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Training Manual

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1. Introduction

The Training Manual you are reading was created during the **PACE project** and is intended for sports trainers, lecturers, community workers and other adult education professionals who want to provide a professional **training course for older people aged 50+ to improve their psychological and physical wellbeing.**

It is aimed at equipping trainers with **scientific knowledge and important background information**, but mainly with **a step-by-step guide to conducting a sport and physical activity course.**

During the PACE project, five partners from six European countries created a set of physical activities (**adapted physical activity, Zumba, Nordic Walking and athletics**)

As a trainer, you can choose one of the physical to meet the needs and requirements of your target group. The model programme created and tested in PACE consists of a **6 months course, with 2 lessons per week.**

More information can be found on the project website at www.pace.uispsettincirje.eu where you can also find the contacts of the PACE Project team.

2. The science behind the PACE Project

Aging is a natural process in life, a consequence of time in systems designed for a limited life span. In humans, aging is a process with a loss of function, loss of adaptability, and finally death. During life span are inevitable some physiological changes in human body. A great increase in the human life span has been achieved in the last century, as a consequence of some behavioral and environmental changes. As a consequence, there is a great increase in physiological changes produced by aging in our actual societies.

The most evident changes with aging are physical changes. During aging, there are a great number of physiological changes that will lead our bodies to a loss of physical performance and fitness. This impairment on physical fitness leads to common mobility limitations in elderly, and frequent dependent states. We can group the different changes in three great areas: the loss of strength, the loss of endurance, and the loss of mobility.

Regarding strength, there are many physiological processes that underlies this loss, the most evident is sarcopenia that means, the loss of muscle mass. The European consensus on definition and diagnosis of sarcopenia include three criteria to identify sarcopenia: low muscle strength, low muscle quantity or quality, and low physical performance. Some physiological processes are the cause for these loss of quantity and quality in muscle mass. With aging, there is a fast-to-slow fiber type shift associated with changes in motor neurons. In muscle fiber, there is a reduction in excitation-contraction coupling, reducing the calcium flow, and affecting the muscle quality. The reduction in mitochondrial content of muscle fiber with aging is another cause for a lesser functionality in muscle, impairing the muscle energy intake. Looking at the whole muscle, there is an increase in intermuscular adipose tissue-related to a reduction in strength and functionality in older people.

Many molecular changes explain the reduction on muscle quality and quantity, as aging has an impact in fundamental molecules related to muscle health. The reduction in testosterone and growth hormone reduces the possibility of hypertrophy and muscular regeneration. In addition, there is also a reduction in insulin-like growth factors related to proliferation, differentiation, and fusion of muscle satellite cells, the stem cells precursors of muscle mass. Moreover, myogenic regulatory factors (MRF), involved in the growth and development of muscle cells, do not respond to exercise in older people as they do in young people.

All this tissue and molecular changes in muscle go with a group of neural changes also related to muscle functionality. For example, there is a reduction in axon diameter of motor neurons with age. That implies a reduction in firing speed and a reduction in excitability of muscle fibers. This axonal reduction is accompanied by a significant reduction in motor neurons, and its consequent reduction of motor units, producing the atrophy of muscle denervated fibers.

Related to endurance loss with aging, it is evident the reduction in oxygen uptake with aging. There are a number of physiological causes for this reduction in performance, like the reduction of maximal heart rate with aging, changes in right ventricular diastolic function during exercise, lesser number of capillaries perfusing

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the lungs. The increased stiffness of the vascular system increases systolic and diastolic pressure during exercise, increasing heart afterload and, reducing volume stroke during exercise. The already mentioned reduction in mitochondria with aging implies the reduction in muscle fibers to use oxygen to produce ATP, with the consequent reduction in arteriovenous difference O₂, and the reduction in oxygen consumption.

Finally, aging has an impact on neuromotor response, with coordination difficult, increased variability of movements respect young, slow movements, and problems with balance and gait. As a consequence, older people present a high number of falls than young people.

To compensate for this entire decline, physical exercise has proven to be the most efficient treatment. Many studies have shown that resistance training can reduce strength decline, with improvements in muscle mass, and also improvements in motor unit recruitment, and motor unit firing rates. These improvements are related to intensity, with greater improvements with higher intensities, and with contraction velocity, where power exercise shows great improvements in strength and health-related conditions. Strength training has also a positive impact on functionality and other health variables.

Besides, aerobic exercise training, based on cycling, walking, or similar repetitive endurance activities improves oxidative capacity and redox status, improving heart conditions, reducing metabolic syndrome, and high arterial pressure. Moreover, exercise can reduce the risk of falls, reducing disability risk, improving gait and walking speed, and functionality.

Also, exercise shows the potential to improve psychological variables like quality of life, cognitive function and well-being. Self-efficacy and self-esteem also are affected by exercise training. It seems that aerobic training and moderate intensity is the most beneficial combination to improve well-being.

The PACE project pilot intervention aimed was to prove the different exercise programs proposed by the different European groups. As an efficiency measure, some physical and well-being variables were measured during the pilot study. This article presents the results of the program respect the improvements in physical and well-being measures.

1. Material and Methods

Participants:

Participants were distributed in two groups in each country, one younger group selected by the rank age 50-65 years (YG; n = 79, 30 males and 49 females; Age = 58.39 ± 5.89 years), and the older group, selected by the rank age 65-75 years (OG; n = 53, 24 males and 29 females; Age = 69.34 ± 3.44).

All participants were selected in each country. There were participants from four countries for the YG, and participants from three countries for the OG. The participants signed informed consent to participate in the project. They were selected with two criteria, aged more than 50 years old, and do not present a medical inconvenient to do physical exercise. The experiment was approved by the Ethics Committee of the authors' university.

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Exercise programs:

All the participants, in each country, complete a six months program based on two days of physical exercise. Three of the four different countries distribute these six months in two periods of three months of training, with a period of two months of holidays in the middle of the program. One country organizes the six months program as a continuous program. These differences have been taken into account in the statistical analysis. All the programs have the objective to improve the endurance of participants, and also their strength. All the information about the programs is in the PACE Project Memory. As a synopsis, younger participants (50-65 years) complete endurance activities, like running, Nordic walking or Zumba. The older group, complete activities of less intensity, like adapted gymnastics, fitness exercises, and stretching and walking activities.

Fitness and Well-being measurements:

Different fitness measurements were used to measure physical fitness in both groups (YG and OG). Both groups used a Strength Grip test for arm strength, and one stand up test to measure leg strength. To measure endurance, the YG group used the Rockport walking test, a mile walking test to estimate oxygen consumption. Old group use the Six minutes' walk test, more adapted for their capacities. Finally, the OG also did Time Up and Go test, as a measure of agility and gait. Weight was also registered, and participants complete one Vitality test to measure well-being.

All evaluators of each country were trained together in one of the project meetings. And all the evaluators had videos and documentations about the protocols.

1. Strength Grip Test

Each country used its own strength grip dynamometer for the test. Subjects were placed stand, with 90 degrees of elbow flexion, and with the strength grip dynamometer adapted to their hand. They did their maximum strength during 3 seconds with right and left hand, and repeat three times with each hand alternatively. The medium of all six tests was used as a result.

2. Stand Up Test

The participant was placed in a chair without arms. Both hands crossed over their shoulders. They were asked to stand up and sit down in the chair as many times as they could in 30 seconds. The evaluator counts how many repetitions they did. This test was presented exactly equal to in Senior Fitness Test.

3. Rockport Walking Test

Rockport Walking Test is a demonstrated indirect test to measure oxygen consumption. Subjects must walk one mile in a constant speed, and must register their heart rate and time spent to complete the distance. With this information, the age, sex, and weight of the participant, we can estimate the VO₂. Oxygen consumption is presented related to body weight, in ml/gamin.

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4. Six minutes' walk test.

In the Six minutes' walk test, participants must walk for six minutes, as fast as they can, and they can stop to rest during the test. The test is developed around a rectangular field of 50 yards. The total distance done in the six minutes is registered. The test was done with the exact specifications of the Senior Fitness Test.

5. Timed Up and Go test

The participants are seated in a chair. In front of them, separated eight feet distance, there is a mark. When the evaluator speaks the start signal, the participant must stand up, walk around the mark, and come back to sit down again in the chair. The time placed to complete the test is registered. The test is done twice, and the best time is used as a result. The test has been done following the instructions of the Senior Fitness Test.

6. Subjective Vitality

To measure well-being, it was used the Subjective Vitality Questionnaire. The questionnaire has 7 items about personal feelings related to vitality. Is rated on a Likert-type scale (1 to 7).

7. Weight

All participants were weighed at the beginning and at the end of the program. In each country was used a different weight, but each participant was weighted in the same instrument both times.

Statistical Analysis.

All data are presented as median and standard deviation. Paired T-Test was used for each test to analyze the impact of the exercise program on the different dimensions of fitness and well-being. Statistical significance was marked as $p < 0.05$. The effect size of the treatment was calculated by d of Cohen [26,27]. 95% Confidence Interval of the Difference (CI) is presented Effect sizes are reported as small (≤ 0.20), medium (≤ 0.50), or large (≤ 0.80). To analyze the possible interaction in results of different country groups, or analyze possible differences between six months of continuous training against two blocks of three months training with a middle rest. Two 2x2 ANOVA was done, first of them, with the variables MOMENT (Pre vs Post) and Program (Continuous vs. Blocks). The other compared MOMENT and. Country (4 different countries)

2. Results

In the YG, we can observe a significative improvement in leg strength (Stand Up Test), Well-being (Subjective Vitality), and a small but significant loose of weight. No changes were observed in arm strength, neither in oxygen consumption.

3. Discussion

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This study shows a positive impact of the different programs used in old people, with an interesting difference that must be discussed. First of all, it can be seen that exercise programs proposed produce better improvements in the older group. The older group, aged 69.34 ± 3.44 years old, presents significant improvements in all the fitness and well-being variables. There is only a lack of improvement in weight, but weight is dependent on more variables than only physical exercise, for example, caloric consumption. However, the amount of improvement in the physical variables of the older group is not too big. The effect sizes of the change show small changes for all the variables, excepting vitality, which presents a medium effect size. That means the programs produced an improvement in fitness, but a small improvement. The small changes in strength are probably due to the small amount of resistance training and small intensity because resistance training usually has bigger improvements in strength in old people. And as we know, the intensity is relevant variable respects the strength improvements.

