

# D'Oswaldo set for postural assessments

Before describing its content, we want to illustrate the purpose and importance of the project "Spine Leg Toolkit". The examination of the locomotor system concerns many professional figures, the orthopedist, physiotherapist, physiatrist, orthopedic technician, pediatrician, sports doctor, motor sciences doctors, just to mention the main ones: every professional has his own goals and objectives strategies but also many shared points.

List of tools contained in the suitcase called "Spine-Leg Tool kit":

1. Inclinometer
2. Arcometer
3. Postural caliber
4. Torsion meter
5. Iliac crests analyser
6. Delta leg N
7. Hindfoot goniometer
8. Foot size indicator
9. Goniometer



In particular, evaluating the alignment of the spine and lower limbs means first knowing the variability of the various parameters present in the population, age-related changes and finally the thresholds beyond which we can speak of anomalies or pathology. The mere observation is no longer sufficient: it gives us a first impression, qualitative data, too vague limits. Especially if we want to check a normal threshold, the trend over time or document the effectiveness of our therapeutic measures, we have absolute need for numbers, precise data. On the other hand, the daily use, in the surgery or in the gym, requires simple data, not bulky and above all non-invasive tools.

For this reason the "Spine Leg Toolkit" case has been designed, as an accurate choice of clinically tested tools to evaluate a high number of clinical interest parameters: frontal and sagittal compensation of the head and trunk, rotations on the transverse plane in static and in flexion, the sagittal curves, the heterometry of the lower limbs, the alignment and the foot length, together with joint angle measurement and analog scale ache. For the first time the professional finds what he needs all inside a single case, which, we are sure, will become an essential accessory.

## 05006

### SPINE-LEG TOOL KIT

It is a set of tools for non-invasive assessment of the locomotor system apparatus. The set is collected in one suitcase for convenient portability.

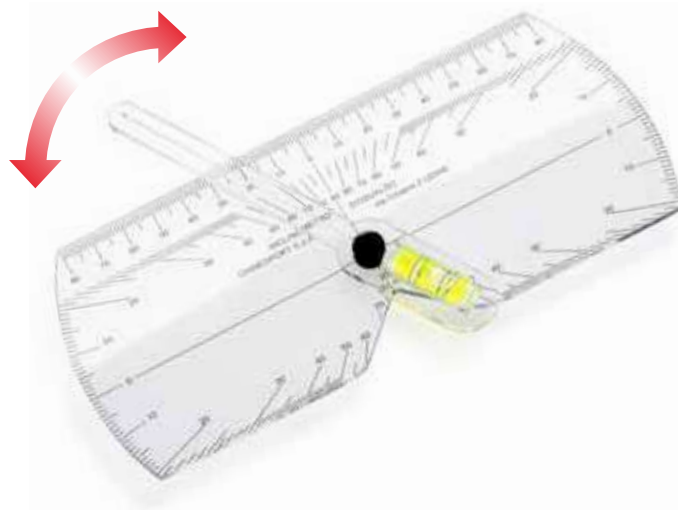
In its standard layout the set contains the following tools: inclinometer, arcometer, postural caliber, torsion meter, iliac crest analyser, delta-leg N, hindfoot goniometer, foot size indicator, goniometer.

## 06855 D'OSUALDO'S INCLINOMETER

D'Oswaldo's inclinometer is an original instrument that brings together two important functions: measuring the hump in antero-flexion (also called ATR: trunk rotation angle) in the patient with scoliosis and the measurement of the Cobb angle on radiographs; in this case can be used both in frontal curves (scoliosis) and in the sagittal plane curves (kyphosis and lordosis).

The inclinometer is composed of an almost-rectangular plexiglas element, bearing a protractor scale, and in its center there is fixed one small rod free to rotate around the same center and bearing one bubble; the free end of the rod bears the reading index for the scale protractor; the longer side of the rectangle has an indentation to make it easier to apply on the patient, in case of protruding thorns.

Dimensions: 19 x 8.5 x 1 h cm; Weight: 0.6 kg.



