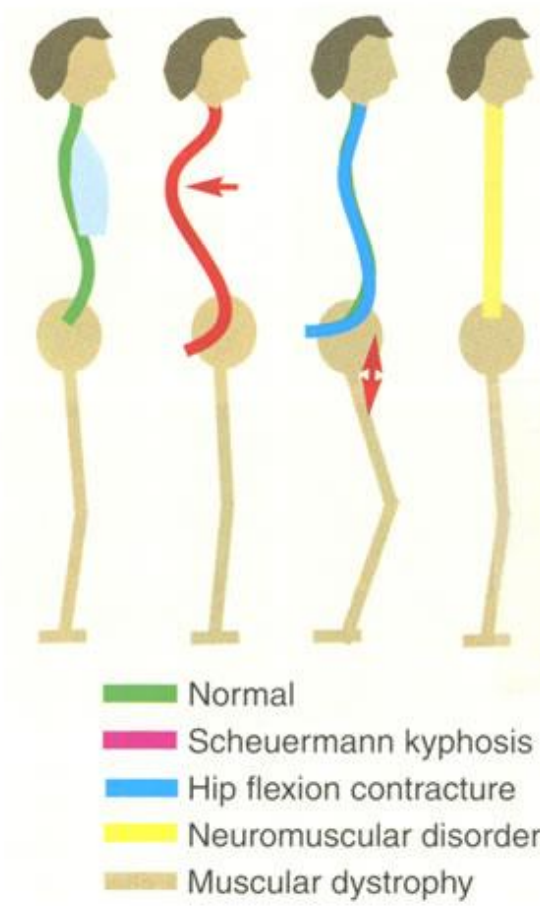
SCOLIOSIS BLOCK 14

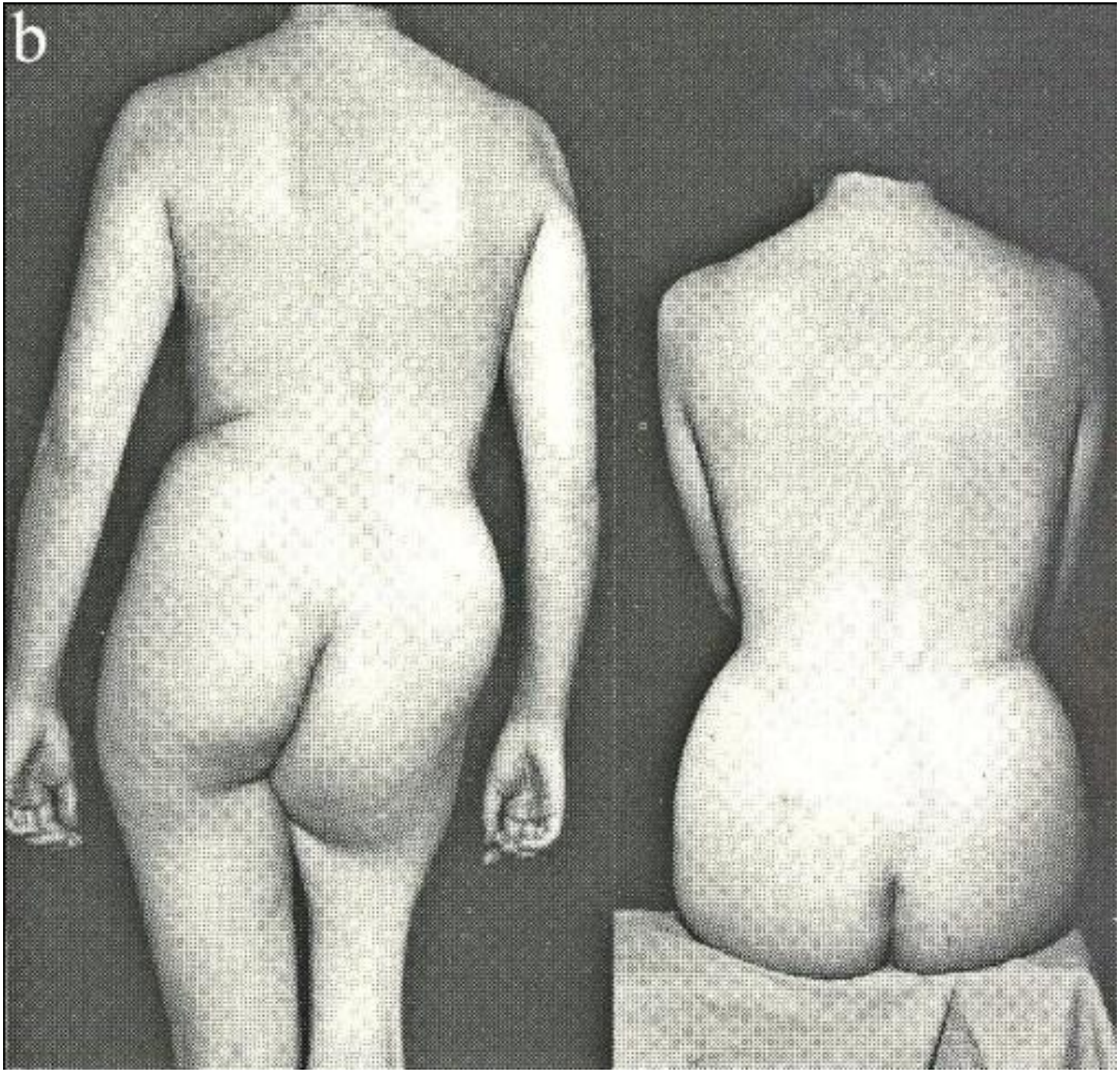
Definition

- Scoliosis is a **fixed** lateral curvature of the spine. It is considered abnormal when this curvature in the frontal plane exceeds 10 degrees.


Normal
Scheuermann kyphosis
Hip flexion contracture
Neuromuscular disorder
Muscular dystrophy

Classification

- **A. NON STRUCTURAL:**
- **Postural,**
- **Sciatica,**
- **Inflammatory,**
- **Compensatory**
- **(Hysterical,)**


b

Classification

- **B.STRUCTURAL**
  - **IDIOPATHIC (80%):**
    - **Infantile (<3 years)**
    - **Juvenile (3-10 years)**
    - **Adolescent (10 years until maturity)**
  - **NEUROMUSCULAR (10%)**
    - **Neuropathic: Cerebral Palsy, Syringomielia, Polio-myelitis, Spinal muscular atrophy, Freidrich's ataxia**
    - **Myopathic: Arthrogryposis, Muscular distrophy, Myotonia dystrophica**

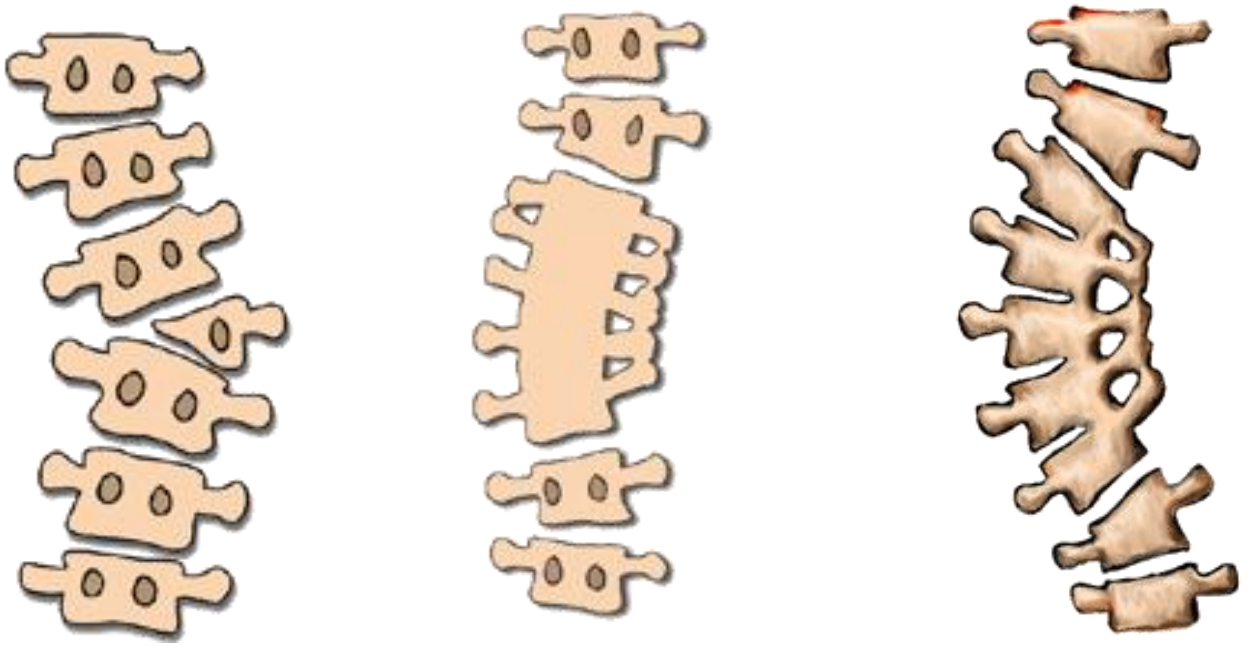
    -CONGENITAL: Diastematomyelia, Spina bifida, Hemivertebra, Wedge vertebra, Block vertebra, Unsegmented bar.

