

UKK WALK TEST

Tester's guide



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THE UKK WALK TEST SUITS ALMOST EVERYONE

The UKK Walk Test, developed by the Urho Kaleva Kekkonen Institute for Health Promotion Research (the UKK Institute), measures the most important factor of a person's fitness, endurance, or cardiorespiratory capacity. It suits almost anyone between the ages of 20 and 65 years who does not have a disease or disability that prohibits brisk walking or who is not taking a medication that affects heart rate. The UKK Walk Test also provides reliable test results for people who are overweight. However, it is not recommended for those who are extremely fit.

PERFORMING THE TEST

The test is performed by walking 2 kilometers on a flat surface at as brisk pace as possible. The results of the test are recorded as a fitness index, which takes into consideration the person's age, gender, height, weight, time taken to walk the 2 kilometers, and heart rate at the end of the test. The index has been used to form five "fitness classes", which can be used to compare the individual result with the fitness of others of the same age. By performing the test at suitable intervals a person can reliably follow the changes that occur in his/her own fitness.

EXPERT GUIDANCE OF THE TEST

The test should be performed under guidance, because then the results are reliable. Many different factors can cause an incorrect result and therefore affect the success of the test. Such factors are, for example, incorrect measurement of the distance, a non-flat surface or hilly terrain, and an incorrect recording of the time or heart rate. In addition unsuitable clothing or careless preparation for the test can spoil the results. The results can also be distorted by walking too slow, health factors that limit brisk walking or medication that affects heart rate.

The UKK Walk Test was developed especially to assess cardiovascular fitness by measuring its gold standard, maximal aerobic power (VO_2 max). In later studies it was also found that the test reflects the functional capacity of the musculoskeletal system. Therefore, the UKK Walk Test is well suited for the assessment of health-related fitness among the general population.

1. WHAT IS THE UKK WALK TEST?

The UKK Walk Test is based on research

The UKK Walk Test was developed through a series of scientific studies. In the first of the investigations the factors and characteristics associated with walking performance and the individual and which were also related to aerobic fitness were first determined. Thereafter, a mathematical equation was devised to predict maximal aerobic power from the defined factors and characteristics. In addition the precision and error range of the prediction were determined. Next, the population groups for which the model could and could not be used reliably were defined. Thereafter the sensitivity of the test in detecting changes in fitness was studied. Another important step was to determine both the strengths and weaknesses of the UKK Walk Test in measuring the fitness of the general population. (See figure 3, page 22)

Reference values of the fitness index

Reference values are used for all fitness tests. They are values obtained by studying a broad group of people and calculating the means and distributions by age groups, generally for men and women separately. An individual person's test result is then compared with these means.

It is important for the tester to know the type of population sample that was used to obtain the reference values. In ideal circumstances the reference values are based on maximal aerobic power determined through the use of direct stepwise measurements in a maximal stress test in a group large enough to represent the entire population. Such reference values are not available, not in Finland nor elsewhere. Instead the reference material is mostly non-representative.

The reference values of the UKK Walk Test are based on the results of laboratory tests directly measuring the maximal aerobic power of a total 160 male and female residents of Tampere in the age range of 20–65 years. These reference values represent relatively well those of the healthy adult population of Tampere, and thus the fitness index calculated from the UKK Walk Test describes the fitness in relation to the men and women living in Tampere. Since the Finnish population is also fairly homogeneous regionally, the reference values can be considered to represent the entire country reasonably well.

The UKK Walk Test is primarily meant to follow the fitness changes through repeated testing. The test reliably describes changes in fitness as long as the test is done each time under comparable conditions.

The UKK Walk Test is suitable for most people

The UKK Walk Test is a reliable method for measuring aerobic fitness for:

- 20- to 65-year-old men and women who have no illness or disability that limits brisk walking or who are not on medication that affects heart rate
- Slightly overweight persons who fulfill the previous criterion.

There are some persons for whom the test is not suitable however:

- The test is not recommended for highly fit persons who exercise intensively and regularly.
- Nor is it suitable for pathologically obese persons.
- For those who take medication that affects heart rate, the test can be used as a measure with which to follow fitness changes due to physical activity if the medication dose remains the same. Since the result does not represent the maximal aerobic power reliably under such circumstances, it cannot be compared with the reference values of the UKK Walk Test.
- The reliability of the UKK Walk Test as a predictor of the maximal aerobic power of those under 20 years of age and those over 65 years of age has not been demonstrated. For this purpose a similar series of studies must be made in these age groups.

The UKK Walk Test is a predictor of maximal aerobic power

The fitness index obtained with the UKK Walk Test is based on the estimation of maximal aerobic power. Therefore the test almost always includes some error. A comparison of two persons on the basis of the index does not always give the same results as a comparison made with a direct measurement method. Correspondingly, a fitness class based on the fitness index can deviate from that determined by direct measurement, especially when the index is close to a class limit. It is important for the tester to take this possibility for error into consideration when individual results are being interpreted. The significance of the error decreases as the number of properly performed repeated tests increases.

VO₂max and the fitness index

The results of the UKK Walk Test are affected by

- the time taken to walk the 2 kilometers
- the heart rate measured at the end of the test
- the body mass index (= the person's weight in kilograms divided by his/her height in square meters)
- age

The equation formed from these variables first calculates the estimated maximal oxygen consumption in milliliters per kilogram. Because the result is strictly a physiological quantity and, as such, is not very informative for an average testee, it is transformed to a fitness index that relates the VO₂max result to the reference values so that a fitness index of 100 represents the mean of an age-specific male or female group. According to the distribution of the reference values, an index value above the mean represents better-than-average fitness and one below the mean depicts lower-than-average fitness. The reference values are used to establish the fitness class, which is based on the distribution of specific male and female group values.

The accuracy of the VO₂max estimation made by the UKK Walk Test is of the same magnitude as that of other traditional and generally used indirect measurements of VO₂max. A more precise determination of aerobic fitness is possible only with the use of "direct" measurement tests.

The UKK Walk Test and health

The UKK Walk Test can be used for feedback to the testee about the sufficiency or insufficiency of his/her aerobic fitness in relation to health and functional capacity. It also provides a good basis for counseling with respect to physical activity. Most of the data available on the association between health and fitness concern aerobic fitness. Epidemiological studies have shown that the risk of death from all causes and heart disease is significantly greater for the fifth of the population at the lowest end of the aerobic fitness scale than for those with a better aerobic fitness rating. The borderline value between these two sections of the population is about 30 ml · min⁻¹ · kg⁻¹ for middle-aged men and 20 ml · min⁻¹ · kg⁻¹ for middle-aged women. The respective fitness index is approximately 70, which can therefore be considered the minimum level for the health-related fitness of the general population.

2. SAFETY OF THE UKK WALK TEST AND THE TESTER'S RESPONSIBILITY

A safety model to support testing

Basically, all physical activity that exceeds the limits of a person's daily activities can be associated with a risk of accident, injury, or an attack of illness, especially among middle-aged and older persons. Even though walking is an everyday activity, familiar to almost everyone, brisk walking can correspond to extreme exertion for those not used to it and for those who are in poor condition or who are ill.