Regarding endurance, other studies have shown important improvements in oxygen consumption for 6 months and one-year exercise training. We used an adapted endurance test (six-minute walk test) to measure this fitness dimension in the older group, to be sure they could do it despite their functional limitations, this test correlates with oxygen consumption. Anyway, the improvements are small and maybe are related with a small intensity of exercise program.

However, despite the small improvements in fitness, subjective vitality, as a measure of well-being, increased to a moderate degree. We are already knowing that well-being is improved with physical exercise, and is not only related to fitness, but also with a social activity, self-esteem...

Respect the younger group, aged 58.39 ± 5.89 years, this group is larger, and more heterogeneous, as we can see in the larger standard deviations for the strength grip and stand up tests. In this younger group, the exercise program shows lesser improvements in physical fitness, with only changes in leg strength and with a small effect size. The strength improvements are clearly lower than usual improvements with recommended resistance training. Moreover, oxygen consumption neither improves as usual it can change with aerobic training. It is clear that exercise programs were designed with a lack of intensity and/or volume for the younger and more fitness participants.

At least, subjective vitality of this group increases with large effect size, probably not as a response of fitness changes, and maybe more related to social and personal aspects of well-being, related to the social activity and self-esteem.

4. Conclusion

In conclusion, the PACE program seems to present different alternatives to do exercise with older people, which can show the professionals new practice possibilities, in a safe manner. These programs seem enough to produce some improvements in the fitness of the older elders, and probably need more individualized intensities and volumes for the younger elders. In

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both cases, these programs present the capacity to improve well-being in older adults, and this is really good because all the starting programs have the most important aim to increase adherence and prevalence to practice and adherence is strongly related to well-being.

Future Projects will need to study how to increase volume and intensity, and how to individualize the training stimulus, to obtain the greatest improvements in fitness.

Cit from the official PACE Project Article

EFFECT OF SIX MONTHS EXERCISE TRAINING IN OLDER ADULTS. THE RESULTS OF THE ERASMUS PLUS PACE PROJECT.

Carbonell-Hernández, L., Ballester-Ferrer J.A., Cervelló E., Pastor D. Department of Sport Science. Miguel Hernández University

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3. Safety Principles for Physical Activities of Seniors

This Manual is designed for people who already have experience of working with seniors. We assume that they know some general rules regarding the safety and adequacy of the training. It is important to pay attention to the gradual increase of strain and to the regularity of exercise.

Below is a list of basic safety rules which you should adjust to the actual age of the people you are working with and to the type of activities.

Basic Rules for Seniors

1. Consult a doctor first
2. Inform the instructor about your state of health
3. Exercise calmly according to your disposition and emphasize proper movement management and breathing
4. Be aware of the movement of the body and try to perceive your feelings
5. Exercises should be pleasant and painless for you
6. Repeat each exercise at least 4 times (6–8 times is best) and respect your subjective feelings
7. Relax when feeling discomfort or tiredness
8. Avoid exercise which is not recommended for seniors (abrupt alternation of positions, jumping, fast movements, trunk bends, etc.)

Basic Rules for Instructors

1. Enquire about seniors' age and state of health; if necessary, request a medical certificate
2. Keep brief records of members of your group
3. You should have expertise of remedial exercises and physical activities for the handicapped (i.e. medical restrictions, possible health problems, illnesses), if working with this group
4. You should have basic knowledge of the physiological and psychological changes of the ageing organism
5. Try to incorporate exercise in the morning routine, from 09:00 to 10:00 (seniors are alert, with a taste for self-realization, grandchildren are at school or kindergarten)
6. Try to assemble a group of seniors with similar health problems or handicaps
7. If doing training with a heterogeneous group, prepare in advance and choose a combination of exercises suitable for everyone
8. Learn about exercise modifications related to seniors' state of health and their physical abilities

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9. Introduce new exercises gradually; repeat and fix rigorous ones more often
10. Teach the right technique where both exercise and breathing are consistent
11. Speak loudly and plainly enough to comment on particular exercises appropriately (explain the importance of exercise, its impact on the organism, motivate the seniors)
12. Have respect for individual abilities – everyone should exercise according to his/her abilities and skills
13. Organize training sessions, from the simple to the complicated
14. Use your knowledge from the area of psychology – about motivation, encouragement and approval, concentration
15. Be patient in explaining and showing the exercises several times
16. Select appropriate music – it is important for trainees' emotional experience
17. Be in a positive mood even if having a rough day
18. Emphasize a holistic lifestyle; motivate seniors towards the harmonious interconnection of both physical and mental activities, and to have a positive attitude to themselves, nature and life
19. If necessary, be able to administer First Aid

Activities to Avoid during Seniors' Exercise

1. Sudden changes of movement and position
2. Complicated exercises of coordination
3. Vaults, hops, jumps, drops
4. Swings
5. Head bows with rotary motion
6. Trunk bends, head-down positions
7. Strenuous movement games involving speed and prowess
8. Apparatus gymnastics
9. Isometric exercises involving holding the breath
10. Spinal exercises, when there is suspicion of a slipped disc
11. Fast pace and inappropriate rhythm of music

4. Nordic Walking

Nordic Walking is a very pleasant type of exercise that anyone can do – a beginner or a good athlete, a young person or a person of advanced age. The heart rate during normal exercise moves into an area where one feels good, despite the fact that energy consumption is very high. The performance during the lesson is required from 600 muscles in the human body, representing nearly 90 % of all the muscles in the body. Nordic Walking is spoken of as a new health sport. Walking with the stick's changes muscle tension and blood circulation. It has a positive influence on headaches caused by sedentary work. To improve overall health and fitness, 30 minutes of Nordic Walking is sufficient. Nordic Walking is also a social sport where communication is possible (while walking) and therefore it is very popular with seniors. Regular Nordic Walking exercise (meaning walking 1–2 times a week) significantly helps to improve fitness and health

1. *Health Factors of Nordic Walking*

During Nordic Walking, up to 90 % of the muscles of the whole body, (including auditory and pulmonary) are involved and strengthened. Blood circulation improves, blood oxygenation and metabolism occur.

Involvement of the muscles, joints and other important organs of the human body in Nordic Walking training contributes to enhancing the physical fitness of seniors.

While walking, the following joints move:

- Shoulder joints
- Lumbosacral joints
- Hip and ankle joints

The pelvis is rotated – Lumbar spine load??

While walking, the entire skeletomuscular system moves, which is divided into muscles. Both groups of muscles are developed.

- a. postulate – muscles keeping the figure together
- b. kinetic – muscles responsible for flexion and extension (motion)

In the upper body, there is movement in the following major muscle groups:

Upper back

- Abdominal (straight abdominal and oblique abdominal muscles)

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- Trapezoid (shoulders)
- Deltoid muscles (arms)
- Biceps and triceps
- Forearm muscles

In **the lower part of the body** there is movement especially in the following muscle groups:

- Flexors
- Large calf muscles
- Training steps (load)

Training during a Nordic Walking lesson should be adjusted according to the heart rate, i.e. by the number of heart beats per minute. Depending on the heart rate, the personal training intensity is optimised without unnecessary overload symptoms.

- Resting heart rate frequency – indicates the number of heart beats per minute during total rest (e.g. in the morning after waking). Generally, the lower the frequency, the better the state of health.
- Training heart rate – counts the number of beats per minute during training. It is stated in % and is derived from the individual's maximum heart rate (see Heart Rate Zones).
- Maximum heart rate – indicates the maximum heart rate per minute that the heart is theoretically able to achieve. It is essentially used only for the training of professional Athletes.

The ideal heart rate can be adjusted individually, according to the target of the training, the place of training, the age of the training participants and their physical condition. The heart rate is measured by a heart-rate monitor – a special device placed on the body.

2. Nordic Walking Heart Rate Zones

Target of training	Heart rate zone	Heart area target	Target group
Start basic training	Beginning zone	40 – 50 % MHR	Beginners
Training for fat burning, building endurance performance	Fat burning area	50 – 60 % MHR	Beginners, overweight
Training for fat burning, stabilisation of endurance performance and improvement of performance level	Health zone	60 – 70 % MHR	Intermediate
Further increase in performance and enhancement of the circulatory system	Heart circulation	70 – 85 % MHR	Intermediate, advanced

3. Exercise Unit Contents

The training unit must be divided into several basic phases:

- Warming up the body – this can be a normal walk without the need to walk with sticks (especially for beginner groups)
- Warm-up, stretching
- Walking instruction (for beginner groups)
- The walk itself, in which the load must be adapted to the current health status of participants
- Walking breaks, games, discussions
- At the end of the lesson, stretching again

4. Walking Technique with Sticks

The technique of walking with poles is basically simple. The step is important and the heel goes down. The step is longer for Nordic Walking, and it should be done with the foot on the heel and the natural movement of the foot to the toes and at the same time a slight knee-bend.

The pole is held at a right angle and helps keep the body in the right position while walking.

The elbows move straight along the hull. While walking, the right leg alternates with the left hand and vice versa. The sides and shoulders are held in one plane; alternatively, the upper part of the body can be leaning slightly forwards.



The body is slightly inclined, the sight is directed towards the horizon. The shoulders are pushed down and back.

The movement of the hand begins behind the body. The elbow is propped up. After the tap, the hand is bent at a right angle and the step continues forwards. Then the hand returns again.

At the moment of stretching the hand behind the body, the palm is open.

Push dynamically off the back leg.

Stick the pole in approximately at the level of the forefoot.

5. *Warm-Up and Final Stretching*

The importance of stretching and warm-up is indispensable; they should be performed before each exercise and for a long enough time, even if this part of the walk is not very popular with the seniors. A proper warm-up will make the body work on the load and will heat it up. Due to proper stretching of the muscles, the risk of injury (muscle stretching or tearing) is minimal.

During exercise, we activate the muscular system and let the muscles go into "operating" temperature; we prepare them for sports performance.

