

Scientific Osteopathic Approach To Patients With Cervical Pain



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The same author also published books on:

- Cranial Nerve Disorders and the Scientific Osteopathic Approach
- Fascial Chains
- Nutrition and Physical Complaints
- Posturology and its Scientific Osteopathic Approach
- Scientific Osteopathic Approach to Patients with Abdominal Complaints
- Scientific Osteopathic Approach to Patients with Cervical Pain
- Scientific Osteopathic Approach to Patients with Headache
- Scientific Osteopathic Approach to Patients with Knee or Foot Pain
- Scientific Osteopathic Approach to Patients with Low Back Pain
- Scientific Osteopathic Approach to Patients with Shoulder, Elbow, Wrist or Hand Pain
- Scientific Osteopathic Approach to the Immune System
- Scientific Osteopathic Approach to Vascularization and Oxygen Supply in Patients
- Understanding Pain and the Scientific Osteopathic Approach of Pain
- Understanding Stress and the Scientific Osteopathic Approach of Stress
- Understanding the Autonomic Nervous System and its Scientific Osteopathic Approach
- Perimenopausal Women and their Complaints
- Cerebrospinal Fluid and its Influence on Health
- Attention Deficit Disorder / Hyperactivity and the Scientific Osteopathic Approach
- Principles of Modern Osteopathy – Integration of Osteopathy into General Healthcare
- Evidence Based Practice
- Patient Information – What can Osteopathy do for You?

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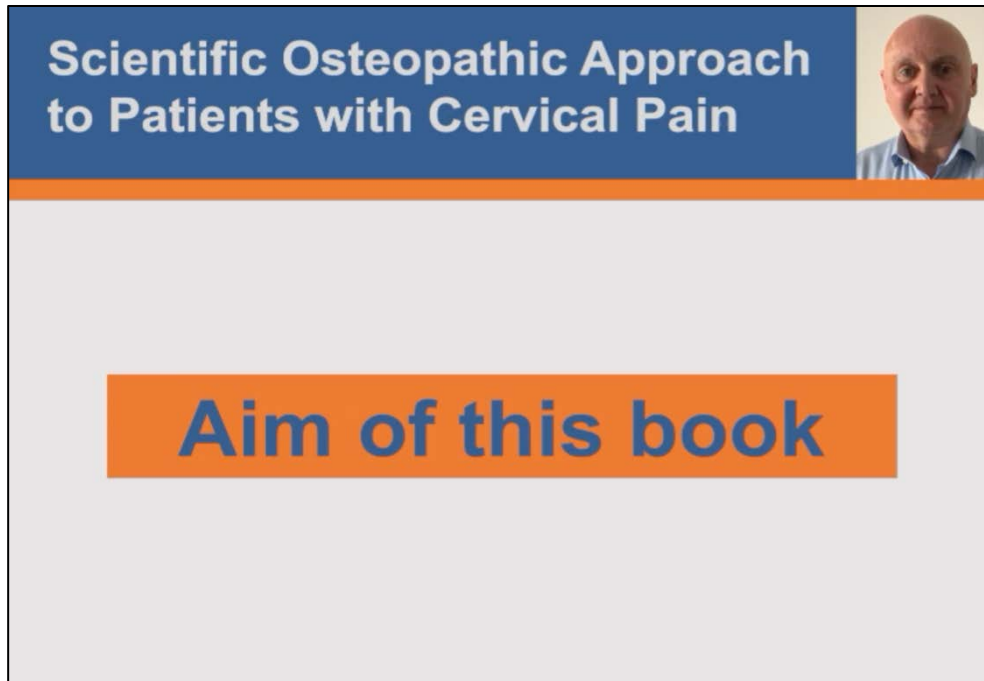
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Aim of this book

In this book, we provide all possible information, theoretically and practically to **manage patients with cervical pain** in an Evidence Based Practice approach.



Video 1 - Aim of the book

We discuss

- Relevant and functional anatomical information.
- Information on the basic principles of osteopathy.
- Relevant and functional biomechanical information.
- Assessment and treatment strategies.
- Palpation (on topography and tissue quality).
- Exclusion diagnosis.
- Mobility tests.
- Techniques.
- Treatment strategies.

The book contains

- Texts.
- Figures.
- Explanatory videos.
- Streaming videos of all tests and techniques.

Learning outcomes

After having studied this book, the student will be able to:

- Efficiently differentiate between the different possible causes of cervical pain.
- Recognize the red flags in patients with cervical pain and be able to refer appropriately.
- Palpate, investigate and test the regions that originate cervical pain.
- Set up and execute an appropriate treatment for patients with cervical pain.