The 20- to 65-year-old men and women who participated in the development of the test reached an average heart rate corresponding to 85 % of their measured maximal heart rate. At this level of exertion even the UKK Walk Test can be associated with a risk to health. Therefore the health status of every participant must be determined, and this information used to assess whether or not the test is suitable.

What is included in the safety model?

The questionnaire can be used reliably and effectively to reveal persons for whom physical activity and fitness testing may be associated with a possible health risk. An expert assessment of the response to the health survey improves the pertinence of the screening and decreases the need for a medical examination before the testing. An expert assessment also decreases unnecessary elimination from the test.

The essential components of the safety model for the UKK Walk Test are:

- trained testers
- questionnaire-based screening of health status and expert assessment of the responses with an interview when necessary
- sufficient instruction for the testees and monitoring during the test or, if needed, recommendation for a health examination or rejection from testing
- appropriate preparations for first-aid and suitable arrangement for safety
- self-initiated assessment and development of testing practices and also maintenance of testing skill.

Skill and training of the testers

The UKK Walk Test has been designed for field conditions without complex laboratory techniques. Therefore the testers must have sufficient knowledge and skill and must be familiar with the information presented in this guide and its application to different target groups. The testers' professional skill includes the ability to apply the screening procedures to instruct and monitor the testees and to carry out the test, and also the ability to apply first-aid if needed.

Health survey

A pre-test health screening procedure, a health survey, has been developed for the participants in the UKK Walk Test. It is based on the experiences originally gained in Canada with the screening program of the "Home Fitness" test.

A questionnaire is used to screen out the persons for whom the physical exertion of the walk test may be associated with health problems. The questionnaire also helps screen out both those who use medication that would affect the test or its results and those with other health-related limiting factors.

The testee fills out the questionnaire, and the tester checks the responses before the test. If additional information is needed, the testee is also interviewed.

Table 1

*Illnesses and symptoms for which the testee should be referred to a health examination before the UKK Walk Test or the test should be postponed (cases marked with an *) until symptoms have disappeared*

- serious cardiovascular diseases and symptoms
 - recent myocardial infarction or coronary bypass or angioplasty (within six months)
 - coronary heart disease, with related chest pain
 - heart valve disorder, cardiomyopathy or other illness causing cardiac insufficiency
 - untreated and significantly high blood pressure (180/100 mmHg or higher)
 - arrhythmias that increase, or whose related symptoms become worse, during physical effort
 - severe anaemia (hemoglobin 100 g/l for women and 110 g/l for men)
- severe symptoms during physical effort (dyspnea, dizziness, pain)
- severe or unbalanced chronic illness such as diabetes or hyperthyroidism
- influenza* or other general infection
- recent serious injury*
- recent surgery*
- last trimester of pregnancy, a risk pregnancy, recent birth*
- unusual tiredness or weakness*
- hangover or drug overdose*

Safety measures

The organizers of the walk test must plan and agree on the details of the methods to be used to ensure safe testing conditions.

The following procedures help improve safety:

- ensuring that the testers have been properly trained
- providing enough testers to handle the size of the testing event and properly organizing the tasks
- appropriately applying the health screening
- ensuring that the test site is safe and that the degree of first-aid readiness is sufficient during the test.

The testee's signature on a certificate indicating that his/her participation is voluntary does not relieve the test organization of the responsibility to supply appropriately safe conditions.

3. HOW SHOULD THE UKK WALK TEST BE ORGANIZED AND CARRIED OUT?

Preparing for the test

Test course

Before the UKK Walk Test, the tester should become familiar with the testing terrain or the route that the test will follow.

A good course is level and hard-surfaced, for example, the track of a sports field. On a sports track it is recommended that the test begin on the inside lane and the finish line be located in the outside lane. In this manner, traffic across the lanes will be avoided, and the track can be reserved for the walkers.

Good surfaces for the test, in addition to a sports track, are, for example, asphalt, and a hard-surfaced dirt roads and asphalt. A track covered by soft sawdust or routes covered by loose gravel are not suitable for the test since these types of surfaces make it difficult for the walker to maintain an even rhythm and safe performance.

A measurement error of no more than 10 meters is allowed for the course. For reliably measuring the track, a measuring wheel can be used. The track should be clearly marked, as should the starting and finishing lines. In this manner, straying from the course and mix-ups can be avoided. If the test is done by walking back and forth along the same route, the turning point should be marked by a sign that is clearly differentiated from the surroundings or by signs or a chart.

Table 2

List of materials needed at the test site

- signs: registration desk, fitness calculation desk, other possible signs
- identifiable clothing or guides for the start and finish
- guides and signs for the turning points
- possible intermediate distance markers
- marking materials: colored strips, lime marker
- clocks for the start and finish (digital faces) and also spare clocks
- individual heart rate monitors or a single test handle with a single heart rate monitor receiver
- water, disinfectant and paper towels for wetting and cleaning the electrode handle
- pencils
- UKK Walk Test fitness and test cards, health screening questionnaires
- scale for weighing and tape measure for measuring height
- reading glasses (for people with poor eyesight)
- for the calculation of the results (a computer or a calculator and the WinWalk3 software)
- an indoor facility or shelter for the registration and fitness calculation desks

Table 3

Need for testers for different-size groups

Group size (number of persons)	Time between starts (s)	Time need to start entire group (min)	Testers (N)	Time needed for test (min)
10	60	10	1	30
20	30	10	2	30
30	30	15	2(-3)	45
50	30	25	3	60
50	15	12.5	3	45

In order to prepare for the test

- Avoid the use of alcohol and especially heavy physical effort on the day before the test.
- Avoid a heavy meal, smoking, and coffee, tea or cola beverages within 2–3 hours of the test.

Clothing

- Wear clothing suitable to the weather and sports shoes.

Instructing and taking the UKK Walk Test

Filling out the fitness card

When the testees arrive at the test site, they are told what the UKK Walk Test is and the objective of the test is explained along with how the test is to be carried out.

Before the test begins, the participants are requested to fill out the fitness card developed for the UKK Walk Test (see page 26–27). The fitness card includes, for example, questions on health to be used in assessing the suitability of the test. Once the participant has familiarized him/herself with the card and filled it out, he/she must sign it and return it to the tester.

The tester checks that the card has been sufficiently filled out and issues instructions if the health questions reveal something that should be taken into consideration during the test. As an indication that the participant is sufficiently healthy and has received permission to participate in the UKK Walk Test, the participant receives a test card (see page 29).

The testee adds his/her name, birth date, physical activity group, sex, age, height, weight to the test card before the test. His/her height should be recorded with an accuracy of 2 cm and his/her weight within 2 kg. If needed the height and weight are measured. It is a good idea to have a scale for checking weight and a tape measure for measuring height available in a place isolated for privacy.

The testee keeps the test card with him/her throughout the test. The card is used to record the test time and heart rate at the end of the test.

Initial warm-up

Before the test the tester instructs the testees to warm up by walking a distance of 300–500 meters. It is also possible to use the distance from the registration desk to the test site as the warm-up and instruct the testees to try out a brisk walking pace. As an initial warm-up the testees can also walk the course of the test. After a few minutes to return to normal, the actual test can be started.

Test instructions

If the testee does not familiarize him/herself with the test course while warming up, the tester should give a detailed description, and any turning points in the surroundings should be pointed out or shown on a map with the route drawn on it. When the test

instructions are given, the tester should remind the testee to use his/her own walking rhythm and step length.

