Juan Marino

Professor Okerblom

Human Physiology

14 November 2023

Lab #14-CARDIOVASCULAR MEASUREMENTS

Purpose

The purpose of this lab is to introduce two different methods that are used to determine our lung capacity. We will be using those methods to determine VC (Vital Capacity) and FEV1(Forced Exhalation Volume at 1 second).

Procedures

14-B: The Forced Vital Capacity (FVC) or Forced Expiratory Volume(FEVT)–MorganComPAS Pneumotrac:

1. The Morgan ComPAS computer program has already calculated and factored in the BTPS (Body Temperature Pressure Saturation) correction factor.
2. Fully insert the Pneumotrac filter/mouthpiece you purchased at the bookstore. If you have difficulty keeping air from leaking through your nose, you may need to wear a nose clip, as air leakage will result in inaccurate results.
3. Be sure the correct student information is loaded up before you start the FVC test.
4. After starting the FVC test, follow the verbal instructions of your instructor: begin with your mouth off the mouth piece so the pneumotach can equilibrate; after getting a good seal with your mouth, start with tidal breathing; when you are ready, take in the deepest breath possible, then forcefully blow it out as fast as you can and keep squeezing until instructed to stop. The instructor will print out your “FVC Volume Time Curve” (part of your 14-B results), and it should look similar to Figure 14-2

