

Guideline Update: Diagnosis and Treatment of Degenerative Lumbar Spondylolisthesis

Written by Toni Rizzo

Paul Matz, MD, St Luke's Hospital, Chesterfield, Missouri, USA, and cochair of the North American Spine Society (NASS) Evidence-Based Guideline Development Committee, was joined by R. J. Meagher, MD, The Spine Institute, Marlton, New Jersey, USA, a key member of the Diagnosis and Treatment of Degenerative Lumbar Spondylolisthesis Guideline Work Group, to discuss key recommendations made within the 2014 guideline update on the diagnosis and treatment of degenerative lumbar spondylolisthesis [Matz P et al. NASS. 2014]. Dr Matz and Dr Meagher reviewed the guideline development process and the current state of the evidence on diagnosis and imaging, medical and interventional treatment, surgical treatment, and the cost-effectiveness of treatment for patients with degenerative lumbar spondylolisthesis.

GUIDELINE DEVELOPMENT PROCESS

The guideline is reviewed and revised approximately every 5 years. The 2014 guideline is an update to the previous guideline published in 2008. The first objective of the update was to provide evidence-based recommendations to address key clinical questions about the diagnosis and treatment of degenerative lumbar spondylolisthesis. The guideline also aimed to reflect contemporary treatment concepts for symptomatic degenerative lumbar spondylolisthesis as reflected in the highest-quality clinical literature available on this subject as of May 2013. The work group consisted of neurosurgeons, orthopaedic surgeons, pain and rehabilitation specialists, neuroradiologists, and nonphysician practitioners who specialize in spine care. The work group members were trained in the NASS Fundamentals of Evidence-Based Medicine Course.

The guideline-development process first involved defining degenerative lumbar spondylolisthesis and then reviewing existing clinical questions and identifying new clinical questions to address. Literature search terms and parameters were identified, and a literature search was performed. The update was based on a complete literature search of English-language references in MEDLINE (PubMed), EMBASE, the Cochrane Library, and bibliography review. Retrieved abstracts were reviewed to identify full-text articles for review. The evidence analysis was conducted using NASS evidentiary tables. The work group reviewed the evidence and formulated evidence-based recommendations and consensus statements.

NASS LEVELS OF EVIDENCE

The recommendations were graded according to the quality of the available evidence across therapeutic, prognostic, and diagnostic studies. Level I evidence consists of high-quality randomized clinical trials (RCTs), prospective studies, testing of previously developed diagnostic criteria on consecutive patients (with universally applied reference gold standard), and systematic reviews of level I studies. Level II evidence consists of lesser-quality RCTs and prospective studies, prospective comparative studies, retrospective studies, untreated controls from RCTs, development of diagnostic criteria on consecutive patients (with universally applied reference gold standard), and systematic review of level II studies. Level III evidence consists of case-control studies, retrospective comparative studies, diagnostic studies of nonconsecutive patients (without consistently applied reference gold standard), and systematic review of level III studies. Level IV evidence consists of case series, case-control diagnostic studies, and diagnostic studies with a poor reference standard. Level V evidence is based on expert opinion.

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For economic and decision analyses, level I evidence consists of values obtained from many studies, with multiway sensitivity analyses. Level II evidence consists of values obtained from limited studies, with multiway analyses. Level III evidence consists of analyses based on limited alternatives and costs and poor estimates. Level IV evidence consists of analyses with no sensitivity analyses. Level V evidence is based on expert opinion.

Each recommendation was graded as follows:

A. Recommended: Good evidence for or against recommending an intervention (≥ 2 level I studies with consistent findings)

B. Suggested: Fair evidence for or against recommending an intervention (level II or III studies with consistent findings)

C. May be considered; is an option: Poor-quality evidence for or against recommending an intervention (level IV or V studies)

I. Insufficient or conflicting evidence not allowing a recommendation for or against

Each recommendation section includes recommendations for future research when there is limited or no evidence.

SUMMARY OF WORK GROUP RECOMMENDATIONS

Degenerative lumbar spondylolisthesis was defined by the guideline work group as an acquired anterior displacement of 1 vertebra over the subjacent vertebra associated with degenerative changes, without an associated disruption or defect in the vertebral ring.

The updated diagnosis and imaging recommendations are summarized in Table 1.

An updated systematic literature review yielded no studies to adequately address any of the medical and interventional treatment questions from the original guideline. The work group consensus states that medical and interventional treatment for degenerative lumbar spondylolisthesis—when the radicular symptoms of stenosis predominate—most logically should be similar to treatment for symptomatic degenerative lumbar spinal stenosis.

Little evidence was found in the literature to make recommendations regarding outcomes and cost-effectiveness of treatments for patients with degenerative lumbar spondylolisthesis. For the question regarding which patient-specific characteristics influence outcomes and prognosis in the treatment of degenerative lumbar spondylolisthesis, there was insufficient evidence to make a recommendation for or against the influence of nonorganic pain on treatment

Table 1. Diagnosis and Imaging Recommendations for Degenerative Lumbar Spondylolisthesis

