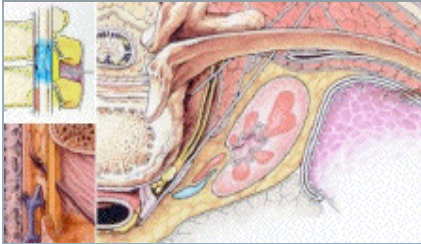


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News You Can Use

Insights Into Clinical Practice

IN THE NEWS

Approximately 80% of Americans experience LBP during their lifetime

In fact low back pain is one of the top 10 reasons patients seek care from a family physician. In epidemiologic studies of different populations, the prevalence of low back pain has varied from 7.6 to 37 percent, with peak prevalence occurring between the ages of 45 and 60., LBP is second only to the common cold as a cause of lost work time; it is the fifth most frequent cause for hospitalization and the third most common reason to undergo a surgical procedure.

References:

Facts about family practice. Kansas City, Mo.: American Academy of Family Physicians, 1996:62.

Borenstein DG. Epidemiology, etiology, diagnostic evaluation, and treatment of low back pain. *Curr Opin Rheumatol* 1997;9:144-50.

Kuritzky L, Carpenter D. The primary care approach to low back pain. *Prim Care Rep* 1995; 1:29-38.

ASSESSING THE PARTURIENT WITH BACK PAIN

Backache is a common complaint in the pregnant population and it is not usually from an epidural.

You receive a call from Mrs. Jones' doctor who tells you that she is complaining of right leg pain and weakness and lower lumbar pain. Mrs Jones contributes the pain to the epidural she received the day before for labor and delivery. What do you suspect?



To me, the answer is pretty clear. This person is using an alias. Her name is not Jones. She is an IRS agent investigating your 2004 tax return. Furthermore, you don't really care about Mrs. Jones' symptoms because you're a taxi driver and don't know the first thing about epidurals. Besides, your back hurts too! And your not alone.

Approximately 80% of Americans experience LBP during their lifetime. In fact low back pain is one of the top 10 reasons patients seek care from a family physician. In epidemiologic studies of different populations, the prevalence of low back pain has varied from 7.6 to 37 percent, with peak prevalence occurring between the ages of 45 and 60., LBP is second only to the common cold as a cause of lost work time; it is the fifth most frequent cause for hospitalization and the third most common reason to undergo a surgical procedure.

Mrs Jones belongs to the sector of the population where the overall prevalence of back pain during the period of pregnancy is thought to be about 50% with symptoms beginning around the 12th week of pregnancy and lasting up to 6 months postpartum. While there are multiple reasons for back pain (see table), the lower back pain associated with pregnancy can be categorized into three types:

Lumbar pain can occur with or without radiation to the legs. True sciatica is rare and thought to account for a small percentage of low-back pain in pregnancy. Sacroiliac pain is felt distal and lateral to the lumbar spine near the posterior superior iliac spine, and may radiate to the posterolateral thigh, usually to the level of the knee and rarely to the calf. It is four times more common than lumbar pain. Symptoms of sacroiliac joint pain typically continue several months after delivery. It is thought that 20% to 30% of pregnant women experience both lumbar and sacroiliac pain. Nocturnal pain occurs in the low back only at night while recumbent.

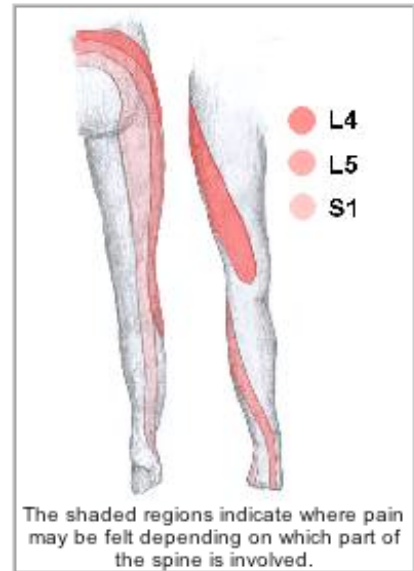
Let's take a closer look at these types of pain. Understanding the normal musculoskeletal changes that occur during pregnancy is useful for targeting and treating the sites of the parturient's back pain.

