



Al-Mustaqbal University

Collage of Engineering

Prosthetics and Orthotics Engineering

Third Stage

ORTHOTICS III

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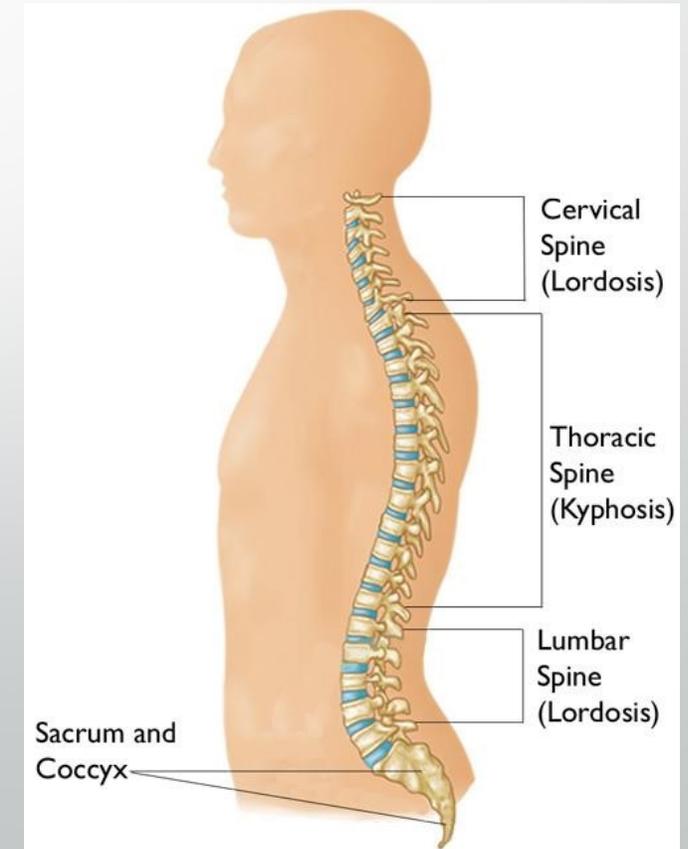


