

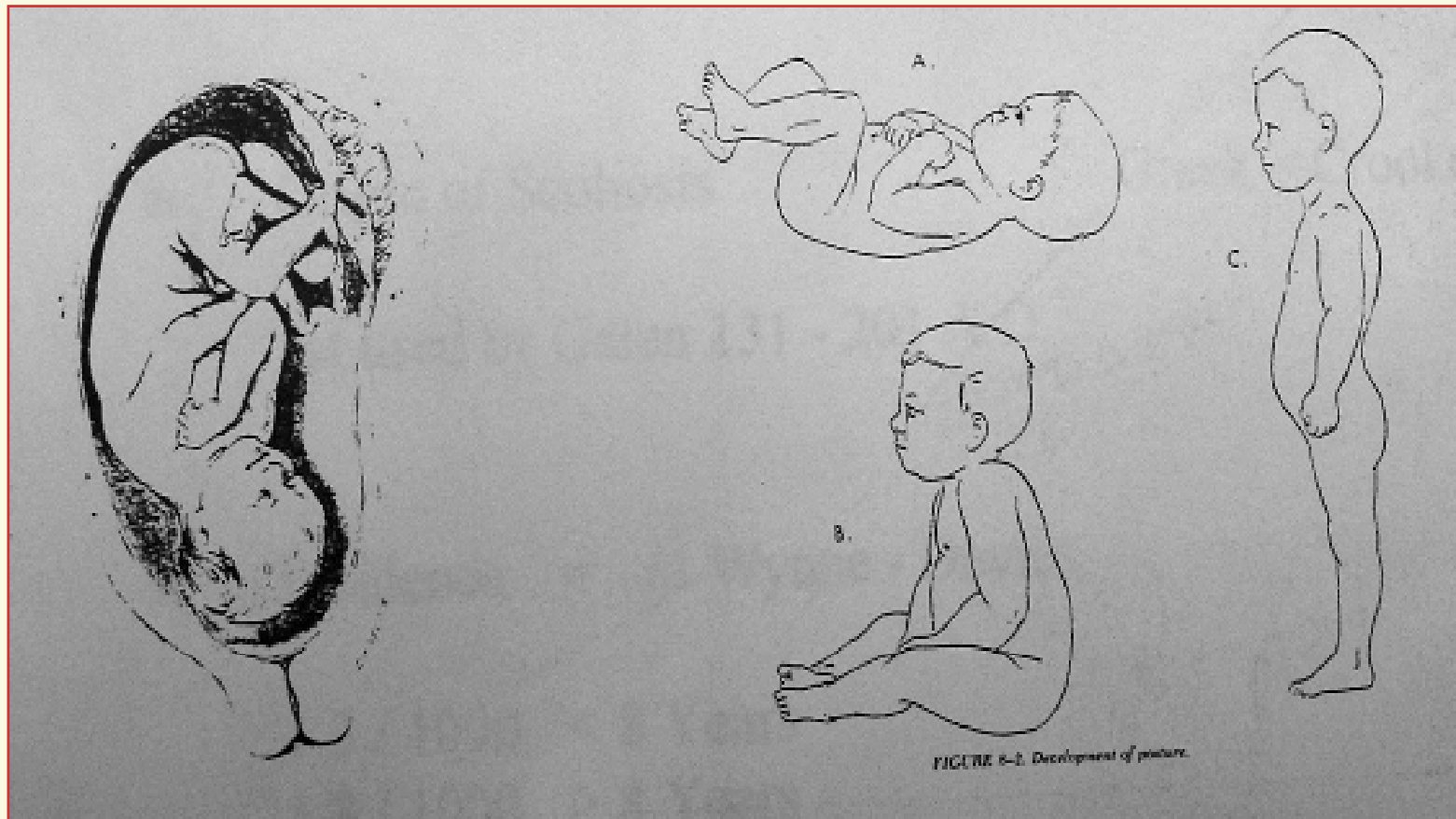
BASICS OF SPINAL DEFORMITIES

**Freih Odeh Abuhassan,
F.R.C.S. (Eng.), F.R.C.S. (Tr.&Orth.),**

Professor of Orthopaedics

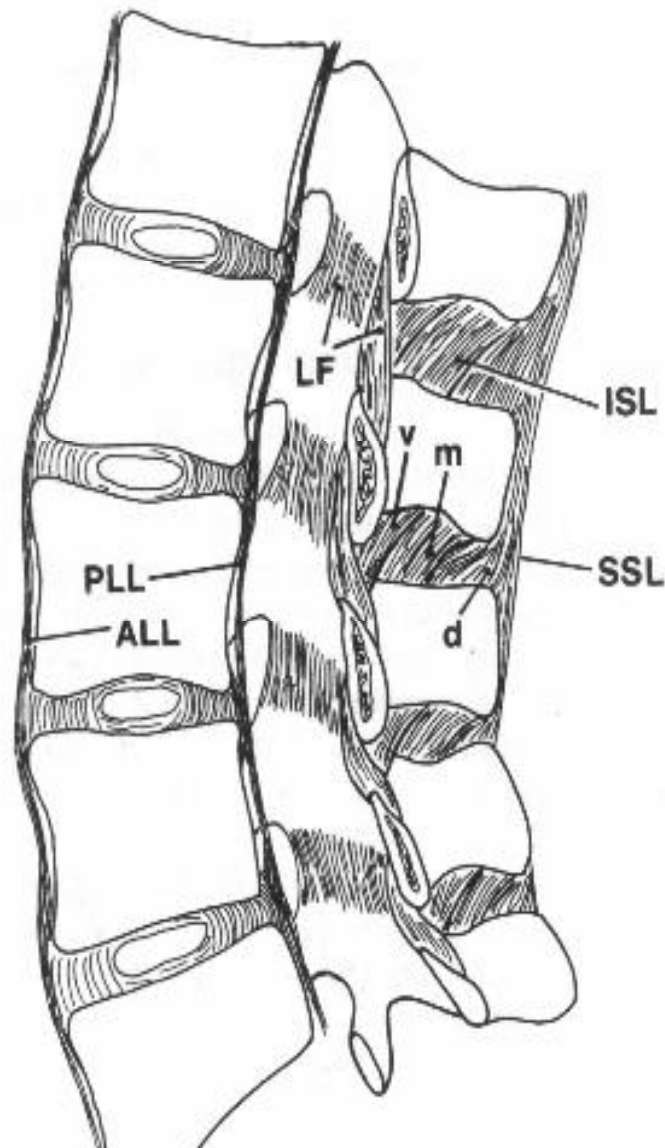
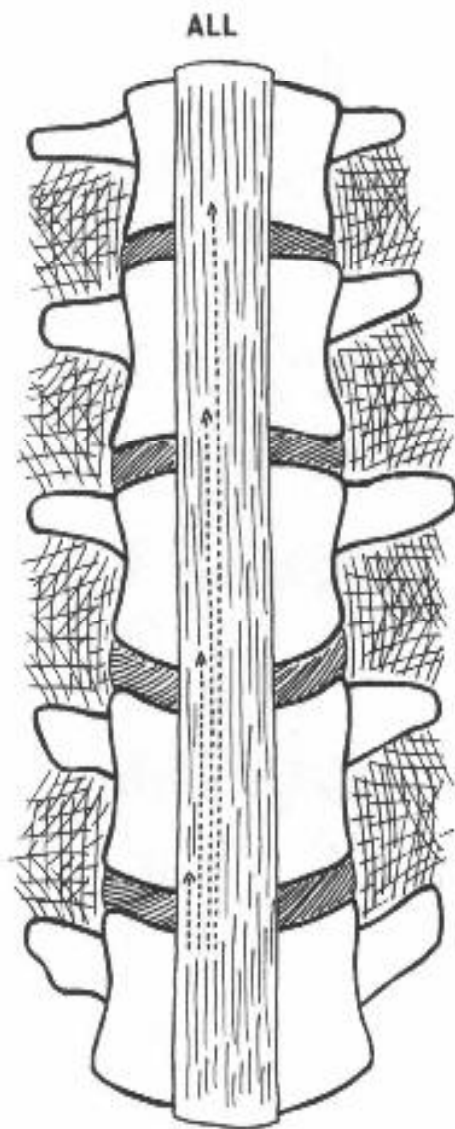
University of Jordan - Amman

