



**DIAGNOSIS AND THERAPY**  
**JOINTS OF THE SPINE AND PELVIS**

## CERVICAL SPINE

### ORIENTATION EXAMINATION OF THE C SPINE WITH PASSIVE FUNCTIONAL MOVEMENTS



At anteflexion examination the therapist fixes the chest in the sternum area with one hand. With the other hand, placed on the top of the patient's head, he guides the movement. The chin goes into the fossa jugularis.

At retroflex examination the therapist stands next to the patient. One hand fixes the CTh transition. With the other hand, placed on the patient's forehead, he slowly leads the movement into a bend.

At examination of lateroflexion the therapist stands behind the seated patient. One hand fixes the shoulder on the side of the bow. With the other hand, placed on the patient's temple, he guides the movement.

At examination of rotation the therapist stands behind the seated patient. Rotation is investigated in four positions:

1. In an upright position: The therapist fixes the shoulder from which he turns his head and watches how brings the chin far closer to the shoulder joint. In the final phase, he verifies the movement in the atlas – occiput segment (**AO**) by gentle suspension. During the examination, it is necessary to maintain an upright position of the cervical spine.
2. In the maximum forward bend: The therapist fixes both shoulders of the examinee with his forearms. She grabs his chin with one hand, her other hand rests on the headboard. Both hands will passively rotate to their side. In this position, rotational movement takes place mainly in the atlas – axis segment (**AA or C1-2**). If rotation is limited or painful, we assume dysfunction of this segment.
3. In the maximum forward swing (i.e. bending the head forward against the upright cervical spine): We are moving forward as in the previous case. We make sure to maintain a true forward swing throughout the movement. In this examination, we are focused on the segment **C2-3**.
4. In back (extension): The position of the subject is the same as in the previous case. The therapist will state C spine with both hands in an arch – when performing a passive rotation, his arms are crossed. This means that the hand that is on the head is pushing the head apart and at the same time the hand on the chin is pushing the chin apart (eg the therapist's left hand on the chin rotates the head to the right). In this position we examine the segments **C3-4** and below.



### ATLANTOOCIPITAL JOINT (C0-1) – ANTEFLEXION

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** He stands at the patient's head.

**Execution:** The therapist places the patient's head on his palm and the fork formed by the thumb and forefinger of this hand is just below the skull. The back of the fixing hand must lie on the couch. The other hand is placed on the patient's forehead (fingers go over the eyes and avoid the nose) and anteflexes the head against the erect cervical spine. The movement is also helped by the lower hand – the patient's chin approaches the neck.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The pressure of the upper hand is directed directly to the couch, not rotationally. The therapist neglects to make the forward bend against the upright C-spine and flexes the entire cervical spine.



### ATLANTOOCIPITAL JOINT (C0-1) – RETROFLEX

**Patient position:** He (she) is lying on their back, their head is off the table.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist, on the rotation side, places the patient's head on his forearm and reaches under the chin with his hand. On the opposite side, he places his thumb on the upper jaw towards the ear – the edge of the hand (the index finger) is just above the cervicocranial transition on the skull. Then the therapist rotates the patient's head by 25-30°, (maximum 45°), thus "locking" the C1-2 segment. Subsequently, he bends his head against the upright cervical spine – the index finger forms the hypomochlion.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** A breath.

**Relaxation:** Exhale.

**The most common mistakes:** The head is in too much rotation. The therapist neglects to make the bend against the upright C-spine and performs full cervical spine extension.



### ATLANTOOCIPITAL JOINT (C0-1) – LATEROFLEXION I

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist places his hands on the patient's temples and cheeks and rotates his head more than 25-30° (maximum 45°), thus "locking" the C1-2 segment. Then he bends his head against the erect cervical spine towards the chest – he lifts his head off the couch and the thumb forms a hypomochlion.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** A breath.

**Relaxation:** Exhale.

**The most common mistakes:** The head is in too much rotation. The therapist does not ensure that the bow is performed against an upright C spine. The therapist performs the suspension with too much force.



### ATLANTOOCIPITAL JOINT (C0-1) – LATEROFLEXION II

**Patient position:** He (she) is lying on their back, their head is off the table.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist, on the rotation side, places the patient's head on his forearm and reaches under the chin with his hand. On the opposite side, he places his thumb on the lower jaw and his fingers on the head. He then rotates the patient's head by more than 25-30° (maximum 45°), thus "locking" the C1-2 segment. Subsequently, he bends his head against the erect cervical spine towards the chest – he lifts his head from the couch and the thumb forms a hypomochlion.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** A breath.

**Relaxation:** Exhale.

**The most common mistakes:** The head is in too much rotation. The therapist does not ensure that the bow is performed against an upright C spine. The therapist performs the suspension with too much force.

**C1-2 – LATEROFLEXION**

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist places his hands on the temples and cheeks of the patient, the thumbs are placed on the lower jaw (it is better to have the hand a little lower on the planned side of the bow). The therapist then performs a head tilt against the upright cervical spine. Holds the position in pretension and detects if the bow increases during inhalation or exhalation.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** If the segment relaxes into inspiration, there is no activation. If the segment is releasing into exhalation, then a deep breath is used to activate it.

