

Approach to Spirometry in Children

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Lung Volumes

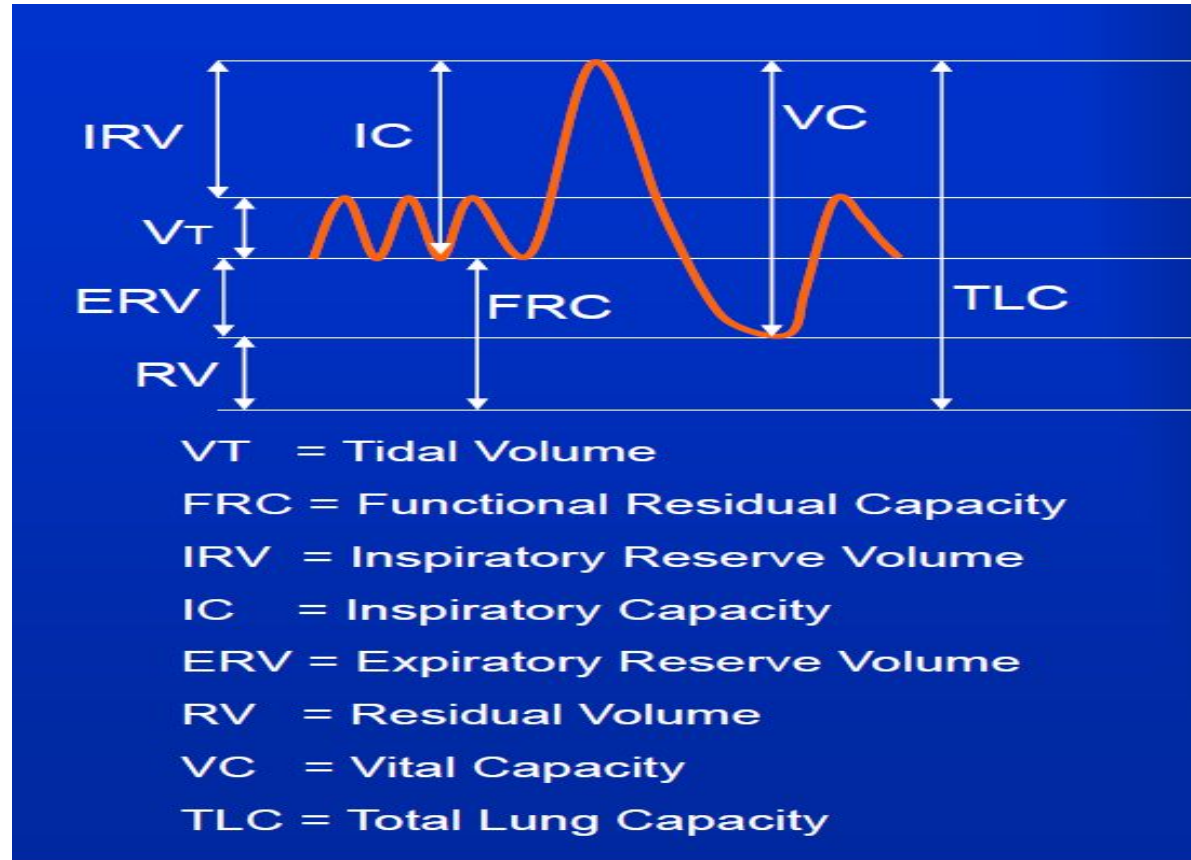
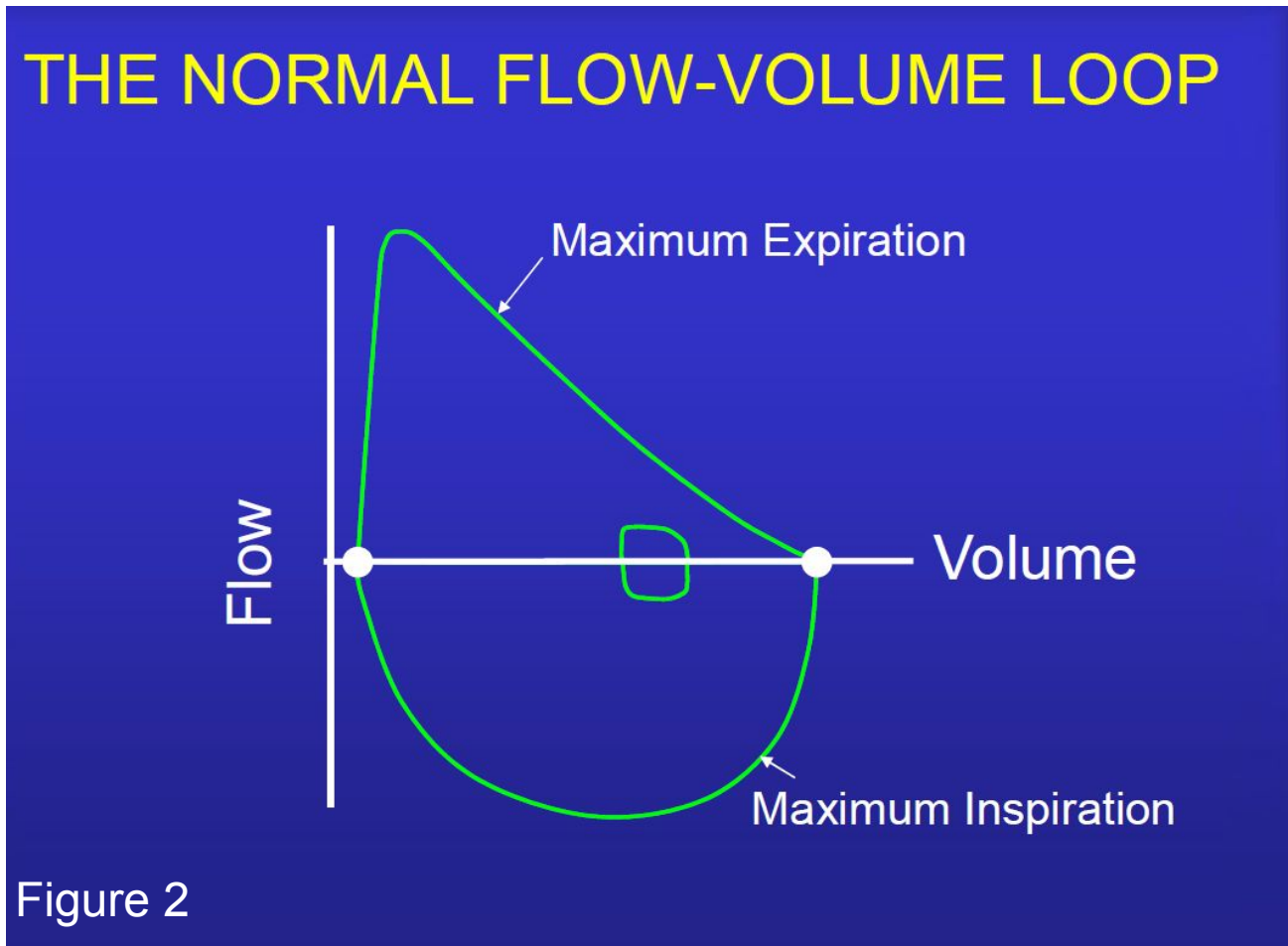