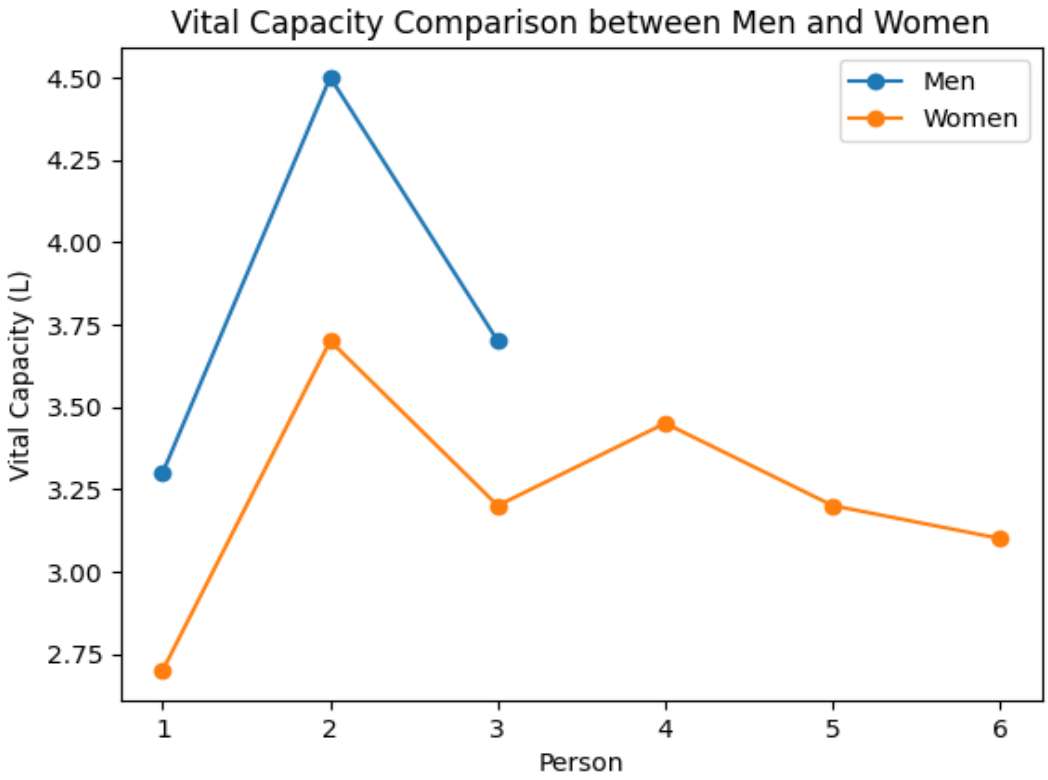
14-C: Portable spirometry

1. Open the gray plastic box on your lab desk that says “BASELINE Lung Capacity Spirometer" on the lid. Inside the lid of the box is a white paper that has specific instructions, please read the whole inside page with “how to use.”
2. Insert the clear plastic mouthpiece on the “Windmill-Type” spirometer and make sure the the measurement indicator is at the zero position before beginning.
3. Make sure you only exhale into the spirometer, DO NOT inhale from it.
4. After exhaling, record the measurement from the spirometer.Be sure to place your used plastic mouthpiece in the correct tub after use (the tub is labeled).
5. Calculate your predicted vital capacity from the nomograms available in lab. Using a straight edge, make a line matching your height and age to the vital capacity prediction. Note that the VC is in liters whereas other measurements have been taken in milliliters.
6. Compare the values obtained from the portable spirometer, the predicted values from the nomograms, and the value obtained from the Koko spirometer, if available. How can you account for any differences? (NOTE: your predicted VC from the nomogram, and a comparison to the measured VC in 14-A should be included in your discussion of 14-A).

