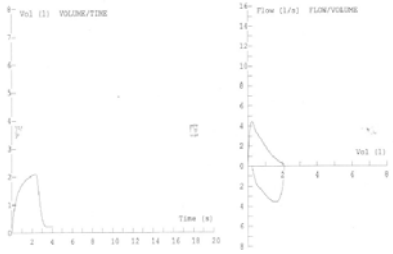
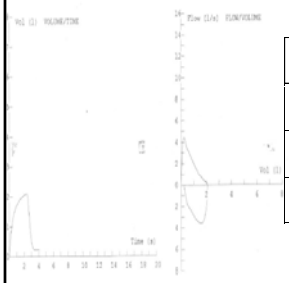
Case Studies : Spirometry

24 year old female referred for C/O breathlessness, cough, H/o recurrent LRTI's since 1year .H/O taking many antibiotic courses for cough and breathlessness
O/E : Rhonchi+,CXR: clear



24 year old female referred for C/O breathlessness, cough, H/o recurrent LRTI's since 1year .H/O taking many antibiotic courses for cough and breathlessness
O/E : Rhonchi+,CXR: clear

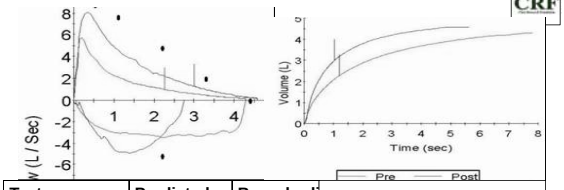


Test	Predicted	Actual %pred	
FEV1/FVC	84.3	**82.03**	**97**
FVC L	2.87	2.09	**72%**
FEV1L	2.50	1.72	**68.6%**

Case Study :2

- A 25 year old atopic female
- H/o Chest pain and dry cough with occasional mucoid expectoration since 4years.The symptoms increased over the last 2mnths. She confessed that she had not slept soundly for 4 days due to cough.
- H/o recurrent upper respiratory tract infections since1yr
- O/E: Bilateral rhonchi
- CXR: Clear

Case Study :2



Test	Predicted	Bronchodi
		Before
FEV_1/FVC		**51**
FVC	5L	4.2
FVC%		**84%**
FEV_1	4.5L	2.15
FEV_1 %		**47**

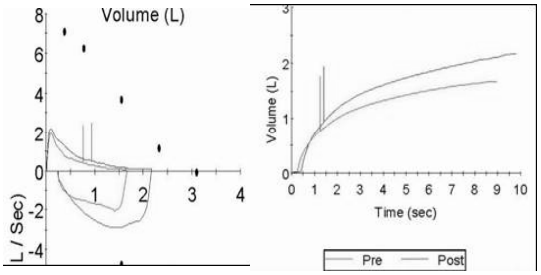
Staging Asthma Severity :60-80 Rule

Severity	FEV1
Interpretation : Obstructive abnormality with good BDR Diagnosis : Severe persistent Bronchial Asthma	
Mild persistent	≥ 80%
Moderate persistent	60-80%
Severe persistent	≤ 60%

Case Study :3

- 35 year old female, presented with symptoms suggestive of bronchial asthma for 5yrs which increased since 1 month. She was mostly bed ridden and had not slept peacefully in the last 2weeks.
- O/E, :accessory muscles of respiration and had diminished breath sounds on auscultation
- CXR –clear

Case Study :3



Case Study :3

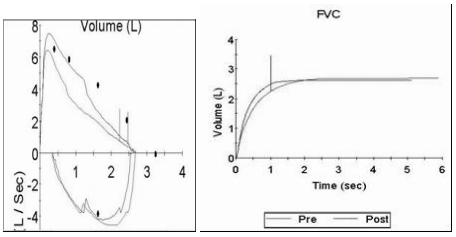
Test	Predicted	Bronchodilat
		Before
FEV1/FVC		**61%**
FVC%		**48%**
FEV1L	2.75	0.95 **(34.5%)**

Good BDR

Low Vital capacity : Air trapping

Case 4

- Spirometry of the same case as in example 3 performed 3 mnths after treatment with inhaled corticosteroids (ICS) and Long acting beta-agonist (LABA)



