

home from an observation unit without being scanned. Two subjective issues would need to be dealt with by qualitative research: the degree to which patients are reassured by (unnecessary) imaging thereby preventing re-attendance, and the degree to which doctors' (possibly irrational) fears of medicolegal consequences of not imaging can be assuaged.

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Growing pains

Parents and children need reassuring about this self limiting condition of unknown cause

Growing pains are typically non-articular, intermittent bilateral aches or pains in the legs that occur in the evening or at night in children aged 3-12 years. They are not associated with limping or limited mobility and do not involve the joints (all of which are recognised signs of pathology); no signs of local trauma or infection are seen.¹ Physical examination and laboratory and x ray investigations are normal. The diagnosis of growing pains is one of exclusion. Reported prevalence ranges from 2.6% to 49.4%, which reflects the diverse criteria used to identify cases and the differing populations sampled.

What causes growing pains? The short answer is that we still do not know. Although the term has been used for more than 180 years it has proved to be a misnomer—growth spurts do not play a part in this condition.² Many aetiologies have been proposed but have not been supported by subsequent research. The idea that growing pains are caused by rheumatic fever was disproved in the 1930s.³ Subsequent causal theories include faulty posture and an association with restless leg syndrome, vascular perfusion disorder, fatigue, or emotional disturbance.

Only one small study has shown a relation between growing pains and posture, and it suggested a possible association with pronated foot.^{w1} Restless leg syndrome in children is sometimes misdiagnosed as growing pains, but unlike growing pains this syndrome persists into adulthood. One small study found that children with growing pains were more likely than others to have a parent with a history of restless leg syndrome.^{w2} A study comparing bone scans of children with growing pains with those of controls concluded that growing pains are not associated with changes in vascular perfusion.^{w3}

One study found that children with growing pains had lower tibial bone strength than controls.^{w4} This supports the hypothesis that growing pains are a symptom of “overuse syndrome of the lower extremities” with bone fatigue. However, growing pains are not associated with bone fracture. The study provided insufficient information to determine whether the children had increased pain after physical activity.

Another study found that children with “osteomuscular pains of unknown origin” (synonymous with growing pains) had markedly increased levels of lead in their scalp hair compared with children of similar age.^{w5} The diagnostic criteria for growing pains were ill defined, however, and the person who conducted the assay did not seem to be blinded to the children’s diagnoses.

Because the pathogenesis of growing pains is unclear, psychological factors have been suggested to have a role, but no convincing evidence has been found.⁴ In an Australian longitudinal study of temperament, children with growing pains were more likely than controls to be rated by their parents as also having abnormal pains, negative moods, or behavioural problems, although the children’s teachers rated them the same as the controls for these measures.⁵ In a study of school children, episodes of limb pain were reported to have similar trigger factors, associated symptoms, and relieving factors to episodes of headache in children with migraine.⁶ No differences in personality were noted between children with growing pains and controls. Another study found that children with growing pains had lower pain thresholds than children of similar age and

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sex (not a matched sample). However, the assessing doctor in this study was not blinded.⁷

What should a doctor do when a child or family seeks help for growing pains? Laboratory screening and imaging studies are not warranted in the absence of limping, loss of mobility, or physical signs, yet doctors vary greatly in the investigations they order.⁸ Serious underlying illness is unlikely in children who typically present with growing pains. Parents should be reassured that growing pains are benign and self limiting and that the child does not need to undergo investigation.⁹

Paracetamol is recommended for growing pains, but its effectiveness has not been studied. The one study so far to investigate treatment was a randomised trial of children with growing pains who received either a muscle strengthening programme over 18 months or usual care.¹⁰ Symptoms resolved more quickly in the intervention group than in the control group. Although this finding supports the theory that growing pains are related to muscle spasm after fatigue, the sample size was small and the investigating doctor was not blinded. The children in the intervention group were given more time and attention by their parents to help them perform the exercises, and this may have influenced the outcome.

The term growing pains denotes a common, possibly heterogeneous disorder of unknown aetiology, which does not progress to serious organic disease and

usually resolves over time.¹¹ We would like to rename this condition "recurrent limb pain in childhood."

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Restless legs syndrome

Is treatable but under-recognised

Restless legs syndrome has probably been known for over three centuries but remains underdiagnosed. Recent advances in pathophysiology and new treatment options for the symptoms may not be widely appreciated. The syndrome has a prevalence of 10-15% in white adults, with some preponderance in women.¹ Although it is widely believed to occur in middle aged or elderly people, it also affects children and adolescents.² In over a third of patients symptoms start before the age of 10 years, although in most the disorder is not diagnosed until middle or late adult life.^{w1} One study has even asked whether "growing pains"—in a subgroup of children—may be a manifestation of this syndrome.³

The syndrome is characterised by unpleasant, "creepy crawly" sensations in the lower limbs, which occur at rest, mainly in the evenings when the person is seated or at night in bed, and are temporarily relieved by moving the legs. These cause the patient to move the legs relentlessly usually by pacing about in an attempt to gain relief. The International Restless Legs Syndrome Study Group has suggested four criteria for diagnosis: the desire to move the extremities, often associated with paraesthesiae or dysaesthesiae; motor restlessness; aggravation of symptoms by rest and at least temporary relief by activity; and worsening of symptoms in the evening or night.⁴

Restless legs syndrome is commonly associated with periodic leg movements of sleep (limb jerking) and even involuntary leg movements when awake. Such a complex of symptoms may be idiopathic or it may indicate a diverse range of underlying neurological and non-neurological disorders such as peripheral neuropathy, Parkinson's disease, uraemia, iron deficiency, varicose veins, and rheumatoid arthritis, or it may occur after gastrectomy. Restless legs may develop in or be aggravated by pregnancy.

Iron deficiency deserves a special mention as it is present in about a quarter of patients with restless legs syndrome, particularly in older people. In this group serum ferritin concentrations are inversely correlated with the severity of the symptoms in the legs.⁵ Reduced ferritin in the cerebrospinal fluid suggests that iron may have a role in the pathophysiology of the disorder. Reduction of iron has also been shown by magnetic resonance imaging in certain areas of the brain, notably the substantia nigra and the putamen.^{w2} The reduction in iron is proportionate to the severity of symptoms.

About 40% of patients with restless legs syndrome have a family history. In these patients it is inherited as an autosomal dominant disorder with variable