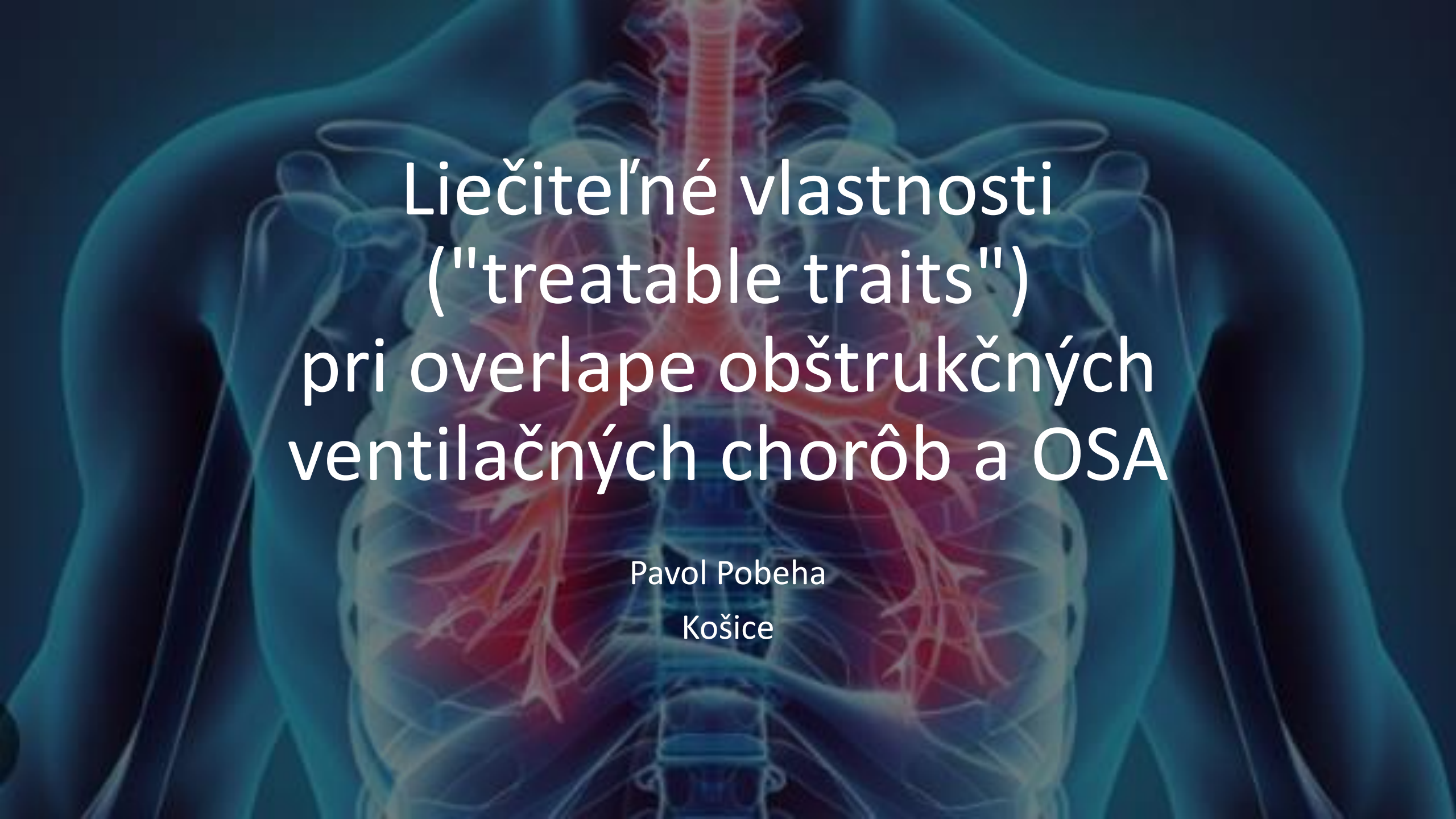




Liečiteľné vlastnosti ("treatable traits") pri overlape obštrukčných ventilačných chorôb a OSA

