

# About Scoliosis - symptoms, causes, treatment

## Information for Patients and Parents

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### WHAT IS SCOLIOSIS?

Scoliosis was originally a Greek word meaning curved or bent. Today it is a word used to describe the most common type of spinal curvature. Scoliosis is simply a descriptive term, like headache, and not a precise diagnosis.

When a scoliosis develops the spine bends sideways and rotates along its vertical axis. These changes have cosmetic and physiological effects with long-term consequences which may result in significant health problems with severe curves.

### TYPES OF SCOLIOSIS

There are many causes of scoliosis, like there are many causes of headache. It is the doctor's task to determine which type of scoliosis the patient has.

### IDIOPATHIC SCOLIOSIS

The word idiopathic also comes from the Greek language and means pathology unto itself. More simply, idiopathic means a condition not associated with any other disease or disorder. Unfortunately the term idiopathic is widely used in medical literature to indicate the cause of a given condition is unknown.

There are three main types of idiopathic scoliosis which are classified according to the age of onset.

**INFANTILE**– A curvature that develops before a child is two years old. Nine out of ten of these curves will spontaneously resolve. This type of scoliosis is very rare in Australia.

#### **Physical Therapy in Infantile Idiopathic Scoliosis**

Infantile idiopathic scoliosis is a rare condition. The cause is unknown, but possible factors include birth position and sleeping position after birth. It is more common in boys. It tends to improve with simple measures such as stretching and changing sleeping position. Early diagnosis and treatment is important as the smaller curves are truly curable in most cases. These children should be seen by paediatric spinal surgeons. They will usually involve physiotherapists at children's hospitals to teach the parents the positioning needed. Progressive cases are treated as for early onset scoliosis.

**JUVENILE IDIOPATHIC** – A curve that develops in the age range of two to ten years. This type is also rare in this country.

**ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS)** – This type appears in early adolescence and is much more common in girls than boys. While the incidence of very small curves is similar in both sexes, the ratio of boys to girls for curves in the treatment category is 1 : 8-10. AIS in girls accounts for about 90 percent of curves seen in clinical practice. More information on AIS can be found [here](https://www.scoliosis-australia.org/about-scoliosis/adolescent-idiopathic-scoliosis/):

<https://www.scoliosis-australia.org/about-scoliosis/adolescent-idiopathic-scoliosis/>

## Scoliosis in Boys

Scoliosis can occur in boys at any age. In very small children, the "infantile idiopathic" form is actually more common in boys than girls. However, past that age, scoliosis is far more common in girls. In adolescence, girls are up to eight times more likely than boys to have a scoliosis. For reasons that are not known, the bigger the curve the more likely it is that it will be in a girl. Therefore, it is uncommon for a boy to have a scoliosis requiring treatment. Consequently, there have not been the same screening measures for boys in the past. Nevertheless, it is recommended that parents check their boys for scoliosis at least once. The recommended age to do this is 14.

In as much as approximately 90 percent of the patients seen in scoliosis clinics are adolescent girls with AIS, this website concerns this disorder and its management. However, the management of curves of other aetiology is generally along the same principles as those used in AIS.

The above remains a useful way of considering scoliosis. However, the following is a newer classification system:

**EARLY/LATE ONSET SCOLIOSIS** - It is rare for children to develop scoliosis below the age of 10. Given that scoliosis is driven by growth, one occurring in younger children is more likely to need treatment than those seen in adolescence. Early onset scoliosis is defined as that presenting at 5 years or less. Late onset is in those over 5 years. At 5 years or less, a scoliosis can have a major impact on health if untreated. This is because a deformed spine can affect the development of heart and lungs. Long term, this can lead to breathing and blood pressure problems (pulmonary hypertension) in adulthood. A scoliosis developing over the age of 5 does not significantly impact on heart and lung development. Life expectancy is generally normal.

The difficulty of treating scoliosis in the young is controlling the scoliosis without interfering with growth of the spine. In adolescents, surgery involves fusing the bent part of the spine. This straightens it and prevents further growth at those levels. This is not a problem as the spine has grown enough by that age. In fact, by the age of 10, the spine is 80 per cent grown.

Treatment in children under 10 years of age aims at avoiding fusion (except in special circumstances). The options are:

### 1. Casting

In young children, plaster jackets are applied around the trunk under a general anaesthetic to straighten the curve. The child is in hospital for a day. The cast stays on for between 1 and 4 months before being changed. Casting is useful in treating small, fast-growing children where a brace would be quickly outgrown, or when curves are too big to be braced (generally over 50 degrees). Casting is usually reserved for children under 6 years of age.

### 2. Bracing

Braces similar to those used in adolescents are commonly used when there is a progressive curve between about 20 and 50 degrees. A brace will last 1 to 2 years depending on the growth of the child. It needs to be worn for 16 to 20 hours per day, until either the curve disappears (which can happen, particularly in children under 3 or 4 years) or until the end of growth.

### 3. Growing Rods

These are used when the other methods have failed. They are not first line treatment, given the high complication rate. The principle of the surgery is to put anchor points on the upper and lower ends of the curve (screws or hooks), without exposing the rest of the spine. Then rods are inserted under the skin or muscle to be attached to the anchor points. The rods then act as a type of internal splint that allow continued growth.

There are several different types:

a) Traditional locked growing rods: To allow growth, the rods need to be "unlocked" and distracted (lengthened) with an operation every 6 to 9 months. The repeated surgeries can cause problems with scarring and infection. Also, the spine tends to get stiff, even though it has not been surgically fused. This is probably because this method doesn't mimic the normal, constant growth of the spine.

b) Guided growth rods: The Shilla technique uses a combination of a local fusion to which the rods are locked, and screws above and below where the rods are allowed to slide freely. This permits an "automatic" lengthening.

c) Magnetic rods: These are inserted as traditional locked rods would be. However, after the operation they are lengthened by placing a rotating magnet on the skin. This can be done every month or so. This avoids repeated trips to the operating theatre and more frequent lengthenings probably protect the spine from the stiffness seen in a). Magnetic rods are new technology and not yet in widespread use. Early results seem to indicate a lower complication rate.

Other types of scoliosis are:

**CONGENITAL**– In this type a curve develops because of congenitally abnormal vertebrae. This form of curvature is often associated with congenital abnormalities in other body systems such as the heart and kidney. Detailed investigation of these children is required.

**NEUROMUSCULAR**– A wide variety of diseases and disorders of the central nervous system (brain), nerves and muscles can, but not invariably, result in the development of scoliosis. Muscular dystrophy is one such condition in which scoliosis can occur. More information on neuromuscular scoliosis can be found here:

<https://www.scoliosis-australia.org/about-scoliosis/neuromuscular-scoliosis/>

**SYNDROMIC SCOLIOSIS**- Scoliosis is defined as a lateral curvature of the spine of greater than 10 degrees. Syndromic Scoliosis is a scoliosis associated with an underlying genetic syndrome such as Marfan Syndrome, Neurofibromatosis, Noonan Syndrome and many others. More information on syndromic scoliosis at the link below.

<https://www.scoliosis-australia.org/about-scoliosis/syndromic-scoliosis/>

**PARALYTIC**– This is the term applied to the curvature which frequently develops when there is loss of spinal cord function early in life from disease or disorder, particularly injury (quadriplegia and paraplegia).

The management of the above-mentioned types of scoliosis is very much tailored to the individual patient and the underlying condition. There are many factors which enter into the decision-making process and the advice given to the patient and the family by the spinal surgeon.

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