SPORT ACTIVITIES FOR ELDERLY

STUDY MATERIAL

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Increase and development of manual skills and physical vitality of citizens of the European Union over 50 years

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INTRODUCTION

1 IMPORTANCE OF PHYSICAL ACTIVITY AND SPORT FOR ELDERLY

Physical activity, exercises and sport are a significant constituent of life of people of all ages. Movement in general represents an essential condition for survival, independence, self-sufficiency and maintaining the mental and social activity. In addition, it reduces the feeling of loneliness, encourages social integration, represents a source of fulfilling personal interests, develops the fitness level and prevents various illnesses. Furthermore, adequate physical activity slows down the process of aging, stimulates the nervous system, cardiovascular system, improves the metabolic processes, eliminates the impact of adverse mental health and strengthens the immune system. The above-mentioned benefits of regular physical activity are often the main motives of the elderly leading to carrying out regular physical activity, affecting the organism in a positive way, stimulating not only the physical but also mental well-being of an individual and extending the length of active life of the elderly.

The positive impact of regular physical activity is guaranteed if the content, extent and intensity of the exercise are selected accordingly. In addition, it is important to consider activities suitable for the specific age category when selecting the exercise. This allows the elderly people to choose appropriate physical activity considering their individual needs, abilities and health.

A lack of physical activities can gradually lead to problems associated with overweight or obesity, hypertension (high blood pressure), musculoskeletal system (muscle atrophy, loss of strength, decreasing the extent of movement) or with fatigue and general weakness.

"Promoting the model of lifelong physical activity of today's society can be one of the steps of expanding people's knowledge of the need and significance of regular physical activity leading to improving the health, adequate performance and a long active life"1 (Čormaničová, 2007).

Although a gradual decrease in the physical activity is one of the features of the elderly, the significance of such activity and its implementation into the daily routine of the elderly is vital. Regular exercises help them lead a well-rounded and quality life. Therefore, it is important

1 Author's translation

to maintain the functions of the fine and gross motor skills, coordination and overall capability of free and independent movement of the elderly through appropriate exercises and physical activities in order to prevent illnesses and reduce the need for institutional care. Before commencing any exercise, it is inevitable to consult it with the physician, since not all exercises are suitable for all seniors. Thus, the appropriate selection of the most suitable exercise respecting the current as well as long-term health of a person is crucial. It is important to start with the exercise gradually and after few weeks increase the intensity without overexertion or uncomfortable feelings associated with the exercise. Besides the principle of suitability when selecting the exercise (extent, intensity and focus of the exercises), the presence of a trainer - instructor is essential as well, due to the individual approach, guidance and supervision over the correct execution of the exercises and systematic, permanent and regular character.

There are various types of exercises that can be considered suitable and most often used for seniors. Everyone can select physical activity, which they have experience with, or they can start with a completely new activity. Suitable examples are as follows:

1.1 Aerobic exercises or cardio exercises

a) walking – long walks and hiking, Nordic walking (these are exercises performed in the fresh air, easy on money and equipment. Equipment you need is trekking poles that serve as a support while walking in more difficult terrain)

b) swimming (strengthens the immune system and helps in case of spine or joint problems);

c) aqua aerobics, aerobics, Zumba Gold (slower pace, choreographies contain simpler steps, while unsuitable movements (such as jumps) are omitted, focus is on fine motor skills of elderly)

d) cycling (exercise bike, cycling trainers, Orbitrack) – (physical activity are not harmful to joints, they are relaxing and strengthen the whole body; they impact positively the blood pressure and circulation; in addition they help increase the lung capacity)

e) dance (easy dace classes with the content adapted to the age of the participants)

1.2 Other physical activities

a) easy weight training and fitness (exercises focused on strengthening the whole body and problematic body parts working with own bodyweight or with aids – physio balls, overballs, small dumbbells, expanders…)

b) stretching exercises (they warm up and relax the body and are suitable for muscle activation)

c) balance exercises (improving the body balance – decreasing the risk of falling and subsequent injury)

d) yoga and Tai chi (the physical exercise is supplemented by stress relieving mental exercise)

e) breathing and relaxation exercises (exercises focused on deep relaxation which gradually help individuals get rid of stress, whether mental and physical)

f) outdoor activities – pétanque, backyard cricket, darts (simple games with rules are fun and are also characterised by competition among individuals or teams)

g) pilates (exercises focused on body strengthening, relieving back pain, activation of deep core muscles with precisely prescribed breathing; the precision of exercises is more important rather than the number of repetitions)

h) manipulative exercises (exercises focused on fine motor skills using simple aids – overballs, tennis balls…)

i) exercises focused on joints, spine (focused on mobility and possible pain relief of problematic body parts)

During every exercise, every participant has to be conscious of their own body, their requirements, needs and abilities. In general it is good to follow Feldenkrais' principles, who drew conclusions that the more one tries to improve the movement, the more complex development of human being they will achieve.

During exercising following general principles are recommended to follow (Štilec, 2004):

1) Perform all movements slowly, precisely and feel them.
2) Enjoy the good feelings during physical activity.
3) Work with one's own imagination, visualise the course of the movement.
4) Do not hurry, relax often according to the mental fatigue.
5) Start the exercise in the lying position leading to muscle relaxation.

2 WARMING-UP AND STRETCHING

2.1 WARMING-UP

Warming-up is an inevitable part of every organised physical and sport activity. Its aim is to prepare the body for the subsequent planned physical exertion and load. The warm-up activities should be focused on intensifying the blood circulation and respiration, increasing the pulses and cardiac output. Simple long activities (running, jumps, turns) are suitable. With increasing intensity the body gets warmed-up and starts sweating. The overall duration should not exceed 3 – 5 minutes.

Types of warm-up exercises

In practice we can encounter several types of warm-ups, all with the same objectives but different content closely associated with the age, as well as with the subsequent exercise. Warm-up activities of professional athletes differ from those performed by casual athletes, children or seniors.

Since our activities are aimed at the age category of elderly people, following exercise examples are adapted for them, as well.

Simple forms of warming-up suitable for the elderly

2.1.1 Walking

- Brisk walking in circles
- Brisk walking in circles, same rhythm and pace (counting)
- Brisk walking in circles with altering the direction after signal (180° turn)
- Brisk walking sideways (with side leg lift or crossing the legs)
- Brisk walking sideways with altering the direction by 180°
- Brisk walking with additional exercise after signal (half squat, squat, turn, passing the baton…)

2.1.2 Simple movement games

- Game with overball (standing in a circle, hitting the overball with one or both hands with the aim of keeping the overball in the air and within the circle. For breaking the rules, penalty points are assigned. Participant with the highest number of penalty points is eventually assigned a special task, which has to be completed.)
- Passing the overball in the circle above the head forwards and backwards (standing in a circle with passing the overball forwards and backwards above the head with the aim of keeping the overball in the air. For breaking the rules, penalty points are assigned. Participant with the highest number of penalty points is eventually assigned a special task, which has to be completed. For making the exercise more difficult, more overballs can be used simultaneously.)
- Passing the overball in teams (participants create rows, the first one standing in the row after passing the overball to the second one moves to the back of the row. Activity continues until all participants have the first place in the row. Team whose members are the fastest to complete the whole round wins.)
- Passing the overball in teams (participants create rows with legs wide, the first one standing in the row after passing the overball to the second one between the legs moves to the back of the row. Activity continues until all participants have the first place in the row. Team whose members are the fastest to complete the whole round wins.)

- Passing the overball in teams (participants create rows standing next to each other, the first one in the row after passing the overball to the second one to the left or right moves to the back of the row. Activity continues until all participants have the first place in the row. Team whose members are the fastest to complete the whole round wins.)
- Push of war (Two people are facing each other touching their palms. When they hear a signal they start to push trying to push the opponent beyond a designated line. The one who manages it is the winner.)
- Devilish chasey (Each participant puts an expander behind the back representing the devil's tail. During the chasey everyone tries to collect as many expanders as they can and at the same time protect their own. The one, who manages to get the highest number of expanders, wins.)
- Conquering the castle (Participants are standing in a circle close to each other. One is outside the circle trying to throw a ball into the circle. The others are trying to prevent the ball from getting into the circle. If the ball passes over someone, they take the role of the one outside the circle.)
- The dragon (Participants are standing in a row holding the waist of the person standing in front of them. The first one and the last one in the row represent the dragon's head and tail, respectively. The "head" is trying to catch the "tail" and if they are successful, the participants swap the roles.) – Novotná et al. 2007.

2.1.3 Light aerobic activities

- 3-5 minute warm-up using cycling trainers at low to medium intensity with the heart rate ranging from 93 – 110 hear beats per minute.
- 3-5 minute warm-up using Orbitracks at low to medium intensity with the heart rate ranging from 93 – 110 hear beats per minute.
- Warm-up in the form of light aerobics or Zumba Gold based on easy dance steps, easy rhythm and slow pace without difficult variations or jumps.

https://youtu.be/nnR5szYbSG0?t=5 (0:05 – 4:18)

https://youtu.be/bj-xtjdD358?t=2 (0:02 – 4:02)

https://youtu.be/i-wAteLXS6g?t=3 (0:03 – 4:06)

2.2 STRETCHING EXERCISES

Stretching exercises are also a part of the warm-up. Their role is to:

- warm up the muscles, relax the muscles and release unwanted tension in muscles,

- activate the musculoskeletal system,
- relax and warp up the joints,
- stretch individual muscle groups (mainly shortened muscles – pectorals, hamstrings etc.),
- tune the body to the specific physical activity and prepare it for dynamic stress – Alter (1998).

Stretching should be varied, thought out, thorough and long enough – 5-15 minutes – (http://www.jindrichpolak.wz.cz/skola_tv_rozcvicka.php)

According to Perečinská (2000), stretching has several functions:

1 physiological function consists in the positive impact on increasing the cardiac output, stroke volume, lung capacity, metabolism and warming up the body followed by moderate sweating,

2 prevention function is understood as preventing injuries. A suitable warm-up and stretching prepares the musculoskeletal system for muscular work – contraction,

3 didactic function covers the knowledge about the significance and impact of warm-up and stretching and creating and application of certain exercise sets,

4 psychological function consists in creating a positive attitude of the participants towards the physical activity.

Types of stretching

2.2.1 Static stretching

Participants repeat after the instructor stretching exercises (see Fig. 1 – 8). Each exercise is repeated several times with a hold in the extreme position for 8 – 10 seconds – Vladovičová (1998).

- Upright seat with legs together, bend forward towards the toes, touch the toes and hold.
- Upright seat with feet wide, bend forward, touch the mat with palms and hold.
- Upright seat with feet wide (hurdle seat), the leg folded with the right sole tucked against the inside of the left tight, bend forward to the leg you are stretching, grasp the ankle and hold, then swap the legs.
- Upright seat, bend the knees with the soles touching each other, bend forward and hold (butterfly stretch).
- Stand facing a wall, right or left foot forward, both hands flat against the wall, arms fully extended, stretch the calf muscle, hold.
- Standing position, feet slightly apart, place right arm across your chest, bend the elbow and gently pull the elbow with the left hand and hold, then swap the arms.

- Standing position, feet slightly apart, extend the right arm above the head, keep the elbow up and bend the arm behind the head, gently pull the right elbow and hold, swap the arms (overhead triceps stretch).
- Standing position, feet slightly apart, lift right of left foot behind you and grab your foot with your hand on that side. Pull your heel gently toward your butt and hold. The other arm can be extended forward or used as a support against the wall. Swap the legs.

2.2.2 Stretching using a jump rope

Participants fold the jump rope in half and hold it above the head while standing with feet apart.

a) In four beats slowly perform a side bend, twice to the right, twice to the left.

b) In four beats turn twice to the right, twice to the left.

c) With the stretched jumping rope, arms above the head, rotate the arms back and then forward – four times.

d) Forward bend, down to the toes, knees can be slightly bended, hold for four beats – four times.

e) Upright seat with feet wide, in four beats bend towards the right foot – four times, bend towards the left foot – four times.

f) Upright seat with feet wide, in four beats perform forward bend – four times.

g) Lying on back, place the jump rope around the foot and bring the knee towards your chest in four beats, repeat the exercise two – four times with right and left foot.

WATCH THE VIDEO

https://youtu.be/nnR5szYbSG0?t=259 (4:19 – 5:23)

https://youtu.be/bj-xtjdD358?t=243 (4:03 – 5:17)

https://youtu.be/i-wAteLXS6g?t=244 (4:07 – 5:26)

3 MUSCLE STRENGTHENING WITH OVERBALL

The Importance of Strengthening Exercises

Strengthening the muscles of the whole body helps improve the overall fitness level, strengthens the muscles, tendons and joints. The muscles learn to work effectively and their endurance is improved. It is important to start with light exercises, to increase the intensity gradually and to avoid overexertion, mainly with the elderly. In case of this specific age group, exercises with one's own body weight or with moderate intensity is preferred. Lower intensity with higher number of repetitions in one set is always preferred. Number of sets depends on the overall fitness level and muscular endurance of the individual. It has no meaning to increase the number of sets disproportionately; more appropriate is to alter the exercise with a more difficult one. Strength training with seniors decreases the risk of losing the muscular strength, which decreases by 15% per 10 years after the 50th year of age and by 30% per 10 years after the 70th year of age. This results from a decrease in the amount of muscle fibres and is more significant with women than with men. Strength training, however, can replace this decrease by 25-100%, thanks to muscle hypertrophy and engaging more muscle motor units (by 14%). Strength is an important element in everyday life. Due to the decrease in strength the elderly often encounter walking disorders, difficulties with walking up the stairs or problems with overall balance. Strength training along with suitable nutrition can prevent muscle atrophy of the elderly.

(http://www.unipo.sk/public/media/files/docs/fz_veda/svk/dokument_145_31.pdf)

General principles of muscle strengthening

1 Before exercises always warm-up and stretch the muscles.

2 Work out the whole body – all muscles.

3 Exercise regularly at least two – three times per week.

4 Start with light exercises, increase the intensity gradually.

5 Focus mainly on the proper technique of exercises and breathing.

6 Always start with big muscle groups then proceed to smaller muscles.

7 Each strengthening exercise has to be performed by pulling and pushing not by swinging.

How to Increase the Intensity During Strengthening

1 increasing the number of repetitions

2 increasing the number of sets

3 increasing the difficulty of exercises with the similar focus

4 increasing the pace of exercises appropriately

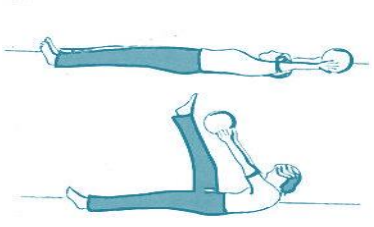
Exercises are performed slowly without holding the breath; each one is repeated 8 – 10 times depending on the difficulty. In the beginning, mastering the technique and correct breathing are in focus. With more advanced participants, each exercise can be repeated 8 – 15 times in three sets. There is a break of 30 – 60 seconds between two sets. After finishing one exercise, the break is longer – up to 3 minutes. Do not forget to drink during the exercise and breathe properly. Exhale is always performed during the more difficult part of the exercise; inhale is performed during relaxing.

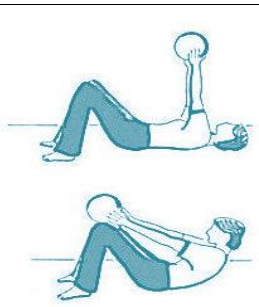
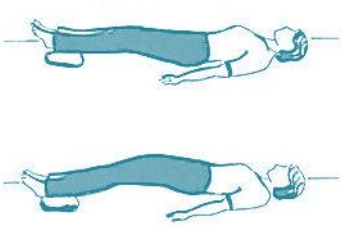
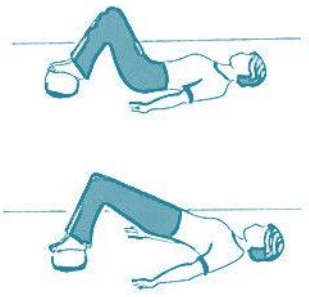
Strengthening Exercises with Overball

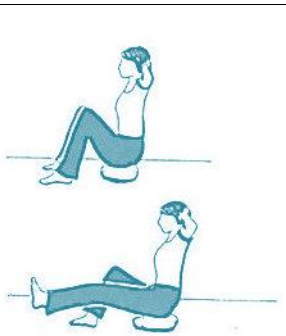
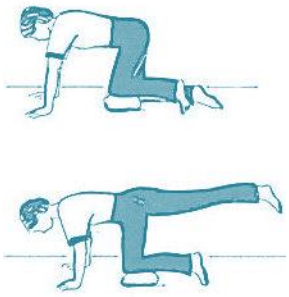
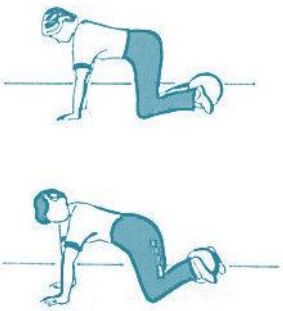
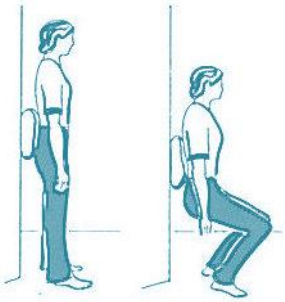
Overball is used very often as an aid for physical activities of the elderly. Strengthening exercises using overball have a positive impact also on the muscle coordination and balance. Oberball can be half or fully inflated depending on the type of exercise. In general, it can be said that the more inflated the overball the higher the resistance and the more difficult the performance of the particular exercise (strengthening or balance exercise). Overball can be used for catching, throwing, rolling or as a support during exercise (Štilec, 2004; Jebavý – Zumr, 2009; Muchová – Tománková, 2010).

Set of Strengthening Exercises Using an Overball

It is recommended to do 5 – 8 repetitions, breathing regularly and relax accordingly between the exercises (Štilec, 2004).

Lying on the back, hold the overball with both hands extended over the head. With exhale lift stretched leg or slightly bended knee (right – left) and try to touch the ankle or knee with the overball. With inhale recover to the original position. The exercise strengthens mainly the abdominal muscles.	

Lying on the back, both knees bended, soles against the mat, hold the overball with arms extended in front of the body. With exhale lift the head and the upper trunk off the mat up to the inferior angle of the shoulder blades, move the overball towards the knees. With inhale lay down back on the mat. The exercise strengthens rectus abdominis.	
Lying on the back, arms along the body, heels are placed on the overball. With inhale firm the whole body and lift the butt off the mat for few seconds. With exhale recover to the original position. The exercise strengthens butt and hip joint muscles and decreases the muscle imbalance.	
Lying on the back, overball is placed under the pelvis, knees are bended, soles against the mat and arms along the body. With regular breathing make circular movement with the pelvis or move the pelvis to the right and left. At the same time intentionally contract and strengthen the pelvic floor muscles.	
Lying on the back, knees bended, soles against the overball, arms along the body. With inhale slowly lift the pelvis to the extreme position, the glutes are contracted.	
Lying on the back, knees bended, soles against the mat, place the overball between the knees and hands under the head. With inhale press the overball between the knees, increase the pressure and hold for 6-7 seconds. With exhale lift the bended knees, keep 90° angle between the thighs and lower legs and at the same time lift the head and the upper trunk. With inhale recover to the original position, then exhale. This exercise strengthens the abdominal muscles and inner thighs.	

Sitting on a half-inflated overball, place your hands behind the head, knees bended, soles against the mat. With inhale lift one leg (either stretched or bended), keep the trunk straight and upright and hold 3 seconds. With exhale recover to the upright sitting position and swap the legs. The exercise strengthens the trunk muscles, legs and improves muscle coordination and balance.	
Kneel down, place half-inflated overball under the left knee; arms are stretched under the trunk. With inhale extend the right leg to be aligned with the trunk and head. With exhale recover to the original position. Repeat 7-8 times according to breathing for both legs. It is important to keep the core tight. Exercise strengthens the glutes and hip muscles and improves muscle coordination.	
Kneel down to all-fours position, hold the overball between the ankles, keep 90° angle between thighs and mat and arms and mat. With exhale rotate the lower legs to the right and watch the overball over the right shoulder. With inhale recover to the centre, repeat to the left. Repeat 7-8 times to both sides. Exercise strengthens oblique muscles, hip muscles and glutes.	
Stand with the back against the wall; place the overball between the hips and the wall, legs wide. With exhale drop slowly to the half squat; the overball rolls down massaging individual back parts. With inhale lift, or with circular movements massage the spine. Exercise is focused on massage of spine muscles and strengthening leg muscles.	

WATCH THE VIDEO

https://youtu.be/nnR5szYbSG0?t=324 (5:24 – 6:31)

https://youtu.be/bj-xtjdD358?t=318 (5:18 – 6:31)

https://youtu.be/i-wAteLXS6g?t=327 (5:27 – 6:36)

4 STRENGTHENING THE MUSCLES OF PELVIC FLOOR

The Importance of Strengthening the Pelvic Floor Muscles

A healthy lifestyle includes any type of physical activity and exercise that are appropriate to the individual's capabilities and age. Besides stretching, strengthening, relaxing and other types of exercises, exercises focused on strengthening the pelvic floor muscles are crucial. Regarding the anatomy, the pelvic floor is composed of several muscles attached to the pelvic bones and spine. From these muscles, sphincters and some of the hip muscles are consciously controlled. Their function is to support pelvic organs – bladder, uterus. Strengthening of these muscles helps prevent urinary, faecal or bowel incontinence at higher age or during female climacteric changes. Weak pelvic floor muscles are caused by repeated pregnancies, sedentary occupation, and obesity; however, strengthening these muscles is beneficial also for women planning a family. A disadvantage to strengthening the pelvic floor muscles is that they are nor visible neither we feel their function. Therefore, it is crucial to learn gradually to contract the pelvic floor muscles. The individual exercises are known as Kegel exercises; however, a set of other exercises recommended for strengthening the pelvic floor can be found as well. All exercises are focused on strengthening the pelvic floor muscles either as prevention or as a correction of certain anatomic variations caused by parturition and at higher age, mainly with women.
(http://www.zdravie.sk/clanok/45979/posilnovanie-svalov-panvoveho-dna-kegelove-cviky)
The essence of all exercises focused on strengthening the pelvic floor muscles is the correct position – pelvic tilt. The pelvic tilt is performed basically by contracting the glutes and external and internal abdominal muscles. You can try it by sitting down on a chair or edge of a table, legs wide and try to lift the muscles inside the pelvis without moving the pelvis. The glutes are relaxed. Try to contract the muscles as much as possible and subsequently relax them as much as possible, too.

