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**EUROPEAN
FITNESS BADGE**



Handbook
for
Instructors

Edition notice

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Background

1. Purpose and Spirit of the European Fitness Badge

The European Fitness Badge (EFB) is on the one hand an individual confirmation of a health enhancing fitness status and is awarding this status on three levels



BASIC



ADVANCED



APPROVED

A health enhancing fitness status reflects fitness as a physical health resource; which can be systematically influenced by exercise. In this meaning Fitness is based on the following components: endurance, strength, flexibility and coordination. Additionally, body composition and posture is integrated to the EFB.

The European Fitness Badge is on the other hand an effective instrument for sport and health organizations to enhance the awareness of the adult population in Europe of the importance of a health enhancing fitness status. Thus the European Fitness Badge is helping to

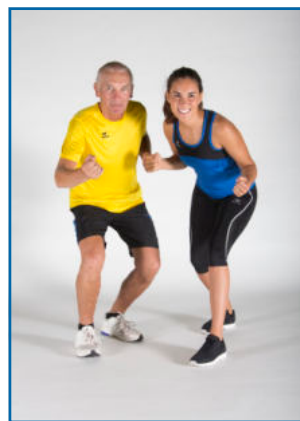
- motivate and support people changing their behaviour to an active lifestyle;
- invite, include and commit more people to exercise, do sport and physical activities.

More in detail:

By creating award situations people will be motivated to test their fitness. With a short feedback or a more detailed counselling the awareness of the importance of fitness

for staying healthy increases and motivates the target groups to do more exercise or to carry on exercising.

The information about one's own strengths and weaknesses is an important point for a realistic self-perception as well as for building up goals and plans for a more active lifestyle, including the sustainable participation in exercise and sports.



Awarding the European Fitness Badge can make one proud and helps to sustain self-confidence – with the effect of an emotional commitment with health enhancing physical activity (HEPA).

A constant testing of the fitness factors with individual feedback over the years helps the participant to recognize the individual improvement and to continue the active lifestyle with the aim to improve or to sustain the fitness level. With the constant testing of the fitness factors, the instructor also gets important information to plan the exercises and to adapt them to the individual's needs.

2. Understanding Fitness

The European Fitness Badge is focusing on "health-related fitness". Different scientists stated that the most important components of health-related fitness are cardiorespiratory fitness (endurance), muscular fitness (strength), coordination and flexibility. Often other components especially "body composition" and "posture" are added to this

health-related understanding of fitness (Caspersen et al. 1987; Oja 1991; Bös & Mechling 1983; Samitz & Baron 2002).

In history many approaches were made to differentiate basic "motor abilities" as components of "motor fitness", describing a general physical capacity and mostly used in connection to fitness tests.

The here used systematisation (Bös 1987, Bös et al. 2001, 2009, 2016², Lämmle et al. 2010) structures the motor abilities into conditioning abilities and coordinative abilities. Conditioning abilities include endurance and strength, whereas speed is partly conditional and coordinative. Part of the coordinative abilities is also coordination under

precise conditions and coordination under time pressure. These abilities are structured into duration and intensity of the physical strain in ten subfields not pointed out in detail in this context. In this understanding flexibility applies as a passive system of energy transfer and is nearly independent of the motor abilities. (Figure 1)

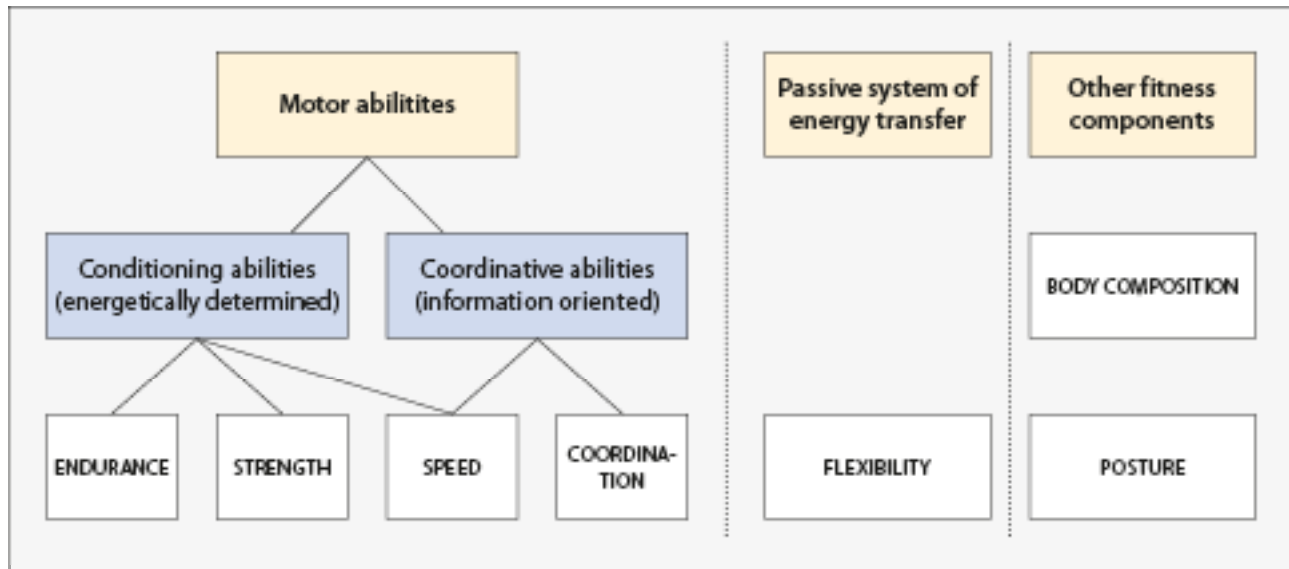


Figure 1: Differentiation of motor abilities

Besides the ability structure the strained muscle groups and the type of exercise of the performed test items, the following also needs to be considered for constructing a fitness test:

- Muscle groups can be differentiated in the whole body, trunk, upper and lower limbs.
- The differentiation among the structure of exercise is defined as activity with or without change of place (locomotion movement) or as activity with subfield movement.

For a simple taxonomy of test items a two dimensional classification including the ability and exercise structure is used. This taxonomy is displayed in table 1. In the interest of simplification, speed is neglected due to involvement of speed – in particular action speed – in the other dimensions strength and coordination.

Table 1: Taxonomy of test items structured according to ability and exercise structure (Bös et al. 2009, p. 21)

Structure of exercise		Motor performance abilities			Passive system of energy transmission
		Endurance	Strength	Coordination	Flexibility
Locomotion movements	walking, running, jumping				
Limb movements	upper extremities, trunk				

This structure serves as a basis for the development of the test profiles of the European Fitness Badge. The taxonomy is full of test items to measure health-related fitness.

The idea of test profile 1 (see table 3, p. 9) and test profile 2 (see table 4, p. 29) is to fill the taxonomy with test items as complete as possible on the one hand and as economical as possible on the other hand.

Test profile 1 is function oriented (e.g. standing up with one leg, balancing on one leg). The test items will be evaluated in three categories.

Test profile 2 is performance oriented (e.g. number of performed push-up in 40 seconds). The test items will be evaluated quantitative through age- and gender-specific reference values in five categories.

In short, thus in both test profiles we will have basically 6 motor performance tests. But for endurance and strength we have also integrated a "second choice test".

In chapter 6 (TP1) and in chapter 7 (TP2) you will find the test overviews as well as the detailed test descriptions.

Other components like activity, body composition and posture are also part of the European Fitness Badge (see chapter 8).

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3. The European Fitness Badge and the test profiles

The European Fitness Badge is awarding the fitness status on three levels.

Level 1: Basic*

The fitness is basic with respect to promoting health. A basic fitness status makes it possible to take part in basic fitness-exercise-programmes at sport- and gymnastic clubs. If the basic fitness level is not achieved, there is an urgent need to be integrated in special health and exercise programmes with a strict orientation on the preconditions of these people (marginal fitness status, overweight and/or other risk factors, motivation etc.) and on the stages of behaviour change (see chapter 4).



BASIC

Level 2: Advanced**

The fitness corresponds to an average level of the population of the same age and sex – that means the participant is fitter than 40% and less fit than 40% of his/her age group. The test result corresponds to a percentile rank between 41 and 60 (the average 20%). More health related fitness activities can be done to gain a better health. The participation in many fitness-exercise-programmes is possible (e.g. functional training, aerobic).



ADVANCED

Level 3: Approved***

The fitness status is better than the average of the population of the same age and sex – that means the participant is below the fittest 40% of his/her age group. The percentile rank of the test person is over 60. The participant can continue with health-related fitness activities. Challenging and/or competitive activities can also be chosen – based on a correspondent motivation.



APPROVED



The European Fitness Badge with its three levels is based on two test profiles

Test profile 1 (TP1): basic fitness – especially for beginners (level 1).

Test profile 2 (TP2): advanced (level 2) & approved fitness (level 3) – for already physical active adults.

Criteria of the test profiles

- are scientific founded and practical;
- contain the health related motor dimensions of strength, endurance, coordination, flexibility;
- are motivating and challenging;
- don't require specific motor skills from sports;
- provide information about physical strengths and weaknesses;
- offer the chance to compensate weaknesses by exercising;
- are in part based on fitness trends, such as functional-training or core-training.

Both test profiles are described in detail – together with the meanings of the results – in chapter 6 (TP1) and 7 (TP2).

4. The European Fitness Badge and the stages of Health Enhancing Physical Activity (HEPA)

With respect to the purpose and spirit of the European Fitness Badge (see chapter 1), the European Fitness Badge should also be involved within the process of behaviour change in the direction of maintaining health enhancing exercise and physical activity as well as in the direction of a sustainable integration in an exercise group. We know from scientific research that behaviour change is a long process including several different stages and is influenced by correlates like knowledge, motivation, emotions, social support, and group integration. The stage-model of figure 2 is validated in many studies.

Within the stages 1 & 2 **“Not considering and Considering”**, main tasks are (a) to build up problem awareness about one's own health situation; (b) to develop knowledge about the health effects of physical activity as well as about the possibilities to start with an activity.

Within the stage 3 **“Preparing”**, main tasks are to help people to come to a positive decision and making concrete plans on how to become – more and more effective – active. A feedback concerning the own fitness status combined with counselling about a strategy to enhance the fitness and possibilities doing this in a motivating way may be a key point in advancing to the next stage. The European Fitness Badge gives a detailed feedback to the individual fitness status. In combination with an effective counselling a positive decision to become more and more active can be promoted as well as making specific plans how doing this (e.g. by joining a special exercise group).

Within the stage 4 **“Exploring”**, main tasks are to help people to find an activity and/or an exercise group which is motivating and supporting to enhance one's own fitness. It is very important that the participant feels good

in the exercise situation and can recognize his improvement. The European Fitness Badge with its three levels can help to understand one's performance level and can help motivate people to continue. Furthermore, for most

people the integration in a group with a supporting instructor is very important during this stage in order to get to the stage of maintaining the activity.

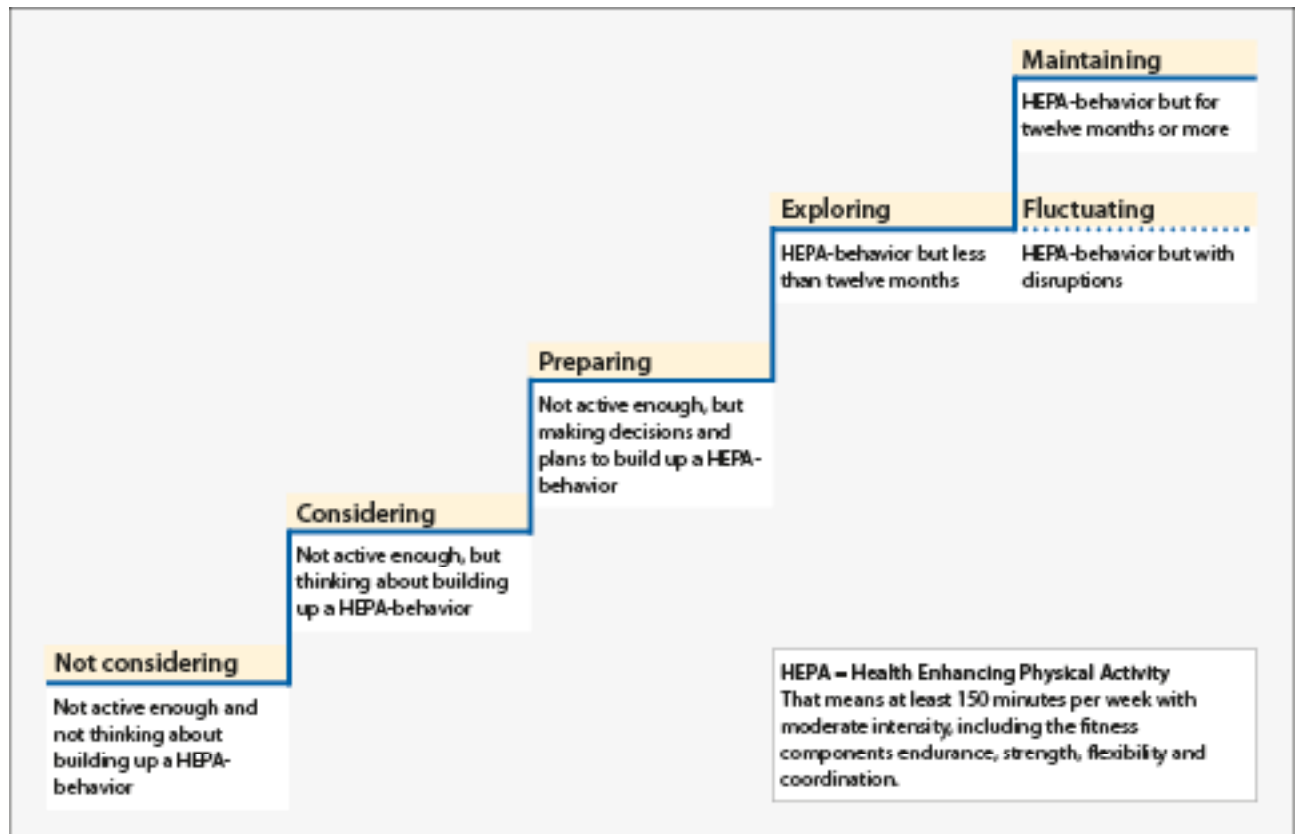


Figure 2: Stage Model of Health Enhancing Physical Activity Behaviour

Within the stage 5 “**Maintaining**”, a regular participation in the European Fitness Badge can give a sustainable feedback of the fitness status and promote positive emotions by being proud to have an above average fitness.

For persons who are “**Fluctuating**”, that means who show HEPA-behavior but with disruptions, the EFB can be a stimulation for returning to a regular physical activity.

The described HEPA-Stages should be considered before choosing the test profile and during the behaviour counselling.

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5. Target Groups & Award Situations/Settings

For awarding the European Fitness Badge the following **target groups** are distinguished:

Target group 1: Basic fitness or below

Sedentary people who are not sufficiently physically active and with under average fitness:

- basic fitness or below
- mostly on HEPA-Stages 2 “considering” and 3 “preparing”
- test profile 1 should be chosen

These adult population is not used to strenuous physical activities, they have a bigger chance to be overweight or even obese, they might have other risk factors like high blood pressure, they are often not content with their body, and the barriers to start a regular physical activity are high. A fitness test for this group can therefore have only quite low demands – and must be different from a test for the target groups 2 and 3. Testing fitness within this group is normally only feasible under “safe” circumstances like in a one to one situation with an instructor and without spectators.

Target group 2: Average fitness

People who have started with regular physical activity within the last year or who are “fluctuating”:

- average fitness
- mostly on HEPA-Stage 4 “exploring” and “fluctuating”
- test profile 2 should be chosen

These adults are somehow used to being physically active and are in principle interested in being physically active, but barriers like the feeling of “having no time because of job or family demands” keeps them often away from regular physical activities. Most members of this group might be “open” for testing their fitness, but they usually prefer an environment within a sport or company group in a club or fitness centre.

Target group 3: Above average fitness

People who are maintaining regular physical activity for more than twelve months:

- fitness level above average
- mostly on HEPA-Stage 5 “maintaining”
- test profile 2 should be chosen

These adult population is not only motivated by being regularly physically active, they experience mostly positive feelings by doing activities, they often have a positive body concept and they organize their daily life with respect to being physically active. This group is easily motivated for doing a fitness test and they might be eager to get the fitness badge. They can also be tested in “open” situations like during big events.



As already mentioned for the three target groups **different testing and awarding situations** might be important, e.g.

Small events at sport or gymnastic clubs (e.g. “open doors day”) where target group 1 could be addressed to start in regular physical activity especially within the clubs. Other interested institutions of the health sector like health insurance companies could be included here.

In the context of companies such small events can also be integrated. For example the EFB test profile 1 can be executed on a “health prevention day” in the business company.

Exercise or sport groups of sport or gymnastic clubs can use the test profile 2 of the badge to reflect the fitness status of the group members as well as improvements over time – for target groups 2 & 3. To give the members of these groups a feeling of success, it can make sense to execute first test profile 1 and after this test profile 2.

Big events e.g. of sport federations, like the “Deutsche Turnfest” in Germany, can be an interesting frame offering the European Fitness Badge – addressing target groups 2 & 3.

All these situations described before can be integrated in European or worldwide events like the “Move Week” or the “European Week of Sport”.

Other award situations for the three target groups might be created under the special conditions of a setting (e.g. in clubs or in working settings).

Before starting the test, chapter 11 needs to be read carefully. The flowchart on page 61. is a good help for executing the test.

Description of the European Fitness Badge

6. Test profile 1

TP1 is designed for testing a basic fitness. The test items are oriented to simple daily life functions (like standing up with one leg). They will be evaluated in three categories.

The goal isn't to get a special performance. The successful completion of test profile 1 (fitness level “Basic”) allows test persons to take part at sports classes with low requirements in sports and gymnastic clubs (“low-threshold” offers).

If the basic fitness level is not high enough to solve these basic functions, there is a need to be integrated in special health-oriented exercise programmes with a strict orientation on the preconditions of the test person, like overweight and/or other risk factors. The target group of this profile are sedentary adults and physical inactive people (see chapter 5). With TP1 tested people can achieve the award Level 1 “Basic” of the EFB (see chapter 3).

Due to the target group and the expected settings of testing, the scoring and organisation is designed to be as easy as possible. Therefore, the scoring is equal for every tested person (exception is the sit & reach test with a differentiation between men and women).

The scoring ranges from 1 to 3 points according to the done performance. The rating of 1 to 3 points happened through the division into percentiles. Between 60 and 80% of the test persons should achieve the highest score of 3 points in every test item. The scoring of TP1 was determined based on existing norms from studies (see test descriptions, p. 10).

The test person gets an evaluation of each test item. Corresponding to the scoring of each test item the test person gets 1 to 3 points. Afterwards the results are summarized to dimensions. If more than one test item is per-

formed per dimension, the average value is calculated and if needed rounded up.

This results in a profile for the four dimensions endurance, strength, coordination and flexibility, where the individual strengths and weaknesses are displayed. In the next step the result of all four dimensions will be summed up. This value ranges from 4 points (1 point in every dimension) to 12 points (3 points in every dimension).

Level Basic* is reached, if the test person gets the overall result which is needed for the corresponding age (see table 2).

Table 2:
Overview of the needed overall result related to age

Age	Overall result
≤ 40	≥ 11
41-50	≥ 10
51-60	≥ 9
61-70	≥ 8
> 70	≥ 7

Younger test persons need to reach more points than older test persons. For example, a 65-years-old test person gets Level Basic* with 8 points or higher, whereas a 35-years-old test person needs at least 11 points. Women and men will be evaluated the same in TP1, except for flexibility.

Table 3: Overview of test items of TP1

Test items of TP1				Additional measurements (see chapter 8)
110 Endurance	120 Strength	130 Coordination	140 Flexibility	
111 Step test	121 Plank test	131 Balance	141 Sit & Reach	150 Body composition
112 N-Ex	122 Stand-up	132 Jumping Jack		160 Posture
	123 Push-up			Activity questionnaire

In table 3 an overview of all test items of TP1 can be seen. The test items have simple names and are additionally marked with numbers.

In the endurance part, the test leader (who mostly will decide which test item will be performed) has the choice between a performance test (111 Step test) and a non-performing test (112 N-Ex). Here the step test should always be the first choice and the N-Ex is just a compromise if the required material is not available.

In the strength dimension, two out of three test items have to be performed. The three options are the plank test (121), which concentrates especially on the core stability, the standing up with one leg test (122), which focusses on the strength in the lower extremities, and the push-up test (123), which concentrates on the upper

extremities especially the arm strength. We recommend performing 122 and 123.

In the coordination part the test person has to perform the balancing on one leg test (131) and the jumping jack test (132). The first one concentrates on the static balance of the whole body while the second one tests the whole body coordination.

The sixth test which has to be performed is the sit & reach test (141) in the category flexibility. This test item contains the flexibility of the lower back and the hamstring muscles.

For detailed descriptions, instructions and hints of all test items in TP1 see also the picture cards in the toolbox (chapter 12..).

111: The Danish step test – modified short version

The Danish step test is a safe and feasible method for estimation of VO₂max. It is quick, needs very little equipment and it is easy and fun to do. The Danish step test is a progressive test based on the principle that the energy cost of stepping with a known step height and pace is relatively independent of age, gender, and training status.

The test is a gradually increasing exercise test, using a step-bench with a pace given by a computer programme. At the start you step up for every 5 seconds and the pace increases to every 1 second. The test person should be able to follow the pace for 2:40 minutes, or 160 seconds, in order to pass the test.

In a practical situation, this means that you are able to climb a staircase with 53 steps in 2 minutes and 40 seconds. (See Aadahl et al. 2013)

Main reference

Aadahl, M., Zacho, M., Linneberg, A., Thuesen, B.H., & Jørgensen, T. (2013). Comparison of the Danish step test and the watt-max test for estimation of maximal oxygen uptake: the Health2008 study. *European journal of preventive cardiology*, 20(6), 1088-1094.

10

Content of the test

cardio-respiratory endurance

Picture / description



The test person has to wear sport shoes. It is possible to rehearse the step sequence for two to three times besides the step bench, to make sure the test person knows how to follow the step commands. It is important to step up on the bench and to stretch the legs each time. The weight of the body should always be distributed evenly on the foot. Take turns on using the left and the right leg. The recommended step height is 25 cm.

The test person should stand close to the step bench and the movement should be straight up and down, following the pace, without jumping. If they make a "mistake" but immediately get back into the rhythm again, the test person is allowed to continue the test. The test has to be stopped when the test person is at least four steps behind the computer program.

The test is over and passed if the test person manages to keep up the pace for 2 minutes and 40 seconds (or 160 seconds). If you test a group of people at the same time the scoring is the same regardless the different heights of the bench.

Scoring

- 1: the pace can only be followed for less than 1 minute (60 seconds)
- 2: the pace can be followed for 1 minute to 2:39 minutes (60 seconds to 159 seconds)
- 3: the pace can be followed for 2:40 minutes (160 seconds or more) – the test is passed

Sources of error

- the rhythm of the pace is not followed correctly
- the legs are not stretched when standing on the bench
- the weight is not distributed evenly over the entire foot



Materials

- computer
- speaker
- step sequence (Download at online data platform)
- step bench (25 cm high)
- stopwatch

Special remark

Height of the step

The recommendation for the step height at 111 is 25 cm for women and men.

For active and trained people, the step height needs to be different, but this will be described at 211 in detail.

Scientific background

Psychometric properties

Objectivity & Reliability

Study 1: 25 young people from two Danish schools implemented the step test at two different occasions with one week in between. The results didn't show any significant difference from the first to the second test, which points out that the test results are consistent. This indicates a good reliability of the step test. (Zacho et al. 2005)

Study 2: In 2016, 22 test persons were tested twice with one week in between. The results of both test days were the same at 89% for the tested people. The accordance of 89% displays a good reliability. (Klemm et al. 2017)

Validity

Study 3: A regression analysis showed high correlations with $VO_{2\max}$ ($R_2 = 0,77$; $P < 0,0001$). That indicates a good construct validity of the step test. (Aadahl et al. 2013)

Reference values

Study 3: The Danish step test was tested for the estimation of $VO_{2\max}$ in comparison to the watt-max test during the Health2008 study. 346 men and 449 women were tested. The correlation between $VO_{2\max}$ (ml/kg/min) estimated by the two tests was moderate to high (men: $r = 0.69$, $p = 0.0001$; women: $r = 0.77$, $p = 0.0001$). (Aadahl et al. 2013)

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Zacho, M., Bloomquist, K., Saltin, B. (2005). *Udvikling af ny Steptest*. Center for Muskelforskning og Motion og Kost På Recept.

112: Non-Exercise Test (N-Ex)

The N-Ex test is a well-evaluated self-assessment questionnaire measuring the cardiorespiratory fitness. There are different versions of the N-Ex test, which are well checked concerning the psychometric properties.

In this context a version with five questions will be used.

Main reference

Jurca, R. et al. (2005). Assessing Cardiorespiratory Fitness without testing. Am J Prev Med 29 (3), 185-193.

Content of the test

self-reported physical activity to measure cardiorespiratory endurance without testing

Picture / description



The N-Ex is a questionnaire with five activity-questions. The test person has to answer the question honestly and if necessary with the help of the instructor.

- Question:** "Choose one activity statement that describes best your usual pattern of physical activities during a normal week"
- Answer 1:** I just do my daily activities like housework and family care.
- Answer 2:** Besides my daily activities I do regularly (5 days or more a week) low level activities like stair climbing for at least 10 minutes per day with slight increases in breathing and heart rate.
- Answer 3:** I do 20 minutes to one hour per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity, that means with substantial increases in breathing and heart rate.
- Answer 4:** I do 1-3 hours per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity.
- Answer 5:** I do more than 3 hours per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity.

Scoring

- 1: no regular activity (answer 1)
- 2: some regular participation in modest physical activities involving sports and recreational activities (answer 2)
- 3: aerobic exercise such as run/walk for 20 to 60 minutes per week or more (answer 3 or higher)

Sources of error

- no correct answers
- wrong interpretation of the question/statement.

