overall Contraindications/Precautions**
› In patients with rheumatoid arthritis, manipulation (or any other forceful movement) of the spine is contraindicated
› See specific Contraindications/precautions under Assessment/Plan of Care

**Examination**
› History
  – History of present illness/injury
    - What is the reason for referral?
    - How long has the patient been experiencing current symptoms?
    - Did a specific event/activity precede the onset of symptoms? Onset of symptoms is insidious in most patients
  – Course of treatment
    - Medical management
      - Chronic facet joint pain may be managed by intraarticular injections, facet joint nerve blocks, and neurolysis of facet joint nerves. The results of systematic reviews of the effectiveness of these treatments are conflicting
      - Currently the gold standard for treating lumbar facetogenic pain is radio frequency treatment (See Other considerations, below)
    - Management may include a steroid or anesthetic injection into the joint
    - Evidence supporting intraarticular corticosteroids is limited, so they are recommended only for patients who do not respond to radio frequency treatment
    - The patient may undergo a facet rhizotomy
    - In a quasi-experimental (nonrandomized) study, patients underwent viscosupplementation in an effort to reduce the symptoms of facet arthropathy. However, no significant improvements in pain or disability were observed
    - Viscosupplementation – “replacement of synovial fluid with an elastoviscous hyaluronic acid solution”
    - 13 individuals participated in the study; all had a diagnosis of facet joint arthritis (lumbar spine)
  – Medications for current illness/injury: Determine what medications clinician has prescribed; are they being taken? Occasional improvement with use of nonsteroidal anti-inflammatory drugs (NSAIDs) is reported
  – Diagnostic tests completed
    - Computed tomography (CT) scanning is generally used to assess for the presence of lumbar facet joint osteoarthritis
    - Facet arthroses is a common radiographic finding, with nearly 10% of all adults showing signs of degeneration by the time they are 30 years old, and are equally common in people with and without low back or neck pain
    - Standard magnetic resonance imaging (MRI) generally does not reveal the presence of inflammation in and around the facet joints of the spine; however, fat-saturation techniques utilized during a MRI may improve detection
    - Due to the lack of specificity of facet joint osteoarthritis on imaging, anesthetic blockade using fluoroscopically guided injections has become standard practice
    - Medial branch blocks are reported to be the most reliable method of diagnosing pain related to facet joint pathology
    - Diagnostic blocksof lumbar facet joints with bupivacaine are typically used. At least 2 diagnostic injections should be performed to decrease incidence of false positives
    - Additional diagnostic testing may be recommended in an effort to rule out other conditions
    - Existing literature does not support the use of history or physical examination to diagnose lumbar facet joint pain
  – Home remedies/alternative therapies: Document any use of home remedies (e.g., ice or heating pack) or alternative therapies (e.g., acupuncture) and whether or not they help
- **Previous therapy**: Document whether patient has had occupational or physical therapy for this or other conditions and what specific treatments were helpful or not helpful
- **Aggravating/easing factors** (and length of time each item is performed before the symptoms come on or are eased)
  - In lumbar facet joint syndrome, lumbar hyperextension, extension from flexion,\(^6^,^7\) and extension and rotation\(^6\) generally aggravate the patient’s symptoms
  - Forward flexion may ease symptoms in individuals experiencing pain originating from lumbar facet joints\(^14\)
  - Pain aggravated by standing and ameliorated by sitting or flexing the spine is common\(^3\)

- **Body chart**: Use body chart to document location and nature of symptoms
  - Localized unilateral pain and pain not radiating past the knee are indicative of lumbar facet joint syndrome

- **Nature of symptoms**: Document nature of symptoms (constant vs. intermittent, sharp, dull, aching, burning, numbness, tingling). In general, are symptoms getting worse, better, or staying the same?

