

ADVANCED RESPIRATORY INVESTIGATIONS

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Contents

- Lung function
- CT scanning
- Bronchoscopy

Remember its place

- History
- Examination
 - Measure expiratory time
 - Look in the sputum pot
- Special investigations
 - CXR
 - Peak flow

LITERS

8
7
6
5
4
3
2
1
0

TOTAL LUNG
CAPACITY

VITAL
CAPACITY

TIDAL
VOLUME

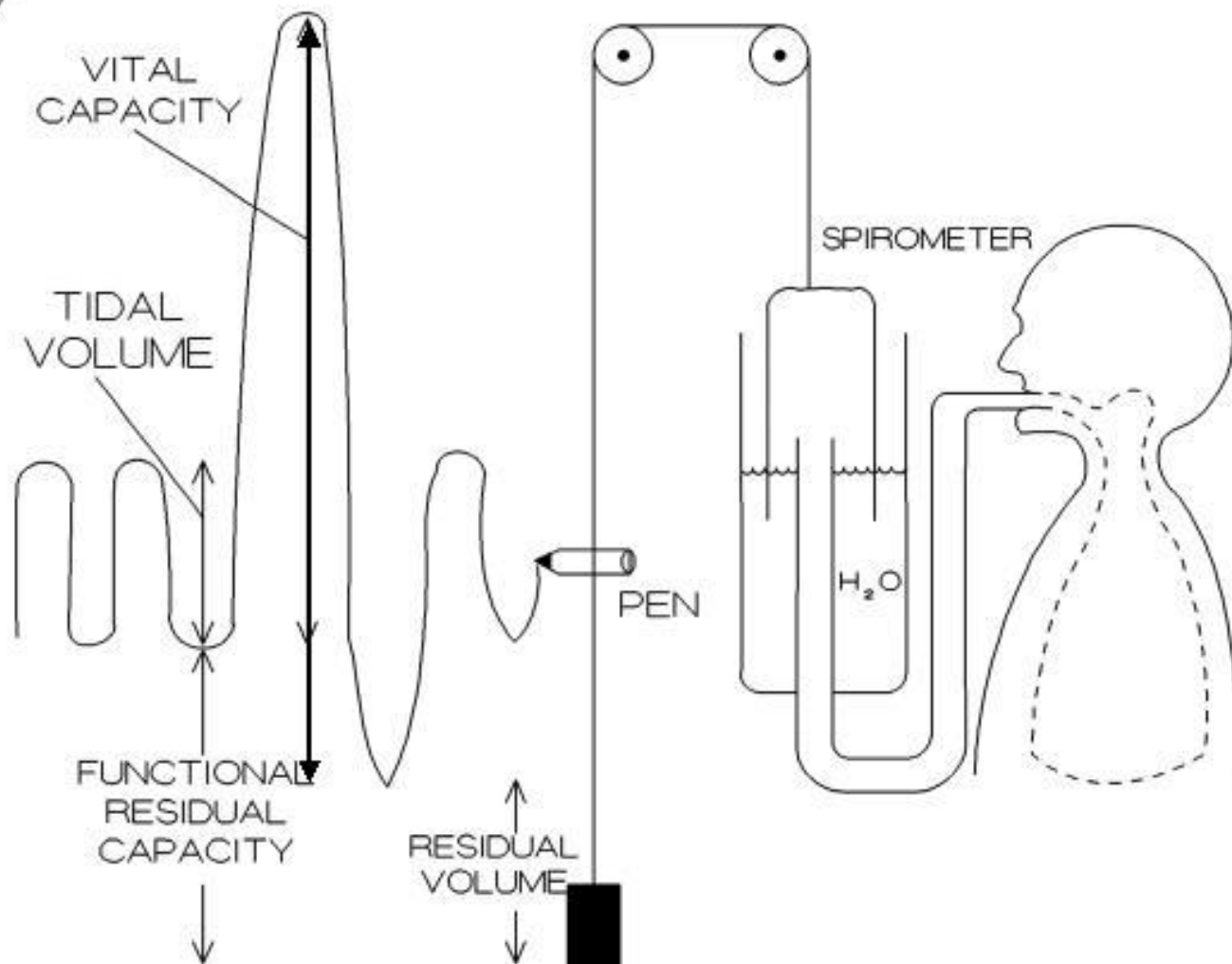
FUNCTIONAL
