

## Scoliosis and the Child's Spine

Peter Fysh, DC

Scoliosis is defined as an abnormal curvature of the spine greater than 10 degrees in the sideways or coronal plane. Since scoliosis is a physical finding and does not represent a diagnosis, its cause should be investigated in all cases and its classification established prior to the commencement of any treatment program.

### Scoliosis Screening

Scoliosis can be readily detected during a thorough physical examination and many cases of scoliosis are found during routine spinal screenings. Scoliosis screening is such an effective process for locating previously unidentified cases of scoliosis that screenings are becoming a common occurrence in schools. Many school screenings are now carried out by local chiropractors.

Examination of a patient for scoliosis requires undressing and careful examination of the entire spine. A scoliosis which is evident with the patient in the standing position, but which disappears when the patient sits, is most commonly classified as a functional scoliosis. A scoliosis which is evident in the standing position and which persists with the patient in the forward bending position is most likely a structural scoliosis. The forward bending test is performed by having the patient flex forward at the waist to 90 degrees with the hands clasped together in-front. With the patient in this forward bent position, alignment of the ribs and vertebral spinous should be evaluated. If a distortion is detected, such as a unilateral rib hump, prominent scapular or obvious deviation of the spine to one side, then x-ray films should be obtained.

### X-Ray Evaluation

Any patient who has the signs of apparent scoliosis should have their spine x-rayed to determine the extent of the scoliosis. Scoliosis is evaluated using the following criteria: the angle of the scoliosis, the side to which the curve deviates, the upper and lower vertebrae which form part of the curve and the apex vertebra, i.e., the vertebra which is furthest from the spinal midline. Evaluation of any spinal curvature detected on an x-ray film should be made using either the Cobb method or the Riser-Ferguson method to determine the extent of the curvature.

### Functional Scoliosis

The patient with suspected functional scoliosis should be evaluated for leg-length inequality or pelvic distortion. Frequently, these scoliosis can be corrected by spinal and pelvic adjusting.

### Congenital Scoliosis

Congenital scoliosis is associated with failure of appropriate formation of the spine during embryological development. It may be due to specific vertebral anomalies, such as hemivertebrae, or to failure of proper segmentation of the vertebral structures. Congenital scoliosis frequently presents concurrently with other developmental anomalies, such as genitourinary anomalies, cardiac anomalies and spinal cord tethering. The goal of any management program is to prevent the progression of the scoliosis. Classically, bracing has been the method of choice to prevent

further progression of the curve. Initially, watching and evaluating the curve, especially small ones, may be appropriate. Also curves may be nonprogressive but this can only be determined by evaluation over a period of 6-12 months.

### Idiopathic Scoliosis

The most common form of scoliosis is an idiopathic scoliosis, which means scoliosis of unknown origin. Idiopathic scoliosis has no associated back pain, therefore any young patient who presents with scoliosis, accompanied by associated back pain, should be evaluated carefully for an alternative cause for their complaint.

Idiopathic scoliosis is the most common classification of scoliosis and is a classification which is reserved for scoliosis which cannot be classified into any other category. Idiopathic scoliosis may therefore be considered to be a diagnosis of exclusion. It is more common in females and tends to progress more rapidly during an adolescent growth spurt.

Scoliotic curvatures which are less than 25 degrees can be safely treated in the chiropractor's office, without referral for orthopedic opinion. Once the curvature reaches or exceeds 25 degrees, the patient should be referred for possible bracing. Some scoliotic curvatures have more of a tendency to progress than others. Such curvatures are seen in females whose scoliosis developed before the onset of menses, who have not as yet reached skeletal maturity and whose curvature measures 20 degrees or greater.

### Neuromuscular Scoliosis

Scoliosis associated with neuromuscular disorders, e.g., cerebral palsy, tend to be progressive and usually require bracing to minimize deterioration.

### Other Scoliosis Classifications

Identifiable scoliosis should be classified according to the following table, as such classification helps to determine not only the cause, but also the likely progression and prognosis.

## CLASSIFICATION OF SCOLIOSIS

### Idiopathic

Infantile (0-3 years)

Juvenile (4 years to puberty)

Adolescent (puberty to epiphyseal closure)

### Neuromuscular

Cerebral palsy

Spinal muscular atrophy

Syringomyelia

Friedreich's ataxia

Spinal cord tumor

Spinal cord trauma

### Myopathic

Muscular dystrophy

### Congenital

Failure of formation (hemivertebrae)

Failure of segmentation (Unilateral bar)

Mesenchymal

Marfan's syndrome

Ehlers-Danlos syndrome

Other Causes

Leg-length inequality

Hysterical

Metabolic

Soft tissue contractures

Osteochondrodystrophies

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