

# *Overlap CHOPN a astma CON*

*jan chlumský  
Pneumologická klinika 1.LF UK  
a Thomayerovy nemocnice*

*Tato prezentace vznikla za podpory NFA*

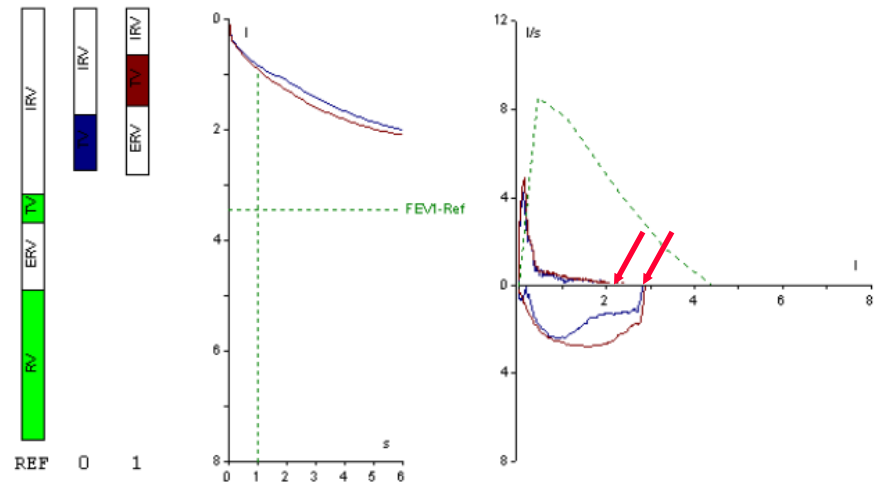


# *Bronchiální obstrukce*

# Definice CHOPN

Irr-OVP  
Expozice  
Symptomy

## Spirometrie, křivka průtok / objem, srovnání Pre / Post



### Statické plicní objemy

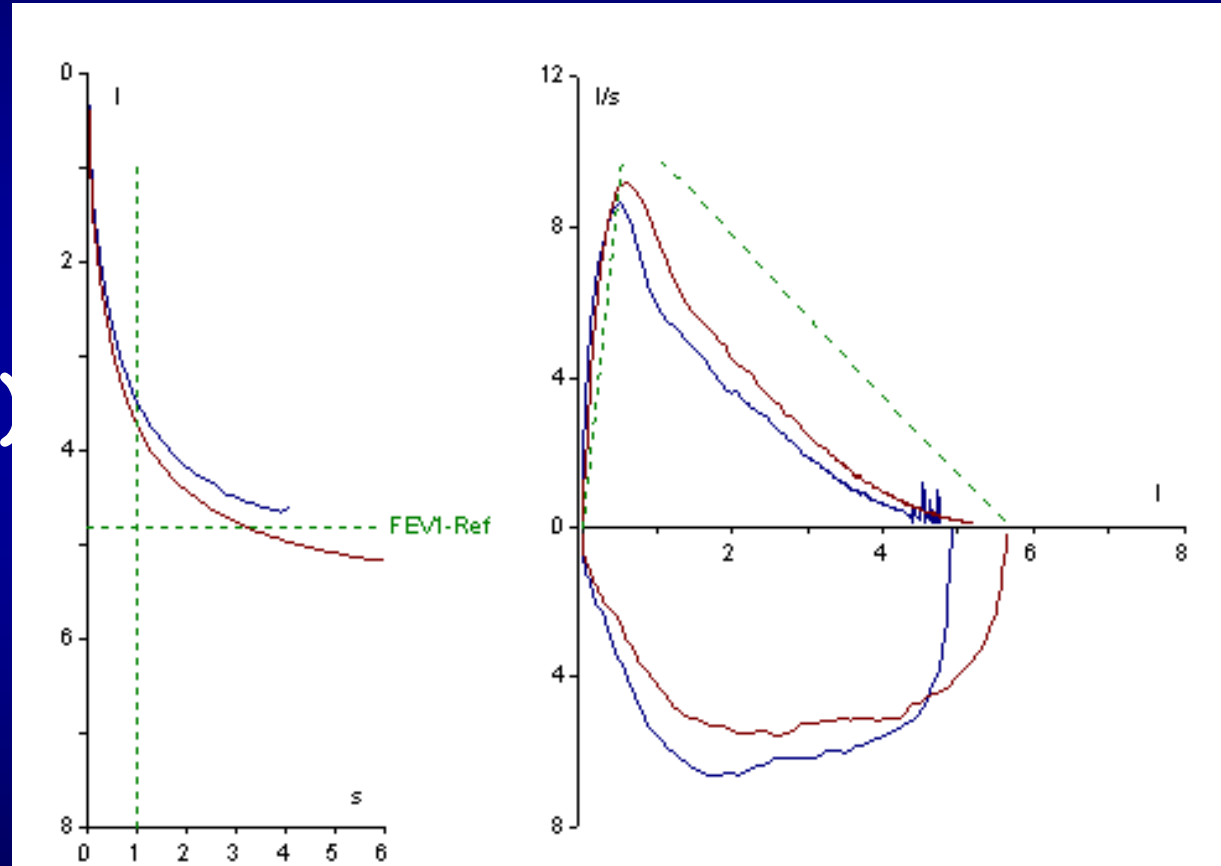
Parametr	Jednotka	Nálezitá	Pre 14:57 %Nálezitě		Post 15:13 %Nálezitě		Post%Pre
VC	l	4.63	2.81	61	2.88	62	2
ERV	l	1.17			1.18	101	
IRV	l		1.85		0.80		-57
TV	l		0.96		0.89		-7
IC	l	3.70	2.81	76	1.70	46	-40

### Dynamické plicní objemy

FVCex	l	4.45	2.27	51	2.38	53	5
FEV1	l	3.45	0.85	25	0.93	27	9
FEV1/VC	%	76	30	40	32	43	6
FEV1/FVC	%	76	38	50	39	52	4
PEF	l/s	8.53	4.25	50	4.90	57	15
MEF75	l/s	7.58	0.48	6	0.65	9	35
MEF50	l/s	4.53	0.25	5	0.37	8	49
MEF25	l/s	1.72	0.20	12	0.22	13	10
MEF25-75	l/s	3.44	0.32	9	0.37	11	17
PIF	l/s		2.38		2.83		19
MIF50	l/s		1.96		2.74		40
Aex	l*/l/s		1.56		1.85		19
Rocc	kPa/(l/s)	0.30	0.33	110	0.27	89	-19
tPEF	ms		106		53		-50
EV/FVC	%		1		1		7
EV	l		0.03		0.03		12
tex	s		8.8		8.7		-1

# Definice AB

symptomy  
remodelace (BHR)  
zánět (eos, FeNO)



# *Jaká jsou kriteria reverzibility?*

FEV<sub>1</sub> 12%, 200 ml

Snaha o snížení hranice - viz Aex

150ml variace měření

FEV<sub>1</sub> 12% je hranice přirozené variability

$\Delta$ FEV<sub>1</sub> záleží na změně objemu !!!