**Relaxation:** Slow inhale while relaxing into the inhale, exhale in the opposite case.

**The most common mistakes:** The therapist does not ensure that the bow is performed against an upright C spine.

**SEGMENTS C2-3 TO C5-6 – ROTATION**

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** During the examination, the therapist places one hand flat with the thumb and forefinger on the C2 arch. The last joint of the thumb must reach the lateral part of the neck – the transverse process of the vertebra. Thumb pressure is gentle, not fixation. The rotation is performed with the other hand by pressing on the chin, towards the thumb of the hand on the neck. With a physiological finding after rotation of 20-30 degrees, the therapist can feel an increase in the pressure of the transverse process in the thumb. He stops the movement and moves his fingers a vertebra lower. He slowly increases the rotation and waits for the "impact" (touch) of the thumb projection and stops the movement again. If there is minimal or no rotation, this is a blockage of the relevant segment. It is examined to the C5-6 segment.

During therapy, the position of the hand is identical to the examination. Only the pressure with which the hand fixes the lower vertebra of the segment will increase.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** Eye gaze to the side – against the direction of mobilization, breath. Resistance to automatic rotation of the head by the hands of the therapist.

**Relaxation:** Eye gaze in the direction of mobilization, exhalation.

**The most common mistakes:** The therapist tries to fix the vertebra and does not respect the first touch of the projection under the thumb. If the therapist continues to rotate, they can see the thumb move dorsally, which is pushed by the rotating vertebra. The therapist does not hold the C spine in an upright position. In therapy, the therapist uses greater force in both resistance and mobilization.

**SEGMENTS C0-1 AND C2-3 TO C5-6 – VENTRO-DORSAL DISPLACEMENT**

**Patient position:** He (she) is sitting on the edge of the deck chair.

**Position of the therapist:** He (she) stands next to the patient.

**Execution:** The therapist grasps the patient's head so that the elbow socket is on the forehead and the little finger is placed on the arch of the upper vertebra of the segment. With the other hand, he fixes the arch of the lower vertebra of the segment between the thumb and forefinger. The pressure of the arm and forearm on the head pushes the head and C spine up to the upper vertebra of the segment dorsally.

**Technique:** Diagnostic and therapeutic, repetitive mobilization technique.

**The most common mistakes:** The position of the examined segment should not be in lordosis, otherwise we perform extension and not displacement. It is necessary to straighten the C spine – this can be achieved, especially in the upper segments, by positioning the patient's head in a slight forward bend.

**Note:** Correct fixation of the C2 arch is necessary for examination of the C0-1 segment. Examination of the C1-2 segment is not possible due to the existence of the dens axis.

**SEGMENTS C2-3 to C5-6 – LATEROLATERAL DISPLACEMENT**

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist grasps the patient's head between the arm and forearm. The cubital fossa is approximately at the level of the ear and the little finger is attached from the lateral side on the upper vertebra of the examined segment. With the other hand, he fixes the transverse process of the lower vertebra with the radial edge of the index finger, the other fingers are placed on the neck. By applying arm and forearm pressure to the head, the therapist pushes the head and C-spine up to the upper vertebra of the segment laterally into pretension.

**Technique:** Diagnostic and therapeutic, repetitive mobilization technique.

**The most common mistakes:** The movement is done into lateroflexion, not displacement.

**Note:** Due to the anatomical arrangement, it is not possible to examine segments C0-1 and C1-2.

### SEGMENTS C2-3 TO C5-6 – LATEROFLEXION

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist places his hand on the patient's cheek and temple on one side, the thumb is on the lower jaw. The hand on the bowing side is on the lateral side of the neck and the radial edge of the index finger creates a hypomochlion at the level of the lower vertebra of the examined segment. The therapist bends the head and cervical spine up to the index finger. The spine under the examined segment must be upright.

**Technique:** Diagnostic and therapeutic, PIR technique.

**Activation:** Eye look up, breath.

**Relaxation:** Eyes down, exhale.

**The most common mistakes:** The therapist does not ensure that the bow is performed against an upright C spine.

**Note:** If the patient reacts according to "Gaymans rules", then for even segments (C2-3, C4-5) proceed according to the previous description. For odd-numbered segments (C3-4, C5-6), the procedure is the opposite – during activation, the patient exhales slowly and the therapist performs mobilization at the end of inhalation.



### MANUAL TRACTION OF CERVICAL SPINE

#### Manual traction of the C spine lying on the back

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** Stands or sits at the patient's head.

**Execution:** The therapist places his hands under the patient's head. The thenary rests on the mastoid processes, the fingers are placed on top of each other and support the nape. The therapist performs a gentle pull on the axis of the spine, thereby creating pretension.

**Technique:** Diagnostic – traction test. Therapeutic, PIR technique.

**Activation:** A look at the forehead, a breath.

**Relaxation:** Look ahead, exhale.

#### Manual traction of the C spine while sitting

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist takes the patient's head in their hands. The thumb rests on the head, the thenars on the mastoid processes, the hypothenars on the lower jaw, and the fingers point cranially. The forearm rests on the patient's shoulders. The therapist presses his forearms into the shoulders, thereby obtaining pretension.

