The Effect of Exercise on Lungs

By Damien Sharifi

Hypothesis

I think people who exercise regularly have a larger *lung capacity because exercise increases blood flow.

***Lung Capacity** is the maximum amount of

oxygen your body can use

Supplies

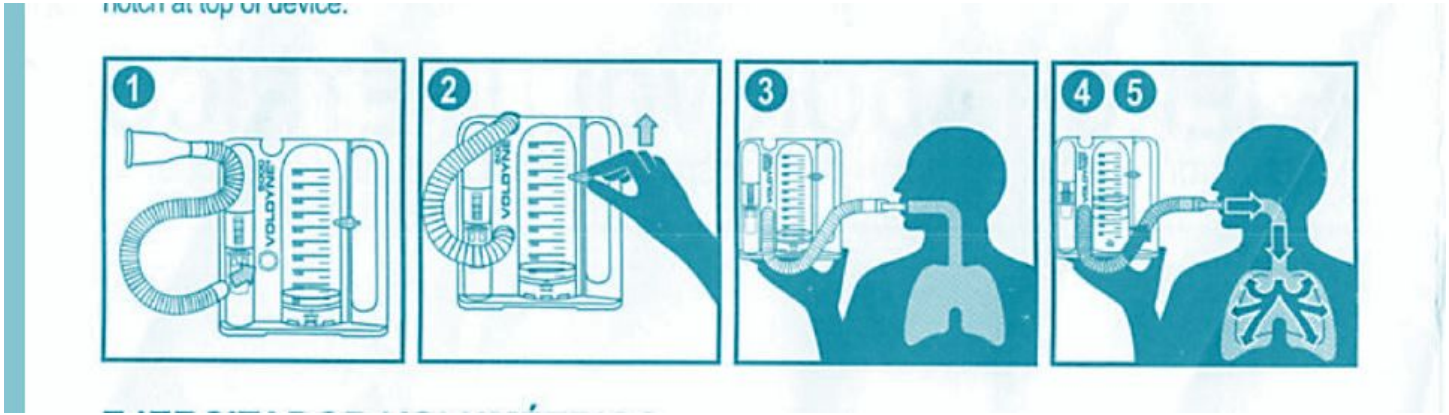
The supplies I will need to carry out this project are:

- spirometer
- paper (to write down the results)

Procedure

1. I asked the person to tell me their age and height
2. I used the given tables for predictive nomogram-inspiratory capacity to write down their normal breathing volume (the amount of air that should be in their lungs)
3. I slid the pointer on the side of the unit to the number I found in step 2
4. I asked the person to exhale normally
5. Then I asked them to hold the spirometer upright
6. I asked them to put the mouthpiece tightly around their mouth
7. I told them to inhale slowly and try to raise the piston on the chamber to reach their predicted volume level
8. I repeated the test 2 more times and record the numbers where the top of the piston is

Spirometer Demonstration



Predictive Nomogram-Inspiratory Capacity**
Nomograma predictivo-Capacidad inspiratoria**

FEMALE / MUJER

HEIGHT / ALTURA

AGE EDAD	58" 1.47m	60" 1.52m	62" 1.57m	64" 1.63m	66" 1.68m	68" 1.73m	70" 1.78m	72" 1.83m	74" 1.88m
20	1900	2100	2300	2500	2700	2900	3100	3300	3500†
25	1850	2050	2250	2450	2650	2850	3050	3250	3450
30	1800	2000	2200	2400	2600	2800	3000	3200	3400
35	1750	1950	2150	2350	2550	2750	2950	3150	3350
40	1700	1900	2100	2300	2500	2700	2900	3100	3300
45	1650	1850	2050	2250	2450	2650	2850	3050	3250
50	1600	1800	2000	2200	2400	2600	2800	3000	3200
55	1550	1750	1950	2150	2350	2550	2750	2950	3150
60	1500	1700	1900	2100	2300	2500	2700	2900	3100
65	1450	1650	1850	2050	2250	2450	2650	2850	3050
70	1400	1600	1800	2000	2200	2400	2600	2800	3000
75	1350	1550	1750	1950	2150	2350	2550	2750	2950
80	1300	1500	1700	1900	2100	2300	2500	2700	2900