Principles of Strengthening the Pelvic Floor Muscles

Pleasant environment with music is most suitable. Perform the exercise in a well aired out room, on a suitable mat, in loose clothing. Do not eat at least one hour prior to exercising and empty the bladder. Regularity in doing the exercises is very important. Each exercise is repeated three to five times to the extreme positions, but the exercise must not cause pain. Pay attention to the correct technique of performing the exercise, not to the number of repetitions; breathing is

regular and relaxed and the pelvic floor muscles and correct pelvic tilt is controlled. It is essential that an instructor, leading and supervising the correctness of the exercise is present at first few classes. This increases the effectivity and importance of the whole exercise.

(http://www.moliklub.sk/home-sk/zscvicenie)

Set of Exercises Focused on Strengthening the Pelvic Floor

The exercise is carried out slowly without holding the breath; each exercise is repeated five – ten times.

(http://www.zdravie.sk/clanok/45979/posilnovanie-svalov-panvoveho-dna-kegelove-cviky)

1 In standing position lift one knee and grasp the leg below the knee; bring the knee towards the chest. Hold for 5 – 10 seconds. Repeat with the other leg.

2 In standing position cross the legs. Bend forward try to touch the floor with the palms. Bend slowly, with exhale, one vertebra after another; with inhale recover slowly to the original position.

3 Sit on the heels, slightly lift your butt, and focus on the pelvic tilt.

4 All-fours position, arms are right below the shoulders and knees below the hip joints (90° angle); head and spine are aligned. Extend and stretch one leg and slightly pulse.

5 In sitting position supported by arms, elbows bended, bend the knees and lift the feet off the mat. Alternately touch the mat with toes and heels.

6 In sitting position supported by arms, elbows bended, bicycle while trying to stretch alternately one leg completely.

7 Lying on the back, knees bended, legs wide, stretch arms over the head, hands clasped. With exhale slowly lift the trunk up to the inferior angle of the shoulder blade.

8 Lying on the back, knees bended. Stretch the arms forward and with exhale slowly without a swing sit up and touch the knees with the palms.

9 Lying on the back, legs are lifted with slightly bended knees. Slowly lift the pelvis, try to lift the butt off the mat. Focus on contracted pelvic floor.

10 Sit down, put your hands behind the back. Bend your knees, feet firm on the floor, lift your hips, glutes are tight. Hips are aligned with the pelvis, head is aligned with the cervical spine. Exercise is performed slowly, not through swing. Recover to the original seating position and relax.

11 Lying on the back, knees are bended, rotate the legs alternately to the right, then to the left. Exhale while rotating legs to the side.

https://youtu.be/nnR5szYbSG0?t=392 (6:32 – 7:21)

https://youtu.be/bj-xtjdD358?t=392 (6:32 – 7:27)

https://youtu.be/i-wAteLXS6g?t=369 (6:09 – 7:11)

5 BALANCE EXERCISES

Balance – stability belongs to the fundamental movement skills. It is basically the capability to maintain balance of body and its parts in an unstable environment. Although this skill is created subconsciously, it can be improved using suitable and age appropriate exercises. Balance is divided into static and dynamic, both types having a significant impact on the overall movement and its form. Static balance can be characterised as keeping the balance in sitting and standing, while the dynamic balance is responsible for walking, gallop, running etc.

Sensory information is the deciding factor for the balance skill, mainly information from the vestibular system, visual and kinaesthetic apparatus. However, the balance skill also depends on other conditions. It is closely linked with e.g. height and weight of an individual. People with lower height and lower weight are provided with better balance then taller and heavier people. People with bigger feet have better stability, as well.

With increasing age the balance skill is getting worse due to weakening the visual and kinaesthetic apparatus, degenerative changes to the vestibular system and inner ear, decreasing the muscular strength, all leading to certain difficulties with keeping the stability with older people. Nevertheless, regular physical activity including balance exercises help maintain not only the level of fitness and independence of an individual, but they also reduce the risk of falling and subsequent injury or fracture. Therefore, this type of exercises should not be neglected. These balance exercises can be used everywhere and anytime, also during other physical activities and gradually increase the difficulty of individual exercises without any aids, or with using balance aids such as BOSU, overballs, physio balls, balance cushions, massage balls or small trampolines or beams.

Set of Balance Exercises

Exercises are performed slowly without holding the breath; each one is repeated 5 – 10 times depending on the difficulty and on how well they have been mastered. Advanced participants can do 8 – 15 repetitions. Exercises are organised from the easy ones to the most

difficulty ones – Novotná et al. (2006) and (http://www.fsps.muni.cz/impact/patofyziologie-telesne-zateze/zakladni-principy-preskripce/cviceni-pro-zlepseni-rovnovahy/).

From sanding position, lift one bended knee, touch the knee of the standing leg with the toes of the lifted leg, stretch the arms sideways and hold.	
From standing position change the position to half squat standing on one leg lift the other leg forward and flex the foot, stretch the arms sideways and hold.	
In standing position, do a side leg lift, bend the knee, place the toes of the bended leg against the inside of the knee and stretch the arms sideways. Bend to the side, lift the arms and hold.	
In standing position, do a side leg lift, raise the arms above the head, and at the same time bend the whole body to the side, leg is lifted to the side. Hold.	

In half squat lift one leg and place the ankle against the knee, raise the arms sideways, bend the elbows, palms up – hold.	
In half squat lift one leg and place the ankle against the knee, perform forward bend with the back straight and raise the arms sideways – hold.	
Scale position (any version) with hold.	
Standing position and half squat on one leg with other parts of body in any position.	
Standing position, bend right knee and lift it sideways, place right sole against the left knee. Lift arms above the head, bend the elbows, hands clasped. Hold. Repeat with the other leg.	

WATCH THE VIDEO

https://youtu.be/nnR5szYbSG0?t=442 (7:22 – 8:30)

https://youtu.be/bj-xtjdD358?t=448 (7:28 – 8:42)

https://youtu.be/i-wAteLXS6g?t=432 (7:12 – 8:12)

6 HEALTHY BACK EXERCISES

Too many people suffer unnecessarily from back pain. Although, some of the spine problems result from injury, illness or birth defect, most of the back problems can be prevented. Back pain is usually caused by sedentary occupation and unnatural spine position, incorrect sleeping, bad movement habits or psychological stress. There are many more causes, but this place is suitable for some neck and shoulder relaxing exercises.

Selected Exercises for Relaxing the Back

Exercise 1

Sit down, put the hands on the knees, or clasp the hands behind the back. Relax, inhale and with exhale tilt the head to the side. Hold for a while in the extreme position, inhale and exhale and with inhale recover to the centre. Repeat to the other side.

Exercise 2

If you want to exercise also muscles around the shoulder blades, place the hands behind the head and repeat exercise 1. You can tilt the head also backwards and forwards and hold in the extreme position.

Exercise 3

Lying on the back, extend the legs, arms along the trunk. Relax and with exhale lift the head and bring the chin towards the chest. Perform the exercise slowly, to feel every vertebra. If it is painful, do not bring the chin farther.

Exercise 4

This exercise can be also modified with the hands placed behind the head. Lift similarly as in exercise 1, this time partially lift also the back, help lift the back with hands. If you want to focus also on lumbar spine, bend the knees and lift the head with the help of hands.

Exercise 5

In the lying position try also the easiest relaxation exercises. In the original position – extended legs and arms along the trunk, tilt the head to the sides, feel every move. Proceed in the same way also lying on the chest. Keep the shoulders on the mat and rotate the head to the sides.

(http://wanda.atlas.sk/cviky-pre-chrbticu-bez-bolesti/wellness-a-fit/fitness/762439.html)

Most of us start suffering from back pain, and one cannot expect to avoid them completely. However, there are many options how to prevent the back pain or minimize its recurrence. The pain can be relieved by regular suitable exercises, what eventually increases the life quality. It is important to remain active and avoid swift movements, jumps or movements with directional changes.

There are many sources, e.g. professional literature, Internet or other sources, of exercises aimed at relieving back pain, and these exercises can be performed also individually after consulting with a physician (Stackerová, 2011). Here is a short selection of relaxation exercises suitable for the elderly.

Sitting on a chair, legs hip wide, feet slightly rotated to the sides, trunk slightly bended forward, head loosely bowed, elbows against the thighs.

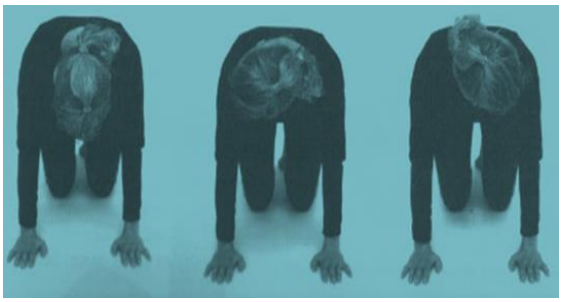
In the kneeling position, legs slightly wide, take the physio ball into arms and rest the trunk on it, head is loosely rotated to one side and resting on the ball.

Exercise with a physioball, lying on the back on the physioball in a half sqaut, head is slightly tilted backwards, knees are bended, feet firm on the mat slightly rotated to the sides.

Exercise with a physioball, kneeling position, arms lifted resting on the physioball, head loosely bowed. Take a deep breath and exhale, repeat several times.

Lying on the back, with inhale lift the head, arms and forearms. Clench the fists, at the same time bend the knees and lift the toes towards the knees, hold for a while and relax with exhale, slowly recover to the original position.

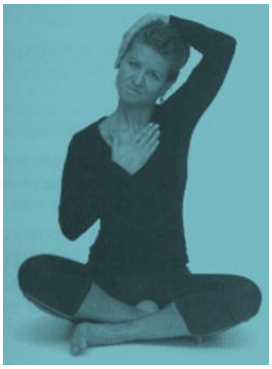
All-fours position, knees are on the mat hip wide, head is bowed, rotate the head to sides with inhale and exhale.



Sitting on the heels, clasp the hands behing the back, slowly bend forward and lift the arms, touch the mat with the forehead and with exhale slowly return to the sitting position, drop the arms slowly with exhale.

Sitting on the heels, arms akimbo, with exhale bend forward, then with another exhale bend the trunk and head backwards.

Cross-legged sitting, bend the right elbow and place the palm under the left collarbone, extend the left arm and and place the palm agaist the right ear and slightly pull, repeat on the other side.



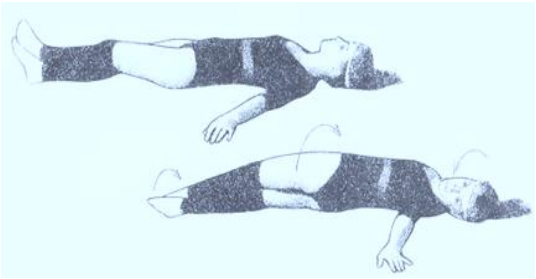
Cross-legged sitting, place the hands behind the head, tilt the head forwards and slightly pull, elbows are parallel shoulder wide directing towards the floor, bring the chin towards the chest.

Exercises for Strengthening the Spine

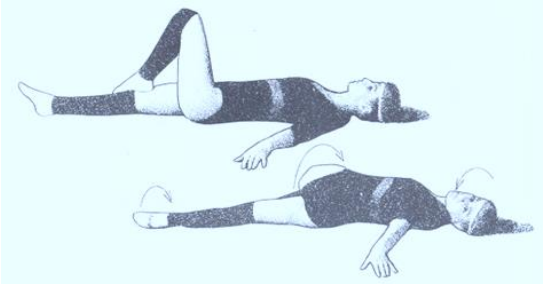
These are active exercises using breathing techniques to a large extent. They are relaxing and significantly improve the spine health. Exercises gradually engage and strengthen the muscle groups along the spine, vertebrae get to the right position and reflexive self-massage is carried out. The exercises follow certain principles: carry out the exercises only up to the pain threshold, carry out the movement with closed eyes and focus on the spine, the change from one to another position has to take 5 seconds, each exercise has to be repeated 3 – 5 times on both sides, it is important to follow the order of exercises, as the exercises are ordered with an increase in rotation. Exercises are not recommended in case of serious spine conditions, e.g. spinal disk herniation or after surgery.
(http://www.svetvomne.sk/index.php?com=content&mod=db&task=show&id=2619)

The essential movement is based on the movement of head which is always opposite to the movement of pelvis and legs.
Head – to the right, pelvis and legs – to the left.
Head – to the left, pelvis and legs – to the right.
In order to **perform the exercises correctly**, the pelvis has to rotate in a way that you are lying almost on the side, legs are relaxed, pulled only by the pelvis movement. The head has to touch the opposite shoulder at the moment, when the pelvis finishes the movement. The shoulder blades must not be lifted from the mat when lying in the position on the back. The movement has to be carried out slowly (Šebej, 1991).

Examples of Spine Strengthening Exercises

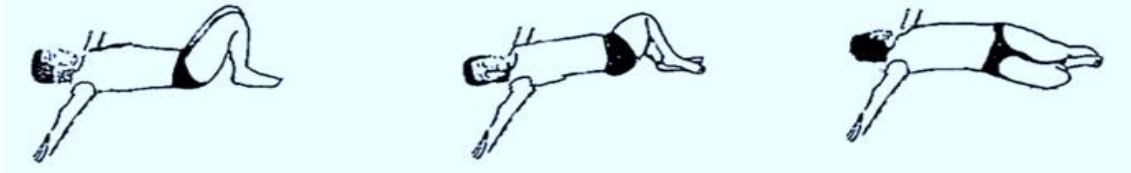


Lying on the back, cross the legs, so that one calf is on the other shin. With exhale rotate the legs to one side, the head to the other side, then change sides.

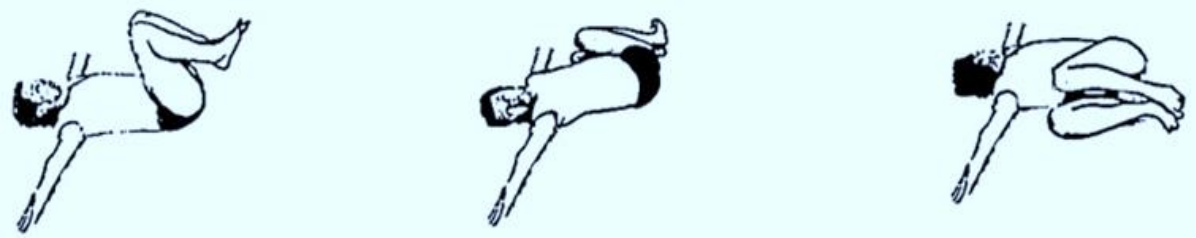


Lying on the back bend one knee and place the sole against the knee of extended leg. With exhale rotate the legs to one side, the head to the other side, then change sides.

Lying on the back bend the knees. Take few deep breaths, hold the breath and slowly rotate the head to the right, drop both knees to the left on the mat. Recover to the original position, breath normally. Repeat to the other side.



Lying on the back bend the knees, bring the knees towards the chest. Take few deep breaths, hold the breath and slowly rotate the head to the right, drop both knees to the left on the mat. Recover to the original position, breath normally. Repeat to the other side.



WATCH THE VIDEO

https://youtu.be/nnR5szYbSG0?t=486 (8:06 - 10:30)

https://youtu.be/bj-xtjdD358?t=523 (8:43 – 10:22)

https://youtu.be/i-wAteLXS6g?t=493 (8:13 – 10:57)

All videos on YouTube channel:

https://youtu.be/nnR5szYbSG0

https://youtu.be/bj-xtjdD358

https://youtu.be/i-wAteLXS6g

REFERENCES

1. ADAMČÁK, Š. – NOVOTNÁ, N. 2009. Hry v telocvični a základná gymnastika. Žilina: EDIS ŽU, 2009. 204 s. ISBN 978-80-554-0125-6

2. ALTER, M. 1998. Strečink. ISBN 807169763 X

3. ČORNANIČOVÁ, R. 2007. Edukácia seniorov. Bratislava : UK v Brastilave. 2007. 156 s. ISBN 978-80-223-2287-4

4. JEBAVÝ, R. – ZUMR, T. 2009. Posilování s balančními pomůckami. Praha: Grada, 2009. 175 s. ISBN 978-80-247-2802-5

5. MUCHOVÁ, M. – TOMÁNKOVÁ, K. 2010. Cvičení s měkkým míčem. Praha: Grada, 2010. 157 s. ISBN 978-80-247-3115-5

6. NOVOTNÁ, N. - BLAHUTKOVÁ, M. - OTTMÁROVÁ, E. 2007. Hry s netradičným náčiním. Banská Bystrica: UMB, PF 2007, 35 s. ISBN 978-80-8083-395-4

7. NOVOTNÁ, V. – ČECHOVSKÁ, I. – BUNC, V. 2006. Fit programy pro ženy. Praha: Grada, 2006. 225 s. ISBN 80-247-1191-5

8. PEREČINSKÁ, K. 2000. Pedagogický proces v gymnastike. In: Perečinská, K. – Antošovská, M. 2000. Všeobecná gymnastika. Prešov: PU, FPHV, 2000. S. 49-61. ISBN 80-8068-021-3

9. STACKEOVÁ, D. 2011. Relaxační techniky ve sportu. Praha: Grada Publishing, a. 2011, 134 s. ISBN 978-80-247-3646-4.

10. ŠEBEJ, F. 1991. Strečing. Bratislava: Šport, 1991. 275 s. ISBN 80-7096-172-4

11. ŠTILEC, M. 2004. Program aktivního stylu života pro seniory. Praha: Portál, 2004. 135 s. ISBN 80-7178-920-8

12. VLADOVIČOVÁ, N. 1998. Pohybové hry na 1. stupni ZŠ. Banská Bystrica : PF UMB, 1998. 74 s.

WEB Resources

http://www.jindrichpolak.wz.cz/skola_tv_rozcvicka.php

http://www.unipo.sk/public/media/files/docs/fz_veda/svk/dokument_145_31.pdf

http://www.zdravie.sk/clanok/45979/posilnovanie-svalov-panvoveho-dna-kegelove-cviky

http://www.moliklub.sk/home-sk/zscvicenie

http://www.zdravie.sk/clanok/45979/posilnovanie-svalov-panvoveho-dna-kegelove-cviky

http://www.fsps.muni.cz/impact/patofyziologie-telesne-zateze/zakladni-principy-preskripce/cviceni-pro-zlepseni-rovnovahy/

http://wanda.atlas.sk/cviky-pre-chrbticu-bez-bolesti/wellness-a-fit/fitness/762439.html

http://www.svetvomne.sk/index.php?com=content&mod=db&task=show&id=2619

In the context of human evolution, ageing seems to be a recent phenomenon. In the 20th century, there has been a dramatic increase in life expectancy and the absolute number and percentage of older adults. In 1990, approximately 9% of the world's population was 60 years of age or older, and it is estimated that by the year 2030 this percentage will grow to roughly 16%. Despite demographic variability between countries (in some countries, approximately 20% of the population already belongs to this age group), the trend towards an older society seems to be universal. Thus, it is estimated that every month the world has an additional 800,000 people over 65 years of age.

It is a reality that the health and quality of life of the human being can be improved, worked on, preserved and improved by regular physical activity. A sedentary life does not fit in with those who want to live and with better quality. The most significant prophylactic measure is the practice of physical exercise regularly, and not the purchase of medication.

It is also statistically proven that the length of life in more developed countries has increased considerably due to advances in medical research. However, living longer is not enough. There are other variables inherent to the whole process. It is essential to living with quality of life, autonomy and vigour. It is imperative to find the correlation between quantity and quality of the time we will still live.

The scientific community has not yet been able to prove that physical exercise prolongs life. Still, there is an agreement among researchers that a sedentary life can cause a decrease in muscle mass, bone mass causing muscle atrophy in all age segments. However, there is also a consensus that regular physical activity can significantly delay the natural deterioration resulting from the normal ageing process.

Most of the medical community and gerontological experts bet on physical activity as a health promotional factor. Short walks are advised, even in hospital corridors, to patients who have undergone surgical intervention.

Physical activity is also recommended for people with the most varied pathologies. It has been scientifically proven that the regular practice of physical exercise benefits the respiratory and cardiovascular system, strengthens the muscles, regulates the intestinal transit, lowers the percentage of cholesterol and triglycerides. And also combats and prevents arthrosis, the lack of cartilage in the joints and the strengthening of bone mass, in addition to improving human being self-esteem.

The increase in physical activity in the population could make a considerable contribution to the local and consequently, the national economy. A healthier community will lead to an

automatic reduction of the state costs for public health, namely with the decrease of hospital admissions, clinical observation in health centres and the decrease of the state co-participation in medicines, such as antidepressants, anxiolytics and drugs, to fight venous insufficiency, insomnia, osteoporosis, and joint and muscular inflammations.

Exercise for the elderly contributes to the improvement of the economy and will have beneficial effects on health. Naturally, physical activity will mean that people will enjoy increasingly sophisticated and comfortable equipment for good practice, especially in comfortable trainers and gym suits with a high level of comfort, but at the same time showy. At the landscape level, cities and urban centres would also benefit greatly. In time, pleasant places would be created to encourage outdoor sport, and the areas that are currently in disrepair could become leisure centres.

However, while physical exercise is beneficial to the health of all people, including the elderly, precautions must be taken to ensure that everything goes well.

According to the U.S. Surgeon General's Report on Physical Activity and Health, inactive people are about twice as likely to develop heart disease. Sedentarism is also associated with more doctor visits, hospitalizations and use of drugs for various diseases.

Regular exercise has a very positive impact on our health and quality of life as we age. Exercising improves mood, helps manage emotional distress, prevents depression and, according to science, helps prevent and slow the development of a cardiovascular disease, diabetes and some types of cancers.

7 PHYSICAL EXERCISE AS THERAPY

In seniors who suffer from some pathology or physical disability, exercise can even be part of the therapy of the disease. Research shows that people have arthritis, heart disease or diabetes benefit from regular exercise.

Being physically active helps seniors to improve their strength, physical stamina, flexibility and balance, which allows them to continue to carry out their daily activities and routines while maintaining their independence.

However, the senior must consult a specialist in sports medicine, assessing the clinical history of the person, making sure that he/she meets the necessary conditions to practice physical exercise. What care should be taken, what type of physical activity is most appropriate and what to do in case of complaints.

The beginning of physical exercise should always be gradual, and the presence of pain or bad moods makes it necessary to interrupt the training and advice with the doctor.

Recalling the soundtrack of the Madagascar film in which one of the parts of the song said: "I like to move it, move it, I like to move it, move it, Ya like to (Move it)". This theme should be the motto of all those who wish to have a better quality of life, not only in the present time but also as a way of preventive gerontology to have healthy ageing. Since living is action, it is movement; we should move *more to live better.*

But there is one basic fundamental principle, which has already been mentioned above:

The start of physical exercise should always be gradual, and the presence of pain or discomfort requires the interruption of training and counselling with the doctor.

