

2. 2. CORRECTIVE EXERCISES

Corrective exercises help us focus on individual target groups of motor apparatus and improve their functional parameters (articular mobility, tone, power and muscle co-operation). In fact, they are simple exercises, natural movements or positions aimed at particular parts of the motor apparatus and their impact is not limited only to the peripheral organs such as the organs of performance and the support part, but they help us to use known mechanisms of neuro-muscular regulation and thus form and strengthen desirable reflexive links on various levels of dynamics management.

They serve to eliminate not only shortening or enfeeblement in muscles but also fixed habits of improper body posture as well as improperly performed movements in some body parts and also to positively influence specific weaknesses.

We differentiate:

- relaxing
- stretching
- strengthening.

Compensatory exercises have the right physiological effect only if they are aimed at a particular body part and duly performed with reference to the nature of the damage as well as the necessary physiological corrections.

When choosing exercises, it is necessary to think of the weaknesses, individual needs of the patient, body posture and the results of the functional examination of the motor system (as this shows the level of muscle shortening and enfeeblement as well as malfunction of movement stereotypes).

As corrective exercises influence mainly the central nervous system and the peripheral parts of the motor apparatus, we have to follow a precise method. Muscle rigidity and increased tone of muscles, which moulding articulations are problematic not only for stretching but also for muscle strengthening. Therefore, all the stretching and strengthening exercises should be preceded by exercises designed to relax articulations and muscle tone.

Relaxing, stretching, and strengthening exercises should be performed in accordance with all necessary didactic principles:

- exercising slowly in co-ordination with breathing (controlled movement)
- keeping proper procedure, i.e. first relaxing articulations and muscles, then stretching shortened muscles, and then strengthening enfeebled muscles, eventually relaxing muscular tension again
- including a suitable number of individual exercises with the aim of achieving requisite physiological effects with regard to age, health conditions, and general fitness of the individual.
- Monitoring the correct performance of all individual exercises.

Relaxing exercises

The aim of such is to relax stiff and limited mobility articulations and muscular contractures and, simultaneously, warm up muscles with a tendency to shorten by mild stretching. Movements are performed in all directions (along the movement axis) to their maximal position (according to what is maximum for the particular individual) with minimum muscular effort. Therefore, this movement is more or less passive. When performing a movement in all directions signals are sent from muscles and tendons to the nerve centres and activate the appropriate reflex circuits. Thus, they indirectly effect the muscular tone around articulations, which culminates in stretching slightly the muscles which have the tendency to get shortened.

The articulations are relaxed by rotation and swaying, using the powers of inertia and gravity. We brake the movement when going in the direction of gravity so as not to end in a sharp bump when reaching the maximum position. When reaching the maximum position, we relax all the surrounding muscles and fluidly move into the reverse position. The movement in articulation should only go as far as is possible without comfortable. All the movements are performed slowly and should never develop into swinging movements.

Examples of exercises

Exercise 1

Basic position: Stand on one leg: lift the other leg a little above the ground and use rotational movements to slowly relax the ankle bone. Perform the movement slowly extending into your maximum position. Repeat 5 times rotating both clockwise and anticlockwise. Then do likewise with the other leg.

Effect : Anklebone relaxation.

Exercise 2

Basic position: Stand – your arms by the side: right leg and left arms sway forwards and backwards to the maximum comfortable position. NB: no swinging. Repeat 5 times and do likewise with the other arm and the other leg.

Effect: Hip-joint and anklebone relaxation

Exercise 3

Basic position: Stand with legs slightly astride, feet parallel – your arms by the side: gradually bend your head forwards, lowering your shoulders, bending your spine. Allow the effect of gravity to carry you forward as far as is comfortable. Stay still in the final position for a while breathing freely. Breath in, start going up very slowly, raising first the spine, then the head.

Effect: Spine relaxation Attention: Do not use with cardiacs.

Exercise 4

Basic position: Stand slightly astride, your arms by the side: Sway your arms alternately one forwards, one backwards to facilitate turning your upper body. Arms should reach the level of your shoulders and then drop to the level of your pelvis.

Effect: Spine and shoulder relaxation.

Exercise 5

Basic position: Lie down, bend and spread your legs – stretch arms sideways, palms up: incline your knees slowly left and then right. Do not move your

pelvis, and shoulders. Repeat 5 times to the left, 5 times to the right (alternately).

