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# Use Of The Slump Test Over The Straight Leg Raise Test For Diagnosing Lumbar Disc Herniations In Physical Therapy Initial Evaluations

Clinton T. Boone  
*University of New England*

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## Scientific Inquiry II

Fall 2014

### Critically Appraised Topic (CAT) Assignment #1

**Title:** Use of the Slump Test over the Straight Leg Raise Test for Diagnosing Lumbar Disc Herniations in Physical Therapy Initial Evaluations

**Author & Date:** Clinton T. Boone – September 27, 2014

**Clinical Scenario:** (Note: Verbal consent was obtained before proceeding) My patient is a 29-year old female pastry chef. She is a former Marine that would work out at the gym – doing cardiovascular activities and free weight activities – about five days per week prior to her injury. On September 19, 2014, at work, the patient bent over to grab a bag of flour from a bottom shelf. After picking up the flour from the bottom shelf, the patient immediately experienced massive back pain which traveled into the left lower extremity. After initial onset, the patient also began experiencing intermittent tingling in the left lower extremity. The patient saw her doctor and he suspected it could be a herniation of a lumbar disc. X-Rays were negative, but a magnetic resonance imaging test (MRI) is scheduled in the future. A Slump Test and Straight Leg Raise Test were both administered at the initial physical therapy evaluation. Both tests yielded a positive finding indicative of a lumbar disc herniation.

Based off personal experience, my clinical instructor stated that he prefers the Slump Test over the Straight Leg Raise Test when testing for possible lumbar disc herniation. The Straight Leg

Raise Test is more prone to false positives in patients exhibiting hamstring tightness and muscles strains. Moreover, the same movement is basically being tested when performing gross range-of-motion assessment for lumbar flexion.

**Clinical Question:** Is the Slump Test a more accurate tool in ruling-in lumbar disc herniation during a physical therapy initial evaluation compared to the Straight Leg Raise Test in young adult women with low back pain?

**Patient/Problem:** Young adult women with low back pain

**Intervention:** Slump Test

**Comparison:** Straight Leg Raise Test

**Outcome:** Ruling-in lumbar disc herniation during a physical therapy initial evaluation

**Clinical Bottom Line:** In this study, the Slump Test had overall higher values of sensitivity (84%) and specificity (89%) than the straight leg raise test (52% & 83%, respectively). This research implies that the Slump Test is more accurate than the Straight Leg Raise Test in ruling in and ruling out lumbar disc herniations. According to this study, the Straight Leg Raise Test is more prone to false positive and false negative results. This article supports the use of the Slump Test over the use of the Straight Leg Raise Test in my Plan of Care. For this patient, and for future patients, I will use the Slump Test as my primary test for suspected lumbar disc herniations. If for some reason I feel the Slump Test results are not valid, or if the patient cannot perform the Slump Test, I will use the Straight Leg Raise Test as a secondary measure.

**Search History:** On Saturday, September 27, 2014, I began searching for articles regarding the use of the Slump Test and Straight Leg Raise Test in patients with low back pain and suspected lumbar disc herniations. I decided to use Medline – EBSCO due to my favorable experiences with this database in the past. I used the search terms “slump test,” “lumbar disc herniation,” “straight leg raise,” and “low back pain.” I included filters under the Advanced Search feature to ensure female adults ages 19-44 were included in the study. Additionally, I added filters to ensure the subjects were humans and the article was in the English language. My search yielded three results, but none were relevant. I replaced the search term “straight leg raise” with “straight leg raising,” which yielded one result. After briefly reading through this search result, I decided to further investigate this article for my CAT. This study included both males and female with a mean age within the age range I selected as a filter for my search. Even with the inclusion of males in this study, I still feel this study is relevant and will answer my PICO question.

<b>Databases/Sites Searched</b>	<b>Search Terms</b>	<b>Limits Used</b>
Medline – EBSCO (9/27/14)	“slump test,” “lumbar disc herniation, ” “straight leg raising,” and “low back pain.”	Females Adults ages 19-44 Humans English

**Citation:**

1. Majlesi J, Togay H, Unalan H, Toprak S. The sensitivity and specificity of the Slump and the Straight Leg Raising tests in patients with lumbar disc herniation. *J Clin Rheumatol*. 2008;14(2):87-91. doi: 10.1097/RHU.0b01e31816b2f99.

**Summary of the Study:**

Study Design: This is a prospective case-control study.

