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Physiology

13 November 2023

Lab 14

Title: 14-A: The measurement of human lung volumes –Morgan ComPAS Pneumotrac (SVC)/14-B: The Forced Vital Capacity (FVC) or Forced Expiratory Volume (FEVT) –Morgan ComPAS Pneumotrac

Introduction: the movement of air in and out of our lungs is super important for a process called cellular respiration. It's all about getting oxygen to our cells and getting rid of carbon dioxide. A spirometer coupled with a kymograph is capable of measuring and recording several human lung capacities. Today, plugged into a computer's USB port, a digital pneumotach can be used to measure lung volumes. This helps us understand how well our lungs are working. In the lab, students get to measure different lung capacities and learn about techniques like impedance pneumography.

Procedure:

14-A: The measurement of human lung volumes –Morgan ComPAS Pneumotrac (SVC) Procedure:

1. The Morgan ComPAScomputer program has already calculated and factored in the BTPS (Body Temperature Pressure Saturation) correction factor for the spirometer temperature
2. Fully insert the Pneumotracfilter/mouthpiece If you have difficulty keeping air from leaking through your nose, you may need to wear a nose clip.
3. Be sure the correct student informationis loaded up before you start the SVC (slow vital capacity) test.

4. After starting the SVC test, follow theverbalinstructions of your instructor: begin with your mouth off the mouthpiece so the pneumotach can equilibrate; then get a good seal with your lips and begin normal quiet (tidal) breathing.

5. Watch the screen to be sure you are showingstable tidal breathing;the moving line should be around a half liter and NOT drifting up or down.

6. After stable tidal breathing, you will be instructed to take the deepest breath in as you can, then blow it all out, and finally return to normal tidal breathing.

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

The Morgan ComPAScomputer program has already calculated and factored in the BTPS (Body Temperature Pressure Saturation) correction factor.

2. Fully insert the Pneumotracfilter/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 ininaccurate results.

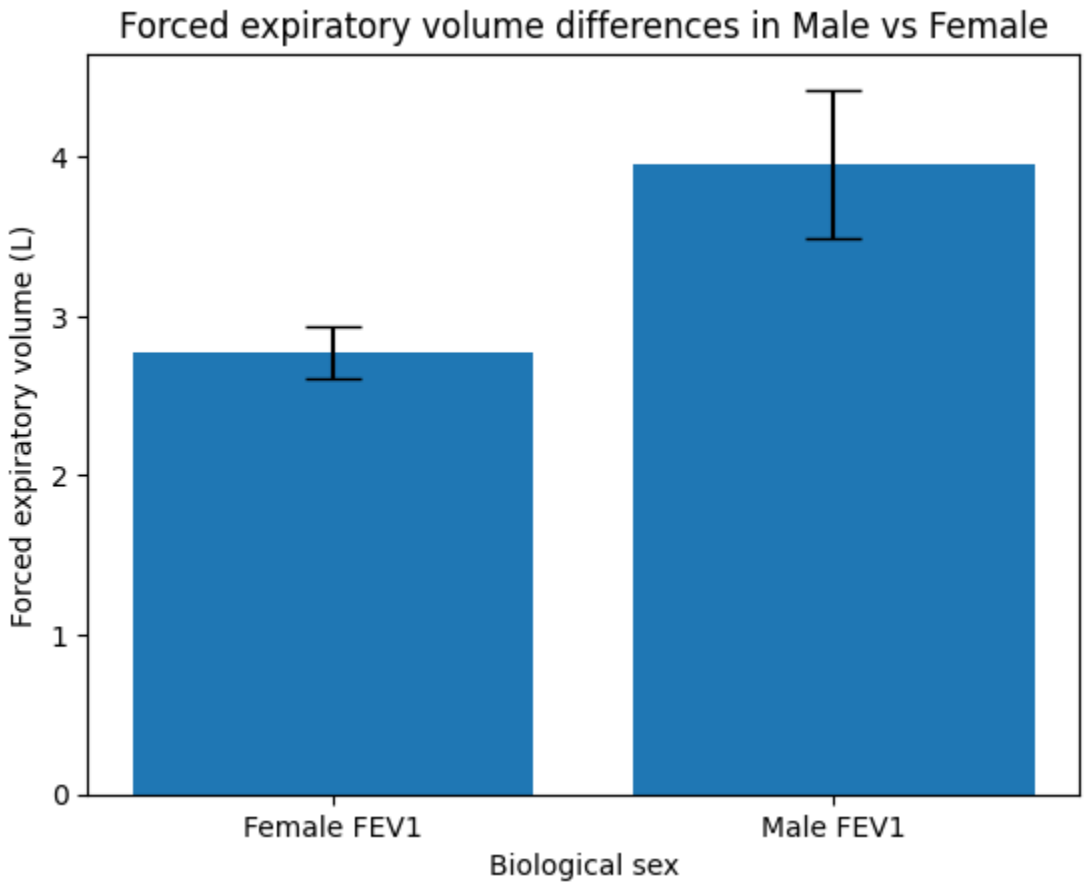
3. Be sure the correct student informationis loaded up before you start the FVC test.