Case 4

Test	Predicted	Bronchodilator		Change
		Before	**After**	
FEV1/FVC		**76**	**83**	
FVC%		**79.6%**	**86%**	
FEV1	2.75	1.95	2.3	18%, 350ml
FEV1 %		**70**	**84**	

Significant improvement after therapy

Case 5

- 55 year old male atopic,asthmatic since 7 years ,presented with uncontrolled asthma, increased breathlessness during routine activities, frequent nocturnal symptoms
- Treatment consisted of Oral bronchodilators, and occasional use of oral steroids. Recently he had been prescribed asthalin inhaler. He was using inhaler sparingly for the fear of "addiction"
- O/E: Bilateral rhonchi
- Laboratory investigations : normal
- CXR : Clear
- Diagnosis : Severe Persistent Bronchial Asthma

Case 5 :Report Interpretation

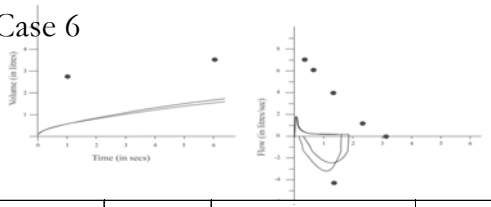
Test	Predicted	Bronchodi
		Before
FEV1/FVC		81
FEV1 L	2	0.9 **(45%)**
FVC L	2.75	1.1 **(40%)**

- Obstructive abnormality with poor BDR
- False Normalization of FEV1/FVC due to air trapping

Case 6

- A 65 year old male , nonatopic, 30 pack-year smoker presented with cough ,sputum and dyspnoea with wheeze since 6 yrs
- These symptoms had gradually progressed over the years and currently he felt breathless on walking for 50 mts on flat ground
- O/E : Bilateral rhonchi
- CXR : Changes of Emphysema.

Case 6

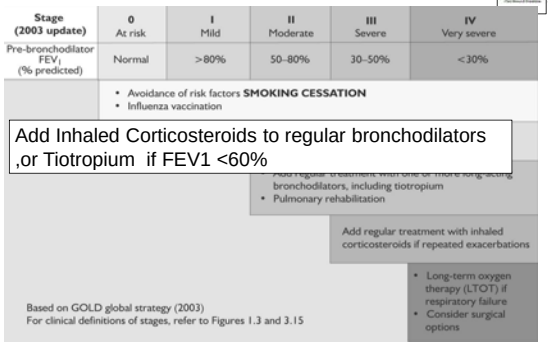


Test	Predicted	Bronchodilator		Change
		Before	**After**	
FEV_1/FVC		**41%**	**34%**	
FVC	2.3L	1.8	2.2	
FVC%		**78%**	**95%**	
FEV_1	1.95L	0.75	0.75	(+0, 0ml)
FEV_1 %		**38%**	**38%**	

Staging COPD Severity :30-50-80 Rule

Severity	FEV1
At risk	Normal
Mild	≥ 80%
Moderate	50-80%
Severe	30-50%
Very Severe	≤ 30%

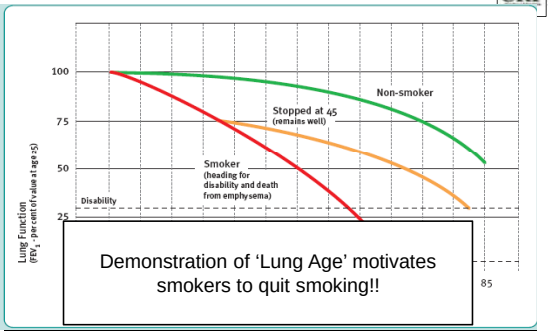
Spirometry a Guide to COPD Management



Case7:Therapeutic role in quitting smoking

- 50 year old male, smoked 20 cigarettes a day for 20 years. Had some symptoms of cough and breathlessness but did not want to attribute it to smoking.
- In spite of several warnings by the doctor he did not believe that his lungs were being damaged by cigarette smoking.
- Spirometry – FEV1 1.86 Lts
- Lung Age – **<u>76 years old</u>**

Peto and Fletcher Graph



Demonstration of 'Lung Age' motivates smokers to quit smoking!!