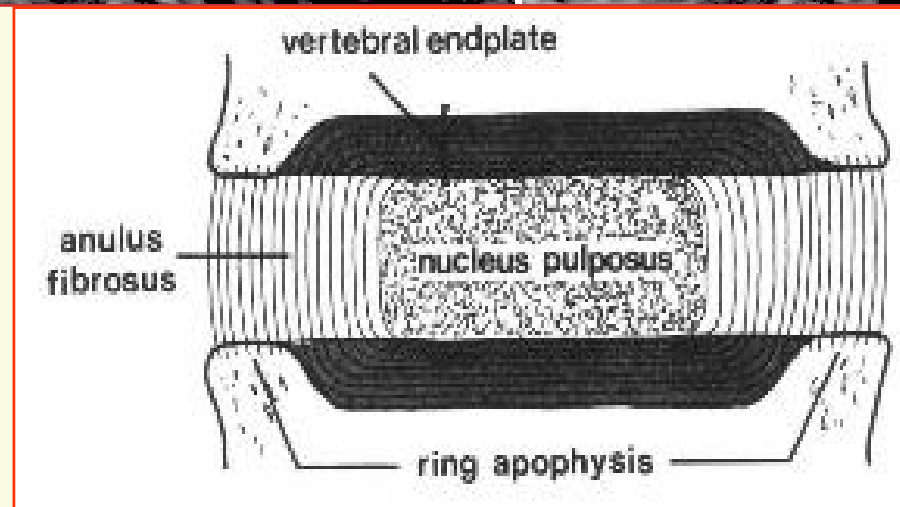
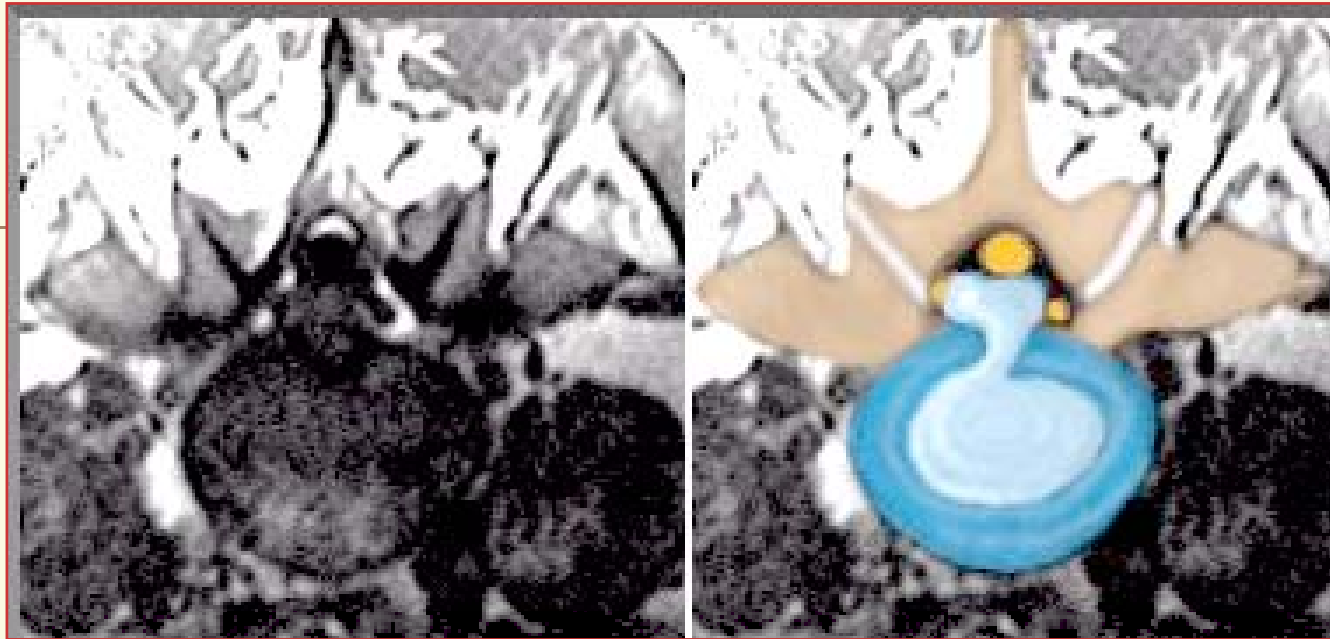
DEVELOPMENT OF THE SPINAL SHAPE