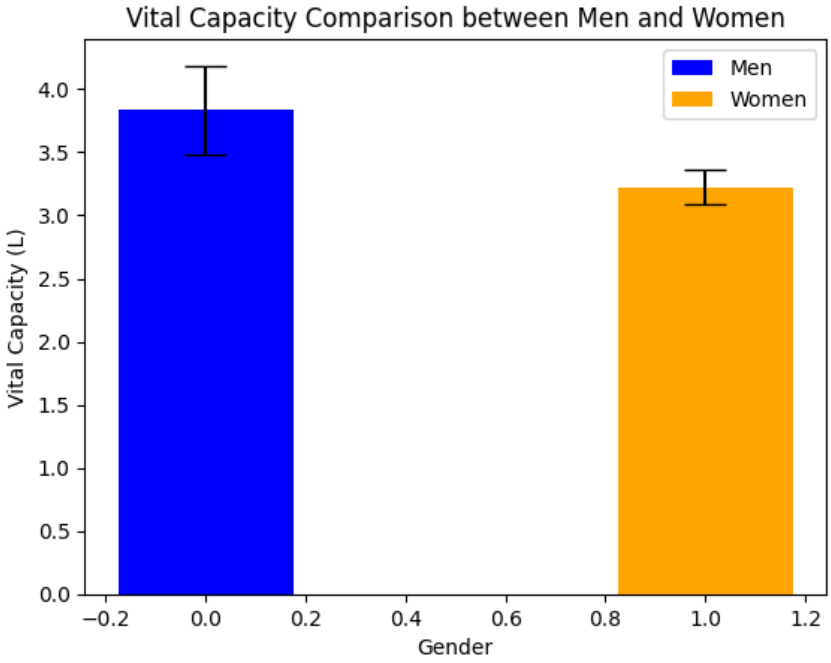
Results

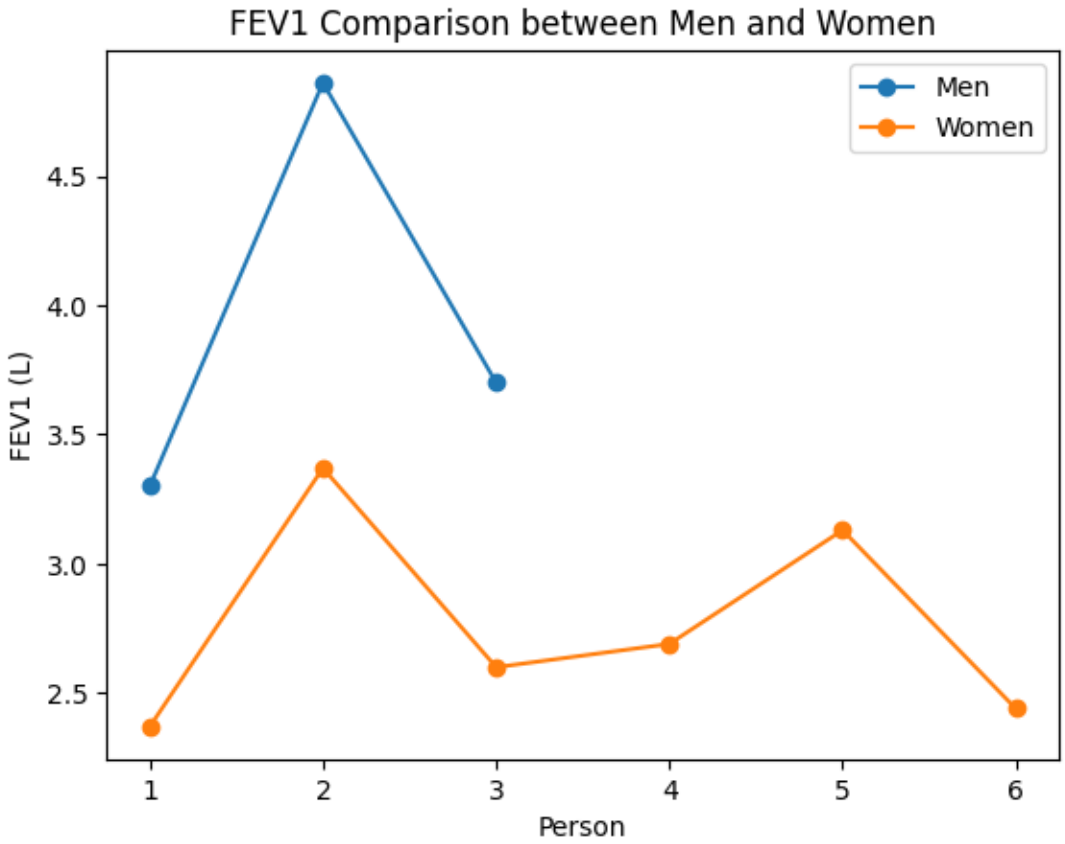
14-B: The Forced Vital Capacity (FVC) and 14-C: Portable spirometry

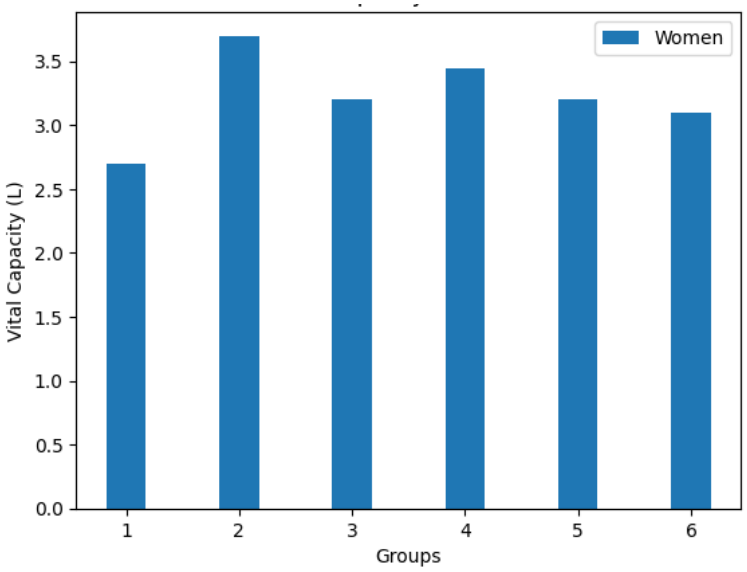
	Sex	FEV_1	VC
#1	**F**	**2.37**	**2.7**
#2	**F**	**3.37**	**3.7**
#3	**M**	**3.3**	**3.3**
#4	**F**	**2.6**	**3.2**
#5	**F**	**2.69**	**3.45**
#6 (Me)	**M**	**4.86**	**4.5**
#7	**M**	**3.7**	**3.7**
#8	**F**	**3.13**	**3.2**
#9	**F**	**2.44**	**3.1**

