

SELECTED PHYSIOTHERAPEUTIC METHODS OF VERTEBRAL SPINE DISEASES TREATMENT:

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The Kaltenborn-Evjenth method

The basis of this method is a theory that the primary and most important cause of joint dysfunctions is slide dysfunction of two segments that make up the joint. We examine and treat patients only with the use of translator spinal manipulation. In order to increase the range of mobility with the use of the mobilization method, we need to set the joint at the end of the limited motion. Then we stabilize one segment and put the other one forward, parallel to the treatment plane (slide mobilization) in the direction of motion increase. In order to increase the range of motion, the therapist may also do tractions (separation of joint structures) – that's a perpendicular movement. The process of treatment starts with the examination. This is when the therapist pays attention to the quantity and quality of movement and the so-called end feel of movement. This allows the therapist to set a temporary diagnosis and to proceed with a trial treatment. If patient's condition improves after this treatment, the diagnosis becomes permanent. If the condition deteriorates, the examination must be repeated.

The most important therapeutic aims of this method are as follows:

- analgesic effect: stabilization, physiotherapy, three dimensional traction, vibration, oscillations;
- increased range of motion: if the limited range of motion is evoked by periarticular tissues – massage, post isometric relaxation, passive stretching of contracted structures; if the limited range of motion is evoked by articular structures: mobilizations, manipulations (mobilizations with an impulse);
- reducing the excessive mobility: passive stabilizers, active stabilizing exercises;
- exercises that support and sustain the range of motion: exercises of strength, endurance and coordination, automobilization, autostretching and preventive exercises.

We must remember that manipulation procedures are done sporadically, once and in strictly defined situations. They're done in a sudden, quick way and slightly exceed present range of motion, thus, when done in inappropriate way or case, they can be dangerous.

The McKenzie method

It'll be easier to understand the method and the way of gaining therapeutic effect if we say a few words about the mechanics of the spine, especially what happens with the intervertebral disc during specific movements. The inside of the disc (nucleus pulposus) is always in the opposite direction, that is against the trunk movements (you bend – the nucleus pulposus moves to the back, you erect or bend to the side – the nucleus moves forward). The movement of the nucleus puts pressure on the surrounding fibrous ring, which may lead to its damage. Frequent spine flexion, no hyperextension and sitting position cause permanent displacement of the nucleus towards the back. This is, according to the inventor of the method, the most frequent cause of spine pain. The patient is examined and based on the examination they're qualified for one of the following three:

- postural syndrome: placement of pathologically intact elastic tissues in long-lasting excessive tension. The pain source is lack of correct posture. Thus the therapy will consist in posture correction and teaching the patients to behave correctly in their every day activities and at work,
- functional disfunctionality: shortening and overloading of pathologically changed paravertebral tissues. In order to treat this syndrome we introduce a lot of exercises to be done by the patient himself/herself after being taught how to do them. These exercises aim at stretching the concorted structures.
- structural disfunction: when the nucleus pulposus is damaged, faulty placements occur in the motion segment. When this kind of disfunction is treated, there may appear: the centralization phenomenon (centralization of pain towards the spine), which proves the therapy is working and the peripheralization (the symptoms are drifting away from the spine). In the latter case the examination treatment procedures need to be verified. This syndrome is treated in four stages:
 1. reduction of the nucleus pulposus shift
 2. sustaining the correction
 3. restoring of the function
 4. secondary preventive measures.

The Mulligan method

The inventor of this method has considered the change of axis of rotation due to incorrect articular structures' placement to be the main cause of pain ailments and limitation of the range of motion. This method is original as it combines passive mobilizations with active motion in the treated joint. This mobilization is done in natural conditions (compression forces take part in it and gravity influences it). Examination isn't much different from examinations in other methods. The only difference is that the therapist, whilst examining the joint, changes the present joint axis of motion. If there's an increase in the range of motion and decrease in pain ailments, we've found the proper therapeutic direction. The mobilizations in motion are as follows:

- the patient does the motion in the limited direction to the point where ailments appear

- the therapist mobilizes the joint to work towards the limited direction
- the patient deepens the motion whilst the therapist puts pressure on the joint
- going back to the start position
- ending of the passive mobilization.

At breaks Mulligan often uses taping in order to keep proper axis of motion in the joint. We should remember though that if the skin becomes even slightly irritated, the plaster must be removed immediately.

The PNF method

This method aims at mobilizing the present adaptative reserves of the nervous system. The functional capabilities of the patient are recreated based on the reserve. In order to fully use the plasticity of the nervous system we use the so-called patterns of movement. In order to regain the maximum possible function, present motion capabilities must first be assessed.

The PNF philosophy assumes:

- positive attitude towards the patient and their needs,
- overall observation of the patient,
- mobilization of patient's reserves,
- irradiation (the stimulating radiation) and strengthening,
- taking into consideration global movement activities,
- intensive exercise schedule,
- functional thinking (every day activity),
- frequent change of start positions,
- change in ordinary movement sequence,
- receiving response to every stimulant.

Main criteria applied in the PNF method are:

- manual contact,
- verbal contact,
- eye contact,
- manual resistance,
- traction – separation,
- approximation – compression,
- stretch – a stimulating impulse for the muscle either to contract (if the muscle is stretched) or to contract more intensely (if the muscle is tense),
- therapist's body work,
- patterns of movements,
- radiation and strengthening of the stimulation ,
- timing – ordinary movement sequence,
- timing for emphasis – change in ordinary movement sequence,
- adding up the stimulants in time and space.

When the above criteria are met, the range of mobility, stability, endurance,

dexterity and stimulation of coordination are increased.

The S-E-T method

Authors of the method have claimed the weakening of local stabilizing muscles to be the main reason of secondary chronic inflammations and pain ailments in the locomotor system. The spine must be stabilized during movements of limbs and trunk. It's stabilized thanks to deep stabilizing muscles, attached to adjacent vertebra. However, after a pain accident in the vertebral spine the muscle work is disturbed and thus the surface muscles try to take up the stabilizing function. The surface muscles are designed for motion function and they tense up and cause pain in such a situation. During an examination the therapist tries to find the „weak segment“, that is a segment of the stabilizing system too weak to fulfill its function. In the acute phase we aim at normalizing the functions. This can be reached through the analgesic activity, regulating the muscle tension and regaining the correct joint mobility. Then we introduce exercises increasing the strength and endurance of muscles, fitness and sensomotoric and stabilizing exercises. At the beginning we exercise in isolated positions and so-called open kinematic chains. Yet we should start exercises in closed kinematic chains as soon as it's possible. The latter exercises stimulate whole muscle groups, facilitate their cooperation and allow for complex activities, reminding of every day activities. We regain neuromuscular control thanks to well scheduled exercises in both: closed and open kinetic chains. The level of difficulty must be carefully chosen to make sure exercises are done with significant effort yet correctly and without pain.

Read more about the vertebral spine:

- [Vertebral spine - Chronic illnesses and injuries](#)
- [Preventive exercise in spine pain ailments](#)

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