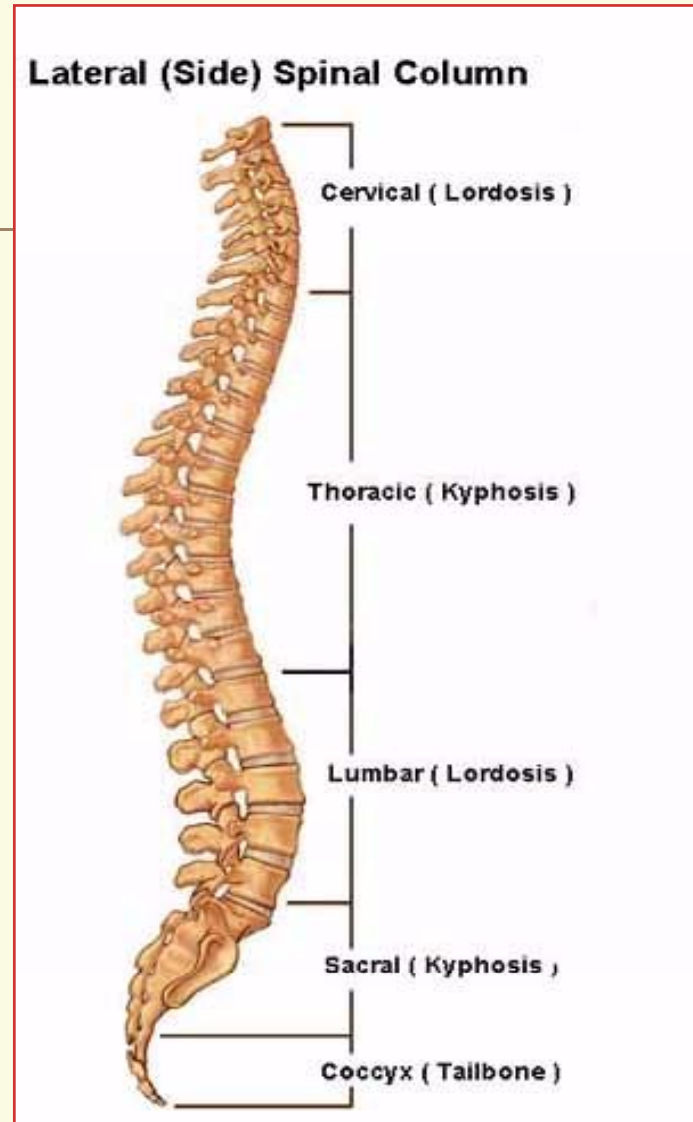
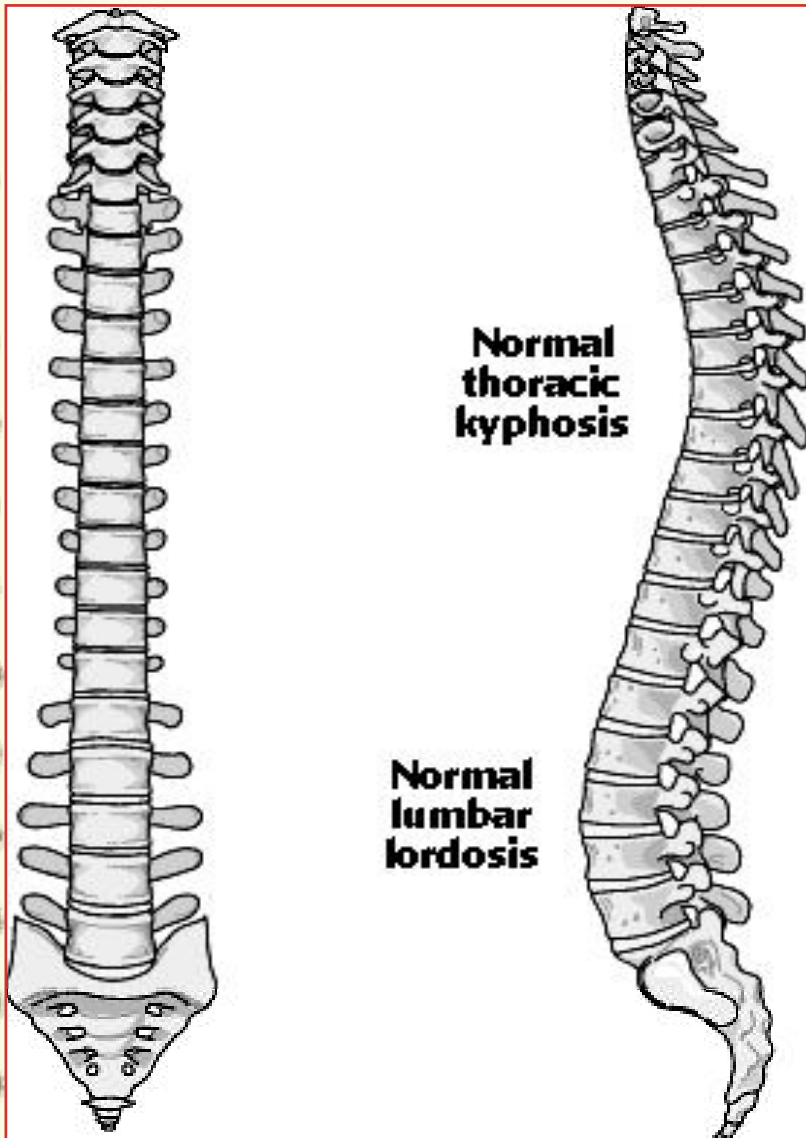


1/15/2011

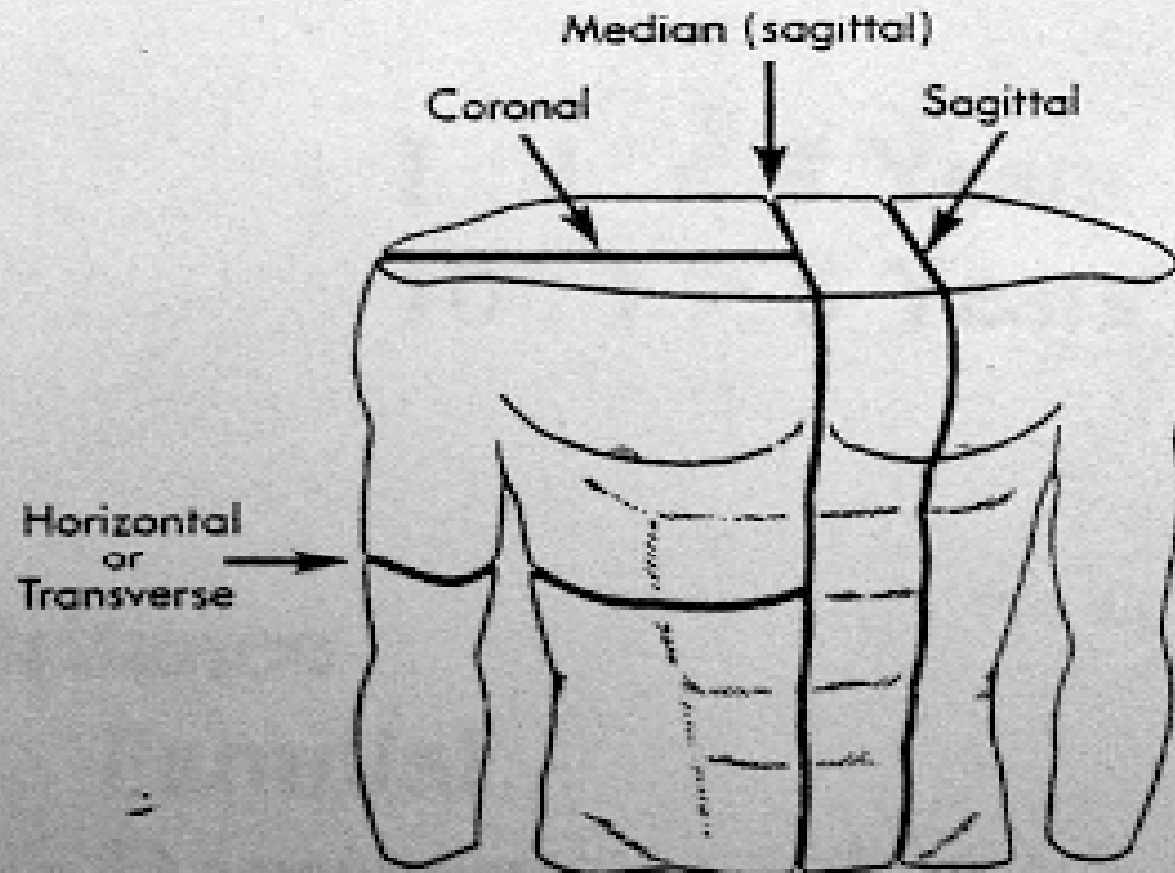
Professor Freih Abuhassan -
University of Jordan