Lordosis in The Spine

Eng. Hussein D. Hussein

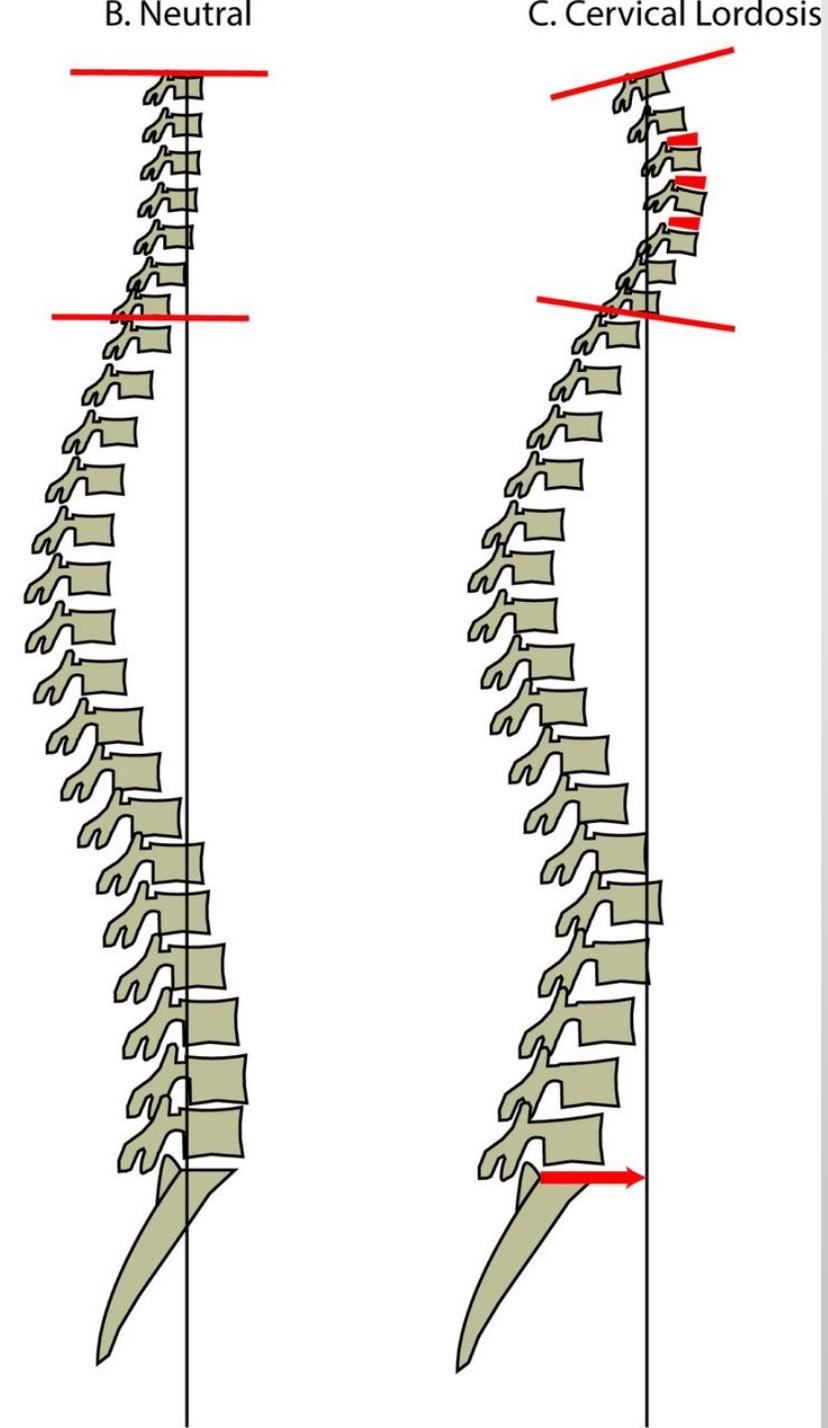
Lordosis

- The normal inward lordotic curvature of the lumbar and cervical regions of the human spine. The term comes from the Greek *lordōsis*, from *lords* (bent backward).
- lordosis help your body:
 1. absorb shock
 2. support the weight of the head
 3. align your head over your pelvis
 4. stabilize and maintain its structure
 5. move and bend flexibly