**Technique:** Diagnostic – traction test. Therapeutic, PIR technique.

**Activation:** Look to the forehead (up), breath.

**Relaxation:** Look at the chin (down), exhale.

**The most common mistakes:** Too much preload. The patient tilts his head at the same time as his eyes look to his forehead.



**CTh TRANSITION – LATERAL DISPLACEMENT WITH ANTEFLEXION IN CC**

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist fixes the spine of the lower vertebra of the examined segment from the side with the thumb of one hand. With the other hand, he grasps the patient's head so that the thumb is on the head, II. and III. finger on the lower jaw, IV. and V. finger below it. He anteflexes the head and then moves the C spine into extension, rotation to his side and lateroflexion to the opposite side – towards the fixing hand. With this movement, the C segments of the spine are "locked" and the technique is aimed at the CTh transition. This hand holds and directs the head with its fingers, at the same time it fixes the thenar from the side of the cervical vertebra, if possible up to the upper vertebra of the examined segment, and then springs laterally against the thumb on the spine of the lower vertebra.

**Technique:** Diagnostic and therapeutic – technique of repetitive mobilization and PIR.

**Activation:** Eye look up, breath.

**Relaxation:** Eyes forward, exhalation.

**The most common mistakes:** Insufficient targeting of the segment with proper flexion, bowing and counter-rotation or, conversely, striving for more extension and rotation in patients with limited C-spine range of motion. Inadequate maintenance of CC transition anteflexion. When exhaling in the relaxation phase, the patient looks to the chin, thereby canceling the tilt.

**Comment:** The lower the segment we are examining or mobilizing, the more extension/or rotation of the C spine we are locking the segments should be.

**CTh TRANSITION – LATERAL DISPLACEMENT**

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist fixes the spine of the lower vertebra of the examined segment from the side with the thumb of one hand. With the other hand, he grasps the patient's head so that the thumb is on the head, II. and III. finger on the lower jaw, IV. and V. finger below it. Performs movements of the C spine into extension, rotation to its side and lateroflexion to the opposite side – towards the fixing hand. With this movement, the C segments of the spine are "locked" and the technique is aimed at the CTh transition. This hand holds and directs the head with its fingers, at the same time it fixes the thenar from the side of the cervical vertebra, if possible up to the upper vertebra of the examined segment, and then springs laterally against the thumb on the spine of the lower vertebra.

**Technique:** Diagnostic and therapeutic, technique of repetitive mobilization and PIR.

**Activation:** Eye look up, breath.

**Relaxation:** Eyes forward, exhalation

**The most common mistakes:** Insufficient targeting of the segment with proper flexion, bowing and counter-rotation or, conversely, striving for more extension and rotation in patients with limited C-spine range of motion. When exhaling in the relaxation phase, the patient looks to the chin, thereby canceling the tilt.

**Comment:** The lower the segment we are examining or mobilizing, the more extension/or rotation of the C spine we are locking the segments should be.



**CTh TRANSITION – LATERAL SHIFT SIDE LYING**

**Patient position:** He (she) is lying on their side, facing closer to the edge of the couch.

**Position of the therapist:** He (she) stands in front of the patient.

**Execution:** The therapist places the patient's head on his forearm so that he fixes the back arch of the upper vertebra of the examined segment with the ulnar edge of the hand. Using the forearm on which the head rests, C brings the spine into slight tilt (into the segment), bowing (upwards) and rotation (facing the couch). This movement locks the cervical spine above the examined segment. The therapist then performs a lateral shift of the head and cervical spine against the thumb of the other hand, which fixes the spine of the lower vertebra of the examined segment laterally – from above.

**Technique:** Diagnostic and therapeutic, technique of repetitive mobilization and PIR.

**Activation:** Eye look up, breath.

**Relaxation:** Eyes forward, exhalation.

**The most common mistakes:** There is more than one segment between the thenar of one hand and the thumb of the other hand. Insufficient targeting of the segment with proper flexion, bowing and counter-rotation or, conversely, striving for more extension and rotation in patients with limited C-spine range of motion. When exhaling in the relaxation phase, the patient looks to the chin, thereby canceling the tilt.

**CTh TRANSITION – TRACTION I**

**Patient position:** sits as close to the back edge of the lounge as possible. The fingers of the hands are intertwined and placed behind the back of the head.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist intertwines his upper limbs with the patient's elbow pits and places them on the CTh transition area. The patient relaxes his upper limbs so that the elbows point forward and the head is relaxed into a slight forward bend. The therapist performs a gentle pull along the axis of the spine.

**Technique:** Therapeutic, PIR technique. Thrust traction technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The therapist uses his chest to push the patient into extension in the thoracic spine. Spreads the patient's elbows apart. The movement is not smooth, in the axis of the spine. The therapist does not respect relaxation during exhalation.



**CTh TRANSITION – TRACTION II**

**Patient position:** It sits as close to the back edge of the lounge as possible. The fingers of the hands are intertwined and placed behind the back of the head.