    - MISCELLANEOUS

SCOLIOSIS

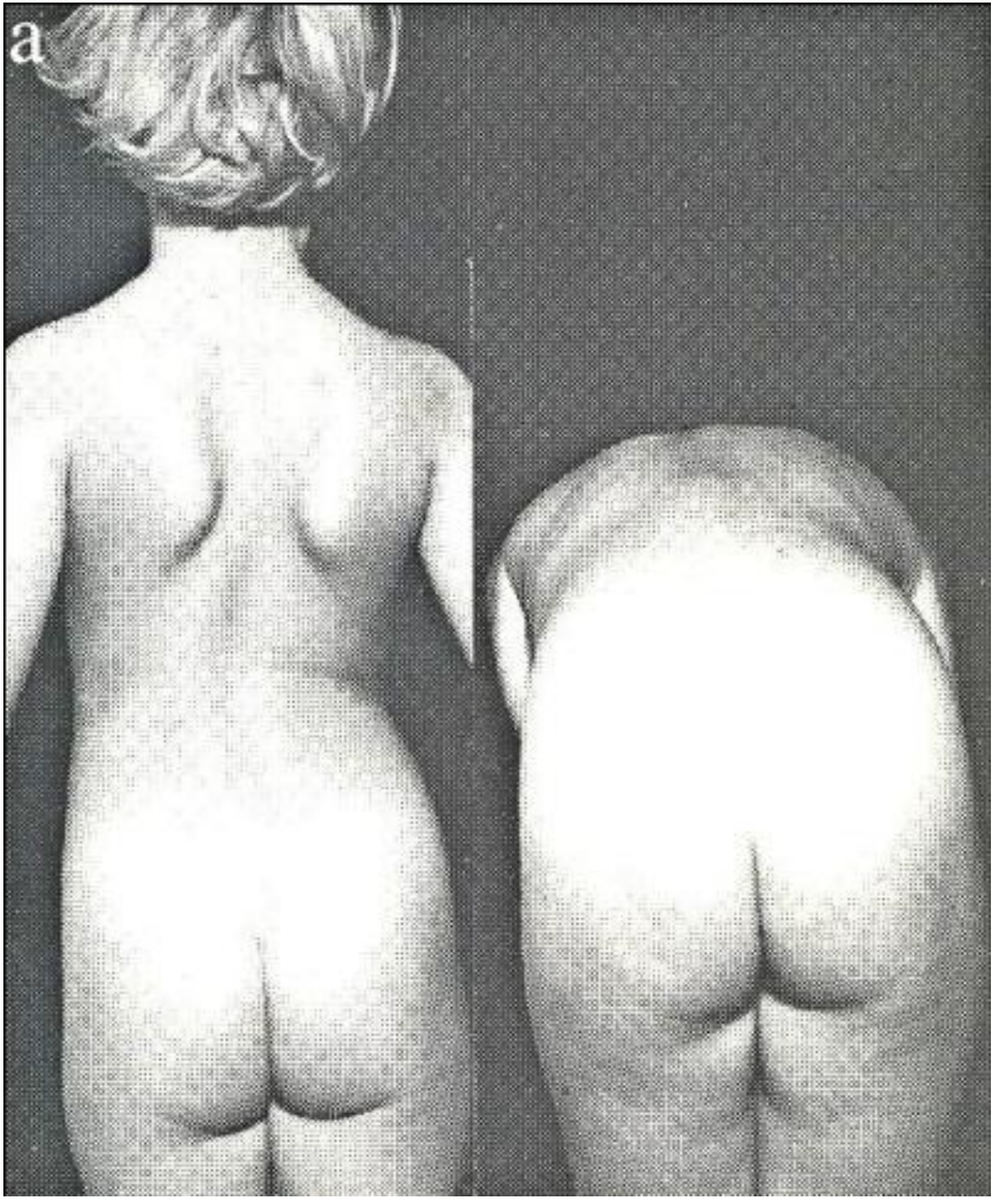
Classification

- **CONGENITAL: Diastematomyelia, Spina bifida, Hemivertebra, Wedge vertebra, Block vertebra, Unsegmented bar.**



