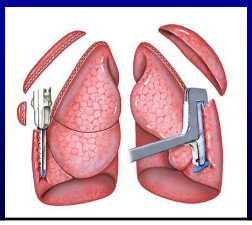
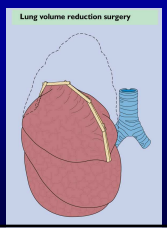
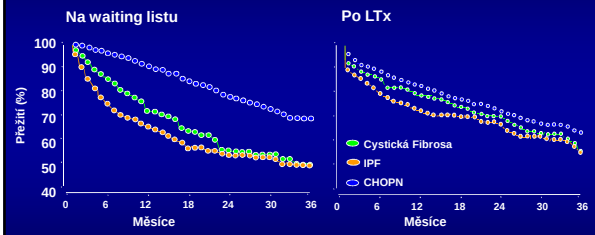
Léčba emfyzemu u pacientů s CHOPN – EVR?

jan chlumský
Pneumologická klinika 1.LF UK
a Thomayerovy nemocnice, Praha

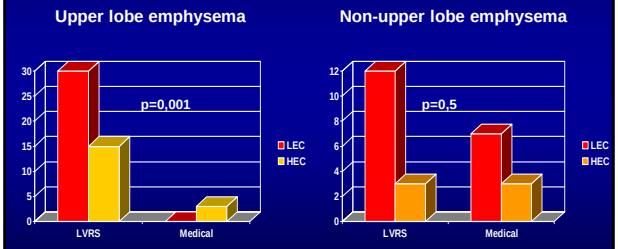




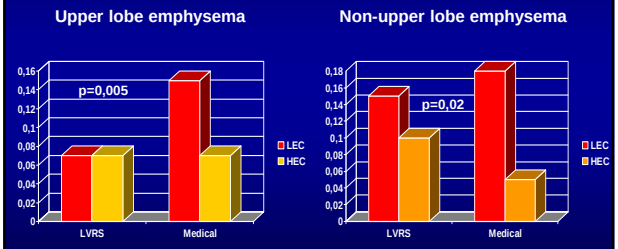
LTx u CHOPN: přežití



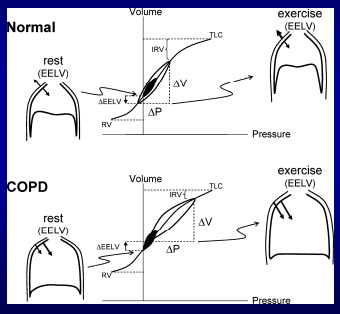
Zlepšení tolerance zátěže



Celková mortalita

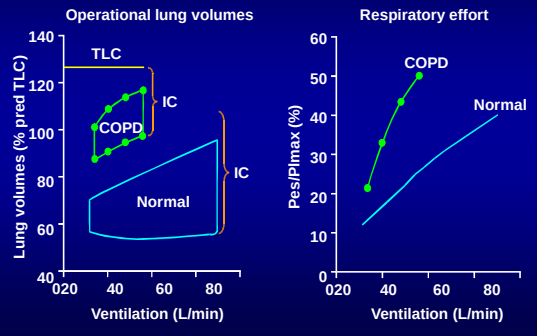


CHOPN - dynamická hyperinflace

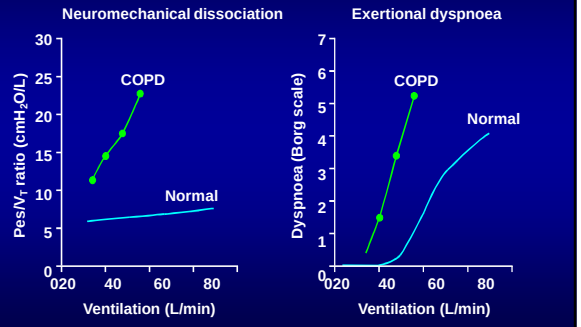


D O´Donnell, COPD 2007

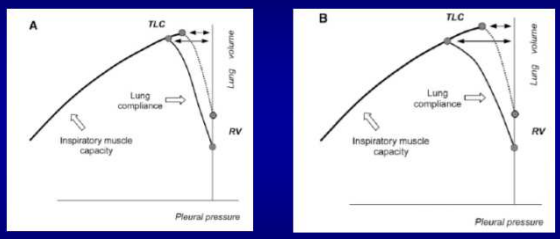
Neuromechanická disociace



Neuromechanická disociace a dušnost



Efekt LVRS



Fessler HE, Proc Am Thorac Soc 2008

Efekt LVRS

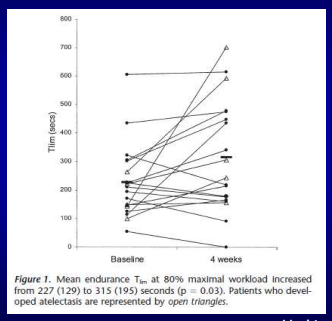
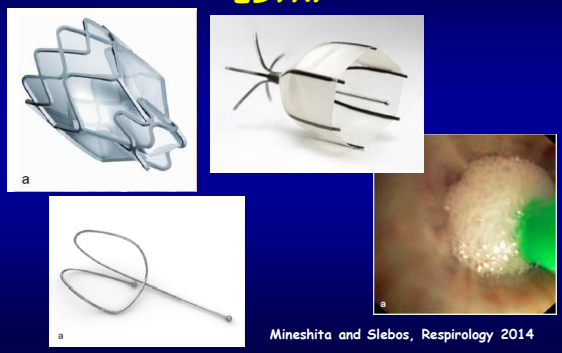


Figure 1. Mean endurance T_{lim} at 80% maximal workload increased from 227 (129) to 315 (195) seconds ($p = 0.03$). Patients who developed atelectasis are represented by *open triangles*.

ΔTL_{CO}
ΔIC

Hopkinson NS, et al. AJRCCM 2005

EBVR?



Mineshita and Slebos, Respirology 2014

Eur Respir J 2012; 39: 1319–1325
DOI: 10.1183/09031936.00019711

Multicentre European study for the treatment of advanced emphysema with bronchial valves

Vincent Ninane*, Christian Geltner#, Michela Bezzi+, Pierfranco Foccoli+, Jens Gottlieb*, Tobias Welte*, Luis Seijo1, Javier J. Zulueta1, Mohammed Munavvar*, Antoni Rosell**, Marta Lopez**, Paul W. Jones##, Harvey O. Coxson++, Steven C. Springmeyer++ and Xavier Gonzalez++

