

Treating Leg-Length Inequality

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An early suspicion of leg-length inequality ("short leg") may arise from a patient's clinical exam, spinal X-rays or the existence of recurrent subluxations. If leg-length inequality is suspected, perform an accurate examination to determine the amount of difference and influence this discrepancy has on the patient's spine and gait. Next, determine the source of the inequality, so the correct treatment can be provided. Finally, determine by evaluation whether the treatment has sufficiently addressed the problem.

Begin by examining the patient in the upright, weight-bearing position. Measurements of leg-length discrepancy obtained in non-weight-bearing positions [have been found to be unreliable](#).¹ In the upright posture, positioning errors and measurement confusions are not a factor. [Accurate clinical determinations are then possible](#)² and effective chiropractic care can proceed. Since the lower extremities provide foundational support for the pelvis during standing and walking, it is not surprising that they can have a profound effect on both pelvic and spinal alignment.

Anatomical or Functional?

When one leg is shorter, there is often pelvic unleveling with a [compensatory lumbar curve to the short side](#).³ Gait will be somewhat altered in an attempt to make up the difference. Eventually, specific degenerative changes will occur in the spine and hip joints.^{4,5} A leg-length difference (measured while standing) 5-9 mm or over results in a [higher incidence of low back pain](#).⁶ Athletes and those who spend a lot of time on their feet may develop chronic symptoms with just 3 mm of discrepancy.⁷

There are two possible causes of a short leg, and each needs different treatment. An *anatomical* short leg is caused by a difference in the length and/or size of the structures between the femur head and the ground. This is sometimes found after a fracture or surgery, but is most often the result of asymmetrical growth. A *functional* short leg develops secondary to a difference in the supporting structural alignment between the femur head and the ground. The most common cause is excessive pronation on one side, but knee valgus may also be a causative factor.

Postural Examination

Before beginning treatment of a short leg condition, perform a weight-bearing postural examination of the pelvis and lower extremities. Position the patient in bare (or stocking) feet on an unyielding, level surface. Tell the patient to stand relaxed in a "normal upright posture."⁸ [Palpate the iliac crests](#)⁹ and the lumbar spine to determine if there is any pelvic unleveling and a compensatory lateral curvature. If either is found, see whether the greater trochanters and knee joints are level; then evaluate the knee alignment for valgus and the feet for asymmetrical hyperpronation.

If there is evidence of a functional short leg, see if the pelvis and spinal imbalances can be temporarily corrected by having the patient roll onto the outsides of both feet. As you palpate the levels of the iliac crests and greater trochanters, ask the patient to relax and return to a normal stance. If the pelvis dips down or rotates forward on the side of greater foot pronation, this shows the effect of the foot imbalance on the pelvis and lumbar spine. A lack of significant asymmetry in the lower extremity alignment reveals an anatomical difference.

Orthotic or Lift?

When evidence exists of a difference in lower extremity alignment (such as excessive pronation), providing symmetrical support is the most effective treatment. This is accomplished by supplying custom-made, corrective orthotics for both feet. It is important to recognize the functional short leg, since providing a lift instead of an orthotic will likely [perpetuate the associated sacroiliac subluxations](#).¹⁰ Only the standing postural exam, with careful evaluation of lower extremity alignment, permits this determination. If there is any doubt, the safest approach is to fit the patient initially with custom-made orthotics. If a leg-length discrepancy persists after wearing the orthotics for several weeks and receiving chiropractic adjustments, a heel lift can then be easily added to the orthotic for complete correction.

When an anatomical difference in leg length affects the alignment of the pelvis and spine, chiropractic care should include the recommendation of an appropriate amount of lift under the heel. Since some asymmetry is tolerated by the body (most reliable studies find that about 5 mm is the limit),¹¹ an exact correction of the difference measured at the femur heads is not needed. The exception may be athletes (such as long distance runners), who spend many hours a day exercising and competing on their feet.

For most patients, undercorrection (to within about 3 mm) is the best way to ensure a good response while avoiding any negative reactions. If the amount of lift needed exceeds 6 mm (the difference measured at the femur heads is more than 10 mm), the additional lift must be built onto the shoe, since a lift in excess of 6 mm will push the foot out of most shoes. This is done by adding half of the heel lift amount to the sole of the shoe, so the foot is not excessively plantarflexed during stance and gait.

Determine the Source of the Shortening for Best Results

Once a patient with a short leg has been properly examined, the source of the lower extremity shortening can be identified, and effective treatment can be provided. In many cases of functional short leg, as evidenced by radiographic study, the use of scientifically designed, custom-made orthotics has been shown to help eliminate musculoskeletal deficiencies and improve patient outcomes.¹² Those few patients with a true anatomical leg-length discrepancy will need to be supplied with an appropriate lift. The additional time required to determine the source of the short leg will be repaid in more effective chiropractic care and adjustments that last.

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