Concept

The gathered information to build up this book comes from different scientific search engines such as ScienceResearch, Google Scholar, Bioline International, Directory of Open Access Journals, ScienceDirect, PubMed, Medline, Mednets, Healthline, MedConnect, eMedicine and Medscape.

Beside this, the author added his more than 40 years of experience.

The **bibliography** can be found at the end of each chapter.

This book ‘Scientific Osteopathic Approach to Patients with Cervical Pain’ consists of 2 main Chapters, depending on the region from which the pain originates:

- ***Chapter 1 – The Cervical Spine.***
- ***Chapter 2 – The Thoracic Spine with Visceral Component.***

Evidence Based Practice – EBP

In this book, we respect the Evidence Based Practice (EBP) principles and approach.

This doesn't mean that everything we suggest in this book is proven on Evidence Based Medicine (EBM) basis. EBM is dominated by the pharmaceutical industry and EBM research is done on specific and highly selected cases. This is often without considering real life, in which we mostly see combinations of cases.

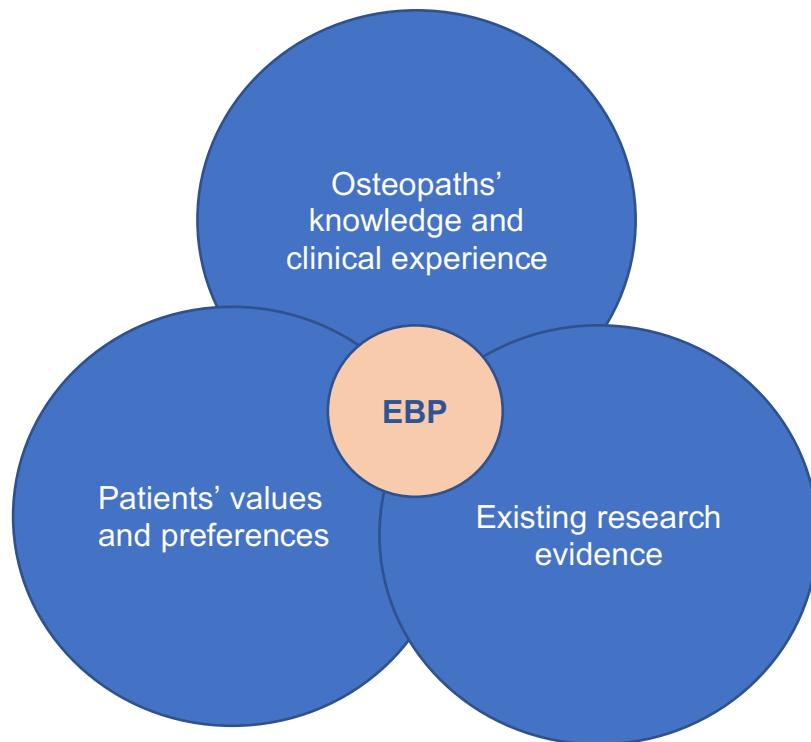


Figure 1 - Evidence Based Practice

EBP is 'the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research.' (Sackett 1996)

EBP is the integration of clinical expertise, patient values, and the best research evidence into the decision-making process for patient care.

Clinical expertise refers to the clinician's cumulated experience, education and clinical skills.

The patient brings to the encounter his or her own personal preferences and unique concerns, expectations, and values.

The best research evidence is usually found in clinically relevant research that has been conducted using sound methodology. (*Sackett 2002*)



Video 2 - Evidence Based Practice

Why Evidence Based Practice?

For scientifically educated readers, the level of this part may be a bit too elementary, but I will give it here, because there is still a large group of people who still don't seem to understand why an accurate scientific methodology is so important when testing the reliability of statements, tests and treatments.

All people, both you and I are susceptible to deception and self-deception.

Science is the only way to adjust our false perceptions and all too quick conclusions, and to make sure we don't deceive ourselves and our patients.

Some people say 'the treatment worked' but they don't realize that their personal experience is no basis for proof that the treatment indeed is or was effective.

All they can claim is that they have noticed an improvement after the treatment. This may indicate a real effect, but it may also be an inaccurate observation or a post hoc ergo propter hoc fallacy reasoning, incorrectly assuming that succession in time necessarily indicates a causal link.

A personal experience can therefore only be a starting point: we need the scientific method to determine what the observation actually means.

Some say: 'People who defend a scientific and evidence-based osteopathy do not seem to have confidence in what they see happening to their own eyes.'

