Laboratory 11 - Cardiovascular Measurements
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Purpose

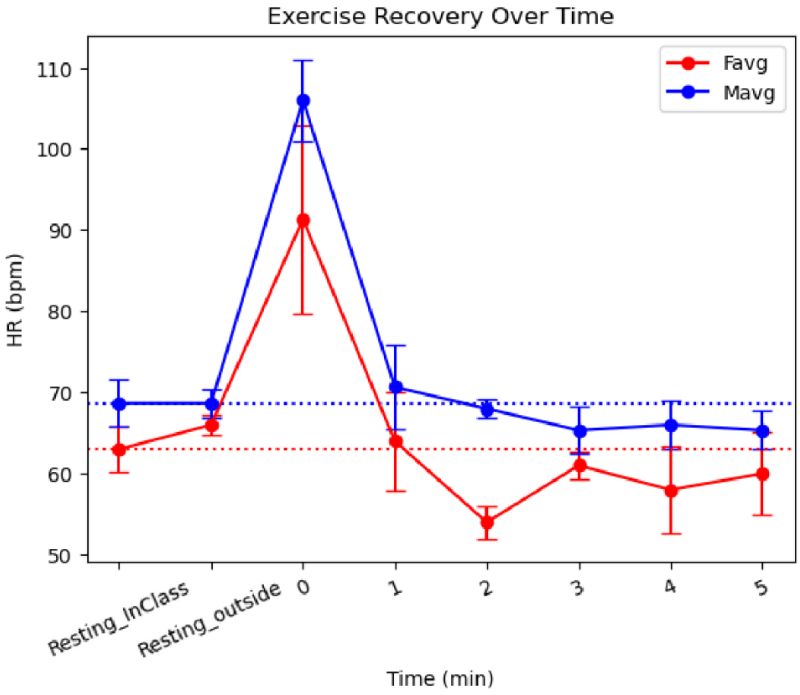
Some cardiovascular parameters, other than an electrocardiogram are blood pressure, heart sounds and heart rate. These different parameters may be measured to reflect the general condition of an individual. The comparison of the values obtained between resting and exercise states may provide a good measure of the physical fitness of a person. For laboratory 11 we measured the effect of postural change and exercise on these cardiovascular parameters. The purpose of this laboratory is to understand the effect of postural changes on blood pressure, understand the events that occur during the taking of a normal blood pressure and be able to describe the major events that occur during a mammalian diving response.

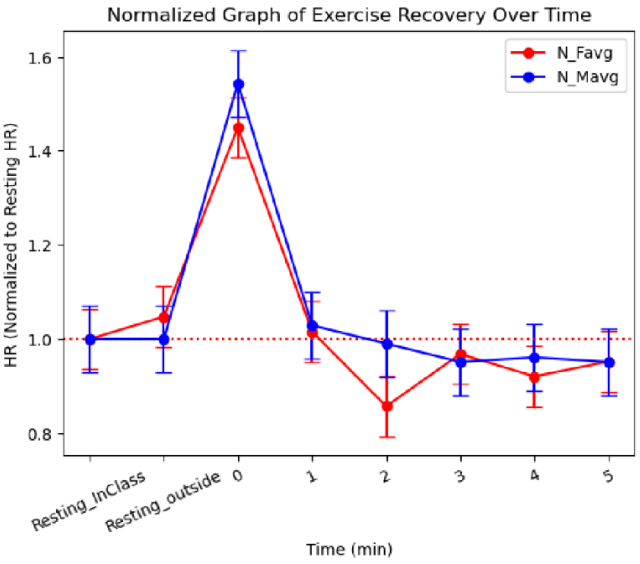
Procedure

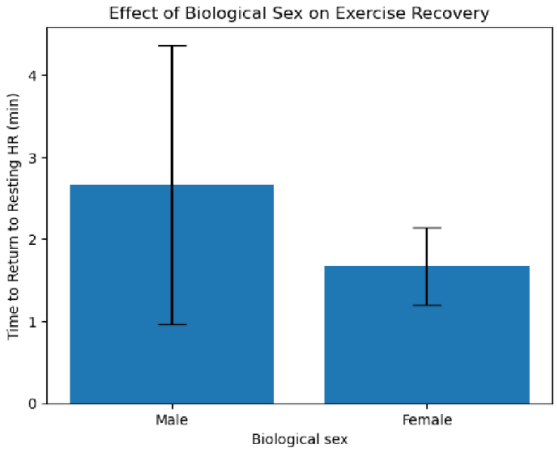
For the first part of the lab, my partner and I recorded each other's blood pressure on three different occasions. The first occasion was when we were relaxed in a sitting position, the second time was taken immediately upon standing, and the last time was three minutes after standing. We then record these results. For the next part of the lab prof oak had six students take his/her resting pulse rate for one minute and record that value. After the six students went outside, and jumped off and on a bench a couple of times. After the six students recorded their pulse for one minute and recorded this result. The student then took their blood pressure every five minutes after the exercise to determine how long it took for their heart rate to go back down to their normal heart rate before the exercise. We compared the results between males and females. For the last part of this laboratory, prof oak had 3 students fill a tub with cold water, the student then hooked himself up to the computer. After that, recordings of a Lead II ECG and pulse pressure from a thumb were obtained with the student at rest for a baseline measurement. A recording was then taken again with the student holding her breath for at least 20 seconds. The last step was the student held her breath again while this time placing her head into a bucket of ice cold water.

