

# LUNG FUNCTION IN HEALTH AND DISEASE: SPIROMETRY



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# SPIROMETRY



- ❑ Spirometry is a widely used, effort depended basic lung function test
- ❑ Assess the lung performance
- ❑ Assess physiological parameters; lung volumes, capacities & flow rate
- ❑ Differentiate between the obstructive and restrictive lung conditions
- ❑ Play a critical role in the diagnosis, differentiation and management of respiratory illness.

# PHYSIOLOGICAL CONDITIONS AND SPIROMETRY

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## Physiology conditions:

- Age
- Gender
- Height
- Weight
- Ethnic group
- Pregnancy

# INDICATIONS OF SPIROMETRY

**Based on clinical features / abnormal lab tests**

**Symptoms:** Dyspnea, cough, sputum production, chest pain

**Signs:** Cyanosis, clubbing, chest deformity, diminished chest expansion, hyperinflation, diminished breath sounds, Prolongation of expiratory phase & crackles

**Arterial blood gas analysis:** Hypoxemia, hypercapnia

**Abnormal chest X Ray:**

# INDICATIONS OF SPIROMETRY



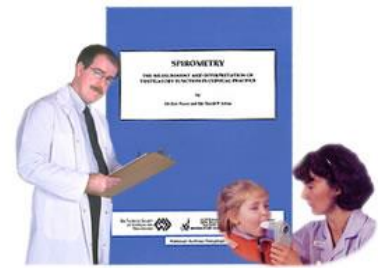
**Describe the course of diseases affecting PFTs**

**Neuromuscular diseases:** Guillain Barre Syndrome,  
Myasthenia gravis

**Pulmonary diseases:** Obstructive airway diseases,  
Interstitial lung diseases

**Adverse reactions:** Drugs with known pulmonary  
toxicity [Pulmonary fibrosis]

# INDICATIONS OF SPIROMETRY



## Monitoring indications

**To assess the therapeutic interventions:**

**Bronchodilator therapy**

**Steroid treatment for asthma**

**Chronic obstructive lung disease**

**Interstitial lung disease**

# INDICATIONS OF SPIROMETRY

## PRE OPERATIVE INDICATIONS

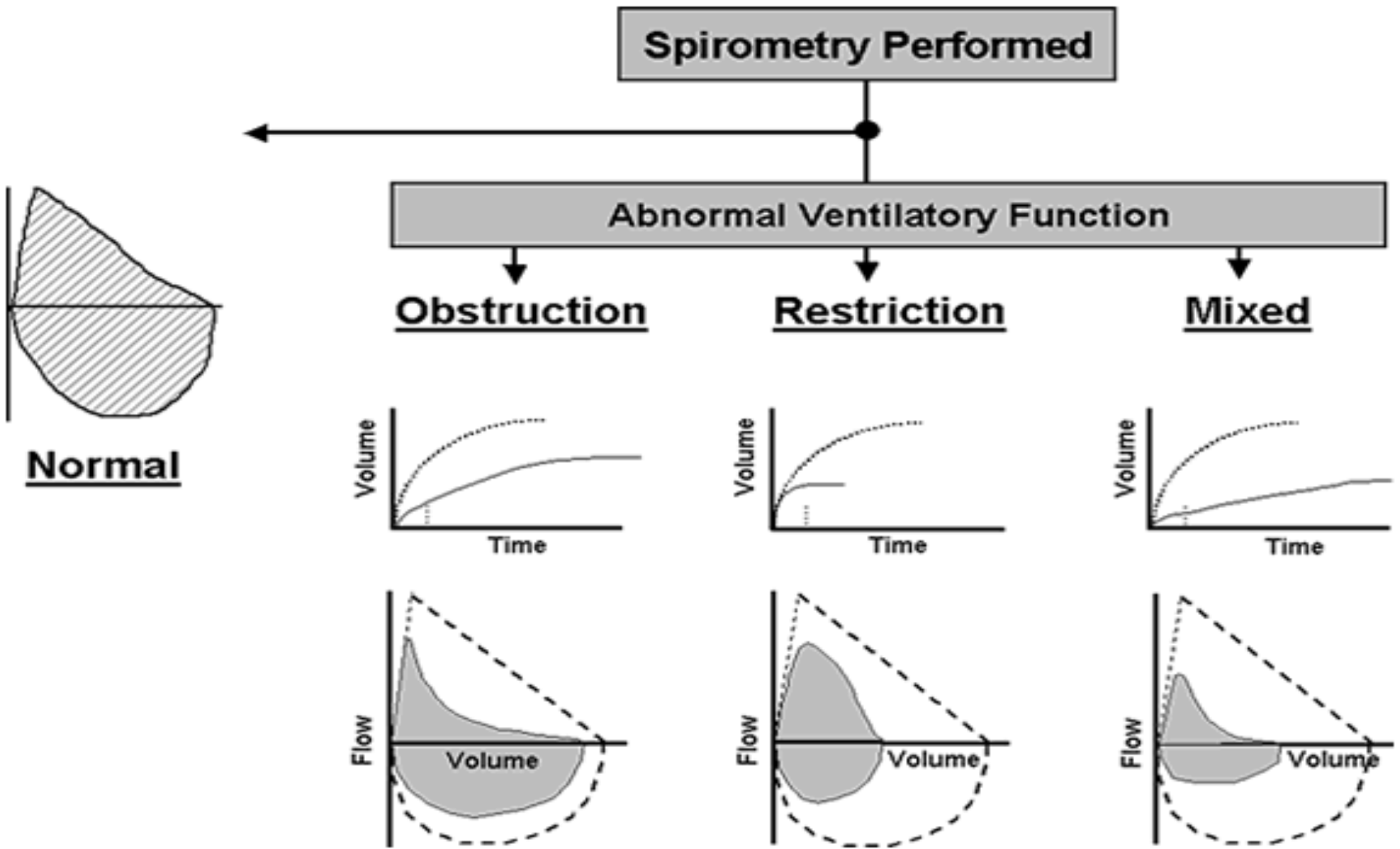
**To determine the suitability for and management during and after anaesthesia**