Complaints concerning the fronts of the legs are generally a result of insufficient warm-up or taking steps that are longer than usual during the test as the pace increases. As first-aid for this problem the tester can recommend that the testee relax the walking pace, shorten the step or walk on the toes for a short distance.

UKK Walk Test instruction for walking
“Walk as fast as possible at a steady pace, without risking your health.”

It is a good idea to have the instruction for walking visible at the starting point. The instruction is also repeated to every testee verbally as the test begins. The objective is to walk normally as fast as possible at a regular pace. The pace should clearly be brisk enough to cause slight sweating and breath-lessness (see the criteria for heart rate and walking time, page 16). The accuracy and reliability of the results depends on there being no extra spurt or slowing down at the end of the test. Nor are running, “bent-knee jogging” or competitive walking accepted.

- Walk briskly also using your arms efficiently. Brisk walking generally causes slight sweating.
- Walk normally. Competitive walking or running are forbidden.
- Walk at a steady speed. An end spurt affects negatively the results by increasing the end heart rate.

The testees are instructed to organize themselves into a line up for the start, and at the same time the test and walking instructions are repeated. The tester records the starting time on the test card that the testee has with him/her and instructs him/her to do additional warm-up if the waiting time is long. The bigger the group of testees, the greater the need for the last starters to do additional warm-up.

Start

The testees are started at the time marked on the test card from their order in the line up. The tester starts the testee by verbally counting the last 5 seconds before the time marked on the testee’s card and then giving the testee a clear signal to start, for example, a light tap on the back. The tester must make sure that the testee takes his/her test card along.

The testee’s progress is followed from the starting line, the finish line or both, depending on the route and shape of the course. If the tester notices that the walking pace of someone is not sufficiently brisk, the tester should encourage the testee to increase his/her pace. The testee is asked how the test is going and how he/she feels. The test is aborted if the tester decides that continuing may possibly be a health hazard for the testee.

It is not permitted to walk with shoestrings untied! If a testee's shoestrings come untied, ask the testee to stop and tie them. The tester records the time taken to tie the shoes and this time is subtracted from the final walking time.

If a tester notices that a testee is having trouble with the forepart of his/her legs or the testee him/herself reports such a problem, the tester can, as a form of aid, recommend that the testee take shorter steps, rolling the step from the heel to the toe. If this does not help, ask the testee to walk a short distance on his/her toes.

Approach to the finish line and measurement of heart rate

When the testee approaches the finish line at the end of the test, the tester asks the testee to get out the test card and raise his/her shirt(s) so that the chest is exposed. Once at the finish line the testee first gives the card to the time recorder, who records the finish time, to the second, from the clock located at the finish line. The heart rate is measured the instant the testee has crossed the finish line. If there are two testers, the heart rate is measured as the finish time is being recorded.

Heart rate is measured immediately after the test. If the measurement is delayed by more than 30 seconds, the test is disqualified. If there are several persons crossing the finish line at the same time, the measurements can be speeded up as follows:

- 1) The same tester records both the time and the heart rate. Therefore more testees can be measured at the same time by having several testers working at the same time.

If there is congestion ready for heart rate measurement:

- 2) The time recorder writes down the testee's finish time at the finish line and asks the testee to continue walking at the same pace for a short distance. The heart rate measurement is made at the completion of the extra steps. It is important that the testee walks with the same walking technique and pace as during the test. Walking in place does not maintain the heart rate at the same level as during the test.

The heart rate is most easily measured from the chest with an electronic test handle and a heart rate monitor's receiver. For women the measurement point is immediately below the brassiere. The measurement is best made when the test handle is held in the hand on which the heart rate monitor is worn (on the wrist). Then the tester can freely support the testee's back from behind at the same time that he/she presses the test handle with the other hand.

If the heart rate does not appear immediately on the monitor, it is generally located by shifting the handle slightly. During the heart rate measurement the tester uses a firm grip, calms the testee, and encourages him/her to breathe normally. The tester reports the heart rate verbally so that both the testee and the recorder receive the information simultaneously. Another possibility is to equip each testee with a personal heart rate monitor.

Post-test stretching

After the measurements the testee is instructed to cool down. Illustrations of stretching exercises should be located in an area close to the finish line to help the testee stretch properly.

Table 4

Summary of the tester's tasks for the UKK Walk Test

Before the test

- Mark the walking route clearly and check the materials and equipment.
- Send the pre-test instructions to the testees.

At the time of the test

- Distribute the fitness cards to be filled out. Check each fitness card for the testee's suitability for testing before giving him/her permission to take the test.
- Give the testees the test card as a sign that they are able to take the test and ask them to fill out the card.
- Instruct the testees to warm up.
- Give clear walking instructions (and offer guidance during the test if needed).
- Record the starting time on the testee's test card.
- Start the testees at intervals.
- Record the finish time on the test card.
- Measure the heart rate immediately after the testee crosses the finish line or see from the clock the heart rate when a person comes to the finish line.
- Record the heart rate on the test card.
- Instruct the testee to stretch.
- Calculate the fitness index and transfer the data on the testee's test card to the fitness card.
- Return the filled out fitness card and possible computer results to the testee and give him/her feedback.

4. CALCULATING THE RESULTS OF THE UKK WALK TEST

Choosing the method for calculating the results

The following two methods can be used to calculate the fitness index of the UKK Walk Test:

- 1) using the equations shown on the fitness card
- 2) using the WinWalk3 computer program.

The choice of calculation method depends upon the time available, the number of testees, and the equipment available.

No matter which calculation method is chosen, the calculation is begun by pairing the test card of the testee with his/her fitness card. All the data recorded by the testee and needed for the calculation should be found on the test card: test date, name, birth date, age, height and weight. During the test a tester records the starting and finishing times to an accuracy of 1 second and the heart rate at the finish line. The Win Walk3 program automatically calculates the walking time (i.e., the actual time needed to perform the test) once the starting and finishing times are entered. If the computer program is not available, the walking time is determined by subtraction. If the figures are calculated manually and the smaller number of seconds is subtracted from the larger number of seconds, it should be remembered that, when borrowing from the minutes to the seconds, 60 should be used, not 10 or 100 as is generally the case in subtraction. Final times such as 15:87 or 14:61 are not possible.

Sample calculation of the finish time (subtraction)

Finishing time	18:00
Starting time	2:30
Walking time	15:30

Calculating the results according to the equations on the fitness card

On the inside of the fitness card, provides the equations for the calculations, for men and women separately.

■ The calculation of the results is begun by subtracting the starting time from the finishing time marked on the test card and by marking the walking time in the proper gender column in the equation on the fitness card. The minutes are marked in the first row (min, e.g., 15) and the seconds in the second row (s, e.g., 30). Even if the walking time is an even number of minutes, the second value is filled in. The heart rate measured at the finish line and recorded on the small test card is added on the third row of the equation (beats/min, e.g., 145).

