

TEMP: 37.0°C

FLOW: 0.0 L/S

PULSE: 72 BPM

-----

-----

-----



# Measuring Every Breath

A Clinical Guide to Respiratory Volumes and Capacities.

TEMP: 37.0°C

FLOW: 0.0 L/S

PULSE: 72 BPM

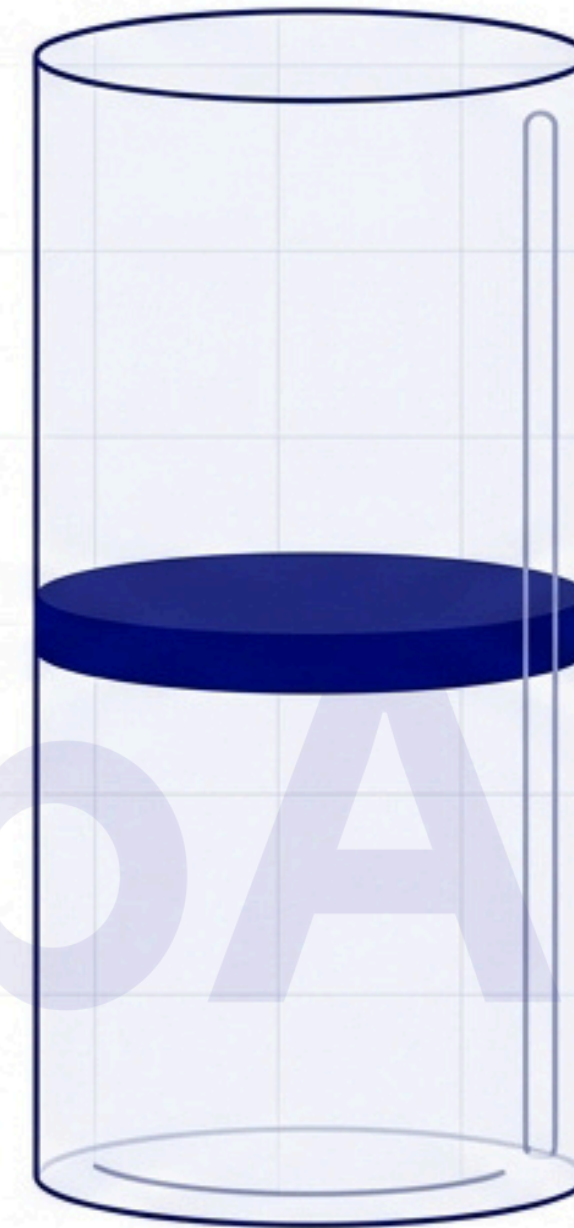
STATUS: ONLINE | CALIBRATING SPIROMETER...

## The Baseline: Tidal Volume

[ TV ]

# 500 mL

Volume of air inspired or expired during a normal respiration.



Normal  
Breath

**RATE NOTE:** A healthy human breathes 12-16 times/min, resulting in 6000-8000 mL of air exchanged per minute.

## Maximum Intake: Inspiratory Reserve Volume

[ IRV ]

# 2500–3000 mL

The additional volume a person can inspire by a forcible inspiration.



← Maximum Intake

**RATE NOTE:** A healthy human breathes 12–16 times/min, resulting in 2500–3000 mL of air exchanged per minute.



**You've Learned the Theory.  
Let's Test Them Now.**

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

**Practice Now**



At [prep.topall.app](https://prep.topall.app)

### Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter

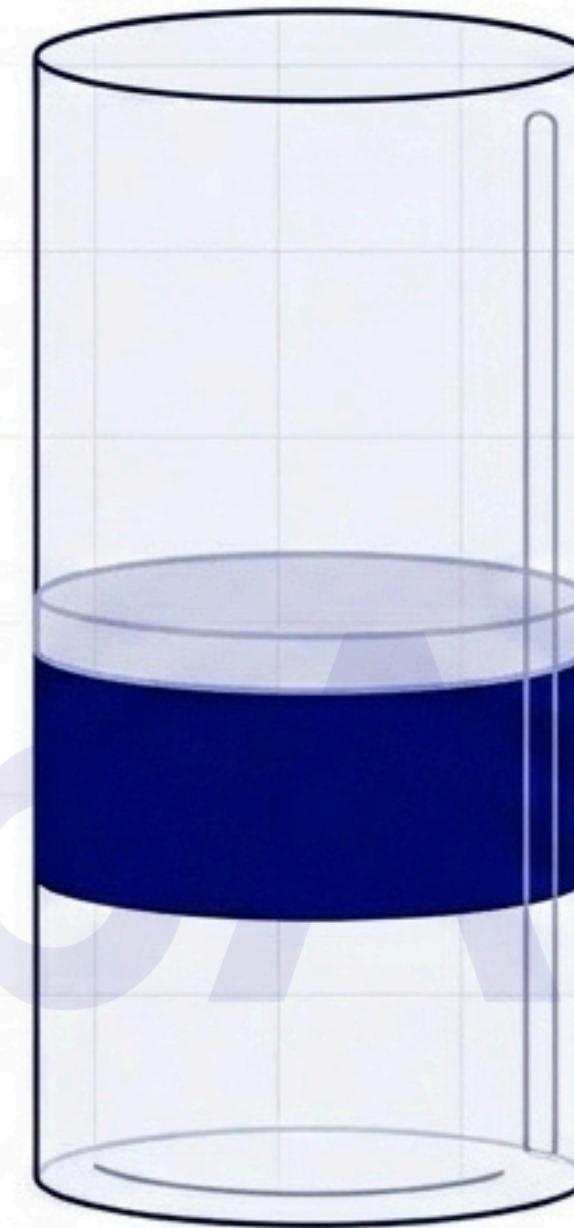


## Forced Exhale: Expiratory Reserve Volume

[ ERV ]

1000–1100 mL

The additional volume a person can expire by a forcible expiration.



← Forced Exhale

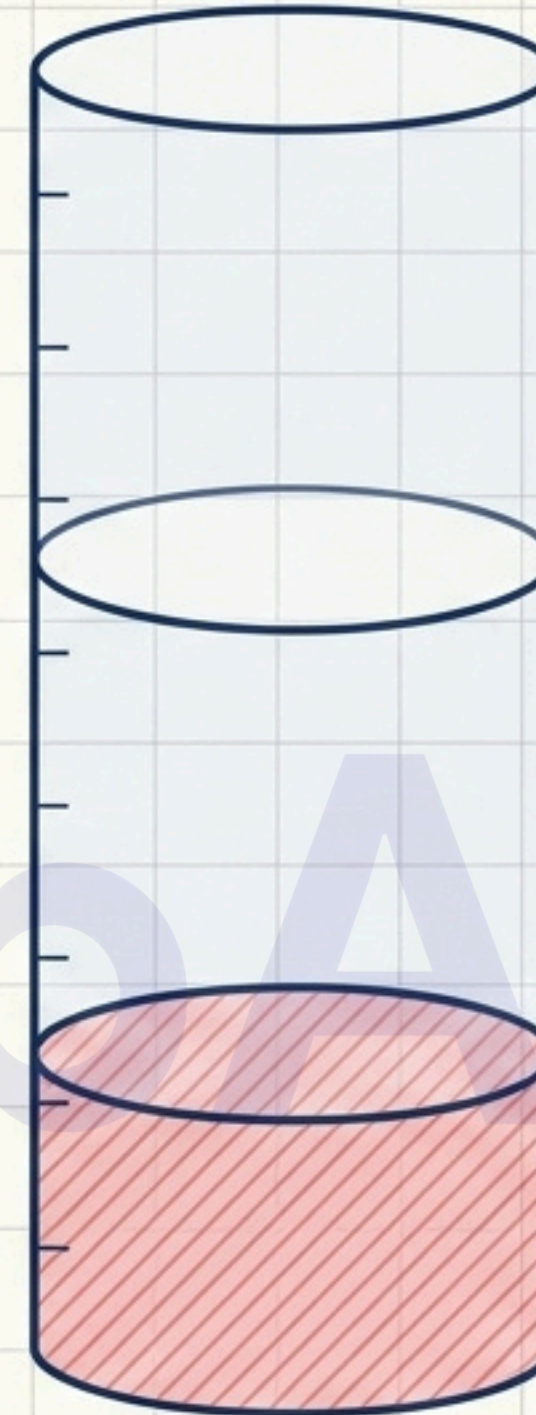
**RATE NOTE:** A healthy human breathes 12–16 times/min, resulting in 1000–1100 mL of air exchanged per minute.

## The Permanent Baseline: Residual Volume

[ RV ]

