

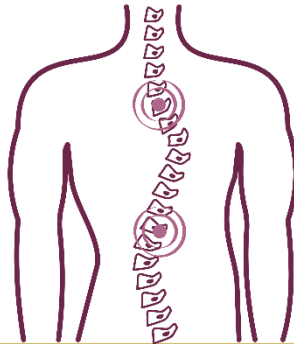


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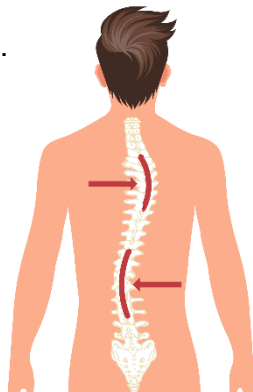
# Spinal Deformities

## Scoliosis



## What is Scoliosis?

- Adult scoliosis is identified by a sideways curvature of the spine in the frontal plane exceeding **10 degrees** in special measurement in individuals who have completed skeletal growth.
- Curves measuring **10 degrees** or less are deemed to be within the normal boundaries of spinal irregularity.
- The determination of scoliosis direction (left or right) is based on convexity.
- The position is determined by the vertebral body that is **most deviated and rotated away from the midline**, known as the apical vertebral body; Cervical, Cervicothoracic, Thoracic, Thoracolumbar, Lumbar, or Lumbosacral.



# What are the types of scoliosis?

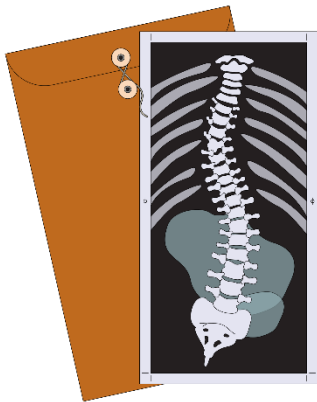
## Congenital Scoliosis

- Congenital scoliosis results from malformed vertebrae, leading to a curved spine.
- Diagnosis can occur in early infancy if evident signs are present, although many cases are detected during later childhood.
- As the child grows, scoliosis may progress, potentially causing bodily asymmetries.
- The standard management approach for congenital scoliosis involves a strategy of observation and monitoring.
- Surgical intervention is contemplated if the curvature is deteriorating significantly, posing risks of persistent deformity and potential future discomfort for the child.

# What are the types of scoliosis?

## Idiopathic Scoliosis

- Idiopathic scoliosis is a type of spinal curvature without a specific known cause, making up one of three primary forms of scoliosis.
- This condition is prevalent within families and predominantly affects girls over boys at an approximate ratio of 8 to 1.
- Often mild in nature, idiopathic scoliosis frequently requires minimal intervention beyond regular observation.
- It is the most common form of scoliosis characterized by an abnormal spinal curve development



# What are the types of scoliosis?



## Neuromuscular Scoliosis

- Neuromuscular scoliosis is an abnormal sideways curvature of the spine linked to disorders impacting the brain, spinal cord, and muscles.
- It disrupts spine and trunk alignment due to nerve and muscle issues, often causing pelvic obliquity where one side of the pelvis is higher.
- Kyphosis, a forward rounding of the back, commonly accompanies neuromuscular scoliosis.
- Children with neuromuscular conditions have a higher scoliosis risk as a straight spine relies on normal muscle balance, often affected by conditions like cerebral palsy or muscular dystrophy.

## What are the types of scoliosis?



### Continue Neuromuscular Scoliosis

- Wearing a scoliosis brace can be an option for managing neuromuscular scoliosis and potentially slowing or halting its progression.
- Surgical intervention is typically considered when the curvature exceeds **50 degrees** to prevent further deterioration.
- Untreated curves may worsen, leading to progressive torso imbalance, with severe cases beyond **80 degrees** potentially causing breathing difficulties due to decreased lung space.



## How does idiopathic scoliosis have an effect on infants, children and teenagers?

Idiopathic scoliosis can affect individuals at any age, but it typically turns to a concern during pre-adolescence and adolescence as children experience rapid growth. There are three types of idiopathic scoliosis:

### Infantile idiopathic scoliosis:

Diagnosed in kids **between birth and 3 years old**, it represents less than 1% of all pediatric cases.