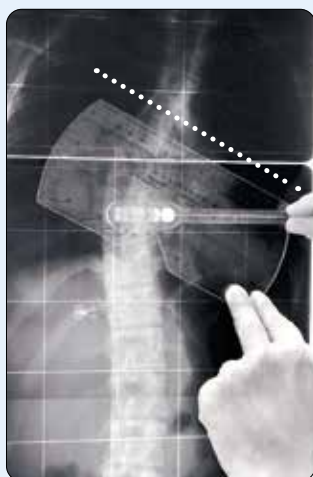
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### A simple measuring tool for the hump (trunk rotation angle) and for the Cobb corner

In **patient measurement** - standard position with patient on extended knees, flexed trunk, arms abandoned in front, the tool is placed gently on the back, the rod comes then rotated until it is "leveled"; the degree of inclination can be read immediately or even, unlike other tools, removing the instrument from the back and keeping the rod between the thumb and forefinger, thus allowing an even more precise reading. Scrolling along the back, from the thoracic to the lumbar tract, you can identify the most rotated section (s) and record its level.

In **radiographs measuring** the edge of the instrument comes next to the edge of the vertebra upper limit of the curve, the rod is then rotated until it is "leveled"; the degree of inclination is read on the protractor scale; the operation is then repeated for the lower limit vertebra. Cobb's angle is given by the sum of the angles of inclination of the two limit vertebrae. The inclinometer is also useful for the precise identification of the limit vertebrae, which are the most inclined.



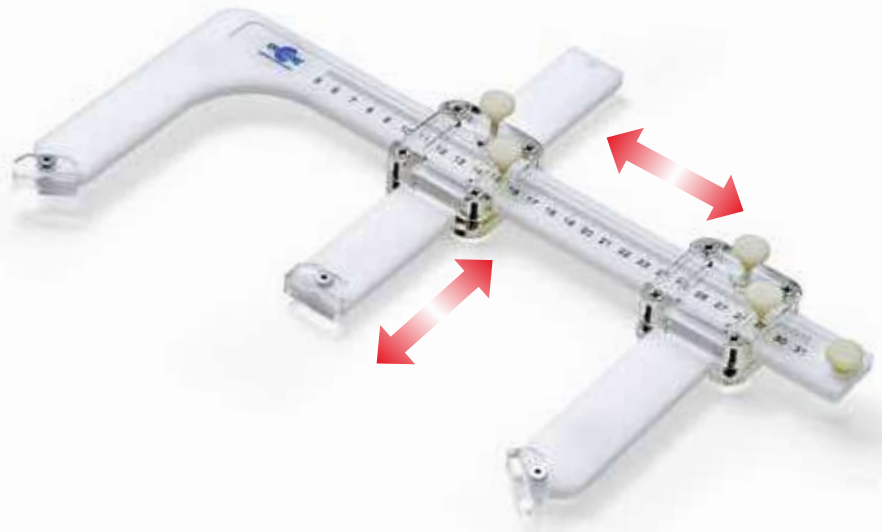
POSTURE ANALYSIS

# D'Oswaldo set for analysis of the back

## 05003 D'OSUALDO'S ARCOMETER

D'Oswaldo's arcometer is an original manual tool for measuring curves spine surface on the sagittal plane, kyphosis and lordosis. Consists of a millimeter bar on which there are orthogonally applied three rods: one fixed at one end, a movable intermediate on two axes and a third mobile on a single axis.

Dimensions: 35 x 21 x 4.5 h cm; Weight: 3.2 kg



### A precise tool for non-invasive measurement of kyphosis and lordosis

The principle behind the tool is the axiom that for three points only one circumference passes. The tool provides us with two data related to the tract of measured spine, approximated to an arc of circumference: the arrow and the rope. Starting from these two data we can obtain: the radius of curvature and the subtended angle, corresponding to the Cobb angle evaluated on the radiography.

The arcometer is a particularly useful tool as an integration to the clinical examination, screening for specialists, follow-up of the patient with curved back already radiographically evaluated: even if it does not replace radiographs, it helps to reduce their numbers. It also allows you to evaluate the subject both in spontaneous and self-correcting position, useful element for assessing the stiffness of the curve, for a judgment on the course and to evaluate the effectiveness of the kinesitherapy and / or orthotic treatment. The instrument is also equipped with a central rod with smaller diameter foot to allow the evaluation of the corset correction (by providing the dorsal pelota with a special hole).

