

# IN BRIEF:

## Topics in Pediatric Orthopedics

### Legg-Calvé-Perthes Disease

By Jennifer Laine, M.D., pediatric orthopedic surgeon

#### Overview

Legg-Calvé-Perthes disease (LCPD), a childhood hip disorder, occurs when the blood supply to the femoral head is disrupted spontaneously, without known cause. In North America, LCPD affects 1 in 740 boys and 1 in 3700 girls (Molloy *NEJM* 1966). LCPD affects both hips in 10 to 15 percent of patients (Barker and Hall, *CORR* 1986), although typically, onset is not simultaneous.

With LCPD, the femoral head progresses through four stages that can be seen radiographically: the femoral head appears avascular and sclerotic, fragmented with varying degrees of collapse, reossified as it heals, and healed. The majority of the first and second stages occur over a 1 to 2 year period, while it may take 3 to 5 years for the femoral head to reossify and heal.

Several factors are associated with LCPD's long-term prognosis. The child's age at onset and the degree of femoral head involvement are early indicators of outcomes, while femoral head shape and its fit within the acetabulum are later indicators of outcomes. Significant deformity in the healed hip is associated with early hip arthritis and pain.

#### Clinical Features and Diagnosis

A history, physical exam and plain radiographs are usually sufficient for reaching a diagnosis.

**History:** Most patients are between 4 and 8 years old and have a history of a limp with insidious onset. The limp may be painless, or the child might report mild hip, thigh or knee pain. LCPD seems to be more common in high-energy children who are physically immature for their chronologic age.

**Physical exam:** Patients usually limp with their trunk swaying over the affected side. While on the examining table, the patient's affected hip usually has a decreased range of motion, especially abduction and internal rotation.

**Imaging:** Request AP and frog-lateral views of the pelvis—not just the affected hip. Look for signs that the affected femoral head is smaller, more sclerotic, flatter or more fragmented than the contralateral side. Very early in the disease process, radiographs may be negative.

**Diagnosis:** LCPD is a diagnosis of exclusion. Rule out trauma, infection, transient synovitis and slipped capital femoral epiphysis. Also, consider other causes of osteonecrosis, such as steroid use.

#### Referral and Treatment

Refer patients to a pediatric orthopedist promptly if LCPD is likely or confirmed. While the condition is not emergent, many orthopedists believe that, in some cases, early intervention may help prevent femoral head deformity.

LCPD treatment remains one of the most controversial topics in pediatric orthopedics. Most pediatric orthopedists agree that treatment goals are maintaining range of motion and preventing or minimizing femoral head deformity. However, treatment ranges from observation alone to a number of different surgical interventions. Pediatric orthopedists base treatment decisions on the child's age, degree of involvement, stage of disease and provider preference. Historically, providers used a variety of abduction braces for treatment. Currently, long-term bracing is rare, although braces or casts may be used short-term to maintain range of motion or promote healing postoperatively.



**Jennifer Laine, M.D.**, pediatric orthopedic surgeon, has a particular interest in Legg-Calvé-Perthes disease, limb deformity, developmental dysplasia of the hip, and foot/ankle surgery. Laine has contributed to orthopedic textbooks and authored journal articles. Her professional affiliations include candidate membership in the American Academy of Orthopaedic Surgeons and the Pediatric Orthopaedic Society of North America. She is a member of the Ruth Jackson Orthopaedic Society, the Minnesota Orthopaedic Society and the International Perthes Study Group.

#### Key Insights

- With LCPD, the blood supply to the femoral head is disrupted spontaneously. As a result, the femoral head appears sclerotic, fragmented or collapsed on radiographs in the early stages of the disease.
- The peak onset of LCPD is between 4 and 8 years, although the range is 2 to 14 years.
- Symptoms may include a painless limp, or the child may report mild hip, thigh or knee pain. During an exam, the affected hip will often have a decreased range of motion.
- History, physical exam and basic radiographs of the pelvis (AP and frog lateral) are usually sufficient for reaching a diagnosis.

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# INSIDE:

**Legg-Calvé-Perthes Disease**



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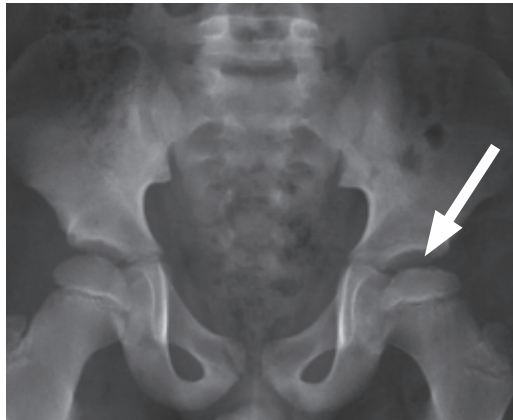
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## About *InBrief*

*InBrief* has been developed by pediatric orthopedic specialists at Gillette Children's Specialty Healthcare as a resource for primary care providers. If you have comments or questions, please contact Jason Kelecic, D.P.T., program manager, Center for Pediatric Orthopedics, at [jkelecic@gillettechildrens.com](mailto:jkelecic@gillettechildrens.com).

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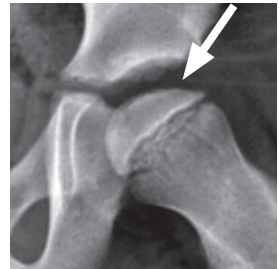
## Legg-Calvé-Perthes Disease



This 8½-year-old patient presented with an atraumatic limp and mild left thigh pain for 1 to 2 months. The left-sided radiographic findings are subtle and are consistent with early Perthes disease. The left femoral epiphysis is smaller and more sclerotic than the right side.

On the lateral view at right, note the early subchondral collapse ("crescent sign") in the left femoral epiphysis.

Overall, the left proximal femur looks more osteopenic than the right side.



## Gillette Participates in Recently Launched International Perthes Study Group

LCPD is common enough to present a frequent dilemma to pediatric orthopedic surgeons, but uncommon enough that it is difficult to study. In 2012, representatives from approximately 50 medical centers worldwide gathered for the first meeting of the International Perthes Study Group (IPSG). The study group's goal is to gain a better understanding of LCPD by conducting multicenter, prospective studies. Gillette Children's Specialty Healthcare has two representatives in the IPSG and plans to participate in these upcoming studies.