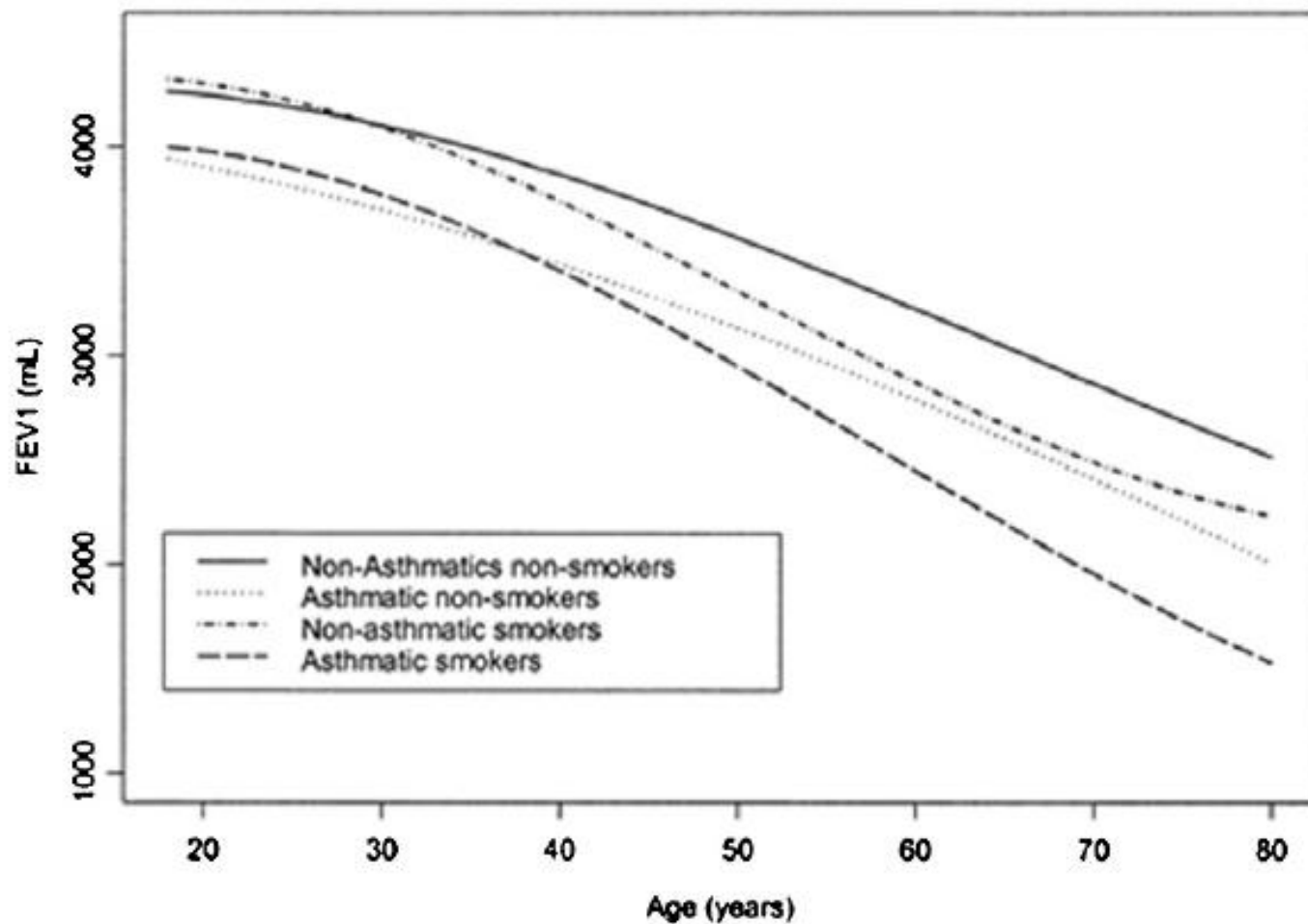
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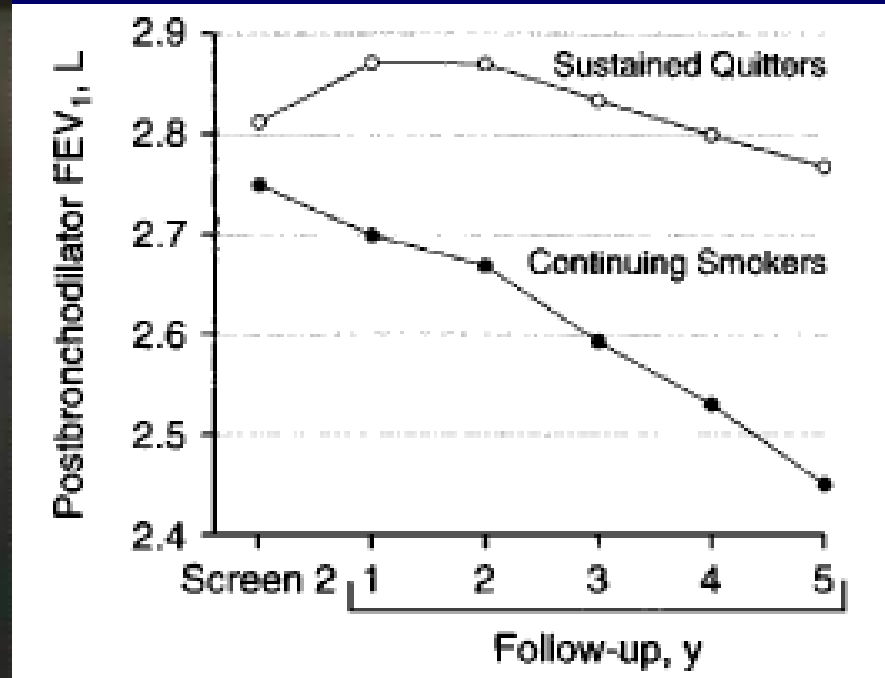
**NENÍ SHODA**

*Rychlost poklesu ventilace*

# Pokles $FEV_1$



# Hlavní „hrdina“ ve vedlejší roli



Effects of Smoking Intervention and the Use of an Inhaled Anticholinergic Bronchodilator on the Rate of Decline of FEV<sub>1</sub>

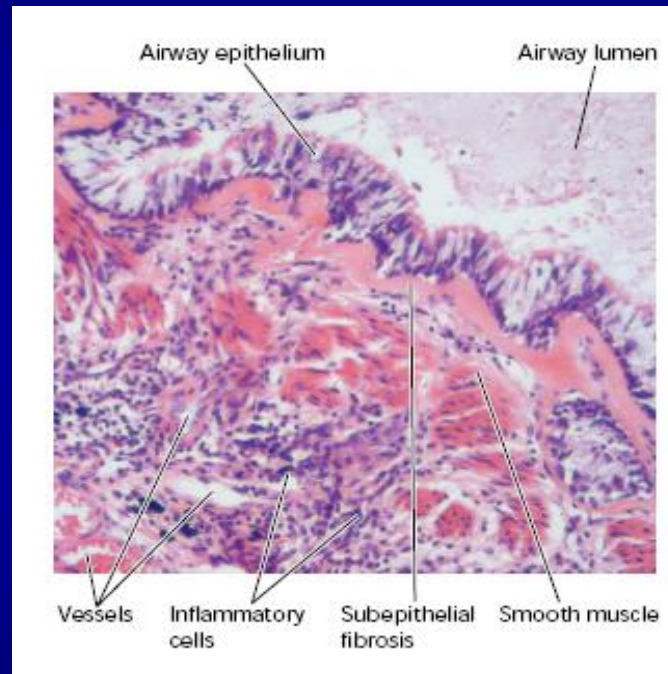
The Lung Health Study

Nicholas R. Anthonisen, MD; John E. Connett, PhD; James P. Kiley, PhD; Murray D. Altose, MD; William C. Bailey, MD; A. Sonia Buist, MD; William A. Conway, Jr, MD; Paul L. Enright, MD; Richard E. Kanner, MD; Peggy O'Hara, PhD; Gregory R. Owens, MD; Paul D. Scanlon, MD; Donald P. Tashkin, MD; Robert A. Wise, MD; for the Lung Health Study Research Group



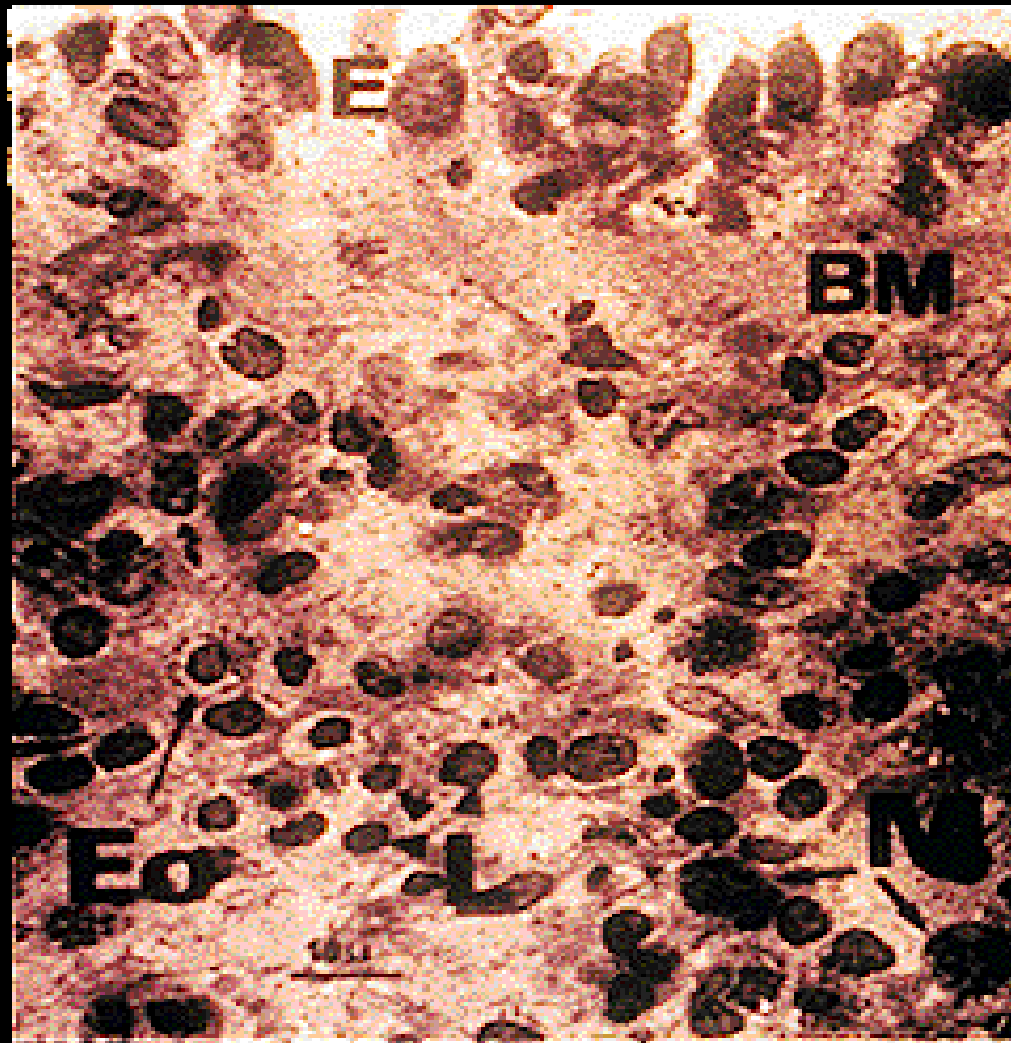
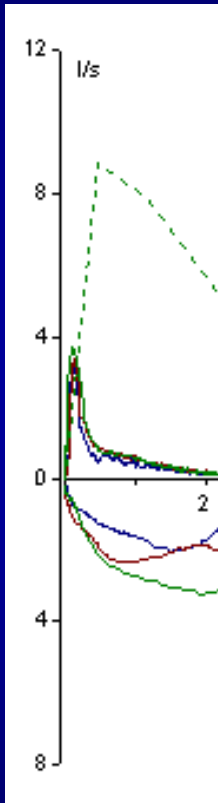
# *Imunologická reakce*