Pavol Pobeha

Košice

DEKLARACE KONFLIKTU ZÁJMŮ

	Nemám konflikt zájmů	Mám konflikt zájmů	Specifikace konfliktu (vyjmenujte subjekty, firmy či instituce, se kterými Vaše spolupráce může vést ke konfliktu zájmů)
Zaměstnanecký poměr	x		
Vlastník / akcionář	x		
Konzultant	x		
Přednášková činnost	x		
Člen poradních sborů (advisory boards)	x		
Podpora výzkumu / granty	x		
Jiné honoráře (např. za klinické studie či registry)	x		

Problematika treatable traits

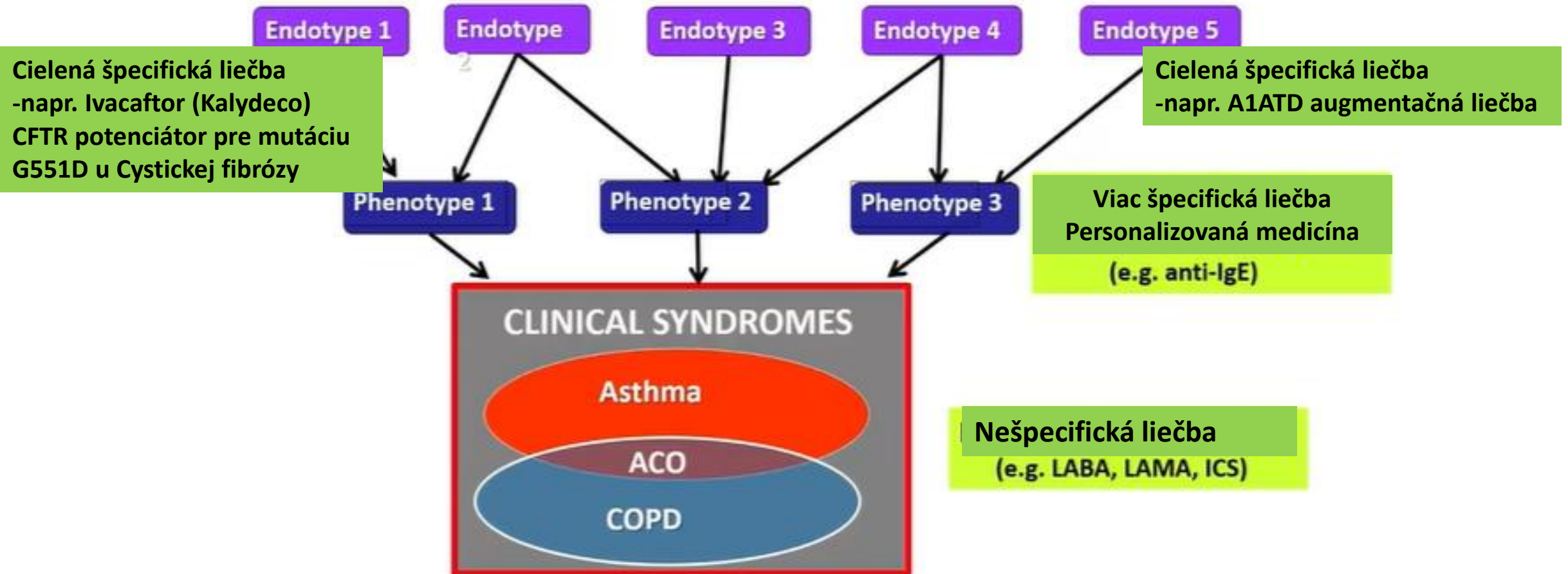
- Väčšina terapeutických prístupov je založená na:
- cieľi liečiť „priemerného pacienta“
- a na prístupe **“one size fits all”**
- to môže byť dobré pre časť pacientov, ale nie pre všetkých
- „moderný“ prístup- proaktívna a personalizovaná odpoveď na symptómy pacienta kombinujúca presnú diagnostiku a cielenú liečbu **„šitú na mieru“**



