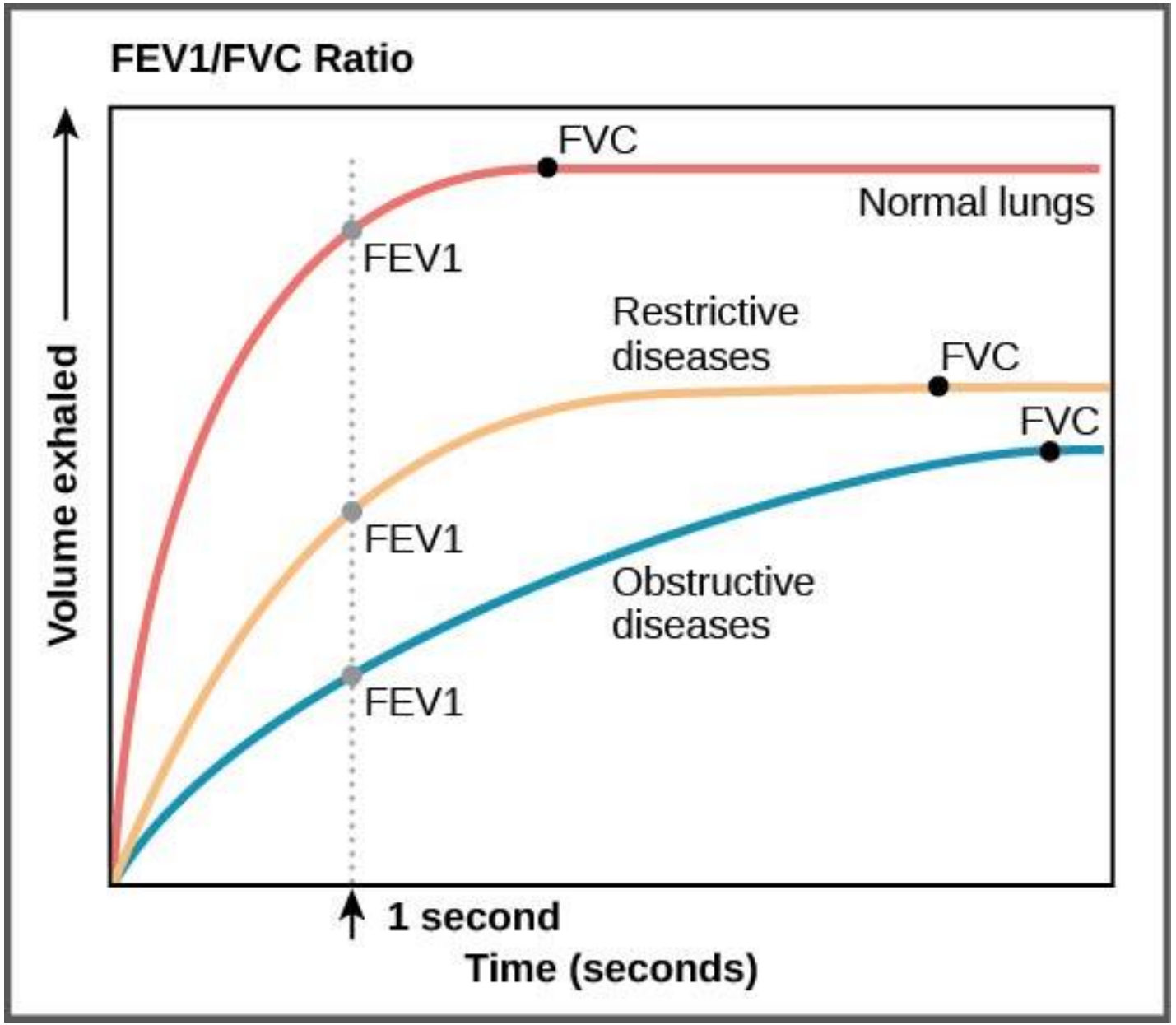
Spirometry

Contraindications: (Increases Intraocular,Intrathoracic, Intra-abd and Intracranial pressure)

