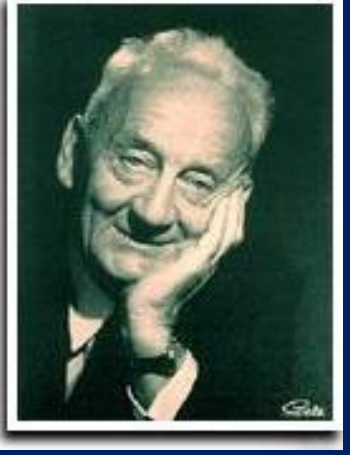


A spirometria értékelésének új szempontjai

Somfay Attila

SZTE Tüdőgyógyászati Tanszék

MTT Továbbképző Tanfolyam
Budapest, 2019. január 25-26.

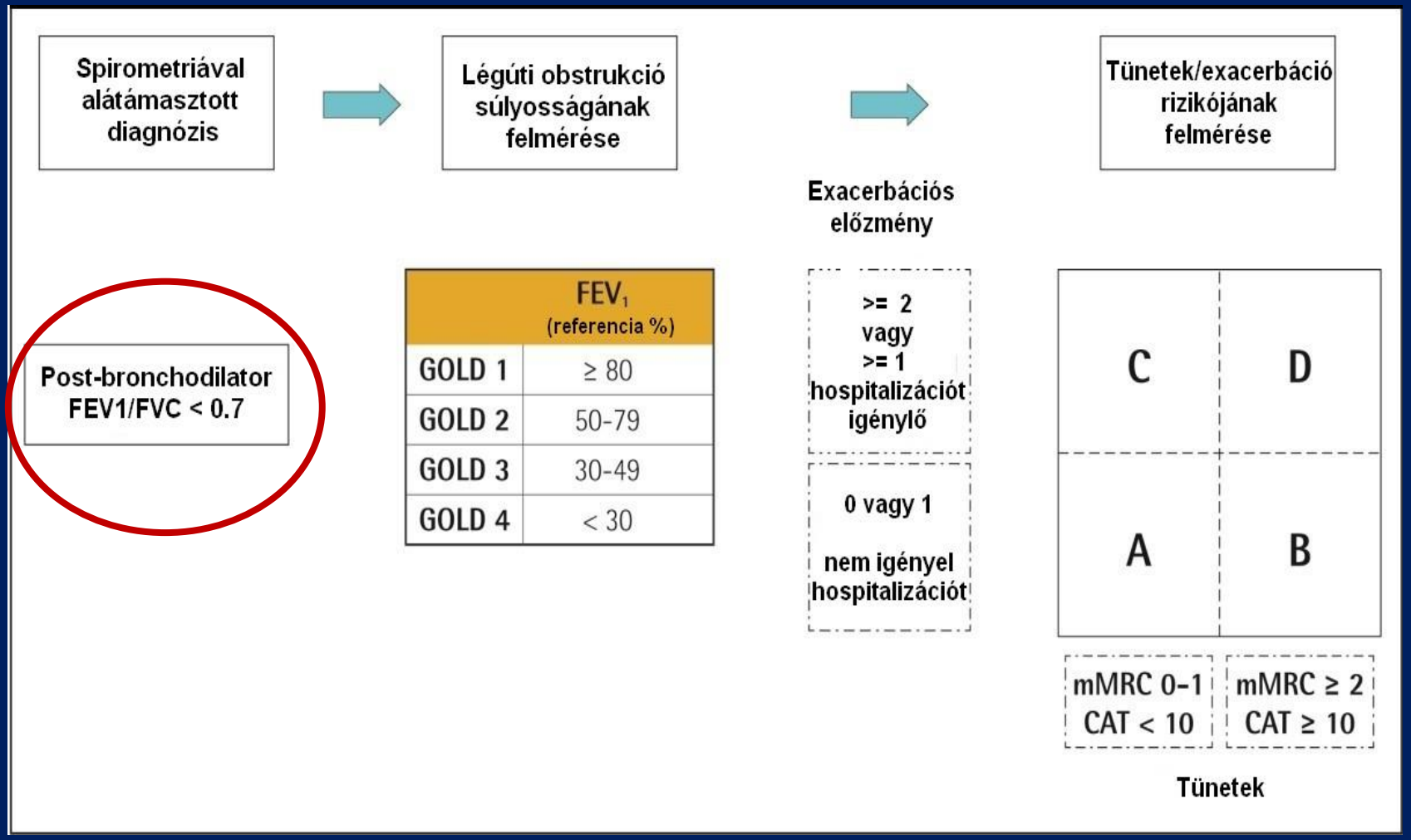
A spirometria szerepe

GOLD 2017

- Diagnózis (LF + Tünet + Expozíció)
- Prognózis (obstrukció súlyossága, gyors funkcióvesztők)
- Terápiás döntések
  - Diszkrepancia a tünetek és a spirometriás értékek között
  - Differenciál diagnosztika (pl. krónikus szívelégtelenség)
  - Nem-gyógyszeres intervenciók

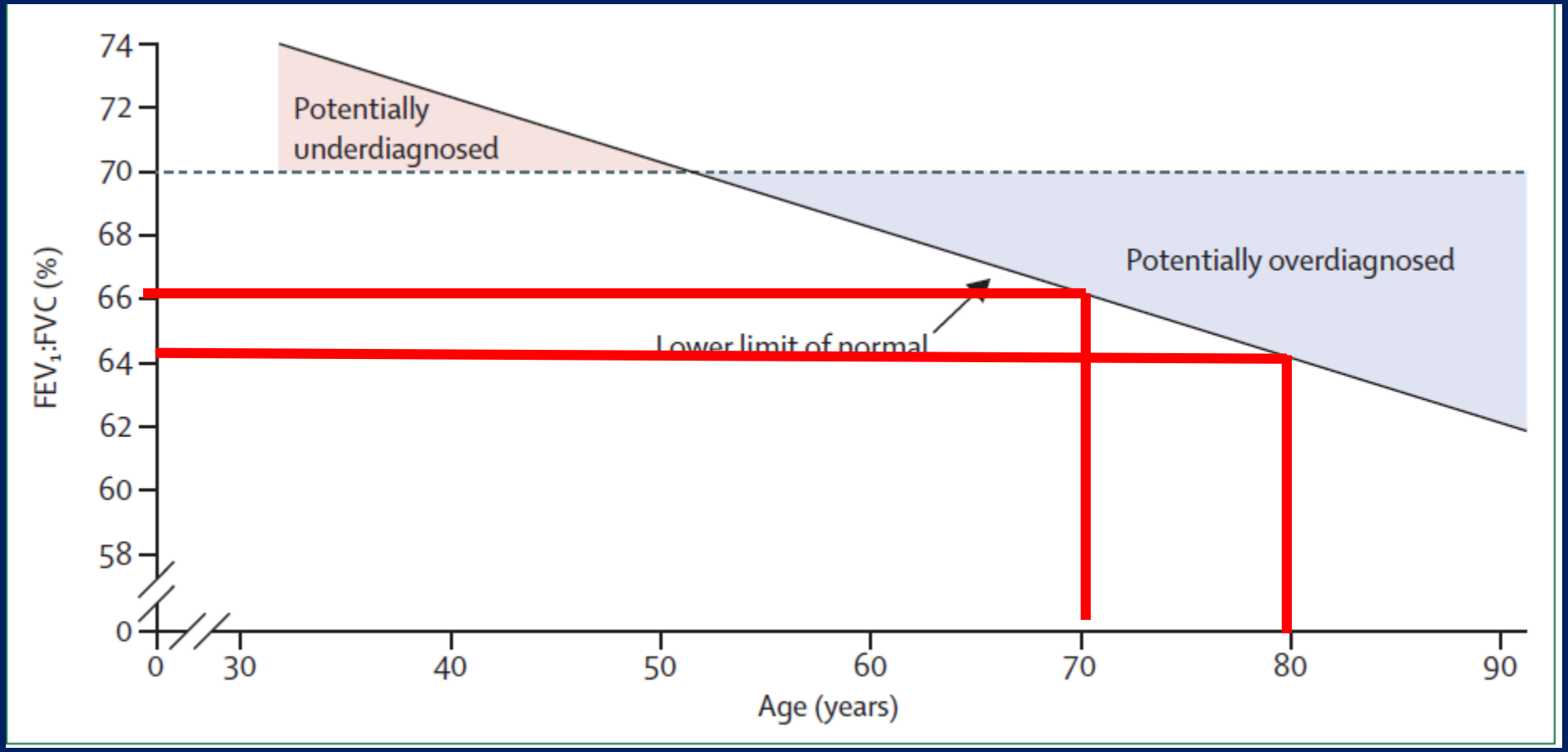
Az új ABCD

GOLD 2017



Légúti obstrukció definíciója (0.7 vs LLN)

