Katowice 2015
7th-9th May

SOSORT

10th SOSORT Annual Meeting

2nd SOSORT Instructional Research Course

The Anterior (ATSI) and Posterior Trunk Symmetry Index (POTSI) as objective photographic measurement of posture

Łukasz Stoliński [1,2,3]

[1] Rehasport Clinic, Poznań, Poland
[2] Spine Disorders Unit, Department of Pediatric Orthopedics and Traumatology, University of Medical Sciences, Poznań, Poland
[3] Sport Secondary School Complex of John Paul II, Skierniewice, Poland

email: stolinskilukasz@op.pl

Digital photography

For a 2D assessment of body shape

Is a valuable method to:

✓ document the body posture

✓ calculate quantitative parameters

The advantages of body posture assessment using digital photography

1. Objectivization
2. Non-invasive
3. Low cost
4. Reliability
5. Simplicity

Projections for digital photography evaluation

Frontal plane

Tested parameters of posture

with front projection

POTSI Index

Posterior Trunk Symmetry Index

POTSI

=

(FAI-C7 + FAI-A + FAI-T)

+

(HDI-S + HDI-A + HDI-T)

Suzuki N., Inami K., Ono T., Kohno K., Asher MA.:Analysys of posterior trunk symmetry index (POTSI) in scoliosis, part 1.
Stud Health Technol Inform 1999; 59: 81-84

Inami K., Suzuki N., Ono T., Yamashita Y., Kohno K., Morisue H.:Analysys of posterior trunk symmetry index (POTSI) in scoliosis, part 2.
Stud Health Technol Inform 1999; 59: 85-88

Kotwicki T, Kinel E, Chowańska J, Bodnar-Nanuś A: Potsi, hump sum and sum of rotation - new surface topography parameters for evaluation of scoliotic deformity of the trunk.
Polish Journal of Physiotherapy, 2008; 8: 231-240

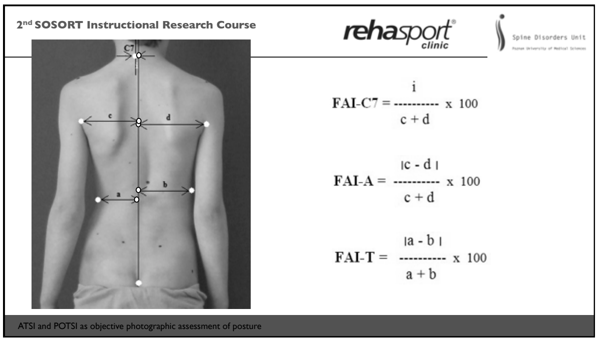
The medio-lateral lenght difference at the :

✓sternal notch level (FAI–C7)

✓axilla level (FAI-A)

✓waist level (FAI-T)

are defined as Frontal Asymmetry Index



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C7
c
d
a
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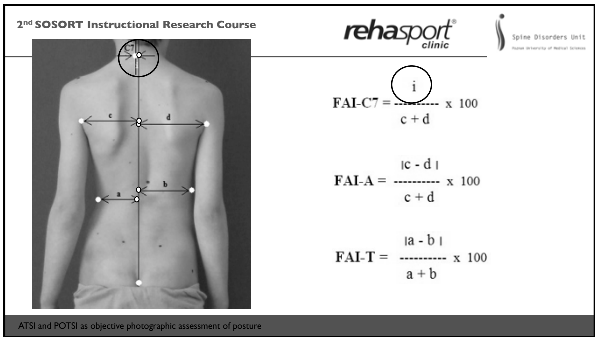
FAI-C7 = i / c + d x 100
FAI-A = |c - d| / c + d x 100
FAI-T = |a - b| / a + b x 100
ATSI and POTSI as objective photographic assessment of posture



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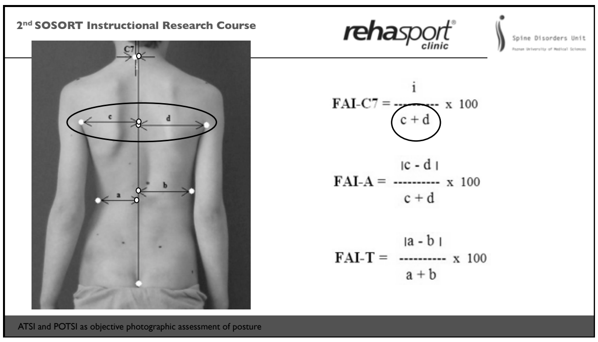