8 MAINTENANCE GYMNASTICS

8.1 The importance of strength exercises in the senior population

We know that strength is one of the most critical physical assets. Muscle weakness can advance until an older person can no longer perform the ordinary activities of daily life, such as household chores of getting up from a chair, sweeping the floor or throwing out the trash. Therefore, it is vital to maintain strength as we get older, because it is vital for health, functional capacity and independent living (Fleck and Kraemer, 1999).

Strength

Exercises that increase muscle strength (lightweight exercises) help to maintain the ability of seniors to go up and downstairs, carry shopping bags or hold their grandchildren on their lap.

It is common knowledge that training motor skill strength in young individuals and athletes results in necessary physiological adaptations and performance gains. However, for many years this type of exercise was considered dangerous for senior individuals.

On the other hand, endurance training has become a very receptive mode of physical activity for the senior segment due to its beneficial effects on cardiovascular function. The myth that strength training is not useful and/or safe in the elderly has begun to be dispelled.

During the last few years, several scientific studies have shown that seniors can be safely trained through strength exercises. Several studies have shown that the regular execution of exercises that enhance this motor capacity brings important benefits in the physiological, functional and psychological spheres.

However, the biggest problem is not the statistical or mathematical importance of population changes. The main focus should be on the functional implications of advanced age. Ageing is associated with a reduction in strength and muscle mass, motor units, aerobic capacity, hormonal reserve, as well as various other physiological changes. All these variables together result in a reduction in maximum walking speed, the ability to perform daily activities, the ability to climb stairs or get up from a chair, and other difficulties and disabilities.

As a result of these losses of capacity, an 80-year-old individual is not able to perform tasks that they easily performed at age 20/30 /40. The force required to perform specific tasks can represent, in the elderly, a maximum or maximum effort, when compared to the same assignment performed by individuals of a lower age group.

The result of reduced physiological capacity is deconditioning, loss of independence and more assiduous use of medical services, factors that represent an essential burden for the elderly themselves and the health services.

Suppose we assume as accurate the statement that some of the physiological losses with age can be explained through associated processes. In that case, we can suggest that methodically planned corrective interventions, such as exercise programmes, can prevent some of the losses and can help the recovery of functional capacity in the elderly.

Types of exercises	Free weights, pulleys, hydraulic and isokinetic devices
Frequency	Three training sessions per week (maintenance may require only one or two sessions)
Series and number of repetitions	Three sets of eight to ten repetitions per muscle group; two-minute rest between sets
Intensity	60 to 80% of 1MR*

**Translator's Note: 1MR (Maximum Repeat) can be defined as the load with which a given movement can be executed only once, and not more than once.

The interest in the strength of the musculoskeletal muscle of the elderly becomes evident. Proof are several scientific studies published about subject that have increased from three in the period between 1966 and 1974, to 132 between 1994 and 1997. Until 1988, at least 25 studies have explored the physiological adaptations and the benefits from the functional point of view of lower limb muscle strength training. A further six studies examined the effects of strength training on upper limb muscles.

In general, these studies included people of both sexes in the 60-90 age group. Were based on progressive exercises against resistance, which require a progressive (weekly) change in the load administered to cope with the gains made during previous sessions. The purpose of this approach was to maintain the stimulus of a constant training program. An example of the exercise prescription used in several studies is in the table below:

Programmes similar to the one described above resulted in strength gains in the range between 15 and 175% of initial strength (pre-workout). An increase in muscle mass of 10 to 15% has been consistently reported, based on measurements made using sophisticated imaging techniques (computed tomography and nuclear magnetic resonance). The muscle fibres (both type I and type II) also show significant hypertrophy (10 to 30%), evidenced by cross-sections obtained by biopsy, prepared with histochemical methods. It seems that the process that leads to strength gains and hypertrophy includes a dynamic turnover of muscle proteins and that the musculoskeletal in the elderly can adapt and respond to the stimulus provided by the exercise, with the synthesis of new myofilaments.

Finally, it has been shown that strength training preserves bone density as muscle mass and strength increase, as well as balance in postmenopausal women. These observations are of

particular clinical relevance given the high incidence of falls in the elderly, with associated morbidity and mortality.

As already reported in young women, relative increases in strength are more significant than increases in muscle size, suggesting an essential effect on the neural components of the neuromuscular system. The nature of these neural adaptations is unclear. Still, adaptations of synapses conduction speed, spinal reflexes, activation and synchronization of motor units, and central cognitive and learning processes are factors that may contribute.

At least two studies have reported peripheral adaptations in the oxygen transport chain, resulting in small but essential improvements in maximum aerobic power after strength training.

An increase in both capillary density and oxidative enzyme activity has been reported suggesting that VO2max adaptations are peripheral.

Other cardiovascular adaptations include attenuation of blood pressure response to exercise when individuals lift the same weight after exercise.

This adaptation could reduce the wear and tear of the cardiovascular system during daily activities, such as carrying objects at home or work. Despite these positive observations, strength training should not include exercise that enhances endurance, for the development of aerobic power and capacity.

The regularity in the execution of strength exercises seems to offer some security for the most fragile seniors. The limits for strength training in the elderly population are not well understood. Both men and women respond to strength training, and even ninety-year-olds seem to maintain the ability to adapt to this type of exercise. Long-term studies (one to two years) show no clear correlation in strength gains.

In other words, after several months of training this motor skill, the volunteers continued to show improvements in their abilities. Finally, functional adaptations to strength training include increased walking resistance, longer breakout time, shorter time for climbing stairs and reduced risk of falls. All these factors have clear implications for achieving independent living.

8.2 Flexibility and agility

Exercises such as stretching help the body to remain flexible and agile, which improves freedom of movement and helps the senior in daily tasks such as making the bed, tying shoelaces or taking off a jumper and even driving. Modalities that work on balance, such as tai chi, improve the ability to control the body, whether it is stationary or moving. Having the right balance is vital to prevent falls (and the physical disability that can result), going down and upstairs, or being able to reach objects stored on high shelves in the kitchen, for example.

As noted in the previous chapter, seniority being the period when physical capacities begin to decline. It is evident that so much strength, agility, balance and joint mobility are also affected, thus generating instability and decline in the quality of life of this population segment, and their daily tasks are directly affected by these changes. For this reason, studies have been carried out on flexibility and its importance for improving the quality of life in this population.

Studies from the academic google platform and the virtual health library were used for the resolution of this work, containing the keywords: "flexibility", "elderly" and "quality of life". There were 27,774 articles from which the 18 most suitable ones were separated. Five of these were selected, and it was concluded that with the advancement of age, a series of changes arise in the elderly population, such as:

a) It is usual for falls to occur frequently and consequently; the risks of injuries potentially increase.

b) Muscle weakness, loss of flexibility and motor control difficulties contribute to this increased risk (MATSUDO, 2002).

Increased levels of physical activity seem to be a useful measure for prevention, as this activity provides an increase in muscle strength and flexibility and promotes improvements in motor control (DANTAS, 2002; MAZO, 2007).

Supervised exercise programmes are usually composed of aerobic resistance training, then muscular and flexibility exercises. Average gains of 38 % have been observed in these programmes in the ease of performing the 11 daily actions. Namely, they are going up and downstairs, getting in and out of the car, tying shoes, riding a bicycle, walking on a treadmill, crossing your legs, reaching your back to scratch or rub during the bath, reaching an object on top of a shelf, walking, getting out of bed, performing squatting (COELHO E ARAÚJO, 2000).

Studies by Varejão et al. (2007) also concluded that due to flexibility and stretching training, the quality of life and functional autonomy levels of the elderly has increased.

The conclusion of these studies showed that flexibility training is fundamental for seniors, as they can avoid risks of accidents.

Besides, the studies have also shown that if there is an increase in the ease of performing daily activities, it promotes a healthier, more beneficial old age and increases the quality of life.

Examples of "dance" classes that work flexibility and agility:

https://www.facebook.com/548866511956813/videos/293411128489535
https://www.facebook.com/548866511956813/videos/1589208201233895

8.3 Endurance training

Walking at a fast pace or swimming improves breathing and heart rate and is beneficial for the heart, lungs and circulatory system. Increasing endurance helps seniors to continue playing with their grandchildren (pushing them on the swing, for example), playing sports or performing domestic tasks such as vacuuming, among others.

Aerobic exercises, low intensity walks of more than 30/40m, cycling, swimming, outdoor activities always performed in a comfortable way, dancing and other exercises that require oxygen metabolism, are advisable for those who want to gain more endurance, motor capacity always essential to gain motivation and that serves as a catalyst. Beneficially aiding other motor tasks, provides oxygenation, helps maintain cartilage lubrication, improves aerobic capacity and overcoming capacity, lowers cholesterol and triglyceride levels, lowers heart rate, and increases the metabolism's ability to resist harmful exogenous elements.

Of course, having resistance and failing in other basic motor skills is insufficient, and for this reason, although with age the seniors will progressively lose some faculties, it is advisable to perform exercises which improve the individual performances of each individual, not only to perform well but also to be more capable of carrying out the daily tasks which are required both in household chores and in personal hygiene.

Example of activities that work resistance:

https://www.facebook.com/548866511956813/videos/682585885913424

8.4 Recommended exercises for a maintenance gym class

To plan careful work with the senior population, the following indicators should be evaluated:

a) **Age**. Of course, if there is an excellent age inequality in a class because there are students of 60 and others of 80, teachers should respect this age inequality and prescribe adaptable exercises that students feel based on great comfort. To this end, students who do not have the motor skills to do some of the recommended activities are suggested to do what they are capable of, and gradually improve their performance. However, there are students of 80 years old who can perform all the proposed tasks well.

b) **Gender**. It is normal for the male gender to have more appetite and greater ease in performing resistance and strength exercises and for the female gender to perform flexibility exercises better and to require greater grace.

c) **Health history**. In a rather heterogeneous class, there will undoubtedly be students with various pathologies, and this is an essential variable in the prescription of exercises because there are students with different needs and also depending on their pathological history have impediments in performing certain tasks. There is, therefore, a need for the teacher to find exercises which are specific to certain students. If there are members of the class who may suffer from diabetes, the teacher must take special care to know whether they have had breakfast, whether they have had their glycemia level checked, and whether they drank water. Particular attention should be paid to these students in strength exercises, as they ask for fast sugars, which can lead to a drop in blood sugar levels, and cause the student to go into decompensation.

d) **The sporting past**. There are students who have always had an active and regular sporting life, who have taken gymnastics classes assiduously, or practised another activity that without being gymnastic developed some skills for them, they have greater ease in performing all the exercises and the class for them even becomes monotonous and too easy. With these

students, it is necessary to review and plan specifically for them exercises with greater complexity of execution, whether it is putting more load on the strength exercises, intensifying the times of aerobic exercises, or proposing greater difficulty in the exercises in which flexibility is mobilized.

Always having in mind these indicators, teachers should do planning in which the classes gather diverse exercises, which mobilize all the capacities of the performers without demanding, in the beginning, a perfect execution, but motivating the practitioners to progressively improve their performances, maintaining a basal comfort but always trying an improvement and a permanent correction of what was done in the previous session. It is essential that each student tries in each session to improve the execution of the last class.

8.5 Class organization

It is essential in the first few lessons for the teacher to gain specific knowledge of their students by even providing a questionnaire for students to indicate the following:

a) Age, so that the teacher knows what loads he should ask his student to perform and knows how to respect the necessary rest times, as well as the appropriate repetitions for each exercise.

b) Clinical pathology, so as to know better which exercises are advisable and which are inadvisable, or even diseases which prevent certain exercises.

c) Profession they have exercised, to take into account whether the student has had a more physically demanding or more sedentary profession which has certainly influenced the general and current state of the student.

d) Academic level, there may be more or less receptivity of students to the execution of certain exercises if they understand it okay or worse if they cannot understand the effect of its performance. Also, the teacher's message may have different effects, and for this reason, he or she will have to look for a fluent speech but of simple understanding by everyone. This will help all students to interact better and avoid the teacher having to have different dialogues.

e) Means of transport used to go to class because if students walk, they have already done the so-called "muscle awakening" and the warm-up should be slightly less heavy than a student going by car.

f) Sporting past, because students who have done some physical activity regularly, will logically have all the muscular components more suitable for certain proposed tasks and will also naturally be more muscularly developed than the other students.

g) Evaluation of the physical condition of the users. This is an important indicator for more effective planning, and if there are students who need specific exercises. In the following table, we can observe one of the evaluation protocols.

Framework of tests to be performed for physical evaluation

Test	**Lift and sit in the chair**	**Forearm bending**	**Sitting and reaching**	**Sitting, walking 2.44m and sitting down again**	**Reaching behind the back**	**6 minute walk**	**Stature and weight**
Objective	Eval. Strength and Resilience of L.M.	Eval. Strength and Resilience of S.M.	Assess Trunk and Lower Limb Flexibility	Physical Mobility Assessment - speed, agility and dynamic balance	Assessment Shoulder flexibility	Assessment Aerobic capacity	Body Mass Index Assessment (MI Kg/m2)
Protocol	He begins sitting, his back straight and his feet shoulder wide. Arms crossed over the chest	It starts with the forearm in extension, rotating the palm upwards while doing the bending. Control all movement	Exhale during flexion, with fingertips superimposed, hold position for 2`	He starts sitting down, after the signal he leaves walking as fast as possible around the cone and back	In the standing position, place the dominant hand over the same shoulder by moving it towards the middle of the back. The other is placed behind and below	Rectangular track 20m long, 5m wide	Remove heavy clothing and barefoot
Scoring	Maximum of repetitions for 30`		Up to the foot the register is negative, + surpassing	Time spent on the journey	The distance between the middle fingertips (-), + when overlapping	The total of meters walked in 6 minutes	Registration

It is also important that after talking to your students, you make the following decisions:

a) Plan for two sessions per week but with sufficient time to promote good physiological adaptation to exercise but also adequate cardiovascular and muscular recovery.

b) Create a good organisation of the lesson, with previously defined tasks weekly and equally distributed among all the students to make the best use of the useful practice time.

c) Create good empathy so that there is a healthy environment among all the elements, also knowing to choose the students who interact best, for when it is necessary to perform exercises in pairs.

d) Introduce themselves and know the names of all the students as soon as possible.

e) Warn students about the most appropriate clothing and footwear for the lessons (depending on their specificity), the support material (mattresses, alters, elastics, towels) that students should have, and the importance of bringing their water for the lessons.

f) Define the break times for students to be able to drink liquids.

g) Warn about the importance of having a medical inspection up to date.

h) To warn students of the importance of having a good breakfast, and the importance of water in the food wheel.

i) Always giving positive feedback on the benefits achieved and motivating those who have more difficulties in implementation.

j) When there is a student who cannot perform a task, give another that he can do but explain to the rest of the class, the reason for the change of exercise.

k) Treat all students by their first name and never by social status or profession, as this may cause some division among students, or there may be others who feel marginalised or inferior because they have lower social status.

l) Make good use of the available space, because depending on the size of the sport space you may have to redo the class organisation, because being a space divided by other classes of professional schools that have specific programmes, and priority of use, we have to know in advance which space we can use, to better schedule the session.

8.6 Classroom planning

a) Joint heating. Perform joint mobility exercises, always starting from one end (feet or head) and sequentially, so that all the combined components are appropriately exercised, with the same number of repetitions on both sides.

b) Warm-up muscles also sequentially by executing exercises so that the antagonists in the next training are the agonists.

c) Interval of the warm-up muscle exercises with slow running or fast walking, depending on the capacity of the students.

d) In the strength exercises, use light weights (1Kg dumbbells or a bottle of water filled with sand) and gradually increase the number of repetitions, respecting the interval of the same in the intensity ratio 1/1 by 1.

e) In the flexibility exercises, respect the students' skill levels, as some still have a reasonably large degree of flexibility, and others who have a greater degree of difficulty in performing the exercises. If there are any students with pathological impediment problems, replace them with other practices that are more compatible with their current condition. There were classes in which students could use judo mattresses. In these classes, time was better used to work on this motor skill, when it was not possible to use this room, students worked on their

mattresses which were not so comfortable, and so they trained this skill-less and worked the others longer.

f) In the pair exercises, the height and weight of the pupils were respected when the number of pupils was odd, what was left overworked with the teacher.

g) Return to calm. Always with a joke between the students for better interaction between all and the class ended with stretches for muscular recovery, preferably with the use or the mattresses and in pairs.

h) Final conversation between teacher and students for decompression, and especially for the teacher to learn about the degree of comfort of the students after class and to be able to prepare the next session.

9 WALKING FOOTBALL

9.1 Presentation of the concept

Walking Football is a team sport for those who want to stay active in old age

Walking Football was born in England in 2011 and arrived in Portugal through the Algarve about 4 years ago, through the English community living in our country.

This "step by step football", which keeps the original English name, is a sport for those who want to stay active and have fun playing, even when the body no longer allows great sports performances.

The objective of this activity is more than physical; it also aims at integration and socialization in favour of more active ageing.

In the 2017/18 school year, this sport-inspired a partnership between RUTIS (Senior University Network) and the Benfica Foundation (Football Team Foundation) , in which the challenge was set for the senior population of universities to join this activity, as its practice

instils healthy competitiveness within universities, creating team spirit, and how teams are mixed is a way for women who had never played football before to interact with their male colleagues, and also some men who had not played for a long time, to remember old practices from their youth days, going back to doing what they liked and others living new experiences, as stated by Luís Jacob, president of RUTIS.

However, even for those who have previously played both the 11-a-side and futsal variant, they have to adapt to new rules. Rule number 1 is predictable as it is translated to the letter of the sport's name and it is forbidden to run, both when driving the ball and when moving to look for the best positioning, being mandatory that one foot must always be in contact with the ground.

Then, besides there is usually a limit number of touches that each player can give before passing the ball, it cannot be played above a certain height, for some above the waist area, for others above the head (whose height was defined as a maximum of 1.83m). Physical contact is also to be avoided.

The rules vary according to the region where the sport is played, and for this reason, the English federation has decided to formalise a book of Walking Football regulations. The rules include principles such as the definition of "walking" and the penalty for those who run, which is the attribution of a free-kick to the opponent. Otherwise, there is play, enthusiasm and goals.

As there is no age limit for the practice of this sport, it is a healthy and appealing way for men and women in their 50s and early 50s to be on the same competitive level and collaborate with colleagues who have already reached the 70/80s, in search of the best possible result and being in joy at the end of the games, not seeing at that stage any social or age difference.

9.2 Class organization

Being always an appealing sport for men, it happens that fortunately there are already a large number of female people who want to try a sport where mainly in the sports fraternization there

is a very high degree of socialization. For this reason, there is also a great inequality of execution between the various elements that appear for the practice. It is important in the 1st class that the teacher does the following:

a) Distribute to the students a questionnaire, with name, age, academic degree, time of sports practice, knowledge about football, and sporting past.

b) To inform the students of the material to be used in each session and to distribute tasks at the beginning and end of each training unit, equally and on a weekly scale.

c) Talk about the concept of the sport, distribute the rules, and advise on the best equipment to use in class, such as sports shoes and other equipment.

d) To make available some precautions to be taken in the practice of this modality, and how the sessions will take place.

e) To find a lesson plan that motivates the students.

f) To adapt the exercises of the session, so that they naturally produce effects on the technical learning of the less able, without causing monotony in the best performers.

g) Try to plan two sessions per week but with sufficient time between them, so that the students have enough recovery.

h) At the beginning of the session and after the warm-up, pair the practitioners by technical competence, but at the end save training time for the most able to help the colleagues to consolidating the techniques.

i) Motivate the students to use both feet in the reception and pass exercises, as well as in the game simulation exercises, because it is fundamental to develop equal muscular capacities in both the dominant and the non-dominant limbs.

j) Constantly providing positive feedbacks. Even when the exercises do not go well, we should look for something positive to transmit security to the practitioner.

k) To communicate to the students in all the classes but in a gradual way, tactical concepts about the movement and positions they should occupy, without giving much information at a time.

l) In the training exercises, find strategies so that the less able ones have more and more interaction with the more predestined ones, to provide a gradual technical increase.

m) Finding exercises in which play situations are recreated and always finish with completion.

n) Always reserve a training space, preferably the final part for recreational play, in which only ladies can score or men can only score using the non-dominant member.

o) Attend the organised meetings only when the practitioners have a perfect knowledge of the rules and some technical clearance. They are taking students before there is some mastery of the basic principles that can lead to abandonment.

9.3 Conclusion

This modality which is expanding, with more and more teams involved in the meetings, brings clear benefits because besides being an exercise which mobilises the oxygen metabolism, socialises all those involved (practitioners, coaches and even assistants), allows mixed teams, allows ladies who do not have such sporting aptitude, for the practice of the modality, have to interact with those who have previously assimilated technical skills, allows to gain more significant muscle tone in the lower limbs, allows better oxygenation, strengthens the cardiac muscle, allows gains in *opulo-pedal* coordination, improves spatial orientation, strengthens peripheral vision and allows teamwork.

REFERENCES

Ades PA, Ballor DL, Ashikaga T, Utton JL, Sreekumaran Nair K. Weight training improves walking endurance in healthy elderly persons. Ann Int Med 1996;124:568-72.

Brown AB, McCartney N, Sale DG. Positive adaptations to weight-lifting training in th elderly. J Appl Physiol 1990;69:1725-33.

COELHO, C. W.; ARAÚJO, CLAUDIO GIL SOARES.Relação entre aumento da flexibilidade e facilitações na execução de ações cotidianas em adultos participantes de programa de exercício supervisionado.Ver. Bras. Cineantropom Desempenho Hum, v. 2, n.1, p.31–41, 2000.

DANTAS, E.H.M.; PEREIRA, S.A.M; ARAGÃO, J.C.; OTA, A.H. A preponderância da diminuição da mobilidade articular ou da elasticidade muscular na perda da flexibilidade no envelhecimento. Fit Perf J, v.1, n.3, p.12-20, 2002.

Fiatarone MA, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ. High-intensity strength training in nonagenarians. JAMA 1990;263: 3029-34.

Frontera WR, Hughes VA, Lutz KJ, Evans WJ. A cross-sectional study of muscle strength and mass in 45- to 78-yr-old men and women. J Appl Physiol 1991;71:644-50.

Frontera WR, Meredith CN, O'Reilly KP, Knuttgen HG, Evans WJ. Strength conditioning in older men: skeletal muscle hypertrophy and improved function. J Appl Physiol 1988;64:1038-44.

