

Kurt Mosetter, MD

## Performance optimisation, causal prevention and injury prophylaxis

Chess in 3 D muscle fascia vector calculations for prevention and injury prophylaxis, for chew- sale pain management and for efficient performance optimization.

Today, professional performance and multimodal training management can develop extended potentials through transdisciplinary teams of experts. The athletic development integrates the health of the athletes, based on a targeted prevention and prophylaxis training.

In this sense, we can look at the living system of the musculoskeletal system via muscle-fascia-vector calculations. We can recognise weak points in the movement geometry and optimise them in a targeted manner using KiD (force in stretching; muscle fascia length training).

The observation of "motor-neuro-patterns" in corresponding movement sequences and functional kinetic muscle-fascia chains can shed light on the dynamic relationships of muscular dysbalances and fascial compensations. Pain and analogous structural adaptations develop in bio-logically calculable - and accordingly reconstructable - steps. In this sense, many pains, injuries and weak points can be cushioned and avoided.

Comparable to the moves in a game of chess, moves, positions and entire game variables can be read and recognized. In this sense, all individual moves of the player and his opponent are comprehensible. For good players the following moves are predictable. So not only single moves can be recognized, but whole games can be understood, reconstructed and played through.

- The squares of the chessboard are geometrically arranged and predetermined in the game. These squares correspond to the laws of physics, gravitation and biokinematics within a three-dimensional vector space
- The figures are given certain movement options with more or less degrees of freedom.
- The figures can be compared with the anatomical laws and ranges of motion of individual muscles.
- Each move of a chess player is answered by a countermove.

- The sequence of individual moves corresponds to movement sequences in which several muscles become active with each other.
- These sequences of play lead to special positions of the game. In the living and moving organism these positions correlate with posture patterns.

A good experienced player can reckon back in the moves and the corresponding positions the whole course of the game in single moves; and the Predict probability of progression of possible game vari-  
O anten.

A good player is neither caught in the chess board nor by the single movement options of the pieces. Rather, he acts and analyses dynamically in a complex way by being able to call up learned constellations in his mind, relate them and play through comparisons in his head. This forward-backward-forward calculation of probabilities makes a purposeful prediction of which moves can happen possible. The grandmaster can reenact and foresee everything at the same time.

### Motor-neuro-patterns in the frame of reference of myoreflex therapy

In the frame of reference of myoreflex therapy we can read, grasp, understand and optimize the living anatomy of posture and movement patterns in athletes and patients via motor-neuro-patterns. Correctly understood, we can understand exactly which moves, movements and movement patterns have led to the corresponding body posture and position.

At this point the reconstruction leads back to the beginning of the game, respectively to the first moves that initiated the position. Individual mistakes, the patterns of old injuries can be recognized as well as personal compensations.

### Neuroanatomy of the GPS

The connections between experiential medical possibilities and knowledge of neuroanatomical circuits in the body and brain opened up the possibility of a far-reaching thought model: the working hypothesis of a self-organizing neural feedforward - online feedback system.

The unification of different theories of muscle meridians, myofascial kinetic chains, dynaments, biokinematics, tensegrity and brain research led to the postulation of a multi-sensory, actively perceiving, anticipatory control and planning system in the brain [1]. In this sense, these calculations and computations within the body, in and with its environment, would be similar to a rapidly synchronizing and constantly learning internal navigation system - a GPS. Within this model the organism uses all sensory systems synchronously in the service of orientation, attention and goal-directed behaviour. Within pre-traced motor-neuro-patterns, all sensory inputs can be quickly synchronized online, and computed and coordinated with the neuromuscular and myofascial systems. The organism and its brain are thus

able to anticipate; they can predict what is likely to happen.

Computation failures, connection failures, delays in timing, and mismatches in feed-forward and feedback networks can produce a wide variety of symptom patterns.

The background of an always active perception (in contrast to outdated stimulus-response models) was established in the fields of phenomenology and neuroscience decades ago. Within the development of myoreflex therapy we were able to present the first modules of an inner navigational system in writing and graphically already in 2005 [2].