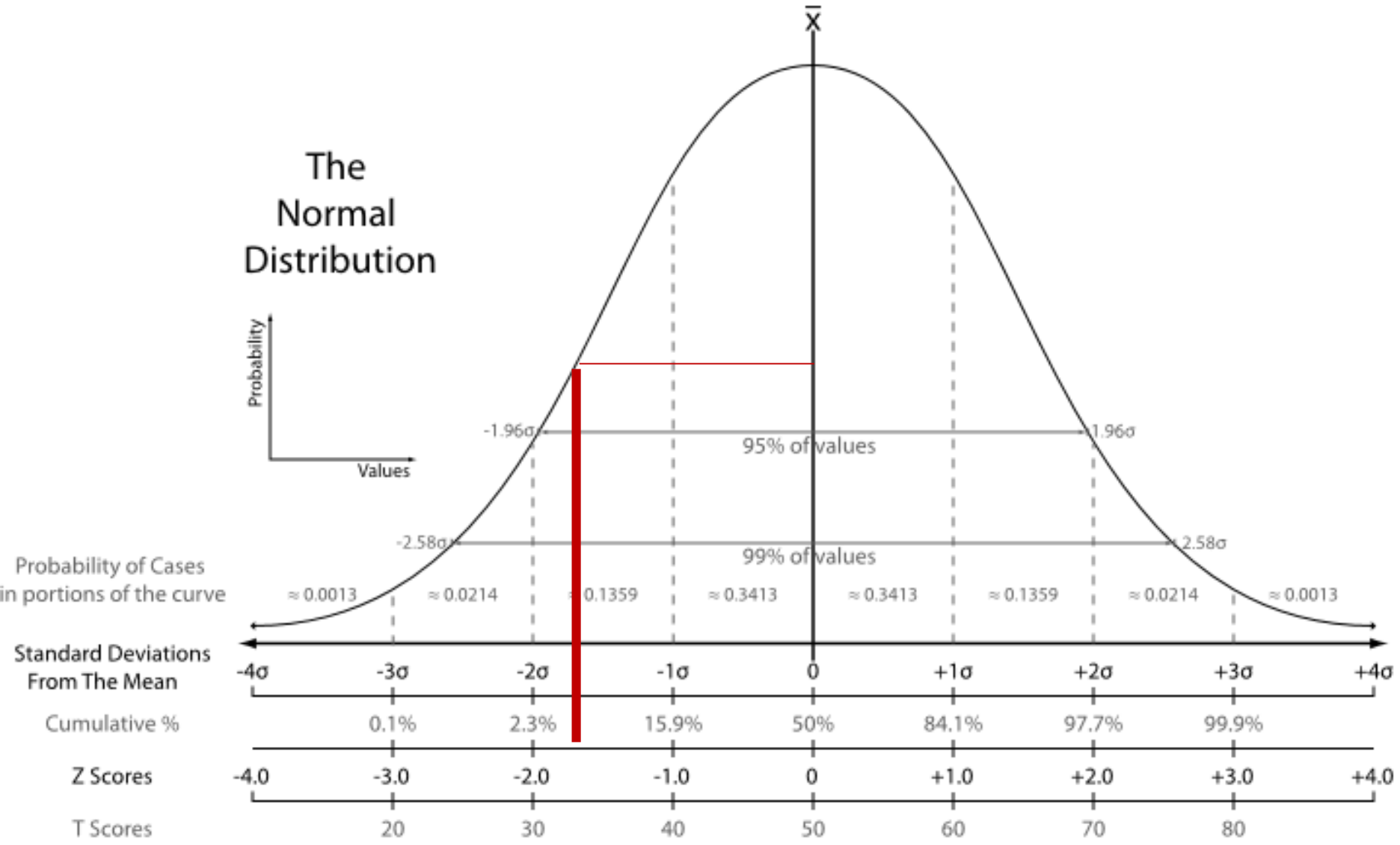
Mannino, Thorax 2007



Miller MR, Quanjer PH, Swanney MP, Ruppel G, Enright PL. Interpreting lung function data using 80% predicted and fixed thresholds misclassifies more than 20% of patients. *Chest* 2011; 139: 52–59

Z-score = SD

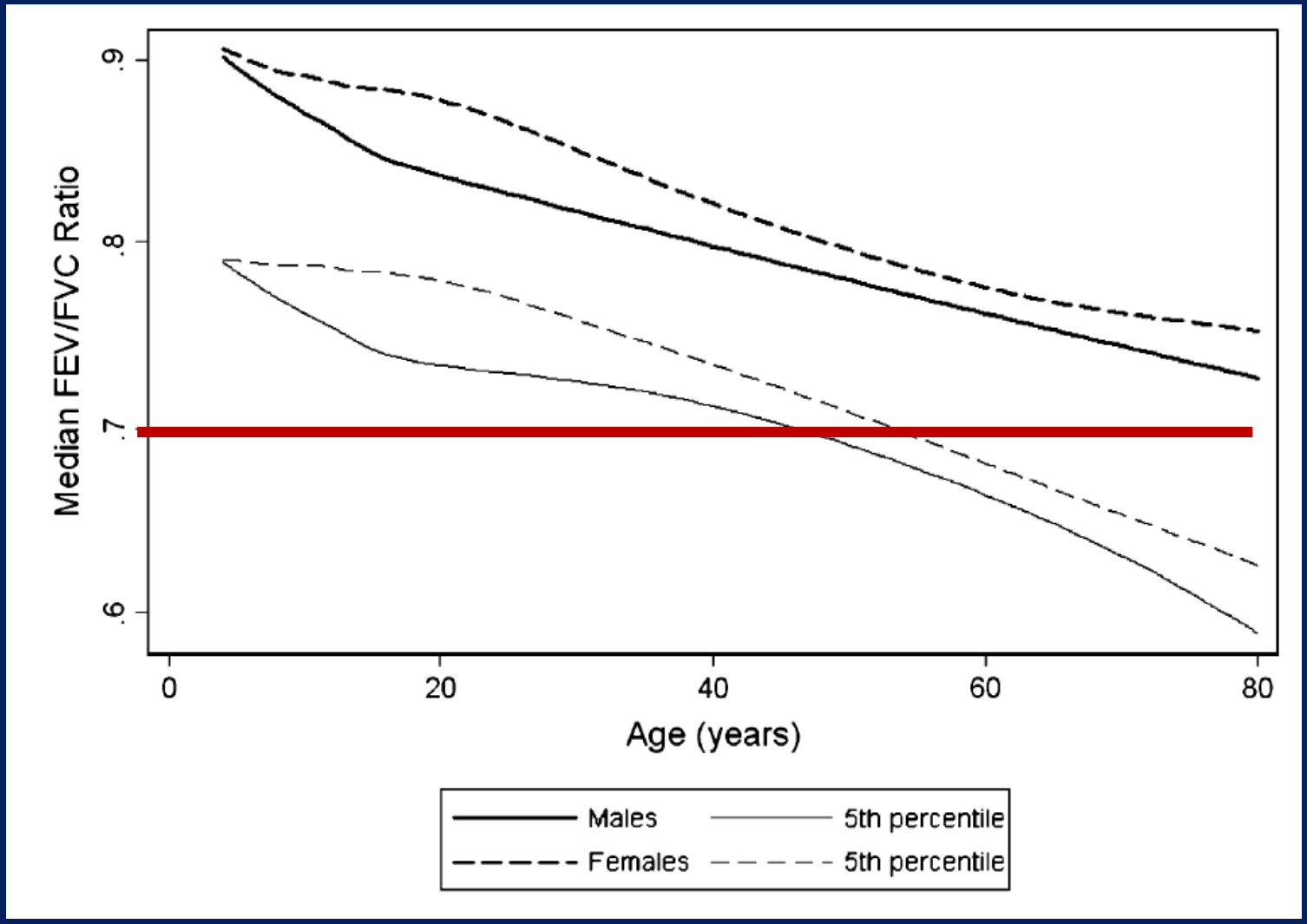
LLN (RSD) = -1,64 Z-score (alsó 5%, 95% C.I.)



