The Thoracic Spine and the Ribs

Luc Peeters & Grégoire Lason
The thoracic Spine and the Ribs

Luc Peeters & Grégoire Lason

All rights reserved. Osteo 2000 bvba © 2013. No part of this e-book may be reproduced or made public by printing, photocopying, microfilming, or by any means without the prior written permission of the publisher.
Contact: Osteo 2000, Kleindokkaai 3-5, B – 9000 Ghent, Belgium
Mail: info@osteopathie.eu
Web: http://osteopedia.iao.be and www.osteopathie.eu
Tel: +32 9 233 04 03 - Fax: +32 55 70 00 74
ISBN: 9789074400404

The International Academy of Osteopathy – I.A.O.
Content

1. Introduction ............................................................................................................ 8
2. Biomechanics ........................................................................................................ 9
   2.1. The thoracic Spine ........................................................................................... 9
      2.1.1. Motion in the sagittal Plane ........................................................................ 9
         2.1.1.1. Neutral Position .................................................................................... 9
         2.1.1.2. Flexion ............................................................................................... 10
         2.1.1.3. Extension ........................................................................................... 10
      2.1.2. Motion in the frontal Plane ........................................................................ 11
         2.1.2.1. The Region T_{1-5} ............................................................................. 11
         2.1.2.2. The Region T_{6-11} .......................................................................... 12
      2.1.3. Motion in the horizontal Plane .................................................................. 15
   2.2. The Ribs ......................................................................................................... 16
      2.2.1. The costovertebral Motion ........................................................................ 16
      2.2.2. The costotransverse Motion ..................................................................... 17
      2.2.3. The chondrosternal Motion ....................................................................... 17
      2.2.4. The Rib Motions during Respiration ......................................................... 18
         2.2.4.1. Motion of Rib 1 to Rib 5-6 .................................................................. 19
         2.2.4.2. Motion of Rib 7 to Rib 10 ................................................................... 19
   2.3. The Thorax ..................................................................................................... 20
      2.3.1. Extension .................................................................................................. 20
      2.3.2. Flexion ...................................................................................................... 21
      2.3.3. Rotation .................................................................................................... 22
      2.3.4. Limited Range of Sidebending .................................................................. 23
      2.3.5. Large Range of Sidebending .................................................................... 24
3. Lesion Mechanics ................................................................................................ 25
   3.1. Thoracic Spine .............................................................................................. 27
      3.1.1. Lesion in bilateral Extension ..................................................................... 27
      3.1.2. Lesion in bilateral Flexion ........................................................................ 28
      3.1.3. Group Lesion T_{1-5} in NRS_R or L ......................................................... 29
      3.1.4. Group Lesion T_{1-5} in ERS_R or L ......................................................... 30
      3.1.5. Group Lesion T_{1-5} in FRS_R or L ......................................................... 31
      3.1.6. Group Lesion T_{6-11} in NS_{R,L} or NS_{L,R} ............................................. 32
      3.1.7. Monolytic Lesion ERS_R or ERS_L .......................................................... 33
      3.1.8. Monolytic Lesion FRS_R or FRS_L .......................................................... 34
      3.1.9. Shift Lesion ............................................................................................. 35
   3.2. Ribs ................................................................................................................ 37
      3.2.1. Lesion in Inhalation, as Group or Monolytic ............................................. 37
      3.2.2. Lesion in Exhalation, as Group or Monolytic ............................................ 39
4. Thoracic pain ....................................................................................................... 41
4.1. General ........................................................................................................... 41
4.2. Ankylosing Spondylitis ................................................................................ 48
4.3. Scheuermann’s Disease ............................................................................... 49
4.4. Osteoarthritis ................................................................................................. 50
4.5. Degenerative Disc Disease .......................................................................... 50
4.6. Herniated thoracic Disc ................................................................................ 53
4.7. Facet Joint Arthropathy ............................................................................... 53
4.8. Scoliosis ........................................................................................................ 55
4.9. Fractures ........................................................................................................ 56
4.10. Osteomyelitis ............................................................................................... 57
4.11. Herpes Zoster or Shingles ......................................................................... 58