Effect: Hip-joint relaxation.

Exercise 6

Basic position: Lie down, bend your right leg – stretch your arms sideways: put your left hand on the outer part of your right knee and pull your right knee gently to the left. Go back to the basic position after reaching your maximum position. Put your left hand on your pelvis and hold the left part of your pelvis in place. Put your right hand on the inner part of your right knee and lower your knee gently towards the ground. Do not lift your pelvis off the ground when performing either of the movements. Repeat at least 3 times. Then do the same with your left leg.

Effect: Hip-joint relaxation.

Exercise 7

Basic position: Lie on your right side: pull your left knee to your chest; put your right hand on the left hand side of the left knee, left arm resting on the ground. Slowly turn your upper body to the left to the maximum position; allow the effect of gravity to carry you forward as far as is comfortable. Then add rotational movements with your left arm. Then do the same on your left side.

Effect: Spine and shoulder relaxation.

Exercise 8

Basic position: Lie down, bend your legs – your arms by the side: breathe out and slowly pull both your knees toward your chest. Repeat 5 times.

Effect: mainly lumbar spine relaxation.

Exercise 9

Basic position: Lie down; stretch your arms sideways, palms on the ground, breathing out pull your right knee to your right shoulder with the assistance of your right hand, simultaneously turn your head to the right. Do likewise to the left. Repeat 5 times to the right, 5 time to the left.

Effect: cervical and lumbosacral spine relaxation, also hip-joint relaxation

Exercise 10

Basic position: Adopt the standard “press-up” position but with the knees on the ground, bend your head and relax (a): breathe in and clench your gluteal and abdominal muscles and pull your pelvis

forwards. Breathe out, relax your muscles to the position of gentle sagging your spine. Repeat 5 times.

The same exercise can be performed in the same basic position but with arms leaning on your elbows (b) and in “press-up” on your knees, arms extended to take the weight on the ground (or on about 20 cm thick pad (c)).

Effect: spine elasticity and gentle mobilisation of the cervical, pectoral and lumbar spine.

Exercise 11

Basic position: Press-up on your knees, bend your head and relax: breathe in and slowly stretch your right arm to the right, turn your upper body to the right and look at the fingers of your stretched arm. Breathe out and go back to the basic position. Do likewise to the left. Repeat 5 times alternately.

The exercise can be performed the same in push-up on your knees on your forearms or in press-up on your knees, arms leaning on the ground on about 20 cm thick pad (c).

Effect: spine elasticity and gentle mobilisation of the cervical, pectoral and lumbar spine.

Exercise 12

Basic position: Press-up on your knees, bend your head and relax: Breathe in and slowly lift your feet off the ground and look at your toes to the right. Breathe out and go back to the basic position. Then do likewise to the right. Repeat 5 times alternately.

The exercise can be performed the same in push-up on your knees on your forearms or in press-up on your knees, arms leaning on the ground on about 20 cm thick pad (c).

Effect: spine elasticity and gentle mobilisation of the cervical, pectoral and lumbar spine.

Exercise 13

Basic position: Sit comfortably, your arms by your sides: breathe in and bend your head gently backwards, looking up. Breathe out, bend forwards, and relax. Look down. Do not overdo it when bending your head backwards.

Effect: Cervical spine relaxation.

Exercise 14

Basic position: Sit comfortably, your arms by your sides: turn your head up: breathe in and turn your head to the right, complete the movement and allow

your eyes to continue the arc to the right. Breathe out, drop your gaze and then move your head back to the starting position. Do likewise to the left. Repeat 5 times alternately.

Effect: Cervical spine relaxation.

Exercise 15

Basic position: Sit comfortably, your arms by your sides: bend your head down and allow the effects of gravity to carry you forward as far as is comfortable. Breathe in and move your head in a semi-circle to the right, breathe out and go back, breathe in and turn your head to the left, breathe out and go back to the relaxed basic position. Repeat 5 times alternately.

Effect : Cervical spine relaxation.

Exercise 16

Basic: Sit comfortably, your arms by your sides – bend your head down: slowly rotate your head coordinating the movement with your breathing. Breathe in when moving the head towards your shoulder and bending backwards, breathe out when moving towards the other shoulder and bending forwards. Be careful when bending backwards. If you feel any blocks or other problems in your neck, do not perform the exercise.