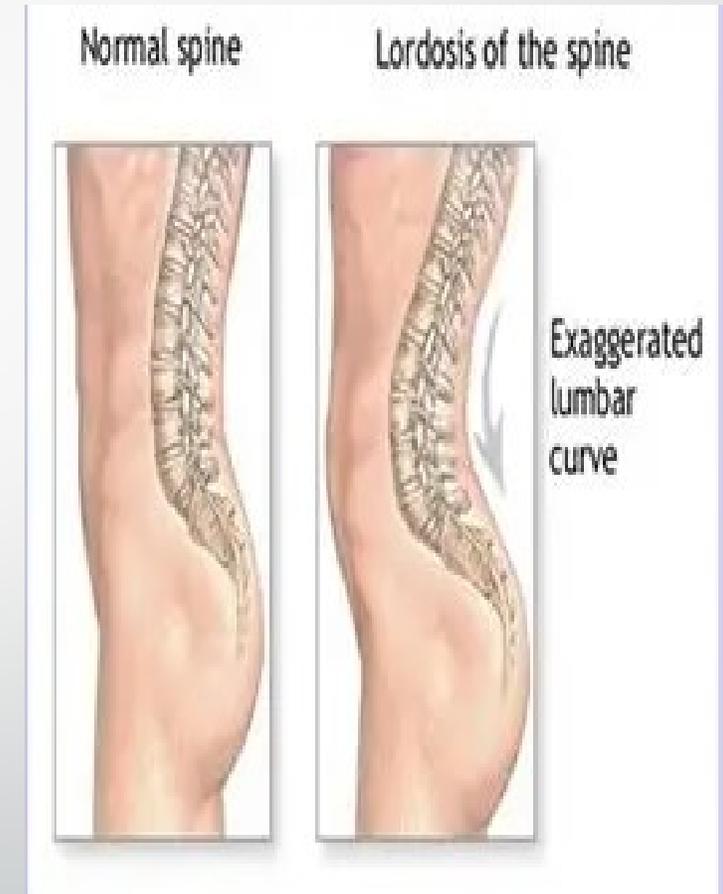
Types of Lordosis

- Cervical lordosis: In a healthy spine, the neck should look like a very wide C, with the curve pointing toward the back of the neck. The problem occurs when the curvature is greater than it should be.
- A normal cervical lordosis is commonly described around 30–40°, but the “normal range” can vary depending on how it’s measured and which vertebrae are included



Cont.

- Lumbar lordosis (swayback): The most common type. The easiest way to check for this condition is to lie on back on a flat surface. Should be able to slide hand under lower back, with little space to spare.
- lordosis will have extra space between their back and the surface. If they have an extreme curve, there'll be a visible C-like arch when they stand. And from the side view, their abdomen and buttocks will stick out
- Many clinical references describe a typical lumbar lordosis around $40-60^\circ$.



Lordosis in children

- Often, lordosis appears in childhood without any known cause. This is called benign juvenile lordosis. It happens because the muscles around the child's hips are weak or tightened up.
- Benign juvenile lordosis typically corrects itself as the child grows up.
- Lordosis can also be a sign of hip dislocation, especially if the child has been hit by a car or fallen somewhere.
- Other conditions that can cause lordosis in children are normally related to the nervous system and muscle problems.



