Idiopathic Scoliosis

James J. Lehman, DC, MBA, FACO
Associate Professor of Clinical Sciences
University of Bridgeport College of Chiropractic

Diagnosis is the key to successful treatment

Etiology

• The exact pathophysiologic mechanism for scoliosis is unknown.
• A genetic factor has been implicated in the development and progression of scoliosis.


Etiology

• If both parents have idiopathic scoliosis, their children are 50 times more likely to require scoliosis treatment compared with the general population.

Back Pain

• Back pain is fairly prevalent in healthy children and adolescents.
• When children or adolescents seek medical care for back pain, it is highly likely that underlying pathology will be identified.

Back Pain

• Common causes of back pain include nonspecific pain or muscle strain, herniated disk, spondylolysis, scoliosis, and Scheuermann’s kyphosis.

Idiopathic Scoliosis

Idiopathic or degenerative scoliosis is the cause of:
600,000 physician visits annually
30,000 children put in braces
38,000 spinal fusion surgeries
(Source: National Scoliosis Foundation)

Important physical exam findings in scoliosis

Curve Patterns

Thoracic
Lumbar
Thoracolumbar
Cervical

Source: National Scoliosis Foundation
Adolescent Idiopathic Scoliosis Management

- It is important to monitor the curves with x-rays until approximately 15 years of age in girls, and 18 years of age in boys. When curves reach 25-30 degrees, we consider bracing. Surgery may be indicated in curves over 40-45 degrees.
- Illinois Spine and Scoliosis Center
  - [http://www.myissc.com/spine_problems/scoliosis/idiopathic_scoliosis.htm](http://www.myissc.com/spine_problems/scoliosis/idiopathic_scoliosis.htm)
Adolescent Idiopathic Scoliosis

A typical case would be a young patient whose parents have noticed excessive spine curvature or the patient complaining of back pain.

Classifications of Scoliosis

Structural or Nonstructural

1. Structural curves are fixed, nonflexible, and fail to correct with bending.
2. Nonstructural curves are not fixed but flexible and readily correct with bending.

Question

Does this child present with an idiopathic scoliosis?

Radiographic Examinations for AIS

The physician takes a series of X-rays and measurements and if AIS is diagnosed, begins a treatment plan as follows:

- Observe (via X-ray) curves less than 30°
- Brace curves in the 30°–40° range
- Perform surgery if curves exceed 40°
AIS Management

Notice that each decision point rests on a 10° increment—including between observation and major spinal surgery. Well, 10° is also the commonly discussed margin of error for measuring scoliotic curves.

Question?

Can you name the radiographic view and examination?

Scoliometry

• A scoliometer measures the angle of trunk rotation, not vertebral rotation.
• Readings are taken in the sitting, forward bending position, so it is recommended as it provides stable posture and eliminates limb discrepancy


Scoliometer

• Scoliometer measurements, following the methodology proposed in this study, showed good correlation with the Cobb angle, the gold standard measurement. It had good intra- and inter-rater reliability and was sensitive in detecting curvatures greater than 10° Cobb using a referral criterion of 5° ATR, indicating its potential for screening individuals with idiopathic scoliosis.

Adolescent Idiopathic Scoliosis (AIS)

Presently, AIS is diagnosed and then treated almost entirely by a time lapse series of x-rays which form the basis for measuring the patient’s curve magnitude (the only caveat being that brace treatment is thought to be effective only in patients who are still growing).

Scoliosis is an inherited disease.

After four years of development, testing DNA samples from more than 9,000 patients, tracking billions of genotypes and making trillions of calculations, a company announced that it has found the specific, genetic markers for scoliosis.
How accurate is the Axial Biotech ScoliScore?

- Based on data from over 6,500 AIS patients:
- Sensitivity of ScoliScore is 90% (87–93)
- Specificity of ScoliScore is 88% (86–90)
- Sensitivity and specificity were confirmed in two clinical trials, with each trial including over 400 scoliosis patients

www.spine-health.com/physicians/using-dna-predict-scoliosis

ScoliScore

- **Indications** Adolescent Idiopathic Scoliosis
- Ages 9 to 13 years
- Self reported Caucasian males and females (North American, South American, European, Eastern European, Middle Eastern)
- Mild Curve (10° - 25° Cobb angle)

Clinical Question

Should this young girl be referred for ScoliScore or traditional management with radiographic examinations, bracing, and then surgical intervention?

Diagnosis is the key to successful treatment
Suggested Reading

- Horne JP, Flannery R and Usman S.