5. Examination ......................................................................................................... 59
5.1. Thoracic Spine .............................................................................................. 59
  5.1.1. Observation in a Standing Position .......................................................... 59
  5.1.2. Active Tests .............................................................................................. 61
    5.1.2.1. Active Flexion Test ............................................................................. 61
    5.1.2.2. Active Extension Test ........................................................................ 62
    5.1.2.3. Active Flexion Test with the Head ...................................................... 63
    5.1.2.4. Active Extension Test with The head ................................................. 63
    5.1.2.5. Active Sidebending ............................................................................ 64
    5.1.2.6. Active Sidebending with the Head as Lever ...................................... 65
  5.1.3. Passive Tests ........................................................................................... 66
    5.1.3.1. Topography of spinal Processes ........................................................ 66
    5.1.3.2. Oscillation Test .................................................................................. 67
    5.1.3.3. Oscillation Test with the Head ........................................................... 67
    5.1.3.4. Oscillation Test with the Patient Prone .............................................. 68
    5.1.3.5. Flexion Test ....................................................................................... 68
    5.1.3.6. Flexion Test for the upper Thoracics ................................................. 69
    5.1.3.7. Extension Test ................................................................................... 69
    5.1.3.8. Sidebending Test ............................................................................... 70
    5.1.3.9. Sidebending Test for the upper Thoracics ......................................... 70
    5.1.3.10. Test in Rotation ................................................................................ 71
5.2. The Ribs ......................................................................................................... 71
  5.2.1. Rotation Test Sitting rib 6 to 12 ............................................................... 71
  5.2.2. Rotation Test Sitting rib 1 to 5 ................................................................. 72
  5.2.3. Flexion Test for the first Rib .................................................................... 72
  5.2.4. Test of the first Rib in Rotation ............................................................... 73
  5.2.5. Test of the first Rib with Respiration ...................................................... 73
  5.2.6. Test of the chondrosternal Joints in Rotation ......................................... 74
  5.2.7. Test of the chondrosternal Joints – Supine ............................................ 74
  5.2.8. Test of the Ribs with Respiration ............................................................ 75
  5.2.9. Test for Ribs 11 and 12 .......................................................................... 76
  5.2.10. Elasticity Test of the Ribs ..................................................................... 76
5.2.11. Tests of the Sternum ................................................................. 77
  5.2.11.1. Manubrium in the frontal Plane ............................................. 77
  5.2.11.2. Manubrium in the sagittal Plane .......................................... 77
  5.2.11.3. Manubrium in the horizontal Plane ....................................... 78
  5.2.11.4. Sternum in the frontal Plane ............................................... 78
  5.2.11.5. Sternum in the horizontal Plane .......................................... 79
  5.2.11.6. Sternum in the sagittal Plane .............................................. 79
  5.2.11.7. Sternum in craniocaudal Direction ....................................... 80