- At least 6 weeks since the last exacerbation.
- Recent MI less than 3-6 months ago.
- Unstable angina in last 24 hours.
- Haemoptysis of unknown origin.
- Recent eye surgery less than 3-6 months.
- Abdominal surgery within last 3-6 months.
- Recent CVA less than 3-6 months.
- Diagnosis of Tuberculosis unless special precautions used.
- Current chest infection or within in last 6 weeks.
- Current chest pain with no diagnosis.
- Pulmonary embolism (PE) within last 3-6 months.
- Ear infection.
- Spontaneous pneumothorax.
- Aortic aneurysm.


FEV1/FVC Ratio
Volume exhaled
FVC
Normal lungs
FEV1
Restrictive
diseases
FVC
FVC
FEV1
Obstructive
diseases
FEV1
1 second
Time (seconds)

What do I look at ???????

Weight: 72 Kg Height: 1.69 M BMI : 25.38
Age : 68 Sex : M Smoker: X
Consultant: [redacted]

SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	3.32	2.3	.98	34	.91	32	-7
FVC	L	4.24	3.02	2.04	56	2.09	57	2
FEV1/FVC	%	82	68	48	64	43	57	-10
PEFR	L/MIN	528	384	199	43	155	34	-21

- Only need to look at 5 numbers
- Look at the post bronchodilator values too.

FEV1/FVC	
FEV1	% Predicted
FVC	% Predicted

First look at FEV1/FVC

- IF FEV1/ FVC Ratio <70%
- ***Obstructive defects***

Mechanism -Airway damage and flow obstruction +collapse of airways under forced expiration.

Obstructive Differentials

Causes

- COPD
- Asthma
- Bronchiectasis
- Pulmonary fibrosis
- Chronic extrinsic allergic alveolitis

Then look at **FEV1** to assess severity

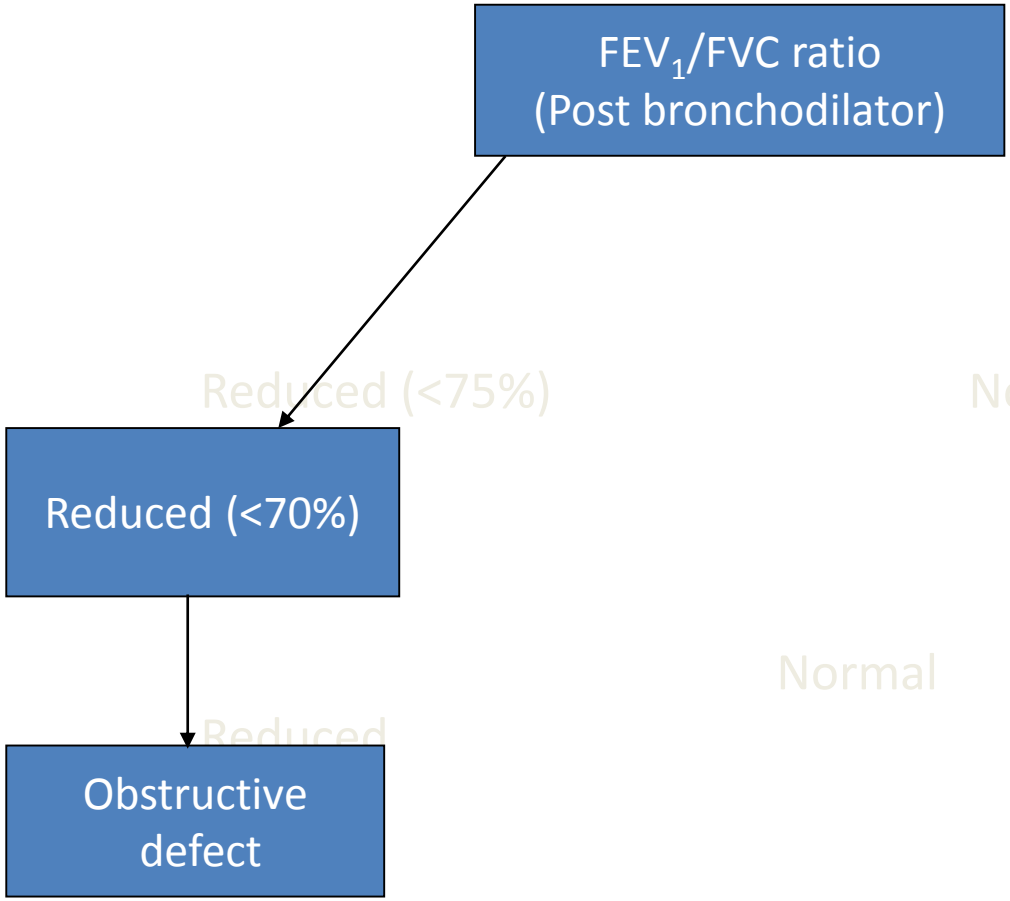
Severity	**Post bronchodilator FEV1 (% of predicted value)**
Mild airflow obstruction	> 80%
Moderate airflow obstruction	50-79 %
Severe airflow obstruction	30 – 49%
V. Severe airflow obstruction	<30%