Reference Ranges for Spirometry Across All Ages

A New Approach

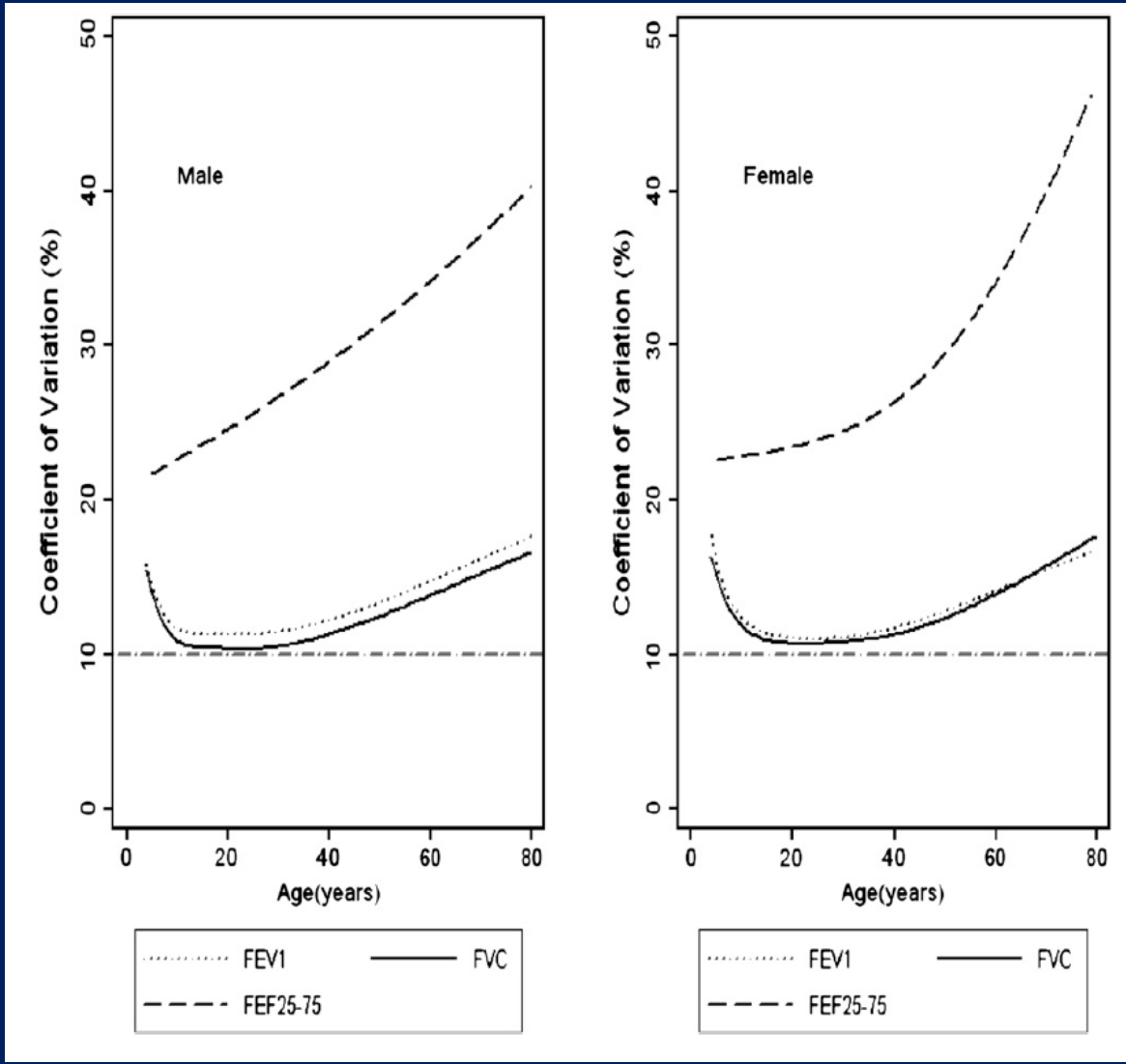
Am J Respir Crit Care Med Vol 177. pp 253–260, 2008



Reference Ranges for Spirometry Across All Ages

A New Approach

Am J Respir Crit Care Med Vol 177. pp 253–260, 2008



Recommendations for a Standardized Pulmonary Function Report
An Official American Thoracic Society Technical Statement

Culver, AJRCCM 2017

FEV1 és FVC minőségi kritériumai

A	⩾3 acceptable tests with repeatability within 0.150 L for age 2–6, 0.100 L, or 10% of highest value, whichever is greater
B	⩾2 acceptable tests with repeatability within 0.150 L for age 2–6, 0.100 L, or 10% of highest value, whichever is greater
C	⩾2 acceptable tests with repeatability within 0.200 L for age 2–6, 0.150 L, or 10% of highest value, whichever is greater
D	⩾2 acceptable tests with repeatability within 0.250 L for age 2–6, 0.200 L, or 10% of highest value, whichever is greater
E	One acceptable test
F	No acceptable tests

Recommendations for a Standardized Pulmonary Function Report

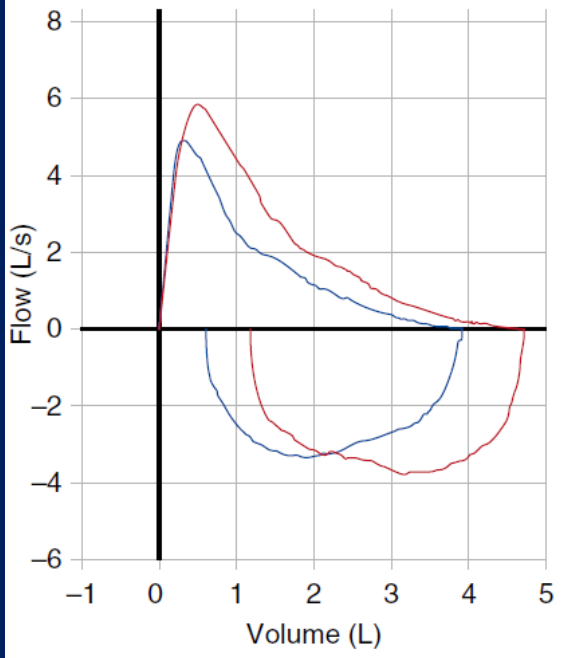
An Official American Thoracic Society Technical Statement

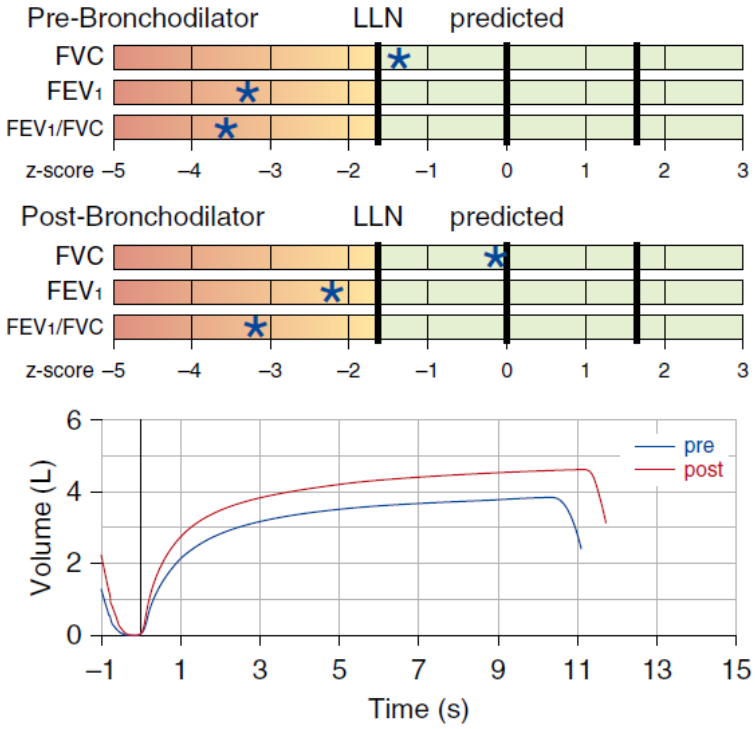
Culver, AJRCCM 2017

SPIROMETRY **51 éves férfi**

	Pre-Bronchodilator				Post-Bronchodilator				
	Best	LLN	z-score	%Pred	Best	z-score	%Pred	Change	%Chng
FVC (L)	**3.90**	3.70	–1.34	82%	**4.70**	–0.09	99%	600 mL	20%
FEV1 (L)	**2.02**	2.91	–3.78	54%	**2.61**	–2.21	70%	590 mL	29%
FEV1/FVC	**0.52**	0.68	–3.54		**0.55**	–3.35			
FET (s)	**10.3**				**11.2**				

Reference values: GLI 2012 Test quality: Pre: FEV1 - A, FVC - A; Post: FEV1 - A, FVC - B





LLN = -1,64 Z-score

ERS Global Lung Function Initiative. Multi-ethnic reference values for spirometry for the 3-95-yr age range: the global lung function 2012 equations (GLI).

Eur Respir J 2012;40:1324–1343.

70 000 feletti egyénből származó

fehér, fekete és ázsiai populációra is érvényes

Phenotype of Normal Spirometry in an Aging Population

Carlos A. Vaz Fragoso[1,2], Gail McAvay[2], Peter H. Van Ness[2], Richard Casaburi[3], Robert L. Jensen[4], Neil MacIntyre[5], Thomas M. Gill[2], H. Klar Yaggi[1,2], and John Concato[1,2]

AJRCCM 2017

Among 5,100 participants with GLI-defined normal spirometry (z-score), GOLD identified respiratory impairment in 1,146 (22.5%), including a restrictive pattern in 464 (9.1%), mild COPD in 380 (7.5%), moderate COPD in 302 (5.9%), and severe COPD in none.