Lumbar pain. Lumbar pain during pregnancy can stem from multiple sites, most commonly the facet joints, paraspinal muscles, supporting ligaments, or discogenic sources.

Posture changes that occur during pregnancy help the woman maintain balance in the upright position as the fetus grows. After 12 weeks of pregnancy the uterus expands out of the pelvis and moves superiorly, anteriorly, and laterally, and consequently the parturient's abdominal muscles become less effective at maintaining neutral posture (i.e. shoulders back). As pregnancy progresses, the hormone relaxin, increases tenfold, reaching its peak at the 14th week. This is a good thing because this hormone allows for pelvic expansion to accommodate the enlarging uterus and makes the parturient's joints more lax and flexible.

But on the negative side, joint laxity increases. In the lumbar spine, most notable in the anterior and posterior longitudinal ligaments, both of which are pain-sensitive structures. As these static supports in the lumbar spine become more lax, they can't as effectively withstand shear forces, and discogenic symptoms and/or pain from the facet joints may increase.

Sacroiliac pain. In the pelvis, joint laxity is most prominent in the symphysis pubis and the sacroiliac joints. The symphysis pubis widens throughout pregnancy from its normal width of 0.5 mm to a maximum of approximately 12 mm. With widening comes the possibility of vertical displacement of the pubis and rotatory stress on the sacroiliac joints.

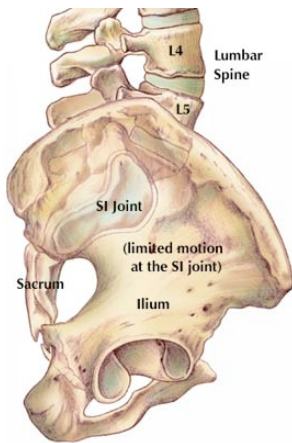


SCIATICA/SLIPPED DISC/PROLAPSED DISC

WHAT IS SCIATICA

Sciatica is the pain that starts in the back and radiates down one of the legs. It is quite a common complaint. It is caused by pressure on the sciatic nerve which runs down the leg. The cause of the pressure can be varied from a slipped (prolapsed) disk to muscle tension (Piriformis syndrome) or something less common such as tumors, bony growths and infections.

Depending on where the sciatic nerve is pinched will determine where you feel the pain which can radiate to the front of the knee or right down the back of the leg to the foot.



THE SACROILIAC (SI) JOINT IS A VERY IRREGULARLY SHAPED JOINT LOCATED WHERE THE ILIUM (HIP BONE) AND THE SACRUM (TAIL BONE) MEET. THE JOINT HAS VERY LITTLE MOTION; HOWEVER, THE LIMITED MOTION IT DOES HAVE IS VERY IMPORTANT TO THE PROPER FUNCTIONING OF THE LUMBAR SPINE, AS WELL AS THE HIP.

In the nonpregnant state, the sacroiliac joints are extremely stable with tight anterior and posterior ligament support and a sigmoid articular surface that limits movement. During pregnancy, however, movement in the sacroiliac joints can increase dramatically, causing discomfort when the pain-sensitive ligamentous structures are stretched.