6. Osteopathic Techniques ................................................................. 81
  6.1. Thoracic Spine ............................................................................ 81
    6.1.1. Mobilisations ......................................................................... 81
      6.1.1.1. General ............................................................................ 81
      6.1.1.2. Extension Mobilisation – Sitting ........................................ 82
      6.1.1.3. Extension Mobilisation – Sitting – with Knee ....................... 83
      6.1.1.4. Extension Mobilisation – Prone .......................................... 83
      6.1.1.5. Sidebending Mobilisation .................................................. 84
      6.1.1.6. Sidebending Mobilisation – Sidelying .................................. 84
      6.1.1.7. Rotation Mobilisation ....................................................... 85
      6.1.1.8. Rotation Mobilisation – Prone .......................................... 85
    6.1.2. Manipulations ........................................................................ 86
      6.1.2.1. General ............................................................................ 86
      6.1.2.2. Hand Positions .................................................................... 88
      6.1.2.3. Lesion in bilateral Extension .............................................. 88
      6.1.2.4. Lesion in bilateral Flexion .................................................. 89
      6.1.2.5. Lesion in bilateral Flexion – upper Thoracics ....................... 89
      6.1.2.6. Lesion in ERSR mid Thoracic ............................................. 90
      6.1.2.7. Lesion in FRSR – lower Thoracics ....................................... 90
      6.1.2.8. Lesion in ERSR – lower Thoracics ....................................... 91
      6.1.2.9. Lesion C7 FRSR – Rotation Dominant .................................. 91
      6.1.2.10. Lesion C7 FRSR – Sidebending Dominant .......................... 92
      6.1.2.11. Lesion T1 ERSR – Sitting .................................................. 93
      6.1.2.12. Lesion in bilateral Flexion – Prone ..................................... 93
      6.1.2.13. Lesion in bilateral Extension - Prone ................................... 94
      6.1.2.14. Lesion in FRSR - Prone ..................................................... 94
      6.1.2.15. Lesion in ERSR - Prone ..................................................... 95
      6.1.2.16. Lesion in NSLR ................................................................. 95
      6.1.2.17. Manipulation of the thoracolumbar Junction ...................... 96
      6.1.2.18. Manipulation of the thoracolumbar Junction – alternative Grip 96
    6.1.3. Muscle Energy Techniques (M.E.T.) ......................................... 97
      6.1.3.1. General ............................................................................ 97
      6.1.3.2. Lesion in NSRRL ................................................................ 98
      6.1.3.3. Lesion in FRSL upper Thoracic .......................................... 99
      6.1.3.4. Lesion in FRSR mid and lower Thoracic ............................... 99
6.1.3.5. Lesion in ERS_L ................................................................. 100
6.1.4. Strain and Counterstrain Techniques .................................................. 101
  6.1.4.1. General .................................................................................. 101
  6.1.4.2. T1 Posterior Right and T2 Posterior Right ................................... 101
  6.1.4.3. T3-5 Posterior Right ............................................................... 102
  6.1.4.4. T6-12 Posterior Right ............................................................. 102
  6.1.4.5. T1 and T2 Anterior Right ......................................................... 103
  6.1.4.6. T3-6 Anterior Right ............................................................... 103
  6.1.4.7. T7 and T8 Anterior Right ......................................................... 104
  6.1.4.8. T9 Anterior Right .................................................................. 104
  6.1.4.9. T10-12 Anterior Right ............................................................. 105
  6.2. The Ribs ..................................................................................... 106
  6.2.1. Mobilisations .......................................................................... 106
  6.2.1.1. General Mobilisation, Prone .................................................... 106
  6.2.1.2. General Mobilisation in Rotation ............................................. 106
  6.2.1.3. Extension Mobilisation ............................................................. 107
  6.2.1.4. Mobilisation around the three Axes: craniocaudal Axis ............... 107
  6.2.1.5. Mobilisation around the three Axes: transverse Axis .................. 108
