

ESSOMM Consensus Curriculum Basic Course Manual Medicine

Schedule for a basic course: 100 hours (teaching units/TU)

Certificate of Advanced Studies according to the Bologna Concept (CAS)

Topics:

- Anatomy/ Biomechanics
- Examination: spine
 - global
 - regional
 - segmental
 - provocation
- Examination: pelvic girdle and peripheral joints
- Indications/ contraindications
- Treatment
- Case reports
- Patient education and exercises
- Basics in imaging
- Neurophysiology:
 - neuronal network
 - convergence
 - peripheral and central sensitization
 - chronification
 - inhibition, inhibitory systems
 - therapeutic approach

Relationship between clinical findings and neurophysiology

Relationship between clinical findings and anatomy

Relationship between clinical findings and imaging

Concerning all regions:

- cervical spine
- thoracic spine
- lumbar spine
- pelvic girdle
- peripheral joints upper & lower limb

Module 1 & 2: Introduction and mobilisation vertebral spine (2 x 25 TU)

Scientific basis of explanation

1. The locomotor system and the autonomic nervous system react to afferent input of any origin.
2. Segmental functional testing may increase or decrease a nocireactive motor reaction in a manner of changes of tension of muscle and fascia.
3. Afferent input may also initiate reflex changes of tissues innervated by the autonomic nervous system.
4. Increased tension results in the reduction of passive range of motion.
5. Segmental dysfunction can be identified by palpation.
6. Clinical functional examinations attempt to identify altered movement patterns that can demonstrate both restriction and free direction of motion.
7. Acknowledgement that vertebral dysfunction may be caused by pathology outside the locomotor system (convergence in neurophysiological sense).

Manual Medicine (provided by physicians) uses all medical skills and knowledge such as anatomy, biomechanics, physiology, biochemistry and imaging at the respective actual state of the art.

The unique property of Manual Medicine amongst other medical specialities is the possibility of entering into the system of diagnosis by identifying the motor and other reactions by palpation (i.e. by the reproducible finding of functional induced changes of tissue tension).