Materials

- questionnaire
- pen
- glasses if needed

Scientific background

Psychometric properties

Study 1: objectivity / reliability: 0.90

criteria referenced validity (correlation with $VO_{2\max}$): 0.67

sample: N = several thousand people; age 20-70 years; male, female (see Jurca et al. 2005)

Study 2: test-retest reliability: 1.00 (Gamma coefficient)

sample: N = 22; 25-77 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

63% of men and 53% of women at the age of 35-55 (N = 500 in a community-study) are doing sports. About half of them are exercising more than 40 minutes per week (Woll 1992).

Other references

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121: Plank Test

This plank test also known as the “prone-bridge” measures the endurance of the anterior muscle chain which plays an important role in daily activities.

This static test can be used as an alternative to other – more traditional – abdominal assessments like curl up or sit-up test.

Many variations exist. Within our test protocol, this static test involves maintaining a challenging position, with the body’s weight borne on forearms, elbows, and toes for 30 seconds. The test requires very little equipment.

Main reference

Strand, S. L., Hjelm, J., Shoepe, T. C., & Fajardo, M. A. (2014). Norms for an Isometric Muscle Endurance Test. *Journal of human kinetics*, 40(1), 93-102.

Content of the test

core strength – anterior core muscular endurance

Picture / description



15

The test person takes a prone position on the floor, feet are placed hip width apart. Lift your body away from the floor so that the elbows are lined directly under the shoulders. In this way only the forearms and toes are in contact with the ground. The body creates a straight line from head to toes. This position is characterized by a neutral spine, phalangeal extension. There should be no sag in the back and everything should be tight. For elderly participants it is recommended to use flat hands.

When the test person reaches the standard plank position, the instructor places a stick on the back to make sure the spine is straight. The instructor observes if the stick touches three contact points: at the back of the head, the upper back and the tailbone.

When the test person assumes the proper position and indicates he/she is ready, the instructor starts the stopwatch. The test person tries to maintain this position for 30 seconds.

In the evaluation form Planking results appeared in the additional measurements results.

The test is terminated when:

- The test person fails to maintain the proper position.
- The test person fatigues, voluntarily stops the test or reports ill effects or pain from the test (e.g. headache, dizziness, pain, etc.)

Scoring

- 1: the test person feels pain or cannot perform the prone plank for 15 seconds
- 2: the test person can hold the prone plank for 15 seconds
- 3: the test person can hold the prone plank for at least 30 seconds

Sources of error

- head is tilted back in the neck
- the neck is placed under the chest
- a convex back, where the thoracic part of the spine becomes round
- the pelvis is tilted back and buttocks protrude above the knee / rib line out
- hips, head or shoulders drop
- placing your hands too close together

16



Materials

- slim gymnastic mat
- flat plank (10 cm wide)
- stopwatch

Scientific background

Psychometric properties

Study 1: Intraclass correlation $r = 0.996$

Study 2: In 2016, 22 test persons have been tested twice with one week in between. The calculation of the Chi-square value and Gamma cannot be executed, because the results of both test days are the same at 100% of the test persons. The accordance of 100% displays a very good reliability. (Klemm et al. 2017)

Reference values

Sample: $N = 471$, 20 years, $m = 194$, $f = 277$, (Strand et al. 2014)

Norms for 20 years old ($N = 471$): male athletes: 20th percentile = 125 sec, male non-athletes: 20th percentile = 72 sec; female athletes: 20th percentile = 59 sec, female non-athletes: 20th percentile = 47 sec

Other references

- Chase, K. A., Brigham, C. E., Peterson FACS, J. T., & Coste, S. C. (2014). Fitness norms for the plank exercise. In *International Journal of Exercise Science: Conference Proceedings* (Vol. 8, No. 2, p. 14).
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- Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.
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- Schellenberg, K. L., Lang, J. M., Chan, K. M., & Burnham, R. S. (2007). A clinical tool for office assessment of lumbar spine stabilization endurance: prone and supine bridge manoeuvres. *American journal of physical medicine & rehabilitation*, 86(5), 380-386.

122: Standing up with one leg

Standing up with one leg is a test which refers to everyday activities.

Standing safely and getting up on one leg is one of the frequently used skills in daily life. People who are not able to stand safely on one leg have a higher risk of falling during sport exercises like running or jumping.

This exercise correctly performed is a good functional strength test of the leg muscles.

Main reference

Bös, K., Wydra, G., & Karisch, G. (1992). Gesundheitsförderung durch Bewegung, Spiel und Sport: Ziele und Methoden des Gesundheitssports in der Klinik. Erlangen: Perimed.

Content of the test

leg strength

Picture / description

18



The test person has to sit on a chair in the middle of the seating surface. The feet should be flat on the floor, the knees bent at a 90 degree angle.

The test person has to get up with both legs at the same time. Afterwards the test person has to get up by just using one leg (first the preferable one and then the other one). While standing, the test person has to keep the balance for at least 3 seconds.

The foot of the non-weight bearing leg can be used for balancing. The upper body can be bent forward to support the movement, but the nose shouldn't reach further than the knees. The hands are placed on the costal arches.

The test person has two attempts.

Scoring

- 1: test person can get up with both legs at the same time
- 2: test person can get up with the right or the left leg
- 3: test person can get up with the right and the left leg

The test is passed if the test person could get up with both legs individually without losing balance.

Sources of error

- touching the floor with the non-weight bearing leg
- losing balance
- falling backwards onto the seat
- not correctly reaching the final-position (standing level)

Materials

- chair with flat sitting surface
- height: 42 cm chair height till 165 cm body height
47 cm chair height above 165 cm body height

Scientific background**Psychometric properties**

test-retest reliability 1.0 (Gamma coefficient)

sample: N = 22; 25-77 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

Percentage of completing the test (= 3 Points)

N = 1082; m, f; age 35-70 years (Wydra 2012)

male: 75%

female: 67%

Other references

Bös, K., Wydra, G., & Karisch, G. (1992). *Gesundheitsförderung durch Bewegung, Spiel und Sport: Ziele und Methoden des Gesundheitssports in der Klinik*. Erlangen: Perimed.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Wydra, G. (2012). *Eine problemorientierte Diagnosestrategie für die Sporttherapie. Prävention, ambulante und stationäre Rehabilitation*. In K. Schüle & G. Huber (Hrsg.) (2012). *Grundlagen der Sport- und Bewegungstherapie* (S. 182-194). Köln: Deutscher Ärzteverlag.

123: Push-ups – combined version

The push-up test is a motor performance individual test for measuring the muscular endurance of the muscles of the torso and the arms, which is often described in the literature of sport science. The push-up test is a widespread and frequently used performance test.

There are numerous versions of the push-up test (see Bös 2016). The variations differ in the execution and the duration of the test performance.

The proposed test version includes two levels of difficulty and is based on Johnson & Nelson (1974, 121ff) and Tittlbach et al. (2005). It's well suited for beginners and people with low physical ability.

Main reference

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Content of the test

muscular endurance of the arms and the torso (upper extremities)

20

Picture / description



The test person starts with a prone position on the floor. The thumbs should be directly under the shoulders. The knees are steady on the floor. Now, the test person lifts the upper body away from the floor, crosses the lower legs (so that the load is on the lower part of the upper thigh) and starts the test (see pictures Basic 1). The test person lowers the body to the floor until the arms are bent to 90° (the nose nearly touches the floor). After that the person pushes its upper body up until both arms are straight. This exercise should be repeated five times.



After having done five repetitions with the knees on the ground, the knees should be lifted / the legs should be straight (see pictures Basic 2) and the test person should perform five repetitions without touching the knees on the floor and having the legs straight.

Scoring

- 1: <5 modified push-ups (Pictures Basic 1)
- 2: 5 modified push-ups (Pictures Basic 1)
- 3: ≥5 additional normal push-ups (Pictures Basic 2)

The push-ups are counted if they are correctly done.

The test is passed with three points, if five modified push-ups and five normal push-ups are performed.

Sources of error

- push-ups are not correctly done (hip drops)
- arms are not straight in top position of the movement (the range of motion for the arms should be from completely straight up to 90°)
- the whole body should be pushed up in one move
- face touches the floor

Materials

- slim gymnastic mat

Scientific background

Psychometric properties

Study 1: test-retest reliability: 0.94

sample: N = 40; 35-65 years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest reliability 1.0 (Gamma coefficient)

sample: N = 22; 25-77 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

In the FINGER-study (N>1000; 33-77 years; m, f) the mean value of the performed push-ups is approximately ten repetitions with a standard deviation of five repetitions (see Bös et al. 2013). About 20% do not achieve the cut off value of five push-ups. This proposed test suits for surveying the minimum muscular performance of the arm-, shoulder- and trunk-musculature.

Other references

Bös, K. (2016) (Hrsg.). *Handbuch motorischer Tests*. Göttingen: Hogrefe.

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *International Sport Studies* 34(2), 42-50.

Johnson, B.L. & Nelson, J.K. 1974). *Practical Measurements for Evaluation in Physical Education*. Minneapolis (Minnesota): Burgees Publishing.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Saint Romain, B., & Mahar, M.T. (2001). Norm-referenced and criterion-referenced reliability of the push-up and modified pull-up. *Measurement in physical education and exercise science*, 5(2), 67-80.

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

131: Balancing on one leg

Balancing on one leg, sometimes also described as “flamingo balance”, is a well-known and good evaluated test to measure the static balance of the total body.

The proposed test version is a simple version to test the basic skill level of balance. A basic skill level in balance is necessary to take part in health-oriented sport programmes.

Main reference

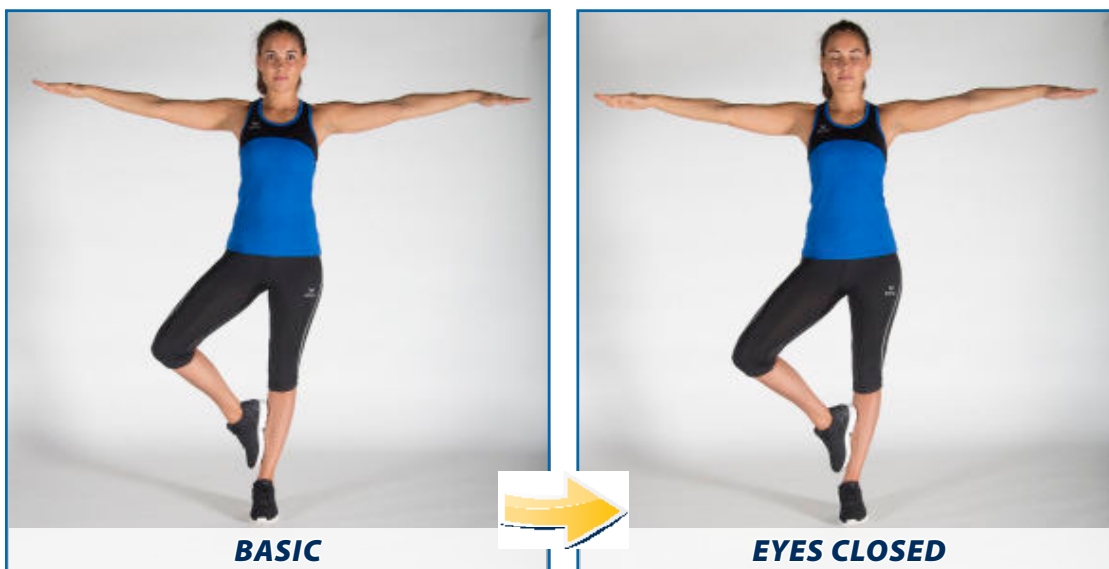
Bös, K. & Wydra, G. (2002). Fitness-Basis-Test. Aussagekraft und Praktikabilität eines einfachen funktionsorientierten Tests. *Gesundheitssport und Sporttherapie*, 18(6), 196-201.

Content of the test

static balance of the whole body (coordination under precise conditions)

Picture / description

22



The test person stands relaxed on both legs.

- 1) The test person tries to stand on the preferred leg for 15 seconds without losing balance or touching the ground with the second leg.
- 2) Without dropping the second leg, the test person closes the eyes and continues to stand on the preferred leg for another 15 seconds without losing the balance or touching the ground with the second leg.

The lifted leg should be positioned as shown in the picture above. The heel of the leg is touching the lower part of the standing leg and the knee is rotated outwards. The arms of the test person are stretched to the sides and can be used for keeping balance. There should not be jerky movements of the feet.

The test person has two attempts.

Scoring

- 1: test person couldn't stand for 15 seconds with open eyes on one side (preferred leg)
- 2: test person could stand for 15 seconds with eyes open on one side (preferred leg)
- 3: test person could stand additional for 15 seconds with eyes closed on one side (preferred leg)

Sources of error

- losing balance and touching the ground with the non-weight bearing leg
- opening the eyes before the 15 seconds are over

Materials

- stopwatch

Scientific background

Psychometric properties

Study 1: test-retest reliability: 0.50

sample: N = 40; 35-65 years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest reliability 0.1 (Gamma coefficient)

sample: N = 22; 25-77 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

sample: N = 500; m, f; 35-55 years (Woll 1992)

eyes open (%)			
sex	1 point	2 Points	3 Points
male	3	8	89
female	6	14	80
eyes closed (%)			
sex	1 point	2 Points	3 Points
male	47	28	25
female	63	17	20

Other references

Bös, K. & Wydra, G. (2002). Fitness-Basis-Test. Aussagekraft und Praktikabilität eines einfachen, funktionsorientierten Tests. *Gesundheitssport und Sporttherapie*, 18(6), 196-201.

Johnson, B.L., Nelson, J.K. (1979). *Practical measurements for evaluation in physical education*. 4th Edit. Minneapolis: Burgess.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Woll, A. (1992). *Diagnose körperlich-sportlicher Aktivität, Fitness und Gesundheit*. Methodenband I. Karlsruhe: Research report (unpublished).

132: Jumping Jack

The jumping jack test is a well-known and widespread coordination exercise, which is also used as a screening test.

The proposed test version of the jumping jack is part of the well-evaluated "Movement Coordination test" (see Bös & Wydra 1984).

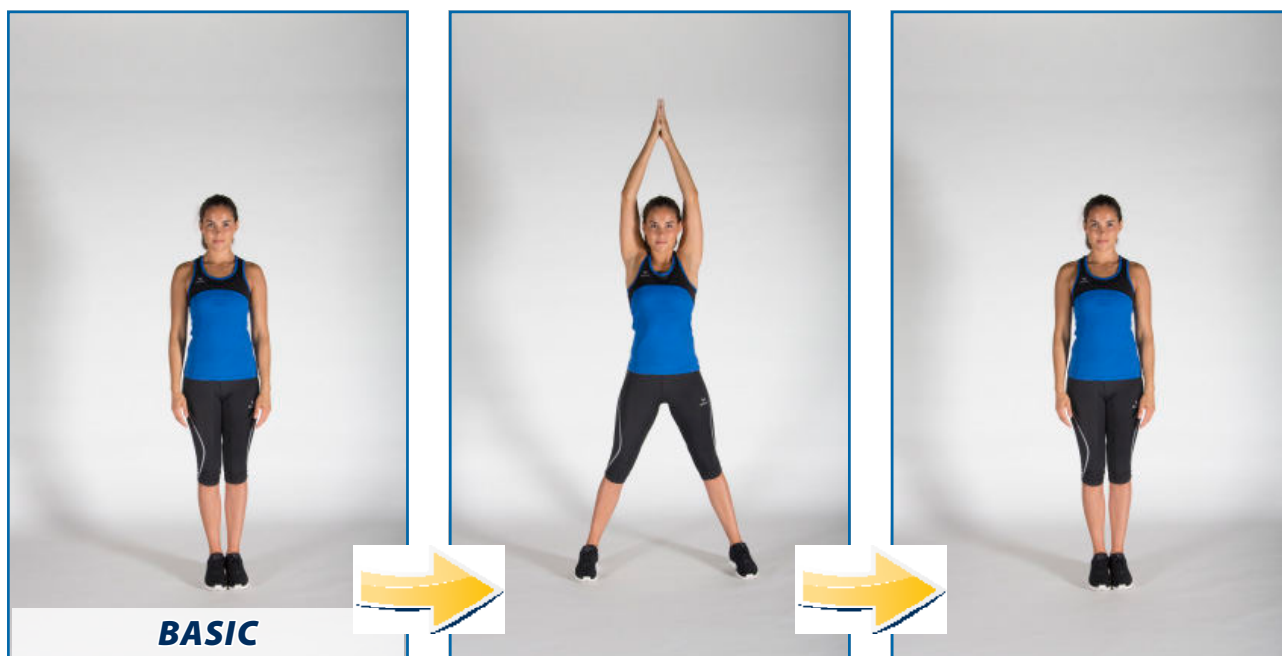
Main reference

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Koordinationstest (KGKT). In *Bewegungstherapie und Gesundheitssport*, 21 (2005) 6, 253-258.

Content of the test

whole body coordination (coordination under time pressure)

Picture / description



Starting position: The test person stands with the feet together and the arms down by the side (left picture).

The feet jump sideways (around shoulder width) and the arms are raised above the head (the palms touch each other above the head and perform a clap) in one motion (middle picture). Immediately the test person reverses that motion by jumping into the starting position (right picture).

This exercise should be repeated 10 times in a fluent way. Fluent means a performance without interruptions with a permanent correct movement.

The test person has two attempts.

Scoring

- 1: test person could not repeat the exercise 10 times
- 2: test person could repeat the exercise 10 times – but with a few mistakes and not in a fluent performance
- 3: test person could repeat the exercise 10 times without mistakes and in a fluent performance

Sources of error

- feet do not hit the ground at the same moment the hands clap above the head
- in the upper position palms do not perform a clap

Materials

- no material needed

Scientific background

Psychometric properties

The test "jumping jack" is part of the movement coordination test (BKT-Kur; Bös & Wydra 1984, Bös 2016). The BKT-Kur is well evaluated concerning the psychometric properties.

Study 1: test-retest-reliability: 0.80

Validity: Data concerning the validity can be found by Bös & Wydra 1984.

Study 2: In 2016, 22 test persons have been tested twice with one week in between. The calculation of the Chi-square value and Gamma cannot be executed, because the results of both test days are the same at 89% of the tested people. The accordance of 89% displays a good reliability. (Klemm et al. 2017)

Reference values

sample: N = 500; 35-55 years; m, f (Woll 1992)

jumping jack (correspondent %)			
sex	1 point	2 points	3 points
male	6	14	86
female	4	10	80

Other references

Bös, K. & Wydra, G. (1984). Ein Koordinationstest für die Praxis der Therapiekontrolle. *Krankengymnastik*, 36(12), 777-798.

Bös, K., Wydra, G. & Karisch, G. (1992). *Gesundheitsförderung durch Bewegung, Spiel und Sport*. Erlangen: perimed.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Koordinationstest (KGKT). *In Bewegungstherapie und Gesundheitssport*, 21(6), 253-258.

Woll, A. (1992). *Diagnose körperlich-sportlicher Aktivität, Fitness und Gesundheit*. Methodenband I. Karlsruhe: Research report (unpublished).

141: Sit and reach

The sit and reach test makes a statement about the flexibility of the lower body. There are a lot of tests under the general term of “trunk bending”, which differ in the way of performance and the measuring equipment. Well-known are the two versions “stand and reach” and “sit and reach”.

The proposed test is the sit and reach test, it is described as a qualitative performing version (achieving the sole level). This test is well-suited to make a diagnosis about the lower extremities minimum flexibility.

Main reference

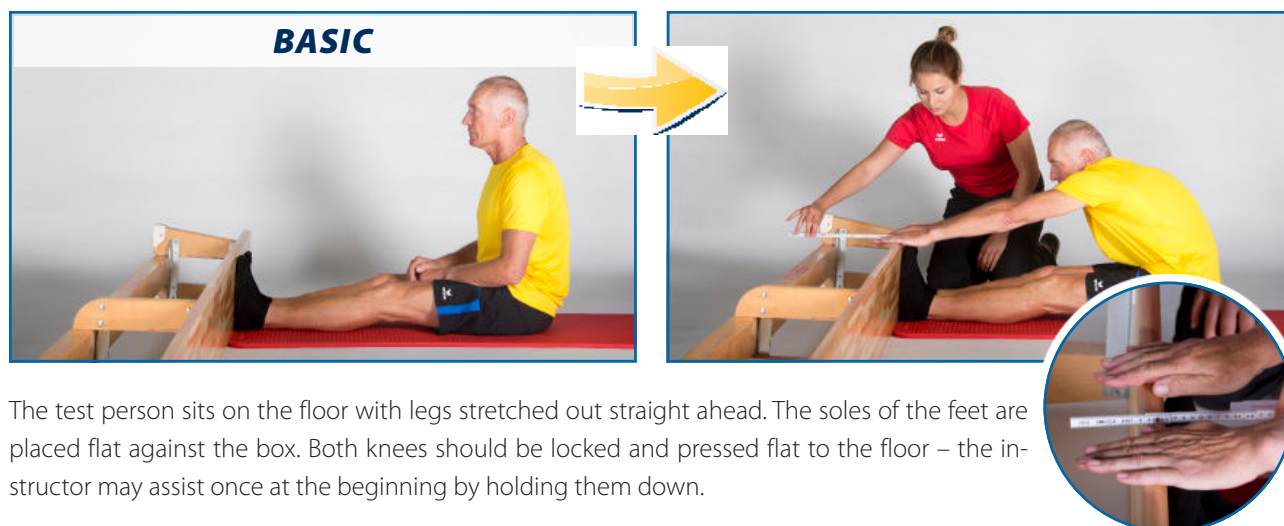
Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Content of the test

measuring the flexibility of the lower back and hamstring muscles

Picture / description

26



The test person sits on the floor with legs stretched out straight ahead. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor – the instructor may assist once at the beginning by holding them down.

With the palms facing downwards, and the hands on top of each other or side-by-side, the test person reaches forward along the measuring line as far as possible. The hands remain at the same level, not one reaching further forward than the other. The test person reaches out and holds that position for one to two seconds while the distance is recorded.

Not being able to reach the soles results in a negative value.

The instructor has to make sure that there are no jerky movements and that the legs remain straight on the floor.

The test person has two attempts.

Scoring

measuring the distance between sole level and fingertips in cm:

Points	Male	Female
1	<-10 cm	<-5 cm
2	-10 cm to -5 cm	-5 cm to 0 cm
3	>-5 cm	>0 cm

If the fingers don't reach ahead of the feet, a negative value results.

Sources of error

- the position of the hands cannot be held for one to two seconds
- legs are not straight

Materials

- sit and reach box or inverted gymnastic bench
- specific measuring tape for 5 and 10 cm (see toolbox , chapter 12. d.)

Scientific background**Psychometric properties**

Study 1: test-retest reliability: 0.95

sample: N = 40; 35-65years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: criterion oriented validity (correlation between sit and reach and back-saver sit and reach test): 0.51-0.59 (men), 0.66-0.76 (women)

sample: N = 93; 20-30 years; m, f (Lopez-Minarro et al. 2009)

Study 3: test-retest reliability 0.9 (Gamma coefficient)

sample: N = 22; 25-77 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

In the FINGER-study (N>1000; 33-77 years; m, f) the mean value for trunk bending is approximately -1 for men and +6 for women (see Bös et al. 2013). On average men don't achieve the sole level.

The limit values of 0, as described above, achieve 74% of women and 46% of men, -5 achieve 91% of women and 46% of men. The lowest level of -10 achieves 95% of women and 82% of men.

Other references

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *International Sport Studies* 34(2), 42-50.

Chillon, P. et al. (2010). Hip flexibility is the main determinant of the back-saver sit-and-reach test in adolescents. *Journal of sports sciences*, 28(6), p. 641-648.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Koordinationstest (KGKT). *In Bewegungstherapie und Gesundheitssport*, 21(6), 253-258.

Wells, K. F., & Dillon, E. K. (1952). The sit and reach—a test of back and leg flexibility.

Research Quarterly. American Association for Health, Physical Education and Recreation, 23(1), 115-118.

7. Test profile 2

Test profile 2 is performance oriented and consequently the best results as possible should be reached. The reference values are age- and gender-oriented. The evaluation is based on five classifications (quintiles), from “far below average” to “far over average”.

Advanced fitness corresponds to an average fitness level of the population (percentile rank 40-60) of the same age and sex. That means the test person is fitter than 40% and less fit than 40% of the corresponding age group. More health-related fitness activities are advised. The participation in most fitness-exercise-programmes is possible.

Approved fitness means, the fitness level is better than the average of the population (better than percentile rank 60) of the same age and sex. The test person is among the fittest 40% of the corresponding age group. The test person should keep on with health-related fitness activities. Challenging and competitive activities can also be performed.

Physical active adults are the target group of this TP2 (see chapter 5). Through performing this test profile with different test items, the test person can achieve the award Level 2 or Level 3 (see chapter 3).

Compared with TP1, this test profile addresses active sport persons. Due to the higher level of activity and the expected setting the scoring is more differentiated. The scoring in TP2 corresponds to the age and the sex of the test person, which means the result of every single test person will be compared with the results of the reference group of the general population. With the help of existing norms and executed studies in the last years (see test de-

scriptions, p. 30.), the scoring of TP2 could be determined. In addition, the norms will be renewed after a certain period of time to fulfill a modern and current badge.

The test person gets an evaluation for each test item first. Every single result will be structured with the help of age- and gender-specific norms to a point value from 1 to 5. The point values refer to quintiles: 1 point = percentile rank 0-20, 5 points = percentile rank 81-100. Afterwards the single results are summed up into dimensions. If two or more test items exist per dimensions, average values will be built and if necessary will be rounded up. This results in a result profile for the four dimensions of endurance, strength, coordination and flexibility. Motor strengths and weaknesses can be recognized here. In the next step, all four dimension results are summed up to one overall result. This value ranges from 4 points (1 point per dimension) to 20 points (5 points per dimension).

Level 2 Advanced** will be reached, if the test person gets at least 11 points. This refers to a percentile rank of 40 and above.