Žádná smysluplná změna ve funkčních parametrech

TABLE 3 Per cent responders and change from baseline in computed tomography (CT) lung volumes and St George's Respiratory Questionnaire (SGRQ) score at 3 months, and per cent of responders (paired data)

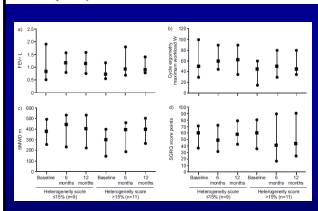
	Treatment	Control	p-value
CT volumes and SGRQ responders# n	8/33	0/35	0.002
CT lung volumes % change			
Upper lobes (treated)	-7.3±9	0.7±5.2	<0.0001
Non-upper lobes (untreated)	6.7±14.5	0.2±7.8	0.027
SGRQ total score	-4.3±16.2	-3.6±10.7	0.837

Data are presented as mean±SD, unless otherwise stated. #: responder defined as having both a ⩾4-point improvement in SGRQ and a volume decrease in upper lobes with a compensatory volume increase of ⩾7.5% in non-treated lobes measured by CT (composite end-point).

Eur Respir J 2012; 39: 1334–1342
DOI: 10.1183/09031936.00161611

Efficacy predictors of lung volume reduction with Zephyr valves in a European cohort

Felix J.F. Herth, Marc Noppen, Arschang Valipour, Sylvie Leroy, Jean-Michel Vergnon, Joachim H. Ficker, Jim J. Egan, Stefano Gasparini, Carlos Agusti, Debby Holmes-Higgin and Armin Ernst, on behalf of the International VENT Study Group



Úspěch závisí na anatomických a technických faktorech

TABLE 2 Clinical outcomes at 6 and 12 months in endobronchial valve (EBV)-treated and control patients stratified by computed tomography fissure integrity