Neurophysiology of segmental dysfunction

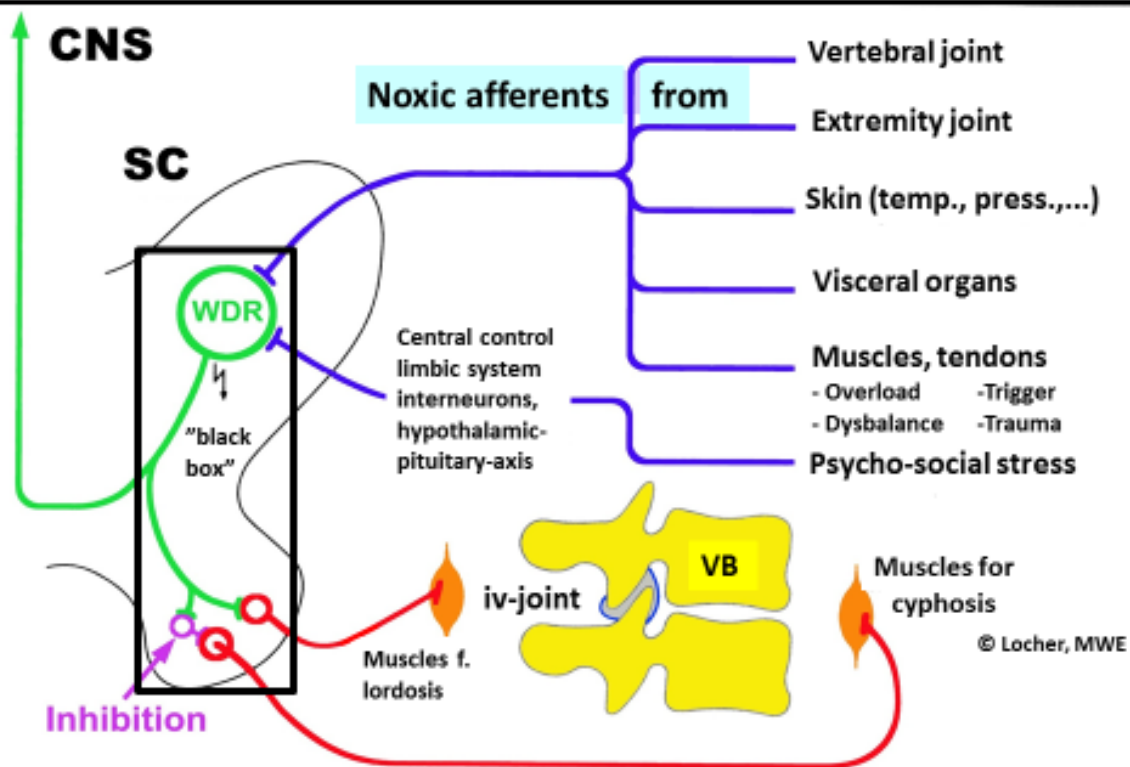


Fig. 1: Model of the neurophysiology of segmental dysfunction. Comment:

The terms „muscle for lordosis“ and „muscle for kyphosis“ in the figure are used as a highly simplified model of three dimensional complex innervation patterns of spinal muscles as a neurophysiological reaction of body protection.