RESIDUAL
CAPACITY

RESIDUAL
VOLUME

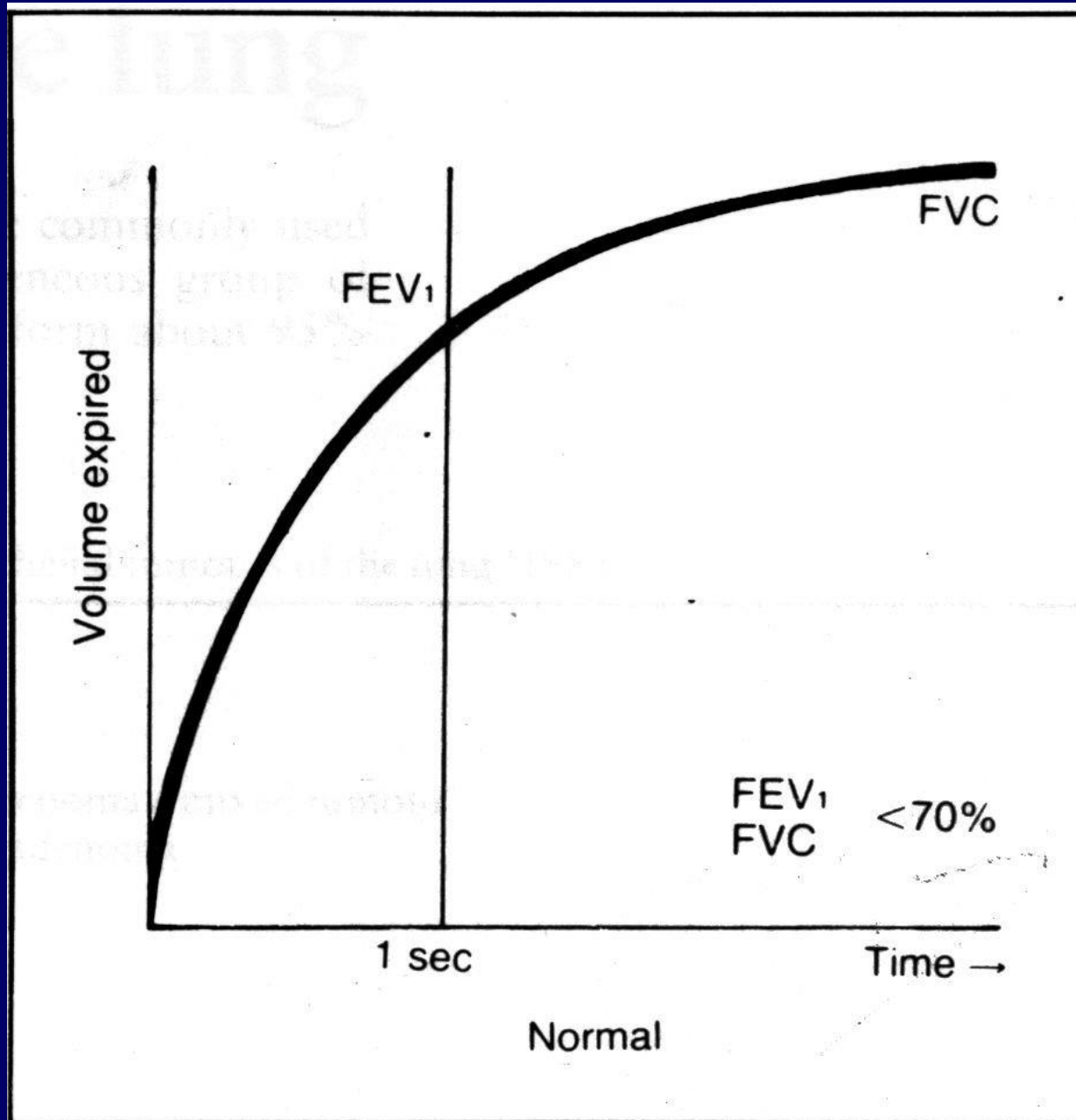
PEN

SPIROMETER

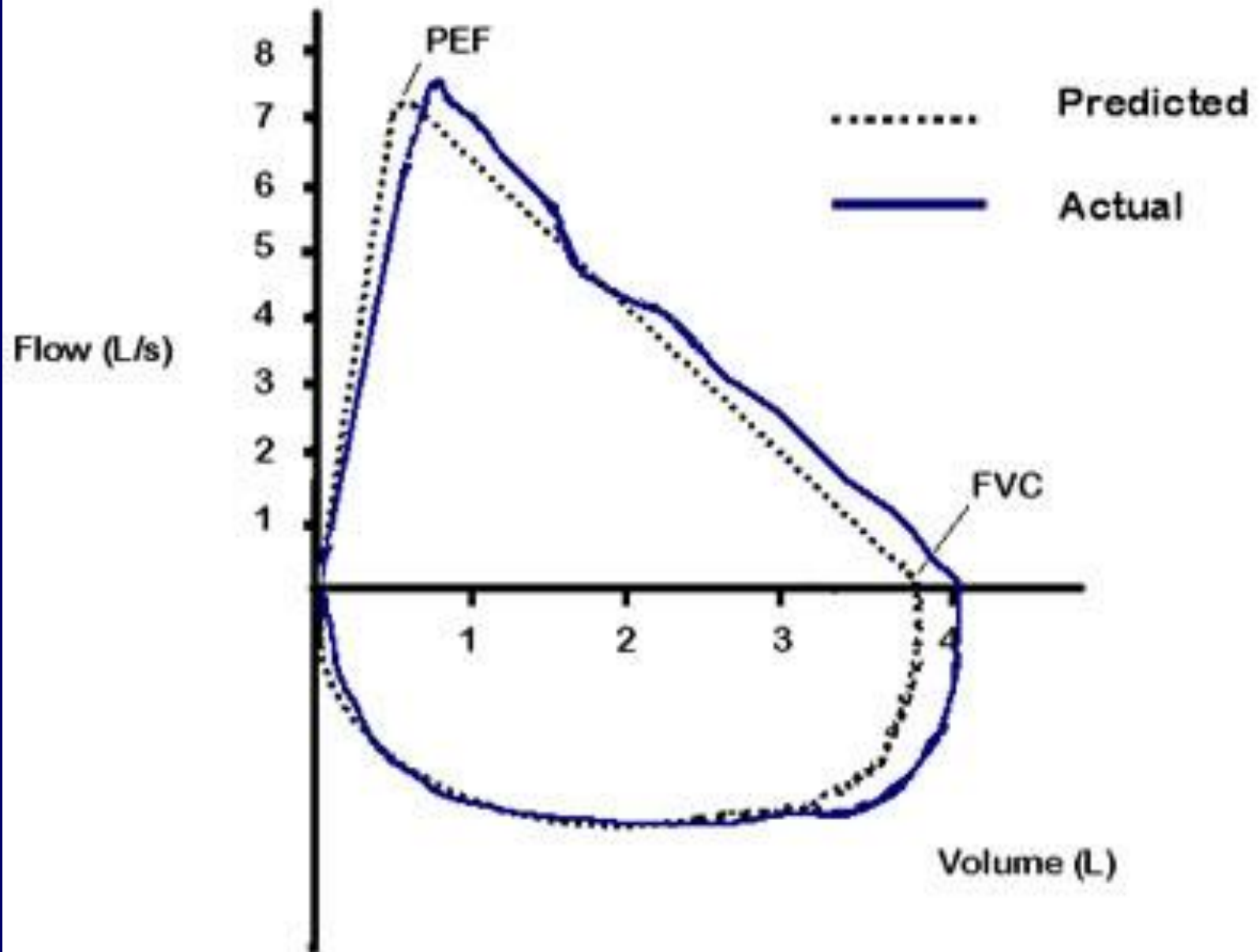
H₂O



Spirometry: normal



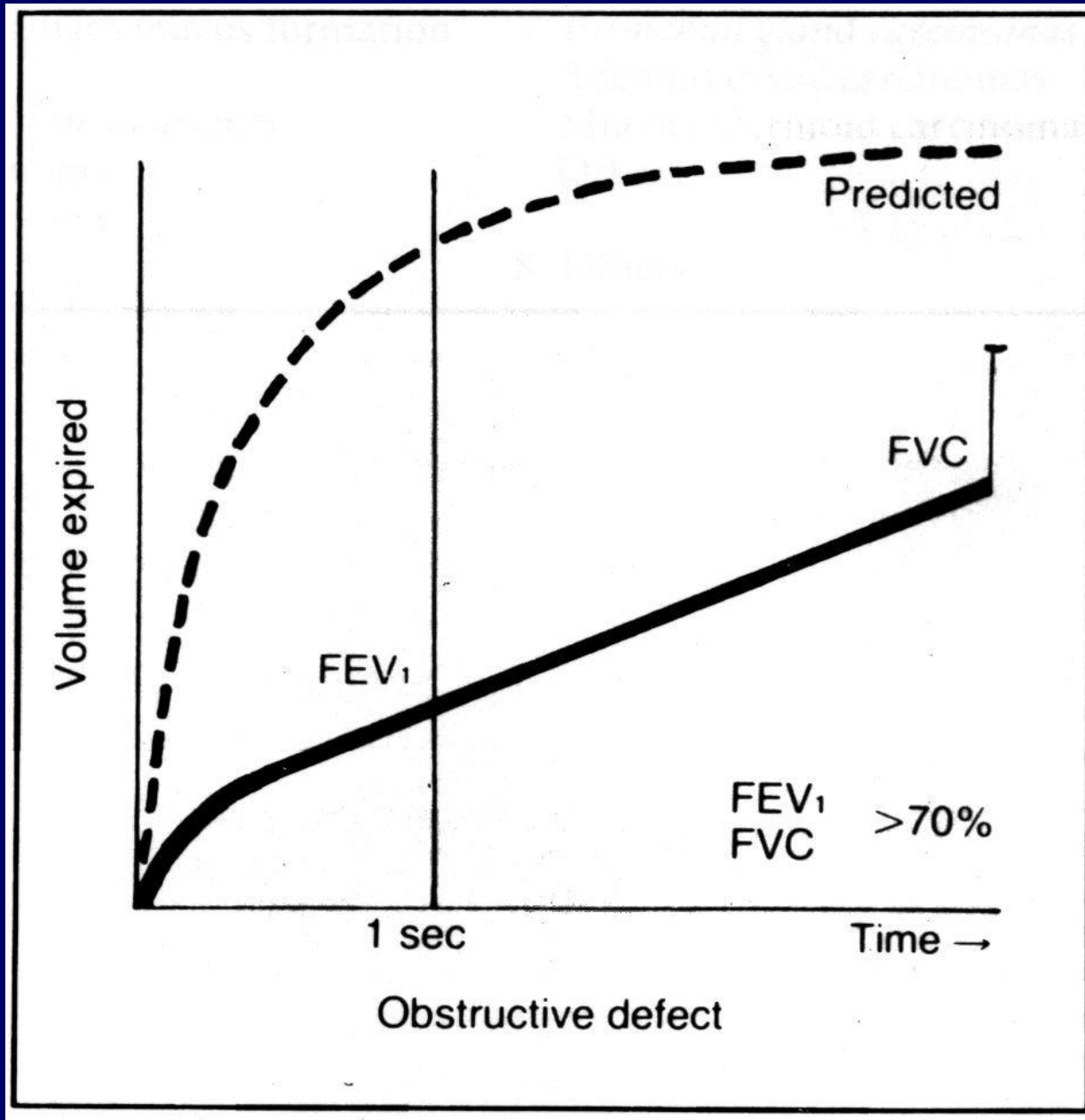
Flow-volume loop



Other features on lung function testing

- Lung volumes
 - Helium dilution
 - Body plethysmography
- Diffusion capacity
 - Measured by CO diffusion
 - Assesses access to pulmonary capillary circulation