GLI normális fenotípusok (mMRC:0,8 SGRQ:15,9 6MWT:434m Bdrev:2,7%, Emphys:0,9%) a GOLD kóros csoportokban is reprodukálhatók voltak

Phenotype of Spirometric Impairment in an Aging Population

Carlos A. Vaz Fragoso[1,2], Gail McAvay[2], Peter H. Van Ness[2], Richard Casaburi[3], Robert L. Jensen[4], Neil MacIntyre[5], H. Klar Yaggi[1,2], Thomas M. Gill[2], and John Concato[1,2]

AJRCCM 2017

GLI-vel meghatározott enyhe, mérsékelt és súlyos COPD-ben, a normálishoz képest a kóros funkciók társulásának az ***esély***e az alábbi volt:

mMRC:	- 1,3	2,2	10,7
SGRQ:	-1,5	2,7	14,6
6MWT	-1,1	1,6	4,6
BDrev	-2,8	5,2	6,2
Emph	-4,9	6,4	17,8

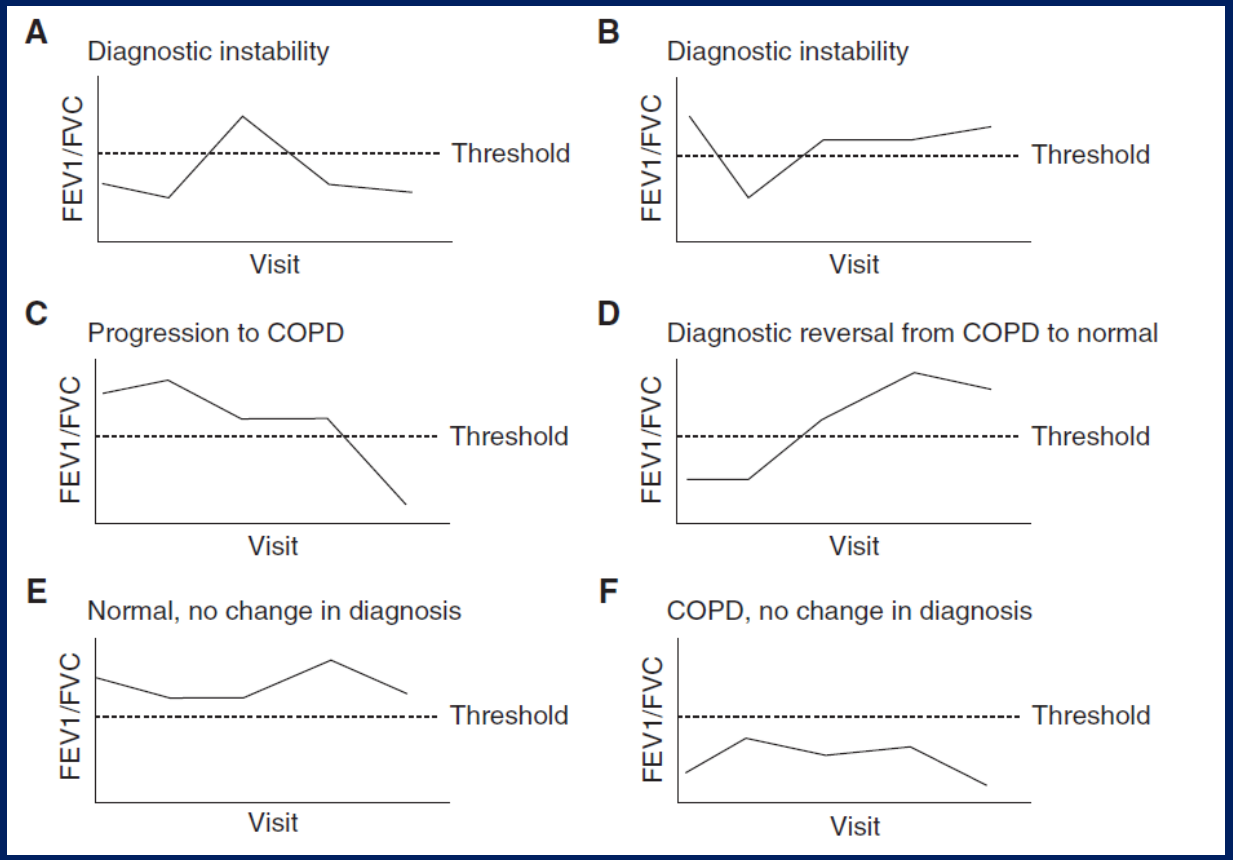
Conclusions: GLI-defined spirometric impairment establishes clinically meaningful respiratory disease, as validated by graded associations with respiratory-related phenotypes.

Diagnostic Instability and Reversals of Chronic Obstructive Pulmonary Disease Diagnosis in Individuals with Mild to Moderate Airflow Obstruction

Shawn D. Aaron[1], Wan C. Tan[2], Jean Bourbeau[3], Don D. Sin[2], Robyn H. Loves[1], Jenna MacNeil[1], and George A. Whitmore[1,4]; for the Canadian Respiratory Research Network

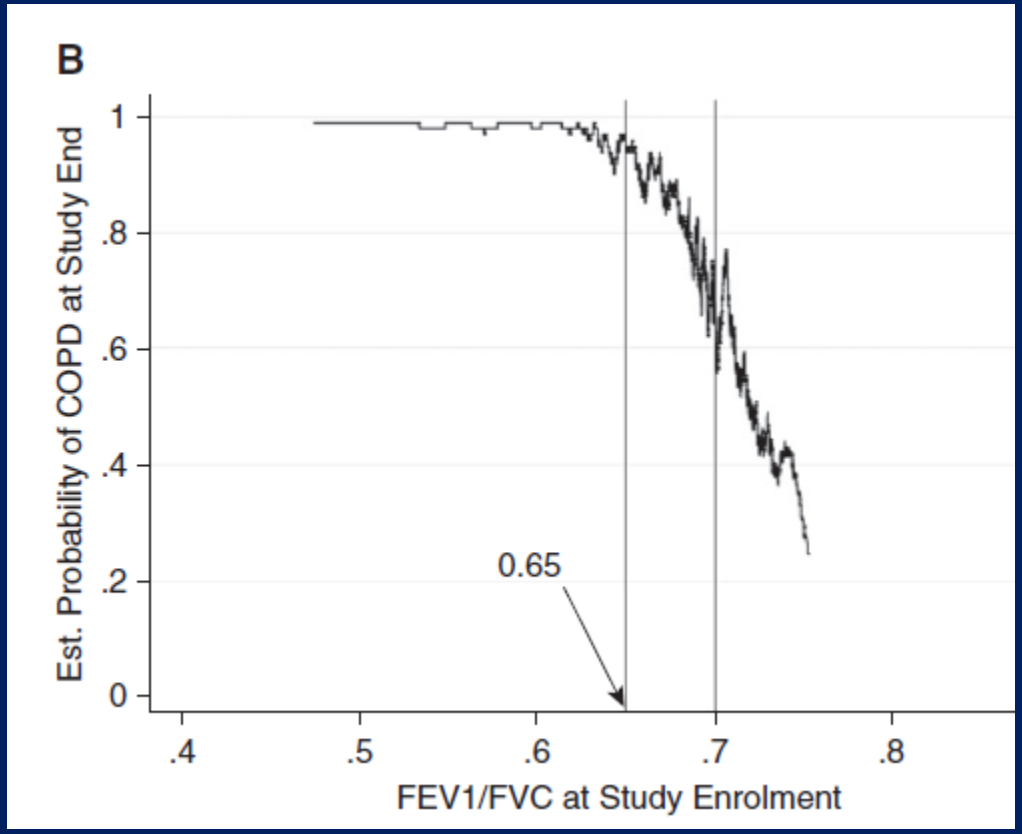
LHS – 5 év + CanCOLD - 4 év, > 7000 beteg

AJRCCM, 2017

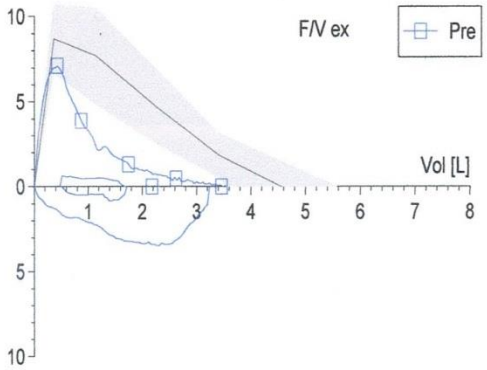


Mikor marad konzisztensen obstruktív a beteg az 5 éves nyomonkövetés (LHS) végén is?