MISCELLANEOUS

- NEUROFIBROMATOSIS
- MESENCHYMAL DISORDERS: Marfan's, Ehler-Danlos
- REUMATHOID DISEASE
- TRAUMA: Fracture, Surgery, radiation
- EXTRASPINAL CONTRACTURES: Burns, Tho-racic surgery
- OSTEOCHONDRAL DYSTROPHIES
- INFECTION
- METABOLIC DISORDERS
- RELATED TO LUMBOSACRAL JOINT
- TUMORS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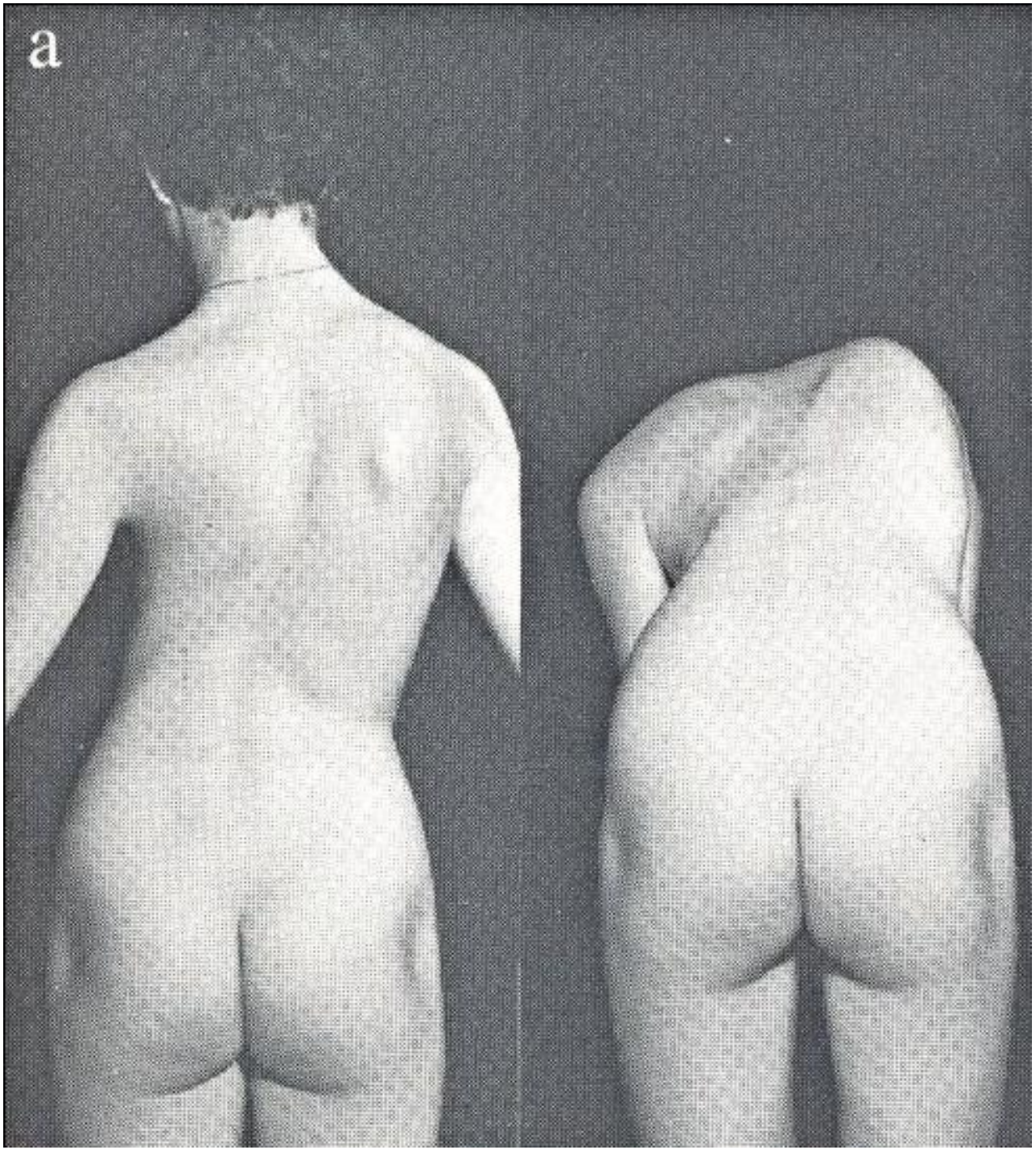
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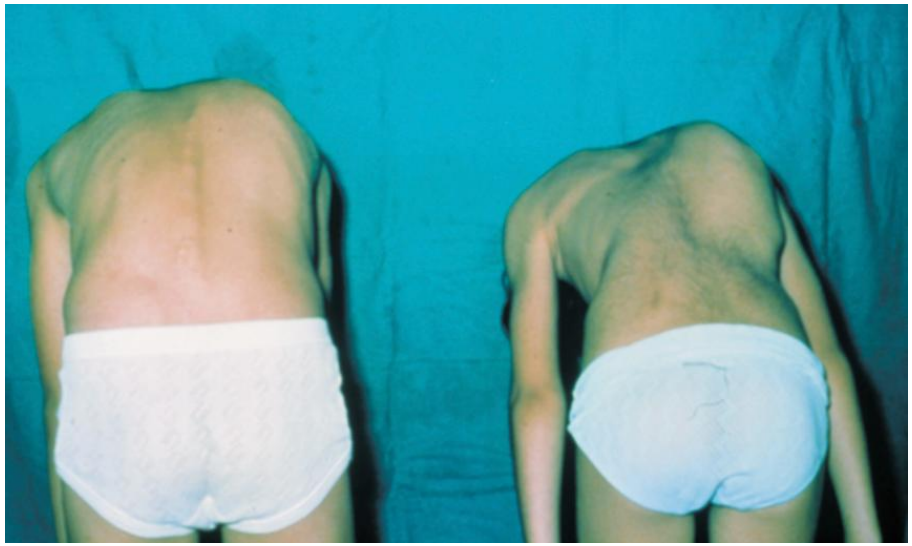


Screening

- Adams forward bending test
- Pros vs Cons

Adolescent Idiopathic Scoliosis(AIS)

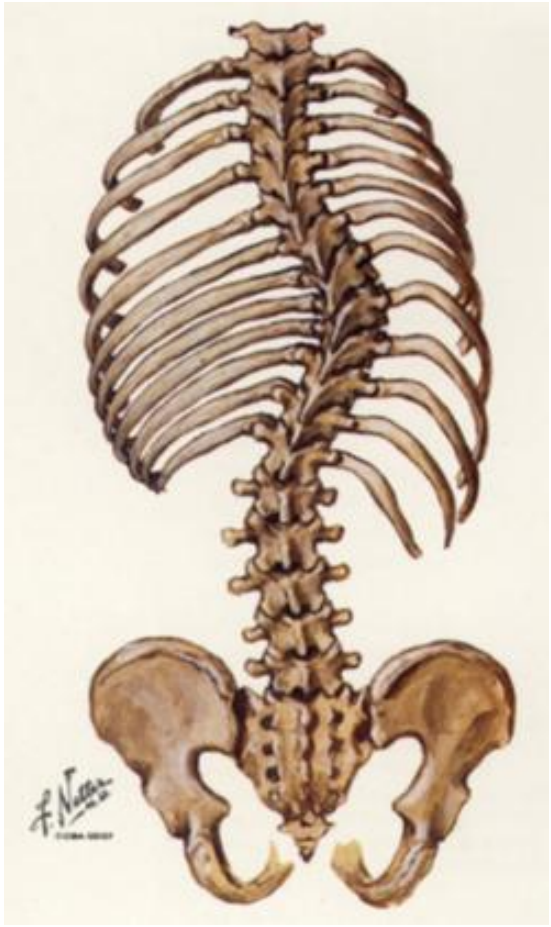
- Pathology
- Aetiology
- clinical presentation
- Physical examination
- Radiology
- treatment

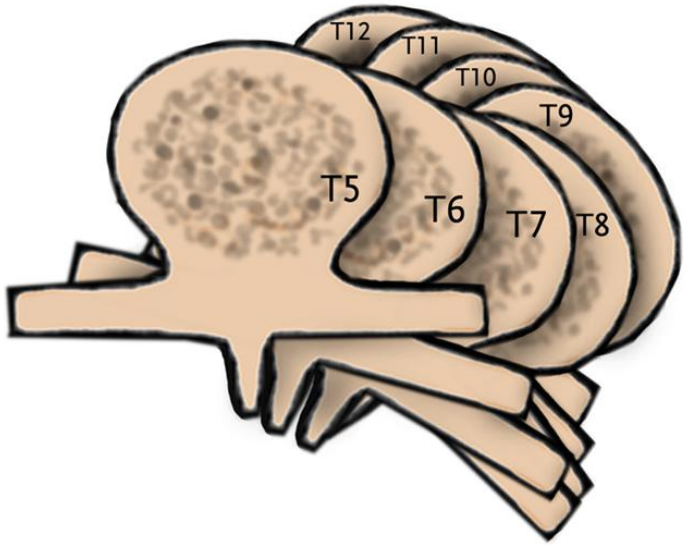
Idiopathic scoliosis-Pathology

- Rotation-to convex side of curve
- Compression-wedge shaped vertebra
- Laminae-broad and widely separated on convex side
- Pedicles-concave side shorter and stubbier
- Discs- compressed concave side,degenerative changes
- Intraspinal canal- cord compression-tight dura
- Muscles and ligaments-thickened and contracted concave
- Thoracic cage-ribs thrust back on convex side