The whole process of seeing is in itself largely an interpretation of the brain. We have two blind spots in our field of vision, and we are not even aware of them. I saw with my own eyes how a magician sawed a woman in two, but it was an illusion, a false perception. I saw how a patient got better after treatment, but my interpretation that the treatment was the cause of this improvement can be a mistake, based on a wrong attribution.

Why do we often have the impression that some treatments work: some possibilities:

- The affection just followed its normal course and lots of affections heal spontaneously.
- Many diseases and syndromes have a cyclic pattern whereby there are better and worse periods.
- We are all subject to suggestions.
- Maybe there was also another treatment, maybe medication?
- The original diagnosis could have been wrong.
- Temporary mood improvement is often mistaken for healing.
- Correlation and causality are often misinterpreted.
- It is not because an effect in time follows a certain action, that that action is necessarily also the cause of the effect. When the rooster crows and the sun rises, we usually realize that it is not the crows that make the sun rise.

There are so many ways to be wrong.

Fortunately, there is also a way in which we can ultimately get it right: scientific research. There is nothing mysterious or complex about the scientific method. In essence, it is just a handy toolbox full of sensible ways to test things.

Therefore: Osteopaths with an academic and scientific background are more reliable than others.

In this book I use an Evidence Based Practice approach.

General Approach To Patients With Cervical Pain

1. Introduction and First Differentiation

The Cervical Spine

The cervical spine is an important body region because of different reasons:

- Mechanically, this region adapts to all possible postural mechanical dysfunctions in the body. The eyes have to be kept as horizontal as possible and in the forward directions of the feet. For the same reason, mechanical dysfunctions in the cervical spine will influence other body regions mechanically.
- Neurologically, in this region, proprioception is strongly present as well as sympathetic and parasympathetic influences.
- The cervical region can also play a crucial role in the vascularization of the head and brain since as well ascending as descending vessel pass through the cervical and throat fascial structures. The cervical region also contains blood pressure and blood pH detectors.

The cervical spine has as well a static supportive function for the head (carrying the weight of the head) and a dynamic function (mobility in 3 planes) for the special senses (sight, hearing, proprioception...).

This double function leads to the fact that the different cervical regions (upper, middle and lower cervical regions) have different anatomical and biomechanical properties.

The chapter on the cervical spine explains the different biomechanics of these zones within the cervical spine. It also provides written and visual description of relevant functional tests and techniques.

The anatomy of the cervical spine can be found in all possible anatomy-books and is only repeated here when relevant to observation, tests and techniques.

Significance of Neck Pain

Neck pain is increasingly common throughout the world. It has a considerable impact on individuals and their families, communities, health-care systems, and businesses.

- 8-24% prevalence with 71% lifetime rate.
- It is the second most common reason to seek osteopathic, chiropractic, physiotherapeutic or manual medicine help.
- 1/3 of the patients report complete resolution.
- 1/2 of the patients have neck pain for more than 12 months.

The Thorax, Thoracic Spine and Thoracic Organs

The thorax, thoracic spine and thoracic organs are important regions because of different reasons:

- Mechanically, the thorax protects the thoracic organs in the ribcage. The thorax also provides mobility to assist the filling and emptying of the lungs and the functioning of the diaphragm. Lesions (losses of mobility or hyper mobilities) of the thoracic spine and/or ribs can influence other axial structures mechanically. A fixed thoracic kyphosis can result in a lumbar and cervical hyperlordosis with possible complaints in these regions. The rigid thorax contrasts with the mobile cervical spine and lesions or somatic dysfunctions of the thoracic spine and intrathoracic organs can influence the mechanics, the neurology, the vascularization and the metabolism of all cervical structures, thus causing cervical pain and/or headache complaints.
- Neurologically, the thoracic segments not only have a sclerotome, dermatome, angiotome or myotome but also a viscerotome. The interaction between these tomes can lead to as well musculoskeletal as visceral consequences. Heart, lung or thyroid dysfunctions often dominate the musculoskeletal complaint of a patient without there being a specific heart, lung or thyroid complaint as such. The osteopath can quickly identify this by way of somatic dysfunctions (SD) in the region T₁₋₅.
- The thorax and thoracic spine can also play a crucial role in the vascularization of the whole body because of heart and lung function. One of the principles in osteopathic medicine is optimization of the circulation in the region of complaint. The heart and lungs obviously play an important role in this since they provide a good blood quality concerning the relation oxygen/CO₂. How can the osteopath improve the local cervical or cranial circulation if the heart and lungs are not in an optimal working condition? The correction of cervical, upper thoracic, costal, diaphragm and cranosacral lesions, together with stretching of intrathoracic fascial retractions, the

mobilization of the blood pressure regulating organs and advice related to diet and general lifestyle are therefore important.

