

Neck area and the upper part of trunk

The imbalance in the neck region is associated with muscle overload and faulty posture, where massive neck extensors that tend to tighten oppose deep head flexors that are prone to weaken. This imbalance may result in forward lean of the head. In normal conditions the head erectors and sternocleidomastoid muscles are in an adequate tension, pectoral and trapezius muscles stretched enough; upper fixators of the shoulder blades also in adequate tension and the lower fixators of the shoulder blades sufficiently strengthened. Unless this balance is secured enough, it is impossible to assume the correct position of the head, shoulder joints or a sufficient development of the thorax, which results in the breathing function aggravation.

The muscle imbalance occurring in this region is associated with the cervical spine overload, pectoral muscles tightness, weakened shoulder blade muscles and general kyphotic posture. Scoliotic posture also adds to the formation of deviations. This postural pattern occurs in a great number of non-sporting individuals, as well as in those involved in competitive sport. If such a faulty posture is associated with an unsuitable sports activity without the appropriate compensation, the muscle imbalance further increases.

Areas of sport associated with the neck area and the upper part of torso overload:

- *Running, cross-country skiing*
- *Cycling, canoeing*
- *Volleyball, basketball, tennis, hockey games*
- *Swimming - breaststroke*

As the function of this area is influenced by a number of muscle groups, a proper knowledge of their function and location is prerequisite for the correct choice of compensation exercises.

Neck muscles

Muscle	Origin	Insertion	Function
- long ms. of the neck			<i>Bilateral:</i> <i>forward bend of the head</i>
- straight part	<i>bodies of the last 3</i>	<i>2.-4. cervical vertebrae</i>	<i>unilateral:</i>

	<i>cervical vertebrae and the first 3 vertebrae of the thorax</i>		<i>bow of the cervical spine to its side</i>
<i>- inclined upper part</i>	<i>body of the 3.-5. cervical vertebrae</i>	<i>front bow of the atlas</i>	<i>turning of the head to its side</i>
<i>- inclined lower part</i>	<i>bodies of the first three sternum vertebrae</i>	<i>5th -6th transversal cervical diapophyses</i>	<i>turning of the head to the opposite side</i>
<i>- long head muscle</i>	<i>3rd-6th transversal cervical diapophyses</i>	<i>occipital bone</i>	<i>forward bend of the head</i>
			<i>bilateral: forward bend of the cervical spine</i>
<i>- frontal inclining muscle</i>	<i>3rd-6th transversal cervical diapophyses</i>	<i>1st rib</i>	<i>unilateral: bending to its side, turning to the opposite</i>
<i>- medial inclining muscle</i>	<i>2nd-7th transversal cervical diapophyses</i>	<i>1st rib</i>	<i>same as above</i>
<i>- posterior inclining muscle</i>	<i>5th-7th transversal cervical diapophyses</i>	<i>1st rib</i>	<i>same as above</i>
<i>- splenius muscle</i>	<i>sternum handle, collarbone</i>	<i>diapophysis</i>	<i>bending of the head to its side, bowing of the head</i>

Shoulder joint muscles

Muscle	Origin	Insertion	Function
<i>- deltoid muscle</i>	<i>acromion, shoulder-blade</i>	<i>brachial bone</i>	<i>adduction, flexion, extension</i>
<i>- supraspinal muscle</i>	<i>Subspinal lowering</i>	<i>large papilla of the brachial bone</i>	<i>adduction</i>
<i>- subspinal muscle</i>	<i>Subspinal lowering</i>	<i>large papilla of the brachial bone</i>	<i>outer rotation</i>
<i>- small round muscle</i>	<i>outer edge of the shoulder-blade</i>	<i>large papilla of the brachial bone</i>	<i>outer rotation, adduction</i>
<i>- large round muscle</i>	<i>lower angle of the shoulder-blade</i>	<i>edge of the small papilla of the brachial bone</i>	<i>inner rotation, adduction, extension</i>
<i>- subscapular muscle</i>	<i>frontal area of the shoulder-blade</i>	<i>small papilla of the brachial bone</i>	<i>adduction, inner rotation</i>
<i>- coracobrachial muscle</i>	<i>ancistroid papilla of the shoulder-blade</i>	<i>edge of the small papilla of the brachial bone</i>	<i>flexion, adduction</i>