Pathology

- Vertebral rotation: spinous processes rotates toward concavity



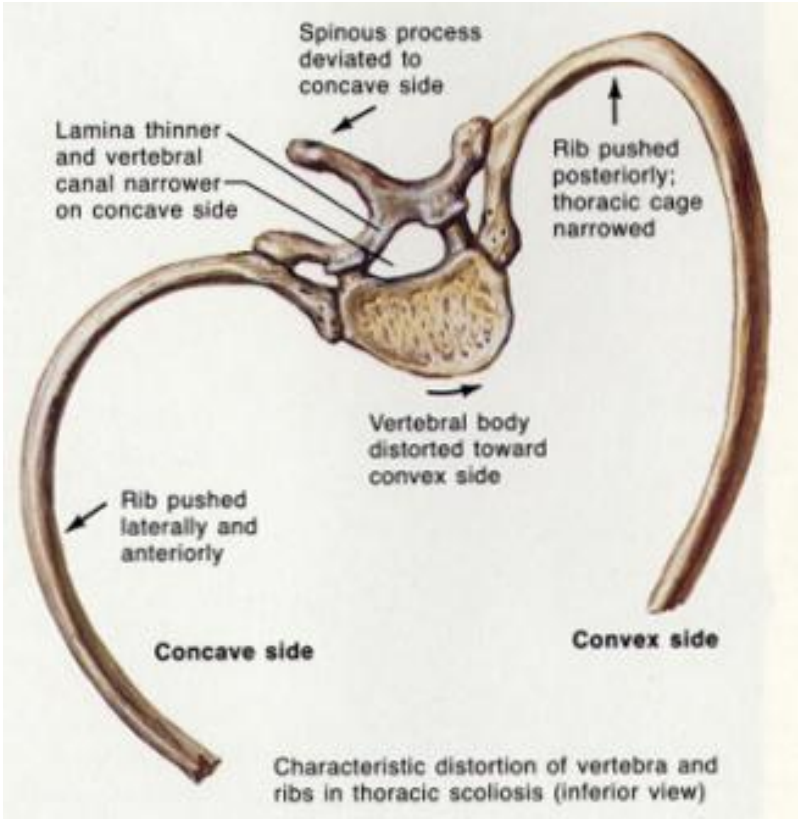


Pathology

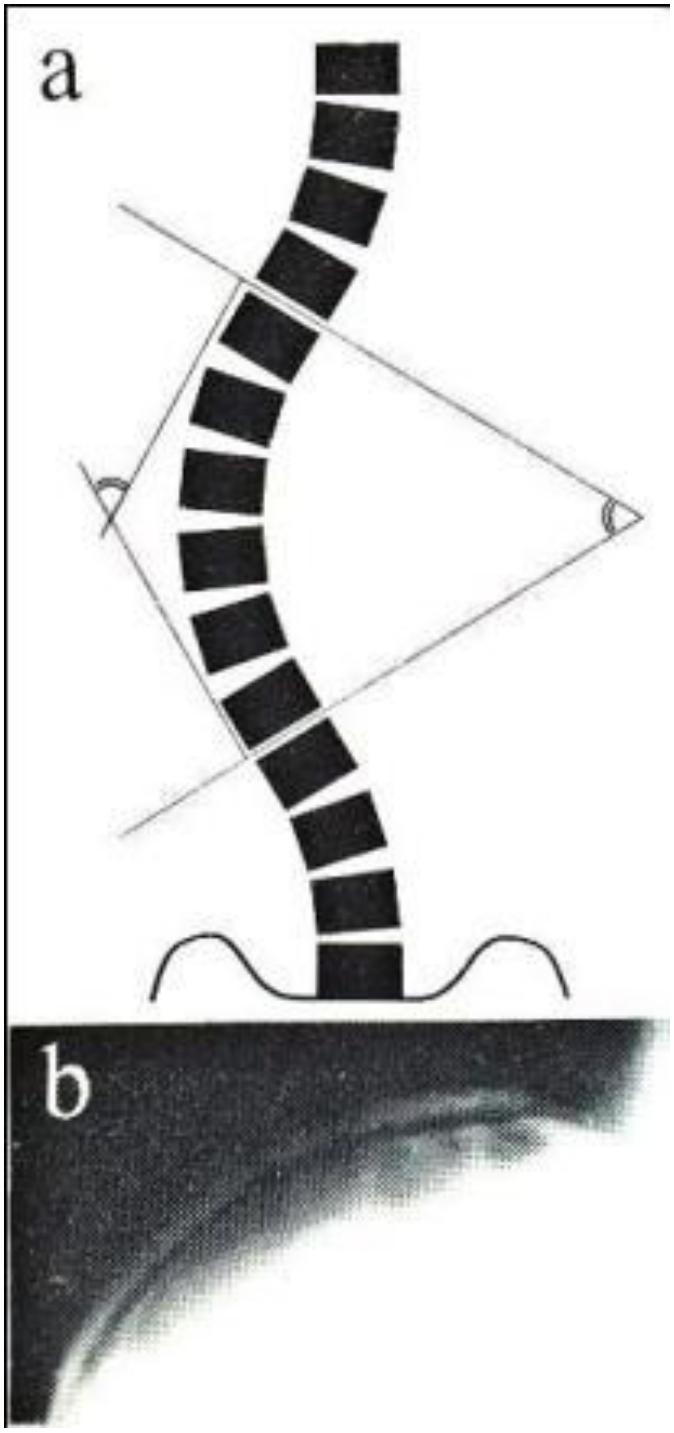
- Deformity in hemithorax (“hump”)

Posterior bulge of ribs on convex side forms characteristic rib hump in thoracic scoliosis

- Vertebral rotation



Characteristic distortion of vertebra and ribs in thoracic scoliosis (inferior view)


a
b

Genetics and etiology

- Familial condition
- Mode of inheritance-unknown
- Strong evidence for a dominant or multiple gene inheritance
- ‘The school bag’
- Etiology-unknown

General approach

Examination

- **FAMILY HISTORY**
- **Elicitation of pain. In general Idiopathic scoliosis does not cause back pain**
- **PHYSICAL EXAMINATION:**
- Examination
  - General
  - Cardiopulmonary
  - Spine
  - **neurology**
  - **Standing:**
    - **Position of the shoulders and pelvis.**
    - **Any prominence of the scapulae is assessed**
    - **Arms distance from the side**

- Patient from the front
- From the back
- Supine

Looking for:

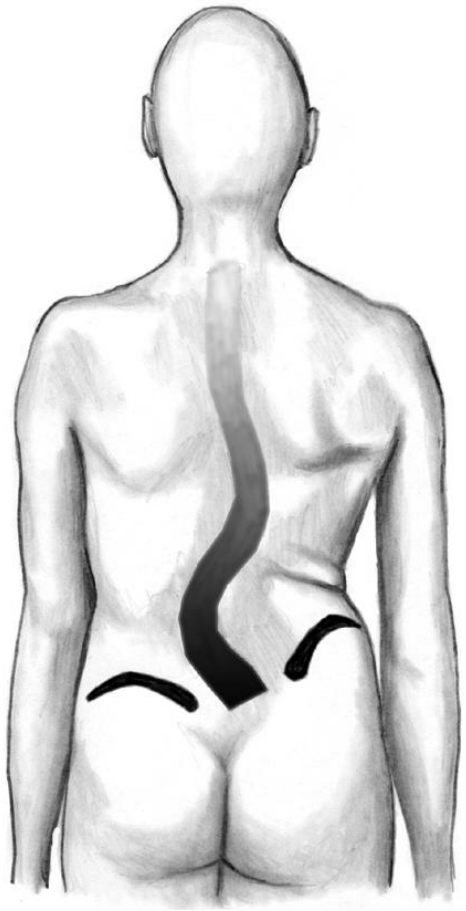
- Confirm if scoliosis is structural
- To identify the cause
- To describe the curve
- Effect of the curve on neurology and leg pulmonary system.

examination

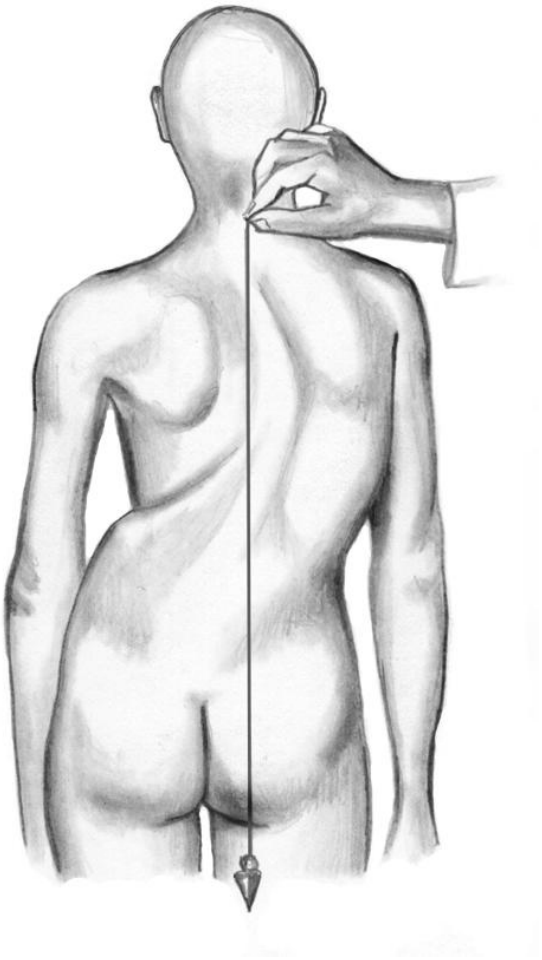
- **PHYSICAL EXAMINATION:**
  - **Bend forward: asymmetry in the para-vertebral muscle area. Rib prominence (“hump”)**