Zánět



Remodelace

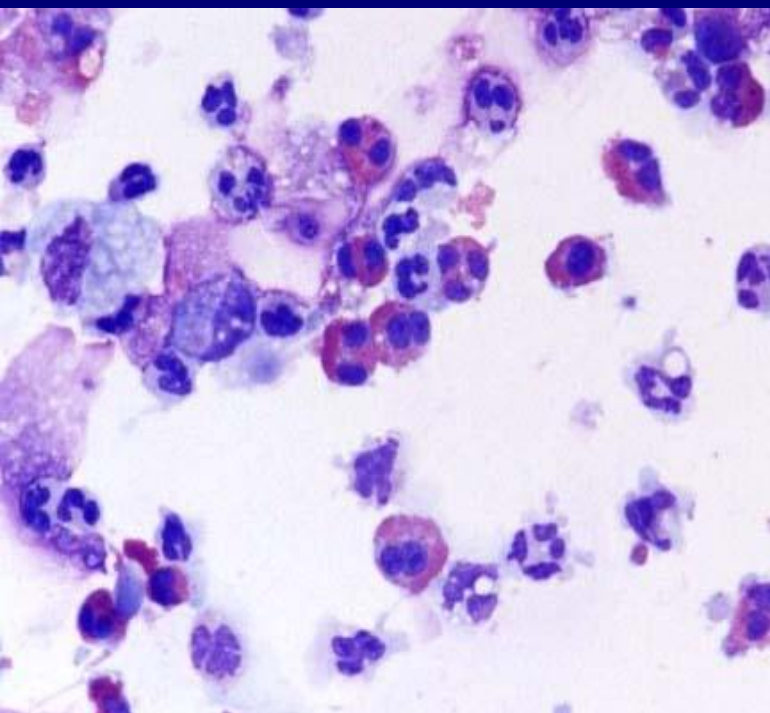
*Záněť dýchacích cest*



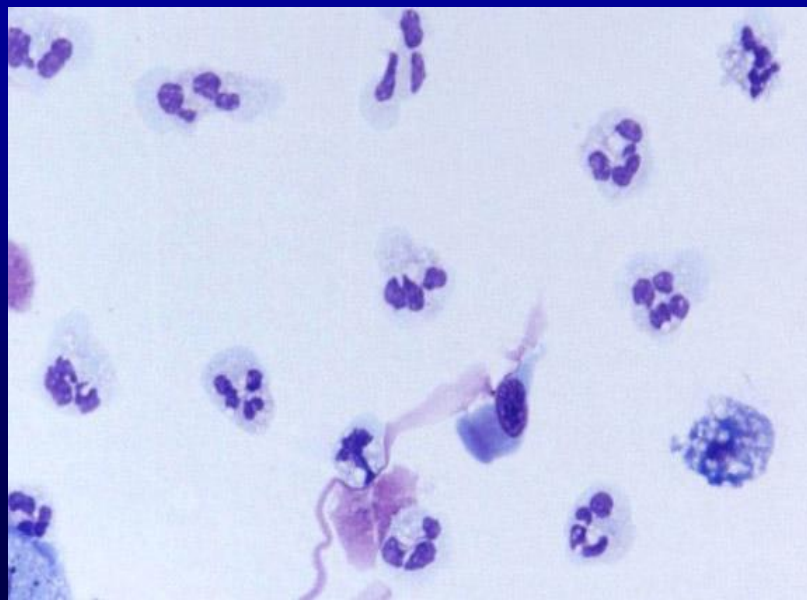
BDT  
 ↓  
 SKS !!!

Asthmatic

# Vyšetření indukovaného sputa - fenotypy



Eosinofilní	}	EO
Smíšené		
Neutrofilní	}	NEO
Paucigranulocytární		



# Buněčné populace sputa (fenotypy) po IKS

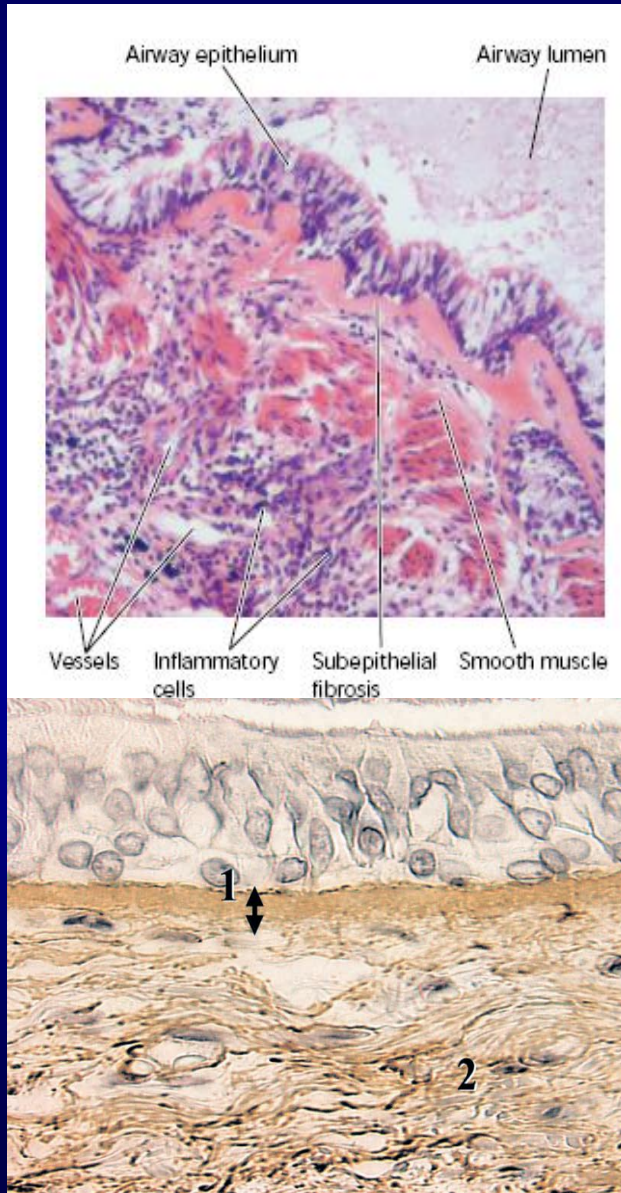
**Table 5** Sputum phenotype at loss of control (LOC) or 28 days after steroid withdrawal and after fluticasone 1000 µg daily for 28+ days

Phenotype at LOC or 28 days after steroid withdrawal		Phenotype after fluticasone 1000 µg daily for 28+ days				
		Eosinophilic	Paucigranulocytic	Mixed	Neutrophilic	NA
Eosinophilic	63 (67%)	32 (51%)	22 (35%)	2 (3%)	2 (3%)	5 (8%)
Paucigranulocytic	29 (31%)	4 (14%)	21 (72%)	0 (0%)	3 (10%)	1 (3%)
Mixed	2 (2%)	1 (50%)	0 (0%)	1 (50%)	0 (0%)	0 (0%)
Neutrophilic	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
All	94 (100%)	37 (39%)	43 (46%)	3 (3%)	5 (5%)	6 (6%)

Results expressed as n (%).

Eosinophilic: eosinophils  $\geq 2\%$ , neutrophils  $< 61\%$ ; Paucigranulocytic: eosinophils  $< 2\%$ , neutrophils  $< 61\%$ ; Mixed: eosinophils  $\geq 2\%$ , neutrophils  $\geq 61\%$ ; Neutrophilic: eosinophils  $< 2\%$ , neutrophils  $\geq 61\%$ ; NA, sputum sample not available after trial of steroid.