Level 3 Approved*** will be reached, if the test person gets at least 15 points. This refers to a percentile rank of 60 and above. Test persons with 19 or 20 points get a special comment for their result.

The norm tables are structured after age and sex. For awarding the EFB, different performances are needed depending on age and sex. For example, a 20-years-old female test person and a 40-years-old male test person can reach the same result in the test items, but get other Levels because of their different age and sex.

Table 4: Overview of test items of TP2

Test items of TP2				Additional measurements (see chapter 8)
210 Endurance	220 Strength	230 Coordination	240 Flexibility	
211 Step test	221 Plank test (Ad. Mea)	231 Flamingo	241 Sit & Reach	250 Body composition
212 Walking	222 Jump & Reach	232 Walk back		260 Posture
	223 Push-up			Activity questionnaire

Table 4 shows an overview about all possible test items in TP2. The test items have simple names and are additionally marked with numbers.

Like in TP1 the test person could perform the step test (211), which monitors the cardiorespiratory endurance, or the walking test, which contains the same, but is linked to a higher effort due to a walking course of 2 km.

We recommend using the step test if the equipment is available. But in case of bigger groups, the 2-km-walking-test could be a good alternative.

Concerning strength the three tests should be performed. The planking test that concentrates on core stability but its results are considered as an additional measurement.

The push up is a positive test for trunk stability and strength of the upper extremities.

In the coordination part both tests should be performed: the flamingo balance test (231) contains the static postural control and the walking back test (232) contains the dynamic balance.

The flexibility will be monitored through the sit & reach test (241).

For detailed descriptions, instructions and hints of all test items in TP2 see also the picture cards in the toolbox (chapter 12.f).

211: The Danish step test

The Danish step test is a safe and feasible method for estimation of $VO_{2\max}$. It's quick, needs little equipment and it is easy and fun to do. The Danish step test is a progressive test based on the principle that the energy cost of stepping with a known step height and pace is relatively independent of age, gender and training status.

The test is a gradually increasing maximum exercise test, using a step-bench with a pace given by a computer program. At the start, you step up for every 5 seconds and the pace increases to every 1 second. The test person should go on until the pace cannot be followed anymore. That means that this is at maximum test of the $VO_{2\max}$. It is possible to test a group at the same time, as long as you have enough benches and everybody can hear or see the computer properly. The maximum testing time is 6 minutes. (See Aadahl et al. 2013)

Main reference

Aadahl, M., Zacho, M., Linneberg, A., Thuesen, B.H., & Jørgensen, T. (2013). Comparison of the Danish step test and the watt-max test for estimation of maximal oxygen uptake: the Health2008 study. *European journal of preventive cardiology*, 20(6), 1088-1094.

Content of the test

cardiorespiratory endurance

Picture / description



The test person should wear sport shoes. It is possible to rehearse the step sequence for two to three times besides the step bench, to make sure the test person knows how to follow the step commands. It is important to step up on the bench and to stretch the legs each time. The weight of the body should always be distributed evenly over the entire foot. The test person should take turns on using the left and the right leg. However, at the end stage of the test, the test person can just continue with up and down. Note that stretching the legs is not possible to the end of the test.

The test person should stand close to the step bench and the movement should be straight up and down without jumping. The test should be stopped when the test person is at least four steps behind the sequence. The maximal time is 6 minutes.

Scoring

measuring the time the sequence can be followed

Sources of error

- the rhythm of the pace is not followed correctly
- the legs are not stretched when standing on the bench (towards the end of the test it is ok if the legs are not completely straight since the pace is very quick)
- if the test person has a very low ability to coordinate the stepping up and down or if the test person feels dizzy and stops before exhaustion the result is not precise
- the weight of the body is not distributed evenly on the entire foot

Materials

- computer
- step sequence (Download at online data platform)
- speaker
- step bench (30 cm for women / 35 for men cm high)
- stopwatch

Special remarks

1) Height of the step

The recommendation for the step height is 30 cm for women and 35 cm for men. But it is possible to deviate from this height for special test groups. In this case, special steps should be prepared:

Guidelines for the correct height of the step bench

20 cm: Very weak or elderly people with minor musculoskeletal problems
25 cm: Untrained people
30 cm: Healthy women
35 cm: Healthy men and well trained women
40 cm: Well-trained men

The choice of a correct height is important, because the height influences the $VO_2 \text{ max}$. This will be calculated with the online data platform through a formula, in which the step height is an important factor. That's why the step height needs to be noted.

2) Weight of the test person

For the calculation of the $VO_2 \text{ max}$ the weight of the test person is necessary. Make sure that the weight item is filled out at the body composition field.

3) Alternative endurance test

If the performance of the step test is not possible due to organisational barriers, the following alternative should be considered: 212 Walking Test (ideal for health sports, can be performed as a walking test event).

Scientific background

Psychometric properties

Study 1:

Objectivity & Reliability: 25 young people from two Danish schools implemented the step test at two different occasions with one week in between. The results did not show any significant difference from the first to the second test, which points out that the test results are consistent. This indicates a good reliability of the step test.

Validity: A regression analysis showed high correlations with $VO_{2\max}$ ($R_2 = 0.77$; $P < 0.0001$). That indicates a good construct validity of the step test. (Zacho et al. 2005)

Study 2:

Test-retest-reliability: 0.71, $m = 0.78$, $f = 0.70$

sample: $N = 62$; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

The Danish step test was tested for the estimation of $VO_{2\max}$ in comparison to the watt-max test during the Health2008 study. 346 men and 449 women have been tested. The correlation between $VO_{2\max}$ (ml/kg/min) estimated by the two tests was moderate to high (men: $r = 0.69$, $p = 0.0001$; women: $r = 0.77$, $p = 0.0001$).

32

Other references

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Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Santo, A. S., & Golding, L. A. (2003). Predicting maximal oxygen uptake from a modified 3- minute step test. *Research Quarterly for Exercise and Sport*, 74(1), 110-115.

Zacho, M., Bloomquist, K., Saltin, B. (2005). Udvikling af ny Steptest. Center for Muskelforskning og Motion og Kost På Recept.

212: 2 km walking test

The 2 km walking test was developed in 1993 at the UKK institute of Raja Laukkanen and has been standardised and adjusted for Germany by Klaus Bös in 2003.

There also exist some test variants on the treadmill.

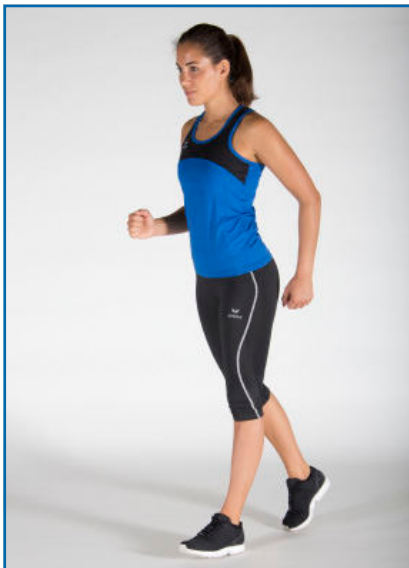
Main reference

Bös, K. (2003). 2 km-Walking-Test. Alters- und geschlechtsspezifische Normwerte. *Gesundheitssport und Sporttherapie* 19 (6) 201-207.

Content of the test

cardiorespiratory endurance

Picture / description



The test person should walk a flat course of 2 km with the walking technique as fast as possible. Therefore, a measured loop road outside can be used. In a gym hall the volleyball court is ideal for walking around.

Optional: pulse control with heart rate monitor.

Scoring

measuring the time needed for 2 km (minutes, seconds)

Sources of error

- jogging instead of walking
- foot contact with the ground is not maintained

Materials

- 2 km walking distance outside on a court or inside the gym
- stopwatch

Scientific background

Psychometric properties

test-retest reliability: 0.73-0.93 (Laukkanen 1993)

Validity (correlation with $VO_{2\max}$): 0.75-0.97 (Laukkanen 1993)

Reference values

There are standard values based on the study of Bös (2003) and the FINGER-Study of Bös, Tittlbach & Woll (2013). Test sample are several thousand men and women in the age from 30 to 80 years.

Other references

Bös, K. (2003). 2 km-Walking-Test. Alters- und geschlechtsspezifische Normwerte. *Gesundheitssport und Sporttherapie*, 19(6) 201-207.

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Laukkanen, R. (1993). *Development and evaluation of a 2-km walking test for assessing maximal aerobic power of adults in field conditions*. University of Kuopio.

Laukkanen, R. M. T., Oja, R., Pasanen, M. E., & Vuori, I. M. (1993). Criterion validity of a two-kilometer walking test for predicting the maximal oxygen uptake of moderately to highly active middle-aged adults. *Scandinavian journal of medicine & science in sports*, 3(4), 267-272.

Oja, P., Laukkanen, R., Pasanen, M., Tyry, T., & Vuori, I. (1991). A 2-km walking test for assessing the cardiorespiratory fitness of healthy adults. *International journal of sports medicine*, 12(4), 356-362.

221: Plank test

This plank test also known as the “prone-bridge” measures the endurance of the anterior muscle chain which plays an important role in daily activities.

This static test can be used as an alternative to other – more traditional – abdominal assessments like curl up or sit-up test.

Many variations exist. Within our test protocol, this static test involves maintaining a challenging position, with the body’s weight borne on forearms, elbows, and toes as long as possible (max. 4 min). The test requires very little equipment.

Main reference

Strand, S. L., Hjelm, J., Shoepe, T. C., & Fajardo, M. A. (2014). Norms for an Isometric Muscle Endurance Test. *Journal of human kinetics*, 40(1), 93-102.

Content of the test

core strength – anterior core muscular endurance

Picture / description



The test person takes a prone position on the floor, feet are placed hip width apart. Lift the body away from the floor so that the elbows are lined directly under the shoulders. In this way only the forearms and toes are in contact with the ground. The body creates a straight line from head to toes. This position is characterized by a neutral spine, phalangeal extension. There should be no sag in the back and everything should be tight.

When the test person reaches the standard plank position, the instructor places a stick on the back to make sure the spine is straight. The instructor observes if the stick touches the three contact points: at the back of the head, the upper back and the tailbone.

When the test person assumes the proper position and indicates he/she is ready, the instructor starts the stopwatch. The test person tries to maintain this position as long as possible.

The test is terminated when:

- The test person fails to maintain the proper position.
- The test person fatigues, voluntarily stops the test or reports ill effects or pain from the test (e.g. headache, dizziness, pain,...)

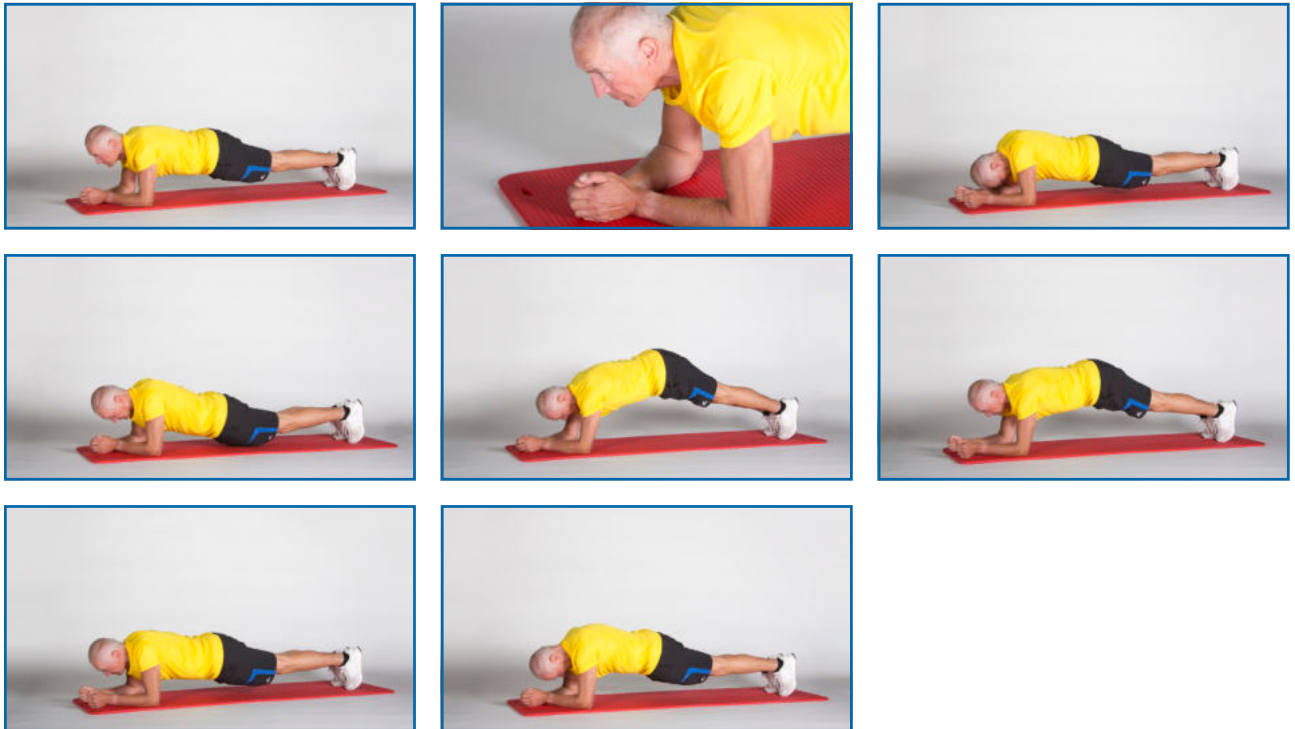
Scoring

measuring the maximum time the test person can hold the correct plank position (max 4 minutes)

Sources of error

- head is tilted back in the neck
- the neck is placed under the chest
- a convex back, wherein the thoracic part of the spine becomes round
- the pelvis is tilted back and buttocks protrude above the knee / rib line out
- hips, head or shoulders drop
- placing your hands too close together

36



Materials

- slim gymnastic mat
- flat plank (10 cm wide)
- stopwatch

Scientific background

Psychometric properties

Study 1: Intraclass correlation $R = 0.996$

Study 2: test-retest-reliability: 0.88 , $m = 0.93$, $f = 0.76$

sample: $N = 62$; 26-67 years; m, f; time test-retest: 1 week; (Klemm et al. 2017)

Reference values

Sample: $N = 471$, 20 years, $m = 194$, $f = 277$, (Strand et al. 2014)

Norms for 20 years old ($N = 471$): male athletes: 20th percentile = 125 sec, male non-athletes: 20th percentile = 72 sec; female athletes: 20th percentile = 59 sec, female non-athletes: 20th percentile = 47 sec

Other references

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Saporito, Gia; Jernstedt, Gretchen; and Miller, Holden, "Test-Retest Reliability and Validity of the Plank Exercise" (2015). *Linfield College Student Symposium: A Celebration of Scholarship and Creative Achievement*. Event. Submission 17.

Schellenberg, K. L., Lang, J. M., Chan, K. M., & Burnham, R. S. (2007). A clinical tool for office assessment of lumbar spine stabilization endurance: prone and supine bridge manoeuvres. *American journal of physical medicine & rehabilitation*, 86(5), 380-386.

222: Jump and reach

The jump and reach test is a much-quoted, international accepted, sport motoric individual test for measuring the explosive strength of the lower extremities (jumping ability).

The test is highly standardized, easy to perform and it is used as individual test, as part of test batteries or in test profiles.

The jump and reach test has a high scope from children to adults. There are many investigations for proofing the psychometric properties.

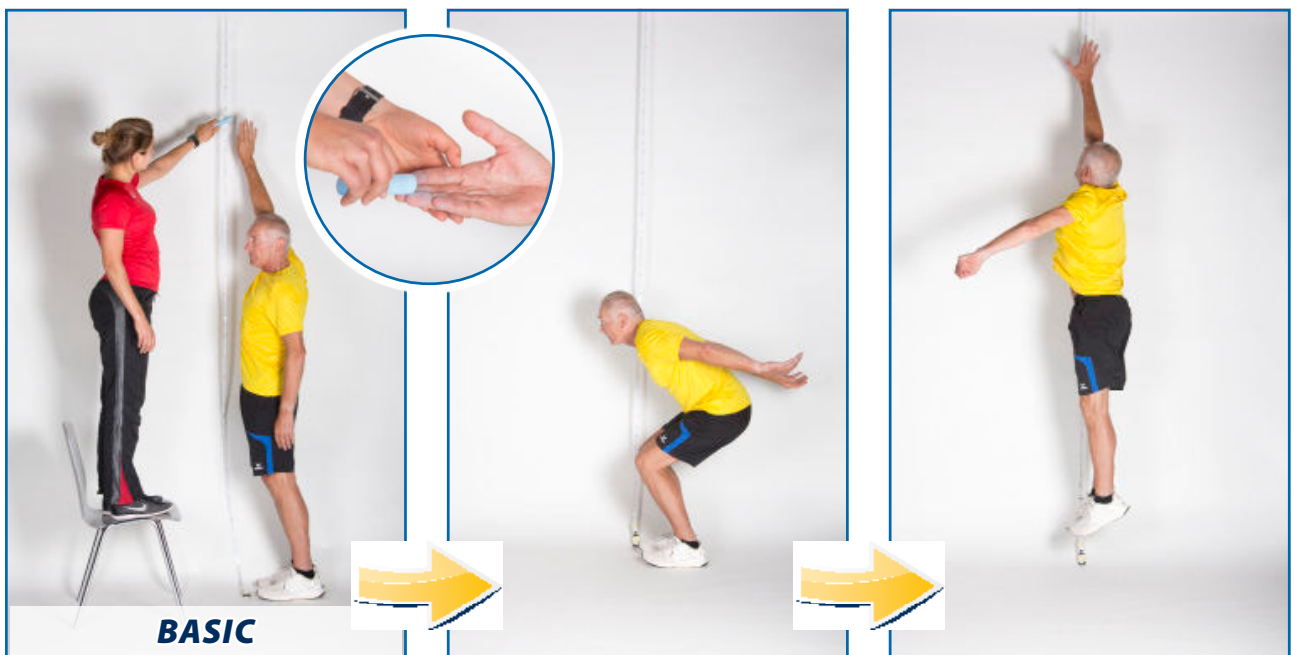
Main reference

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Content of the test

explosive strength of the lower extremities

Picture / description



The test person is placed sideways to a wall. The tips of the fingers are painted with some chalk. The test person puts the wall-side arm up and marks the highest possible position where the middle finger is touching the wall. This height should be noted as vertical reach. Then the test person steps away from the wall (one-foot length) and stands sideways to the wall.

The fingers should be painted again with some chalk.

Now the test person should jump as high as possible while touching the wall with the hand. Knees and arms can be used for swinging, but without stepping. This height should be noted as jumping reach.

The test person has two attempts.

Scoring

difference between vertical reach and jumping reach (highest touching point) in cm

Sources of error

- wrong determination of the heights
- wall is not touched at the highest point while jumping
- test person takes a run-up with the legs

Materials

- measuring tape
- chalk, magnesium
- chair or box/crate to stand on for measuring

Scientific background

Psychometric properties

Study 1: test-retest reliability: 0.95

sample: N = 40; 35-65 years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest-reliability: 0.86, m = 0.87, f = 0.75

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

The standard values are based on the FINGER-study of Bös, Tittlbach & Woll (2013). Test sample are 1303 men and 1683 women in the age of 30 to 80 years.



Other references

Aragón, L.F. (2000). Evaluation of four vertical jump tests: Methodology, reliability, validity, and accuracy. *Measurement in physical education and exercise science*, 4(4), 215-228.

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223: Push-ups – special version

The push-up test is a motor performance individual test for measuring the muscular endurance of the muscles of the torso and the arms. It is often described in the literature of sport science. The push-up test is a widespread and often used performance test.

There are numerous versions of the push-up test (see Bös 2016). The variations differ in the execution and the duration of the test performance. The proposed test version is based on a suggestion by Tittlbach, Kolb, Woll & Bös (2015).

Main reference

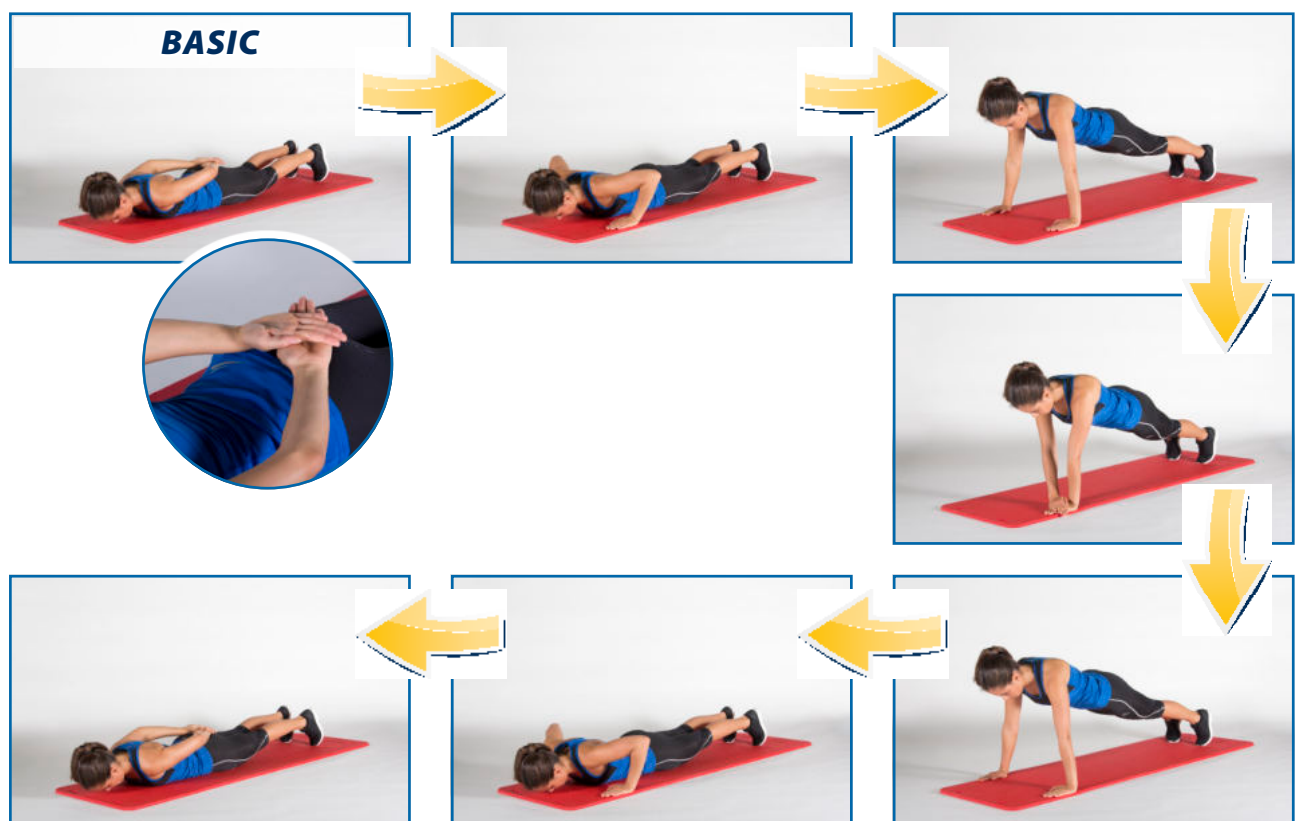
Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Content of the test

muscular endurance of the upper extremities

Picture / description

40



The test person assumes a prone position on the floor. The hands are touching over the buttocks. To start the test, the hands should be detached and placed close to the shoulders, while the feet remain hip width. Now, the test person lifts the whole body away from the floor until the arms are stretched and there is no contact to the floor anymore. One hand should be detached and touch the other hand. During this procedure only one hand and the feet are in contact with the ground. The trunk and the feet are stretched.

The test person lowers the body straight to the floor until he / she reaches the abdominal position and starting position. Before the next push-ups, the hands have to touch each other on top of the buttock again.

Only correct push-ups can be counted.

Scoring

measuring all correct push-ups within 40 seconds

Sources of error



- legs and upper body are not pushed up/laid down at the same time
- hands do not touch behind the back
- in the upright position one hand is not lifted to touch the other hand
- face touches the floor

Materials

- Thin gymnastic mat
- stopwatch

Scientific background

Psychometric properties

Study 1: test-retest-reliability: 0.94

sample: N = 40; 35-65 years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest-reliability: 0.79, m = 0.63, f = 0.80

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

The standard values are based on the FINGER-study of Bös, Tittlbach & Woll (2013). Test sample are 1303 men and 1683 women in the age from 30 to 80 years.

Other references

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *ISS* 34,2, 42-50.

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231: Flamingo balance

The flamingo balance is a widespread sport motoric individual test for measuring the coordination at precision exercises and it is often described in the sport scientific literature. There are many varieties of the flamingo balance test, it has a wide range and a big implementation.

The proposed test is published by Tittlbach, Kolb, Woll & Bös (2005) and is part of the Eurofit (Oja & Tuxworth 1995).

Main reference

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Fitness Test (KGFT). *Bewegungstherapie und Gesundheitssport*, 21(3), 109-115.

Content of the test

static postural control (coordination under precise conditions)

Picture / description

42



The test person should balance with the preferred leg on a balancing beam. The other leg is stretched sideways (around 45 degrees) and shouldn't touch the balancing leg. The test person should balance for 60 seconds, while the instructor counts the bottom-contacts. Contacts with the weight-bearing leg are also noted as fails.

The arms of the test person are stretched to the sides and can be used for keeping balance.

If the test person leaves the balancing beam with both legs the stopwatch has to be held till the test person is back on the beam again. After two total falls (=both legs are on the floor) the test is stopped and the noted scoring is 30.

Scoring

Measuring the number of fails in 60 seconds. The maximum number of fails (leg is touching the ground or the weight-bearing leg) is 30.

The test is stopped if there are more than 30 bottom-contacts or if the test person falls (=touching the ground with both legs) more than two times.