Today we know much more. In 2014, the pioneers of research into the neuro-anatomical details of this inner GPS were awarded the Nobel Prize in Medicine and Physiology.

### Basics of an inner GPS

The perception of space, hearing, sight, smell, orientation and alignment behavior, attention, timing, precision, speed, the ability to anticipate, and the probability of being able to predict what might happen is dynamically calculated in a super-fast online circuit between the body and its brain. All senses are integrated into this inner GPS-organization. These performances that are laid out in us correspond to the version of a dynamic living navigation system that is constantly learning and updating itself.

The nerve cell network circuits of this navigation system are fed and programmed from the body, the neck fields, and corresponding neuro-feed-back loops: muscle sense, proprioception, depth sensibility, interoceptive sensory performance from myofascial chains and fasciae.

The senses of hearing, hearing and smell are connected multisensory and crossmodal continuously; they provide essential information and guarantee the data input for multidimensional intermediate memories of corresponding sensorimotor maps. All inputs from different sensors and from the body sensing areas are collected, pre-connected and dynamically pre-sorted in the segmental feedback loops of the spine, the connective tissue, the myofascial chains. A main control center is located in the region of the upper cervical spine.

## GPS Symptoms

### first symptoms

The immediate symptomatology of GPS synchronization disorders are above all: headache, dizziness, migraine, visual disturbances, hearing loss, tinnitus, bruxism, occlusion disorders, neck pain, fibromyalgia syndrome, gait instability, sleep disturbance, fatigue syndrome. These symptomatology are very often an expression of a billing disorder and not of a manifest "disease".

In the vast majority of cases, it is not the organs of the same sex, the eyes, the ears, the heart, individual blood vessels, nerve branches, nor corresponding regions in the brain that are defective. Specialized medical examinations thus rarely reveal causal findings. Against this background, it is hardly surprising that pharmacological therapy attempts very often come to nothing. A wide spectrum of complementary medical concepts often offers more effective therapy options. Orthomolecular medicine, micronutrient therapy, neural therapy, acupuncture, Chinese medicine, anthroposophical medicine, osteopathy, environmental medicine, biological dentistry, F.X. Mayr programs and nutritional medicine can be used. Mayr programs and nutritional medicine provide decisive help again and again. At this point, however, we want to present a motor-reuro and neuro-muscular concept (with interfaces to these therapies).

For more than three decades, these complaints can be treated very successfully with the development of the concept of myo-reflex therapy and targeted muscle-fascia length training (KID - Strength in Stretch).

### Origins and teachers

- Badenweiler/Freiburg, 1988/89: Dr. Tilmann Görtler treats patients with visual disturbances, glaucoma, dizziness, tinnitus, hearing loss, migraine, sleep disturbances, concentration disorders, and other disorders.

disorders, attention deficit disorders primarily the "Upper cervical joints", the "spine" the autonomic nervous system with "Atlas therapy" and connective tissue massage. The results, outcomes and improvements of all symptom complexes are surprising and deeply impressive.

- Kathmandu, Beijing, 1988/89: Ayurvedic, Tibetan and Chinese doctors treat the same complaints in the area of the upper cervical spine at the intersection of several meridians (3E, Gb, Dü) around the "atlas", via muscle meridians and myo-fascial chains. The successes are surprising.

How are these results to be understood? Central therapeutic starting points are found in the interplay of the neck, floor of the mouth and neck muscles and their fascial transitions to the skull, the shoulder girdle and the back. The neuromuscular guidance around the cranium and the joints of the The 1st and 2nd cervical vertebrae, the vegetative ganglia in the cervical spine, the masseter muscles around the jaw joints and the ear, the portrait muscles in the service of orientation and attention behaviour, the muscles of the floor of the mouth and the hyoid bone as well as the eye muscles play important roles in the service of an endogenous regulation.

Well-founded knowledge in neurophysiology, functional neuroanatomy, neurobiology and biokinematics enables a bridge to the targeted therapeutic use and practical application of myoreflex therapy.