In this chapter, the functional anatomy, physiology and neurology are discussed as well as the mobility of the thoracic spine, the ribs, the intrathoracic organs and the diaphragm and the ways in which the osteopath deals with thoracic, visceral and cervical dysfunctions.

The osteopath is often confronted with patients with a combination of respiratory problems, thoracic and cervical complaints.

In many patients, the lungs are in dysfunction. The first sign for the osteopath is the identification of one or more somatic dysfunctions in the region T₁₋₅. In these patients, the thoracic organs must be osteopathically (functionally) examined.

The complaints that can originate from heart, lung or thyroid dysfunctions are diverse, from respiratory difficulties, thoracic and cervical complaints and headaches to general complaints such as tiredness and fatigue.

The osteopath does not treat real disease but can significantly influence functional problems. Even in patients with specific heart, lung or thyroid disease the osteopath can contribute in an important way to the total multidisciplinary treatment of these patients.

In the chapter 'The Thoracic Spine and the Ribs', the aim is to present the osteopathic vision towards the thoracic spine and the intrathoracic organs in order to manage patients with cervical complaints.

For didactic reasons, the Fryette model is used to explain the biomechanics of the spine. This model is not always accurate, but it is a good didactic tool to learn to understand the different mobilities in the spine.

When we see a patient with acute or chronic cervical pain, it is important to first **differentiate whether the pain comes from:**

- The cervical spine.
- The thoracic spine (thorax) and ribs with visceral component.

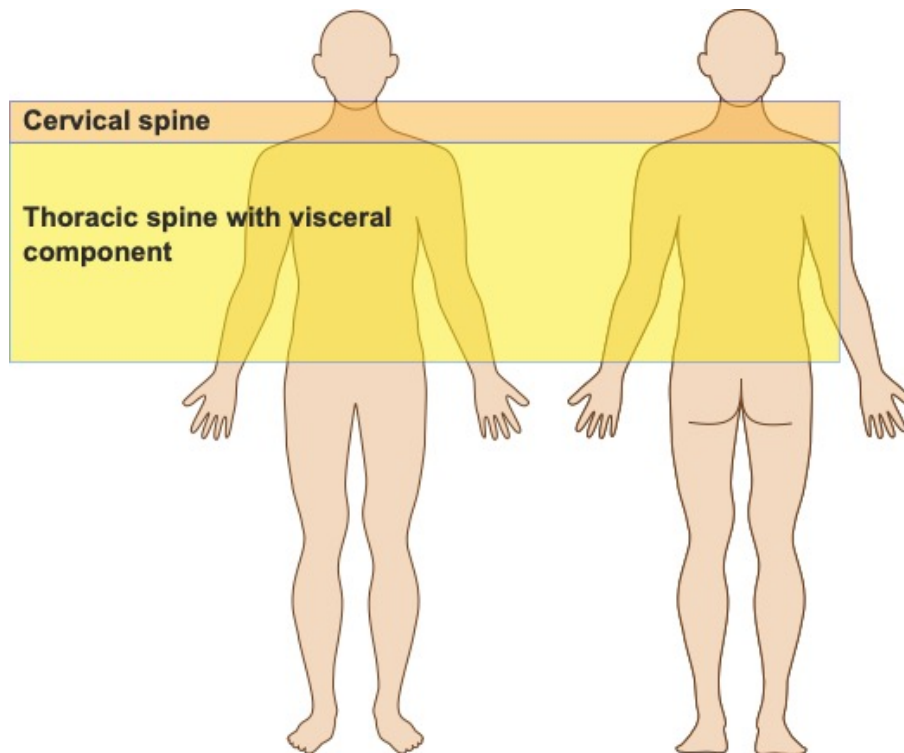


Figure 1 - First differentiation

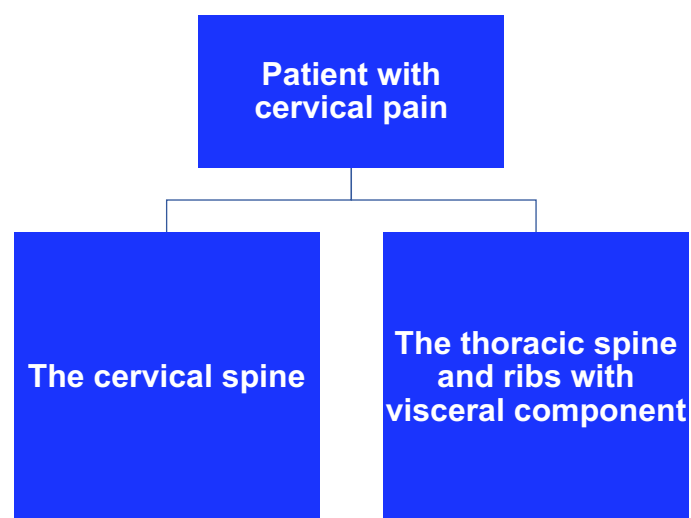


Figure 2 - First differentiation

This differentiation is in some way abstract and not 100% complete but it gives a good standard in our osteopathic examination and differential assessment.