Sources of error



- second leg is touching the ground, the beam or the balancing leg = bottom-contact
- test person leaves the balancing beam with both legs = fall

43

Materials

- stopwatch
- balancing beam (40 cm in length, 4 cm in height and 3 cm in width) for balancing
- flat non-slipping gymnastic mat (if the beam slips)

Scientific background

Psychometric properties

Study 1: test-retest-reliability: 0.92

sample: N = 39; 35-65 years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest-reliability: 0.70, m = 0.65, f = 0.73

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

The standard values are based on the FINGER-study of Bös, Tittlbach & Woll (2013). Test sample are 1303 men and 1683 women in the age from 30 to 80 years.

Other references

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *ISS* 34,2, 42-50.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Oja, P. & Tuxworth, B. (Eds.). (1995). *Eurofit for adults, Assessment of health-related fitness*. Finland: Council of Europe und UKK-Institute Tampere: Research Report.

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232: Walking backwards

Walking backwards is a test for measuring the coordination under time pressure. In the present form, it is a combination of walking backwards (Higbie et al. 1996) and balancing backwards (Kiphard & Schilling 2007). Walking backwards was used in the FINGER-study (Tittlbach et al. 2005) and is part of the German motoric test. (Bös et al. 2005)

Main reference

Tittlbach, S., Kolb, H., Woll, A. & Bös, K. (2005). Karlsruher gesundheitsorientierter Koordinationstest (KGKT). *Bewegungstherapie und Gesundheitssport*, 21(6), 253-258.

Content of the test

dynamic balance (coordination under time pressure)

Picture / description



44

The test person should walk backwards as fast as possible a 6 m walking distance. The toes of one foot should touch the heel of the other one. There should not be a gap between toes and heels. Both feet should be over the 6 m-line, and then the time will be stopped.

The test person has three attempts. Within the three attempts, the test person should concentrate on the first attempt to do the movement correctly. With the second and third attempt the test person can try to increase the speed.

If the movement is not correctly performed at all three attempts or the 6 m cannot be reached, the **longest reached** distance should be measured. Then, this distance counts as the result of this test item instead of the time.

Scoring

measuring the time for the 6 m-distance in sec

If the performed distance is less than 6 m, the longest distance is measured.

Sources of error



- feet do not touch each other
- test person does not walk on the line

Materials

- stopwatch
- 6 m-adhesive tape
- measuring tape

Scientific background

Psychometric properties

Study 1: test-retest-reliability = 0.79

sample: N = 39; 35-65y; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: test-retest-reliability = 0.75, m = 0.49, f = 0.76

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

There are standard values based on the study of Bös et al. 2013 (men N = 1303, women N = 1685, Age 35-75).

Other references

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *ISS* 34,2, 42-50.

Bös, K., Wydra, G. & Karisch, G. (1992). *Gesundheitsförderung durch Bewegung, Spiel und Sport*. Erlangen: perimed.

Higbie, Elizabeth J., Kirk J. Cureton, Gordon L. Warren III, and Barry M. Prior. Effects of concentric and eccentric training on muscle strength, cross-sectional area, and neural activation. *J. Appl. Physiol.* 81(5): 2173-2181, 1996.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

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241: Sit and reach

The sit and reach test makes a statement about the flexibility. There are a lot of tests under the general term “trunk bending”, which differ in the way of performance and the measuring equipment. Well known are the two versions “stand and reach” and “sit and reach”.

The proposed test is the sit and reach test, it is described as a qualitative performing version (achieving the sole level). This test suits to make a diagnosis about the minimum flexibility.

Main reference

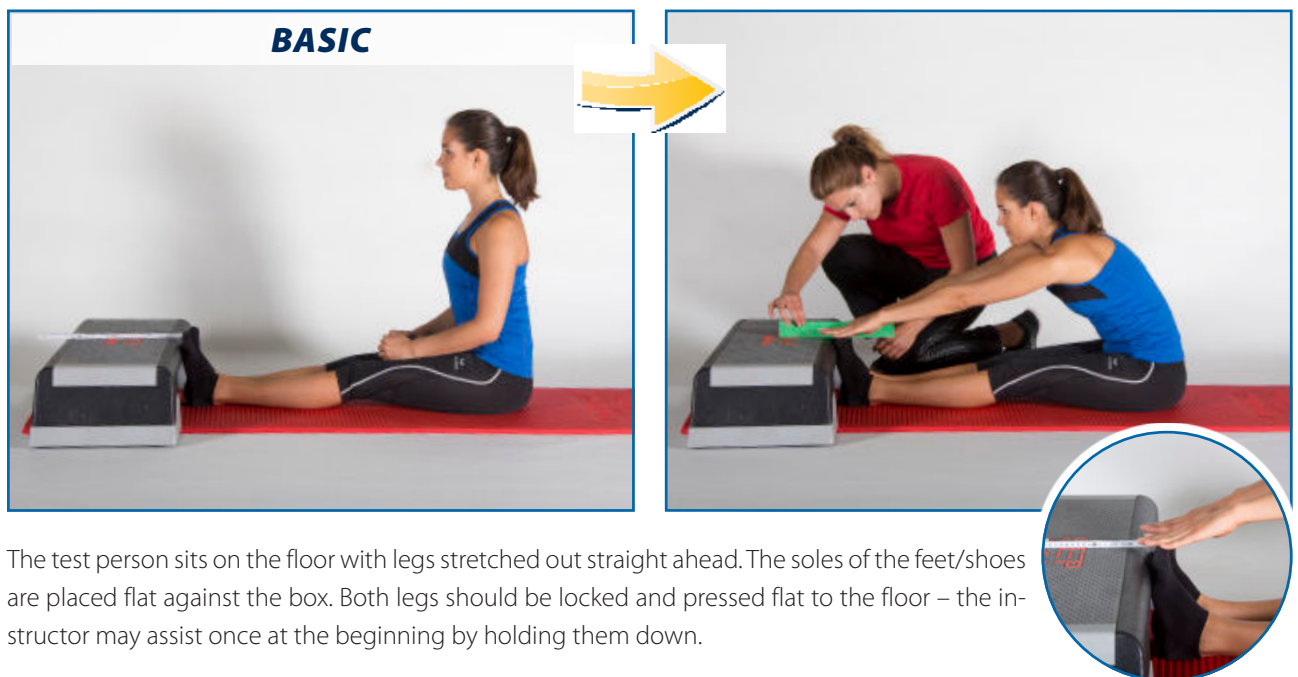
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Content of the test

flexibility of the lower back and hamstring muscles

Picture / description

46



The test person sits on the floor with legs stretched out straight ahead. The soles of the feet/shoes are placed flat against the box. Both legs should be locked and pressed flat to the floor – the instructor may assist once at the beginning by holding them down.

With the palms facing downwards, and the hands on top of each other or side-by-side, the test person reaches forward along the measuring line as far as possible. The hands remain at the same level, not one reaching further forward than the other. The test person reaches out and holds that position for one to two seconds while the distance is recorded.

Not being able to reach the soles results in a negative score.

The instructor should make sure that there are no jerky movements and that the legs remain straight on the floor.

The test person has two attempts.

Scoring

Measuring the distance between sole level and fingertips in cm. If the fingers don't reach ahead of the feet, a negative value results.

Sources of error

- the position of the hands cannot be held for one to two seconds
- legs are not straight

Materials

- sit and reach box or inverted gymnastic bench
- specific measuring tape (see toolbox, chapter 12.d.)

Scientific background

Psychometric properties

Study 1: test-retest reliability: 0.95

sample: N = 40; 35-65years; m, f; time test-retest: 4 weeks (Tittlbach et al. 2005)

Study 2: criterion oriented validity (correlation between sit and reach and back-saver sit and reach test): 0.51-0.59 (men), 0.66-0.76 (women)

sample: N = 93; 20-30 years; m, f (Lopez-Minarro et al. 2009)

Study 3: test-retest-reliability: 0.93, m = 0.92, f = 0.94

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Reference values

The standard values are based on the FINGER-study of Bös, Tittlbach & Woll (2013). Test sample are 1303 men and 1683 women in the age from 33 to 77 years.

Other references

Bös, K., Tittlbach, S. & Woll, A. (2013). FinGer – Physical Activity, Fitness and Health – An international longitudinal study in Bad Schönborn and Tampere (1992, 1997, 2002, 2010). *ISS* 34,2, 42-50.

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Hoeger, W.W.K./Hopkins, D.R. (1992). A comparison of the sit and reach and the modified sit and reach in the measurement of flexibility in women. In: *RQES* 63, 191-195.

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8. Additional measurements

A complete impression of the fitness status of a person can just be reached through additional measurements. These measurements are not part of the evaluation of the badge, but should be executed to give a general feedback.

Additional components of both test profiles are activity questions, body composition and posture. We strictly recommend to measure the additional components. Ac-

tivity is measured with one question which allows five answer categories. To evaluate the body composition weight, height and waist circumference are measured. Out of these measurements it is possible to calculate ABSI (151/251) (a body shape index) developed by Krakauer and Krakauer (2014). If the waist circumference is not measured because of different reasons, BMI is calculated (152/252). Posture is evaluated through a special posture test (161/261).

151/251: A Body Shape Index (ABSI)

ABSI (A Body Shape Index) is the answer to the critics of the BMI, which presents a volume measure.

The ABSI also considers the fat distribution in the body through the integration of the waist circumference. Jesse and Nir Krakauer developed the Body Shape Index (ABSI) in 2012.

Main reference

Krakauer, N.Y., & Krakauer, J.C. (2014). Expansion of Waist Circumference in Medical Literature: Potential Clinical Application of a Body Shape Index. *J Obes Weight Loss Ther*, 4(216), 2.

Content of the test

The ABSI inspects height, body weight, abdominal circumference (measured above the hip bone), sex and age.

Picture/description



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To calculate the ABSI the instructor should measure the body height, the body weight and the waist circumference. During the measurement of the waist circumference the test person should stand upright and the weight should be equally distributed on both legs. The arms should hang naturally at the sides.

The instructor feels for the highest point of the ilium and the lowest point of the costal arch. The instructor should attach the measuring tape in the middle of these two points and pass the measuring tape around the waist parallel to the floor.

The test person must take a deep breath, breath out and then hold the breath. While the person is holding its breath, the instructor measures the waist circumference.

The ABSI is calculated using the following formula (calculator: <https://nirkrakauer.net/sw/absi-calculator.html>):

$$ABSI = \frac{\text{waist circumference}}{BMI^{\frac{2}{3}} \times \text{height}^{\frac{1}{3}}}$$

For the calculation 2 cm of the height (depending on shoes) and 0.5-1.5 kg of the weight (depending on clothes) should be subtracted. It is recommended to measure without shoes.

Scoring

ABSI depends on sex and age. By means of sex and age, depending mean values and standard variances the ABSI-value could be calculated by computer.

For interpreting this value an additional comment is given on the feedback sheet. This comment relates the result to the population of the same age and sex.

For an easy handling the ABSI classification is like the one of the test items. It is structured into five classes, from 1 "far below average" to 5 "far over average".

Sources of error

- the waist circumference is not measured as in the description above
- measuring fault at the determination of height and weight

Materials

- straightedge for body height
- scale for body weight
- flexible measuring tape for waist circumference

50

Scientific background

Psychometric properties

Study 1: With their longitudinal study (N = 7000; m, f; America) over 25 years, the authors show that the ABSI is a valid test to determinate the mortality risk (Krakauer & Krakauer 2014).

Study 2: test-retest reliability: 0.93, m = 0.49, f = 0.94

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

The partially low reliability occurs due to unreliable measures of the waist circumference. Therefore, the measure of the waist circumference should be very precise.

Reference values

The reference values of the online calculator refer to a sample of 7000 male and female Americans. The numerical values are based on a complex formula, which just can be interpreted with the help of reference data.

Other references

Biolo, G., Di Girolamo, F.G., Breglia, A., Chiuc, M., Baglio, V. et al. (2015). Inverse relationship between "a body shape index" (ABSI) and fat-free mass in women and men: Insights into mechanisms of sarcopenic obesity. *Clinical Nutrition*, 34(2), 323-327.

Duncan, M.J., Mota, J., Vale, S., Santos, M.P., & Ribeiro, J.C. (2013). Associations between body mass index, waist circumference and body shape index with resting blood pressure in Portuguese adolescents. *Annals of human biology*, 40(2), 163-167.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Krakauer, N.Y., & Krakauer, J.C. (2012). A new body shape index predicts mortality hazard independently of body mass index. *PLoS One*, 7(7), e39504.

152/252: Body-Mass-Index (BMI)

The BMI (Body-Mass-Index) is an anthropometric measurement which reflects the relation between body height and body weight. The Belgian mathematician Adolphe Quetelet described the BMI for the first time in 1832.

Because of the fast and simple survey of the BMI, it is the most widespread constitution parameter at that time. Due to the high relevance in everyday life, the BMI is a discussed constitution parameter. The missing differentiation between muscle mass and fat mass is the most intensive criticism the BMI receives. (See Krell-Rösch & Schmidt 2016)

Main references

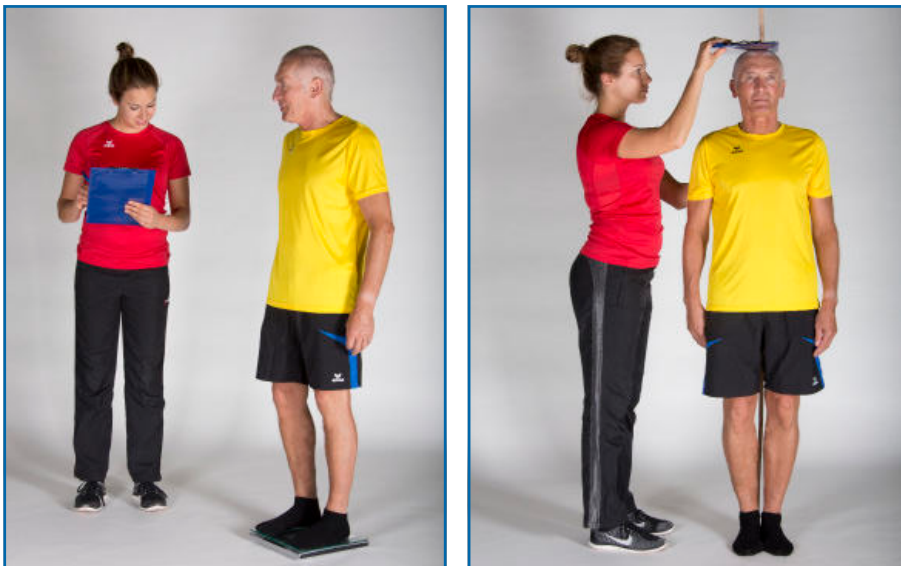
Krell-Rösch, J. & Schmidt, S. (2016). Körperkonstitution. In: Bös, K. (Hrsg.). Handbuch Motorische Tests. Göttingen: Hogrefe, Kapitel 1.6.

Quetelet, M. A. (1841). *A Treatise on Man and the Development of his Faculties*. New York: Burt Franklin.

Content of the test

relative body weight

Picture/description



51

To calculate the BMI, the body weight in kilogram (kg) and the body height in meter (m) should be measured. The calculation corresponds to the formula:

$$BMI = \frac{\text{weight [kg]}}{\text{height}^2 [\text{m}^2]}$$

For the calculation 2 cm of the height (depending on shoes) and 0.5-1.5 kg of the weight (depending on clothes) should be subtracted. It is recommended to measure without shoes.

Scoring

	BMI score
below normal weight	<18.5
normal	18.5-24.9
slightly overweight	25-27.4
overweight	27.5-29.9
adipose I	30-39.9
adipose II	≥ 40

Sources of error

- mistake during measuring the body weight / height

Materials

- straightedge for body height
- scale for body weight

52

Scientific background

Psychometric properties

Test-retest reliability: 0.91, m = 0.73, f = 0.96

sample: N = 62; 26-67 years; m, f; time test-retest: 1 week (Klemm et al. 2017)

Validity: The validity is limited because the BMI considers the volume measure and not the fat distribution. Small and dense persons like bodybuilders get a wrong classification of a high health risk because of their background. This applies for persons without abdominal fat but with hip fat too.

Reference values

For the calculation of the BMI many population studies are available. For adults different fixed BMI limits exist as a guideline to categorise overweight. The World Health Organization (WHO) defined overweight with a BMI over 25 and adiposity with a BMI over 30 (WHO 2000).

Other references

Cole, T.J., Bellizzi, M.C., Flegal, K.M. & Dietz, W.H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal*, 320 (7244), 1240-1243.

Klemm, K., Butzke, M., De Clerck, I., Hoffmann, A., Van Houtte, B., Marschall, M., Reichenbach, C., Trentel Busch, L. & Bös, K. (2017). *Development and Evaluation of the European Fitness Badge. Research Report*. Karlsruhe, Institute of Sports Sciences.

Kromeyer-Hauschild, K., Wabitsch, M., Kunze, D., Geller, F., Geiß, H.C., Hesse, V., von Hippel, A., Jäger, U., Johnsen, D., Korte, W., Menner, K., Müller, G., Müller, J.M., Niemann-Pilatus, A., Remer, T., Schäfer, F., Wittchen, H.-U., Zabransky, S., Zellner, K., Ziegler, A. & Hebebrand, J. (2001). Perzentile für den Body-mass-Index für das Kindes- und Jugendalter unter Heranziehung verschiedener deutscher Stichproben. *Monatszeitschrift Kinderheilkunde*, 149 (8), 807-818.

Pietrobelli, A., Faith, M.S., Allison, D.B., Gallagher, D., Chiumello, G. & Heymsfield S.B. (1998). Body mass index as a measure of adiposity among children and adolescents: A validation study. *The Journal of Pediatrics*, 132(2), 204-210.

161/261: Upright standing posture test (USPT)

A good upright posture is important to maintain stability and balance with minimum effort and least strain. Maintaining a good posture has been said to have great health benefits, such as preventing unnecessary strains and injuries (e.g. chronic lower back pain) and improving respiratory efficiency and preventing fatigue (muscles use less energy). It is known that poor posture may occur due to defects in joints (e.g. immobilization), bones (e.g. deformity), nerves (e.g. overactivation) and muscles (e.g. weaknesses). The trigger for a bad posture is mostly bad habits, with sitting and sedentary lifestyle being number one.

Therefore, applying this test may help sedentary people to be more aware of a less healthy lifestyle. Furthermore, this upright standing posture test (USPT) is an important clearance test for starting any form of exercise, since training with a bad posture may lead to excessive injuries.

Main reference

Page, P., Lardner, R., & Frank, C. (2010). *Assessment and Treatment of Muscle Imbalance: The Janda Approach*. Champaign, IL: Human Kinetics.

Content of the test


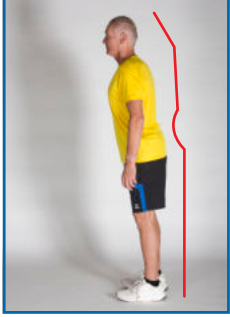

observation of the natural upright standing posture

Picture / description

Choose a quiet place which is sufficiently lighted. A separate locker room or a corner in the hall is perfect. Let the test person take off all loose hanging clothes e.g. jacket that can be removed without hindrance. Form-fitting clothes are recommended but not necessary. Let the test person stand barefoot or with flat shoes.

The instructor observes the test person while standing to the side, at least 3 meters away from him/her. While observing, the test person may slowly be counting back from 20 to 0 for distraction.

Scoring

<p>Posture A: none of the criteria above are present.</p>	<p>This represents a good upright standing posture.</p>	
<p>Posture B: forward head position</p>	<p>Observe if the ear is clearly anterior to (in front of) the shoulder. If this is observed, please score "B".</p>	
<p>Posture C: too hollow lower back posture</p>	<p>While observing the upright standing position, observe if the lower back has an abnormal large arch. If this is observed, please score "C".</p>	
<p>Posture D: (= score B+C) both forward head position (score B) AND too hollow lower back (score C)</p>	<p>If both score B (forward head position) and score C (too hollow lower back) are present, please give a score of D.</p>	
<p>Posture E: the test could not be performed due to pain or injury</p>	<p>If a test person complains of pain while performing the test, please stop the test immediately and give a score of "E".</p>	

Sources of error

- test is not possible because of wide clothes, high heels of loosely hanging gear
- test person does not want to perform the test because of discomfort
- test person does not show his/her “normal” posture and changes it in something he/she thinks is good

Materials

- picture card for the test instructor

Scientific background

Psychometric properties

not yet established

Reference values

not yet established

Other references

Dunk, N., Lalonde, J., & Callaghan, J. (2005). Implications for the use of postural analysis as a clinical diagnostic tool: reliability of quantifying upright standing spinal postures from photographic images. *Journal of Manipulative & Physiological Therapeutics*, 28(6), 386-392.

Ferreira, E. A., Duarte, M., Maldonado, E. P., Bersanetti, A. A., & Marques, A. P. (2011). Quantitative Assessment of Postural Alignment in Young Adults Based on Photographs of Anterior, Posterior, and Lateral Views. *Journal of Manipulative & Physiological Therapeutics*, 34(6), 371-380.

do Rosário, J. P. (2014). Literature review: Photographic analysis of human posture: A literature review. *Journal of Bodywork & Movement Therapies*, 1856-61.

9. Online Data Platform and its use

The online data platform is a tool for the computer-based evaluation of the EFB. Access is provided for every test instructor who wants to execute the EFB with a group of test persons and who has the permit to execute The EFB (www.e-f-b.eu).

The administration of permits is in the responsibility of the involved organisations in the different countries.

A person who wants to execute the EFB needs to contact the national responsible organisation (master) (contact data at www.fitness-badge.eu). The master provides one access code for all certified trainers for creating EFB tests at the online data platform. Therefore, you need to take part in an EFB education seminar.

The moment you get the access code (E-XXX-...) you can start preparing your EFB test with the help of the handbook and the online data platform.

At the online data platform, you can find the following areas:

- **Test area:** At this area information about the test can be typed in, the test profile can be chosen and an overview is displayed
- **Download area:** All documents and media you need for executing like data sheets, declaration of consent, step test video sequence, the handbook, etc. are displayed here and can be downloaded.
- **Input area:** At this area, you will be directed from one test item to another to put in the data of every single test person, depending on the test profile you chose. Just for the input of the data you can generate an assistance code (A-XXX-...). This code is always just valid for one test.
- **Output area:** After the input, the certificates can be printed out or send via email to the according test person with one click. These functions can be found at the overview of participants.

The online data platform works as a calculator and data collector for you. In the background of the calculation there are thousands of data defining the norms and the calculation rules concerning how one gets the EFB of the respective level. The concrete calculation of each profile is displayed in the corresponding chapters 6 and 7.

As a preparation, the online data platform should be consulted for a familiar handling during the data input before the test day.

We highly recommend working with the online data platform.

The data will be used for further scientific calculations and for generating new norms. Therefore, a **precise measuring** and a **correct data input** is very important and should always be ensured.

The only way for not working with it is in the case of executing test profile 1. In this case, it is possible to print out all needed documents including the certificates as well for immediate use. But a detailed feedback is not possible in this case.

There are several possibilities when working with the online data platform. After having collected the data on paper on the day of the test, the data can be entered into the system afterwards, at the office or at home. In this case, be sure the set of data of every test person is complete. The direct input of the data is possible too, but requires a computer with internet access. For the direct printout of the certificates a printer needs to be on-site too.

After the input, a feedback/counselling (see chapter 10) is recommended for a perfect completion of the EFB.

If some concerns occur about the data collection we want to emphasize that all collected data will be directly anonymised after the certificate is printed out or sent to the test person via email (be aware of this issue: 90 days after the input of the data, the data is anonymized and no certificates can be printed out anymore). With this handling, we follow the European data protection standards.

You can find more information about the functioning of the Online Data Platform in the EFB Youtube Playlist: www.youtube.com/user/dtbonline/playlists

Counselling

10. Behaviour Counselling after testing

The European Fitness Badge gives a detailed feedback on the individual fitness status.

An effective counselling can help on:

- Building up a problem awareness concerning one's own fitness status and in developing one's knowledge about the health effects of exercising, and about the possibilities to start an activity (stage 1 "not considering" & 2 "considering").
- Coming to a firm determination to become (more) active, and in making concrete plans on how to do this (stage 3 "preparing").
- Finding an activity and/or an exercise group, motivating and supporting to enhance one's own fitness (stages 3 "preparing" & 4 "exploring").
- Coming back from a "fluctuating" situation to "maintaining" physical activity (stage 5 "maintaining").
- Giving a sustainable feedback of one's fitness status and inducing positive emotions by bringing pride for having a fitness level above average (stage 5 "maintaining").

Principles of counselling

1. Keep it clear and brief
2. Focus on the interests and strengths of the person you are counselling
3. Use open questions
4. Don't give orders but provide support, encouragement and recommendations
5. Stimulate reflection and summarize
6. Keep in mind that you don't fall in love with your own ideas. Ask questions to find the other person's ideas. If the person "on the other side" disapproves of your ideas you should be willing to abandon your idea and take another point of view.

Steps in counselling

There are different steps the consultant should go through. The Counselling Guide provides practical examples and questions.

1. Get to know the test person:

Introduce yourself. Say who you are and what the purpose of the conversation is. Some of this introductions will happen during the test. Acknowledge the effort done to participate in the test.

Ask why the test person wanted to participate and what his/her expectations or goals were.

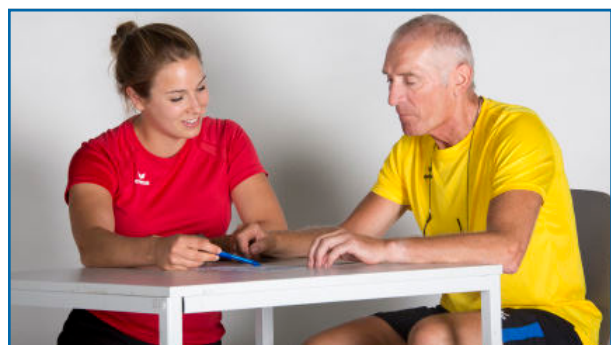
"What motivated you to take part in the European Fitness Badge? What was your goal with this? What do you want to achieve?"

Affirm the efforts that the test person has made.

"I am very happy that you have come to our event today, which is a big step for you."

