

Hip joint area

The area of the hip joint is very closely related to the pelvis, which plays an important role in the emergence of functional malfunctions based on overloading the axial system, formed by the pelvis, spinal column and the head. Relaxing, stretching and exercising muscles in the hip joint area may positively influence correct position of surrounding structures of the joint and prevent unnecessary inconveniences caused by the improper position of above mentioned segments. Muscles of this category are related to the hip joint itself, but their tendons reach all the way to lumbar spine and to various parts of the pelvis.

A muscle imbalance occurs due to hyperactivity and hypoactivity of individual muscles, which, in many cases, form pairs with opposite functions. Tonic muscles, which tend to shorten and therefore need to be *stretched* in particular, are hip joint flexors, thigh fascia tensors, thigh abductors, knee joint flexors. Phasic muscles, which tend to weaken and therefore need to be *strengthened* in particular, are gluteal muscles, quadriceps femoris (except for the rectus femoris).

A common muscle imbalance in the hip joint area occurs between flexors and big gluteal muscle. Imbalance between those muscles leads to pelvis tilting upwards and therefore increasing lumbar lordosis. Gluteus medius acts against adductors of the lower limb. Adductors affect body posture in standing and walking. The connections between inner and outer rotators affect the placement of the soles in walking. The position of pelvis and hip joint therefore affect the walk, which is a basic movement pattern, but also a stand (flat feet by incorrect leg position in hip joint).

We can hardly find any top-performance sport that does not cause hip joint, pelvis and consequently lower limb overload, but some of them are worse than the others and in these we must pay attention to complex and quality compensation. These are as follows:

- *athletics: walking disciplines, throws, shot-putting, jumps, hurdles*
- *downhill skiing, acrobatic skiing, snowboarding*
- *aerobic, rock-and-roll, artistic and modern gymnastics*
- *figure skating,*
- *football, ice hockey*
- *mountain trekking, walking on uneven terrain*
- *combat sports*

The knowledge, or at least a notion of which muscles perform which actions, is vital for the understanding of muscular disproportion.

Muscle	Origin	Insertion	Action
- iliopsoas	<i>lumbar spine vertebrae (Th 12 – L4,5) fovea capitis femoris</i>	<i>femur (thighbone) lesser trochanter</i>	<i>flexion</i>
- gluteus maximus	<i>ala ossis illi sacrum, coccyx</i>	<i>femur (thighbone) greater trochanter</i>	<i>extension outer rotation</i>
- gluteus medius	<i>ala ossis illi</i>	<i>greater trochanter</i>	<i>abduction</i>
- gluteus minimus	<i>ala ossis illi</i>	<i>greater trochanter</i>	<i>inner rotation</i>
- tensor fasciae latae	<i>anterior superior iliac spine</i>	<i>outer side of the thigh</i>	<i>inner rotation</i>
- quadriceps femoris: - straight thigh muscle			<i>extension at the knee</i>
- biceps femoris	<i>tuberosity of the ischium femur (thighbone) (rear)</i>	<i>head of fibula</i>	<i>extension</i>
- semitendinosus	<i>tuberosity of the ischium</i>	<i>tibia</i>	<i>extension</i>
- semimembranosus	<i>tuberosity of the ischium</i>	<i>tibia</i>	<i>extension</i>
- pectineus muscle	<i>pubic bone edge</i>	<i>femur (thighbone)</i>	<i>flexion</i>
- adductors	<i>pubic bone</i>	<i>tibia</i>	<i>adduction</i>
- gracilis muscle	<i>pubic bone</i>	<i>tibia</i>	<i>adduction</i>

Our goal is to reach normalization in the peripheral structures of the musculoskeletal apparatus through suitable exercise, such as relaxing, stretching and strengthening of individual muscles and muscle groups.

The number of repetitions for each exercise depends on individual's level of training and on the quality of execution of the exercise. It's advisable to begin with batches of 8-10 repetitions and gradually raise the number of repetitions to about 15. After mastering the exercise it is possible to repeat it in series.

Basic position: lying on back, bend right leg, right hand holds the right knee, left hand pushes the left side to the ground
- while breathing out, make an outward circle with the knee, then breathe in in the

limit position and while breathing out
repeat backwards

Mistakes: sagging in the lumbar area,
backward lean of the head, wrong
breathing pattern, raising the side of non-
exercising leg from the floor

Basic position: lying on back, legs tucked
astride, hands holding knees

- with breathing in perform an outwards
movement, with breathing out backwards
with simultaneous activation of abdominal
muscles and exhalation to the low back

Mistakes: sagging in the lumbar area,
backward lean of the head, holding breath,
little stress on the exhalation to the low
back

Basic position: lying on the right side,
right arm stretched out on the floor, left
arm propped tucked against the floor in
front of the body, left leg moved to the
side, bent

- with breathing out rotate the knee
upwards (the movement originates in the
hip joint) all the way to the limit position,
when reaching it, tilt the bottom of the
pelvis to the front by contracting gluteal
muscles

Mistakes: incorrect position when lying on
the side, sagging in the lumbar area,
incorrect pelvis fixation, stretching the
non-exercising leg to the front.

Basic position: lying on right side, right
arm stretched out on the floor, left arm
propped tucked against the floor in front
of the body.

- when breathing out, stretch out the left
leg, the tiptoe contracted to the shank,
making circles

Mistakes: incorrect position when lying on
the side, sagging in the lumbar area,
incorrect pelvis fixation, irregular
breathing pattern

Basic position: sitting with legs bent and spread, feet on the floor, arms in the back support position

- when breathing out, push the right knee down towards the floor, following three steps:

1. With breathing out let the knee down until feeling slight pull, wait and breathe freely

2. With breathing out increase the movement by 1cm downwards, breathe freely

3. Repeat step 2

- alternate right and left leg

Mistakes: co-movement of the pelvis, raising the buttocks from the floor

Note to the Basic position – the distance of heels from the buttocks is individual, it's important not to exert too big force on the hip joint and knee ligaments

Basic position: stand facing a support, right leg stretched forward and bent

- with breathing out turn the knee outwards while simultaneously contracting the gluteal muscles, breath in while returning to the basic position.

Mistakes: sagging in the lumbar area, backward lean of the head, raising shoulders.