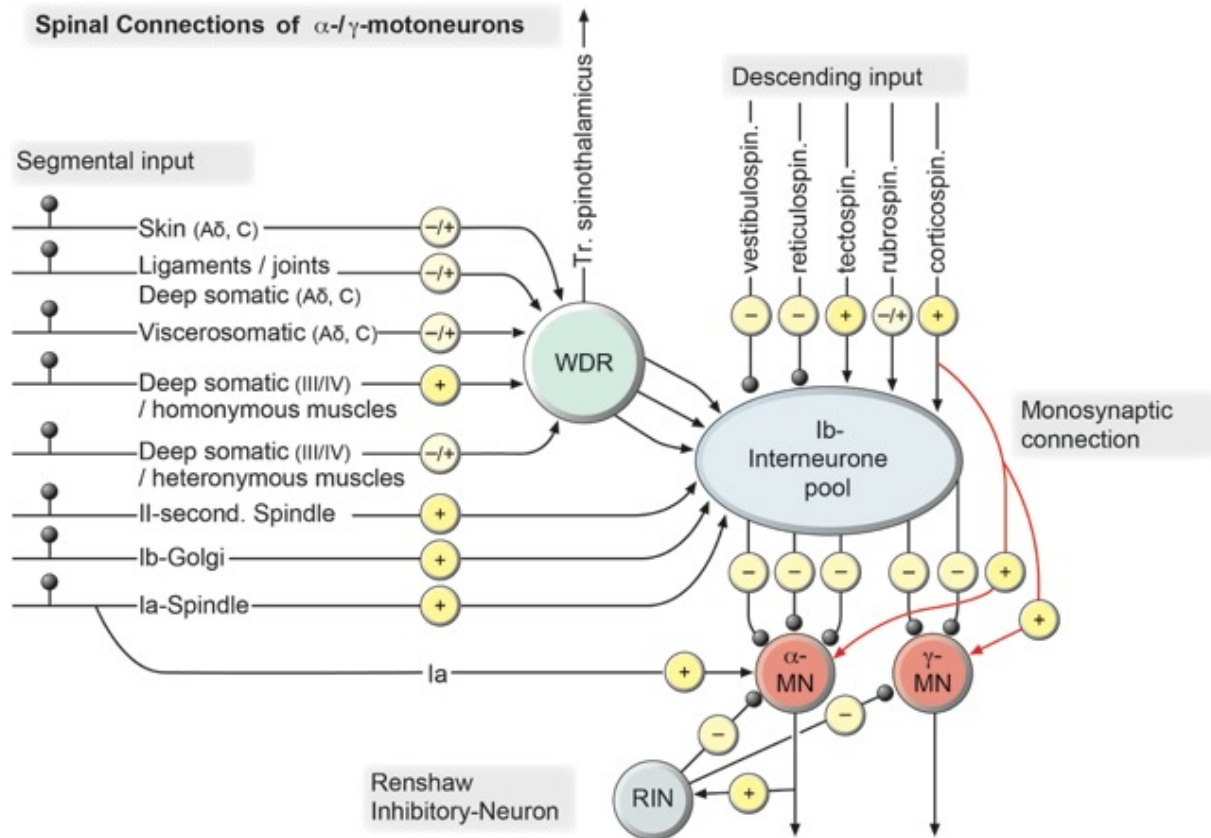


Fig. 2: Some known contents of the “black box” in figure 1 (© Böhni, Lauper, Locher; 2014)

Manual examination is always preceded by standard orthopaedic and neurologic examination.

Principles of manual diagnostics

- Global range of motion (ROM) – asymmetry?
- Segmental or regional range of motion (**m**obility = **M**)
- Segmental irritation = **I** (activation of afferent neurons followed by nocireaction)
- **P**rovocation to identify painful direction(s) = **P**
- **MIP**-diagnostic system is essential to identify the reversibility of any dysfunction of the spine
- To plan any manual treatment the **MIP** test must reveal at least one pain-free or unrestricted direction per plane

Principles of manual therapy:

- Generally four possibilities “hands-on”
 - Manual mobilization – no thrust
 - Manual manipulation – with thrust
 - Neuromuscular techniques
 - Soft tissue techniques
- Before the decision about the therapeutic manual approach be aware of possible contraindications
- No increase of nociception, no increase of pain and nocireaction during therapy
- Achieving long term decrease of nociceptive activity of multireceptive dorsal horn neurons

Diagnostics of spinal dysfunction: cervical spine

- global range of motion (ROM)
- segmental ROM (end feeling)
- segmental Irritation
- combined functional testing
- Provocation: For the preparation of a thrust treatment it is necessary to distinguish the directions of increase or decrease of nocireaction (see advanced courses)
 - MIP (Mobility- Irritation- Provocation)

Therapeutic techniques: cervical spine

- global
 - neuroinhibitory techniques
 - global mobilization
- regional or segmental
 - neuromuscular techniques
 - segmental soft tissue techniques
 - segmental mobilisation (direct/ indirect) in addition to facilitation with respiration and eye movement
- Basic techniques on symptomatic tender/trigger points
- Auto-mobilisation techniques, self exercises, patient education

Diagnostics of spinal dysfunction: thoracic spine

- Posture
- Global Mobility
 - bending forward/ backward/ sidebending
 - rotation in sitting position
- Information about the segmental irritation
 - segmental mobility
 - muscular hypertonicity, nocireactive motor patterns
 - symptoms of autonomous regulation (skin rolling test, dermographism, skin temperature)
- Segmental provocation by functional movements searching for functional asymmetries
 - MIP (Mobility- Irritation- Provocation)

Therapeutic techniques: thoracic spine

- Global
 - Soft tissue techniques
 - Axial traction technique (in upright position)
 - Tangential push-traction
- Regional or segmental
 - Crossed-hand-technique (prone)
 - Supine thenar technique
 - Techniques on symptomatic tender points
 - Neuromuscular inhibition techniques

Diagnostics of rib dysfunction:

- Mobility: costal/intercostal motion during respiration
- Irritation: area of insertion of m. levator costae
- Provocation (inspiration/expiration under irritation-checking)

Therapeutic techniques: ribs

- mobilization in prone position
- crossed-hand-technique (prone)
- mobilisation in lateral position
- traction on the arm in lateral position
- supine thenar technique