  6.2.1.6. Mobilisation around the three Axes: anteroposterior Axis .......... 108
  6.2.1.7. Mobilisation of the chondrosternal Joints ................................... 109
  6.2.1.8. Mobilisation of the chondrosternal Joints – with Lever ................. 109
  6.2.1.9. Recoil Techniques and Mobilisations on the Sternum ................. 110
    6.2.1.9.1. Manubrium Rotation in the frontal Plane ............................. 110
    6.2.1.9.2. Manubrium Mobilisation in the horizontal Plane .................. 110
    6.2.1.9.3. Manubrium Mobilisation in the sagittal Plane ..................... 111
    6.2.1.9.4. Sternum Mobilisation in the frontal Plane ........................... 111
    6.2.1.9.5. Sternum Mobilisation in the horizontal Plane ....................... 112
    6.2.1.9.6. Sternum Mobilisation in the sagittal Plane ......................... 112
    6.2.1.9.7. Sternum Mobilisation in craniocaudal Direction .................... 113
    6.2.1.9.8. Recoil Technique on the Manubrium ................................ 113
    6.2.1.9.9. Recoil Technique on the chondrosternal Joints .................... 114
    6.2.1.9.10. Recoil on the manubriosternal Junction ................................ 114
  6.2.2.1. Hand Position ...................................................................... 115
  6.2.2.2. Lesion of a left Rib in Inhalation ............................................. 115
  6.2.2.3. Lesion of a right Rib – Sitting ................................................ 116
  6.2.2.4. Lesion of the first Rib ............................................................. 116
  6.2.2.5. Rib Lesion - Prone ............................................................... 117
  6.2.2.6. Lesion of the 11th or 12th Rib ............................................... 117
  6.2.3. Muscle Energy Techniques (M.E.T.) ............................................. 118
    6.2.3.1. Lesion of the first Rib in Exhalation ....................................... 118
    6.2.3.2. Lesion of the second Rib in Exhalation .................................... 119
    6.2.3.3. Lesion of 3rd to 5th Ribs in Exhalation .................................. 119
    6.2.3.4. Lesion of the 12th Rib in Exhalation ....................................... 120
    6.2.3.5. Lesion of 7th to 10th Ribs in Exhalation ................................. 120
6.2.3.6. Lesion of lower Ribs in Exhalation ........................................................ 121
6.2.3.7. Lesion of the first Rib in Inhalation ..................................................... 121
6.2.3.8. Lesion of the first Rib in Inhalation ..................................................... 122
6.2.3.9. Lesion of the second Rib in Inhalation ................................................ 122
6.2.3.10. Lesion of the 3rd to 6th Ribs in Inhalation ........................................ 123
6.2.3.11. Lesion of the 3rd to 6th Ribs in Inhalation ........................................ 124
6.2.3.12. Lesion of the 3rd to 6th Ribs in Inhalation ........................................ 124
6.2.3.13. Lesion of the 11th and 12th Ribs in Inhalation .................................. 125
6.2.3.14. Lesion of the lower Ribs in Inhalation .............................................. 125
6.2.4. ‘Strain and Counterstrain’ Techniques .................................................. 126
   6.2.4.1. First Rib in Exhalation .................................................................... 126
   6.2.4.2. Second Rib in Exhalation ............................................................... 126
   6.2.4.3. 3rd to 6th Ribs in Exhalation .......................................................... 127
   6.2.4.4. First Rib in Inhalation .................................................................... 127
   6.2.4.5. 2nd to 6th Ribs in Inhalation ........................................................... 128
7. Bibliography ................................................................................................... 129
8. About the Authors .......................................................................................... 132
9. Acknowledgment ............................................................................................ 133
10. Osteopathic Terminology ........................................................................... 134
   10.1. The Three anatomical Axes ................................................................. 134
   10.2. The Three anatomical Planes ............................................................... 135
   10.3. Spinal Biomechanics ........................................................................... 136
   10.4. General Abbreviations ........................................................................ 138
   10.5. Specific Terms ..................................................................................... 139
11. All Video’s .................................................................................................... 140
1. Introduction

