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### Comparison of the Thickness of Lateral Abdominal Muscles amongst Pregnant Women with and without Low Back Pain

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**Introduction/Background:** To compare the thickness of the External Oblique, Internal Oblique and Transversus Abdominis muscles in pregnant subjects with and without low back pain (LBP), using ultrasound to measure thickness. **Material and Methods:** Design: A case control study. Setting: An academic and tertiary care referral spine and sports medicine center. **Participants:** Fifty pregnant women with LBP during pregnancy and 54 pregnant controls. **Methods:** Case and control subjects were matched for body Mass Index (BMI), gestational age and number of previous pregnancies. A multiple linear regression model with adjustment for the gestational age of the subjects, as the potential confounder of the primary outcomes, was used to evaluate the association between LBP appearance and abdominal muscles thickness of the subjects. **Main Outcome Measures:** The thickness of lateral abdominal muscles was measured by ultrasound (US) with the subject in hook-lying position on the examination table. **Results:** We found that there was no significant difference between pregnant subjects with and without LBP in terms of the thickness of EO, IO and TrA muscles. **Conclusion:** These findings suggest that other factors rather than the thickness of core stabilizing muscles are influential in the etiology of LBP during pregnancy. We hypothesize that enlargement of uterus during pregnancy might influence the thickness of the lateral abdominal muscles.

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### Clinical Usefulness of Electrodiagnostic Study to Predict Surgical Outcomes in Lumbosacral Disc Herniation or Spinal Stenosis

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**Introduction/Background:** Although surgeries have been performed for the treatment of lumbar disc herniation (LDH) or lumbar spinal stenosis (LSS), not all patients who undergo surgery are satisfied with the outcome. There have been studies that relate the prognostic values of radiological studies, including magnetic resonance imaging (MRI), to surgical outcomes, but results were not determined. Compared with MRI, electrodiagnostic study (EDX) can assess the physiological functions of nerve roots with higher specificity and relate better with clinical manifestations. Therefore, we hypothesize that EDX could be useful method to predict patients' prognosis after surgery. The purpose of this study was to examine how EDX can predict surgical outcomes in patients with LDH and LSS and to compare the predicted values of EDX with other clinical factors and MRI findings. **Material and Methods:** Patients (n=448) diagnosed with LDH or LSS without neurological deficits, who underwent EDX before lumbar surgery, were selected and analyzed. Patients were divided into groups of successful and unsuccessful surgical outcomes according to a modified MacNab classification. We obtained preoperative clinical data, radiological results, and EDX results. Excellent and good responses were considered as successful outcomes, and fair and poor responses as unsuccessful outcomes. **Results:** Using EDX, radiculopathy was found in 236 patients (52.7%) in the study population. Before surgery, the visual analog scales for back and leg pain as well as the Oswestry disability index were not significantly different between the successful and unsuccessful surgical outcome groups. Age, diagnosis, type of surgery, and root compression on MRI were not significantly associated with surgical outcome. Radiculopathy on EDX was significantly related only to unsuccessful surgical outcomes. The association of spon-

dylolisthesis showed the trends towards unsuccessful surgical outcome, despite statistical insignificance. **Conclusions:** EDX detected functional abnormalities of nerve roots that did not show clinical manifestation and did not appear compressed on MRI. These abnormalities are important predictive factors for surgical outcomes in patients with LDH or LSS. Therefore, preoperative EDX is a clinically useful method to predict surgical prognosis.

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### Is There a Relationship between Lumbar Spine Proprioception and Non-Specific Low Back Pain? a Systematic Review with Meta-Analysis

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**Introduction:** Non-specific low back pain (NSLBP) is a common problem. Impairment in lumbar spine proprioception has been proposed as a mechanism for the development and perpetuation of NSLBP. The aim of this study is to investigate whether there is a relationship between lumbar proprioception and the development or presence of NSLBP. **Methods:** Four electronic databases were systematically searched for studies measuring lumbar spine proprioception in NSLBP patients. To be included, studies either compared lumbar proprioception between NSLBP patients and healthy controls or prospectively evaluated the relationship between lumbar proprioception and the development of NSLBP. Two reviewers independently extracted data and assessed the quality of included studies with standardised assessment forms. Where possible, meta-analysis was performed to determine any differences in proprioceptive acuity between NSLBP patients and healthy controls. **Results:** Twenty-four studies were included in the review. The included studies were of a moderate quality. Studies measured lumbar proprioception via joint repositioning sense (JRS), threshold to detection of passive motion (TTDPM) or both methods. Active JRS was worse in NSLBP patients than in healthy controls when participants were measured in sitting (standard mean difference 0.97, 95% CI 0.43 to 1.52). Active JRS measured in standing (standard mean difference 0.41, 95% CI -0.07 to 0.89) and passive JRS measured in sitting (mean difference 0.62°, 95% CI -1.24 to 2.48) were not significantly different between groups. However, specific subgroups of NSLBP patients showed larger proprioception deficits than the whole NSLBP cohort. Meta-analysis was not possible in TTDPM studies, but no study found significant differences in TTDPM between NSLBP patients and healthy controls (p>0.05). Two prospective studies showed no significant predisposition of participants with poorer lumbar proprioception to development of NSLBP (p>0.05). **Conclusion:** Patients with NSLBP had either impaired or no significant differences in lumbar proprioception compared with healthy controls, depending on the method of measuring proprioception. Larger deficits in certain NSLBP subgroups highlight the dangers of considering NSLBP patients as a homogenous group. However, these results must be considered in light of the variability in age and pain levels of participants included in the different studies, and the inherent problems and variability with the methods of measuring proprioception.

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### The Evaluation of Scales for Neuropathic Pain in Patients with Low Back Pain Syndrome

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**Introduction/Background:** Chronic low back pain (LBP) is characterized by a combination of nociceptive and neuropathic mechanisms of pain generation. We aimed to determine whether there is a neuropathic component in LBP patients and it is related with physical disability. **Material and Methods:** 102 patients with LBP consented to participate in the study and were assessed using the dif-