Diagnostics of spinal dysfunction: lumbar spine

- Posture
- testing of regional or segmental **m**obility
 - sidebending, flexion, extension
 - rotation in sitting position
- **i**rritation : paraspinal segmental muscles
- **p**rovocation (check for painful /pain-free motion directions)
 - **M I P** (M**o**bility- **I**rritation- **P**rovocation)

Therapeutic techniques: lumbar spine

- Soft tissue techniques
- Neuromuscular techniques
- Regional or segmental mobilization (e.g. rotation traction in lateral recumbent or in prone position)

Diagnostics of joint dysfunction: Sacroiliac Joint and Pelvic Girdle

Preliminary remarks

All movements of SIJ components are defined by the anatomic form of the joint surfaces of the ilium and the sacrum and are physiologically possible only in a minimal range of a few degrees (2 – 4°). In contrast to all other joints according to the definition of a true diarthrosis, actively intentioned movements within the SIJ in a functional direction are not possible. Therefore, movements of the SIJ are not comparable with the function pattern of other joints.

Didactically motivated orientation on functional three-dimensional axes have no basis on functional biomechanical evidence and should not be considered further on. In basic course, we teach just techniques that involve unspecific forces to the SIJ components. The selection of techniques depends on the results of the functional examination and the pain-provocation tests. The aim is to influence the dysfunction based on reactive processes in order to induce a reduction of tension and pain.

There is a wide variation in the accepted practise of SIJ-testing. A general consensus has not been achieved.

Forward bending/spine test: Even though clinical mobility exists, diagnostically conclusions are uncertain.

Mobility tests have not been proven sufficiently reliable.

Instead of using mobility tests it seems to be advisable to use pain provocation tests:

- Compression test
- Distraction test
- Thigh thrust (“4P”-test = “**posterior pelvic pain provocation**”)
- Sacral springing test
- Pelvic torsion test (“Gaenslen-test”)
- **Flexion-Abduction-External-Rotation**-test (FABER-test, Patrick-test, “sign of 4”)

Additional remark:

Signs of irritation in SIJ-related tissues may give information on SIJ dysfunction acknowledging the fact that projections on S1 and S2 are also deriving from different lumbar segments.

No other dysfunction deserves more consideration of differential diagnoses than the SIJ. The initial diagnostic procedure should exclude other (such as lumbar or higher convergence) dysfunctions before identifying a SIJ dysfunction.

Depending on the results of functional and/or pain-provocation tests as well as other clinical findings concerning the SIJ, the decision about appropriate therapeutic techniques can be made.

Therapeutic techniques: SIJ

Not yet any conclusion in respect to therapy of SIJ dysfunction.

Proposals for therapeutic techniques:

- Non-specific mobilisation in nutation resp. counternutation direction
- Traction mobilisation (by vibration)
- Adduction mobilisation in prone position
- Ilium rotation to induce sacrum nutation (no impulse)

Module 3 & 4 : Peripheral joints (2 x 25 TU)

Module 3: Introduction and upper limb

Introductory remarks:

In order to define the appropriate technique for manual treatment of peripheral joints, a concise basic examination of the respective joint is necessary. This examination comprises investigating the functional movement, the range of motion in all planes, the joint play and the palpation of the

different tissue levels in order to differentiate structural lesions from functional disorders. This is a precondition before starting with any manual treatment.

Generally, manual techniques in peripheral joints are indicated in the following conditions:

- Reduction of functional mobility and joint play
- Painful functional disorders
- Post-traumatic, post-inflammatory, post-operative, post-immobilisation, and degenerative stiffness
- Certain cases of neuropathology (e.g. spastic paralytic contractions)
- Post CRPS stiffness or contraction

General considerations:

Concerning peripheral joints, we talk specifically about joint play (see glossary). These movements are related to some considerations involving general biomechanical rules of joint mobility:

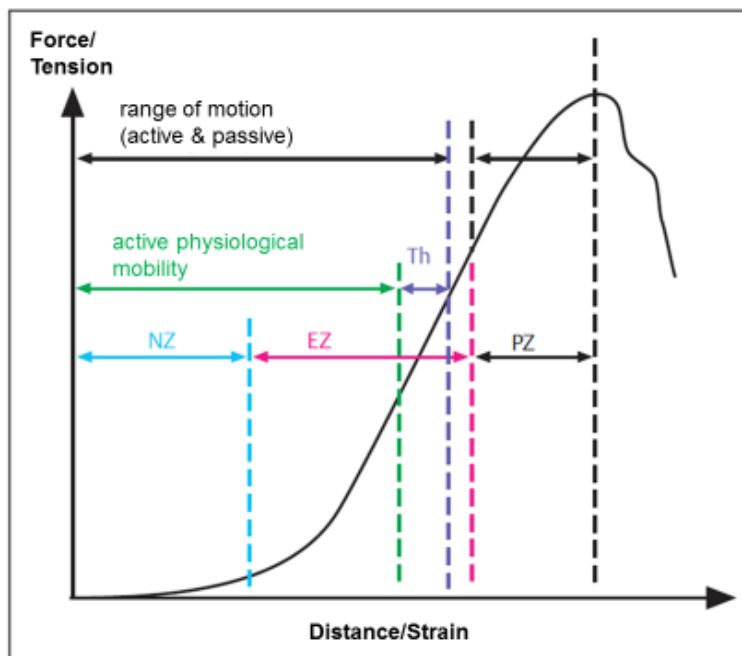


Diagram on distance/force adapted to movements of joints (and segments), concerning the degree of mobility: NZ: neutral zone, EZ: elastic zone, PZ: plastic zone, Th: therapeutic range (Böhni, Lauper, Locher, MM 1, 2014, Thieme).

In this sense, we follow the model of dysfunction as a reduction of the total joint play:

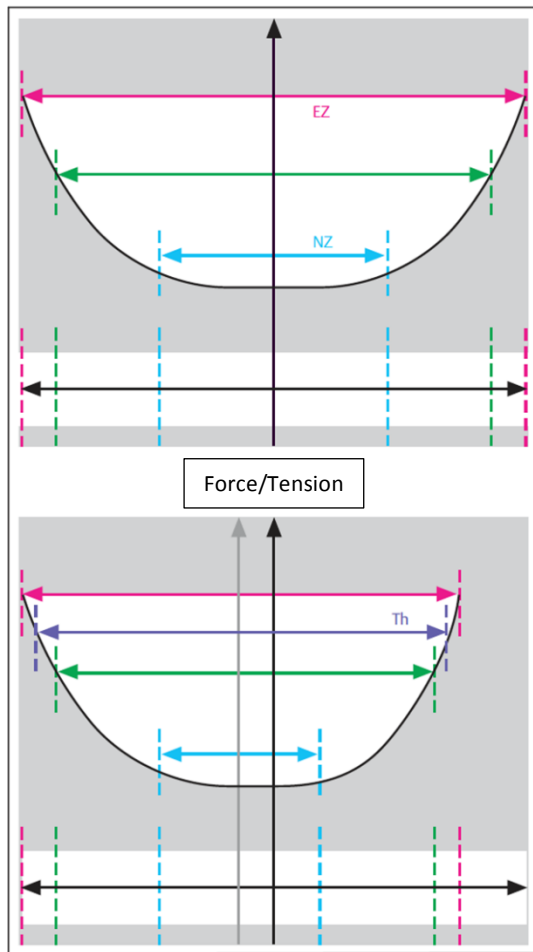


Diagram distance – force – (tension) of one degree of free mobility (e.g. flexion/extension or gliding ap/pa)
 Above: Normal findings
 Below: Restriction to the right side, actual neutral position moved to left side (grey ordinate)
 (Böhni, Lauper, Locher, MM1, 2014, Thieme)

The following movements in a joint can be differentiated and should be taken into consideration before planning any kind of diagnostic or therapeutic approach:

