

Pulmonary Function Tests

An Introduction

PFT Series Outline

Lesson 1 – An Introduction

Lesson 2 – Spirometry

Lesson 3 – Lung Volumes

Lesson 4 – DLCO

Lesson 5 – Summary and Practice Cases

Learning Objectives

- Know the general purpose of pulmonary function tests (PFTs).
- Know the different types of PFTs.
- Know the three major categories of chronic, diffuse lung disease.
- Understand the various subdivisions of the lung volume.

Purposes of Pulmonary Function Tests

- Diagnosis of symptomatic disease
- Screening for early, asymptomatic disease
- Prognostication of known disease
- Monitoring response to treatment

Purposes of Pulmonary Function Tests

- As a diagnostic tool, PFTs help classify diffuse lung disease into one of three broad categories:

Obstructive Lung Disease

COPD
(chronic bronchitis ↔ emphysema)

Asthma

Bronchiectasis

Cystic fibrosis

Restrictive Lung Disease

Interstitial lung disease
(e.g. pulmonary fibrosis, sarcoidosis)

Chest wall pathology
(e.g. kyphosis, scoliosis)

Obesity

Neuromuscular disease
(e.g. ALS, muscular dystrophy)

Pulmonary Vascular Disease

Primary pulmonary hypertension

Chronic thromboembolic disease

- These categories are not mutually exclusive:
 - COPD can be obstructive + vascular
 - Sarcoidosis can be restrictive + obstructive + vascular

Functions of the Pulmonary System Tested by PFTs

- Airways
 - Large and Small Airways
- Parenchyma
 - Alveoli
 - Interstitium
- Pulmonary Vasculature
- Bellows/Pump Mechanism
 - Diaphragm
 - Chest Wall
- Neural Control of Ventilation

Types of PFTs

Standard PFTs

Spirometry
(including flow-volume loop)

Lung Volumes

**Diffusing Capacity of
Carbon Monoxide (D_{LCO})**

Specialized PFTs

Arterial Blood Gas

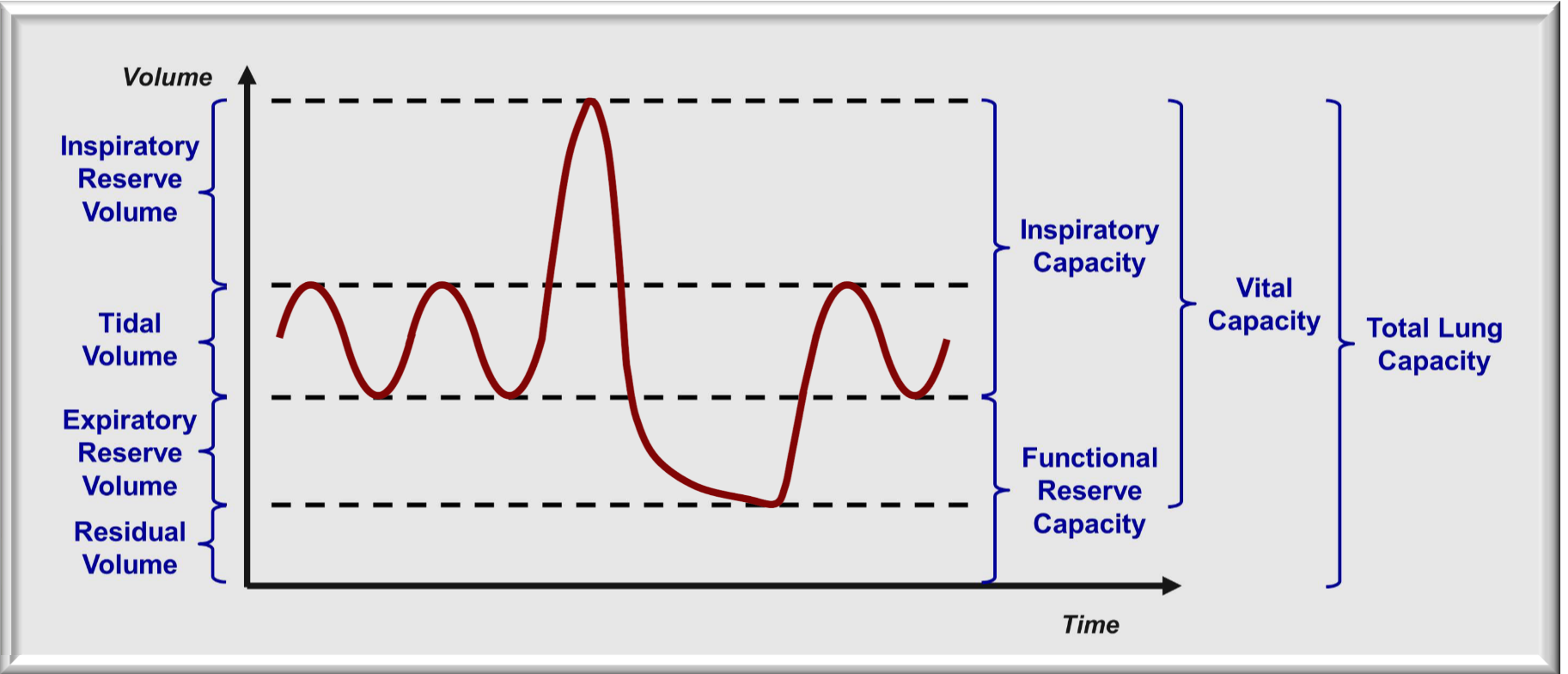
Exercise Oximetry

6 Minute Walk Test

Peak Flow

**Maximum Inspiratory and
Expiratory Pressures**

Lung Volumes



Reporting PFTs

- Values are reported as a % of that predicted (% Ref), given the patient's age, gender, and height.
- “Normal” is generally considered within ~80-120% predicted, or between 5th and 95th percentile.

Patient: Don Draper		Age: 42		Gender: Male		
		Ref	Pre	% Ref	Post	% Ref
Spirometry						
FVC	Liters	3.2	2.3	72	2.5	78
FEV1	Liters	2.6	1.0	38	1.2	46
FEV1/FVC	%	81	43		48	
FEF25-75%	L/sec	2.8	0.6	21	0.7	25
PEF	L/sec	5.9	3.9	66	4.2	71
Lung Volumes						
TLC	Liters	4.9	6.4	131		
VC	Liters	3.2	2.4	75		
IC	Liters	2.1	1.8	86		
FRC	Liters	2.7	3.2	119		
RV	Liters	1.7	3.6	212		
RV/TLC	%	35	56			
Diffusing Capacity						
DLCO	mL/mmHg/min	22	16	73		
DL Adj	mL/mmHg/min	22	14	64		

Comments: Tests are pre and post 4 puffs albuterol



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