Lordosis in pregnant women

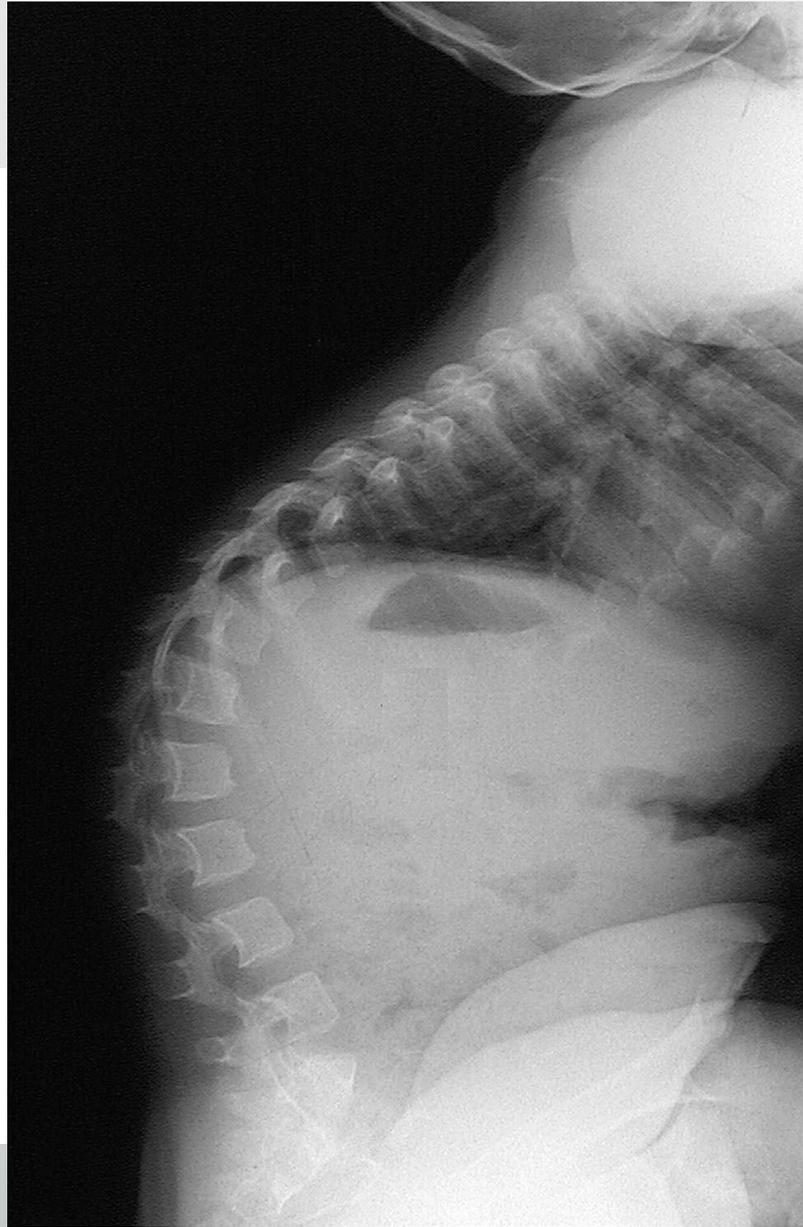
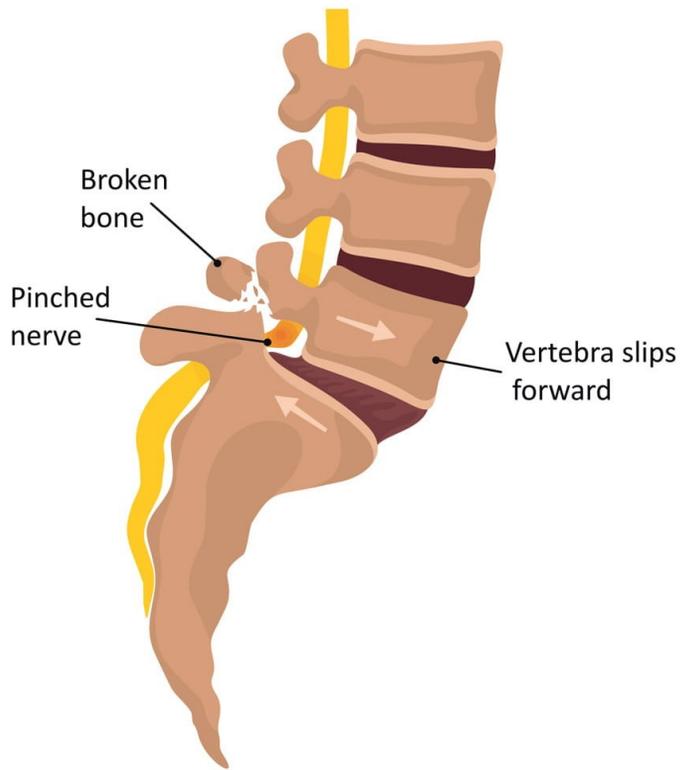
- Many pregnant women experience back pains and will show the signs of lordosis, a protruding belly and buttocks.
- that lordosis during pregnancy is actually spine adjusting to realign center of gravity.



Causes of Lordosis

- Lordosis can affect people of any age. Certain conditions and factors can increase your risk for lordosis. These include:
 - Spondylolisthesis: a spinal condition in which one of the lower vertebrae slips forward onto the bone below. It is usually treated with therapy or surgery.
 - Achondroplasia: one of the most common types of dwarfism.
 - Osteoporosis: a bone disease that causes a loss of bone density, which increases your risk of fractures.
 - Osteosarcoma: a bone cancer that typically develops in the shinbone near the knee, the thighbone near the knee, or the upper arm bone near the shoulder.
 - Obesity: this puts people at a higher risk for serious diseases, such as type 2 diabetes, heart disease, and cancer.