Results

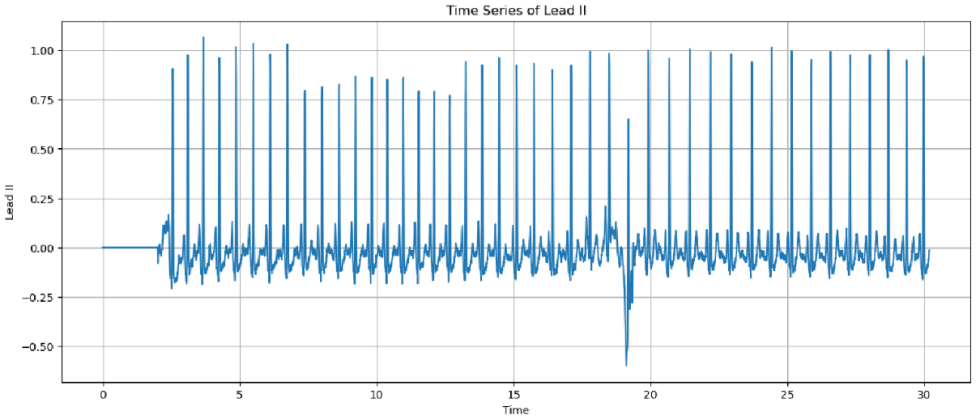
BP at sitting position	119/82
BP immediately upon standing	120/98
BP 3 minutes after standing	119/86

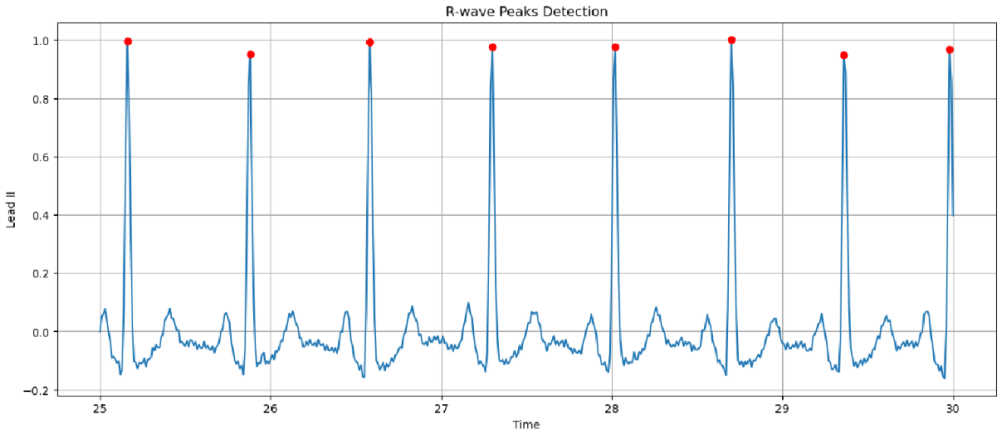

Exercise Recovery Over Time
Favg
Mavg
HR (bpm)
110
100
90
80
70
60
50
Resting_InClass
Resting_outside
0
1
2
3
4
5
Time (min)