#### TO FACILITATE THE CALCULATION

To measure kyphosis or lordosis, the arcometer is positioned with the side rods at the end of the curve. That value represents the rope. The central rod is brought to the medium point of this distance and therefore is approached to the back; her millimeter scale gives us the value of the arrow. The value of the Cobb angle and the radius one are obtained by a simple chart with two entrances which is supplied together with the tool.

## 05004 POSTURAL CALIBER

The long-arm caliber is a tool derived from the orthopedic technician laboratory, where it is used to release orthoses for the trunk and limbs.

With the addition of a sliding ring, where a plumb line is attached to, the caliber makes it possible the description of asymmetries of the trunk and decompensations on the frontal plane in numerical terms, therefore repeatable and comparable.

Dimensions: 60 x 23 x 3.5 h cm; Weight: 5.3 kg



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### A revisited tool for asymmetries measurement

If we only think of a case of lumbar scoliosis and try to describe the hips asymmetry in a report, we find ourselves in using more or less vague terms such as “moderate, evident, remarkable”, certainly not wrong but of little use for comparison.

In the context of a visit for the spine the caliber allows us to quantify the alignment asymmetries on the frontal plane and in particular to evaluate the movement of the head, of the upper trunk part or hips, with respect to the midline, taking for this purpose the inter-gluteal line or alternatively the bisector of the base.

A lateral shift of the midline of the head it's described by the term decompensation, a shift of the median line of the shoulders or hips is described as front, right or left translation respectively. This shift can be indicated in absolute values (cm) or better in percentage (% of translation) suggestable modality in progress for anthropometric changes affecting the trunk.

#### TO FACILITATE THE CALCULATION

To facilitate the calculation of the translation percentage it's available a simple two-entry chart along with the instrument. This tells us with a single number how much, in percentage, the center of the measured segment is displaced laterally than the theoretical center of symmetry. The formula used is the following:  $a - b / a + b\%$ , where as numerator appears hence the difference of the two segments defined on the instrument by plumb line, as denominator the sum of the same segments.

# D'Oswaldo set for analysis of the back

## 05002 TORSION METER

The D'Oswaldo-Corazza torsionmeter is an original manual instrument for measuring the rotation of the trunk in orthostatism.

Rotation, expression of the column torsion on the transverse plane, represents one of the main signs of true scoliosis. The torque meter it's made of an arched base, a vertical telescopic rod connected to the base and by a mobile element above it, also arched circumference, parallel to the base, provided with a scale in degrees.

The total absence of invasiveness and the practicality of use makes the torque meter an ideal tool for use in a specialist clinic (physiatric, orthopedic), in the gym physiotherapy and movement analysis, providing immediate information and at a negligible cost compared to computerized equipment otherwise necessary.

Dimensions: 16÷24 x 12 x 6 h cm; Weight: 1.5 kg



### A practical tool for measuring the trunk rotation in orthostatism

The evaluation of a subject with suspected scoliosis using a torque meter is carried out in a standing position. The basis of the tool is put to the sacrum; in this way a zero plane is defined as reference, with respect to which the alignment of the trunk on the transverse plane to the desired level will be read: from lumbar to middle back.

When the mobile element is placed against the back, it will slide into its housing by a corresponding number of degrees to the rotation of the trunk. An index on the housing indicates with precision degrees of rotation.

The tool is suitable for a diversified use:

- In standing position it accurately identifies a rotation of the trunk, one of the most sensitive clinical signs for identifying a true scoliosis;
- We can compare the static rotation with the rotation in anteroflexion (scoliometer, inclinometer) not always stackable and related data, but inaccurately, with vertebral torsion measured on radiography;
- In orthostatism or even in sitting position we can check for any change of rotation with a stretching exercise (information on defect reducibility);
- With a stabilized pelvis (preferably seated) we can evaluate the excursion of the trunk in an active rotation movement (articular range and symmetry of the excursion).

## 06830 ILIAC CRESTS ANALYSER

The instrument basically consists of a lever at which main bar, curved, two further articulated bars are applied. The curvature of the first bar is intended to adapt to the anatomy of the lumbar back passage, the lateral bars are drawn to lean on the iliac crests and will be more or less open depending on the size of the basin.

