



- Spirometry Made Easy

Answer the question

What is spirometry?

A blue rectangular graphic with a darker blue shadow on its left side, creating a 3D effect. The text "Answer the question" is written in white on the blue surface.

Answer the
question

How is spirometry used as a tool of diagnosis? e.g.
would history taking play a role in diagnosing
patient?

Answer the
question

What is:

FVC:

VC:

FEV1:

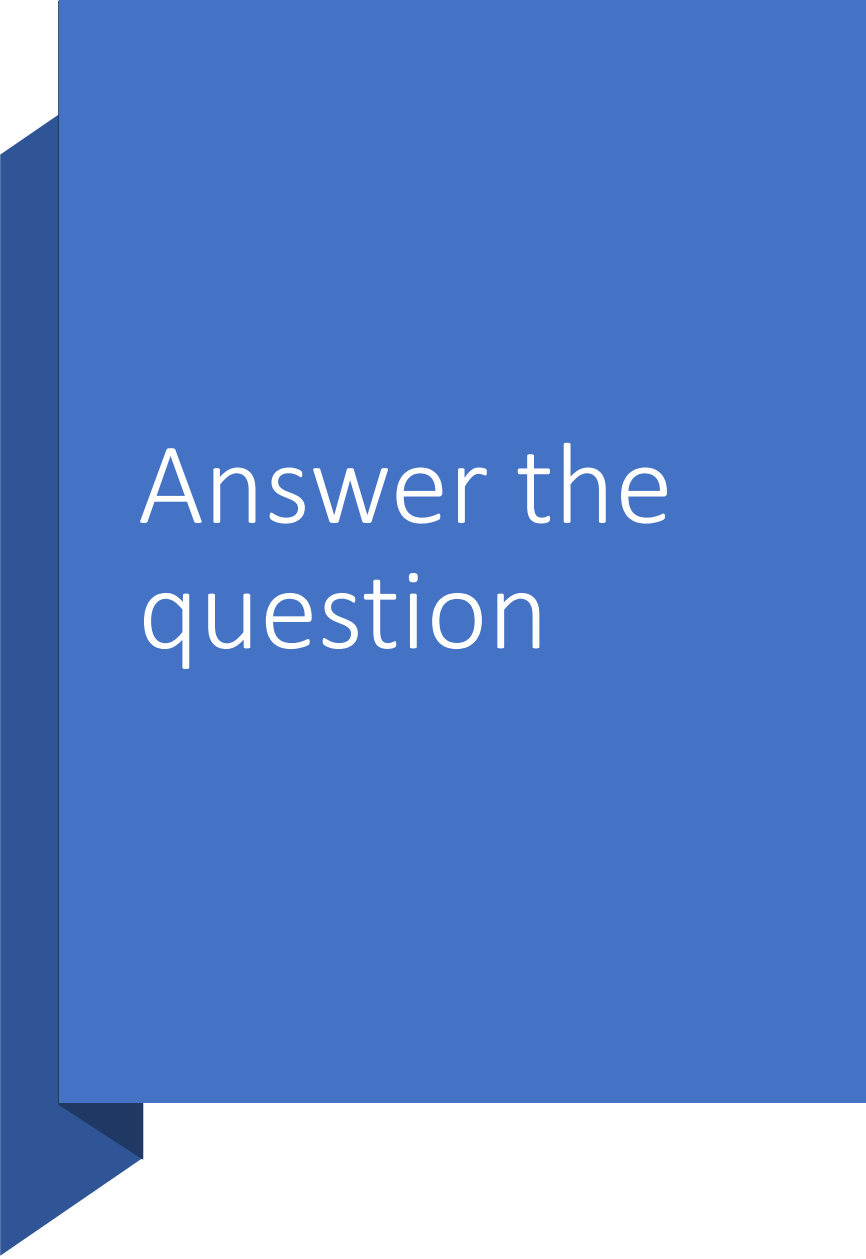
FEV1/FVC:

FEV1/VC:

Answer the questions

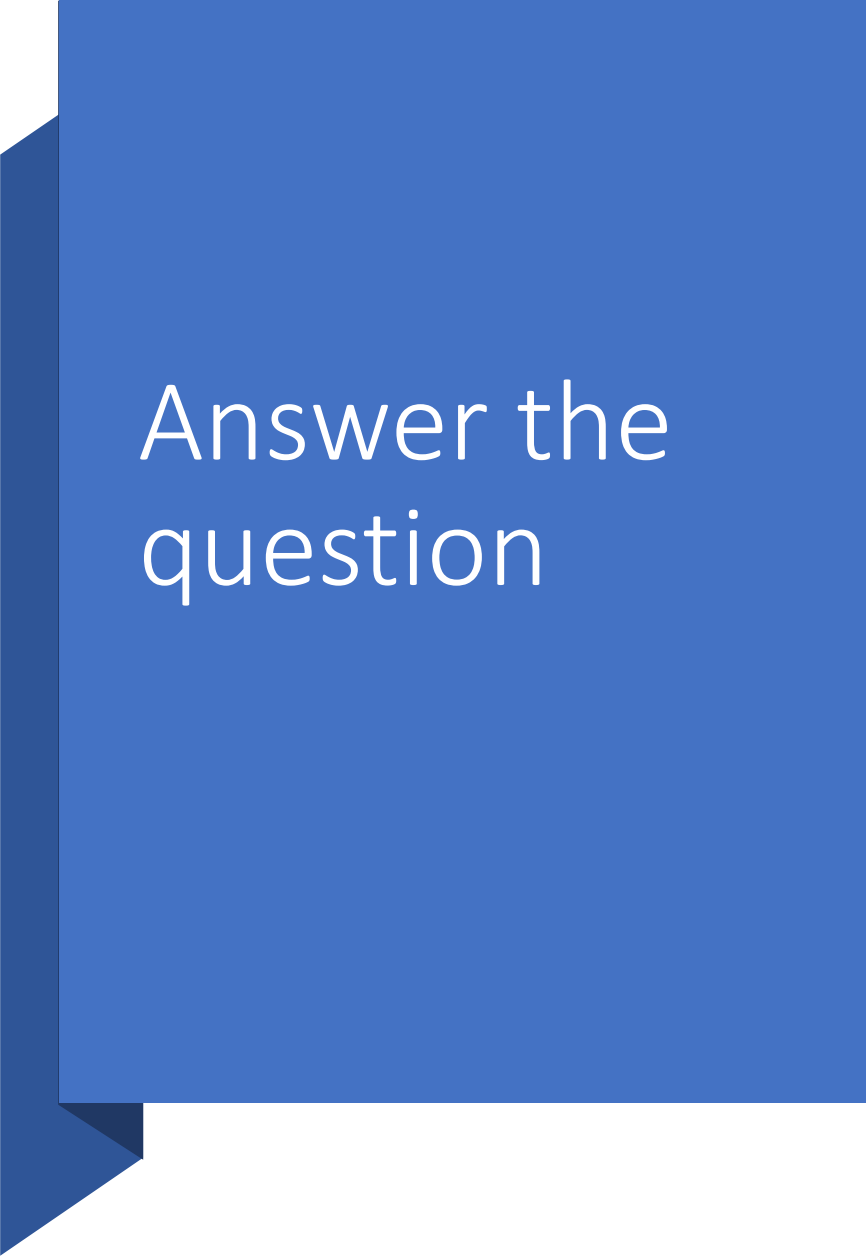


- What is calibration of a spirometer and why is it done?
- As a general rule what size syringe do we use to calibrate a spirometer?
- Why is documentation of calibration results needed consistently, including a simple log of problems as they arise?

A large blue rectangular graphic with a folded effect, featuring a darker blue shadow on the left side.