Planes of the Body



1/15/2011

Professor Freih Abuhassan -
University of Jordan

7

- **Scoliosis:**

**Lateral curvature of the spine.
(reversible lateral curvature with out
rotation) !!!!!!!**

- **Structural Scoliosis:**

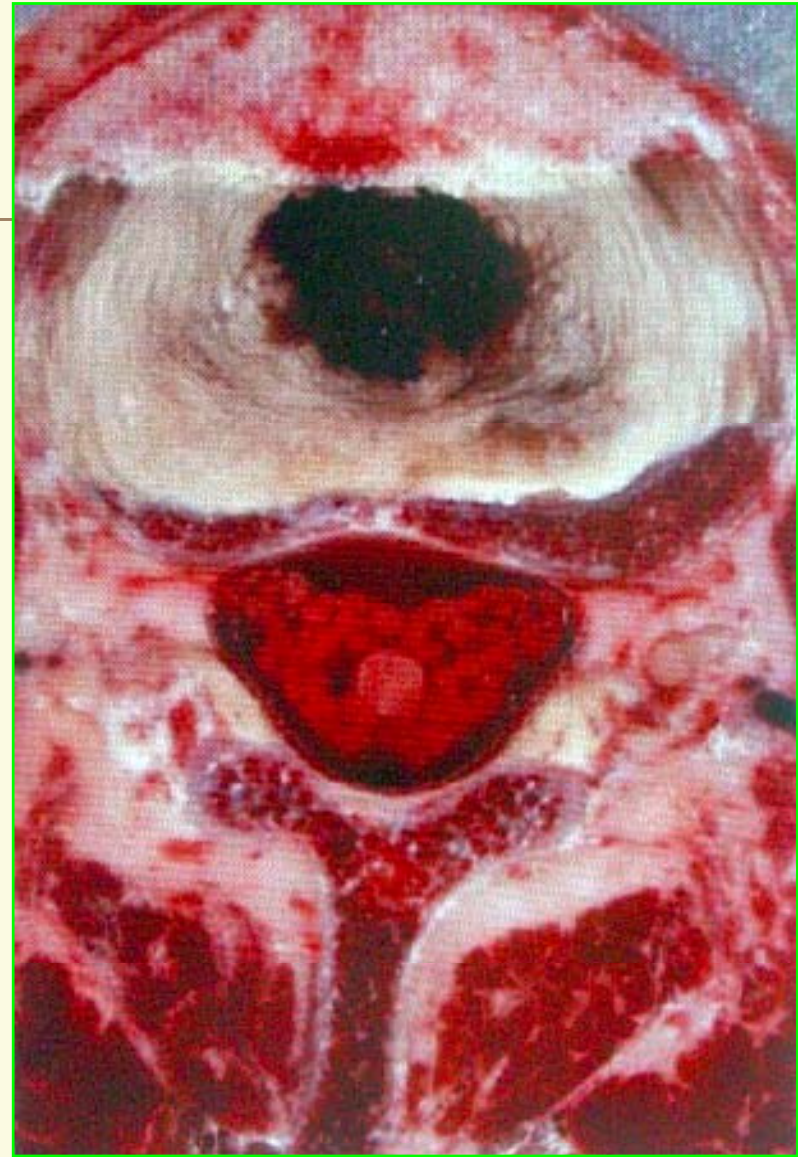
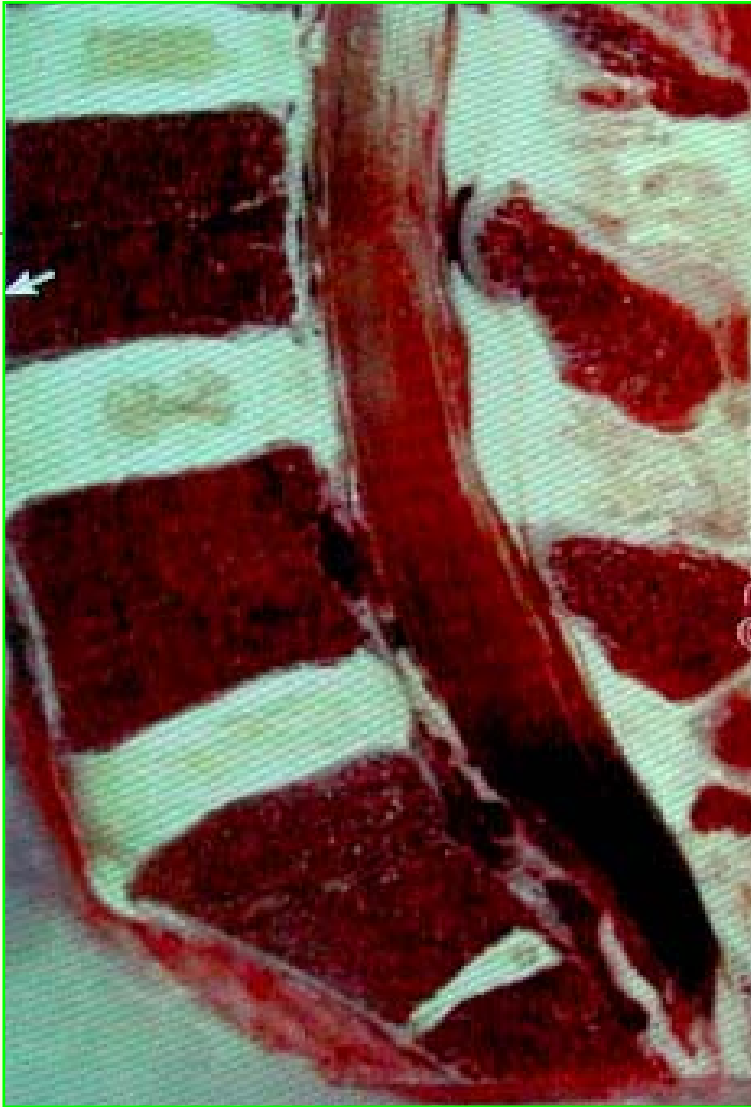
**Irreversible lateral curvature of the spine with
rotation of the vertebral bodies in the area of the
major curve. 3D**

- **Major curve:**

The largest structural curve.