It is not important whether the warm-up is done from head to foot or vice versa. It is important that at least the ankles, knees, hips, and shoulders are addressed, in order to stretch the hands and cervical spine.

Individual exercises should be performed for a minimum of 5 repetitions (for each limb). At the end of each lesson, it is advisable to perform stretching of all the muscles.

The sport load causes the muscles to be shortened, so it is necessary to stretch them after training. The muscles relax quickly and maintain their flexibility. Stretching is also important due to subsequent better regeneration.

6. *Equipment*

Several things are important for Nordic Walking:

- **Sports shoes** – should be comfortable and good quality with a free (open) ankle. The shoe should have a slightly dropped heel and a firm tip. It is not recommended to walk in ankle boots or in high-heeled shoes.
- **Poles** – The length of the stick should be $0.68 \times$ height of the figure, which usually corresponds to a straight-faced heel with which the arms and forearms should be at right angles to the body. The Nordic Walking Instructor should be able to help select and adjust the poles.
- Clothes should be of a sporting type (in winter, similar to cross-country skiing); you should be able to move freely in the clothes.



7. Hygienic Principles

One of the important duties of instructors is to alert participants to the suitability or inappropriateness of their clothing, such as an impermeable sweater in the summer and inadequate clothing in the winter. Furthermore, it is necessary to wear clothing in which there is the ability to move naturally.

It is important to emphasise the need for adherence to the proper drinking regime and for a rest immediately after a meal.

8. Nordic Walking and Seniors

In lessons for seniors, care should be taken to keep them up-to-date and to adjust the pace of lessons to their needs. In addition, seniors need to be repeatedly informed about the need to adhere to the drinking regime, the need to eat small snacks (diabetics), and the need to carry the necessary medication with them.

If respecting the principles mentioned above, Nordic Walking is clearly one of the most ideal sports for the senior generation.

As **Med. Dr. Josef Štolf**, Head of the Department of General Medicine at the Institute of Postgraduate Education in Healthcare at Charles University (Czech Rep.), states: *“With regard to seniors, exercise and adequate movement (not a day-consuming exercise at all costs) help reduce morbidity and allow seniors to remain active for a long time. Positive response to regular walking can be observed related to cardiovascular diseases, type 2 diabetes mellitus, osteoporosis, arthritis, urinary problems, cancer, obesity and others. Exercise works as an anti-depressant, extends the possibilities of social contact, improves the learning ability, especially short-term memory, affects sleep quality. For these reasons, Nordic Walking can be strongly recommended as a physical activity for the elderly.*

9. Conclusions

Nordic Walking benefits in the following ways:

- Helps control weight, prevents diabetes and some types of cancer – e.g. colon
- Reduces high blood pressure and cholesterol levels
- Reduces the risk of heart disease and heart attack
- Improves bone density and helps prevent osteoporosis
- Helps to reduce anxiety, creating a feeling of euphoria
- Contributes to better oxygenation of the brain, improves memory
- Increases creativity and ability to solve problems
- Involves 90 % of muscles in the body
- Relieves muscle tension in the back and shoulder muscles
- Significantly increases the mobility of the spine
- It saves joints and knees and reduces the burden of overweight people
- Increases body calorie consumption more by walking with a pole than normal walking by an average of 20 .

Nordic Walking is a very pleasant type of exercise that everyone can do – a beginner or a performance athlete, a young person or a person of advanced age. The heart rate is at a normal load in the area in which one feels good, even though the energy consumption is very high. Performance during the lesson is required from 600 muscles in the human body, representing nearly 90 % of all muscles in the body.

5. Zumba

1. Introduction

Zumba is an amazing program inspired by Latin rhythms which combines dance and fitness. Was created by Colombian dancer and choreographer Alberto "Beto" Perez in the 1990s. and now is one of the most popular workout classes in the world, reaches 10 million people in more than 110 countries. Zumba is a total body cardio and fun aerobic activity that mixes in simple dance moves performed to the music which comes from the following dance styles: salsa, merengue, rumba, reggaeton, tango, samba, cumbia, hip-hop. There are different types of classes depending on age or needs: Zumba Step, Zumba Toning, Aqua Zumba, Zumba for kids or Zumba Gold dedicated for seniors. The classes are taught by special instructor licensed by Zumba Fitness, LLC.

As an innovative form of fitness zumba is also interval training which means that the alternating sequences (fast and slow) can help improve cardiovascular fitness and therefore physical condition. Zumba dancing may help you also lose weight because burns calories so quickly- an average of 400 calories in 60 minute classes.

Zumba is an excellent form of physical activity for beginners and advanced so you don't have to worry about special skills because this training is for everyone who loves to dance.

2. Benefits of Zumba:

- improved condition of your heart
- increased mobility, muscular strength and endurance
- improved balance and coordination
- strengthens the muscles and bones
- improves metabolism
- burns calories
- release endorphins and reduce stress

3. Tips

It's really important to feel good on classes that's why before you start:

- consult your doctor if you have a medical condition
- if there are any mobility restrictions instructor can modified moves
- start out with one or two classes per week
- eat something light before your class
- get the right and comfortable clothing
- wear comfortable sporting shoes
- drink water between and after lesson

4. Zumba classes

Zumba classes take place in groups in the hall or in the fresh air- when is warm outside. Dance is based on enjoyable choreography. Steps used during training are easy to learn and to remember because songs are formed by cyclically repeating parts. Each time we hear chorus in a verse we make usually the same sequences of movements but the difference is during the verse.

Zumba can also be exercised at home. All you need is a little space and access to the Internet. On the websites you will find many dance inspirations, examples of choreography that you can easily match to your dance predispositions. However it is worth to learn the basic steps first and that will make the entire choreography not that difficult.

The whole zumba workout consists of three parts.

➤ **Warming up**

Before exercise is important because decreases risk of injury and the body is better prepared to make an effort.

Warm up usually takes about 10-15 minutes and is integral part of whole classes. There are a lot of ideas to make this section interesting, sometimes each parts of the body are warmed up to the well- known songs to basic steps and sometimes there are mix of movements which are used in next part.

➤ **Main part**

Takes about 20-30 minutes and is based on the choreographies created by instructor to the rhythm of Latin and international music. In this part the each song is a separate zumba routine and the basic zumba steps are interspersed e.g. march, squats, jumping with combinations engaging others part of the body (adding hands or hip rotation).

➤ **Cool down**

After workout is essential part and can last for 5-10 minutes. Few simple exercises with proper technique can allow heart rate and breathing to return to normal. Cool down is also time to stretch all the muscles used during the workout to avoid injury and keep them flexible.

5. Proposal of movements:

1. Warm up	Description
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<ul style="list-style-type: none"> • march in slow and high tempo • arm circulation • 6x step touch • 4 x knee up • hip circulation • 8x step out • 4x knee Up • 4x grapevine • 3x V step • double step • 4x grepevine • March 	<p>-back straight and stomach in. Change speed slowly</p> <p>-alternately right and left arm</p> <p>-stepping side to side while keeping hands on hips and relaxed shoulders. Back straight without twisting or rotating your body.</p> <p>- put your right leg aside then lift your knee to the side (single move). Do the same other leg</p> <p>- put your right leg aside then accent the left leg in place. Do the same other leg</p> <p>-put your right leg aside then lift your knee to the side. (single and double). Do the same other leg</p> <p>- cross step- step to the side, cross your leg from behind,, step to the side and put legs together</p> <p>- step in shape „V”</p> <p>- double step touch to the side</p>
<p>2. Main part (basic movements)</p>	<p style="text-align: center;">Description</p>
<p style="text-align: center;">Salsa</p>	<p>Stand upright with both feet together.</p> <p>Step out with one leg to the right and back to the middle.</p> <p>Step out with one leg to the left and back to the middle.</p> <p>Shift your weight side to side.</p> <p>Relax your arms.</p> <p>Move your hips.</p> <p>Rock your body and do this move faster.</p>

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<p>Merengue</p>	<p>Stand upright with both feet together.</p> <p>March- stomp with your left foot and stomp with the right foot.</p> <p>Move your opposite arm with opposite knee.</p> <p>Rock your body and do this move faster.</p>
<p>Reggaeton</p>	<p>Stand upright with both feet together.</p> <p>Alternately bend knees.</p> <p>Interchange feet and drop arms side to side.</p> <p>Arms are pointing towards the floor.</p> <p>Do this move faster: single-single and double. Work with your shoulders during moves.</p>
<p>Cumbia</p>	<p>Stand upright with both feet together.</p> <p>Put your right heel into the floor and back.</p> <p>Put your left heel into the floor and back. Rock your body and do it faster.</p> <p>Two step to the side -put your arms on your hips and rock back and forward with one leg moving to the side crossing front leg with the leg behind. Change side.</p>
<p>3. Cool down</p>	<p>Description</p>
<ul style="list-style-type: none"> • stand upright with feet slightly apart breath in • 4x step touch and wave your arms • double step • 4x step out 	<p>-(hands up) breath out (hands down)</p> <p>-relax your arms (slow tempo)</p> <p>- double step touch to the side (slow tempo)</p>

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<ul style="list-style-type: none">• head rotation• hip rotation on right and left side• stretching the right and left side• 3x breath in and out• bring your legs together and stand on tiptoe• stretch the hamstring both legs• 3x breath in and out	<ul style="list-style-type: none">- put your right leg aside then accent the left leg in place (slow tempo)-to the right and left-both feet on the floor-one arm over the head and change side-stand with feet slightly apart- hands up and reach for the sky- put one leg forward - shift your weight to the supporting leg
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6. Adapted Physical Activity

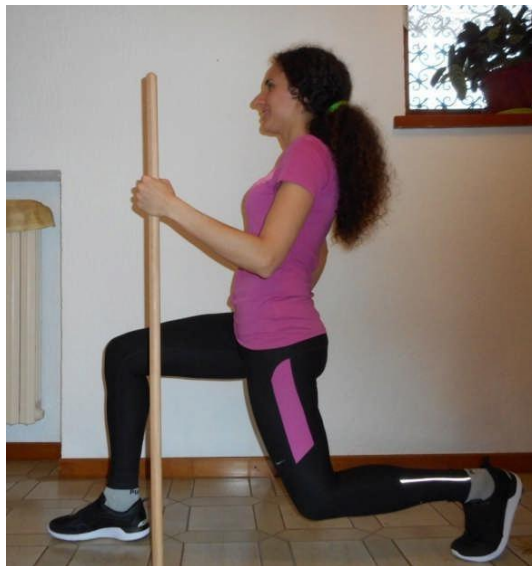
1. Introduction

Adapted Physical Activity (Attività Fisica Adattata), known as AFA, is a group gym programme to alleviate a sedentary lifestyle and to maintain a good health status. Exercises are meant for subjects with painful illnesses caused by hypomobility (backache, gonalgia, coxalgia) and chronic diseases consequent from cerebral ictus and Parkinson's. The activity is not a substitute for rehabilitative intervention, though a change of lifestyle can really help prevent the onset of new menomation and disabilities (secondary and tertiary) caused by a sedentary lifestyle.