In this context, the orchestra of the Sca- leni muscles, the sternocleidomastoid muscle, all masticatory muscles, the individual layers of the occiput, the leading muscles of the upper cervical spine, each at the myofascial, musculotendinous and osseous transitions, are treated manually using pressure point stimulation.

Inspired by Yoga, Qi Gong, TaiQi, Moshe Feldenkrais and special knowledge from the field of brain research and visual motor skills, exact eye, jaw, tongue, head and neck exercises against the resistance of the therapeutic hand are also part of the therapy learning process.

**Second-order symptom pictures** Calculation disturbances from the neuromuscular key circuits of the GPS in the upper cervical spine and the skull can spread and manifest in the locomotor apparatus via force effects, torques, myofascial chains and moto-neuro-movement engrams. Overstrain and compensatory counterstrain lead to back pain, hip-, knee-, foot-, school-, and neck pain.

ter-arm complaints as well as to complex myofascial pain syndromes, up to bladder and pro- tata pain syndromes.

### tertiary symptoms

Injuries, consequences of accidents, stereotypical posture and stress patterns, dystonic myofascial innervations of the lower extremities, the pelvis, the lumbar spine and the thoracic spine project biokinematically and neuro-muscularly and fascially into the upper cervical spine, the neuroanatomy of the skull and into the orchestra of the cranial nerves.

These symptomatologies correspond to the problems of the first order: vertigo, headache, visual disturbances, occlusion disorders, motor dystonia, MCI (mild cognitive impairment), etc.

Within this scenario, ascending caudal-cranial chains leverage the input stations of the GPS.

In the sense of a causal therapy, the reconstruction of the biographical events in these cases opens up new possibilities.

The conception of the treatment is based on the knowledge gained in the period before the onset of the symptoms.

In these cases, the anatomical map of the dorsal chain, the front lines and the lateral chain can serve as orientation. The treatment here is from caudal to cranial.

### Psychoemotional effects

As for the understanding of the emergence of motor neuro-patterns and myofascial chains, the fields of psychosomatics and psychotraumatology should be integrated.

As background patterns, previous experiences, life-historical events, psychoemotional and traumatic experiences can decisively shape these motor neuro-patterns of the turning behaviour and the basic tension of the kinetic myofascial chains.

The neuronal networks of the basal ganglia, amygdala, cerebellum, insula, cingulate cortex, and premotor cortex fields may be characterized by tendencies such as "caution!" and withdrawal behavior" or "conquest behavior"; and vice versa.

The tonus conditions of the autonomic nervous system also colour the activation processes. Anxiety-induced experiences have a condition- and context-dependent effect with excessive sympathetic nerve activations.

### One example: Jürgen Klinsmann

Jürgen Klinsmann suffers a large herniated disc in the area of the lumbar spine L4/L5 and L5/S1 in September 2008. Suffering from severe pain in the lower back, above the ISG, in the buttocks and in the entire leg up to the toes of the foot, can

he can neither stand, nor sit, nor lie down. A major neurosurgical operation has already been arranged after a minimally invasive procedure in the adjacent segment showed no improvement.

The analysis of the "position" in the "chess game": Out- marked flexion posture in the trunk with flexion fixation in the pelvis, clearly stronger on the right than on the left. The left leg appears shorter and is imposing in adduction and internal rotation. The shoulder girdle on the left appears to be flexed ventrally and tense in internal rotation. The head and the cervical spine are rotated to the right.

Reconstruction of the moves: Jürgen Klinsmann stands, facing slightly to the right, on the training ground.

Unexpectedly, a long cross ball hits him right on the forehead. The impulse accelerates his body to the left back. Accordingly Jürgen Klinsmann falls

to the rear left. Of course, he tries to intercept and slow down the acceleration.

This task is performed by the muscle-fascia-systems. In the momentum of the skidding movement, in which the lifted arms were deflected to the left rear, the braking force and the active counter movement pattern starts. The direction of this rescue action is directed to the front right.