Examination

- **PHYSICAL EXAMINATION:**
  - **Pelvis obliquity**



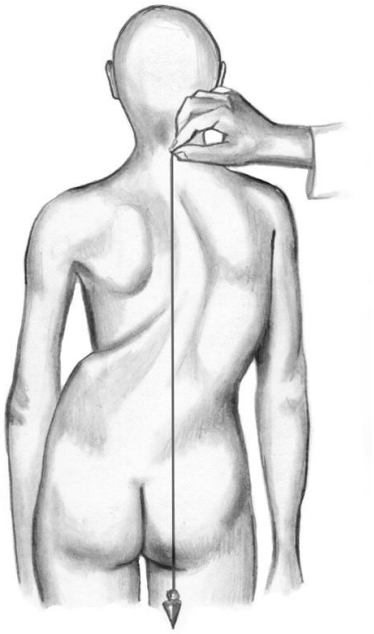
Examine for listing

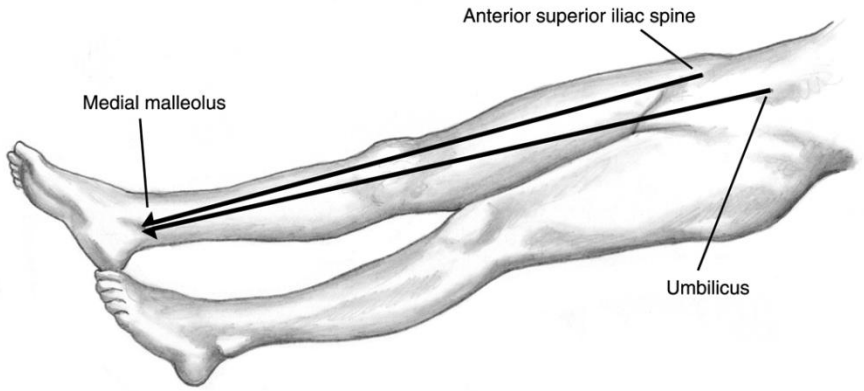


SCOLIOSIS

Patient's Evaluation

- **PHYSICAL EXAMINATION:**
  - **Plumb line: decompensation of the trunk over the pelvis**
  - **Leg lengths are measured and evaluated for discrepancy**

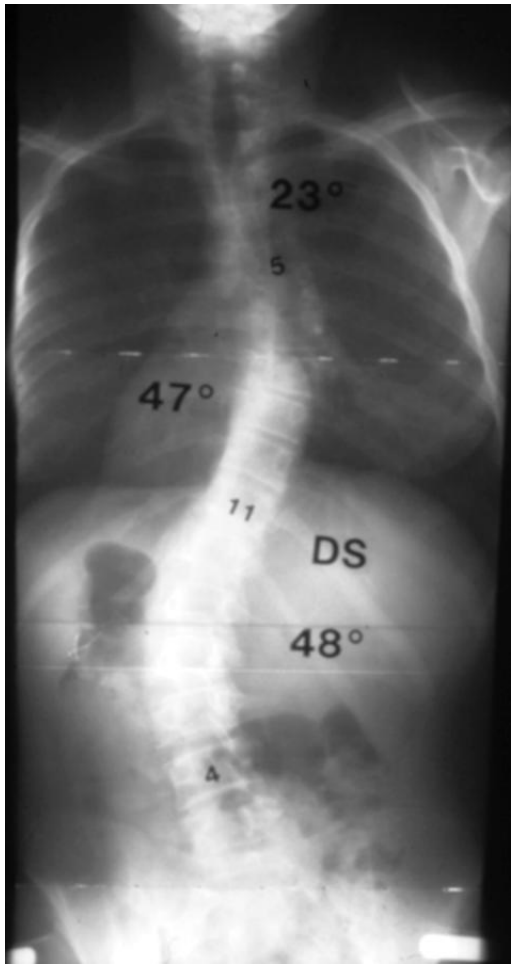


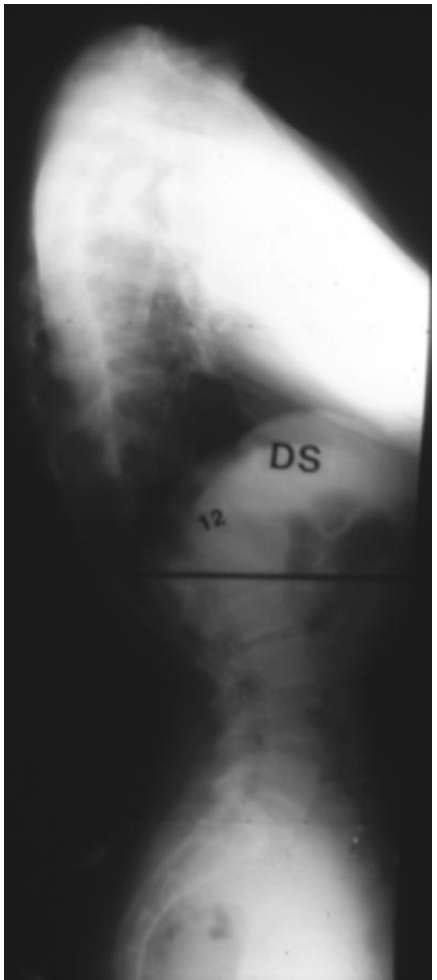


Radiology

- Scoliosis views
- Site of the scoliosis
- Side(convex side)
- Skeletal maturity(Risser sign)
- Size of the curve(Cobb angle)
- Flexibility of the curve

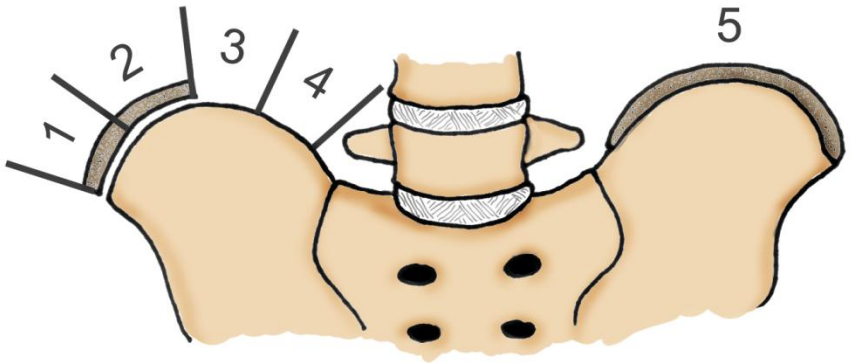
- **RADIOGRAPHIC**
  - **Standard: AP,Lateral**





