TITLE: Lab 14- Respiratory Physiology
PURPOSE:
The reason for this lab is to utilize a spirometer. This will decide the lung limit of a flowing volume, imperative limit, inspiratory limit, inspiratory save volume, expiratory limit, and expiratory hold volume. The spirometer's recording can be analyzed to determine a person's relative pulmonary condition. Additionally, the forced expiratory volume (FEVT) or timed vital capacity (TVC) will be calculated. The changing impendence of an expanding and contacting thorax will be recorded by impendence pneumography and ventilation rate measurements.
PROCEDURE:

14-B
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 mouthpiece so the pneumotach can equilibrate; after getting a good seal with your mouth, start with tidal breathing ;when you're ready, take in the deepest breath possible, then forcefully blow 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

5.To calculate the vital capacity for the FVC test (also called the forced expiratory volume),measure the height of the highest peak of the curve in mm and multiply that length in mm by 66.67ml/mm(our FVC conversion factor). Then round off ml to whole numbers. (NOTE: this is similar to the 14-A SVC calculations, but with a different conversion factor.) Just like in 14-A, use the gridlines to double check that your figures are in the ballpark (e.g., if you calculated the vital capacity in Fig. 14-2 on.94 to be3635 ml, you must be off because you can tell from just looking at the gridlines that it is much closer to 4500 ml than 3635 ml). Can you see this in Fig. 14-2?
6.
Go to the “1 second” vertical line in your FVC graph and measure the height where the curved line crosses the 1 second vertical line in the same way as you did for the FVC instep5. This is your FEV1 volume.

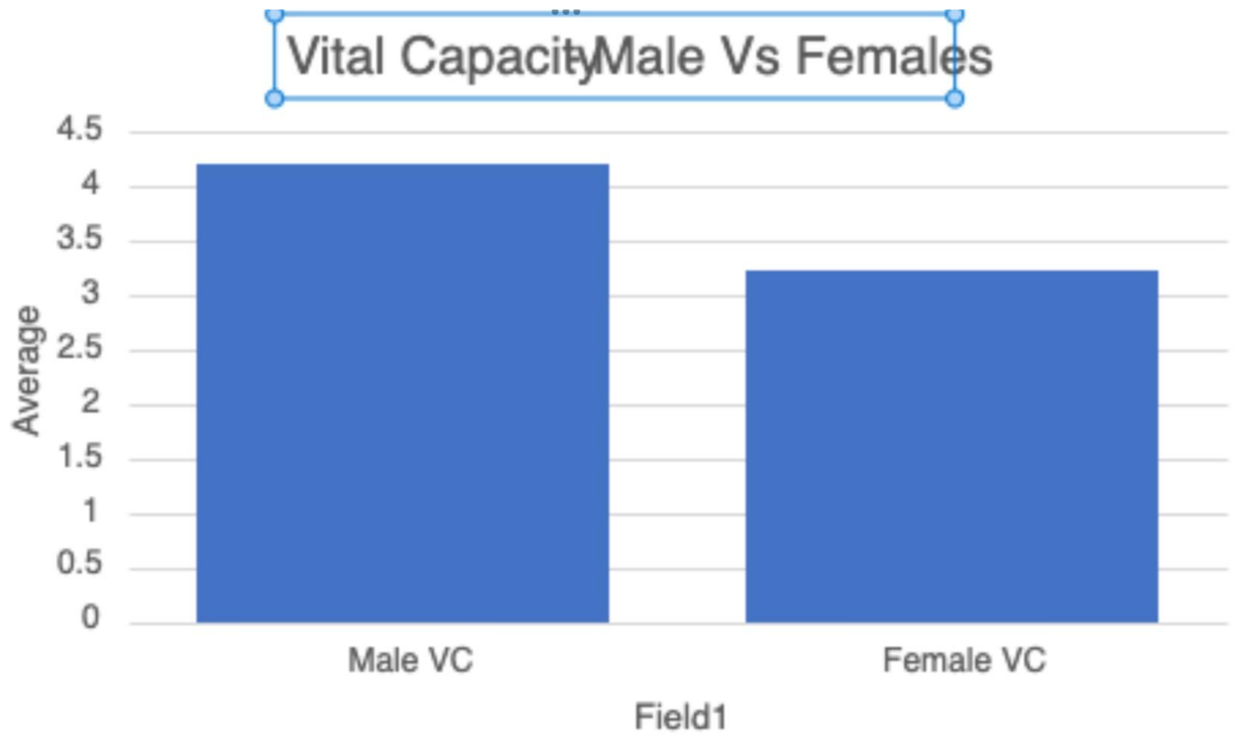
7.Divide the volume you calculated for FEV1by the volume you calculated for the vital capacity in step 6, and then multiply by 100 to determine the percentage of the vital capacity exhaled at one second.