Answer the
question

Why do we need one-way mouthpieces and nose clips to perform the test?



Answer the
question

Why is short acting bronchodilators,
nebulizer/inhaled or volumatic/chambers needed
when performing spirometry test?

Answer the question

How often do we have to clean and calibrate a spirometer?
e.g. national/international
guidelines



What are the indication and contra-indications of spirometry testing?

“ **Assumption**
is a mother of all
mess-ups ”

Answer the question

Why do we measure the patient's height and weight prior to performing a lung function test?



Answer the question

- What are the different manoeuvres when performing the test?
- What is/are the maximum and minimum blows in each test? Refer to the national/international guidelines.
- What do you do if the patient hasn't given you the desired results after the maximum manoeuvres?



What is the procedure of patients' invitation for a spirometry test? E.g. use of medication etc.



On the day of the test how do you prepare the patient for the test?

Answer the question

Answer the question

What is the difference of post-bronchodilator test in COPD and reversibility test in Asthma?

Case 1

Mr. Emanuel is a 60 year-old man who came to your clinic for lung function testing as part of a routine health-screening test. He had no associated complaints. He is a lifelong nonsmoker and had a prior history of asbestos exposure as an ex-builder. His lung function test results are as follows

Spirometry Interpretation Quiz

Case 1

Pre- bronchodilator					Post-bronchodialtor
FVC	4.39	4.32	102	-1	
VC	4.45	4.40	101	-1	
FEV1	3.20	3.37	95	7	
FEV1/VC	72				
FEV1/FVC	73				

Case 2

Mrs. Lamont, a 52 year-old lady presents to the clinic with SOB and cough. She is a smoker of 25 pack years, with no relevant occupational exposures.

Case 2, What is the diagnosis?

Turbine Transducer

(* is for auto best; ^ for manual best)

	UC	Var	Warning	Time: Date:
Base	1.44	*	(Good blow)	11:13 23/02/16
Base	1.41	-2%	(Good blow)	11:14 23/02/16
Base	1.26	-12%	(Good blow)	11:12 23/02/16

BTS Quality Criteria (Relaxed):
Base: Met.

	FEV1	FVC	FEV1/FVC	PEF	Var	Warning	Time:
Base Date: 23/02/16							
Base	0.92	1.42	64.8	179	0%	(Good blow)	11:16
Base	0.90	1.44	62.5	149	*	(Good blow)	11:17
Base	0.85	1.42	59.8	148	-2%	(Good blow)	11:21
Post1 Date: 23/02/16							
Post1	1.00	1.41	70.9	159	-1%	(Good blow)	11:38
Post1	1.00	1.45	69.0	163	0%	(Good blow)	11:39
Post1	0.97	1.48	65.5	116	*	(Good blow)	11:40

Variation is based on FEV1 + FVC.

BTS Quality Criteria (Forced):
Base: Met
Post1: Met

Any forced data and graphs following are either best individual values or composite curve.

Best Spirometry Result:

	Base	%Pr	Min	Pred	Max	Post	%Pr	%Chg	
EVC	1.44	41	2.57	3.49	4.41				l
UC	1.44	41	2.57	3.49	4.41				l
FEV1	0.92	37	1.63	2.47	3.31	1.00	40	9	l
FVC	1.44	43	2.38	3.38	4.38	1.48	44	3	l
PEF	179	42	307	426	545	163	38	-9	l/min
FEV1/UC	64								%
FEV1/FVC	64	89	60	72	84	68	94	6	%