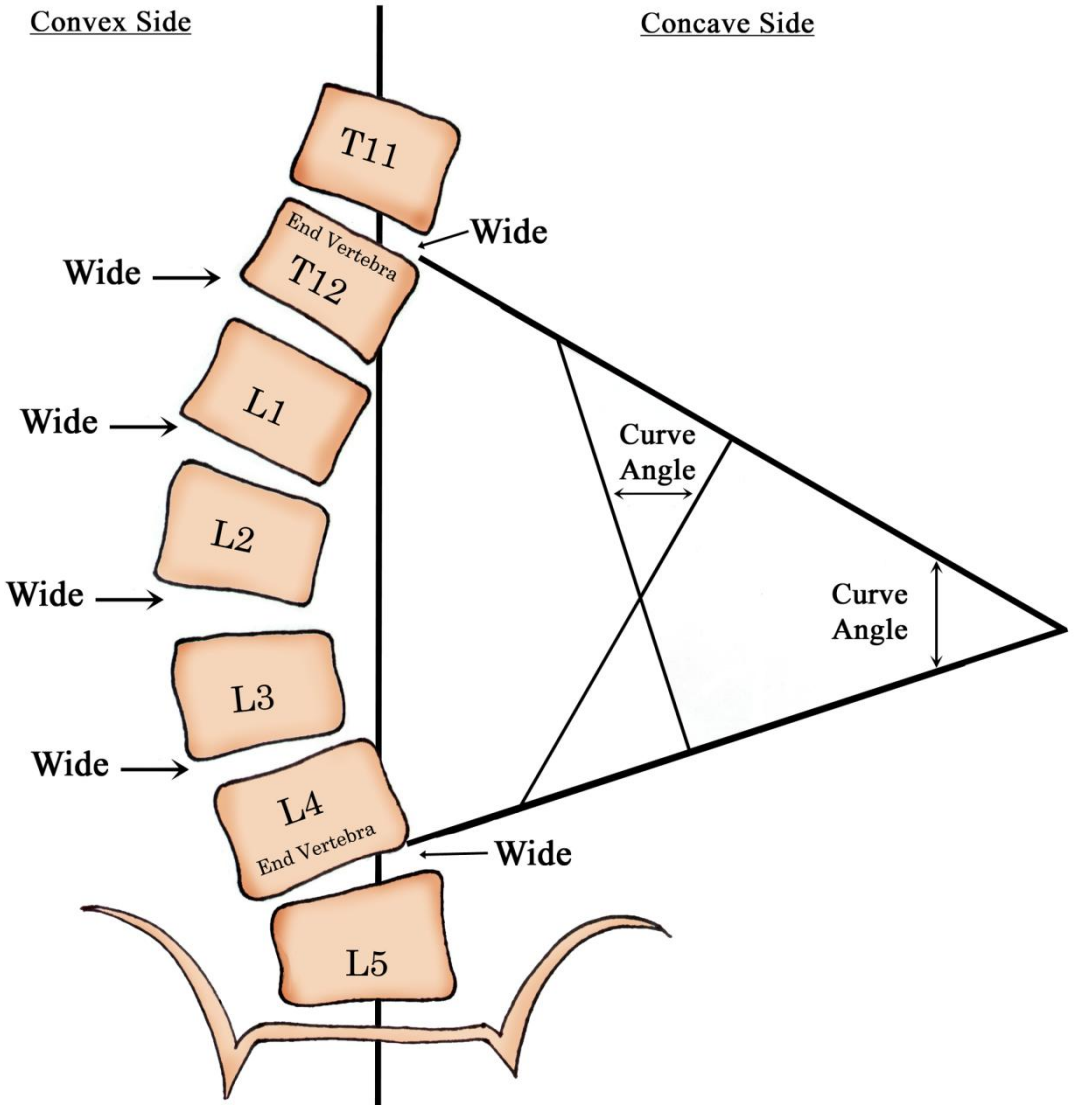
Skeletal maturity

- **RADIOGRAPHS**
- **RISSER SIGN: refers to the ossification of the iliac crest apophysis, and in many cases is a reliable sign of remaining growth.**
- **Risser 4 indicates completion of spinal growth.**
- **PULMONARY FUNCTION TEST**
- **>70% curves have decreased vital capacity, particularly with hypokyphosis**



Size of curve

- **RADIOGRAPHIC**
  - **COBB ANGLE: the angle between the upper and the lower end vertebrae.**



Treatment

- Curves at risk for progression
  - Age-young, particularly during growth spurt
  - Risser sign- ⇑ risk with Risser 0 at diagnosis
  - Menarche
  - Curve magnitude
  - Sex females:males= 10:1
  - Positive family history

Non-operative Treatment

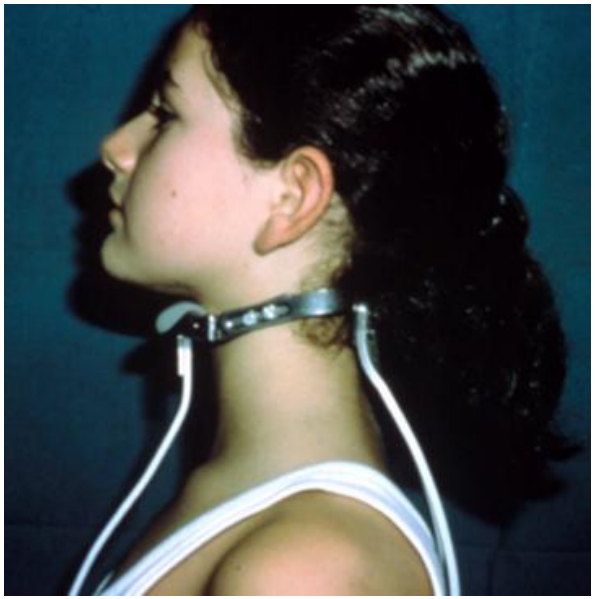
- Objective- arrest progression and minimal permanent correction
- Non-operative modalities
  - Observation
  - Physiotherapy
  - Orthosis

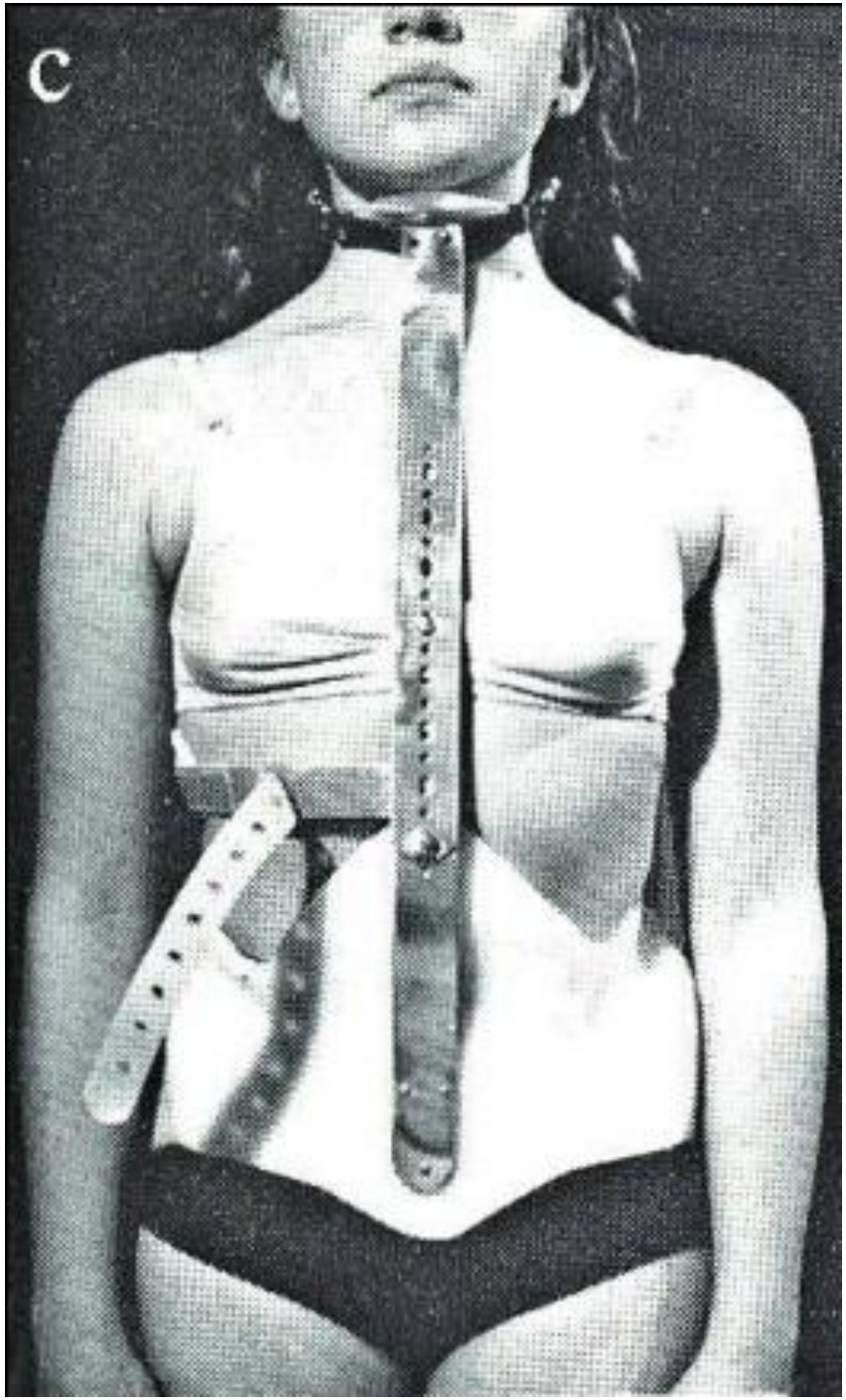
Observation

- Curves <20°:skeletally immature: x-ray every 6/12
  - skeletally mature: no further investig.
- Curves 20-30°:skeletally immature: x-rays 3-4/12
  - Orthosis
- Curves >40°:skeletally mature: follow up for 2-3yr
  - skeletally immature: consider op.

