

ADOLESCENT IDIOPATHIC SCOLIOSIS

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Scoliosis is defined as a lateral deviation or curvature of the spine measuring greater than 10 degrees on a spinal radiograph. This is associated with rotation in a transverse plane creating a true 3-dimensional deformity. The most common form of scoliosis seen in the pediatric population is adolescent idiopathic scoliosis affecting approximately 2 to 3% of all individuals.

Even in the year 2008, the etiology of adolescent idiopathic scoliosis has not yet been elucidated. However, several theories have been studied and are currently being developed. One theory involves genetics, and a familial predisposition has been accepted. Identical twin studies demonstrate a concordance rate of approximately 73%. However, the mode of inheritance is currently controversial. Newer research suggests there may actually be chromosomal markers for scoliosis. Other theories involve abnormal soft tissue pathology such as connective tissue and skeletal muscle abnormalities. It has also been theorized that muscle contractile mechanisms, proprioceptive (peripheral, visual and spatial orientation) or growth and development hormones may be implicated. At the present time, we simply refer to adolescent scoliosis as idiopathic if we cannot identify a true cause.

Adolescent idiopathic scoliosis, also known as late onset pediatric scoliosis, affects individual greater than the age of 10 who are not yet skeletally mature. Patients often will present with shoulder asymmetry, pelvis asymmetry, and rib or lumbar muscle prominences particularly during a phase of growth. Pain is often not associated with adolescent idiopathic scoliosis, and if individuals do report a painful condition, this prompts an additional workup usually with an MRI.

Adolescent idiopathic scoliosis requires a thorough evaluation consisting of a complete history including a growth history and family history, a thorough musculoskeletal and neurologic physical exam, as well as a radiographic investigation. X-rays can assess the magnitude of the curve, the degree of rotation of the curve, pelvic and shoulder asymmetry, imbalances in both the coronal and sagittal planes, as well as the level of the skeletal maturity or immaturity. X-rays are performed on 36-inch cassettes in order to visualize the entire spinal column.

If an individual is diagnosed with adolescent idiopathic scoliosis, options consist of observation with serial radiographic follow-up, bracing or surgery depending on the curve magnitude and the amount of skeletal growth remaining. Realistically, there is no role for alternative treatments such as physical therapy, electrical stimulation, ultrasound or injections, as these have not been shown to halt curve progression.

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Curves greater than 10 degrees and less than 25 degrees in a skeletally immature individual are followed with serial radiographic x-rays. Curves greater than 25 degrees and less than 45 degrees in individuals with significant growth remaining are often placed in a scoliosis brace. Curves greater than 40 to 45 degrees in a skeletally immature individual will likely require surgical intervention. Surgery consists of curve and deformity correction using instrumentation and halting curve progression with a spinal fusion. Surgical techniques have come a long way over the past 20 years allowing us to perform incredible curve corrections with reduction of rotational rib humps allowing for significantly improved cosmetic as well as clinical results.