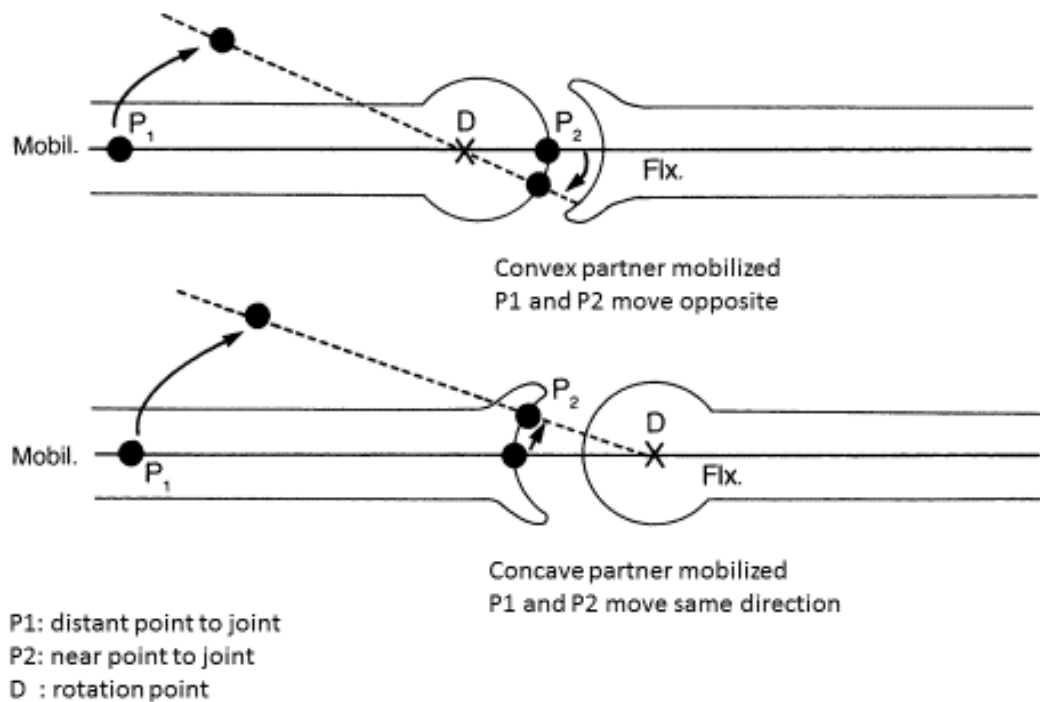
- Rolling = wheel runs on a road
- Gliding = wheel turns on the spot
- Roll-gliding = wheel runs and glides at same time
- Translation = wheel glides without rotation
- Axial forces: compression (coaptation) and separation (decoaptation)

Although the exact role of compression to a joint during a manual procedure has not been completely defined, it has been shown that the improvement of joint play movements will have a positive influence on the nutrition and regeneration of joint cartilage. The repetitive change of compression and separation acts as a pump of synovial fluid in and out of the cartilage. This way compression may have a positive therapeutic influence on joint cartilage. Also it may improve proprioception and reduce nociception as well as having positive effects on the capsule.

In order to improve any functional movement of a peripheral joint, the reduced joint play capacity of the respective joint must be increased.

Concerning peripheral joints, the convex-concave rules have to be considered:

- In case of mobilisation of the (peripheral) convex partner:
P1 and P2 are moving in the opposite direction
- In case of mobilisation of the (peripheral) concave partner:
P1 and P2 are moving in the same direction



© Bischoff & Moll, 6th ed., 2011, perimed

This means for example: In order to improve the abduction in a shoulder, the humerus head has to be mobilized in caudal direction, or to improve the flexion of the knee, the tibial head must be mobilized in dorsal direction.

Therapeutic procedures on limbs are possible applying traction or light compression.