- **Compensatory curve:**

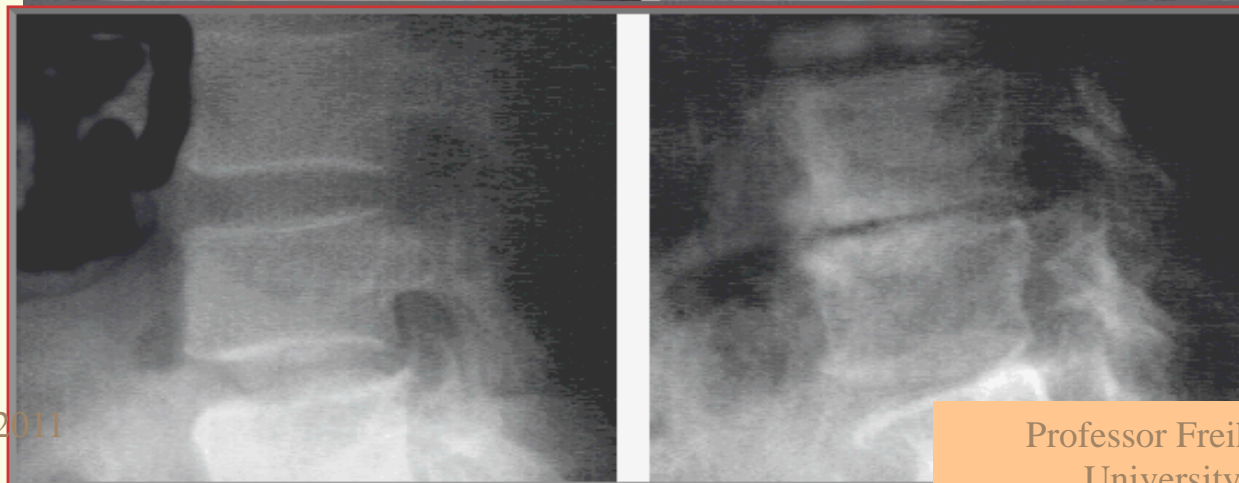
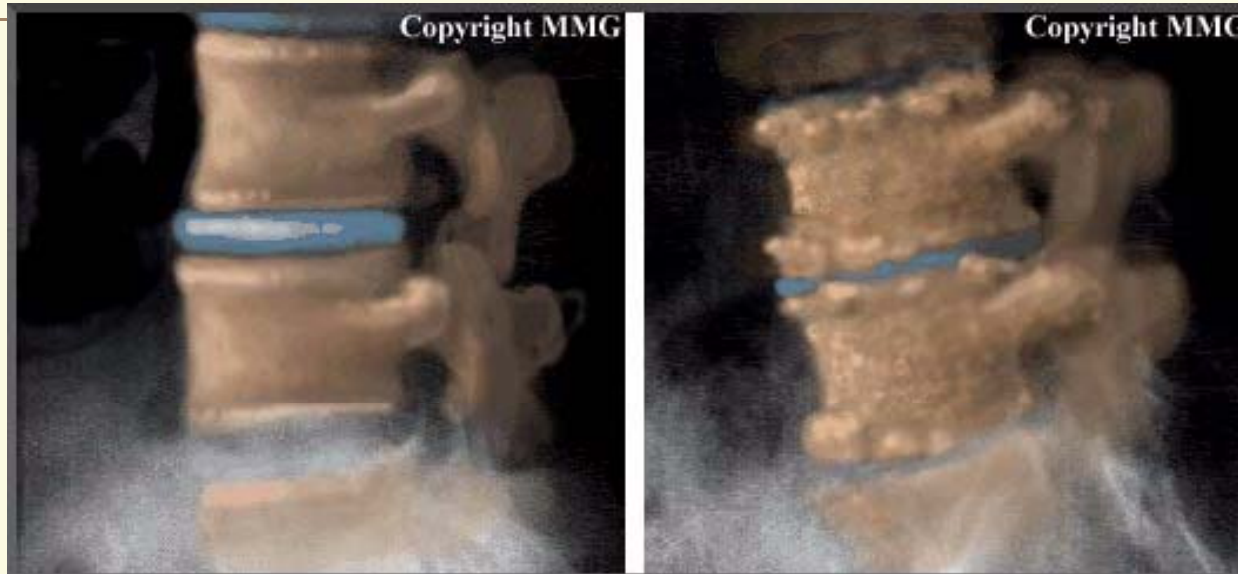
A curve that is above or below a major curve that serves to maintain normal body alignment.



1/15/2011

Professor Freih Abuhassan -
University of Jordan

Degenerative spine



1/15/2011

Professor Freih Abuhassan -
University of Jordan

Normal ranges of spinal contour

Frontal plane (X-ray)

- * < 10 degrees of lateral spinal deviation**
- * < 2 cm of trunk shift level pelvis & shoulders**



Sagittal plane

Thoracic spine

Kyphosis : 25 - 45 deg.

Thoracolumbar junction

-10 to +10 degrees

lumbar spine

lordosis 25 to 65 deg.