AFA can be described as an individualised activity practised in homogeneous groups. Work groups (15–20 people) are characterised by the involvement of subjects with homogeneous psychophysical conditions regarding each pathology. The purpose of the exercises is the same as a gentle gym course: regaining mobility of joints, increase of flexibility, muscular strength and resistance, respiratory and cardiovascular system improvement, etc. AFA exercises differ from others in the gradual nature of the amount of work, the adaptation to the pathology and its development, and the attention to any contraindications or specific needs of the subject. AFA provides aerobic exercises with no load (no weights are used), avoiding any jumps or detachment from the ground, which may cause consequences on already compromised joints and structures.

One of the important goals of AFA is also aggregation, which promotes socialisation between the members of the group, which is fundamental to guarantee a good psychophysical health status.

2. *Examples of exercises*



Floor exercise: Exercise 1

After performing a short warm-up, march to music on site (about one minute). Participants get ready to start the 30-minute lesson that concludes with 15 minutes of stretching exercises. Participants are arranged in multiple lines and follow the movements of the instructor that take place in front of them. Each exercise lasts for about 20 repetitions. There will be cool-down breaks, but the motor action will not be interrupted.

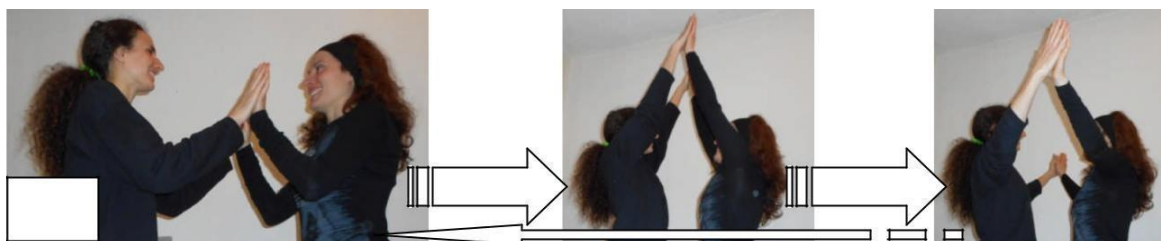
WORKING EXAMPLE: a dynamic series of thrusts and counter thrusts of arms

Participants rapidly group into couples (of similar heights). One in front of the other, staying in neat rows, they reach the hands of the partner. The legs are slightly bent and spread apart, feet parallel for the legs to follow the movement of the upper limbs through light bounces. They perform these actions following the instructor's commands, avoiding exceeding the speed or amplitude of the movements, considering their needs and limits, and those of the partner:

1. Make large circular movements, as for the bicycle exercise. The movement must involve the shoulders and thoracic outlet. 20 times forwards and 20 in reverse.
2. Generate alternate thrusts (right and left) with forearms parallel to the ground. Action must reach the shoulder blades and upper back. 20 repetitions.

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3. Make circles on the frontal plane, matching hands inside-high-off-low, like cleaning a mirror. The gesture must involve shoulder blades and back. 10 repetitions.



Floor exercise: Exercise 2

WORKING EXAMPLE: series of leg push-ups alternating with forward kicks - down and back in the buttocks

Legs are bent at a suitable angle for the articulatory capacity of each person; those suffering from hip or knee arthrosis reach an angle of not less than 90 °, while subjects in a better physical condition can squat, keeping the back straight and bringing the pelvis in anteversion, legs apart, feet parallel and knees in line with the latter. Simultaneously, the upper limbs follow the flexing, bending at right angles towards the forehead, closing the fists. Neck and shoulders remain relaxed. Returning upright, a lower limb moves forward, such as to realise a low height kick as the arms extend back with clenched fists. Proceed to do the same with the contralateral limb, alternate after each bend. Perform 10 repetitions.

After that, the movement after the bending changes, realising a buttock kick, is trying to reach up to the corresponding side with the heel. People who can not fully flex the knee must ensure to bring the joint in line with the torso and perpendicular to the floor. They perform 10 repetitions: 5 with the right leg and 5 with the contralateral leg.



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Sticks EXERCISE 1

WORKING EXAMPLE: series of extensions and bending arms, crossing the sticks

Rapidly group into couples (of similar heights). One in front of the other, the participants remain in rows. Hold the stick parallel to the ground, with the palm facing the front. At the beginning, the legs are bent and spread apart, with the feet parallel, for the legs to follow the movement of the upper limbs with light bounces. Return to the erect position, extending the lower limbs like the upper ones, to have one edge of the stick against the other, forming an X with the partner's stick. Proceed to return to the former position, bending the upper and lower limbs. Repeat the motor gesture, changing the direction of the hands, bringing the edge of the stick which was upwards, down, and vice versa. The exercise involves the shoulders and upper back.

Perform 20 repetitions.

Do not exaggerate the speed and range of the motion, and be careful not to accidentally hit the partner's hands with the stick.



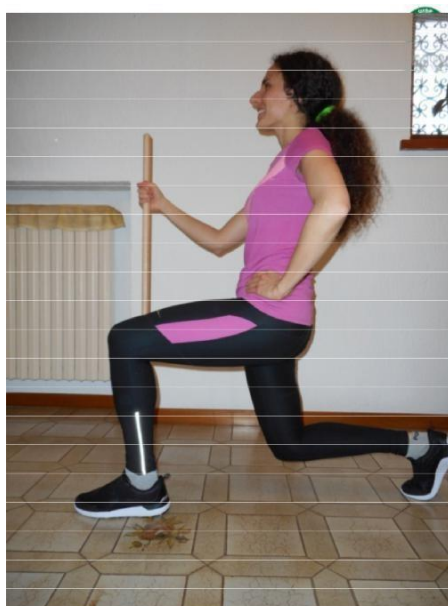
Sticks: Exercise 2

WORKING EXAMPLE: series of lunges with stick

Hold the stick perpendicular to the floor with one hand. Use the tool as a support in the execution of the motor task. When the instructor commands it, bring forward the lower limb – the opposite one to the hand holding the stick – and carry out a series of lunges from that position. The legs are bent at 90 ° angles: the advanced limb will have the leg perpendicular to the ground (be sure to keep the foot forwards compared to the knee, avoiding such an overloading of the articulation). The front leg has to be parallel to the floor, while the knee of the rear leg is perpendicular to the ground (slightly detached from the ground). Stand on the forefoot. The upper limb next to which the stick is held, will also be bent at 90 °, while the other arm rests on the hip. After the lunge is completed, return to the upright posture, keeping the feet in the same position.

Proceed to carry out a series of lunges for 10 repetitions. Repeat the motor action, holding the stick with the other hand and advancing the lower limb which was previously the rear support.

Perform the same movements up to a total of another series of 10 repetitions of lunges.

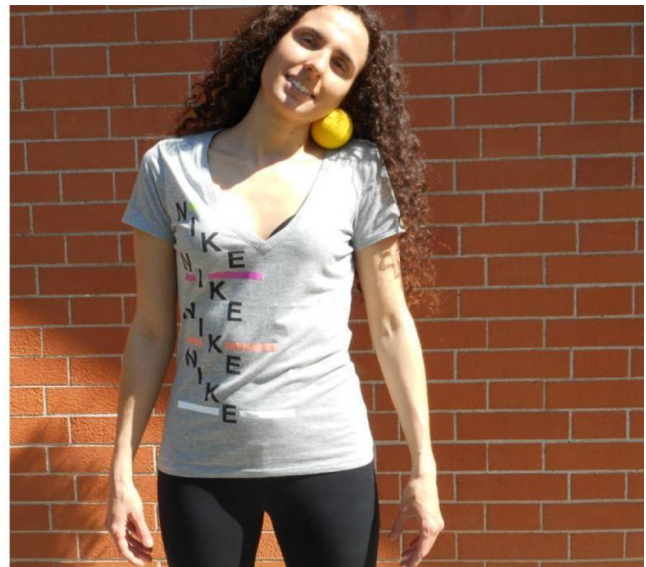


Soft Balls: Exercise 1

WORKING EXAMPLE: series of shoulder elevations towards the ear compressing the ball

Place the sponge ball between the trapezius muscle of the shoulder, the head inclined in the direction of the latter. At the instructor's command, compress the soft ball, bringing the shoulder towards the ipsilateral ear, so as to crush the sponge ball between the two structures. The back is upright and the arms outstretched; remaining relaxed at the sides of the torso. The legs are slightly bent and spread apart, feet parallel in such a way as to follow the upper limbs' tasks with light bounces. After performing 10 compressions of the ball, change shoulders and reverse the inclination of the head to realise another 10 compressions on the opposite side. The exercise involves the muscles of the shoulders, neck and shoulder blades.

Do not to exaggerate the speed of execution or the amplitude of movement and be particularly careful with the cervical spine, since it is an extremely sensitive region.