Capsular pattern indicates specific movement restrictions. Each joint has its typical capsular pattern. In a hip joint this is the internal rotation (and extension).

For functional examination, follow the algorithm **MANSC-VV**:

- Myofascial
- Articular
- Neuro-meningeal
- Stabilisation tests
- Central disorders
- Visceral & Vascular

“Upper limb”:

Diagnostics/Therapy:

1. Finger joints:

- Mobilisation dorsally & palmar
- Mobilisation laterally to both sides
- Mobilisation rotationally
- Mobilisation three dimensionally

2. Thumb:

Speciality: saddle joint (convex-concave in one plane, concave-convex in other plane)

- Mobilisation of the saddle joint

3. Wrist:

Diagnosis:

Check for function (dorsal extension, palmar flexion, radial and ulnar abduction)

Check the mobility of every carpal bone – in two rows (respect the convex-concave rule)

Therapy:

- Traction
- Translation of the first or second row in all possible directions
- Mobilisation of each carpal bone individually

4. Elbow:

Diagnosis:

- Check function humero-ulnar, humero-radial and radio-ulnar joint (range of motion)
- Palpation: muscles, ligaments, insertions and nerve passages

Therapy:

- Soft tissue techniques to the elbow
- Mobilisation of the elbow

5. Shoulder girdle

The shoulder has five different areas of mobility, which all have to function correctly:

- Acromio-clavicular joint
- Sterno-clavicular joint
- Gleno-humeral joint
- Scapular-thoracic gliding area
- Subacromial gliding space

All areas and related muscles must be tested.

Examination directions:
Abduction and elevation
Internal and external rotation
Movements to back and neck
Articular mobility anteriorly and medial clavicular ligaments

Therapy of the shoulder girdle:

Soft tissue and muscle techniques
Mobilisation techniques of:

- Scapular-thoracic gliding area
- Subacromial space
- Acromio-clavicular joint
- Sterno-clavicular joint
- Gleno-humeral joint

Module 4: “Lower limb”

Remember general algorithm of peripheral joint examination

1. Foot:

Diagnostics:

- Check for function and for joint play mobility

Four functional axes/ joint lines of the foot:

- | | |
|---|------------------------|
| 1. Upper ankle (tibio-talar): | Flexion / Extension |
| 2. Lower ankle (talo-calcaneal): | Inversion / Eversion |
| 3. Chopart-& Lisfranc-lines/ middle foot: | Supination / Pronation |
| 4. Meta-tarsal phalangeal I (II-V): | Extension/Flexion |

Therapy:

Toes, metatarsal connections, tarso metatarsal, ankle and subtalar joints, distal tibial-fibular connection:

- Soft tissue and muscle techniques
- Mobilisation with respect to the individual joint play

2. Knee:

Diagnostics:

- functional mobility and joint play

Therapy:

Tibiofibular, femorotibial, patellofemoral joint:

- Soft tissue and muscle techniques
- Mobilisation

3. Hip:**Diagnostic:**

- Examination of mobility and joint play

Therapy:

- Soft tissue and muscle techniques
- Mobilisation

Definitions/ Glossary**Convergence:**

- In neural system: afferents of different tissues converge to dorsal horn neurons (multi-receptive, WDR) (spinal cord and also medulla oblongata)
- Biomechanics: position within facet joints (convergence/divergence)

Joint play:

- All passive movements of a joint, controlled exclusively by gravity or external forces

Referred pain:

- Convergence, the noci-generator being not in the painful tissue (e.g.: 'Head'-zone)

Sensitization:

- Receptive fields enlarged, threshold in first (peripheral) or second (central) neuron lowered, and hyperalgesia

Trigger point:

- Structural lesion within myo-fibres by contraction of a part of the fibre, producing referred pain

Tender point:

- Secondary local hyperalgesia without structural lesion (e.g. widespread pain syndrome with multi-ocular tender points)

There will be constant upgrade according to scientific development and the actual state of the art.

References:

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