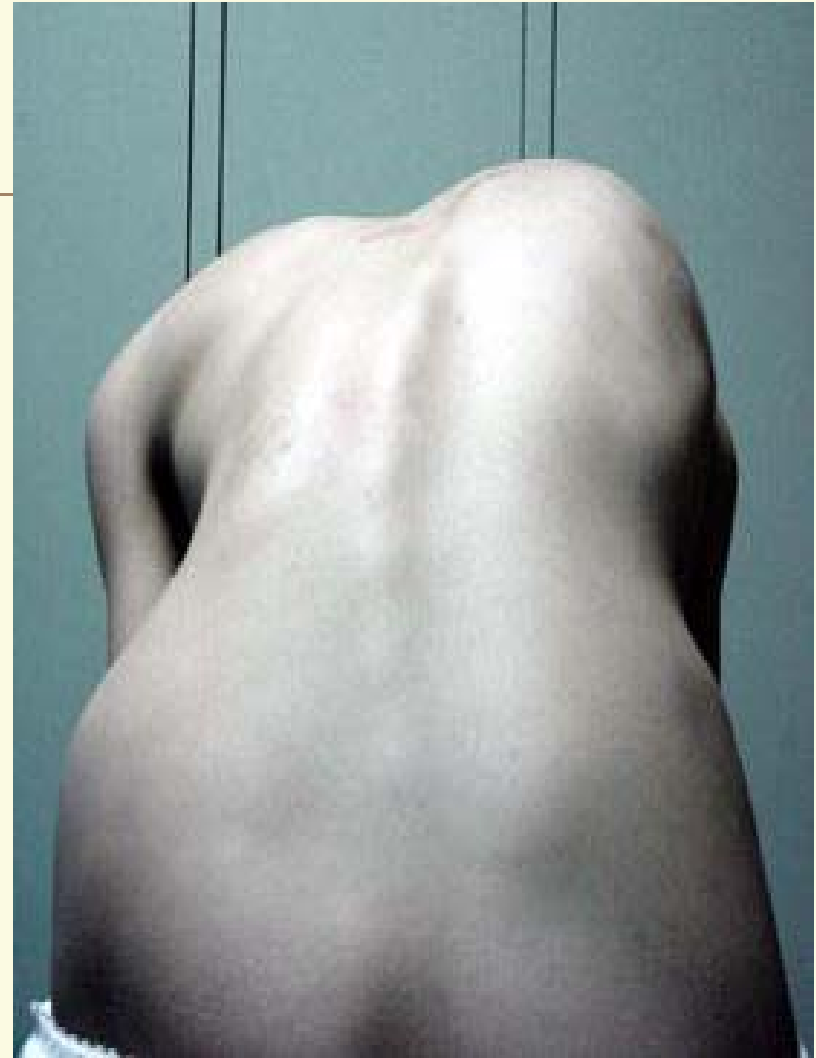
Scoliosis

lateral deviation of the spine?! with measured curvature of greater than 10 degrees on radiographic analysis





Professor Freih Abuhassan -
University of Jordan



1/15/2011

Professor Freih Abuhassan -
University of Jordan

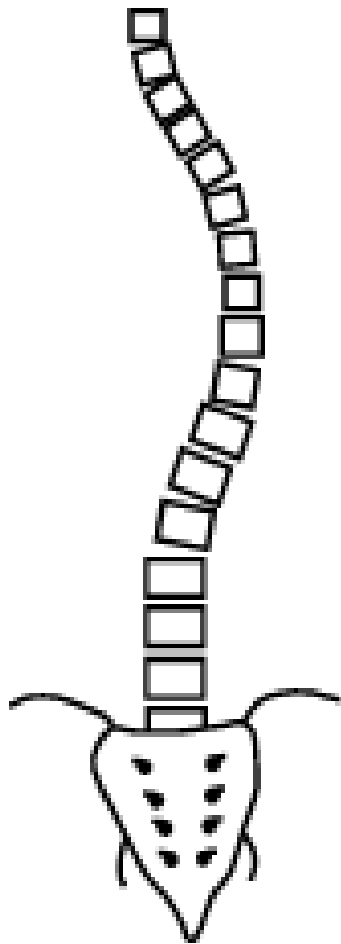
١٥



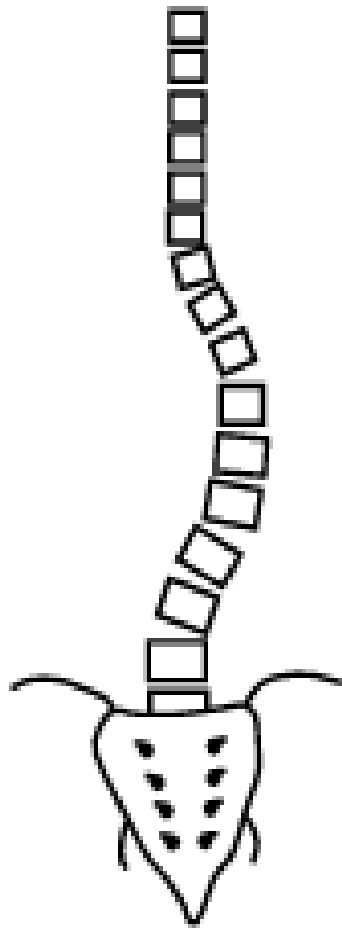
1/15/2011

Professor Freih Abuhassan -
University of Jordan

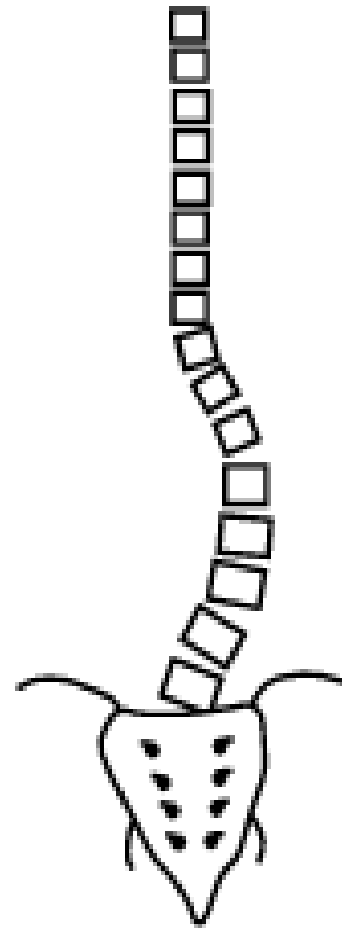
١٦



thoracic
curve



thoracolumbar
curve



lumbar
curve



double major
curve

Crooked tree



1/15/2011

Professor Freih Abuhassan -
University of Jordan

١٨



1/15/2011

Professor Freih Abuhassan -
University of Jordan

١٩

Origin of scoliosis

Greek = Crooked

Ist used by Galen 131-201 A.D

Prevalence of Scoliosis

School screening

Physical exam → 8-10% suspicious!