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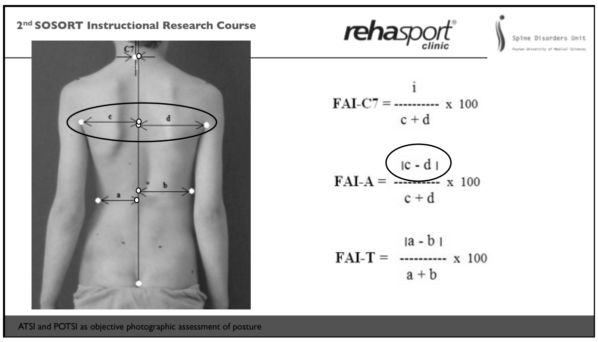

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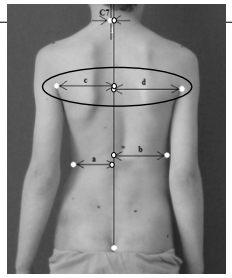

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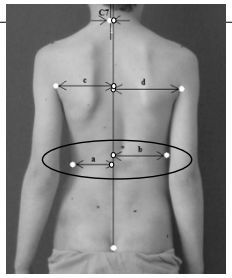

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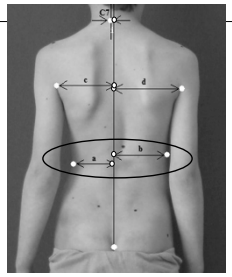

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- ✓shoulder level (HDI-S)
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are defined as Height Asymmetry Index

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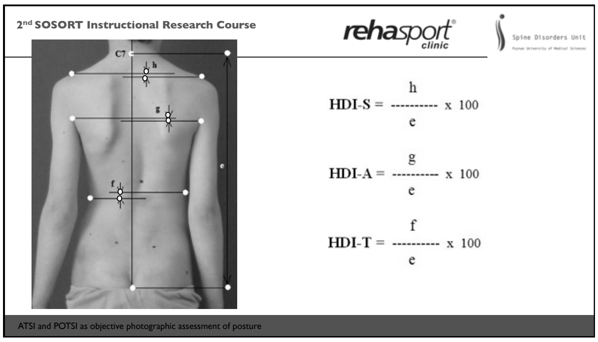
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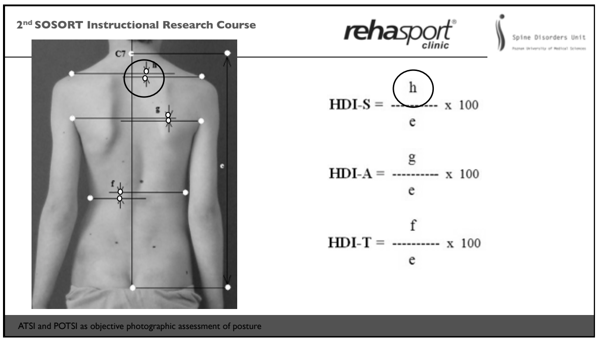
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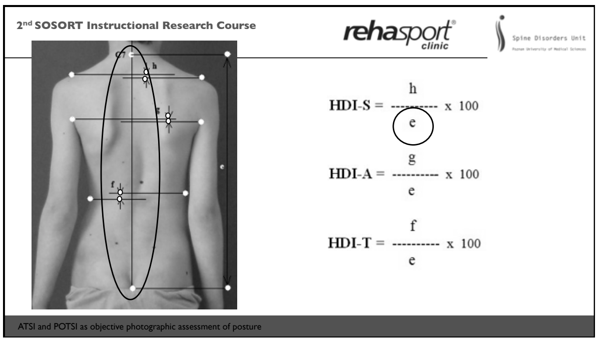
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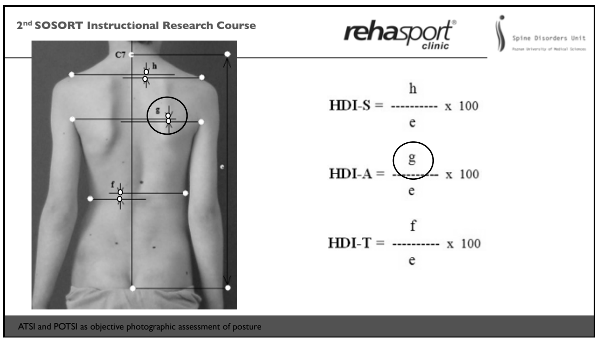
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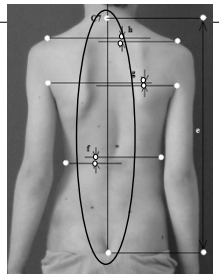