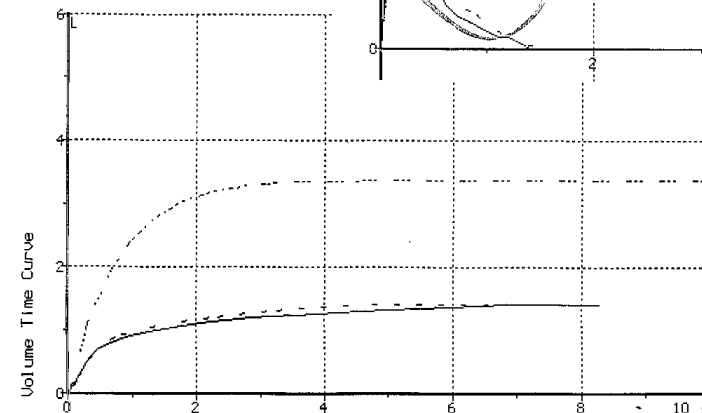
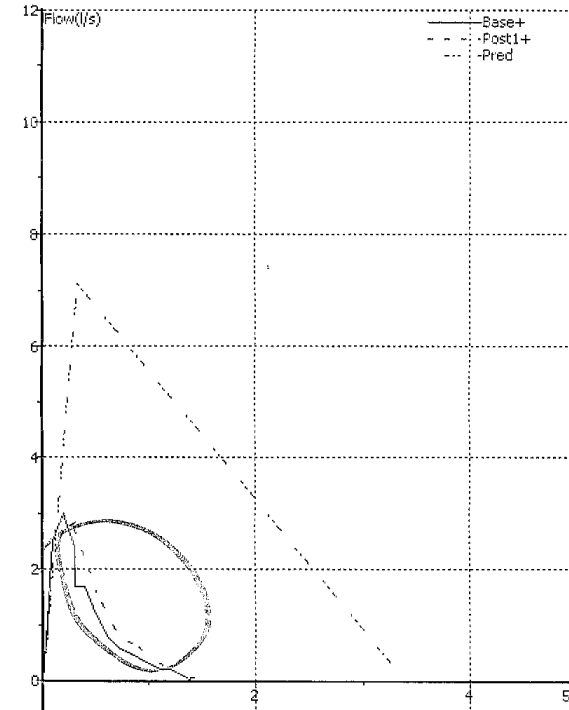
Lungs Age 90yrs

Interpretation (Nice (2010)):

Base: Obstruction.

Post1: Severe Obstruction.

Flow Volume Loop



Case 2: Using the spirometry test above, add the right figures on the table below. Which ratio will you use to interpret the results and why?

Test	Actual	Predicted	%Predicted	%change
FVC				
VC				
FEV1				
FEV1/VC				
FEV1/FVC				



PRACTICE
MAKES
PERFECT

A stack of several colorful sticky notes (yellow, orange, and teal) is piled on a light brown, textured surface. The topmost sticky note is bright green and features the phrase "PRACTICE MAKES PERFECT" written in bold, black, hand-drawn capital letters.

Sex: Male Age: 68
 Factor: 100(Caucasian)
 Height: 183cm Weight: _____kg

Turbine Transducer

(* is for auto best; ^ for manual best)

Factor: 100(Ca
 Height: 183cm

Turbine Transducer

(* is for auto be

UC Var
 Base 4.11 *
 Base 3.99 -2%
 Base 3.93 -4%

BTS Quality Crite
 Base: Met.

FEV1 FVC
 Base Date: 21/05/
 Base 1.74 3.99
 Base 1.73 4.16
 Base 1.69 3.86

Variation is base

BTS Quality Crite
 Base: Met

Any forced data a
 Individual values

Best Spirometry R

Base:
 EUC 4.11
 UC 4.11
 FEV1 1.74
 FVC 4.16
 PEF 288
 FEV1/UC 42
 FEV1/FVC 42
 Lung Age 90yrs
 Interpretation (N
 Base: Obstruction.

	UC	Var	Warning	Time: Date:
Base	4.11	*	(Good blow)	16:24 21/05/15
Base	3.99	-2%	(Good blow)	16:23 21/05/15
Base	3.93	-4%	(Good blow)	16:22 21/05/15

BTS Quality Criteria (Relaxed):

Base: Met.