Video 1 - First differentiation

2. Pain Generators

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

The generator is:

- Tissue damage.
- Near tissue damage such as overstretch or high pressure (mechanoreception).
- Ischemia (chemoreception – pH).
- Inflammation (chemoreception – pH).
- Temperature (if high or low enough – thermoreception).

The pain is captured by nociceptors which are free nerve endings of sensory A δ and unmyelinated C nerve fibers, which respond to tissue damage. They guide the pain stimuli to the spinal cord, from where it is further transmitted to the brain. More detail on pain can be found in the book 'Understanding Pain and the Osteopathic Approach of Pain' by the same author.

3. This First Differentiation is Done By

- Etiology (cause).
- Communication with the patient (verbal, visual... - case history).
- Observation.
- Specific tests.

Once we found out whether the complaint comes from one of the above-mentioned regions, the specific testing can begin.

To be safe and efficient, the osteopath has a specific way of reasoning. Besides the **classic clinical reasoning**, there is the **specific osteopathic reasoning**.

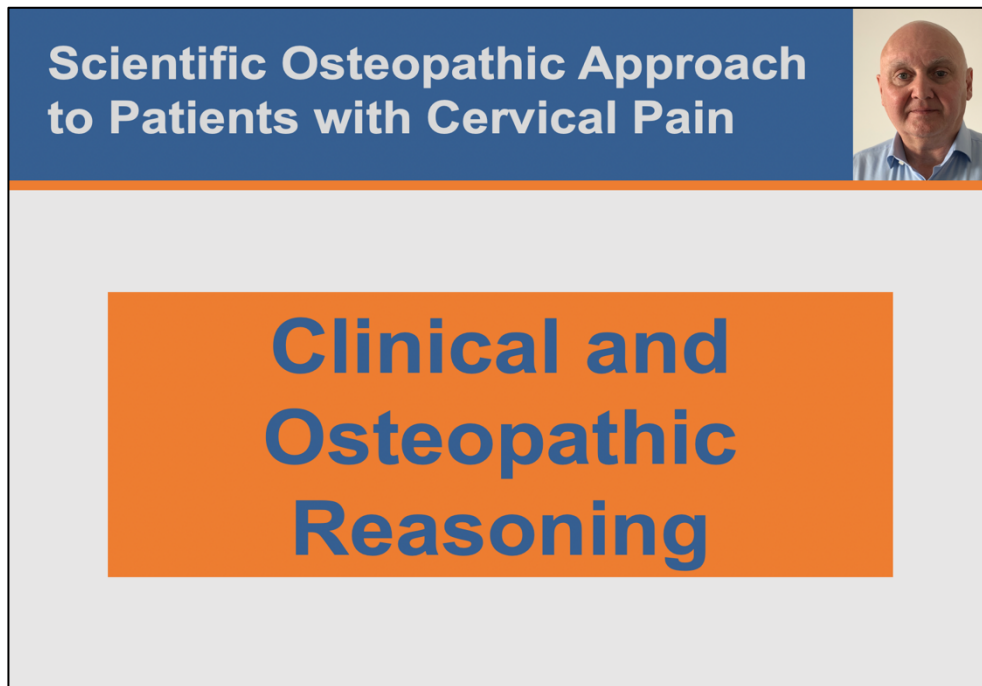
This osteopathic reasoning is based on the osteopathic principles.

4. Osteopathic Principles



Video 2 - Osteopathic principles

5. Clinical and Osteopathic Reasoning



Video 3 - Clinical and osteopathic reasoning

6. Case History

Depending on different criteria that we get from the case history, we can have a good impression from where the complaint (pain) originates.

