Directions for Data Collection

1. After sitting on the bicycle quietly for 2 minutes, take a resting blood pressure and heart rate. Each person will then ride in progressive 3-minute increments from low power outputs to high power outputs on the bicycle ergometer as indicated on the data sheet. **Each person should ride for only two power outputs in succession and then another person in the group should ride and then the third person in the group will ride and then repeat at the next 2 higher power outputs.** Maintain 70 rpm for all power outputs. **All will ride until unable to maintain the 70 rpm during any power output.**

2. During the last minute of each 3-minute power output, take the blood pressure and the heart rate (one group member take the HR by palpation (15 second count) and one group member take the BP). Following palpation of the HR, read the HR off the HR monitor. Record on the data sheet the HR by palpation, the HR by monitor, the systolic pressure, the phase 4 diastolic pressure and the phase 5 diastolic pressure.

Directions for Lab Write-up (**each person will write up their HR and BP data**)

1. Using Excel or similar application, plot on a single graph the relationship between power output and systolic blood pressure, power output and diastolic phase 4, and power output and diastolic phase 5. Use a line graph for each plot. Put power output on the X-axis (horizontal) and blood pressure on the left Y-axis (vertical). Next, plot the heart rate vs power output by putting HR on the secondary (right) vertical axis (to put HR on the right axis, you initially plot heart rate as if it were going on the same axis as blood pressure. Once the line graphs are displayed with the single left blood pressure axis, double click directly on the line graph for heart rate. **A window will open which gives you the option of putting the line graph on the right or secondary axis**). Label the horizontal and both vertical axes in all plots including unit labels. **Begin the X-axis power output with the resting interval.** Use either colors or contrasting line styles for each of the line graphs so they are easily readable and distinguishable. Your graph should look like the sample graph (except your graph will contain your data) in your printed material except the sample graph is in black and white and you can use color if desired. **Extend the size of the graph so it occupies most of the page like the sample graph does and print it in landscape (longwise on the paper).** Relative to the axes, labels, intervals and keys, your graph should look identical to the example graph. Note that the tic marks on the horizontal power axis should coincide with the power labels.
2. Answer the following questions. You do not have to repeat the question but label each answer with the same letter as the question below.

a. Define systolic blood pressure, diastolic (4th and 5th phase) blood pressure, pulse pressure and heart rate. Describe the normal response of systolic and diastolic (4th and 5th phase) blood pressure, pulse pressure and heart rate to increasing power output. Compare your systolic blood pressure, diastolic blood pressure, pulse pressure and heart rate response to the expected response. Would you characterize each of your responses as normal or abnormal? Explain why you characterized your responses as normal or abnormal.

b. Determine your average systolic blood pressure, diastolic blood pressure and heart rate increase per each 210 kgm$^{-1}$min$^{-1}$ increase in power? Was there any evidence that BP and/or HR reached a plateau? If so, what was the evidence? (You must determine which diastolic blood pressure you are using for your true diastolic blood pressure. If your 5th phase diastolic blood pressure dropped more than 20 mmHg below your resting 5th phase blood pressure, use the 4th phase blood pressure as your true diastolic blood pressure).

c. Define a physiologic steady-state. What happens to blood pressure and heart rate when a physiologic steady-state is reached? If you are determining the blood pressure and heart rate response to a specific power output, why is it important that the individual performing the power output stay at the specified power output for at least 3 minutes before the HR and BP is measured?

d. Explain what specifically causes the sounds indicating diastolic pressure and explain why you should always measure both phase 4th & 5th phase diastolic pressures when measuring exercise blood pressures.

e. When palpating HR various counting periods are recommended depending on the circumstances. When palpating HR during a steady-state power output (while exercising at a constant power output), explain why should you take a minimum of a 15-second count as opposed to a 6-second or 10-second count (don’t just say it is more accurate)? When palpating HR at the end of a power output (after stopping the exercise) in order to estimate what the HR was during the power output, explain why should you take a maximum of a 15-second count (don’t just say it is more accurate)?

In preparing your responses to the questions, follow these directions:

1. Type your responses using #12 font size, double spaced with 1 inch margins top, bottom, left and right.
2. Put your name in the top left corner of each page.
3. Put your class number in the top left corner (just below your name) of each page.
4. This lab will be graded on the items on the Lab 1 Evaluation Sheet (in your packet) All responses should be in complete sentences.
5. Turn in the assignment with the pages in the following order and stapled in top left-hand corner: (1) the Lab Report 1 Evaluation Sheet with your name and class number filled in, (2) responses to the questions, (3) Excel graph, (4) Data sheets
6. This assignment is due on _________________________ at the beginning of the class period.
7. Late assignments will be accepted but there is a 10% per day penalty for being late until the total penalty drops to 50%. At this point there is no further penalty.