# Průkaz zánětu a/nebo remodelace



**Zánětlivá celulizace**

**Epitel – pohárkové buňky**

**Hladké svaly – hypertrofie, hyperplazie**

**Submukózní žlázy**

**Kapiláry – dilatace, angiogeneza**

**Lamina reticularis – Ig, kolagen I, III, fibronectin, tenascin,**

**ECM – rovnováha tvorby, degradace a složení (MMP x TIMP)**

**Změny plicního parenchymu**

# Morfologické rozdíly

Table 2 Simplified comparison of COPD and asthma

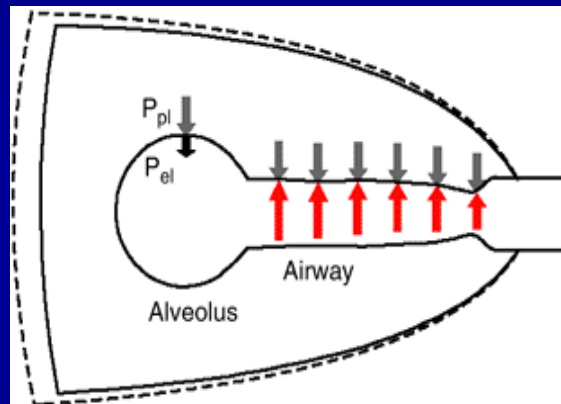
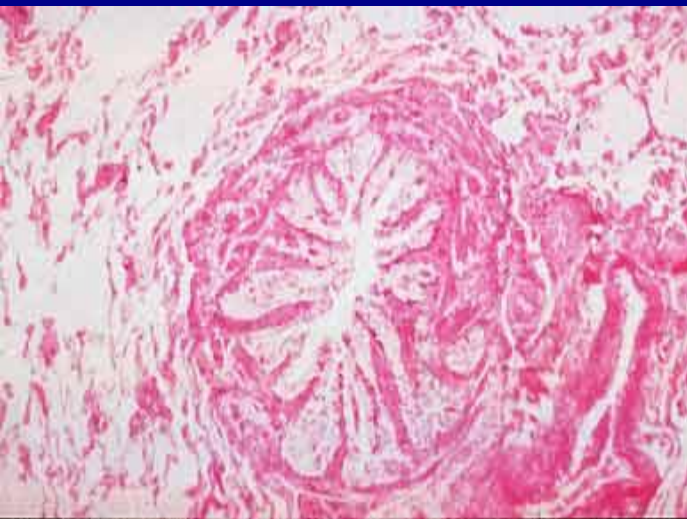
	<i>COPD</i>	<i>Asthma</i>
Airflow obstruction	Progressive deterioration of lung function (? reversible component)	Variable ( $\pm$ irreversible component)
Post mortem	Excessive mucus (mucoid/purulent), small airway disease, emphysema	Hyperinflation, airway plugs (exudate + mucus), no or little emphysema
Sputum	Macrophage, neutrophil (infective exacerbation)	Eosinophilia, metachromatic cells, Creola bodies
Surface epithelium	Fragility undetermined	Fragility/loss
Bronchiolar mucous cells	Metaplasia/hyperplasia	Mucous metaplasia is debated
Reticular basement membrane	Variable or normal	Homogeneously thickened and hyaline
Congestion/oedema	Variable/fibrotic	Present
Bronchial smooth muscle	Enlarged mass (small airways)	Enlarged mass (large airways)
Bronchial glands	Enlarged mass (increased acidic glycoprotein)	Enlarged mass (no change in mucin histochemistry)
Cellular infiltrate	Predominantly CD3, CD8, CD68, CD25, VLA-1 and HLA-DR + ve, mild eosinophilia (not degranulated?), mast cell increase	Predominantly CD3, CD4, CD25 (IL-2R) +ve, marked eosinophilia (ED2 +ve) (degranulated), mast cell increase (decrease in severe/fatal)
Cytokines (ISH)	GM-CSF protein $\pm$ IL-4 but not IL-5	IL-4 + IL-5 gene expression (Th2 profile)

Reproduced with permission from reference 89.

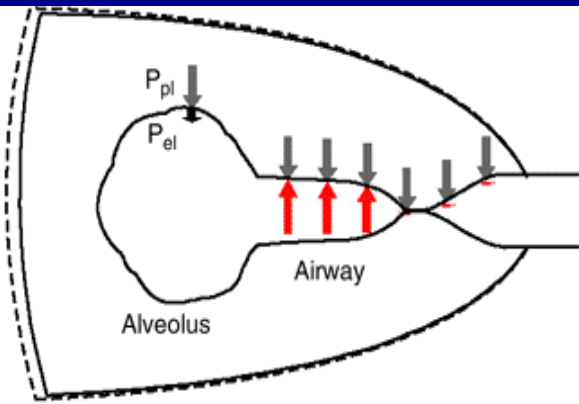
*Remodelace*



# Obstrukční ventilační porucha



A Normal forced expiration from TLC

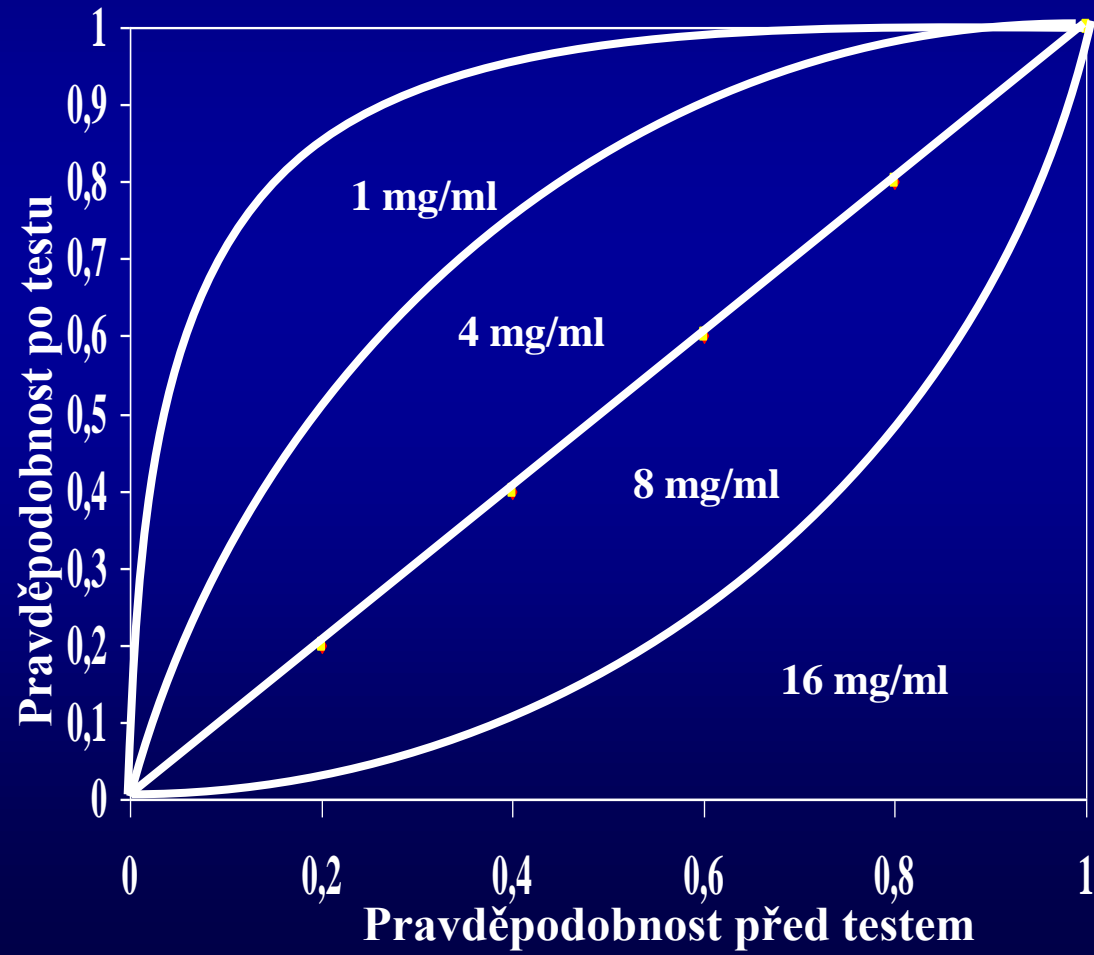
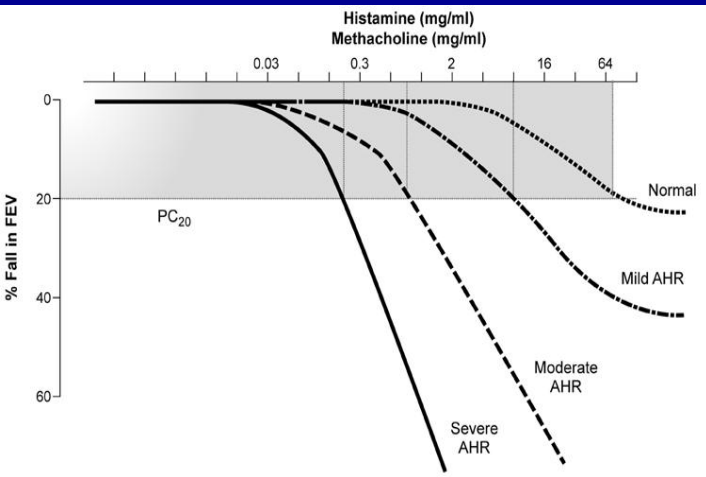