Initially, the deflection of the head from an overextended position to the left dorsal is answered with a counteractivation of the cervical vertebrae leading musculature, here especially of the scaleni muscles to the front. The muscle-fascia-chain of the flexors, the forearm and the upper arm, the pectoral musculature, the serratus anterior, the system of the abdominal muscles (especially the oblique abdominal musculature), the right hip flexor and the right adductor musculature tense synchronized within the rescue action in the sense of a motor-neuro-pattern.

The forces of the rescue action accelerate the upper body in the direction of the lower right front. Another component in the motoric rescue pattern is the right leg, which is strongly bent and tightened as a counter pendulum.

As a sensible answer to the ultimate rescue bending to the front right down, another compensatory braking and counter movement starts at this point. In this sense, the back extensors (quadratus lumborum and the complete system of the fascia thoracolumbalis) tense and activate in order to intercept the body that has meanwhile deflected ventrally.

The sum of the acceleration forces of the flexor-active rescue pattern takes effect in the sense of an overstretched arc in the intervertebral disc compartments.

Around this fulcrum, the orchestra of back extensors and the TLF tense against it. The lever

forces in this momentum lead to compression and prolapse of the intervertebral disc at the end of the conflicting force axes.

### Causal Motor Neuro Pattern

When given these dynamic patterns of movement, the state-dependent emergence of a kinematic motor-neuro-pattern is that have made sense, can only be of poor help:

### 3 D Myo-Chess Treatment

1. Impulse of the ball from the right front
1. Scaleni re
2. Scaleni li
3. Atlas transverse processes in combination with active jaw movements to the left and right
4. Flexors of the left forearm at the medial epicondyle
5. Biceps brachii li
6. Pect minor li
7. serratus ant
8. Ribcage left and right
9. Abdominal muscles at the tuberculum pubicum
10. Adductor brevis and pectineus re
11. Adductor magnus and longus
12. Iliacus / iliopsoas re
13. Tensor f.l and tractus iliotibialis re
14. Embers med and max re.
15. Quadratus lumborum right and left
16. TLF
17. Lat dorsi li
18. Infraspinatus li
19. Triceps. li
20. Brachioradialis li
21. Extensors on the forearm at the epicondylus lat.
22. Atalas transverse process left and right

Result: after a 75-minute match, Jürgen Klinsmann stands up without any complaints. He checks the feeling and strength of his right leg, grasps his now pain-free back and checks his mobility in hip, knee, pelvis, spine, shoulder and neck. The result of the treatment seems almost magical to him.

**"Motor Neuro Patterns"**

In neuromuscular 3 D Chess, no individual joints, muscles, fasciae and reflexes are considered and treated, but rather the respective motor-neuro-patterns. Complex movement, action and alignment patterns activate and engage corresponding differentiated muscle-fascia chains. In this sense, neurological cognitions, in which first perceived and then motor commands activate the muscles, only correspond to smallest pieces of a puzzle, which are not wrong, but by no means described in a sufficiently integrative way. Much closer to the understanding of complex movement patterns are the concepts of active perception. In this sense, an organism actively aligns itself motorically in order to then be able to perceive multisensory - and vice versa.

The basis of these motor-neuro-patterns is based on synchronized and learned sensor-motor- and motor-sensor-units. In the continuous interconnection of multisensory perceptual modules, active perceptual processes can be realized super-fast.

The respective experiential knowledge and the motoric knowledge open up the appropriate strategy of pre-interpretation and anticipation in which direction the organism will actively orientate and align itself.

**Myofascial chains and their GPS**

**3 D-Chess**

Myofascial chains emerge continuously in the organism depending on context and condition. Within the framework of a functional architecture and rapid synchronization between sensor-motor and motor-sensor patterns, navigation and GPS functions are activated.

These living patterns engage potential myofascial chains ready in the organism. Kinetic chains and myofascial axes become calculable in the concept of myoreflex therapy as neuronally coordinated traction belt support systems between muscles, tendons and fasciae. Within a movement geometry of 3 D-vector calculations, quite different pains and disorders can be precisely understood causally; and thus causally treated with KiD exercises in active stretch.