The importance of the thorax is apparent in various ways. On the one hand there is the protective function for the essential organs such as the lungs and the heart and on the other hand, the thoracic spine provides a reflection of the sympathetic afferent flow of the majority of the organs.

In this context somatic dysfunctions of the thoracic spine occur very frequently and the osteopath must be able to differentiate between mobility loss due to visceral afferent flow or a traumatic event.

The thoracic spine and ribs simultaneously provide a rigid, protective function and a dynamic, mobile function.

Lesions of the thoracic spine and/or ribs can influence other axial structures in a mechanical way. A fixed thoracic kyphosis will always result in a lumbar and cervical lordosis with likely complaints in these regions.

This e-book presents the biomechanics, the different mobility tests and the osteopathic techniques for the thoracic spine and ribs.

Readers who are not familiar with the typical osteopathic terminology can read chapter 10 at the end of the e-book.

The anatomy of the thoracic spine is not described. Only relevant anatomical issues are mentioned throughout the text.
2. Biomechanics

2.1. The thoracic Spine

2.1.1. Motion in the sagittal Plane
The motions of the thoracic spine are described under normal body load and with normal anatomical structures.

2.1.1.1. Neutral Position
The neutral position is the position of the spine in a normally balanced standing person.

Flexion-extension motions occur in the sagittal plane.

The axis of motion is through the body of the vertebra in a transverse direction.

The axis of motion differs depending on the vertebral lever due to the physiological kyphosis.

Figure 1 - The neutral position in the sagittal plane
2.1.1.2. **Flexion**
During flexion the vertebrae glide ventrally leading to divergence of the facet joints.

![Figure 2 - Flexion](image)

2.1.1.3. **Extension**
During extension, the vertebrae glide dorsally leading to convergence of the facet joints.

![Figure 3 - Extension](image)
2.1.2. Motion in the frontal Plane
The motion of lateral flexion occurs in the coronal plane, in combination with rotation. In osteopathic medicine the term sidebending is often used instead of lateral flexion.

The axis of motion is through the body of the vertebra in an anteroposterior direction.

2.1.2.1. The Region T₁-₅
Sidebending occurs in combination with rotation in the same direction. This occurs in neutral, flexion and extension positions.

This combined motion can occur at one vertebral level (monolytic) or in a group (multiple vertebrae at once).

The cervical spine is the lever of this motion.

![Diagram of sidebending and rotation](image)

**Figure 4 - Sidebending, followed by ipsilateral rotation: S_R R_R**
2.1.2.2. The Region $T_{6-11}$

In a neutral position

Figure 5 - Sidebending followed by contralateral rotation: $S_R R_L$

The left facet joint diverges because of the right sidebending and the right facet joint converges.

The combination of sidebending with opposite rotation occurs in a group. For example in cases of scoliosis or due to a viscerosomatic afference.
In flexion

Figure 6 - Sidebending, preceded by ipsilateral rotation: $R_R \ S_R$

Both facet joint diverge because of the flexion. The sidebending right means that the left facet diverges more, the right less.

The combination of sidebending with same-sided rotation occurs in one vertebral segment (monolytic). This can be the result of a trauma.
In extension

Figure 7 - Sidebending preceded by ipsilateral rotation: $R_R S_R$

Both facet joints converge because of the extension. Due to the sidebending right the left facet joint converges less, the right more.

The combination of sidebending with same-sided rotation occurs in one vertebral segment (monolytic). This can be the result of a trauma.
3. Lesion Mechanics

Lesion means that there is a loss of mobility.

This loss of mobility can be due to:

- **A mechanical trauma:** a fall or blunt trauma to the thoracic spine can cause a vertebra that blocks mechanically upon another vertebra. The vertebra gets fixed in a specific position and doesn’t move back any more. In osteopathy, a traumatic lesion is called a monolytic lesion and the lesion is mechanically described versus the underlying vertebra. The description of the lesion is always the position in which the vertebra is fixed on the underlying vertebra. The structures that cause the vertebra to stays in the lesional position can differ. It can be a local muscle spasm that keeps the vertebra in the lesional position. It can also be one or more mechanically blocked facet joints. When the intervertebral discus is damaged, this can also be part of the fixing factor.

