



6th International Anthropological Congress of Dr. Ales Hrdlicka 150TH anniversary of birth.
"All mankind is of one origin"

Spatial characteristics orientation of the shoulders and pelvic girdles in patients 7-17 years old with initial symptoms AIS

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Introduction

In this presentation, an analysis is made of the metamorphoses occurring in the spinal column, shoulder and pelvic girdles in a group of children with minimal symptoms of scoliosis ($\geq 5^\circ$ Cobb degrees).

Information for this analysis was obtained using the method of computer optical topography of the spine **TODS (COMOT)**.

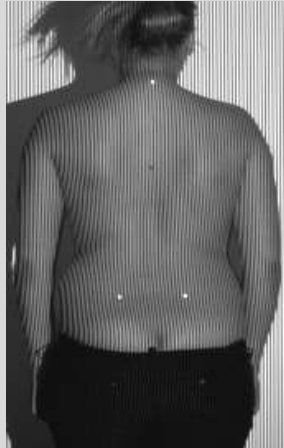
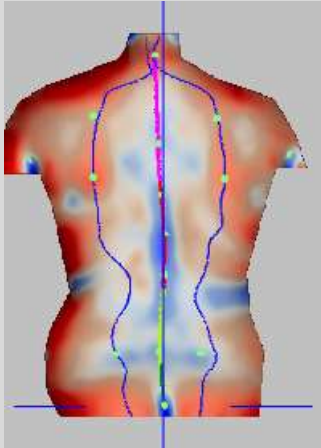
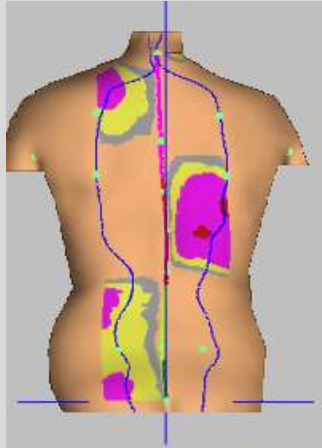
(Sarnadsky V.N. The Structure of Postural Disorders and Spinal Deformities in Age and Gender According to Computer Optical Topography //Research into Spinal Deformities 8. Proceedings of the 9th IRSSD 2012 meeting, Poznan, Poland. July 1-4, 2012. -P.77-82.)

Material:

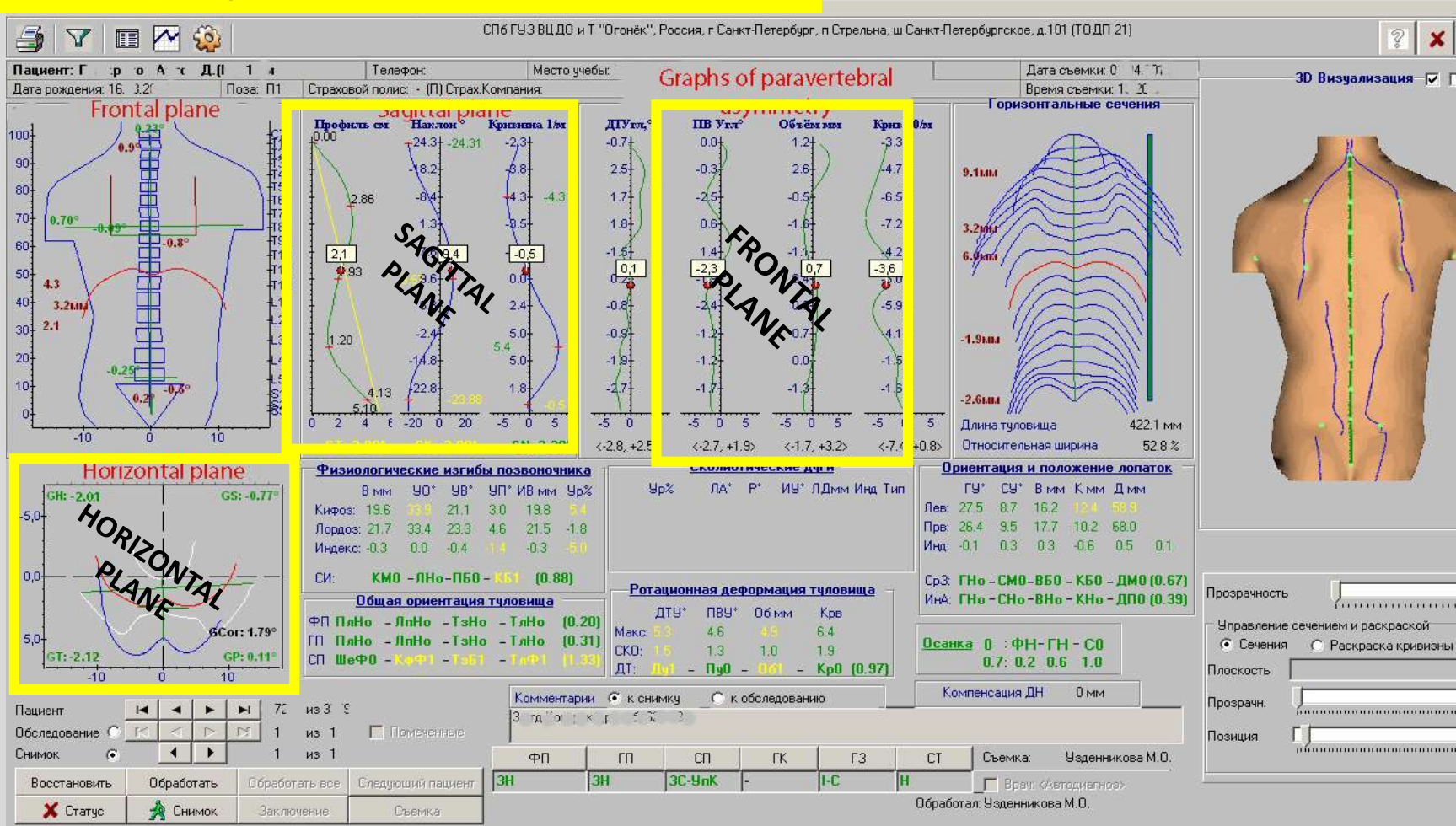
A survey of 85 children of both sexes

(47 girls and 38 boys, age from 7 to 17 years with an average of 12.84 years) with initial clinical symptoms of AIS.

Method: computer optical topography of the dorsal torso TODS (COMOT).



Standard protocol TODS (COMOT)



TODS (COMOT) parameters used in this work:

HORIZONTAL PLANE

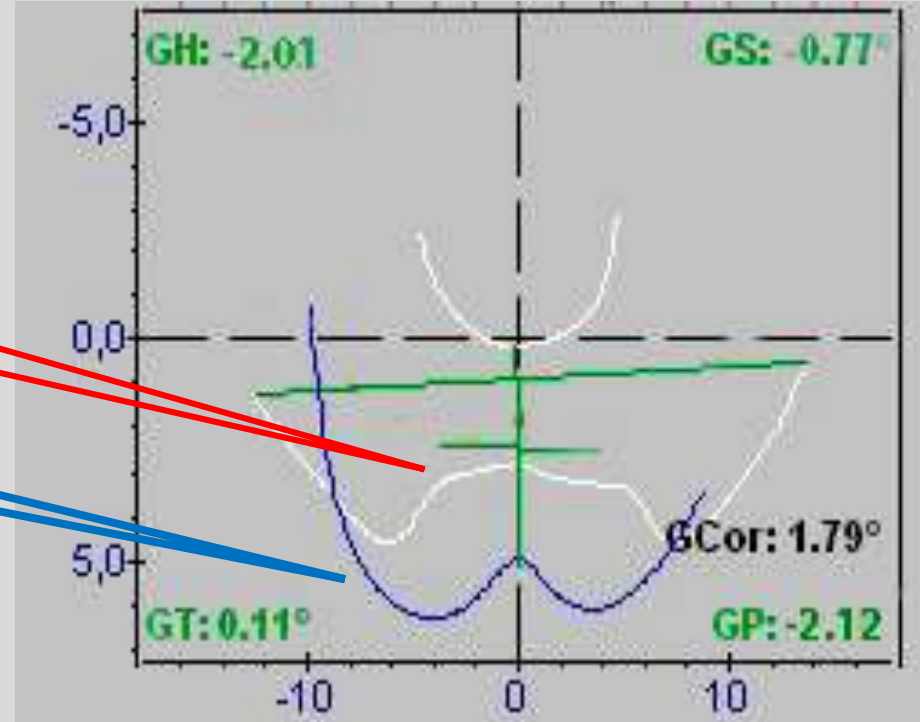
Horizontal torso sections at level

scapulas / shoulder girdle/

and

buttocks /pelvic girdle /

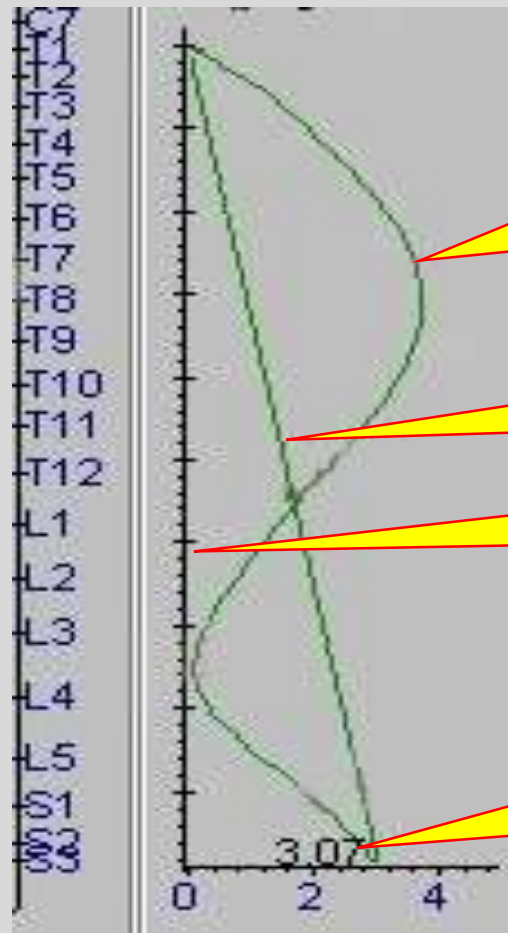
Were estimated the direction of rotation of the parts of the body and the magnitude of the displacement in degrees.



TODS (COMOT) parameters used in this work:

SAGITTAL PLANE

Changes in the severity of physiological bends spinal column and torso in the sagittal plane.



LINE of the
SPINOUS
PROCESSUS in the
SAGITTAL PLANE

The vertical axis of
the trunk in the
zone C₇ to S₂

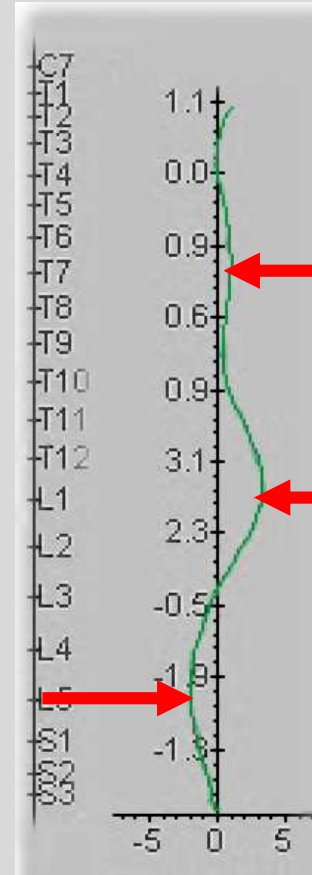
Reference
vertical line

The amount of
torso in
centimeters

TODS (COMOT) parameters used in this work:

FRONTAL PLANE

Graph of the **Angles of Rotation of the Line of the Spinous Processes (ARLSP)** in the horizontal plane.






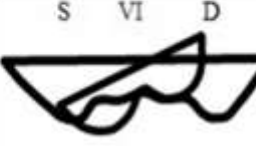

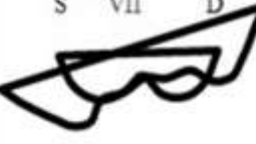

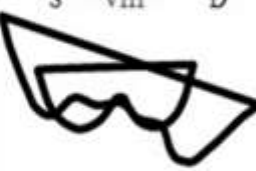
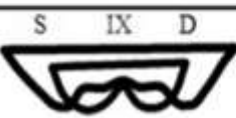
Results: horizontal plane changes

In the study group there were 9 variants of horizontal rotation of the shoulder and pelvic girdles relative to each other.

The most common option is to turn the shoulder girdle - to the RIGHT, and the pelvic - to the LEFT (n = 22, or 25.9%).

In second place in frequency, two variants of unilateral displacement of the shoulder and pelvic girdles met.