Nocturnal pain. Some women have night back pain exclusively, others have both night pain and lumbar or sacroiliac pain. There are many theories about why night pain develops. One theory is that muscle fatigue accumulates throughout the day and culminates in back pain at night. Another is that daylong biomechanical stress from sacroiliac dysfunction or mechanical low-back pain from altered posture produces symptoms in the evening. Circulatory changes during pregnancy may also contribute to low-back pain at night. The enlarging fetus compresses the inferior vena cava when the woman is supine, which may divert blood flow to the ascending lumbar veins, the vertebral venous plexus, the paraspinal veins, and the azygous system. The intravascular volume increase when the pregnant woman is supine may contribute to engorgement of the collateral neurovascular structures, producing low-back pain at night



THE EXAM

Okay, so now that we know that the pregnant female is prone to backache, how can we go about assessing whether the pain she is experiencing is, in fact, related to pregnancy or some iatrogenic phenomenon caused by the introduction of a needle into her back. If you are a taxi driver the answer is pretty simple: do nothing. But assuming you have at least spent a night at the Holiday Inn Express, you should be able to perform some sort of cursory exam

The patient history is perhaps the most useful tool in differentiating the cause of pregnancy-related back pain. Patients should be asked to describe the location, nature, and duration of their pain. Women with lumbar back pain have pain while

weight-bearing and seated for prolonged periods. The pain is usually centralized low lumbar area, with or without lower extremity radiation.

Women who have sacroiliac pain, however, will describe pain in the posterior pelvis and deep in the gluteal area. Those who have sacroiliac pain as their primary complaint generally have low back pain longer throughout the pregnancy than those who have only lumbar low-back pain. The pain is exacerbated by any prolonged posture, especially during weight-bearing. The patient will usually describe stabbing pain in the buttocks distal and lateral to L5-S1 which may or may not radiate to the posterolateral lower extremity as far as the popliteal fossa; typically the pain will not extend to the foot. The patient also will describe pain that occurs while turning in bed at night.

Women who have nocturnal pain often describe a low-back cramp that is similar to the low back ache of menstruation. It may be severe enough to awaken them from sleep. Unlike patients who have sacroiliac or lumbar pain, women with nocturnal pain will not describe pain from turning in bed.

In patients who have lumbar low-back pain, the physical exam will be most consistent with discogenic and /or facet pain. In fact lumbar disk abnormalities is a common problem in pregnancy with the occurrence increasing with the number of pregnancies. Discogenic pain is typically most pronounced on flexion of the back, as when touching the toes from a standing

position. Returning to standing is less painful than going into flexion. If you suspect lower lumbar spine instability or if the patient had a recent c-section you may want to avoid having the patient bend over. In this case you can perform the STRAIGHT LEG RAISING test in which the leg is flexed at the hip with the knee extended while the patient is supine. If pain occurs in the sciatic nerve distribution, disk herniation should be suspected.

In facet pain, the pain is most pronounced when the spine is extended and will be localized to the level of the

Performing a Straight Leg Test

For a straight-leg test for low back pain, lie the patient on her back with both legs straight. Raise one of the patient's legs upward, keeping the knee straight.

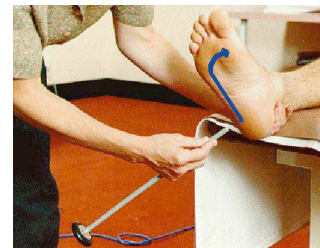
- ❖ If the patient complains of pain down the back the leg below the knee when the leg is raised, the test is positive (abnormal).
- ❖ If doing this test on the unaffected leg causes pain in the affected leg, it is more likely that the patient has a herniated disc. This is known as crossover pain.

irritated facet. Extension and rotation to the symptomatic side increase the pain even more. If the source is sacroiliac, pain will likely occur with back extension and rotation to the symptomatic side. Sacroiliac pain can also be illicited by employing the Patrick's test. Also known as the FABER test which is the mnemonic for flexion, abduction and external rotation, this test is performed with patient in a supine position and with her knee on the affected side flexed to 90 degrees. With her foot on her affected side resting on the opposite knee, the examiner pushes her affected side knee laterally and down while stabilizing her pelvis against the table on the opposite side. Pain will not occur in the healthy individual or even one with sciatica.