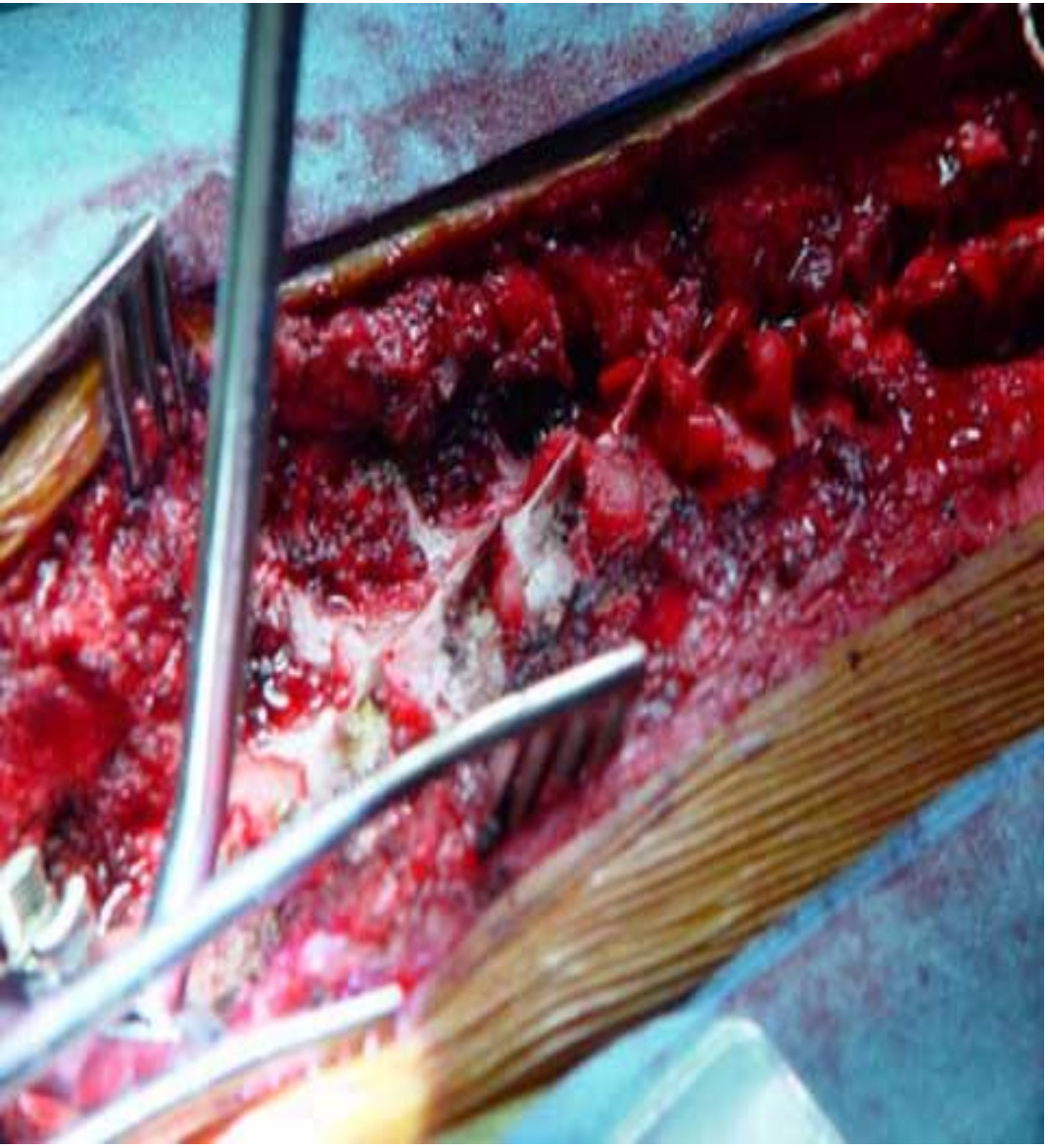
Orthoses

- Conservative
  - Milwaukee Brace




C

- Conservative



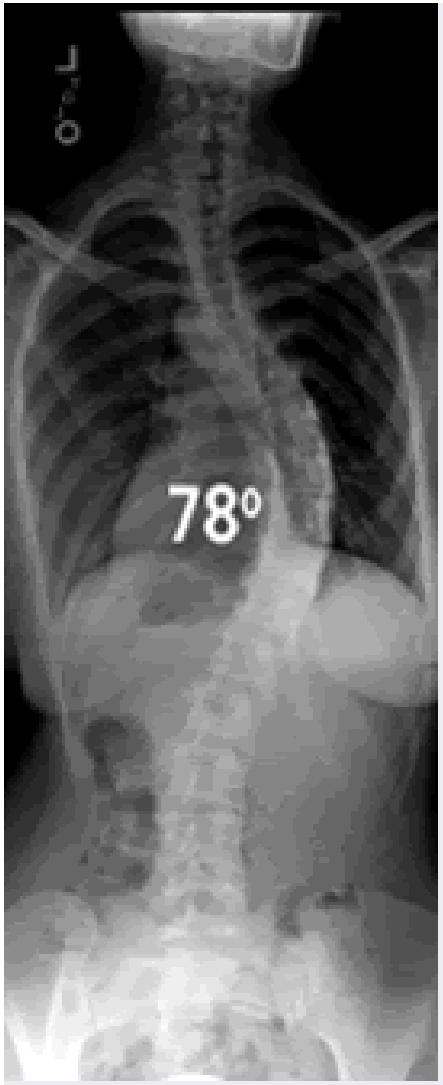


Figure 1: pre-op

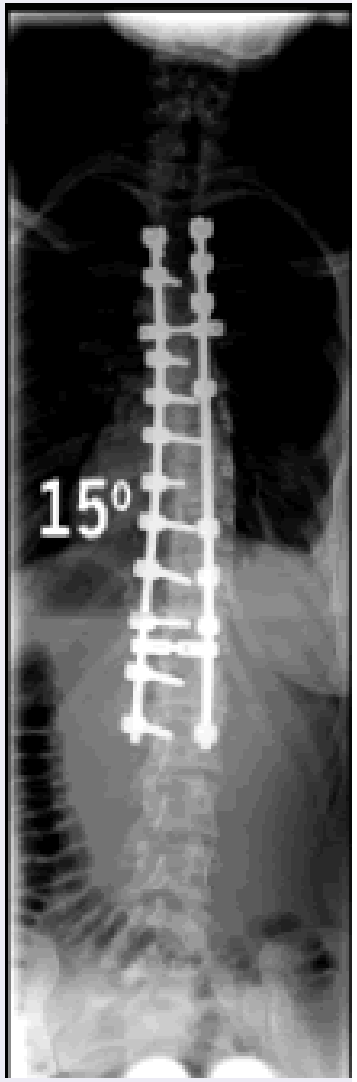
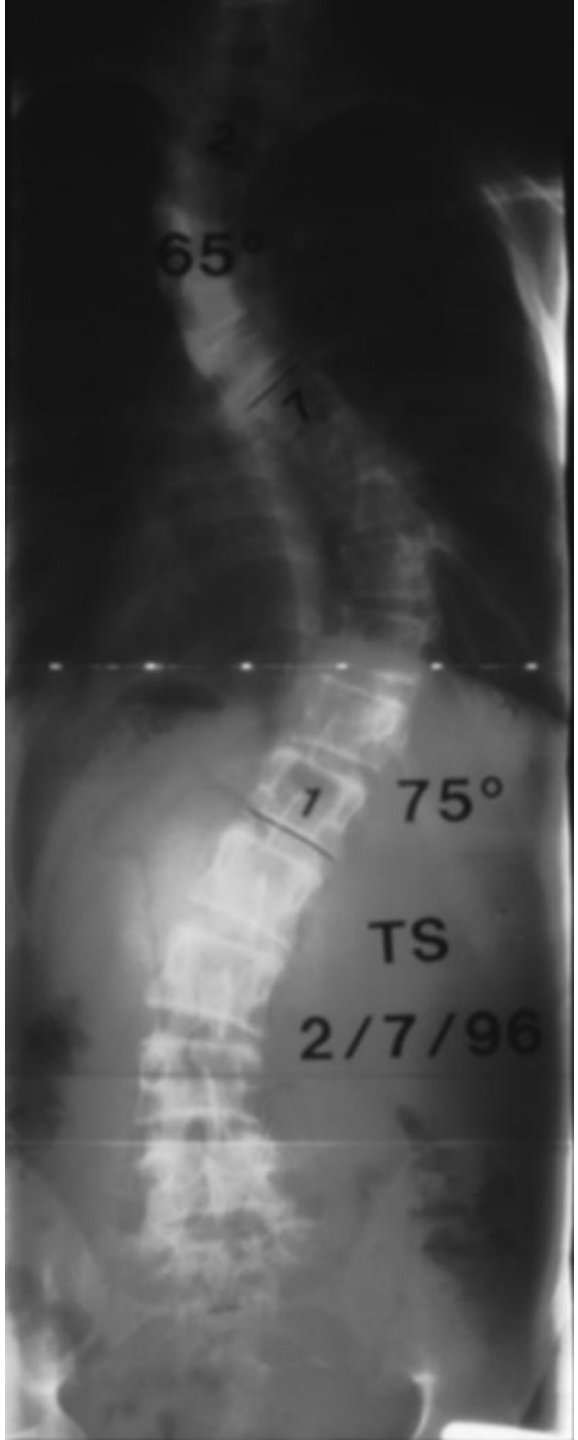
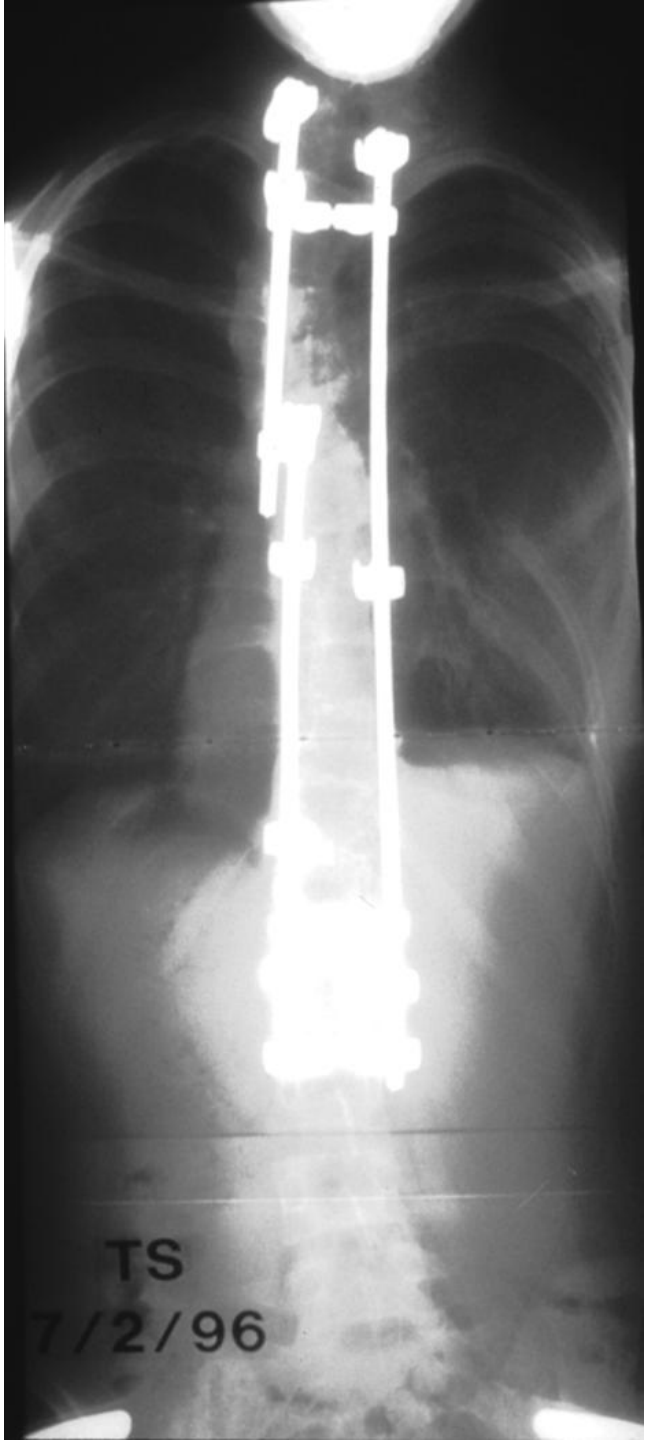