SPONDYLOLISTHESIS



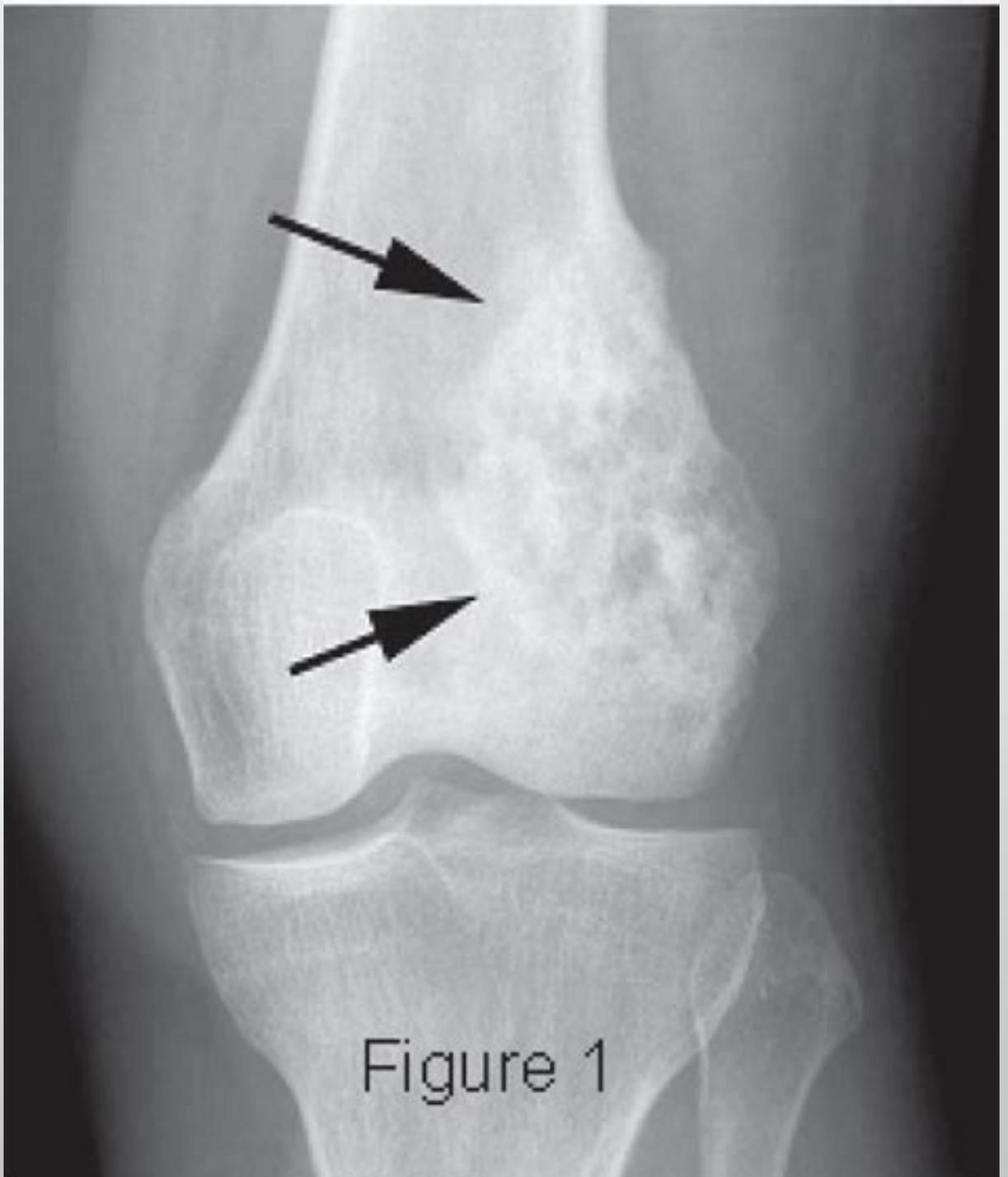


Figure 1

Symptoms of Lordosis

- symptom of lordosis is muscle pain. When spine curves abnormally, muscles get pulled in different directions, causing them to tighten or spasm. cervical lordosis, this pain may extend to neck, shoulders, and upper back. also experience limited movement in your neck or lower back
 - numbness
 - tingling
 - electric shock pains
 - weak bladder control
 - difficulty maintaining muscle control
 - Change in bowel movements

Diagnosis for Lordosis

- Lordosis is diagnosed by combining clinical assessment (history + physical exam) with imaging when needed. The goal is to confirm whether the curve is normal or abnormal (increased/reduced) and to identify any underlying cause.
- History (Symptoms & risk factors): Clinicians ask about:
 1. Location of pain (neck/cervical or low back/lumbar) and whether it radiates to the shoulder/arm or leg.
 2. Mechanical symptoms: stiffness, fatigue, pain worse with posture/standing/sitting.
 3. Neurological symptoms: numbness, tingling, “electric shock” pain, weakness.
 4. Red flags: new bladder/bowel changes, progressive weakness, severe night pain, fever, weight loss, recent trauma.