**To assess the risk for surgical procedures known to affect lung function**



Cotes 1995; ACCP Chest 2003;  
Regli et al., Anaesthesia, 2006

# SPIROMETRY IN RESPIRATORY DISEASES





# DIAGNOSIS OF COPD

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## SYMPTOMS

cough  
sputum  
dyspnea

## EXPOSURE TO RISK FACTORS

tobacco  
occupation  
indoor/outdoor pollution



**SPIROMETRY**

# SMOKERS AND SPIROMETRY



## **Smoker & Non Smoker:**

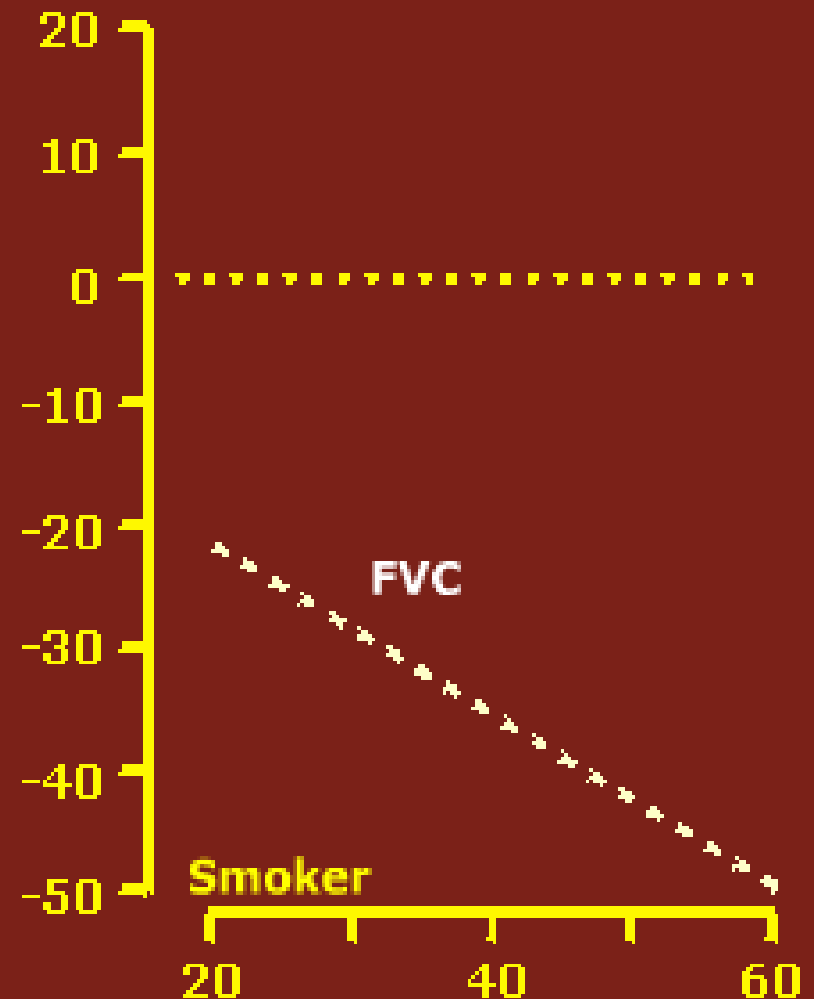