■ The body mass index (BMI) is obtained from the table on the back page of the fitness card using from the height and weight of the testee. The height and weight are rounded to the larger whole number. The BMI can also be calculated from an equation (kg/m^2). For example, weight 75 kg, height 170 cm = 1.70 m; $\text{BMI} = 75 / 1.70^2 = 75 / 2.89 = 26.0$. The BMI obtained from the table or calculated according to the equation is placed on the fourth row of the equation. Each of the aforementioned values is multiplied by its own coefficient, as shown in the equation.

- minutes walked multiplied by 11.6 for the men and 8.5 for the women
- seconds walked multiplied by 0.2 for the men and 0.14 for the women
- heart rate multiplied by 0.56 for the men and 0.32 for the women
- BMI multiplied by 2.6 for the men and 1.1 for the women

■ The results of the multiplications are rounded off to a whole number and entered in the equation on the proper line, and the four values are summed.

■ Thereafter the age of the testee is entered into the equation (found on the fitness card) and multiplied by its own coefficient (0.2 for men and 0.4 for women). The result obtained for the age is subtracted from the sum of the four preceding values. Then the obtained value (e.g., 320) is transferred to the blank under the coefficient (420 for men and 304 for women), as indicated by the arrow, and subtracted from it.

■ The result is the fitness index (e.g., 100), and its corresponding fitness class can be found in item 3 of the fitness card. In this example the calculated fitness index of 100 corresponds to an “average” level of fitness for men of the same age and gender.

Calculating the results according to the equation on the fitness card is rather complicated and time-consuming. Eight different calculations must be made to get the result, and therefore the possibility for error is great. Using this method, however, the testee can always check the results him/herself later and also he/she can get an idea of the factors affecting the results (minutes, seconds, heart rate, body mass index, age and gender) and the weight given each of them.

Calculating the results using the WinWalk3 computer program

The fastest and simplest way to calculate the results is to use the Win Walk3 computer program. This Windows-based program has been developed especially for the UKK Walk Test to store the data, calculate the results, and help provide feedback for testees.

The tester can feed all the required data directly into the program. Once the data of the testee have been added to the database, his/her results can be seen on the monitor or printed out on paper. The personal result report based on the UKK Walk Test includes the most fundamental factors related to health-related fitness and provides a personal "refined recommendation" for health-enhancing physical activity. The testee is also given information about the pace (km/t) at which he/she walked the UKK Walk Test and the energy consumed (kJ, kcal).

The tester can choose the type of report to be printed out. The shorter version provides the personal data of the testee, his/her test results, and also feedback based on the results. The longer version includes this same information but also presents tables giving the classes for the BMI and fitness index. The program also permits a summary to be printed in which all of the testees are included.

Feedback is the most important part of the test

Regardless of the method chosen for calculating the results, the fitness card is returned filled out to the testee. The tester should record the values needed for calculating the equation on the card. Then the testee will be able to check his/her results later. If the Win Walk3 computer program is used, the testee is not only given the fitness card, but also a print out with his/her personal report.

Individual feedback is a fundamental part of the UKK Walk Test, and it given as soon as possible after the test. Sometimes personal feedback is not possible, for example, should be when measurements have been done for a very large group or as a part of a mass event for the general population. Then feedback can be given, for example, in the form of a lecture to the entire group at the same time. Even under such circumstances, it should be important that the test participants will be given the opportunity to ask questions about their own results and, if needed, receive additional information, for example, in physical activity counseling.

5. THE FITNESS INDEX AND THE FITNESS CLASS

The fitness index tells the fitness class

The results of the UKK Walk Test are based on the person's maximal aerobic power. It is indicated as the fitness class, for which the effect of age has been taken into consideration. An index value of 100 describes the average fitness of persons of different ages. Table 5 presents the maximal aerobic power, measured in milliliters per kilogram per minute, for the fitness index 100 for men and women of different ages.

The standard deviation of the maximal aerobic power of the research material on which the UKK Walk Test is based was $8 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$ for the men and $7 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$ for the women. On the basis of these data, the fitness was divided into five classes so that the average class (fitness index 90–110) is the size of one standard deviation (i.e., $4 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$ for the men and $3.5 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$ for the women). Correspondingly, the next classes up and down (fitness index 111–130 and 70–89) are one standard deviation in size (Figures 1 and 2). One index point is thus smaller than $0.5 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$.

Table 5

Average maximal aerobic power (VO_{2max}) for men and women of different ages according to the fitness index (= fitness index of 100)

Age (years)	Maximal aerobic power $\text{ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$	
	Men	Women
20	50.2	39.3
25	48.5	37.9
30	46.8	36.5
35	45.1	35.1
40	43.4	33.7
45	41.7	32.3
50	40.0	30.9
55	38.3	29.5
60	36.6	28.1
65	34.9	26.7

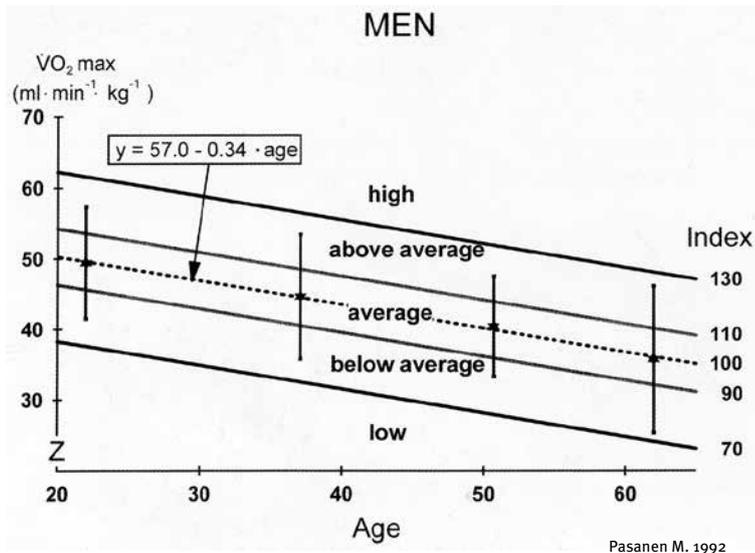


Figure 1

Formation of the fitness index for the men in the original study on the UKK Walk Test, determined according to maximal aerobic power ($\text{ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$) and the standard deviation (SD).

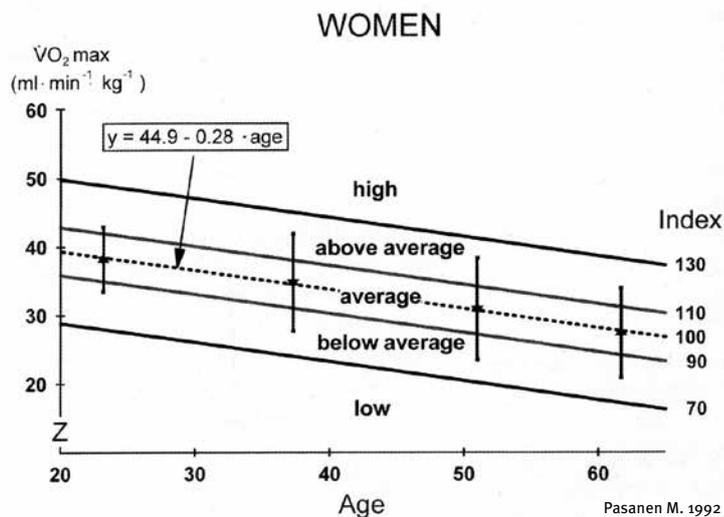


Figure 2

Formation of the fitness index for the women in the original study on the UKK Walk Test, determined according to maximal aerobic power ($\text{ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$) and the standard deviation (SD).

