

Oral presentation

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## The necessity to differentiate between thoracic hyperkyphotic curve types based on architecture in order to propose an appropriate treatment strategy

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### Introduction

Regardless of etiology, a morphologic classification of thoracic hyperkyphosis is needed for health care professionals to treat their patients adequately. Traditionally, thoracic hyperkyphosis has been defined as a kyphosis of more than 50° using the Cobb angle at differing vertebral levels.

This radiologic curvature cut-point offers limited understanding of the overall deformity that occurs in the spines of hyperkyphotic patients. For example, hyperkyphosis can be created by different postures in the sagittal plane and can be localized to different regions in the thoracic spine for a given Cobb angle. Recently, ideal geometric, average geometric, and individual optimized geometric sagittal plane curve models for thoracic kyphosis have been presented in the literature.

Using these models as a normative starting position of thoracic kyphosis, it may be possible to describe and differentiate types of hyperkyphosis.

### Methods

According to our clinical experience and based on the Harrison Sagittal Spinal Model (HSSM), we have chosen to distinguish between at least three (3) major morphologic categories of hyperkyphosis in the general population, plus a fourth one in the geriatric population, which has already been described in depth in the scientific liter-

ature. Postural analysis included an analysis of the lumbo-pelvic spine/lower limb position relative to the feet, and shoulder/cervical spine position relative to the ribcage, as well as any posterior or anterior translation of the ribcage relative to the pelvis and to the shoulders/ribcage.

### Results

According to the postural and vertebral segmental alignment as defined by rotations around the X axis and translations along the Z axis, and by segmental angles created by tangents drawn on the posterior vertebral bodies (HSSM), we can observe where the deformity is most accentuated:

- Lower thoracic (mostly postural). Hyperkyphosis is often associated with a posterior translation of the ribcage relative to the pelvis, (except for in Sheuermann's kyphosis type II).
- Mid-thoracic (and often most severe). Hyperkyphosis is often associated with lumbar hyperlordosis, but without significant translation of the ribcage relative to the pelvis (except for in Sheuermann's kyphosis type I).
- High thoracic. Hyperkyphosis is often associated with anterior translation of the ribcage relative to the pelvis.

And thus, use a treatment strategy that is much more precisely as well as globally addressing the deformity in order to achieve the best rehabilitative results.

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