	Complete fissure			Incomplete fissure		
	EBV	Control#	p-value	EBV	Control	p-value
Patients n	44	19		67	40	
Δ FEV1 %						
6 months	16±21	2±14	0.02	1±18	-1±21	0.7
12 months	15±29	-2±22	0.04	0±23	-2±19	0.6
Δ 6MWD %						
6 months	11±34	19±54	0.6	7±36	2±19	0.4
12 months	13±35	10±44	0.8	5±30	0±34	0.5
Δ cycle work-load W						
6 months	4±14	-3±7	0.03	0±14	-3±11	0.4
12 months	4±14	-2±9	0.10	-2±13	-6±13	0.2
Δ SGRQ points						
6 months	-6±15	3±15	0.09	-4±14	-1±14	0.2
12 months	0±15	4±11	0.4	-1±14	-1±14	0.9
Lost to follow-up	7 (16)	0		6 (9)	2 (5)	
Died	2 (5)	1 (5)		4 (6)	3 (8)	

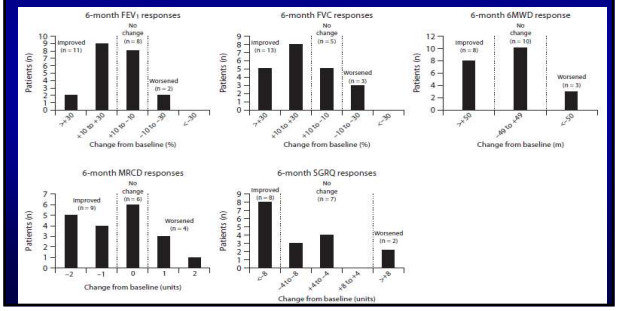
Respiration

Respiration 2011;82:36–45
DOI: 10.1159/000322649

Received: July 20, 2010
Accepted after revision: November 7, 2010
Published online: January 11, 2011

Treatment of Advanced Emphysema with Emphysematous Lung Sealant (AeriSeal®)

F.J.F. Herth[a] D. Gompelmann[a] F. Stanzel[b] R. Bonnet[c] J. Behr[d] B. Schmidt[e]
H. Magnussen[f] A. Ernst[a, g] R. Eberhardt[a]



Eur Respir J 2012; 39: 1326–1333
DOI: 10.1183/09031936.00092411
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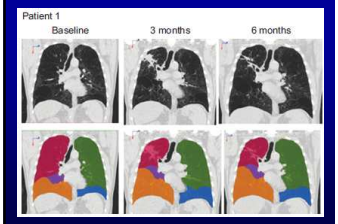
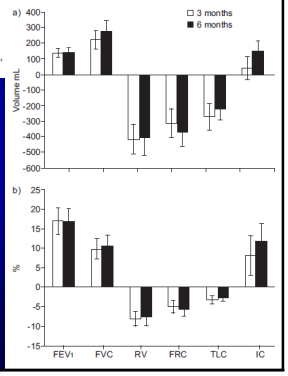
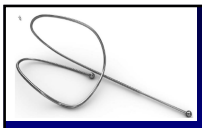
Bronchoscopic thermal vapour ablation therapy in the management of heterogeneous emphysema

Gregory Snell*, Felix J.F. Herth#, Peter Hopkins", Kimberley M. Baker+, Christian Witt§, Mark H. Gotfried', Arschang Valipour**, Manfred Wagner##, Franz Stanzel§§, Jim J. Egan++, Steven Kesten§§ and Armin Ernst¶¶





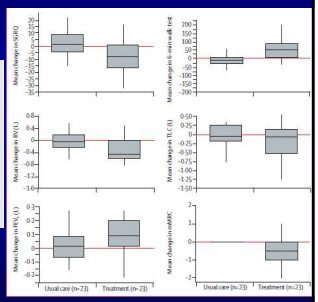


Coil - EVR

Table 5 Responder rates at 6 and 12 months

Variable	MCID	6 months (%)	12 months (%)
FEV_1	≥12%[11]	48.0	40.6
RV	≥0.35[12]	64.8	57.6
6MWD	≥26 m[13]	52.8	60.0
SGRQ	≥4 points[14]	74.1	65.6
SGRQ	≥8 points	61.1	53.1

Responder rates at 6 and 12 months after bilateral lung volume reduction coil treatment using minimal clinically important differences (MCID) for forced expiratory volume in 1 s (FEV_1), residual volume (RV), 6-min walking distance (6MWD) and the St George's Respiratory Questionnaire total score (SGRQ). Results are given as percentage of responders to total patients.