Hayflick L. How and why we age. New York: Ballantine Books, 1996.

Hepple RT, Mackinnon SLM, Thomas SG, Goodman JM, Plyley MJ. Quantitating the capillary supply and the response to resistance training in older men. Pflugers Arch 1997;433:238-44.

Holden C. New populations of old add to poor nation's burden. Science 1996;273:46-8.

Lexell J, Downham DY, Larsson Y, Bruhn E, Morsing B. Heavy-resistance training in older Scandinavian men and women: short-and long-term effects on arm and leg muscles. Scand J Med Sci Sports 1995;5: 329-41.

Masoro EJ, editors. Handbook of Physiology: Aging. New York: American Physiological Society, Oxford University Press, section 11, 1995.

Matsudo, S.M; Barros neto, TL; MATSUDO, V.K.R. Perfil antropométrico de mulheres maiores de 50 anos fisicamente ativas de acordo com a idade cronológica - Evolução de 1 ano. Rev. Bras. Cienc. eMov, v.10, n.2, p.15-26, 2002.

MAZO, G. et al. Incidência de quedas, atividade física e saúde dos idoso. Rev. Bras. fisioter., São Carlos. v. 11, n. 6, p. 437-442, nov./dez. 2007

McCartney N, McKelvie RS, Martin J, Sale DG, MacDougall JD. Weight-training-induced attenuation of the circulatory response of older males to weight lifting. J Appl Physiol 1993;74:1056-60.

Morganti CM, Nelson ME, Fiatarone MA, Dallal GE, Economos CD, Crawford BM, et al. Strength improvements with 1 yr of progressive resistance training in older women. Med Sci Sports Exerc 1995;27:906-12.

Nelson ME, Fiatarone MA, Morganti CM, Trice I, Greenberg RA, Evans WJ. Effects of high-intensity strength training on multiple risk factors for osteoporotic fractures. JAMA 1994;272:1909-14.

Province MA, Hadley EC, Hornbrook MC, Lipsitz LA, Miller P, Mulrow CD, et al. The effects of exercise on falls in the elderly. JAMA 1995;273:1341-7.

Shephard RJ. Aging, physical activity, and health. Champaing, IL: Human Kinetics, 1997.

Spirduso WW. Physical dimensions of aging. Champaign, IL: Human Kinetics, 1995.

Timiras PS. Physiological basis of aging and geriatrics, New York: MacMillan Publishing Co., 1988.

Varejão, R.V.; Dantas E.H.M; Matsudo, S.M.M. Comparação dos efeitos do alongamento e do flexionamento, ambos passivos, sobre os níveis de flexibilidade, capacidade funcional e qualidade de vida do idoso. Universidade Castelo Branco. Rev. Bras. Ci e Mov. v.15, n.2, p. 87-95, 2007

10 SPORT ACTIVITIES IN A CORUÑA

The Senior University of A Coruña and Ferrol, aware of the importance of active life for its students, includes a subject within its Study Plan called “Physical activity for older people”. In it, they learn a series of guidelines so that they can incorporate them and provide a certain autonomy while enjoying physical exercise.

Physical activity represents any body movement of the skeletal muscles that causes an energy expenditure that is added to the expenditure of basal metabolism. Apart from the possible physical activity generated in the workplace or home, the vast majority of situations are manifested in the so-called free time. Human beings, by nature, consume physical activity throughout their entire existence. A full and healthy life could hardly be expressed in the total absence of movement and of our interaction with the world around us.

However, other dimensions, such as personal and sociocultural, must also be considered. Therefore, physical activity will allow human beings to interact with the environment that surrounds them and with their peers, through movement. This also means that physical activity is not an exclusive patrimony of the sports field, but is represented, on a daily basis, in other diverse activities such as work, domestic, recreational, educational ... etc.

When physical activity is programmed with the intention of influencing the physical form of the individual, the concept of physical exercise arises, which represents all programmed, structured and repetitive body movement carried out to improve or maintain one or more of the components of physical fitness. In those cases in which the level of physical activity does not reach the minimum sufficient to maintain a healthy state, we speak of a sedentary lifestyle. In general, although with nuances, we can recognize two different areas:

1. Physical exercise in the sphere of sports competition, whose practitioners follow training plans with the clear aim of increasing performance in their specialties. This programmed search for the improvement of individual and / or collective benefits entails certain risks, characteristic of each sport modality, which can be minimized or significantly reduced by means of adequate control over various factors, such as, for example, scenarios and competition material or on the correct interpretation of the principles of sports training.

2. Physical exercise as an improvement in health or quality of life, whose practitioners have a tremendously heterogeneous profile. The objective no longer points towards sports performance, but towards an improvement in health and / or aesthetics, although,

at times, physical activity is also identified as another form of social relationship. The level of risk of these practices, in principle, is lower, although an erroneous design of the programs to be followed could cause effects contrary to those desired. Of course, as in competitive sports, these contingencies can be reduced or practically disappear, especially when there are perfectly trained technicians, capable of combining and adapting the problem of exercise with the characteristics of each individual.

The current attention in Spain towards physical activity aimed at health begins to have greater institutional support, but there are still social groups that do not have adequate technical attention to optimize their activities. However, it is necessary to recognize the progressive offer, especially from the municipal sphere, directed towards populations of adults and the elderly.

There is no type of social monitoring on the results of sports practice at these levels, except for the publication of studies from this field, since they do not arouse the interest of competitive activity. Within this line we can include recreational, enjoyable or playful physical activity; utilitarian or preventive exercise, which seeks to prevent or correct postural problems, such as lordosis, kyphosis, scoliosis, etc., as well as exercise that seeks to rehabilitate injuries.

However, we could add a third expression of physical exercise, promoted by practitioners who have traveled from one field to another, causing a mixed situation. For example, participants in popular races, who began in practice looking for an improvement in health, aesthetics or as a social relationship and who, with the passage of time, were encouraged to participate in official competitions, although, in many cases, far from the desire for maximum performance.

The Senior University of A Coruña doesn´t want to forget this reality and therefore carries out an academic offer through the subject "Physical Activity for the elderly", with the fundamental objective of promoting the health and quality of life of practitioners through physical training.

10.1 Promoting health through physical exercise at the Senior University

The reason why the Senior University of A Coruña included this subject in its Study Plan is based on the many scientific studies that confirm the benefits of physical activity. Studies and research on the health benefits of physical activity have proliferated in recent decades. Also, history shows us that this human concern is not unique to our time. Already in classical Greece there was a medical tradition that linked physical exercise with health. Over time and depending on the influences of different cultures and lifestyles, these relationships have also evolved.

Currently, the international scientific community has shown that sedentary lifestyle is a determining risk factor for the development of various chronic diseases, including

cardiovascular diseases, which represent one of the main causes of death in Western society. In contrast, the regular performance of physical exercises will lead to a large number of positive effects, both physical and psychological.

Several studies confirm that there is a relationship between physical activity and life expectancy, such that the more physically active, populations tend to live longer than the inactive ones. On the other hand, it is a reality that people who perform physical exercise on a regular basis have the subjective feeling of feeling better than before doing it, both from a physical and a mental point of view, that is, they have a better quality of life. It seems clear, therefore, that the practice of physical exercise is very positive for health.

There is a trend of sports physical practice in the recent decades, especially in the most developed countries. This popularization of healthy physical activity is also accompanied by a greater information and dissemination effort, such us the publication of specialized magazines, books, videos, even press articles. This shows the progressive interest of society towards this movement that is characterizing the end of the 20th century and the beginning of the 21st.

The link between health and physical activity is not a recently discovered relationship since, in Western civilizations, as in classical Greek culture, health manifestos and treatises based on physical exercise already appear. In general, physical exercise is characterized by being healthy when personal well-being and enjoyment is put before the excessive desire for victory, which implies the search for maximum performance.

Social information campaigns on the benefits of physical exercise, adjusted to the demands of the adult population and the elderly, represent a key point of reference towards the motivation of these groups. Today there is a great consensus among the different specialists on the benefits of physical activity aimed at reducing the effects of the natural aging process or maintaining the various devices or organs in the best conditions, taking into account that the sedentary life of the elderly causes an acceleration of these degenerative processes. In fact, active retired people visit the doctor an average of 4.1 times and those with little activity do so with an average of 7.1 (Tico, 1992, 27).

This social reality forces us to reflect on the need to look for an offer of physical exercise for seniors, adapted to their interests, needs, and initial physical and clinical level. Their heterogeneity will be determined by various variables such as: chronological and biological age, sports background, sociocultural level, pathological background of various kinds, lack of facilities and opportunities or having the time while having fewer family responsibilities.

In this sense, a first important conclusion is that, in generic terms, physical exercise, as an improvement in health and quality of life, within the elderly, should be the central axis of our action, since inactivity contributes significantly to atrophy the organs, which deteriorates their proper functioning and alters the subject's state of health.

In this sense, a first important conclusion is that, in generic terms, physical exercise, aimed at the improvement of health and quality of life, should be the central axis of our action, since inactivity contributes significantly to atrophy the organs, which deteriorates their proper functioning and alters the subject's state of health.

As Jarret (1981) indicates, the improvement in the quality of life is enough to justify the practice of physical activities, although its capacity to extend life is not demonstrated. However, in this sense, some authors consider that physical exercise, along with other aspects such as nutrition, weight control, drinking and alcohol habits, rest and the way to react to stress can promote longevity (Tico, 1992).

10.2 Sports habits in the senior population

The population aging rate has increased considerably in recent decades. The demographics speak by themselves. In 1950, according to a report by the United Nations, there were around 200,000,000 people over 60 years old; in 1975, 350,000,000, and it is estimated that by 2025 this figure will reach 1,100,000,000, which means an increase of 224% with respect to 1975. (Rocabruno et al., 2000).

This is due, among other factors, to the improvement of living conditions and habits; advances in health care and in the fight against diseases, especially infectious ones; to a more rational diet; the increase in life expectancy, as well as the decrease in the birth rate and infant mortality. However, it is also unequivocal that the family's economic situation influences not only the frequency of illnesses that can be suffered but also personal life expectancy. For example, it has been found that those socially most disadvantaged groups have less hope of survival than the most favored (Whitehead, M., 1992). Statistics reveal how those countries with a lower social development index, for example, India, have infant mortality rates clearly higher than the most advanced ones, such as Norway or Australia.

In any case, a large part of the negative effects suffered by human beings when they reach old age disappear when they follow physical exercise programs, and ther quality of life improves.

In general, the most important motivation that leads these groups to practice sports is of a hygienic-preventive or prophylactic type, although other arguments also appear, such as the search for social relationships, also of enormous importance in the senior citizens, feelings of

pride in having the possibility of being valued in some type of competition, or simply the inertia of habits acquired earlier or the influences of fashion. It can be said that, in general, senior people who practice physical activities tend to choose the same ones they did when they were young.

McPherson (1984) relates a series of aspects that mediate physical-sporting exercise in elderly populations:

- The education received, an aspect linked to their sociocultural level.
- Marital status (married, single, widowed)
- The level of health
- The economic status.
- Nutrition- Food
- The degree of independence and mobility
- The place of residence and quality of the home.
- The type of dwelling: apartment, house, residence or institution.
- Their preferencies. For example, women prefer less regulated activities than men.

10.3 Variables of healthy exercise for the senior population

Due to the lack of homogeneity in the group of the Seniors from A Coruña and Ferrol (from 50 years old to more than 85), we propose these conditions in a generic way, which requires a subsequent adaptation to the particular conditions of each student.

1. Physical activity must have an integral impact on people, stimulating their different systems and organs: Cardiovascular and respiratory; muscular-skeletal; nervous; metabolic; immune and sensory organs.

2. The physical exercise offered must require the intervention of the three mechanisms that condition motor performance (Marteniuk, 1976): a) Perceptual mechanism, responsible for receiving information and understanding it; b) decision mechanism, responsible for finding the solution to the problem.; c) execution mechanism, in charge of expressing the solution.

3. Physical activity must be broad enough to satisfy all the desires of these groups and to affect the different systems and organs.

- A part of the exercises should have playful content to provoke greater motivation.
- There should be an adaptation of the sports regulations, if they are regulated activities, to the particular characteristics of the senior population, since sport represents a means and not an end.
- In general, the performance of exercises should enhance the mental and physical health of the practitioners, allowing them an autonomous life.
- During the execution of the physical activity program, safety conditions must be maximized to avoid unnecessary risks, both in the material used, including clothing and flooring, and in the type of exercises used.
- It is convenient that the practitioners assume the responsibility of controlling and recording the sessions in the physical activity diaries and know perfectly how to correctly execute the different exercises.

4. Before starting the physical exercise program, teachers must evaluate aspects such as:
    - Have medical information on the health status of the person. The Senior University of Coruña and Ferrol has a questionnaire that represents a very effective initial instrument. In exceptional cases, a medical history may be required, as well as an analysis of risk factors, including a physical examination, blood tests, and stress test. This would make it possible to identify and classify each member of the group in three levels: a) Apparently healthy individuals; b) sick individuals, and c) high-risk individuals.
    - Know the current state of physical condition and the sports habits
    - Determine the interests, objectives and needs in each case. Depending on each situation, a different methodology and content will have to be considered, according to the realistic objectives.

5. All exercises, intensity, frequency, etc., must be part of a studied planning and programming adapted to individual specific characteristics.

10.4 Evolution of systems and consequences in physical exercise

Older people, as a consequence of the aging process, see different organs and functions progressively deteriorate. Some of the systems and functions that deteriorate are the following:

- Aging of the locomotor system. For example, bones suffer some decalcification, as a consequence of the difficulty of fixing calcium; the joints show a degenerative process (osteoarthritis), also losing joint mobility (flexibility); muscles lose volume and, consequently, strength; also elastic capacity.

- Aging of the respiratory system. For example, the vital capacity is reduced, as well as the ventilation capacity, causing less oxygen in the blood; loss of elasticity in the intercostal muscles and diaphragm; less lubrication of the nose and larynx, which impairs the intake of air.

- Aging of the cardiovascular system. For example, the heart decreases its muscle mass and its contractile capacity (it pumps less blood); it also decreases the heart rate; the vascular system manifests a hardening and thickening of the arterial walls (arteriosclerosis).

- Aging of the nervous system. For example, there is a slight atrophy of the brain mass; decreases the number of neurons, thus the neuronal interconnections; the intensity of electrical stimuli decreases; reaction time increases (less ability to react; loss of reflexes); coordination capacity is lost, with all the problems that this causes in the performance of certain exercises; decreases the ability to learn; attention and concentration will diminish.

- Aging of the sensory organs. For example, decreased vision and acoustic ability; loss of skin sensitivity.

- These circumstances, among many others, make it necessary to take extreme precautions when designing a physical exercise session for these populations. Among the risks that may arise, we select the following:

    - Situations that involve possible falls. This makes it necessary to choose the setting well, both outdoors and indoors, taking into account that they must have non-slip flooring. You also have to avoid moving backwards or those exercises that require a high level of balance. Likewise, it is necessary to ensure that there is no material that hinders the actions. Lighting is also very important, due to the loss of vision in the elderly, so it is necessary to avoid practices in places with low light intensity.

- Sudden increases in blood pressure. Isometric or static exercises that can cause significant changes in blood pressure should be avoided, especially in practitioners who have suffered a heart attack. This also justifies eliminating those situations that imply abrupt changes in the positions of the elderly. For example, the sudden transition from lying down to sitting or standing. Therefore, they should always be done gradually, at an individual pace. Exercises that require the head to be lowered below the waist should also be avoided, as this could increase the pressure on the cerebral capillaries, with the possible risk of their rupture, due to their fragility. Also avoid apnea times.

- Joint, tendon and muscle problems, as a consequence of intensive or inappropriate efforts. For example, if the pavement is very hard, risk situations can arise, due to falls or overloads. The jumps are usually exercises very aggressive for the elderly. Large joint mobilizations, for example, hyperextension of the spine, should also be avoided.

- Levels of effort that do not respect the principle of individuality. This could happen when the workloads are common to all the members of a group, without considering the characteristics of each case: age, sex, motivation or fitness level.

- Clearly favor aerobic work, avoiding anaerobic work, since it is much more aggressive and has a greater number of risks.

- Not promoting adequate recovery after physical exercise. For this reason, it is a mistake not to properly adjust the recovery processes, since it can generate risk situations.

- The state of the material and clothing can mean a source of risks when faced with physical exercise, like an inappropriate use or choice of material, a defective conservation of the material or a bad distribution or placement.

- Concentration problems during practice can also cause dangers in the practitioner, so it is necessary to try to favor the attention of the elderly, avoiding too many stimuli: music, material, instructions, etc. at once

- Too rapid increase in the workload performed. Sometimes mistakes are made, after long periods of breaks, illnesses, injuries ... to start with an excessive volume of physical exercises, with the consequent danger.

- Lack of technical mastery over some exercises, so it is necessary for the elderly to learn to perform them correctly. As mentioned above, the exercises should be easy to do.

- Inadequate heating. The warm-up represents the introductory part of the session, which allows optimal conditions for the participation of the practitioner in the session, preventing the risks of possible injuries. A large number of sports accidents are caused by a poorly performed warm-up.

10.5 The healthy offer of physical exercise for the senior population of A Coruña

Once the benefits, characteristics, recommendations and risks of physical exercise for master populations have been generically described, we must ask ourselves what type of activities are the most recommended for Senior University populations.

The offer of physical exercise that is proposed is based on basic (non-competitive) abilities and skills. However, in order to consistently apply the principle of individuality, it is necessary to know the starting level of each student.

Before the start of the training, each participant fills in a simple questionnaire that covers the following aspects:

1. Previous illnesses
2. Surgical interventions
3. Possible physical impediments
4. Experience in physical exercise
5. Lifestyle
6. Possible medical contraindications
7. Expectations about the training
8. What type of physical exercise interests you the most

This questionnaire includes the following set of questions in which they must answer the option that best approximates their situation with YES or NO:

1.- Have you ever lost consciousness (FAINT) or suffer unjustified DIZZINESS in relation to exercise?	YES	NO
2.- Have you ever had CHEST PAIN ("like a weight on the chest") while doing physical activity?	YES	NO
3.- Have you ever noticed unjustified FATIGUE ("LACK OF AIR") that makes it difficult to do light or moderate exercise?	YES	NO
4.- In the last year have you ever been treated in the hospital for bronchial asthma?	YES	NO
5.- Have you ever had seizures or epileptic seizures?	YES	NO
6.- Did any of your close relatives (father, mother, siblings) have sudden death before age 40 or a myocardial infarction (fatal or not) before age 55 (father or brother) or before age 65 (mother or sister)?	YES	NO
7.- Are you a regular (every day) cigarette smoker or did you quit tobacco in the last 6 months?	YES	NO
8.- Have you noticed arrhythmias (PALPITATIONS) or another heart problem related to exercise?	YES	NO
9.- Did you have any important infection, such as pericarditis, myocarditis or mononucleosis in the last 3 months?	YES	NO
10.- Has your doctor ever told you that you have high cholesterol (Total C. ≥200 mg / dl and / or LDLc ≥130 mg / dl) or high blood pressure (≥140 / ≥90 mmHg)	YES	NO
11.- Are you DIABETIC (fasting glucose ≥ 126 mg / dl) or do you take medication to control glucose?	YES	NO
12.- Have you lost any of these organs (eye, kidney, testicle) due to injury or disease?	YES	NO
13.- Do you have BONE OR JOINT PROBLEMS that may get worse when you increase your physical activity?	YES	NO
14.- Does your doctor usually prescribe any medication, which one?	YES	NO
15.- Do you know any REASON WHY YOU SHOULD NOT PRACTICE PHYSICAL ACTIVITY?	YES	NO

If you have feveror shivers, you should not practice sports on those days and you should contact a doctor. If you are a pregnant woman, you can do moderate physical activity, but with the authorization of your doctor or gynecologist.

If you answer YES to only one or more of questions from No. 1,2,3,8,11,13,15, or two or more of the other questions, No. 4,5,6,7,9, 10,12,14, you should contact a doctor before starting exercise or performing a physical test.

If you answered NO to all the questions, you can start playing sports with high confidence that it does not have any risk to your health. If any of the symptoms and signs that appear in this questionnaire happen from, you should tell a doctor about it.

** Questionnaire adapted by Dr. Crespo-Salgado JJ (2012) from the "Lausanne 2004 Recommendations" (IOC Medical Commission, 2004), from the "Pre-participation Sports Monitoring Questionnaire" (American Heart Association / American College of Sports Medicine, 1998), the "Physical Activity Readiness Questionnaire-PAR-Q" (Thomas, Reading and Shephard, 1992), and the "Screening for Sudden Cardiac Death in American school athletes" (Braden and Strong, 1988). VERY IMPORTANT: This questionnaire is confidential and subject to the Personal Data Protection Law (Organic Law 15/1999, of December 13).*

The treatment of this data allows us to differentiate and group students based on, at least:

- Their previous activities (type, intensity, frequency ...)
- Current physical condition
- Physical health
- Motivations

The development of the subject, both in the A Coruña and Ferrol Campus, is carried out through a weekly face-to-face one-hour class. Following the recommendations of the World Health Organization or the American College of Sports Medicine, we advise our students to engage in physical activity at least 3 times a week, although they are informed that when they practice sports 4 or 5 times a week, the benefits will be greater.

They are also instructed to spread physical activity throughout the week instead of doing it for 3 or 4 consecutive days to reduce the risk of injury.
In any case, senior students are advised to encourage the following behaviors on a day-to-day basis:

- Avoid the elevator, walking up the stairs, at the personal pace of each individual.
- Try to walk, whenever is possible, refusing to use transport. It is suitable to participate in excursions on foot, with family or in a group, even by bicycle.
- Promote domestic activities that involve energy expenditure: gardening, shopping ... etc.
- Participate in activities such as ballroom dancing, swimming, crafts, etc.

From this initial diagnosis, which will be enriched in the development of the first sessions, a practice of physical exercise is offered based on:

- **Disciplines of simple execution**, which allows us to deduce that all those complex specialties will be banned for most of the people belonging to the Senior University group, except for those who have been practitioners throughout their lives of more complex modalities. Some of the simplest disciplines are represented in the so-called cyclical activities, such as walking, running, swimming, cycling, rowing ... etc. For this reason, walks, marches ... are part of the usual routines of our students. Some, with a higher level of physical condition, combine walking with running.

There are many advantages that we find in these two basic human locomotion skills. Among them we can highlight:

1. No prior learning is needed due to the simplicity of its execution. Approximately between nine and eighteen months, depending on their level of maturity, the child begins to walk with a certain independence, achieving relative ease in a high percentage of cases over two years. Running begins in humans as a hurried and clumsy gait, being perfected naturally by simple biological evolution. Consequently,

they are two natural forms of movement that do not require, for non-competitive activities, a complex process of learning or improvement.