Ask for interests and goals of the test person concerning activity (e. g. daily activities) and sports. Ask for the reasons why he/she chooses this goal (external, internal motivation). Ask for the importance and the feeling for reaching the goal and ask for approval about the steps to be taken.

"What kind of sport activities/exercise did you participate in the past / when you were young? What are your interests in sports? What are your goals? Why do you choose this goal? What was the reason for the drop-out? Do you generally feel "fit"?"



2. Current exercise participation

It is important to know if the participant is (sufficiently) active or not, because this will affect the counselling talk. Therefore ask how fit he/she feels at the moment and what kind of sport activities he/she does on a weekly basis.

Look at the »Activity questionnaire«:

» When the participant answered options 1 or 2, we assume he/she is not (sufficiently active).

» When the participant answered options 3, 4 or 5, we assume he/she is active.

3. Ask for motivation, intention and goals

Questions about motivation, interests and goals of the participants concerning physical activity and sports. Use the Counselling guide for more information and exact paths to follow depending on the current level of activity performed by the participant. In general terms the following questions should be made:

- Ask for previous sport participation
- Ask what would motivate them to become or to maintain an active lifestyle. Ask for intentions.
- Ask what would motivate them to achieve their goals. Ask for reasons why the goal is chosen and the importance of reaching it.

4. Show results of the European Fitness Badge

Making the test person aware of his/her own situation by evaluating and interpreting the test results with the given goals in mind.

Hand out the results and certificate and show what kind/level of badge was achieved.

Discuss the strengths and give your appreciation. Discuss the weaknesses and relate to his/her lifestyle and/or activity level.

5. Reflection on the results

Ask for personal reflection about the results. Is the participant satisfied; was the result expected?

Ask if the participant would like to improve on certain items. Reflect upon the need for a change.

6. Set a goal

Depending on the intentions of the participant, the strategy to follow is different. Check the Counselling guide for more information.

Help the participant to set realistic goals and specific, measurable goals to accomplish on a specific timeline.

7. Summarize

Summarize the talk and ask for affirmation and/or remarks. Wish the participant good luck with the action plan.

Groups and perspectives for behaviour counselling

For behaviour counselling four groups of people can be distinguished – with respect to the target groups described in chapter 5.

Target group 1 needs to be separated in two groups: “No basic fitness” (1a) – that means failing the badge on level 1 – and with “Basic fitness” (1b) – that means getting the level 1 badge.

Group 1a: No basic fitness (failing the badge on level 1)

If the basic fitness level is not achieved, there is an urgent need to integrate the person into special health and exercise programmes. Counselling is very important for this group. As the members of this group are usually on a HEPA-behaviour stage between 1-3 **counselling should include:**

- Inquire about the interests and goals of the test person
- Making the test person aware of his/her own situation by evaluating and interpreting carefully the test results – including body composition and posture
- Making the test person aware of the possible effects of exercising especially on the weak fitness factors and suggesting appropriate exercise groups
- Identify barriers and give solutions about barrier management

Group 1b: Basic fitness (level 1: Basic)

The fitness of this group is basic with respect to promoting health. A basic fitness status makes it possible to take part in low intensity exercise programmes of sports and gymnastics clubs. The members of this group are usually on a HEPA-behaviour stage between 3 and 4. Therefore **counselling should include:**



- Inquire the interests and goals of the test person
- Making the test person aware of his/her own situation by evaluating and interpreting the test results
- Illustrating the advantages of more and/or better fitting fitness and health related exercises for the person concerned
- Suggesting exercise groups and / or additional physical activities / exercises
- Identify barriers and give solutions about barrier management

Group 2: Average fitness (level 2: Advanced)

These people's fitness is corresponding to an average level of the population of the same age and sex – i.e. these people are part of the 20% of their age group who have a medium fitness level. They should engage more in health-related fitness activities. The people in this group are usually on a HEPA-behaviour stage between 3 and 5. Therefore **counselling should include:**



- Inquire the interests and goals of the test person
- Making the test person aware of his/her own situation by evaluating and interpreting the test results.
- Illustrating the advantages of more and/or better fitting fitness and health related exercises.
- Suggesting exercise groups and/or additional physical activities / exercises.
- Identify barriers and give solutions about barrier management

Group 3: Fitness above average (level 3: Approved)

The fitness status of this group is better than the average fitness of the population of the same age and sex – i.e. members of this group are included in the fittest 40% of their age group and usually on HEPA-behaviour stage 5. For this group, usually **a short feedback is sufficient:**



- Ascertain the interests and goals of the test person
- Evaluating and interpreting the test results – confirmation of a health enhancing fitness
- Suggesting additional physical activities/exercises or giving new ideas of being and staying active (if requested)

Counselling in different situations of testing and awarding

The situation of testing and of certifying the badge (see chapter 5) is also influencing a possible counselling, e.g.

Situation "small sport events or gymnastics clubs": In this situation, the focus of counselling should be on the range of exercises offered by sports and clubs to enhance effectively the fitness of the person concerned.

Situation "exercise or sport groups of sports or gymnastics clubs": Here the focus of counselling should be on the improvement within the group context and on additional exercises designed to effectively enhance the fitness of the person concerned.

Situation "Big events e.g. of sport federations": In this situation, the focus of counselling should be on possibilities to enhance the fitness in general of the person concerned (e.g. exercises at home).

Situation in "companies": Here the focus of counselling should be on organizing an active lifestyle at work. E.g. some exercises in the office or activity breaks for everyone. In this situation, a feedback to the leader of the company concerning possible small changes to activate and motivate the employees should be integrated.

Counselling and barrier management

Barriers are subjective – i.e. individually strongly varying patterns of justification running contrary to engaging in regular physical activities. They often include perceived negative consequences of participation in sports activities, e.g. less time for partners/family, risk of injuries leading to disability and fear of failure, own capacity or disgrace.

To overcome these barriers successfully, they first should be made aware, i.e. to be addressed concretely. Only then it is possible to find strategies for dealing with those situations. The trainer may ask the person being tested about the specific reasons for her/his previous inactivity or why previous attempts to be active were not successful and comment accordingly. Here are some general recommendations for successfully dealing with barriers:

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Exercising with a partner or a friend. Thus, both feeling a certain “obligation” to participate in regular physical activity, and can encourage each other at times of declining motivation.

Setting a goal and rewarding oneself after having achieved a personal goal (e.g. regularly participating in a health-related sports programme for 12 weeks). Such a reward though being rather symbolic should nonetheless have a high significance for the individual involved.

Being tolerant towards oneself. The goal of physical activity should not be “absolute” health and/or fitness. It is important to always be realistic and flexible enough to compensate occasional shortfalls in training.

There is no sure formula, though, for successfully overcoming barriers. Each management strategy should be tailored to the specific circumstances. Described below are a few possible responses to typical barrier situations:

Lack of time: This is quite a frequent argument the consultant may respond to by referring to the assignment of priorities. Regular physical activity can be maintained only by assigning it as a high personal significance. Some top managers, e.g., find the opportunity to go jogging each morning despite an extremely high pressure of work or to, at least, organize the daily activities in an active way. Assigning a high priority is only possible, of course, if physical activity is self-imposed and considered as fun.

Health related reasons: The consultant may illustrate the pre-emptive effects of physical activity and point out the high qualification of the instructors. For people with health or movement restrictions there are also many possibilities to be or become active and to have positive effects on their health.

Fear of disgrace: The consultant may recommend a programme for participants of a similar level of physical and sporting abilities or a comparable health status.

Laziness: The participant should be thoroughly prepared mentally for “being physically active”. In addition, concrete, feasible and a verifiable goals (e.g. after having finished the course being able to go walking for 20 minutes without a pause; being able to carry a crate with bottles from the car into the house) can help in creating and maintaining a sufficient motivation.

Lack of support: If the participant is not sufficiently supported by her/his family and friends the consultant can try to compensate such a lack by involving other participants (e.g. by picking her/him up at home).

Lack of adequate physical activities: The consultant may show the participant the range of health-related sports programmes in a club or of exercises/activities that can be done at home.

Lack of interest: In such a very difficult case it is important to illustrate again the health-related advantages of regular physical activity and emphasize the fun connected with training in a group, to motivate the person concerned to register for a sports programme. Activities which are fun and which boost physical capacities may at last increase the motivation to regularly participation.

Too strenuous: The consultant may emphasize the high qualification of the instructors, who are specifically trained to conduct the exercises in a health enhancing way though not overstraining intensity. To motivate there must be an equal relationship: not “expert trainer” vs “unwitting customer”.

The tester should always try to counsel after testing. It takes time but is effective. The mentioned hints can help.

Execution of the European Fitness Badge

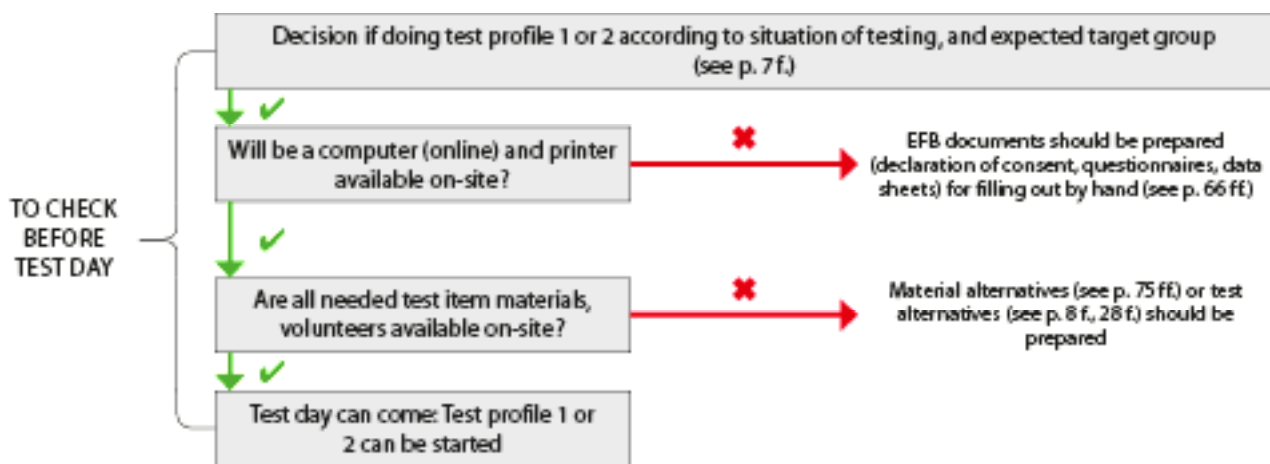
11. Preparing and executing the European Fitness Badge

In this chapter, all relevant tips and information for the preparation and execution of the European Fitness Badge are given. With the help of this chapter and the following chapter “Toolbox” the planning, organizing and performing of the EFB can successfully be done.

The flowchart below, structured into three parts, gives an overview of what should be thought and leads you to the relevant pages.

The first part “To check before test day” should be handled in the weeks before the test day. If these points are clear the performance of the EFB can start.

Flowchart I



The second part “At test day” can be used as a checklist during the test day. First it is important to be on the safe side concerning the health and the agreement of the test persons.

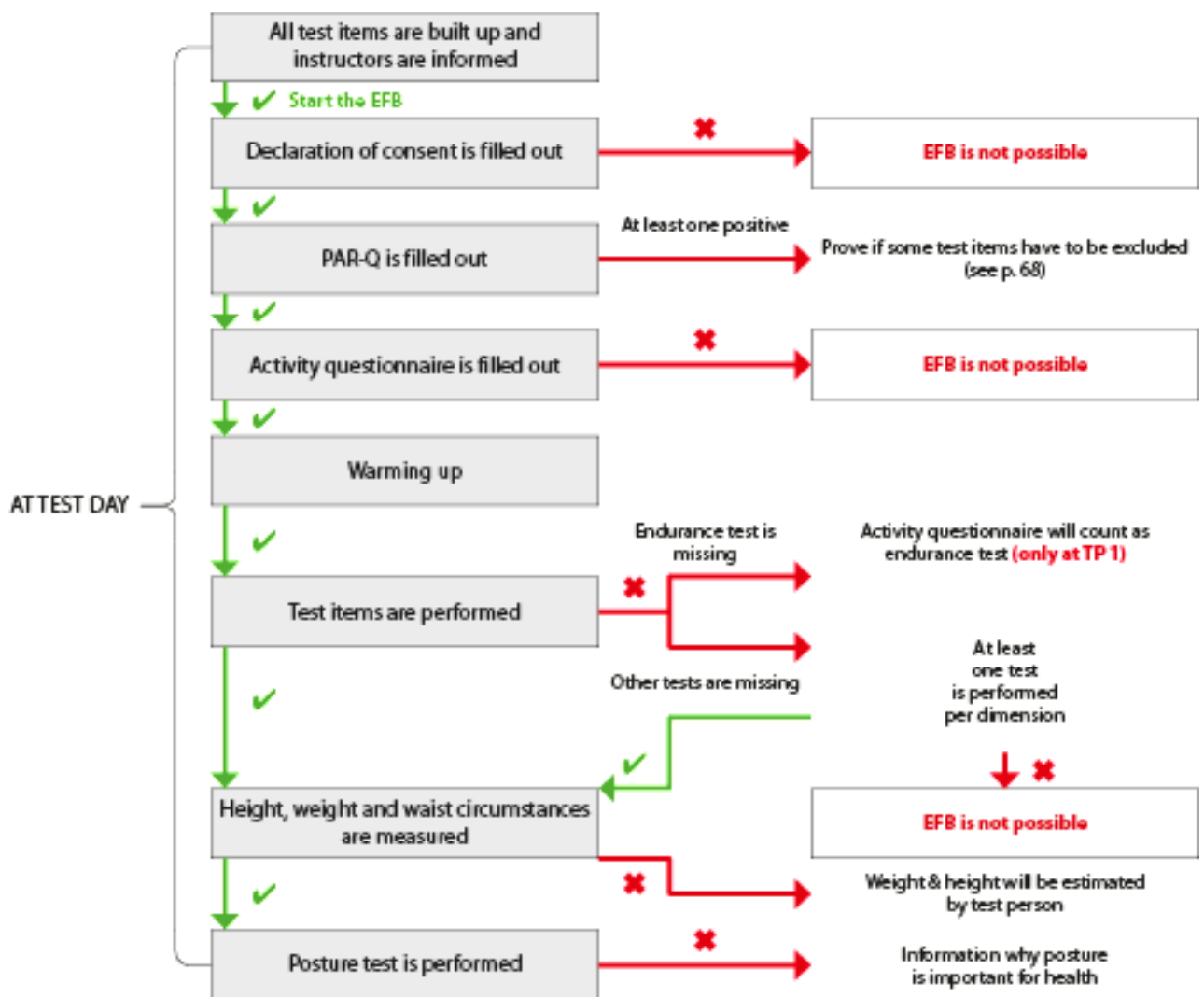
Before the active part of the EFB, a general warming-up should be executed for the best possible preparation. The warming-up can be designed very creatively, just be sure to include all muscle groups needed in the test items and to raise the heart rate. The warming-up should take 5 to 10 minutes.

There are three different ways of performing the EFB with a group of testers or participants. The following questions should be answered before deciding the right way:

- How many people want to perform the EFB?
- How many instructors can help during the execution of the EFB?
- What is the time gap for building-up, performing and removing?
- Are the participants familiar with the test items?
- How many »materials sets« you have?

If these questions are answered, the decision of which way the EFB can be performed should be very clear.

Flowchart II



The *first way* of performing the badge is the expert way. Every test instructor stays the whole time at one test item and the test persons (two people at once) change from one test to another – either in fixed order, else randomly depending on which testing station is available. In the latter case the test persons should be used to doing sports. That option requires many instructors.

The *second way* of doing the badge is the sports club way. The test persons and their trainer know the test items and their abilities very well and can take notes and perform the EFB together during a class. After one general instruction by the certified trainer the test persons perform the test items by themselves in groups and instruct each other. This way does not need additional instructors, but test persons should be very familiar with the test items.

The *third way* of performing the badge is the group way. One test instructor is allocated to a group of test persons. With the group the instructor changes from one test item to another. The optimal group size is four. This way needs just a small number of test instructors and can handle a lot of participants in a short time. This way the instructor gets to know the participants very well and the contact can be very trustful.

As a time example for the third way the test was executed with 4 test instructors and 20 participants in one hour. In addition, setting up and putting the material away takes approximately 30 minutes.

Concerning the recommended order of the test items see p. 78 f. Please consider there is no perfect order, but the order should be well chosen regarding the difficulty of

the test items for the participants. The non-performing posture and body composition can be executed at the beginning, the end or during the test performances, depending on the group size, the conditions on-site and the test persons' requests. Be sure the data is complete and every test person performed enough test items. The test day is the only possibility to get these measurements and results.

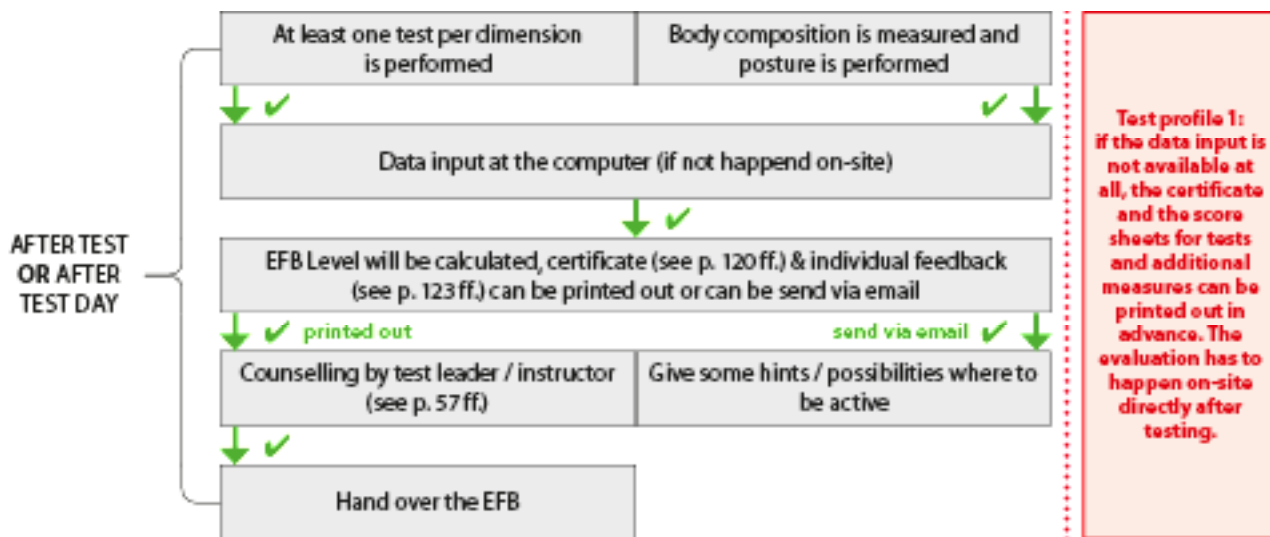
The third part "After test or after test day" covers the process after the test day. If not happened on-site, the data has to be typed in the online data platform (see chapter 9) and the certificates should be sent via email to

the participants or print out directly and handed over in person. In addition to the certificate the participants also get a feedback. If there is no more contact with the participants again and you send it via email, prepare them at the test day for the results and feedback sheets they will get with the email. If the certificate will be handed over directly, explain the feedback here and refer to chapter 10.

Always keep in mind, that the purpose of the EFB is to motivate a healthy behaviour and to maintain this.

Finally, be aware of the whole flowchart before the test day and rethink your own process according to your local conditions during the day in detail.

Flowchart III



General instructions

In general, there are some aspects which have to be considered during the whole process of executing the EFB. Please read these aspects carefully.

Before of the test

- Information letter / email with all important information: Informing the participants about the process and what they can expect; highlighting the material they have to bring by themselves like sport clothes, glasses and drinking water
- Informing the instructors about test content, test process and handling of the test persons.

Setting

- First aid kit should be available on-site
- Assigned space for sports bags should be marked to reduce barriers

Test procedure

- Recommended way of execution: One test instructor is responsible for a group of four participants and executes one test after another with them (needs less test instructors). If enough test instructors are available, it is possible to have an expert for every test item who stays at the appropriate test station while the participants rotate from one test station to another.

- Wearing shoes during all tests, at sit & reach optional, not needed at body composition. Try to combine tests without shoes after each other. At the repetition of the whole test, try to use the same shoes for a good comparison of the results.
- During a test performance the test person should be informed about the remaining time, the time achieved in short intervals (e.g. 30 seconds).
- If pain or anything else occurs, the EFB should be cancelled.
- We want the best result for the test person (e.g. mistakes during counting).
- If a test can't be performed the test should be skipped.
- Drinking breaks should be announced by test leader.

After the test

- Be sure, all participants are doing well before leaving the test setting.
- Data intake should be done by two people.



12. Toolbox

For executing the European Fitness Badge some material is necessary. The according list can be found in the toolbox. Other helpful tools like picture cards, map of the organization of the test stations, etc. are also part of the toolbox.

- | | | |
|----|--|-----|
| a. | Declaration of consent. | 66 |
| | Every participant has to fill out this declaration before the test starts. | |
| b. | Health questionnaire and its explanation. | 67 |
| | Every participant has to fill out this questionnaire before the test starts. | |
| c. | Activity questionnaire and its explanation. | 69 |
| | Every participant has to fill out this questionnaire before the test starts. | |
| d. | Material for executing the European Fitness Badge. | 71 |
| | This material has to be available for executing the badge. | |
| e. | Map and order of the test stations | 78 |
| | Use this map as a proposal for the set up in your gym / event place and the order as a recommendation. | |
| f. | Picture Cards and test instructions | 80 |
| | The picture cards should help to show the right performance and the instructions on the back can be used while explaining the test stations. | |
| g. | Data sheet | 118 |
| | For every participant one data sheet needs to be used for writing down the test results. | |
| h. | Examples of the certificate | 120 |
| | Every participant gets a certificate after performing the EFB. | |
| i. | Example of data result sheet | 123 |
| | In addition to the certificate every participant gets an individual feedback. | |

a. Declaration of consent



Declaration of consent

Event:**Date:**

 name of the participant
With my signature I declare my consent with these points:

- (1) I received information about the testing and I know that I have always the possibility to ask the tester for detailed information.
- (2) My participation is voluntary and at my own risk.
- (3) At any time, I can abort my participation.
- (4) I allow using my anonymized data (only age, sex and test results) for calculations and publications of studies.
- (5) I allow the organization to put my data and results in the online data platform to calculate my test results and print out my certificate. Afterwards my data get anonymized (see 4).

I have read and understood this declaration of consent and I agree with it.

 date, signature

b. Health questionnaire and its explanation



health questionnaire

Please read the following seven health questions carefully and check (X) the YES or NO box opposite the question if it applies to you

		YES	NO
1	Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?	<input type="checkbox"/>	<input type="checkbox"/>
2	Do you feel pain in your chest when you do physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
3	In the past month, have you had chest pain when you were not doing physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
4	Do you lose your balance because of dizziness or do you ever lose consciousness?	<input type="checkbox"/>	<input type="checkbox"/>
5	Do you have a bone or joint problem (for example, back, knee, hip or shoulder pain) that could be made worse by a change in your physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
6	Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?	<input type="checkbox"/>	<input type="checkbox"/>
7	Do you know any other reason why you should not do physical activity?	<input type="checkbox"/>	<input type="checkbox"/>

I confirm these statements are true.

_____ signature of the test person

PAR-Q was seen by the test leader and the European Fitness Badge can be performed.

YES

_____ signature of the test leader

Guidelines for the test instructor/leader for handling the results of the health questionnaire

The PAR-Q (Physical Activity Readiness Questionnaire) serves as background for the used health questionnaire. This questionnaire should ensure that no test person takes part at the EFB with an unpredictable health risk.

Therefore, every test person should fill out the health questionnaire before the EFB begins.

If a test person answers one of the questions with “yes”, the person is instructed to consult the test instructor/leader. As a test instructor/leader you should check all questionnaires anyway.

In the following you can find some advice how you can deal with the different answers.

1) Exclusion criteria

- Current illness/impairments to health or pain
- Question 1-3 is answered positive (in any case it should be mentioned that high physical exercise can cause a higher risk during current infections or illnesses)

2) Partly exclusion criteria

- Question 4: Does dizziness appear often or regularly? Was there any serious reason for unconsciousness? Is the blood pressure normal? In case of no explanation for dizziness and unconsciousness a visit to the doctor should be recommended before participating.
- Question 5: Are there any present joint problems or inflammations in the joint area (in most cases arthritis is no exclusion criteria). In agreement with the test person single tests should be skipped (e.g. jump and reach in case of knee pain).
- Question 6: Medicine is not an exclusion criterion, just if the medication is taken because of current illness (see 1).
- Question 7: The test person should be asked for details. In case of doubt a visit to the doctor should be recommended before participating.

IMPORTANT: If you as a test instructor/leader are unsure about the health condition of your test person, or if one of the PAR-Q is answered positive (yes), the test person should be excluded from the EFB until he or she is checked by a doctor.

c. Activity questionnaire and its explanation



PERSON'S NAME	Sex	Age	Gender	test day

Activity questionnaire

"Choose **one** activity question that describes best your usual pattern of physical activities during a normal week."

- | | | |
|----------|--|--------------------------|
| 1 | I just do my daily activities like house and family care. (1) | <input type="checkbox"/> |
| 2 | Besides my daily activities I do regularly (5 days or more a week) low level activities like stair climbing for at least 10 minutes per day with slight increases in breathing and heart rate. (2) | <input type="checkbox"/> |
| 3 | I do 20 minutes to one hour per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity, that means with substantial increases in breathing and heart rate. (3) | <input type="checkbox"/> |
| 4 | I do 1-3 hours per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity. (4) | <input type="checkbox"/> |
| 5 | I do more than 3 hours per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity. (5) | <input type="checkbox"/> |

Handling of the activity questionnaire

The activity questionnaire is part of the EFB for every test person out of different reasons. First, the results of this questionnaire operate as statistical values in every case. Second, in TP1 this value can be used as an alternative for

the endurance part step test (see p. 13). Though, a performance test is always recommended. The test persons should be aware they should think of a normal average week. The questionnaire should be filled out calmly in a quiet area and privacy should be given during this time.

d. Materials for executing the European Fitness Badge

On the following pages the material for both test profiles are illustrated. First, in order of the test items and second in an overall list. Lastly the alternatives for some special materials are displayed.

