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Recent Advances in Clinical Trials

The Significance of Thoracic Blockages for the Autonomic Nervous System – Neural Therapy and Its Clinical Relevance

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ABSTRACT

Background: *Thoracic blockages not only present as mechanical movement restrictions but also influence a wide range of physiological processes due to their close connection with the autonomic nervous system, particularly the sympathetic nervous system. Persistent sympathetic activation can lead to autonomic dysfunctions, organ disorders, hormonal imbalances, metabolic diseases, myofascial pain syndromes, and circulatory disturbances.*

Methods: *This study analyzes the pathophysiological mechanisms of thoracic blockages and their impact on the spinal and autonomic nervous systems. The primary focus is on the interplay between sympathetic hyperactivity, impaired microcirculation, and the formation of myofascial trigger points.*

Results: *Chronic thoracic blockages can induce reflexive hypertonia of the paravertebral musculature, leading to pain, organ dysfunction, and central nervous system sensitization. This exacerbates muscular imbalances and contributes to the chronicity of pain syndromes.*

Therapy: *Combining neural therapy and manual medicine offers an integrative approach to restoring disrupted physiological balance. While neural therapy targets sympathetic dysregulation and modulates interference fields, manual medicine helps restore mobility and reduce muscular dysfunction.*

Conclusion: *Effective treatment of thoracic blockages requires an interdisciplinary approach that addresses both neurovegetative and mechanical aspects. The combination of neural therapy and manual medicine is an effective method for sustainably regulating structural and functional imbalances while reducing healthcare costs.*

Keywords

Neural therapy, Autonomic nervous system, Sympathetic nervous system, Myofascial trigger points, Manual medicine.

Introduction

Functional Anatomy of the Thoracic Spine (T-Spine) and Its Clinical Relevance

The thoracic spine (T-Spine), composed of 12 vertebrae (Th1-Th12), represents the most extended segment of the spinal column and serves as the connection between the cervical and lumbar spine [1,2]. It plays a crucial role in the motor and sensory innervation of the trunk and maintains a close interaction with the autonomic nervous system (ANS) [3-5]. Pathological stimuli can trigger reflexive chain reactions within the ANS, potentially leading to dysfunctions of internal organs, musculoskeletal imbalances, and chronic pain syndromes [4-8].

The nervous system's segmental organization is most evident in the thoracic spine. The ribs' course includes afferent-efferent somatic and afferent-efferent sympathetic nerve distributions [9-11]. The assignment of thoracic and abdominal organs to their respective thoracic spinal segments based on sympathetic innervation can be utilized for diagnostic and therapeutic purposes [10-14].

The first six ribs form almost a complete bony ring, while the next four ribs create a more open ring. The ventral ends of the 7th to 10th ribs converge at the costal arch. These ribs have three joints: dorsally, the costovertebral and costotransverse joints, and ventrally, the sternocostal joint, a synchondrosis. While the dorsal joints' mobility is limited, the ventral area's mobility is barely noticeable. The three-joint structure of the upper ribs contributes to a biomechanically complex system in which the vertebral joint, facet joint, costotransverse joint, and sternocostal joint interact. Restricted joint movement often leads to irritation of the sympathetic nervous system (ANS), which results in inflammatory processes and perfusion disturbances that impair thoracic function [10,14].

Diversity of Joint Structures in the Thoracic Spine

The present study focuses on the thoracic spine, which is characterized by a high degree of structural complexity. This complexity is mainly reflected in the numerous articulations, as illustrated in Figure 1 [10,15]:

- Intervertebral facet joints between the vertebral bodies facilitate rotational movements [1,2,7,8].
- The costotransverse and costovertebral joints connect the ribs to the vertebrae and play a crucial role in respiration and thoracic mobility [1,2,7].
- Connections between spinous processes and rib heads influence the biomechanical stability of the thoracic spine [1,2,10,15].

This intricate interplay of joint structures underlines the thoracic spine's importance in maintaining mobility and stability while highlighting its susceptibility to dysfunctions that can have far-reaching effects on the autonomic nervous system and overall health.

Figure 1 illustrates the thorax's anatomical diversity, emphasizing the intricate structure of bones and joints. This complexity allows for a broad range of movements in the thoracic spine (T-Spine). While flexion and extension are somewhat restricted due to the rib connections, rotational movements remain well-preserved.

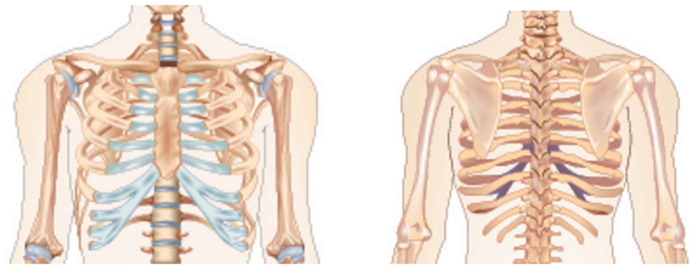

Figure 1: Anatomical Complexity of the Thorax.

Thoracic blockages are not merely mechanical restrictions within the spine but influence numerous physiological processes via the autonomic nervous system [10,15,16]. The activation of the sympathetic nervous system plays a pivotal role in both the onset and chronicity of symptoms that extend far beyond the thoracic region. This study aims to explore the pathophysiological mechanisms of thoracic blockages and their systemic effects on the body [1,10,17].

Pathophysiology of Thoracic Blockages: Impact on the Spinal and Autonomic Nervous System

Segmental Functional Characteristics and Spread Phenomena

A distinctive feature of the thoracic spine is its segmental integration within the nervous system, which establishes a direct link between somatic and autonomic structures [9,11,17-19]:

- Afferent-efferent interactions within the thoracic segments influence somatic and sympathetic nerve pathways.
- Thoracic spinal nerves innervate the rib musculature, intercostal nerves, and visceral organs of the thoracic and abdominal cavities.
- Pathological stimuli at a single vertebral segment can trigger symptoms in distant body regions via reflex circuits and autonomic couplings (e.g., neurovisceral pain or reflexive muscle tension) [10,11].

Table 1: Spinal Nerves from T1 to T12 and Their Innervation Areas. [1,2,13,21].

Thoracic Segment	Innervated Organs	Innervated Muscles
T1	Heart, Lungs, Esophagus	Intercostal muscles, Scalene muscles, Sternocleidomastoid muscle
T2	Heart, Lungs, Upper Extremities	Intercostal muscles, Serratus anterior muscle
T3-T4	Bronchi, Esophagus, Upper Thoracic Organs	Intercostal muscles, Rhomboid muscles
T5-T6	Stomach, Liver, Gallbladder	Rectus abdominis muscle, External oblique muscle
T7-T8	Pancreas, Spleen	Internal oblique muscle, Transversus abdominis muscle
T9-T10	Kidneys, Adrenal Glands	Latissimus dorsi muscle, Iliocostalis thoracis muscle
T11-T12	Small Intestine, Ureters, Reproductive Organs	Quadratus lumborum muscle, Psoas major muscle

The thorax is characterized by a complex biomechanical structure consisting of multiple joint connections, including vertebral bodies, ribs, facet joints, costotransverse joints, and the articulation of the ribs with the sternum. This anatomical arrangement ensures a high degree of mobility [7,10,11,20]. Table 1 concisely overviews spinal nerves and their corresponding organ and muscle innervation.