2. The possibilities of being able to walk or run can be enjoyed throughout a person's life, from the youngest to the oldest, in various fields such as work, domestic, recreational or competitive. The realization of other sports activities are unviable during the aging process or present at least serious risks for the physical integrity. However, doing a continuous low intensity run or just walking is usually within the reach of the vast majority of people.

3. Their practice allows us to better understand our environment. There is usually a routine in the journey that we take every day between our work, residence and leisure areas. On many occasions, the need to design new itineraries for running or walking allows us to discover unknown places, especially in the natural environment, while also stimulating our creativity.

4. There are a large number of routes, both in the natural and in the urban environment, where we can walk or run, without risks to our physical integrity: parks, roads, streets, beach, mountains, circuits ..., to the point of to be able to select variable routes that allow to maintain an interest continued long term.

5. The financial outlay that must be made to follow an aerobic program based on walking or running is very low, in relation to the costs that must be assumed to practice other physical sport activities. It is enough just to have shoes and suitable clothing.

6. The realization of these activities can be shared with other members of the family or friends, so we also reinforce our social relationships. Walking and running are skills that allow, at low intensities, to maintain a conversation without great stress, which encourages communication and social integration, while creating an affective climate.

7. Running and walking are cyclical modalities in which the same motor sequence is repeated in each of the steps or strides. This favors effort and rhythm control, while also promoting better knowledge of the progress that is being made. Likewise, they lack the abruptness of some sports actions so there is less risk of injury, as long as basic safety rules are followed.

- **Physical exercises that stimulate the motivation of the group**, for example, popular games, ballroom dances, adapted sports, activities in nature ... etc. This section is also compatible with the previous one (disciplines of simple execution). In this case, the programming of marches through circuits in which historical points can also be visited causes great motivation.

The image corresponds to the march of the group from the Senior University of A Coruña on the route of the English Cemetery on the Galician Costa da Morte (Camariñas) where you can find the remains of 172 sailors, officers and the captain of the ship Serpent, wrecked in 1890 on its way to Sierra Leone.

Participation in meetings with other European Senior Universities causes, also, enormous motivation among our students. Activities practiced such as walking soccer with rules adapted by the Walking soccer Union ® - WAFU (walking soccer), similar to regular soccer with a big difference, players can only walk and running is not allowed. It is a game designed to help people stay fit and maintain an active lifestyle regardless of age and / or physical fitness.

- **Disciplines dependent on the aerobic system**, avoiding those of anaerobic origin much more aggressive for the body. Over the years, the heart tends to reduce its muscle mass, decreasing its contractile capacity, which causes, together with a decrease in heart rate, a weakening of the systolic volume of blood sent to the arteries. Likewise, there is vascular aging as the arterial walls become increasingly stiff and thick (arteriosclerosis), which makes the transition of blood difficult. An adequate sports offer leads to a better functioning of the cardiovascular system, reducing the risk of hypertension and arteriosclerosis and maintaining the effectiveness of cardiac contractility.

  One of the most recommended offers for these populations is walking or, in certain cases, running, depending on their physical condition, as we justified previously. When they are carried out at low intensities, a series of important physiological changes take place that reduce the chances of suffering heart attacks and notably favor the functionality of the heart. Scientific studies generally show that there is a risk of coronary artery disease in sedentary male populations between two and three times higher than that of men who maintain regular physical activity. Typically, the risks of heart attack are twice as high in untrained subjects as in trained subjects. The march to jogging (light running) or walking improves the general efficiency of the body in all aspects, particularly cardiovascular capacity, and also has a favorable influence on the main risk factors.

However, we must know, before applying a program aimed at improving cardiorespiratory endurance, which are the limits of the heart rate of senior students. In the absence of maximum laboratory stress tests, it can be useful to apply the Karvonen formula that allows us to determine the advisable target heart rate zones in order to be able to program the sessions in a personalized way. The Karvonen formula uses maximum heart rate and resting heart rate in combination with age to obtain a target heart rate.

In those situations where students wish to lose weight, consistent with the American College of Sports Medicine, a minimum of 20 minutes of continuous aerobic activity 3 days a week is recommended. Examples of physical activity that can be considered aerobic are: walking, running, jogging, climbing, swimming, cycling, rowing, cross-country skiing, dancing… etc.

However, these programs must be completed with exercises aimed at joint mobility (flexibility), due to the enormous advantages that this entails in daily life, as well as some strength work that allows maintaining a healthy minimum degree of muscle tone.

- **Exercises of joint mobility or dynamic flexibility**. Flexibility is an involutional quality, since over the years mobility is lost at a level that is affected by different variables. If this decrease is very marked and there is a low level of mobility, and problems may arise such as, for example: postural deviations, lack of coordination, excessive caloric expenditure of the agonist muscles to overcome the great opposition of the antagonist, fibrillar tears, etc. . However, adequate flexibility work allows:
    - Improve the mechanical capacity of the muscles involved
    - Lubricate stimulated joints (only with dynamic methods).
    - Prevent injuries, since it reduces the risk of suffering them. The athlete who enjoys a good range of joint travel can more effectively face situations in which their joints are stressed to high-risk limits, such as hurdlers or pitchers.
    - Also in contact sports, where collisions and falls occur, a flexible joint better absorbs the impact, avoiding possible injuries or lessening its effects if it occurs.
    - Alleviate the pain caused by training stiffness.
    - Maintain muscle elasticity

- Relax stiff and tense muscles by lowering muscle tone.
- Encourage the execution of sports techniques (possibility capacity).
- Enable the development of other abilities, such as strength, speed and endurance.
- Cause less energy consumption.
- Accelerates recovery processes. Being more flexible does not ensure better recovery, but performing joint mobility exercises and stretching after training favors the washing of lactate and elimination of waste products.
- Reduction of stress and emotional tension.
- Optimize coordination
- Promotes the transition from eccentric to concentric phase in muscle contraction.
- … /…

Many studies confirm the presence of high percentages of muscle shortening and large decompensations between the right and left side of our body. Flexibility maintenance work is important in order to improve or maintain quality of life.

Flexibility, unless you work permanently, is lost over the years. In senior populations, the decrease in flexibility will translate into a limitation of joint width and, therefore, in a worsening of the quality of life. Elastic fabrics lose their property, shortening the movement capacity of the different joints, especially at the shoulders and knees. The programming of exercises aimed at the maintenance and / or recovery, as far as possible, of flexibility is part of the usual contents of the Senior University classes.

This section includes stretching. They can be part of the initial warm-up process, as well as specific scheduled sessions and, especially, the cool down. Much emphasis is placed on the need to learn to perform each exercise correctly so that they can perform them independently on other days, on their own.

- **Muscle strength or toning exercises.** As is known, sarcopenia is the loss of skeletal muscle mass associated with aging, and it contributes greatly to the disability and loss of independence of the senior individual.

  Over the years, muscle mass undergoes a decrease in volume and strength, both maximum and power (ratio of strength to speed). It is considered that people over 65 years of age may have suffered a decrease of 15% in their strength and 50% in those over 80 years of age. This loss of muscle tissue associated with the aging process can very negatively affect the functionality and quality of life of senior people. In reality, this influence on health affects the person throughout his life.

  There are already different studies that have identified various factors involved in the development of sarcopenia, including a decrease or hormonal deficit. Also the weight loss can accentuate sarcopenia by causing a greater loss of muscle mass instead of fat mass. And in individuals who regain weight, it is usually at the expense of a higher proportion of fat mass. But even without weight fluctuations, longitudinal studies show a progressive loss of muscle mass with aging.
  For all these reasons, toning exercises aimed at large muscle groups are part of the regular contents of Senior University classes. The World Health Organization advises 3 minimum sessions per week for these age populations.

- **Coordination exercises.** Coordination is an essential element in any motor activity, but also in everyday life. It is synonymous with dexterity and is fundamentally determined by the processes of control and regulation of movement, which allows to execute all motor actions with precision and economy, both in anticipated situations (habitual motor skills), as unforeseen (adaptation), as well as learning motor gestures faster.

  There are various forms of coordination, a general onr, when the movement is global, for example walking, and another coordination motor-eye or the relationship between the sight and the body segment. In this case, there can be two categories:

1. Eye-hand coordination, which represents a complex cognitive skill, which requires precise coordination between sight and hand movements, such as hitting a tennis ball with a racket.

2. Eye-foot coordination, similar to the previous one, but in this case the executions will be carried out fundamentally with the foot, such as hitting a soccer ball, to shoot a penalty.

Although voluntary motor movement involves a large number of frontal brain areas, the main structure in charge of coordination is the cerebellum. And as happens in the physical capacities to which we have referred previously, coordination is one of the capacities that is most deteriorated by the aging process, making daily daily activities difficult.

For the aforementioned reasons, coordination exercises are also included, aware of their importance, both those of handling objects with the hand, as well as coordination with the feet and mixed situations.

One of the activities that is also included at the Senior University is dancing, individually, but to the rhythm of the music, for the emotional well-being, joy and motivation that it involves. Apart from maintaining and improving general level of coordination, it causes cardiovascular benefits, toning, especially in the legs, as well as joint mobility. Dancing can also contribute to a decrease in body weight.

REFERENCES

American College of Sports Medicine (1991) *Guidelines for exercise testing and prescription.* Fourth edition. Philadelphia. Lea & Febiger.

De Febrer, A.; Soler, A. (1989) *Cuerpo, dinamismo y vejez*. Editorial Inde. Barcelona.

Devis, J. (2000) *Actividad física, deporte y salud*. Inde. Barcelona**.**

Downie, R.S.; Fyfe, C. y Tannahill, A. (1990). Health promotion. Models and values. Oxford University Press. Oxford.

Gracia, D. (1988) Salud, Ecología, Calidad de Vida, *JANO,* Vol. 35, Nov. 1988, 133-147. Hayflick L. Theories of biological aging. Exp Gerontol 1985;20:145-59.

Hornillos, I. (2000) *Andar y correr*. Editorial Inde. Barcelona.

Jarrett, R.J. (1981) *Exercises and the heart*. Editorial Lancet.

Jhonson, S. (1755). *A Dictionary of the English Language*. Ed. Charles J. Hendee. Boston

Lain Estralgo, P. (1984) *Antropología Médica*, Barcelona, *Salvat,* Barcelona.

Lavega (1990) El deporte y la tercera edad. *Revist Apunts. Educació Fisica i Esports* pp: 13-20.

Lawton (1980) *Environment and Aging.* CA.: Brooks/Cole. Monterrey.

Marcos Becerro; J.J.; Frontera, W.; Santoja, R. (1994) *La salud y la actividad física en las personas mayores.* Impresión S.A. Madrid.

Marteniuk, R. (1976) *Information procesing in motor skills*. Holt, Rinehart and Winston, 76. New York.

McPherson (1983) *Aging as a social process: An introduction to individual and populanon aging.* Butterworlhs. Toronto

Parsons, T. (1958) Definitions of Health and Illness in the Light of American Values and Social Structure en: Concepts of Health and Disease, Ed. By: Caplan, A. et al. Reading, (Massachusetts), *Addison-Wesley Pu. Co.*1881, 57-81.

Pedersen, P.K.; Froberg, K.; Andersen, B. et al. (1982) *Institute of Fhysical Educatio*n. University of Odense.

Piedrola Gil, G.; Del Rey Calero y cols. (1991) *Medicina Preventiva y Salud Pública.* Ediciones Científicas y Técnicas, S.A., Masson. Salvat. Barcelona. 9ª. Edición.

Rocabruno JC, Prieto O. (1992). *Gerontología y Geriatría Clínica*. La Habana: Editorial Ciencias Médicas, 45-59.

Sánchez González, M. (1991) La clasificación de las enfermedades: funcionales actuales y fundamentos históricos**,** *Rev. Medicina Clínica,* 96: 703-706.

Tico, J. (1992) Aspectos sociológicos de las prácticas físicas en la tercera edad. *Revist Apunts. Educació Fisica i Esports,* pp: 20-28.

Whitehead, M. (1992) Body as Machine and body as a self in teaching PE. En Williams, T.; Sparkes, A.; Almond, L. (eds). *Sports and Physical Activity*. Moving Towards Excellence, E&FN Spon, Londres, pp. 376-383.

11 IMPORTANCE OF SPORT ACTIVITY IN LUBSKO

11.1 Introduction

Adult people often don't have time for sports activities. Work, raising children, as well as household chores are the reasons why there is no time, strength or desire for sports. Lack of the habit of playing sports is sometimes transferred even to later years. Seniors who usually have more time are not in the habit of playing sports.

What are the consequences of inactivity?

First of all, the increased risk of diseases such as hypertension and diabetes. Moreover, the lack of an active lifestyle results in overweight and obesity.

In the scheme developed in the 1970s by the Canadian Minister of Health, Marc Lalonde, lifestyle is the most important factor (50%) among the factors influencing our health. Elements such as the quality of health care (10%) or genetic factors (20%) are definitely less important. Physical activity is part of the lifestyle. The World Health Organization (WHO) has identified insufficient physical activity as the fourth risk factor responsible for premature death and mortality worldwide.[2]

11.2 Effect of physical activity on human health

The list of scientifically proven benefits of a healthy and active lifestyle is very long. Limiting ourselves to the most important ones, it can be mentioned that:

1. reduces the risk of cardiovascular diseases,
2. stops and delays the development of arterial hypertension,
3. reduces the risk of obesity,
4. allows to maintain metabolic functions,
5. helps to prevent type 2 diabetes.
6. physical activity also reduces the incidence of certain types of cancer, such as breast, prostate and colon cancer.

Better bone mineralization at a young age contributes to the prevention of osteoporosis and fractures in old age. But playing sports or exercising is not only beneficial, preventing various serious diseases. We cannot forget that it affects the quality of our daily life. It is worth realizing that activity allows you to maintain and improve muscle strength and endurance, resulting in better possibilities of performing daily activities. Another added value of physical activity is the lower level of stress and the associated better quality of sleep. It should also be

[2] https://www.medicover.pl/o-zdrowiu/aktywnosc-fizyczna-a-zdrowie-czlowieka,3912,n,2673, 05.08.2020.

added that thanks to being active, we have a better self-image and self-esteem, as well as greater enthusiasm and optimism.

11.3 Physical activity and lack of time

Why, when practicing sports is so valuable, are there still so many inactive people? There may be several reasons for this. Part of it is certainly due to a lack of awareness of how dangerous it is. Certainly, however, many of us do not change their lifestyle because we do not have time to exercise. As stated in the introduction, many adults are busy at work, raising children, or doing chores at home. Nevertheless, in later age people lose some of their responsibilities and gain more free time. This is a great opportunity to increase your interest in sports. WHO recommends that children under 18 years do at least 60 minutes of moderate to vigorous exercise daily, incorporating activities to strengthen muscle and bone at least 3 times a week. Adults should do 150 minutes of moderate exercise or 75 minutes of vigorous exercise per week, with muscles strengthening activities on 2 or more days a week. People with poor mobility should also include physical activity to enhance balance and prevent falls 3 or more times per week.[3]

As the body of an elderly person has different possibilities than that of a young person, some sports may turn out to be inappropriate. Nevertheless, there are many sports activities that perfectly affect the development of the body and mind, allow you to fight diseases, are safe and, what's more, they are an excellent form of entertainment, fun and opportunities to meet friends.

12 BOCCIA

12.1 What exactly boccia is?

Boccia comes from the traditional game in Italy known as Bocce and in France known as Boule or Petanque.

The adapted boccia is played on a 12.5 mx 6 m playing court. The equipment is made of small leather balls (now rather plastic ones) - six red, six blue and one white ball. The balls are filled with special granules, which makes them easier to grip. The object of the game is to throw the white ball (called "Jack") into the playing court and then place as many balls of the same color as possible in its immediate vicinity. The starting player throws the white ball into

[3] World Health Organization, https://www.who.int/health-topics/physical-activity#tab=tab_3, 06.08.2020.

the court and throws his ball as close to the white as possible. Then the opponent plays. Then the player of that team whose ball is farther from the opponent's ball in relation to the cue ball is thrown. When throwing balls, players may move the balls in play, smash already set balls, trying to place as many balls of their color next to the white ball as possible. After all the balls have been thrown onto the field of play, the round ends and the referee announces the result, which is the sum of the number of balls of one color, closest to the white ball. The match ends after four or six rounds are announced. It seems complicated at first, but in practice, one short game is enough for the rules to be clear to everyone.

Competitors are classified according to the CPiSRA (Cerebral Palsy International Sports and Recreation Association) regulations. The game is intended for non-disabled and non-disabled people. Depending on the type of disability, functional abilities (mainly grasping functions, smooth movements) and the need for an assistant, players are divided into 4 classes: BC1, BC2, BC3, BC4. The following matches are played in the above-mentioned classes:

- individual (4 rounds, 6 balls for a player)
- in pairs (4 rounds, 3 balls for a player)
- team (6 rounds, 2 balls for a player)

As written above the game takes place on a 12.5 x 6 m court, marked by the outer lines. The main parts of court are:

- line V (the line that must cross the cue ball for it to be allowed)
- throw line
- the throw zone, divided into 6 throwing squares
- cross (the place where the cue ball is placed when it is brought into play or during extra time).

12.2 Boccia - a game for almost everyone

Boccia is a very safe type of sport. Thanks to the advantages of this game, it found its way to the Paralympic sport. It is then addressed to people with the most severe motor dysfunctions. Why? Firstly, because the game equipment, i.e. the balls, are quite light - they weigh about 280 grams and most importantly, they are flexible, easy to grip and do not roll as easily as metal or plastic balls for non-disabled people. Finally, there are solutions in the rules of the game that adapt the game for people with four-legged shocks: the ball may be thrown onto the pitch by throwing, kicking or throwing with the aid of assistive equipment. Players can take part in the game standing or sitting (wheelchair, chair). It is possible to participate an

assistant helping players who need help. Thanks to these solutions, Boccia is a game available to almost everyone. Add to this the emotions accompanying it and the fact that it is a game that encourages thinking, tactical planning of the game and attempts to predict the opponent's moves, and as a result we get the ideal of the Paralympic sport and at the same time an excellent integration game.

12.3 How to train boccia?

Even though boccia is not a complicated and demanding game, you can prepare for it properly. Andrzej Janowski - 10th competitor of the BC4 World Boccia Open 2017 in Seville gave some advice about the right job. Among all the recommendations, there are the following seven:

1. Strength training to strengthen the throwing force.
2. Stretching training - improving the range of motion and increasing the dynamics of the throw.
3. Training of visual perception centers - working on the sense of distance with different surfaces and billet hardnesses and introducing new methods of projection.
4. Working on the psyche and emotions during the match (focus, concentration).
5. Identifying the opponents' good and weak sides (and using them in the tactics of the match).
6. Work on match tactics (preparation of various plans and scenarios).[4]

12.4 Benefits of the boccia game

Boccia is a tool that effectively releases life energy. This sport contributes to the elimination of social exclusion, because apart from shaping physical fitness, it gives the elderly or disabled people the opportunity to integrate activities in an atmosphere of tolerance and respect for physical otherness. Other advantages of the game include, for example:

1. increasing the body's efficiency through the influence of exercise on the system
2. nervous, respiratory, blood, muscle,

[4] Andrzej Janowski - 10th competitor of the BC4 World Boccia Open 2017 in Seville - in the commentary for "*BLOG BOCCIASPORT.PL BOCCIA SHAPES THE MIND*" on 03.10.2019. Source: http://www.bocciasport.pl/boccia/porady-mistrza-bocci-jak-trenowac-boccie-co-kazdy-zawodnik-powinien-sam-zrobic-aby-robic-postepy-w-grze/ 08.08. 2020.

3. shaping physical fitness (gross and fine motor skills, precise movements, developing throwing, kicking and grasping skills),
4. improvement of eye-hand coordination.

There are also many benefits in the mental sphere, such as triggering positive emotions (victory, success, joy), acquiring the ability to deal with stress (during competitions) and failure, and increasing concentration on the task at hand. Boccia also shapes social skills - teamwork, taking responsibility for the team, shaping proper social relations, etc. Boccia has already become the subject of scientific studies. Its rehabilitation values are very clear.[5]

Boccia equipment	
Boccia balls They are available in various hardnesses: super-soft, soft, medium-soft, medium, medium-hard, hard. The set includes 13 balls, weight: 275g +/- 12g, circumference: 270mm +/- 8mm. The balls are often hand-sewn from synthetic leather or natural leather. They are characterized by high flexibility, softness and high durability. They are usually filled with ecological plastic granules, which gives the ball stability and high playing efficiency.	
Bag for storing and transporting balls Bags are designed to transport balls. Thanks to them, the balls will not crumple. They are available in various forms and colors.	
Throwing aid equipment They are available in different sizes, variants and prices. The variants depend on the degree of disability. In professional gutters, the tripod is made of steel and aluminum with milled and turned elements. It consists of 3 elements: a base	

[5] Information taken from an interview with Romuald Schmidt - President of the Polish Federation of Disabled Boccia, entitled "Boccia - a sports discipline for everyone". The material was published on 06.12.2013. It is an integral part of the closed eBIFRON issue and has not been updated.

connected to a tripod and 2 attachments attached with an easy push. Such a system enables effective playing at short and long distances. The sides of the ramp are made of precision-cut aluminum and the bottom of the ramp is made of the highest quality polycarbonate. A well-configured system of bearings ensures smooth rotation of the tripod, which significantly facilitates the game and precise aiming. Thanks to the good profiling and the optimal height of the walls, the gutter has a large ejection force, which enables effective play at the end line of the pitch. The ramp rotates smoothly to the sides and remains stable during ball ejection.	
Referee equipment The equipment usually consists of: a / 14cm compasses, b / 29cm compasses, c / palette, d / measuring cups, e / bag.	     

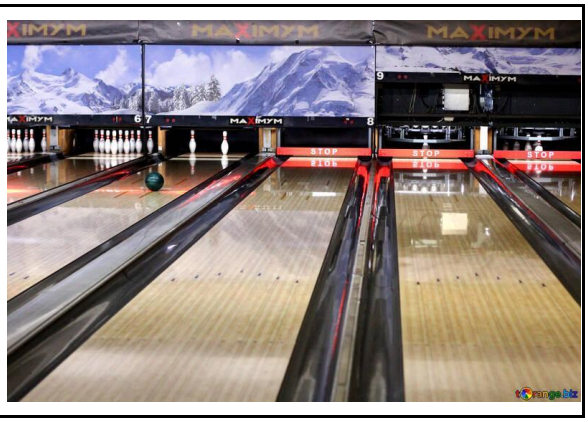
13 BOWLING

13.1 Bowling - different variations of one game

Bowling is a type of game with balls that knock down elements (pins). There are two types of this game: classic bowling and bowling. Contrary to the misleading nomenclature, it is the latter that is very popular all over the world. Bowling is primarily a great form of

entertainment in a friendly circle - a combination of movement and fun. Bowling in the traditional sense (classic bowling) consists of nine elements to smash and a ball without holes. In turn, in bowling you hit ten pins with a ball with three holes for fingers, where the pins are arranged in a triangle. The game is played over ten rounds, with each round with up to two kicks from each player. The number of points scored is indicated by the number of pins knocked, unless a strike or a spare occurs. More about the rules of the game in the next section.