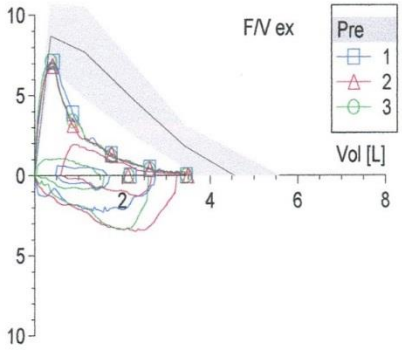
Aaron, AJRCCM 2017



Spirometry Flow-Volume

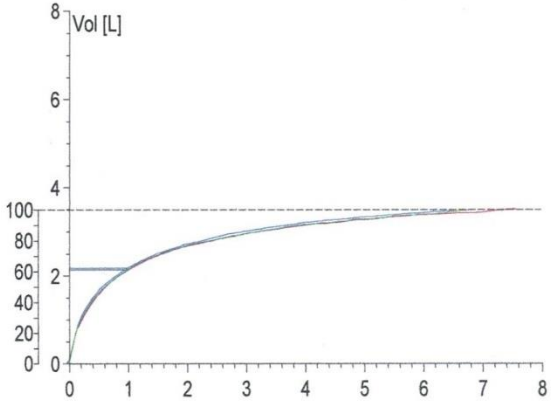


Best Trial



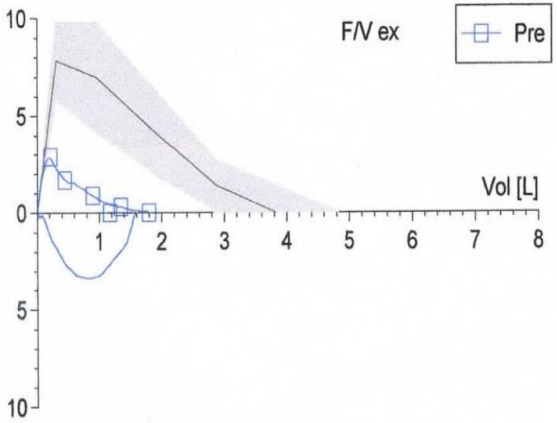
All Trials

Identification:	1561223
Age:	61 Years
Height:	182 cm
Weight:	109.0 kg
BMI:	33

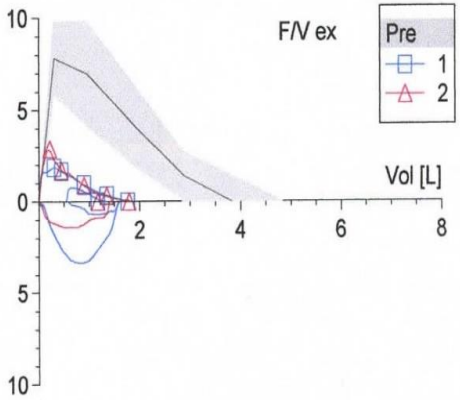


	Pred	Best	%(B/P)	1	2	3	Z-Score	Z-Score
VC MAX	4.74	3.50	74					-2.22
FVC	4.56	3.46	76	3.46	3.50	3.46		-1.79
FEV1	3.57	2.18	61	2.18	2.13	2.14		-2.72
FEV1%F	76.23	62.94	83	62.94	60.85	61.83		-1.85

Spirometry Flow-Volume

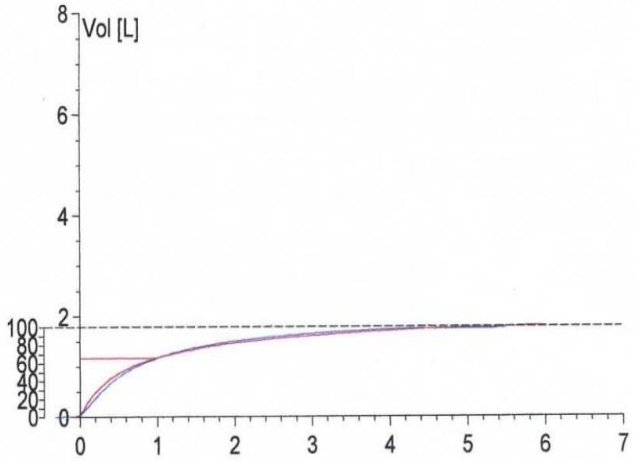


Best Trial



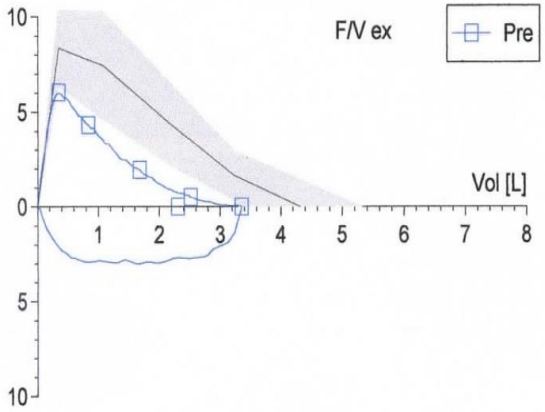
All Trials

Identification:	1500329
Age:	67 Years
Height:	172 cm
Weight:	81.0 kg
BMI:	27

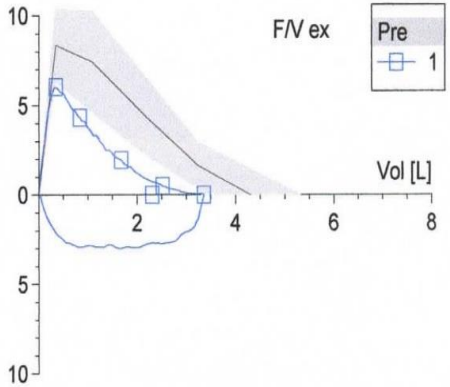


	Pred	Best	%(B/P)	1	2	Z-Score	Z-Score
VC MAX	3.97	1.79	45				-3.88
FVC	3.83	1.79	47	1.77	1.79		-3.33
FEV1	2.96	1.17	40	1.17	1.17		-3.51
FEV1%F	75.15	65.36	87	66.15	65.36		-1.37

Spirometry Flow-Volume

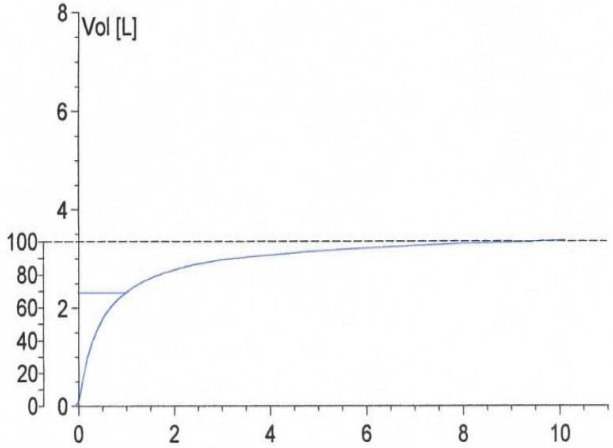


Best Trial



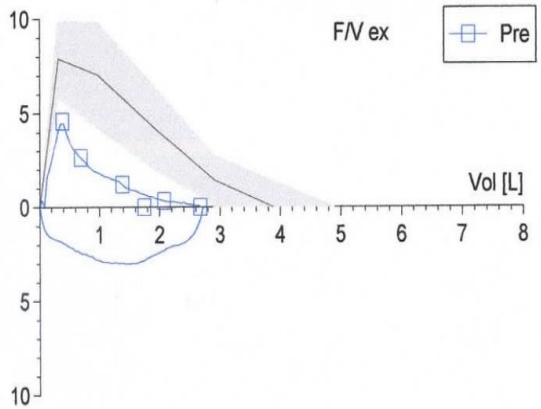
All Trials

Identification:	1511125
Age:	66 Years
Height:	180 cm
Weight:	85.0 kg
BMI:	26

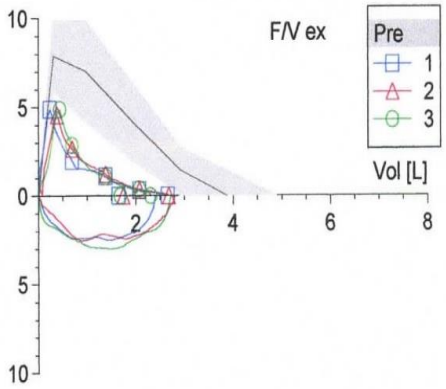


	Pred	Best	%(B/P)	1	Z-Score	Z-Score
VC MAX	4.48	3.36	75			-2.01
FVC	4.31	3.36	78	3.36		-1.57
FEV1	3.34	2.31	69	2.31		-2.02
FEV1%F	75.33	68.76	91	68.76		-0.92

Spirometry Flow-Volume

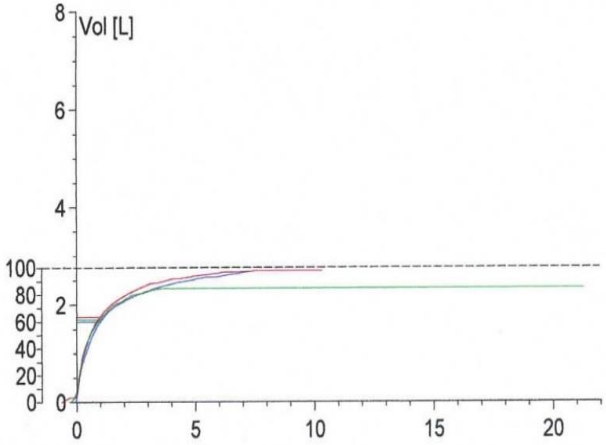


Best Trial



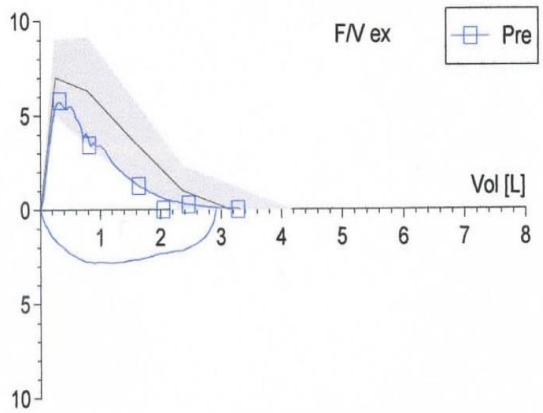
All Trials

Identification:	1510209
Age:	67 Years
Height:	173 cm
Weight:	98.0 kg
BMI:	33

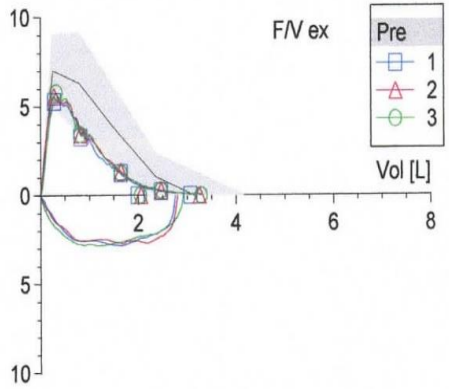


	Pred	Best	%(B/P)	1	2	3	-3 -2 Z-Score 2 3	Z-Score
VC MAX	4.03	2.77	69					-2.25
FVC	3.88	2.68	69	2.65	2.68	2.31		-1.98
FEV1	3.01	1.75	58	1.64	1.75	1.69		-2.47
FEV1%F	75.15	65.27	87	61.95	65.27	73.02		-1.38