List of materials – Test profile 1

These materials should be available for performing TP1.

First you should decide which tests should be performed (see p. 8 f.). With this list, you can see the according materials for each test item.

Important remarks:

- If there is a possible alternative you can find it in the column "Alternative". The alternatives are displayed at p. 75 ff.
- For every test item exists a picture card for an overview during the test performance (see p. 80 ff.).

Test item	Material	Alternative
111 STEP TEST (p. 10)	Computer / laptop / tablet / smartphone with video and sound	
	Step bench (25 cm high)	Gymnastic bench, combination of step benches, gymnastic box
	Speaker	
121 PLANK TEST (p. 15)	Slim gymnastic mat	
	Stopwatch	
	Flat plank (5-10 cm wide, ~100 cm long, out of light material like wood)	
122 STAND-UP (p. 18)	Two chairs with flat sitting surface (42 cm & 47 cm high)	
123 PUSH-UP (p. 20)	Slim gymnastic mat	
131 BALANCE (p. 22)	Stopwatch	
141 SIT & REACH (p. 26)	Sit and reach box	Specific measuring tape + inverted gymnastic bench
151 ABSI (p. 49)	2 m-Straightedge	
	Scale	
	Flexible measuring tape	
152 BMI (p. 51)	Scale	
	Measuring tape	

Overall material list TP1

1x	Speaker
1x	Computer / laptop / tablet / smartphone with video
	Picture cards for every test item
	Data sheets according to number of test persons
	Declaration of consent according to number of test persons
	Activity questionnaire according to number of test persons
	Health questionnaire according to number of test persons
	Clipboards for instructors
	Pens according to number of test persons

The following material depends on the number of test persons and instructors. This table displays the minimum

number required. The more material available the more test persons can perform a test item at the same time.

2x	Step benches (25 cm high)
4x	Slim gymnastic mat
2x	Stopwatch
1x	Flat plank (5-10 cm wide, ~100 cm long, out of light material like wood)
2x	Chairs with flat sitting surface (42 cm & 47 cm high)
1x	Sit and reach box
1x	2 m-straight edge
1x	Scale
1x	Flexible measuring tape
1x	Measuring tape

List of materials – Test profile 2

These materials should be available for performing test profile 2.

First you should decide which tests should be performed (see p. 28f.). With this list, you can see the according materials for each test item.

Important remarks:

- If there is a possible alternative you can find it in the column "Alternative". The alternatives are displayed at p. 75 ff.
- For every test item exists a picture card for an overview during the test performance (see p. 80 ff.).

Test item	Material	Alternative
211 STEP TEST (p. 30)	Computer / laptop / tablet / smartphone with video and audio	
	Step bench (30-40 cm high)	Gymnastic bench, combination of step benches, gymnastic box
	Speaker	
212 WALKING (p. 33)	Stopwatch	
	2 km flat walking distance	
221 PLANK TEST (p. 35)	Slim gymnastic mat	
	Stopwatch	
	Flat plank (5-10 cm wide, ~100 cm long, out of light material like wood)	
222 JUMP & REACH (p. 38)	Chalk	Magnesia
	Chair	Box / crate / table / ladder
	Measuring tape (2 m)	
223 PUSH-UP (p. 40)	Stopwatch	
	Slim gymnastic mat	
231 FLAMINGO (p. 42)	Balance Beam	Wooden beam
	Stopwatch	
232 WALK BACK (p. 44)	6 m. adhesive tape	Floor markings in a gym
	Stopwatch	
241 SIT & REACH (p. 46)	Sit and reach box	Specific measuring tape+ inverted gymnastic bench
251 ABSI (p. 49)	2 m-Straightedge	
	Scale	
	Flexible measuring tape	
252 BMI (p. 51)	Scale	
	Measuring tape	

Overall material list TP2

1x	Speaker
1x	Computer / laptop / tablet / smartphone with video
1x	2 km flat walking distance
1x	Chalk
1x	Chair
	Picture cards for every test item
	Data sheets according to number of test persons
	Declaration of consent according to number of test persons
	Activity questionnaire according to number of test persons
	Health questionnaire according to number of test persons
	Clipboards for instructors
	Pens according to number of test persons

The following material depends on the number of test persons and instructors. This table displays the minimum

number required. The more material available the more test persons can perform a test item at the same time.

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2x	Step bench (30-40 cm high)
4x	Stopwatch
2x	Slim gymnastic mat
1x	Flat plank (5-10 cm wide, ~100 cm long, out of light material like wood)
2x	Measuring tape
1x	Balance Beam
1x	6 m. adhesive tape
1x	Sit and reach box
1x	2 m-straight edge
2x	Scale
1x	Flexible measuring tape

Alternatives

111 & 211 Step

As alternatives for a step bench, different possibilities exist:

- Combination of two step benches

Combination of step benches is possible if one single step bench is not high enough. Be aware of a stable construction. It should be in front of a wall or something similar to avoid the step bench from moving.



- Gymnastic bench

A gymnastic bench can be used, as well. Mostly they have a height of around 35 cm. For stability, a group of 4 test persons can be tested at the same time and can be positioned mirror-inverted on both sides of the bench. Pay attention while using older benches, for small up and down movements of the bench.

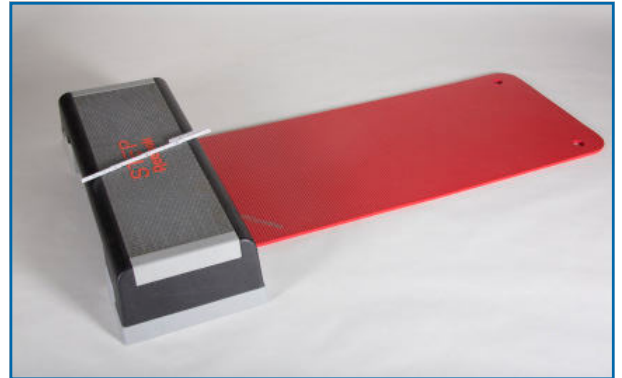


- Gymnastic box

For a higher alternative, a gymnastic box (around 40 cm high) can be used. Please make sure it is a steady construction, too.

141 & 241 Sit & reach

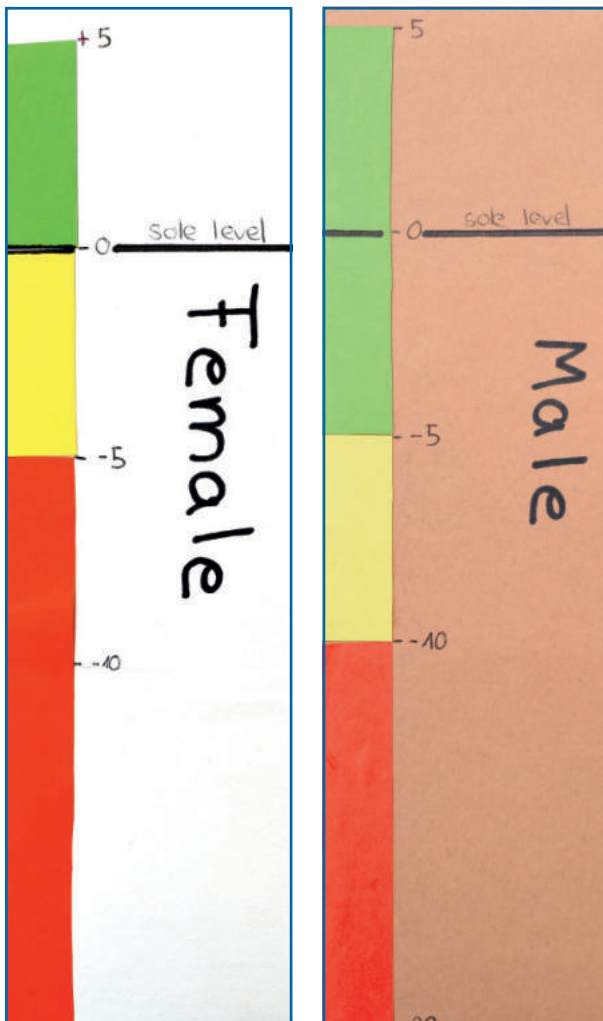
As an alternative for a sit & reach box this possibility exists:



Measuring tape and inverted gymnastic bench. The bench should lean against a wall.

In test profile 1 it is also possible to use a specific measuring tape with the appropriate colours for the scoring on it. If both sides of the tape can be used, both genders can be included. With this measuring tape the test person gets directly feedback to his/her flexibility because of the colours. See p. 27 for the according scoring.

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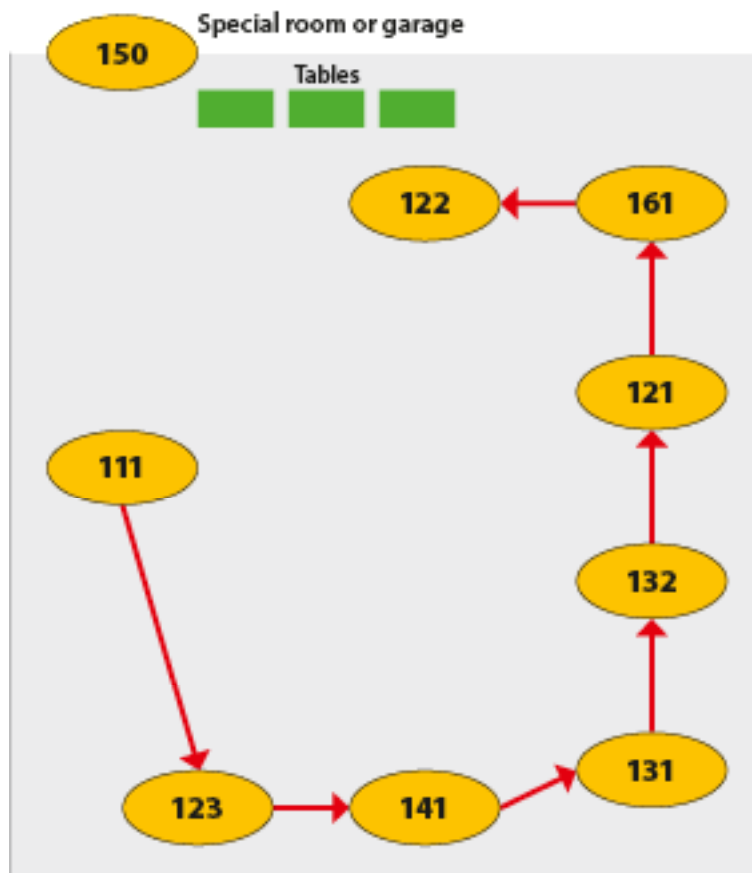
231 Flamingo

As an alternative for a balance beam this possibility exists:

Wooden or metallic beam with approximately 40 cm in length, ≤ 4 cm in height and 3 cm in width. Make sure the construction is stable, so that the test person can balance stable at the beam.

e. Map and order of the test stations

TEST PROFILE 1



ADDITIONAL MATERIAL

At the gym:
tables and chairs

At every test item:
according picture card

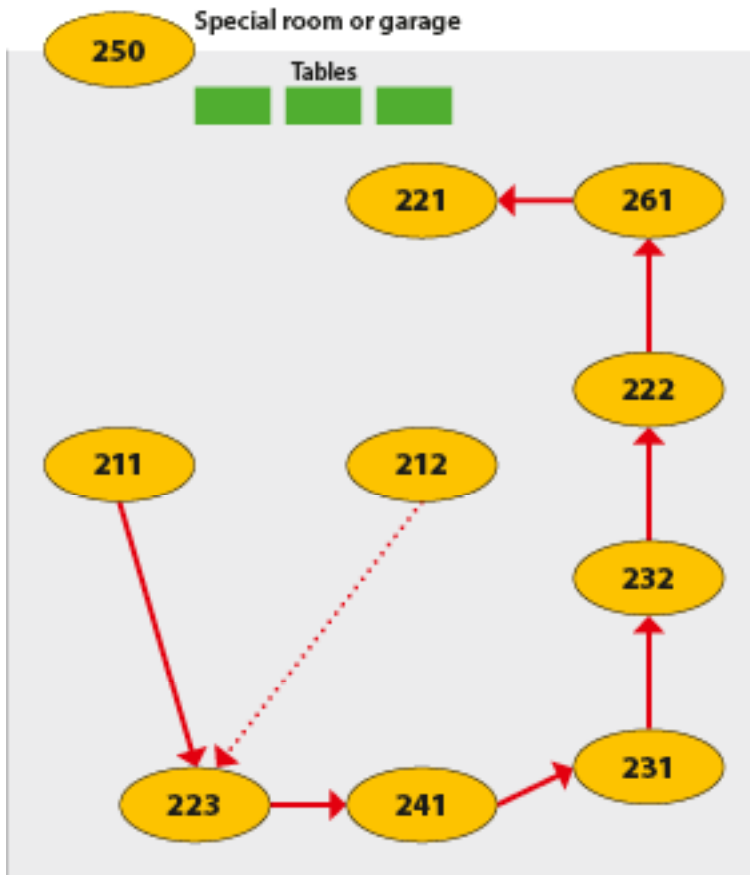
At every test instructor:
stopwatch or mobile phone, data sheets,
clipboard, pen

RECOMMENDED ORDER*

1. 111 Step test
 2. 123 Push up
 3. 141 Sit & reach
 4. 131 Balancing on one leg
 5. 132 Jumping jack
 6. 121 Plank test
 7. 161 Posture
 8. 122 Standing up with one leg
- 150 body composition ahead or after the performance

* this just is about a recommendation, see chapter 11 for some hints.

TEST PROFILE 2



ADDITIONAL MATERIAL

At the gym:
tables and chairs

At every test item:
according picture card

At every test instructor:
stopwatch or mobile phone, data sheets,
clipboard, pen

RECOMMENDED ORDER*

1. 211 Step test (or 212)
2. 223 Push up
3. 241 Sit & reach
4. 231 Flamingo balance
5. 232 Walking backwards
6. 222 Jump and reach
7. 261 Posture
8. 221 Plank test

250 body composition ahead or after the performance

* this just is about a recommendation, see chapter 11 for some hints.

Material:

Step bench (25 cm), computer, speaker, computer program, stopwatch

Purpose:

The test person has to follow the rhythm. The test is over when the test person manages to follow the rhythm 2 minutes and 40 seconds.

Considerations:

- ☒ The pace has to be kept
- ☒ The foot first on the bench is also the foot first back on the ground
- ☒ The legs on the bench should be fully extended



Sources of error:

- ☒ The rhythm of the pace is not followed correctly
- ☒ The legs are not stretched when standing on the bench

Instructions 111: The Danish step test – modified short version

Instruction comments – Before

"I will start the computer program now, and if you want to, you can practise the step sequence for a quick try beside the step bench.

When you change to the bench, it is important to step up and stretch your legs each time. The weight of the body should always be distributed evenly over the whole foot. To step up always switch between the left and the right leg.

The movement should be straight up and down without jumping. The pace will slowly increase so try to keep up as long as you can. If you lose the rhythm, try to get back as fast as possible.

The time will be stopped if you are four steps behind the computer programme.

Now stand close to the bench and if you are ready tell me and we will start with the computer programme.

I will tell you if you achieve the given time (2:40 minutes)."

Observation

Pay attention to the following sources of error:

- 1) The rhythm of the pace is not followed correctly
- 2) The legs are not stretched when standing on the bench
- 3) The weight is not distributed evenly on the entire foot

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) "Catch the rhythm again"
- 2) "Stretch your legs"

Additional information

For the target group of this test profile a step height of 25 cm is recommended.

If the room is big or the distance between computer/tablet and test person is large, you might have to connect a speaker. Make sure before you start that everybody is able to hear the signals.

The step sequence is available to download at the online data platform.

Material:

N-Ex questionnaire, pen, glasses if needed

Purpose:

The test person has to answer one question concerning the activity pattern during a normal week. They have five activity levels to choose from.

Considerations:

- Answer should be honest

**Sources of error:**

- No correct answers
- Wrong interpretation of the question/statement

I Instructions 112: Non-Exercise Test (N-Ex)

Instruction comments – Before

“Read this question and choose your preferable answer. Answer it honestly.”

Observation

The test person should answer honestly and tick by him- or herself. The question should be quite clear, and the instructor shouldn't answer any questions or assist in completing. Other test persons shouldn't be around.

Instruction comments – During

“Choose your preferable answer”

Additional information

The instructor should give as little assistance as possible. The test person should answer intuitively. If the test person wants to check more than one answer, emphasize that the last answer includes all answers given above.

Material:

Slim gymnastic mat, stopwatch, flat plank

Purpose:

The test person tries to maintain the planking position for 15 seconds. If possible, he/she tries to hold the position for another 15 seconds (in total 30 seconds).

Considerations:

- ☒ The plank touches the body on three hit points: seat, upper back and head
- ☒ The elbows are below the shoulders (angle of 90°)
- ☒ The test person looks down (between the two fists, not forward)



Sources of error:

- ☒ The head is tilted back in the neck
- ☒ The neck is placed under the chest
- ☒ A convex back
- ☒ The hips, head or shoulders drop
- ☒ Placing the hands too close together
- ☒ The buttocks are pushed upwards

Instructions 121: Plank Test

Instruction comments – Before

“Please lay down on your stomach with both legs fully extended, feet shoulder-width apart and with the elbows directly under the shoulder. Lift your (upper)body from the floor so only the forearms and toes are in contact with the ground. Make sure your body creates a straight line from head to toes. Tighten your buttocks and pull your belly button in but keep breathing normally! I am going to place a stick on your back to make sure it is straight. The stick should touch the back of your head, your upper back and butt. When you are ready, I will start the stopwatch. Try to maintain this position for 30 seconds.”

Observation

Pay attention to the following sources of error:

- 1) Too much arch in lower back
- 2) The head is tilted back in the neck
- 3) The neck is placed under the chest
- 4) A round back, especially the upper part
- 5) The butt protrudes above the knee / rib line out

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Raise your hip!” or push with your finger under the hip to raise the hip in line
- 2) “Squeeze your bottom and your stomach”
- 3) “Place your elbows a bit to the front, creating some distance between your elbows and your feet”
- 4) “Don’t hold your breath”
- 5) “Think of something other than the test, sing a song in your head”

Additional information

It helps to get into good position with your upper body first before going up onto your toes.

It is much more practical to test without the stick, although in that case you have less control over quality.

Material:

Two chairs with flat sitting surface (42 cm & 47 cm high)



Purpose:

The test person first tries to get up with both legs, then with the preferable leg and afterwards if possible with the remaining leg.

Considerations:

- The test person has to stand straight for three seconds when standing
- The hands have to be placed at the costal arch



Sources of error:

- Touching the floor with the non-weight bearing leg
- Losing balance
- Falling backwards on the seat
- Not possible to reach the correct final-position

I Instructions 122: Standing up with one leg

Instruction comments – Before

“Have a seat at the middle of this chair. Try to sit stable, the feet flat on the ground with a 90 degree angle at your knees. You may bent your upper body forward to support the movement, but your nose should not be further than your knees. Your hands should be placed at your costal archs.

Try to get up with both legs and keep standing straight for 3 seconds. Now try to get up with your preferable leg, keep standing straight for 3 seconds. Lastly, try to get up with the remaining leg, keep standing straight for 3 seconds.”

Observation

Pay attention to the following sources of error:

- 1) Touching the floor with the non-weight bearing leg
- 2) Losing balance
- 3) Falling backwards on the seat
- 4) Not possible to reach the correct final-position (standing level)

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Try it again and concentrate on your balance”
- 2) “Bend your upper body forward for assistance”
- 3) “Stand straight and keep this position for 3 seconds”

Additional information

Chair height:

42 cm chair height till 165 cm body height

47 cm chair height above 165 cm body height

The chair should have a flat sitting surface for a comfortable test performance.

The knee angle should be at least 90°. The higher chair height, the easier the test performance.

Material:

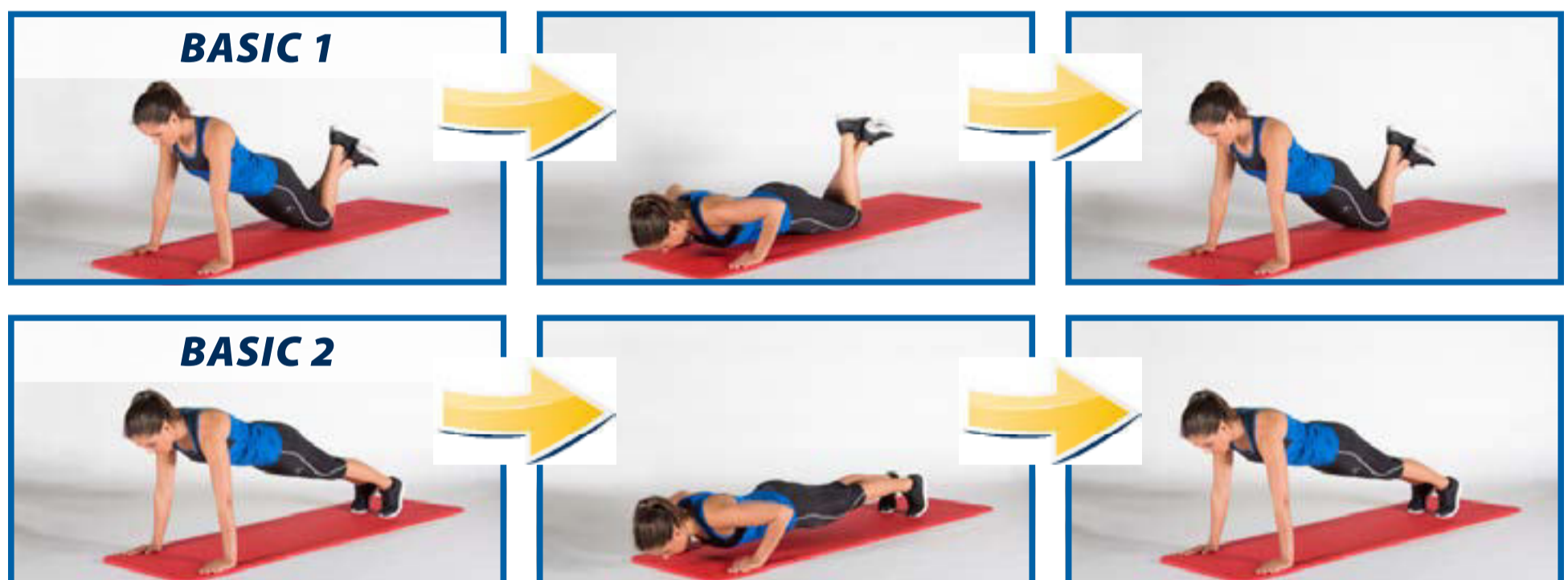
Slim gymnastic mat

Purpose:

The test person has to perform five push ups with crossed lower legs. After five repetitions the legs will be lifted and the test person tries to perform again five normal push-ups.

Considerations:

- ☒ Only the correct performed push-ups count
- ☒ The thumbs should be directly under the shoulders



Sources of error:

- ☒ Push-ups are not done correctly (hip drops)
- ☒ The arms are not straight in top position of the movement
- ☒ The whole body is not pushed up in one move
- ☒ The face touches the floor

I Instructions 123: Push-ups – combined version

Instruction comments – Before

“Please go into a prone position on the floor. Your thumbs should be directly under the shoulders. Your knees are steady on the floor. Now lift the upper body from the floor, your knees are still steady, cross the lower legs and try to do 5 modified push-ups.

Lower the body to the floor until the arms are bent to 90° (the nose nearly touches the floor) and then push up again.

I am going to count only the correct performed push-ups.

(If test person repeated five times)

Now lift your knees and perform 5 repetitions without the knees touching the floor.”