- **Rating of symptoms**: Use a visual analog scale (VAS) or 0-10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present now and how much). Utilize the Oswestry Low Back Disability Questionnaire for the lumbar spine and the Neck Disability Index for the cervical spine

- **Pattern of symptoms**: Document changes in symptoms throughout the day and night, if any (A.M., mid-day, P.M., night); also document changes in symptoms due to weather or other external variables. Morning pain and stiffness may be reported\(^3\)

- **Sleep disturbance**: Document number of wakings/night. Where applicable, inquire about sleeping position and number and firmness of pillows used

- **Other symptoms**: Document other symptoms patient may be experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician (e.g., dizziness, bowel/bladder/sexual dysfunction, saddle anesthesia, radicular pain, neurogenic claudication)

- **Respiratory status**: Document the presence of any respiratory compromise

- **Barriers to learning**
  - Are there any barriers to learning? Yes___No___
  - If Yes, describe _________________________

- **Medical history**
  - **Past medical history**
    - **Previous history of same/similar diagnosis**
      - Does the patient have a history of arthritis in other joints?
      - Has the patient ever had a similar episode of pain?
    - **Comorbid diagnoses**: Ask patient about other problems, including diabetes, cancer, heart disease, complications of pregnancy, psychiatric disorders, other orthopedic disorders, etc. Psychological comorbidity has been reported to have an influence on the outcome of facet joint blocks.\(^15\) In a community-based population, the presence of vascular disease was associated with facet joint osteoarthritis in a study conducted in the United States\(^26\)
  - **Medications previously prescribed**: Obtain a comprehensive list of medications prescribed and/or being taken (including over-the-counter drugs)
  - **Other symptoms**: Ask patient about other symptoms he or she may be experiencing

- **Social/occupational history**
  - **Patient’s goals**: Document what the patient hopes to accomplish with therapy and in general
  - **Vocation/avocation and associated repetitive behaviors, if any**: Does the patient participate in recreational or competitive sports? What is the patient’s occupation?
  - **Functional limitations/assistance with ADLs/adaptive equipment**: What functional limitations does the patient report?
  - **Living environment**: Stairs, number of floors in home, with whom patient lives, caregivers, etc. Identify if there are barriers to independence in the home; any modifications necessary?

- **Relevant tests and measures**: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting.) The information listed below is an overview and meant only to serve as a guide. The clinician is advised to modify/supplement the examination process as indicated by patient symptoms and reason for referral

- **Anthropometric characteristics**: Document the patient’s height and weight and calculate body mass index (BMI).
  - Measure for leg length discrepancy as indicated
• Assistive and adaptive devices: Does the patient currently utilize any assistive or adaptive devices? Are ambulatory assistive devices appropriately measured and correctly used?

• Balance: Complete a balance assessment using a standardized assessment such as the Berg Balance Scale

• Cardiorespiratory function and endurance: Assess vital signs and complete an endurance assessment as indicated. The 6-minute walk for distance test (6MWT) can be used

• Ergonomics/body mechanics: Evaluate ergonomics and body mechanics that may be job related or sport related as indicated and appropriate. A home or work station assessment may be indicated

• Functional mobility (including transfers, etc.): Complete a functional assessment. Does mobility appear to be limited by pain or decreased ROM? The Timed Up and Go (TUG) test or 5 Times Sit to Stand Test (5TSTST) can be used

• Gait/locomotion
  – Complete a gait assessment; document the presence of any deviations
  – Measure preferred and maximum gait speed using the 10-meter walk test (10MWT)
  – If spondylolisthesis is present, the patient may appear to have a myopathic (waddling) gait

• Joint integrity and mobility
  – Initially, the patient may present with facet joint hypermobility
  – Later on, mobility within the injured facet joints becomes restricted

• Muscle strength
  – Complete a thorough strength assessment using manual muscle testing (MMT)
  – Generally, the patient will have difficulty with trunk extension as extension aggravates symptoms

• Observation/inspection/palpation (including skin assessment)
  – Palpate the spine and surrounding musculature; note deviations
  – Pain is typically aggravated by palpation of the paraspinal muscles
  – Muscle spasms may be evident
  – Spondylolisthesis
    - May be present in the spine when
      - a “step deformity” is palpated and/or visualized while the clinician moves from one vertebrae to another
    - the patient experiences pain as the involved area is palpated or percussed

• Posture
  – The patient will likely present with postural deviations; complete a postural assessment, noting any atypical findings
    (e.g., scoliosis, leg length discrepancy, pelvic rotation)
  – Pronounced lumbar lordosis can be indicative of spondylolisthesis
  – Patients with facet joint syndrome typically have a normal lumbar lordosis

• Range of motion
  – ROM of the spine (in the affected area) will be compromised. Clinicians should complete a thorough ROM assessment of the spine
  – Assess hamstring flexibility

• Reflex testing: Assess deep tendon reflexes

• Self-care/activities of daily living (objective testing): Observe ADLs as indicated. Use Barthel Index or FIM for standardized testing

• Sensory testing: Complete a sensory assessment as indicated

• Special tests specific to diagnosis: No examination maneuvers are specific for symptomatic facet joint osteoarthritis.