Effect: Cervical spine relaxation.

Stretching exercises

The aim of these is to recondition the physiological length of muscles as shortening primarily affects the ligamentous part of muscles, muscular frame as well as tendons.

Healthy physical education focuses on controlled stretching, i.e. by fully controlled movement of muscles, which have the tendency to get shortened or are already shortened in various types of health disorders.

Stretching must be smooth and slow, the aim is not to forcibly increase the movement level, as there would be a defensive muscle reaction (so-called stretching reflex). The reflexes causing the defensive muscle reaction must be inhibited. This can be reached by deliberate muscle relaxation, i.e. we exercise using slow (controlled) movement in statically undemanding positions. Methods of static stretching seem most suitable. We slowly start a stretching position, breathe freely and we maintain this position for several seconds or minutes. Then we return to the basic position and relax. When we relax it is appropriate to use post-isometric relaxation. The shortened muscle is first stretched against mild resistance for a period of about 7 to 10 seconds, then we breathe out, relax the muscle and stretch it for about 3 seconds. When we are in the stretching position, we breathe freely and we maintain the position for 10 to 15 seconds. This method is not suitable for children in kindergarten and on the first grade.

Principles for successful stretching:

- Stretch only muscles already shortened or with the tendency to get shortened.
- Stretch your muscles only if they are warm and relaxed.
- Before stretching it is suitable to undertake some relaxation exercises.
- When stretching choose the most stable and comfortable positions, which respect the principles of anatomy and physiology – easing the muscle attachment and enabling stretching the muscle in the direction of its fibre.
- All the stretching movements are performed slowly, continuously and in the co-ordination with breathing.
- At the first hint of discomfort, discontinue the exercise. Stretching is about the muscle warmth and relaxation.
- Breathe regularly and calmly when stretching. Thus you reach better blood circulation in the muscle and increase the feeling of warmth and relaxation (especially when breathing out).
- In the case of shortened muscles, it is fitting to perform the exercises regularly, best every day as muscles get shortened after 48 hours.

Examples of exercises

Calf triceps

This comprises three parts which flow into the robust Achilles tendon and bind on the heel bone.

Its function is to straighten the toes and to enable standing on tiptoes. The ligament above the knee makes bending at the knee possible.

Exercise 1

Basic position: Sit straight – your arms by your sides put your palms on the ground, fingers forward:

Pull toes of your right foot gently towards your shin while pointing your left toes. Maintain for a short while then slowly change your feet positions – point the toes of your right foot and pull the toes of your left foot towards your left shin.

Exercise 2

Basic position: Sit down, bend your right leg, put a scarf (towel, or folded rope) under your foot: raise your foot and pull it with the scarf to your shin. Attempt to hold this position for 20 seconds. Then do the same with your left leg.

Exercise 3

Basic position: Pull-up slightly astride on your toes on the first bar of the wall bars, grip the bar opposite your chest: lower your heels below the bar, maintain the position for 10 seconds, slowly get on your toes, maintain for 7 seconds, relax, breathe out and lower

your heels below the bar again, maintain for 15-20 seconds. Repeat 3-4 times.

Exercise 4

Basic position: Stand, put your right foot slightly to the front, keeping your left heel on the ground – raise your arms above your head (bent), lean on your forearms as well as forehead against the wall (or wall bars): push your right knee to the front and to the ground, pelvis points downwards and to the wall. Maintain for 15-20 seconds then relax. Do likewise with your left foot slightly to the front.

Knee joint flexors

Stretching of biceps flexor cruris, semi-membranous muscle, and semi-tendinous muscle. They bend the leg at the knee and in the upper part they facilitate the extension of the hip joint.

Exercise 1

Basic position: Lie down, bend your left leg, stretch your right leg, put a scarf under your right foot (rope, teraband...) and pull it forward with your arms. Keep your knee straightened and maintain proper head position (no backward bending). When the maximum position has been reached breathe freely. You should experience a sensation of mild pulling and warmth. Maintain the position for 15 – 20 seconds, then slowly lower your leg with the aid of the scarf. Do likewise with your left leg.