Position of the therapist: He (she) stands behind the patient.

**Execution:** The therapist intertwines his upper limbs with the elbow pits of the patient and between II. and III. grips the patient's wrist with a finger to adjust and fix the patient's head and cervical spine in a neutral position. The patient relaxes his upper limbs so that the elbows point forward and the head is relaxed into a slight forward bend. The therapist performs a gentle pull along the axis of the spine.

**Technique:** Therapeutic, PIR technique. Thrust traction technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The therapist uses his chest to push the patient into extension in the thoracic spine. The movement is not smooth, in the axis of the spine. The therapist does not respect relaxation during exhalation.

## THORACIC SPINE AND RIBS

### THORACIC SPINE – EXTENSION

#### Examination



**Patient position:** He (she) sits astride the edge of the lounger. The hands are clasped behind the back, the elbows point forward.

**Position of the therapist:** He (she) stands by the side of the patient.

**Execution:** The therapist guides the thoracic spine into extension with one hand, behind the patient's elbows. With the index finger of the other hand, palpate the mutual approach of the spines, in case of blockage, resistance. Palpation of the blockage can also be performed with a fork formed between II. and III. with a finger, which we apply to the transverse projections of the lower vertebra of the examined segment. The lower segments the therapist examines, the higher the elbows and the greater the tilt in the thoracic spine.

#### Therapy

**Patient position:** He (she) is lying on their side. The hands are clasped behind the back, the elbows point forward.

**Position of the therapist:** He (she) stands in front of the patient.

**Execution:** The therapist supports the shoulder of the lower upper extremity of the patient with his palm, supports his arm with his forearm, and rests his arm on the patient's elbows from below. With the index finger of the other hand, the therapist fixes the spine of the lower vertebra of the mobilized segment. Then the therapist performs a tilt into the segment and thereby obtains pretension.

**Technique:** PIR

**Activation:** Elbow pressure on the therapist's arm, breath on the place of fixation.

**Relaxation:** Release of pressure, maximum exhalation.

**The most common mistakes:** The tilt is located in a segment other than the investigated/mobilized segment.

**Note:** The patient's position during the examination and therapy can also be the usual sitting on the edge of the couch.

## THORACIC SPINE – FLEXION



### Examination

**Patient position:** He (she) sits astride the edge of the lounger. Hands are clasped behind the back, elbows touching.

**Position of the therapist:** He (she) stands next to the patient.

**Execution:** With one hand, behind the patient's elbows, the therapist guides the thoracic spine into flexion so that the examined segment is at the top of the kyphosis. The other hand fixes the trunk under the examined segment with the base of the palm and palpates the removal of the spines with a finger, in case of blockage of tension or resistance.

### Therapy

**Patient position:** Same as examination.

**Position of the therapist:** Same as examination.

**Execution:** With one hand, behind the patient's elbows, the therapist guides the thoracic spine into flexion so that the examined segment is at the top of the kyphosis. The other hand fixes the trunk under the mobilized segment with the base of the palm and fixes the spine of the lower vertebra of the mobilized segment with the finger.

**Technique:** PIR

**Activation:** Eyes up, pressure of elbows on therapist's arm, breath.

**Relaxation:** Look of the eyes to the chin, releasing the pressure, exhaling.

**The most common mistakes:** The therapist performs too much forward flexion at once and does not target the flexion to the examined/mobilized segment.

**Note:** The patient's position during the examination and therapy can also be the usual sitting on the edge of the couch.



## THORACIC SPINE – ROTATION

### Examination – indicative

**Patient position:** He (she) sits astride the edge of the lounger. The upper limbs are crossed at the shoulders.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist places his hands on the patient's shoulders and turns the trunk to one side and the other. It compares the range of motion and assesses the fluidity of the scoliosis created. In this way, he will roughly find out in which section and in which direction the rotation is limited.

### Examination – segmental – intended primarily for the ThL transition area

**Patient position:** He (she) sits astride the edge of the lounger. The hands are clasped behind the back.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist slips one hand through the patient's armpit and grasps the patient's far shoulder from above. II. and III. the finger of the other hand is placed on the adjacent examined vertebral spines and the patient is allowed a slight kyphosis. The patient is then slowly turned. With the other hand, during the examination, he follows the movement of the fingers on the vertebral spines. Under normal circumstances, the spine of the upper vertebra of the examined segment moves a little earlier than the lower one. Gradually, with increasing rotation, the therapist moves the fingers on the vertebral spines caudally. Simultaneous movement of the vertebral spines means blockage.

### Therapy

**Patient position:** He (she) sits astride the edge of the lounger. The hands are clasped behind the back. **Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist slips one hand through the patient's armpit and grasps the patient's far shoulder from above. With this upper limb and its trunk, it creates a support for the patient, who is thus in a mild kyphosis. With the finger of the other hand, the therapist fixes the spine of the lower vertebra of the mobilized segment from the side (contralateral to the rotation) to prevent its movement. It then rotates with the patient in the direction of limited rotation.