1.1% to 4.1% X-ray confirmed

scoliosis F/M ratio → 5-10:1

Scoliosis Classification

Structural

Idiopathic

Neuromuscular

Congenital

Metabolic

Tumor, Trauma



Non-structural

Postural

LLD

Inflammatory

Infection

Tumor

Etiology of Scoliosis

Idiopathic: no single clear etiology

***Genetic** – familial prevalence, twins

***Hormonal** – progressive forms much more common in females.

***Connective tissue** – histologic changes in apical tissues, cause or effect ?

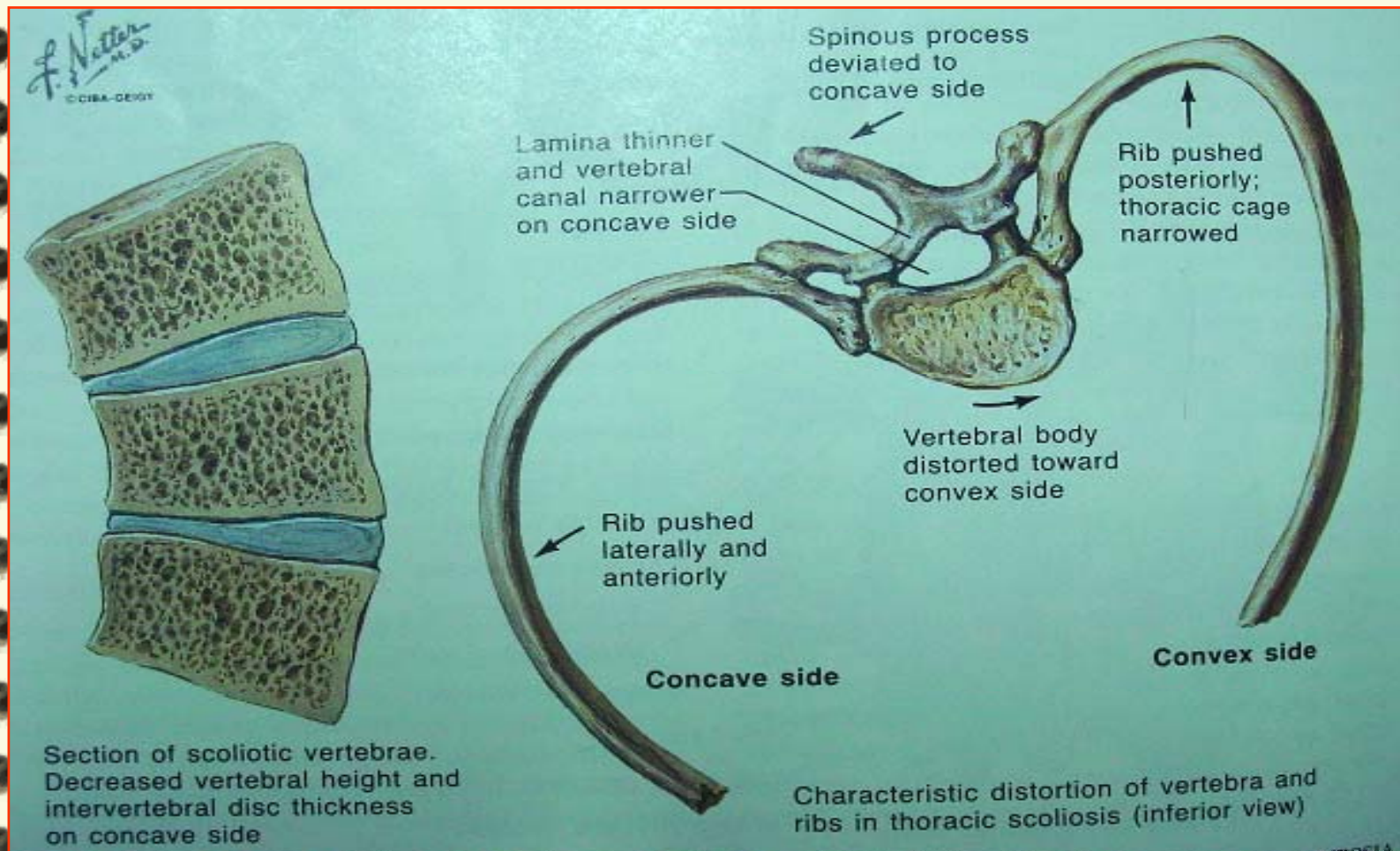
***CNS** – proprioceptive dysfunction

***Neuromuscular**

Pathology of scoliosis

- 1-Spinous process** → deviates toward the concave side.
- 2-The vertebral body** → rotates toward the convex side.
- 3-Ribs** become closer together on the concave side and separated on the convex side.

Pathology of scoliosis

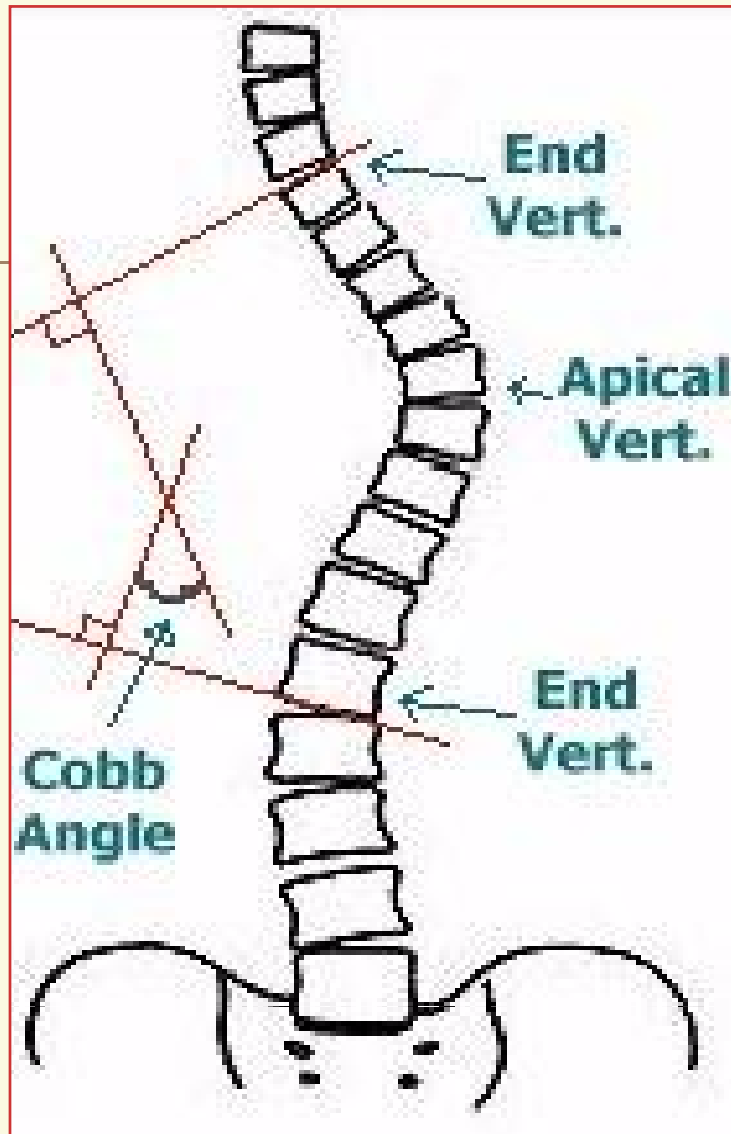


Pathophysiology ?