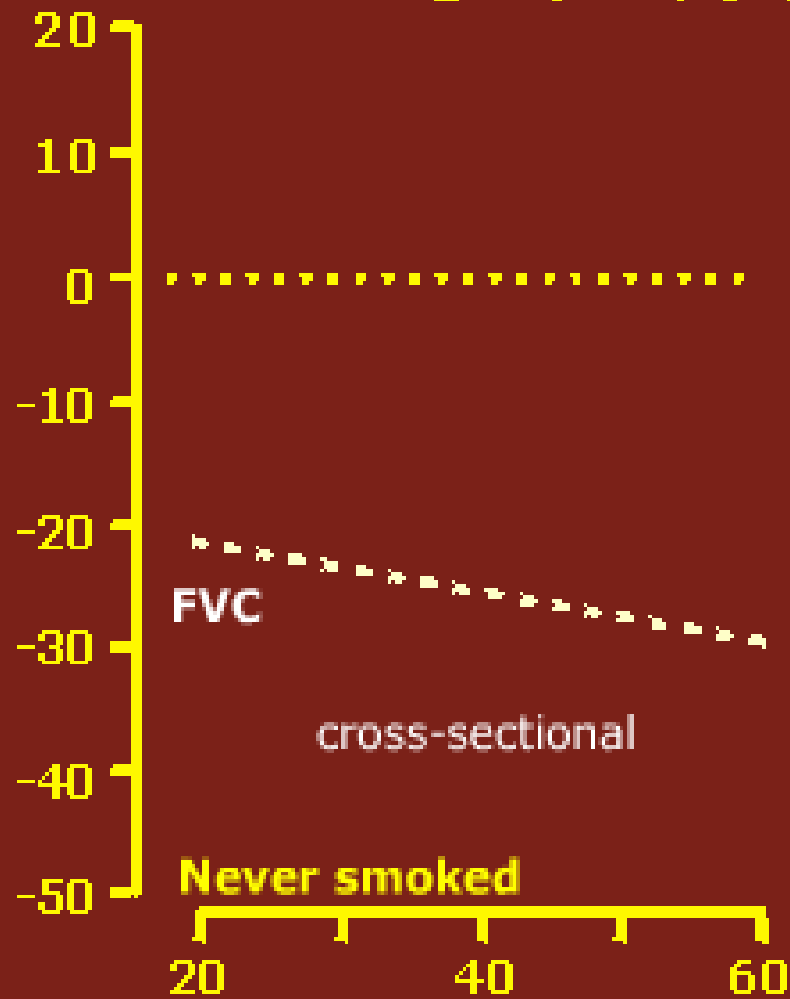
**Non Smoker:** In normal healthy non smoker subject after the age of 30 the expected decline in Lung function parameter [FEV1] is 25–30 ml/ year

**Smoker:** The average rate of decline of lung function in smokers as measured by Forced Expiratory Volume in 1 sec [FEV1] is 60-70 ml / year

# SMOKERS AND SPIROMETRY

Annual change (mL/yr)

Males (177 cm)



# SMOKERS AND SPIROMETRY