Figure 2: Post-op


65°
75°
TS
2/7/96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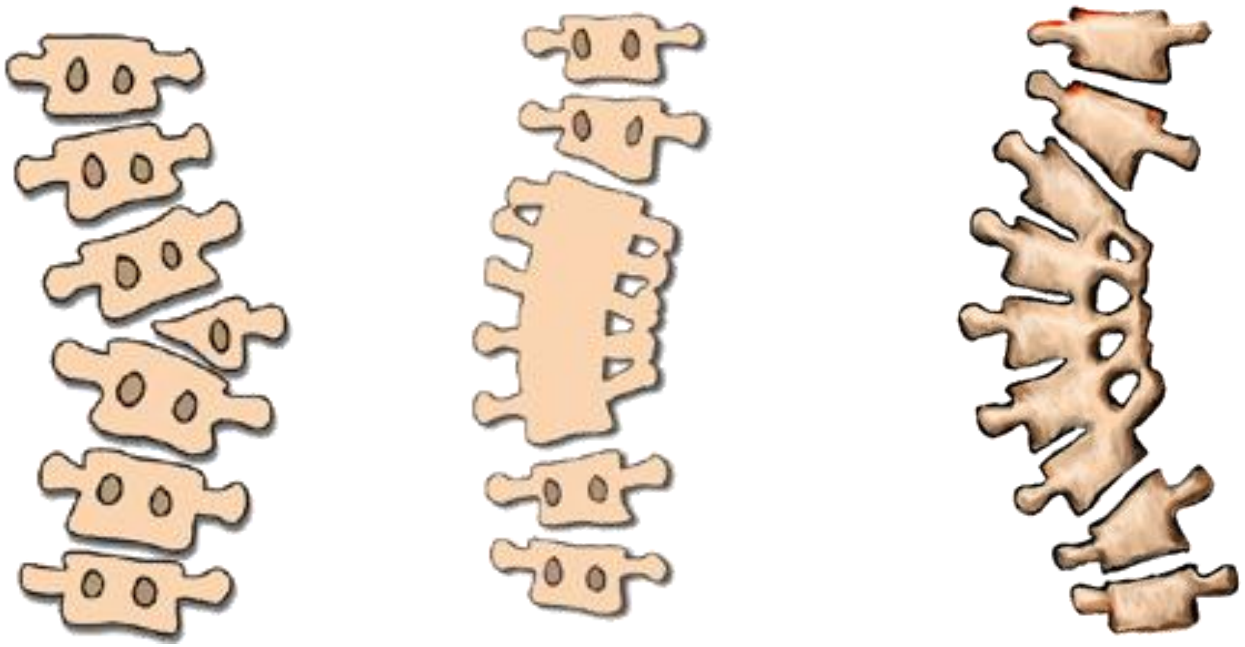
Congenital scoliosis treatment



Acknowledgements

- Dr Shaun East
- Dr Hans Snyckers

IDIOPATHIC SCOLIOSIS

- Adolescent: 10-17 years