

# Computed tomographic study analysing functional biomechanics in the thoracolumbar spine of horses with and without spinal pathology

Baudisch et al. (2024), in Anatomia, Histologia, Embryologia

## Products

Computed Tomography (CT) for thoracolumbar spine biomechanics.

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# Clinical Background

Thoracolumbar pathologies such as spondylosis and overriding spinous processes (ORSPs) restrict spinal motion and impact performance in horses. CT imaging provides precise analysis of these conditions, aiding targeted rehabilitation.

# Aim of Study

To investigate thoracolumbar spinal biomechanics using CT imaging, focusing on range of motion (ROM), the effects of spondylosis and ORSPs, and interspinous pressure during movement.

# **Cohort Study**

CT imaging was conducted on 23 equine thoracolumbar spines (T8-L4), aged 2-29 years, mounted in a mechanical rig. Motion patterns were analyzed under controlled torque conditions, comparing normal and pathological spines.

## Results

- **ROM** varied across the thoracolumbar spine, with **T9-T10** showing the greatest movement.
- Spondylosis and ORSPs significantly reduced ROM, particularly in flexion and extension.
- **Axial rotation** during lateral bending was inconsistent, highlighting **CT's biomechanical detection** capability.
- Severe ORSPs and spondylosis restricted motion, but rotational movement remained measurable.
- No significant interspinous pressure changes were observed in normal spines, ruling out compartment syndrome concerns.

## Summary

- **CT imaging** provides precise **biomechanical analysis** of the equine thoracolumbar spine.
- Spondylosis and ORSPs severely limit motion, reinforcing early diagnosis importance.
- CT enables targeted rehabilitation, improving equine performance and health.
- CT remains the most effective modality for evaluating spinal motion and pathology.
- Findings establish a baseline for future studies, advancing equine spinal biomechanics understanding.

### <u>Link to paper</u>

Source: Baudisch, N., Schneidewind, L., Becke, S., et al. (2024). DOI: 10.1111/ahe.13016, in Anatomia, Histologia, Embryologia.