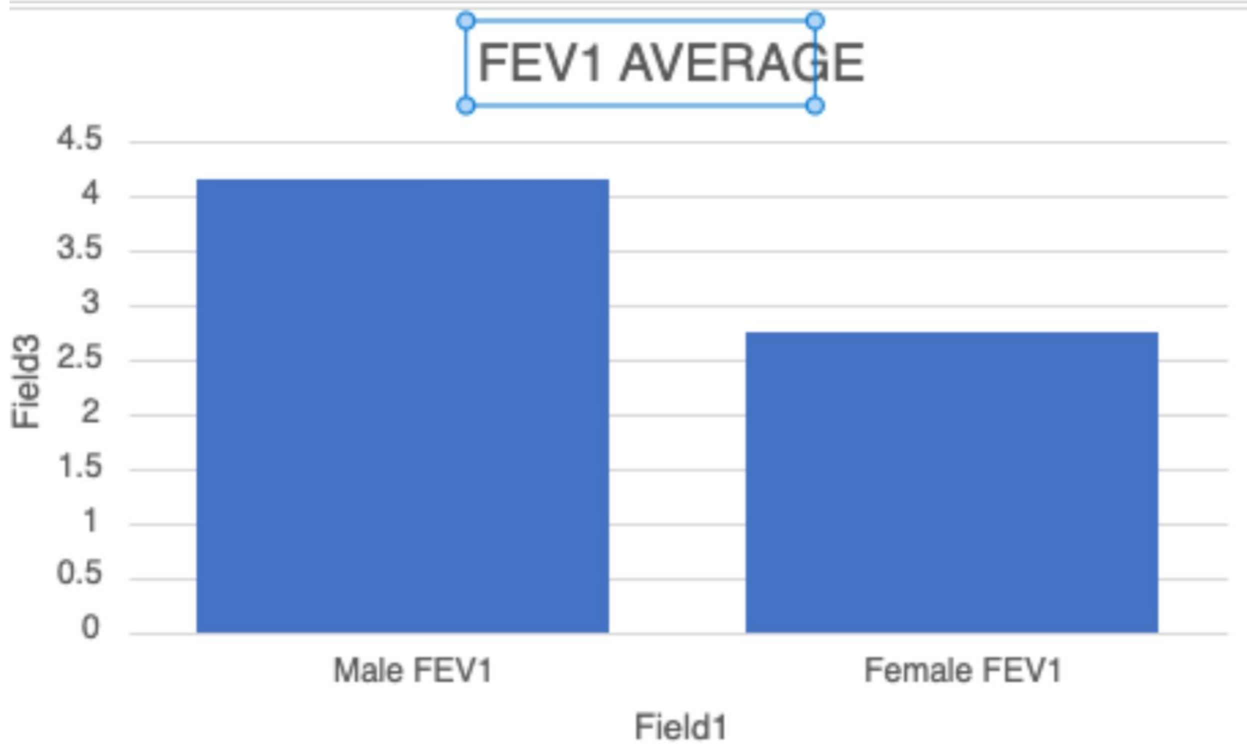
8.Go to the “3 second” vertical line in your FVC graph and measure the height where the curved line crosses the 3 second vertical line in the same way as you did in step 5 and6. This is your FEV volume.

