

(XIV.) Ergometry

Ergometry (stress testing, exercise testing)

- Work load examination – measurement of ECG and other parameters depending on the increasing degree of work load on the ergometer
- In addition to ECG, the following can be recorded:
 - O₂ consumption, CO₂ output, blood pressure, blood samples (mainly lactate)
- Types of ergometers
 - Bicycle ergometer – load mainly on the lower half of the body
 - Rowing machine – upper body load
 - Rump ergometer – exercise bike for hands, para/quadruplegia
 - Master's step
 - Treadmill
- Can be used in:
 - Sports Medicine
 - Rehabilitation medicine
 - Cardiology



Ergometry deals with evaluation of performance (work, power).

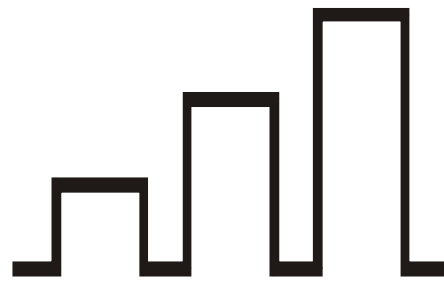
Its name comes from two Greek words: „*ergon*“ = work, „*metron*“ = measure.

The test is a part of complex examinations evaluating responses and adaptation of organism to exercise. It is used to diagnose, to decide about the treatment and/or evaluation of its effectiveness. In the sport medicine, it is used mainly for evaluation of fitness.

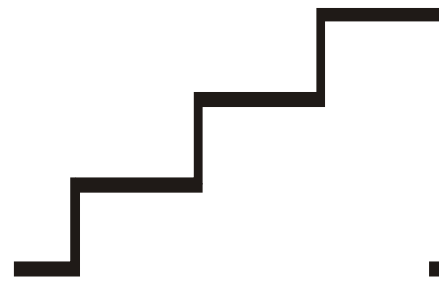
Basic types of protocols for exercise testing:



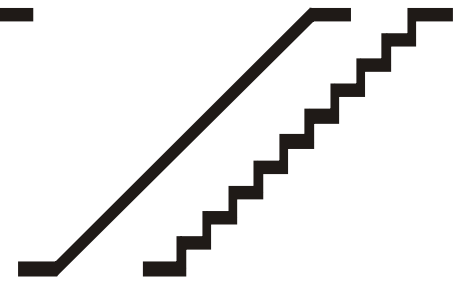
Single stage test



Intermittent incremental steps



Continuous incremental step



„ramp“ protocol

Examination phases:

