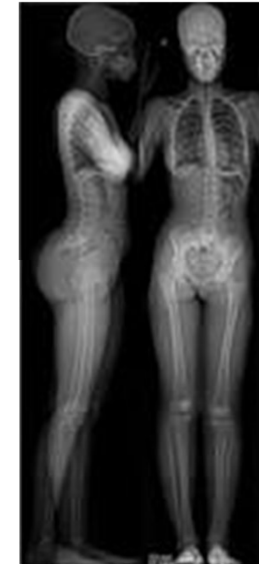
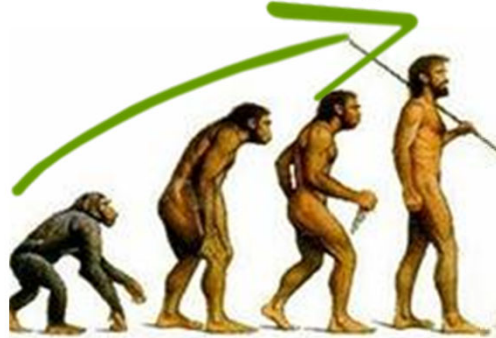




Sagittal alignment of the spine is changing!

- Evolution theories
- Life cycles



Sitting Sagittal Plane



Sagittal alignment

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■ The Evolution of Sagittal Segmental Alignment of the Spine During Childhood

Akin Cil, MD,* Muharrem Yazici, MD,* Akin Uzumcugil, MD,* Utku Kandemir, MD,*
Ahmet Alanay, MD,* Yasemin Alanay, MD,† R. Emre Acaroglu, MD,* and Adil Surat, MD*

- To describe the normative data of the sagittal plane on pediatric age population
- To document the evolution of sagittal alignment with growth

Sitting Sagittal Plane

The Evolution of Sagittal Segmental Alignment of the Spine During Childhood

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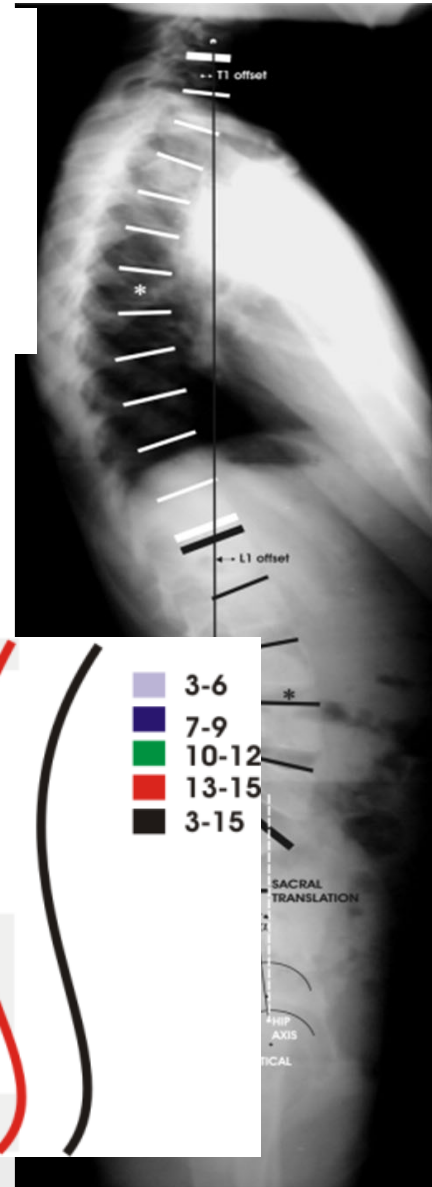
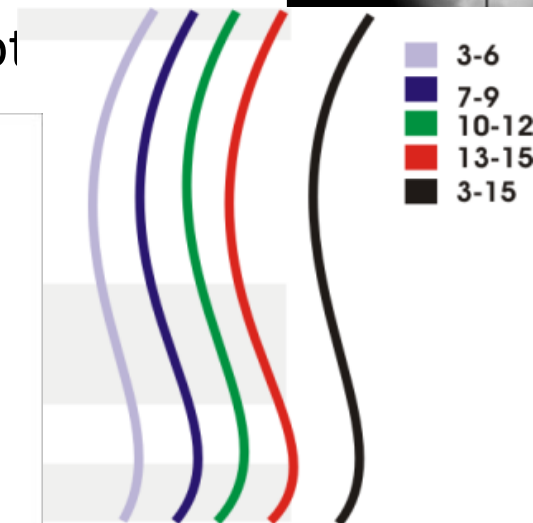
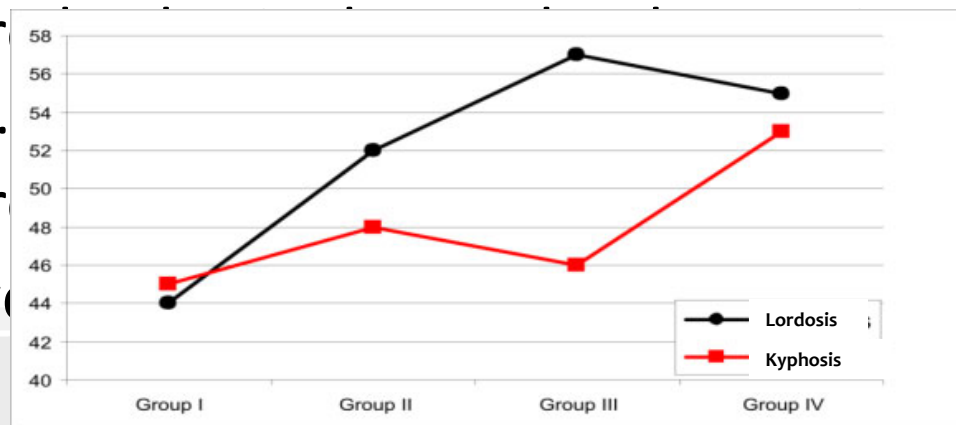
- Pediatric vs. adults
 - Greater thoracic kyphosis
 - Smaller lumbar lordosis
 - Especially upper 3 segments hypolordotic