Spirometry: obstructive



Obstructive disease

SPIROMETRY

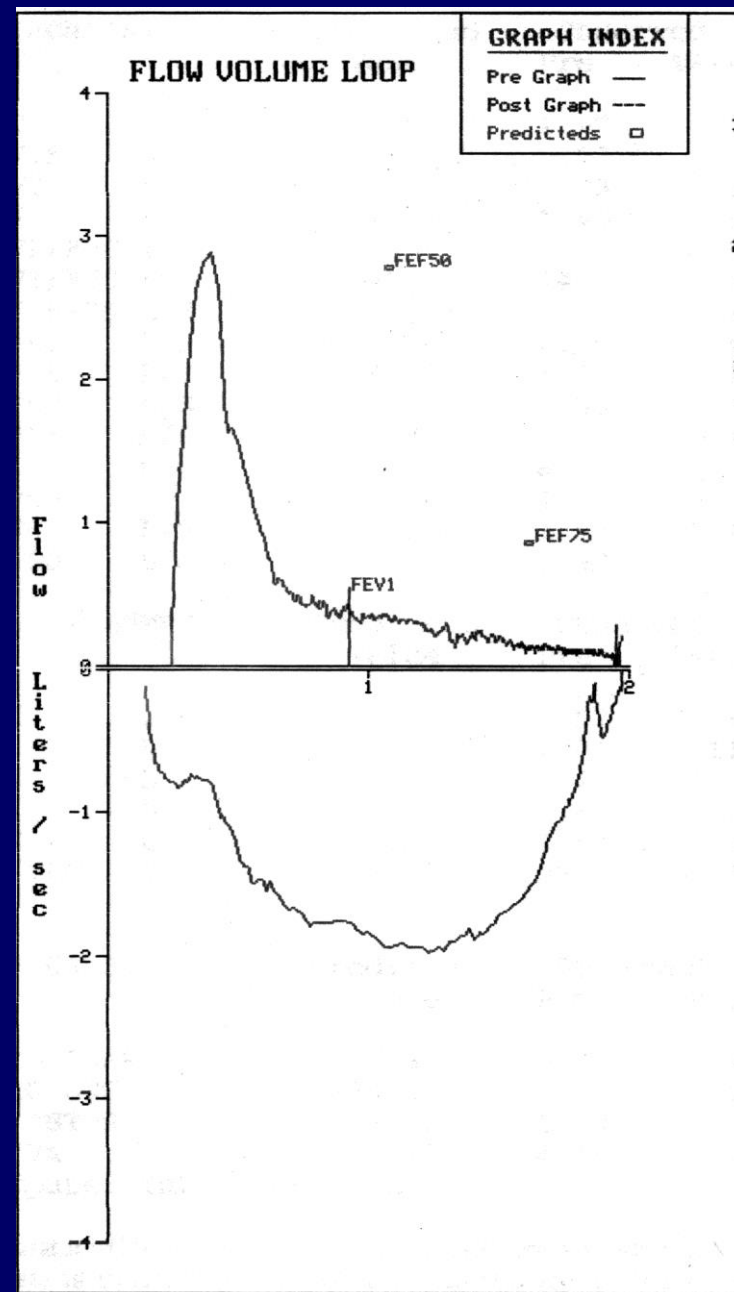
		Predicted Value	Observed Pre	%Pred
FVC	L	2.16	1.97	91
FEV.5	L	1.66	.73	43
FEV1	L	1.71	.93	54
FEV3	L	2.22	1.46	65
FEV1/FVC %		80	47	58
FEV3/FVC %		92	74	80
FEF25-75	L/S	2.17	.34	15
PEFR	L/S	6.49	2.89	44
FEF25	L/S	5.92	1.66	28
FEF50	L/S	2.79	.36	12
FEF75	L/S	.86	.22	25
FET	Sec		8.13	
FIVC	L	2.16	1.82	84
PIFR	L/S	4.33	1.97	45
FIF50	L/S		1.92	

LUNG VOLUMES

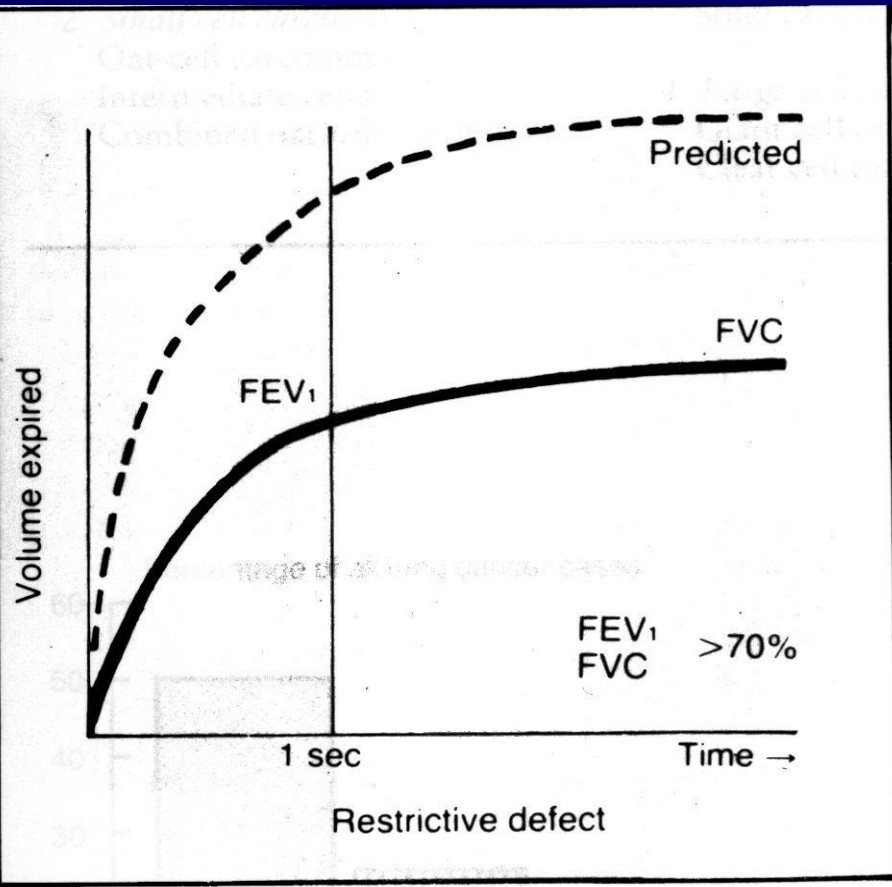
		Predicted Value	Observed Pre	%Pred
SVC	L	2.16	1.97	91
IC	L	1.47	1.76	119
ERV	L	.69	.21	30
RV	L	1.68	.67	39
TLC	L	3.84	2.64	68
RV/TLC %		35	25	71