B Emphysema forced expiration from TLC

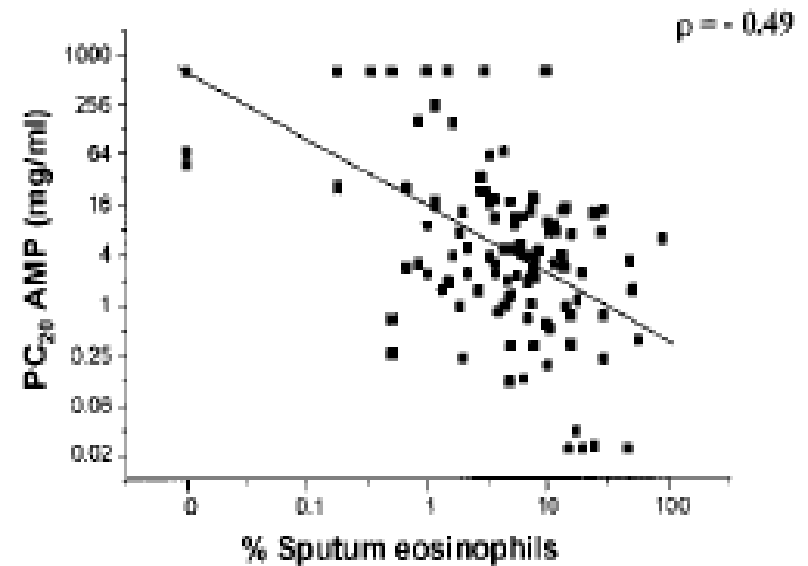
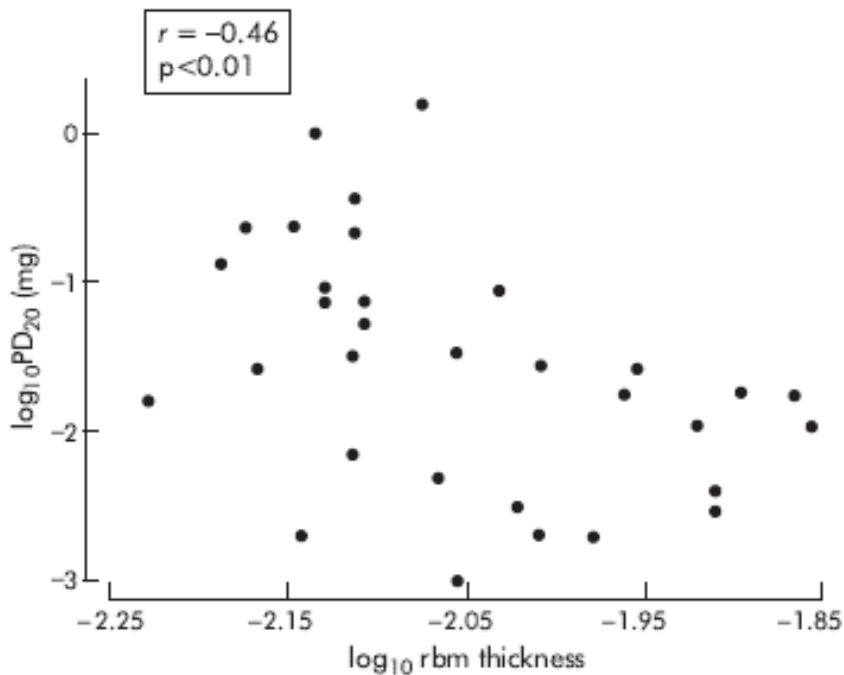
Astma

CHOPN

# Bronchokonstrikční test



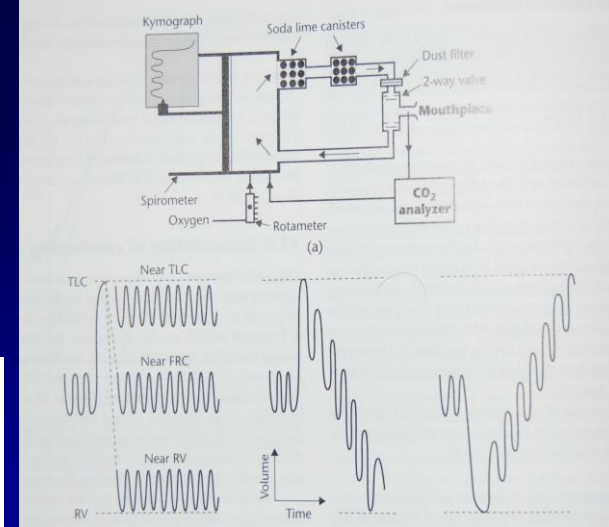
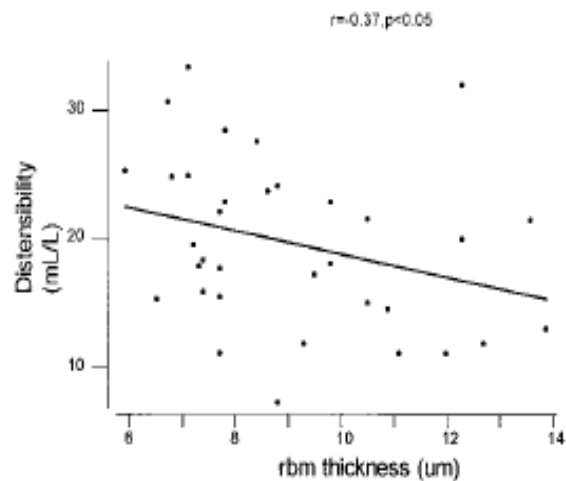
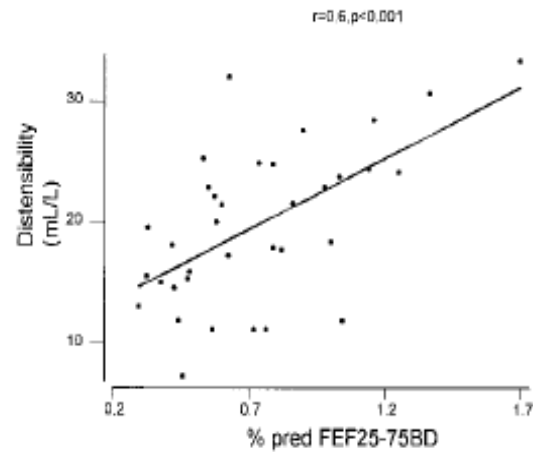
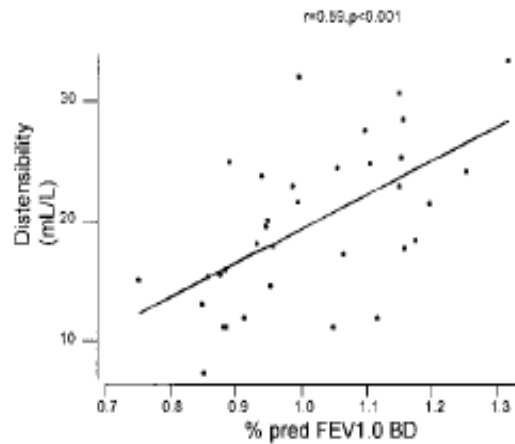
# *BHR - přímé a nepřímé stimuly*



