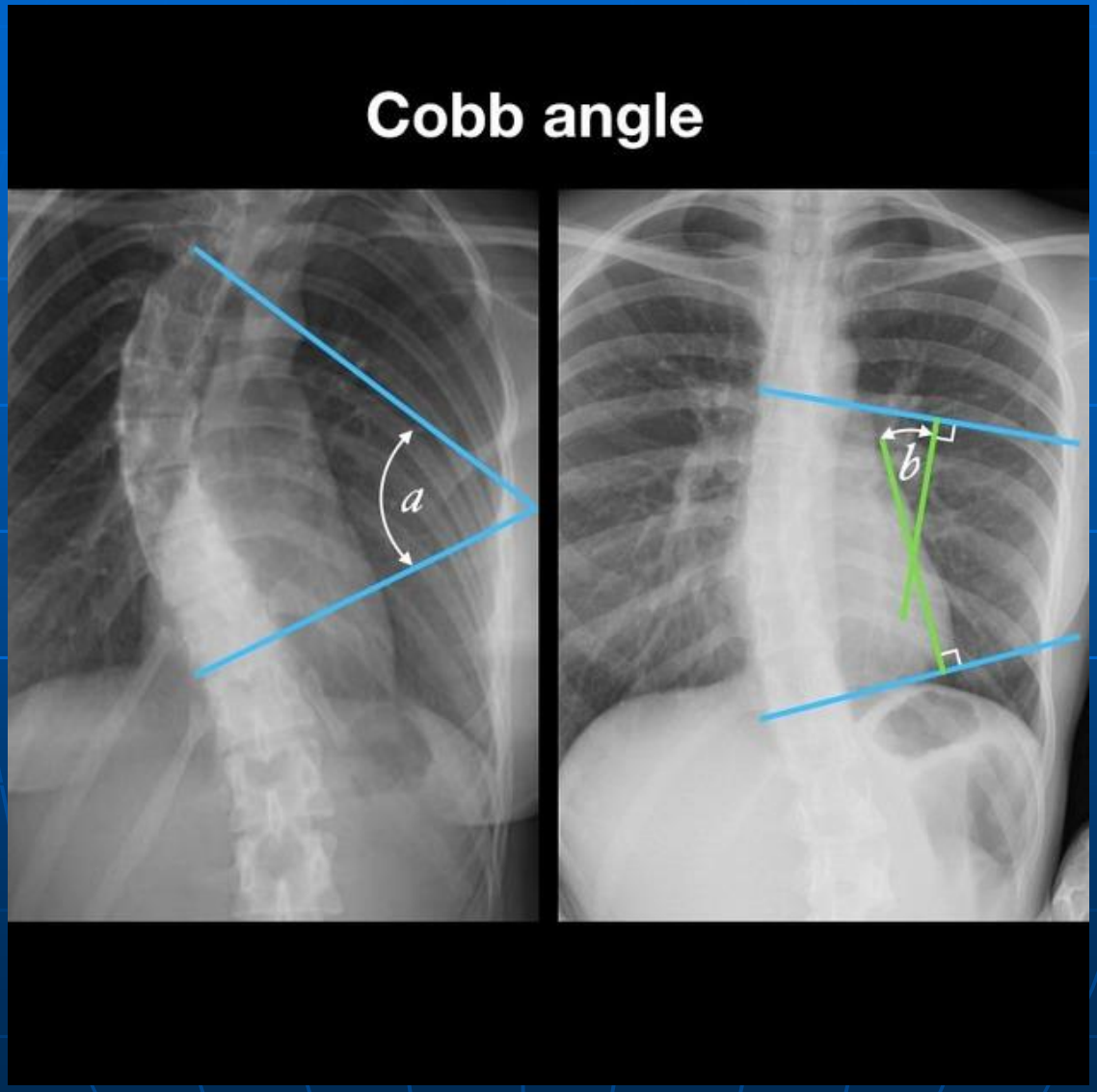
Scoliosis

- General term for any lateral curvature of spine.
- Usually presents in childhood or adolescence
- Idiopathic scoliosis usually asymptomatic
  - Painful scoliosis indicates underlying abnormality
- Surgical fusion for rapidly progressive curves, curves > 40°