**From muscle meridians to biokinematics to KiD and modern training therapy with posture prevention**

The first forms of myofascial chains were described before completely different cultural backgrounds, systems of thought and models in different experiential medical traditions. In its terminology and the corresponding cultural context, classical Chinese medicine describes energy lines as meridians.

For the sustainability of the treatment of these dynamic myofascial chains, Tai Qi, Qi Gong and Yoga exercises were further developed to special strength in stretching exercises against resistance, the KiD exercises.

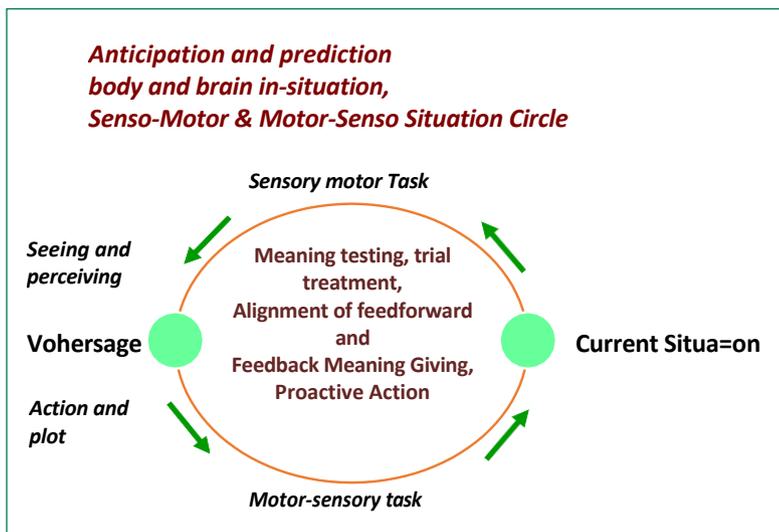
Fascia researcher Robert Schleip has therefore been recommending active stretching of the myofascial chains in KiD exercises for many years [3].

Otto Bergsmann promoted the further development of his "muscle meridians", defined in 1987, into the comprehensive concept of KiD, in which myofascial chains become calculable according to biokinematic laws in vector calculations of a movement geometry.

Since 1997, the pioneer of osteopathy Thomas Myers has been providing broad support for the establishment of the muscle meridians with the "Anatomy trains".

Most recently, since 2008, Liebscher & Bracht have also been gaining momentum with "their pain therapy" by repackaging a small number of points that have been known for decades, as well as active stretching exercises.

In 2015, scientific considerations followed in medical journals, such as the Archives of physical medicine and rehabilitation [4].



**Muscular imbalances" in a new light** The term "muscular imbalance" has become established in recent years in sports science, sports medicine, orthopaedics and pain therapy [5]. It has even found its way onto Wikipedia:

"Muscular dysbalances (imbalance) are increased muscle shortening and/or muscle weakening between agonists (= players) and antagonists (= opponents) due to one-sided force development with simultaneous neglect of their stretching ability. They are caused by a lack of physical strain, one-sided strain in sports or in everyday life, insufficient regeneration, incorrect execution of movement, but also injuries to the musculoskeletal system. (...)

Due to the unfavourable load distribution between muscle and joint can later lead to "arthromuscular imbalances" (disturbed joint-muscle relationships). These can result in painful muscle tension, overloading of the tendons, muscular coordination and functional disorders as well as wear and tear of the joint cartilage. An example of muscular imbalances is the hunchback, caused by weakened back muscles and shortened chest muscles. In order to establish a muscular balance, a adequate training program consisting of strength training and stretching is necessary." [6]

Very often the muscular facts and the diagnosis remain very locally limited to the agonist and the direct antagonist. Simple observations and analyses of the susceptibility of tonic muscles (which tend to shorten) and phasic muscles (which atrophy accordingly) are also correct but by no means sufficient.