Exercise 2

Basic position: Sit down, bend your knees, raise your arms above your head, breathe out and lean forward, try to put your forehead as close to your straightened left knee as possible. Relax in the position, breathe freely and after about 15 – 20 seconds return slowly to the basic position. Do likewise on the other side. This exercise helps stretching also the upper body erector and unilaterally also thigh adductor.

Exercise 3

Basic position: Sit down, bend your knees, put a scarf (rope, teraband) under your left foot: Breathe out, bend forward and pull the foot with the scarf to the straightened leg. Maintain for 10 seconds. There should be a sensation of mild tension in the stretched group of muscles. Pull your left heel towards left gluteal, straighten your upper body and bend slightly

backwards. Maintain for about 7 seconds, breathe out, loosen the tension and go back to the bending down position. Repeat 4 times. Then do the same on the other side.

Exercise 4

Basic position: Kneel down on your left knee, put your bent right leg forward. Breathe out and bend down, stretch your arms sideways, pull your shoulder blades to each other. Maintain the position for a while, breathe deeply, then slowly return to the basic position. Change your legs and do the same.

Hip joint flexors

Iliopsoas (Psoas magnus-psoas parvus-iliacus), i.e. iliopsoas, quadriceps and tensor fasciae latae. These muscles bend the hip joint. Iliopsoas affects the position of the pelvis.

Quadriceps are part of the mechanism for straightening the knee. The tensor fasciae latae enables the outward rotation.

When stretching these muscles, we have to bear in mind pelvic orientation with abdominal muscles so as not to bend backwards in a manner harmful to the lumbar section or outer rotation of the pelvis.

Exercise 1

Basic position: Kneel down on your left knee, put your right foot to the front, put your palms on your right knee: bring your weight onto your right leg. Slide your right foot forward and, maintaining the right angle between your right calf and the pad, allow the effects of gravity to lower your pelvis towards the ground.. Maintain the position for about 20 seconds, breathe slowly, then slowly return to the basic position. Do the same on the other side.

Exercise 2

Basic position: Squat, put your hands on the ground in front of your knees, move your right leg backward, left calf at right angle to the pad, gently push your pelvis to the front and down, your right leg sliding backwards. Maintain in the maximum position for 15 – 20 seconds, relax, then slowly return to the basic position. Do the same on the other side.

Exercise 3:

Basic position: Lie down on your abdomen, your legs spread (pelvis width), your forehead on the ground: First clench your gluteal, then slowly bend your right leg at the knee, take your ankle (if there is greater shortening, you can use a scarf, rope or

teraband) and pull it gently towards your buttock. Maintain the maximum comfortable position for 15-20 seconds, relax and return to the basic position. (a) Do the same with your left leg. If there is a greater shortening, you can use the method of post-isometric relaxation – push your instep, in the maximum extended position, gently against the resistance of your palm (rope...), after 7 seconds relax and pull the heel back to the buttock. Maintain the position for 10 seconds, breathing slowly (b). Repeat 3 times. Do the same with your left leg.

Exercise 4

Lie down on your right side, cushion your head on your bent right arm, rest your left arm in front of your body: First stretch your right leg as far as it will comfortably go, clench your buttocks, keep your pelvis at 90 degrees to the ground. Then start slowly bending your right leg at the knee, get hold of your right heel with your left hand and pull it as close to your right buttock as possible. Maintain the maximum position for 15 –20 seconds, breathing slowly. Your left thigh must be parallel to the ground. After stretching start slowly returning to the basic position. Do the same on the other side.

Exercise 5

Basic position: Lie down, bend your right leg–stretch your arms sideways: put your right foot under your left knee; put your left hand on the outer part of your right knee. Gently pull the knee towards the ground on your left, as far as possible but keep your left hip and both shoulders on the ground. Maintain the maximum comfortable position for 15 seconds, breathe deeply, relax, and slowly return to the basic position. Do the same on the other side.

Thigh adductors

The name describes their function.

Exercise 1

Basic position: Sit down, spread your legs, put your feet flat against each other and pull them gently back towards your pelvis. Then, using your elbows, gently push your knees down. Maintain the maximum position for 15 seconds, breathing deeply. Stop pushing your knees down after the stretching has finished.