Causes and Systemic Impact of Thoracic Blockages

A blockage in this region can be caused by various factors, including mechanical overload, poor posture, traumatic impacts, or degenerative processes [9-11]. The resulting movement restriction affects the spinal and autonomic nervous systems, particularly the sympathetic nervous system, leading to widespread functional and systemic disturbances.

Understanding the possible connections between segmental blockages and organ disturbances is essential to assess the resulting organ dysfunctions [10,15,22,23]. Additionally, a correlation with clinical symptoms must be considered, as outlined in Table 2.

Tables 1, 2, and 3 are practical guides for identifying blockages and highlighting their clinical implications. These references provide valuable insights into the diagnostic approach and assist in locating relevant dysfunctions.

Table 2: Thoracic Segments and Their Clinical Correlations.

Thoracic Segment	Related Organs	Clinical Findings Due to Sympathetic Nervous System Overload
T1-T2	Heart, Lungs	Tachycardia, Hypertension, Functional Cardiac Complaints, Dyspnea
T3-T4	Bronchi, Esophagus	Asthma, Chronic Cough, Gastroesophageal Reflux, Difficulty Swallowing
T1-T6	Stomach, Liver, Gallbladder	Heartburn, Gastritis, Gallbladder Dysfunction, Indigestion
T7-T8	Pancreas, Spleen	Hypoglycemia, Weak Immune System, Pancreatic Dysfunction
T9-T10	Kidneys, Adrenal Glands	Kidney Dysfunction, Hypertension, Adrenal Hyperactivity
T11-T12	Small Intestines, Ureters, Ovaries/ Testes	Small Intestinal Dysfunction, Chronic Constipation/Diarrhea, Gynecological/ Hormonal Disorders

Thoracic Blockages and Dysfunctions as Underestimated Causes of Chronic Diseases

Thoracic blockages and dysfunctions are often underestimated as underlying causes of chronic diseases. As early as 2010, Dr. Nazlikul described the significance of thoracic blockages in regulatory disorders and their impact on the autonomic nervous system [10,15]. Since then, numerous studies and therapeutic approaches have confirmed that addressing thoracic dysfunctions can significantly relieve chronic diseases and functional disorders [10,15,24].

Checklist: Diagnosis of Thoracic Blockage

Medical History – Typical Symptoms Indicating a Thoracic Blockage [10,15]

- Symptoms worsen at night while lying down
- Unclear chest pain without a cardiac cause
- Respiratory issues (tightness, hyperventilation) without pulmonary pathology
- Reflux, bloating, and digestive problems, especially in the evening or at night
- Heart rhythm disturbances, tachycardia while lying down or after eating
- Headaches, neck tension, dizziness
- Nocturnal urination, bladder dysfunction, sexual dysfunction
- Chronic fatigue, sleep disturbances, stress intolerance

Table 3: Thoracic Segments and Their Clinical Correlations.

Thoracic Segment	Affected Regions	Associated Nerves	Possible Clinical Findings
T1-T2	Head, Neck, Upper Extremity	Brachial Plexus (C5-T1), Stellate Ganglion	Headache, Cervicogenic Dizziness, Upper Extremity Paresthesia
T3-T4	Neck, Shoulder, Upper Back	Sympathetic Thoracic Nerves, Intercostal Nerves	Shoulder Stiffness, Upper Back Pain, Rib Movement Restriction
T5-T6	Shoulder, Chest, Thoracic Spine	Intercostal Nerves, Thoracic Sympathetic Chain	Chest Pain, Postural Imbalance, Shortness of Breath
T7-T8	Chest, Abdomen, Lower Back	Lower Intercostal Nerves, Lumbar Plexus	Lower Back Pain, Digestive System Dysfunction
T9-T10	Lower Back, Pelvis, Upper Extremity	Lumbar Plexus, Femoral Nerve	Pelvic Instability, Neuropathic Pain in Lower Extremity
T11-T12	Pelvis, Lower Extremity, Sacral Region	Lumbosacral Plexus, Sciatic Nerve	Lower Extremity Weakness, Sciatic Pain, Sacroiliac Dysfunction

Clinical Examination

- Postural analysis: Hyperkyphosis, rib rotation, scoliosis tendencies
- Palpation of the thoracic spine (T-Spine):
  - o Tenderness over facet joints (Th1–Th12)
  - o Tense paravertebral muscles, trigger points
  - o Restricted mobility of rib-vertebral joints
- Assessment of breathing mechanics:
  - o Limited rib expansion during deep breathing
  - o Pain during inspiration or expiration
- Visceral examination:
  - o Tender points in the upper abdomen (stomach, liver, gallbladder)
  - o Diaphragmatic tension

Special Functional Tests

- **Segmental mobility tests** for the thoracic spine
- **First-Rib Test** (evaluating the first rib as a potential cause of shoulder/neck pain)
- **Functional breathing tests** (diaphragmatic vs. thoracic breathing patterns)

Autonomic Dysregulation (Left Side of the Diagram – Figure 2)

Activation of the autonomic nervous system leads to:

- Vascular responses result in sympathetically induced vasoconstriction and impaired microcirculation in the affected segment.
- Initial phase: Edema in connective tissues develops, further restricting mobility.

- Increased pain sensitization due to the activation of algogenic substances (e.g., Substance P, Bradykinin).

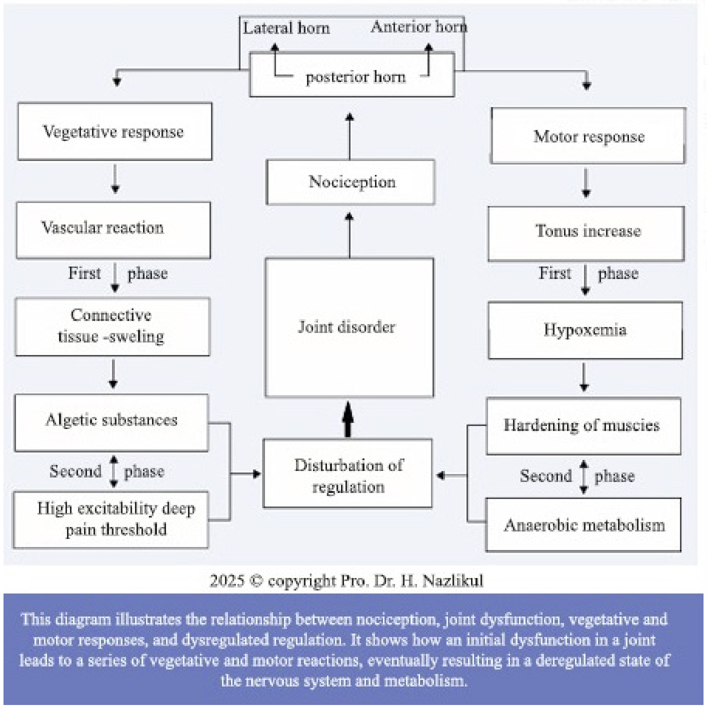

Figure 2: Pathophysiology of Thoracic Blockages – Muscular Dysfunction vs. Autonomic Regulation.