Spirometry Flow-Volume

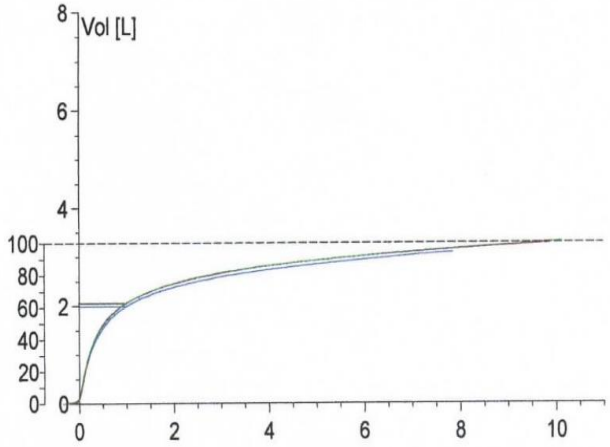


Best Trial



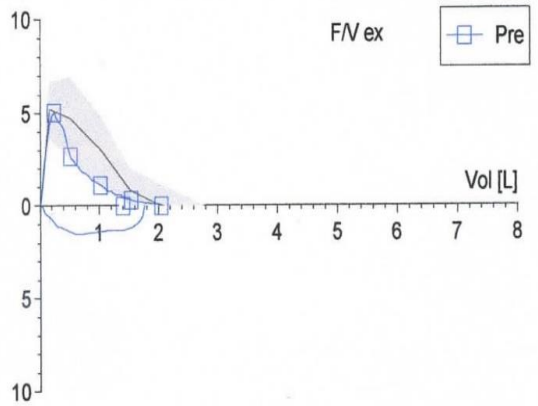
All Trials

Identification:	1440721
Age:	73 Years
Height:	163 cm
Weight:	85.0 kg
BMI:	32

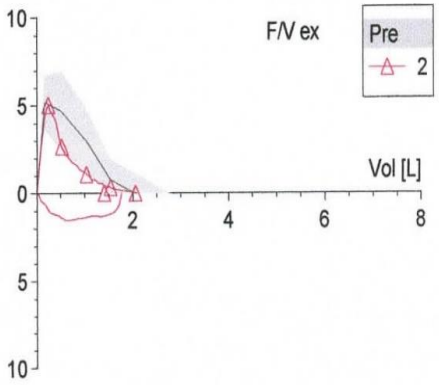


	Pred	Best	%(B/P)	1	2	3	Z-Score	Z-Score
VC MAX	3.25	3.29	101					0.07
FVC	3.15	3.29	104	3.07	3.25	3.29		0.22
FEV1	2.40	2.05	85	1.99	2.05	2.05		-0.69
FEV1%F	74.07	62.30	84	64.94	63.09	62.30		-1.64

Spirometry Flow-Volume

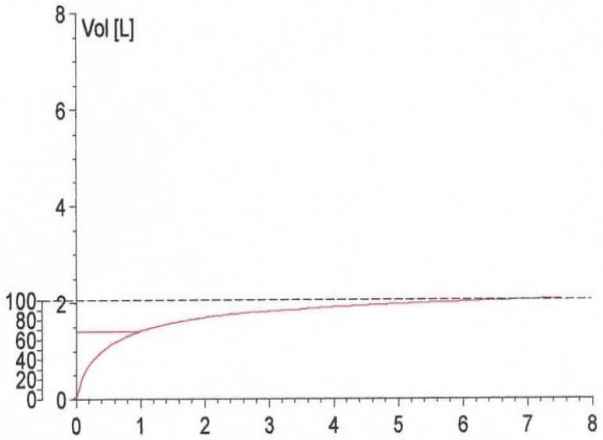


Best Trial



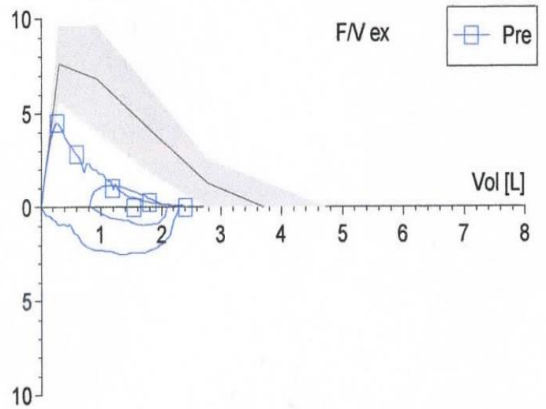
All Trials

Identification:	2370917
Age:	80 Years
Height:	158 cm
Weight:	78.0 kg
BMI:	31

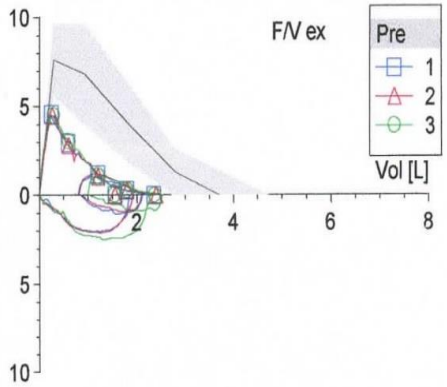


	Pred	Best	%(B/P)	2	Z-Score	Z-Score
VC MAX	2.16	2.05	95			-0.26
FVC	2.03	2.05	101	2.05		0.06
FEV1	1.64	1.40	85	1.40		-0.63
FEV1%F	73.90	68.25	92	68.25		-0.87

Spirometry Flow-Volume

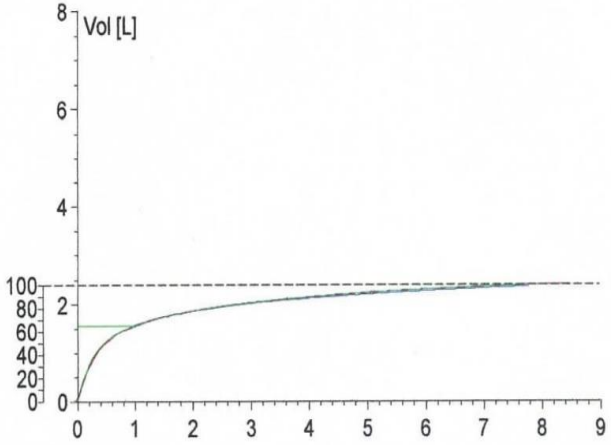


Best Trial



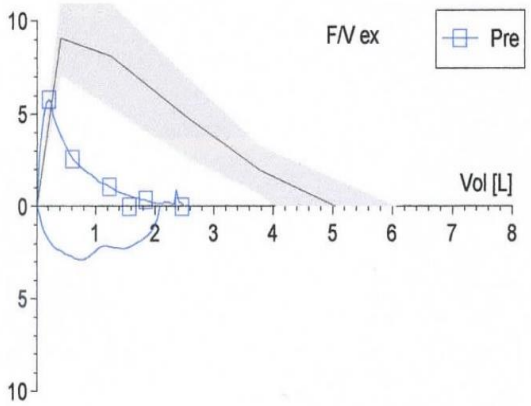
All Trials

Identification:	1450817
Age:	72 Years
Height:	172 cm
Weight:	91.0 kg
BMI:	31

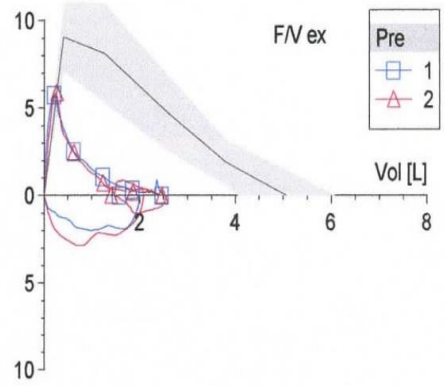


	Pred	Best	%(B/P)	1	2	3	Z-Score	Z-Score
VC MAX	3.83	2.40	63					-2.56
FVC	3.70	2.40	65	2.35	2.40	2.37		-2.13
FEV1	2.82	1.55	55	1.56	1.55	1.55		-2.49
FEV1%F	74.25	64.59	87	66.37	64.59	65.54		-1.35