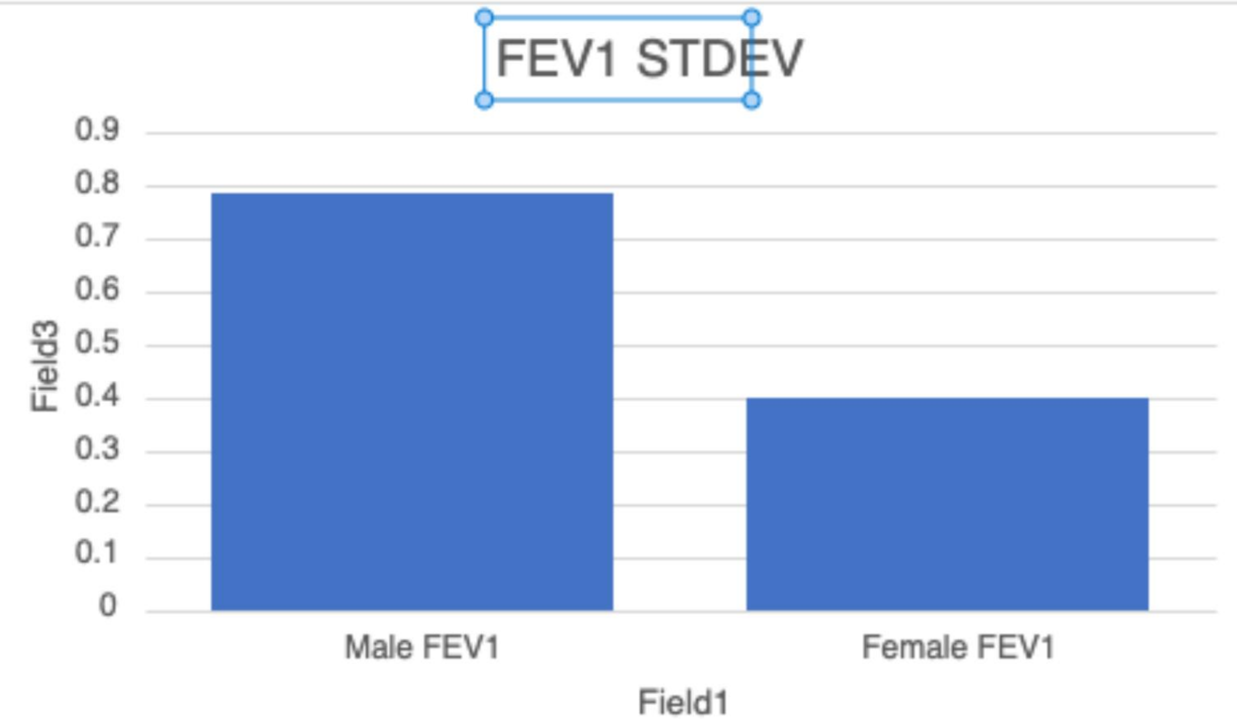
9.Divide the volume you calculated for FEV3 by the volume you calculated for the vital capacity in step 6, and then multiply by 100 to determine the percentage of the vital capacity exhaled at three seconds.

10.Compare these values to the predicted values and explain possible causes for any differences.

14-C
1. Open the gray plastic box on your lab desk that says “BASELINE LungCapacitySpirometer” 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 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 astraightedge, 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 VCfrom the nomogram, and a comparison to the measured VC in 14-A should be included in your discussion of 14-A
RESULTS:


Vital Capacity Male Vs Females
Average
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Male VC
Female VC
Field1


FEV1 AVERAGE
Field3
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Male FEV1
Female FEV1
Field1



Discussion:
There's various lung volumes and limits are proportions of how much an air in the respiratory framework. Some of them are flowing volume (television) the normal is 500mL, inspiratory save volume (IRV) the normal is around 3,000mL. The greatest volume of air that can be breathed in after typical flowing volume inward breath. There's expiratory hold volume (ERV) the normal is roughly 1,200mL. The most extreme volume of air that can be breathed out after a typical flowing volume exhalation. The volume of air that remains in the lungs after a maximal exhalation is known as the residual volume (RV), and its average value is 1,200 milliliters. The average vital capacity (VC) is 4,500 mL, and it is the total of the tidal volume, inspiratory reserve volume, and expiratory reserve volume that can be exhaled after maximal inhalation. The maximum volume of air that the lungs are able to hold is the sum of the vital capacity and residual volume, and the average TLC is approximately 5,700 mL. The volume of air that remains in the lungs following a normal tidal volume is referred to as the functional residual capacity (FRC), and its average value is approximately 2,400 mL. At last, this a few elements of the lung limit and there normal qualities giving general reference.

Conclusion:
A non-invasive technique for measuring respiratory parameters is impedance pneumography. The respiratory rate is determined by estimating the recurrence of impedance changes related with every breath. The amplitude of impendence changes can be used to estimate the tidal volume indirectly. There's additionally minute ventilation is determined by increasing respiratory rate by flowing volume. The inspiratory time and expiratory time these times can be gotten from the shape and span of impendence waveform. The system may provide derived parameters,

such as dynamic lung compliance and other respiratory mechanics-related indices. These are critical to know impedance pneumography is an important device for helping respiratory capability.