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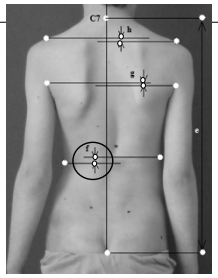

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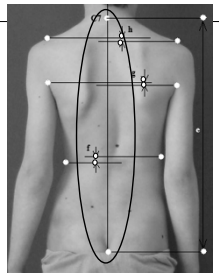

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ATSI Index

Anterior Trunk Symmetry Index

ATSI and POTSI as objective photographic assessment of posture

Stolinski L, Kotwicki T, Czaprowski D, Chowanska J, Suzuki N: Analysis of the Anterior Trunk Symmetry Index (ATSI). Preliminary report. Stud Health Technol Inform 2012; 176: 242-246.

ATSI
=
(FAI-SN + FAI-A + FAI-T)
+
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L Stolinski, T Kotwicki, D Czaprowski, J Chowanska: Analysis of anterior trunk symmetry index (ATSI). Preliminary report. Scoliosis 2013; 8 (Suppl 1):O25;

Stoliński L, Czaprowski D, Kozinoga M, Korbel K, Janusz P, Tyrakowski M, Kono K, Suzuki N, Kotwicki T: Analysis of Anterior Trunk Symmetry Index (ATSI) in healthy school children based on 2D digital photography: normal limits for age 7-10 years. Scoliosis 2013, 8(Suppl 2):P10.

The medio-lateral lenght difference at the :

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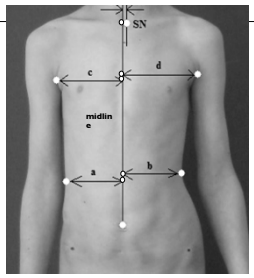

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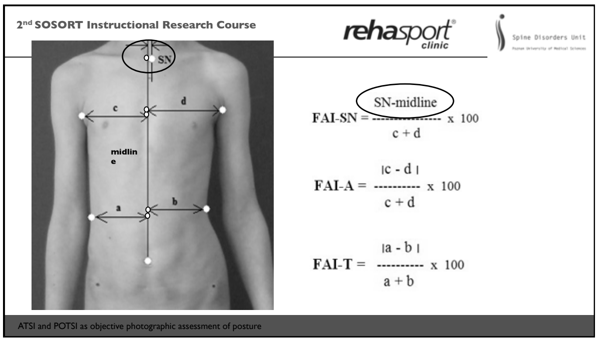
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SN
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SN-midline
FAI-SN = ---------------- x 100
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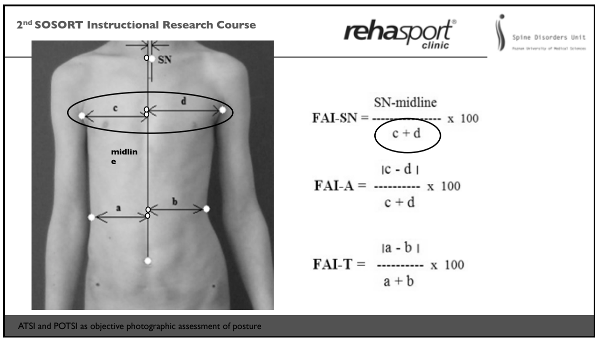
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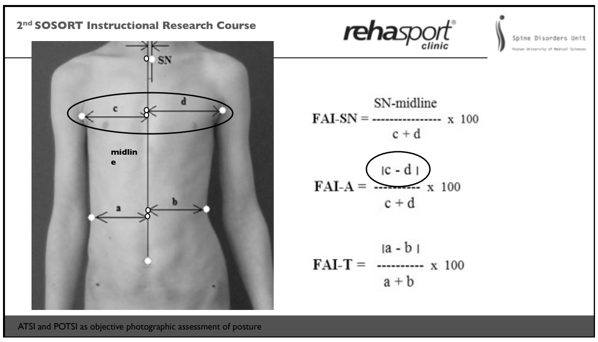
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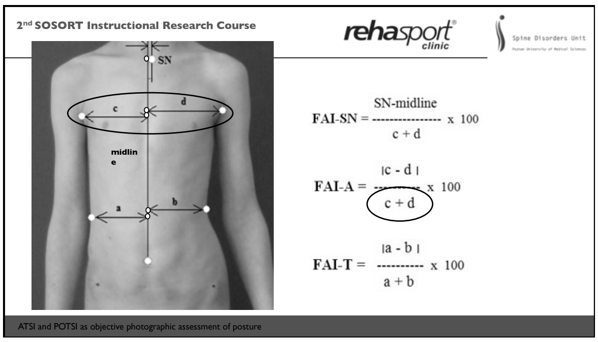
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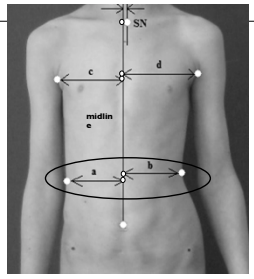