As illustrated in Figure 2, a thoracic blockage induces nociception, which triggers reflexive adaptations within the spinal cord. These affect both the autonomic nervous system (via the lateral horn of the spinal cord) and the motor system (via the anterior horn). Please read the text to understand the description it contains.

Muscular and Movement Dysfunction (Right Side of the Diagram – Figure 2)

In the second phase, the pain threshold decreases, leading to chronic pain, particularly in deep tissues. Simultaneously, a motor response occurs, characterized by increased muscle tension (tonus) as a protective reaction [10,25].

- First phase: Hypoxemia arises due to increased muscle tension, reducing blood flow, leading to muscle hardening and restricted thoracic spine mobility.
- Second phase: The anaerobic metabolism accumulates lactate, exacerbating myofascial trigger points [8,10,26,27].

Summary: Interaction Between the Autonomic and Motor Systems

The activation of the sympathetic nervous system and increased muscle tension mutually reinforce each other, creating a vicious cycle (circulus vitiosus). This dysregulated system leads to chronic dysfunction, causing:

- Visceral symptoms (e.g., functional heart rhythm disturbances, digestive disorders).
- Myofascial dysfunctions (e.g., trigger points, pain, and restricted mobility).

A targeted regulation therapy incorporating neural therapy, manual medicine, and autonomic regulation techniques is essential to interrupting this cycle [5,9,10,29,30]. This analysis applies the described mechanisms to the pathophysiology of thoracic blockages, emphasizing their systemic effects [31-33].

Involvement of the Spinal and Autonomic Nervous Systems

The spinal nervous system interacts directly with the autonomic nervous system (ANS) via afferent and efferent pathways. A thoracic blockage can lead to ANS dysregulation through the following mechanisms:

1. **Irritation of Spinal Nerve Roots**

- A blockage in the thoracic region may cause mechanical compression or irritation of segmental spinal nerves [10,34].
- This results in hyperactivity of afferent nociceptive pathways, leading to central sensitization in the spinal cord [6,7,10].
- Increased transmission of stimuli further enhances sympathetic neuron activity via the dorsal horn, causing chronic sympathetic activation.

2. **Increased Sympathetic Activity (Sympathicotonia)**

- Persistent excitation of sympathetic neurons creates an imbalance between sympathetic and parasympathetic activity [5,10,15,29].
- This autonomic dysregulation increases muscle tension, impaired circulation, and further visceral dysfunction [20,35-37].
- Patients often experience symptoms such as heart rhythm disturbances, functional digestive disorders, respiratory restrictions, and chronic fatigue [38].

3. **Impairment of Neural Conduction**

- Dysfunction of segmental spinal nerves affects somatosensory and autonomic pathways, altering pain processing mechanisms.
- The thoracic spinal nerves (Th1-Th12), through their connections with sympathetic chain ganglia, can trigger reflex responses throughout the body [10,12,39].

Muscular and Vascular Consequences of Sympathetic Overactivity

Reflexive sympathetic activation results in persistent hypertonia of the paravertebral musculature, leading to multiple secondary complications [7,10,40]:

- Persistent muscle contractions due to sympathetically mediated vasoconstriction and impaired metabolic supply [10,41].
- Reduced microcirculation, leading to ischemia and tissue acidosis.
- Increased mechanical irritation of peripheral nociceptors, enhancing pain perception.
- Development of myofascial trigger points (MTrPs) as a secondary consequence of chronic muscle hypertonia [42,43].
- Chronic central nervous system (CNS) sensitization leads to exaggerated pain responses even to non-noxious stimuli [44,45].

Microcirculatory Disorders and Their Consequences

Sympathetic overactivation-induced vasoconstriction significantly disrupts microcirculation, resulting in the following pathophysiological changes [10,15,43,46,47]:

- Reduced oxygen and nutrient supply to muscle and connective tissues, leading to chronic metabolic dysregulation.
- Impaired venous return, causing accumulation of metabolic waste products (e.g., lactate).
- Increased pain sensitivity due to local acidosis and activation of mechanoreceptive nociceptors [48].
- Chronic muscle tension as a protective mechanism against potential ischemic damage.

Development and Persistence of Myofascial Trigger Points (MTrPs)

A particularly relevant phenomenon associated with thoracic blockages is the secondary development of myofascial trigger points [10,20,42-44]. These arise due to:

- Persistent sympathetic overactivity, increasing neuromuscular excitability.
- Hypoxia and metabolic stress within the muscles lead to enhanced release of pain mediators such as Substance P and Bradykinin [44,48].
- Heightened sensitization of spinal interneurons, disrupting pain regulation mechanisms.
- Reflexive muscle contractions, sustained by spinal-autonomic interactions [10,50,51].

These trigger points cause localized and referred pain, which can spread through myofascial chains to other body regions, contributing to widespread musculoskeletal and visceral dysfunctions [51-53].

Diagnostic Approaches in Manual Medicine

The diagnosis of thoracic blockage is based on palpatory and functional tests that help identify movement restrictions and muscular imbalances [9,10,15,51]:

Inspection

- Postural assessment (hyperkyphosis, scoliosis, rib asymmetries)
- Observation of breathing mechanics (paradoxical breathing, asymmetric respiratory movements) [51,41].

Palpation

- Examination of the paravertebral muscles for changes in tone and myofascial trigger points
- Assessment of rib mobility, particularly about breathing (pump-handle bucket-handle mechanisms)
- Facet joints: Evaluation for tenderness or restricted gliding motion

Segmental Mobility Tests

- Examination of thoracic segments (Th1–Th12) for restrictions in flexion/extension, rotation, and lateral flexion
- Assessment of the mobility of the costotransverse joints
- First-Rib Test: Evaluation of the first rib for tension or fixation

Special Tests

- Respiratory Excursion Test: Identification of rib movement restrictions during inspiration/expiration
- Springing Test: Examination of segmental mobility using a springing pressure technique
- Functional Tests for the Sternocostal Joint: Differentiation between muscular and articular dysfunctions

Diagnostic Palpation

Otto Bergmann, one of the leading figures in the Austrian Neural Therapy Society, emphasizes the critical role of palpation in diagnosis. Palpation enables the identification of specific changes in the musculoskeletal and autonomic nervous systems, including those associated with thoracic spine dysfunctions. In this context, Bergmann's neural therapy teachings gain particular significance. His perspective on functional underpinnings as palpatory findings provides valuable insights into detecting dysfunctions and their effects on adjacent tissues. The following sections highlight key palpatory findings [54,55]:

Kibbler’s Skin Fold Test

- Reduced skin mobility is a possible sign of sympathetic system activation [10,56,57].
- Chronic dysfunctions present with increased skin tension (turgor), where the skin fold appears denser and less easily lifted [7-10].
- Local dermographism and hyperalgesia (peripheral sensitization) frequently occur and are typical signs of autonomic dysregulation [9,10,21,35,51,58].