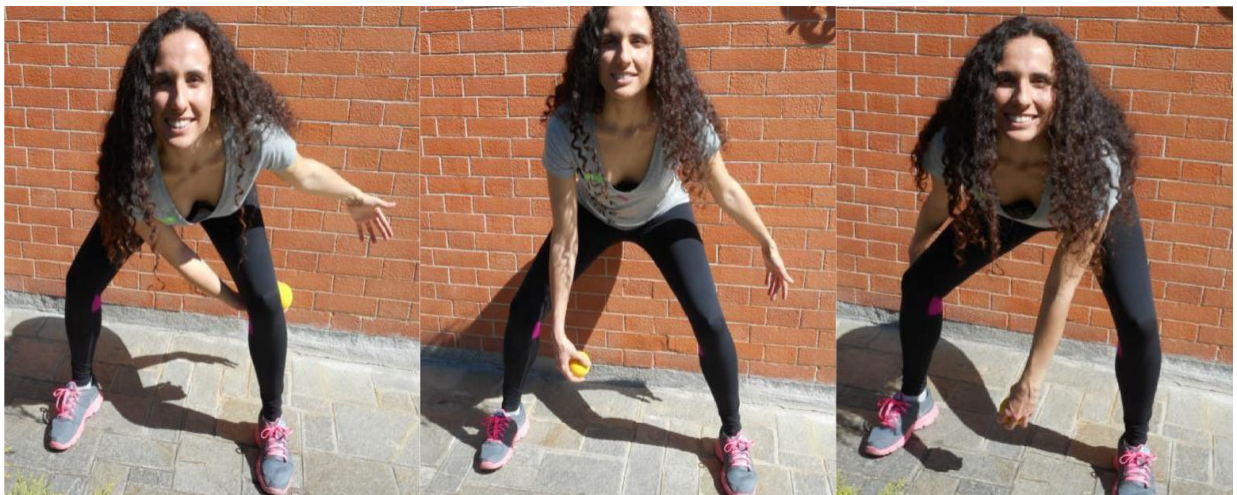
Soft Balls: Exercise 2

WORKING EXAMPLE: passing the soft ball to form the shape of an “8” between spread legs

Bend and spread the legs, keeping the feet parallel and follow the actions of the hands with light bounces. Make sure to have the back straight and the pelvis slightly in anteversion. Grasp the soft sponge ball and pass it from side to side, forwards and behind the knees, not touching them, shaping an “8” between the lower limbs. The arms are freely extended and accompanying the gestures of the hands, that pass the ball from right to left, from front to back and from outside to inside. Keep neck and shoulders relaxed.

Carry out 10 series in one direction and the same number in the opposite direction.

The exercise involves the muscles of the upper and lower limbs, and improves eye-hand coordination.



Chairs: Exercise 1

WORKING EXAMPLE: series of manual handling of loads with chair

Stand behind the chair. Get the body close to the object, spread and bend the legs carefully, bringing the knees to the outside and the feet parallel. Bring the pelvis in anteversion so to push out the buttocks. Maintain the spine upright, the shoulders low and relax the cervical spine. Look ahead to the horizon. From this position, trying to maintain the object as close as possible to the body, lift the chair from the base and extend the legs. Lift the object from the ground, but by acting exclusively with the lower limbs. End the exercise in reverse: put the chair back on the ground, bending the lower limbs and with the back straight.

Repeat 5–8 times.

This motor action involves almost the whole body, so avoid exaggerating the speed or the amplitude of the movement, and be extremely careful with the joints involved.



Chairs: Exercise 2

WORKING EXAMPLE: series of speeding of legs in the sitting position

Sit on a straight-backed chair, legs bent at 90 degrees and arms relaxed at the bust. At the instructor's command, spread the right leg and then the left one alternately to the rhythm of music. After reaching the maximum opening, return to the starting position, bringing the right leg closer to the body and then the contralateral one. Repeat the movement 10 times. After that, reverse the opening round, starting the movement with the left leg, followed by the right. Repeat this movement 10 times too.

This motor exercise involves the lower limbs. Do not to exaggerate the speed and range of motion and be extremely careful with the joints.



Mat: Exercise 1

WORKING EXAMPLE: cycling in pairs on the mat

Divide into pairs quickly (of similar height) and put the mat close to your partner's, at the wide part. Sit on the mat longitudinally, with the legs bent and feet flat on the floor, in front of the partner. Lie on your back on the floor, arms relaxed next to the hips. Lay the head on the mat and bring the chin in retraction, taking care to keep the position for the entire duration of the exercise (a subject with accentuated kyphosis should get a pillow to put under the head to support it). So as not to strain the spine overly, be really close to the partner. From this position, touch the soles of the feet of the partner and perform circular movements with the legs, as if riding a bicycle.

Perform 10 circular movements forwards and 10 backwards.

This particular motor action involves the lower limbs and abdominal muscles. It is recommended not to exaggerate the speed or range of the motion, not to get overly tired, and to respect your own needs and those of your partner.



Mat: Exercise 2

WORKING EXAMPLE: series of antero-posterior displacements with buttocks on the mat

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Sit lengthwise on the mat with legs stretched and back straight. Not using the hands, make small steps forward in succession by moving one buttock and the other, contracting the oblique abdominal muscle and lifting, one after the other, the hips off the ground. The legs follow the movement, slightly flexing, but not contributing much to the motor action. Move the arms, which have to be flexed, to counteract the buttock action. When the right buttock goes forward, bring forward the left arm to compensate the movement, and vice versa. Upon reaching the edge of the mat, perform the reverse movement to return to the starting point, bringing one buttock behind the other and going back on the mat in the opposite direction. Perform three to four moves back and forth, for a total of six to eight repetitions. This particular motor task involves the arms and legs, abdominals, back and buttocks.

It is recommended not to exaggerate the speed or amplitude of the execution and not to get excessively tired.



7. Fitness & Mobility – How to practice it at home

Fitness Activities for seniors

1. *Introduction and short history of fitness*

Physical fitness is a state of health and well-being and, more specifically, the ability to perform aspects of sports, occupations and daily activities¹. According to the Centers for Disease Control and Prevention (CDC), physical fitness is defined as 'the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies'. Based on this definition, fitness involves everything from getting out of bed to strength or high intensity interval training².

The beginning of fitness should be combined with the invention and dissemination of basic forms of recreational gymnastics, which was aerobics. The cradle of aerobics is the United States. Dr Kenneth Cooper, who was a member of the US National Aeronautics Agency (NASA), is considered to be the inventor of this form of exercise. He developed in fitness programs for American astronauts. Numerous studies have been conducted on thousands of people that allowed him to create aerobics or fitness assumptions. While the author of the exercise method bearing the common name "aerobics" was the aforementioned Cooper, the symbol of gymnastic exercises performed to the rhythm of music was his compatriot, popular actress Jane Fonda. Enchanted by aerobics, she opened her fitness club - FONDA'S STUDIO in Los Angeles. By appearing on television, publishing books and video cassettes, she caused millions of people to learn about aerobic exercise.

Generally speaking, fitness consists of many exercises that develop muscle strength and endurance. What is more, they also develop the ability to maintain balance, proprioception, i.e. conscious feeling of body position or flexibility. To be more specific fitness contains of:

¹ https://en.wikipedia.org/wiki/Physical_fitness

² <https://study.com/academy/lesson/what-is-fitness-definition-components-types-examples.html>
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- **Cardiorespiratory endurance** - how long or fast a person can perform an activity and how this impacts measurements such as heart rate and oxygen consumption.
- **Muscular endurance** - how many repetitions of an exercise a person can perform.
- **Muscular strength** - how much weight can be moved in relation to repetitions.
- **Muscular power** - how much force can be generated during a given activity.
- **Flexibility** - how far a muscle group can be stretched or joint can be moved.
- **Balance** - how long a particular position can be held with or without some type of activity being performed.
- **Speed** - how quickly an individual can move from one point to another.

2. The impact on our health

Physical activity such as fitness, mobility and a proper diet are three basic factors that are responsible for maintaining health and proper physical, mental and social development. Exercise causes **muscle fibers to develop and become thicker** (increase in muscle mass), more durable (muscle strength increases) and resistant to fatigue. Movement also promotes **mineralization**, increase in bone density (the layer of compacted matter increases, the amount of organic substances and mineral salts, changes the arrangement of bone beams), making them stronger and less susceptible to mechanical injuries. Due to physical activity such as fitness, **the circulatory system is also more efficient**. Increases blood supply to organs and improves the supply of cells with oxygen and nutrients, improves the system of receiving unnecessary and harmful metabolism products. Movement **mobilizes the immune system**, which is why people practicing sports get sick less often, have milder illness and recover better. Regular fitness and mobility activities **accelerate the burning of fat reserves**, helps fight unnecessary kilograms, maintains a healthy body weight, but above all, systematic exercises of moderate intensity **reduce the risk of many civilization diseases, such as diabetes, hypertension, obesity, heart attack or even depression and senile dementia**.

3. What is necessary for the training or what you need during the training?

- Proper clothes like tracksuits or leggings, cotton t-shirt, socks and comfortable sport shoes.



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- Bottle of water
- Chair or table
- Sports mat
- Dumbbells or small bottles of water
- In the gym you may use TRX, Step, Box etc.

4. Why is movement so important for older people?

The movement is primarily to enable and facilitate daily activities. Therefore, older people should focus on:

- functional training,
- strength training,

which first of all will strengthen their muscles, improve the range of motion in the joints, but also strengthen the bones and have all positive impact on mental and physical health mentioned above. Thanks to this, seniors will be able to cope with everyday situations such as shopping and taking them up the stairs to the apartment for several floors, cleaning the apartment, tying shoes or even in extreme cases rising from the floor in the event of a fall.

5. How should the proper fitness lesson look like?

The whole training should last around **30-60 minutes** (containing warm up, mobility, main exercises and stretching, the time depends on the health ability of senior). Before the basic exercises, you need to do a **warm-up**, which raises body temperature, making the muscles elastic, and thus less susceptible to injury during exercise.

The warm-up can last from 10 min to 15 min. It contains cardio parts and mobility.

The form of warm-up can be different depending on the conditions of the place you or your senior are. If you are doing the training in the gym you may use fitness machines as followed:

- walking on the treadmill (uphill or on a flat surface),
- elliptical cross trainer (perfectly protects the joints against strong contact with the ground as it occurs when running),



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- rowing machine (strengthens and warms up the back and shoulders),
- stepper or stationary bike (for older people I recommend a horizontal bike, because it has a comfortable back support and it is much easier for a senior to get on such a bike than a vertical one).