	FEV1	FVC	FEV1/FVC	PEF	Var	Warning	Time:
Base Date: 21/05/15							
Base	1.74	3.99	43.6	269	-2%	(Good blow)	16:28
Base	1.73	4.16	41.6	288	*	(Good blow)	16:29
Base	1.69	3.86	43.8	241	-5%	(Good blow)	16:30

Variation is based on FEV1 + FVC.

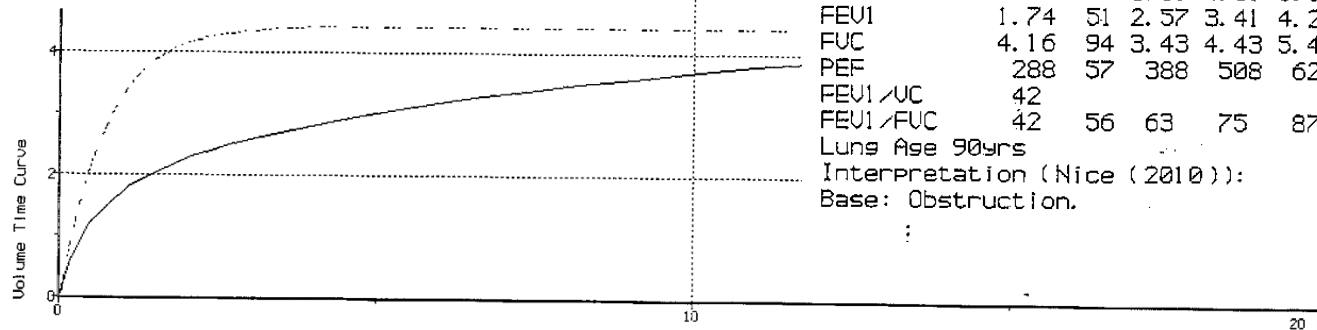
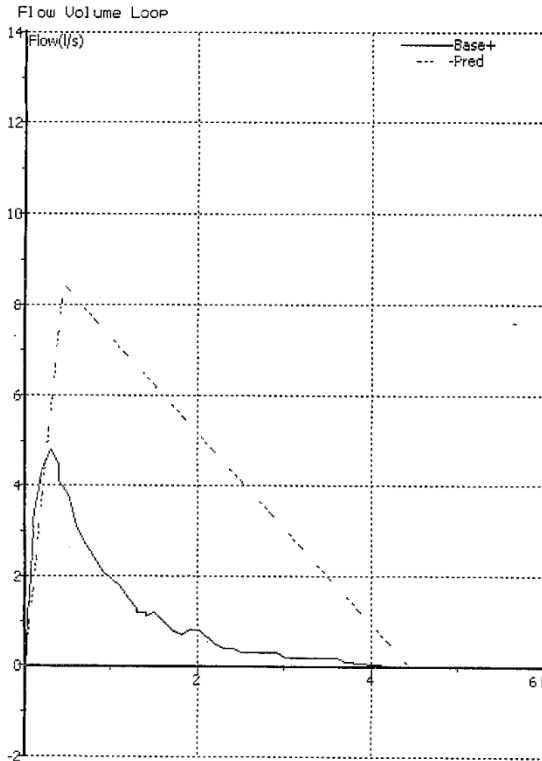
BTS Quality Criteria (Forced):