Observation

Pay attention to the following sources of error:

- 1) Push-ups are not correctly done (hip drops)
- 2) The arms are not straight in top position of the movement (the range of motion for the arms should be between straight and a 90° angle)
- 3) The whole body should be pushed up in one move
- 4) The face touches the floor

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Be stable at the core”
- 2) “Tighten your whole body and push it up at once”
- 3) “Imagine that your body is a wooden board”
- 4) “Your head should be an extension of your upper body”
- 5) “Do not move just with the hips – bend your arms”

Material:

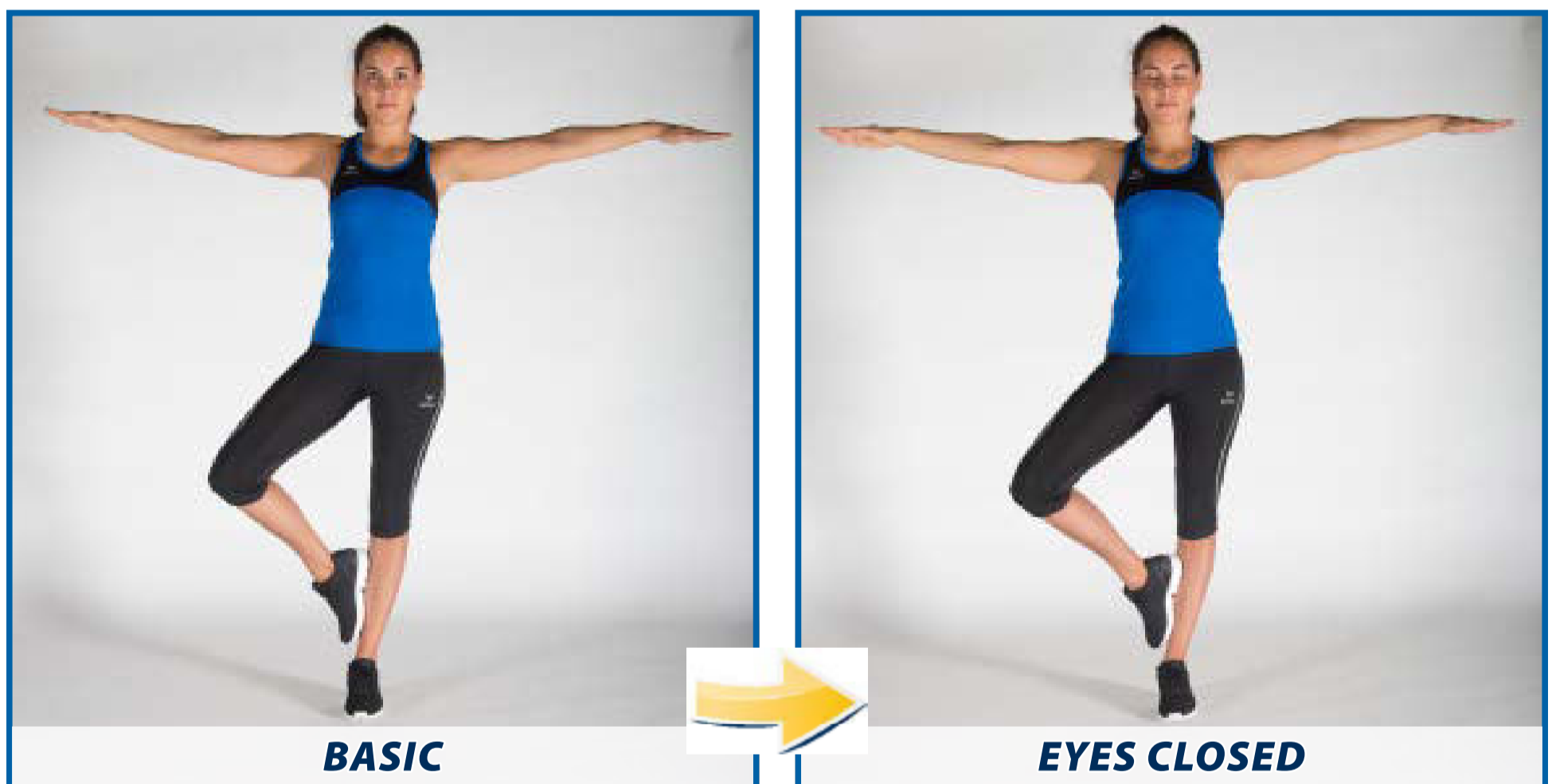
Stopwatch

**Purpose:**

The test person has to stand on the preferred leg for 15 seconds. Afterwards the eyes have to be closed and the test person has to stand for another 15 seconds like this.

Considerations:

- Keeping balance on one leg
- The heel of the lifted leg is placed at the lower part of the standing leg (and the knee is rotated outwards)

**Sources of error:**

- Losing balance by touching the ground with the non-weight bearing leg
- Opening the eyes before 15 seconds are over

I Instructions 131: Balancing on one leg

Instruction comments – Before

“Stand relaxed on both legs.

Now try to stand on the preferred leg for 15 seconds without losing balance or touching the ground with your second leg. The heel of the lifted leg is touching the lower part of your standing leg and the knee is rotated outwards. Your arms can be used for keeping balance. If you move your feet, the test is over and you have to start again.

(If test person succeeds)

Now try to close your eyes and stand for another 15 seconds without losing the balance.”

Observation

Pay attention to the following sources of error:

- 1) Losing balance by touching the ground with the non-weight bearing leg
- 2) Opening the eyes before 15 seconds are over

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Try to fix one point with your eyes to concentrate on the balance”
- 2) “Get into the balance position again”

Material:

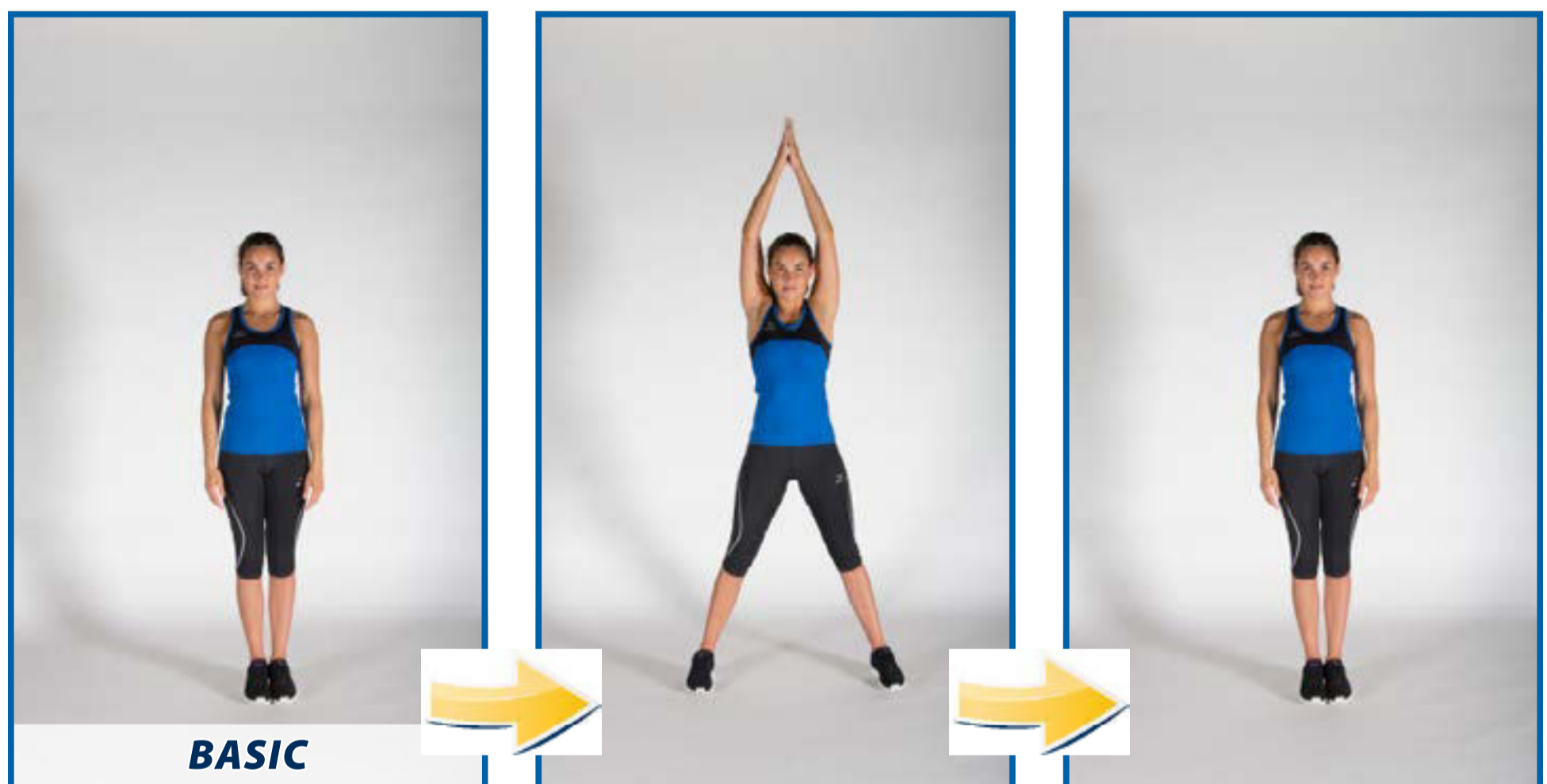
No material needed

**Purpose:**

The test person has to repeat the jumping jack movement ten times fluently.

Considerations:

- The movement has to be fluent
- The movement has to be repeated ten times

**Sources of error:**

- Feet do not hit the ground at the same moment the hands clap above the head
- In the upper position the palms of the hands do not perform a clap

I Instructions 132: Jumping Jack

Instruction comments – Before

“Stand upright with your feet together and the arms down by the side. Then jump sideways (more than shoulder-width) and raise your arms above the head (the palms touch each other above the head) in one motion. Immediately jump back into the starting position. Repeat this movement 10 times fluently.

I will tell you if it is not a fluent movement.”

Observation

Pay attention to the following sources of error:

- 1) Feet do not hit the ground at the same moment the hands clap above the head
- 2) In the end position palms do not perform a clap

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Try to get into the rhythm again”
- 2) “Always clap with your hands above your head”
- 3) “Move your legs and arms at the same time”

Material:

Slim gymnastic mat, sit and reach box, specific measuring tape

**Purpose:**

The finger tips have to reach forward as far as possible.

Considerations:

- ☒ The feet are facing upwards
- ☒ The legs have to stay on the ground
- ☒ The tape to measure is between the feet
- ☒ The step is placed against a wall or similar to avoid its movement

**Sources of error:**

- ☒ The position of the hands cannot be held for one to two seconds
- ☒ The legs are not straight



I Instructions 141: Sit and reach

Instruction comments – Before

“Sit on the floor with your legs stretched out straight ahead. The soles of your feet are placed flat against the box. Both knees should be locked and pressed flat on the floor.

Now, reach forward along the measuring line as far as possible with your palms facing downwards and the hands on top of each other or side-by-side.

Your hands should be at the same level during the whole time and the whole movement should be fluent.

Hold that position for one to two seconds while I record the distance.”

Observation

Pay attention to the following sources of error:

- 1) The position of the hands cannot be held for one to two seconds
- 2) The legs are not straight

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Reach as far as you can, but you should be able to hold the position”
- 2) “Put your legs down in one straight line”
- 3) “Stretch your legs”

Additional information

Manual for the measuring line: see the material alternatives at the toolbox.

Instead of a box, a turned gymnastic bench placed against a wall can be used for having a flat surface.

Material:

2 m-straightedge, scale, flexible measuring tape

Purpose:

Measuring weight, height and waist circumference to calculate body composition index.

Considerations:

- ☒ When length is measured the test person looks straight and the heels have to touch the wall
- ☒ Both feet must be on the scale during the weighing
- ☒ The test person takes a deep breath, then breathes out and holds the breath to execute the measure of the waist circumference

**Sources of error:**

- ☒ The waist circumference is not measured as in the description above
- ☒ Measuring fault at the determination of height and weight
- ☒ Wrong input into the calculator

I Instruction 151/251: A Body Shape Index (ABSI)

Measuring notes

For the determination of the ABSI you have to measure the body height (in cm XXX), the body weight (in kg XX) and the waist circumference (in cm XX).

During the measure of the waist circumference the test person has to stand upright and the weight should be equally distributed on both legs. The arms should hang naturally at the sides.

Now you feel for the highest point of the ilium and the lowest point of the costal arch. In the middle of these two points you have to attach the measuring tape and pass the measuring tape around the waist parallel to the floor.

The test person should take a deep breath, then breathe out and then hold the breath to execute the measure of the waist circumference. As an additional help the test person can point out where his/her waist is placed.

Body height and body weight should be measured without shoes.

For the calculation 0.5-1.5 kg of the weight (depending on worn clothes) should be subtracted.

Instruction

"Please stand stable on both legs, feet hip width. Arms are hanging beside your body. I will measure your waist circumference now. Please take a deep breath, breathe it all out and hold it for 5 seconds for me to measure."

Additional information

Be careful during the measurement. Some test persons might not feel comfortable.

Tell the test person each step you are doing in advance and ask for permission before each measurement. If the test person still feels uncomfortable, let him/her hold the measuring tape him/herself.

Material:

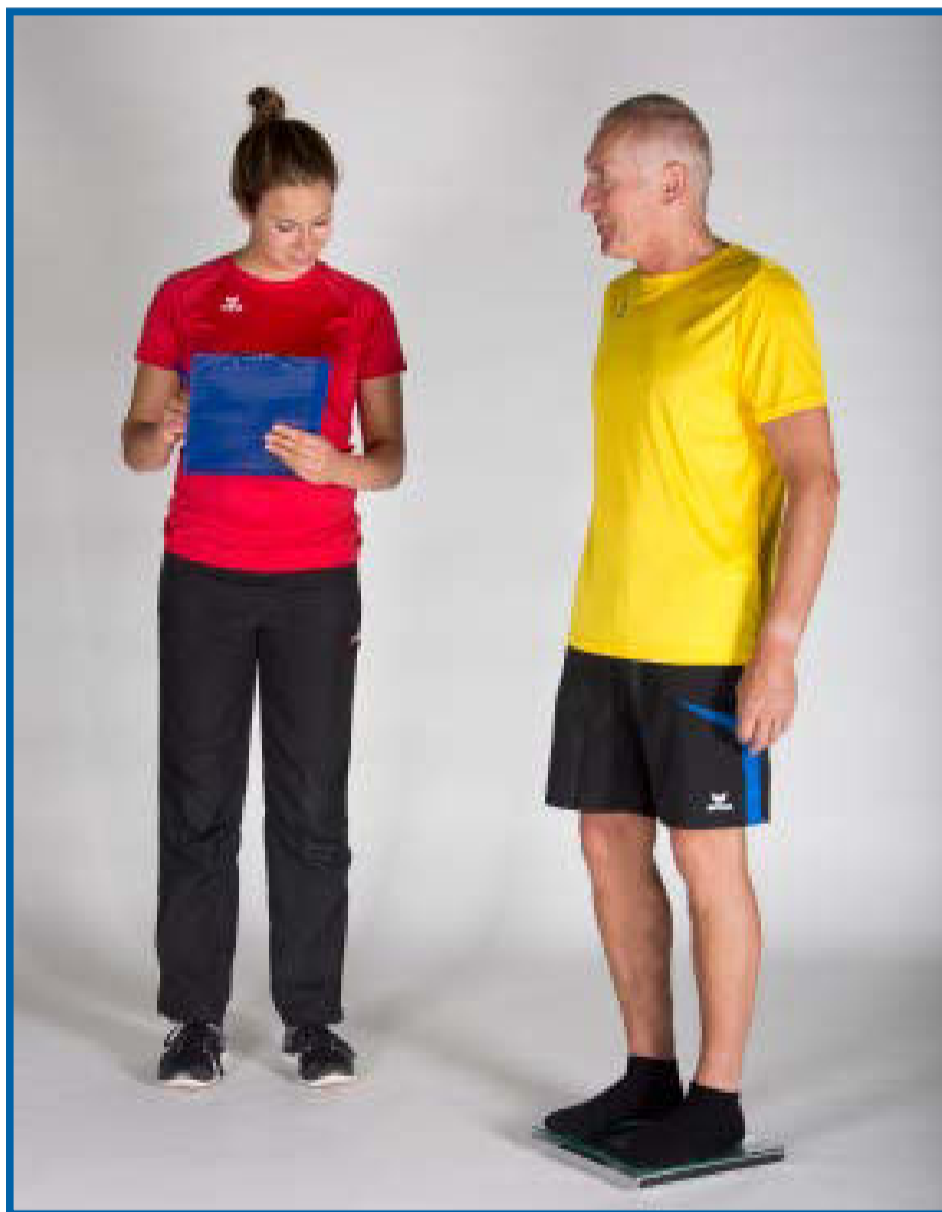
2 m-straightedge, scale

Purpose:

Measuring weight and height to calculate the Body-Mass-Index.

Considerations:

- ☒ When length is measured the test person looks straight ahead and the heels have to touch the wall
- ☒ Both feet must be on the scale during the weighing

**Sources of error:**

- ☒ Mistake during measuring the body weight / height

I Instructions 152/252: Body-Mass-Index (BMI)

Measuring notes

To calculate the BMI you have to measure the body weight (in kg XX) and the body height (in cm XXX).

For the weight measurement the test person should not wear additional clothes (like a jacket).

Body height and body weight should be measured without shoes.

For the calculation 0.5-1.5 kg of the weight (depending on worn clothes) should be subtracted.

Additional information

Be careful during the measurement. Some test persons might not feel comfortable.

Tell the test person each step you are doing in advance and ask for permission before each measurement.

Picture	Description	Score
Perfect Position	No remarks or special observations.	A
	The ears are clearly in front of the shoulder joint.	B
	The lower back has an abnormally large arch. The pelvis has rotated forwards. The knees are hyperextended.	C
	"Forward head position (2)" and "Hollow lower back (3)" occurs together.	D (B+C)
No performance	The test could not be performed due to pain or injury.	E

Instructions 161/261: Upright standing posture test (USPT)



Instruction comments – Before

"I will observe your standing posture for a few seconds now. The aim of this test is to look for postures that can cause pain in your back or in your neck. For example, do you sit a lot during the day? You know, sitting may evoke a bad posture and increases the risk of neck and back problems. That is what we are trying to see here. Okay, let us start the test. Take a normal standing posture which is comfortable and feels natural to you. Look forward and hold your arms relaxed beside you. Now count backwards from 10 until 0."

Observation

- 1) Observe the test participant while standing to the side of him/her, at least 3 meters away. Try to observe the test person for at least 5 seconds.
- 2) When you are observing, try doing some small talk with the test person, or ask him/her to count backwards from 20 until 0. Try to reassure the test person because this might feel a bit odd for him/her.
- 3) Do not instruct the test person on how he or she needs to stand, don't comment on what you see during the test. Just observe.

Material:

Step bench (30-40 cm), computer, speaker, computer programme, stopwatch

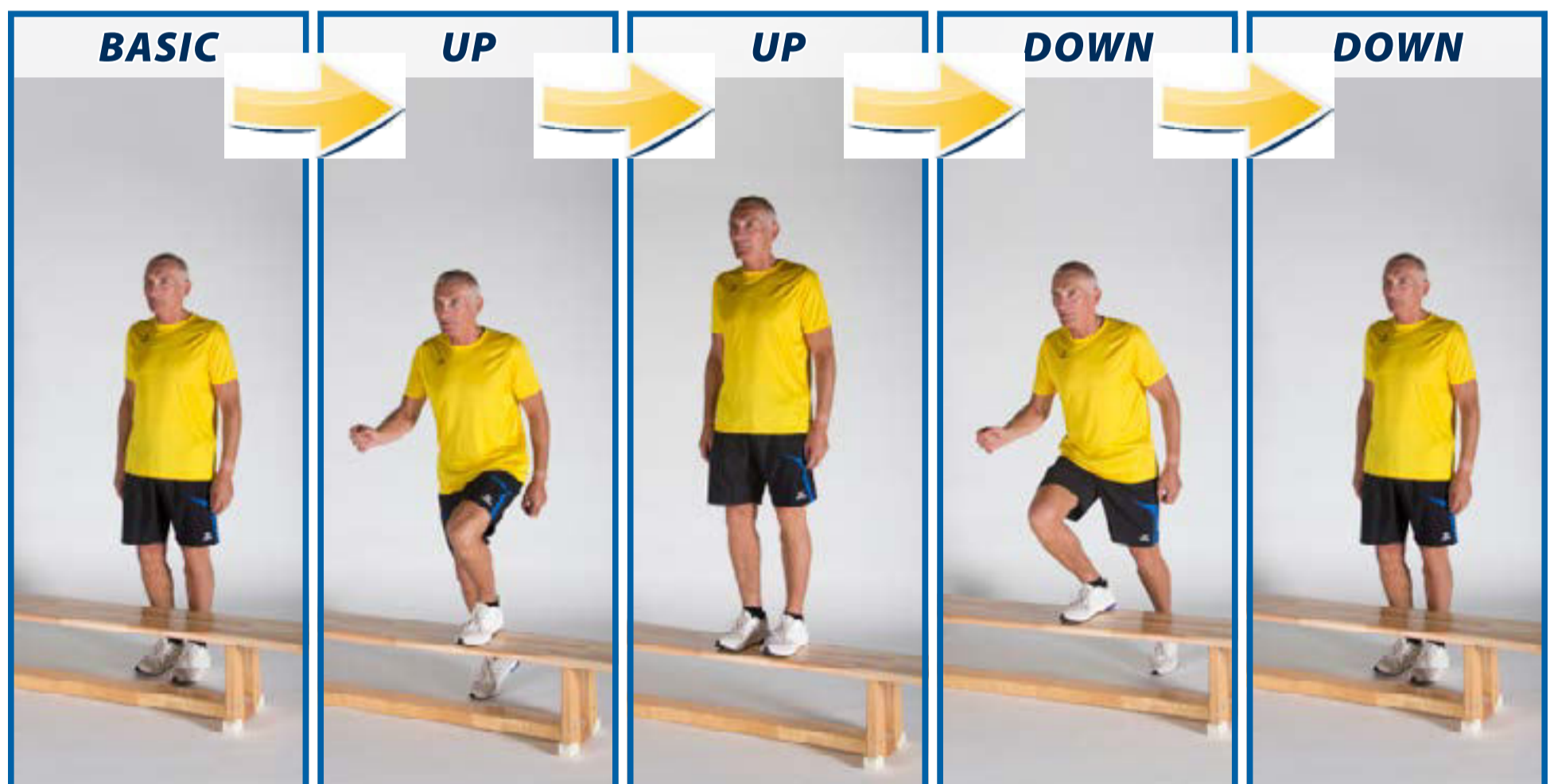


Purpose:

The test person has to follow the rhythm as long as possible.

Considerations:

- ☒ The test person has to keep the pace
- ☒ The foot first on the bench is also the foot first back on the ground
- ☒ The legs on the bench should be fully extended



Sources of error:

- ☒ The rhythm of the pace is not followed correctly
- ☒ The weight is not distributed evenly on the entire foot
- ☒ The legs are not stretched when standing on the bench (towards the end of the test it is ok if the legs are not completely straight as the pace is very quick)
- ☒ If the test person has a very low ability to coordinate the stepping up and down or if the test person feels dizzy and stops before exhaustion the result is not precise

I Instructions 211: The Danish step test

Instruction comments – Before

"I will start the programme, if you want to, you can practise the step sequence for a quick try beside the step bench.

When you change to the bench, it is important to step on the entire foot and stretch your legs each time. The weight of the body should always be distributed evenly on the foot. Take turns on using the left and the right leg.

The movement should be straight up and down without jumping. The pace will slowly increase so try to keep up as long as you can. If you lose the rhythm, try to get back as fast as possible.

The time will be stopped if you're four steps behind the computer programme.

Now get close to the bench and if you're ready tell me and we'll start with the computer programme.

When you can't follow the rhythm anymore, please give me a sign and I will note your achieved time."

Observation

Pay attention to the following sources of error:

- 1) The rhythm of the pace is not followed correctly
- 2) The weight is not distributed evenly on the entire foot
- 3) The legs are not stretched when standing on the bench (towards the end of the test it is ok if the legs are not completely straight as the pace is very quick)
- 4) If the test person has a very low ability to coordinate the stepping up and down or if the test person feels dizzy and stops before exhaustion the result is not precise

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) "Catch the rhythm again"
- 2) "Stretch your legs"

Additional information

At the final stage of the test (>5 minutes) it is hard to follow the commands of the computer programme due to the coordination. Be sure the test person just steps up and down in the right pace and do not stop the test if this works.

If the room is big or the distance between computer/tablet and test person is large, you might have to connect a speaker. Make sure before you start that everybody is able to hear the signals. The step sequence is available as a download at the online data platform.

If you test a group of people at the same time, it is important to notice the height of the bench and the time they manage to go on, in order to calculate the correct result afterwards. To calculate the result the weight of the test person is to be included.

Material:

2 km walking distance outside on a court or inside the gym, stopwatch

Purpose:

The test person has to walk on the flat for 2 km with the walking technique as fast as possible.

Considerations:

- ☒ The test person has to walk 2 km with the walking technique

**Sources of error:**

- ☒ Jogging instead of walking
- ☒ Foot contact with the ground is not maintained

I Instructions 212: 2 km walking test

Instruction comments – Before

“Walk 2 km with the walking technique as fast as possible. Use your arms for swinging.”

Observation

Pay attention to the following sources of error:

- 1) Jogging instead of walking
- 2) Foot contact with the ground is not maintained

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Don’t jog”
- 2) “Use your arms for swinging”
- 3) “One foot has to be in contact with the ground the whole time”

Additional information

Optional: pulse control with heart rate monitor. (Pulse should be around 50-70% of maximum heart rate).

Material:

Slim gymnastic mat, flat plank, stopwatch

**Purpose:**

The test person tries to hold the position as long as possible (maximum of four minutes).

Considerations:

- ☒ The plank touches the body on three hit points: seat, upper back and head
- ☒ The elbows are below the shoulders at an angle of 90°
- ☒ The test person looks down (between the two fists, not forward)

**Sources of error:**

- ☒ The head is tilted back in the neck
- ☒ The neck is placed under the chest
- ☒ A convex back
- ☒ The hips, head or shoulders drop
- ☒ Placing the hands too close together
- ☒ The buttocks are pushed upwards

Instructions 221: Plank Test

Instruction comments – Before

“Please lay down on your stomach with both legs fully extended, feet shoulder width apart and with the elbows directly under the shoulder. Lift your (upper) body from the floor so only the forearms and toes are in contact with the ground. Make sure your body creates a straight line from head to toes. Tighten your buttocks and pull your belly button in but keep breathing normally! I am going to place a stick on the back to make sure your back is straight. The stick should touch the back of your head, your upper back and butt. When you are ready, I will start the stopwatch. Try to maintain this position as long as possible.”

Observation

Pay attention to the following sources of error:

- 1) Too much arch in lower back
- 2) The head is tilted back in the neck
- 3) The neck is placed under the chest
- 4) A round back, especially the upper part
- 5) The butt protrudes above the knee / rib line out

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Raise your hip”
- 2) “Activate your buttocks and your stomach”
- 3) “Place your elbows a bit to the front, creating some distance between your elbows and your feet”
- 4) “Don’t hold your breath”
- 5) “Think of something other than the test, sing a song in your head”

Additional information

It helps to get into good position with your upper body first before going up onto your toes.

It is much more practical to test without the stick, although in that case you have less control over quality.