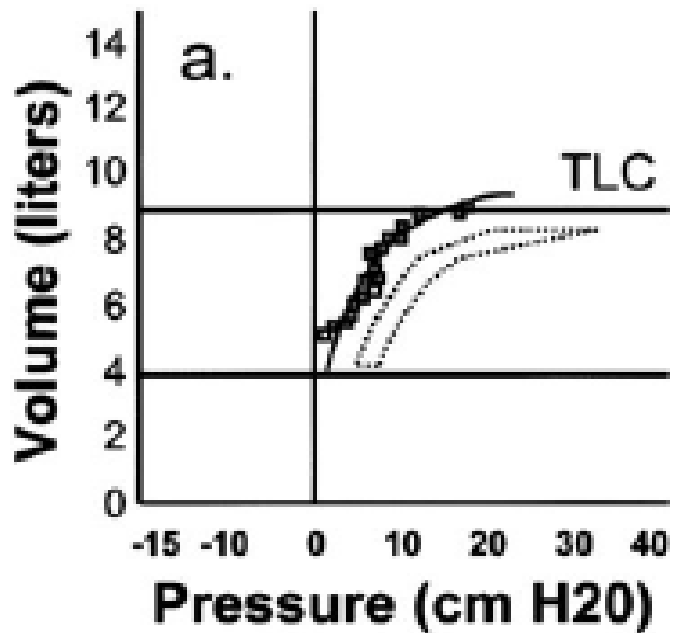
C Ward et al, Thorax 2002

M van der Berge et al, AJRCCM 2001

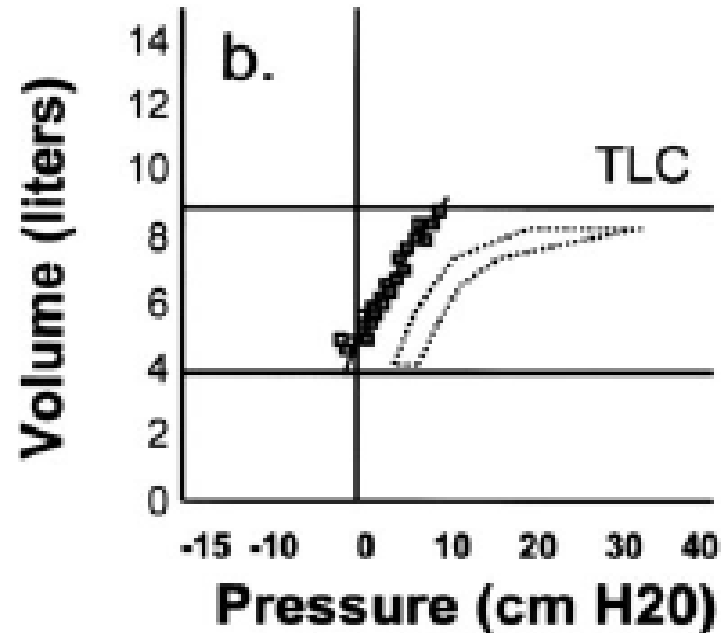
# Fyziologie remodelace



# *Fyziologie remodelace*

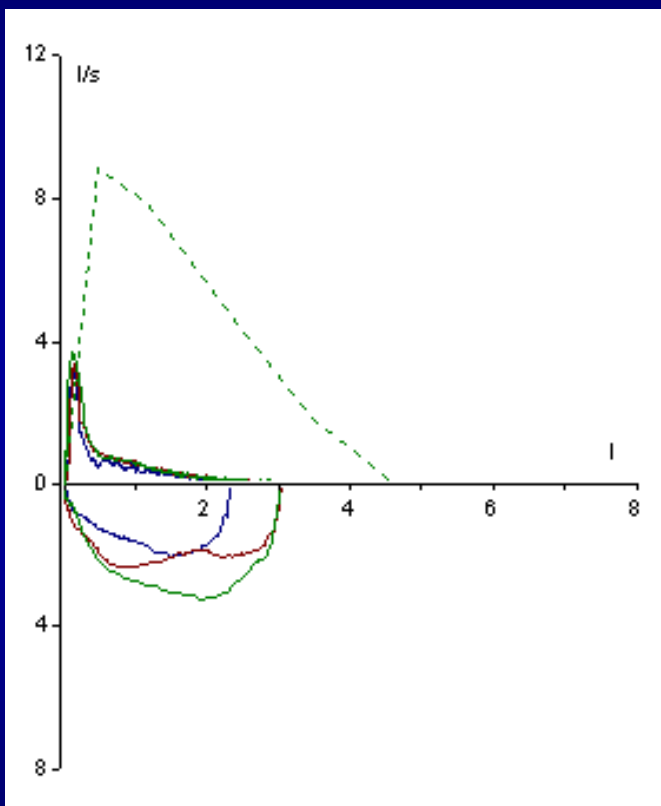


**Mild-moderate**

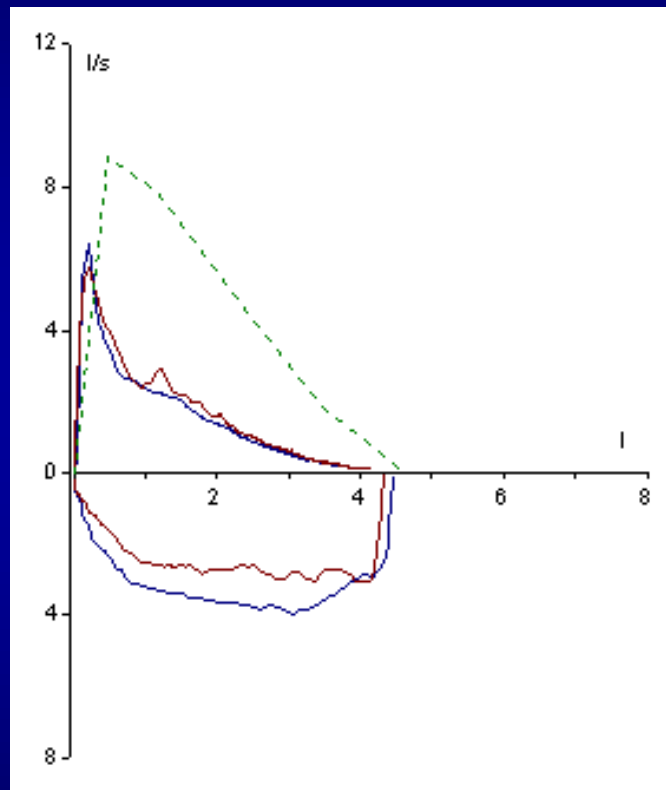


**Severe**

# „Fixní“ obstrukce



29.5.2007



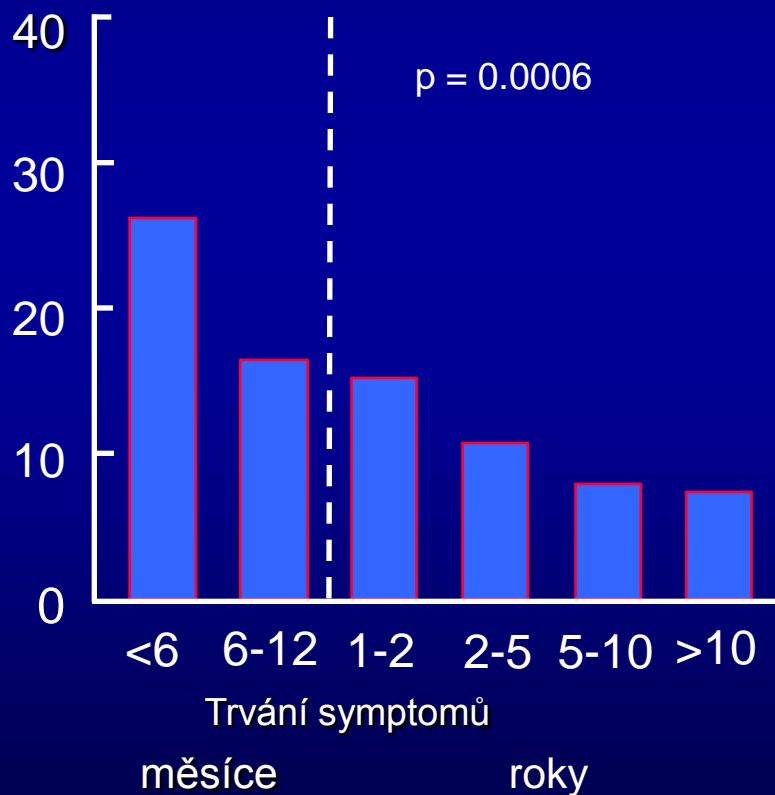
12.6.2007

BDT  
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SKS !!!

# Základní principy léčby perzistujícího astmatu

Dospělí<sup>1</sup>

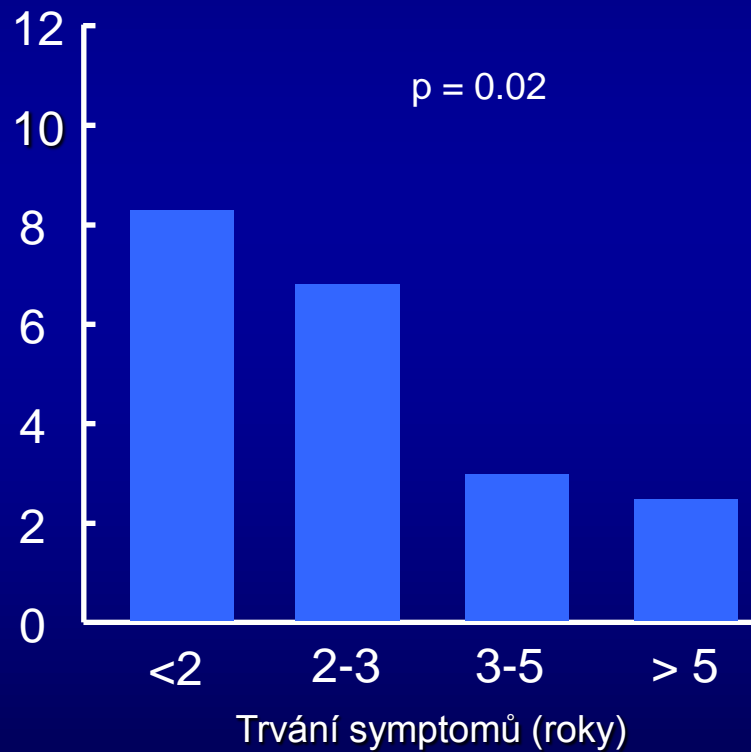
Maximální zlepšení v %  
náležitých hodnot PEF



1. Selroos et al, Chest 1995

Děti<sup>2</sup>

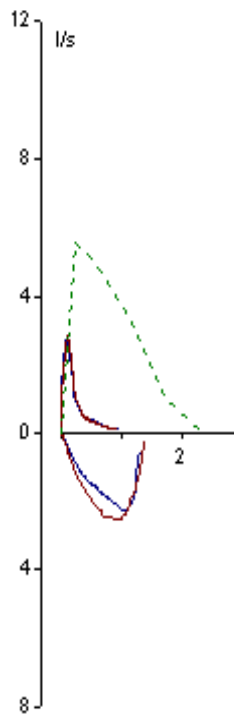
Maximální zlepšení v %  
náležitých hodnot FEV<sub>1</sub>



2. Agertoft and Pedersen, Respir Med 1994

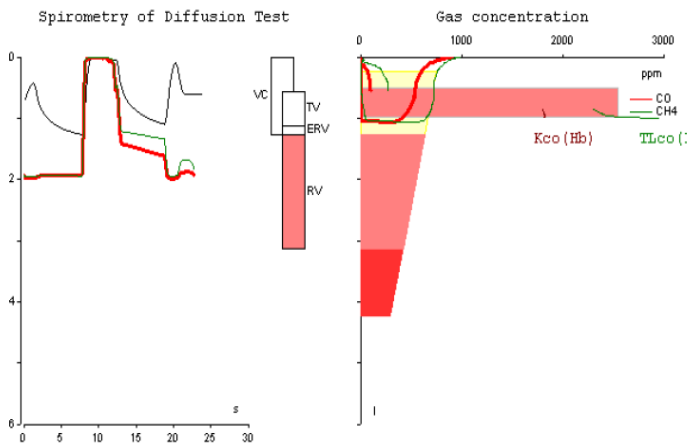
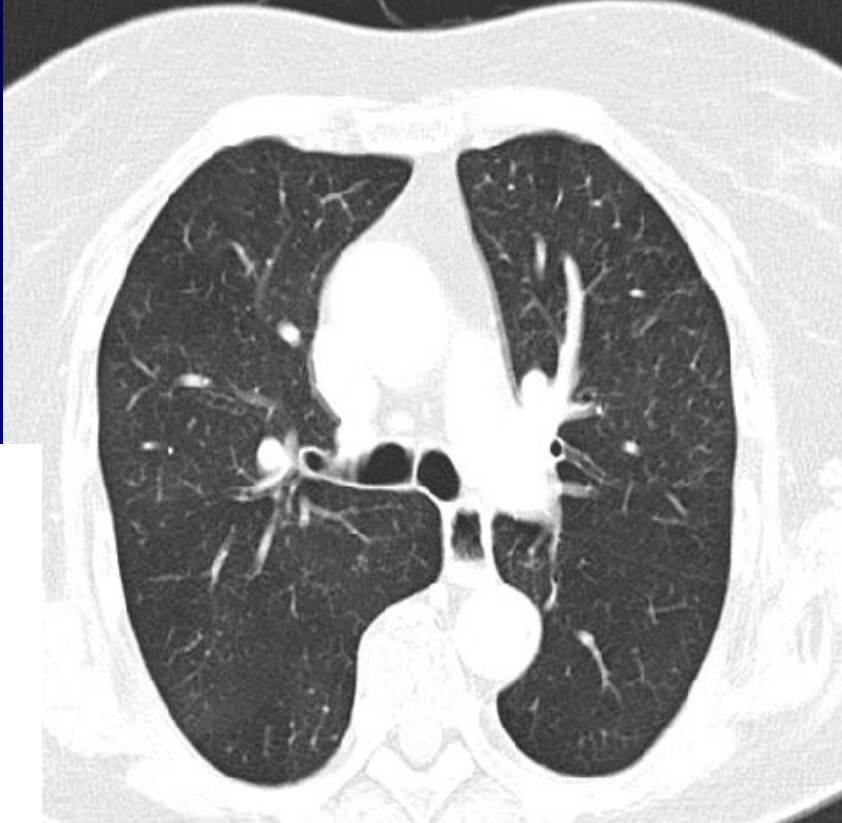
*Respirace*