Figure 1

Flow Volume Loop Maneuver



Flow Volume Loop and Volume Time Curve

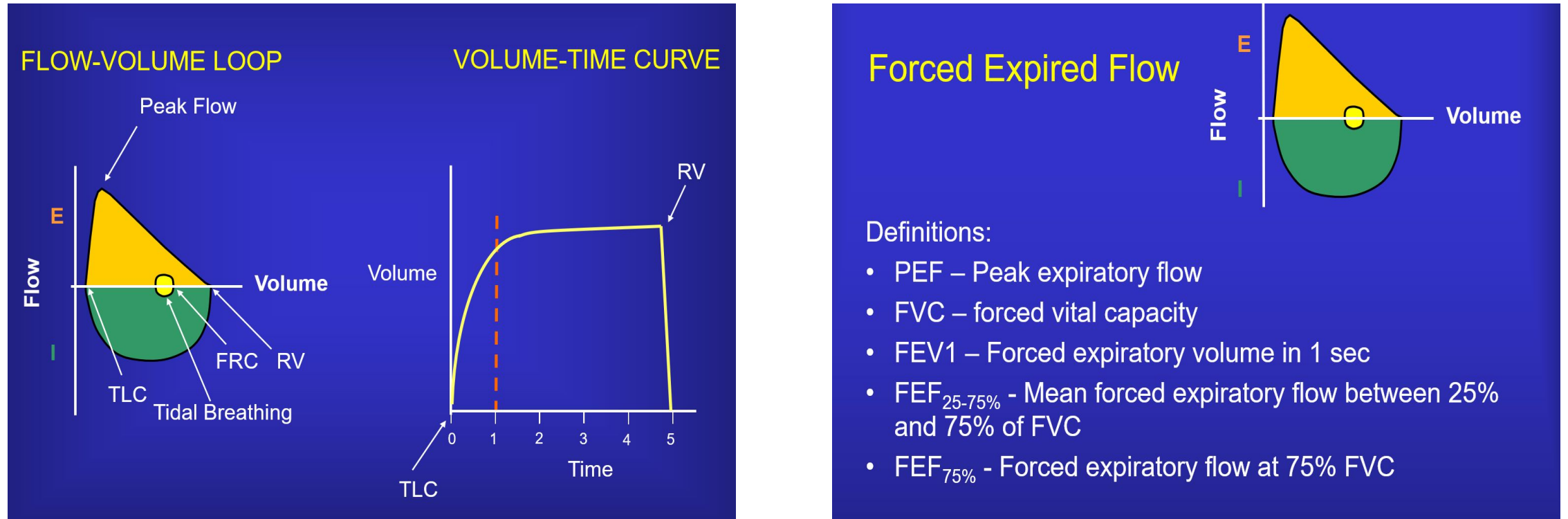


Figure 3

Sample Spirometry Report

Age: 15 Sex: Male Height: 164.00 Cms Weight: 56.00 Kgs

Race: Black

Author/Reference: GLI2012/ Gutierrez2004

Diagnosis: Query Asthma

Medications: none

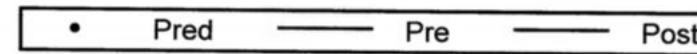
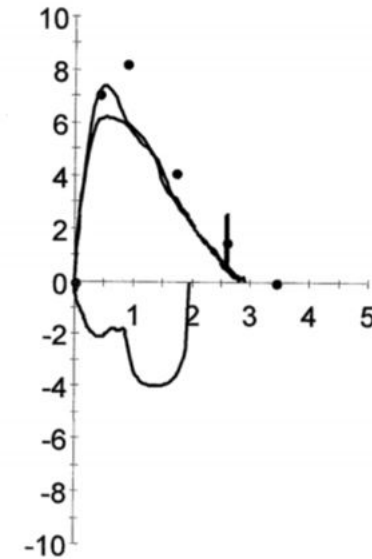
Test Comments: Good patient effort & cooperation.
The results of this test meet the ATS standards for acceptability and repeatability.

--- SPIROMETRY ---	Pre-Bronch				Post-Bronch		
	Pred	LLN	Actual	%Pred	Actual	%Pred	%Chng
FVC (L)	3.43	2.72	2.90	84	2.80	81	-3
FEV1 (L)	3.01	2.35	2.63	87	2.59	86	-1
FEV1/FVC (%)	88	78	90	102	92	105	+2
FEF 25-75% (L/sec)	3.50	1.97	3.37	96	3.45	98	+2
FEF 25% (L/sec)	8.25		6.80	82	6.11	74	-10
FEF 50% (L/sec)	4.11		4.07	98	4.39	106	+7
FEF 75% (L/sec)	1.50	0.58	1.58	105	1.61	107	+1
FEF Max (L/sec)	7.09	4.83	7.40	104	6.21	87	-16
FIF Max (L/sec)	4.58				3.98	86	
FEV1/SVC (%)	88		93	105			