Dimensions: 34 x 8 x 2 h cm; Weight: 1.8 kg



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### An adaptive lever, still useful today

The bubble placed in the center of the main bar tells us essentially if the pelvis is levelled, when patient is positioned in orthostatism with load well distributed on the two lower limbs. Otherwise the operator will place one or more raises on the falling side, until the instrument will be levelled. At this point it will be possible to check the pelvis alignment and quantify the difference in length of the lower limbs. For this purpose, the raises kit 06730 can be useful.

Note that the evaluation of a difference in length of the lower limbs requires a lot of attention. Indeed mistakes are possible either for incorrect positioning of the subject but also for presence of anatomical variables, such as asymmetric skeletal pelvis, twisting of the lower limbs, laxity of one or more joints, musculotendinous retractions. To improve the evaluation accuracy it is therefore suggestable to use multiple measurements in different postures, now made possible by the different tools contained in this kit.



06810 PLUMB LINE

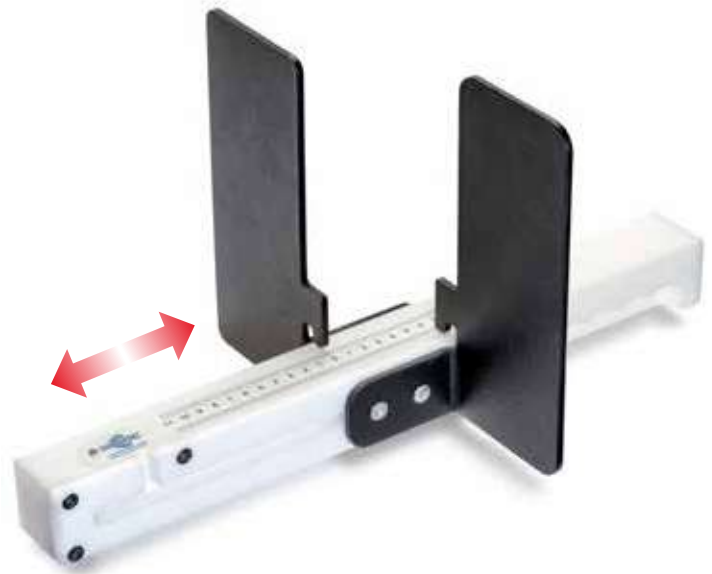
# D'Oswaldo set for analysis of lower limbs

## 05005 DELTA LEG N

The delta-leg is an original tool for lower limbs heterometry evaluation. It was designed to overcome the repeatability limits of traditional non-evaluation invasive methods, until now available, in particular the blocking method and the tape measure.

The tool consists of a bar on which two orthogonal platforms are applied: one is fixed and acts as a reference, the second is movable along the longitudinal axis of the bar and is equipped with a pointer which indicates the numerical value of the heterometry, positive or negative, on a millimeter scale placed on the surface top of the bar, with the "zero" value corresponding to the platform reference. In the carry-case version the instrument is equipped with removable footboards to reduce the footprint.

Dimensions: 45 x 25 x 22.5 h cm; Weight: 1.25 kg



### For measuring the length (heterometry) difference of the lower limbs

To measure, the patient is positioned supine and well aligned: head aligned with zenith nose, trunk aligned, lower limbs parallel with zenith positioned kneecaps. The operator therefore makes sure that the instrument has the longitudinal axis well aligned with the legs. Then he proceeds by placing the fixed platform next to the left foot, exerting moderate pressure to ensure good adhesion to the whole plant, and in particular to the heel. He approaches then the right, mobile platform, exerting equal pressure. The difference, on the millimeter scale, can be read at this point, or after removing the instrument (taking care not to alter the relation between the platforms). In case of retraction of the Achilles tendon we will only be able to measure functional heterometry.



#### Note

Heterometry can be measured with good accuracy with a series of rises and a subject levelled in anteroflexion: the  $\frac{1}{2}$  cm rises are added one after the other until the level positioned on the sacred will be in bubble. Many subjects however, especially males, present a retraction of the hamstrings which makes impossible one complete trunk flexion and therefore measurement. For these cases supine discharge assessment is essential. Another method, frequently used but less precise, involves the tape measure, with reference to the anterior iliac spine and a malleolus.