The neurologic examination should include testing of the lower extremity strength, sensation, and reflexes. The tests I routinely use are the patellar and Achilles reflexes. A reduced or absent patellar reflex suggests an L4 radiculopathy, whereas reduced or absent Achilles reflex suggests an S1 radiculopathy. (Bilateral reflexes should always be examined, with comparison of the symptomatic and asymptomatic limb.)

Testing plantar responses are useful for differentiating upper from lower motor neuron lesions. The one I'm most familiar with is the Babinski reflex. A positive Babinski, that is, an extensor plantar response (upgoing great toe) in the setting of low back pain is concerning for cord compression.



Meningeal Signs: Kernig's Sign and Brudzinski's Sign

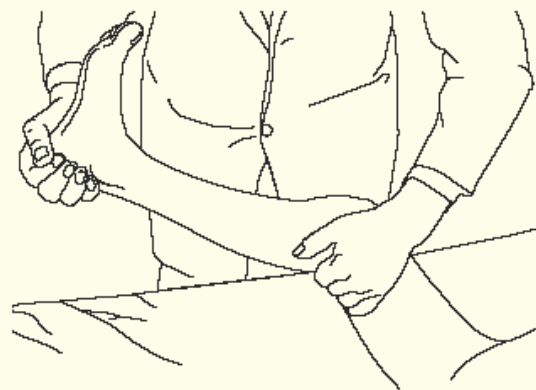
Meningitis, an inflammation of the meninges, is a life-threatening illness. If left untreated, meningitis has a high, almost absolute mortality and certain types of acute bacterial meningitis can be lethal within a matter of hours.¹ Therefore, early and accurate diagnosis and effective treatment are critical. Several clinical signs facilitate the diagnosis of meningitis. Kernig's sign and Brudzinski's sign are easy to elicit and can alert physicians to the precarious situation of a patient with meningitis. Both of these signs are thought to be caused by the irritation of motor nerve roots passing through inflamed meninges as the roots are brought under tension.

HISTORIC PERSPECTIVE

Meningitis has been recognized since antiquity.² As early as the 15th century BC, Hippocrates taught that "If during fever, the neck shall have been suddenly twisted, the deglutition be rendered difficult without a tumor, it is a fatal sign." Centuries later, King Henry II of France (1519–1559) is believed to have died from meningitis that he contracted after sustaining a scalp injury during sport. Meningitis was first described as a specific disease entity by British physician Thomas Willis (1621–1675) and Italian anatomist and pathologist Battista Morgagni (1682–1771). The earliest recorded epidemic of meningitis on the American continent that might have been caused by bacterial meningitis was recorded at Medfield, MA, in 1806. Autopsy data that showed pus between the patients' dura mater and pia mater substantiated bacterial

KERNIG'S SIGN

Elicitation: Flexing the patient's hip 90 degrees then extending the patient's knee causes pain.



meningitis as the causative factor.

MENINGEAL SIGNS

Kernig's Sign

Russian physician Vladimir Kernig was born in Lepaia, Latvia, in 1840. Kernig received his medical degree in 1865 and joined the Obuhorsk Hospital in Saint Petersburg, Russia, where he held a position until World War I. Kernig first described the sign in the Saint Petersburg Medizinische Wochenschrift in 1882. During Kernig's examination, the patient was seated upright with hips and knees flexed. Kernig would then attempt to extend the patient's knee. He noted that, in patients with meningitis, he was unable to extend the knee beyond 135 degrees without causing pain.