Deslee G, et al, Thorax 2014
Shah PL, et al, Lancet 2013

EVR u AATD?

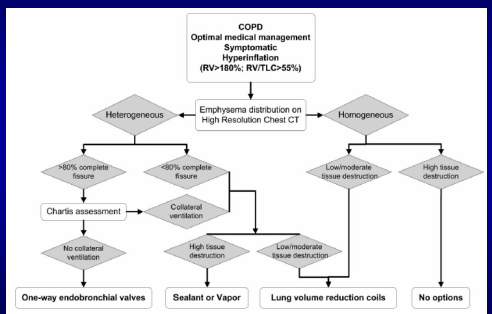
Table 2. Summary statistics for lung function

Parameter	Baseline (n = 15)	6 months (n = 13)	Change vs. baseline, %	1 year (n = 12)	Change vs. baseline, %
FEV_1, liters	0.73 (0.59–1.14)	1.03 (0.65–1.74)	+38	1.13 (0.8–1.63)	+54
FEV_1, % of predicted	26 (18–34)	37 (25–64)		42 (25–80)	
FVC, liters	1.9 (1.2–2.7)	2.6 (1.5–3.9)	+27	ND	
FEV_1/FVC, %	33 (24–55)	41 (29–68)	+24	ND	
RV, liters	4.5 (3.1–10.0)	3.63 (2.5–4.2)	–20	ND	
RV, % of predicted	195 (140–309)	171 (104–230)			
TLC, liters	7.4 (5.9–8.4)	6.9 (5.6–7.7)	–7	ND	
TLC, % of predicted	122 (107–141)	113 (100–130)			
RV/TLC, %	68 (52–81)	54 (60–61)	–21	ND	
Diffusion capacity, % of predicted	28 (25–34)	38 (35–42)	+26	ND	

Arithmetic means (range).

Hillerdal G, Mindus S, Respiration 2014

Komu indikovat EVR?



Mineshita and Slebos, Respirology 2014

Komu indikovat EVR?

Table 2 Summary of the different bronchoscopic lung volume reduction (BLVR) approaches with proven efficacy

	Patient selection								Clinical approval	
	Emphysema phenotype		Collateral ventilation		Target lobe					
BLVR approach	Hetero	Homo	Negative	Positive	Upper	Lower	Removable (Reversible)	Main adverse event	CE mark	FDA
One-way valve	✓	✓/✗	✓	✗	✓	✓	✓	Pneumothorax	EBV IBV	none none
Coil	✓	✓	✓	✓	✓	✓	✓/✗	Acute exacerbation	LVRC	none
Vapor†	✓	✗	✓	✓	✓	✗	✗	Severe acute exacerbation	InterVapor	none
Sealant†	✓	✓/✗	✓	✓	✓	✗	✗	Severe acute exacerbation	ELS	none

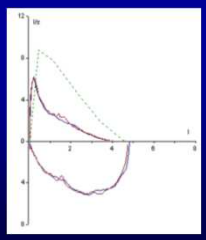
† Only available in early-phase clinical trials.
‡ Not available any more. ✓: yes; ✗: not, ✓/✗: intermediate.
CE, Conformité Européenne; EBV, Zephyr endobronchial valve; ELS, emphysematous lung sealant; IBV, spiration intrabronchial valve; LVRC, lung volume reduction coil.

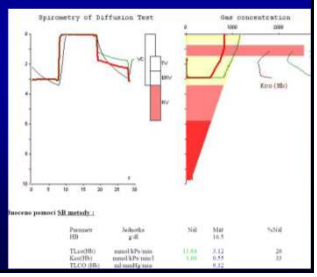
Mineshita and Slebos, Respirology 2014

Otázka č.1
mám před sebou pacienta s CHOPN?

Negativní BDT, včetně SKS

Snížený TL_{CO} !!!!





Otázka č.2
má pokročilý emfyzém?