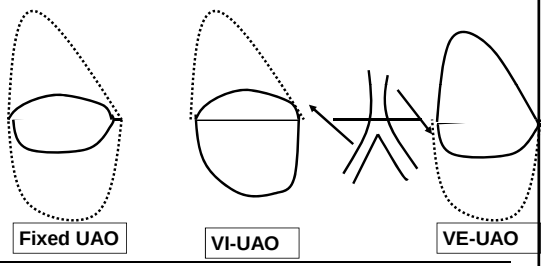
Case 8

- Tukaram 50 years nonsmoker came with complaints of cough with mucoid sputum production once in 2mnths for the past 3 years. His cough intensity had increased since the last 6mnths.
- Past History of been treated for pulmonary Tuberculosis (Rt upper lobe cavity) 7 years back (took 1year complete Rx)
- Frequent use of antibiotics and cough syrups ,but no relief.
- CXR (2001) : healed cavitation with fibrotic streaks in Rt upper lobe
- Sputum AFB :Negative
- Repeat CXR and sputum examination (March 2008) –same as above no fresh changes

Case 8 :
Old healed PTB is a risk factor for COPD

- Spirometry done : FEV1/FVC: 60
  FEV1: 56% predicted
  FVC : 79%
- Started on Inhaled Bronchodilators :Tiotropium
- FUP after 1 mnth: Symptoms of cough better .

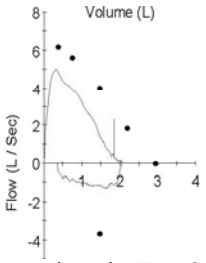
Spirometry for Differential Diagnosis For UAO



Case 9

Anita, developed stridor and horse voice following thyroidectomy, which was mistaken for "asthma." Treated with bronchodilators but no relief

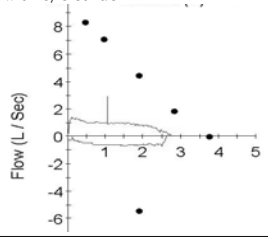
IDL- as bilateral vocal cord palsy.



Remarks: variable extrathoracic VE-UAO

Case 10

43 year old man, k/C/O COPD was on prolonged endotracheal intubation (2mnths) with c/o stridor.



•CT Thorax showed a 3cm narrowing of the trachea

Remarks: Tracheal stenosis with fixed UAO

Pre-operative Evaluation Pulmonary Resection Surgery

A 45-year old chronic smoker presented with cough and haemoptysis since 6 months.
O/E--- grade 3 clubbing and signs of right upper lobe obstructive collapse.
CXR showed right upper collapse with "bronchus cut off" sign.
He was referred for pre-operative pulmonary evaluation for a right upper lobectomy.

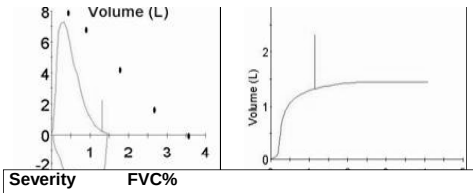
Test	Pred	BD		Pred ppo
		Before	After	
FVC(L)	4	3	3	2.5
FVC%		75	75	
FEV1(L)	3	2.5	2.5	2
FEV1/FVC		75	75	

Case Study 11

- A 48 year old male was referred for dry cough and progressive dyspnoea since 1year
- O/E: Grade 3 clubbing
- Fine end inspiratory crackles
- CXR: Bibasilar reticular opacities

Case Study 13

Diagnosis: Interstitial Pulmonary Fibrosis



Severity	FVC%
Mild	60-80%
Moderate	45-60%
Severe	<45

FVC	3.38L	1.53	1.56	
FVC%		**45%**	**46%**	
FEV_1	2.94L	1.5	1.55	3%,50ml
FEV_1 %		**51**	**57**	

Take Home Message

- Detect
- Quantify
- Monitor

} Obstructive Lung Diseases

- Breathlessness – Pulmonary/Cardiac
- Occupational Lung Disease
- Suspect Restrictive Lung Diseases

Spirometry is to **Dyspnea** as the Electrocardiogram is to chest pain

Thank- you

Liberation Through Research
CRF
Chest Research Foundation