

IENG301 LABORATORY 8

Experiment: Energy Expenditure

Objective: To investigate **energy expenditure** during cycle ergometry and recovery.

Preliminary Information:

Table I: Classification of work by caloric expenditure.

Work	Males	Females
light	2.0 - 4.9 kcal/min	1.5 - 3.4 kcal/min
moderate	5.0 - 7.4 kcal/min	3.5 - 5.4 kcal/min
heavy	7.5 - 9.9 kcal/min	5.5 - 7.4 kcal/min
very heavy	10.0 - 12.4 kcal/min	7.5 - 9.4 kcal/min
maximal	12.5 + kcal/min	9.5 + kcal/min

p.s.: For men and women based on average body weights (65 kg for men, 55 kg for women).

Study Procedure:

1. Select a participant who has no problem with blood pressure and heart rate ($6 \leq \text{diastolic} < 9$, $11 \leq \text{systolic} < 14$).
2. Adjust the seat and rest for 5 mins.
3. Connect the plug to his/her ear, and measure heart rate and blood pressure.
4. Start riding the bicycle ergometer for 5 mins, with initial load 1 and constant speed 25 km/hr.
5. Read heart rate and oxygen consumption (calories) at the end of each minute.
6. After reading heart rate and oxygen consumption (HR & O₂), increase the load to 1.5 and let the rider to continue for another 4 mins.
7. At min. 9, after reading HR & O₂ increase load to 2, and let the rider to continue for more 4 mins.
8. After 13 mins., let the rider continue driving until he gets exhausted. Then remove the load and measure HR & O₂, and let the rider to slow down. (test for endurance)
9. After finishing riding, measure the blood pressure and heart rate until they reach to the initial levels.

Time (mins.)	Heart Rate(/min)	Calories (kcal)	Blood Pressure (diastolic, systolic)
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
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