**Technique:** PIR

**Activation:** Looking against the direction of rotation, pressing the shoulders into the therapist's hand, inhaling.

**Relaxation:** Looking in the direction of rotation, releasing pressure, exhaling.

**The most common mistakes:** Failure to keep the trunk in the axis of rotation.



### THORACIC SPINE – MANUAL TRACTION I

**Patient position:** It sits as close to the back edge of the lounge as possible.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist runs both hands through the patient's armpits. She rests her right hand on his face. With his left hand, he grasps the wrist of the patient's right hand and holds it lightly against his chest. He leans the patient against himself and pulls on the axis of the spine, thereby creating pretension.

**Technique:** Therapeutic – PIR. Thrust traction technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The therapist uses his chest to push the patient into extension in the thoracic spine. The movement is not smooth, in the axis of the spine. The therapist does not respect relaxation during exhalation.



### THORACIC SPINE – MANUAL TRACTION II

**Patient position:** It sits as close to the back edge of the lounge as possible. He puts his hands over his eyes.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist embraces the patient and grasps him just above the elbow joints. He leans the patient against himself and pulls on the axis of the spine, thereby creating pretension.

**Technique:** Therapeutic – PIR. Thrust traction technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The therapist uses his chest to push the patient into extension in the thoracic spine. The movement is not smooth, in the axis of the spine. The therapist does not respect relaxation during exhalation.



### THORACIC SPINE – MANUAL TRACTION III

**Patient position:** It sits as close to the back edge of the lounge as possible.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist passes both hands through the patient's armpits and grasps the patient's contralateral upper extremity by the wrist – gently pulling the patient's hands apart. He then leans the patient against himself and pulls on the axis of the spine, thereby creating pretension.

**Technique:** Therapeutic – PIR. Thrust traction technique.

**Activation:** Eye look up, breath.

**Relaxation:** Look of the eyes to the chin, exhalation.

**The most common mistakes:** The therapist uses his chest to push the patient into extension in the thoracic spine. The movement is not smooth, in the axis of the spine. The therapist does not respect relaxation during exhalation.





## THE FIRST RIB

### Examination and mobilization by suspension

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient, his back resting on his chest.

**Execution:** The therapist places the lateral edge of the index finger from above on the first rib – perpendicular to its course. It springs over the upper part of the trapezius muscle in the direction of the patient's opposite buttock.

**Technique:** Diagnostic and therapeutic – repetitive mobilization.

**The most common mistakes:** Pressure on the rib is applied too close to the neck.

**Note:** If we move the contact of the edge of the index finger more dorsally, we can examine the second rib in a similar way.

### Examination with an oblique forward bend

**Patient position:** He (she) is sitting.

**Position of the therapist:** He (she) stands behind the patient, his back resting on his chest.

**Execution:** The therapist places his ipsilateral hand with the radial edge on the neck above the collarbone, parallel to it. The edge of the index finger lies in the direction of the course of the first rib and serves as a hypomochlion when examining movement. With the other hand, the therapist rotates the patient's head facing away from the examined rib – about 45°. He then tilts his head and neck into an oblique forward bend over the hypomochlion described above. On the movement limitation side, the ribs feel more resistance and the range of oblique forward bending is smaller.

**Technique:** Diagnostic.

**The most common mistakes:** The hand that creates the hypomochlion is attached incorrectly.

The correct position of the head is not observed during the oblique forward bend examination.

**Note:** To make the examination more precise, the radial edge of the index finger can be stretched against the first rib after creating pretension.

### Mobilization using scaly muscles

**Patient position:** He (she) is sitting.

**The position of the therapist:** He (she) stands behind the patient, his back resting on his chest.

**Execution:** The therapist fixes the shoulder on the untreated side with one hand. The second, mobilizing hand rests from the side on the head just above the ear of the treated party, the forearm is directed laterally. The therapist then tells the patient to keep their head upright against his pressure. It then alternates with relaxation, with a frequency of one to two per second.

**Technique:** Therapeutic – alternating isometric contraction and relaxation.

**The most common mistakes:** The therapist does not fix the patient's arm tightly enough. The patient does not hold the head firmly in an upright position. The forearm does not point laterally, and thus the traction of the scalene muscles is not properly used.





## RIBS – STERNOCOSTAL JOINT

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** It stands at the patient's head.

### Examination

**Execution:** The therapist places his thumbs on the ribs and observes the movement of the ribs during deep breathing. If the thumb on one side does not move caudally during exhalation, we assume that the relevant rib is blocked during exhalation – exhalation block. However, if the thumb on one side does not move sufficiently cranially during inhalation, we assume that the relevant rib is blocked during inhalation – inspiratory block.

### Therapy

**Execution:** The therapist encourages the patient to breathe deeply. During exhalation blockage, thumb pressure on the rib helps movement in a caudal direction. During inspiratory block, during exhalation, we again press the rib caudally, but at the start of inhalation, we prevent the movement of the rib cranially with the pressure of the thumb until the end of the inhalation, and then suddenly release the pressure on the rib.

**RIBS – TRANSVERSOCOSTAL JOINTS -**Examination

**Patient position:** He (she) is sitting on the edge of the deck chair. The upper limb on the examined side is braced and bent at the elbow.