"Prof. Dr. phil. Lutz Vogt, a sports physician at the University of Frankfurt am Main, advises adapting training sessions to compensate for existing muscular imbalances or to prevent further aggravation of the imbalance. To do this, it is advisable to treat shortened muscles with light loosening or stretching exercises. This can be done in separate sessions, before or after a training session. To adapt weakened muscles, the usual training session should be supplemented with strength exercises for the affected muscles." [7]

The usual recommendations and therapeutic measures such as loosening or stretching exercises, stimulation current, taping, massage, acupuncture or more strengthening of the immediately weaker muscle are very often not effective enough.

After all, it is considered certainly evident that immobilization and immobilization will exacerbate the problem. Unrecognized and/or insufficiently treated, the complex offshoots of muscular imbalance lead to sarcopenia, osteopenia, osteoporosis, arthrosis and frailty.

### **Muscular imbalances**

Muscular imbalances do not only correlate with a loss of performance, but also lead to injury susceptibility, strains, muscle fibre tears, tendon irritations, ligament injuries, bone oedema, muscle fasciae and joint pain, spinal column problems, but also circulatory disorders, nerve compression syndromes and cartilage damage.

Modern sports physicians such as Dr. Hans Joachim Rist, Dr. Percy Marshall, Dr. Henning Ott, Dr. Thomas Fröhlich, Dr. Patrick Ingelfinger and others are well aware of the complexity of this problem today. Even the spreading of the muscular imbalance over muscle chains is seen today.

The problem has a much more drastic effect on all age groups in the population.

Immobilisation, lack of movement, stereotypical stress, sedentary work, screen work, smartphone head postures and stress place a serious strain on the body posture and the so-called musculoskeletal system. Chronic pain, sarcopenia, degenerative changes of the spine, arthrosis, osteoporosis.

The wide spectrum of "muscular imbalances" represents a causal cause for many different pain conditions. The field of "back pain" alone, with the identified lifestyle culprits, led to a cost explosion of 49 billion euros in Germany in 2019.

Muscular imbalances have to be analyzed against the background of complex functions in movement. The observation of "motor-neuro-patterns" in corresponding movement sequences and functional kinetic muscle-fascia chains can shed light on the dynamic relationships of muscular dysbalances AND fascial compensations and analogous structural adaptations.

Local views of agonist/antagonist or fascial structures and their stress behaviour at the site lose their central significance, and yet are seen as small pieces of the puzzle in the overall melody.

When function-related motor-neuro patterns act three-dimensionally on joint axes via biomechanical torques, compensatory "counter-torques" came on the scene [8].

**Ex. abdominal muscles**

Abdominal muscle training from a shortened position leads biologically to a shortening of the abdominal muscles, which are predisposed to shortening anyway, the hip flexor and the rectus femoris muscle.

Analyses regarding muscular imbalance left / right show nothing conspicuous in this frequent situation. The force development of the antagonists also behaves symmetrically. The relative and hidden restrictions are not recognized at this time. The system of the thoracolumbar fascia (thoracolumbar fascia; TLF, see above) steps in compensatorily with a servile system - and holds against it. The tension ratios increase and must already tense at rest in order to ensure a balance.

Via the torque effects in the pelvis with pre-tilt and hyperlordosis, the rotational moments and the mobility of the hips and knees change with reduced extensibility. The gluteal musculature jumps in antagonistically and will chronically tense against it. In the second line gluteal muscles are overloaded, exhaust and degrade.

The muscle-fascia-vector system of the M. tensor f.l. and the tractus iliotibialis gets into a changed angular position, causes a terminal extension inhibition in the knee and increases the bending position in the knee.

The tensor f.l. muscle and the tractus iliotibialis synchronize with the flexors in the thigh into a flexion in the knee joint, and become functional agonists of the (hamstring) ischiocrural muscles.

The muscle system of the adductors compensates with additional tension against the abduction activities. They can develop an equal amount of force symmetrically on the left and right, but even at rest they run up against the levers of the functional agonists. The performance is reduced multidimensionally, since every action runs up against a counterforce.

Local examinations of muscular imbalances in the shoulder girdle, the cervical spine or the lower legs are futile under these circumstances. These muscular imbalances are often only offshoots of derailed motor-neuro-patterns.