Superficial Palpation

- Tenderness over the periosteum and ligamentous insertions at the spinous processes suggests potential blockages or inflammatory processes [7,8,59-61].
- Local or regional increases in muscle tone and myofascial trigger points in the paraspinal musculature (e.g., within the longissimus system) indicate muscle-related dysfunctions [62].

Palpation of the Paraspinal Musculature

- Deep palpatory examination of paraspinal tissue, bony landmarks, and muscular structures aids in detecting regional tone changes [62].
- Typical findings in thoracic blockages include focal, tender indurations (e.g., near the facet and costotransverse joints) and irritation zones over the costal angle [9,10,60].

Paraspinal Palpation

- This involves assessing the deeper tract of the erector spinae muscles (especially the rotatores and multifidus muscles).
- Focal tone increases and tenderness in this region indicate muscle-related dysfunction or facet joint issues [62].
- It is not always straightforward to differentiate between a muscle-related irritation due to segmental dysfunction and an activated facet joint or other deep-seated pathology.

Palpation of the Transverse Process Region

- Applying lateral pressure along the rib mediates the longissimus system, allowing the palpating finger to reach the dorsal

transverse process region [62].
- Dysfunction in this area often presents with painful palpatory findings.

Palpation of the Costal Angle

- Rib joint dysfunction is often associated with palpable myofascial tone changes at the costal angle.
- These changes can be reflexively linked to the longissimus and iliocostalis systems, which attach to the muscular structures of the costal angle.

Note: Diagnosing thoracic blockage requires precise palpation, manual medical techniques, and targeted diagnostic procedures. This approach facilitates the recognition of dysfunctions and increased muscle tone in the paraspinal musculature and identifies autonomic dysregulation caused by sympathetic overactivation [10].

Significance for Diagnosis and Therapy

The diagnostic assessment of the thoracic spine requires a thorough understanding of segmental interconnections:

- Palpation and functional diagnostics are essential for identifying segmental dysfunctions, restricted joint mobility, and reflexive muscular tension.
- Injection techniques targeting the spinous processes, facet joints, costovertebral joints, or intercostal nerves can precisely regulate sympathetic reflex activity and pain modulation [63-66].

Clinical Significance and Therapeutic Implications

Due to the close interplay between mechanical joint function, autonomic regulation, and neurological innervation, the thoracic spine holds a key position in functional medicine [9,10,44,67-69]. A comprehensive approach to thoracic structures is particularly essential in cases of chronic pain syndromes, visceral dysfunctions, and autonomic dysregulation to ensure effective and sustainable therapy [9-11,52,67,70-72].

The pathophysiological mechanisms of thoracic blockages demonstrate that these disturbances involve mechanical and neurovegetative dysfunctions, making it evident that a purely structural treatment approach is insufficient [9-11]. The most effective therapy integrates manual medicine, neural therapy, and targeted autonomic regulation techniques to restore function.

Effective Treatment Strategies

1. Neural therapy to normalize sympathetic dysregulation through targeted injections of procaine or lidocaine [72].
2. Manual medicine to resolve mechanical blockages and restore thoracic mobility [10].
3. Myofascial therapy treats trigger points and muscular imbalances [10,42,43,49,51,57,72].
4. Autonomic regulation techniques (e.g., vagal stimulation, breathing therapy) to restore the balance between the sympathetic and parasympathetic nervous systems [4,5,15,29,72].
5. Targeted movement therapy to enhance local and systemic circulation [10,15].

Association Between Thoracic Blockage and Systemic Symptoms

A remarkable example of the impact of thoracic blockages on the autonomic nervous system is Restless Legs Syndrome (RLS). While patients experience no symptoms during the day, nighttime mainly when lying down can lead to increased sympathetic activation due to restricted thoracic mobility. This heightened sympathetic response results in impaired blood flow to the lower extremities, which can only be temporarily alleviated through movement. This phenomenon illustrates the intricate link between mechanical restrictions in the thoracic region and autonomic regulatory disturbances [9-11,15].

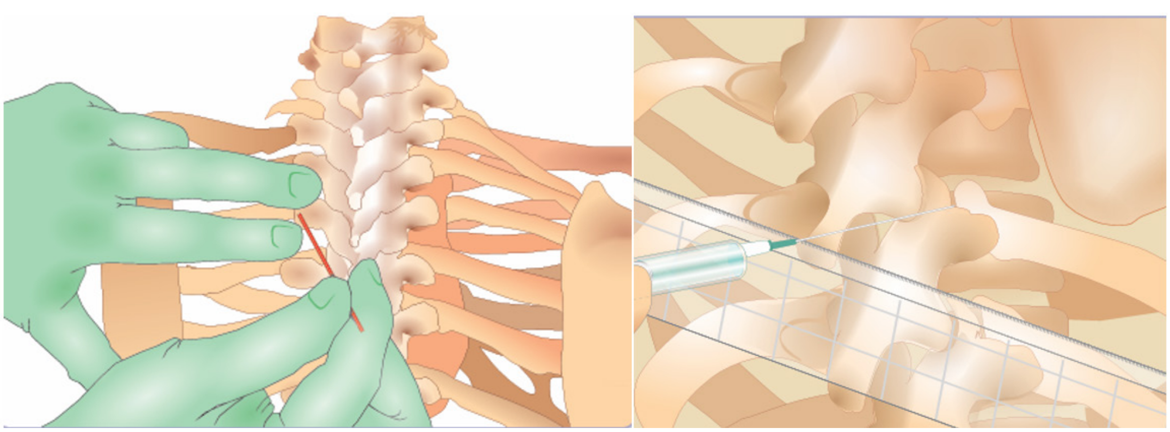

Figure 3: This figure illustrates injection techniques targeting the costovertebral joints and facet joint infiltration.

Figure 3: Left image: *The injection is administered in the region of the costovertebral joints, which are located at the articulation between the ribs and the vertebral bodies of the thoracic spine. This injection is utilized for targeted pain therapy, anti-inflammatory effects, and improving function in cases of movement restrictions.* ***Figure 3: Right image:*** *A precise facet joint infiltration is depicted, performed using a cannula under imaging guidance. Facet joints are small articulations between the vertebral arches that play a crucial role in spinal mobility. This infiltration treats pain, inflammation, or dysfunctions arising from irritation or degenerative changes.*

Neural Therapy: The Regulatory Power of the Nervous System

Neural therapy is a regulation-based method that activates the body's self-healing mechanisms through the targeted use of local anesthetics [73,74]. It harnesses the regulatory and plastic properties of the nervous system, particularly the autonomic nervous system, to reorganize its function [5,15,29,72].