- **A hypertone muscle group:** when a vertebral segment is hypertone due to a high afferent load from the related dermatome, viscerotome, angiotome, neurotome or sclerotome, also the myotome of the segment is in a state of high muscular tone. This high muscular tone can progressively fixe one or more vertebrae in a lesional position. In osteopathy this is called a group lesion since mostly more than two vertebra are involved.

- **Changes in trophicity:** of the surrounding soft tissues such as ligaments, joint capsules and muscles. In the case of scoliosis for example, the scoliosis can become rigid due to the trophicity changes and cause loss of mobility of one or more vertebral regions. In osteopathy, this type of lesion is also called a group lesion.

  The difference between a group lesion caused by neurological afference and by changes in trophicity is that in the case of neural afference all the surrounding tissues (periost, muscles, skin) will be more or less painful on provocative palpation. There is no palpatory pain in lesions caused by trophic changes.

- **Pain:** when moving in a certain direction is very painful, the lesion is called an antalgic lesion. In this case the cause of the pain can be inflammation of soft tissues or of a facet joint, discitis, neuritis, infection or fracture.

- **Note:** it is important that the osteopath differentiates between the different types of lesions in order to take the proper actions, refer the patient, treat with manipulation, treat with mobilisation, treat the visceral or other tomes of the lesioned segment.

Lesions in the thoracic spine can not only cause local complaints and pain but can even so influence the function of the segmental related organs. More details can be found in the e-books on visceral and neurological themes.
Loss of mobility doesn’t only mean that there is a loss of mobility amplitude. More important in osteopathy is that in the case of a lesion, the local normal biomechanics are disturbed.

Normal biomechanics means that when there is movement that all the soft tissues around the joints concerned are brought under stress (stretch) in a more or less equal way and that the axes of mobility are in the normal positions so there is little loss of energy to move.

In the case of loss of mobility, where certain soft tissues are shortened, the axes of mobility are not at their original location any more. Therefore the soft tissues are brought under stress in different ways.

![Diagram of normal and abnormal biomechanics](image)

**Figure 22 - Mobility loss – wrong axis**

In this example the rotation between the two structures remains possible. However, independent of any changes to the range of motion the biomechanics are incorrect and require correction.

The retracted peri-articular structures will create the 3-dimensional false axis.

This concept is one of the significant differences between osteopathy and other manual therapies where the range of motion is considered to be the dominant evaluation for joint mobility.

Lesions in the thoracic spine can also reflect in complaints in other spinal regions such as the lumbar and cervical region.
Flexion lesions in the thoracic spine tend to increase the lordotic curves of as well in the lumbar as in the cervical spine. Too much lordosis in the cervical and/or lumbar spine can disturb the muscular balance and thus cause complaints.

Extension lesions in the thoracic spine tend to flatten the curves in the lumbar and cervical spine. This can lead to more disc compression in these spinal areas and thus to disc complaints.

3.1. Thoracic Spine

3.1.1. Lesion in bilateral Extension
The vertebra is fixed in an extension position and flexion is no longer possible.

In the case of a monolytic block, the vertebra does not translate any more.

![Diagram of lesion in bilateral extension](image)

**Figure 23 - Lesion in bilateral extension**
4. Thoracic pain

4.1. General
Thoracic pain, although less common than cervical or lumbar pain occurs frequently.

The cause of thoracic pain can be very different. Therefore it is important to find the structure that causes the pain.

Is the pain caused by a muscle and if so which muscle?

Is the pain caused by a ligamentous strain, and if so which ligament? Are the ligaments that cause the pain overstretched or are they retracted?

Is the pain caused by an inflamed joint and if so which joint?

Is the pain caused by an inflamed disc and if so at which level?

Is the pain caused by an inflamed nerve and if so which nerve and at what level is the inflammation?

Is there spinal stenosis, fracture or tumour in the vertebral canal?

Are there specific bone diseases or rheumatic factors?

Are there local infections present?

Is there a visceral afference towards the thoracic segments?

Is there a postural overload caused by lesions in other spinal areas?