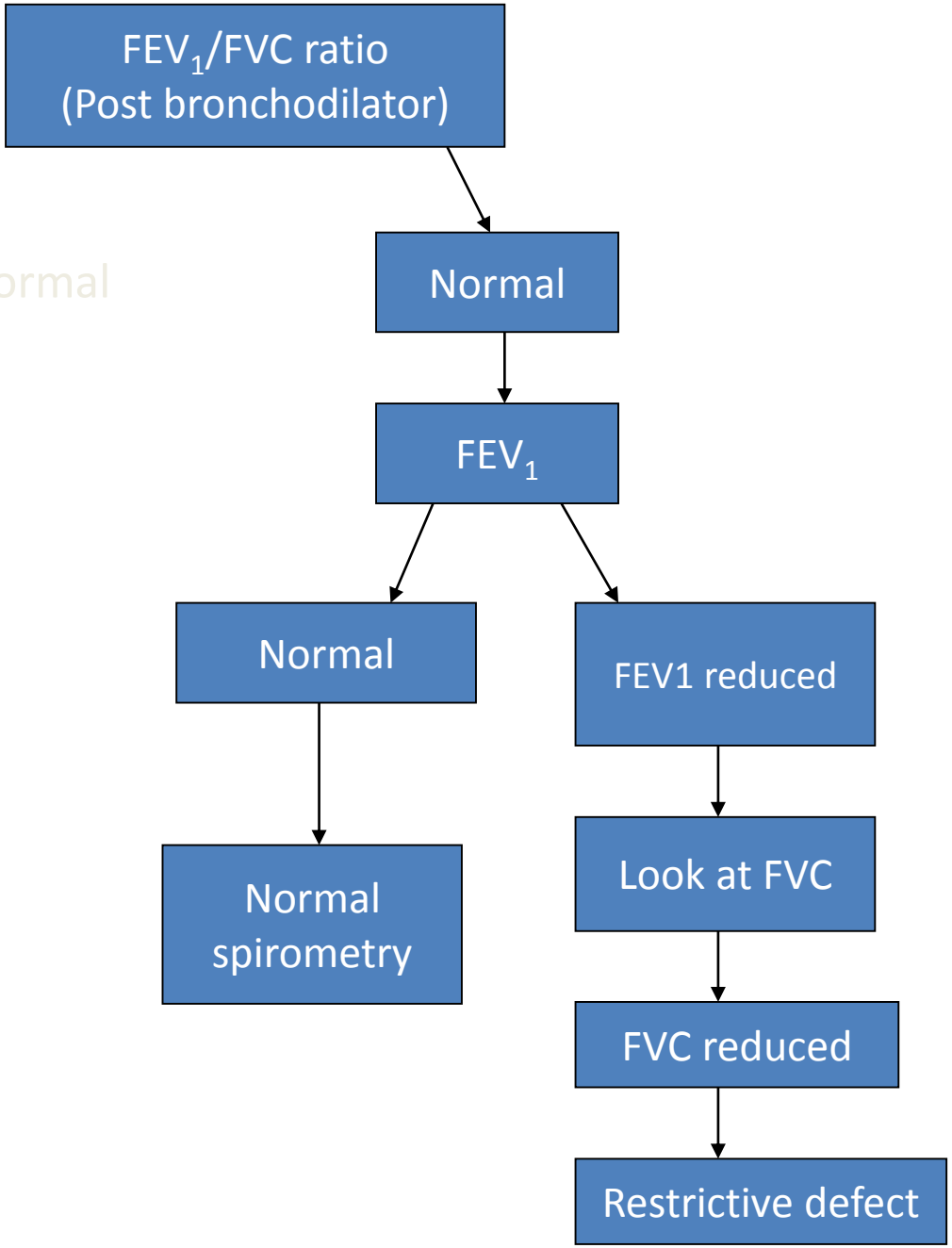
Obstructive with reversibility

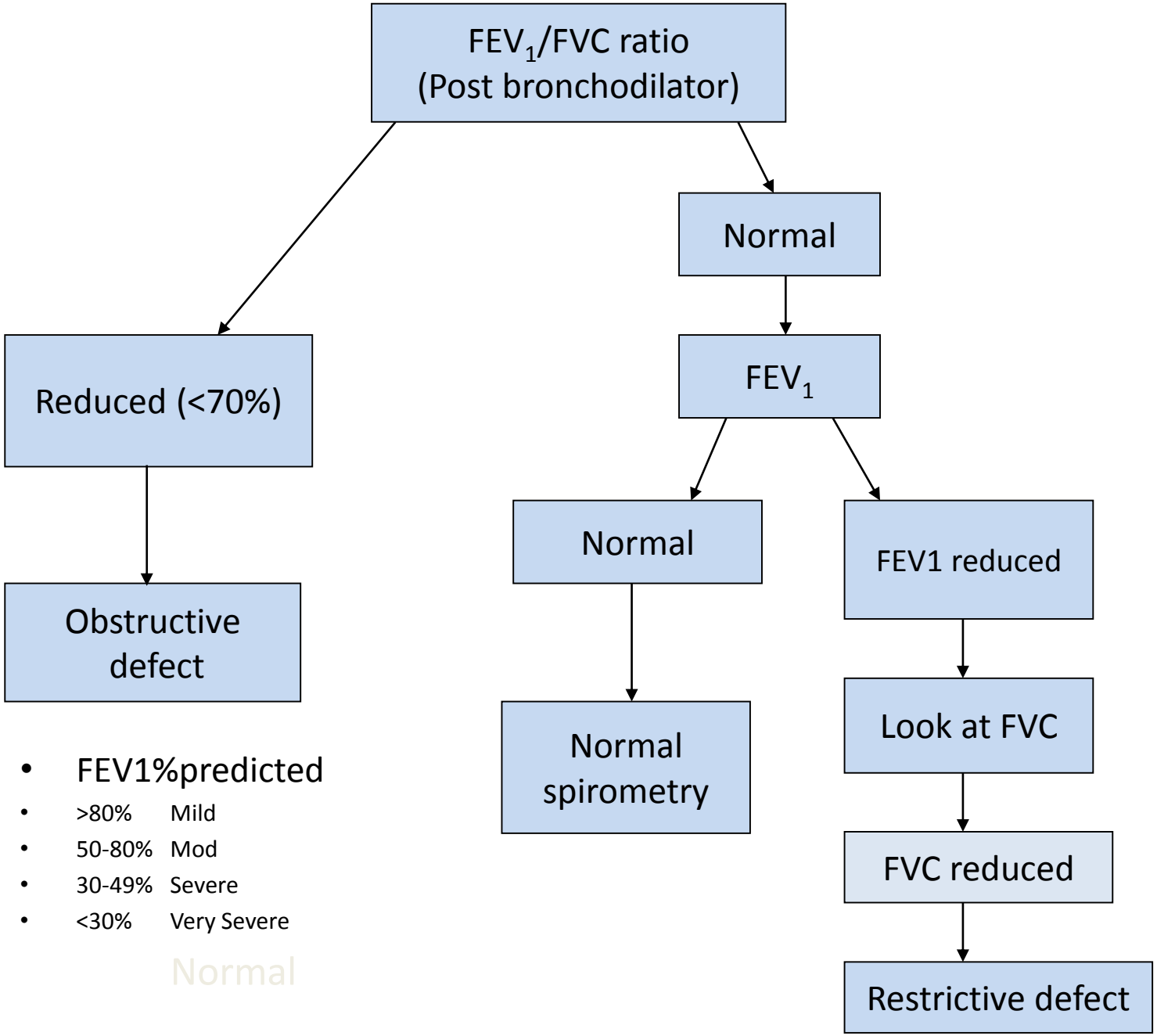
- If a COPD picture (FEV1/FVC < 70% and FEV1 <80%) check for reversibility-