## 06730 SET OF RAISES

The set consists of seven elevations, one of 0.5 cm high and other six of 1 cm each.



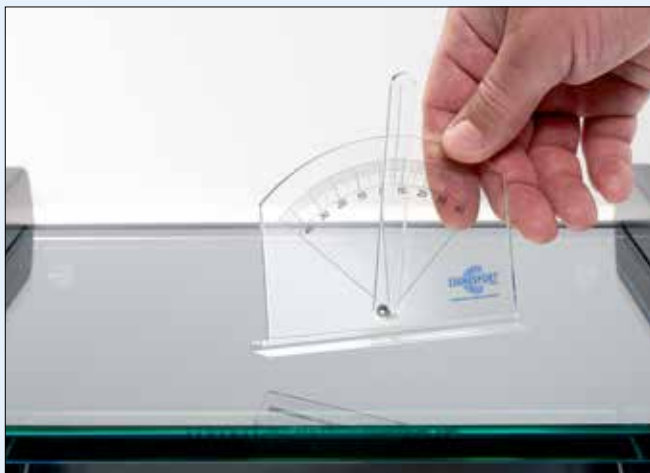
## 02049 HINDFOOT GONIOMETER

The hindfoot goniometer is a small, simple and intuitive tool designed to measure the alignment of the baby's hind foot, but also useful in adults. It consists of a plexiglass polygon bearing a staircase protractor, a rotating pointer and a foot that keeps it vertical.

Dimensions: 10 x 3 x 10.5 h cm; Weight: 0.5 kg



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### A simple tool for objective hindfoot axis evaluation

To collect measurement, the instrument is brought close to the hindfoot, with the examined patient in static position, preferably on a plane raised above the floor to facilitate the reading. The pointer is oriented parallel to the hindfoot axis and the value of valgus or of varism is immediately readable in degrees.

Normality limits cannot be indicated absolutely, since they may vary according to age and loading methods (mono or bipodalic) and the scientific literature itself provides heterogeneous values. However in the child it can be roughly indicated as a threshold of attention, a valgus superior than 8-10 °, any varism value and significant asymmetries between the two sides.

In doubtful cases it is not much the absolute value but rather the trend over time that can guide us for a physiological or pathological situation. For this purpose the tool, for its ease of use, is particularly useful by allowing repeated measurements at longer or shorter intervals. This is particularly valid in the young child, where the laxity of the ligamentous structures frequently involves major deviations in valgus of the hindfoot, while loaded, however usually progressive improvement are noticed with growth. Even the difference in value of the hindfoot angle in monopodalic load compared to the bipodalic one, could provide clinicians with important information.



# D'Oswaldo set for analysis of lower limbs

## 05001 FOOT SIZE INDICATOR

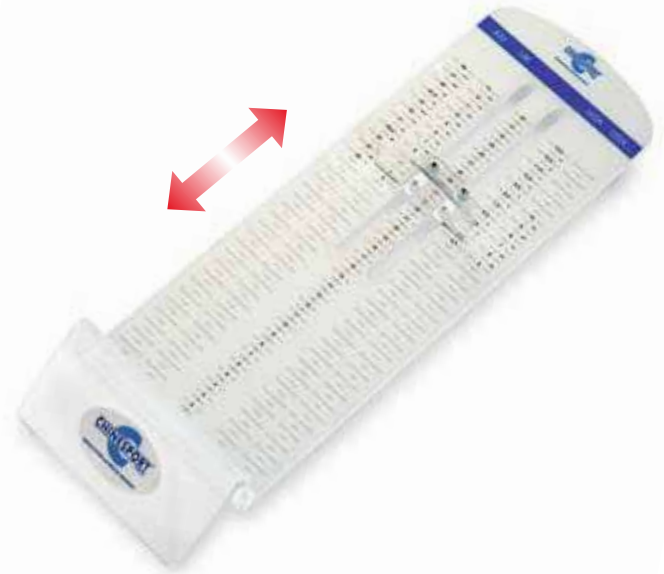
Foot length measuring devices are present on the market since time however their use has rarely come out the orthopedic technician laboratory.