MALE / HOMBRE

HEIGHT / ALTURA

AGE EDAD	58" 1.47m	60" 1.52m	62" 1.57m	64" 1.63m	66" 1.68m	68" 1.73m	70" 1.78m	72" 1.83m	74" 1.88m	76" 1.93m	78" 1.98m
20	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000†
25	1950	2150	2350	2550	2750	2950	3150	3350	3550	3750	3950
30	1900	2100	2300	2500	2700	2900	3100	3300	3500	3700	3900
35	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800
40	1750	1950	2150	2350	2550	2750	2950	3150	3350	3550	3750
45	1700	1900	2100	2300	2500	2700	2900	3100	3300	3500	3700
50	1650	1850	2050	2250	2450	2650	2850	3050	3250	3450	3650
55	1550	1750	1950	2150	2350	2550	2750	2950	3150	3350	3550
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75	1300	1500	1700	1900	2100	2300	2500	2700	2900	3100	3300
80	1250	1450	1650	1850	2050	2250	2450	2650	2850	3050	3250

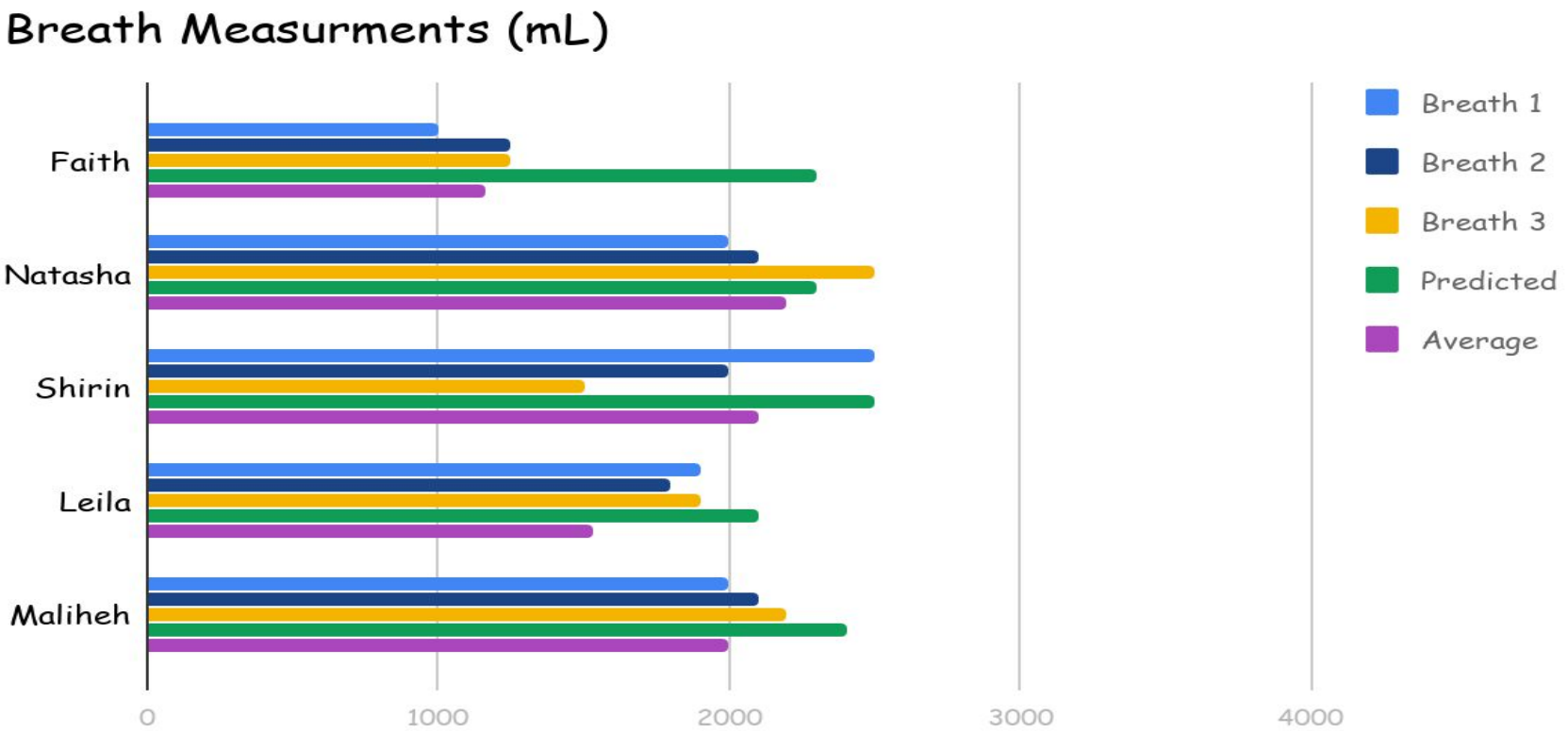
** Formula used in the above Nomogram published in The American Review of Respiratory Diseases, official journal of the American Thoracic Society, September 1979, Vol. 120, Number 3, by G. Polgar and V. Promadhat.
† Inspiratory capacity measured in milliliters rounded off to the nearest 50 ml.