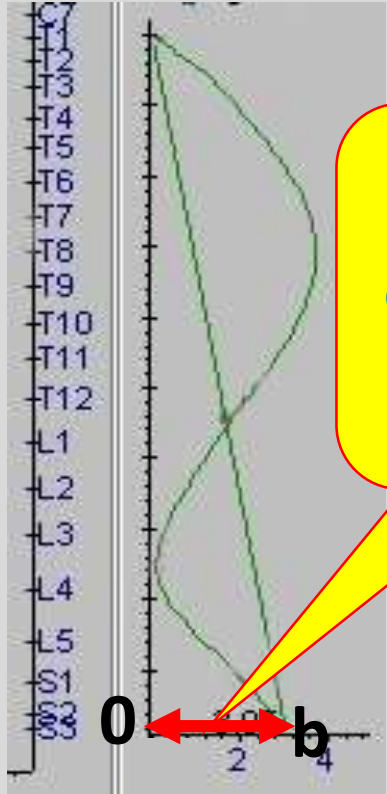
The horizontal displacement of the shoulder and pelvic girdles relative to each other was in the range from 0.2° to 17° /average - 4.5°/.

Variants of the rotations shoulder and pelvic girdle in the horizontal plane in the study group n = 85 (100%)			
	n=22(25,9%)		n=4(4,7%)
	n=20(23,5%)		n=3(3,5%)
	n=20(23,5%)		n=2(2,4%)
	n=12(14,1%)		n=2(2,4%)
		n=1(1,2%)	

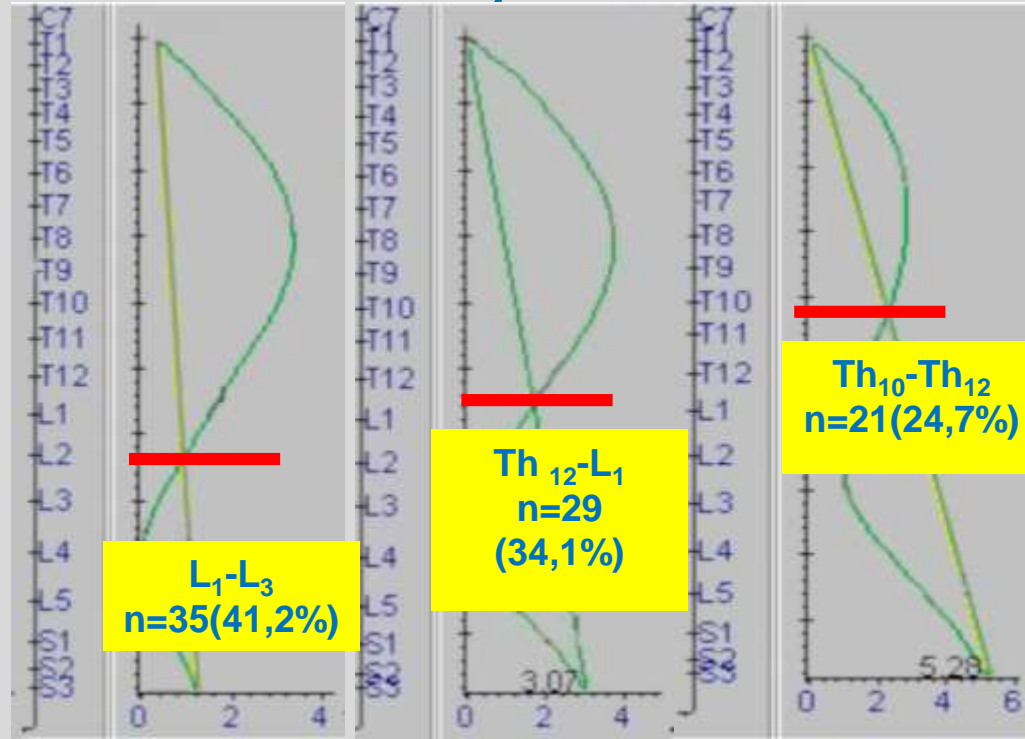
Results: sagittal plane changes

In (n = 56, or 65.8%) patients, a shift of the “kyphosis-lordosis” transitions was observed within one or two spine motor segment (SMS), both caudally and cranially.