This tool has been inserted in the "Spine Leg Toolkit" case because in the evaluation of the musculoskeletal system, during growth, it can provide with important information, often underestimated. The most interesting period is the pre-adolescence and adolescence.

The foot meter gives us the length of the foot, collected in load, in centimeters, but it is not so much the absolute value that is of interest.

In fact, the foot in pre-adolescence has an acceleration phase that precedes of one or two years the stature, therefore a rapid change in foot length will be an important information to understand when the height will begin to accelerate, as well as its braking phase will therefore anticipate the end of the statutory growth.

Dimensions: 45 x 14 x 6 h cm; Weight: 5 kg



## An ancient tool for collecting new information

On a first visit, often information on growth foot is not available and in this case we can enhance the foot / height comparison. In fact, a high comparison, over 16, 16.5%, will indicate a phase of acceleration of the foot and therefore one initial pubertal development. A low comparison, less than 15% in one teenager with secondary sexual characteristics, already mature, will tell that we are in a phase where the height growth is slowing down.

It should certainly be taken into account the variability present in the population: there are small people with long feet and vice versa, however for the clinician who has to take important decisions, also the foot growth speed value and the comparison between foot & height, have an important value, near all other anamnestic data and secondary sexual characteristics, equally variable.

## 06061

### FOOT MORPHOLOGY POSTER

It is a plastic poster with matt anti-reflect surface. In particular there are shown the three different degrees of the hollow foot and flat feet. Edition only in Italian.

Dimensions:  
66.5 x 48 h cm.



Anatomical models of the three different types of foot, normal (M30), flat (M31) and cavus (M32).

Dimensions: 13 x 24 x 10 h cm; Weight: 0.4 kg.

**M30** NORMAL FOOT

**M31** FLAT FOOT

**M32** CAVUS FOOT

## 05000 GONIOMETER

The algo-goniometer contained in the "Spine Leg Toolkit" case brings together in one instrument two important functions that have been intentionally associated for their frequent concomitance: joint examination and pain assessment.

The joint examination represents a fundamental step in the evaluation of the musculoskeletal system at any age and acquires particular importance after a trauma, orthopedic interventions, inflammatory pathologies or degenerative joints, allowing to document both the spontaneous trend over time and the effectiveness of the therapeutic measures. The tool is then indispensable where there is need to correctly position an adjustable orthosis.

Dimensions: 20.5 x 4.5 x 2 h cm; Weight: 1.4 kg



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### A classic, always essential tool

Pain assessment is recognized today as an obligation for each user who is taken in charge and its documentation represents an essential standard for every healthcare facility.

The instrument presented here has a double scale: the method of smileys (Wong Baker) for the child from 3 years and the VAS scale (visual-analogue scale) from 8 years onwards.

In the first one, the choice is made from a series of smiley faces with different expressions, in the second a cursor indicates the score along a graduated scale from 1 to 10.

The pain scale usually depends on the user and, subsequently, at shorter or longer intervals depending on the problem, acute or chronic.





# SPINE PATH

Your support in evaluation of idiopathic scoliosis

## PATIENT CARD

Complete the patient's evaluation form and begin your process with Spinepath

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## THE PROCEDURE

Follow the instructions of the algorithm to get the evaluation of your patient

[DISCOVER MORE >>](#)

## SPINE PATH PROJECT

The Spine-Path procedure has been developed to help clinicians dealing with adolescents affected by idiopathic scoliosis during their evaluation and clinical decision-making process. This document is meant to help, not to replace, the clinician's analysis. The procedure has to be a guide and not a diagnostic device used without a specific clinician's evaluation. The Spine-Path procedure has been specifically developed for children and adolescents aged 9-15 with suspected scoliosis. Although idiopathic scoliosis is the most common type of spine deformity, its diagnosis is still made by exclusion

## PROCEDURE

Who is Spine Path for?

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The Spine-Path procedure has been specifically developed for children and adolescents aged 9-15 with suspected scoliosis

Although idiopathic scoliosis is the most common type of spine deformity, its diagnosis is still made by exclusion. The first medical examination of an adolescent with suspected scoliosis consists of a detailed personal and family medical history, a physical examination to exclude associated symptoms or other underlying conditions, the spine alignment and mobility evaluation on all planes, the collection of any aurological information at disposal.