Differentiation per region

The pain/complaint comes from or includes	The cervical spine	The thoracic spine with visceral component
Location of the pain	From occiput till C ₇	Thoracic spine, abdomen, cervical spine, head
Irradiation in the upper extremity	Possible, even likely	Possible (upper thoracics)
Irradiation in the head	Possible	No
Muscle weakness	Possible, even likely	Possible (upper thoracics)
Sensibility disturbance	Possible, even likely	Possible (upper thoracics)
Reflexes disturbed	Possible positive, even likely	Possible positive (upper thoracics)

Limited mobility in the neck	Possible, even likely	Possible
Non-mechanical pain	Possible, less likely	Possible
Neurovegetative symptoms	Possible	Possible
Paresthesia	Possible	Seldom in the neck
Gait disturbance	Sometimes (myelopathy, proprioception disturbance)	No
Intensity of the pain (the worst pain is rarely the scariest)	All is possible	All is possible
Confusion	Possible	No
Intermitted	Possible	Possible
Constant	Possible	Possible
Nocturnal pain	Possible	Possible
Gastrointestinal disturbances	Possible	Possible
Together with visceral symptoms	Possible	Possible
Jaundice	No	Possible
Fever	Possible	Possible
Respiratory complaints	Possible	Possible
Complaints with senses (sight, hearing, taste...)	Possible	No
Pain on movement	Possible, even likely	Possible
Onset trauma	Possible	Possible
With vomiting	Possible	Seldom
Dizziness	Possible	Mostly not
Gender	More in women (30-50)	Equal
Age	More from 45 +	Seldom below 20
Morning stiffness	Possible	Possible
Worse by coughing (sign of inflammation)	Possible	Possible
Worse by lifting	Possible	Possible
Torticollis	Possible	Negative
Swallowing difficult & painful	Possible	Negative
Headache	Possible	Possible
Neck pain	Possible	Possible
Thoracic pain	Possible	Possible

The following general scheme is a guide for the anatomical inventory process (to find the structure that causes the complaint or pain). It uses keywords and typical characteristics of complaints finding origin in certain structures.

Use the following **keywords** to pose specific questions to your patients.

STRUCTURE WHERE COMPLAINT ORIGINATES	CONDITION (What must be considered?)	KEYWORDS	PROVOCATION
Bony structures	Bone cancer, tumor (malign or benign) Expansive processes (cysts,...) Fracture or burst	<ul style="list-style-type: none"> * Sensitivity in the region (constant and spontaneous) * Progression of intensity (worsened over several days or weeks) * Nocturnal pain, relieved on movement * Pain during weight bearing activity * Trauma (always suspect fracture or burst) 	Compression test Percussion painful Direct pressure painful
Intra-articular cause	Arthritis (with or without sepsis)	<ul style="list-style-type: none"> * Sensitivity of the region * Progression of intensity (worsened over several days or weeks) * Nocturnal pain, sometimes relieved with movement * Pain during weight bearing activity * Recent infections in other body regions * Fever (in case of sepsis) 	Compression test painful
Capsule/ Ligamentary cause	Overstretch or Retraction of ligaments	<ul style="list-style-type: none"> * After specific maintained positions * Start (on movement) pain * Morning stiffness (reduces when moving) * Better during non-weight bearing movements * Worse during weight bearing activity * Constant but stable pain 	Direct pressure is painful Held stretch of the ligament is painful Maintained traction becomes painful
Muscle	Spasm of the muscle	<ul style="list-style-type: none"> * Heavy radiation during movement, resistance or 	Direct pressure,

	Overstretch of the muscle Trophicity changes of the muscular tissue	stretch (in the direction of the muscle) * Pain free in rest (in certain positions where the muscle can relax) * In cases of trophicity changes, the muscle reacts more like a ligament	stretch and contraction are painful
Arterial	Diameter narrowing of the arteries	* Cramps * Loss of normal color (pale or purple) * Worse during circulatory load (activity) * Position dependent * Radiation sometimes deep sensation	Palpation of pulses before and after circulatory load (after the load, the pulse is reduced)
Venous	Entrapment in the course of the venous return towards the heart	* Feeling of heaviness * Fatigue in the region of the complaint * Swollen feeling * Blue-red color * Warm feeling * Position dependent * Varicose veins (visible or not)	Positional changes Observation
Lymph	Entrapment in the course of the lymphatic return	* Feeling of heaviness * Fatigue * Swelling (visible or not) * Pallor * Moistness * Red striations	Palpation of nodes possible Observation of lymph nodes and swelling
Peripheral nerve	Entrapment of the nerve Radicular-pseudoradicular complaints Tension	* Radiation in the course direction of the nerve * Motor and/or sensory changes	Tension tests (stretch of the nerve) Abnormal reflexes Sensation changes Muscle force changes
Central neurological cause		* Consciousness changes * Cranial nerve dysfunctions * Bilateral neurological symptoms	Cranial nerve function testing Babinski reflex Co-ordination/balan

			ce/ senses testing
Neurovegetative system	Hyper/hypofunctions	* General status (hyper/hypo sympathetic) Segmental symptoms	Observation of the segments, dermatomes
Metabolic	Dietary/ excretory organs/ oxygen supply (heart/lung functions)	* Generalized symptoms * Difficult localization	
Systemic conditions	Diabetes, rheumatism...	Typical characteristics, depending of the dysfunctional system	Classic assessment in combination with the osteopathic assessment