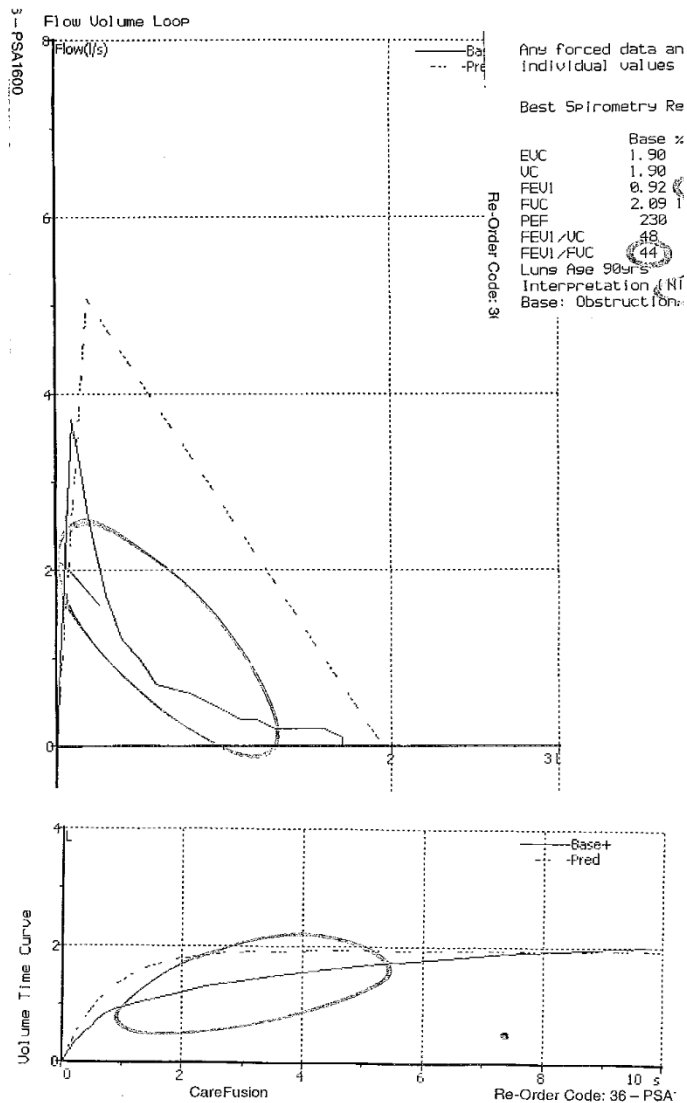
Base: Met

Any forced data and graphs following are either best individual values or composite curve.

Best Spirometry Result:

	Base	%Pr	Min	Pred	Max	Post1	Post2	%Chg
EUC	4.11	89	3.69	4.61	5.53			1
UC	4.11	89	3.69	4.61	5.53			1
FEV1	1.74	51	2.57	3.41	4.25			1
FVC	4.16	94	3.43	4.43	5.43			1
PEF	288	57	388	508	627			1/min
FEV1/UC	42							%
FEV1/FVC	42	56	63	75	87			%
Lung Age 90yrs								
Interpretation (Nice (2010)):								
Base: Obstruction.								





Sex: Female Age: 87
Factor: 100(Caucasian)
Height: 160cm Weight: _____kg

Turbine Transducer

(* is for auto best; ^ for manual best)

	UC	Var	Warning	Time: Date:
Base	1.90 *		(Good blow)	11:10 19/01/16
Base	1.80 -5%		(Good blow)	11:10 19/01/16
Base	1.73 -8%		(Good blow)	11:12 19/01/16
Base	1.49 -21%		(Good blow)	11:09 19/01/16

BTS Quality Criteria (Relaxed):
Base: Met.

	FEV1	FVC	FEV1/FVC	PEF	Var	Warning	Time:
Base Date:	19/01/16						
Base	0.92	1.65	55.8	230	-14%	(Good blow)	11:14
Base	0.89	1.98	44.9	221	-4%	(Good blow)	11:16
Base	0.92	2.09	44.0	141	*	(Good blow)	11:16

Variation is based on FEV1 + FVC.

BTS Quality Criteria (Forced):
Base: Not Met. Greatest 2 FVCs differ by 110ml.

Any forced data and graphs following are either best individual values or composite curve.