Spinal growth
Ligamentous laxity, hormonal changes

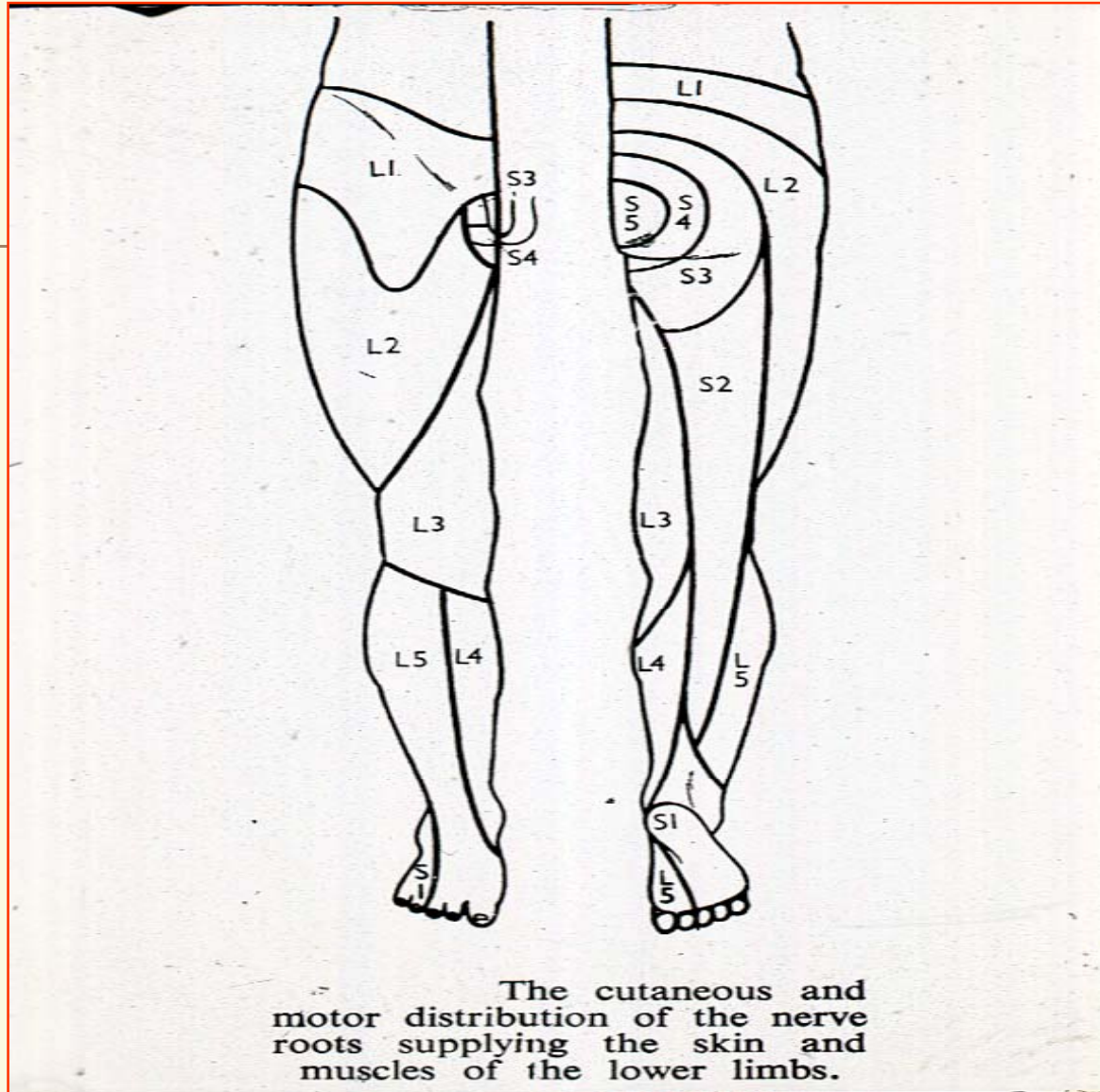


- Rotational deformation**
- Progressive**
 - *rotation***
 - *translation,***
 - *complex 3D deformity***



Muscle Power Testing (MRC Scale)

- 0 Total paralysis**
- 1 Barely detectable contracture**
- 2 Not enough to act against gravity**
- 3 Strong enough to act against gravity**
- 4 Still stronger but less than normal**
- 5 Full power**



1/15/2011

Professor Freih Abuhassan -
University of Jordan

٣٠

Imaging for spinal problems

☰ **Computed tomography (with myelo.)**

☰ **Plain x-rays**

- AP and lateral views
- Oblique views
- PA view in females !!!!!

☰ **MR imaging**

☰ **Radioisotope scanning**

☰ **Discography & facet joint arthrography**

Cauda Equina Syndrome

- 📄 **Large midline compression e.g disc**
- 📄 **Compresses several nerve roots**
- 📄 **Sphincter disturbance**
- 📄 **Saddle anaesthesia**
- 📄 **Prompt surgical intervention**

Spondylolisthesis

**Forward slippage of
one vertebral
body on another**



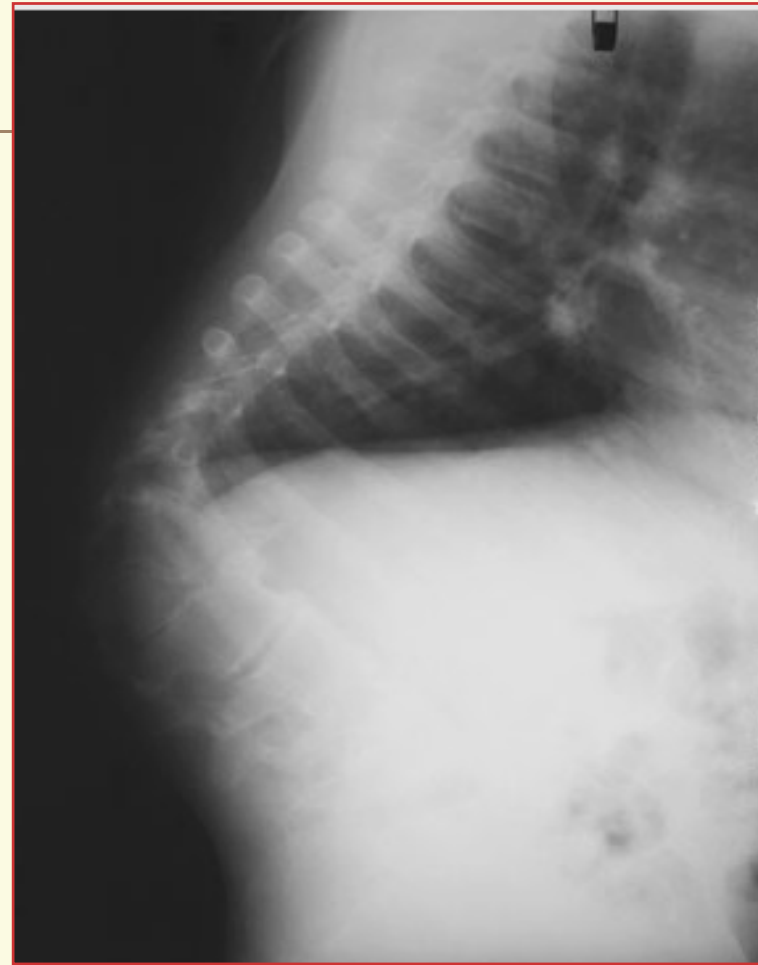
Kyphosis

Sagittal plane deformity in the thoracic or thoracolumbar spine

 **Postural (Round back)**

 **Compensatory**

 **Structural**



1/15/2011

Professor Freih Abuhassan -
University of Jordan

٣٥



1/15/2011

Professor Freih Abuhassan -
University of Jordan

٣٦
WEBSHOTS