**Position of the therapist:** He (she) stands next to the patient on the non-examined side.

**Execution:** The therapist places the thumb II. to IV. finger on the angulus costae of the examined rib. The elbow of the braced upper limb leads the other hand along with the trunk backwards, and the fingers of the palpating hand form the hypomochlion. Under physiological conditions, the rib moves slightly ventrally, and resists when blocked. We feel this resistance well through the shoulder blade.

Therapy

**Patient position:** Lie on the untreated side. The upper upper limb is braced and bent at the elbow, the forearm is directed towards the couch.

**Position of the therapist:** He (she) stands in front of the patient.

**Execution:** The therapist places the hand that is closer to the patient's head from the front on the patient's elbow. Thumb II. to IV. the finger of the other hand is placed lengthwise on the angulus costae of the treated rib. Over the already formed hypomochlion, he pushes the patient's elbow backwards into pretension.

**Technique:** PIR

**Activation:** Elbow pressure forward, inhale.

**Relaxation:** Release pressure, exhale.

**The most common mistakes:** The upper limb on the examined side is not sufficiently braced. The therapist palpates the rib in the wrong place, usually too medial to the transverse processes – avoiding the scapula.

**RIBS – TRANSVERSOCOSTAL JOINT USING THE SCAPULA**

**Patient position:** He (she) is lying on their stomach. The head is turned towards the treated side.

**Position of the therapist:** He (she) stands on the treated side facing the patient's head.

**Execution:** The therapist abducts the patient's ipsilateral arm to 90°. She rests her forearm on his arm and grabs his shoulder with her hand. The other hand places the palm firmly on the shoulder blade. The therapist performs a circular movement that starts from his trunk and legs. As the scapula approaches the costovertebral junction, the therapist increases pressure on its medial edge.

**Technique:** Therapeutic.

**The most common mistakes:** The therapist's hands circle against each other. Movement is also performed in the glenohumeral joint. The movement does not come from the trunk and legs of the therapist.

## LUMBAR SPINE AND PELVIS

### LUMBAR SPINE – SPRING EXAMINATION



**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** He (she) stands next to the couch, facing the examinee's head.

**Execution:** The therapist places the index and middle fingers of the hand that is closer to the table on the transverse projections of the examined vertebra. He places the medial edge of the other hand over the tips of these fingers. Both arms, if possible extended at the elbows, push into pretension and then briefly relax – the pressure comes from the whole body. The position of the upper limbs and thus the directed pressure should always be perpendicular to the axis of the examined segment – the curvature of the spine must be respected. With springing, we start with pressure on the upper edge of the sacrum, and then proceed to L5 and further cranially.

**Technique:** Diagnostic.

**The most common mistakes:** The therapist stretches with a hand that ensures contact. The therapist releases the preload before springing.

**Comment:** The examination is primarily performed as a test for disk failure. It is positive, when pain is repeatedly induced when flexing. This technique is not used to assess joint play, but to induce pain, so the springing must be fast and more intense. The investigation is rather indicative and does not guarantee the exact location. The examination can be performed in the entire lumbar and thoracic spine, but it is most often used to assess disc disorders in segments L3-4, L4-5 and L5-S1.



## LUMBAR SPINE – MANUAL TRACTION

### Traction I

**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** It stands at the patient's head.

**Execution:** The therapist places his hands on the patient's buttocks so that the roots of the palms rest on the ridges of the pelvic bones, the fingers point caudally. Cranial hand pressure, together with the patient's breath, tilts the pelvis into retroversion. During exhalation, the pelvis moves into anteversion, which the therapist prevents by pressure in the cranial direction. Traction occurs both during inhalation, due to the flattening of the lumbar lordosis, and especially during exhalation, due to the return of the spine to lordosis and the opposite effect of hand pressure on the pelvis.

**Technique:** Therapeutic.

**The most common mistakes:** The therapist does not respect exhalation-inhalation synkinesis.

### Traction II

**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** He (she) stands at the patient's feet.

**Execution:** The therapist grasps the patient's lower limbs above the ankles and by tilting his own body backwards, while the upper limbs are extended, pulls on the axis of the spine – this creates pretension. The rhythmic rocking of the knees then creates intermittent traction of the L spine.

**Technique:** Therapeutic.

**The most common mistakes:** The therapist lifts the patient's lower limbs too high, causing a tilt in the lumbar spine. The bias does not come from the lower limbs and the therapist's backward tilt, but only from the upper limbs. The therapist does not target the preload exactly to the lumbar region – he does not choose such an amplitude of movements that targets the traction to the treated segments. The direction of traction is not cranio-caudal.

### Traction III

**Patient position:** He (she) is lying on their back (on a very low couch). The lower limbs are in 90° flexion in the hip and knee joints.

**Position of the therapist:** He (she) faces the longer side of the lounger. The lower limb, which is farther from the patient's head, is placed on the couch so that the thigh is in a horizontal position.