### Juvenile idiopathic scoliosis:

Diagnosed in children between **3 to 9 years old**, it represents **12-20%** of all pediatric cases.

## How does idiopathic scoliosis have an effect on infants, children and teenagers?

🚦 Adolescent idiopathic scoliosis:

Diagnosed in kids between the ages of 10 and 18 years old, it represents 80% of all pediatric cases of idiopathic scoliosis.

**Note:** Early detection allows for monitoring and treatment of idiopathic scoliosis, and in many cases, early intervention can prevent the patient from reaching surgical treatment.





## What is the scoliosis clinical presentation?

Patients with spinal deformities can be asymptomatic, although some may face significant issues. Healthcare providers should be mindful of the possibility of undiagnosed scoliosis in adult patients. Degenerative adult scoliosis typically emerges at 50 years or older due to degenerative changes in the spine. Conversely, congenital, early-onset, and adolescent idiopathic scoliosis often appear during growth years and may present symptoms in adulthood. Many childhood deformities can be missed during growth and only recognized by adult healthcare providers.

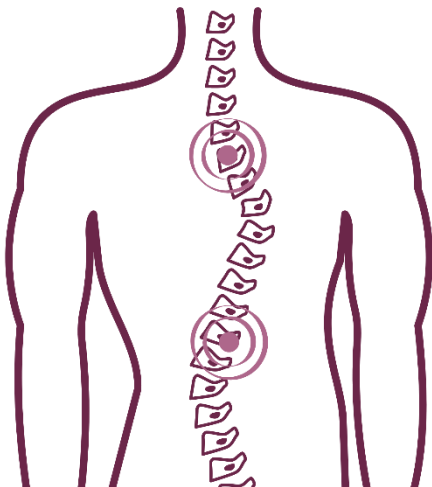
- Symptomatic patients typically exhibit the following:
  - o Back pain, found in as many as 90% of individuals
  - o Postural imbalance leading to challenges with standing and walking.

## What is the scoliosis clinical presentation?

- Symptoms of spinal stenosis in around 50 to 89 percent of patients:
  - Neurogenic claudication: Leg pain, sensory loss, or weakness affecting legs, aggravated by walking or certain positions.
  - Radiculopathy: Pain, numbness, tingling, or weakness spreading to legs and feet.
  - Neurological issues like weakness, numbness, or bowel/bladder control loss are uncommon in adult scoliosis patients, but urgent assessment is needed for spinal cord compression or cauda equina syndrome
  - Psychosocial concerns include worries about posture, appearance, future curve progression, and mood changes such as depression due to factors like height loss or clothing fit changes.

## What is the scoliosis clinical presentation?

- Symptoms of spinal stenosis in around 50 to 89 percent of patients:
  - o As the deformity progresses, sufferers may also increase constant sagittal imbalance (e.g., flatback syndrome). Although degenerative changes might also additionally plateau over time, stenosis can preserve to worsen, ensuing in growing radiculopathy and/or neurogenic claudication.

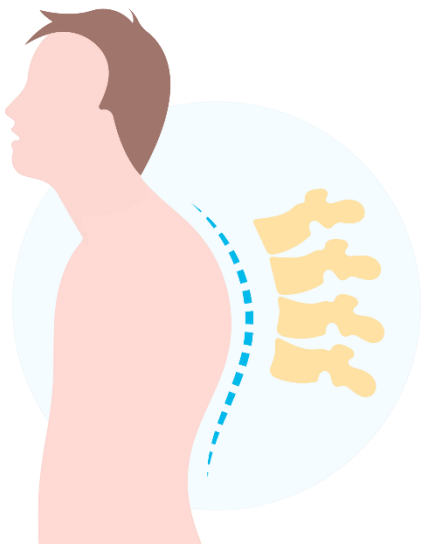


## What are the scoliosis causes and factors?

These are the causes of scoliosis:

In maximum cases, the reason of scoliosis is idiopathic (unknown). Researchers hold to examine feasible reasons for idiopathic scoliosis and assume that a mixture of numerous elements can also additionally result in the disorder.

