

An overweight 12-year-old boy presents with left knee pain that has been going on intermittently for the past three months. Physical activity, especially stair climbing, exacerbates the pain. The boy's mother also points out that he has been limping recently. On physical examination, his anterior left hip is moderately tender to palpation, and when he is asked to stand on his left leg, the right half of his pelvis tilts downward. Which of the following best explains this finding?

- ☐ A. Tensor fascia lata weakness
- ☐ B. Psoas muscle weakness
- ☐ C. Quadratus lumborum weakness
- ☐ D. Quadriceps muscle weakness
- ☐ E. Gluteus muscle weakness



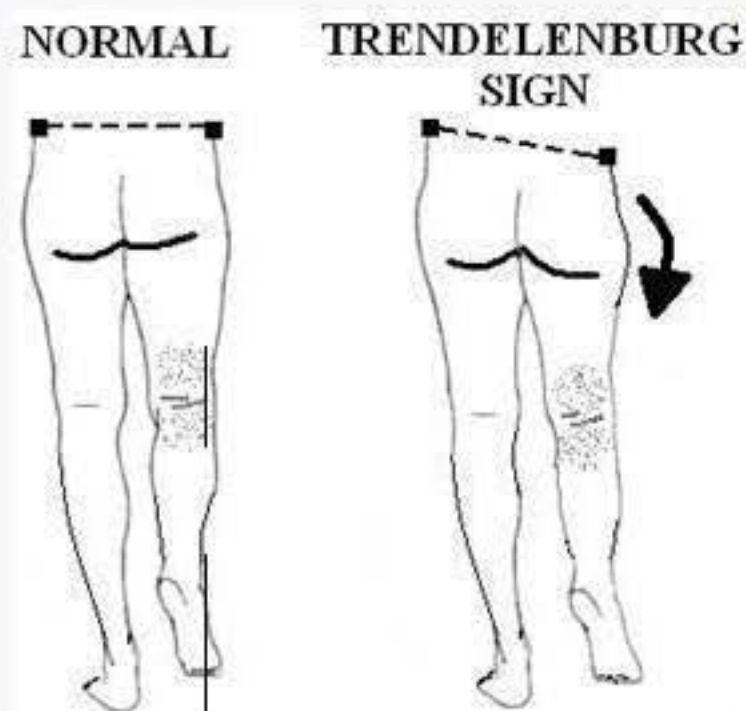
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- ☐ A. Tensor fascia lata weakness [6%]
- ☐ B. Psoas muscle weakness [7%]
- ☐ C. Quadratus lumborum weakness [5%]
- ☐ D. Quadriceps muscle weakness [6%]
- ☒ E. Gluteus muscle weakness [76%]

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### Explanation:

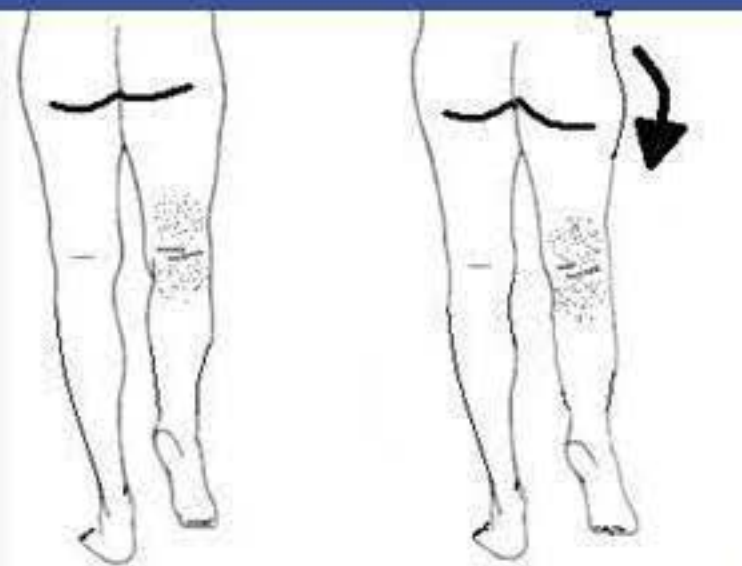
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The physical exam finding described is the Trendelenburg sign, a drooping of the contralateral pelvis that occurs when the patient stands on one foot. The associated Trendelenburg gait is waddling in quality, caused by the trunk's rocking to compensate for this pelvic drooping during the stance phase of gait.

Normally, the gluteus medius and gluteus minimus muscles, which are both innervated by the superior gluteal nerve, function to abduct the thigh at the hip when standing on one





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Normally, the gluteus medius and gluteus minimus muscles, which are both innervated by the superior gluteal nerve, function to abduct the thigh at the hip when standing on one foot or during normal ambulation when the body's weight rests on only one foot. Weakness of these muscles, as can occur in neuromuscular disease, impingement of or trauma to the superior gluteal nerve, or inflammatory myopathies, results in a positive Trendelenburg sign and gait.

**(Choice A)** The tensor fascia lata spans from the iliac crest to the fascia lata. It is a small muscle that assists in hip abduction and maintenance of knee extension.

**(Choice B)** The psoas major muscle spans from the transverse processes of the lumbar vertebrae to the lesser trochanter of the femur. It functions to flex and laterally rotate the thigh.

**(Choice C)** The quadratus lumborum spans from the iliac crest to the 12th rib and the transverse processes of the first four lumbar vertebrae. It functions in rib cage fixation and in lateral flexion of the trunk.

**(Choice D)** The quadriceps femoris muscles all function in leg extension at the knee. The rectus femoris also functions as a hip flexor.

**Educational objective:**

Drooping of the contralateral hemipelvis below its normal horizontal level during monopodal stance constitutes a positive Trendelenburg sign. It is caused by weakness or paralysis of the gluteus medius and minimus muscles, which are innervated by the superior gluteal nerve.