**Execution:** The therapist places the patient's lower limbs with the knee sockets on his thigh. She grabs his lower legs and pushes them toward the mat so that he lifts his pelvis up – creating a bias. If the pretension is not sufficient, the therapist will further move the thigh away from the patient's pelvis. By pressing on the lower leg and releasing it, it performs intermittent traction. An additional technique is the latero-lateral movement of the patient's pelvis, which the therapist performs by moving the body ventrodorsally.

**Technique:** Therapeutic.

**The most common mistakes:** The therapist's thigh is not horizontal, and this causes rotation of the patient's pelvis. The patient is not relaxed and therefore there is no preload when lifting the pelvis.

**LUMBAR SPINE – EXTENSION (SEGMENTS L2-3 TO L5-S1)**

**Patient position:** It lies on its side in a neutral position. The lower limbs are bent at the hip and knee joints to about 80°.

**Position of the therapist:** He (she) stands in front of the patient.

**Execution:** The therapist rests his thigh on the patient's knees and the fingers of both hands fix the spine of the upper vertebra of the segment. By pressing on the patient's knees in the axis of the femur, the therapist performs extension in the segments of the L spine, or L5-S1.

**Technique:** Diagnostic and therapeutic – PIR.

**Activation:** Knee pressure on the therapist's thigh, inhale.

**Relaxation:** Release pressure, exhale.

**The most common mistakes:** Pretensioning and springing is primarily done by pressure of the upper limbs – correctly, the upper limbs only fix the upper vertebra of the respective segment. When applying pressure to the patient's lower limbs, there is a lack of sufficient fixation on the spine.

**Note:** The position of the lower limbs must respect the neutral position of the spine, the given angle is only indicative.

**LUMBAR SPINE – FLEXION (SEGMENTS L2-3 TO L5-S1)**

**Patient position:** He (she) is lying on their side at the edge of the lounge. The lower limbs are flexed at the hip and knee joints.

**Position of the therapist:** He (she) stands in front of the patient.

**Execution:** With the forearm, which is closer to the patient's head, the therapist fixes the chest area, and with the belly of the finger (II or III) of this hand, he palpates the interspinal space of the examined segment – he (she) perceives movement between the spines. Next, the therapist, with their hip or thigh, pushes the patient's lower legs towards his abdomen to further increase the kyphosis in the lumbar region. He (she) places their other hand and forearm on the sacrum – the fingers go all the way to the spine of the caudal vertebra. This upper extremity aids further kyphotization until pretension and springing are achieved.

**Technique:** Diagnostic and therapeutic – PIR.

**Activation:** Buttock pressure against the therapist's hand and inhale.

**Relaxation:** Release pressure and exhale.

**The most common mistakes:** During therapy in the isometric phase, anteflexion occurs in the mobilized segment – instead of the required extension.

**Note:** During mobilization, the hand that is between the spines increases the pressure on the spine of the cranial vertebra of the treated segment and thus helps fixation.



**LUMBAR SPINE – ROTARY MOBILIZATION IN FLEXION (SEGMENTS L2-3 TO L5-S1)**

**Patient position:** He (she) is lying on their side. The lower leg is in slight semiflexion, the upper leg hangs forward over the edge of the table. The pelvis is tilted slightly ventrally. The upper upper extremity is placed with the hand on the abdomen at the navel point.

**Position of the therapist:** He (she) stands sideways in front of the patient.

**Execution:** In case of insufficient kyphotization of the lumbar spine, the therapist pulls on the lower upper limb of the patient. After setting the correct initial position, the therapist steps over the patient's upper lower limb and with their thigh, which is closer to the patient's legs, can change the amount of flexion of the patient's drooping lower limb. With the upper limb, which is closer to the patient's head, the therapist fixes the position of the trunk. The forearm is tucked under the upper limb of the patient at the level of the elbow, resting on the chest and back. The hand with the thumb, pulling from above, fixes the spine of the cranial vertebra. With the other hand, the therapist reaches across the pelvis and hip to the spine of the lower vertebra. Pretension is created by pulling this upper limb in the direction of the forearm and slight pressure of the thigh increasing the flexion of the patient's upper lower limb.

**Technique:** Therapeutic – PIR. Thrust technique.

**Activation:** Buttock pressure against the therapist's forearm, event. abduction of the lower limb. A breath.

**Relaxation:** Exhale.

**The most common mistakes:** Mistakes are various and very common, resulting from poor positioning of both the patient and the therapist.

**LUMBAR SPINE – ROTARY MOBILIZATION IN NEUTRAL POSITION (SEGMENTS- L2-3 TO L5-S1)**Therapy I

**Patient position:** It lies on its side in a neutral position. The lower leg is slightly bent at the hip and knee joints. The upper lower limb is bent more and the instep rests on the lower lower limb below the knee.

**Position of the therapist:** He (she) stands sideways in front of the patient.

**Execution:** The therapist rests his elbow on the patient's shoulder from the front, fixes the spine of the upper vertebra of the mobilized segment laterally (from above) with the thumb of the same hand. He rests his thigh on the patient's knee, also from above. The therapist rests the forearm of the other hand on the patient's pelvis, and the fingers of the same hand fix the spine up to the spine of the lower vertebra. Using the forearms, which rest on the patient's shoulder, rotates the trunk apart. The therapist then asks the patient to rotate the head and trunk in the direction of the desired rotation. The opposite upper limb and thigh fix the pelvis and spine against this rotation. Until taking up the slack.