More

- 3.

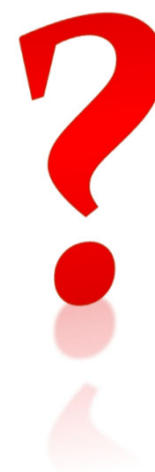
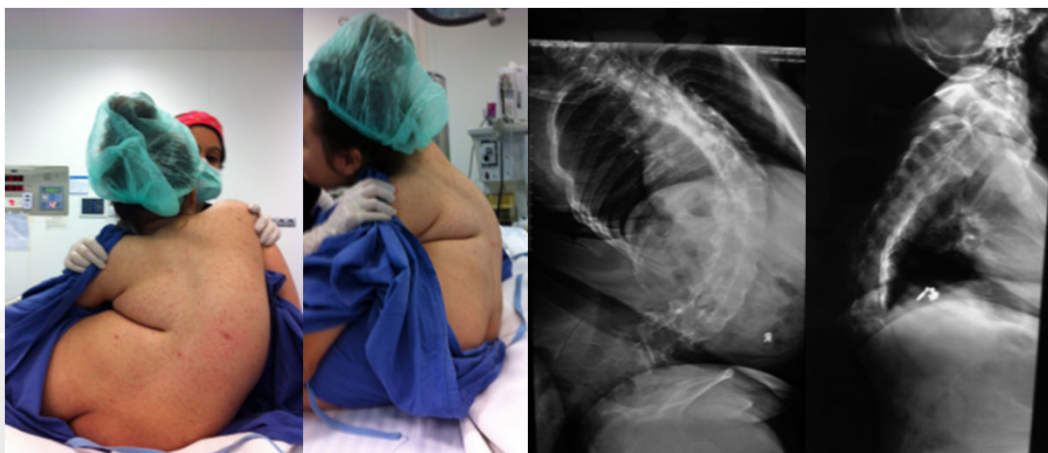
More

Lower





Non-ambulatory patient



Sitting Sagittal Plane



Purpose

- Describe normative values in sitting position
- Document evolution of alignment with growth