Upper trunk muscles

Muscle	Origin	Insertion	Function
- trapezoid muscle	nape muscle, cervical and a sternum vertebraic thorns	acromion, shoulder-blade	shoulder retraction, elevation, shoulder downward constriction
- rhombic muscle	the thorns of the last two cervical and first four sternum vertebrae	vertebral edge of the shoulder-blade	shoulder elevation
- shoulder blade elevator	first four transversal cervical diapophyses	upper shoulder-blade	shoulder elevation
- small pectoral muscle	2 nd – 5 th rib	ancistroid prominence of the shoulder-blade	depression and protraction of the shoulder
- large pectoral muscle	collarbone, 2 nd -7 th rib, primal abdominal muscle covering	the edge of the large brachial bone tuberosity	shoulder protraction, adduction, flexion and inner rotation
- subclavicular muscle	1 st rib		shoulder depression

The same rules for the relaxation of the hyperactive, tonic muscles and the strengthening of the muscles with the tendency to weaken apply to the compensation of muscle imbalance in the neck area and the upper part of trunk. During the exercise itself, the method of synchronous compensation is applied, which means that through the appropriately chosen exercise groups, the hypertonic muscle group is stretched, and the hypotonic (weak) muscle group is strengthened at the same time.

It is important to emphasize at this point that the number of repetitions depends on the quality of the performance and the locomotor abilities of the performer. The number of repetitions increases gradually, so that unwanted (helping) muscle group would not interact. Recommended daily rate is 6-8 repetitions, later 12-15; repeat the series.

BP: Lie on your back, legs are bent, arms on the sides, palms down

- while exhaling, stretch your arms and head as far as possible

Mistakes: bending in the lumbar area, bending of the head and holding your breath.

BP: Lie on your back, arms on the sides, palms down

- while exhaling, stretch your arms as far as possible and turn your head to the left

Mistakes: bending in the lumbar area, bending the head backward, holding your breath.

BP: Lie on your back, arms on the sides, palms rest on the floor, cross your right leg over your left, put your left hand under your left buttock, bend your right hand over your head and hold your left temple

- perform the exercise while exhaling, 1st phase: indicate bending of the head, 2nd phase: move your head until you feel medium tension, 3rd phase: bend your head to the maximum. Repeat to the other side.

Mistakes: bending in the lumbar area, bending the head forward, holding your breath.

BP: Lie on your back, legs bent, arms rest on the sides

- while exhaling, bend your head forward and make semi-circles with your chin from the left shoulder to the right and back

Mistakes: holding your breath, not keeping your chin close to your chest

BP: Lie on your back, legs bent, hands stretched above your head, palms facing up, stretched fingers

- while exhaling, shift your arms on the mat until they are bent and in the right angle with your spine

Mistakes: bending in the lumbar area, flexing your wrists, bent fingers, holding your breath

BP: Sit with your legs crossed, tighten your abdomen, put you head up and hands on your shoulders (but do not cross them)

- while exhaling, pull your head up as far as possible and make outward circles

Mistakes: round back, lifting your shoulders, forward bending of the head, elbows not directed downwards, irregular breathing

BP: Sit with your legs crossed, hold your stomach in, head up straight, arms loosely by your sides

- put your right hand to your right temple
- while exhaling push against the head (hold for 15 s), head pushes against the hand
- while exhaling release the arm, put your left hand to your right temple, while exhaling the hand bends the head to the left while stretching your right arm by force with its wrist bent and not touching the ground

Mistakes: forward bending of the head, holding your breath, round back

BP: Sit with your legs crossed, bend your arms at the elbows with your hands up and your palms facing forward first in the right angle and then to form the letter V, press your pelvic forward

- while exhaling bring your shoulder-blades together, keep your arms where they are

Mistakes: contraction of the shoulder-blade muscles is too fast, forward bending of the head, moving your arms, holding your breath

BP: Take the front-support kneeling position, the head position follows the spine

- while inhaling, lift your right arm from the inside
- while exhaling bend it back inwardly
- do the same with the other arm

Mistakes: bending your head backwards, bending in the loin area, holding your breath

BP: Sit on a chair, bend your arms at the elbows with your hands up and your palms facing forward first in the right angle and then behind your nape, back straight

- while exhaling pull your head up as far as possible and your shoulders down, bend your head forward with the help of your hands

Mistakes: trunk bending, round back, holding your breath