Clinical Question: Current Guideline Recommendation	Grade of Recommendation ^a
What are the most appropriate historical and physical examination findings consistent with the diagnosis of degenerative lumbar spondylolisthesis?	
No evidence to address this question.	Work group consensus statement
Obtaining an accurate history and physical examination is important for diagnosis and treatment.	Work group consensus statement
Formulating appropriate clinical questions is essential to obtain accurate history for developing a treatment plan.	
What are the most appropriate diagnostic tests for degenerative lumbar spondylolisthesis?	
Lateral radiograph is the most appropriate noninvasive test.	B (suggested)
In the absence of evidence, it is the work group's opinion that a lateral radiograph should be obtained in the standing position.	Work group consensus statement
The most appropriate noninvasive test for imaging the stenosis accompanying degenerative lumbar spondylolisthesis is MRI.	Work group consensus statement
Facet joint effusion > 1.5 mm on supine MRI may be suggestive of degenerative lumbar spondylolisthesis. Further evaluation should be considered, including plain standing radiographs.	B
Insufficient evidence to make a recommendation for or against the utility of upright-seated MRI.	I
Insufficient evidence to make recommendation for or against use of axial-loaded MRI to evaluate the dural sac cross sectional area.	I
Plain myelography or CT myelography useful to assess spinal stenosis in patients with degenerative lumbar spondylolisthesis, especially in those with contraindications to MRI.	B (suggested)
In patients with degenerative lumbar spondylolisthesis with associated spinal stenosis for whom MRI is contraindicated or inconclusive, CT myelography is suggested as the most appropriate test to confirm presence of anatomic narrowing of the spinal canal or nerve root impingement.	Work group consensus statement
In patients with associated spinal stenosis for whom MRI and CT myelography are contraindicated, inconclusive, or inappropriate, CT is suggested as the most appropriate test to confirm presence of anatomic narrowing of the spinal canal or nerve root impingement.	Work group consensus statement
What are the most appropriate diagnostic or physical exam tests consistent with the diagnosis of fixed vs dynamic deformity?	
Insufficient evidence to recommend the most appropriate diagnostic or physical exam test consistent with fixed or dynamic deformity due to the lack of uniform reference standards defining instability.	I
No universally accepted standard to diagnose fixed vs dynamic spondylolisthesis. To evaluate instability, many studies use lateral flexion extension radiographs, in the standing or recumbent position; however, there is wide variation in the definition of instability.	n/a
Is dynamic MRI and/or dynamic CT myelography imaging (including standing imaging with axial loading) helpful in the diagnostic testing for degenerative lumbar spondylolisthesis?	
Insufficient evidence to recommend for or against the utility of dynamic MRI and dynamic CT myelography.	I

CT, computed tomography; MRI, magnetic resonance imaging.

^aB, suggested; C, may be considered, is an option; I, insufficient evidence to make recommendation for or against.

Source: Matz P et al. *Evidence-Based Clinical Guidelines for Multidisciplinary Spine Care: Diagnosis and Treatment of Degenerative Lumbar Spondylolisthesis*. 2014.



■ FEATURED ARTICLES

outcomes. There also was insufficient evidence to make a recommendation regarding the influence of age and ≥ 3 comorbidities or the influence of symptom duration on treatment outcomes. Insufficient evidence was found to make a recommendation regarding the influence of obesity (defined as body mass index > 30) and its impact on treatment outcomes.

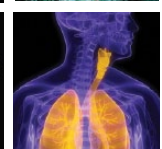
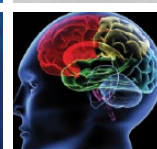
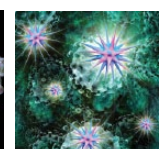
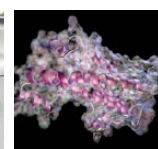
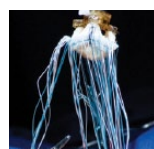
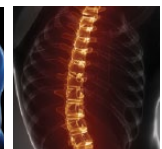
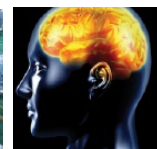
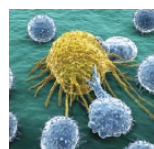
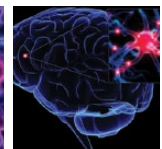
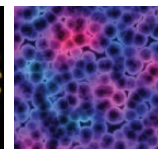
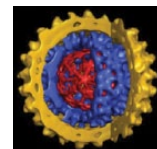
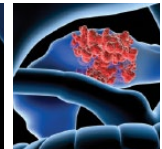
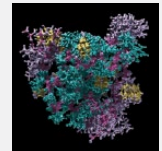
No evidence was found to answer the question regarding the effect of postsurgical rehabilitation, including exercise, spinal mobilization or manipulation, or psychosocial intervention, on outcomes compared with patients who do not undergo postsurgical rehabilitation. Due to the paucity of evidence, a recommendation could not be made.

No evidence was found to address the question regarding the cost-effectiveness of the surgical treatment of degenerative lumbar spondylolisthesis compared with medical and interventional treatment alone (considered with and without fusion separately). Due to the paucity of evidence, the work group could not make a recommendation. There was insufficient evidence to make a recommendation for or against the cost-effectiveness of minimal access-based surgical treatments compared with traditional open surgical treatments for degenerative lumbar spondylolisthesis.

NASS also has developed guidelines on the diagnosis and treatment of disc herniation with radiculopathy, diagnosis and treatment of degenerative lumbar spinal stenosis, diagnosis and treatment of cervical radiculopathy from degenerative disorders, antibiotic prophylaxis in spine surgery, antithrombotic therapies in spine surgery, and diagnosis and treatment of adult isthmic spondylolisthesis (under review). The next guideline will address the diagnosis and treatment of low back pain.

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