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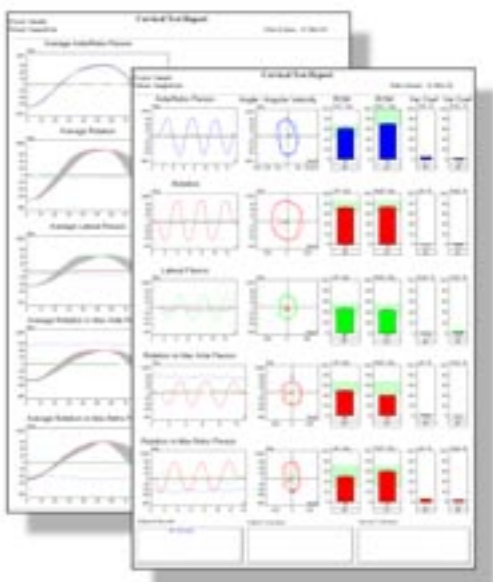
# Determining the Posture, Shape and Mobility of the Spine



# Assessment of the Mobility Function



Using a special Triple Cervical marker set comprising miniature ultrasound transmitters, functional tests can be carried out simply and quickly on the cervical spine. A measuring sensor attached to a mount receives the ultrasound pulses via a microphone and transmits the results to the main unit.



The measuring system permits an objective analysis of the movement sequence of the entire cervical and lumbar spine. During the measuring procedure the patient carries out uniform movements up to a maximum motional extent. The Report on the results shows the Range of Motion (RoM) in the directions of movement, i.e. flexion/extension, rotation and lateral flexion, in clearly displayed mobility bar charts, together with the respective normal ranges.



The movement of the cervical and lumbar spine is clearly demonstrated using an animated skeleton model.

# of the Cervical and Lumbar Spine

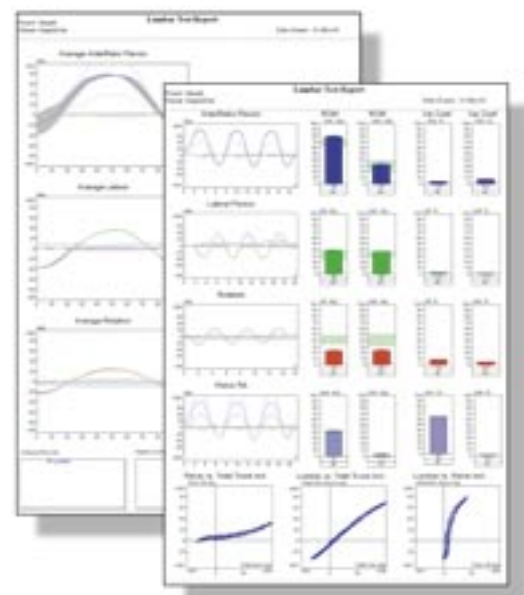


For analyzing the muscular activity at the same time, the zebris EMG radio adapter system can be used. This cordless radio adapter is fitted with eight analog inputs, four digital inputs, an infrared interface and an output for direct connection to a USB via a special adapter.



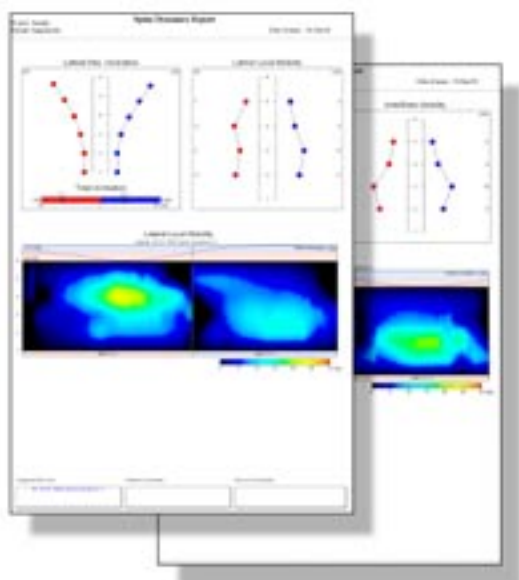
The quality of the movement carried out is displayed in phase diagrams, taking the speed of the movement into account. The patient's ability to reproduce movements or movement restrictions, becomes clear in the variability coefficient. Besides the mobility, the lumbar spine analysis includes the movement coordination between the hip joint and the lumbar spine.

The Reports on the analysis of the cervical and lumbar spine show the extent of the movement, deviating movements, and the variability and coordination of the movement. The normal ranges of the RoM are shown against a colored background.



# Investigation of the Mobility with Individual Markers.

Small, flat ultrasound markers are stuck onto the skin down the patient's back, on the sacrum and the lumbar spine.



In the Report the approximate intersegmental mobility and coordination of the spinal and pelvic movement are presented, that derive from the individual markers.



The measuring system permits indications for the diagnosis, severity of a handicap, progress in the course of the therapy, and also for the patient's capacity under stress. The patient carries out movements with a maximum sideways and forward inclination. Together with the surrounding soft tissues, the spine transmits a motion pattern to the body surface markers. Besides deriving the intersegmental mobility, the mobility coordination provides important information for evaluating the functional condition.

# Objective Determination of the Shape of the Back

The zebris motion analysis systems offer the possibility for static spinal and back measurement. Using an ultrasound probe, defined skeleton reference points are scanned and displayed on a PC.



The Report provides information on the positioning of the back contour on the sagittal, frontal and horizontal plane. Further output parameters are: kyphosis of the thoracic spine, lordosis of the lumbar vertebral column, inclination of the upper body, the sacral angle, pelvic and shoulder obliquity, lateral scoliosis, and mobility of the pelvis and spine.



The measuring systems enable the objective assessment of the individual statics in 3D. The documentation of the posture typology is carried out in such a way that it can be clearly visualized and understood by the patient. It is therefore also particularly suitable for a patient commencing and keeping to a posture training on his own.

# System Components



Triple Cervical Set TCS head attachment set and reference marker with triple markers for cervical spine measurement, reference marker (no picture).



Measuring unit CMS10 with floor stand



Ultrasonic Pointer PS33-1 and reference marker PR1 for back measurement



Triple Lumbar Set TLS attachment set with triple markers for the motion analysis of all degrees of freedom of the lumbar spine



Ultrasonic single markers



Wireless Bluetooth DAB for measuring the muscle activity

# Further zebris systems



The FDM-S measuring system  
for stance and roll-off analysis

