

Science Education Collection

Lower Back Exam

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Overview

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The back is the most common source of pain in the body. Examination of the back can be a challenge due to its numerous structures, including the bones, discs, ligaments, nerves, and muscles—all of which can generate pain. Sometimes, the location of the pain can be suggestive of etiology. The essential components of the lower back exam include inspection and palpation for signs of deformity and inflammation, evaluation of the range of motion (ROM) of the back, testing the strength of the muscles innervated by the nerves exiting in the lumbar-sacral spine, neurological evaluation, and special tests (including the Stork test and Patrick's test).

Procedure

1. Inspection

Inspection should be done with the patient standing, while observing from behind. Have the patient remove enough clothing so the entire back and sacral area can be properly inspected.

1. Inspect the entire back for redness, asymmetry, deformity, scoliosis, or abnormal hair growth.
2. From the side, observe lumbar lordosis, which normally appears as a gentle, reverse C-shaped curve of the spine.

2. Palpation

Palpate for areas of tenderness. Important areas to check include:

1. Spinous processes: These are the hard bony structures that run down the midline of the back. Look for a step-off at L4-S1, which is suggestive of spondylolisthesis.
2. Paraspinal muscles: These are the muscles that run along either side of the spinous processes and are often tender with overuse of the back.
3. Sacroiliac (SI) joint: Palpate below and lateral to the posterior superior iliac spine.
4. Sciatic notch: The sciatic notch is located midway between the posterior superior iliac spine (which is the posterior tip of the iliac crest) and ischial tuberosity. Push here to aggravate pain caused by sciatica.
5. Iliac crests: Place your hands on both iliac crests, and compare their height. If one hand sits higher than the other, it may suggest leg length inequality or scoliosis.

3. Range of Motion (ROM)

Evaluate the ROM of the back. Look for deficits or excessive pain. Key motions include:

1. Forward flexion (normally 80-90°): To evaluate, have the patient bend forward to touch the toes. This loads the discs, which makes it more likely to increase disc pain. Be sure to observe from behind when the patient is bent forward to look for asymmetry of the back, which is suggestive of scoliosis.
2. Extension (20-30°): Have the patient bend straight backward as far as possible. This loads the facets, which makes it more likely to increase facet pain.
3. Lateral bending (20-30° in each direction): Assess by having the patient bend, first to one side and then the other. This stretches the muscles and is more likely to aggravate pain from muscle strain.
4. Twisting (30-40° in each direction): Have the patient (standing) rotate as far as possible, first to one side and then the other. This also stretches the muscles and increases pain from the source.

4. Strength Testing

Evaluate the strength of the muscles innervated by the key nerve roots exiting in the lumbar-sacral spine. Weakness suggests irritation of these nerve roots from disc or bony pathology. These include:

1. Heel walking (anterior tibial muscles; L4): Ask the patient to walk a few steps on the heels.
2. Toe walking (gastrocnemius soleus muscles; S1): Ask the patient to walk a few steps on the toes.
3. Resisted great toe dorsiflexion (L5): Ask the patient to sit and lift the big toe up against your resistance, pressing down on the top of the toe.

5. Neurologic Exam

Conduct a focused neurologic exam in patients with lower back pain.

1. Deep tendon reflexes (knee jerk - L4 nerve root; ankle jerk - S1 nerve root): Tap a reflex hammer briskly against the patella and Achilles tendons, comparing side to side.
2. Ankle clonus: Elicit ankle clonus by sudden passive ankle dorsiflexion, which may result in repetitive and uncontrolled ankle twitches. This suggests an upper motor neuron lesion, such as proximal spinal cord compression.
3. Straight-leg raise: Lift the patient's leg, with the knee extended, in the sitting (or supine) position. Pain radiating past the knee suggests sciatica, likely caused by disc herniation in the lumbar-sacral area (L5 and S1 nerve roots). Dorsiflexion of the ankle during the straight-leg raise test increases sciatic tension and pain, while plantar flexion relieves sciatic tension and pain.
4. Crossed straight leg raise: Do a straight-leg raise test on the opposite, uninvolved leg. If this maneuver aggravates the pain in the opposite leg, it is suggestive of sciatica.
5. When cauda equina syndrome is suspected, consider a rectal exam to check for decreased sphincter tone and perianal sensation.

6. Special Tests

Special tests in the back include:

1. Stork test (one-leg standing hyperextension test): Have the patient hyperextend the back while standing on one leg. This position aggravates pain associated with spondylolysis, spondylolisthesis or SI joint dysfunction.
2. Patrick's or the flexion, abduction, and external rotation (FABER) test: Place the patient's hip and leg into the figure-of-four position (flexion, abduction, and external rotation). This position aggravates SI joint pain.

Summary

Low back pain is very common, and occasionally can be a manifestation of a serious underlying condition, such as cancer, infection, or a surgical emergency. Systematic physical examination supplements the information obtained in the history by helping to identify serious problems that require earlier clinical actions or neurological dysfunction. Examination of the lower back is best done with the patient in both sitting and standing positions, following a step-by-step approach. It is important to have the patient remove enough clothing so the surface anatomy can be easily seen and evaluated. The exam begins with inspection, looking for asymmetry or deformity. This is followed by palpation, looking for tender spots or an abnormal step-off between the vertebrae. Next is an assessment of ROM, looking for pain or limitation in motion. From there, an evaluation can be made for lumbar nerve problems by assessing strength and the deep tendon reflexes, and conducting the straight-leg raise. This is followed by special tests, including the Stork test and the FABER test.