On the basis of the method used to establish the reference values, it can be estimated that, with respect to physical activity, about 50% to 60% of the general population is represented by the average fitness class (90–110). About 15% to 20% belong in the next classes (70–80 and 111–130), and about 3–5% belong to both the lowest (<70) and highest (>130) classes.

Equation predicting maximal aerobic power on the basis of the results of the UKK Walk Test

Men:

$$184.9 - 4.65 \times (\text{time, min}) - 0.22 \times (\text{heart rate}) - 0.26 \times (\text{age}) - 1.05 \times (\text{body mass index})$$

Women:

$$116.2 - 2.98 \times (\text{time, min}) - 0.11 \times (\text{heart rate}) - 0.14 \times (\text{age}) - 0.39 \times (\text{body mass index})$$

On the basis of the preceding equation, the $\text{VO}_2 \text{ max}$ of, for example, a 40-year-old woman can be calculated from her walking time (17 minutes, 30 seconds), heart rate (145 beats/minute), and body mass index (23 kg/m^2 , weight 64 kg & height 167 cm) as follows:

$$\text{VO}_2 \text{ max} = 116.2 - 2.98 \times (17.50) - 0.11 \times (145) - 0.14 \times (40) - 0.39 \times (23) = 33.5 \text{ ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$$

Table 6

Fitness class according to the fitness index

Fitness index	Fitness class
< 70	Considerably below average
70 – 89	Somewhat below average
90 – 110	Average
111 – 130	Somewhat above average
> 130	Considerably above average

The fitness index represents the fitness class for men and women in comparison with men and women of the same age, respectively. Maximal aerobic power per kilogram per minute ($\text{VO}_2 \text{ max}$), on the other hand, indicates the maximal aerobic performance capacity. Table 7 presents examples of the oxygen consumption required by rest and different forms of physical activity.

Table 7

Oxygen consumption, VO_2 ($ml \cdot min^{-1} \cdot kg^{-1}$), required by different forms of physical activity.

VO_2 ($ml \cdot min^{-1} \cdot kg^{-1}$)	Type of physical activity	Rate (km/h)
3.5	rest	
5	light sitting work	
10	slow walking	3.3
15	walking	5.0
20	brisk walking	6.2
25	walking/jogging	7.2
30	jogging	8.6
40	running	11.4
50	running	14.2
60	running	16.9

For example, a 20-year-old adult male whose maximal aerobic power was predicted to be $50 ml \cdot min^{-1} \cdot kg^{-1}$ would be given a fitness index of 100 (Table 5). According to his VO_2 max he should be able to run for a few minutes at the speed of about 14 km/h. (Table 7). A 60-year-old male with a fitness index of 100 has an estimated maximal aerobic power of $37 ml \cdot min^{-1} \cdot kg^{-1}$ (Table 5). This means that he should be able to run for a few minutes at the speed of 10 km/h (Table 7). The fitness index of both men is the same, the average for their own age range, but, on the basis of their maximal aerobic power, their performance capacity clearly differs. The efficient and safe upper limit for fitness training is considered to be 85% of the maximal aerobic power, and the lower limit is 50%.

6. FACTORS AFFECTING THE TEST RESULTS

A reliable result requires that the test measurements have been done properly and carefully and that the personal data accurate. With respect to the reliability of the results of the UKK Walk Test, the following factors are the most important:

1. walking time
2. walking heart rate
3. body weight
4. different environmental factors
5. used medication
6. age
7. learning.

Walking time

Walking time is the most important factor affecting the results of the test. For example, a 1-minute difference in walking time for a 40-year-old man in poor condition or a 60-year-old woman in good condition can cause a 10-point difference in the fitness index. For this reason the walking time should be measured within an accuracy of 5 seconds, but preferably within 1 second.

The length of the course should be measured within an accuracy of less than 10 meters, and the walking time should be recorded within at least 1–5 seconds of the actual walking time.

Time targets

The UKK Walk Test requires that the testee walks as fast as possible at an even pace. The success of the walk can be estimated from the time taken to walk the course and the final heart rate.

During the development of the walk test, special attention was paid to the walking pace, and the walking times recorded in the research represent the near maximum walking pace of the group studied. The UKK Walk Test is based on the average walking times presented for men and women in different age groups in Table 8.

Table 8

Average walking times (minutes.seconds) attained in research on the UKK Walk Test according to age and gender.

	Age group (years)			
	20–25	35–40	50–55	60–5
Men	14.36	15.06	15.18	16.18
Women	16.24	16.48	17.18	17.30

The walking times presented in Table 8 are suitable targets for the presented age groups according to gender. The age groups not represented in the table can use the averages of the age group closest to their own. Because the effect of age on walking time was not linear for the subjects in the study, the times presented in the table should be adjusted according to their use.

In actual test situations there are, of course, both times above and below the averages. The faster times are not a problem as long as the test has been performed with a normal walk, without running, competitive walking or “bent-knee” walking. Nor do slower times as such indicate an unsuccessful test as long as the walk has been sufficiently brisk in respect to the testee’s own physical condition.

Heart rate

The effect of heart rate on the final result is not as great as that of the walking time. Including heart rate in the equation makes the VO_2 max prediction 18% more accurate for men and 8% more accurate for women.

Heart rate should be measured at the end of the test, immediately after the testee crosses the finish line. If monitors that record heart rate are used, the heart rate of the last minute of the test can be used (e.g., the average). If non-recording heart rate monitors are used, the result is read from the monitor at the finish line and marked on the test card. In both cases the result depends on an even pace being maintained throughout the test.

An error of a few beats in the final heart rate does not essentially affect the fitness index. For a 40-year-old man in poor physical condition a 3-beat error means a 1-point difference in the fitness index. And for a 60-year-old woman in good physical condition a similar error affects the fitness index by 2 points. On the other hand, a 10-beat error means a 5-point difference in the fitness index in the former case and a 4-point error in the latter. In the measurement of heart

rate the result should be recorded with an accuracy of within 3–4 beats.

With respect to the reliability of the test, heart rate can be a problem even if it is accurately measured. There are many physiological and environmental factors that can affect heart rate. Such factors are being too heavily or inappropriately dressed, wearing poor shoes, and a heavy meal or coffee consumption, smoking, hangover, or heavy physical effort before the test. There are also many medications that affect heart rate by either raising or lowering it. Some environmental factors can also affect heart rate.

Table 9

Means and ranges (smallest and largest value) of the walking heart rates (beat/min) obtained in research on the UKK Walk Test according to age and gender

Age group (years)	Men		Women	
	Mean	Range	Mean	Range
20–25	167	136–191	164	145–190
35–40	156	110–189	154	136–181
50–55	155	117–175	147	123–166
60–65	140	106–176	144	132–166

Heart rate targets

A sufficiently high heart rate at the end of the test is the sign of a brisk walk. The UKK Walk Test is the most reliable when the walking heart rate increases to at least 80% of the maximal heart rate. Heart rate can nevertheless fluctuate even in an accepted walk since the fluctuation partially indicates good physical fitness. For the UKK Walk Test research group the heart rate averaged 154 beats/minute.