Using precise injections, a "reset" effect is induced in the nervous system, improving circulation especially microcirculation and promoting tissue regeneration [4,5,15,72,75]. This mechanism can be particularly beneficial in chronic pain and inflammatory conditions, helping break the persistent symptoms cycle [4,76-79]. Normalizing pathological sympathetic and nociceptive excitability leads to long-lasting therapeutic effects extending beyond anesthesia's immediate duration [15,76,78]. Restoring the autonomic balance between the sympathetic and parasympathetic nervous systems can positively impact various conditions and pain syndromes [35,45,57,76,77,80].

Neural therapy is used both locally and segmentally. The injections are made into the skin (wheals). Into myofascial trigger points, as shown in Figure 4. points, fascia, joints, and peripheral nerves to relieve pain and optimize nerve function [15,21,29,72,81-84]. Segmental therapy influences systemic processes through reflective connections between the skin, musculoskeletal system, and internal organs [72,85,86]. An essential component of this therapy is infiltrating peripheral nerves, arterial structures, and sympathetic ganglia to harmonize vegetative dysregulation [72,80,87].

A central component of neural therapy is the treatment of so-called interference fields = neuromodulatory triggers. These chronic irritative foci in specific body regions may not cause localized symptoms but can disrupt higher-level regulatory mechanisms. Familiar sources of interference fields include scars, chronic inflammatory foci (e.g., tonsillitis), dental interference fields (e.g., root-treated teeth, osteitis), and past infections such as mononucleosis, pneumonia, or hepatitis. Targeted injections into these interference fields can alleviate systemic symptoms, and repeated treatments may contribute to desensitization to pain and inflammatory responses [15,9,10,29,72,84].

In summary, neural therapy is a method that directly regulates the nervous system, improves circulation, and supports the body's self-healing capacity. Its effects on autonomic balance, chronic inflammation control, and targeted interference field treatment represent a holistic approach to pain therapy and functional medicine [87-89].

Manual Medicine: Diagnosis and Therapy by Hand

Manual medicine is an evidence-based method for diagnosing and

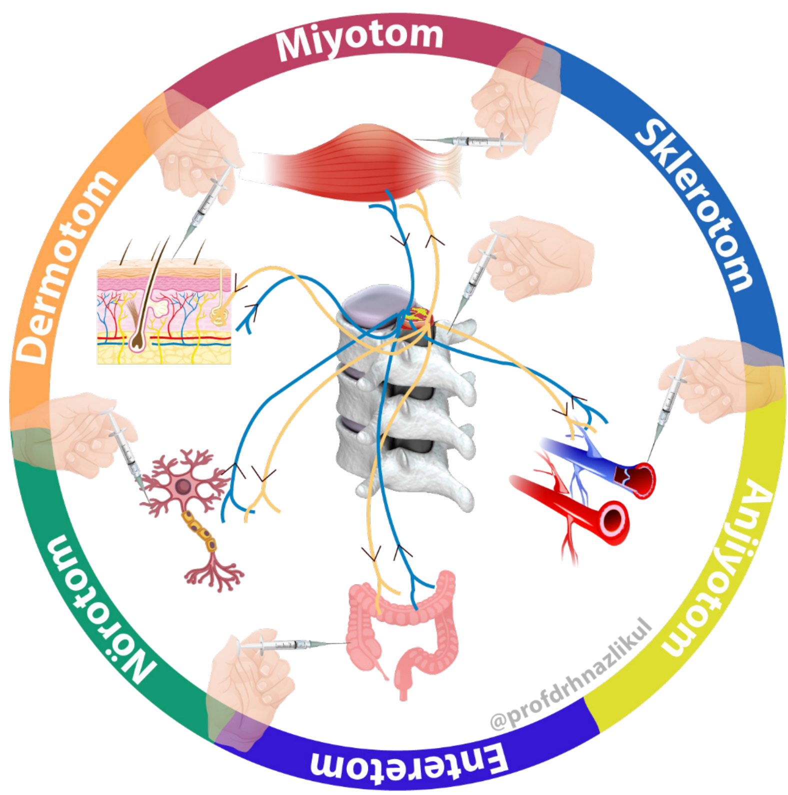

Figure 4: The segmental organization in neural therapy based on the embryological development of body structures. In the center is a spinal column with nerves that innervate different tissue types. Miyotome (red): Muscles and their motor control; sclerotomes (blue): Bones, joints, and connective tissue; Angiotomes (yellow): Blood vessels and circulatory system; enterotomes (purple): Visceral organs such as the intestines, Neurotomes (green): Nervous system and neural control, dermatomes (orange): Skin and sensory receptors. The neural therapy injections shown symbolize segmental therapy in neural therapy, in which specific wheel techniques, infiltrations, or interference field therapies are used to treat vegetative dysregulation and support the body's self-healing process.

treating functional disorders of the musculoskeletal system. It is based on the precise application of specific manual techniques for examining and treating muscles, fascia, joints, and their neurological control mechanisms [6,7,10,35,51]. Manual diagnostics involve palpation to detect movement restrictions and tension changes, enabling the identification of dysfunctions even at irritation points, as illustrated in Figure 5. This diagnostic approach expands the interpretation of pain and postural abnormalities, often the root cause of musculoskeletal complaints [7,10,15,62].

These points hold diagnostic and therapeutic significance, particularly in manual medicine, neural therapy, and osteopathic approaches. Manual therapy encompasses various techniques, including mobilization, manipulation, and soft tissue techniques, specifically targeting blocked or restricted structures [7,8,32,33,90,91]. These methods influence the musculoskeletal system, the autonomic nervous system, and circulation. Manual medicine has demonstrated high efficacy in treating back pain, joint dysfunctions, myofascial syndromes, and visceral or neurogenic conditions [92]. Activating the body's intrinsic regulatory mechanisms contributes to the long-term restoration of mobility and pain relief [9,10,92-94].