# TL<sub>CO</sub>

CO Difuze



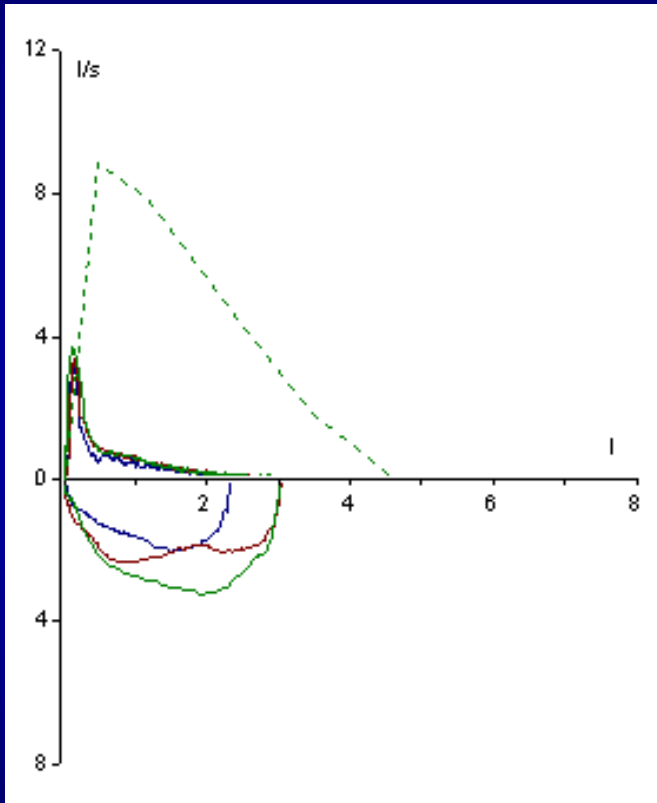
Vyhodnoceno pomoci **SB metody** :

Parametr	Jednotka	Nál	Mér	%Nál
HB	g/dl		13.5	
TLco(Hb)	mmol/kPa/min	5.75	4.27	74
Kco(Hb)	mmol/kPa/min/l	1.91	1.42	74
FRC	l	2.66	2.00	75
RV	l	2.05	1.87	91
RV/TLC	%	43	60	138
TLC	l	4.77	3.14	66
IVC CH4	l	2.30	1.27	55
IVC CH4 / IVC			0.98	
%FRC/%TLCO	l		1.01	
%VC/%TLCO	l		0.74	

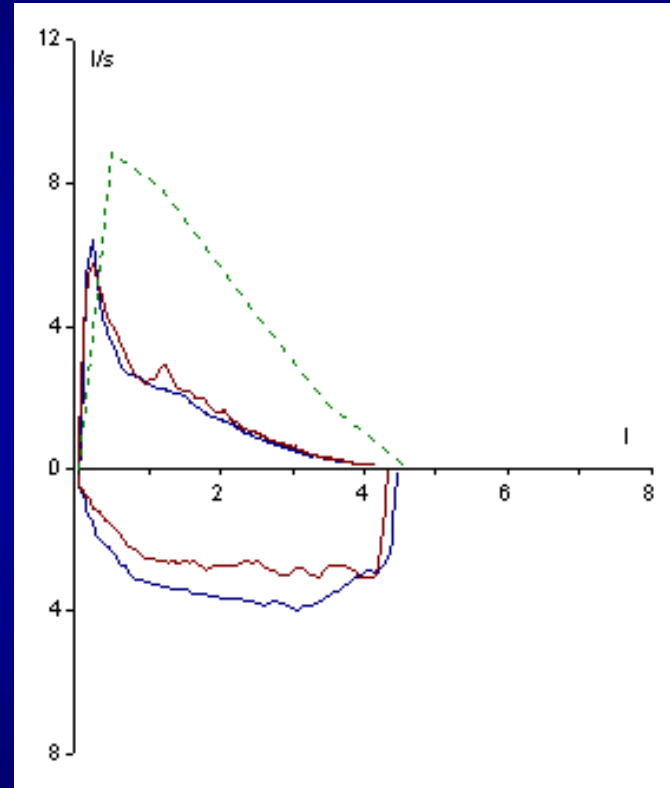
Vyhodnoceno pomoci **Fast Space (fs) balancní metody**

FRC (fs)	l	2.66	3.10	116
RV (fs)	l	2.05	2.97	145
RV/TLC (fs)	%	43	70	163
TLC (fs)	l	4.77	4.23	89

# „Fixní“ obstrukce



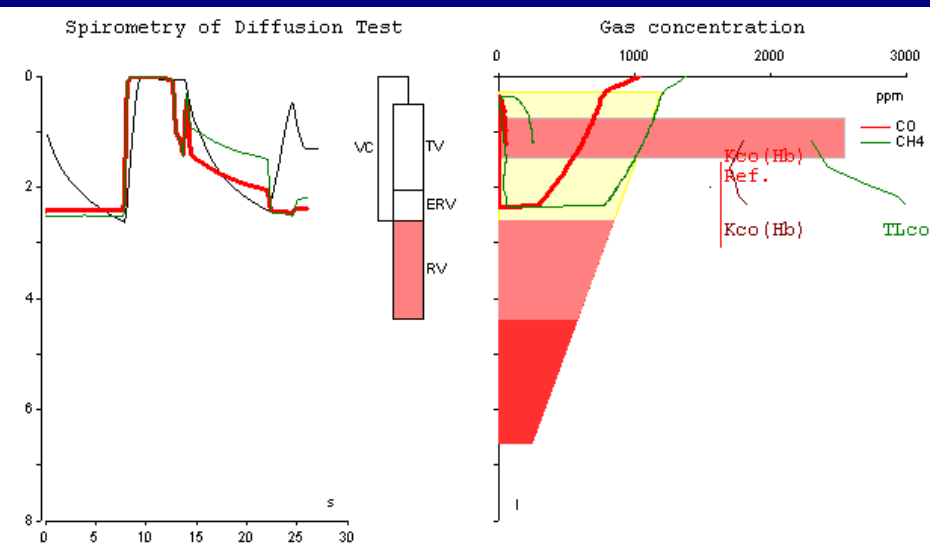
29.5.2007



12.6.2007

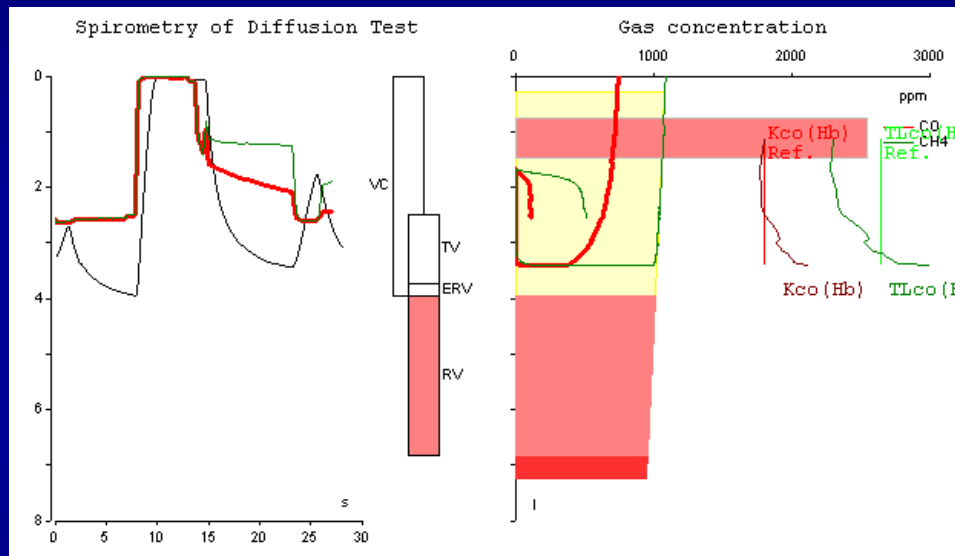
**BDT**  
|  
|  
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**SKS !!!**