A very low heart rate at the end of the test is a sign that either the walking rate was not brisk enough or that the person was not able to exert him/herself enough. Such can be the case, for example, for an extremely fit sportsperson who is not used to walking. A specific minimum limit cannot be set for the final heart rate. A walking heart rate that is under 120 beats/minute for 20- to 40-year-olds and under 110 beats/minute for 40- to 65-year-olds does not usually describe the physiological load required by walking. These levels can be considered the lower limits for an acceptable walk.

As with the walking time, the heart rate averages obtained for the age groups, according to gender, in research on the UKK Walk Test can be considered the target. The average heart rates and their ranges are given for the different age groups according to gender in Table 9. For the age groups not represented, the averages of the age group closest to their own can be applied, as was the case for walking time in Table 8.

To increase the reliability of the results, it is very important that the testees walk at a pace brisk enough to cause at least slight sweating and breathlessness.

For normally fit men and women a walk test done at 60 % of the maximal heart rate will underestimate the actual performance capacity by as much as 30 index points, and a walking pace that corresponds to 70 % of the maximal heart rate can still underestimate actual performance capacity by about 15 index points. The UKK Walk Test functions the most reliably at 80 % of the maximal heart rate.

Environmental factors

Walking course

The walking course should be selected with care. A test done on a hilly route or a soft surface increases the heart rate and slows down the pace so that the fitness index is lower than when the test is done on a sports track or a level, hard dirt or asphalt surface. In addition short straight courses with sharp turns at each end slow down the walking pace and lower the fitness index when compared, for example, with the results of a test done on a sports track. A test done on a gently curving inside track gives a result that is within a few index points of the result of a test done in good outdoor conditions.

Weather

The test should not be done when the temperature is too cold or too hot. Hot summer weather over 25 °C increases the heart rate to the point that the result is incorrect. Cold weather at temperatures of less than 0 °C decreases heart rate, but a cold wind on the face or chest can increase it considerably.

It is recommended that the test be made outdoors only during the usual walking season and then only when the weather is good. In winter the test should not be done outdoors.

Other factors

Medication

The effect of medication can either decrease or increase the rise in heart rate during the test or it can affect the resting heart rate. Medication that affects heart rate is generally taken for a cardiovascular disease, especially hypertension. The most typical medication group that affects either the resting or exercise heart rate are beta blockers. Other medications affecting heart rate are some of those taken for asthma and other respiratory diseases and some taken for mental illness.

If a person who takes a medication affecting heart rate has already participated in the UKK Walk Test, he/she can be informed, for example, according to the following statement at the time he/she receives the results:

The medication you are taking affects the walk test results.

Because the medication affects heart rate, your fitness index and maximal aerobic power could not be calculated accurately. Your fitness assessment and the recommendations for regular physical activity are merely indicators.

The test results can however be used for comparison, if you decide to take the test again at a later date using the same medication.

Weight

In the UKK Walk Test body weight affects the results in that, for the same results, the heavier of two persons would have a lower fitness index. A person's weight affects the fitness index because the index describes the maximal aerobic power in relation to body weight. The taller the person, the more he/she generally weighs. Therefore the equation for the UKK Walk Test uses the body mass index (BMI), which denotes the person's weight in relation to his/her height. The BMI depends more on the weight than the height. Usually additional weight slows the walking pace and therefore lowers the results.

The body mass index is calculated by dividing the weight in kilograms by the height squared (height being measured in meters). The classification of the body mass index can be found in Table 10. Errors of less than 2 cm and 2 kg in height and weight, respectively, do not essentially affect the results. A 5-kg error for body weight will, however, lower the fitness index by a few points. One inch equals to 2.54 cm and 1 pound equals to 0.453 kg.

The test results can even be affected by a change in weight only. If a person's weight decreases, the fitness index improves, and if weight increases, the index worsens. Such changes occur because the predictive variable is maximal aerobic power in milliliters per kilogram of weight ($\text{ml} \cdot \text{min}^{-1} \cdot \text{kg}^{-1}$), and, therefore, as a divisor, weight directly affects the results. This also has a functional significance in that, as weight decreases, aerobic power has a lighter body mass to move and vice versa.

Age

The UKK Walk Test gives compensation for age. In its results the maximal aerobic power values have been changed so that an index value of 100 describes the average fitness for walkers in the same age group and of the same gender. Because a person's maximal aerobic power decreases with age, an older person is given a higher fitness index than a younger one if both have the same walking time and all the other variables (heart rate, body mass index) are the same.

The UKK Walk Test has been developed for 20- to 65-year-old men and women. If the result is calculated for younger or older persons the equation assumes that the relation between maximal aerobic power and age is the same as for the 20- to 65-year olds. This is not true during the period of growth.

In addition, it is not known whether or not the

relation between maximal aerobic power and age is exactly the same for those under 20 who are fully grown and those over 65 years of age. The fitness index cannot be used for growing children and adolescents, nor is it certain that the test is valid for fully grown persons under the age of 20 years and for those over 65 years of age.

Learning

According to research results the walking time can be improved by as much as half a minute when the test is repeated after a period of time. Because an increase in heart rate is not always apparent, the difference indicates that a learning process has taken place. The effect of learning can be greater for sedentary and older testees (nervousness). Therefore the first test should be approached as a "practice test", or, alternatively, before the test a thorough "practice walk" should be done in which the technique that best suits the test is found.

Table 10

The most important factors affecting the UKK Walk Test and their significance

Walking time

The most important factor affecting the results. A difference or error of one minute in recording the time means a difference of about 10 points in the fitness index.

Heart rate

- Should be measured immediately at the finish line with a heart rate monitor
- Affects the results relatively less than the walking time, but adds additional reliability to the test. A difference or error of about 10 beats in the recording has a significant effect.
- A change in heart rate of 20–25 beats/min corresponds to 10 fitness points.

Body mass index

- Is formed from body weight and height
- A difference or error of less than 2 kg or 2 cm does not essentially affect the fitness index.
- Merely a reduction in weight can improve the fitness index.
- A change of 10 kg for men and 20 kg for women corresponds to about 10 fitness points.

Age

The effect of age is directly taken into consideration in the fitness index so that an index of 100 corresponds to the average relative fitness for each year between 20 and 65 years of age.

7. INTERPRETATION OF THE RESULTS

Feedback is the most important phase of the test for the testee

To increase the reliability of the results and ensure appropriate feedback, the following aspects should be ascertained in advance:

1. Preparation for the test

- the physical effort and meals preceding the test, medication and stimulants that affect heart rate
- sufficient stretching, familiarization with the quick walking pace

2. Success of the technical performance

- Was the walk sufficiently brisk and even-paced?
- Was the recording of the walking time and heart rate successful?

3. Effect of environmental factors

- temperature, wind conditions, walking course

4. Suitability of the compiled physical activity recommendation for the testee

- On the basis of the results, what is the need for additional physical activity?
- Is the recommendation in line with the current physical activeness of the testee and his/her possibilities to realize the recommendation?

Getting information from the tester beforehand on the aspects listed under the preceding points helps provide a good foundation for giving and receiving feedback. The worst possible feedback from the point of view of the tester is a form received in the mail a week after the test.