DIFFUSION

		Predicted Value	Observed Pre	%Pred
DLCO CORR		20.3	9.93	48
DLCO UNC		20.3	9.39	46
VA @BTPS		6.12	2.39	39
DL/VA		3.93	4.15	105



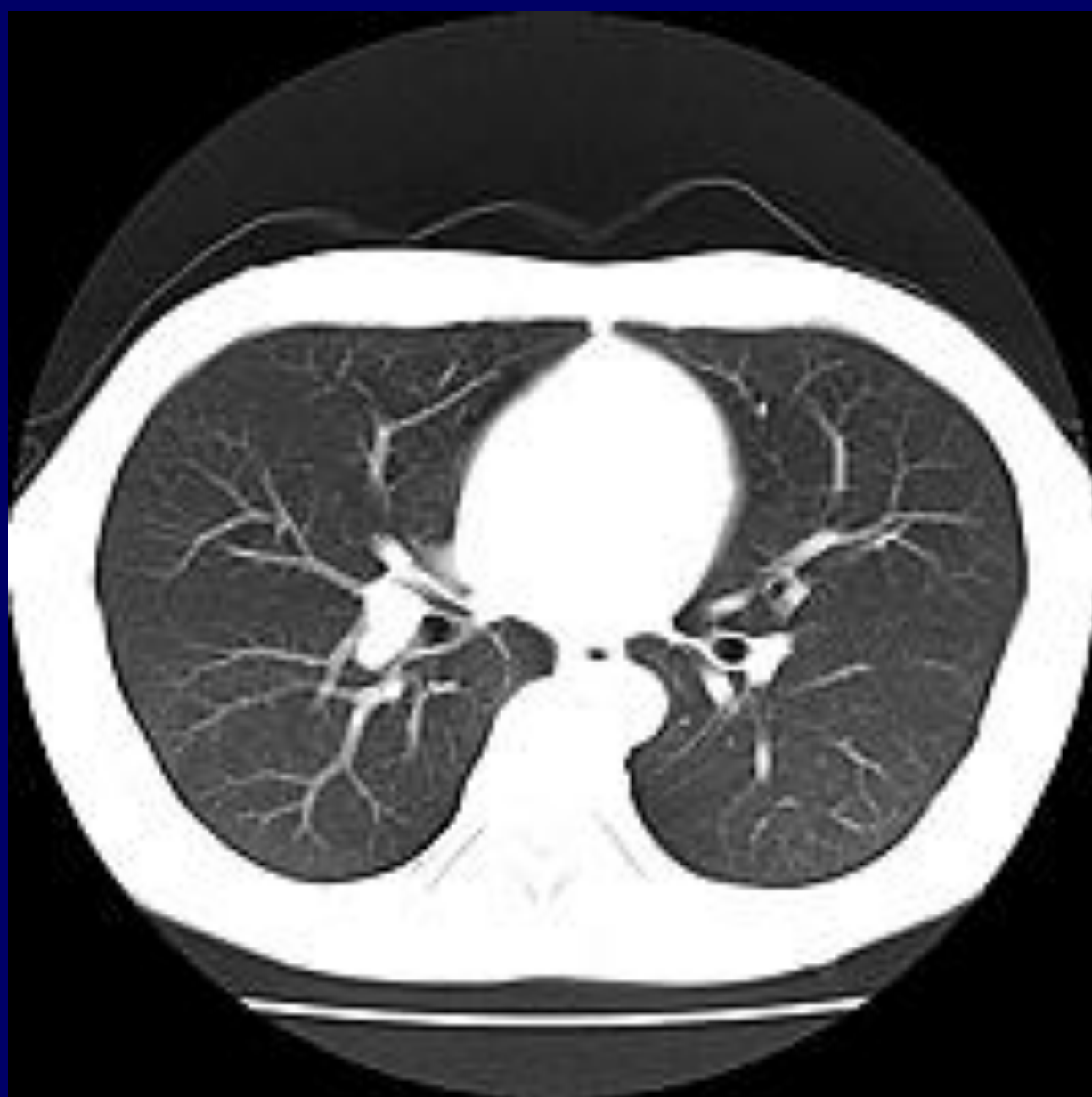
Restrictive disease



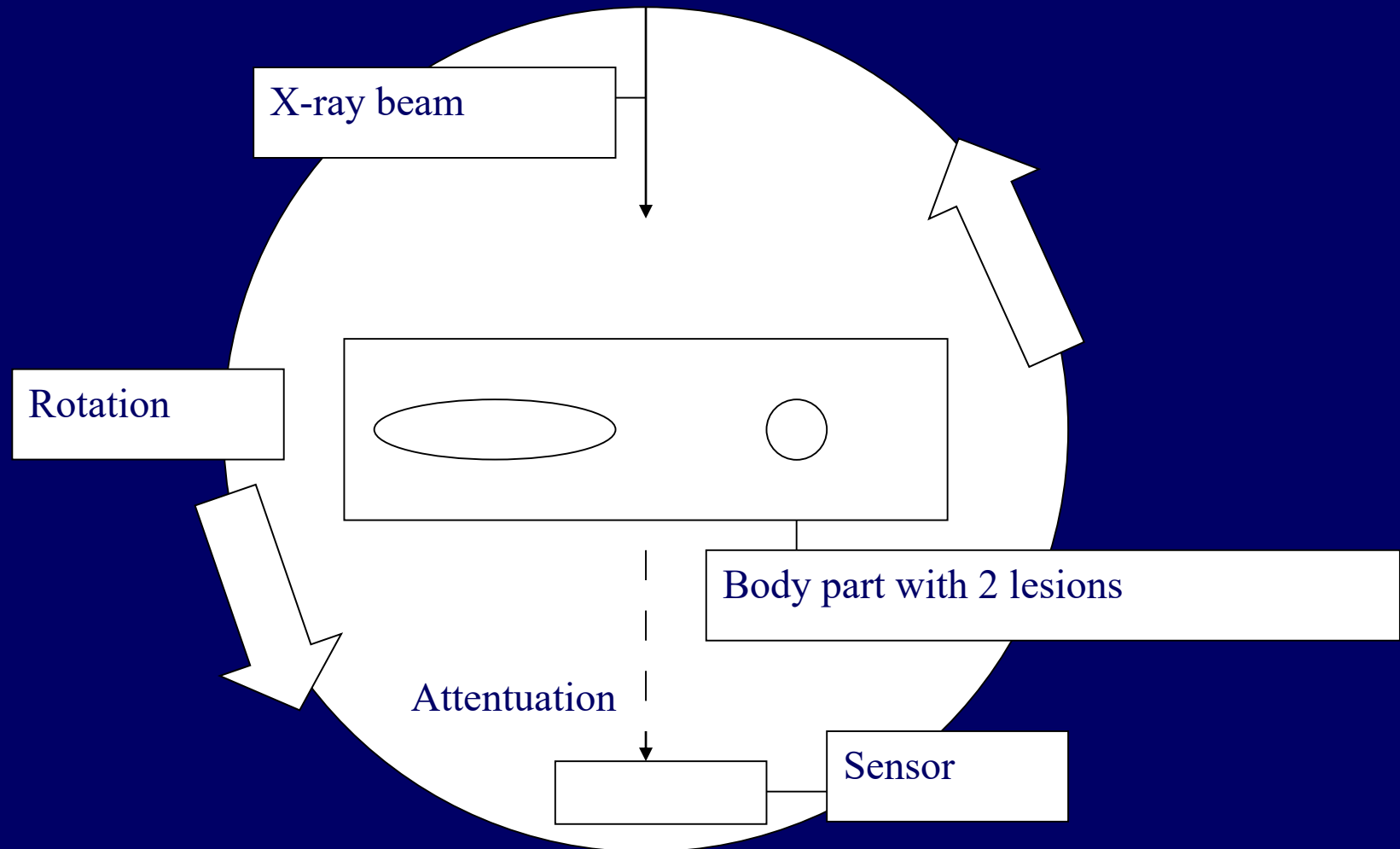
LUNG VOLUMES		Predicted Value	Observed Pre	%Pred
SVC	L	1.81	1.77	97
FRC	L	2.17	1.37	63
IC	L	1.56	.97	62
ERV	L	.25	.8	320
RV	L	1.92	.15	7
TLC	L	3.73	1.91	51
RV/TLC	%	49	8	16

