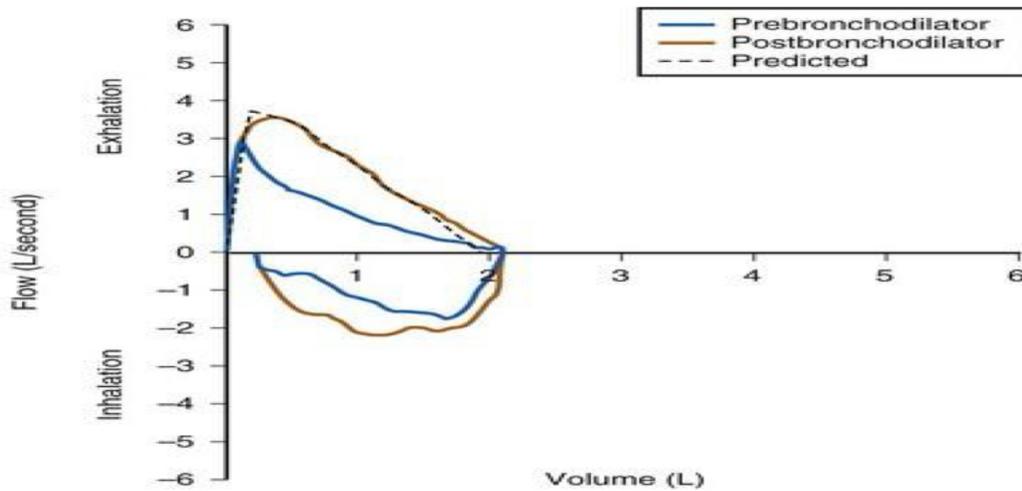


# Asthma - PFT



Spirometry Parameter	Units	Predicted Value	Observed Pre	Percent Pred	Observed Post	Percent Pred	Percent Change
FVC	Liter	1.94	2.15	111	2.14	110	0
FEV <sub>1</sub>	Liter	1.71	1.30	76	1.82	106	40
FEV <sub>1</sub> /FVC	Percent	90	60	67	85	94	42

## What the Graph Shows

This is a Flow–Volume Loop from a spirometry test:

- X-axis (horizontal): Lung volume (Liters)
- Y-axis (vertical): Air flow (Liters/second)
- **Blue curve:** Before bronchodilator (Prebronchodilator)
- **Brown curve:** After bronchodilator (Postbronchodilator)
- Dashed line: Predicted normal curve

## What Happens in Asthma (Before Bronchodilator)

Asthma is an obstructive lung disease caused by:

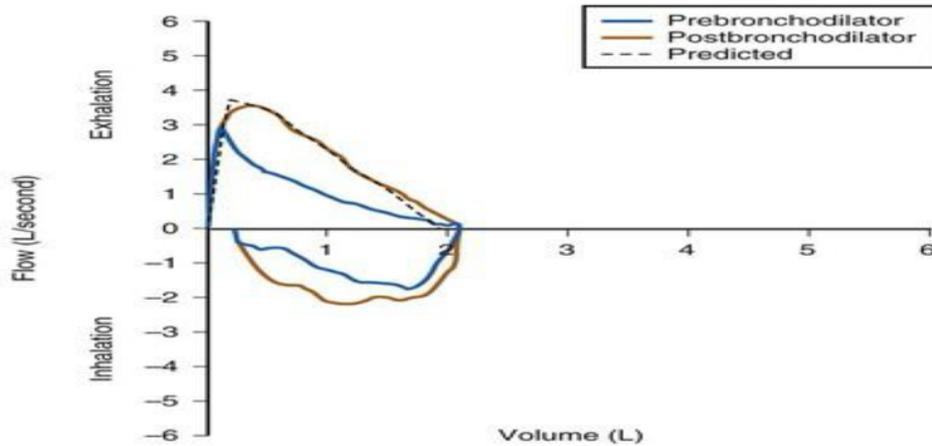
- Airway inflammation
- Bronchoconstriction
- Increased mucus secretion

These changes narrow the airways, especially during expiration, so the patient cannot exhale quickly.

## In the blue (prebronchodilator) curve:

- The peak expiratory flow rate (PEFR) is reduced (the top of the curve is lower).
- The curve looks scooped out or concave — a typical sign of airway obstruction.
- FEV<sub>1</sub> (forced expiratory volume in 1 second) is low (1.30 L = 76% predicted).
- FVC (forced vital capacity) is normal or slightly high (2.15 L = 111% predicted).
- FEV<sub>1</sub>/FVC ratio is decreased (67%), confirming obstruction.

# Asthma - PFT



Spirometry Parameter	Units	Predicted Value	Pre Observed Percent Pred	Post Observed Percent Pred	Percent Change
FVC	Liter	1.94	2.15 111	2.14 110	0
FEV <sub>1</sub>	Liter	1.71	1.30 76	1.82 106	40
FEV <sub>1</sub> /FVC	Percent	90	60 67	85 94	42

## After Bronchodilator

After giving a bronchodilator drug (like albuterol), the airways dilate, reducing resistance.

In the brown (postbronchodilator) curve:

- The shape moves closer to normal.
- FEV<sub>1</sub> increases from 1.30 → 1.82 L (a 40% improvement).
- FEV<sub>1</sub>/FVC ratio also improves from 67% → 85%.

A >12% and >200 mL improvement in FEV<sub>1</sub> after bronchodilator confirms reversible airway obstruction, typical of asthma.

## Summary

- Asthma causes reversible airway obstruction.
- Before treatment: airway narrowing → ↓ FEV<sub>1</sub>, ↓ FEV<sub>1</sub>/FVC, concave flow–volume curve.
- After bronchodilator: airways open → ↑ FEV<sub>1</sub>, ↑ FEV<sub>1</sub>/FVC, curve improves.
- This reversibility differentiates asthma from COPD, which is irreversible.