  - If > 400mls more likely to be asthma than COPD.

  - If less than 400mls could be a combination of asthma and COPD or another diagnosis .


FEV1/FVC ratio
(Post bronchodilator)
Reduced (<75%)
Normal
Reduced (<70%)
FEV1
Normal
Reduced
Obstructive
defect
(FVC↓)

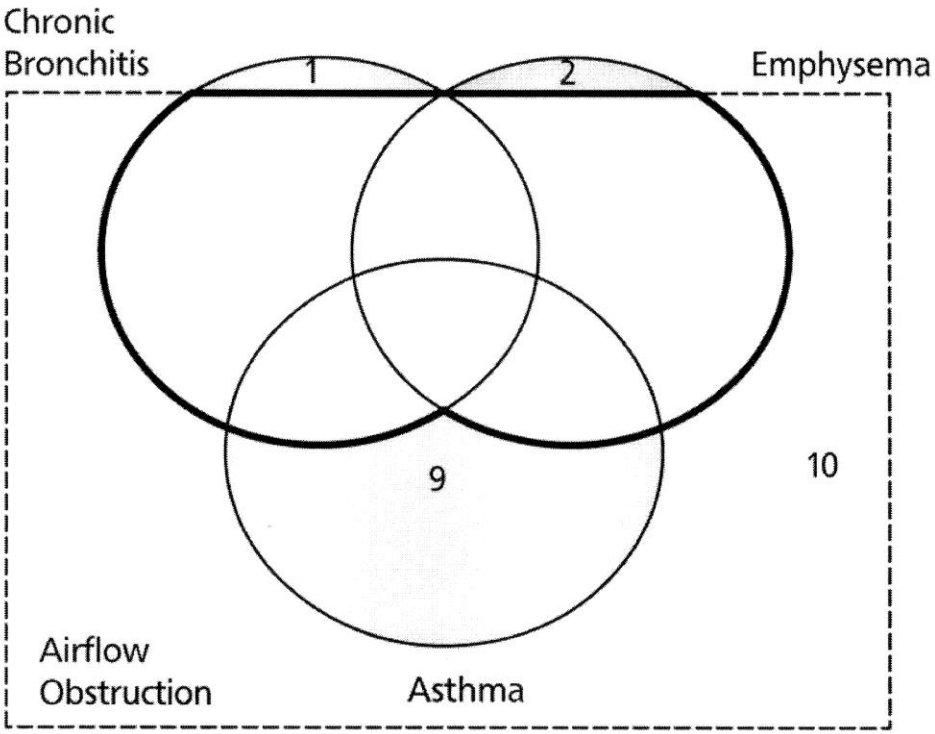

FEV1/FVC ratio
(Post bronchodilator)
Normal
Normal
FEV1
Normal
FEV1 reduced
Normal spirometry
Look at FVC
FVC reduced
Restrictive defect