Bowling equipment	
Bowling pins a/ Wooden pins (drilled, intended for string machines or not drilled). They are covered with a layer of plastic, which makes them more resistant to cracking, b/ Synthetic pins with increased durability. The bowling pins are 38 cm high and 12 cm wide. The weight of a single pin should be between 1.47 kg and 1.64 kg.	
Bowling ball balls with diameters: a/ with a diameter of 160 mm and weight of 2800–2900 g, b/ with a diameter of 165 mm and weight 3050-3150 g, c/ with a diameter of 218 mm, weight 7250 g. Bowling balls are most often made of various plastics. Guaiac wood was also used for their production.	

Bowling alley The parquet is 18 m long and 1 m wide. On the sides there are ditches preventing the return of the ball that fell out of the alley.	

13.2 Bowling technique - step by step

13.2.1. Bowling ball grip.

A standard 3-hole ball should be grasped by inserting the two middle fingers and thumb, the palm resting loosely on the ball surface. This is a typical trick. If the holes fit snugly, the player can throw a relatively heavy ball without having to squeeze it. There is also no fear that your fingers will get stuck in the holes.

13.2.2. Attitude.

When you're on the runway surface, you'll notice two rows of dots. The back row is 4.5 meters from the offside line, while the second row is 3.6 meters. These dots are very helpful in determining the starting position. Children or much shorter people must stand closer to the burnt lines than adults because their steps are smaller. Also for new players, a shorter run-up area is recommended. Once you gain some experience, you can choose to stay further from the offside line. Regardless of your starting distance, your final step always ends with your foot in front of the offside line.

13.2.3. Steps.

A 4-step run is recommended for new players. A fifth step can be added later. Take each step straight, firmly ahead. Only the last step, which involves gliding, should be different. During this step, the right leg comes down with the ball to touch the floor and causes the ball to slide forward. The weight then shifts back onto the foot, causing it to brake until it comes to a stop. The first step should be the shortest. The last step, as it involves a slip, should be the longest. For right-handed players, the sequence of steps is: right, left, right, left. For left-handed players the opposite is true, i.e. left, right, left, right.

13.2.4. Combining steps with projection.

Swinging the ball and steps are not difficult movements, the only problem may be their coordination. It depends on this whether the first phase of the throw is performed smoothly. The body should be in a stable position when making the throw in order to use the force of the run-up. The throw should be performed when the leg balancing the back body stops. The best time to roll is to max swing before taking the last step. From this position, the balancing leg moves to the side and we swing the ball forward. This is a good starting position for a throw.

During the first three steps, the ball reaches its maximum swing height from the rear. Then the final step is made, the ball is swung forward and it is thrown. The starting position is equally important, the ball is approximately 20-30 cm from the chest during the first step. This is the starting position for the swing and the second and third steps. Timing your steps with your swing is the key to getting a good throw. It is not an easy matter, even the best players work on this element of the throw. When trying to perfect this technique, concentrate on the first movement of the ball in relation to the steps. After performing the first step, the ball's backward swing is harmonized with the step of the balancing leg. From that moment the ball begins to move forward, the balancing leg stops at the back and finally the throw.

13.2.5. Final steps.

A certain sequence of movements is required for any type of sporting activity where a ball is hit, kicked or thrown. This is also necessary when playing bowling. A good bowler can always be recognized by the movements he makes after releasing the ball. The arm should travel up above the shoulder line without bending to the right or left. Although this does not affect the further course of the ball, this movement helps to get the maximum effect from the swing and improves the habit of running the arm parallel to the track.

13.2.6. Scoring.

The game consists of 10 rounds. At the beginning of each round, the player tries to knock over all the pins. If the attempt is successful, then the result is called "Strike" and the round is over. If there are remaining pins left after the first throw, a second throw occurs.

Knocking down all pins during the second throw is called "Spare". If after the second throw the pins are still not knocked down, then the result is the so-called "open frame" - the player scores only as many points as the pins knocked down.

13.2.7. List of important terms.

OPEN FRAME - not all pins knocked down during one round. You get as many points as you knocked down pins.

STRIKE - You knocked down all pins on the first throw. You don't throw the ball a second time. You have 10 points plus the sum of the pins knocked down on the next two throws.

SPARE - You knocked down all pins in the second throw. You have 10 points plus the number of pins knocked down for the next throw.

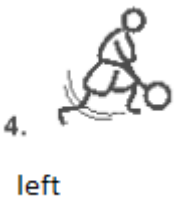
MISS - You haven't knocked any pins down. You don't get points.

SPLIT - You knocked the pins on the first throw so it will be difficult to take the others on the second throw.

FAUL - you have crossed the offside line. You don't get any point despite your pins being knocked.

The maximum number of points that can be obtained in one game is 300.

The traditional pre-throw run consists of 4 steps. The first three should be performed straight, firmly ahead.	
 1. right	**Step 1 - Pushaway** The ball is about 20-30 cm from the chest; this is the starting position for making a swing. Right-handers start with their right foot
 2. left	**Step 2 - Pendulum Swing** Do it with your left leg, then swing your arm down.
 3. right	**Step 3 - Backswing** The arm should travel backwards, below the shoulder line, without bending to the right or left. This movement helps to get the maximum effect from the performed swing and to consolidate the habit of keeping the arm parallel to the track.

	**Step 4 - Sliping Step** The last, fourth step ends with the slide of the left leg. During this step, the right foot is behind the player to his left side, touching the floor. The body should be in a stable position when making the throw in order to use the force of the run-up.

14 ACTIVE TOURISM AND HEALTH TOURISM

The word "tourism" comes from the French word "tour", also accepted by English, which means a trip or journey that ends with a return to the starting point. This is one of the characteristics of the tourism phenomenon. Contemporary tourism:

- is an element of the modern lifestyle,
- is a way of getting to know the world, nature, people, culture,
- gives the opportunity to rest, relax, regenerate strength, improve health,
- causes the economic and social development of tourist regions.

14.1 Active tourism

14.1.1 What the active tourism is?

There are many definitions of active tourism in the scientific literature. The combination of cognitive values with sports activity is the shortest and easiest way to define the term "active tourism". It is a sport, the main aim of which is to give pleasure from dynamically spent free time. Other definitions present active tourism not only as an active recreation, but primarily as the development of the body and mind and work on improving one's personality through sport and exploring the surrounding world.[6]

One of the simplest and most concise definitions of "active tourism" in the literature is the one proposed by E. Szczepanowska and P. Wasilewska. Researchers describe it as: "*Active tourism is an element of a healthy lifestyle, as well as, a nice and interesting way of spending leisure time with many health benefits. There are many forms of active tourism, so it can be*

[6] J. Merski, *Turystyka aktywna, turystyka kwalifikowana*, Wyd. DrukTur, Warszawa 1999, 3; J. Drabik, *Aktywność fizyczna w edukacji zdrowotnej społeczeństwa*, cz. 1, Akademia Wychowania Fizycznego im. Jędrzeja Śniadeckiego w Gdańsku, Gdańsk 1995, 113; B. Przysiężna, *Zdrowy styl życia*, „Wychowanie Fizyczne i Zdrowotne" 2003, nr 1, 13-19.

practiced in relation to individual preferences and fitness level. Participation in active tourism gives many health benefits for the human organism."[7]

The concept of active tourism includes individual tourism and tourism in small groups of several or a dozen or so people. Active tourism can be practiced not only in the countryside, but also in the city. An example may be a bicycle trip taking into account the most interesting architectural features of the city or a hiking trip in the green areas of the city, such as parks or the surrounding forests or primeval forests. Physical activity is a natural human need, extremely important for people of all ages. In larger cities, there are many places for people who prefer an active lifestyle. Good conditions for hiking, cycling and water tourism appear more and more often.

A healthy lifestyle allows people to avoid many diseases, and this risk is reduced through healthy eating, avoiding stress, stimulants and physical activity. Living in accordance with the principles of a healthy lifestyle means engaging in such forms of activity that also include human mental development, an excellent example of which is active tourism.

A healthy lifestyle has been greatly promoted by the media and institutions in recent years. It is more difficult for middle-aged and elderly people to change their lifestyle and get rid of bad habits that are unfavorable to health. Nevertheless, tourism can turn out to be an excellent example of a sport in which everyone, even the most demanding seniors, will find their way.

14.1.2 Health benefits of active tourism.

Physical activity as an element of a healthy lifestyle is essential for every human being, because it helps to prevent civilization diseases and is a way to get pleasure, improves well-being, and helps ensure a high quality of life for many years. In today's world, you can observe a very dangerous phenomenon, which is hypokinesia. It is a term that defines the disproportions between the increasing load on the nervous system and the simultaneous decrease in the activation of the locomotor system. Hypokinesia is considered a negative civilization phenomenon. Active tourism can help to minimize the phenomenon of hypokinesia. Practicing it reduces the tension of the nervous system, but requires proper involvement of the human motor system.[8]

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[7] E.Szczepanowska, P.Wasilewska, *Turystyka aktywna jako element zdrowego stylu życia młodzieży licealnej Szczecina*, Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu, t. 63/6, Poznań 2015.

[8] R. Szeklicki, *Aktywność fizyczna a samoocena zdrowia, sprawności fizycznej, osiągnięć sportowych oraz zadowolenie z życia u dzieci i młodzieży w Polsce*, „Wychowanie Fizyczne i Sport" 1997.

Practicing active tourism is very important for proper human development. Civilization transformations have a negative impact on the nervous system and contribute to the reduction of physical activity in the society. By adding improper nutrition, insufficient sleep a day and contamination of the environment with pollutants, we can observe the phenomenon of deteriorating health of the society. One of the ways to strengthen psychophysical efficiency is active tourism, which is a pleasant and interesting form of physical activity based on learning about the world.

Active tourism helps to prevent civilization diseases. Moreover, activity related to tourism has a positive effect on the acquisition of knowledge, positive interpersonal relations, and better behavior and social skills. What's more, involvement in tourism will allow you to develop healthy habits related to regular physical activity. Scientists note that thanks to tourism and the resulting activity, people:

- reduce addictions,
- their negative attitude towards the world decreases,
- negative emotions decrease,
- aggressive behavior decreases.[9]

14.1.3 Types of active tourism.

The basic types of active tourism are: adventure tourism, extreme tourism and qualified (specialist) tourism. Moreover, mutual relations with active tourism are also shown by sports tourism.

- "Adventure tourism" is a type of outdoor active tourism and means active leisure in the open air, which takes place in exotic, often very wild terrain. It includes both active recreation in contact with nature as well as physical challenges and education. Its main element is a journey into the unknown, exploration, dealing with unknown terrain, research and searching for "something new" (adventure). More and more often the literature emphasizes: its emotional aspect, spiritual and aesthetic experiences, as well as: insight and deepening knowledge and skills. In terms of the level of risk, a distinction is made between hard, high-risk and soft, low-risk adventure tourism. It is also worth emphasizing the subjective nature of adventure tourism. Due to the different perception of adventure, for some it will be a mountain trek in a secluded area, for others it will be rafting or

[9] W. Gaworecki, *Turystyka*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2003, 32; I. Chodorowska, *Aktywność ruchowa – wpływ na zdrowie i rozwój dzieci i młodzieży*, „Wychowanie Fizyczne i Zdrowotne" 2008, nr 2, 49-50.

ski touring. The features of adventure tourism are: the challenge of one's own skills, stimulation of senses and emotions, excitement, escapism (a form of psychological escape from everyday life), emotions. More and more often, adventure tourism is organized by professional tour operators, which is related to the fact that it does not require much psychophysical preparation. Then gains the so-called commercial form, e.g. organized guided tours, during which the main attraction is activity in the open space, providing strong emotions to the participants of the expedition.

- "Extreme tourism", like adventure tourism, means a type of outdoor active tourism, where the main motive is the element of risk and strong emotions. Some researchers also distinguish it as a type of adventure tourism. Extreme tourism means practicing extreme forms of recreation (extreme sports). It is often accompanied by physical exhaustion, as well as a high risk of losing health and even life. Therefore, risk is the most important element in this type of tourism. In the motivational structure of extreme tourism, there are also ambition motives, such as, for example, the desire to stand out, pursue one's own ambitions, individualism and the desire to raise the social status. Extreme tourism participants often experience the limits of mental and physical resilience.
- "Qualified (specialized) tourism" is the most specialized form of tourism activity. In Polish science, it is considered the highest form of tourism specialization. Its assumptions include: development of physical fitness, but also cognitive goals. The literature mentions numerous features of qualified tourism, including: conscious participation, preparation, knowledge of the use of tourist equipment, knowledge of the visited region, independence. Significant elements also seem to be the ability to behave on the trail and in tourist facilities, as well as the knowledge of safety rules in the selected field of activity. Qualified tourism can be practiced individually and in teams, in informal or organized groups, sometimes with elements of competition. Moreover, it can be practiced in the form of hiking and stationary (e.g. sailing, ski and other camps). To sum up, the complex phenomenon of qualified tourism consists of personal qualifications and qualifications related to the pursuit of higher achievements in a given field (including obtaining certificates and qualifications).

14.2 Health tourism

14.2.1 What the health tourism is?

Health tourism can be defined as the conscious and voluntary going away from home for a certain period during leisure time in order to regenerate through active physical and mental rest. M. Tabacchi's definition treats health tourism much more broadly and defines it as: any type of journey that makes the departing person or his family feel healthier.[10] On the other hand, A. Łoś in her research work concludes that health tourism can be defined as a trip organized by tourism market entities for a day or longer outside the place of residence in order to regenerate physical and mental health, correct beauty or undergo treatments and surgeries in health care facilities.[11]

14.2.2 Various aspects and forms of health tourism.

Scientists still do not agree on the exact definition and area of health tourism. It is often said that it is carried out only in spas due to their functions (healing and tourism). Moreover, the concepts of spa tourism, health tourism and medicinal tourism are often treated as one.[12] According to the aforementioned researcher, Agnieszka Łoś, health tourism includes:

- *healing tourism* - it is an activity carried out in tourist spa towns related to the provision of health treatment services, which includes the treatment of chronic diseases, rehabilitation, prophylaxis, education and health promotion. Health resorts are the areas designated for the protection and use of natural healing resources, where spa treatment is carried out.

- *spa and wellness tourism* - in this form of tourism we can distinguish offers belonging to two groups. The first group includes those whose main purpose is taking care of the body and relaxing (pampering). The most common beauty treatments include massages (dry and water), clay and herb compresses, peeling, gymnastics, gym, radiation therapy, cryotherapy, etc. The second group of offers includes tourist products whose main goal is wellness. Treatments that allow you to obtain it are, above all, various methods of fighting stress, detoxification treatments, as well as oxygen therapies, slimming treatments and meditation.

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[10] M. Tabacchi, *Sustaining tourism by managing health and sanitation conditions*, Inter-American Travel Congress, San Jose 1997.
[11] A. Łoś, *Turystyka zdrowotna - jej formy i motywy. Czynniki rozwoju turystyki medycznej w Polsce*, Zeszyty Naukowe Uniwersytetu Szczecińskiego 699 - Ekonomiczne Problemy Usług 84, 2012, 569 - 578.
[12] A. Jagusiewicz, *Funkcje turystyczne uzdrowisk polskich*, Instytut Turystyki, Warszawa 2001, 10; Z. Szamborski: *Turystyka zdrowotna uzdrowiskowa, jako istotny element odnowy sił człowieka*, Zeszyty Naukowe Instytutu Turystyki 6, Warszawa 1978, 58; E. Wysocka, *Turystyka uzdrowiskowa*, „Rocznik Dydaktyczny" 1996; Z. Krasiński, *Kondycja turystyki uzdrowiskowej w Polsce a reformy społeczne w 1999*, Rozwój usług turystycznych u progu XXI wieku, AE, Poznań 1999, 93.

- *medical tourism* in traditional medical centers (research institutes, hospitals, clinics, plastic surgery centers). It is tourism combined with treatment, understood as conscious human activity, in which the traveler (medical tourist) aims to obtain broadly understood healthcare - both in his own country and abroad - consisting primarily in maintaining (or gaining) a better condition health and / or aesthetic appearance of your body, combined with relaxation, regeneration of physical and mental strength, visiting attractions and tourist attractions, and entertainment.[13]

14.2.3 When and why is health tourism worth doing?

Health tourism is an excellent option in many cases. The following should be mentioned:

- convalescence after diseases and injuries;
- reducing the negative effects of stress;
- rejuvenating and beauty maintenance treatments (including plastic surgery);
- fighting addictions;
- a decision to improve health by undergoing specialist treatments or surgeries in conditions of relaxation and in an environment not resembling hospital conditions;
- an opportunity to take advantage of the increasingly diverse and unconventional prophylaxis offer;
- the use of treatments unavailable in the place of residence or more affordable.[14]

All videos on YouTube channel:

1. https://youtu.be/7-_F_Xlszjw
2. https://youtu.be/WfvWRj3QGU4
3. https://youtu.be/tNojXTFfT-w

[13] A. Łoś, *op.cit.*, 571 - 572.
[14] *Ibidem*, 572.

REFERENCES

1. Cwojdziński G., Łoszyk A. *Kręglarstwo. Poradnik metodyczny.* COS, Warszawa 2004.
2. Drabik J., *Aktywność fizyczna w edukacji zdrowotnej społeczeństwa*, cz. 1, Akademia Wychowania Fizycznego im. Jędrzeja Śniadeckiego w Gdańsku, Gdańsk 1995.
3. Chodorowska I., *Aktywność ruchowa – wpływ na zdrowie i rozwój dzieci i młodzieży*, „Wychowanie Fizyczne i Zdrowotne" 2008, nr 2.
4. Gaworecki W., *Turystyka*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2003.
5. Goodrich J.N., *Health Tourism: A New Positioning for Tourist Destinations*, „Journal of International Consumer Marketing" 1994, Vol. 6, No 3–4.
6. Jagusiewicz A., *Funkcje turystyczne uzdrowisk polskich*, Instytut Turystyki, Warszawa 2001.
7. Korporowicz V., *Zdrowie i jego promocja. Kształtowanie przyszłości*, SGH, Warszawa 2005.
8. Krasiński Z., *Kondycja turystyki uzdrowiskowej w Polsce a reformy społeczne w 1999*, Rozwój usług turystycznych u progu XXI wieku, AE, Poznań 1999.
9. Łęcka I., *Nowe (?) trendy w turystyce zdrowotnej*, Prace i Studia Geograficzne, t.32, Warszawa 2003.
10. Merski J., *Turystyka aktywna, turystyka kwalifikowan*a, Wyd. DrukTur, Warszawa 1999.
11. Mika M., Ptaszycka-Jackowska D., *Formy turystyki zdrowotnej*, Turystyka, red. Kurek, Wydawnictwo Naukowe PWN, Warszawa 2007.
12. Przysiężna B., *Zdrowy styl życia*, „Wychowanie Fizyczne i Zdrowotne" 2003, nr 1.
13. Szamborski Z., *Turystyka zdrowotna uzdrowiskowa, jako istotny element odnowy sił człowieka*, Zeszyty Naukowe Instytutu Turystyki 6, Warszawa 1978.
14. Szeklicki R., *Aktywność fizyczna a samoocena zdrowia, sprawności fizycznej, osiągnięć sportowych oraz zadowolenie z życia u dzieci i młodzieży w Polsce*, „Wychowanie Fizyczne i Sport" 1997.
15. Szczepanowska E., Wasilewska P., *Turystyka aktywna jako element zdrowego stylu życia młodzieży licealnej Szczecina*, Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu, t. 63/6, Poznań 2015.
16. Tabacchi M., *Sustaining tourism by managing health and sanitation conditions*, Inter-American Travel Congress, San Jose 1997.

17. Wysocka E., *Turystyka uzdrowiskowa*, „Rocznik Dydaktyczny" 1996.

WEB Resources

1. https://www.who.int
2. http://www.pzkregl.pl
3. http://pzksbs.pl
4. http://www.bocciasport.pl
5. http://polskaboccia.pl
6. https://www.fundacjaavalon.pl
7. http://bazhum.muzhp.pl/czasopismo/150/?idno=9560

15 MOVEMENT AS A PART OF THE DAY

Any movement is marvellous in that it knows no age restrictions. An old woman from the film Honeyland said, "I stopped moving, I became a tree." But even a tree has its crown, which is constantly changing, its branches, which move in the wind, the leaves which draw light, water and nutrients. And what about its roots, maybe static but crucial foundation that holds the tree no matter what happens in the area. It is interesting that with the increasing age of the tree, not only the trunk gains strength, but also its roots. Strong roots hold the tree, even if it grows crooked. Even in situations where we cannot stand on our own two feet, movement associated with the breath can represent those roots for us, as the cornerstone of life. Life is a constant movement, changeable, and that is why it is beautiful. Although we love our rituals and established mechanisms, we are not afraid to take a step towards new stimuli, changes, challenges that can enrich us.

15.1 Why is movement important for us

Energy

Do you remember when you went downhill on a sleigh, climbed a tree, or could take a deep breath while playing tag, football or Chinese jump rope with your friends? What do you remember? Apart from small friendship fights and anger from losing, do you remember happiness, a smile, joy?

Why did you enjoy it so much and couldn't stop? It is due to the surge of energy, of happiness hormones - endorphins. These are released into the body by the brain, which helps us to improve our mental health, reduce stress, and at the same time, all it needs are a few minutes of increased physical activity. If you provide this to your body regularly, exercise can also help alleviate long-term mental health problems.

Strong bones

Studies state that regular exercise reduces the risk of osteoarthritis by up to 83% and the risk of hip fracture in the old age by up to 68%.

Healthy heart

Thanks to exercise, a lot of oxygen get to the whole body, and the blood flow around the heart increases, which also helps to lower blood pressure.

