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THE RELIABILITY AND PROGNOSTIC IMPLICATIONS OF A SIMPLIFIED BONE AGE CLASSIFICATION SYSTEM FOR ADOLESCENT IDIOPATHIC SCOLIOSIS

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Sanders et al. 1 describe a simplified system for determining digital skeletal age (DSA) and its use in predicting the likelihood a curve will reach surgical magnitude. We assessed the inter-and intra-rater reliability and prognostic implications of this classification system using data from a multicenter trial of outcomes in AIS (BrAIST).

36 subjects were randomly selected. We determined the predicted prognosis by cross-classifying the DSA and Cobb angle using Sanders' estimates.

Kappa coefficients ranged from 0.76 to 0.88. For example, one rater's reading corresponded to a 0% risk of the curve reaching surgical magnitude, while the other rater's reading for the same subject corresponded to a 92% risk.

The high level of agreement in DSA found by Sanders et. al was replicated in this study, and would be considered "substantial" to "almost perfect" using widely applied standards. 2 Despite this agreement, different prognoses were predicted for 11% of these subjects.

Clinicians and researchers should consider seeking a second review of the DSA (especially if it appears to be in the DSA 2 to 3 range), and the Cobb angle, prior to using it to make prognostic predictions and treatment decisions.

1. Sanders JO, Browne RH, McConnell SJ, et al. Maturity Assessment and Curve Progression in Girls with Idiopathic Scoliosis. J Bone Joint Surg Am 2007;89:64-73.
2. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977;33:159-74.

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SAGITTAL AND PELVIC PARAMETERS ANALYSIS IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

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PURPOSE/BACKGROUND
The sagittal alignment of the spine and pelvis in adolescent idiopathic scoliosis is poorly defined in the literature. The purpose of this study was to assess the sagittal alignment in scoliosis patients according to curve degree and type.

METHODS
Sagittal parameters of the spine and pelvis were analysed in lateral standing radiographs of 256 adolescents (13.7±5 years, curve range 4-57) and compared with statistically normal values (NV) in adolescents found in the literature: thoracic kyphosis TK (NV 22-66), lumbar lordosis LL (NV 24-72), pelvic incidence PI (NV 27-71), sacral slope SS (NV 25-57) and pelvic tilt PT (NV -8-16). Lateral standing radiographs were matched with anteroposterior radiograph. Patients were classified according to the entity of scoliosis curves, age, gender and risser score.

RESULTS
There is a weak negative correlation (0.2) between scoliosis and kyphosis. Over 20° Cobb PI increased, mainly due to an increase of the SS. In our population we had low PI and SS, but mainly in less than 20° curves than in higher scoliosis; on the contrary, PT was high in all children. Analysing curves type and decrease of SS we found that this occurs more frequently in patients with double curves (thoracic and thoracolumbar).

CONCLUSION
PI increases through life, and curves degree worsen with growth, and this influence our results. Patients with spinal deformities have a positive sagittal balance and signs of pelvic retroversion such as decreased SS. According to our data this situation occurs to patients with thoracic and thoracolumbar curves.