Exercise 2

Basic: Lie down, with your arms by your sides, and your feet touching each other. by sliding bend your legs at the knees pushing your knees to the ground (you can help yourself with your hands). Maintain the maximum position for 15 seconds, breathing deeply, then relax the pressure of knees on the ground and slowly return your feet to the basic position.

Exercise 3

Basic position: Stand with your hands on your hips: step sideways with your left leg, push your pelvis downwards. Maintain for 10 seconds, breathing deeply, release the pressure and slowly return to the basic position. Do the same on the other side.

Upper body erectors

Their name describes their function. We stretch them in bending positions.

Exercise 1

Basic position: Lie down – your arms by your sides with the palms up: Breathe out and bend your right leg, pull your knee to your chest with your hands don't arch your neck. Maintain the position for about 7 seconds, breathing slowly and sense the relaxation in the area of your hip joint and lumbar spine. Then breathe out and slowly put your forehead to your knee and after maintaining this position for a short while slowly return to the basic position. Do the same with your left leg.

Exercise 2

Basic position: Lie down, bend your legs forwards, embrace your knees with your arms: pull your knees to your chest and after maintaining the position for a short while, then straighten your arms at the elbows, push your elbows against the resistance of your arms, clench your buttocks and maintain muscle tension for about 7 seconds. Breathe out and release the tension then pull your knees back to your chest. Maintain the position for 10 seconds and breathe into the abdominal area. Repeat 3-5times.

Exercise 3

Basic position: Sit down, bend your legs – put your hands on your knees: Breathe out and gradually bend your upper body forward until you can place your forehead on your knees. Maintain the position

for about 7 seconds, taking deep breaths. Breathe in and return to the basic position.

Exercise 4

Basic position: Sit down, put your feet flat against each other and draw them back toward your pelvis slowly, then bend your upper body forward as far as it can comfortably go. Maintain the maximum position for about 15 seconds, breathing deeply, relax and return to the basic position.

Lumbar quadriceps

We use these bilaterally when bending our upper body backwards and unilaterally when bending the upper body sideways. When shortened it increases sagging in the lumbar spine. It is stretched in bowing.

Exercise 1

Basic position: Sit down, stretch your arms sideways, bend your upper body to the right (without any upper body rotation or change in orientation), with the right forearm moving toward the ground. Maintain the maximum position, breathing deeply. Relax and return to the basic position. Do the same on the other side.

Exercise 2

Basic position: Kneel down, stretch your right leg out to the side, slide your right arm down the leg and raise your left arm: Breathe out and bend your upper body to the right, left arm up, right arm sliding down along your right leg. Maintain the maximum position for a while then relax. Breathe in and return to the basic position.

Exercise 3

Basic position: Stand with the legs slightly apart, bend your knees, keep your arms by your sides: slowly start bending your upper body to the right, raise your left arm and hold your pelvis still with your right hand. Maintain the maximum position for 15 seconds, breathing deeply. Then gently relax and return to the basic position. Do the same on the other side.

Pectoral muscles

These muscles pull the arms from a position by your sides to the position of stretching them in front of the body (palms down); they raise arms above head (palms forward), lower the arms by your sides side (palms backwards).

Exercise 1

Basic position: Lie down, bend your legs – put your arms by your sides, palms up: Activate your abdominal and gluteal muscles and pull your pelvis forwards, breathe in, stretch your arms sideways, then move them through an arc on the ground into a position next to your head. Maintain the position for a short while with pressing your arms into the pad. Then slowly stretch your arms sideways. Stretch your arms into the distance pull your shoulder blades together and shoulders down and feel the stretching of your pectoral muscles. Maintain the position for a short while and then relax your whole body.

Exercise 2

Basic position: Press-up on your knees: hold your pelvis still by contracting your abdominal muscles then slowly pull your buttocks backwards. Drop forward slowly with the top of your chest towards the ground. Maintain the maximum position for 15 seconds, breathing deeply. Then relax and slowly return to the basic position.

Exercise 3

Basic position: Stand with the legs apart, face the wall bars, raise your arms above your head, slightly bend your knees and bend your upper body forward and down. Grip the wall bar above the level of your waist, hold your pelvis still by contracting your abdominal muscles and drop your chest towards the ground. Maintain the maximum position for 15 seconds, breathing deeply. Relax and slowly return to the basic position. This exercise can be adapted by changing your arms position – you can raise them higher.