**Technique:** Therapeutic – PIR.

**Activation:** View – turning the head against the direction of rotation, breath.

**Relaxation:** View – turning the head in the direction of rotation, exhalation.

**The most common mistakes:** The spine is not in a neutral position. Preloading is done unsparingly and causes pain.

Therapy II

**Patient position:** The same as in the previous case.

**Position of the therapist:** He (she) stands sideways in front of the patient.

**Execution:** The therapist rests his thigh on the patient's knee from above (laterally) and with both hands fixes the spine of the lower vertebra of the blocked segment – from below. The patient rotates the head and trunk away from the therapist into pretension. Active movement into rotation alternates with release into pretension.

**Technique:** Therapeutic – repeatedly into rotation.

**The most common mistakes:** The spine is not in a neutral position.

**SI JOINT – EXAMINATION**Springing of the SI joint while lying on the back

**Patient position:** He (she) is lying on their back.

**Position of the therapist:** It stands on the side of the non-examined SI joint.

**Execution:** The therapist grasps the lower limb on the examined side by the knee, flexes the knee joint and flexes the hip joint up to 90°. By adducting the thigh, it tilts the pelvis to its side. The thumb of the other hand presses into the index finger, thereby strengthening the thenar, and places the palm on the sacrum. Then the therapist turns the patient back so that the arm is placed on the couch. With the hand on the knee, he adducts the hip without rotating the pelvis and springs to the knee in the longitudinal axis of the thigh. The other hand on the sacrum palpates the movement between the pelvis and the sacrum.

**Technique:** Diagnostic.

**The most common mistakes:** The pelvis is rotated. The hand contact is in the wrong place – it goes all the way to the back upper spin of the pelvis.

The upper part of the SI joint in the prone position

**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** He (she) stands next to the table on the non-examination side, at the patient's pelvis.

**Execution:** The therapist grasps the pelvis by the anterior spina with one hand. The other hand is placed on the sacrum with the tip of the finger touching the posterior superior spina. He then lifts the pelvis from the pad to the bias.

**Technique:** Diagnostic.

**The most common mistakes:** Using too much force.

The lower part of the SI joint in the prone position

**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** He (she) stands next to the table, at the patient's pelvis.

**Execution:** The therapist places the thumb on the mid-lower part of the sacrum – at the highest point, slightly lateral to the midline on the examined side. Lightly pushes ventrally into preload.

**Technique:** Diagnostic.

**The most common mistakes:** Using too much force. Placing the thumb in the area of the upper part of the sacrum, or vice versa near the coccyx.



**SI JOINT – WHITS CROSSED HANDS**

**Patient position:** He (she) is lying on their stomach.

**Position of the therapist:** It stands next to the table at the patient's pelvis, on the opposite side of the SI joint being examined.

**Execution:** The therapist places crossed hands on the patient's SI joint under examination with one hand resting on the lower end of the sacrum, fingers pointing caudally, and the other hand resting on the posterior superior spine, fingers pointing latero-cranially. The forearms point in the direction of the intended movement. The therapist simultaneously pushes into pretension with both hands.

**Technique:** Diagnostic and therapeutic – repetitive, preload is released during mobilization.

**The most common mistakes:** The hand that is placed on the sacrum does not lie on its lower end. The pressure of the hands is not directed away from each other, but ventrally. The pressure of both hands of the therapist is not equally intense.

**SI JOINT – SIDE LYING THERAPY**Therapy I

**Patient position:** He (she) is lying on their side. The lower limb is bent at both the hip and knee joints, and her knee is resting on the table.

**Position of the therapist:** He (she) stands behind the patient.

**Execution:** The therapist places one hand on the iliac blade – the fingers point ventro-craniomedially. Fingers or the thumb of the other hand palpates the movement in the SI joint – between the sacrum and the posterior superior spina. The therapist creates spring pressure with his hand on the hip bone in the ventro-cranio-medial direction.

**Technique:** Diagnostic and therapeutic – repetitive.

**The most common mistakes:** The knee of the upper leg does not lie on the table. The pressure on the hip bone is not directed in the right direction.

Therapy II

**Patient position:** He (she) is lying on their side. The lower limb is bent at both the hip and knee joints, and her knee is resting on the table. If there is limited movement in the hip joint of the upper lower limb, both lower limbs may be bent.

**Position of the therapist:** He (she) stands or sits behind the patient on the couch, facing his head.

**Execution:** The therapist has one hand placed palm down on the front upper spine. The index finger of the other hand, supported by the thumb, rests on the upper end of the sacrum just below the posterior superior spina. The hand on the sacrum fixes, the hand on the anterior spine moves the pelvis dorsally – not directly, but in an imaginary circle.

**Technique:** Diagnostic and therapeutic – repetitive.

**The most common mistakes:** Improper positioning of the therapist. Hand contact on the upper end of the sacrum is painful.