- Genes
- Hormones
- Changes in cell structure



## What are the scoliosis causes and factors?

For some children, scoliosis occurs as a result of another disease, disorder, or trauma that causes the spine to curve. These include:

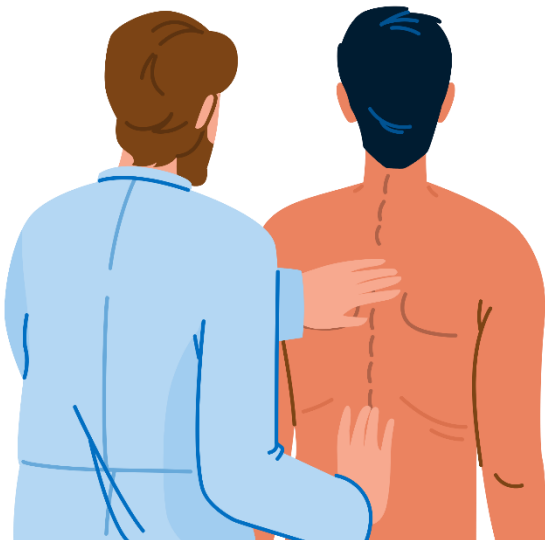
**Congenital factors:** These occur during the development of the spine while the baby is in the womb, leading to a curve in the spine.

- **Genetic diseases:** These occur when changes happen in one or more genes.
- **Injury to the spine:** Usually from trauma to the spine or back.
- **Neuromuscular diseases:** These affect the nerves that send messages to muscles, leading to muscle weakness and loss.
- **Tumor:** This can cause physical changes to the spine.

# What are the management options for scoliosis?

For scoliosis, treatment depends on several factors:

- The cause of scoliosis
- The location of the curve in your spine
- The size of the curve
- Whether your body is still growing
- ❖ Idiopathic scoliosis often does not require treatment, but regular check-ups with a healthcare provider every **6 months** are advised.



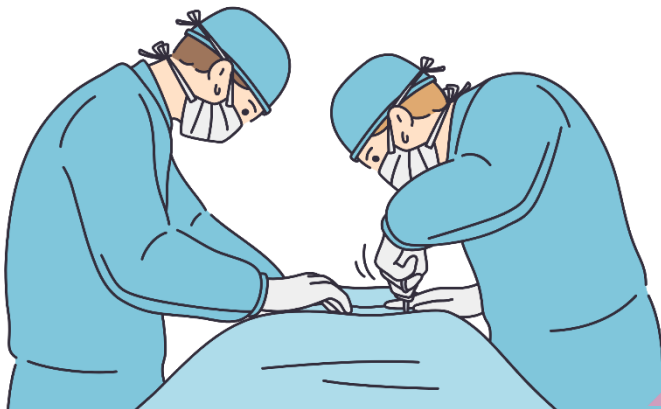
## What are the management options for scoliosis?

- ❖ If you the patient is still growing, a healthcare provider may recommend a **back brace** to halt further curvature. The type of brace chosen is based on the size and position of the curve, with adjustments made as you grow.
- ❖ Back braces are most beneficial for individuals over **10 years old** with continued growth potential but are not effective for those with congenital or neuromuscular scoliosis.



## What are the management options for scoliosis?

- ❖ Surgery may be essential in severe or rapidly deteriorating cases to correct the curve significantly.
- ❖ The surgical procedure often involves an incision in the back, abdomen, or below the ribs to access the spine, where metal rods are inserted to stabilize the spine until the bones fuse.
- ❖ Post-surgery, wearing a brace for a period might be required to maintain spinal stability.





## What are the management options for scoliosis?

- ❖ Scoliosis treatment may involve emotional support, physical therapy, and collaboration with specialists to ensure proper brace fit and treatment comprehension.
- ❖ This holistic approach is crucial, particularly for children and teenagers who might feel self-conscious wearing a back brace.





### References and resources:

Mayo Clinic, Advocate Health Car, spine-health.com, uptodate-com.library.iau.edu.sa and Physical risk factors for neck pain.

Scandinavian journal of work, environment & health.

All pictures used from canva.com.

### Review and audit:

The content of this booklet has been reviewed by Neurosurgery consultants at King Fahad University Hospital.

**Neurosurgery Department**

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**Health Awareness Unit**

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