15.2 Yoga for seniors

Why yoga

Nowadays, the term yoga covers several types and ways, and each teacher takes a different approach. The term "yoga" derives from the Sanskrit word yuj - yoke harnessing of draft animals. In a figurative sense, this is the name of the main principles of yoga: the all-round integration of body, spirit and breath (Larsen, 2013). But what is mutual and characteristic of all kinds of yoga is breathing, stretching, strengthening and relaxation. It is a safe and effective way to improve your overall well-being and physical health. The advantage of yoga is that you can practice it both from the comfort of your home and attend group lessons and get to know others with the same passion for doing something for themselves.

Benefits of yoga

People of all religions and faiths can benefit from yoga. Because poses can be easily adjusted or modified to suit an individual's needs, yoga is safe for seniors of all levels or abilities (https://www.greatseniorliving.com/articles/yoga-for-seniors). The benefits of yoga for seniors are almost the same as for the general population.

Many people practice yoga because they want to lose weight and shape the body, others because they want to find balance, harmony and peace in a hectic day. Most seniors no longer come to the gym, and it is not a priority for them to have muscles, but to stay in good shape, relieve chronic pain.

The benefit of yoga in senior age is that compared to other sports, where you feel more tired and exhausted after exercise, after practising yoga, you will feel good, with much more energy.

Flexibility, pain relief

Yoga supports toning, i.e. increasing muscle strength and muscles support our bones, which can also prevent possible injuries. Yoga increases flexibility and range of motion of joints; it improves body stability and balance.

Participants in research conducted by Harbor-UCLA Medical Center reported that the need for pain medication had decreased after only four weeks of daily yoga.

Improvement of the state of mind and overall well-being

Through Pranayama (breathing exercises), the capacity of lungs increases and targeted breathing significantly contributes to the management of stressful situations.

Yoga is a calming and regenerating activity developed to relax the body and mind. By focusing on breathing exercises and slow movements, yoga can help alleviate health problems

such as depression. Bel Marra Health organization reports that recent studies have concluded that yoga offers incredibly effective relief from several mental health complications. Instead of masking the symptoms, yoga acts as a counterweight to the very core of the problem and provides lasting alleviation.

Besides, a University of Illinois study found that just two minutes of daily yoga practice for two months improved cognitive decline and forgetfulness, symptoms that are considered an integral part of the ageing process.

Coping with stress

It is almost impossible to avoid stress in life. It is a natural physical and mental response to what is happening around us, from everyday responsibilities to major life-changing events. We cannot avoid stressful situations, but the way we can deal with them can have a significant impact on our body and mind. For many people, practising yoga has a profoundly calming effect. Some poses, combined with meditation and relaxation techniques, can help you establish the right state of mind, and your body can begin to release the tension you have accumulated during the day.

Sleep disorders can also result from stress. The physical demands of yoga, combined with breathing and relaxation techniques, can help you fall asleep easily and get a deep continuous sleep with a healing effect that will make you feel refreshed in the morning (https://blog.stannah.cz/zdravi/jak-celit-starnuti-jogou/).

A simple chart of happiness hormones shows and inspires how to stimulate the production of hormones other than endorphins so that you can contribute to your mental health.

Happiness hormones and how to stimulate their production	
Dopamine "reward hormone" • finishing a task • self-care • food • celebrating little victories	**Oxytocin "love hormone"** • playing with a dog • playing with a child • holding hands • hugging someone dear • appreciating someone
Serotonin • mood stabilizer" • meditation or running • sunlight • walks in nature • swimming • cycling	**Endorphine "pain relief"** • laughter • ssential oils • watching a comedy • dark chocolate • exercise

The importance of breathing

Yoga teaches you how to breathe correctly. And breath is an integral and essential part that affects many things in our body. The breathing is connected to the body, it encourages and gently leads the body to the proper posture, and a good posture affects the quality of breathing.

During the lesson, it is necessary to pay attention to the connection of breath with movement, movement with breath. It won't work right away. In some poses, we can focus our attention on the correct positioning in the pose and let the body breathe itself, gradually in an acquired and well-learnt pose we can focus more on the breathing.

The breath is like a wave on the water; it is enough to watch it, bring in more fullness and a regular rhythm.

Let us not understand the fullness of the breath as a feeling of being inflated, but as sending breath wave to every place in our body and at the same time creating a kind of pressure, the tension in the entire inner space of the body. We can perceive the fullness even with very gentle breathing. Physiological and best for the body is to inhale and exhale through the nose. Let's not look for complexity, but let the breath be consciously present every day like a good cup of coffee, without which we can no longer imagine our day.

Combining yoga with other physical activity

The performance of the cardiovascular system is reduced by lack of exercise and developed by appropriate exercise - optimal physical activity in the so-called aerobic heart rate zone. By practising yoga, we can "cleanse" the physical structure, harmonize and deepen the breath, but we do not improve the performance of the cardiovascular system. However, relaxed myofascial network and knowledge of working with breath that yoga can teach us will significantly make all aerobic activities (cycling, brisk walking, swimming, etc.) easier and optimize them (Oravcová, 2016).

15.3 How to start with yoga

The best way is just to start learning; the first time you may feel insecure. You will learn new physical positions; the instructor will introduce new terminology to you. The most important thing is to focus on yourself, your body and your breath. After some time, you will become more confident, and everything will be easier.

Good advice when you start

- A correctly performed pose

Whether you practise at home, taking benefit of a video, or in a yoga class, listen carefully to how to position yourself and how to get into the pose. It is essential to make the most of what it offers, what it brings to the body and at the same time to prevent injuries. It is ok if the lecturer touches you during the lesson and slightly adjusts you. If you don't want him to do it, watch what it looks like when it's performed right, or let yourself be guided verbally into the pose. Even a small correction can be essential.

- Stay positive

Yoga primarily works with personal experience and personal capacities; it is not necessary to compare with others. Everyone has a different movement experience and disposition, and, for example, if you lose your balance, there is nothing to be ashamed of, it is an opportunity to laugh at it and move on.

- Be yourself

Yoga is not, and does not have to be, about the maximum range of motion, but about personal well-being in the pose that makes your body good. No one else knows your body better than you. Do not hurry and do not place too great demands on yourself, listen to your body and respect as it is.

- Ask

If something is not clear to you, or you would like to know something more, do not hesitate to ask.

You can make exercise at home a pleasant everyday ritual, devote it a place and time to look forward. It is enough to exercise for 20 minutes every day, and it is more desirable than an hour once a week.

If you are not going to train only on a chair, it is advisable to buy a non-slip mat with good insulation against the cold.

Find pleasant music that won't distract you too much. Choose a few exercises that you want to practice that day, and you can repeat them several times. Don't overstretch yourself, but feel that something is happening in and with the body. Poses should be stable and comfortable. At the end of the exercise, include a short relaxation.

If you are in a good physical condition and not being treated for something serious and if you have time to attend regular lessons, then you can try all the mentioned yoga styles. If you are not sure whether yoga is right for you, talk to your doctor or yoga instructor directly. It is not recommended to practice yoga with a bulging disc or glaucoma, forward bend and inverted poses may increase intraocular pressure. You can choose what suits you best and with which lecturer you enjoy the lesson best. It is advisable to find out whether the lecturer has experience with exercises with seniors. But find out in advance if the lesson you want to attend is suitable for seniors and, if necessary, look for those designed directly for seniors. It is essential to acquaint the lecturer with your possible health restrictions such as high blood pressure, balance problems, severe back pain, etc.

In most exercise facilities where yoga is practised, all equipment is available, including a non-slip mat, yoga blocks, yoga straps, or seats and blankets for support or final relaxation. Comfortable, flexible clothing is suitable, e.g. sweatpants, leggings, shorts. A T-shirt that won't fall over your face when you bend is good. In yoga, it's nice that you don't need any shoes, people train barefoot, but you can buy non-slip socks or warmer socks and a sweatshirt if you are cold during final relaxation or in longer-lasting poses

15.4 Etiquette for group lesson exercise

Yoga should be a pleasant activity for everyone involved; people who come to practice also came to draw energy and relaxation. Yoga teaches mutual respect, and the following tips, which are specific to these lessons, may help.

- Mute the mobile phone

The studios have both lockers and, for example, other smaller lockers for small personal belongings directly in the hall. There are several options where to keep your phone or turn it off totally, so it does not disturb you or the others.

- Do not be late

Come in time so that you have the opportunity to change the clothes in peace, go to the toilet, prepare a mat and equipment.

- Respect the personal space of others

Even when there are many people in the class, respect the personal space and do not step on the mats of others. Maybe you have your favourite place that someone else has just chosen, don't stick to it and be prepared to provide space, move so that other participants have their place.

- Respect the instructor

Even if you find out that this instructor does not suit you during the lesson, do not let it out loud or stop practising. Finish the class and try someone else next time.

- Do not miss the final Savasana - relaxation pose

Do not leave until the lesson has truly finished, if you have to leave earlier, inform the instructor. But try to organize your time so that you don't have to leave sooner. This pose is a significant part of yoga lessons.

There are instructors who, instead of Czech names of poses, will use their Sanskrit (Indo-European language) ones. It is not so important to understand the names of poses, but it is necessary to consciously and correctly perform individual poses, i.e. asanas.

The term asana comes from Sanskrit and means "seat". Originally, this term referred to the place where a yogi sits. However, its most generally accepted meaning is "yoga pose" (https://www.jogin.cz/slovnik/asana/).

The individual poses are designed in such a way that the muscles do not participate in their execution. Instead of contracting the muscles, the exercises lengthen them, and the

joints and muscles are stretched without effort. In fact, it is quite common for a practitioner to feel much more energy and inner strength after several hours of practising hatha yoga than at the beginning of a session, as opposed to a sport where the practitioner feels tired and exhausted at the end.

16 WHICH YOGA TYPE TO CHOOSE

New systems, that build on yoga, change and transform it in various ways, emerge all the time. Not only to yoga, however, is related the tendency to search for some higher, perhaps more spiritual, meaning in life than the one world we live in offers (Vojtíšek, 2004).

People who practice yoga today do not usually need to know the history or origin of what they actually practice. The important thing is what the exercise does with them and why they chose yoga as an area that will fill their free time. You will still find yoga centres that stay with classical yoga and the exercises that directly originate from it.

16.1 Classical yoga

This name refers to Patanjali's teachings preserved in his "Yoga Sutras", often also called Raja Yoga. The Sanskrit text of sutras consists of less than 200 statements, which have been and continue to be accompanied by various commentaries over the centuries. Every real yoga student will sooner or later have to deal with the meaning of these brief statements.

Yoga sutras were probably written sometime during the 2nd century. The earliest commentary in Sanskrit is called Yoga-Bhâshya ("Speech on Yoga") and attributed to Vyâsa. It was written in the 5th century, and it provides profound explanations of Patanjali's often mystical statements.

Apart from a few legends, we know nothing more about the life of Patanjali or Vyâsa. That is a problem that affects most ancient yoga practitioners, but sometimes even later ones. Often the only thing left is their teachings, which is, of course, much more important than the historical facts we might find out about their personal lives.

Patanjali, who, by the way, is often wrongly called the "father of yoga," believed that each individual is composed of matter (prakriti) and spirit (purusha). He understood the yoga process as their separation, the restoration of the soul in its absolute purity. His view is, generally, characterized as philosophical dualism. That is important because most Indian philosophy systems favour some kind of non-dualism: innumerous aspects or forms of the

empirical world are ultimately recognized as one and the same thing - pure existence without form, yet conscious.

16.2 Post-classical yoga post

That is again an extensive category, which includes many types of yoga schools that started to appear in the period after the original Patanjali Yoga Sutras and which do not depend on them.

Centuries after Patanjali, the development of yoga reached an intriguing point. Some great adepts began to explore the hidden potential of their bodies. The previous generation of yogis paid no particular attention to the body. They were more interested in contemplation, during which they could consciously free themselves from the body. Their goal was to leave the world behind and merge with the formless reality, with the spirit.

Under the influence of alchemy (the spiritual forerunner of chemistry), the new yoga masters created a system of exercises designed to rejuvenate the body and prolong its life. They considered the body to be a temple of the immortal soul, and not just a container to get disposed of at the first opportunity. Through advanced yoga techniques, they were even able to find the possibility of energizing the physical body to the point where biochemical changes occur, and even the elemental components of the body undergo changes to make it immortal. This interest led them to create an early version of Hatha Yoga, a system that is practised all around the world today. It also marked the beginning of various schools of tantra, for which Hatha Yoga is only one of the possible approaches (https://www.jogin.cz/puvod-jogy/strana-2/).

16.3 Suitable yoga styles

Hatha yoga

Hatha yoga is one of the specific types of yoga; also known as Raja Yoga as the so-called royal discipline requires strong will and self-discipline. It is a system whose main components are the body poses (so-called asanas), breath control (so-called pranayama) and calming of the mind (meditation). Hatha yoga is an exercise system leading to toughness. The goal of this system is the purification of body and spirit. It is necessary that the exercise of poses, breathing and cleansing exercises is done very slowly, step by step and often. The body must not be overstretched and should not be exhausted after the practice. The first records of hatha

yoga probably date back to the 8th century BC (https://www.fyzioklinika.cz/clanky-o-zdravi/hathajoga).

Iyengar yoga

Iyengar yoga is a name for the method of teaching Hatha yoga, which focuses on the structural adjustment of the physical body by the gradual construction of an asana (pose). By regularly exercising the asana system, it strives for a balance of body, mind and soul, which helps overall health and mental well-being. This method is considered a powerful tool that helps to cope with the stress of modern life.

It is possible to define three elements that differentiate it from other methods: technique, sequence, time.

Technique means the emphasis on precise body adjustment during the practice of asanas (poses) and pranayama (breathing techniques). During the lesson, the teacher gives many detailed verbal instructions that not only help to adjust the body correctly but also lead the student to a deeper knowledge of himself. A typical element of Iyengar yoga is the use of equipment (e.g. blocks, bands, chairs, bolsters, etc.). They serve either as a second teacher and provide the student with space to explore the pose in depth, or, in the beginning, as an aid to the proper performance of the asana. The teacher also actively corrects students to bring life to those parts of the body the student has not yet reached mentally.

For the Iyengar yoga class, it is typical to follow logical sequences of poses, which is essential for several reasons. It allows the student to gradually make the body move on a mechanical and organic level. Only the right combination of asanas and breathing techniques can make full use of the potential of individual poses and bring positive benefits.

During Iyengar yoga classes, the student remains in each asana for a longer time. On the one hand, this boosts fitness, and on the other hand, a longer time will allow the student to examine which parts of the body work excessively and which, on the contrary, do not work at all (https://jogaiyengar.cz/iyengar-joga/cesta-iyengarovy-jogy/).

Restorative yoga

Restorative yoga is based on a method developed by B. K. S. Iyengar, who was one of the greatest yoga masters of this century. Many poses are similar to standard yoga asanas,

though, they are slower to perform, they last for several minutes, and use the support of aids to make your body and mind feel comfortable.

Restorative yoga originates from the English word restore, which means to heal, or restore balance. It is a type of yoga that helps to achieve physical, mental and emotional relaxation. Using aids helps to maintain balance while stimulating and relaxing the body. Some restorative poses are beneficial to the whole body, while others aim at a specific area of the body, such as the heart and lungs or hips.

B. K. S. Iyengar led his students to use aids to achieve the right pose and to achieve certain effects on the body and mind through specific body support, and his teachings became known as Iyengar yoga. Later, one of his long-time students, Judith Hanson Lasater, PhD, popularized restorative yoga. Judith says, "We work hard enough in life, and even when we sleep, we hardly ever make time for relaxation. Restorative yoga helps us learn to relax and how to relax deeply and fully."

Restorative yoga has the effect of healing the body and mind. It can be particularly helpful at a time when we need to reduce stress and fatigue that result from our fast or tense lifestyle. It can also help us recover from illness, injury, or even overcome milder emotional depression and anxiety caused by traumatic events such as divorce, job loss, or the death of a loved one.

Restorative yoga can activate the parasympathetic nervous system, which is not controlled by the will and which maintains the automatic functions of organs or blood vessels. For example, it slows down the heart, increases the digestive system activity, increases the mobility of the digestive tract, affects the respiratory process. This system is controlled by an area of the brain called the hypothalamus. It receives information about any abnormalities, such as the chemical composition of the internal environment, and ensures that the autonomic system arranges that they are adjusted. The usual will-controlled nervous system rests, and muscles and nerves can relax more. Regular practice of restorative yoga strengthens our body and makes us more resistant to stress-related illnesses.

Many poses are similar to usual yoga asanas, though, they are slower to perform, last for several minutes, and use the support of aids to make your body and mind feel comfortable. The use of aids has its rules and principles, so it doesn't matter how the body is supported, and the instructor usually seeks to achieve a certain body shape in the asana so that the

support has a beneficial effect. Practising restorative yoga is also suitable, for example, during menstruation, when the body needs to rest, and it is not desirable to push it into active strength-requiring activity.

Restorative yoga is not suitable to practice, for example, when experiencing severe apathy, inactivity, laziness or deep depression, as it can deepen this condition. In this case, more active yoga practice is appropriate to support our principle of activity, but again it depends on the specific state of the person (https://www.jogadnes.cz/joga/restorativni-joga-753/).

Yin Yoga

Yin yoga is a slow style of yoga, an exercise involving the principles of traditional Chinese medicine, with asanas (poses) that you stay in for a longer time than in other styles. Beginners can hold the asanas for 45 seconds to two minutes. More advanced practitioners can stay in one asana for five or more minutes. The pose sequences are designed to stimulate pathways in the body known as meridians in Chinese medicine and as nadis in Hatha Yoga. Yin yoga targets the connective tissues of the body – tendons, fascia and ligaments - to increase blood circulation in the joints and improve flexibility. Yin Yoga was founded in the late 1970s by martial arts expert and yoga teacher Paulie Zink (https://en.wikipedia.org/wiki/Yin_Yoga)

Therapeutic yoga

Yoga therapy is understood in different ways, but it should be individual to the client. Group lessons are always a compromise, but that doesn't mean they can't be beneficial. Usually, in these classes, you will encounter easier techniques that replace stressful poses, the use of aids without long stamina, there are fluency and balance. Movements of various dynamics are included to detach and move all types of tissues and to support internal flow.

From the beginning of the last century, the influence of Western medicine and physical education began to be more significant, so today, it is almost impossible to tell apart what is the origin of the individual elements. The very word therapy refers to a set of means of influencing a disease - that is, treatment, but it is complicated to define what exactly means that we are ill. When something hurts? When we suffer? When something in the body does not work or is not as usual?

The need for therapeutic exercise is growing unceasingly, and here "modern" yoga has a large field of activity and can offer its specific tools (Oravcová, 2016).

17 HISTORY OF YOGA

Despite more than a century of research, we do not know much about the beginnings of yoga. At least we know it came into existence in India 5,000 years or more ago. But that does not mean yoga is Indian, just as electricity and light bulbs are not Jewish, even though Edison was a Jew. We can all use this excellent system without having to be closely acquainted with the Indian culture. Until recently, some Western scholars believed that the origins of yoga date back to a much later period, around 500 BC, to the time of the Buddha (Prince Gautama), the famous founder of Buddhism. But then, in the early 1920s, archaeologists surprised the world with the discovery of the so-called Indus Civilization, a culture we now know spread over an area of about 300,000 square miles (the size of Mexico and Ohio combined). It was the largest civilization of early antiquity. In the ruins of the great cities of Mohenjo Daro and Harappa, there were depictions discovered in talc, which strongly resemble the figures of yogis. Many other findings speak of a bewildering connection between this civilization and later Hindu society and culture (http://www.jogin.cz/clanek.php?id=53).

The civilization now called the Indus-Sarasvati, (after two great rivers once flowing through northern India; nowadays there is only the Indus River which flows through Pakistan), was far from primitive society. They used multifunctional buildings, a wastewater system to which the ancient Roman one couldn't compare, or large public baths. They paved roads with regularly laid bricks and used burnt bricks where suitable (these technologies are now so common that we forget that they also had to be invented sometimes). The Indus-Sarasvati people were an influential coastal nation that exported a wide range of goods to Mesopotamia and other parts of the Middle East and Africa. Although only a few works have survived, some of them are an example of excellent skill. For a long time, scholars thought that this magnificent civilization was suddenly destroyed by invaders from the northwest who called themselves Arya (arya means "noble" in Sanskrit). Some researchers have even assumed that it was these warrior nomads who "invented" yoga, while others attribute it to the people of Indus. However, some give the merit for the emergence of yoga as mutual to both nations.

Contemporary researchers prefer a completely different picture of ancient Indian history. They conclude that the decline of the Indian cities of Sarasvati is not the result of any

raid (which, according to them, did not take place at all), but of dramatic climate change. This reversal appears to have been caused by a severe tectonic catastrophe that caused a shift in the direction of river flow. It led to the drying up of what was once the largest of India's rivers - the Sarasvati. Numerous towns and villages lay along its banks (so far 2,500 such places have been recognized). Today, the dry riverbed borders the vast Thar Desert. Without the use of satellite images, we would not have learnt about so many settlements buried under the sand. The drying up of the Sarasvati River, which finished sometime around 1900 BC had far-reaching consequences. Just imagine what a desolation it would be if the water of the Mississippi River dried up like this! The drying up of the Sarasvati River forced the population to migrate to more fertile parts of the country, especially to the east towards the Ganges River and to the south to central India and Tamil Nadu.

And why is this so important for discovering the history of yoga? The Sarasvati River became the most sacred river in Rigveda, which are the oldest known texts in the Indo-European language. They are composed of archaic (and complex) forms of Sanskrit and were passed down orally between numerous generations. Sanskrit is the language in which most yogic sacred texts are written. It belongs to a group of languages such as Greek, Latin, French, German, Spanish and last but not least English. This relationship is evident in the very word yoga, which is zugos, iugum, joug, Joch, yugo, and yoke in these languages. Sanskrit is like the older brother of other Indo-European languages. If Sarasvati dried up around 1900 BC or earlier, the Rigveda must be of the earlier date. If it is true, the authors of this collection of hymns must have been contemporaries with the people of Indus civilization, which prospered sometime between 3000 and 1900 BC. In fact, astronomical references in the Rigveda suggest that at least some of the 1,028 hymns were written in the third or even the fourth millennium BC. Then the Aryans, who spoke Sanskrit and created the Rigveda, did not come from outside of India to destroy the Indus-Sarasvati civilization. They were there the whole time.