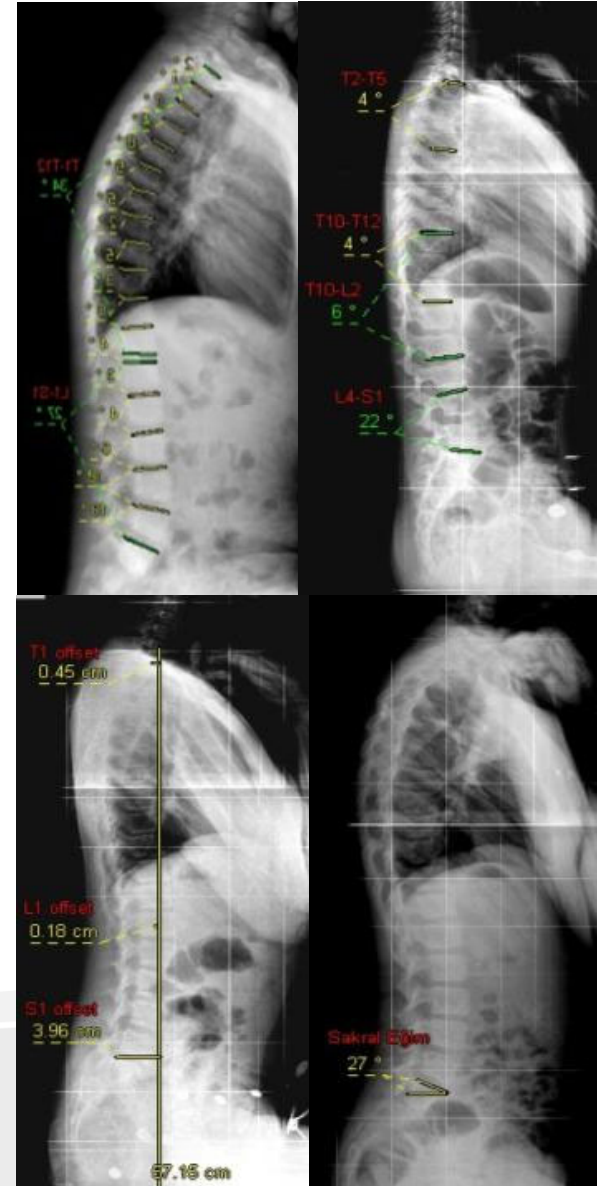
Materials & Methods

- Between 3-16 age
 - 114 children (54 female, 60 male)
 - NO musculoskeletal abnormality
 - Group 1 (3-6 ages)
 - Group 2 (7-9 ages)
 - Group 3 (10-12 ages)
 - Group 4 (13-16 ages)
 - 30" Lateral X-ray with the arms flexed 30° on sitting position



Materials & Methods

- Segmental angulations from T1–T2 to L5–S1
- Global kyphosis (T1–T12) and lordosis (L1–S1)
- Segmental angulations of T2–T5, T10–T12, T10–L2, and L4–S1 levels
- Sacral slope and offsets