LLN = lower limit of normal. Compare actual values to lower limit of normal

Actual value for patient

Percent change in FEV1 for assessing bronchodilator response



Volume time curve

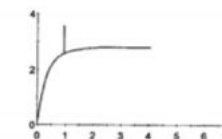
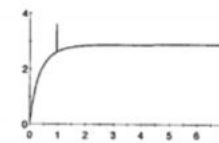
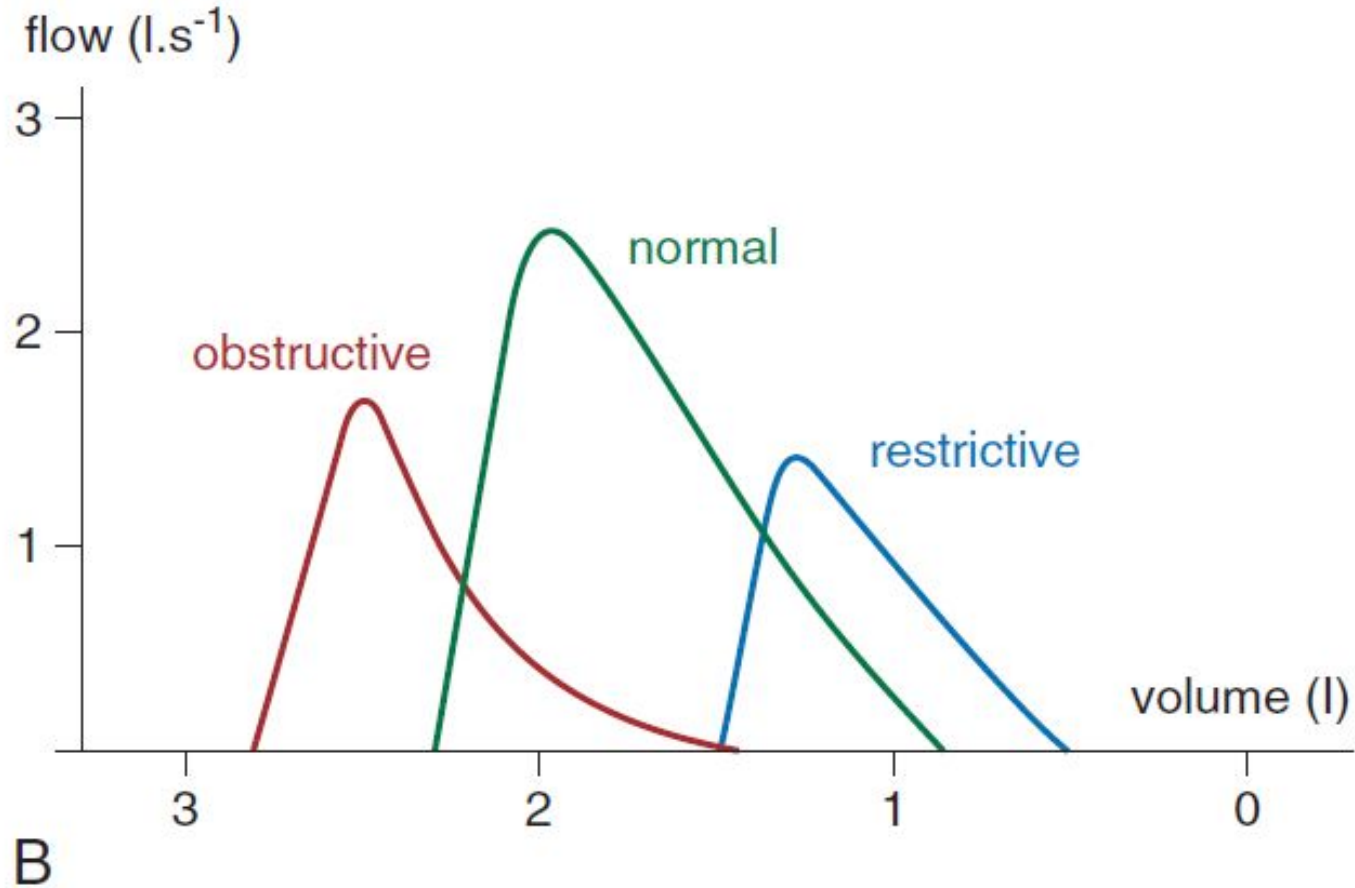