So what was their relationship with the Indus-Sarasvati people? Opinions still differ here, but there is an idea spreading that the Aryans and the Indu-Sarasvati were the same people. There is nothing in the Rigveda that would suggest otherwise. In fact, the Rigveda and other archaic Sanskrit texts appear to be the "missing" literature of the Indus civilization. Conversely, archaeological findings from the Indus Valley and surrounding areas are the "missing" foundations of the beginnings of Sanskrit literature - both an elegant solution to a

problem that has troubled researchers for so long. That means that yoga is a product of an advanced civilization, unmatched in the ancient world. Indian civilization can be considered the oldest surviving in the world. Her current problems should not overshadow our view of her exceptional past and the teachings she gives us. Yoga practitioners can benefit mainly from India's many years of experimentation with life, especially in the area of the mysteries of the mind. Indus civilization was home to great philosophers and spiritual masters, whose knowledge covers answers to questions that are as relevant today as they were a thousand years ago (http://www.jogin.cz/clanek.php?id=53).

The history of yoga could consist of the following extensive areas: Vedic yoga, the period before classical yoga, classical yoga, the period after classical yoga. These four categories are a kind of static capture of what was, in fact, in constant motion - the march of history. The systems of yoga teachings found in the mentioned Rigveda and the other three ancient hymns are known as Vedic yoga. The Sanskrit word veda means knowledge or art, while rig means praise. Thus the Rigveda are a hymn collection to glorify a higher power. This collection is the original source of Hinduism, which currently has about a billion followers. We can say that the Rigveda are for Hinduism what the book of Genesis for Christianity is. The other three Vedic hymns are Yajur-Veda (The Art of Sacrifice), Sama-Veda (The Art of Chants) and Atharva-Veda (The Art of Atharvana).

The first contains the formulas used by the priest during the sacrifice, the second songs that accompany this ceremony. The third is full of magic formulas for all kinds of occasions, but also contains a large number of philosophical hymns. It is associated with Atharvan, the famous priest of fire, who is remembered as a master of magic rituals. These hymns can be compared to numerous books of the Old Testament. From what was said, it is clear that Vedic yoga, which could also be called archaic, was closely connected with the ritual life of the ancient Indians. It revolves around the idea of sacrifice understood as the connection of the material world with the invisible world of spirituality. Those offering the sacrifice, to be able to perform the rigorous ceremony successfully, had to be able to concentrate their minds for a long time. Such inner concentration aimed at expanding the limits of the ordinary mind is the root of yoga. If successful, the Vedic yogi was rewarded with a vision or experience of transcendent reality. The great masters of yoga were called rishi in Sanskrit. The Vedic masters

were able to know the fundamental substance of existence, and their hymns speak of their amazing divinations that can inspire us even today (http://www.jogin.cz/clanek.php?id=53).

Pre-classical yoga covers an extensive period of approximately 2000 years into the second century AD. It comes in many forms. The earliest ones were still closely connected to the Vedic culture of sacrifice as developed in the Brahmanas and Aranyakas. Brahmanas are Sanskrit texts explaining the Vedic hymns and their ritual background. Aranyakas are ritual texts dedicated to those who have decided to live the life of a hermit in solitude. Yoga found itself with the Upanishads, which are Gnostic texts explaining the hidden teachings of the fundamental unity and harmony of all things. There are more than 200 of these sacred books, although only a few of them come from before the Buddha period (5th century BC). There can be found an analogy with the New Testament, which is based on the Old Testament, but at the same time transcends it. One of the most prominent yogic sacred books is the Bhagavad-gita (Song of the God). The great social reformer Mahatma Gandhi declared about it: "When disappointments stare me in the face, and I see not one ray of hope on the horizon, I turn to Bhagavad-gita and find a verse to comfort me; and I immediately begin to smile in the midst of overwhelming sorrow. My life has been full of external tragedies, and if they have not left any visible or invisible effect on me, I owe it to the teaching of the Bhagavad-gita" (Young India, 1925, pp. 1078-79).

By its significance, this work of only 700 verses is perhaps as important to Hindus as Jesus' Sermon on the Mount for Christians. However, its mission is not to turn the other cheek but to actively oppose evil in the world. In its current form, "Gita" was written around 500 BC and since then it has been a daily inspiration for millions of Hindus. Its teaching, in a nutshell, says this: living means being active, and if we want to avoid difficulties for us and others, our actions must be harmless and must also be based on mastering the ego. It's simple, and the Bhagavad-gita teaches how to follow this in daily life. Pre-classical yoga also includes many schools, the teachings of which can be found in two Indian national epics - the Ramayana and the Mahabharata (from which the Bhagavad-gita is taken and which is seven times larger than the Iliad and the Odyssey combined). These various schools have developed all possible techniques for achieving deep meditation through which yogis can transcendent their body and mind and discover their true nature (Pospíšilová, 2010)

18 SUN SALUTATION

Before you start exercising, whether according to our guide, video or elsewhere, you will probably want to find out what kind of poses can appear in yoga. Probably the best-known sequence you may have heard of is "Sun salutation" or Surya Namaskar. It's a sequence you can learn and practice when you want to exercise, but you can't think of anything.

In Sanskrit, Surya means the Sun, and Namaskar means honour or greeting full of devotion and love. Surya Namaskar is a unique combination of yoga exercise that prepares practitioners very well for the subsequent practice of asanas and which itself also offers extensive effects. Surya Namaskar strengthens the muscles of the whole body, and it activates a harmonious breath and heart rate acceleration, without, however, leading to states of fatigue or being out of breath.

Surya Namaskar is a sequence of 12 movements that are repeated several times so that during the exercise our muscular system "retains heat", which increases the effectiveness of the practice of Hatha Yoga asanas. Sun salutation is also a great way to relax. It is faster and more dynamic than yoga poses. It can be a separate set of exercises that you can successfully use without practising hatha yoga.

Yogis in India traditionally practice this sequence at sunrise, before the asanas, as a preparatory procedure to "warm-up" the body. Of course, this is not a type of pagan sun worship, as some people might want to believe, nor a masked Hindu ritual.

How to learn Surya Namaskar easily?

The whole set consists of just six simple movements. At first, our muscles tend to be a little stiff, especially in the morning.

Some sources state that if we practice sun salutation perseveringly every day, we will notice changes directly on the physical level within six months.

In the beginning, we can first practice each step of this sequence for several days separately, which is easier for their correct performance. We do not strive for perfection from the first attempt. Sun salutation is still here for us. Time and continuous improvement will ultimately bear fruit.

Synchronization of the breath with the performed movements is essential for the proper performance of the yogic sun salutation. This synchronization, although it may seem very complicated at first glance, is actually a natural breathing tempo complemented by our movements.

In the first days of our practice, when we are not yet so familiar with the individual moves, we do not necessarily have to observe breathing when performing them (https://www.jogin.cz/joginsky-pozdrav-slunce-surja-namaskara/)

Detailed pictures, including modification with the chair, will be shown in the next manual. In this guide, we have tried to outline and illustrate what yoga is and what it can show or bring to life. If you have built up a picture of what yoga could mean for you, we are happy for it. We believe that you will find your way to yoga, whatever it may be.
The important thing is that you will fancy moving your body and enjoy it.

19 YOGA AT HOME

We want to support and motivate you to exercise every day. Sometimes it is not possible, for various reasons, to regularly visit the centres where you can practice. We, therefore, bring you inspiration and suggestions for the basic sequence, Sun salutation, in three variants. It is always better to practice the individual exercises first with an expert who will describe them precisely and tailor them to need of your body. So be listening and kind to your body, respect your current health condition every day.

It is enjoyable to make exercise a daily ritual, to exercise at regular times of the day, ideally about an hour after a meal; if you can, listen to pleasant music during the practice.

SURYA NAMASKAR – SUN SALUTATION

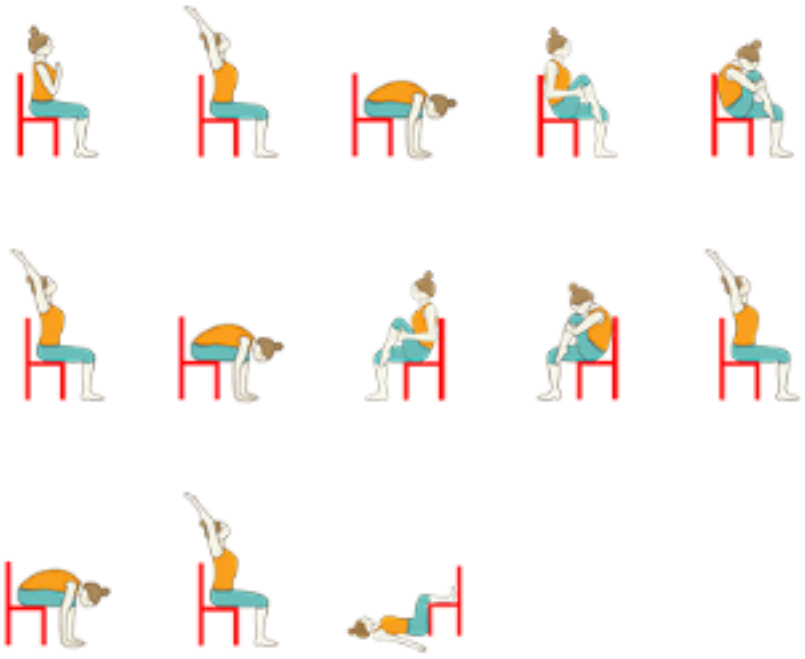
THE VARIANT USING A CHAIR

Sun salutation on a chair can help warm up the body for further exercise, whether on a chair or while standing. You can use this variant when your body does not let you stand or exercise on the ground.

BENEFITS

The benefit of this variant is that you involve the muscles of the hands and shoulders more. You will perceive the work of the neck and chest, i.e. the ribs and hips. You can practice some of the exercises wherever you don't find it strange when you feel like you've been sitting for a long time and want to stretch. If you are still active at work, somewhere in the office, then why not take a short break with the Sun salutation.

Let's start



Source: https://cz.pinterest.com/pin/532480355939594394/

1. Bring your palms together in front of your chest, about the level of your heart. Move the pelvis forwards and backwards several times to find its centre, with the prominences of the sitting bones pointing straight down. Then pull yourself lightly up from the sitting bones to the crown of your head. The nape should feel like leaning back and then pull the back of your neck upwards. Place your feet hips distance apart. Knees should point in the direction of your toes, preferably after your second and third toes.
2. With an **inhale**, the disconnected hands rise. It is enough if you can see them without tilting your head.
3. **Exhale** and fold forward as deep as you can. Put your stomach on your thighs. If that doesn't work, lean forward only halfway.

   Hold the pose for one inhale and exhale.
4. **Inhale** and take hold of your right thigh and lift it up.
5. **Exhale** and draw your forehead to the knee.

   Hold the pose for one inhale and exhale.
6. With an **inhale**, raise your arms up again.

7. **Exhale** and fold forward as deep as you can.
   Hold the pose for one inhale and exhale.
8. **Inhale** and take hold of your left thigh and lift it up.
   Exhale and draw your forehead to the knee.
   Hold the pose for one inhale and exhale.
9. With an **inhale**, raise your arms up again.
   Exhale and fold forward as deep as you can.
   Hold the pose for one inhale and exhale.
10. With an **inhale**, raise your arms up for the last time and then bring the palms together in front of your chest.

Stay here for a while, observe your heartbeat, warmth going through your body and pleasant feeling of stretching.

You can repeat the whole sequence several times. Ideally at least 5 times.

Do not rush if the sequence of poses is fast for you, slow down and breathe several times in each pose.

SURYA NAMASKAR – SUN SALUTATION

THE VARIANT STANDING IN FRONT OF A CHAIR

BENEFITS

The benefit of this variant is that you have the support of a chair, you don't have to worry about losing your balance. You will not only involve the muscles of the arms and shoulders but also the body will work with its weight, the legs will be strengthened and stretched. Here, too, the advantage is that you can exercise anywhere where there is a solid chair without wheels or the headboard.

It is advisable to place the chair against the wall so that you can be sure that it will not go anywhere if you lean against it.

In the first pose, inhale and exhale. When moving to the second pose, inhale along with the movement of your arms upwards. With an exhale, continue into the forward fold. Extend your right foot backwards with an inhale, and hold for one exhale and inhale. Fold forward and exhale, get into a plank with chair support and inhale, fold forward and exhale. Extend your

left foot backwards with an inhale and exhale, another inhale and raise your arms. Finally, exhale and bring your palms together in front of the chest.

Source: https://cz.pinterest.com

OTHER VARIANTS OF EXERCISE WHEN SITTING ON A CHAIR

Source: https://cz.pinterest.com

SUN SALUTATION SITTING ON A MAT

There are several variants of Sun salutation. We will introduce one of the creative variants, for which you only need a mat and it is possible to practice it again as a part of our, for example, morning ritual, when we don't want to stand on our feet yet.

We start and finish in a child's pose.

If you have more sensitive knees, place a blanket or towel under your knees. It will be more pleasant and gentle on your knees.

1. Child's pose - Balasana

Child's pose or Balasana - "I release myself from all external bonds and enter the inner harbour of peace." This relaxed position restores body balance and harmony.

How to do it

Sit on your heels. The insteps are stretching back; knees are together. If you feel great tension in the insteps, roll up the towel and place it under the ankles. With the exhale, pull the body forward, the movement coming from the pelvis. The heart area should lie on the thighs. Rest your head on the mat; it is good to put your forehead on a yoga pad or a book so that there is no tension in your neck. It is also possible to place the forehead on joined fists put on top of each other. The hands are along the body, the palms upwards, the fingers slightly bent. Relax your elbows. Release all tension in the neck area. Relax your hips. The eyes are closed.

If you cannot fully sit on your heels, help yourself by placing a pillow or blanket between your calves and thighs. Breathe into the whole body, do not forget to breathe into the back, up into the ceiling. In the position of the child, we massage the organs in the abdominal cavity. Mild pressure on the legs, feet and abdomen helps eliminate fatigue in the lower half of the body.

2. Diamond pose - sitting on the heels

How to do it

From the child's pose, lift yourself with an inhale and sit on your heels. You are in a diamond pose. Feel the length of your spine. The crown of the head points upwards. We lean the back of the neck backwards.

3. Camel pose - Ustrasana

"I open myself to your light in silent faith."

How to do it

Through the **kneeling position**, we get to the camel pose. The inhale lifts us to our knees. We will learn a simpler variant. Otherwise, it is a position that moves the shoulders, opens the chest, improves the flexibility of the hips.

On your knees, tuck your toes under, your heels up. The knees and feet are hips distance apart; the body is upright. Place your hands on the sacrum, the large bone under the flexion of the hips. Push into the sacrum with your palms downwards; you want to pull the spine

downwards, the hips do not bend, the lower rib curves are pulled into the pelvis. The abdomen gently supports the spine. From the knees, push gently upwards, thus increasing the tension on the front of the thighs, the groin opens, the pubic bone pointing in front of you. Keep your body position, transfer your hands to your waist, thumbs pointing backwards, elbows pulling us to the sides.

Light up the collarbones. Eyes are looking up. Breathe in the camel pose, be patient and tolerate the restrictions of your body. We start with the pose and will not go deep into it.

4. Pose with fists at the knees

How to do it

This pose stretches the neck and shoulders. It restores the lost balance, calms.

From the position of the camel, clench our fists and place them as close to our knees as possible. We round the back in the area of the shoulder blades, where we also inhale, the head approaches the chest. Let's breathe in the pose for a while.

5. Plank pose - Kumbhakasana with knees on the ground

How to do it

The position strengthens the arms and wrists, as well as the abdominal muscles. The upper part of the back expands, the area between the shoulder blades is oxygenated.

Kneel on all fours. Palms shoulder-width apart, hands slightly in front of shoulder level. Shift the weight forward on your hands, leave your knees on the ground, chest (breasts), press into the shoulder blades to feel the skin tighten between the shoulder blades and the upper back widens. The elbow pits point between the first and second fingers. The cervical spine is elongated, the face facing the mat.

6. Low plank position - Chaturanga dandasana (four-limber staff pose)

How to do it

The position exercises the arms, wrists, shoulders and strengthens the abdomen. From a knee position, bend your arms at the elbows at a right angle. Move your chest forward, the nose is approaching the floor and is about 30 cm in front of your fingertips. Just bend your elbows a few inches, and you don't need to go much down, but only deep enough to keep your elbows at your chest. The elbows must not point away from the body, and the abdomen must not break into the mat. You look like a sloping board, a plank.

7. Downward facing dog pose - Adho mukha svanasana

How to do it

This position really resembles a stretching dog. It exercises the spine, hamstrings and shoulders. The upside-down position supports blood flow to the head.

We move to the pose of the downward facing dog with an exhale, by pulling ourselves out of the low-plank pose into the cat pose and pulling the tailbone upwards out of the cat, the knees remain bent.

The feet are the hips distance apart. The weight in the palms is not only at the ends, but large finger joints also carry it; a little more weight is in the space between the thumb and the index finger. Below the centre of the palms, there remains a bit of space. The elbow pits point more at each other, turn the triceps outwards, the forearms inwards.

Turn the hips and sitting bones upwards, pull the ribs into the pelvis. The spine is nicely straightened. The crown of the head points downwards, eyes looking at the stomach, the back of the neck and neck remains lengthened. Gently pull your chin into your neck.

8. Child's pose - Balasana / see 1.

How to do it

Sit back in the starting child's pose, in which we will calm the flowing energy in the body.

SET OF EXERCISES ON THE MAT

Another set is a sequence of exercises on a mat, which includes bending forward for basic spinal stretching, bending backwards to strengthen the centre of the body and back, a bow to deflect the spine from the anteroposterior position and movement stereotype, and rotation to release tension in the spine.

We will describe the individual exercises here, but if you are afraid that you will not do them correctly without professional supervision, follow your own body. Do not push yourself into them, try to imitate them as much as possible, and it is perfectly fine if you do not feel pain, but just a pleasant tension.

Stay at least five breaths in each pose so that the body can deeply relax and the pose can bear fruit.

Let's start

Seated forward bend - Paschimottanasana

How to do it

Take a sitting position on the mat, your legs are straight in front of the body. Put a folded blanket under the bottom, so that the hips get higher and the forward bend can come from the pelvis, not from the neck and spine. Put another rolled-up blanket or towel under your knees.

Inhale and draw your spine up long from the sitting bones to the crown of the head. Hands or fingertips touch the pad at the pelvic level.

Tilt the pelvis forward and shift the weight to the front of the sitting bones. Another inhale draws your arms towards your ears and lean forward with an exhale, pulling your lower abdomen slightly towards your spine.

Stretch your arms along your feet or rest your fingertips on your knees or blocks. Elbows should be bent, trapeziuses relaxed.

Do not lower the thoracic spine; leave it open so that breath can flow better.

Aim the eyes at the toes.

Counter pose - Reverse table top pose - Ardha Purvottanasana

The backbands warm up the body, increase energy and provide encouragement. They improve the flexibility of the spine and strengthen the weak muscles of the back. The backbands provide balance to all-day forward bends. At the same time, they open the chest, allowing better breathing and expansion of the heart centre.

How to do it

Bend your knees while sitting on a mat, your feet are pelvis distance apart.

Place your hands back behind the pelvis more than shoulder distance apart, fingers pointing forward.

Rest your feet and hands, and lift your pelvis off the ground so that it is parallel with the floor.

Transfer the weight on the palms and fingers, not just the root of the palm. The elbows are slightly bent.

The chest opens upwards, and your body evokes the position of a table top.

The head does not tilt, look upwards, try to keep the feeling of a long neck.

Side angle head to knee pose - Parsva janu sirsana (parsva = side, janu = knee, sirsa = head)

Stretching to the side exercises a stiff back and restores the body's lost flexibility. It brings the possibility of opening, expanding the ribs and quality breathing to the side.

How to do it:

Sit on the mat, support your bottom again with a blanket or pillow, bend your right knee, point the foot to the inner thigh.

A bent knee should not be in the air; if this is the case and it is not lying on the ground, support it with a yoga pad, pillow or blanket so that the knee can rest comfortably.

Point the knee of the extended leg upwards, leave it flexible, as well as point the toes at the ceiling as if you were standing on the floor. The heel gently pushes into the mat.

From the sitting bones, pull upwards to the crown of the head, point your left hip over your left thigh and begin to bend.

The left hand lies on the knee of the flexed leg; the right hand goes above and besides the head, the body is slightly tilted and you should have a feeling of long spine and back of the

neck, the torso does not exceed the level of the stretched leg, it is a stretch to the side, and you do not want to feel crouched.

Both sitting bones remain in contact with the mat.

Repeat the same stretch on the other side.

Twist - Marichyasana (Marichi = sage, according to Indian mythology the son of Brahma = Marichi's pose)

This position opens the hips, relieves back pain, massages internal organs.

How to do it

Return from the side stretch position. Bend your right knee and place the foot as close to your bottom as possible. It should be in line with the sitting bone; a hand width should be between the two legs. The knee of the bent leg points upwards.

Place the fingertips of your right hand on the block or the ground behind your right sitting bone.

With an inhale, bring the left hand up, straighten the spine, then turn the left side of the chest to the right knee and hug the knee with your hand or grab it with the palm. Keep the head in the axis of the spine; the chin should be in the axis of the chest bone. Inhale and with your exhale push your right breast against the shoulder blade. All you have to do is breathe in this way, and the rotation will gradually come on its own. Do not push too much; do not force your head turn back. Just look with the eyes to the back. The muscles of the body make the twist, not the arms or the head.

Keep your shoulders apart; do not pull them to your ears, keep the feeling the wide-open collarbones.

Repeat the same twist on the other side.

SPORT

Part I.: https://youtu.be/NzPcfkSb4Oc
Part II.: https://youtu.be/zFuGw4-NYCI
Part III.: https://youtu.be/ZXA_TvxMRa0

References

Larsen, Christina et al. (2013). *Medical Yoga*. Olomouc: Poznání.

Oravcová, Lenka (2016). *Principy zdravého pohybu.* Olomouc: Poznání.

Pospíšilová, Markéta (2010). *Analýza účinnosti jógových programů pro seniory v ČOS*. České Budějovice: Jihočeská univerzita v Českých Budějovicích.

Web sources

https://www.greatseniorliving.com/articles/yoga-for-seniors
https://blog.stannah.cz/zdravi/jak-celit-starnuti-jogou/
https://www.facebook.com/terapie.jmk
https://www.jogin.cz/slovnik/asana/
https://www.jogin.cz/puvod-jogy/strana-2/
https://www.fyzioklinika.cz/clanky-o-zdravi/hathajoga
https://jogaiyengar.cz/iyengar-joga/cesta-iyengarovy-jogy/
https://www.jogadnes.cz/joga/restorativni-joga-753/
https://en.wikipedia.org/wiki/Yin_Yoga
http://www.jogin.cz/clanek.php?id=53
https://www.jogadnes.cz/joga/restorativni-joga-753/
http://www.jogin.cz/clanek.php?id=53
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