Remember that the warm-up session prepare the whole body to the main exercises so you or your senior should not be exhausted after this. You may check whether the heart rate during the warm-up or main exercises is good by telemetry bands or hand sensors on the machines. During exercise, the pulse increases, but it should not be too high.

Maximum exercise heart rate (HRmax) is the limit that should not be exceeded during intense workouts. The exercise pulse can be calculated using the following formula:

$$\text{HRmax} = 220 - \text{age.}$$

So as an example if you are a 65 years old person, your HR max is 155. Remember that you should focus on your inner feelings and if you feel dizzy or just not good you should slow down and have a rest.

At home or in the fitness room, it is good to start a warm-up in the Joint-by-Joint concept, which means that you are warming up all parts of body depending on what joint is it and giving them proper work.

- Ankle joint needs more mobility
- Knee joint needs more stability
- Hip joint needs more mobility
- Lumbar spine needs more stability
- Thoracic spine needs more mobility
- Scapulothoracic joint needs more stability
- Glenohumeral joint needs more mobility

Warm-up exercises at home:



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- **Neck movement** (neck turns to the right, left side), half-circle from shoulder to shoulder (important - we do not do full circulation in particular, do not tilt the head back too much so that there is no pressure on the nerves - older people often faint in such situations - as an example, hanging curtains causes such pressure on the nerves and it dangerous for older people)
- **Arms circulation**
- **Opening chest and rounding back**
- **Hip circulation**
- **Standing calf raise** (keep your ankle joint stable so that it doesn't move sideways)
- **Raising one leg bent at the knee** (builds balance, strengthens deep muscles, teaches motor coordination)
- **Circling your feet while standing on one leg**
- **Rolling the spine** (roll down, roll up - relaxes and makes the spine more elastic, extends intervertebral spaces)
- **Hip mobility in lunge position**
- **Chest mobility in lunge position**
- **March**

6. Main exercises - will improve body functions

What will improve the health of seniors is primarily strength training (resistance) based on functional movements, unilateral exercises, i.e. involving one limb, tissue mobilization - i.e. increasing joint mobility, making tissues more elastic, but also cardio training for improving the work of the cardiovascular system.

The main parts should last around 20-35 minutes.

Examples of exercises:

- **Squats** (it's best to start with seniors from the version of "sitting on the bench / chair, so as to secure them at the hardest moment of sitting, or getting up) as the senior copes well, you can go with him/her to the squat on TRX (hands hold the handles for the stability) or for ordinary squats with a body weight or low external load

- **Dead lifts** (if there are no hernias, discopathy) will teach the senior how to lift something from the ground
- **Lunges** (preferably leaning against a wall, chair or holding TRX) - will strengthen the muscles of the legs, buttocks; if the senior is doing well, you can try to take a step, but this requires good body coordination
- **Glute Bridge** (raise your hips while lying on the floor) - a very important exercise for seniors who usually have weakened buttocks and thus back pain; the exercise is performed on bent legs, tense stomach, shoulder blades stuck to the floor. We raise our buttocks to the full extension of the hips and lower. (it will also be important to work at the right pace and isometric work, i.e. maintaining constant muscle tension, e.g. raising your hips, holding for 3s. or longer high and then lowering)
- **Side or Back Leg Lifts**
- **Pilates swimming** (kneeling supported and raising, e.g. one arm forward or to the side / raising straight legs in the knee alone / or a combination of exercises: the opposite arm and the opposite leg) this exercise will great strengthen the deep abdominal muscles, back and build body balance
- **Table Position** (starting position is supported knee - the knees are under the hips, hands under the shoulders; the senior lifts his knees above the mat and holds several seconds) will strengthen the muscles of the legs, arms and stomach.
- **Plank** (in the easy version the senior holds the position of the supported kneel and extends the knees a little further - beyond the hip line; tightens the stomach and buttocks), the more difficult version can lift the knees above the mat
- **Back rises lying on the stomach** (Lie on your stomach, place your elbows at shoulder height. Tightening your buttocks and pressing the hip bones into the mat, lift the top of the back and lower it)

- **Leg lifts lying on the stomach** (we lie on the stomach, we put our hands under the forehead, legs straight in the knees, we start the movement by pressing the hip spikes into the mat and then raise one leg until the buttock tension)
- **Swimming lying on the floor** (position as above, but straighten your arms in the elbows and stretch out in front of you, the head is slightly raised, but we do not mess the chin - we lengthen the spine; we raise our right hand and left leg to tighten the buttock at the same time, then the other side)
- **Rolling the spine while sitting** (something a'la sit up, but we do it controlling the vertebrae after the vertebrae) we sit on the mat, the knees are bent, round the back and we begin to put the vertebral column vertebrae (vertebra, chest, neck and head, and then vice versa) Firstly, we tear off the head, cage and loins. If it is too hard, let senior grab under thighs, it will be easier.)
- **Shoulder lifts (lift side and front) while sitting on a chair / bench**
- **Biceps Curl / Arm Extension** (rather avoid working on triceps overhead - here the danger may be hypertension)
- **Pushups** against the wall or on a platform under your arms

What to avoid during the exercises?

Seniors should not do HIIT type of training (high intensity interval training). They should not exercise too quickly, with high intensity or with heavy loads. Remember to check the heart rate during the training session as explained above in the warm-up explanation. If you do not have the telemetry bands you may check just while having a talk with senior. During the exercises your senior should be able to talk with just a small pant. What is crucial try to do all exercises with some things to balance the body just to make the training as safe as possible. It may be TRX, box or grip to hold during the training. Remember that all exercises should be planned to do from the highest positions to the lowest ones, and changes of the movement should be gradual and slow to avoid dizziness.

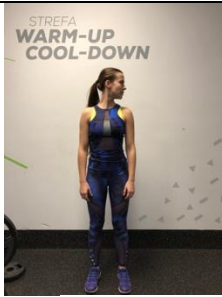
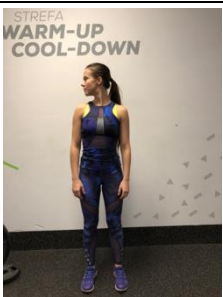


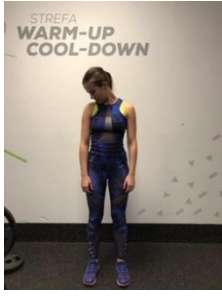
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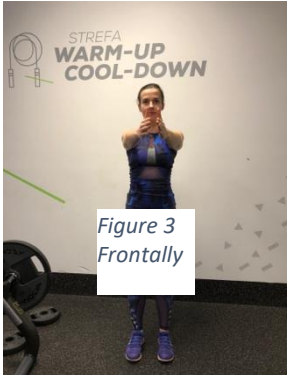
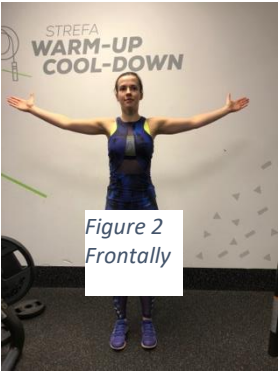
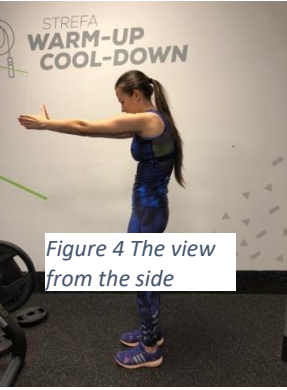
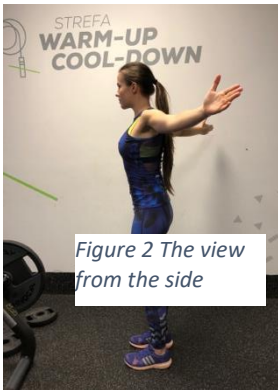




Relaxation / stretching

The relaxation part should last around 5-10 minutes or more if the senior is able to do all of the stretching exercises.

It is important that the senior also stretches the body so that the muscles can regenerate and become more elastic. You should stretch all the muscles that you were working out. Senior should stretch the muscles in order to prevent injuries and make the muscles more flexible. This part differs from the mobility part because it is static and last longer. Each muscle should be stretched around 1 minute or longer.

Warm up	Description
<p>Moving the neck</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure 1</p> </div> <div style="text-align: center;">  <p>Figure 2</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Figure 2</p> </div> <div style="text-align: center;">  <p>Figure 2</p> </div> <div style="text-align: center;">  <p>Figure 3</p> </div> </div>	<p>Neck turns to the right, left side, then half-circle from shoulder to shoulder.</p> <p>Reps: 10-15</p>
<p>Arms Circulation</p>	<p>Reps: 15 per each arm</p>
<p>Opening chest and rounding back</p>	<p>Stand upright and move your arms forward to shoulder height. Inhale and during</p>

	 <p><i>Figure 3 Frontally</i></p>  <p><i>Figure 2 Frontally</i></p>  <p><i>Figure 4 The view from the side</i></p>  <p><i>Figure 2 The view from the side</i></p>	<p>exhale, move your arms sideways to open your chest. Return your palms forward and round your back.</p> <p>Reps: 10-15</p>
<p>Hip Circulation</p>		<p>Reps: 10-15 per each side</p>
<p>Standing calf raise</p>	 <p><i>Figure 5 The view from the side</i></p>  <p><i>Figure 2 The view from the side</i></p>	<p>Keep your ankle joint stable so that it doesn't move sideways and try to climb to the toes and come back on the heel.</p> <p>Reps: 20</p>

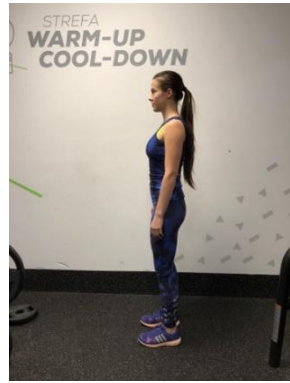
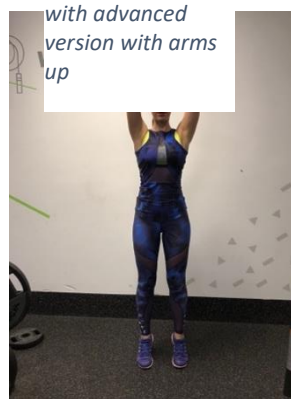
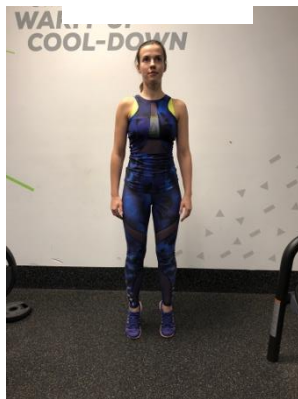