Bodypletysmografie:

TLC 100-130% normy

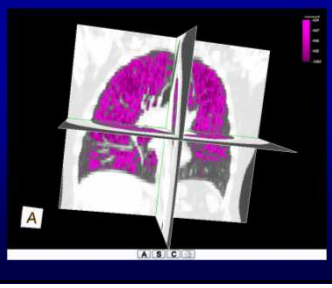
RV > 200% normy

Spirometrie:

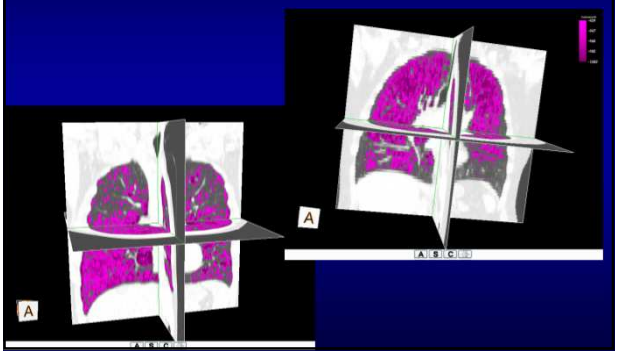
FEV1 < 40 (45)%

Otázka č.3
má heterogenní emfyzém?

Shoda CT denzitometrie a perfuzního scanu (SPECT)



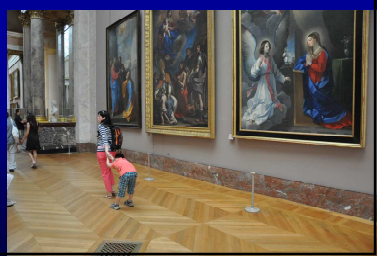
CT denzitometrie



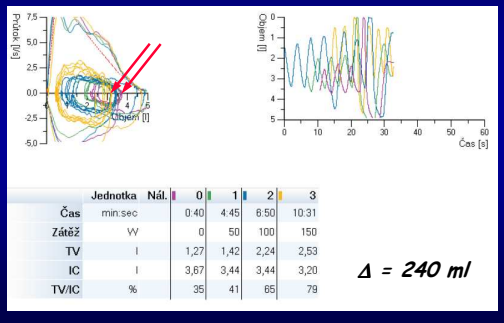
Otázka č.4
nakolik je symptomatický?

mMRC 3-4?

6-MWT > 100 metrů?



Otázka č.5a
a dynamickou hyperinflaci?

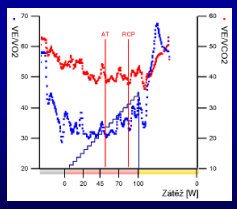


	Jednotka	Nál.	0	1	2	3
Čas	min:sec		0:40	4:45	6:50	10:31
Zátěž	W		0	50	100	150
TV	l		1,27	1,42	2,24	2,53
IC	l		3,67	3,44	3,44	3,20
TV/IC	%		35	41	65	79

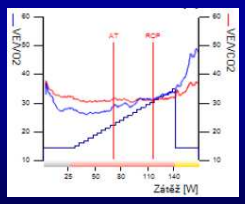
Δ = 240 ml

Otázka č.5b
jak velkou V/Q neshodu?

???



ANO



Návrh algoritmu

Pacienty indikovat
- ZÁSADNĚ ambulantně (alespoň 2 měsíce po poslední exacerbaci),
- po ALESPOŇ 6 týdnech ambulantní RHB

1) FEV_1 20-45% normy
2) TL_{CO} 20-79% normy
3) TLC ≥ 100% normy, RV ≥ 185% normy, RV/TLC ideálně > 65%
4) pVO_2 20-60% normy
5) DH > 500 ml, V_E/VCO_2 ≤ 55
6) heterogenní emfyzem (CT denzitometrie)
7) odpovídající defekt perfuze na SPECT

Relativní kontraindikace

1) Významná hypoxémie, vyžadující DDOT
2) diskordantní PAH
3) závažné komorbidity
4) není schopen CPET
5) FEV_1 < 20% normy
6) TL_{CO} < 20% normy
7) homogenní emfyzem (pouze pro coily a nesmí být pokročilý)
8) málo pokročilý heterogenní emfyzém (RA(950) < 10%)

Jak to bylo u nás?

Situace k 10/2014

• Celkový počet EBV	12 (1x coily)
• mimo indikaci	1
• těsně po exacerbaci	3
• Bez bodypletysmografie	3
• Bez CPET	5
• CT různými protokoly	3
• V/P scan chybí	6
• Sledování nestandardní	4

Z provedených EBV se dá orientačně hodnotit jen 7 pacientů