1100–1200 mL

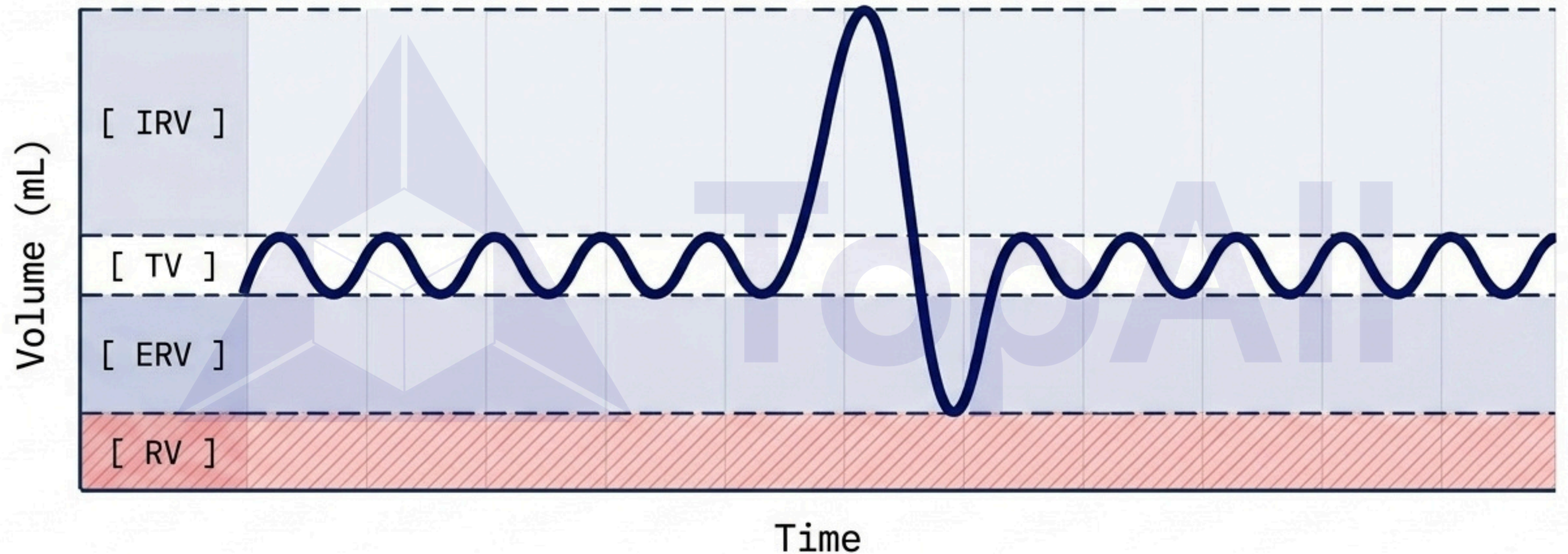
Volume of air remaining in the lungs  
even after a forcible expiration.



← Never Empty:  
Prevents alveolar  
collapse.

**WARNING:** Unlike TV, IRV, and ERV, Residual Volume cannot be measured directly by a basic spirometer because it cannot be exhaled.

# The Spirometric Dashboard



DIAGNOSTIC VISUALIZATION: Plotting the four fundamental, non-overlapping respiratory volumes.

# Calculating Pulmonary Capacities

[ TV ]

+

[ IRV ]

=

Inspiratory Capacity (IC) : Total air inspired after normal expiration

[ TV ]

+

[ ERV ]

=

Expiratory Capacity (EC) : Total air expired after normal inspiration

[ ERV ]

+

[ RV ]

=

Functional Residual Capacity (FRC) : Air remaining after normal expiration

[ ERV ]

+

[ TV ]

+

[ IRV ]

=

Vital Capacity (VC) : Maximum air breathed in/out after forced action

[ RV ]

+

[ ERV ]

+

[ TV ]

+

[ IRV ]

=

Total Lung Capacity (TLC) : Total accommodated air

# Clinical Significance: Why We Measure

## Spirometry as a Diagnostic Tool

By assessing respiratory volumes and capacities, clinicians can identify and diagnose structural or functional pulmonary disorders.

| Emphysema                                                                                                                                        | Asthma                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Chronic disorder damaging alveolar walls. Decreased respiratory surface dramatically alters Vital Capacity (VC). Major cause: Cigarette smoking. | Inflammation of bronchi and bronchioles causing wheezing. Airway resistance heavily impacts Expiratory Reserve Volume (ERV). |

END OF REPORT



# You've Learned the Theory.

## Now Let's Test It.

Reading notes gets you knowledge.

**Practicing MCQs gets you marks.**

**That's exactly what TopAll Pro is built for.**

**Try TopAll Pro Now**

### What TopAll Pro Does Differently

-  **Stuck? Snap it. Solve it. — Doubts AI**  
Photo → step-by-step solution in seconds, 24/7
-  **Your AI Coach finds your blind spots**  
Concept-level weakness detection — not just chapter-level
-  **4.5 Lakh+ questions. Never run out.**  
13× more content than any other prep app in India
-  **Build your own test in 60 seconds**  
Pick a chapter, set difficulty — AI does the rest instantly.
-  **AI Recommendation that helps you improve**  
AI Recommendation Analysis your Tests and tell you where you need to improve.



**Practice the moment you finish studying**  
Jump in while the concept is still fresh in your head

**4.5L+**  
MCQs

**1.5L+**  
Students

**AI Powered**  
In-Depth Analysis