Figure 6 Frontally



Figure 2 Frontally
with advanced
version with arms
up



Raising one leg

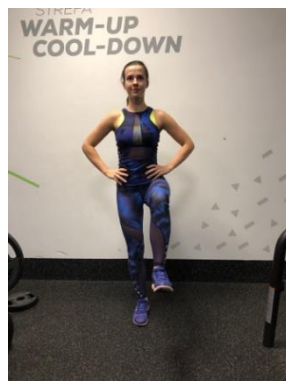


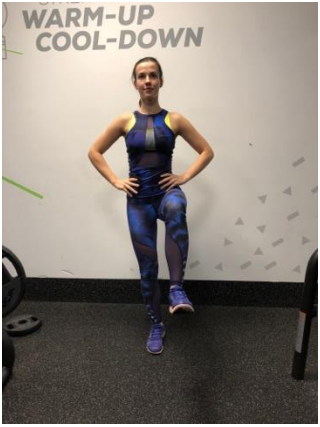

Figure 7 Frontally


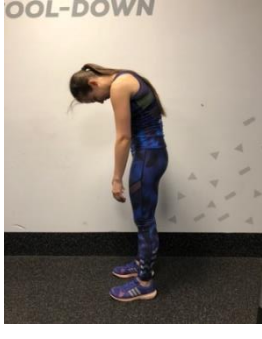
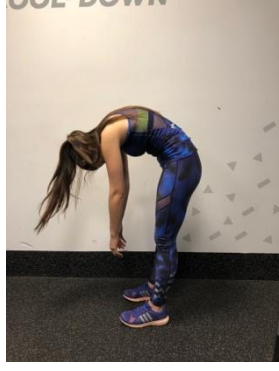

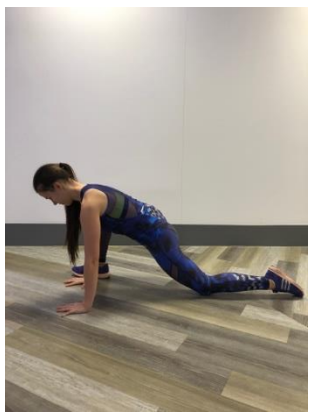

Stand upright and lift one leg bent at the hip height and after exercise lower it.

Reps: 10-15 per each side

Training Manual



<p>Circling the ankle of one foot while standing on the other leg</p>	  <p><i>Figure 8 Frontally</i></p> <p><i>Figure 2 Ankle movement</i></p>	<p>Stand upright and lift one leg bent at the hip height, start to make circle by your foot and put your leg down.</p> <p>Reps: 10-15 per each leg</p>
<p>Rolling the spine</p>		<p>Standing straight, bring your chin closer to your posture, release your shoulders loosely and start rolling your spine towards your thighs. At the bottom, relax the whole body, and then carefully roll up vertebra by the vertebra. Imagine that you begin to lift the loins, chest and finally the head.</p> <p>Reps: 10-15</p>

	 <p><i>Figure 9 Starting position</i></p>  <p><i>Figure 2 Rolling down</i></p>  <p><i>Figure 3 Rolling down</i></p>  <p><i>Figure 4 Rolling down the end position</i></p>	
<p>Hip mobility in lunge position</p>	 <p><i>Figure 11 The view from the side</i></p>  <p><i>Figure 10 Frontally</i></p>	<p>Place yourself on the mat with one knee on the floor. Put one leg forward and place the heel under the knee. Put your two hands on your thigh or on the floor, and extend your other leg further back. Tighten your buttocks and let your hips stretch.</p> <p>Reps: 10-15</p>

**Chest mobility
in lunge
position**

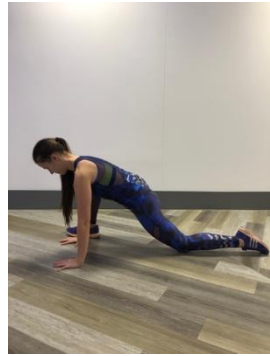


Figure 12 Starting position



Figure 2 Chest mobility






Figure 13 Frontally




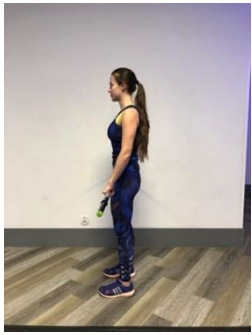






Figure 2 Chest mobility frontally

From the position as above, put your hands on the mat. If you have your right leg in front, take your right hand off the floor and put it over your head. Try to go low with the right elbow to the floor, and on the exhale rotate your back and pull the elbow to the ceiling.

Reps: 10-15

Main exercises	Description
<p data-bbox="214 464 311 499">Squats</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p data-bbox="440 926 618 984"><i>Figure 14 Starting position</i></p> <p data-bbox="711 919 857 978"><i>Figure 2 Squat movement</i></p> <p data-bbox="976 919 1110 978"><i>Figure 3 Final position</i></p> </div>	<p data-bbox="1242 464 1567 926">Starting position: Set your feet shoulder width apart. Rotate your knees slightly outside and tighten your buttocks and stomach. Start to slowly sit down on the chair without losing stomach and buttocks tension. Then return to standing position.</p> <p data-bbox="1242 932 1534 1041">Advanced version: do squats without any chair.</p> <p data-bbox="1242 1047 1356 1081">Reps: 20</p>

<p>Dead lifts</p>	 <p><i>Figure 15 Starting position</i></p>  <p><i>Figure 2 Dead lift movement</i></p>  <p><i>Figure 3 Final position</i></p>  <p><i>Figure 16 Starting position, the view from the side</i></p>  <p><i>Figure 2 Dead lift movement</i></p>  <p><i>Figure 3 Final position</i></p>	<p>Starting position: Set your feet shoulder width apart. Straighten your back and tighten your stomach. Holding the grip or other load (ex. Bottles of water, dumbbells), start pulling back your buttocks and guide the grip along your legs. Keep your back straight and your knees slightly bent. Remember to keep your head as extension of the spine. Try reaching halfway down your calves and then return to standing on a straight back.</p> <p>Advanced version: with external load like dumbbells/grip</p> <p>Reps: 15</p>
<p>Lunges</p>	 <p><i>Figure 17 Starting position, the view from the side</i></p>  <p><i>Figure 2 The final position 1</i></p>	<p>Starting position: Set your feet hip width apart. Retract one leg and lift the heel of the leg from the back. Holding the chair / wall / stick, go vertically down just above the floor and return to standing.</p> <p>Reps: 12-15 per each leg</p>



Glute Bridge



Figure 18 Starting position, the view from the side

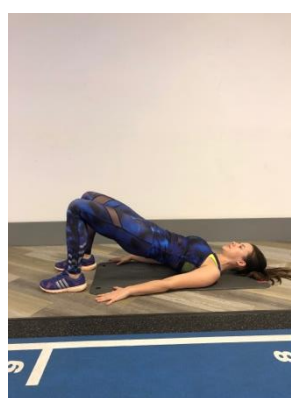



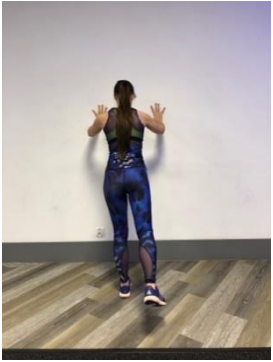





Figure 2 Final position

Starting position: Lie on your back and bend your knees. Pull the tailbone under you and tighten your buttocks. Then lift your hips up slowly so that your stomach and thighs form a single line. Hold for a few seconds at the top and return to the floor.

Reps: 20-25

<p>Lift Side</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><i>Figure 19 Starting position</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 Final position</i></p> </div> </div>	<p>Starting position: Standing in front of the wall, place your arms at the arm height. Bend your knees and tear one leg off the floor. Start to lead your leg to the side while tightening your buttocks.</p> <p>Reps: 15-20 per each leg</p>
<p>Lift Back</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><i>Figure 20 Starting position</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 Final position</i></p> </div> </div>	<p>Starting position: Standing in front of the wall, place your arms at the arm height. Bend your knees and tear one leg off the floor. Start to lead your leg to the back while tightening your buttocks and stomach.</p> <p>Reps: 15-20 per each leg</p>
<p>Pilates swimming</p>		<p>Starting position: Place hands under shoulders</p>

	 <p><i>Figure 21 Starting position</i></p>  <p><i>Figure 2 First movement</i></p>  <p><i>Figure 3 Final position</i></p>	<p>and knees under hips. Tension your stomach and pull your tailbone under you. Tightening your buttock, pull back one leg and lift it up so that your back and leg form a single line. Return to the floor and lift the other leg. In different way you may add the opposed arm.</p> <p>Reps: 10 per each side</p>
<p>Table position</p>		<p>Starting position: Place your hands under your shoulders and your knees under your hips. Tension your stomach muscles and pull your tailbone under you. Raise your knees up so that your back is parallel to the floor.</p> <p>Reps: Hold for 10s. and have a rest, repeat 5-10 times.</p>






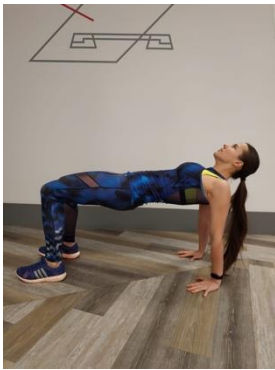
	 <p><i>Figure 22 Starting position</i></p>  <p><i>Figure 2 Final position</i></p>	
<p>Plank</p>	 <p><i>Figure 23 Starting position</i></p>  <p><i>Figure 2 Final position</i></p>	<p>Starting position: Place your hands under your shoulders and your knees under your hips. Retract your legs a few cm back and bend your hips. You can lift your knees to make it more difficult, but be sure to tighten your buttocks.</p> <p>Reps: hold the position as long as you can and don't feel any pain in the back</p>
<p>Reverse Plank</p>	 <p><i>Figure 24 Starting position</i></p>  <p><i>Figure 2 Final position</i></p>	<p>Starting position: Sit on the floor with your knees bent. Place your hands behind your buttocks and lift your hips up. The head should be an extension of the spine and buttocks should be tight for the whole time.</p> <p>Reps: Hold the position for 10s. or more and have a rest, repeat 5-10 times.</p>



Figure 3 Advanced final position

Back rises lying on the stomach

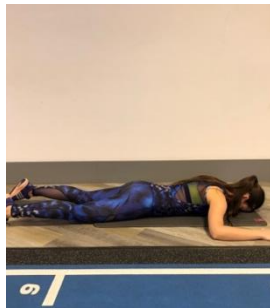


Figure 25 Starting position









Figure 2 Final position



Starting position: Lie on your stomach, place your elbows at shoulder height. Tightening your buttocks and pressing the hip bones into the mat, lift the top of the back and lower it.