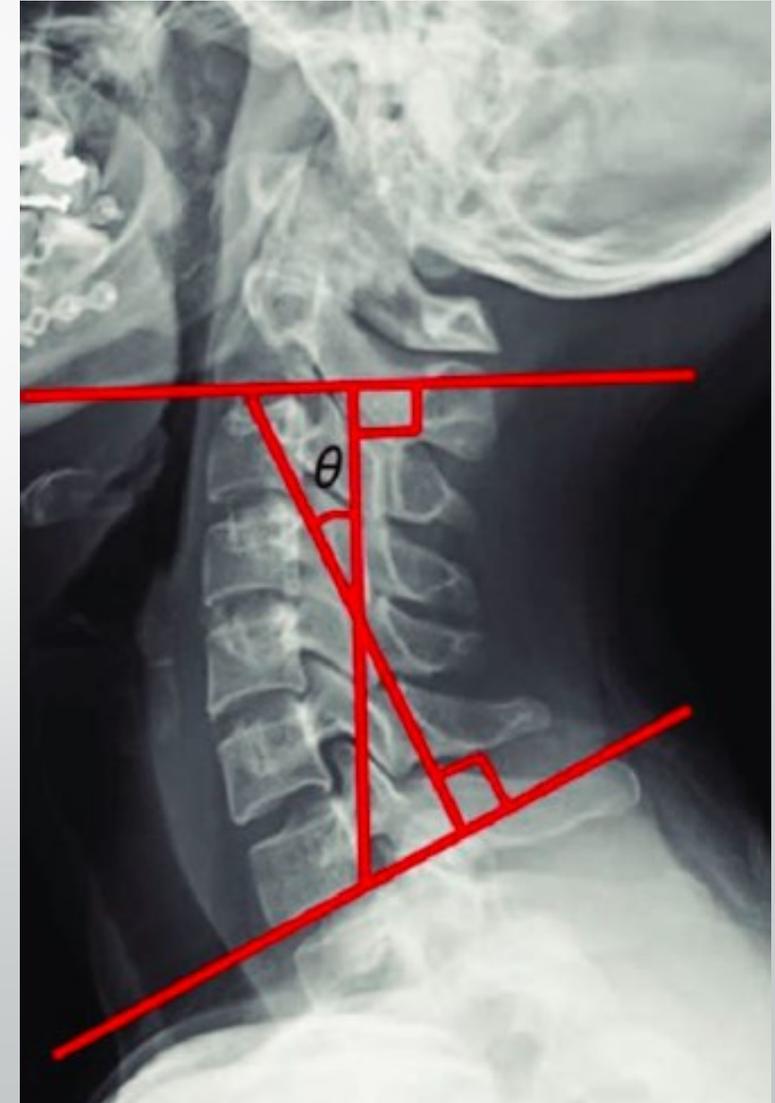
Past history: spinal injury, degenerative disease, obesity, pregnancy, congenital conditions, osteoporosis.

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- Physical examination: Typical exam components:
 1. Posture inspection (side view): exaggerated curve (“swayback”) or reduced/flat curve.
 2. Palpation: tenderness and muscle spasm.
 3. Range of motion (ROM): limited bending/extension or painful movement.
 4. Flexibility testing: whether the curve corrects with movement/position (flexible vs rigid).
- Neurological screen (if symptoms present):
 1. Strength testing (myotomes)
 2. Sensation testing (dermatomes)
 3. Reflexes
- Gait and balance