  – In the absence of suitable reference standards for validating indicators of lumbar facet joint pain, the Delphi technique has been used to achieve a consensus on the indicators of lumbar facet joint pain
    - 12 indicators were selected by a panel of experts in medicine and physical therapy in a study conducted in Australia:
      - Positive response to intraarticular facet joint injection
      - Localized unilateral back pain
      - Pain relieved by fluoroscopically guided double-anesthetic blocks of the medial branch of the dorsal ramus supplying the facet joint
      - Replication or aggravation of pain by unilateral pressure over the facet joint or transverse process
- Lack of radicular features
- Pain eased in flexion
- Pain if referred to the leg is above the knee
- Local unilateral passive movement shows reduced ROM or increased stiffness on the side of the facet joint pain
- Unilateral muscle spasm over the affected facet joint
- Pain in extension
- Pain in extension, lateral flexion, or rotation to the ipsilateral side
- Radiology is unreliable and cannot diagnose lumbar facet joint pain

**Assessment/Plan of Care**

› **Contraindications/precautions**

• Only those contraindications/precautions applicable to this diagnosis are mentioned below, including with regard to modalities. Rehabilitation professionals should always use their professional judgment

• Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary presented below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols

• **Cryotherapy** contraindications

  – Raynaud’s syndrome
  – Medical instability
  – Cryoglobulinemia
  – Cold urticaria
  – Paroxysmal cold hemoglobinuria
  – Avoid applying cold over superficial nerves, areas of diminished sensation, poor circulation or slow-healing wounds

• **Cryotherapy** precautions

  – Use caution with patients who are hypertensive as cold can cause a transient increase in blood pressure; discontinue treatment if there is an elevation in blood pressure
  – Use caution with patients who are hypersensitive to cold
  – Avoid aggressive treatment with cold modalities over an acute wound
  – Use of cryotherapy with patients who have an aversion to cold may be counterproductive if being used to promote muscle relaxation and decrease pain

• **Superficial heat** contraindications

  – Decreased circulation
  – Decreased sensation
  – Presence of deep vein thrombosis (DVT)
  – Acute/subacute traumatic and inflammatory conditions
  – Impaired cognition
  – Malignant tumors
  – Tendency for hemorrhage or edema
  – Very young or old individuals

• **Electrotherapy** contraindications/precautions (in some cases, when approved by the treating physician, electrotherapy may be used under some of the circumstances listed below when benefits outweigh the perceived risk)

  – Stimulation through or across the chest
  – Cardiac pacemakers
  – Implanted stimulators
  – Over carotid sinuses
  – Uncontrolled hypertension/hypotension
  – Peripheral vascular disease
  – Thrombophlebitis
  – Pregnancy
  – Over pharyngeal area
  – Diminished sensation
  – Acute inflammation
  – Seizure history
- Confused patients
- Immature patients
- Obesity
- Osteoporosis
- Used in close proximity to diathermy treatment

Diagnosis/need for treatment: Pain, impaired ROM, impaired strength, and reduced mobility

Rule out
- Referred pain from kidneys, prostate, female pelvic organs, gastrointestinal tract, pancreas, or abdominal aortic aneurysm
- When the pain is unilateral – muscle strain, or stress fracture of pars interarticularis
- Discogenic pain
- Nerve root impingement

Prognosis
- Conservative intervention (e.g., physical therapy, prescription medication) provides the majority of patients with facet joint syndrome relief from their symptoms
- Because a common cause of facet joint pathology is degeneration, it is often progressive
- It often coexists with spinal disc abnormalities, and can lead to chronic pain

Referral to other disciplines (as indicated)
- Physician
- Occupational therapy

Other considerations
- Radio frequency denervation may provide a reduction in pain (stemming from the cervical facet joints) in the short-term
  - Based on a Cochrane systematic review
  - 7 randomized controlled trials were included in the review
  - Radio frequency denervation utilizes electricity to cauterise nerves
  - The results of studies investigating the efficacy of radio frequency denervation for the treatment of pain (stemming from the lumbar facet joints) are inconsistent; further research is warranted
- Physiotherapists’ manual examinations are often used to identify the facet joint as the primary source of a patient’s pain in order to refer for diagnostic facet joint blocks to assess suitability for radio frequency denervation
  - Manual examination typically involves passive physiological and passive accessory intervertebral movements, with the therapist evaluating the quality and quantity of segmental movement and pain provocation
  - Sensitivity and specificity of manual examination has been reported to be 100% in the diagnosis of cervical facet joint pain; however, more recent studies have challenged this
  - The criterion standard used to validate the manual examination were single diagnostic facet block procedures that are now known to have a high rate of false positives
  - Currently the diagnostic accuracy and reliability of the manual examination is reported to be variable
- Radio frequency denervation of lumbar facet joints appears to be an effective therapy with a reported success rate after one year of 43-87%
  - Depression is a predictor of poor outcome of radio frequency denervation of lumbar facet joints