Cobb angle

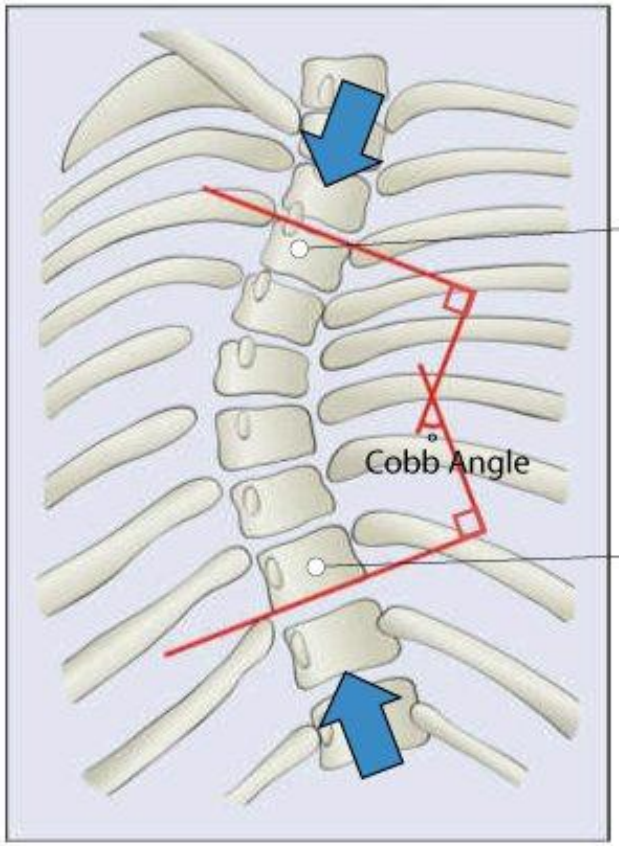
- Most widely adopted technique to quantify the magnitude of spinal deformities, especially in the case of scoliosis, on plain radiographs.
- A scoliosis is defined as a lateral spinal curvature with a Cobb angle of 10 or more
- intraobserver and interobserver variation (at least 5-10° variation)
- rotation: minor rotation of patients between examinations can significantly change measurements (may be as high as 20° variation); consistent positioning must, therefore, be obtained
- diurnal variation: in the same patient on the same day, curvature increases during the day (~5° variation)

Cobb angle



Cobb Angle

MEASURING THE COBB ANGLE



From the top, the most displaced vertebrae

From the bottom, the most displaced vertebrae

Source: e-radiography.net and core concepts

X-ray

- Standing PA radiograph of full thoracic and lumbar spine on single cassette
  - PA projection gives lower radiation dose to breasts than AP
  - Lifts used to equalize limb lengths if needed
- Method of Cobb is standard for measuring scoliosis
  - Draw lines parallel to endplates of terminal vertebrae
  - If endplates difficult to see, use pedicles as landmarks
  - Cobb angle is between terminal endplates
  - Can also measure angle between 2 lines drawn perpendicular to endplates
  - 2nd method is easier with small curves
- Choosing correct vertebrae to measure scoliosis is critical to accuracy and monitoring
  - Terminal vertebra is one with greatest angle of endplate from horizontal
  - Rotoscoliosis: Terminal vertebra spinous process returns to midline
  - Interobserver variability 7-10°
- Coned-down radiographs for better definition of vertebral abnormalities
- Lateral radiograph to show sagittal plane abnormalities
  - Usually alters normal thoracic kyphosis, lumbar lordosis
- Estimate rotational deformity by rib displacement on lateral radiograph

Morphology

- S-curve scoliosis
  - Idiopathic
  - Congenital
  - Syndromic
- C-curve scoliosis
  - Neuromuscular
  - Neurofibromatosis
  - Scheuermann disease
  - Congenital
  - Syndromic
- Short-curve scoliosis
  - Tumor
  - Trauma
  - Infection
  - Radiation
  - Congenital
  - Neuropathic

Treatment

- Observation for minor curves
- Bracing for curves > 25°
- Fusion for rapidly progressive curves, curves > 40°

Anteroposterior radiograph in an idiopathic scoliosis patient shows the typical curve of idiopathic scoliosis that is convex to the right in the thoracic spine and convex to the left in the lumbar spine. No vertebral anomalies are present, excluding congenital