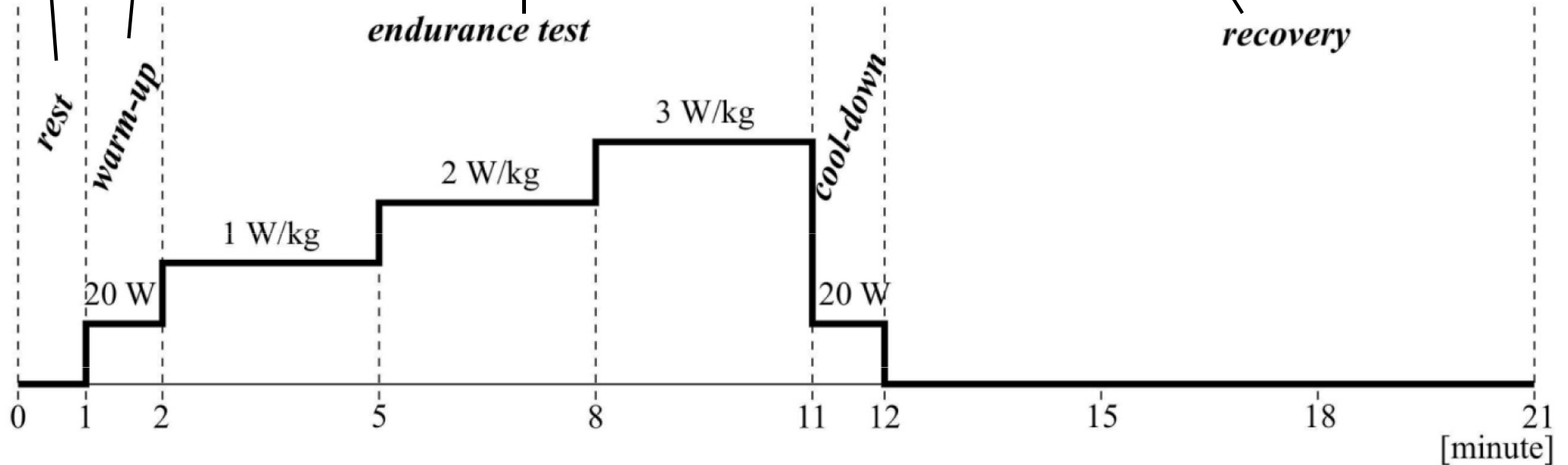
recording of resting values

exposure of examined person to graduated physical work

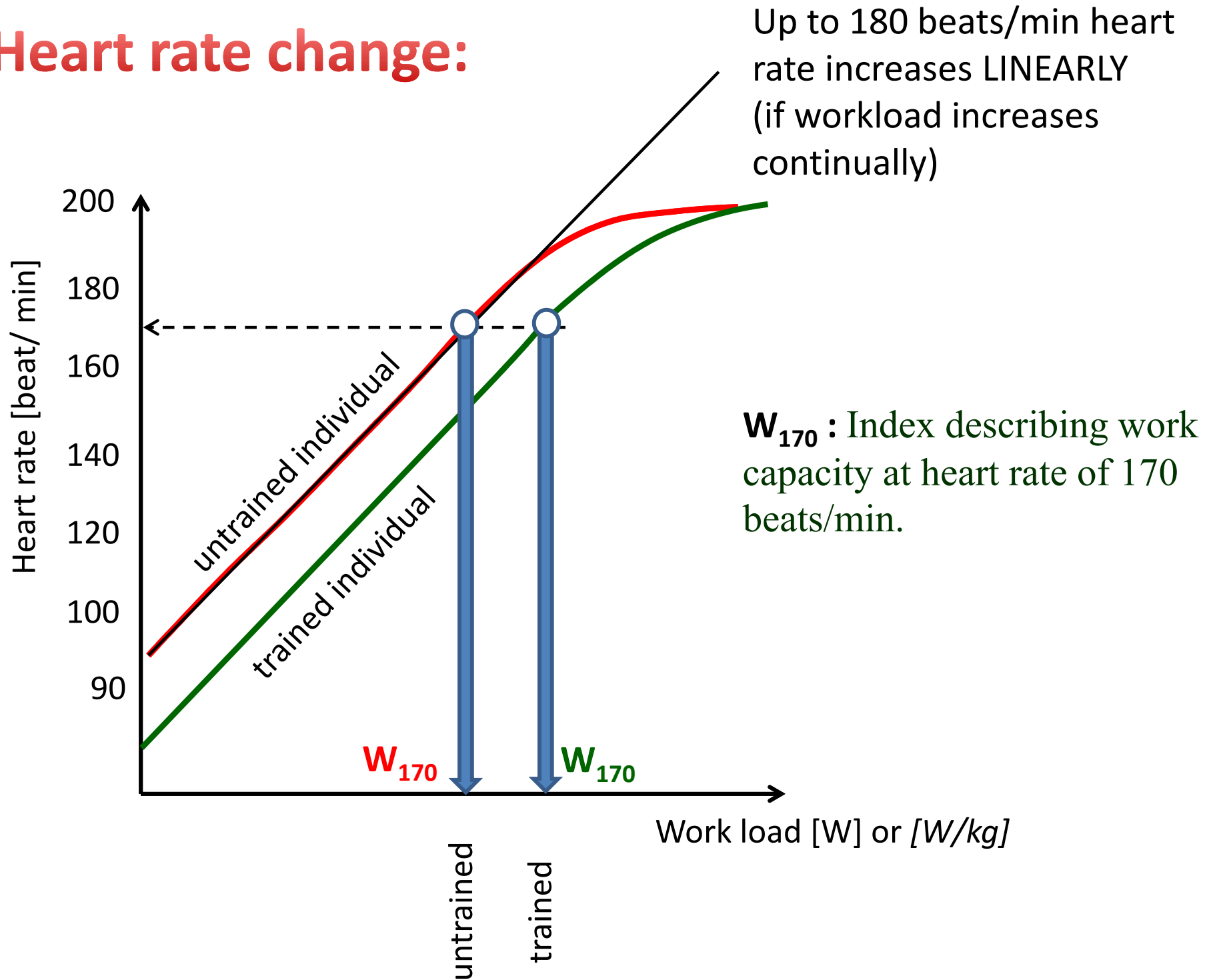
workload of low intensity supporting catabolites removal (lactic acid), helping heart rate recovery, reducing vertigo and collapses (due to after-work hypotension)

application of low workload in order to increase tissue perfusion and improve joints mobility

follow-up after exercise



Heart rate change:



Heart rate change:

W_{170} : Index describing work capacity at heart rate of 170 beats/min

Population norms (Heller, 2005)

A G E	Men		Women	
	[W]	[W/kg]	[W]	[W/kg]
18	178	2,7	103	1,8
20	185	2,7	106	1,8
22	190	2,7	107	1,8
25	193	2,7	109	1,8
30	194	2,6	112	1,8
35	195	2,6	115	1,8
40	195	2,5	118	1,8
45	195	2,4	121	1,8