** La fórmula utilizada en el nomograma anterior fue publicada en The American Review of Respiratory Diseases, la publicación oficial de la American Thoracic Society, en septiembre de 1979, Vol. 120, Número 3, por G. Polgar y V. Promadhat.
† Capacidad inspiratoria medida en mililitros redondeada a los 50 ml más próximos.

Non-Exerciser Data Table

Participant's Name	Predicted (Normal) Lung Capacity (mL)	Breath Volume#1 (mL)	Breath Volume #2 (mL)	Breath Volume #3 (mL)	Breath Average Volume (mL)
Faith	2300	1000	1250	1250	1167
Natasha	2300	2000	2100	2500	2200
Mali	2400	2000	2100	2200	2100
Leila	2100	1900	1800	1900	1867
Shirin	2500	2500	2000	1500	2000

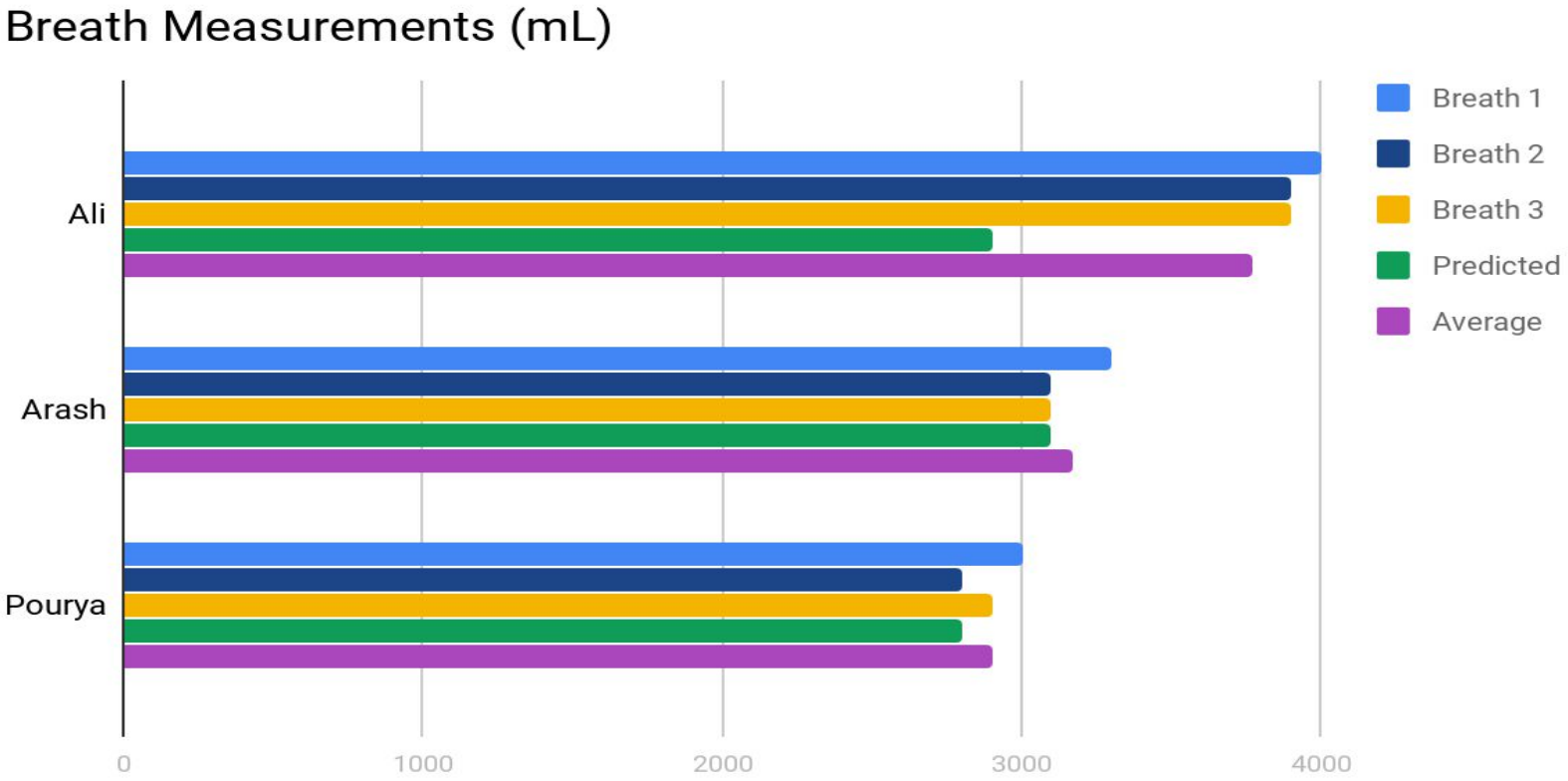
Non-Exerciser Spirometer Readings



Exerciser Data Table

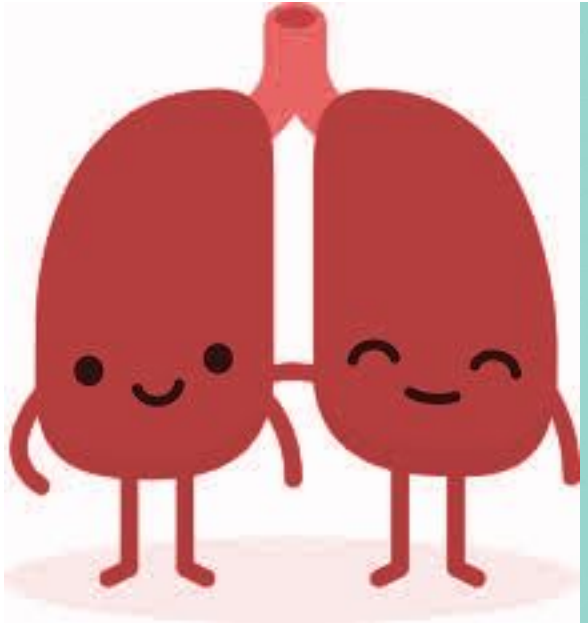
Participant's Name	Predicted (Normal) Lung Capacity (mL)	Breath Volume#1 (mL)	Breath Volume #2 (mL)	Breath Volume #3 (mL)	Breath Average Volume (mL)
Ali	2900	4000	3400	3900	3767
Arash	3100	3300	3100	3100	3167
Pourya	2800	3000	2800	2900	2900

Exercisers spirometer readings



Results

The result of my experiment is what I expected. People who exercised had the larger lung capacity compared to those who did not exercise.



Conclusion

My hypothesis was that people who exercise regularly would have a larger lung capacity because exercise increases blood flow. To test my hypothesis, I had people who did and didn't exercise inhale while holding the mouthpiece of the spirometer in their mouth. I observed how far they could raise the piston of the spirometer. This would measure their lung capacity. The result of my testing was that people who exercise could raise the piston at or higher than their normal lung capacity. Through my research I learned that when you exercise regularly, the muscles involved in breathing become stronger. Also, the blood volume and blood flow increase when you exercise. Therefore, your body gets more oxygen from the lungs and blood without working as hard. The result of my experiment proves that my hypothesis was correct.