The osteopath starts his/her investigation with an anamnesis.

In the case history, the osteopath tries to identify the nature of the pain:
- Aching pain can be ligamentous, especially when occurring in the morning with morning stiffness. Also when it occurs after a longer period of immobilization (sitting or standing).
- Sharp pain on specific movements can be caused by muscle strain or inflammation.
- Sharp pain when coughing often directs towards inflammation.
- Irradiating pain indicates a neurogenic factor, can be radicular or pseudo radicular.
- Numbness or muscle weakness indicates severe radicular inflammation, often with hernia compression on the nerve root.
- Are there visceral signs associated with the thoracic pain?
- Nocturnal pain often indicates cancer.
- Pain that changes with respiration can be associated with rib lesions or lung affections.
The type of patient (child, adult, elderly, pregnant, peri-menopausal woman) can give information to the osteopath.

The onset of the thoracic pain is important. Was there a trauma? Was the onset sudden or progressively worsening?

Where there recent infections?

Is there symptom magnification and psychological distress? (superficial or non-anatomical pain distribution, non-anatomic sensory or motor disturbance, inconsistent SLR, inappropriate or excessive verbalization of the pain).

**Referred pain also occurs in the thoracic region:**

- From the heart and coronary arteries.

*Figure 38 - Referred pain from the heart and coronary arteries*
• From the lungs.

Figure 39 - Referred pain from the lungs

• From the pleura.

The sensory innervation of the parietal pleura comes from the intercostal nerves and via the phrenic nerve (C3-5).

Figure 40 - Pain from the pleura
5. Examination

5.1. Thoracic Spine

5.1.1. Observation in a Standing Position
The osteopath observes the thoracic spine for normal curvatures.

Normal curvatures:

Less flexion T₁-₅

Most flexion T₆-₁₀

Less flexion T₁₁-₁₂

Figure 58 - Normal curvatures
Some indications for lesions:

- When the normal curvatures are not there, lesions can be present, especially if this goes together with connective tissue swelling, trophic tissue changes and periostal sensibility.
- When in one vertebral segment, tissue changes, periostal sensibility and loss of mobility occurs, osteopaths speak about a somatic dysfunction.
- **The common characteristics of somatic dysfunction are:**
  - Tissue changes that mostly occur as intracellular connective tissue swelling. In cases of long-standing somatic dysfunctions or older patients this swelling becomes trophic in forms such as skin striations or irregularity and colour and texture changes.
  - Periostial palpation pain that is only provoked by palpatory pressure on the periost of the spinous process. The intensity of the periostial pain is not an indicator of the grade of the problem but that there is a dysfunction within the related segment.
  - Mobility loss of the involved vertebra or rib.
  - Asymmetry is not always readily observed.
  - Identification of a somatic dysfunction does not mean that this vertebra must immediately be manipulated but indicates that in this segment.
there is a problem. Further examination is needed using simple and structured systems such as those presented later in this chapter.

5.1.2. Active Tests

5.1.2.1. Active Flexion Test
The patient bends forwards, starting from the head.

The osteopath observes the different qualities of the movement in the thoracic spine:
- Is the curve harmonious?
- Does the patient stays in the sagittal plane or is there deviation?
- Is the amplitude sufficient for the age and gender of the patient?

![Video 1 - Active flexion test](image)

When the osteopath observes a knick in the thoracic spine, there is a hypermobility in flexion in that spinal segment. Note that when the same observation is done with the patient standing, a structural lesion such as osteochondrosis or Scheuermann must be suspected.

When the osteopath observes a flat area in the thoracic spine, this indicates an extension lesion.