In all patients of the group (n = 85 or 100%) found:



Incline torso forward.
Cathetus value 0b
in centimeters.
(average 4.14 cm)

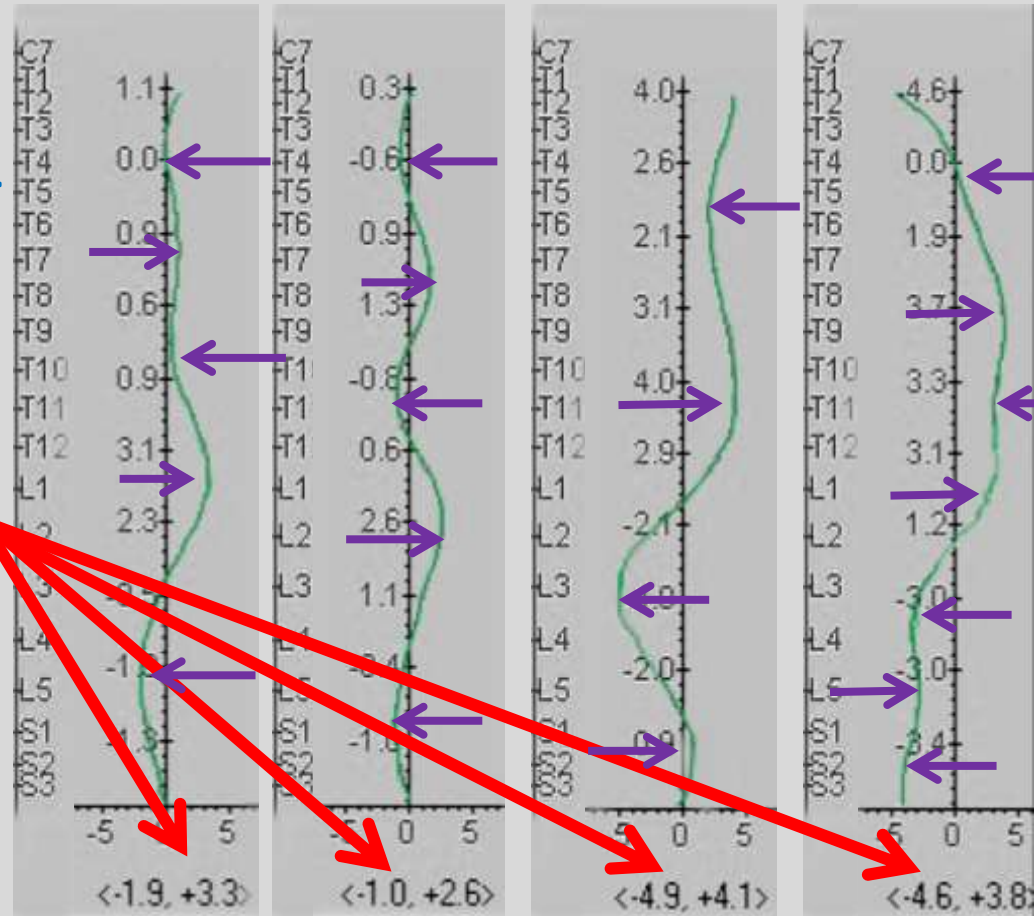


Results: frontal plane changes

On the ARLSP graphs were observed multiple (from two to seven) both multidirectional and unilateral wave-like "curves".