Checklist: Therapeutic Approaches for Resolving Thoracic Blockages

1. **Neural Therapy for Autonomic Regulation**

- Paravertebral Injections (Th1–Th12) → Calming the sympathetic nervous system
- Costotransverse Joint Injections → Enhancing respiratory mechanics
- Stellate Ganglion Blockade → Reducing autonomic hyperactivity
- Interference Field Therapy – Neuromodulation of Triggers (scars, tonsils, dental foci)

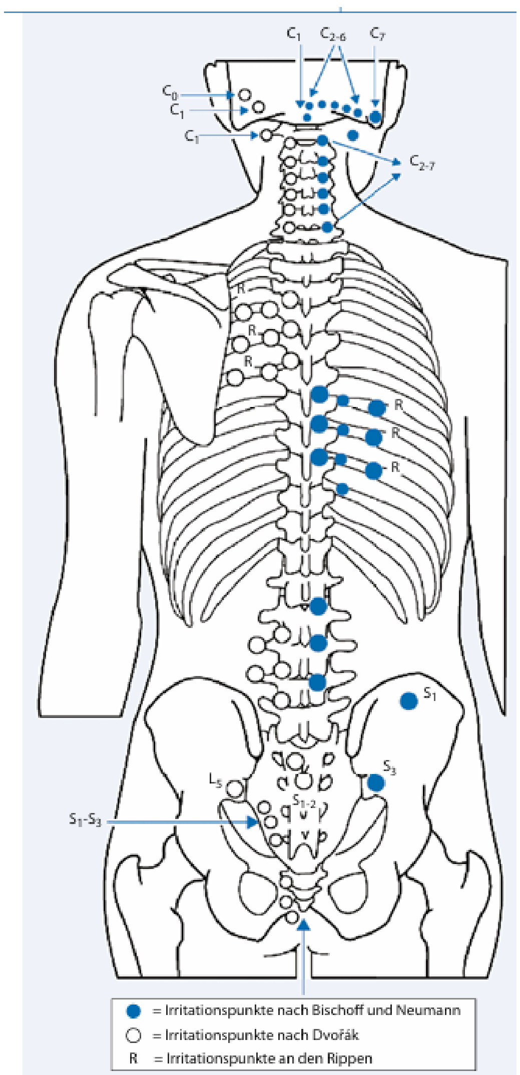

Figure 5: Irritation Points Along the Spine [8]. This figure illustrates the irritation points along the spine described by various authors [8]. Blue points indicate the irritation points, according to Bischoff and Neumann. These are distributed along the entire spine, particularly in the cervical, thoracic, and lumbar regions and the sacral area. White points represent the irritation points described by Dvořák, which are primarily found in the upper cervical spine (C0-C1) and the lower lumbar and sacral regions. Points labeled "R" refer to irritation points on the ribs associated with thoracic dysfunctions.

2. **Manual Medicine and Osteopathy**
- Mobilization of Facet Joints
- Resolution of Rib Blockages (especially Th3–Th7 for respiratory mechanics)
- Visceral Techniques for the Stomach, Liver, and Diaphragm
- Fascial Techniques for Relieving Autonomic Tension

3. **Breathing Therapy & Vagus Nerve Stimulation**
- Diaphragmatic Training → Activating the parasympathetic nervous system
- Heart Rate Variability (HRV) Training → Supporting autonomic regulation
- Cold Applications (cold facial water, cold showers) → Stimulating the vagus nerve

4. **Micronutrient Support for the Autonomic Nervous System**
- NADH (10 mg), Coenzyme Q10 (50–200 mg), Magnesium (300–600 mg daily) → Stress reduction and muscle relaxation
- Vitamin B Complex (especially B1, B6, B12) → Supporting the nervous system
- Omega-3 Fatty Acids → Anti-inflammatory effects and enhancement of membrane fluidity
- Adaptogens (Ashwagandha, Rhodiola, Ginseng) → Regulating the stress axis

Therapeutic Approach: Combining Neural Therapy and Manual Medicine

The treatment of thoracic blockages requires an interdisciplinary approach. Combining neural therapy and manual medicine provides an effective strategy for restoring mobility and autonomic balance.

Manual Medicine Techniques for Thoracic Blockages

The approach depends on the underlying cause of the thoracic restriction and may involve various manual techniques:

1. **Soft Tissue Techniques**
- Myofascial Release Techniques → Relieving tension in the paravertebral musculature
- Trigger Point Therapy → Deactivating active trigger points
- Post-Isometric Relaxation (PIR) → Reducing hypertonic muscle activity

2. **Mobilization Techniques**
- Traction Mobilization of the Thoracic Spine → Improving facet joint mobility
- Rib Mobilization → Restoring breath-dependent movement
- Thoracic Extension and Rotation Mobilization (e.g., Maitland technique)

3. **Manipulative Techniques (HVLA Techniques)**
- High-Velocity Techniques for Facet Joints or Costotransverse Joints → Addressing fixed blockages
- "Thoracic Impulse Techniques" → Rapidly resolving segmental restrictions

4. **Visceral Mobilization**
- Treatment of Sternocostal Joints → Restoring movement in the upper thoracic region
- Releasing Adhesions in the Mediastinal Area (e.g., postoperative adhesions)

5. **Correction of Movement Chains**
- Integration of Lumbar and Cervical Patterns → Addressing connections between thoracic blockages and other regions (e.g., cervical or lumbar spine)
- Postural Correction Exercises → Promoting long-term mobility and preventing recurrences

Therapeutic Approaches in Neural Therapy

1. **Thoracic Blockage and Its Effect on the Autonomic Nervous System (ANS)**

In the case of chronic complaints, which often cannot be treated successfully, please consider resistance to therapy and thoracic blocks. The mechanical stimulation of both sympathetic and parasympathetic nerves via the ANS can result in a complex clinical picture. Organ reference to the axial organ with its movement segments and their pathological consequences are listed for each level of the affected organs in Table 4. This table is not complete but indicates clinical pictures.

The thoracic spine (T-spine) is closely linked to the sympathetic nervous system. The sympathetic ganglia of the sympathetic trunk are located directly next to the spine and receive afferents from the thoracic segments (T1–T12) [95]. A blockage of the T-spine can lead to the following effects:
- **Increased sympathetic activity** → Chronic stress response and autonomic dysregulation.
- **Impaired parasympathetic activity** → Lack of recovery and reduced regenerative capacity.

2. **Consequences of Sympathetic Overactivity Due to Thoracic Blockage (10, 96, 97)**

Persistent sympathetic activation can contribute to various chronic diseases and dysfunctions:

A. **Chronic Pain and Muscle Tension**
- Increased muscle tension due to sympathetic reflexes.
- Myofascial pain syndromes with trigger points in the paravertebral musculature.
- Hard tension bands due to autonomic dysregulation.

B. **Respiratory Disorders and Chronic Hyperventilation**
- Blockages in the upper T-spine (T1–T5) can affect diaphragm function and breathing mechanics.
- Increased chest breathing instead of abdominal breathing → Leads to hyperventilation, hypoxia, and fatigue.

C. **Cardiovascular Issues**
- Segments T1–T5 regulate the heart and coronary arteries.
- This area's dysfunction may cause tachycardia, arrhythmias, and blood pressure fluctuations.
- Occurrence of angina-like symptoms without a cardiological cause.
- Reduced vagal tone → Increased heart rate and hypertension.