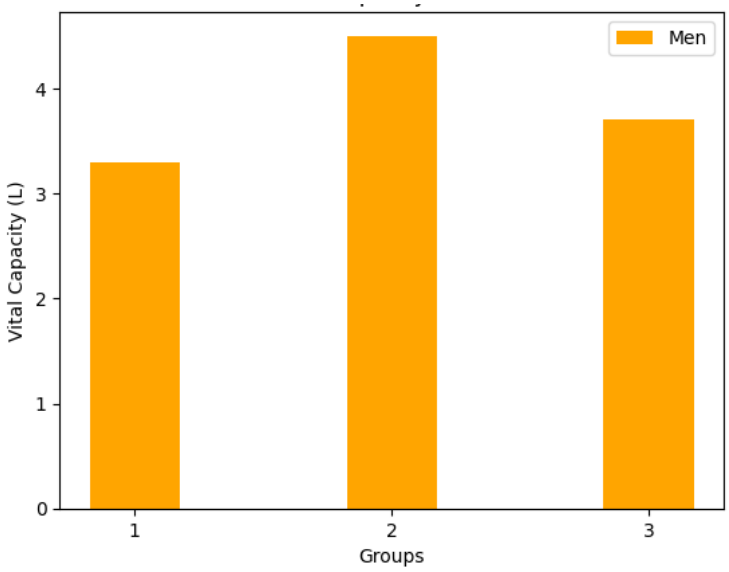


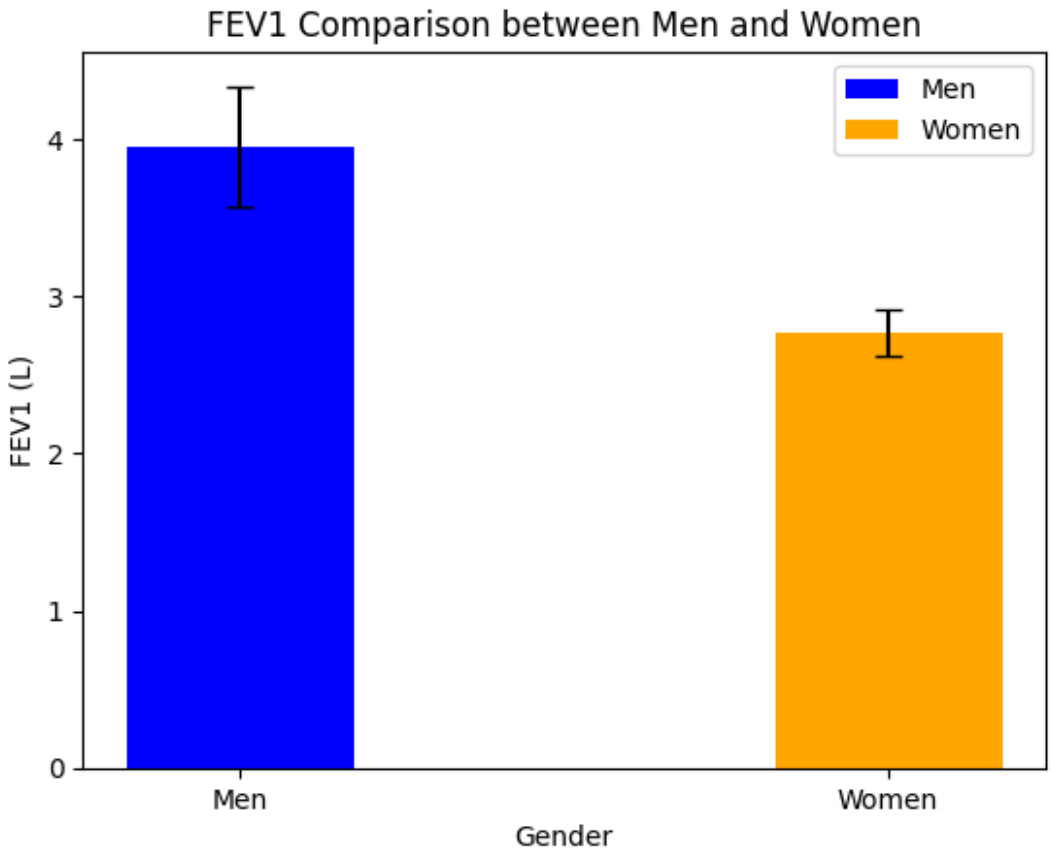
Average Vital Capacity for Women: 3.225 L
Average Vital Capacity for Men: 3.833 L