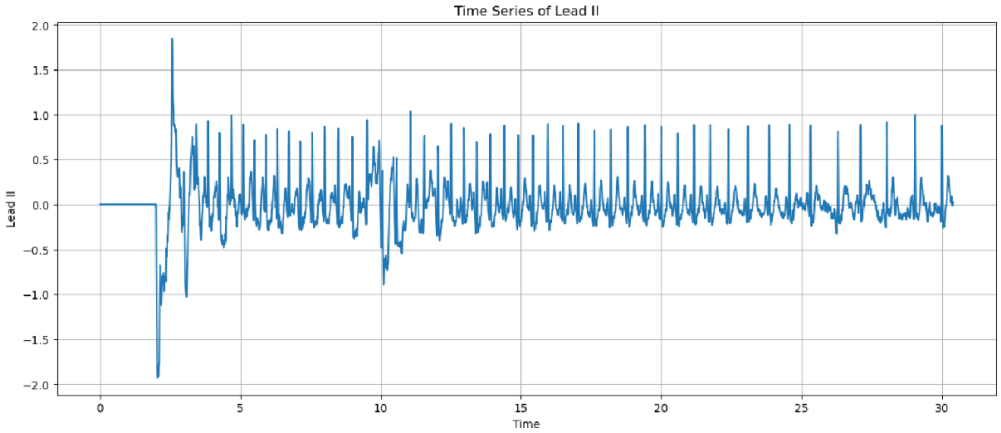

Normalized Graph of Exercise Recovery Over Time
N_Favg
N_Mavg
HR (Normalized to Resting HR)
1.6
1.4
1.2
1.0
0.8
Resting_InClass
Resting_outside
0
1
2
3
4
5
Time (min)

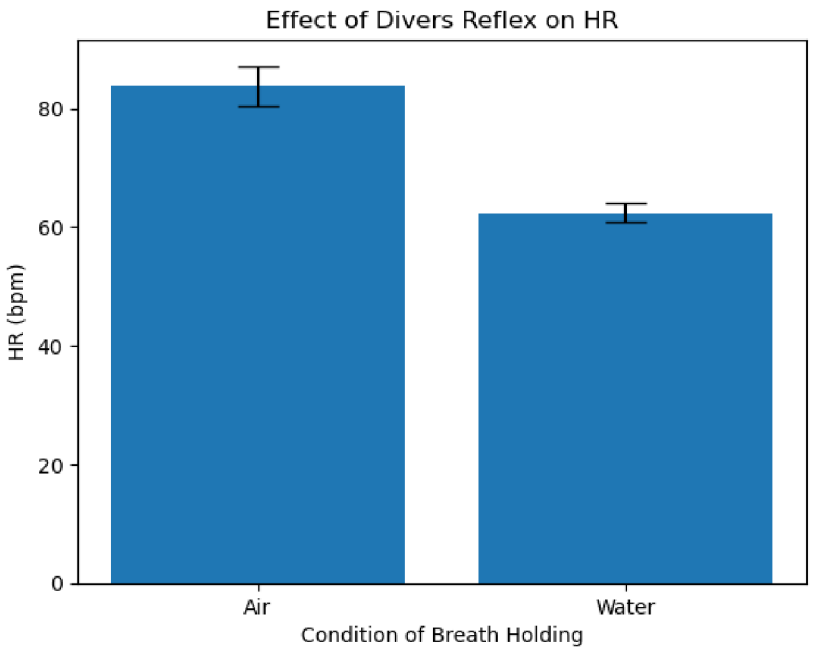

Effect of Biological Sex on Exercise Recovery
Time to Return to Resting HR (min)
0
1
2
3
4
Male
Female
Biological sex

11-C


Time Series of Lead II
Lead II
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
0
5
10
15
20
25
30
Time


R-wave Peaks Detection
Lead II
Time
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
25
26
27
28
29
30


Time Series of Lead II
Lead II
Time
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
0
5
10
15
20
25
30



Discussion

I really liked laboratory 11, the first part of the lab was really easy and straightforward. My partner and I recorded each other's blood pressures, when we were sitting, upon standing, and 3 minutes after standing. For me my systolic pressure only raised 1 mmg when standing but my diastolic pressure raised 16mmg. After standing for three minutes my systolic pressure went back down w mmg and my diastolic pressure went down 12 mmgs. For the second part of the lab the students took their normal heart rate and then went outside and jumped up and down and bench and recorded their results. I noticed that after doing the exercise everyone's heart rate significantly increased. 15 minutes after their heart rates started going back down to their normal rate. We compared the results for males and females in regards to whose heart rate goes back down faster. No one returned back to their normal heart rate immediately, I would say it was all pretty close. An experiment that may have occurred would have been if the students were not taking their pulse correctly. This would have given us incorrect results which I think was the case with our results because the results were very scattered. A solution to this would be to have the same student taking everyones pulse.

Conclusion

In conclusion of laboratory 11, orthostatic blood pressure is very common immediately upon standing. Your heart rate goes up when exercising and there is not much of a difference between males and females when comparing how soon their heart rates go back to normal. Humans experience bradycardia as a response of being immersed into water. I enjoyed laboratory 11 and learned a lot of interesting stuff.