

Spirometry Review February 2012

Interpreting Spirometry

Volume is the amount of air exhaled-- in restrictive lung conditions, less air is exhaled
Flow is the rate (how fast) air is exhaled--in obstruction, air is exhaled slower

Forced Expiratory Time	FET	How long the patient exhaled
Forced Vital Capacity	FVC	Total volume of air exhaled Ideal 6 seconds in adults 3 seconds in children <10 years old
Force Expiratory Volume in one second	FEV1	How much air patient exhaled in one second
	FEV1/FVC	Percentage of the FVC exhaled in the first second. Healthy people exhale 80-90% of their FVC in the first second
Peak Expiratory Flow	PEF	This is what is measured by Peak Flow Meter. Measures the maximum flow achieved
Mid-Flow	FEF₂₅₋₇₅	Flow between 25% and 75% of the FVC. If the FVC is inaccurate it is also inaccurate

Step 1 Demographics

-Check that the name, age, race, height, and gender are correctly entered since normal reference is affected by age, race, height and gender.

Step 2 Inspection

-Inspect both the Volume/Time and Flow/Volume curves to determine if they meet acceptability and reproducibility criteria. Don't try to get clinical information out of unacceptable curves.

a. GOOD START OF TEST: sharp rise beginning of both curves. Patient took a good deep breath, had good seal around the mouth piece and generated maximum effort.

FIGURE 2- 1. NORMAL VOLUME TIME CURVE

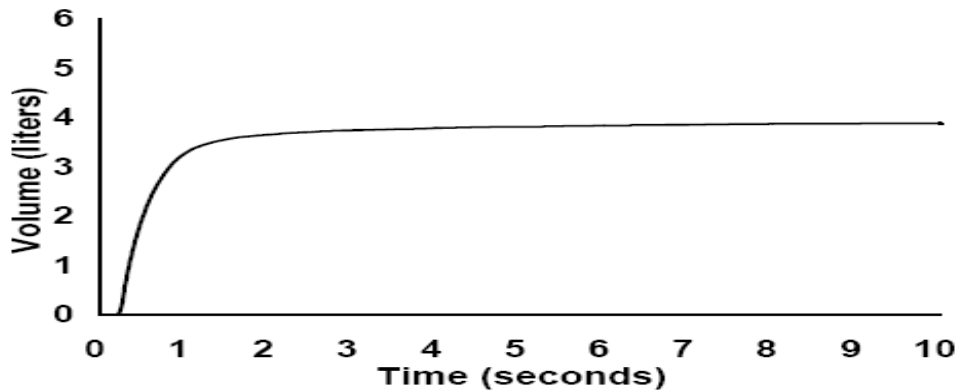
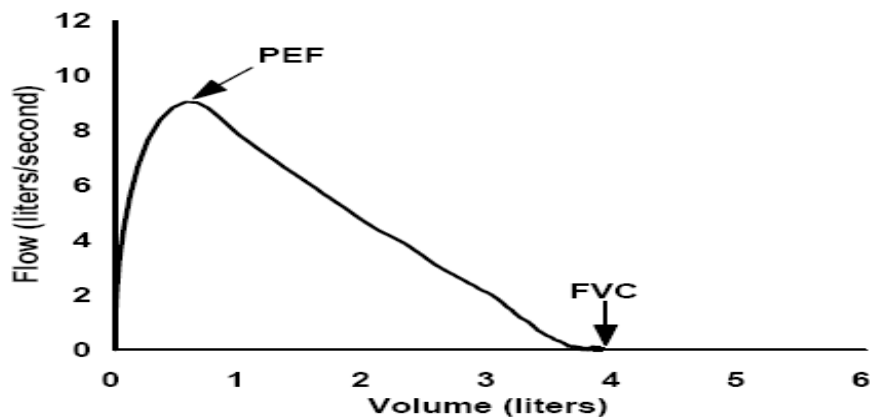


FIGURE 2- 2. NORMAL FLOW VOLUME CURVE



b. DISTINCT PEAK: on the Flow/Volume Curve one distinct peak representing the peak flow (PEF or Peak Expiratory Flow). Patient made a good effort to exhale hard and fast. If there isn't a sharp peak this could mean poor effort.

c. GOOD END OF TEST: the Volume/Time Curve should plateau during the last second of the test. The Flow/Volume curve should gradually return to zero at the end of the test and not end abruptly. Important for accurately determining the FVC

d. ABSENCE OF ARTIFACT (coughing, glottic closure, leaking around the mouth piece, breathing in and out).

e. REPRODUCIBLE: goal is to get 2 curves which look a like. Try 3 to 8 times. Note, sometimes you can get bronchospasm with testing which results in a decline in function with each attempt.

Step 3 Interpret

Normal for children:

FVC greater than or equal to 80% of predicted

FEV1 greater than or equal to 80% of predicted

FEV1/FVC greater than or equal to 80% of predicted

interpretation	FVC	FEV1	FEV1/FVC %
Normal spirometry	normal	normal	normal
Airway Obstruction	Low or normal	low	low
Lung Restriction	low	low	normal
Combination of Obstruction & Restriction	low	low	low

When To Refer:

1. Presence of restriction
2. Severe obstruction
3. No response to therapy
4. Unexplained inability to perform spirometry
5. Clinical history inconsistent with lung function findings

Pre and Post dilator testing

1. Pre-albuterol spirometry
2. Give albuterol. Wait 15-30 minutes
3. Repeat spirometry. Increase FEV1 of 12% is a good response