

What is the diagnostic approach to a patient with leg cramps?

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EVIDENCE-BASED ANSWER

Leg cramps are very common (strength of recommendation [SOR]: **C**, case series), and most cases have no detectable cause (SOR: **C**, expert opinion). Arterial vascular disease and neurological diseases are more prevalent among male patients with leg cramps (SOR: **C**, small case series).

History and physical should focus on detecting precipitating factors for iron deficiency anemia (gastrointestinal bleeding, frequent blood donations, menorrhagia), electrolyte imbalance (renal

disease, fluid losses), endocrine disorders (thyroid, Addison's disease), neuromuscular disorders (neuropathies and myopathies), and medication use (antidepressants and diuretics). Laboratory testing is guided by the history and physical and may include ferritin, electrolytes, blood sugar, magnesium, zinc, creatinine, blood urea nitrogen, liver function test, and thyroid-stimulating hormone (SOR: **C**, expert opinion and nonsystematic review).

CLINICAL COMMENTARY

If a thorough search reveals no cause, keep your patient educated

Leg cramps are a common nonspecific complaint that can have a significant impact on quality of life. The literature on the potential causes and treatments of leg cramps is limited to small studies and expert opinion. This leaves the clinician on the spot with their own knowledge of medicine and their relationship with the patient. A careful history and physical may suggest some avenues of inquiry while simultaneously excluding other

serious causes. Lab and radiology testing can be useful when used in a thoughtful manner. A confusing clinical picture has frustrated me when I was too aggressive with studies. If a thorough search reveals no specific cause, I attempt to keep my patient educated regarding possible complications while keeping my differential diagnosis broad when addressing this problem in future visits.

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■ Evidence summary

More than two thirds of people aged >50 years have experienced leg cramps.¹ Though leg cramps are common, little is known about their actual causation.^{2,3}

A small, retrospective chart review, limited to male patients, identified an association of vascular and neurologic diseases among patients taking quinine, presumably for leg cramps.² Although commonly idiopathic, leg cramps are sometimes associated with various disorders including endocrine, metabolic, occupational, structural, neuromuscular, vascular, and congenital disorders, as

well as toxin- and drug-related causes (**TABLE**).^{4,5} All reviews suggest that the best diagnostic approach to leg cramps is a thorough history, and careful physical and neurological examination.^{1,3,4} The health care provider should clarify the onset and duration of leg cramps, any precipitating activity, and factors that provide relief. A detailed history should focus on precipitating factors for iron deficiency anemia (gastro-intestinal bleeding, frequent blood donations, menorrhagia), a history of renal disease (especially end-stage renal failure) and medication use (antidepressants and diuretics).

TABLE

Possible causes of leg cramps

CATEGORY	DISEASES
Congenital	McArdle's disease, "Glycogen storage disease," autosomal dominant cramping disease
Endocrine disorder	Thyroid disease, diabetes mellitus, Addison's disease
Fluid and electrolyte disorder	Hypocalcemia, hyponatremia, hypomagnesemia, hypokalemia, hyperkalemia, chronic diarrhea, hemodialysis
Neuromuscular	Nerve root compression, motor neuron disease, mononeuropathies, polyneuropathies, dystonias
Drugs	Calcium channel blockers (nifedipine), diuretics, phenothiazines, fibrates, selective estrogen receptive modulators, ethanol, morphine withdrawal
Vascular	Peripheral vascular disease
Toxins	Lead or strychnine poisoning, spider bites
Occupational	Focal dystonias (in writers, athletes, miners, and musicians)
Others	Diarrhea, liver cirrhosis, chronic alcoholism, sarcoidosis
Hematological	Iron deficiency anemia

Modified from Kanaan and Sawaya, *Geriatrics* 2001.³

FAST TRACK

Focus your history-taking on precipitating factors for iron deficiency anemia, history of renal disease, and medication use

The physical examination should include a search for obvious physical signs of symptoms noted in the history.⁶ Neurological examination can exclude most disorders that simulate leg cramps such as contractures, dystonia, myalgia and peripheral neuropathy.^{1,2,4}

The choice of laboratory investigations such as ferritin, electrolytes, blood sugar, magnesium, zinc, creatinine, blood urea nitrogen, liver function test, and thyroid function test are largely governed by the findings from the history and physical examination.¹ Though neurophysiological research shows that true muscle cramps are caused by explosive hyperactivity of motor nerves, using diagnostic tools such as electromyography, muscle biopsy, and muscle enzymes are seldom needed.⁷

Because of the lack of well-designed, randomized controlled studies, this diagnostic approach is based on non-systematic reviews, and may differ for individuals based on history and clinical examination.

Recommendations from others

UpToDate states, "a careful history and examination can exclude the majority of disorders in the differential diagnosis" of leg cramps.⁷ ■

REFERENCES

- Hall AJ. Cramp and salt balance in ordinary life. *Lancet* 1947; 3:231-233.
- Haskell SG, Fiebach NH. Clinical epidemiology of nocturnal leg cramps in male veterans. *Am J Med Sci* 1997; 313:210-214.
- Kanaan N, Sawaya R. Nocturnal leg cramps. Clinically mysterious and painful—but manageable. *Geriatrics* 2001;56:34, 39-42.
- Butler JV, Mulkerrin EC, O'Keeffe ST. Nocturnal leg cramps in older people. *Postgrad Med J* 2002; 78:596-598
- Riley JD, Antony SJ. Leg cramps: differential diagnosis and management. *Am Fam Physician* 1995; 52:1794-1798.
- Jansen PH, Joosten EM, Vingerhoets HM. Clinical diagnosis of muscle cramp and muscular cramp syndrome. *Eur Arch Psychiatry Clin Neurosci* 1991; 241:98-101.
- Sheon RP. Nocturnal leg cramps, night starts, and nocturnal myoclonus. UpToDate, version 13.1. Wellesey, Mass: UpToDate. Last updated December 2004.