Individual, person-to-person feedback should be a part of every UKK Walk Test. If such feedback is not possible, the tester should at least go through the results at the group level so that the testees will have a possibility to ask questions about their tests. The UKK Institute has developed a calculation program called Win Walk₃ for compiling the data and calculating the results.

Fundamentals of the physical activity recommendations given by the computer program

The WinWalk₃ computer program developed for the UKK Walk Test speeds up and diversifies the recording and control of the test information and the drafting of the feedback for clients. The program can be used to print out both personal reports (see, e.g., pages 23–24) and group summaries. The recommendations in the individual reports (on page 24) are based on the recorded Walk Test data and the latest recommendations for health-enhancing and fitness physical activity.

The recommendation printed out by the computer program should be discussed with the testee. The tester should be able to interpret the suitability of the feedback with respect to the physical activity needs, motivation, and possibilities of the client.

7. THE UKK WALK TEST AS AN AID TO PERSONAL PHYSICAL ACTIVITY COUNSELING

Practical use of the UKK Walk Test

The testing of physical fitness should never be done as an end in itself; instead it should be an instrument that helps fulfill an objective. Traditionally, fitness testing attempts to estimate a person's current physical condition and follow changes in fitness.

The UKK Walk Test lends itself well to the promotion of health-enhancing physical activity. It is an excellent aid for use in health-targeted physical activity counseling for the adult population in that endurance training and good aerobic performance capacity have many beneficial effects on different dimensions of health. With respect to health, following changes in fitness is more important than the results of individual tests. Following fitness can be used to motivate people to lead a physically active life.

Information needed about the client for physical activity counseling

The most important information needed about the client is health status, the physical activity of his/her work, leisure-time sports and physical activity, and the opportunities, skill and motivation for physical activity. In many instances, the responses to the questions of the UKK health questionnaire provide sufficient data on health and physical activity for the physical activity counseling. Sometimes it is necessary to obtain more specific information in an interview or with a broader questionnaire. Information about the physical activity of the person's work is important both for the setting of physical activity

goals (the physical demands of work in relation to the person's fitness) and for setting the physical activity dose (quantity, type, and timing of the activity).

From the point of view of counseling and guidance the most important factors to be determined are the client's opportunities for regular physical activity e.g., his/her basic knowledge of the subject, time available for such activities, available equipment and facilities, monetary resources, skills (previous participation in certain sports), and motivation. It is essential to take these factors into consideration when the objective is to persuade the client to commit him/herself to a specific physical activity program. A successful physical activity program is not the product of the dose prescription produced by the tester and computer program; rather it is the result of the discussion between the tester and client about what is important in respect to the client's health or fitness and also what is feasible in respect to his/her life situation and motivation.

A lack of time is one of the most limiting factors for regular physical activity. Few people have the time to participate in a certain form of physical activity several times a week. Daily activity, commuting to and from work, running errands, and other forms of necessary activity (e.g., gardening, shoveling snow in winter, fishing) offer notable opportunities for endurance training and weight control. Physical activity counseling should always take into consideration the possibilities of daily activity and attempt to include the short bouts of physical activeness provided by normal daily routines.

Table 12

Checklist for physical activity recommendations

Determination of the client's background data

- personal information
- health status
- physical activity
- physical demands at work
- possibilities, skill and motivation for physical activity

Test circumstances

- health limitations that become apparent during the test
- opinions and experiences of both the client and the tester
- reliability of the test

Interpretation of the test

- need to increase physical activity according to the recommendation for health-enhancing physical activity

Physical activity objectives

- consideration and specification of the client's health and fitness goals
- objective for physical activity during the first few weeks
- objectives for developing health-related fitness, setting time goals,
- commitment of the client

Recommendation for physical activity

- factors affecting the realization of the recommended form of physical activity (opportunities, skills, motivation)
- forms of physical activity (daily activity, type of exercise or sports)
- frequency, duration and intensity of the physical activity

Check of the physical activity prescription provided by the UKK Walk Test computer program

- Is the recommended physical activity safe?
- What are the possibilities of complying with the recommendation?
- Does the recommendation meet the goals of the client?

Need for additional services

- follow-up tests
- physical activity counseling
- medical examination or other investigations with regard to health
- other

UKK WALK TEST

instructions for preparing for participation

- The test is meant for 20- to 65-year-old adults.
- The test measures performance capacity of the cardiorespiratory system (oxygen intake capacity).
- The test is a 2-km walk as fast as possible at an even pace.

Pre-test preparation

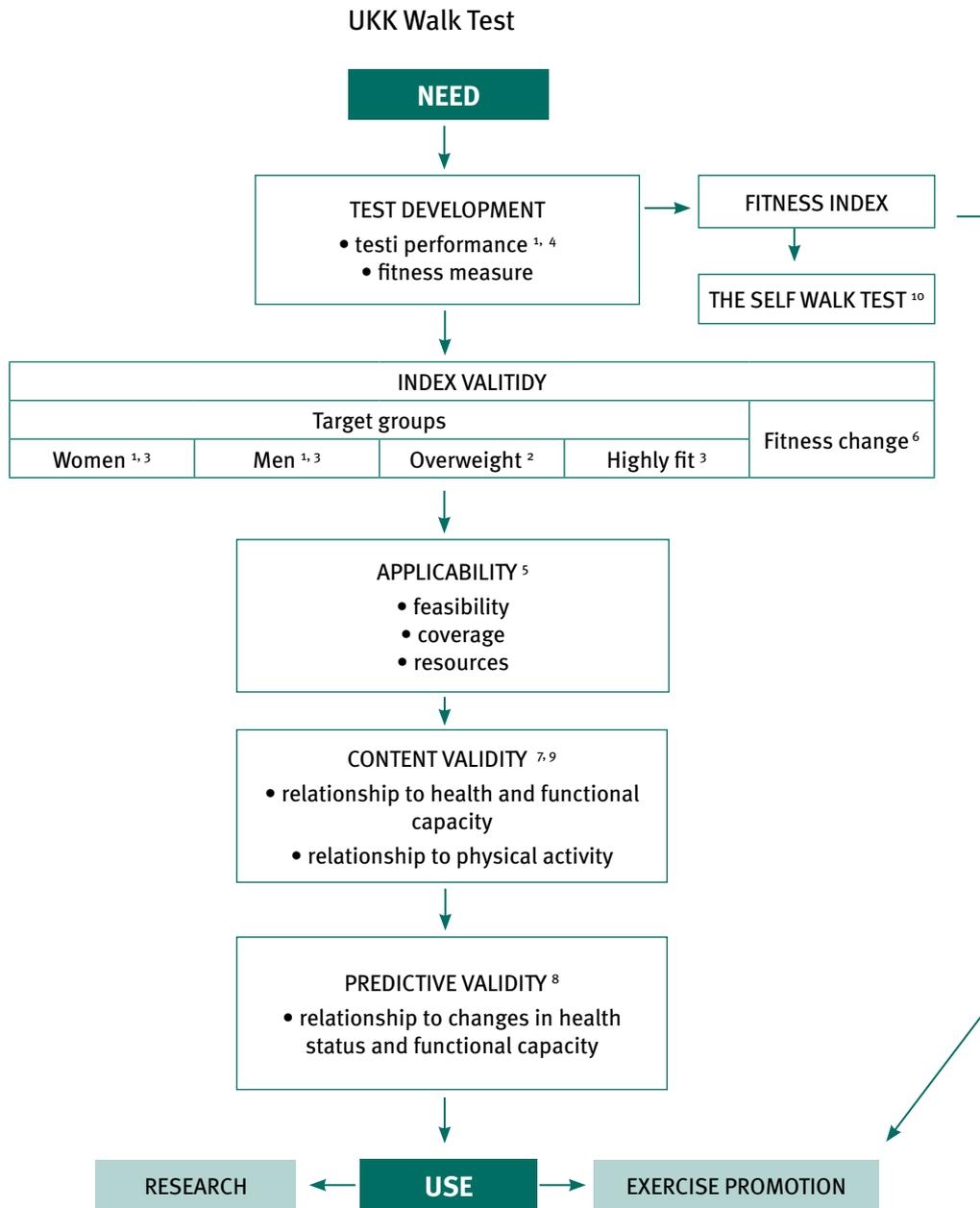
- Refrain from using alcohol and from undertaking any unusually heavy physical effort the day before the test.
- Do not eat a heavy meal, smoke, or drink coffee, tea or cola beverages within 2–3 hours of the test.

