



# Wellness News Network™

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## The Long & Short of Leg-Length Inequality

Presented by:

### Introduction

Leg-length inequality, also known as lower limb length discrepancy, is a condition in which the length of one of your legs is different from the other (i.e., either shorter or longer).

Leg-length inequality may be classified as functional (i.e., involving muscles and posture) or anatomical (i.e., involving bone or cartilage abnormalities). Leg-length inequality may cause lower extremity and spine problems, including knee pain and low back pain, and it may be associated with lumbar spine scoliosis. According to the American Academy of Orthopaedic Surgeons, a leg-length inequality of approximately 1 2/3 inches or 4 cm in an average adult may cause easily observable gait abnormalities.<sup>1</sup> Your chiropractor can assess your lower limb length and make appropriate treatment recommendations for your unique situation.

### Anatomical Inequality

An anatomical leg-length inequality is a structural variation in lower limb length, which means that there is a true difference in the length of your leg bones or other leg structures. Causes of anatomical leg-length inequalities can be further subdivided into two categories; those that shorten a limb

and those that lengthen a limb. Congenital growth deficiencies, infections that infiltrate your epiphysis (the end part of a long bone) and growth plate fractures, among other problems, can cause lower limb shortening. Lower limb lengthening may be caused by rare conditions, such as hemihypertrophy, that encourage enlargement of one or more structures on one side of your body. A 2005 article published in the journal *Chiropractic & Osteopathy* states that some degree of anatomical leg-length inequality is present in almost every person, though the variation usually is small in most people.<sup>2</sup>

### Functional Inequality

A functional leg-length inequality occurs when your legs are the same length, but another condition or problem, such as pelvic tilting, creates the appearance of one leg being longer or shorter than the other.



### QUESTION:

What conditions can cause **anatomical** leg-length discrepancies?

- A) Growth deficiencies
- B) Fractures
- C) Poor posture

### ANSWER:

A) & B)

### TRUE OR FALSE:

A **functional** leg-length discrepancy involves bone and cartilage.

### ANSWER:

False – muscles and posture

### QUESTION:

For **functional** leg-length inequality your chiropractor may....

- A) adjust your spine
- B) adjust your sacroiliac joints
- C) perform soft tissue work
- D) all of the above

### ANSWER:

D) all of the above

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Other possible causes of a functional leg-length inequality include excessive ankle pronation on one side, hip dislocation, and one-sided genu varum and valgum (bowleg and knock knee, respectively). A 2000 article published in the journal *Gait & Posture* notes that a functional leg-length inequality may also be caused by rigid or dynamic contracture (i.e., loss of normal joint movement due to injury or scarring in nearby supporting muscles and other structures) of one of your lower limb joints.<sup>3</sup> Certain environmental factors may also contribute to a functional leg-length inequality, including banked running surfaces (e.g., crowned roads) and excessive shoe sole wear and tear.

## Assessing Leg-Length Inequality

Your chiropractor may be able to determine the degree of your leg-length inequality by visual inspection in combination with certain manual tests. In some cases, though, your chiropractor may order a scanogram to better assess your precise leg length dimensions. A scanogram is a radiographic (x-ray) technique in which images are taken of your hips, knees, and ankles in

sequential order while you are standing to discover the underlying location or cause of your leg-length discrepancy or symptoms. According to a 2006 study published in the *Journal of Bone & Joint Surgery*, a full-length standing radiograph of the lower extremities may be an even better approach than a scanogram for assessing leg-length inequalities, as it allows for a more comprehensive evaluation while reducing radiation exposure.<sup>4</sup>

## How Chiropractic Can Help

Your chiropractor will treat your leg-length inequality using different techniques, depending on whether the discrepancy is caused by anatomical or functional factors. For an anatomical leg-length inequality, your chiropractor may suggest you wear a full-length (i.e., heel-to-toe) lift to compensate for the discrepancy. A full-length lift (or a built-up, full-length shoe sole) allows your foot to remain on a flat surface and helps reduce low back pain and other low back problems. For a functional leg-length inequality, your chiropractor may adjust your spinal and sacroiliac joints and perform soft tissue work to release any tight, shortened muscles.



## Quote to Inspire

**“Winning is about heart, not just legs. It’s got to be in the right place“**

**Author: Lance Armstrong**

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4. Sabharwal S, Zhao C, McKeon JJ, McClemens E, Edgar M, Behrens F. Computed radiographic measurement of limb-length discrepancy: full-length standing antero-posterior radiograph compared with scanogram. *The Journal of Bone and Joint Surgery*. 2006. Oct; 88(10): 2243-2251.

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