- FEV1%predicted
- >80% Mild
- 50-80% Mod
- 30-49% Severe
- <30% Very Severe

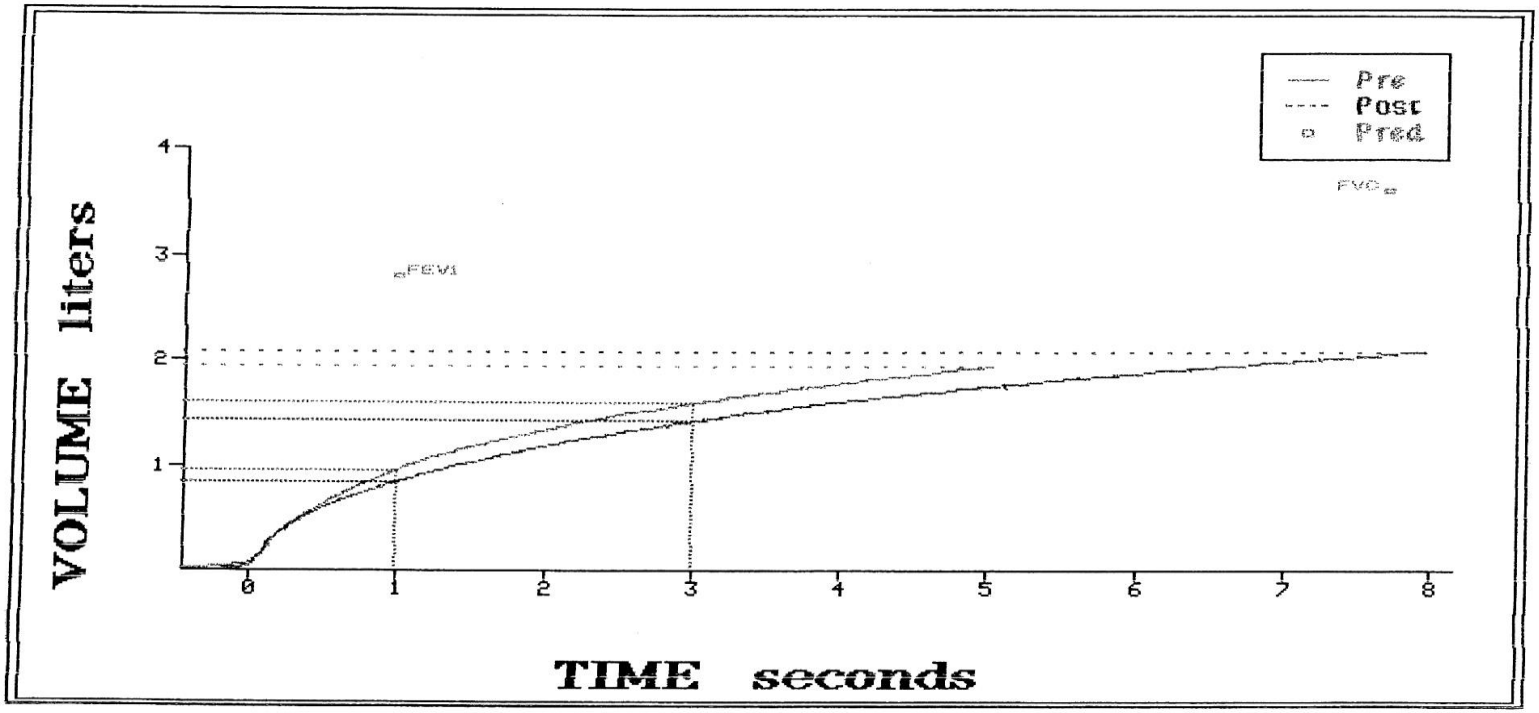
Normal

Airflow Obstruction



1	clinical or radiographic features of chronic bronchitis but airways obstruction is not present
2	clinical or radiographic features of emphysema but airways obstruction is not present
9	unequivocal asthma with completely reversible airways obstruction
10	airflow limitation not due to COPD (e.g. cystic fibrosis, obliterative bronchiolitis)