Upper part of trapezius

This allows the head to bend to the side. By bending the neck, you stretch this muscle.

Exercise 1

Basic position: Lie down – your arms by your sides, palms up: slowly bend your head to the right, left shoulder and arm sliding down. Maintain the position for a short while, breathe freely. Then breathe in and slowly return to the basic position. Do the same on the other side.

Exercise 2

Basic position: Sit down, keeping your spine straight, your arms by your sides: Breathe out and slowly bend your head to the right. Breathe in and slightly raise your left shoulder up, breathe in and slide your shoulder down. Maintain the position for 10 seconds, breathe deeply and feel the weight of your head. Breathe in and slowly return to the basic position. Do the same on the other side.

Exercise 3

Basic position: Sit in an upright position on a chair or bench: stretch your right arm sideways and bend it, then put your palm on your left ear. Bend your head to the right gently assisting it with your right arm, left hand holding the edge of the chair. Maintain the position for 10 seconds then slowly return head back into the upright position. This exercise can be performed using the post-isometric relaxation but be careful: only minimal pressure with the hand is required to provide the head with the requisite resistance.

Deep cervical muscles

These muscles, which are on the back part of neck, raise your head. They are stretched when you bow your head.

Exercise 1

Basic position: Lie down, bend your knees, put your hands behind your neck, head is relaxed resting in your palms. Use your hands to bend your relaxed head forwards. Maintain the maximum position for 10 seconds and then use your hands again to restore your head back into the basic position.

Exercise 2

Basic position: Sit down in an upright position, hands behind your head. Breathe out and slowly bend your head forward, stay in the maximum position feeling the weight of your head and of hands resting on it. Maintain the position for 10 seconds and slowly return to the basic position.

Shoulder blade levator (Levator scapulae)

Its name describes the function.

Exercise 1

Basic position: Sit in an upright position. Turn your head to the right, stretch your right arm forwards and bend it, then put your right hand on the back of your

head. Gently pull your head down and to the right, assisting gently with your right hand. Maintain the maximum position for 10 seconds, breathing deeply and then breathe in and slowly return your head into the basic position.

This exercise can also be performed using the post-isometric relaxation but be careful: only minimal pressure with the hand is required to provide the head with the requisite resistance.

Strengthening exercises

The aim of these exercises is to increase the functional fitness of weakened muscles or of those muscles that are susceptible to debilitation. Considered physical education prefers the methods of dynamic strengthening, where the movement is controlled and co-ordinated with breathing. The movements are performed either using the weight of your own body or using various simple pieces of equipment (traditional or unusual).

There are certain principles which need to be observed to ensure that exercises are both effective in strengthening the target area and not harmful to other parts of the body.

- First, we have to eliminate the negative influence of antagonistic pairs of muscles by stretching the relevant muscles (e.g. before strengthening the lower muscles that spread your legs or the shoulder blades, we have to stretch the pectoral muscles)
- All the basic positions must be convenient to prevent involving the antagonistic and synergic muscles, which could supplant the function of the muscles we want to strengthen and thus contribute to the formation of undesirable habits of movement.
- If the person's muscles are already weakened, it is appropriate to train the person to co-ordinate the exercises with breathing.
- All the strengthening exercises should be performed slowly in co-ordination with breathing; later they can be performed at a quicker pace but never using dramatic swinging movements where centripetal acceleration may cause detrimental effects.
- The number of repetitions is selected on the basis of individual circumstances (general state of health, current psychological state, fitness level). At first the number of repetitions should be low and should only be increased as appropriate.
- First, we strengthen using the body's own weight, and only after correct habits of movement have been established should the loading be increased, using various pieces of equipment.

Examples of exercises

Deep neck and head flexors

Their name describes their function. They are strengthened by bowing your head. Before strengthening them, we have to stretch the muscles of the nape area.

Basic position: Press-up on your knees, stretching your head and neck forwards, breathe out and slowly and consciously activate the deep head and neck flexors and your head towards the ground, breathe in and return to the basic position.

Exercise 2

Basic position: Kneel down; sit back on your heels – your arms by your sides: Stretch your chin forwards then return it to the basic position and try to activate the deep head and neck flexors to retract your chin. Maintain the position for a while and feel stretching of your nape as well as activation of the deep head and neck flexors.