Figure 4

Obstructive and Restrictive Lung Disease



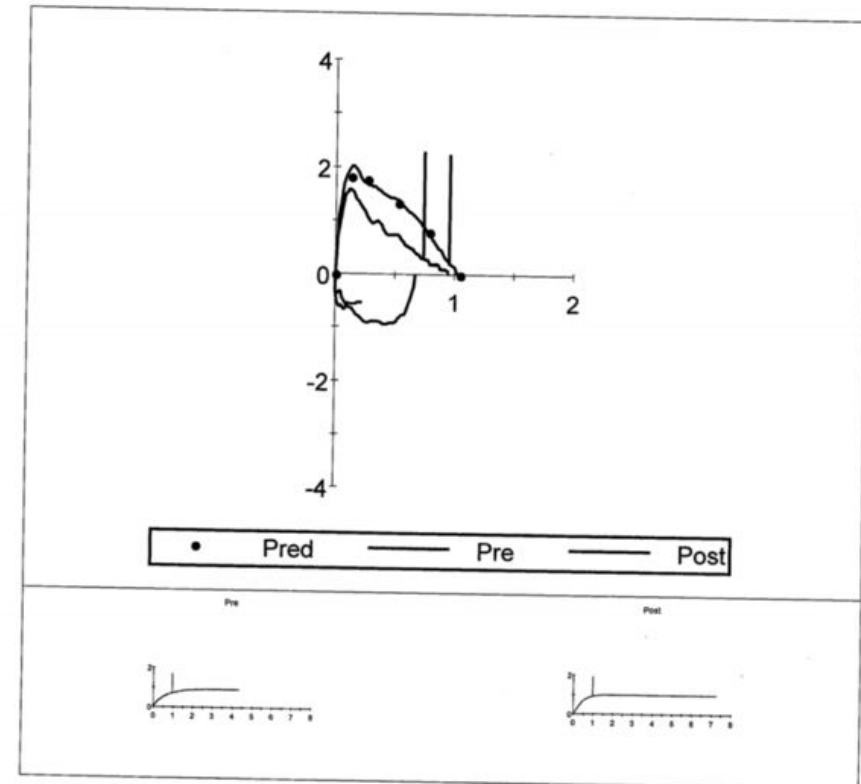
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Back to our case...

Test Comments: Good patient effort & cooperation. The results of this test meet the ATS standards for acceptability and repeatability. Gave 4 puffs salbutamol via aerochamber for post spirometry results. This is patient's first PFT.

--- SPIROMETRY ---	Pre-Bronch				Post-Bronch		
	Pred	LLN	Actual	%Pred	Actual	%Pred	%Chng
FVC (L)	1.05	0.84	0.94	89	1.02	97	+8
FEV1 (L)	0.98	0.77	0.75	76	0.96	98	+28
FEV1/FVC (%)	94	86	79	84	94	99	+18
FEF 25-75% (L/sec)	1.45	0.87	0.66	45	1.35	93	+105
FEF 25% (L/sec)	1.75	0.31	1.20	68	1.72	98	+43
FEF 50% (L/sec)	1.33		0.74	55	1.42	107	+93
FEF 75% (L/sec)	0.78	0.35	0.34	43	0.97	124	+186
FEF Max (L/sec)	1.81	0.37	1.57	86	2.01	110	+27
FIF Max (L/sec)	1.28		0.94	73			
FEV1/SVC (%)	93						

FEV1 % predicted defines severity of airflow obstruction



References

- Graham, B. L., Steenbruggen, I., Miller, M. R., Barjaktarevic, I. Z., Cooper, B. G., Hall, G. L., Hallstrand, T. S., Kaminsky, D. A., McCarthy, K., McCormack, M. C., Oropez, C. E., Rosenfeld, M., Stanojevic, S., Swanney, M. P., & Thompson, B. R. (2019). Standardization of Spirometry 2019 Update. An Official American Thoracic Society and European Respiratory Society Technical Statement. *American Journal of Respiratory and Critical Care Medicine*, 200(8), e70–e88. <https://doi.org/10.1164/rccm.201908-1590ST>
- Kaslovsky, R., & Sadof, M. (2014). Spirometry for the Primary Care Pediatrician. *Pediatrics in Review*, 35(11), 465–475. <https://doi.org/10.1542/pir.35-11-465>