D. **Digestive Disorders (Dysbiosis, Irritable Bowel Syndrome, Gastric Acid Problems)**
- T5–T9 controls the stomach, liver, gallbladder, and pancreas. Dysfunctions may contribute to reflux, gastritis, and disturbances in gastric acid production.
- Liver metabolism disorders due to autonomic dysregulation.
- T10–T12 influences the small and large intestines → Dysbiosis,

Figure 6: This illustration demonstrates the application of neural therapy at various levels of reflex therapy. Through targeted interventions on the skin, muscles, tendons, joints, nerves, and vessels, neural therapy contributes to regulation and stabilization of the entire body. It supports both pain reduction and functional restoration, playing a crucial role in holistic therapy.

Table 4: Organ reference to the axial organ with its movement segments and their pathological consequences.

Segment Level	Indications / Organ Correlation
Th1 - Th4	These segments influence the head, eyes, ears, nose, temporomandibular joint (TMJ), facial muscles, mucous membranes, and cerebral circulation. Chronic conditions such as migraines, tension headaches, tinnitus, trigeminal neuralgia, or chronic sinusitis can be exacerbated by dysfunction in these segments.
C7 - Th1	Sympathetic regulatory dysfunction in this area can lead to cold hands, circulatory disturbances, paresthesia (tingling, numbness), and muscle weakness.
Th1	Hemarthrosis, Heberden's osteoarthritis, paresthesia of the fingers.
Th2	Wrists, fingers, blood vessels of the upper extremities. Carpal tunnel syndrome, wrist dysfunctions.
Th3	Chest muscles, upper lung areas. Dry cough, especially when lying down. Epicondylitis of the elbow. Breathing difficulties due to sympathetic overreaction.
Th4 - Th5 (left)	Heart, bronchi, upper esophagus. Heart rhythm disturbances, especially at rest and when lying down. Chest tightness (not of cardiac origin).
Th5 (right)	Shoulder region, dyskinesia of the bile ducts. Functional bile duct dyskinesia (e.g., pressure sensation after fatty meals).
Th5	Shoulder pain without joint involvement.
Th6	Dysfunction of the acromioclavicular joint and shoulder joint, heartburn, stomach issues.
Th7	Liver, gallbladder, diaphragm. Digestive problems due to reduced liver and bile secretion.
Th8	Pancreas, small intestine, autonomic regulation of the stomach. Right-sided pancreas involvement, irritable bowel syndrome. Digestive problems due to disturbed pancreatic enzyme secretion.
Th9 - Th10	Adrenal glands, large intestine, autonomic regulation of energy balance. Cold feet due to sympathetic dysregulation of circulation. Adrenal fatigue (chronic fatigue, lack of energy). Functional intestinal disorders, bloating, and food intolerances.
Th11	Kidneys, ureters, pelvic floor muscles. Kidney weakness altered urine excretion. Functional bladder problems (frequent urination without infection).
Th12	Urogenital tract, prostate, uterus, ovaries.
Th10 - Th12	Prostate in men, uterus, and ovaries in women.
L5	The veins of the legs, lower leg muscles, lumbar-sacral transition. Venous disorders in the legs, heavy legs, tendency to swelling. Circulatory disorders, cold feet due to impaired venous return.
S1	Ankle joint, lower leg, heel, autonomic regulation of the lower extremities. Ankle joint dysfunction, instability. Cold feet due to impaired autonomic regulation. Heel pain (plantar fasciitis).
S2	Knee, calf muscles, blood vessels of the legs. Knee dysfunctions, pain without a clear structural cause. Restless legs syndrome. Venous insufficiency, heavy legs.
S3	Hip joint, pelvic floor muscles, lymphatic drainage of the pelvis. Tonsillitis as an interference field (reflex connection via the autonomic nervous system). Functional complaints in the sacroiliac joint.
S4	Bladder, rectum, anus, pelvic organs, sexual function. Frequent urination, incomplete emptying, incontinence. Pain in the lateral hip. Erectile dysfunction, reduced sexual sensitivity.
S5	Sacroiliac joint (SIJ), pelvic floor, sacral nerves. SIJ blockages, pain in the lower back and gluteal region. Pelvic pain, pressure sensation, or discomfort in the pelvic area.

irritable bowel syndrome, and bloating.

E. **Chronic Inflammation and Immune System Dysregulation**

- Persistent sympathetic dominance can suppress the immune system.
- Increased cortisol and adrenaline levels promote "silent inflammation."
- Microcirculation disorders impair healing processes and increase susceptibility to infections.

F. **Autonomic Exhaustion, Burnout, Sleep Disorders**

- Chronic sympathetic dominance can lead to persistent stress responses.
- Dysregulation of cortisol secretion → Sleep disturbances, daytime fatigue, depressive mood.

These findings highlight the critical importance of regulatory therapy for restoring autonomic balance. Neural therapeutic interventions can be specifically applied to effectively modulate the autonomic nervous system.

3. Treatment with Neural Therapy for Autonomic Nervous System Regulation

Neural therapy can help regulate the autonomic nervous system (ANS) and reduce sympathetic overactivity.

A. **Segmental Therapy: Paravertebral Injections**

- **Objective:** Vegetative calming, improved blood circulation, pain reduction
- **Technique:** Injection of 1–2 ml of 1% procaine into the paravertebral ganglia at Th1–Th12

Effects:

- Reduction of sympathetic nervous system activity
- Improvement of microcirculation
- Relaxation of musculature

B. **Interference Field Therapy – Neuromodular Trigger**

- Scar injections (e.g., sternotomy scars, old surgical scars)
- Dental interference fields (jaw, tonsils, chronic sinusitis)
- **Effect:** Regulation of the dysregulated ANS through the Head's zones system

C. **Stellate Ganglion Block (for Chronic Sympathetic Overactivity)**

- **Objective:** Vegetative rebalancing, stress reduction
- **Technique:** Injection of 5 ml of 1% procaine at the stellate ganglion (C6/Th1 region)

Effects:

- Improved blood circulation in the head and chest region
- Inhibition of stress hormone release

- Enhancement of vagus nerve function

4. Combination with Manual Medicine & Regulation Therapies

Neural therapy is most effective when combined with other treatment modalities:

Manual Medicine:

- Mobilization and manipulation of the thoracic spine (T-spine)
- Release of rib and facet joint blockages

Breathing Therapy & Vagus Activation:

- Diaphragmatic Training to activate the parasympathetic nervous system
- HRV training (heart rate variability) for autonomic balance

Micronutrients for ANS Regulation:

- Magnesium, B vitamins, Omega-3 → Reduction of stress response
- Adaptogens such as Ashwagandha Rhodiola → Stabilization of adrenal function

Note: Thoracic blockages induced by sympathetic overactivity can contribute to developing numerous chronic conditions. Combined with manual medicine techniques and autonomic regulation therapies, Neural therapy can help restore physiological balance.