Exercise 3

Basic position: Lie down, bend your legs; stretch your arms alongside your body, palms up. Pull your shoulders actively down and to the pad, then breathe out and start raising your head into forward bending so that your chin finds the shortest way to get nearer to you're the base of the neck. Maintain the maximum position for a short while and slowly return to the basic position.

Muscles which fix the lower shoulder blade

These are rhombic muscle, which pulls the shoulder blade to the spine and the fore pilated muscle (serratus anterior) pulls the shoulder blade downs to the ribs. We can concurrently strengthen the middle and lower part of trapezius and upper body erector in the pectoral part of the spine. Before strengthening them, we have to stretch the shortened pectoral muscles.

Exercise 1

Basic position: Lie down on your stomach, raise your arms, hold your pelvis firmly to the ground, breathe in and slightly raise your arms off the ground, keeping your little fingers forward. Breathe out, slowly move your arms to the side, bending them and keeping them facing forward. Pull your elbows in towards your waist. Breathe in and return to the basic position. During the exercise, bear in mind that shoulders must be down and back, hold the pelvis still, and the forehead should be resting on the pad.

Exercise 2

Basic position: Lie down on your stomach – your arms by your sides, palms down: Activate your abdominal and gluteals muscles, pull your pelvis to the ground, slightly raise your shoulders from the pad, slightly stretch your arms backwards and feel

your shoulder blades going together. After maintaining the position for a while, release the muscular tension, put your arms down and shoulders back on the pad.

Exercise 3

Basic position: Lie on your stomach, your arms by your sides – palms on the ground, forehead resting on the pad. Pull your pelvis to the ground and slowly bend your chest backwards (forehead goes about 2 cm above the pad). Simultaneously, raise your arms slightly above the ground and stretch them out to the sides – the movement starts in your shoulders. Maintain the position for a while then slowly return to the basic position.

Exercise 4

Basic position: Sit down cross your legs; stretch your arms out and down, palm forwards. Start rotating your whole arms backwards starting at the shoulders. Make small circles, in the course of which your shoulders will be pulled downwards and backwards.

Exercise 5

Basic position: Sit down, bend your legs – bend your arms sideways pull your elbows and shoulders down and feel the activation of the muscles fixing the lower part of your shoulder blades. Breathe in and put your arms to the basic position.

Exercise 6

Basic position: Kneel down, sit back on your heels – your arms by your sides, palms forwards: Breathe in, raise your arms above (do not raise your shoulders), feel the pulling of your shoulder blades towards the rib cage. Breathe out and move your arms by the side.

Abdominal muscles

- Direct abdominal muscle (rectus abdominis) gradually bends the spine forward and in its lower part it brings pubic bone nearer ribs
- Superficial abdominal muscles (obliquus externus and obliquus internus) bend the spine forwards in connection with its rotation
- Transverse abdominal muscle (Transversus abdominis).

All these muscles operate as a unit, helping to hold the pelvis in its proper position and thus also preserving the relative positions of the organs in the abdominal cavity.

Before strengthening the abdominal muscles we have to stretch the shortened muscles in the spinal area – i.e. upper body erectors and lumbar quadriceps.

When strengthening the abdominal muscles it is wise to go from the lower part of the direct abdominal muscles and superficial abdominal muscles and eventually strengthen the upper part of direct abdominal muscles. Always breathe out in contraction. When going into the basic position bear in mind not to involve hip flexors or the muscles in the lumbar part of the spine.

Exercise 1

Basic position: Lie down, bend your legs, put your arms by your sides: Consciously contract the abdominal muscles, buttocks – slightly pull your pelvis forwards and push your lumbar spine onto the ground. Relax.

Exercise 2

Basic position: Lie down, stretch your legs forwards, bend your legs and cross your legs at the ankles, put your hands behind your head. Contract the lower part of your abdominal muscles, breathe out and keep your spine flat on the ground. Lift your knees towards your shoulders. Breathe in and return to the basic position. In the final phase of the movement be careful not to bend your lumbar spine backwards.

People with increased lumbar lordosis can adapt the basic position by putting a cushion under their head and putting their fists under their buttocks.