Best Spirometry Result:

	Base %Pr	Min	Pred	Max	Post %Pr	%Chg
EVC	1.90	99	1.22	1.91	2.60	1
UC	1.90	99	1.22	1.91	2.60	1
FEV1	0.92	59	0.93	1.55	2.17	1
FVC	2.09	108	1.23	1.94	2.65	1
PEF	230	75	216	305	394	l/min
FEV1/UC	48					%
FEV1/FVC	44	61	62	73	83	%
Lung Age 90yrs						
Interpretation (Nice (2010)):						
Base: Obstruction						

Sex: Female Age: 82
 Factor: 100(Caucasian)
 Height: 152cm Weight: _____kg

Turbine Transducer

(* is for auto best; ^ for manual best)

	UC	Var	Warning	Time:	Date:
Base	1.57	*	(Good blow)	16:14	22/03/16
Base	1.50	-4%	(Good blow)	16:17	22/03/16
Base	1.49	-5%	(Good blow)	16:15	22/03/16

BTS Quality Criteria (Relaxed):
 Base: Met.

	FEV1	FVC	FEV1/FVC	PEF	Var	Warning	Time:
Base Date:	22/03/16						
Base	0.98	1.51	64.9	209	*	(Good blow)	16:19
Base	0.94	1.52	61.8	212	-1%	(Good blow)	16:20
Base	0.97	1.36	71.3	200	-6%	(Good blow)	16:24

Variation is based on FEV1 + FVC.

BTS Quality Criteria (Forced):
 Base: Met

Any forced data and graphs following are either best individual values or composite curve.

Best Spirometry Result:

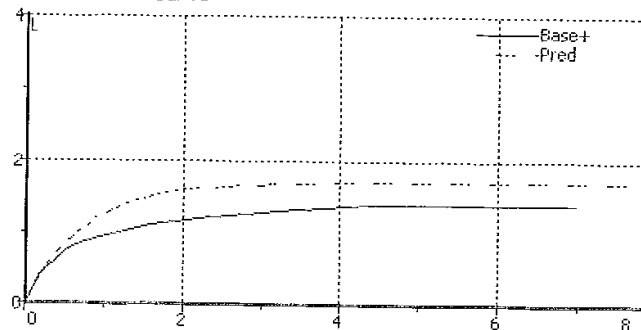
	Base	%Pr	Min	Pred	Max	Post	%Pr	%Chs
EVC	1.57	94	0.98	1.67	2.36			1
UC	1.57	94	0.98	1.67	2.36			1
FEV1	0.98	73	0.73	1.35	1.97			1
FVC	1.52	89	1.00	1.71	2.4			1
PEF	212	74	195	287	37			1/min
FEV1/UC	62							%
FEV1/FVC	64	88	63	74	84			%

Lung Age 90yrs

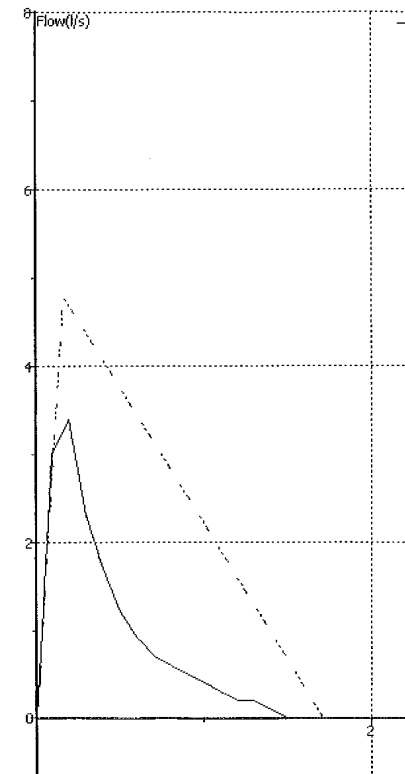
Interpretation (Nice (2010)):

Base: Obstruction.