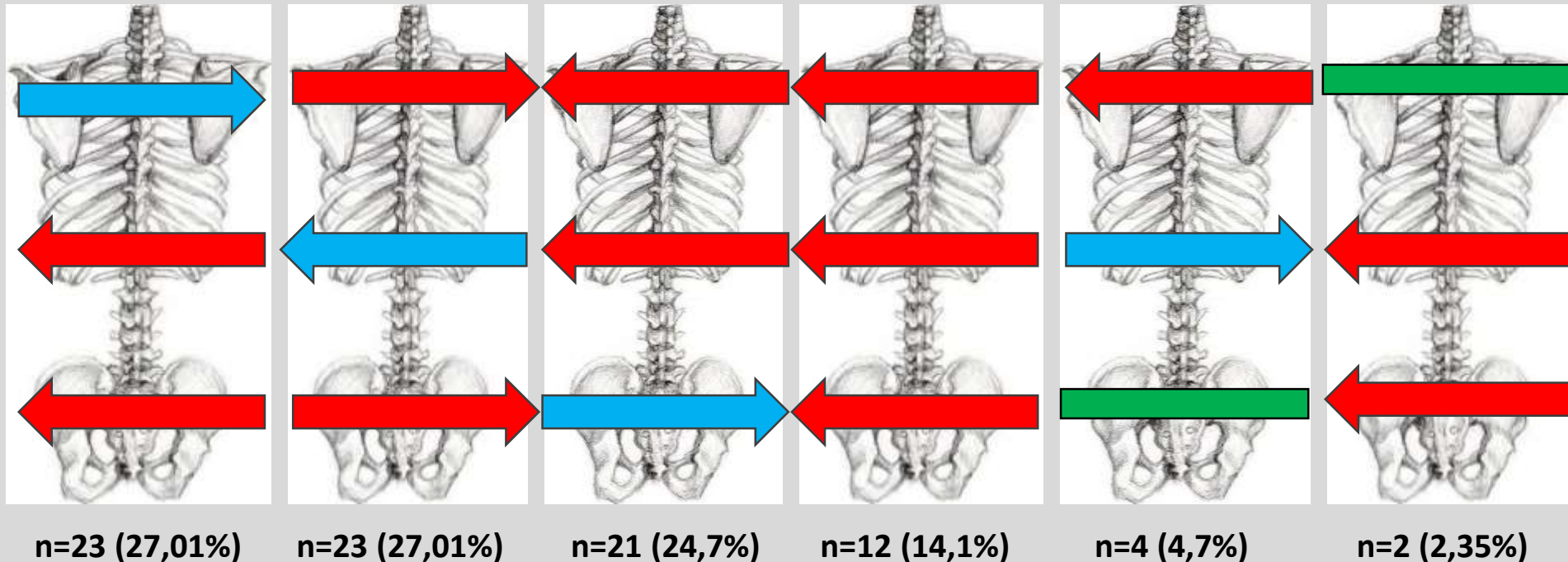
The arithmetic mean value of the ARLSP indicated the side of the rotation of the spinal column:
(+) – right turn,
(-) – left turn.

The volume of the indicated displacement did not exceed 10°,
(average - 2,3°).



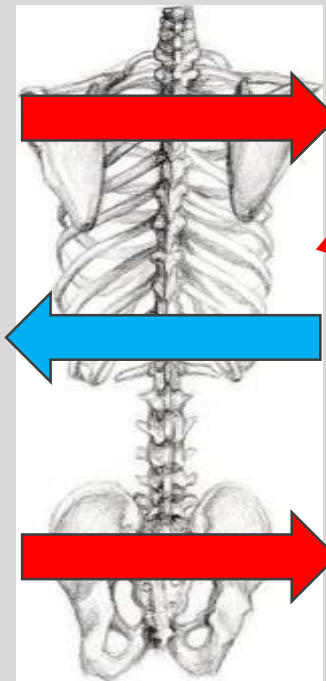
RESULTS: changes in the horizontal and frontal planes

Comparison of changes in the horizontal plane with ARLSP revealed 6 variants for combinations in the horizontal and frontal planes throughout spine.



RESULTS: changes in the horizontal and frontal planes

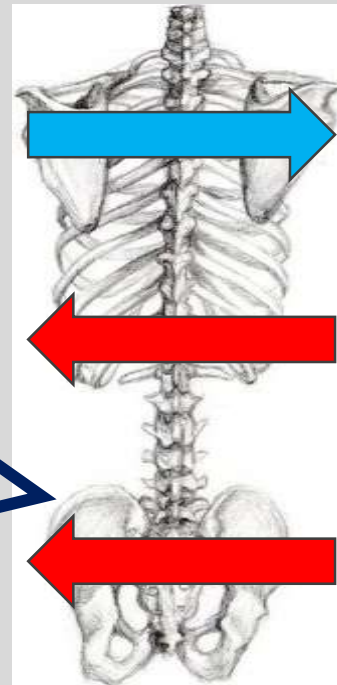
The following two configuration options were observed most often:



n=23 (27,01%)

1. Combined rotation of the shoulder and pelvic girdle in one direction, with simultaneous rotation of the spinal column in the contralateral (n = 23, or 27.01%).

2. Combined rotation of the vertebral column and pelvic girdle in one direction with simultaneous rotation of the humeral girdle to the contralateral (n = 23, or 27.01%).



n=23 (27,01%)



Conclusion

The results obtained allow us to see the primary changes in the vertebral complex of the child at the initial stages of development of scoliosis deformity.



A nighttime aerial view of the Shanghai skyline. The Shanghai Tower, a tall, spiraling skyscraper, is the central focus, illuminated with blue lights. To its left, the Shanghai Sports and Exhibition Center is lit up with red lights. In the background, the Oriental Pearl Tower is visible. The city lights reflect on the water in the foreground.

Thank you for attention!