Material:

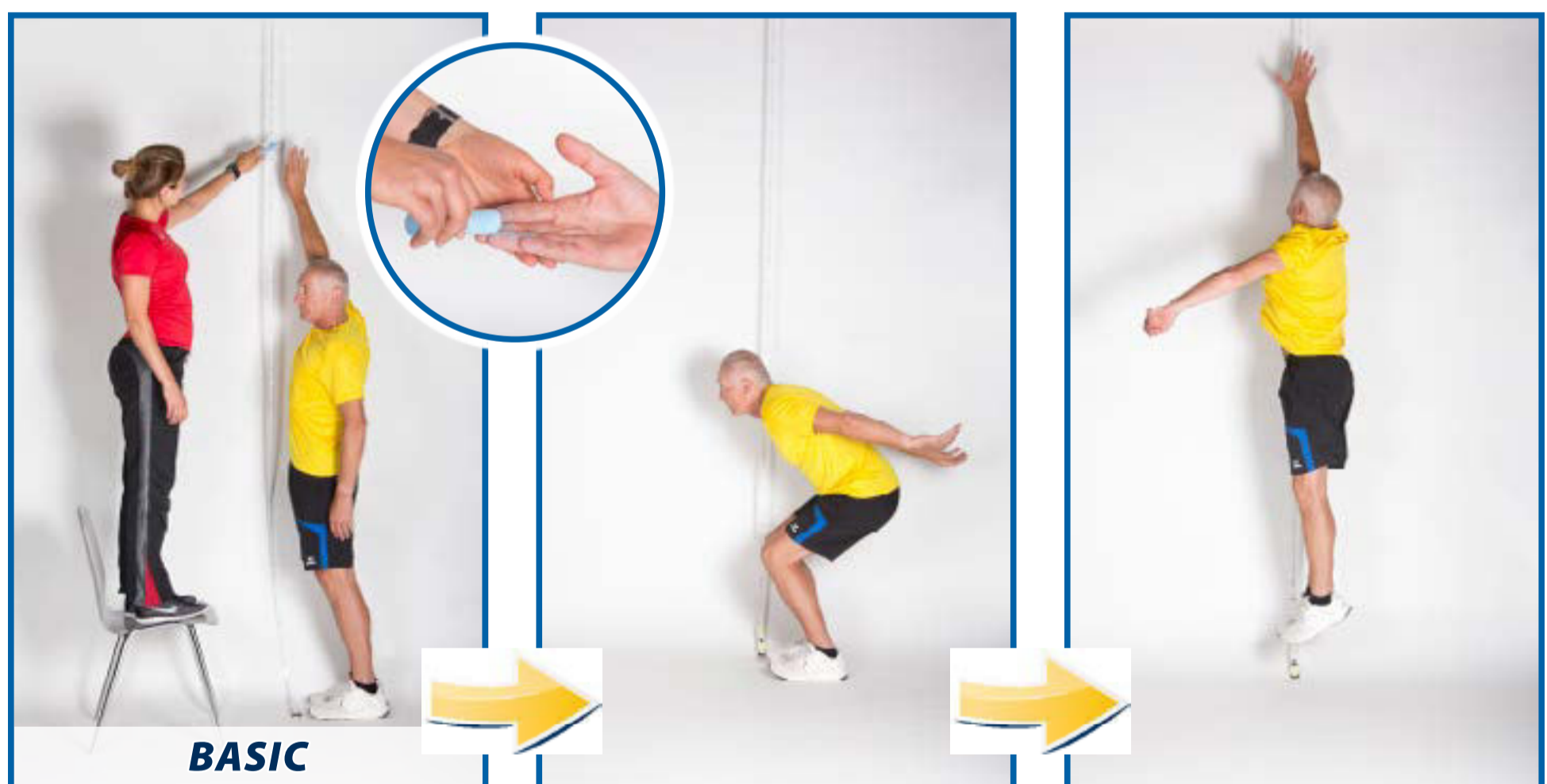
Measuring tape, chalk/magnesia, chair/box or ladder to stand on for measuring

Purpose:

The test person has to jump as high as possible.

Considerations:

- ☒ Stretched arm during the first measuring
- ☒ Standing sideways against the wall
- ☒ Jumping as high as possible
- ☒ The wall has to be touched with the fingertips



Sources of error:

- ☒ Wrong determination of the vertical reach
- ☒ Wall is not touched at the highest point while jumping
- ☒ Test person takes a run-up with the legs

I Instructions 222: Jump and reach

Instruction comments – Before

“I’m going to paint your fingertips with some chalk. Now stand sideways to the wall.

Put the wall-side arm up and mark the highest point with your middle finger. I measure this point.

After that take a one-foot-length step away from the wall and I’m going to paint your fingertips again.

From this position, jump as high as possible. You can use your knees and arms for swinging. Touch the wall with your fingertips at the highest point and I measure this point too.

Now you can have another try.”

Observation

Pay attention to the following sources of error:

- 1) Wrong determination of the vertical reach
- 2) Wall is not touched at the highest point while jumping
- 3) Test person takes a run-up with the legs

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Use your arms and knees for swinging”
- 2) “Jump one more time and try to touch the wall at the highest point”
- 3) “Your feet should be stable during the jumping; no steps are allowed”

Additional information

Make sure there is enough space for the test person.

For orientation and simplification during the test use a measuring line (2 meters high) and fix it at the wall at 1 meter height, so the measuring is possible up to 3 meters. For this the usage of a table or a ladder to stand on is the best and safest way.

Material:

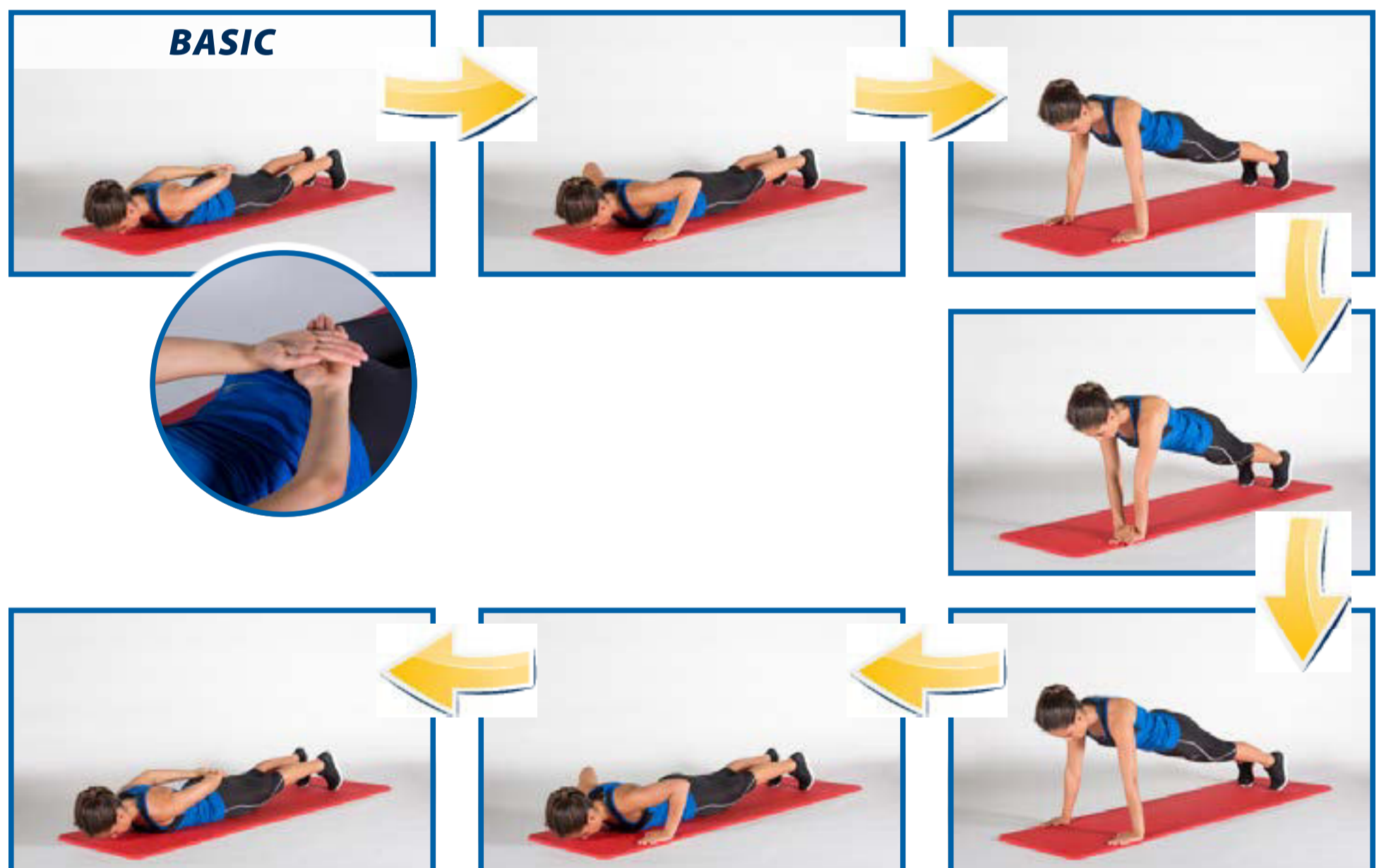
Slim gymnastic mat, stopwatch

Purpose:

The test person should perform as many push-ups as possible in 40 seconds.

Considerations:

- ☒ Hands tap on the back in the prone position
- ☒ Hands are tapping each other



Sources of error:

- ☒ Feet and upper body are not pushed up at the same time
- ☒ Hands do not touch behind the back
- ☒ In the upright position one hand is not lifted to touch the other hand
- ☒ Face touches the floor

I Instructions 223: Push-ups – special version

Instruction comments – Before

“We will try this special version of a push-up once and then we start the test.

Please lay down on the ground in the abdominal position. Your hands should be touching behind your back. Your feet are spread hip width.

Now detach your hands, put them close to your shoulders and push up your whole body in one move until the arms are stretched and only hands and feet are touching the ground.

In this position one hand (preferable one) should be detached and has to touch your other hand. During this procedure only one hand and the feet are in contact with the ground. The trunk and the feet are stretched.

After that the hand goes back in the push-up position. And you lower your body down to the starting position.

Now go back into the starting position.

If you are ready, we will start with the test and I am going to count the correct performed push-ups. I will announce half time and when the 40 seconds are over.”

Observation

Pay attention to the following sources of error:

- 1) Feet and upper body are not pushed up at the same time
- 2) Hands do not touch behind the back
- 3) In the upright position one hand is not lifted to touch the other hand
- 4) Face touches the floor

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Push the whole body at the same time, as if your body is a wooden board”
- 2) “Make a clap behind the back, then you know you touched”
- 3) “Lift one hand and touch the other”

Additional information

Make sure that the orders are clear for the test person. But just try once or twice before the test starts. Otherwise the test person will get tired.

If necessary, repeat the obligatory steps verbally during the performance.

Material:

Balance beam, stopwatch, flat gymnastic mat

**Purpose:**

The test person should keep balance on the beam for 60 seconds without touching the floor with the feet.

Considerations:

- ☒ Feet must be straight on the balance beam
- ☒ If the feet touch the ground or each other, it counts as a mistake
- ☒ If the test person loses balance, time stops
- ☒ The time starts when both feet are off the ground
- ☒ Both legs are always stretched
- ☒ The person is looking forward

**Sources of error:**

- ☒ Second leg is touching the ground, the beam or the balancing leg = bottom contact
- ☒ Test person leaves the balancing beam with both legs = fall

I Instructions 231: Flamingo balance

Instruction comments – Before

“Please stand on this beam with your preferred leg. Stretch the other leg sideways and try to keep the balance. Use your arms for balancing.

During the 60 seconds I am going to count how often you are touching the ground with your unused leg or if your legs are touching.

Be careful not to fall down. If this occurs, I stop the stopwatch until you are on the beam again. But if this occurs more than twice the test will be stopped and you get the lowest result of 30 fails.

If you are ready, I will start the 60 seconds.”

Observation

Pay attention to the following sources of error:

- 1) Second leg is touching the ground, the beam or the balancing leg = bottom contact
- 2) Test person leaves the balancing beam with both legs = fall

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Fix one point on the ground or the gym with your eyes for concentrating”
- 2) “Use your arms for balancing”
- 3) “Try to get up again”

Additional information

For safety reasons the beam should have a wider platform for stabilisation.

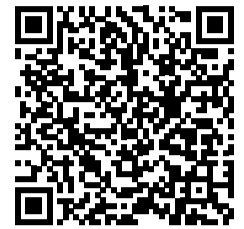
This test should be performed with shoes.

After two complete falls, the scoring to note is 30 fails. But to motivate and satisfy the test person, he/she can finish the test until 60 seconds are over.

For constructing a beam see the material alternatives at the toolbox.

Material:

6 m-adhesive tape, measuring tape, stopwatch

**Purpose:**

The test person walks backwards as fast as possible on a straight line of 6 m. The toe must touch the heel every step.

Considerations:

- The heel of the first foot touches the toe of the second foot every time
- The feet must be straight on the line
- The test person has three attempts

**Sources of error:**

- The feet do not touch each other
- The test person does not walk on the line

Instructions 232: Walking backwards

Instruction comments – Before

“Please walk along this 6 m line backwards as fast as possible. You will have three attempts.

First, concentrate on the correct performance and after the safe attempt you can increase your speed.

While walking backwards your toe must touch the heel of the other foot. There may not be a gap between toes and heels.

Both feet should be over the 6 m line, and then the time will be stopped.

If your movement is not correct the test will be stopped and the time and the length will be measured until that point.

With the second and third attempt you can try to increase the speed.”

Observation

Pay attention to the following sources of error:

- 1) Feet do not touch each other
- 2) Test person does not walk on the line

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Do it slowly and correctly, your feet should always touch each other”
- 2) “Try it again and slow down, looking down to the line for a correct movement”
- 3) “The first attempt is just for a safe result”

Additional information

A measuring line should always be available. If 6 m are not reached completely, the farthest attempt (in m X,XX) is to be written down.

Always use the first attempt for a safe result.

Material:

Slim gymnastic mat, sit and reach box, specific measuring tape

**Purpose:**

The finger tips have to reach forward as far as possible.

Considerations:

- ☒ The feet are facing upwards
- ☒ The legs have to stay on the ground
- ☒ The tape to measure is between the feet
- ☒ The step is placed against a wall or similar to avoid its movement

**Sources of error:**

- ☒ The position of the hands cannot be held for one to two seconds
- ☒ The legs are not straight

I Instructions 241: Sit and reach

Instruction comments – Before

“Sit on the floor with your legs stretched out straight ahead. The soles of your feet are placed flat against the box. Both knees should be locked and pressed flat on the floor.

Now, reach forward along the measuring line as far as possible with your palms facing downwards and the hands on top of each other or side-by-side.

Your hands should be at the same level during the whole time and the whole movement should be fluently.

Hold that position for one to two seconds while I record the distance.”

Observation

Pay attention to the following sources of error:

- 1) The position of the hands cannot be held for one to two seconds
- 2) The legs are not straight

Use the instruction comments to correct the performance of the test person.

Instruction comments – During

- 1) “Reach as far as you can, but you should be able to hold the position”
- 2) “Put your legs down in one straight line”
- 3) “Stretch your legs”

Additional information

Manual for the measuring line: see the material alternatives at the toolbox.

Instead of a box, a turned gymnastic bench placed against a wall can be used for having a flat surface.

g. Data sheet

TEST PROFILE 1



With the Support of the
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EUROPEAN FITNESS BADGE



Test	Scoring	Result
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endurance 1 of 2

STEP₁₁₁

- 1 = less than 1 minute
- 2 = 1 minute to 2:30 minutes
- 3 = 2:40 minutes – the test is passed

If the step test is not possible, activity questionnaire is used and N-Ex is calculated

strength 2 of 2

PLANKING₁₂₁

- 1 = feels pain or cannot perform the prone plank for 15 seconds
- 2 = hold the prone plank for 15 seconds
- 3 = hold the prone plank for at least 30 seconds

STAND-UP₁₂₂

- 1 = get up with both legs at the same time
- 2 = get up with the right or left leg
- 3 = get up with the right and the left leg

PUSH-UP₁₂₃

- 1 = < 5 modified push-ups
- 2 = 5 modified push-ups
- 3 = additional ≥ 5 normal push-ups

TEST PROFILE 1

Test	Scoring	Result
coordination 2 of 2		
BALANCE₁₃₁	1 = stood less than 15 seconds with open eyes on one leg 2 = stood 15 seconds with open eyes on one leg 3 = stood 15 seconds with closed eyes on one leg	<input type="text"/>
JUMPKACK₁₃₂	1 = repeated the exercise less than 10 times 2 = repeated 10 times – but not fluently 3 = repeated 10 times in a fluently performance	<input type="text"/>
flexibility 1 of 1		
SIT&REACH₁₄₁	1 = ≥ -10 cm (male), ≥ -5 cm (female) 2 = -10 cm to -5 cm (male), -5 to 0 cm (female) 3 = ≥ -5 cm (male), ≥ 0 cm (female)	<input type="text"/>
body composition ^{***}		
It is highly recommended to measure height, weight and waist circumference. If not please ask the participant for an estimation concerning his/her weight and height.		
WEIGHT		kg <input type="text"/>
HEIGHT		cm <input type="text"/>
WAIST		cm <input type="text"/>
	body composition was measured by the test instructor	<input type="text"/>
	participant was asked about his body composition – in this case only BMI can be calculated	<input type="text"/>
posture ^{***}		
POSTURE₁₆₁	Posture A: none of the criteria below were present Posture B: forward head position Posture C: too hollow lower back posture Posture D: (= score B+C) both forward head position (score B) AND too hollow lower back (score C) Posture E: the test could not be performed due to pain or injury	<input type="text"/> A - E

Project management: Prof. Dr. Klaus Bos (), Prof. Dr. Walter Hirth (), Prof. Dr. Pia Faury ()

h. Examples of the certificate





EUROPEAN FITNESS BADGE



On the **01/06/2017**,

Peter Schmidt

took part at the
European Fitness Badge Event
Sportevent

121



ADVANCED

Congratulations!

You are in a rather good physical shape.
Keep it up to raise your fitness to the next level!

Anne Müller, EFB Instructor

Project management: Prof.Dr. Klaus Bös (KIT), Prof.Dr. Walter Brehm (DTB), Pia Pauly (DTB)





EUROPEAN FITNESS BADGE



On the 26/03/2017,

Max Schmidt

took part at the
European Fitness Badge Event
ProjectgroupEvent



APPROVED

Congratulations!

You are in a very good physical shape.
Go further on to keep it!

KIT-Team, EFB Instructor



i. Example of data result sheet

P-GER-4F3S-97D8



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EUROPEAN FITNESS BADGE



ID

P-GER-4F3S-97D8

Test	Scoring	Result
endurance 1 of 2		
STEP 211	The test person has to go on until the pace cannot be followed anymore	<div style="display: flex; justify-content: space-between;"> Min <input style="width: 40px; text-align: center;" type="text" value="4"/> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Max <input style="width: 40px; text-align: center;" type="text" value="55"/> </div>
	Height of the step	<div style="display: flex; justify-content: space-between;"> cm <input style="width: 40px; text-align: center;" type="text" value="34"/> </div>
WALKING 212	Measuring the time needed for 2km	<div style="display: flex; justify-content: space-between;"> Min <input style="width: 40px;" type="text"/> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Max <input style="width: 40px;" type="text"/> </div>
strength 3 of 3		
PLANKING 221	Maintaining the position, with the body's weight to come on forearms, elbows, and toes as long as possible (max 4 minutes)	<div style="display: flex; justify-content: space-between;"> Min <input style="width: 40px; text-align: center;" type="text" value="3"/> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Max <input style="width: 40px; text-align: center;" type="text" value="10"/> </div>
JUMP 222	Measuring the vertical reach (highest reaching point) and the jumping reach (highest jumping point) in centimeter	<div style="display: flex; justify-content: space-between;"> reach / cm <input style="width: 40px; text-align: center;" type="text" value="170"/> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> jump / cm <input style="width: 40px; text-align: center;" type="text" value="218"/> </div>
PUSH-UP 223	Measuring all correct push-ups within 40 seconds	<div style="display: flex; justify-content: space-between;"> count <input style="width: 40px; text-align: center;" type="text" value="18"/> </div>

123

Project management: Prof.Dr. Klaus Böls (KIT), Prof.Dr. Walter Brehm (DTB), Pia Pauly (DTB)

P-GER-4F3S-97D6

Project management: Prof.Dr. Klaus Bös (KIT), Prof.Dr. Walter Brehm (DTB), Pia Pauly (DTB)

Test	Scoring	Result
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coordination 2 of 2

FLAMINGO 231	Measuring the number of falls in 60 seconds, the maximum number of falls is 30	count	<input type="text" value="3"/>
WALKBACK 232	Time if the 6 meter are reached	sec	<input type="text"/>
	Distance if the 6 meter are NOT reached	cm	<input type="text" value="18"/>

flexibility 1 of 1

SIT&REACH 241	Measuring the distance between sole level and fingertips in cm (please mark positive or negative)	cm	<input type="text" value="-"/>
		cm	<input type="text" value="0"/>

body 3 of 3

WEIGHT 251		kg	<input type="text" value="88"/>
HEIGHT 252		cm	<input type="text" value="178"/>
WAIST 253		cm	<input type="text" value="80"/>
		Not measured	<input type="text"/>

posture 1 of 1

POSTURE 261	<p>A = none of the criteria below are present</p> <p>B = forward head position</p> <p>C = too hollow lower back posture</p> <p>D = forward head position (B) AND too hollow lower back (C)</p> <p>E = the test could not be performed due to pain or injury</p>		<input type="text" value="C"/>
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EUROPEAN FITNESS BADGE



Your individual result

Peter Schmidt



1	You received one point at a test. This corresponds to the percentile rank ≤ 20 . This means 20 % or less of the population have the same or a worse result than you.
2	You received two points at a test. This corresponds to the percentile rank 21 – 40. This means 20-40 % of the population have the same or a worse result than you.
3	You received three points at a test. This corresponds to the percentile rank 41 – 60. This means 41 – 60 % of the population have the same or a worse result than you.
4	You received four points at a test. This corresponds to the percentile rank 61 – 80. This means 61 – 80 % of the population have the same or a worse result than you.
5	You received five points at a test. This corresponds to the percentile rank > 80 . This means > 80 % of the population have the same or a worse result than you.

125

Project management: Prof. Dr. Klaus Bös (KIT), Prof. Dr. Walter Brehm (DTB), Pia Pauly (DTB)

	Test	Notice		result	points	color
endurance						
211	STEP	VO2max	ml/kg/min	45.00	4	
212	WALKING	time needed for 2 km	min, sec		-	
strength						
221	PLANKING	in stabilizing the position, with the body's weight borne on forearms, elbows, and toes as long as possible	min, sec	03:10	-	
222	JUMP	difference between the vertical reach (highest touching point) and the jumping reach (highest jumping point) in centimeter	cm	45	4	
223	PUSH-UP	number of push-ups in 40 seconds	count	16	5	
coordination						
231	FLAMINGO	number of falls in 60 seconds	count	3	3	
232	WALKBACK	time in seconds if the 6 meter are rounded	min, sec	00:15.0	2	
flexibility						
241	SIT&REACH	difference to sole level	cm	-0 cm	3	
	TOTAL	The TOTAL value is calculated as sum out of the single results in the four dimensions (endurance, strength, coordination, flexibility). If there exist more than one level then per dimension, the mean value is calculated.			14	

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With the Support of the
Erasmus+ Programme
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EUROPEAN FITNESS BADGE



Your individual feedback

Peter Schmidt

OVERALL RESULT

Congratulations! You achieved the European Fitness Badge Level 2.

ADVANCED

This means, your result on average is over the percentile rank 40.
Your Result is:

4 - 6 7 - 10 11 - 14 15 - 18 19 - 20



You reached 14 of achievable 20 points.

For a successful performance of the European Fitness Badge you need at least 11 points.

RESULTS IN SPECIFIC FITNESS DIMENSIONS

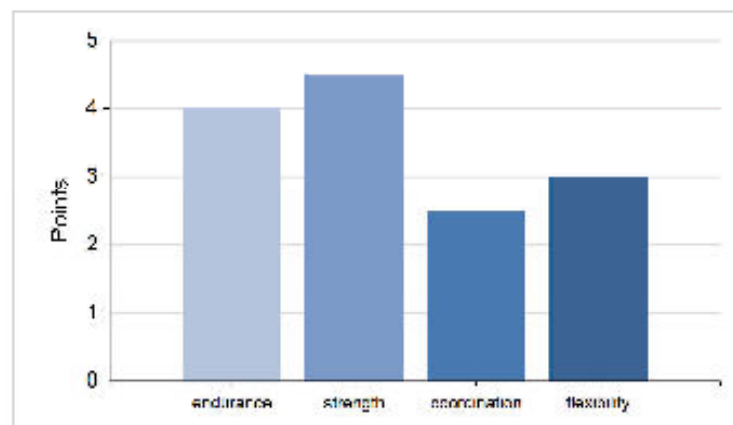
6 Points: The result is high over average.

4 Points: The result is over average.

3 Points: The result is average.

2 Points: The result is under average.

1 Point: The result is far under average.

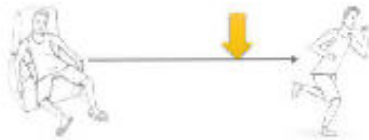


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Profile 2

ACTIVITY RESULT



You answered "I do 1-3 hours per week physical exercises (like fitness, running, swimming, cycling or brisk walking) with at least moderate intensity."

Please consider the following advice:

Very good, you are doing a lot of sport. Try to maintain your level or maybe you can increase the time to over three hours a week.

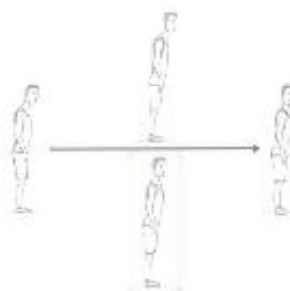
BODY COMPOSITION RESULT



The ABSI Score provides an information about your body composition, especially about the health risk of your abdominal fat distribution.

Your ABSI classification is average. Your ABSI Score is 0.0802. Your body composition is ok, you have a normal risk for illness and mortality.

POSTURE RESULT



The instructor observed an abnormal lower back curvature. This might be due to a sedentary lifestyle and poor sitting habits, causing lower back pain.

Project management: Prof.Dr. Klaus Bös (KIT), Prof.Dr. Walter Brehm (DTB), Pia Pauly (DTB)



For further information about the EFB see our website: www.fitnessbadge.eu



**Let's get active!
Catch the badge!**