Without a three-dimensional view of movement with exact knowledge of the myo-fascial transitions, physical torques as well as passive and active movement patterns, muscular imbalances can only be understood to a limited extent.

**Example knee**

With this in mind, a common analysis of a muscular balance between hamstrings and quadriceps must be performed without integrating pelvic position, iliopsoas muscle tone ratios,

abdominal muscles as well as the tension patterns of the TLF and the tractus iliotibial come to nothing.

### Example cervical spine

Bio-mechanical and bio-kinematic rotational moments within a joint axis usually synchronize with corresponding counter-rotational moments in the neighboring joints.

Relatively shortened abdominal muscle systems and hip flexors correlate with hyperlordosis and pelvic pre-tilt [9].

Analogously, the "little sisters" of the ilio-psoas, the M. scaleni and the system of the neck musculature also step in.

Within this torque alignment, an increased lordosis with hyperextended upper cervical joints develops in the cervical spine. The functions of the atlanto-occipital and atlanto-axial joints come to a standstill.

the way into chronic blockages.  Headache, neck pain, shoulder-arm-

syndrome, dysfunctions of the brachial plexus, the sympathetic cervical ganglia with stereotyped increase in tone, circulatory disturbances of the vertebral artery with its branches (the spinal artery, the cerebellar artery inf. and sup. or the labyrinthine artery), conduction pathway irritations and collateral stresses of the trigeminal nuclei and thus of the tonus relationships of the masseter muscles around the trigeminal nuclei. or the labyrinthine artery), irritations of the conduction pathways and collateral stresses of the trigeminal nuclei and thus of the tonus of the masticatory muscles around the temporomandibular joint are bio-logical consequences.

Isolated analyses of a muscular imbalance in the cervical spine can only be of very limited use against this background. And- there are no one-way streets in biological systems.

Dysfunctional motor-neuro patterns of the upper cervical spine, e.g. after acceleration injuries or whiplash trauma of the cervical spine, immediately take shape over the entire spine and project into the joint axes of the pelvis, and also into the hip, knee and ankle joints.

### Example shoulder

Muscular imbalances in the region of the shoulder girdle are centrally dependent on several remote controls.

Firstly, the position and balance of the shoulder-leading muscles from the region of the cervical spine and the inner GPS with the interconnections of the upper cervical joints are regulated in the first place.

Neuro-muscular dysfunctions and malpositions of the cervical spine, irritations of the shoulder-arm controlling plexus brachialis via contracted scaleni muscles in the so-called scalenus gaps lead to decentration of the rotator cuff.

The Mm. scaleni as inspiratory respiratory muscles, which raise the upper two ribs physiologically during inhalation, experience in dysfunction and



under bio-kinematic stress a change in function. Instead of lifting the ribs, the ribs become transitions to the punctum fixum, so that the M. scaleni force the neck into an exaggerated hyperlordosis with hyperextended craniocervical joints. This dysfunction initiates blockages of the 1st and 2nd ribs.

Secondly, together with the interfaces of the scaleni muscles with the serratus anterior and the tonic pectoralis muscles, a strong torque develops ventrally caudally. The position of the scapula tilts ventrally. Biologically, the relative distances and angular relationships between the acromion-humerus head and the supraspinatus muscle change.

Thirdly, an exceptionally strong leverage effect is developed under these circumstances, but also secondarily as an offshoot of basin tilting and entgleisten torques of the pelvis and the TLF, the M. latissimus dorsi.

In restricted function, this so-called "apron truss muscle" causes strong internal rotation in the shoulder with ventral pull. Any external rotation and elevation of the shoulder joints can be blocked by these passive legs. In compensation and as a consequence, the

M. Trapezius and the M. Deltoideus on the other hand, are chronically overloaded and fatigue.

As a respiratory muscle (it is also called the "cough muscle"), the lat. dorsi. in its interplay with the diaphragm is very often a limiting factor for the free function of the diaphragm and breathing. Instead of opening the thorax, the fibers of the diaphragm and allied respiratory muscles generate rib blocks, thoracic blockades and (via the anatomical pathways of the serratus ant., serratus post sup., subscapularis, pectoralis major and minor as well as the small intercostal muscles) reduced ROM and functional limitations in the shoulder girdle.