## CLINICAL TIPS

Aim and limits of the procedure

### ● INFORMATION FOR THE CLINICAL EXAMINATION

#### ● THE ANGLE OF TRUNK ROTATION

#### ● LEG LENGTH DISCREPANCY (LLD)

#### ● QUANTIFYING ROTATION

#### ● EVALUATING GROWTH AND DEVELOPMENT

#### ● ADDITIONAL CLINICAL ELEMENTS

#### ● RADIOGRAPHS

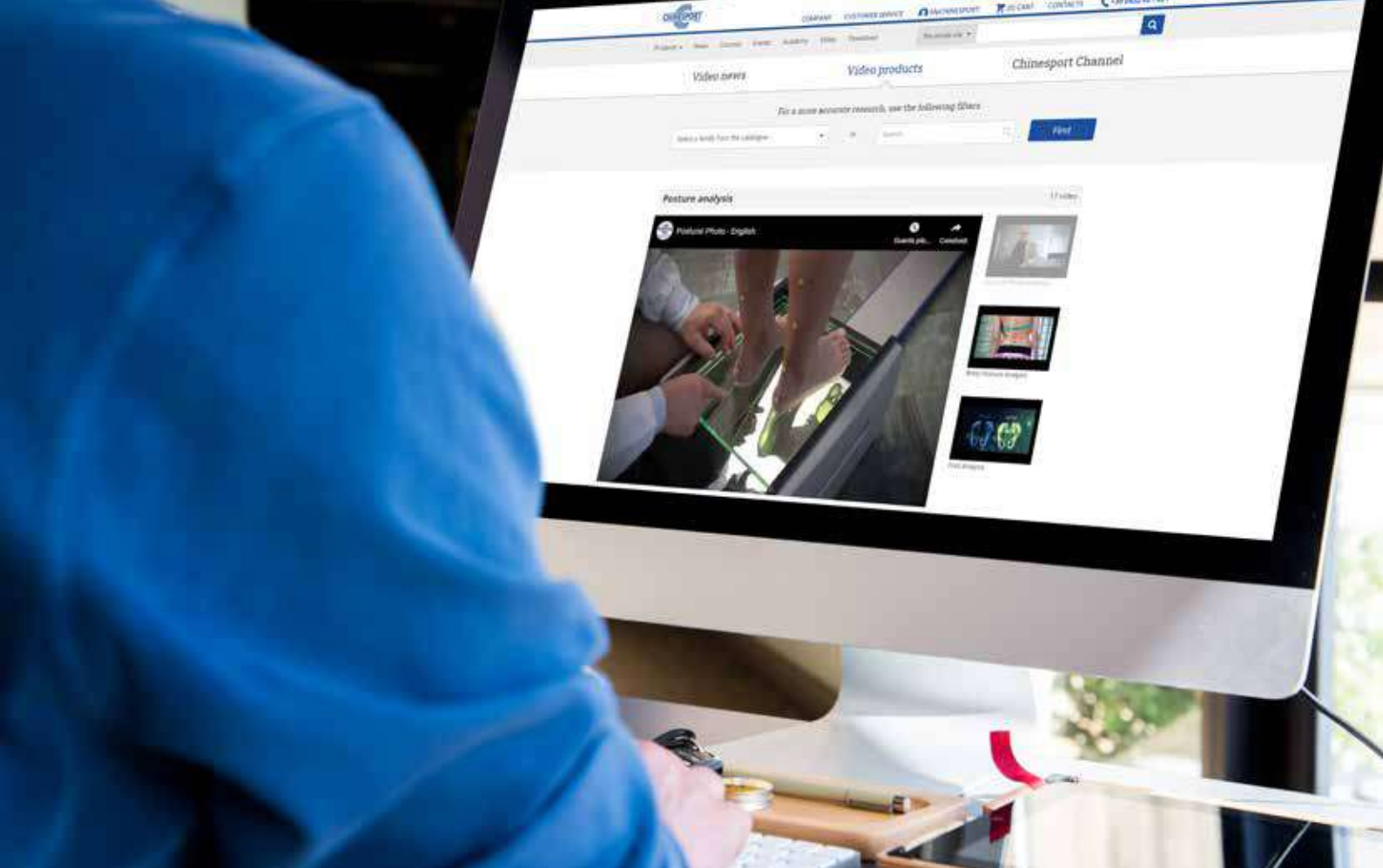
#### ● BRACE PRESCRIPTION

#### ● THE FOLLOW-UP EXAMINATION

#### ● ORTHOPAEDIC EXAMINATION

During the medical examination boys should wear only their pants whereas girls should wear only their bra and underwear. The examination usually starts observing the patient standing with parallel feet. The clinician looks for asymmetries on the frontal plane observing shoulder, hip, head and spine alignment. The above mentioned elements are important to complete the clinical examination but are of uncertain clinical interpretation.

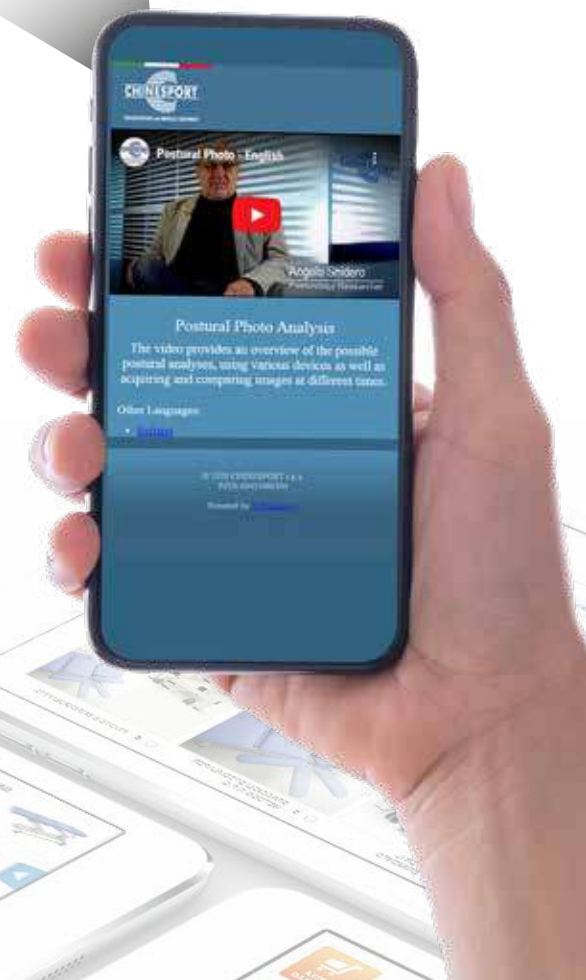
If spine asymmetries are noticed, the clinician has to verify whether the patient is affected by scoliosis or functional scoliosis asking the patient to bend forward and noticing if trunk asymmetries or any abnormal spinal curvatures are present. The spine evaluation always includes the observation of dorsal kyphosis and lumbar lordosis on the sagittal plane. Their degree can be easily quantified using an arcometer but the present algorithm does not include any specific cut-off value for them. Sometimes, however, they play an important role during the clinical decision-making process.



Chinesport's website has also been designed and set up for those using mobile phones or iPads, not necessarily because they are out-and-about or travelling, but because they wish to know more about it while using our catalogue or other documentation. We are constantly involved in publishing new detailed information, photos (now even bigger), videos and multimedia files that are worth sharing.



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Chinesport is based in Udine, Italy, between the Alps and Venice. For over 40 years we have been dedicated to healthy posture for healthy movement. The root of our company name refers to the Italian word “chinesiterapia”, or movement therapy. We strongly believe and adhere to “movement culture” as a way to prevent and cure injury and disease.

Today we are a global leader in developing and manufacturing rehabilitation equipment and assistive devices. We have excellent and long-standing business relationships in almost 80 countries worldwide. The Chinesport general product catalogue contains over 1.000 innovative, high-quality products. New catalogue editions that include the latest product innovations and trends are regularly published. Our own medical-scientific training and educational program is continuously expanding and caters for all specialised rehabilitation fields. As an organisation, we have been working with a certified quality management system and in compliance with international ISO 9001 and ISO 13485 standards since 1998.



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