DIFFUSION		Predicted Value	Observed Pre	%Pred
DLCO CORR		20.3	9.93	48
DLCO UNC		20.3	9.39	46
VA @BTPS		6.12	2.39	39
DL/VA		3.93	4.15	105

Computer Interpretation:



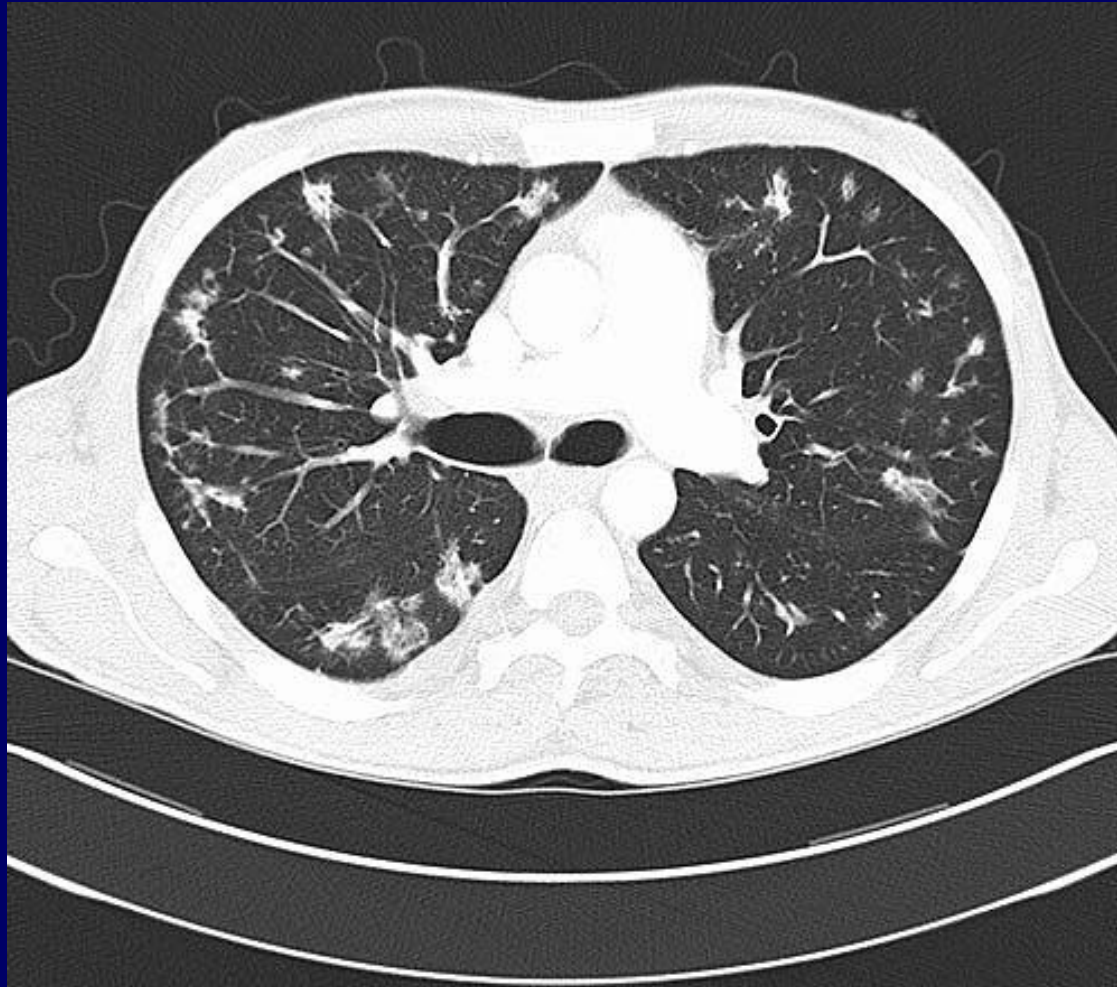
CT thorax - mechanics



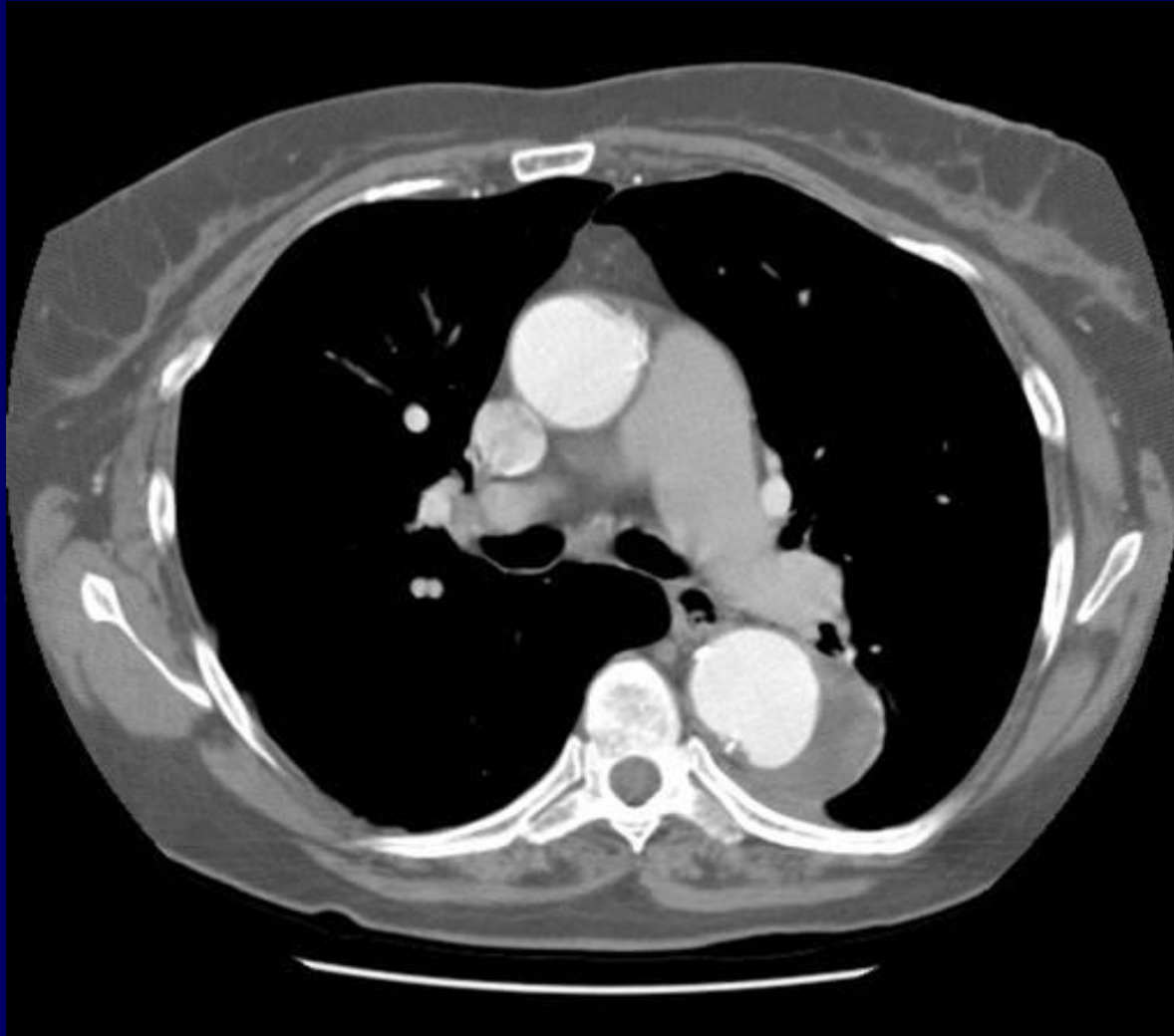
Advantages of CT

- Better resolution than CXR
- Digital manipulation allows different 'window settings'
- Contrast enhancement
- Single slice vs multi slice
 - 3D reconstruction
- High resolution