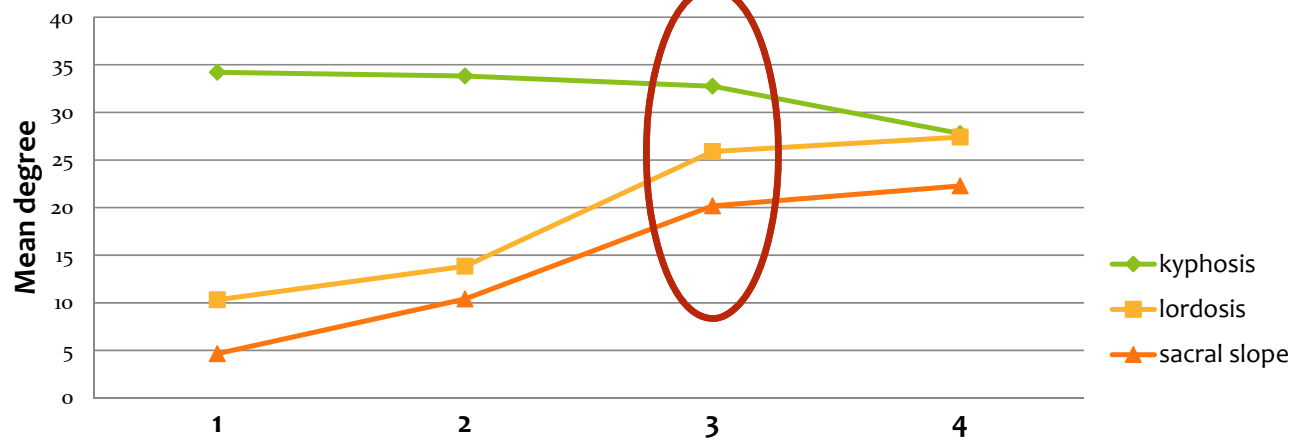




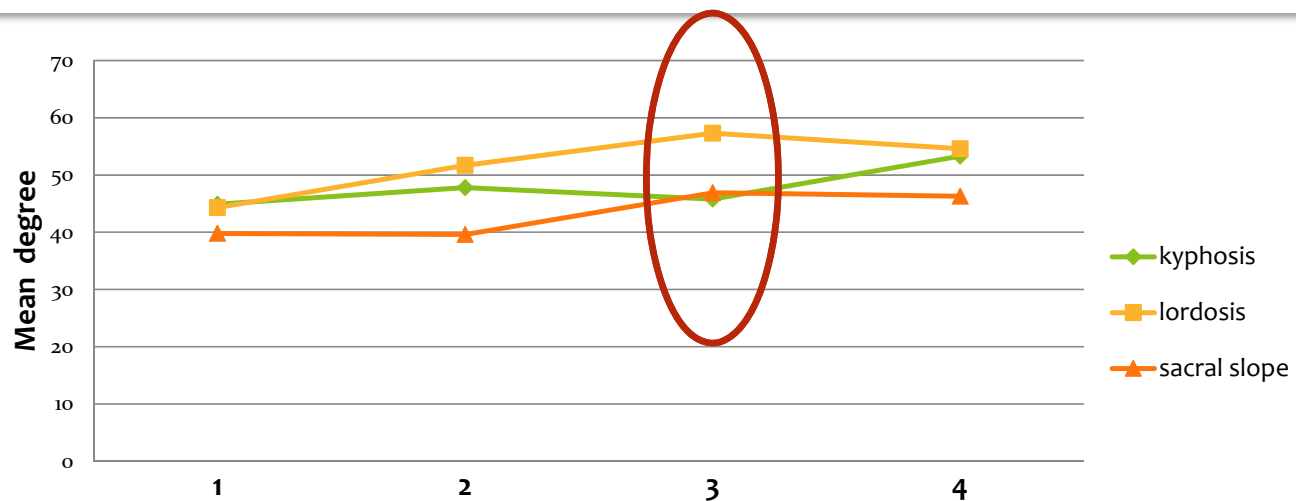
Results

- Global kyphosis and lordosis angles are different in sitting position
 - Smaller thoracic kyphosis and lumbar lordosis
- Alignment (both segmental and global) is changing with age
 - Statistically significant differences
 - T2-T5, T5-T6, L1-L2, L4-S1, L5-S1, lumbar lordosis and sacral slope

Results



Sitting position

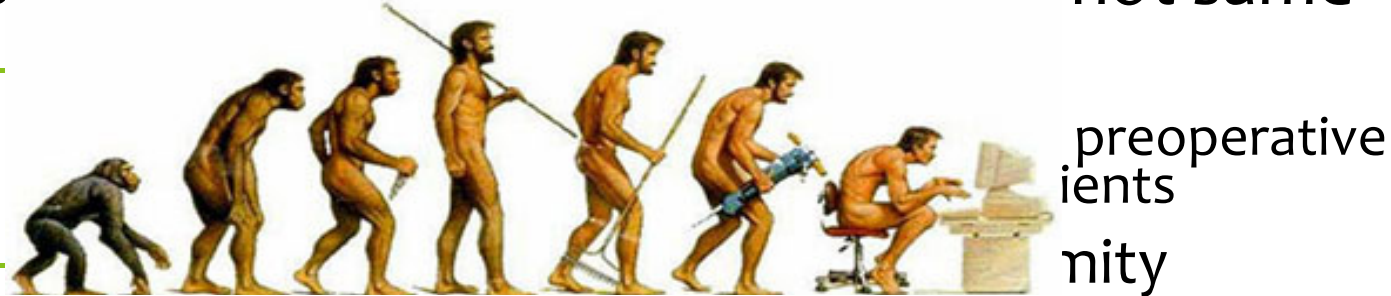


Standing position



Conclusion

- Children is not miniature of adults
- Sitting and standing alignments are not same



Homo computericus

- Requires more kyphosis
- SOLUTION???