

Evaluation of Spinal Disorders

Diagnostic Tests

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Spine physicians utilize a variety of diagnostic tests to help identify the specific nature of spinal injuries and disorders. Diagnostic tests are used to help identify or confirm the presence of abnormal function or an abnormal structural state. Testing can also help reveal complications associated with a spinal disorder. Follow up diagnostic testing helps determine the pattern of progression or recovery. It is used to guide therapy and measure therapeutic outcome. There are many types of diagnostic tests available to evaluate the spine, the spinal cord and the integrity of the spinal nerves. Common spinal diagnostic tests are reviewed.

Algometry:

Algometry is a method of measuring pain threshold relational to the degree of pressure applied to soft tissue. Pressure algometry uses a pressure manometer to estimate pain thresholds an area where pressure is applied. It provides quantitative measurements of pressure thresholds and pressure tolerances perceived and reported by the patient. The algometer itself is a device, which has a pressure measurement tip which can be applied over a body region. The algometer records the amount of pressure applied, which is correlated with the patient's perception of pressure and reported level of discomfort or pain. This technique is usually repeated over time and the test results are compared to determine if pain levels are diminishing, resolved or worsening in response to care. Pressure induced pain thresholds provide a sensitive way to assess treatment outcome. Pressure-pain-threshold testing offers acceptable levels of reliability and reproducibility. Algometry can be used to evaluate paraspinal tissue tenderness.

Autonomic Testing:

Your doctor may wish to determine whether your autonomic nervous system is functioning normally. The nervous system consists of motor, sensory and autonomic components. The autonomic portion of the nervous system controls and regulates vital functions such as blood pressure, blood flow, sweating, bowel and bladder function. Certain disorders and diseases can compromise the autonomic nervous system in isolation, or as part of more neurological compromise. In the second case, many functions of the nervous system, including autonomic, sensory and motor systems, may be affected, and autonomic testing can be used as a "marker" to evaluate disease.

Autonomic testing is usually non-invasive and generally well tolerated. Some of the tests for autonomic function include evaluation of blood pressure, sweating, skin temperature and heart rate variability. Measurement of these functions can help determine whether the autonomic nervous system is working normally.

Blood pressure testing is done under different postural, breathing and exertional conditions. The ability to sweat on different areas of the body can be assessed and compared to normal ranges. Skin temperature along with digit blood flow can be monitored during a variety of provocative procedures that will increase or decrease blood flow. Electrocardiography (EKG) testing may be used to evaluate heart rate response and variability during different procedures. Ambulatory electrocardiography (EKG) may be performed to address heart rate variability (R-R intervals).

Blood Testing

Blood testing is often performed as part of the evaluation of back pain with or without related nerve compromise. Specialized blood tests can help a physician determine if there are laboratory indicators for those conditions that might be contributing to a back problem. One of the most common blood tests performed is the complete blood count (CBC). This is a test performed to evaluate the level and types of blood cells. The total white blood cell (WBC) count and the pattern of white blood cells help determine whether there may be an infection that may involve the spine. The CBC is also used to rule out various types of anemiaâ€™s that may occur as a result of bone marrow disease in the spine. The CBC can also help determine whether there is an inflammatory process.

Another common test, the erythrocyte sedimentation rate (ESR) is a blood test used to quantify the degree of systemic inflammation. The ESR test serves as an important bio-marker of inflammation. It is often evaluated when there is a spinal infection.

Another category of blood testing is tissue typing. The presence of a specific genetic marker called HLA-B27 in the blood can help a physician identify the possibility of ankylosing spondylitis involving the spine. This is a form of arthritis that principally affects the spine and sacroiliac joints. There are various types of arthritic disorders associated with the presence of HLA-B27. Although, the presence of this genetic marker is more common in individuals with certain arthritic disorders, its presence does not mean that it is inevitable that a disease process will develop.

A metabolic profile is often performed to help rule out organ (internal) disease that may cause secondary back pain. A urinalysis may be performed to help determine whether there is a urinary tract infection, kidney infection or other forms of kidney problems

that might contribute to referred flank or back pain. A comprehensive blood test, often referred to as a connective tissue profile, may be performed to determine whether there is a disease process compromising connective tissues of the spine or extremities. The typical connective tissue profile includes a variety of tests such as an anti-nuclear antibody screen (ANA) and rheumatoid factor (RF). There are many types of specialized anti-nuclear antibody testing. Benign and malignant prostatic disorders can refer pain to the spine and in the case of cancer may metastasize to the spine. The prostatic specific antigen (PSA) is a widely used test, a laboratory indicator of prostate problems and is often ordered by spine specialists.