Scientific Osteopathic Approach to Patients with Cervical Pain



Case History

Video 4 - Case history

General red flags

(Red flags are signs and symptoms that cannot exclude severe illness)



The risk for severe illness in cervical pain is higher at the age under 20 and above 55.

- Fever and chills.
- Weight loss.
- History of cancer.
- General unwell feeling and extreme fatigue.
- Recent bacterial or viral infections.
- Associated chest pain with shortness of breath.
- Light tapping on the bones is painful.
- Bilateral complaints (both arms: numbness, tingling, muscle weakness).
- Paralysis.
- Pain not getting better after 6 weeks or even getting worse.
- Nuchal rigidity, and/or positive Brudzinski's, or Kernig's sign, Babinski reflex positive.
- Trauma (even minor or repetitive) may cause fractures.
- Head trauma, especially when there is unconsciousness and/or neurological signs.
- Bladder or other visceral dysfunction associated with the onset of neck pain.
- Associated dysphasia.
- Associated cranial nerve, or central nervous system (CNS) signs/symptoms.
- Pleuritic pain, chronic cough, dyspnea.
- Immune-compromised state.
- Structural deformities.
- Abnormal vital signs (tachycardia (>120 bpm), bradycardia, tachypnoea (>30bpm), hypotension).
- Unexplained bleeding (bloody urination).
- Anemia.
- Jaundice.
- Nocturnal pain.
- Non-mechanical pain.
- Joint swelling with heat.
- Pain not relieved by rest.
- Drug abuse, alcoholism.
- Prolonged corticosteroid use.
- Personality disorders, confusion.

Some of these red flags are more or less red. F.E. weight loss can also come from a diet.



Video 5 - Red flags

7. Acute or Chronic

There are different views on when and why an acute pain turns into a chronic pain. Mostly, acute means within the first 6 months. Once the pain persists more than 6 months it is called chronic pain. **More details on acute and chronic pain come later in this book.**



Figure 3 - Case history

8. Specific Tests

After the case-history (communication with the patient), specific tests differentiate between the cervical spine and the thoracic spine with visceral component.

The execution and description of the specific tests can be found in the different chapters on:

- ***The Cervical Spine.***
- ***The Thoracic Spine with Visceral Component.***

Here follows an overview of the different **tests**:

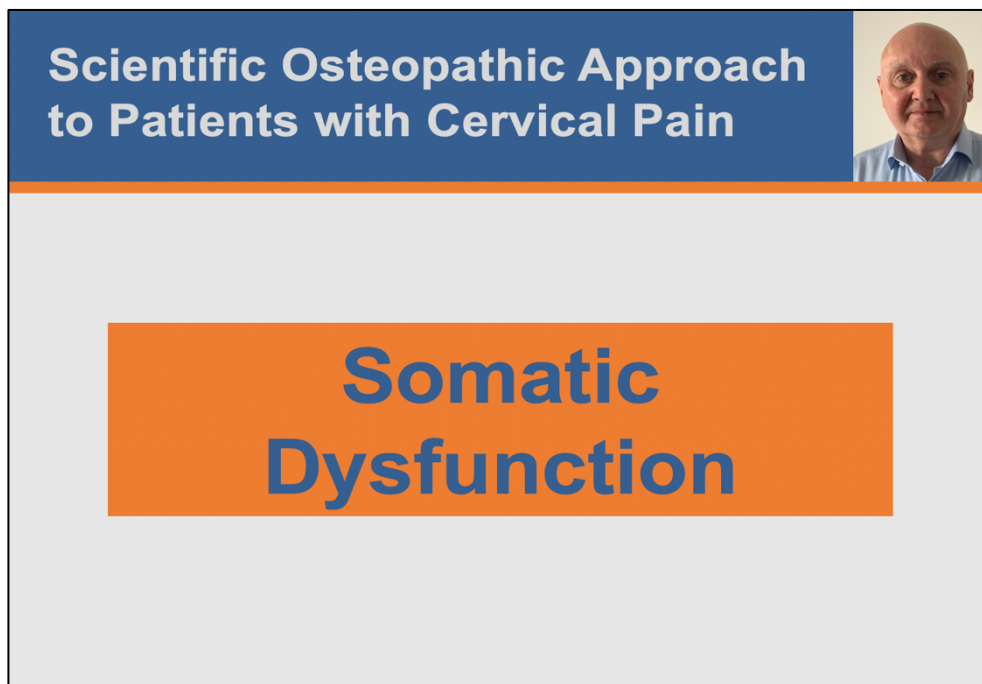
Test	The cervical spine	The thoracic spine with visceral component
Palpation	Minimal 3 spinal processes sensitive/painful	Periosteal pain spinal processes (mostly 3 or more) Periosteal pain associated ribs
	Swelling connective tissue next to one or more cervical vertebra: only visible at C ₇ level, not other cervical levels	Swelling connective tissue next to one or more thoracic vertebrae
Palpation skull skin	Can be positive on pain	Negative
Palpation of lymph nodes	Can be positive	Can be positive
Palpation ganglions (sympathetic trunk)	Can be positive on pain	Can be positive on pain
Compression test	Positive in caudal direction when discitis. Positive in rotation when inflammation of facet joint. (rotation right: compression of left facet joint). Positive in sidebending (uncovertebral joints).	Can be positive (disc, facets, joints with ribs)
Active mobility neck	Positive on pain	Can be positive on pain
Deep inhalation	Mostly negative	Can be positive on pain
Peripheral neurological tests	Can be positive	Only upper thoracics
Babinski	Can be positive	Can be positive
Tests of the cranial nerves	Can be positive (only upper cervicals)	Negative
Trigger points in muscles	Possible	Possible
Test of Hautant	Possible	Possible
Nystagmus test	Possible	Possible
Doorbell sign	Possible	Possible
O'Donoghue maneuver	Possible	Negative
Rust's sign	Possible	Negative

Shoulder depression test	Possible	Negative
Soto-Hall test	Possible	Possible
Distraction test	Possible	Negative
Bakody's sign	Possible	Negative
Cervical flexion test	Possible	Negative
De Kleyn-Nieuwenhuyse test	Possible	Negative
Vertebral artery test	Possible	Possible
Vasalva test	Possible	Possible
Swallowing test	Possible	Negative
Hypermobility test neck	Possible	Negative
Sharp Purser test	Possible	Negative

We know that there is also overlap possible between the different regions.

Didactically however, it is interesting to differentiate the 3 regions.

9. Somatic Dysfunction



Video 6 - Somatic dysfunction

Osteopaths refer often to 'Somatic Dysfunctions (SD)'. The old term is 'Osteopathic Lesion', sometimes even just the word 'Lesion' is used.

The definition of 'Somatic Dysfunction' is: Impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodiar and myofascial structures, and their related vascular, lymphatic, and neural elements.

Somatic dysfunction is treatable using osteopathic manipulative treatment (OMT).

The positional and motion aspects of somatic dysfunction are best described using at least one of **three parameters**:

- The position of a body part as determined by palpation and referenced to its adjacent defined structure.
- The directions in which motion is freer.
- The directions in which motion is restricted.

In the spinal area, a somatic dysfunction is mostly accompanied with connective tissue swelling or other trophicity changes left and right of the spinal processes.

The evolution from swelling towards other soft tissue trophicity changes is depending on the age of the patient and the age of the dysfunction. There are also gender and inter-individual differences.

The soft tissue (connective tissue) swelling is visible and palpable in most regions of the spine except for the region Occiput - C₆.

A combination of several somatic dysfunctions is possible in one patient.

An easy way to find a somatic dysfunction is to use the word TART: A somatic dysfunction is found where these 4 findings are present at the same location:

- **T**enderness and/or pain: can be caused by inflammation, degeneration or neuroplastic changes, nociceptive driven functional changes or peripheral sensitization.
- **A**symmetry: positional asymmetry or uneven tissue or motor changes, but not always visible.
- **R**ange of motion: abnormal.
- **T**issue texture abnormality: swelling, trophicity changes.

Specific for the cervical spine:

- In the cervical spine, the soft tissue changes next to the cervical spinal processes, are not well visible and also difficult to palpate. Especially when it concerns tissue swelling. Muscular tightness or trophicity changes,

ligamentary loss of elasticity are also tissue changes that can be palpated by a skilled hand.

- The exception is the region of C₇. In this region, swelling is mostly visible as part of a somatic dysfunction.
- Therefore, palpation for periosteal pain is important (from occiput to the spinal process of C₇), together with the testing of the mobility.