The Effectiveness of Medicine Stems from Its Ability to Address Structural and Functional Disorders

1. **Neural Therapy for the Regulation of the Autonomic Nervous System**
   - Targeted infiltrations with procaine or lidocaine interrupt sympathetic dysregulation [10,15,72,86,98-100].
   - Interference fields and neuromodulatory triggers in the thoracic segments are modulated, thereby reducing reflexive tension patterns [15,29,72,100].
2. **Manual Medicine for Restoring Mobility**
   - Techniques such as joint mobilization, fascial treatments, and trigger point therapy resolve muscular imbalances and improve thoracic mobility.
   - Restoring physiological joint function reduces overload patterns.
3. **Long-Term Stabilization through Targeted Breathing and Movement Exercises**
   - Breathing therapy enhances thoracic flexibility and optimizes oxygen supply.
   - Individually tailored exercise programs help correct postural imbalances and increase musculoskeletal resilience.

Checklist: Prevention – How to Avoid Thoracic Blockages and Sympathetic Overactivity

- **Promoting Daily Thoracic Spine Mobility:**
  - *Cat-Cow movement* (a yoga exercise) to improve spinal flexibility.
  - *Thoracic rotation exercises* (e.g., side twists with bent knees).
- **Optimizing Breathing Techniques:**
  - Practicing *diaphragmatic breathing* for 5–10 minutes daily.
  - Engaging in slow nasal breathing to reduce sympathetic activity.
- **Improving Postural Habits:**
  - Avoiding prolonged sitting in poor posture.
  - Using dynamic sitting or a standing workstation.
- **Regularly Activating the Vagus Nerve:**
  - Humming, singing, gargling.
  - Daily relaxation exercises (e.g., progressive muscle relaxation).
- Regulating **Chronic Stress:**
  - *Heart rate variability (HRV) training* to monitor autonomic balance.
  - *Mindfulness exercises* to reduce cortisol production.

Discussion and Summary

Thoracic blockages, particularly in the ribs and costotransverse joints, affect mechanosensory perception by restricting normal mobility and joint range of motion. These restrictions change afferent stimulation, resulting in prolonged muscle tension and over-stimulation of the sympathetic nervous system. This prolonged stimulation can cause hyperactivation of the sympathetic nervous system, leading to further dysfunction throughout the thoracic segment [10,28,101-104].

This model's underlying mechanism of sympathetic stimulation is based on intense afferent feedback from the irritated joints and surrounding musculature. The altered sensory input rate - caused by restricted mobility and mechanical irritation - leads to a reflexive over-activation of the sympathetic nervous system. This sympathetic hyperactivation is often accompanied by inflammatory processes and perfusion disturbances that promote not only local but also systemic dysfunction [101,104,105].

The blockage of a functional unit is a reversible condition characterized by reduced mobility and pain. This process irritates the affected segment, involving all tissue components: the musculature responds with increased tone, joint mobility becomes restricted, the skin exhibits heightened sensitivity (hyperalgesia), and the vascular system displays functional disturbances, as evidenced by altered dermographism. Both external and internal stimuli can trigger this condition [10,101]. In reaction to blockage, the body often adopts protective or compensatory postures that overload adjacent segments. This compensatory mechanism may induce blockages even when objective signs are present before the patient perceives pain or movement limitations [10,101,102).

A crucial aspect is the involvement of the autonomic nervous system, particularly the sympathetic branch. Excessive sympathetic activation and additional strain on the spinal nerves significantly contribute to the development and persistence of segmental dysfunctions [103-105]. This sympathetic hyperactivity is frequently accompanied by hypoxic conditions, as reduced blood flow and impaired perfusion lead to an insufficient oxygen supply to the tissue. Although many blockages are resolved spontaneously, persistent cases require targeted therapeutic intervention. In this context, neural therapy has proven effective in resolving segmental blockages. Precise injections alleviate local blockages and modulate dysfunctional interactions within the sympathetic nervous system. This results in improved peripheral circulation and the elimination of hypoxic states, ultimately restoring the functional unit.

The autonomic nervous system also plays a central role in thoracic blockages. Movement restrictions in the chest, particularly affecting respiration, can cause a variety of complaints. Syndromes that worsen in the supine position often originate in the spine, where excessive stimuli lead to increased muscle tension and heightened sensitivity to further triggers [10,101,105]. Persistent autonomic irritation in the thoracic spine may result in lasting muscular imbalance, impair joint function, and ultimately cause thoracic blockage. Identifying the underlying source of disturbance is essential for successful treatment. This requires a deep understanding of physiological interrelationships and the precise administration of small amounts of a local anesthetic (usually 1% Procaine or Lidocaine) into the affected structures.

Conclusion

Thoracic dysfunctions are often an overlooked factor in chronic diseases. Since the pioneering work of Dr. Nazlikul, it has become increasingly evident that addressing these dysfunctions can significantly improve many chronic conditions. Nocturnal symptoms are frequently a sign of sympathetic overactivity caused by thoracic blockages. Sustainable relief can be achieved through targeted neural therapy, manual medicine, breathing therapy, and vagus nerve-activating measures.

Many chronic complaints that worsen at night or in a lying position are often interpreted solely as organic issues. In clinical practice, mobility restrictions are frequently ruled out as a "red flag" without considering the functional causes rooted in the thoracic spine (T-spine) and the associated autonomic nervous system regulations. This limited perspective can lead to prolonged suffering and ineffective treatments.

In particular, thoracic dysfunctions involving the costotransverse joints contribute to increased sympathetic activation. This excessive sympathetic activity impairs the perfusion of segmentally associated organs, exacerbating symptoms, especially in the evening or during sleep. Thoracic blockages are not merely local musculoskeletal issues; they have far-reaching consequences through their influence on the autonomic nervous system, potentially triggering a wide range of systemic complaints. Understanding the clinical significance of thoracic blockages is crucial not only for specialists in neural therapy and manual medicine but also for all medical practitioners across various fields, including general practice, internal medicine, neurology, and physical therapy. Recognizing and treating thoracic dysfunctions can effectively address many chronic health conditions that have persisted for years without a precise diagnosis. This realization has profound implications for everyday clinical practice, offering a new diagnostic and therapeutic perspective that has the potential to resolve long-standing health issues. Furthermore, acknowledging the role of thoracic blockages in chronic disease management could significantly reduce healthcare costs. Many patients undergo extensive diagnostic procedures and prolonged pharmacological treatments without sustainable improvement simply because the functional aspect of their condition remains unrecognized. Integrating neural therapy and manual medicine into routine medical practice can significantly improve individual patient outcomes and alleviate the overall burden on healthcare systems.

Ultimately, thoracic dysfunctions represent a critical but underappreciated component of chronic disease pathophysiology. A comprehensive approach that includes mechanical and functional treatment strategies is essential for breaking pathophysiological feedback loops and restoring systemic balance. Raising awareness of thoracic blockages and their clinical relevance could revolutionize how we approach chronic diseases, leading to more effective, individualized, and sustainable treatment strategies across all medical disciplines.

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