Clothing

- Apparel appropriate for the weather and sports shoes.

Figure 3

Summary of research on the UKK Walk Test
(superscripts indicate the related study)





MARION WALKER

COMPANY DEPARTMENT

8.10.2013

Age	40	year
Height	168	cm
Weight	72,0	kg
BMI	25,5	kg/m ²
Time	16 min 52 s	
Speed	7,1	km/h
Heart rate	152	beats/minute
Fitness index	100	
Maximal aerobic power	34	ml/kg/min
Predicted maximum heart rate	185	beats/minute
Energy expenditure	124 kcal/	519 kJ

WEIGHT ASSESMENT

Your body mass index (BMI), calculated from your height and bodyweight, is **25,5**. This indicates that **you are slightly overweight**.

Reference values for you body mass index (BMI) and corresponding body weight ranges

under 18,5	underweight	under 52
18,5 - 24,9	acceptable	52 - 71
25 - 29,9	slightly overweight	71 - 85
30 - 34,9	moderately overweight	85 - 99
over 35,0	considerably overweight	over 99

WALK TEST RESULTS

The UKK Walk Test predicts the endurance capacity of your cardiovascular system. The factors affecting your test result are walking time, heart rate, body mass index, age and gender. **Your fitness index, calculated from the test results, is 100.** Your fitness level compared to women of the same age is average.

Fitness index classification and predicted maximal aerobic power

Fitness index	Fitness classification	Maximal aerobic power (ml/kg/min)
under 70	considerably below average	under 23
70 - 89	slightly below average	23 - 30
90 - 110	average	30 - 37
111 - 130	slightly above average	37 - 44
over 130	considerably above average	over 44

Factors affecting the test result:

Walking time: a 1-minute change in the walking time corresponds to 10 fitness index points

Walking heart rate: a 20-25 bpm change in heart rate corresponds to 10 fitness index points.

Body weight: a 10-kg change in body weight in men and a 20-kg in women corresponds to 10 fitness index points.

UKK WALK TEST / Individual report

MARION WALKER

COMPANY DEPARTMENT

8.10.2013

The test results indicate that increasing your current amount of exercise would be good for you. Regular exercise allows you to promote your health and improve your fitness. You have engaged energetic and brisk physical activity about once a week. This exercise recommendation is for you a starting exercise training program. It will get you properly started on your way to improve your fitness. Remember warming up before and cooling down after your exercise.

EXERCISE RECOMMENDATION

Frequency of exercise: daily or almost daily

Duration of exercise Altogether half an hour a day

Intensity of exercise: 126 - 148 beats/minute Some sweating and breathlessness.
You should be able to talk without heavy breathlessness.

Types of activities
brisk walking, pole walking
bicycling
swimming, rowing
cross-country skiing
aerobic or other similar types of conditioning exercises
commuting to work
yard work and gardening
climbing stairs, running errands

Monitor the intensity of your exercise by measuring your heart rate with a POLAR heart rate monitor. To monitor improvements in your fitness, retake the walk test every third month.

ENJOY YOUR EXERCISE!

UKK Walk Test

FITNESS CARD

Name _____

The **UKK Walk Test** is based on the results of a brisk 2-km walk in flat terrain. The test measures cardiorespiratory performance. The Fitness Index indicates the fitness level in relation to that of others of the same age and gender. The test is meant for healthy **20- to 65-year-olds** who have no disease or disability that would limit brisk walking. The test is not suitable for highly fit persons. It is carried out under the direction of a trained tester.

Test instructions

- Fill out and sign this **fitness card**
- Add your name and other personal data to the separate **test card**
- Warm-up for 5–10 minutes before the test begins and also cool off using stretching exercises after the test
- Walk the 2 kilometers at an even pace throughout. Walk as fast as you can within the limits of your fitness and health

Please note!

First, fill out the questionnaire on the following page (an assessment of your suitability for testing) and **then** circle the proper response to the following statements.

I have participated in the UKK Walk Test earlier	yes	no
I have carefully read the questions on the fitness card and answered them to the best of my ability	yes	no
I am participating in the UKK Walk Test voluntarily and at my own responsibility	yes	no

signature _____

Equation for calculating the fitness index

1. Multiply and add the values

MEN			WOMEN		
Walking time					
min	x 11,6	=	min	x 8,5	=
s	x 0,2	=	s	x 0,14	=
Heart rate					
beats/min	x 0,56	=	beats/min	x 0,32	=
Body mass index (see the table)					
kg/m ²	x 2,6	=	kg/m ²	x 1,1	=
Total			Total		

2. Subtract from the sum

Age					
years	x 0,2	=	years	x 0,4	=
		=			=

3. Subtract the calculated difference from

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420								
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Fitness index =		Fitness index =						

Fitness classification

Your endurance fitness in comparison with that of persons of the same age and gender according to the fitness index (valid in the age range of 20–65 years).

Fitness index	Fitness class
< 70	Considerably below average
70 – 89	Somewhat below average
90 – 110	Average
111 – 130	Somewhat above average
> 130	Considerably above average

Table for body mass index BMI

Check the table below for an example. Round the weight and height up to the nearest even number.

Body mass index is calculated from the weight and height (weight divided by height squared, kg/m²).

For example, weight 75 kg, height 170 cm = 1.70 m : $\text{BMI} = 75 / 1.70^2 = 75 / 2.89 = 26.0$.

Height (cm)	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
200	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
198	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
196	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
194	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
192	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
190	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
188	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
186	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
184	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
182	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
180	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
178	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
176	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38		
174	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
172	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		
170	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
168	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
166	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
164	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
162	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
160	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
158	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
156	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
154	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44		
Weight (kg)	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100

UKK Walk Test

TEST CARD

Date	
Name	
Date of birth	
Physical activity group (1-6)	<input type="checkbox"/> men <input type="checkbox"/> women



Age	years
Height	cm
Weight	kg

Starting time	min	s
Finishing time	min	s
Walking time	min	s
Heart rate	beats/min	

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