

spine on a turntable. This 3D approach of asymptomatic spine and pelvis is used to characterize the postural balance of the subject while standing. Age varied between 5 and 17 years old (mean age 12 years). Pelvic and spinal parameters were grouped in 11 classes, with all values drawing a Gauss curve. Sagittal curves were assimilated to planes, the number of which can vary between the subjects, and measured in Cobb degrees on the plane; plane rotation was defined, as well as the number of included vertebrae. This analysis method is then applied for scoliotic deformities.

#### Results and discussion

Pelvic incidence was lower than 28.4° in class 1 and higher than 68.7° in class 11. Pelvic version was lower than 4.7° in class 1 and over -21.6° in class 11. Pelvic tilt (T) was measured in degrees in order to get rid of the bias of the distance between the subject and the source of x-rays: it was over 2.5° right in class 1 and under -2.5° left in class 5. Pelvic asymmetry (B) which represents the position of the sacrum compared to hips from top view, was lower than -7° right in class 1 and over 7° left in class 5. The number of planes could vary between 3 to 5, and plane rotation could vary of less than 10° in class 1 and over 85° in class 7. For the lumbar curve (C1), angulation on the plane varied between less than 21.2° in class 1 to more than 60.5° in class 11, with 4 to 6 vertebrae included in the plane.

#### Conclusion and significance

This study shows how it is important to measure pelvic and spinal parameters in 3D and how important are the variations in healthy children. Extreme values found in our asymptomatic group can blend into values that can be found in patients with spinal pathology. It is essential to apply this kind of analysis to understand spinal deformities' mechanism and results of orthopaedic treatments.

#### P22

##### Preliminary results of the implementation of a new software-based clinical photographic posture assessment tool (CPPAT) in the clinic: Translating knowledge into practice

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#### Introduction

Implementation of research results into clinical practice is essential to improve health services. Presently, there is a lack of evidence regarding the effectiveness of physiotherapy interventions on posture. This may be due to the lack of evidence-based clinical methods to quantitatively assess posture. This study examines the implementation of CPPAT in different clinical settings.

#### Objectives

1. To implement CPPAT for standardizing posture assessment in clinical practice. 2. To evaluate the success of the implementation by determining the practical usefulness and facilitators/barriers for its adoption.

#### Methods

We recruited 35 clinicians working in public or private institutions in Canada (Montréal, Québec, Edmonton), France (Lyon) and United Kingdom (London, Middlesbrough, Chesterfield). Inclusion criteria were clinicians assessing posture of persons with spinal disorders or posture impairments within their clinical routine and having access to a photographic set-up. Participants received a 4-5 hours training session for photographic acquisitions and data processing with the software program. To complete the training, participants had to use the software to assess the posture of 3 eligible patients (with spinal disorders or posture impairments). Following the training period, participants were asked to record how many cases were assessed with the tool and time spent for marker placement/acquisition of photographs and for data post-processing during a period of three months. After the trial period, participants completed a validated questionnaire. Domains assessed included Perceived ease of use (six items), Perceived usefulness (six items) and Intention to use (six items).

Participants also commented on the advantages/disadvantages of the CPPAT and factors facilitating/inhibiting use of the tool.

#### Results and discussion

Preliminary results are reported for eight participants from Québec with half of them working in public institutions. Fifty percent of the participants found it easy to learn or interact with the tool. Seven of the eight (88%) participants indicated that the tool would be useful to assess posture more accurately and objectively and to provide better evidence on their posture exams. Only two (25%) noted that the tool would increase their treatment performance/effectiveness. Fifty percent intended to continue using the tool. The principal facilitator was usefulness to quantify and provide evidence for posture assessment whereas the principal barriers were time required to do the complete analysis of the posture indices and the skill required with the software program.

#### Conclusion and significance

The preliminary results on implementation in clinical practice indicate that the CPPAT is well perceived by clinicians and seen as useful if modifications were made to ease the use of the tool. The CPPAT should contribute to clinical practice by facilitating the quantitative analysis of posture. Complete analysis of our cohort and of facilitators/barriers will help inform the promotion of CPPAT into clinical practice.

#### P23

##### A critical role of abnormal leptin bioavailability in the etiology of adolescent idiopathic scoliosis

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#### Introduction

There currently exists no consensus whether the level of leptin, sOB-R, adiponectin are altered in adolescent idiopathic scoliosis (AIS) patients, although previous studies claim lower level of leptin in AIS patients than the healthy volunteers.

#### Objectives

To validate the differences of the level of leptin, sOB-R and adiponectin between AIS patients and healthy controls in a large sample size.

#### Methods

Three hundred twenty-four AIS patients and 286 healthy adolescent volunteers were recruited in this study. Anthropometric parameters including age, body height, arm span, body weight, BMI were measured and biochemical parameters including level of leptin, sOB-R and adiponectin were assayed by ELISA in both AIS group and controls. The Cobb angle was then investigated in the AIS group. The anthropometric data and level of biochemical parameters were compared between the AIS group and the controls. The correlation between the biochemical parameters and the age, body weight, height, BMI were analyzed in AIS patients and healthy volunteers, together with the relationship between the scoliosis curve magnitude and biochemical parameters above.

#### Results and discussion

The AIS group was older, with greater body weight, height and BMI than the healthy volunteers. With the use of independent T test combined with multivariate regression analysis, the level of sOB-R was determined to be significantly higher than normal controls ( $31.6 \pm 7.5$  ng/ml Vs.  $20.6 \pm 6.8$  µg/mL,  $P < 0.001$ ), while the level of leptin and adiponectin between the two cohorts did not show significant differences. In addition, the severity of scoliosis curve was not observed to correlate with the level of the assayed biochemical parameters.

#### Conclusion and significance

This validation study confirms previous findings that the level of soluble leptin receptor is higher in AIS patients than controls, while the concentration of leptin and adiponectin remains unchanged in