Case 1



Weight: 72 Kg Height: 1.69 M BMI : 25.38
Age : 68 Sex : M Smoker: X
Consultant: [redacted]
SPIROMETRY

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FEV1/FVC	%	82	68	48	64	43	57	-10
PEFR	L/MIN	528	384	199	43	155	34	-21

Case 1

Weight: 72 Kg [redacted] Height: 1.69 M BMI : 25.38
Age : 68 Sex : M Smoker: X
Consultant: ALEXANDER

SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	3.32	2.3	.98	31	.91	32	-7
FVC	L	4.24	3.02	2.04	56	2.09	57	2
FEV1/FVC	%	82	68	48	64	43	57	-10
PEFR	L/MIN	528	384	199	43	155	34	-21

CASE 1

- SEVERE COPD

Case 2

Weight: 84 Kg Height: 1.77 M BMI : 26.97
Age : 68 Sex : M Smoker: N
Consultant: [redacted]R

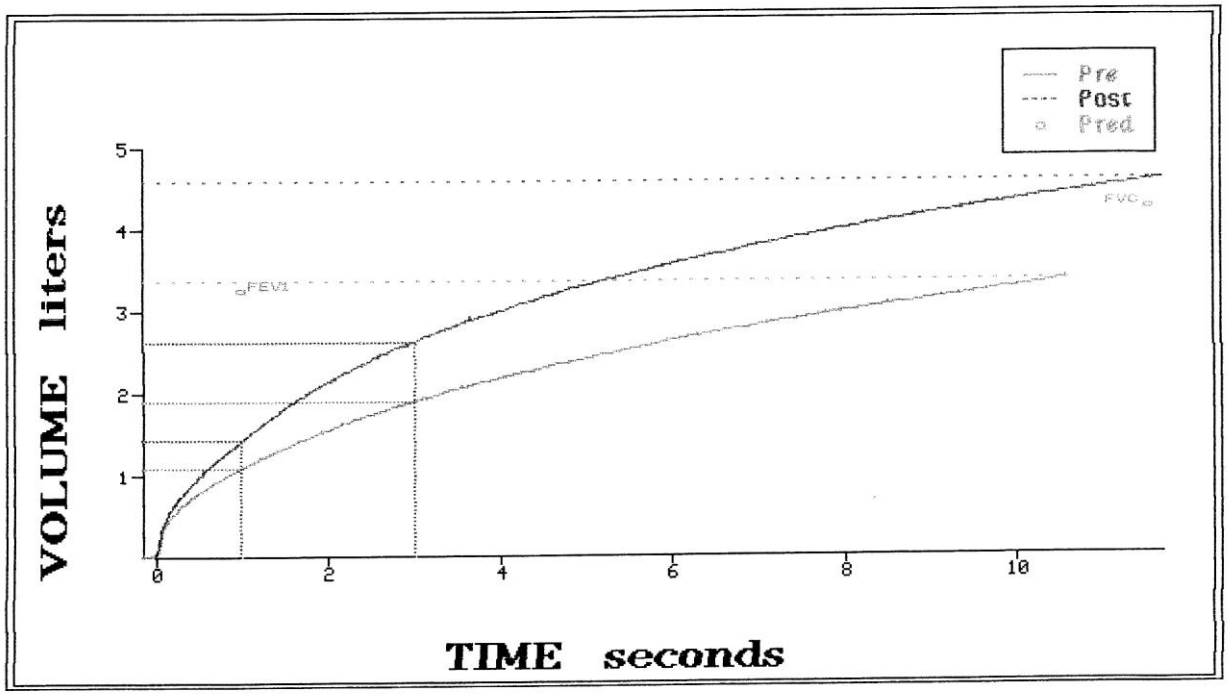
SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHA
FEV1	L	3.99	2.31	1.56	49			
FVC	L	5.1	3.08	1.64	40			
FEV1/FVC	%	87	63	95	126			
SVC	L	5.1	3.08	1.66	40			
PEFR	L/MIN	606	366	362	74			