Treatment summary
- Combining facet injections with a regular stretching program may improve ROM in individuals with segmental rigidity
  - Based on a randomized controlled trial in the United States comprised of 70 individuals with segmental rigidity
  - Segmental rigidity – “mobility deficits affecting the 3-joint complex at one or more lumbar levels”
  - Extended periods of immobilization can negatively impact the facet joints (e.g., loss of mobility)
- Participants were randomized to one of two groups
  - Treatment group – facet injections and exercise
  - Facet injections were guided by fluoroscopy
  - Injections were bilateral; from 1 to 3 segmental levels
  - Control group – exercise alone
  - Exercise program
    - Home component (stretching)
- Instruction/training by a physical therapist ~ 2 x/week on progressive stretching program
  – Results (statistically significant)
- The treatment group experienced larger gains in ROM
- The treatment group had a greater proportion of individuals with gains in ROM
– 5/29 participants (from the treatment group) were actually deemed as having facet joint syndrome
– There were no statistically significant differences noted between the treatment arms in measures of pain or disability

<table>
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<tr>
<th>Problem</th>
<th>Goal</th>
<th>Intervention</th>
<th>Expected Progression</th>
<th>Home Program</th>
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<tbody>
<tr>
<td>Facet joint syndrome</td>
<td>Decrease/eliminate symptoms and complications of facet joint syndrome, including pain and subsequent mobility restrictions</td>
<td>Therapeutic interventions</td>
<td>Progress each unique patient as appropriate and indicated</td>
<td>Implement a home program as appropriate and indicated for each patient</td>
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<tr>
<td></td>
<td></td>
<td>Implement ROM, stretching, and strengthening activities as indicated and appropriate</td>
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<td></td>
<td>Orthotic prescription for the management of a leg length discrepancy, as indicated</td>
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<tr>
<td>Pain</td>
<td>Resolve pain and inflammation of soft tissues</td>
<td>Physical agents and electrotherapeutic modalities</td>
<td>Progress each unique patient as appropriate and indicated</td>
<td>Provide the patient with instructions for home heat or cold pack as indicated</td>
</tr>
<tr>
<td>Decreased ROM and flexibility</td>
<td>Restore joint mobility, ROM, and flexibility</td>
<td><strong>Manual therapy</strong></td>
<td>Normal and symmetrical joint mobility</td>
<td>Home stretches as indicated</td>
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<tr>
<td>Decreased strength</td>
<td>Improve strength for functional mobility, ADLs, work and recreational activities</td>
<td><strong>Therapeutic exercises</strong></td>
<td>Gradual increase in intensity and repetitions of exercises without low back pain</td>
<td>Provide written home exercises</td>
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</table>

**Desired Outcomes/Outcome Measures**

› Desired outcomes
  • Decrease/eliminate symptoms and complications of facet joint syndrome, including pain and subsequent mobility restrictions
  • Improve function, posture, body mechanics, and strength to return to previous activity level

› Outcome measures
  • VAS
  • ROM
  • MMT
  • Oswestry Low Back Disability Questionnaire
  • Neck Disability Index
  • FIM, Barthel Index
  • TUG test, 5STST
  • 6MWT
  • Berg Balance Scale

**Maintenance or Prevention**

› Continue with home program and follow up with physician as indicated

**Patient Education**


**Coding Matrix**

References are rated using the following codes, listed in order of strength:

<table>
<thead>
<tr>
<th>M</th>
<th>Published meta-analysis</th>
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<tbody>
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<td>Published research (randomized controlled trial)</td>
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<td>Published research (not randomized controlled trial)</td>
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<td>Unpublished research, reviews, poster presentations or other such materials</td>
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<tr>
<td>CP</td>
<td>Conference proceedings, abstracts, presentation</td>
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References