Volume Time Curve



Flow Volume Loop



Sex: Female Age: 80
 Factor: 100(Caucasian)
 Height: 165cm Weight: 67kg BMI: 24.3

Turbine Transducer

(* is for auto best: ^ for manual best)

	UC	Var	Warning	Time: Date:
Base	2.86	*	(Good blow)	15:01 12/01/16
Base	2.82	-1%	(Good blow)	15:00 12/01/16
Base	2.71	-5%	(Good blow)	14:59 12/01/16
Post1	2.86	*	(Good blow)	15:30 12/01/16
Post1	2.73	-4%	(Good blow)	15:29 12/01/16

BTS Quality Criteria (Relaxed):

Base: Met.

Post1: Not Met. Need 1 more good blow(s).

	FEV1	FVC	FEV1/FVC	PEF	Var	Warning	Time:
Base Date: 12/01/16							
Base	1.91	2.61	73.2	326	*	(Good blow)	15:03
Base	1.94	2.42	80.2	345	-3%	(Good blow)	15:03
Base	1.79	2.40	74.6	322	-7%	(Good blow)	15:04
Base	1.81	2.40	75.4	319	-6%	(Good blow)	15:05
Post1 Date: 12/01/16							
Post1	1.69	2.32	72.8	322	-10%	(Good blow)	15:31
Post1	1.90	2.57	73.9	353	*	(Good blow)	15:32
Post1	1.69	2.29	73.8	328	-10%	(Good blow)	15:32

Variation is based on FEV1 + FVC.

BTS Quality Criteria (Forced):

Base: Not Met. Greatest 2 FVCs differ by 190ml.

Post1: Not Met. Greatest 2 FVCs differ by 250ml.

Any forced data and graphs following are either best individual values or composite curve.

Best Spirometry Result:

	Base	%Pr	Min	Pred	Max	Post	%Pr	%Chg
EUC	2.86	120	1.69	2.38	3.07	2.86	120	0
UC	2.86	120	1.69	2.38	3.07	2.86	120	0
FEV1	1.94	99	1.34	1.96	2.58	1.90	97	-2
FVC	2.61	110	1.67	2.38	3.09	2.57	108	-2
PEF	345	102	248	337	426	353	105	2
FEV1/UC	68					66		-2
FEV1/FVC	74	101	63	74	85	74	100	-1

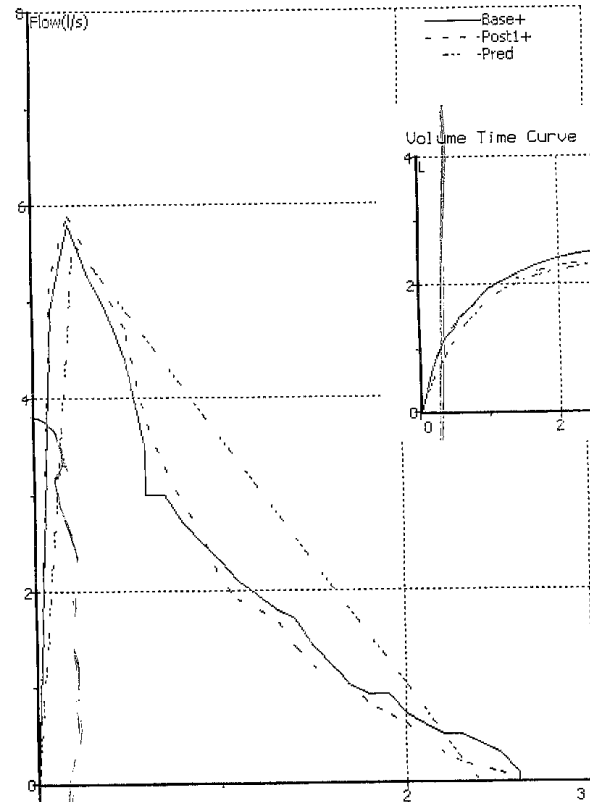
Lung Age 80yrs

Interpretation (Nice (2010)):

Base: Normal Spirometry.

Post1: Normal Spirometry.

Flow Volume Loop



Volume Time Curve