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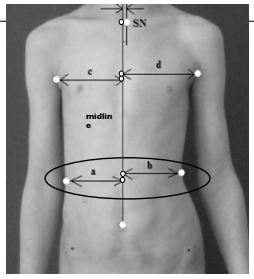

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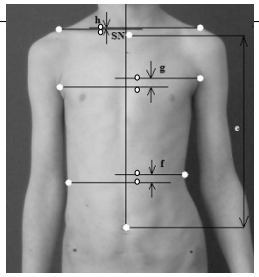

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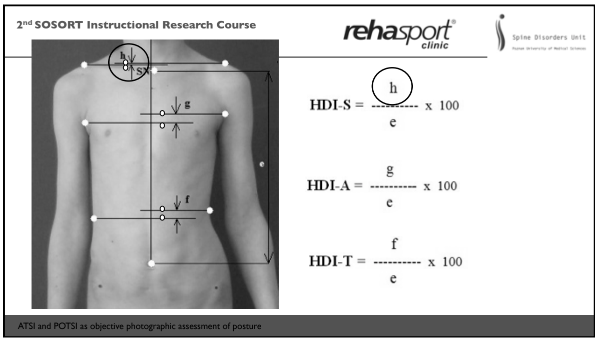
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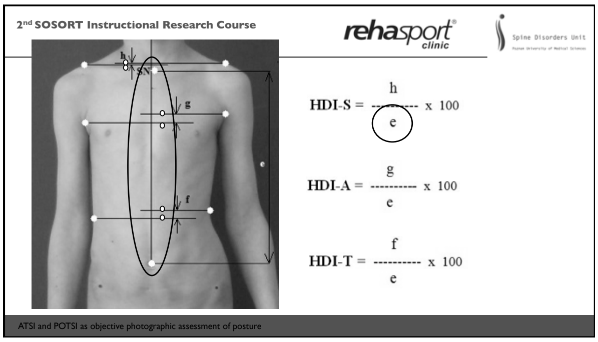
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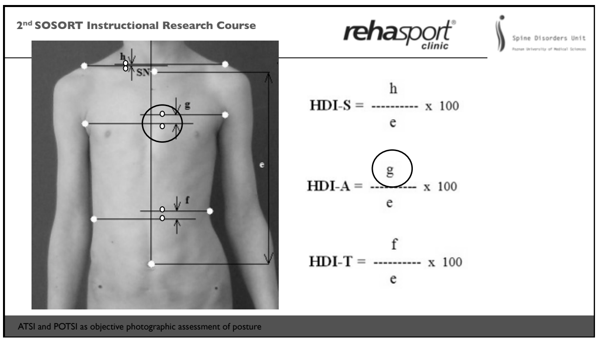
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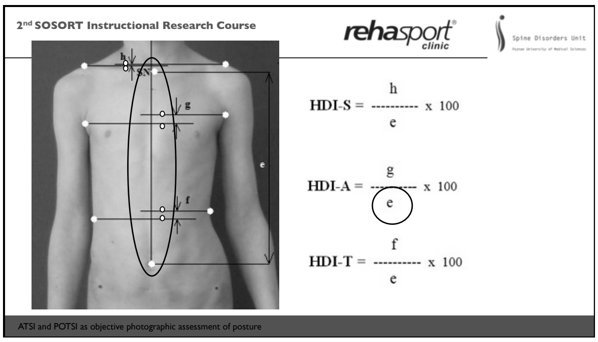
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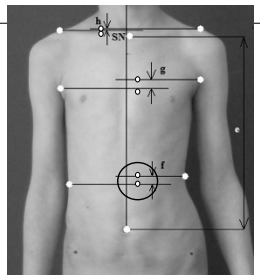