# TL<sub>CO</sub>



TL<sub>CO</sub> 54%  
 K<sub>CO</sub> 85%  
 VA 65%

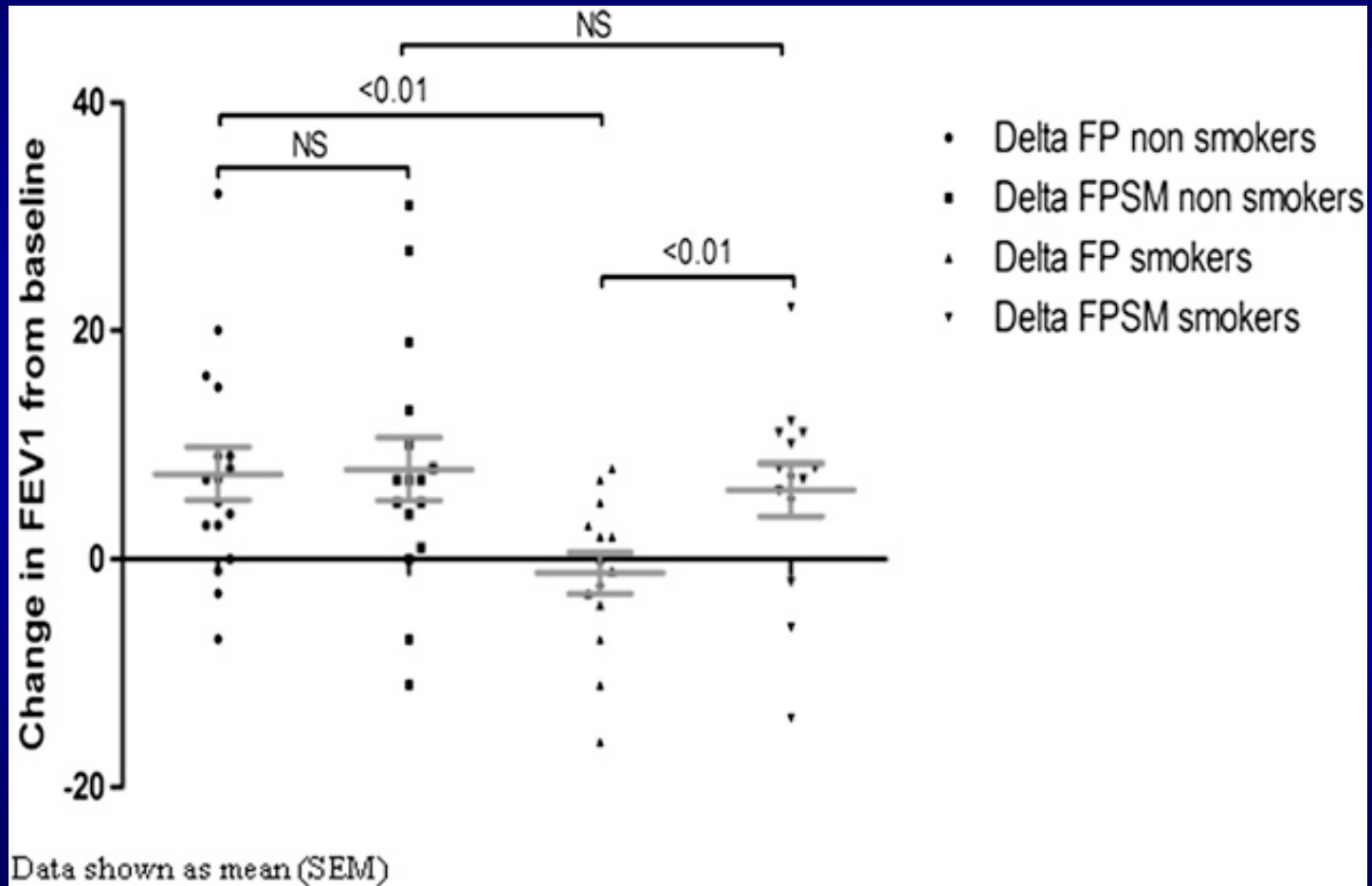
29.5.2007



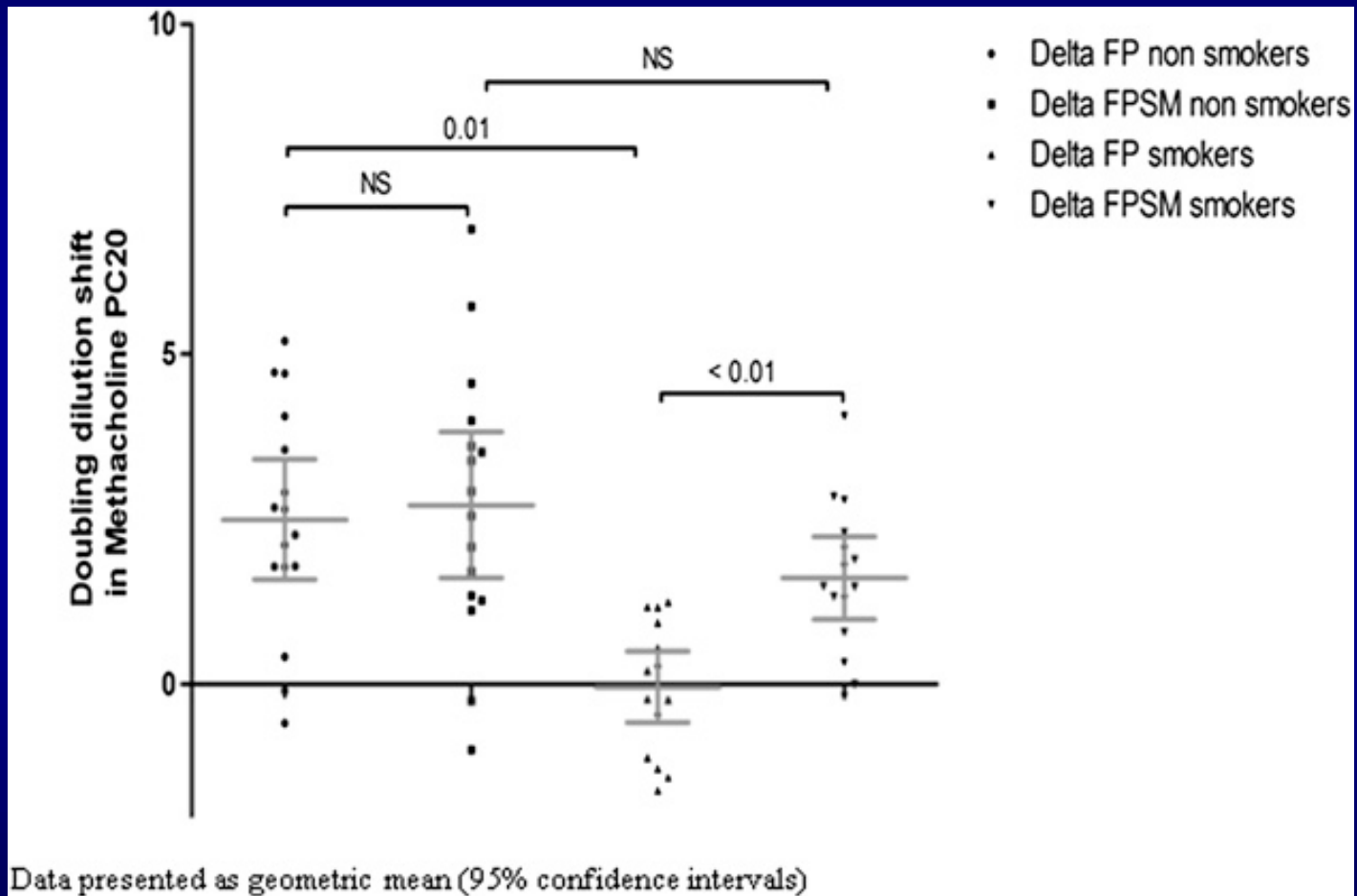
TL<sub>CO</sub> 101%  
 K<sub>CO</sub> 109%  
 VA 95%

12.6.2007

# *Kouřící astmatici*



# *Kouřící astmatici*



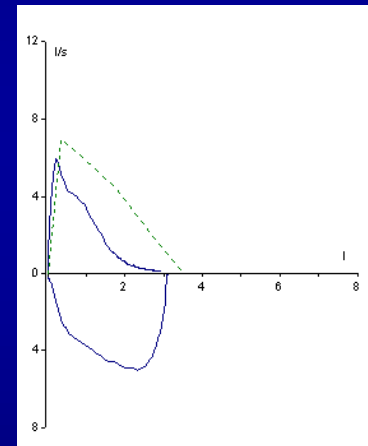
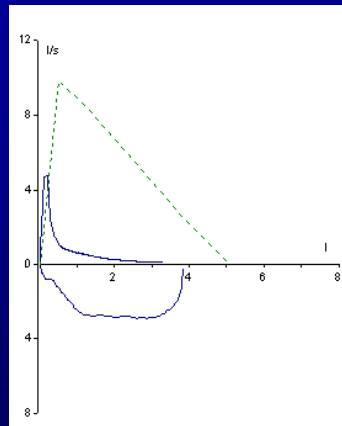
# Čemu všemu budeme říkat CHOPN?

✓ Astma s irreverzibilní obstrukcí?

✓ IPAH?



✓ BPD?



✓ BE, EB a další...

# Overlap CHOPN a astma?



✓ A  
✓ A  
✓ A  
✓ B  
✓ a

"Diagnosa ještě není zcela potvrzena laboratorně, ale zdá se, že máte krávy."





*A není to vlastně fuk?*

*...když na všechno dáváme fixní kombinace?*

