

Conducting an optimal lung function

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Calibration

- ☞ Daily
- ☞ Adjust atmospheric variables
- ☞ 3Litre syringe
- ☞ Bacterial filter
- ☞ Varying flows
- ☞ Maximum deviation :50 ml



- ☞ Accurate measurement requires accurate calibration

Abstinence

- β-Agonists - 4 hours
- Anti-cholinergics – 6 hours
- Oral/long acting β-Agonists and theophylline - 24 hours
- Caffeine products and smoking - 2 hours
- Inhaled steroids continue as prescribed
- Rest for ± 15 minutes prior to test

Contraindications

- ⊃ Haemoptysis (severe)
- ⊃ Post ophthalmology surgery
- ⊃ Post neuro surgery
- ⊃ Angina
- ⊃ Upper aorta aneurysm
- ⊃ PTB (untreated, RX $<^2/_{52}$, MDR, XDR)

Demographics

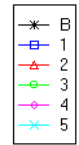
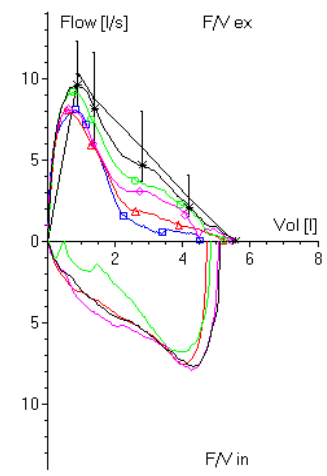
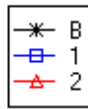
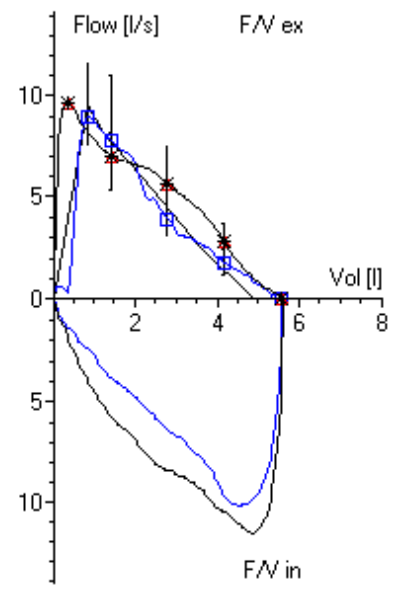
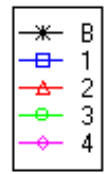
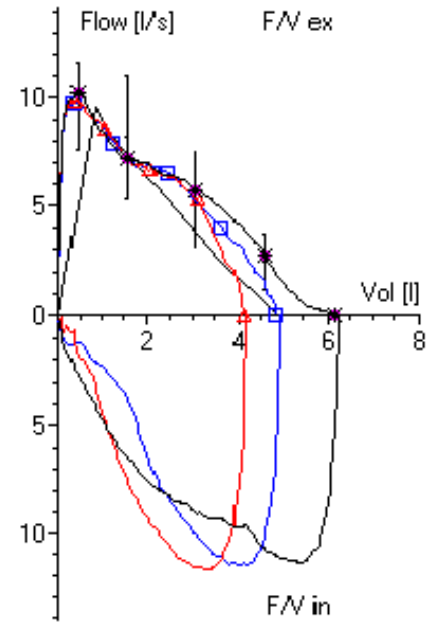
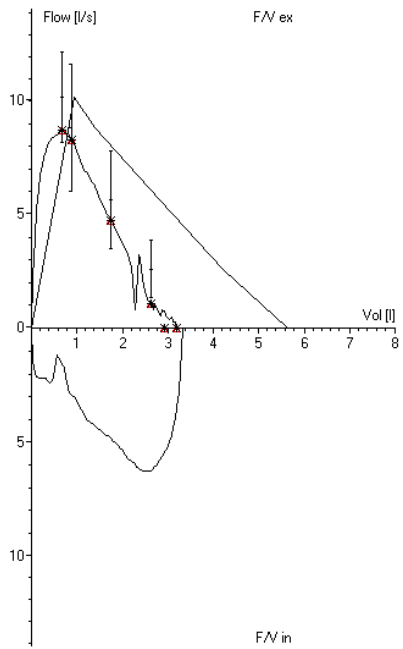
- 👉 Patient name
- 👉 Patient number
- 👉 Date of birth / Age
- 👉 Height
- 👉 Weight
- 👉 Gender
- 👉 Race

Test methods

- ☞ Sitting / standing (make note of position)
 - ☞ Sitting erect
 - ☞ Neck extended
 - ☞ No slouching or bending over during test
- ☞ Tidal volume – Inspiration – Forced expiration – Forced inspiration
- ☞ Tidal volume – Expiration – Forced inspiration – Forced expiration
- ☞ Both maneuvers are easy!
- ☞ But

