

# Examination of the mobility of the spine

The Spine is part of the axial skeleton of vertebrates, it consists of individual vertebrae that are connected to each other firmly but moveably.

## Connection on the spine

We distinguish three types of connection on the backbone:

- **cartilaginous joints** - synchondroses columnae vertebralis - disci intervertebrales;
- **ligamentous joints** - syndesmoses columnae vertebralis - long and short ligaments;
- **articular joints** - articulationes columnae vertebralis - joints between the processus articulares of adjacent vertebrae, craniovertebral joints - joints and ligaments connecting the occipital bone to the atlas and axis.

## Mobility of the spine

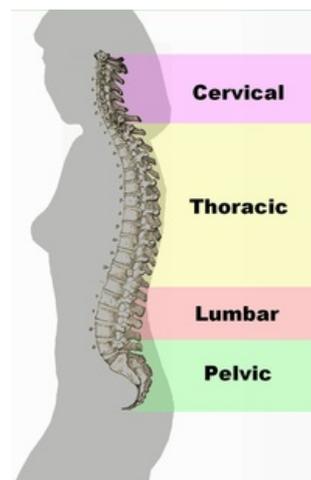
The mobility in the presacral region is determined by the sum of the mobility between the individual vertebrae. Its range is influenced by the height of the intervertebral discs (direct proportion), the shape and inclination of the spines of the vertebra and the shape of the joint surfaces.

Among the movements of the spine we rank

1. **anteflexi** (lean forward) and **retroflexi** (lean back)
2. **lateroflexion** (bows)
3. **rotation, torsion** (rotation)
4. **circular movements** - combination of flexion, extension and lateroflexion

Individual sections of the spine differ in mobility:

Spine section	FL	EXT	LATFL	ROT
C p.'	30°-35°	80°-90°	35°-40°	45°-50°
Th p.'	35°-40°	20°-25°	20°-25°	25°-35°
L p.	55°-60°	30°-35°	20°-30°	5°



## Spine Orientation

During retroflexion of the cervical spine, we place 2 fingers on the adjacent spines of the C-Th transition region: during this maneuver, the C6 spine moves forward so that it escapes under the palpating finger, while the C7 spine remains in place. [1] The C7 vertebra may not always be the most forgiving! To delineate the presacral part of the spine, palpation of the spine of the L5 vertebra - the last spine that moves during forward and backward bending - is used. We can also find it by connecting both spinae iliacae posteriores superiores - where the connecting line crosses the spine, the L5 spine is located.

## Self examination of spinal mobility

For most tests, we assume the starting position in an upright back position, if this is not the case, it is noted in the testing.

### Schober distance

The distance that shows the development of the lumbar spine. From the L5 spine, we measure 10 cm cranially in adults and 5 cm cranially in children, both points can be marked with a dermograph. After the measurement, the examinee leans forward, with a healthy spine, the distance between the two points should be increased to 14 cm for adults and 7.5 cm for children. Some authors report a measurement from the spine of the S1 vertebra together with an extension of the distance from 10 to 15 cm.

File:Shober's test.png  
Shober's test

### Stibor's distance

The Stibor distance shows us the development of the thoracic and lumbar spine. The starting point is again the spine of the L5 vertebra (S1), the second point is the spine of the C7 vertebra - we measure the distance between them and observe its change during relaxed forward bending. A healthy spine should lengthen by 7-10 cm.

### Forestier's Fleche

Forestier's fleche, or the perpendicular distance of the protuberant occipitalis externa from the wall. It can be measured while standing or lying down and is detected with "forward head posture" and with increased thoracic kyphosis. It should be 0 when standing with your knees bent and your head touching the back of your head against the wall.

### **Chepojev's (Čepoj's) distance**

Čepoj's distance assesses the range of motion in the cervical spine into flexion. We find the spine of the C7 vertebra and measure 8 cm cranially from it, with maximum forward bending the measured distance increases by at least 2.5-3 cm.

### **Otto's Inclination Distance**

Otto's inclination distance measures the mobility of the thoracic spine during forward bending. The starting point is again the spine of the C7 vertebra, from which we measure 30 cm caudally. The distance of the points shown increases by at least 3.5 cm with forward tilt.

### **Otto's reclination distance**

Otto's recline distance measures the mobility of the thoracic spine when leaning. The second point is again 30 cm away from the initial spine of the C7 vertebra, the distance decreases by 2.5 cm when leaning. The sum of both Otto distances gives the index of sagittal mobility of the thoracic spine.

### **Thomayer distance**

The Thomayer distance, sometimes referred to as the simple forward bend test, displays and non-specifically assesses the mobility of the entire spine. It consists in a forward bend performed from a standing position, when the distance of the third finger from the mat is measured in the most extreme position. We consider the touch of the fingers to be a normal result, we tolerate a distance of up to 10 cm, over 30 cm it is already a clear pathology. During the test, we must pay attention to certain distortions - the movement can be compensated by movement in the hips or, on the contrary, limited due to the shortening of the knee flexors (the patient bends the knees and feels pain in the popliteal fossa). In addition to hypomobility, the test can also detect marked hypermobility, when the patient touches the pad with the entire palm or the forearm (this is already considered a very significant ligament disorder). Increased ligament laxity and therefore a positive examination of hypermobility is more common in women.

### **Lateroflexion**

The bowing test is only indicative and provides information on the symmetry and range of bowing. While standing with your back against the wall, your arms are along your body with your palms facing your body. The examinee bows and we mark with a point the distance reached by the longest finger.

## **Links**

### **References**

1.



### **References**

1. LEWIT, Karel. *Manipulační léčba v myoskeletální medicíně*. 5. vydání. Sdělovací technika, 2015. 418 s. ISBN 9788086645049.

### **Použitá literatura[upravit | editovat zdroj]**

- KOLÁŘ, Pavel, et al. *Rehabilitace v klinické praxi*. 1. vydání. Praha : Galén, 2010. 713 s. ISBN 978-80-7262-657-1.
- HALADOVÁ, Eva a Ludmila NECHVÁTALOVÁ. *Vyšetřovací metody hybného systému*. 3. vydání. Brno : Národní centrum ošetrovatelství a nelékařských zdravotnických oborů, 2010. ISBN 978-80-7013-516-7.
- ČIHÁK, Radomír a Miloš GRIM. *Anatomie 1*. 3. vydání. Praha : Grada, 2011. 534 s. ISBN 978-80-247-3817-8.