Spirometry Flow-Volume

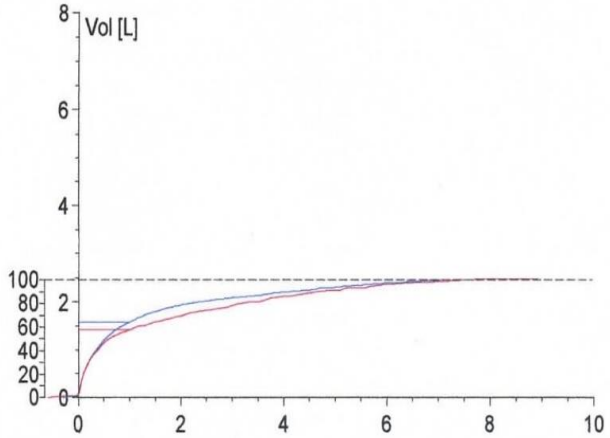


Best Trial



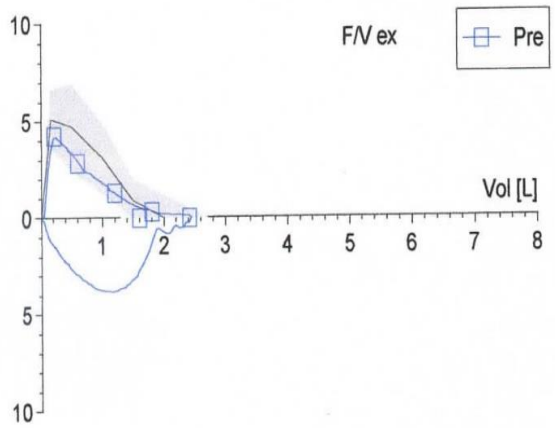
All Trials

Identification:	1460413
Age:	71 Years
Height:	195 cm
Weight:	113.0 kg
BMI:	30

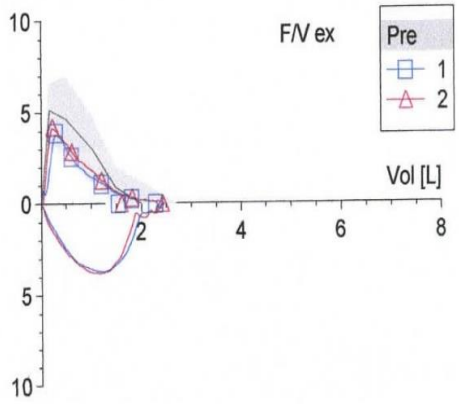


	Pred	Best	%(B/P)	1	2	Z-Score	Z-Score
VC MAX	5.26	2.46	47				-4.99
FVC	5.05	2.46	49	2.46	2.46		-4.23
FEV1	3.84	1.57	41	1.57	1.41		-4.44
FEV1%F	74.43	63.75	86	63.75	57.22		-1.49

Spirometry Flow-Volume

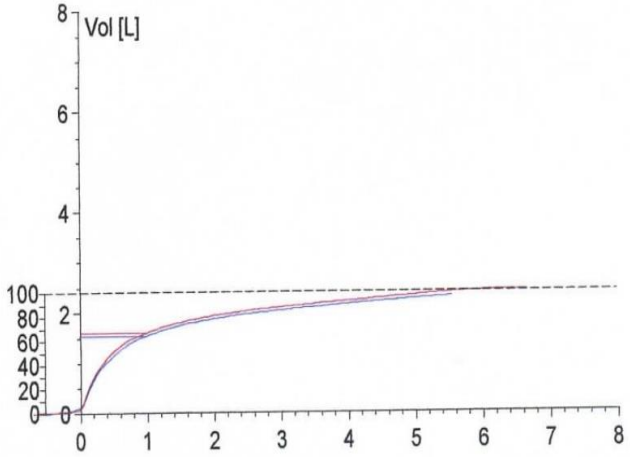


Best Trial



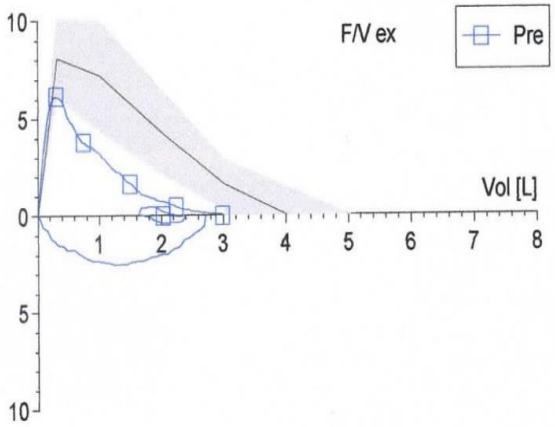
All Trials

Identification:	2420927
Age:	75 Years
Height:	154 cm
Weight:	59.0 kg
BMI:	25

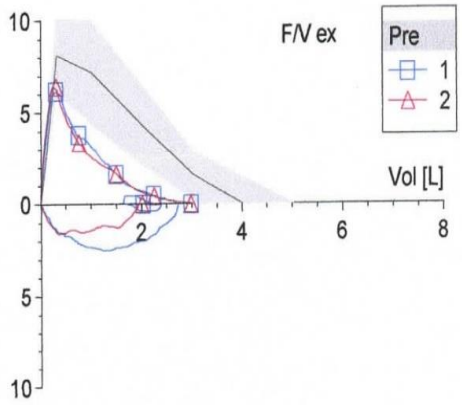


	Pred	Best	%(B/P)	1	2	Z-Score	Z-Score
VC MAX	2.10	2.42	115				0.76
FVC	1.98	2.42	122	2.29	2.42		1.01
FEV1	1.61	1.61	100	1.54	1.61		-0.01
FEV1%F	74.85	66.48	89	67.37	66.48		-1.29

Spirometry Flow-Volume

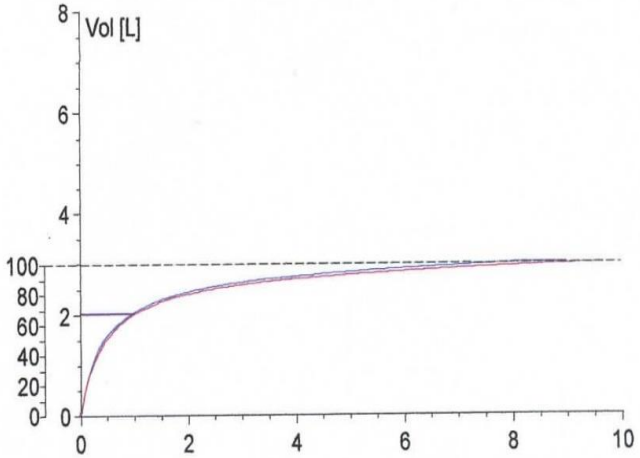


Best Trial



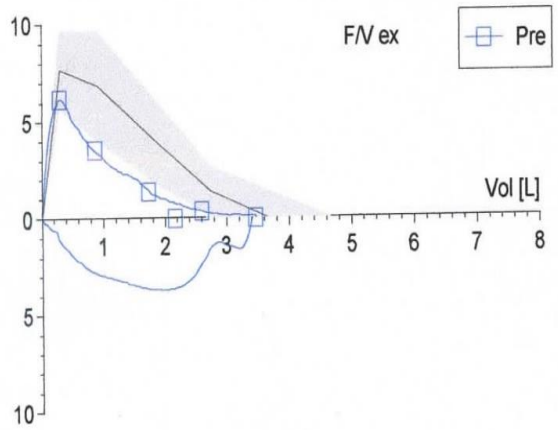
All Trials

Identification:	1551019
Age:	62 Years
Height:	173 cm
Weight:	95.0 kg
BMI:	32

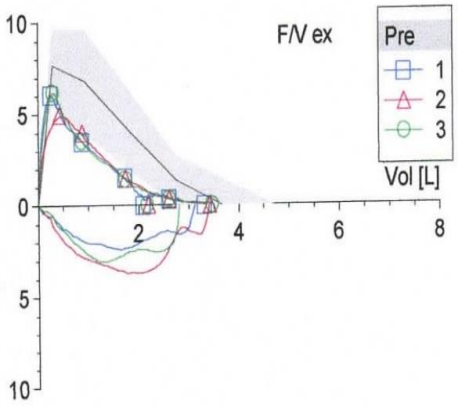


	Pred	Best	%(B/P)	1	2	Z-Score	Z-Score
VC MAX	4.17	2.99	72				-2.10
FVC	4.01	2.99	75	2.99	2.97		-1.67
FEV1	3.15	2.03	65	2.03	2.01		-2.19
FEV1%F	76.05	67.91	89	67.91	67.54		-1.13

