



# POSNA

## The Core Curriculum

### **Scheuermann's kyphosis**

#### **Objectives**

1. Define Scheuermann's kyphosis, including criteria for diagnosis
2. Describe structural anatomic findings noted in Scheuermann's kyphosis
3. Describe symptoms and physical findings noted in patients with Scheuermann's kyphosis
4. Discuss the natural history of Scheuermann's kyphosis
5. Discuss indications for treatment of Scheuermann's kyphosis
6. Describe the indications for surgery in patients with Scheuermann's kyphosis

#### **Discussion points**

1. What other conditions occasionally accompany Scheuermann's kyphosis?
2. What is thoracolumbar Scheuermann's kyphosis? How should it be treated?

#### **Discussion**

Scheuermann's kyphosis is a relatively common cause of kyphosis in adolescents. The cause is unknown, genetics has a role, but it is far from the only causative factor. The others are unknown. Disorganized enchondral ossification has been described in the cartilaginous vertebral body endplates, and the anterior longitudinal ligament is thickened. Deformity is generally the reason for seeking medical attention as an adolescent. Some patients complain of a low grade pain, generally located at the apex of the curve. With more severe structural kyphosis, the patient may have difficulty looking straight ahead. On physical exam, the lateral view is essential. With thoracic Scheuermann's kyphosis, there is an obvious kyphosis which is fixed on forward bending with the spine demonstrating an inverted "V" shape. The head may be forward, and there is generally an increased cervical and lumbar lordosis. Hamstring tightness is common. The most often used radiographic criterion for diagnosis is Sorensen's, that of 5 degrees or more wedging of three adjacent vertebrae.

Natural history studies are, not surprisingly, inconclusive. It is even difficult to ascertain the risk of progression in adults. Murray's study seems to minimize the problem of back pain as adults, although Lowe and Kasten report back pain as a predominant complaint in adults. The degree of kyphosis was greater in Lowe and Kasten's series.

Brace treatment has been described for adolescents with Scheuermann's kyphosis. The largest study by Bradford reported that of consistent brace wearers, 76 improved, 24 worsened, and 10 had no change. Platero reports preliminary casting improved results. Wenger and Frick conclude that bracing studies for Scheuermann's kyphosis are inconclusive.

Surgery is effective in reducing kyphosis. Earlier studies of posterior fusion alone reported a fairly high rate of recurrence, loss of correction, or junctional kyphosis. Present practice usually includes an anterior release, either thoracoscopic or open, combined with posterior fusion and instrumentation.

Lumbar Scheuermann's is a subset of structural kyphosis, usually affecting adolescent boys (the sex distribution for structural thoracic kyphosis is even). Weight lifting may play a role. If there is not structural wedging, the prognosis is good with avoidance of repetitive lifting and back strengthening.

## References

1. Aufdermaur M. Juvenile kyphosis (Scheuermann's disease): Radiography, histology, and pathogenesis. *Clin Orthop* 1981;154:166-74.
2. Bradford DS, Moe JH, Montalvo FJ, Winter RB. Scheuermann's kyphosis and roundback deformity: Results of Milwaukee brace treatment. *J Bone Joint Surg (Am)* 1974;57:740-58.
3. Greene TL, Hensinger RN, Hunter LY. Back pain and vertebral changes simulating Scheuermann's disease. *J Pediatr Orthop* 1985;5:1-7.
4. Lowe TG, Kasten MD. An analysis of sagittal curves and balance after Cotrel-Dubousset instrumentation for kyphosis secondary to Scheuermann's disease. *Spine* 1994;19:1680-85.
5. Lowe TG. Scheuermann's disease. *Orthopedic Clinics of North America* 1999;30(3):475-87, ix.
6. Montgomery SP, Erwin WE. Scheuermann's kyphosis: Long term results with Milwaukee brace treatment. *Spine* 1981;6:5-8.
7. Murray PM, Weinstein SL, Spratt KF. The natural history and longterm followup of Scheuermann's kyphosis. *J Bone Joint Surg (Am)* 1993;75:236-48.
8. Platero D, Luna JD, Pedraza V. Juvenile kyphosis: effects of different variables on conservative treatment outcome. *Acta Orthopaedica Belgica* 1997;63(3):194-201.
9. Tribus CB. Scheuermann's kyphosis in adolescents and adults: diagnosis and management. *Journal of the American Academy of Orthopaedic Surgeons* 1998;6(1):36-43.
10. Wenger DR, Frick SL. Scheuermann's kyphosis. *Spine* 1999;24(24):2630-9.