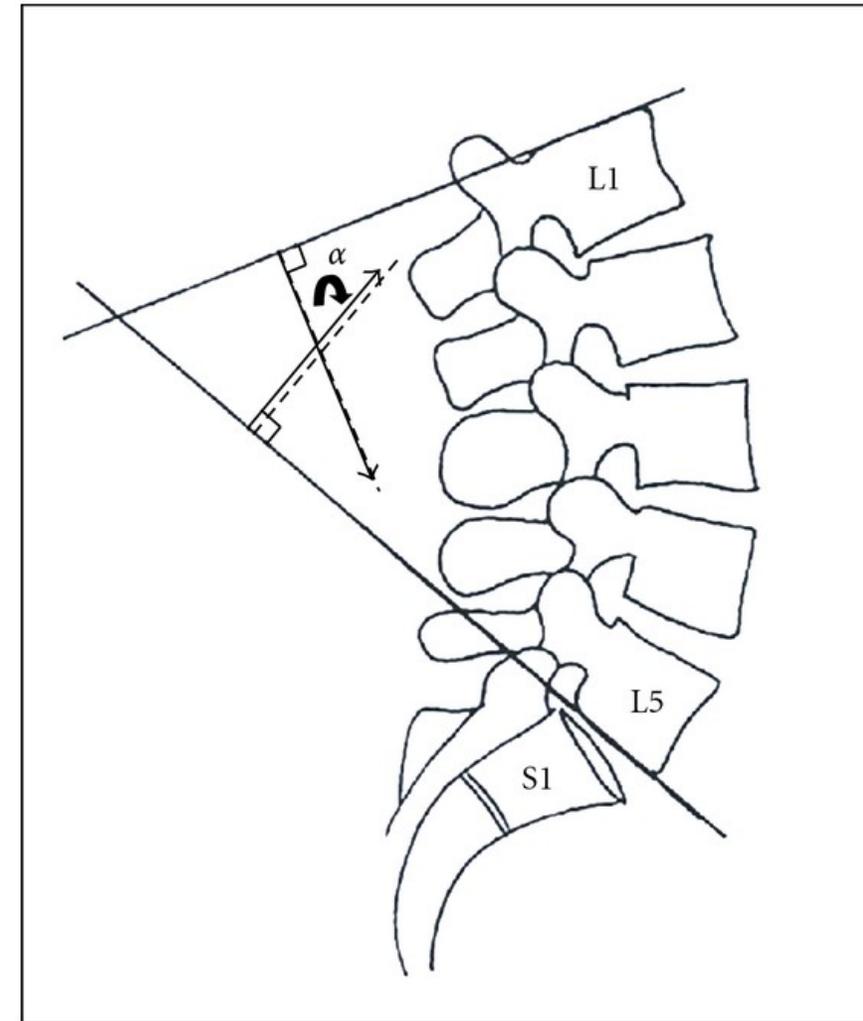
How to measure lordosis angle on X-ray (Cobb method)

- Cervical lordosis (C2–C7 Cobb angle) — lateral cervical X-ray:
 1. Use a neutral lateral cervical radiograph (ideally standing).
 2. Draw a line parallel to the inferior endplate of C2.
 3. Draw a line parallel to the inferior endplate of C7.
 4. Draw perpendiculars to those two lines.
 5. The angle where the perpendiculars meet = C2–C7 Cobb angle (cervical lordosis).
 6. Typical “normal” cervical lordosis: often described as ~20–35° (C2–C7 Cobb), but it varies by study and measurement details.



Cont.

- B) Lumbar lordosis (most common: L1–S1 Cobb angle) — lateral lumbar X-ray:
- Use a standing lateral lumbar/lumbosacral radiograph when possible.
- Draw a line parallel to the superior endplate of L1.
- Draw a line parallel to the superior endplate of S1 (some protocols use L5 instead of S1).
- Draw perpendiculars to those lines.
- The angle between the perpendiculars = lumbar lordosis (Cobb).
- Many references quote lumbar lordosis around 40–60°.



Treatment for Lordosis

- Most people with lordosis do not require medical treatment unless they experience a severe case. Treatment for lordosis will depend on how severe the curve is and the presence of other symptoms. Treatment options include:
 1. medication, to reduce pain and swelling.
 2. daily physical therapy, to strengthen muscles and range of motion.
 3. weight loss, to help posture.
 4. braces, in children and teens.
 5. surgery, in severe cases with neurological concerns.
 6. nutritional supplements such as vitamin D.
 7. Orthoses