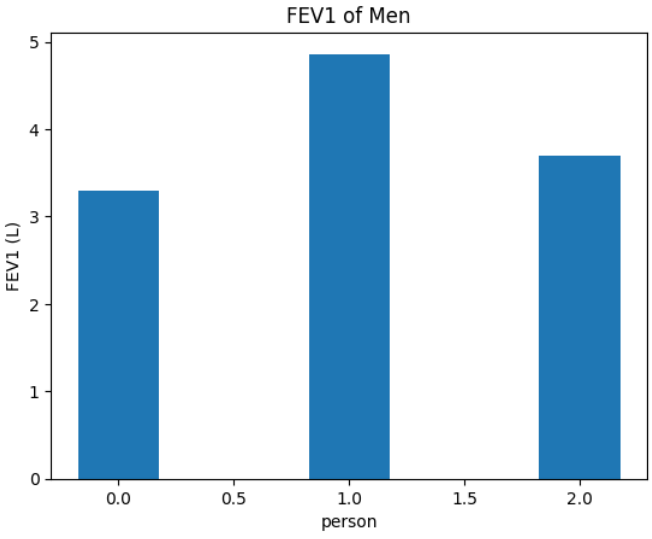


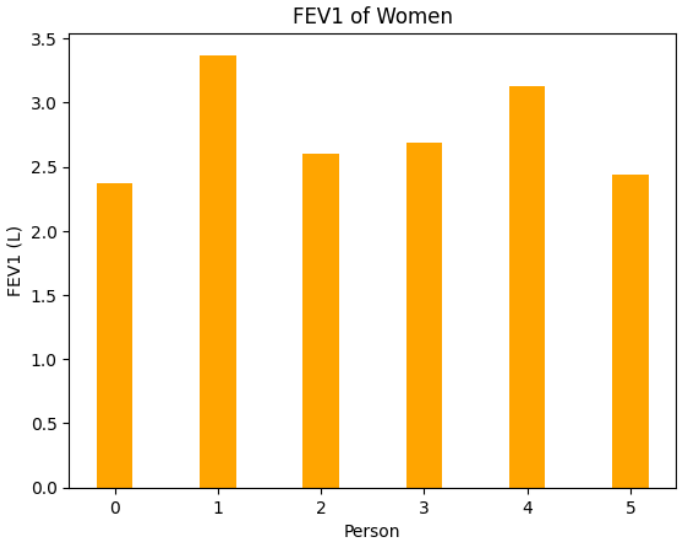

FEV1 Comparison between Men and Women
Men
Women
FEV1 (L)
4.5
4.0
3.5
3.0
2.5
1
2
3
4
5
6
Person


Women
Vital Capacity (L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1
2
3
4
5
6
Groups


Men
Vital Capacity (L)
4
3
2
1
0
1
2
3
Groups







Average FEV1 for Men: 3.95 L
Average FEV1 for Women: 2.77 L

Discussion

we can see in the result in both Vital capacity and forced expiratory volume, men have a higher lung capacity than women. The mean VC in females was 3.225, and the average in men was 3.833. The mean FEV1 in women was 2.765, while in men it was 3.953 this could be because on average men tend to be taller/bulkier than women and therefore would have bigger lungs and bigger VC and FEV1 reading when compared to women.

Conclusion

In conclusion, we learned how to use a portable spirometry to determine vital capacity in men and woman also concluding that men on average have higher vital capacity than women due to men being taller than women on average . We also learned that FEV1 measures how much air can be exhaled in one second, just like the vital capacity readings, men were larger on average when compared to women. These tests can be use as good indicators on detecting lung conditions.