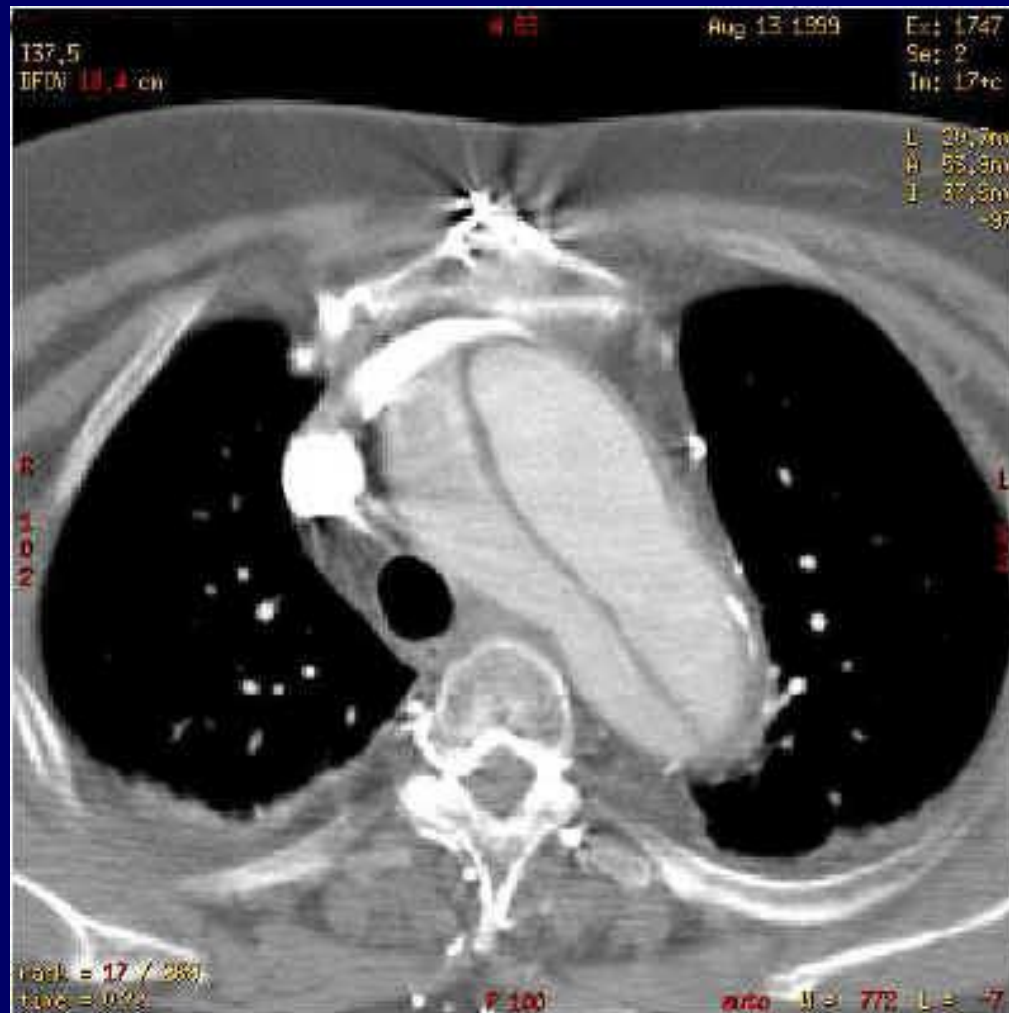
Lung window



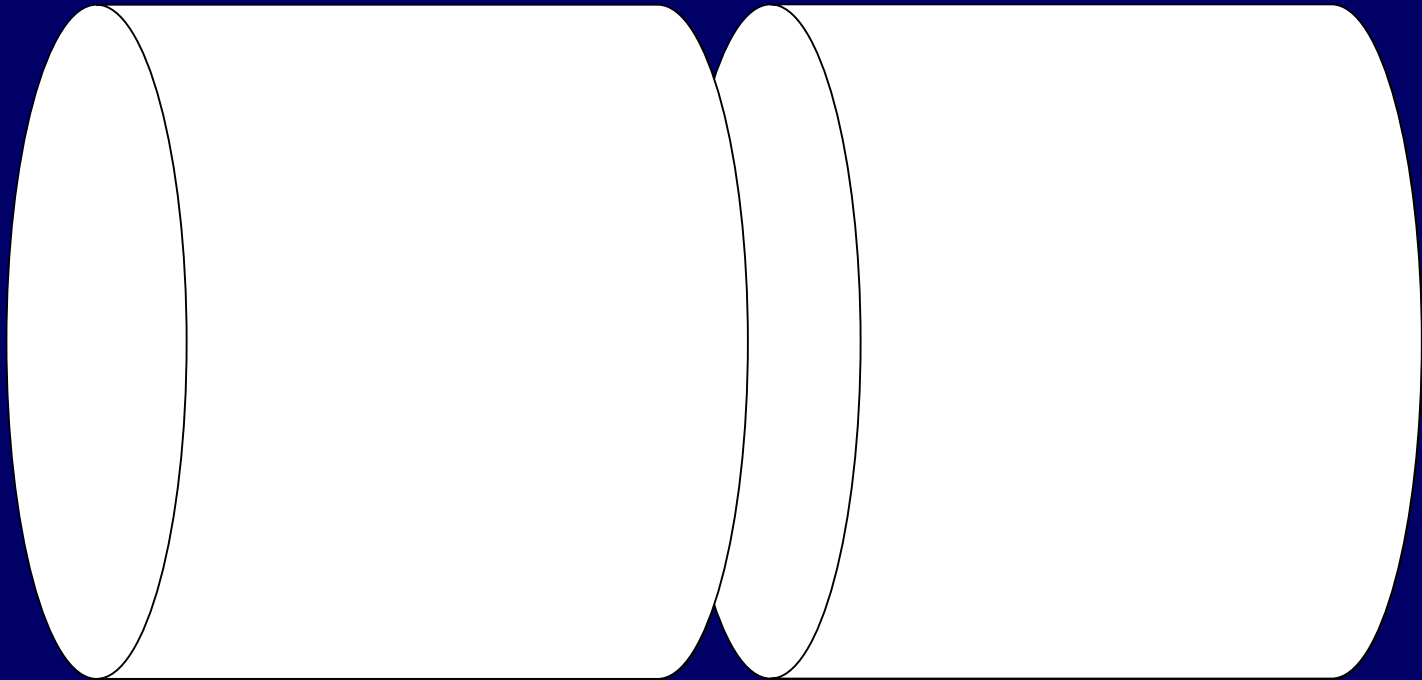
Mediastinal window



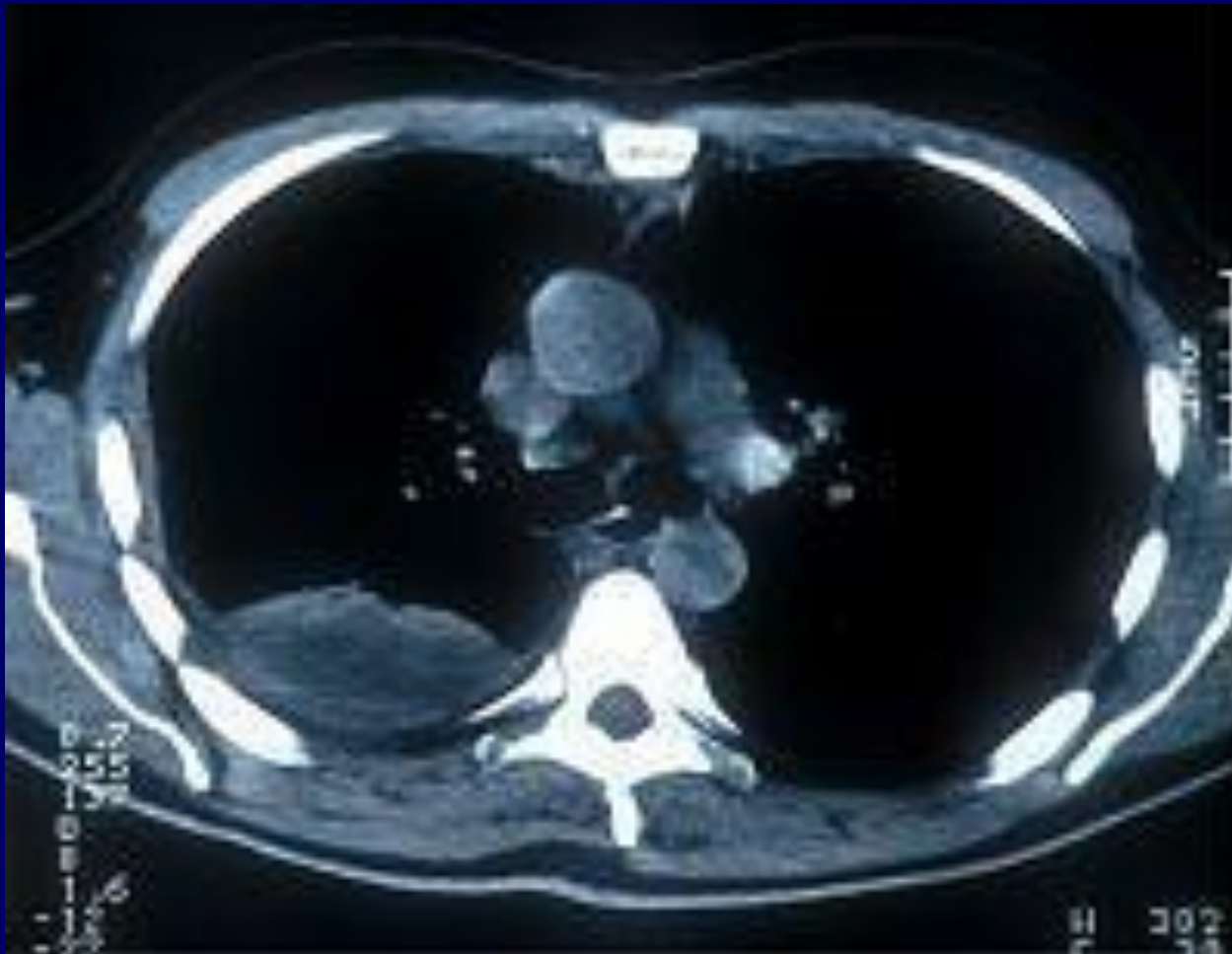
Contrast enhancement



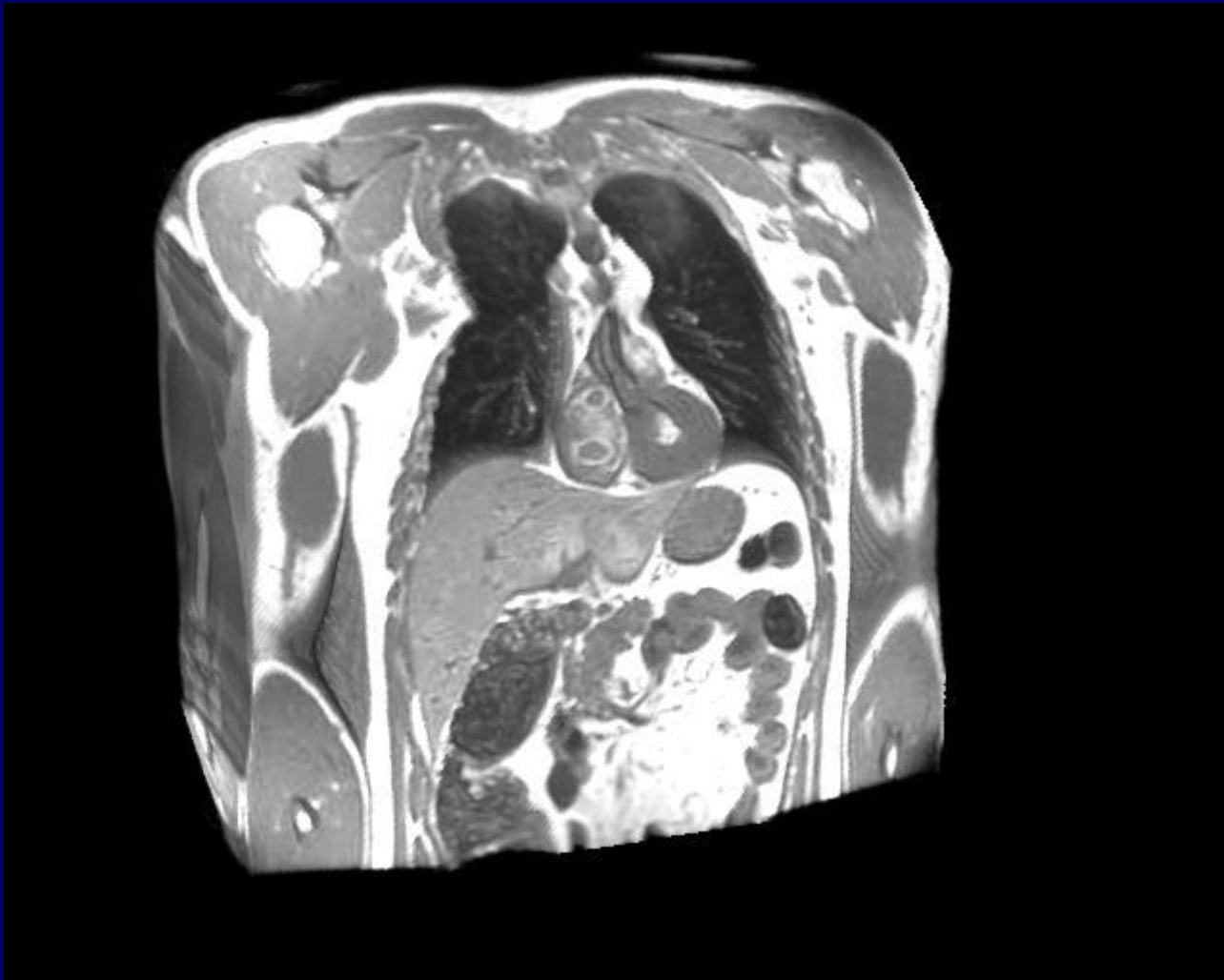
Single slice vs multi slice



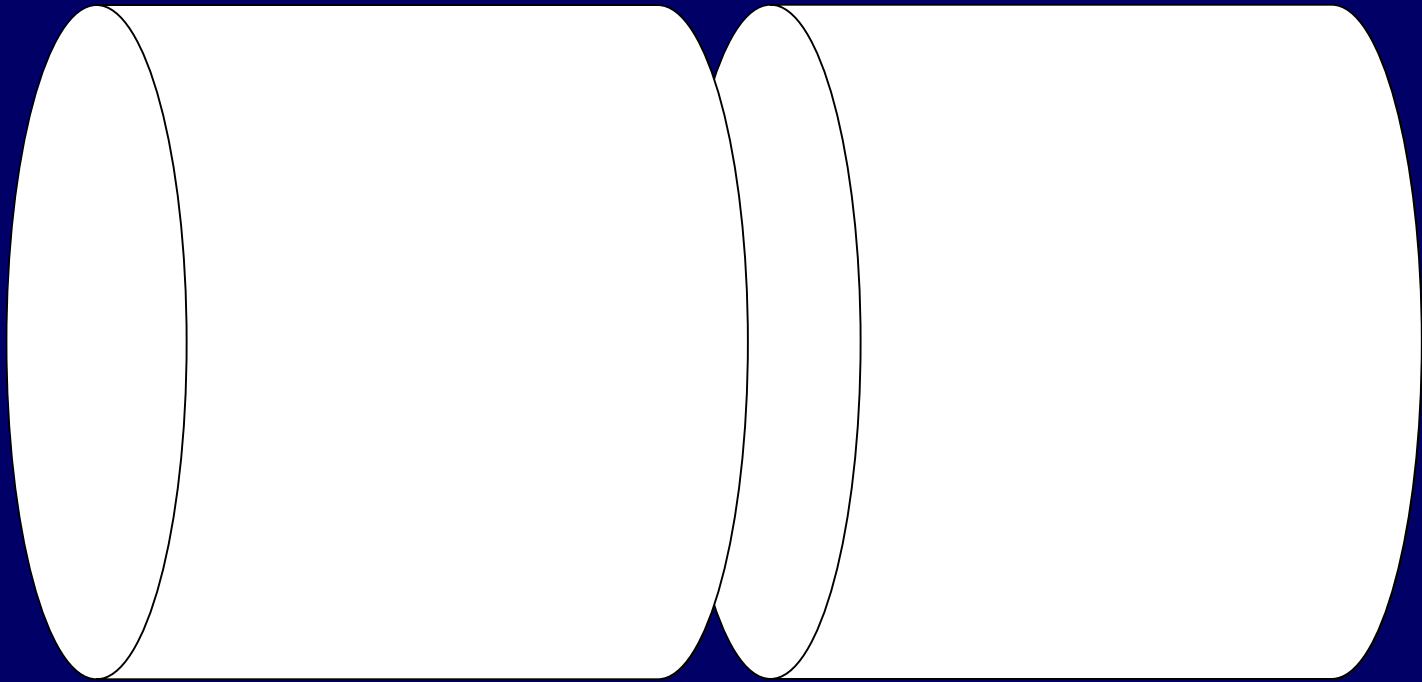
Single slice