CASE 2

- Pulmonary Fibrosis

Case 3


Pre
Post
Pred
FEV1
FVC
VOLUME liters
1
2
3
4
5
0
2
4
6
8
10
TIME seconds

Case 3

Weight: 78 Kg
Age : 69
Consultant:

Height: 1.8 M
Sex : M

BMI : 24.13
Smoker: X

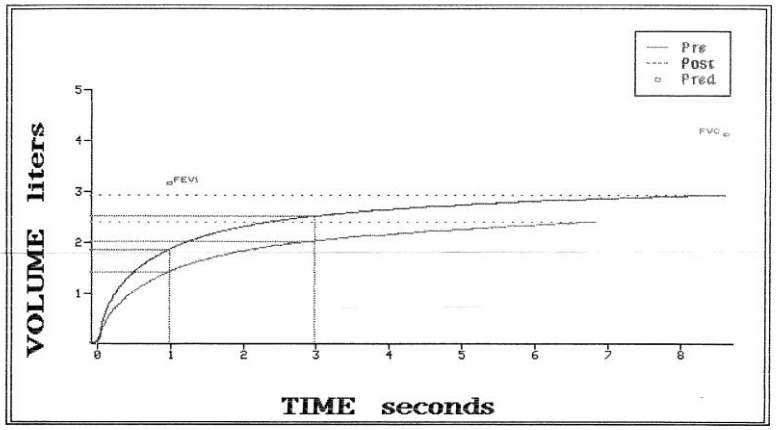
SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	4.09	2.41	1.09	33	1.44	44	32
FVC	L	5.25	3.23	3.4	80	4.61	108	35
FEV1/FVC	%	87	63	32	42	31	41	-3
PEFR	L/MIN	614	374	348	70	387	78	11

Case 3

- SEVERE COPD with REVERSIBILITY

Case 4



Weight: 77 Kg
Height: 1.78 M
BMI : 24.17
Age : 69
Sex : M
Smoker: X
Consultant: Masani

SPIROMETRY

		PREDICTED RANGE		PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	4.01	2.33	1.43	45	1.88	59	31
FVC	L	5.14	3.12	2.43	58	2.95	71	21
FEV1/FVC	%	87	63	59	78	64	85	8
PEFR	L/MIN	607	367	286	58	389	79	35

Case 4

Weight: 77 Kg Height: 1.78 M BMI : 24.17
Age : 69 Sex : M Smoker: X
Consultant: [redacted]

SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	4.01	2.33	1.43	45	1.88	59	31
FVC	L	5.14	3.12	2.43	58	2.95	71	21
FEV1/FVC	%	87	63	59	78	64	85	8
PEFR	L/MIN	607	367	286	58	389	79	35

Case 4

- Bronchiectasis
- (Asthma or COPD + reversibility)

Case 5

Weight: 81 Kg Height: 1.67 M BMI : 29.04
Age : 62 Sex : M Smoker: X
Consultant:

SPIROMETRY

		PREDICTED	RANGE	PRE BRONCHODILATOR TEST	% PREDICTED	POST BRONCHODILATOR TEST	%PREDICTED	%CHANGE
FEV1	L	3.74	2.06	2.35	81			
FVC	L	4.68	2.66	2.78	75			
FEV1/FVC	%	88	64	84	110			
PEFR	L/MIN	585	345	525	112			

Case 5

Pulmonary fibrosis