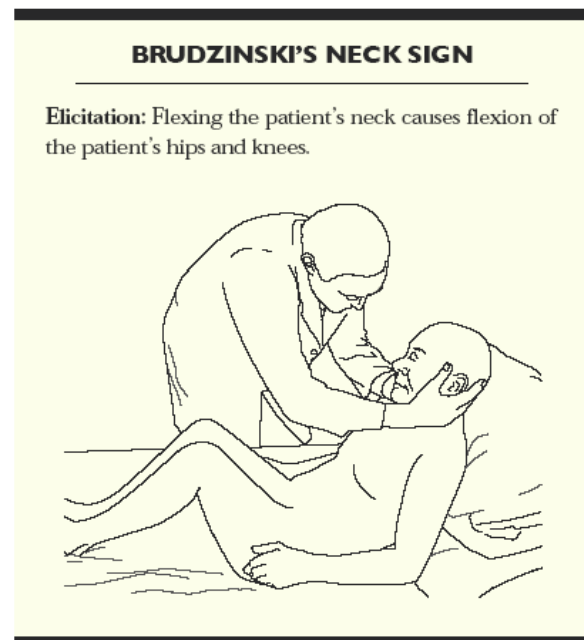
Today, the maneuver is usually performed with the patient supine with hips and knees in flexion. Extension of the knees is attempted: the inability to extend the patient's knees beyond 135 degrees without causing pain constitutes a positive test for Kernig's sign.

Brudzinski's Sign

Jozef Brudzinski, a Polish physician in the early 20th century, became the dean of the University of Warsaw (Warsaw, Poland) and chief physician at the Hospital of Karl and Maria (Warsaw, Poland). By the beginning of the 20th century, Kernig's sign was well known and in widespread use in the medical community. However, Brudzinski's contribution to the understanding of meningeal signs is unique because Brudzinski used animal experiments to study the signs he elicited in patients with meningitis.

Brudzinski's neck sign.

Brudzinski actually described several different signs in patients with meningitis. Brudzinski's neck sign is most commonly recognized and is often simply referred to as Brudzinski's sign. With the patient supine, the physician places one hand behind the patient's head and places the other hand on the patient's chest. The physician then raises the patient's head (with the hand behind the head) while the hand on the chest restrains the patient and prevents the patient from rising. Flexion of the patient's lower extremities (hips and knees) constitutes a positive sign. Brudzinski's neck sign has more sensitivity than Kernig's sign. Brudzinski's contralateral reflex sign. Brudzinski's contralateral reflex sign has two components: the identical and reciprocal contralateral reflex. The patient's hip and knee are passively flexed on one side; if the contralateral leg bends in reflex, identical contralateral reflex is demonstrated. Reciprocal contralateral reflex occurs when the leg that has flexed in response to the passive flexion of the contralateral hip and knee begins to extend passively.



