



Critical Appraisal of a Diagnostic Paper (Diagnosis of Lumbar Spinal Stenosis)

Goal:

To enhance skills in assessing an article related to diagnostic testing in terms of validity and applying results to clinical care.

Reference (Further Reading):

Guyatt GH, Rennie D, Meade M, Cook DJ. Editors. Users' Guides to the Medical Literature: A Manual for Evidence Based Clinical Practice, 3rd Edition, New York, NY: The McGraw-Hill Companies, Inc.

Available here:

<http://jamaevidence.mhmedical.com/book.aspx?bookID=847>

- Chapter 16: The Process of Diagnosis
- Chapter 17: Differential Diagnosis
- Chapter 18: Diagnostic Tests
- Chapter 19.2: Examples of Likelihood Ratios

Educational Exercise:

1. Read the Users' Guides to the Medical Literature reference chapters (listed above)
2. Read the Clinical Scenario (below)
3. Read the relevant article
4. Complete the critical appraisal form
5. Return to the scenario and indicate how you would use the resource

Clinical Scenario:

A 65-year-old woman reports low back pain of a 1-year duration that is brought on by prolonged standing or walking. She also develops dull, aching right posterior thigh pain after several minutes of walking, as well as mild tingling on the soles of both feet. Her pain is typically relieved when she bends forward while standing. On examination, no abnormalities are found on sensory nerve, motor nerve, reflex, or balance testing.

A 74-year-old man with no major medical problems reports right-sided low back and right calf pain that are worse with prolonged sitting and standing. Walking neither improves nor worsens his leg pain, and no particular position provides relief. On examination, the patient has no change in pain with bending forward or backward, excellent peripheral pulses, and a positive right straight leg raise. The neuromuscular examination findings are otherwise normal.

Given that the characteristic signs and symptoms of lumbar spinal stenosis are common, the primary care clinician is left with the question: “Which patients with lower extremity and back pain have the clinical syndrome of lumbar spinal stenosis and which do not?” You have been advised that electrodiagnostic testing may provide additional clarity to help establish your diagnosis for each patient.

After going to PubMed ‘clinical queries’ and putting in your search terms: lumbar spinal stenosis and electrodiagnostic testing, you identify the following study which you decide to explore further:

Haig AJ, et al. The sensitivity and specificity of electrodiagnostic testing for the clinical syndrome of lumbar spinal stenosis. *Spine*. 2005. 30(23):2667-76.

The abstract indicates it is relevant to your patients and you decide to critically appraise this paper using the “Users’ Guide” for a Diagnosis paper.

After critically appraising this paper, will you recommend electrodiagnostic testing for either patient? What is your best guess as to the probability of lumbar spinal stenosis in the two patients presented?



CRITICAL REVIEW FORM: DIAGNOSTIC TEST

Identify and outline your clinical question in plain language:

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Build a PICO:

P	
I	
C	
O	

Databases Searched:

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Resource Acquired:

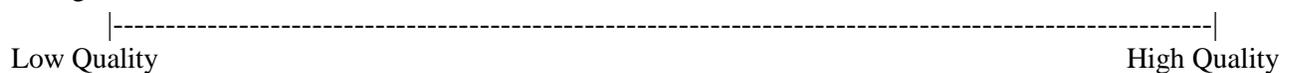
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Are the results of the study valid?

Did participating patients present a diagnostic uncertainty?	
Did investigators compare the test to an appropriate, independent reference standard?	

Were those interpreting the test and reference standard blind to the other results?	
Did investigators perform the same reference standard to all patients regardless of the results of the test under investigation?	
What are the results?	
What likelihood ratios are associated with the range of possible test results?	
How can I apply the results to patient care?	
Will the reproducibility of the test result and its interpretation be satisfactory in my setting?	
Are the results applicable to patients in my practice?	
Will the results change my management?	
Will patients be better off as a result of the test?	

Strength of Evidence:



Adapted by John Stites DC and Amy Minkalis DC from: Walsh M, Perkovic V, Manns B, Srinathan S, Meade MO, Devereaux P, Guyatt G. Diagnosis. In: Guyatt G, Rennie D, Meade MO, Cook DJ. eds. *Users' Guides to the Medical Literature*. New York, NY: McGraw-Hill; 2014.

CRITICAL REVIEW FORM: DIAGNOSTIC TEST

Identify and outline your clinical question in plain language:

Which patients with lower extremity and back pain have the clinical syndrome of lumbar spinal stenosis (LSS) and which do not?

Build a PICO:

P	Lumbar spinal stenosis
I	Electrodiagnostic testing
C	N/A
O	Accurate diagnosis

Databases Searched:

PubMed

Resource Acquired:

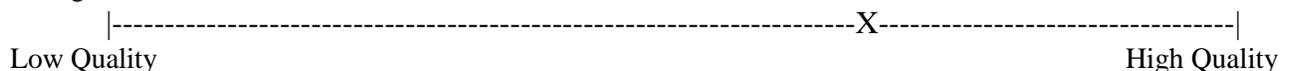
The sensitivity and specificity of electrodiagnostic testing for the clinical syndrome of lumbar spinal stenosis

Are the results of the study valid?

<p>Did participating patients present a diagnostic uncertainty?</p>	<p>Limitations with the population include: i) Asymptomatic people are irrelevant because we will use the test in symptomatic patients. ii) trying to differentiate the symptomatic with the target condition from those without. Of the 120 symptomatic, clinicians will be dealing with all those patients, not just the sample of 36 in which the adjudicator could agree on the diagnosis. Thus, the sample is very unrepresentative. Further, we do not know if, in the patients without LSS, LSS was in the clinicians' differential diagnosis. Finally, the exclusion of those with a late diagnosis of polyneuropathy or myopathy is problematic because clinicians would not know of those diagnoses at the time of testing.</p>
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Did investigators compare the test to an appropriate, independent reference standard?	The gold standard required the agreement of a neurosurgeon, a physiatrist, and a neuroradiologist on the diagnosis. One can be confident that in those in whom they agreed patients did or did not have LSS, but as above, the process creates a very unrepresentative population.
Were those interpreting the test and reference standard blind to the other results?	Yes, those conducting the electrodiagnostic testing were blind to the gold standard, and the three sets of experts making the gold standard decision were blind to test results.
Did investigators perform the same reference standard to all patients regardless of the results of the test under investigation?	Yes.
What are the results?	
What likelihood ratios are associated with the range of possible test results?	The best performing test was "any abnormality." The associated likelihood ratios are 1.6 and 0.4.
How can I apply the results to patient care?	
Will the reproducibility of the test result and its interpretation be satisfactory in my setting?	The skills of the individuals performing electrodiagnostic testing may vary across centers.
Are the results applicable to patients in my practice?	As per the first validity question, it is unclear if target negative patients had LSS as a possible diagnosis.
Will the results change my management?	Even putting aside the validity concerns, the test performs so poorly that results would not change management.
Will patients be better off as a result of the test?	No.

Strength of Evidence:



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