Spirometry Flow-Volume

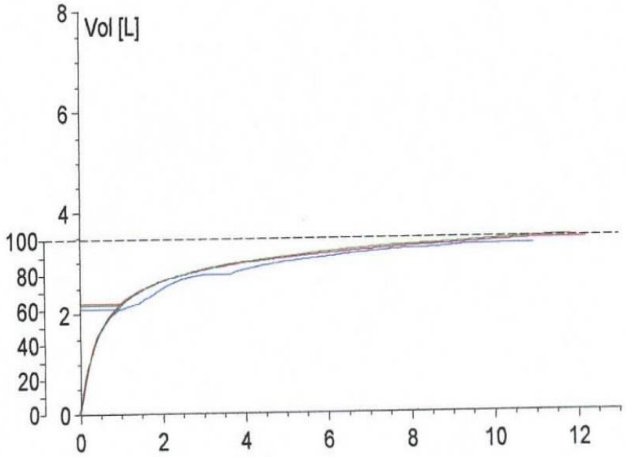


Best Trial



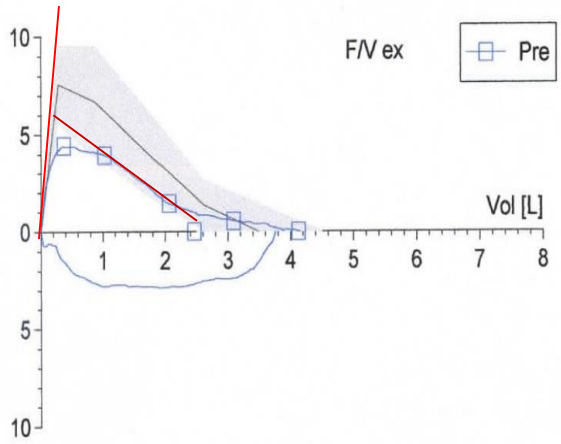
All Trials

Identification:	1530423
Age:	65 Years
Height:	168 cm
Weight:	48.0 kg
BMI:	17

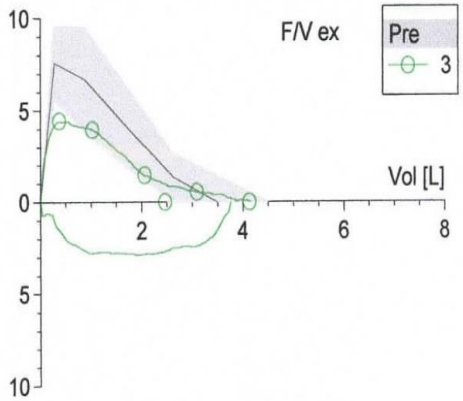


	Pred	Best	%(B/P)	1	2	3	Z-Score	Z-Score
VC MAX	3.78	3.47	92					-0.55
FVC	3.65	3.47	95	3.31	3.42	3.47		-0.29
FEV1	2.85	2.16	76	2.08	2.20	2.16		-1.34
FEV1%F	75.51	62.35	83	62.90	64.42	62.35		-1.84

Spirometry Flow-Volume

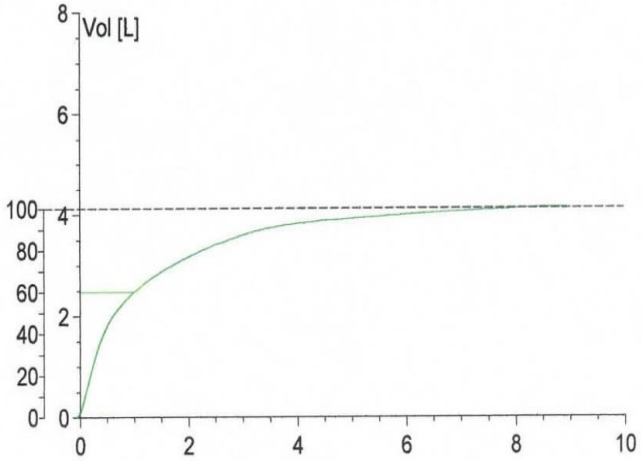


Best Trial



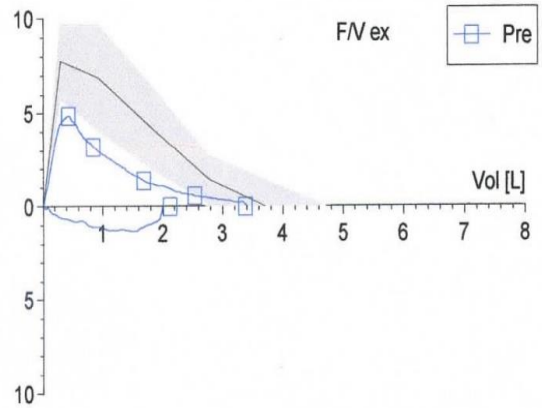
All Trials

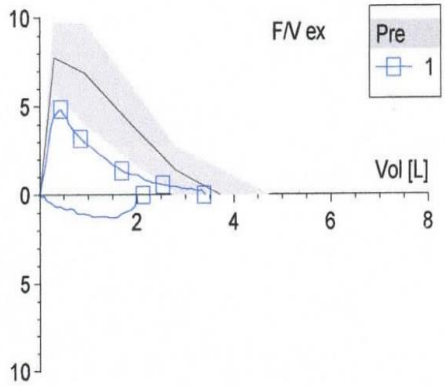
Identification:	1570529
Age:	60 Years
Height:	163 cm
Weight:	81.0 kg
BMI:	30



	Pred	Best	%(B/P)	3	Z-Score	Z-Score
VC MAX	3.61	4.13	114			0.92
FVC	3.49	4.13	118	4.13		1.05
FEV1	2.78	2.47	89	2.47		-0.61
FEV1%F	76.41	59.74	78	59.74		-2.32

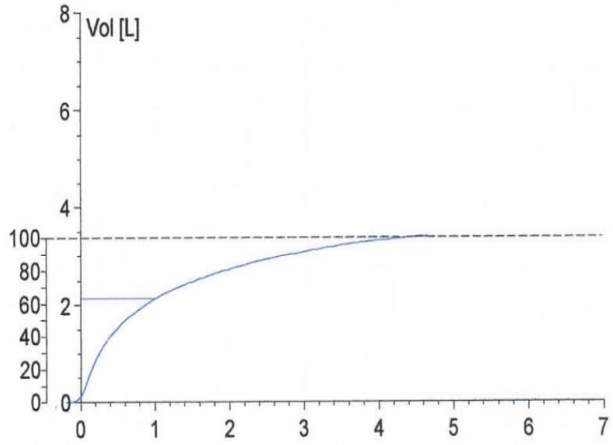
Spirometry Flow-Volume



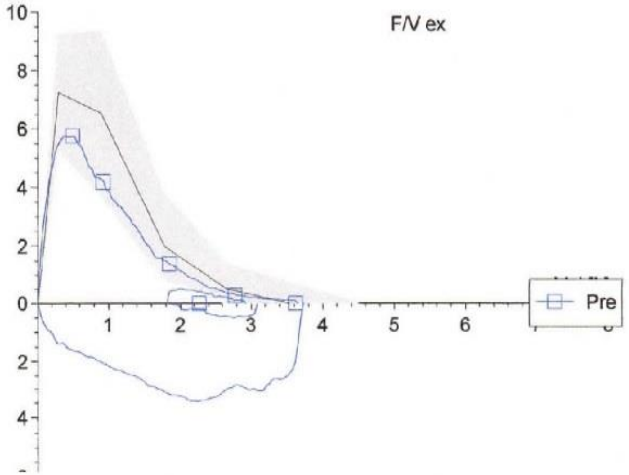


Best Trial ***All Trials***

Identification:	1550103
Age:	63 Years
Height:	168 cm
Weight:	61.0 kg
BMI:	22



	Pred	Best	%(B/P)	1	Z-Score	Z-Score
VC MAX	3.83	3.38	88			-0.81
FVC	3.70	3.38	91	3.38		-0.52
FEV1	2.91	2.12	73	2.12		-1.54
FEV1%F	75.87	62.84	83	62.84		-1.82



Identification:	1430615
Age:	75 Years
Height:	168 cm
Weight:	80.0 kg
BMI:	28

Spirometry

		Pred	Pre	%(Pre/Pred)	Level 2	%(/)	%Chg...	Z-Score	Z-Score
Meas date			19-01-18						
Meas time			12:02						
FVC	L	3.53	3.62	102.5					0.15
FEV 1	L	2.66	2.27	85.2					-0.85
FEV 1 % FVC	%	73.71	62.75	85.1					-1.53
MFEF 75/25	L/s	2.00	1.02	51.2					-1.28
FEF 50	L/s	2.00	1.43	71.4					-0.70
PEF	L/s	7.24	5.75	79.4					-1.23
MVV	L/min	101.19							
IC	L	2.60							
PIF	L/s		3.47						
FE%FIF	%		42.33						
FET	sec		9.23						

„Mi a teendő”

GOLD 2018-19

„Assessment of the presence or absence of airflow obstruction based on a single measurement of the post-bronchodilator FEV1/FVC ratio should be confirmed by repeat spirometry on a separate occasion if the value is between 0.6 and 0.8, as in some cases the ratio may change as a result of biological variation when measured at a later interval. If the initial post-bronchodilator FEV1/FVC ratio is less than 0.6 it is very unlikely to rise above 0.7 spontaneously.”