Exercise 3

Basic position: Lie down, put your legs apart and bend them, put your hands behind your head. Pull your pelvis forwards, breathe in and slowly roll your head, shoulders and upper part of your back from the ground with a gentle rotation of your spine to the right. Breathe in and return to the basic position. Do the same on the other side. The feet should remain on the ground during the whole exercise.

Exercise 4

Basic position: Lie down, bend your legs, put your hands behind your head. Pull your pelvis forwards, breathe out and gradually roll your head, shoulders and upper part of your back off the ground (when your shoulder blades get off the ground, stop). Then breathe in and slowly return to the basic position. The feet should remain on the ground during the whole exercise.

Great gluteal muscle (Gluteus maximus)

This muscle stretches the legs backwards. Before strengthening it, we have to stretch the shortened knee joint flexors – direct thigh quadriceps and iliopsoas.

Exercise 1

Basic position: Lie down onto your stomach, spread your legs and stretch your arms by your sides. Lean your forehead against the ground; bend your legs backwards, put your feet flat against each other and push them together for a short while. Feel the activation of the great gluteal muscles.

Exercise 2

Basic position: Lie down on your stomach, stretch your arms by your sides, put your forehead and face on the ground (do not bend your head backwards!) Consciously activate your great gluteal muscle and start moving backwards first your right leg and then your left leg. When moving backwards, do not lift your pelvis off the ground.

Exercise 3

ZP: Push-up on your knees, lean on your elbows and stretch your right leg backwards: Hold your pelvis still by contracting your abdominal muscles, do not let it turn or move backwards. Then start slowly and consciously moving your right leg, repeatedly, activating your great gluteal muscle. Do the same with your left leg.

Exercise 4

Basic position: Stand – stretch your arms sideways and downwards, palms forwards. Activate your great gluteal muscle and repeatedly move your right leg backwards. Do the same with your left leg.

Middle and small gluteus

These muscles stretch the legs backwards and facilitate stabilising the pelvis. Before strengthening them, it is necessary to stretch thigh adductors.

Exercise 1

Basic position: Lie down on your right side, bend the lower leg at the knee, cushion your head on your bent right arm, rest your left arm in front of your body, keeping your pelvis at 90 degrees to the ground. Bend the toes of your left foot, let it go

down freely and repeatedly move your left leg to the side up to the maximum of 45 degrees. Feel the activation of your gluteal muscles. Pay attention to perform the exercise properly – do not move your leg forwards and do not rotate your pelvis. Do the same on the other side.

Exercise 2

Basic position: Lie down on your right side, bend your legs backwards; rest your head on your bent right arm. Clench your gluteal muscles and start slowly moving your left leg to the side. Do the same on the other side. When moving your leg to the side, do not rotate your knee outwards and do not move your leg forwards.

Exercise 3

Basic position: Kneel down on your left knee, move your right leg sideways, put your arms by your sides, raise your right arm: First bend your upper body to the left stretching your right arm as long to the distance as you can, hold your pelvis still. Activate your middle and small gluteus and start moving your right leg to the side. Do the same on the other side.

Exercise 4

Basic position: Stand – stretch your arms sideways, palms to the front. Hold your pelvis in its proper position by activating your abdominal and gluteal muscles. Then activate your middle and small gluteal muscle and start moving your right leg sideways (your knee and toes are pointing to the front). Do the same with your left leg.

Note. Do this exercise only if you are able to hold your pelvis properly.

When performing any compensatory exercises we should try to sense the feelings of our body. By performing these exercises we influence not only the physical but also psychical part of our personality.

All the listed compensatory exercises are used also when preparing the list of compensatory exercises for individual sport disciplines as they serve for regeneration of sportspeople forces but also for calming or also eliminating functional malfunctions of their muscular system burdened with their unilateral physical and psychical load. The compensatory exercises can also help to develop properly the functions of the muscular system.

Compensatory exercises can also help in prevention of functional malfunction of the muscular system (muscular imbalances, movement stereotype malfunctions). That shows the positive effects of these exercises on the peripheral level (i.e. effecting articulations and muscles) as well as on the physiological level (function of the organs and their inner management) and on the psychical level (feeling, experiences).

We choose the compensatory exercises on the basis of kinesiological analyses of a sports discipline with regard to the individual problems and on the basis of functional status examination of the motoric system.

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Vocabulary