Reps: 15-20

	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Figure 26 Starting position, the view from above</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 Final position, the view from from above</i></p> </div> </div>	
<p>Leg lifts lying on the stomach</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Figure 27 Starting position</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 Final position</i></p> </div> </div>	<p>Starting position: Lie on your stomach. Tightening your buttocks and pressing the hip bones into the mat, lift one leg up and down. Then lift up the other one.</p> <p>Reps: 15</p>
<p>Swimming lying on the floor</p>	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><i>Figure 28 Starting position</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 The other side</i></p> </div> </div>	<p>Starting position: Lie on your stomach and move your arms straight forward. Tightening your buttocks and pressing the hip bones into the mat, lift right leg up and in the same time left arm. Then the other side.</p> <p>Reps: 10-15 per each side</p>

Rolling the spine while sitting



Figure 29 Starting position



Figure 2 First movement



Figure 3 Rolling down

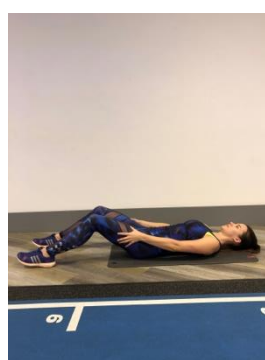


Figure 4 Final position

Starting position: Sit on the mat and bend your knees. Bend your back and start to put them on the floor, circle by circle. For ease you can hold on to your thighs. Then lift your head, top of your back and vertebral circle, lift the body to the starting position. If it is too hard, try to hold your thighs during the movement. It's a requiring exercise for your abs and spine so do it carefully.

Reps: 10-15

Side Rises sitting on a chair / bench









Figure 30 Starting position










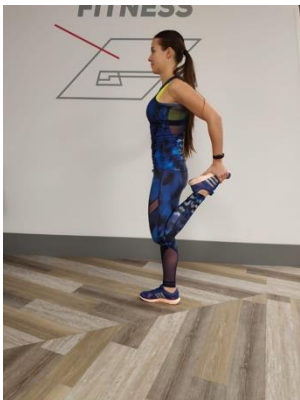
Figure 2 Final position

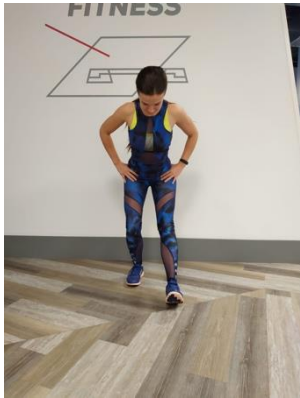
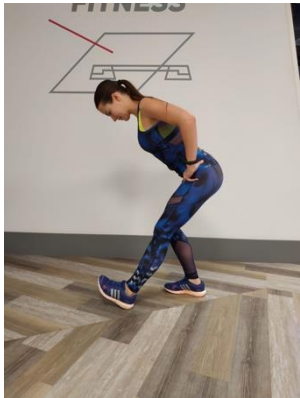

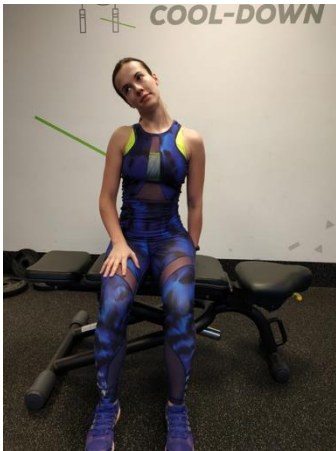
Starting position: Sitting on a chair or bench, hold dumbbells or water bottles in your hands. Straighten your back and stretch your stomach, raise your straight arms to the side.



Reps: 10-12

<p>Front rises sitting on a chair/bench</p>	<div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p><i>Figure 31 Starting position</i></p> <p><i>Figure 2 Final position</i></p> </div>	<p>Starting position: Sitting on a chair or bench, hold dumbbells or water bottles in your hands. Straighten your back and stretch your stomach, raise your straight arms in front of you and get back to hips.</p> <p>Reps:10-12</p>
<p>Biceps curl</p>	<div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p><i>Figure 32 Starting position</i></p> <p><i>Figure 2 Final position</i></p> </div>	<p>Starting position: Sitting on a chair / bench, grab a dumbbell or a bottle of water. Straighten your back and push your chest out. start bending your arms and straightening alternately.</p> <p>Reps: 15</p>
<p>Arm Extension</p>	<div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p><i>Figure 33 Starting position</i></p> <p><i>Figure 2 Final position</i></p> </div>	<p>Starting position: Sitting on a chair / bench, grab a dumbbell or a bottle of water. Straighten your back and push your chest out. Start straightening your elbow and move your hands slightly backwards.</p> <p>Reps: 15</p>

<p>Pushups against the wall or on a platform under your arms</p>	 <p><i>Figure 34 Starting position</i></p>  <p><i>Figure 2 Final position</i></p>	<p>Starting position: Standing in front of the wall, place your arms on the wall at shoulder height. Flexing your buttocks and stomach, begin to bend your arms and pull the cage to the wall and return to the starting position.</p> <p>Advanced version: Do it on the table or even floor.</p> <p>Reps: 10-15</p>
<p>Stretching</p>		<p>Description</p>
<p>Torso side stretching</p>	 <p><i>Figure 35 The first position</i></p>  <p><i>Figure 2 The second position</i></p>	<p>Starting position: Set the legs wider than the shoulders, straighten the abs and buttocks. Lift up one arm and tilt the torso to one side when lowering the shoulder. Feel the stretch in your torso in each side.</p> <p>Hold for about 1 minute per each side.</p>
<p>Legs and back stretching</p>		<p>Starting position: Set your legs to the width of your hips or arms. Raise your arms in front of you to shoulder height. Slide your buttocks back and move your torso parallel to the floor. Imagine that your arms are pulling you forward firmly and your body weight is on the metatarsal of your</p>

	<p style="text-align: center;"><i>Figure 36</i></p>	<p>feet. If it is difficult to maintain this position and your back will round, try to bend your knees and keep the back straight. Hold for about 1 minute.</p>
<p>Chest stretching</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><i>Figure 37 Starting position</i></p> </div> <div style="text-align: center;">  <p><i>Figure 2 The final position</i></p> </div> </div>	<p>Starting position: Stand sideways to the wall. Put your arm at shoulder height and point your fingers to the back. Squeeze your whole hand and remove your shoulder blades. Start unscrewing from the wall so that you feel the stretching of the forearm, biceps and chest. Hold for about 1 minute per each side.</p>
<p>Quadriceps stretching</p>	<div style="text-align: center;">  <p><i>Figure 38</i></p> </div>	<p>Starting position: Stand sideways to the wall and hold one hand on the wall. Bring the distal leg to the buttock and hold it with the other hand. In this movement, be sure to tighten your buttocks and try to keep your knees at one height. Hold for about 1 minute per each side.</p>

<p>Two-headed thigh stretching</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="446 289 743 684">  </div> <div data-bbox="824 289 1122 684">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p data-bbox="451 709 738 768"><i>Figure 40 The frontal view of the position</i></p> <p data-bbox="829 709 1117 768"><i>Figure 39 The side view of the position</i></p> </div>	<p>Starting position: Stand on the width of your hips. Extend one leg forward and put it on your heel. Point your toes at yourself. Slide your buttocks back, keep your back straight, and start pulling your navel to your thigh. You can hold onto a wall or a chair.</p> <p>Hold for about 1 minute per each side.</p>
<p>Neck stretching</p>	<div style="display: flex; justify-content: space-around;"> <div data-bbox="431 842 764 1289">  </div> <div data-bbox="837 842 1170 1289">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p data-bbox="443 1304 704 1333"><i>Figure 41 Starting position</i></p> <p data-bbox="862 1304 1081 1333"><i>Figure 2 Final position</i></p> </div>	<p>Starting position: Sit upright in a chair or bed. Put one hand under the buttock. Actively pull the shoulders down so that the neck lengthens. Start pulling the opposite ear to your shoulder.</p> <p>Hold for about 1 minute per each side.</p>

<p>Back neck stretching</p>	 <p><i>Figure 42</i></p>	<p>Starting position: Sit upright in a chair or bed. Put your hands on top of your head and gently pull your chin to the breastbone. Hold for about 1 minute.</p>
<p>Two-headed thigh stretching</p>	 <p><i>Figure 43 Starting position</i> <i>Figure 2 Final position</i></p>	<p>Starting position: Lie on a bed or mat and straighten your legs in front of you. Then pull one leg to your chest. Keep your hands under your thigh. If possible, try to straighten your knee and push the heel to the ceiling. If you feel that your shoulders rise, you can help yourself in this exercise with a yoga belt or towel (instead of hands, if you have a smaller range of motion). Hold for about 1 minute per each side.</p>

8. Disclaimer

The contents of this Training Manual do not reflect the official opinion of the European Union. Responsibility for the information and views expressed herein lie entirely with the author(s).

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