



Interpreting spirometry reports

When suspecting COPD

Spirometry is a reliable test to measure airflow limitation. It identifies three abnormal ventilatory patterns: obstructive (such as in COPD and asthma), restrictive (such as in pulmonary fibrosis and pleural disease), and mixed (when both obstructive and restrictive lung diseases are present).

Compare the patient's spirometry indices against reference or predicted values

Table 1. Features of ventilatory patterns

Spirometry indices	Normal pattern	Abnormal ventilatory patterns			
		Obstructive	Restrictive	Mixed	
FEV ₁ /FVC	>0.70	↓	Normal or ↑	↓	↑ Increased ↓ Decreased
FEV ₁	>80% predicted	↓	Normal or ↓	↓	
FVC	>80% predicted	Normal or ↓	↓	↓	

FEV₁, Forced expiratory volume in one second is the air volume forcibly expelled in the first second following a maximum inspiration.
FVC, Forced vital capacity is the total air volume forcibly expelled following a maximum inspiration.
FEV₁/FVC, the ratio of both measurements.

If FEV₁/FVC <0.70, there is airflow limitation.² Post-bronchodilator FEV₁/FVC <0.70, in patients with pertinent risk factors and symptoms, confirms COPD.^{2,3}

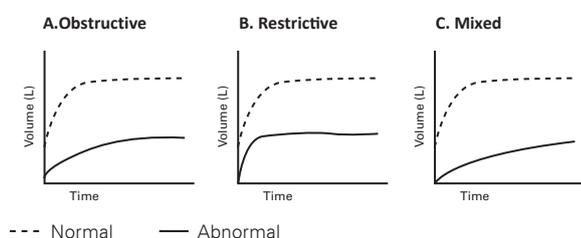
Examine curve shape to confirm pattern

The spirometry curve shapes indicate the type of ventilatory pattern. Refer to a specialist when spirometry is abnormal but not diagnostic.¹

- Volume-time curve (Figure 1)

With a normal lung, the curve steeply ascends and plateaus in three to four seconds.¹ In obstructive disorders, expiration takes longer and the slope is less steep.¹ In restrictive disorders, the shape is normal but the curve is lower.¹

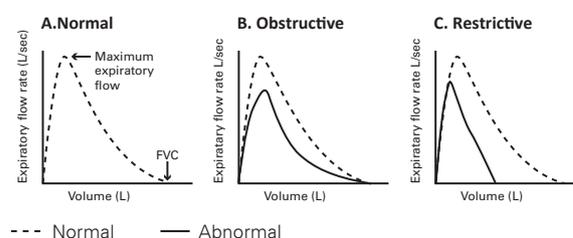
Figure 1. Volume-time curves



- Flow-volume curve (Figure 2)

With a normal lung, the curve steeply ascends to the maximum expiratory flow rate before it descends evenly to the end of expiration.¹ In obstructive disorders, the peak of the curve is lower followed by a concave dip.¹ In restrictive disorders, the FVC is reduced (moved to the left).¹

Figure 2. Flow-volume curves



References

1. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Spirometry for Healthcare Providers. 2010.
2. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of COPD. 2018.
3. Singapore Ministry of Health. Clinical Practice Guidelines: Chronic Obstructive Pulmonary Disease. 2017.