

BICYCLE ERGOMETER: STRUCTURE OF THE TEST SITUATION

Booking an appointment

- Customer can print the preliminary and risk assessment form when booking the appointment at Wellness Center's website.
- If you book the appointment for the customer on the phone, you must send the **preliminary and risk assessment form** for the customer to fill and the **preparation instructions** from Wellness Center's email.

Steps before the test

- Checking the condition of the measurement tools.
- Make sure that the preparation instructions have been given in written or verbally when booking the appointment.

Receiving the customer

- Clarifying if there is any **contraindications**:
 - Check the list of absolute contraindications (see attachment 1.)
 - **Going through the preliminary and risk assessment form together with the customer**
 - Measuring resting blood pressure, height, weight (InBody scale) and waistline. Mark them in the preliminary form (see preliminary form's attachment 1)
 - **Evaluating customer's risk classification – make the decision whether or not the test is taken. Sign the form and make sure that the customer has also signed – return the form to a locked cabinet at Wellness Center!**
 - If the test is taken, mark the room temperature to the preliminary form (see attachment 1). Proper temperature is 18-22 degrees.

Instructions for measuring blood pressure:

Blood pressure can be measured from either upper arm. Check the monitor's instructions, if there is a difference between attaching the cuff to left or right arm.

- Sit on a straight-backed chair, lean on the backrest and try to be as relaxed as possible.
- Wrap the right sized cuff on a bare upper arm, make sure that a finger fits between the cuff and the arm.
- Make sure that the air tube's attachment point is facing upwards and that the tube is loose. Support the arm to 90-degree angle, the cuff and the heart should be on a same level. Keep the arm relaxed. Once you have attached the cuff to the arm calm down for five minutes before the measurement.
- Take the measurement. Be as relaxed as possible. Don't speak or move during the measurement. Repeat the measurement after 1 minute and mark both results to the form.
- **If the resting blood pressure is repeatedly measured over 180/100 mmHg (either one), must the blood pressure be observed after each load during the test.**

- **The test will not be performed at Wellness Center if the blood pressure is over 180/120 mmHg (either one) after two measurements. The risk limits are marked in the preliminary form (140/90).**

Measuring waistline:

Waistline is measured in the test room before the test. Risk limits for waistline -> 100 cm (men) or 90 (women).

- Equipment: measuring tape.
- The goal is to evaluate the amount of fat in abdominal cavity, so called visceral fat.
- The measurement is performed standing up by feeling both sides, the highest point of the hip bone can usually be felt quite clearly. The measurement tape is placed on the soft spot above the hip bones. There must be no clothes when measuring. The measurement is performed during exhalation.

The test situation

- The customer places on the heart rate belt, the test device is adjusted for the customer.
 - the customer can start to pedal on the bike.
 - saddle in a way that the knee joint is bent (about 5 degree angle) when the pedal is in the lower position. Arm rests are adjusted to be in a comfortable position, when the customer is sitting up above the pedals.
- Orientating the customer for the test.
 - Choosing the test happens based on the
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 - The test protocol is explained to the testee, what is done and how: Load model, Borg's scale (RPE), pedal revolutions (60), reasons for stopping the load test (see attachment 1)
 - End of the test: target heart rate reached (85% of maximum) or RPE 16–17 (observe the client) or pedal cycles drop below 60 and do not rise after prompting twice.
 - If the customer is healthy, under 40 years old, can the test be continued 1-2 minutes from the subjective fatigue limit or after a well thoughtful consideration be taken to the fatigue limit → reliability increases
- The customer is given precise instructions considering the test
 - Is told about the right to discontinue the test if needed
 - Go through the safety regulations before beginning the test
 - Make sure one time last that there's no contraindications
- Performing the test
 - Is carried through professionally and carefully
 - The student must be present at all times and observe the customer
 - Be aware of **the reasons for interrupting the load test** (see attachment 1)

- There must not be ventilation straight to the face, because it may lower the customers heartbeat significantly
- The test room must be as calm as possible and try to avoid discussing with the customer during the test
- First aid first aid readiness must be in order during the test situation
- Ending the test
 - The customer continues after the last load for example pedaling on with no load to ensure undisturbed blood circulation cooling down”) for 2-4 minutes. The heartbeat should drop 20 beats per minute.
 - Once the customer gets off the bike, there must be someone near them
 - **Ask the customer to take off the heart rate belt and wash it!**
 - The customer is not left alone after the test
 - Customer’s well-being is taken care of until the test situation is completely over and can be sure that no common complications are appearing
 - The results can be printed once the customer is changing their clothes
- Giving test results and training instructions
 - Results and further training instructions are given orally and in written in a way that the customer understands them
 - You must take the time to give the results and not to hurry
 - There is not allowed to be external persons (secrecy)
 - The customer has the right to aski if the feedback is unclear – also afterwards

ATTACHMENT 1.

Contraindications for the test are:

- If the resting blood pressure is repeatedly measured over 180/100 (either one) mmHg *safest to test when resting blood pressure is normal 140/90 mmHg
- Confirmed or suspected cardiac disease
- Confirmed or suspected lung disease, that is not controlled with medication
- Acute pulmonary embolus or -infarction
- Suspected aneurysm
- Acute infections and febrile illnesses
- Medication, minkä vuoksi sydämen syke ei nouse rasituksen kasvaessa (for example beta blockers)

Kuormitustestin keskeyttämisen aiheet

- The customer's will to stop
- Goal heartbeat has been reached (about 85% HRmax) or RPE 15-17
- Chest pain, feeling of pressure on chest, sudden upper limb
- Strong, sudden fatigue
- Strong dyspnoea or hyperventilation
- Nausea, paleness, blue lips
- Sudden headache
- Vertigo, decrease in level of consciousness, decreased motor skills
- Strong pain in calf or local pain
- Heart rate decreases even though the load increases
- If during the test blood pressure:
 - Systolic blood pressure decreases, even though load increases
 - Diastolic blood pressure > 130 mmHg, systolic > 280 mmHg

Sources of error on the bicycle ergometer

- Technical
 - Accuracy of the ergometer/calibration
 - Measuring the heart rate
 - Environment
 - Temperature, humidity, different kinds of distractions
- Subject
 - Stressing, bad cooperation
 - Deviant size (for example obesity)

- Water balance, previous eating
- The degree of filling of muscle glycogen stores
- Possible recreational drug
- Medication
- Previous exercise
- Determination method
 - Differences in the maximum heart rate
 - Submaksimaalinen syke vaihtelee päivittäin 2–8 % rasitustasosta riippuen
 - Submaximal heart rate varies daily 2.8% depending on the level of stress
 - The efficiency of ergometer work varies