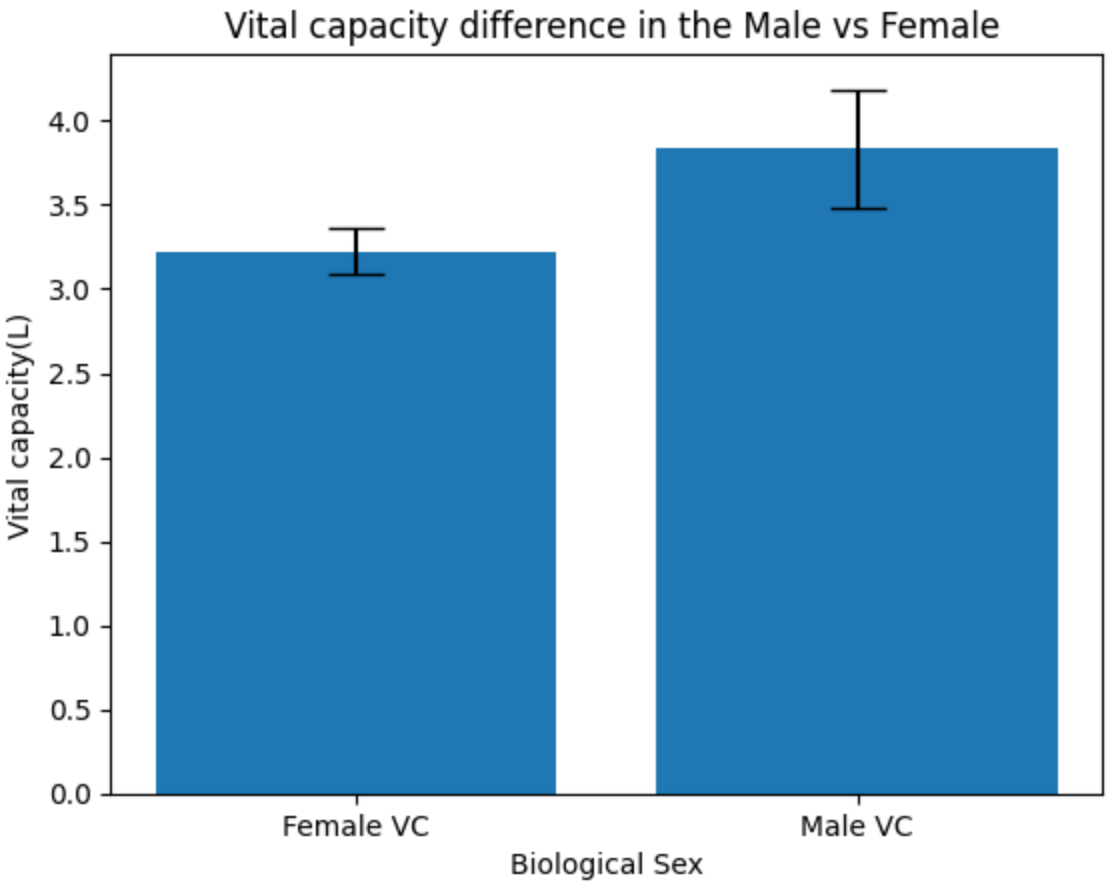
4. During the FVC test, your instructor will give you instructions. First, keep your mouth off the mouthpiece to let the device adjust. Then, make sure you have a good seal with your mouth and start with normal breathing. When you're ready, take the deepest breath you can and blow it out as hard and fast as you can, squeezing until you're told to stop. instructor will print out a graph called the "FVC Volume Time Curve" that shows how well you did.

Discussion: It was fascinating to see how the spirometer and pneumotach were used to measure lung capacities. Analyzing the FVC Volume Time Curve and comparing it to Figure 14 provided valuable insights into our respiratory health.

Conclusion: The lab aimed to record different lung volumes like tidal volume, vital capacity, inspiratory capacity, and more. It calculated timed vital capacity or forced expiratory volume, as well as understanding pulmonary function.

Results:




Vital capacity difference in the Male vs Female
Vital capacity(L)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Female VC
Male VC
Biological Sex