Acceptability criteria

- ☞ Satisfactory start
- ☞ Min. FVC exhalation time
- ☞ End of test Criteria
- ☞ Free from artifacts
- ☞ Expiratory start



	Pred	Act1	Act2	Act3	Act4	Act5	Best%Pred
FVC.....[l]	5.49	4.52	5.18	5.24	5.42	5.57	101.4
FEV 1.....[l]	4.61	2.91	3.34	4.34	3.98	4.57	99.20
FEV 1 % FVC.....[%]		64.41	64.56	82.85	73.53	82.13	82.13
FVC IN.....[l]	5.75		4.68	4.80	5.03	5.05	87.81
FIV1.....[l]			4.56	3.72	4.86	4.72	4.72

Reproducibility

- ❏ First apply acceptability criteria
- ❏ Unacceptable maneuvers discarded
- ❏ Reproducibility criteria need minimum 3 acceptable FVC maneuvers
- ❏ If not reproducible – continue testing
- ❏ Maximum of 8 attempts

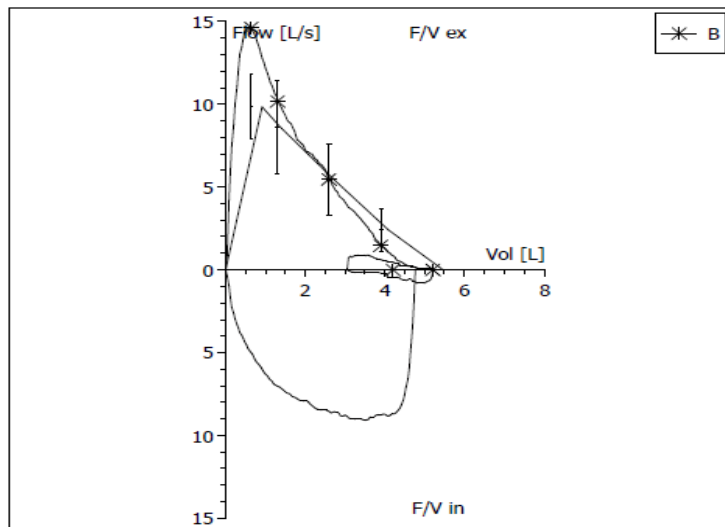
Reproducibility

- 2 Largest FVC values within 150ml
- 2 Largest FEV₁ values within 150ml
- 2 Largest PEF values within 670ml/s
- Where FVC ≤ 1ℓ attempts within 100ml

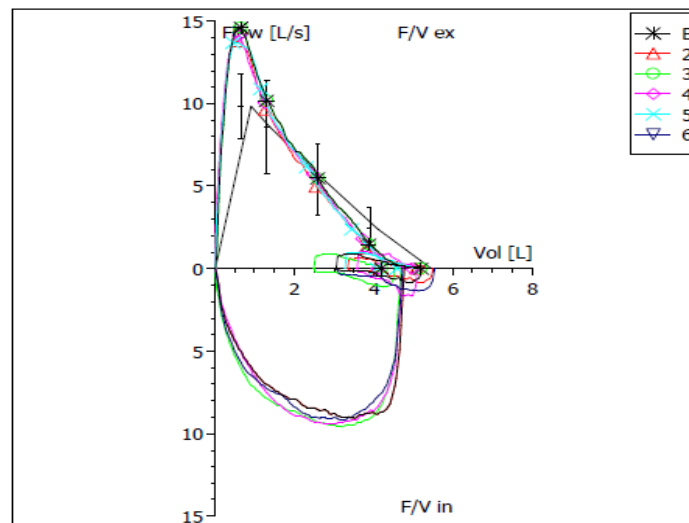
Last Name:
 Identification:
 Race: White
 Height: 192 cm
 Smoker:
 Operator:
 Diagnosis:

First Name:
 Date of Birth: 24/01/1963
 Sex: male
 Weight: 110 kg
 Age: 49 Years
 Physician: --

BEST FLOW-VOLUME:



FLOW-VOLUME ATTEMPTS:



		Pred	Act2	Act3	Act4	Act5	Act6	Best	%Pre
FVC	[L]	5.45	5.07	5.19	4.95	4.58		5.19	95.2
FEV 1	[L]	4.34	4.05	4.19	4.10	4.07		4.19	96.5
FEV 1 % FVC	[%]		79.92	80.86	82.89	88.92		80.86	
FVC IN	[L]	5.69	4.74	4.68	4.70		4.72	4.74	83.4
FIV1	[L]		4.72	4.64	4.68		4.68	4.72	
FEV6	[L]		4.85	5.00	4.80			5.00	
FET	[s]		16.06	10.10	10.18	5.71		10.10	
MEF 75	[L/s]	8.59	9.60	10.16	10.03	10.89		10.16	118.3
MEF 50	[L/s]	5.41	4.96	5.45	5.70	6.16		5.45	100.8
MEF 25	[L/s]	2.40	1.20	1.43	1.78	2.36		1.43	59.7
MMEF 75/25	[L/s]	4.32	3.76	4.08	4.40	5.15		4.08	94.6
PEF	[L/s]	9.83	13.78	14.58	14.13	13.69		14.58	148.3
PIF	[L/s]		9.12	9.61	9.41		9.21	9.12	
Exspir. F/V area	[L*L/s]	29.45	28.01	29.75	28.68	28.54		29.75	101.0
Inspir F/V area	[L*L/s]		34.29	36.11	34.97		34.20	34.29	
AEX % AIN	[%]		81.68	82.40	82.00	115.9		82.40	

Measuring date: 08/11/12
 Measuring time: 09:18:34

Folder no: 20143244

Birth Date: 1959/05/27

Gender: Female

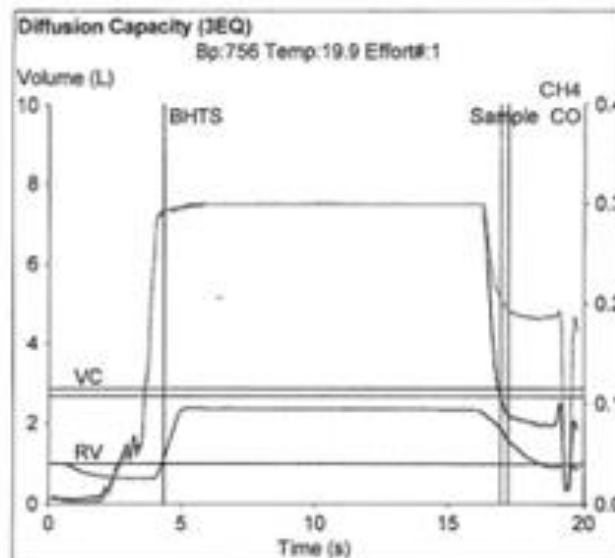
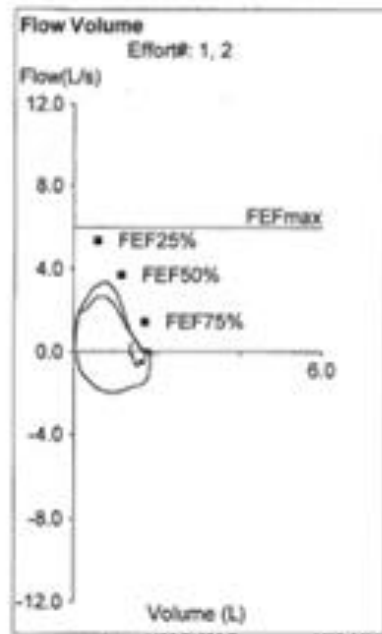
Age: 51

Weight: 73.0 kg, 160.6 lbs

Height: 156.0 cm, 61.4 in

Body Mass Index: 30.00 kg/m²

Pre Flow Volume Loop



	Predicted	Pre BD Reported	Pre BD Effort 1	Pre BD Effort 2	Pre BD Effort 3	Pre BD Effort 4	Pre BD Effort 5	Pre BD % Predicted
FEV1	1.94	1.60	1.57	1.60				82
FVC	2.29	1.87	1.72	1.87				82
FEV1/FVC	79.41	85.79	91.37	85.79				108
PEFmax	5.94	3.35 <	2.69 <	3.35 <				56 <
FEF50%	3.71	3.15	2.52	3.15				85
PIFmax	4.01	2.00	0.69	2.00				50 <
TET		6.57	2.26	6.57				
Test Time		01:10 PM	01:09 PM	01:10 PM				
Test Date		2010/08/25	2010/08/25	2010/08/25				
	Predicted	Pre Drug Reported	Pre Drug % Predicted	Post Drug Reported	Post Drug % Predicted	%Change		
Test Date		2010/08/25						

Interpreting lung function tests

1. System calibrated accurately
2. Correct patient demographics
3. Lung function tests acceptable
4. Lung function tests reproducible

1. Miller MR, Crapo R, Hankinson J, et al. Eur Respir J. 2005; 26: 153-161
2. Miller MR, Hankinson J, Brusasco V, et al. Eur Respir J. 2005; 26: 319-338
3. Koegelenberg CF, Swart F, Irusen EM. S Afr Med J. 2013;103:52-61

Thank you



Infection control

- ↳ Disposable mouthpiece
- ↳ Bacterial filters
- ↳ Mask for operator
- ↳ Gloves for operator
- ↳ Clean spirometer