Setting: Outpatient clinic of the Department of Neurosurgery of Istanbul SSK Education Hospital.<sup>1</sup>

Participants: 75 self-admitted patients with symptoms which are indicative of lumbar disc herniation. One group included 38 participants (8 females, 30 males, mean age = 38.08 years) which had MRIs indicative of disc herniation and the other group included 37 patients (12 females and 25 males, mean age = 40) who had no signs of a disc herniation on previous MRIs.<sup>1</sup>

Patients included in the study must have had a complaint of low back pain – with the current episode being no longer than 12-weeks – and have also undergone an MRI.

Patients with pain originating from the sacroiliac joint or hip were excluded. Other exclusion criteria included: radiologic evidence of spondylolysis and/or spondylolisthesis, existence of diabetes, cardiac disease, and/or pulmonary disease, or being on medication during the first visit.<sup>1</sup>

Intervention: Patients were recruited in the first half of 2005 for this study.<sup>1</sup> All patients signed forms of consent prior to beginning the study. Two different authors of the study conducted an initial evaluation of the patient, which included a history, physical assessment, Slump Test, and Straight Leg Raise Test. The authors of the study also recorded the angle between the patient's leg and the table for the Straight Leg Raise Test.<sup>1</sup> Results of the Straight Leg Raise Test and Slump Test were compared to the patient's MRI. For each initial evaluation, one of the two authors was blind to the MRI results.

Outcome Measures: This study measured the patient's MRI results, which had many classifications: bulging, protrusion, extrusion, bulging and extrusion, protrusion and root compression, and extrusions and root compressions.<sup>1</sup> The results of the Slump Test were also recorded. Results include a positive test (shooting nerve pain) or a negative test. Lastly, the results of the Straight Leg Raise Test were also recorded, with results either being a positive test (shooting nerve pain) or a negative test. The Straight Leg Raise can be used to rule-in many different pathologies, but for this study, the research team just needed to know if the Straight Leg Raise Test yielded a result that could rule-in lumbar disc herniation. The angle achieved on the Straight Leg Raise Test was recorded. This measure is pertinent to determining the results of the test.

Data Analysis: Slump Test findings and Straight Leg Raise Test findings were compared to MRI results by the research team. The research team used Epi Info 2000 to analyze

their data.<sup>1</sup> Epi Info 2000 is a computer program used for analyzing data, particularly in the healthcare community. It is developed by the Centers for Disease Control and Prevention.

**Summary of Evidence:** This study supports my hypothesis that the Slump Test is the preferred test for lumbar disc herniations as opposed to the Straight Leg Raise test. Overall, the Slump Test had higher values of sensitivity (84%) and specificity (89%) than the straight leg raise test, which had sensitivity and specificity levels of 52% and 83%, respectively.<sup>1</sup> Sensitivity measures the percentage of participants who rightfully had a positive test result. High sensitivity means the test has a low percentage of false positive results. Specificity measures the percentage of participants who rightfully had a negative test result. High specificity means the test has a low percentage of false negative results. These results imply that the Slump Test has a low percentage of those who are both misdiagnosed with and wrongfully cleared of having a suspected lumbar disc herniation.

With L4-L5 and L5-S1 herniations, when compared to MRI imaging, the Slump Test and Straight Leg Raise Test had similar levels of specificity but the Slump Test had higher levels of sensitivity.

The Straight Leg Test is sometimes taught in schools as the gold standard<sup>1</sup> for ruling-in lumbar disc herniations, but this study suggests that the Slump Test may be a more accurate tool than the Straight Leg Raise test.

**Additional Comments:** Overall, I feel this was a very well-done study. This study is Level 3 according to the Oxford Centre for Evidence-Based Medicine's 2011 Levels of Evidence. This prospective case-control study was a local non-random sample with non-consecutive studies. However, my main gripe concerning this study is the comparison of Slump Test and Straight Leg Raise Test findings to MRI results. This study assumes that the MRI results are infallible. Based on this study's heavy reliance on imaging results, a faulty MRI reading or inaccurate image collecting could skew the results of this study.

Although the authors do not comment on reliability or validity, I believe validity is dependent on the accuracy of the MRIs, but reliability cannot be determined with the data given. Reliability is the ability of a study to produce consistent results, and validity is the ability of a study to measure what it is intended to measure. Since neither the Slump Test or Straight Leg Raise Test were retested, reliability of these tests cannot be measured from the data given. As for validity, it must be assumed that the MRI is correct and infallible. With the MRI results, both the Slump Test and Straight Leg Raise can be compared to the patient's MRI to determine validity.

Ultimately, this was a very informative article and the results support my use and my clinical instructor's use of the Slump Test over the Straight Leg Raise Test in patients with suspected lumbar disc herniations.

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This CAT was completed as part of Scientific Inquiry II (Fall 2014) under the instruction of Sally McCormack Tutt PT, DPT, MPH