REFERENCES

- Facts about family practice. Kansas City, Mo.: American Academy of Family Physicians, 1996:62
- Borenstein DG. Epidemiology, etiology, diagnostic evaluation, and treatment of low back pain. *Curr Opin Rheumatol* 1997;9:144-50.
- Mantle MJ, Greenwood RM, Currey HL: Backache in pregnancy. *Rheumatol Rehabil* 1977;16(2):95-101
- Hammar M, Berg G, Lilliesköld U, et al: Back pain during pregnancy [in Swedish]. *Swed Med J* 1986;83(21):1960-1961
- Östgaard HC, Andersson GB, Karlsson K: Prevalence of back pain in pregnancy. *Spine* 1991;16(5):549-552
- Östgaard HC, Zetherström G, Roos-Hansson E, et al: Reduction of back and posterior pelvic pain in pregnancy. *Spine* 1994;19(8):894-900
- Hainline B: Low-back pain in pregnancy. *Adv Neurol* 1994;64:65-76
- Endresen EH: Pelvic pain and low back pain in pregnant women: an epidemiological study. *Scand J Rheumatol* 1995;24(3):135-141
- Petersen LK, Vogel I, Agger AO, et al: Variations in serum relaxin (hRLX-2) concentrations during human pregnancy. *Acta ObstetGynecol Scand* 1995;74 (4):251-256
- Calguneri M, Bird HA, Wright V: Changes in joint laxity during pregnancy. *Ann RheumDis* 1982;41(2):126-128
- McCarthy SM, Stark DD, Filly RA, et al: Obstetrical magnetic resonance imaging:maternal anatomy. *Radiology* 1985;154(2):421-425
- Kuritzky L, Carpenter D. The primary care approach to low back pain. *Prim Care Rep* 1995; 1:29-38.
- Berkow R, ed: *The Merck Manual*, 16th ed. Rahway, NJ: Merck Research Laboratories, 1992:1466-1467.
- Vergheze A, Gallemore G: Kernig's and Brudzinski's signs revisited. *Rev Infect Dis* 1987;9:1187-1192.
- Fast A, Weiss L, Parikh S, et al: Night backache in pregnancy: hypothetical pathophysiological mechanisms. *Am J Phys Med Rehabil* 1989;68(5):227-229
- Wyke B: The neurology of low back pain, in Jaydon MIV (ed): *The Lumbar Spine and Back Pain*, ed 3. New York City, Churchill Livingstone, 1987, pp 56-99
- O'Connell J: Lumbar disc protrusions in pregnancy. *J Neurol Neurosurg Psychiatr* 1960, 23:138-141;
- Kelsey J, Greenberg R, Hardy R, Johnson M: Pregnancy and the syndrome of herniated lumbar intervertebral disc: an epidemiological study. *Yale J Biol Med* 1975, 48:361-368.
- Sigerist HE: *A History of Medicine*, vol 2. New York: Oxford University Press, 1961.
- Encyclopaedia Britannica*, vol 3, 15th ed. Chicago: Encyclopaedia Britannica, Inc, 1993:842.
- Bendiner E: Andreas Vesalius: man of mystery in life and death. *Hosp Pract (Off Ed)* 1986;21:202-204.
- Thomas Willis. *Encyclopaedia Britannica Online*. Available at:<http://members.eb.com/boftopic?eu=79154&sctn=1>(Accessed June 2, 1999.)
- Encyclopaedia Britannica*, vol 3, 15th ed. Chicago: Encyclopaedia Britannica, Inc, 1993:31/8.
- Danielson L, Mann E: The history of a singular and very mortal disease, which made its appearance in Medfield. *Medical and Agricultural Register* 1806;1:65-69.

Causes of Low Back Pain

Condition	Clinical Clues
Spondylolysis	Affects young athletes (gymnastics, football, weight lifting); pain with spine extension; oblique radiographs show defect of pars interarticularis
Malignant disease (multiple myeloma), metastatic disease	Unexplained weight loss, fever, abnormal serum protein electrophoresis pattern, history of malignant disease
Connective tissue disease (systemic lupus erythematosus)	Fever, increased erythrocyte sedimentation rate, positive for antinuclear antibodies, rheumatoid arthritis
Ankylosing spondylitis (morning stiffness)	Mostly men in their early 20s, positive for HLA-B27 antigen, positive family history, increased erythrocyte sedimentation rate
Nephrolithiasis	Colicky flank pain radiating to groin, hematuria, inability to find position of comfort
Nonspecific back pain (mechanical back pain, facet joint pain, osteoarthritis, muscle sprains, spasms)	No nerve root compromise, localized pain over lumbosacral area
Sciatica (herniated disc)	Back-related lower extremity symptoms and spasm in radicular pattern, positive straight leg raising test
Infection (disc space, spinal tuberculosis)	Fever, parenteral drug abuse, history of tuberculosis or positive tuberculin test
Abdominal aortic aneurysm	Inability to find position of comfort, back pain not relieved by rest, pulsatile mass in abdomen
Cauda equina syndrome (spinal stenosis)	Urinary retention, bladder or bowel incontinence, saddle anesthesia, severe and progressive weakness of lower extremities
Hyperparathyroidism	Insidious, associated with hypercalcemia, renal stones, constipation
Spine fracture (compression fracture)	History of trauma, osteoporosis, localized pain over spine