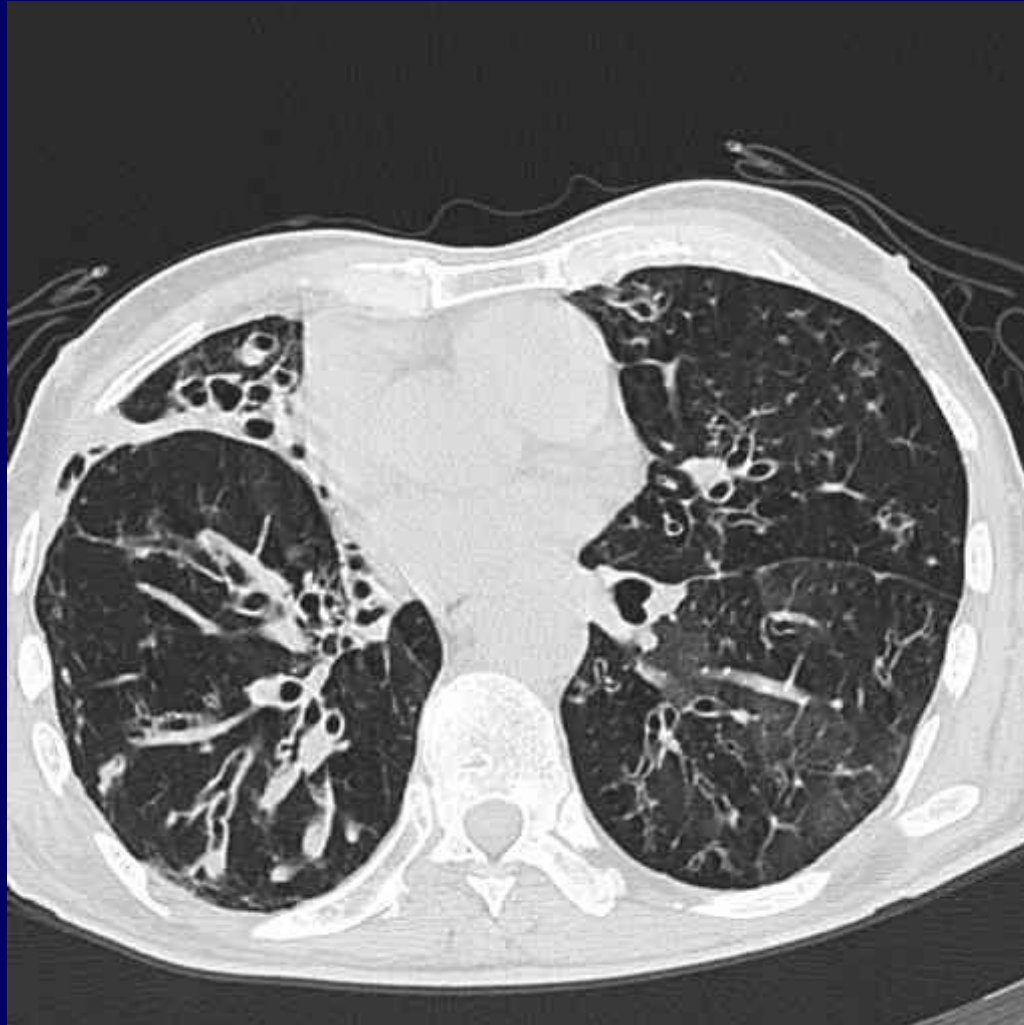
Spiral reconstruction



High Resolution (thin slice)



Bronchiectasis



Bronchoscope



Preparation

- Consent
- Fasting for 6 hrs (NB diabetes mellitus)
- Atropine, nebulise 2% lignocaine
- Consider i.v. sedation
- Recovery

Indications

- Diagnostic
 - Lavage
 - microbiology
 - cytology
 - Biopsy
 - endobronchial
 - transbronchial
- Therapeutic
 - Removal of foreign bodies
 - Lavage
 - Stenting
 - Haemorrhage

Vocal cords



Trachea



Bronchial carcinoma



Normal LLL



Tumour Occluding LLL

Complications

- Laryngospasm
- Bleeding
- Pneumothorax
- Cross-infection

Summary

- Lung function
- CT scanning
- Bronchoscopy