The weakest element in the interaction is very often the supraspinatus muscle, which decompensates under the influence of such changes in angle and strong lever forces and innervation difficulties that get out of hand. Calcifications are an expression of chronic permanent activation and the influence of static holding forces on this small dynamically designed muscle. Rotator cuff syndromes, supraspinatus tendon syndromes and

"Frozen shoulders" are not usually conditions in their own right, but offshoots of complex imbalances elsewhere.

Last but not least, the shoulder centering is also significantly determined by the pelvic region and the TLF. The latissimus dorsi muscle inserts itself caudally directly into the system of the upper

TLF, and can come under very strong pressure via these reins and then translate these forces into the transition zones of the shoulder girdle with reduced ROM.

**KSD - Strength in Stretching / Muscle-Fascia-Length Training**

1. GPS, upper cervical spine, atlantooccipital joint



1. Anterior (ventral) extension and opening: activation against resistance and gravity: the step, the sun salutation and the proud cock



2. a) Lateral (lateral) opening: Lateral bending over the whole length and activation against resistance: The bile line and the tree in the wind,

shoulder.

2. b) *Stretching the legs, inside: The stretching step*



3. Posterior (dorsal) extension: bending forward in the pelvis: table in different variations



4. Diagonal (spiral) openings and turns; from the toes to the hands: and the step; with turn

Kurt Mosetter, MD Obere  
Laube 44  
78462 Konstanz | Germany  
kurt.mosetter@myoreflex.de

#### Literature

- [1] Mosetter, K. & Mosetter, R. (2010). *Myoreflex therapy volume 2: Regulation for body, brain and experience*. Constance: Vesalius.  
Myers, Tom (2011). *Revisoning the Fascia as a Body-Wide Regulatory System*. MASSAGE Magazine.  
Schleip, R., Findley, T. W., Chaitow, L. & Huijing, P. A. (2012). *Fascia: The Tensional Network of the Human Body, 1st Edition. The science and clinical applications in manual and movement therapy*. Edinburgh: Churchill Livingstone, Elsevier.
- [2] Mosetter, K. & Mosetter, R. (2005). *Dialectical neuromuscular trauma therapy*. *Journal of Psychotraumatology and Psychological Medicine*. 2. pp. 31-45. Cf. Mosetter, K. & Mosetter, R. (2010). *Myoreflex therapy volume 2: Regulation for body, brain and experience*. Konstanz: Vesalius.
- [3] Cf. Müller, D. G. & Schleip, R. (2011). *Fascia fitness: fascia-oriented training for sports, gymnastics and exercise therapy*. *Terra Rosa e-magazine, Issue no. 7*; Online at: <http://de.scribd.com/doc/52170144/Terra-Rosa-eMagazine-Issue-7#scribd>, 1-11.

- [4] Wilke, J., Krause, F., Vogt, L. & Banzer, W. (2015). *What is evidence-based about myofascial chains? A systematic review*. *Arch Phys Med Rehabil*.
- [5] Rist, H.J. (2005). *Muscular imbalances- cause of many injuries and overuse injuries in sport*. *SPORTMEDICINE* 10. 18-19.
- [6] Wikipedia. Retrieved 2020-01-17. [https://de.wikipedia.org/wiki/Muscul%C3%A4re\\_Dysbalance](https://de.wikipedia.org/wiki/Muscul%C3%A4re_Dysbalance)
- [7] Source : eGHYM. Retrieved 2020-01-17. <https://egym.com/en/magazine/health/muscular-dysbalances/>
- [8] Mosetter, Kurt (2012). *The myoreflex concept. Pain-free via the physics of functional anatomy*. *medicalsports network* 1. 4-7.
- [9] Mosetter, K. (2012). *Back pain due to wrong vectors: Physical and anatomical basis for the development of pain*. *pt Journal for Physiotherapists* 9 and 10.

Mit Strategie Gesund

Dr. Mosetter  
PRINZIP