When the osteopath observes a deviation to the right, this indicates a facet joint on the right side fixed in convergence or shortened soft tissues on the dorsal right side.
6. Osteopathic Techniques
*(Paris 1997, Peeters & Lason 2005)*

6.1. Thoracic Spine

6.1.1. Mobilisations

6.1.1.1. General

The aim of a mobilisation is:

- Correction of the false axis in the joint by stretching retractions in the capsule and surrounding ligaments. This is done with enough specificity so that it is appropriate even in a joint that is hypermobile in other directions. In this way the biomechanical quality of the joint can be repaired and the overstretched soft tissues can be relaxed.
- Via rhythmical mobilisations and use of long lever techniques a drainage of all soft tissues around the joint will occur. Local to the false axis a congestion of all tissue will still occur.
- The mobilisation is done in a pain free and rhythmical manner. The aim is to normalize any hyperactivity of the sympathetic system in the surrounding tissues. Pain will increase this sympathetic activity further.
- Via rhythmical compression/traction the synovial production is stimulated which is a desirable reaction when treating arthrotic joints. This is also the reason why mobilisations of an arthritic joint are not suggested.
- Range of motion increase is not necessarily the primary aim of mobilisation. It can even be relatively contra indicated so as not to cause instability (especially of concern in arthrotic joints).

The mobilisation must be pain free so as to avoid increasing sympathetic activity further, which is contradictory to the aim.

The mobilisation must be done at the end of range so that a light tension is maintained in the tissues being treated.

The mobilisation is rhythmical and with circumduction where possible.

If the aim is to stimulate synovial production, a light push/pull (compression/traction) technique is indicated.

The mobilisation is always done in the direction of the false axis and according to the normal biomechanics of the joint. The hypermobile directions are avoided.
Contraindications

- Inflammation or infection.
- A joint with intra-articular swelling. Mobilisation will only increase and worsen the swelling.
- Painful end of range.
- In the direction of a structurally damaged capsule.
- Directly following recent trauma.

6.1.1.2. Extension Mobilisation – Sitting

The patient is in a sitting position, both arms on the thorax of the osteopath as a lever.

While the osteopath moves every segment into extension, he or she adds an anterior translation movement.

Video 33 - Extension mobilisation – sitting
6.1.1.3. **Extension Mobilisation – Sitting – with Knee**

The patient is in a sitting position, both arms in the neck.

While the osteopath moves every segment into extension, he or she adds an anterior translation movement.

![Extension Mobilisation – Sitting – with Knee](image)

*Video 34 - Extension mobilisation – sitting – with knee*

6.1.1.4. **Extension Mobilisation – Prone**

The patient is in a prone position, both arms upwards to be used as a lever.

While the osteopath moves every segment into extension, he or she adds an anterior translation movement.

![Extension Mobilisation – Prone](image)

*Video 35 - Extension mobilisation – prone*
8. About the Authors

Grégoire Lason
Gent (B), 21.11.54

Luc Peeters
Terhagen (B), 18.07.55

Both authors are holders of university degrees, namely the Master of Science in Osteopathy (MSc.Ost. – University of Applied Sciences), and are very active with the promotion and academic structuring of osteopathy in Europe. In 1987 they began The International Academy of Osteopathy (IAO) and are, to this day, the joint-principals of this academy. The IAO is since several years the largest teaching institute for osteopathy in Europe. Both osteopaths are members of diverse professional organisations, including the American Academy of Osteopathy (AAO), the International Osteopathic Alliance (IOA) and the World Osteopathic Health Organisation (WOHO), as part of their mission to improve osteopathic development.

This osteopathic encyclopaedia aims to demonstrate the concept that a proper osteopathic examination and treatment is based upon the integration of three systems: the musculoskeletal, visceral and craniosacral systems.
This e-book is a product of Osteo 2000 bvba.

If you are interested in publishing an e-book or if you have questions or suggestions, please contact us:

Mail: ebooks@osteopathie.eu

Fax: +32 55 70 00 74

Tel: +32 9 233 04 03

Web Osteopedia: http://osteopedia.iao.be

Web The International Academy of Osteopathy – IAO: http://www.osteopathie.eu