

Protocol

Ergometry

Methods

Equipment

Bicycle ergometry + continuous incremental steps protocol + 2-lead ECG

Procedure:

The experimental subject takes a seat on the bicycle ergometer. Place five ECG electrodes on the chest (scheme near PC). Connect the electrodes and PowerLab recording system using ECG cables.

Start up the program called ERGOMETRY by double-clicking the icon. Set the amplifier sensitivity for ECG registration in channel 1 and 2. Upper two channels represent the ECG curve obtained from 2-lead ECG, lower two channels represents the heart rate calculated from the RR intervals of corresponding ECG leads.

Record continuous ECG during all 5 phases of the exercise.

1. **Resting period** – record resting ECG for 1 minute
2. **Warm-up period** – set 20W on the ergometer, the experimental subject cycles at a constant speed (60 turns/minute) for 1 minute.
3. **Stress testing**
 - *Stage 1:* set 1 W/kg on the ergometer (weight of the person x 1W), the person cycles for 3 minutes at a constant speed;
 - *Stage 2:* set 2 W/kg on the ergometer (weight of person x 2 W), the person cycles for 3 minutes at a constant speed;
 - *Stage 3:* set 3 W/kg on the ergometer (weight of the person x 3 W), the person cycles for 3 minutes at a constant speed;
4. **Cool-down period:** set 20 W on the ergometer, the person cycles for 1 minute at a constant speed.
5. **Recovery period:** the person simply sits on the ergometer without pedaling for 9 minutes; subsequently stop the ECG recording, insert comments about particular phases, and save the recording as “Ergometry XY” to the computer memory.

Evaluation:

In the 3rd or 4th channel (that represent the heart rate calculated from the 1st and 2nd ECG channels, respectively) choose the last 30 seconds of each phase (resting period, warm-up period, 3 endurance stages, cool-down period and recovery period at the end of the 3rd, 6th and 9th minute); the value of the heart rate will appear in a mini-window.

Use the obtained data to construct a graph of heart rate (axis y) dependence on time and work (axis x). Interpolate a line among points representing the endurance phases and estimate work at the heart rate 170/minute (index W_{170}). Compare your value with physiological values.

Name:

Numer:

Study group:

Results

Man heart rate

person	rest	20W	1W/kg	2W/kg	3W/kg	20W	3rd min	6th min	9th min

$W_{170} = \dots\dots W/kg$

Conclusion

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