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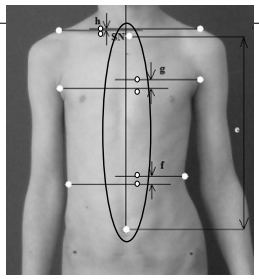

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How ATSI parameter

on the digital photos may be measured?

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software

ATSI and POTSI as objective photographic assessment of posture

Advantages of the use of ATSI and POTSI Indexes

- ✓ possibility to make a photograhic measurement with the use of mobile camera with standardized conditions for photographic documentation
- ✓ possibility of the use a simple digital camera for photographs
- ✓ use a tripod for good stability of digital camera

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Advantages of the use of ATSI and POTSI Indexes

- ✓ time for preparing a child for photographic measurements in two projections: front and back is about 3 minutes
- ✓ time for one index calculating (ATSI or POTSI) is about 3 minutes

ATSI and POTSI as objective photographic assessment of posture

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Advantages of the use of ATSI and POTSI Indexes

- ✓ The mean ATSI value 24.3. ±12.7 (n=421, aged 7-10 y)
- ✓ The intra-observer error 1.07
- ✓ The inter-observer error for the three observers 4.06

Stoliński L, Czaprowski D, Kozinoga M, Korbel K, Janusz P, Tyrakowski M, Kono K, Suzuki N, Kotwicki T: Analysis of Anterior Trunk Symmetry Index (ATSI) in healthy school children based on 2D digital photography: normal limits for age 7-10 years. Scoliosis 2013, 8(Suppl 2):P10

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Limitations of the use of ATSI and POTSI Indexes

- ✓ lack of marker points on the body before take a photo (C7 and SN)
- ✓ clinical usefulness of the ATSI parameter is still to be determined by undertaking studies on larger groups of healthy and scoliotic children at different age

Difficulties that may influence for photographic assessment:

- ✓ protraction of the shoulders

- ✓ head and gaze directed incorrect

Difficulties that may influence for photographic assessment:

- ✓ straight possition of the body

- ✓ hair covering the body contours

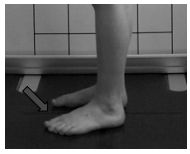
Difficulties that may influence for photographic assessment:

✓ brassiere or swimsuit with limited contact of the body and obscuring the trunk

Difficulties that may influence for photographic assessment:

✓ one-leg standing

✓ incorrect feet setting



Difficulties that may influence for photographic assessment:

✓ limited comunication with child

✓ no leveling of digital camera

Advantages of ATSI and POTSI Indexes

✓ Objectivization

✓ Non-invasive

✓ Low cost

✓ Reliability

✓ Simplicity

Advantages of ATSI and POTSI Indexes

- ✓ calculation of quantitative parameters (the actual results) and possibility to show the quantitative results for patient's parents
- ✓ compilation of medio-lateral height differences and lenght differences beetween left and right side ot the trunk

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Advantages of ATSI and POTSI Indexes

- ✓ digital documentation of the trunk
- ✓ low costs of equipment for photograpic measurement
- ✓ possibility to use in private practice

ATSI and POTSI as objective photographic assessment of posture

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ATSI and POTSI as objective photographic assessment of posture

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7th-9th May

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Thank you for attention

Łukasz Stoliński, MSc, PT

[1] Rehasport Clinic, Poznań, Poland
[2] Spine Disorders Unit, Department of Pediatric Orthopedics and Traumatology, University of Medical Sciences, Poznań, Poland
[3] Sport Secondary School Complex of John Paul II, Skierniewice, Poland

email: stolinskilukasz@op.pl

ATSI and POTSI as objective photographic assessment of posture