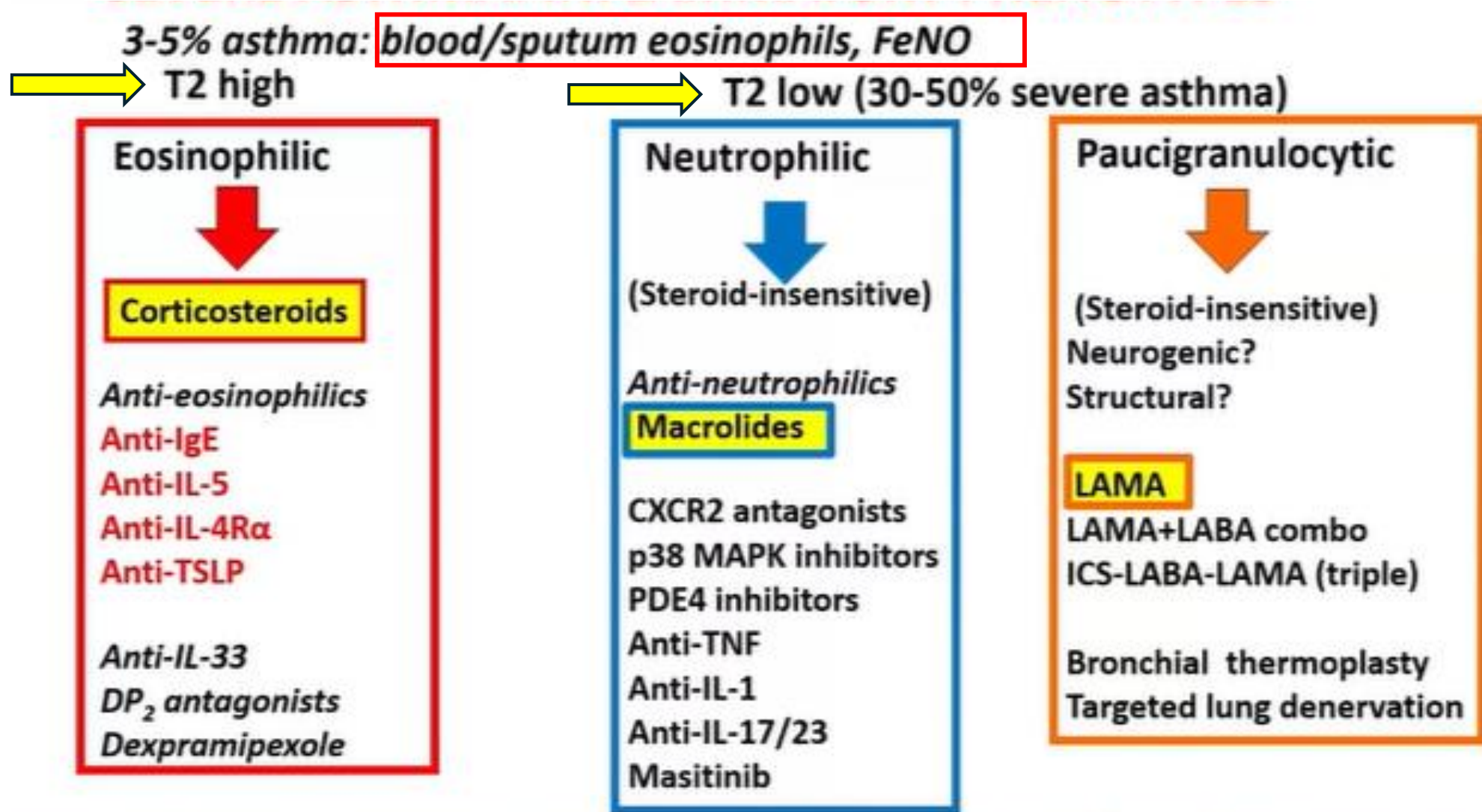
Treatable traits- liečbou ovplyvniteľné vlastnosti

- V poslednom desaťročí sa koncept „liečiteľných vlastností“ vo veľkej miere rozšíril ako základ prístupu precíznej „precision“ medicíny pri chronických ochoreniach dýchacích ciest vo všeobecnosti, a najmä pri astme a CHOCHP.
- je založený na identifikácii charakteristík s potenciálom na liečbu alebo na predikcii odpovede k liečbe u jednotlivého pacienta

Syndrómy, fenotypy, endotypy...



Ťažká astma : zápalové fenotypy





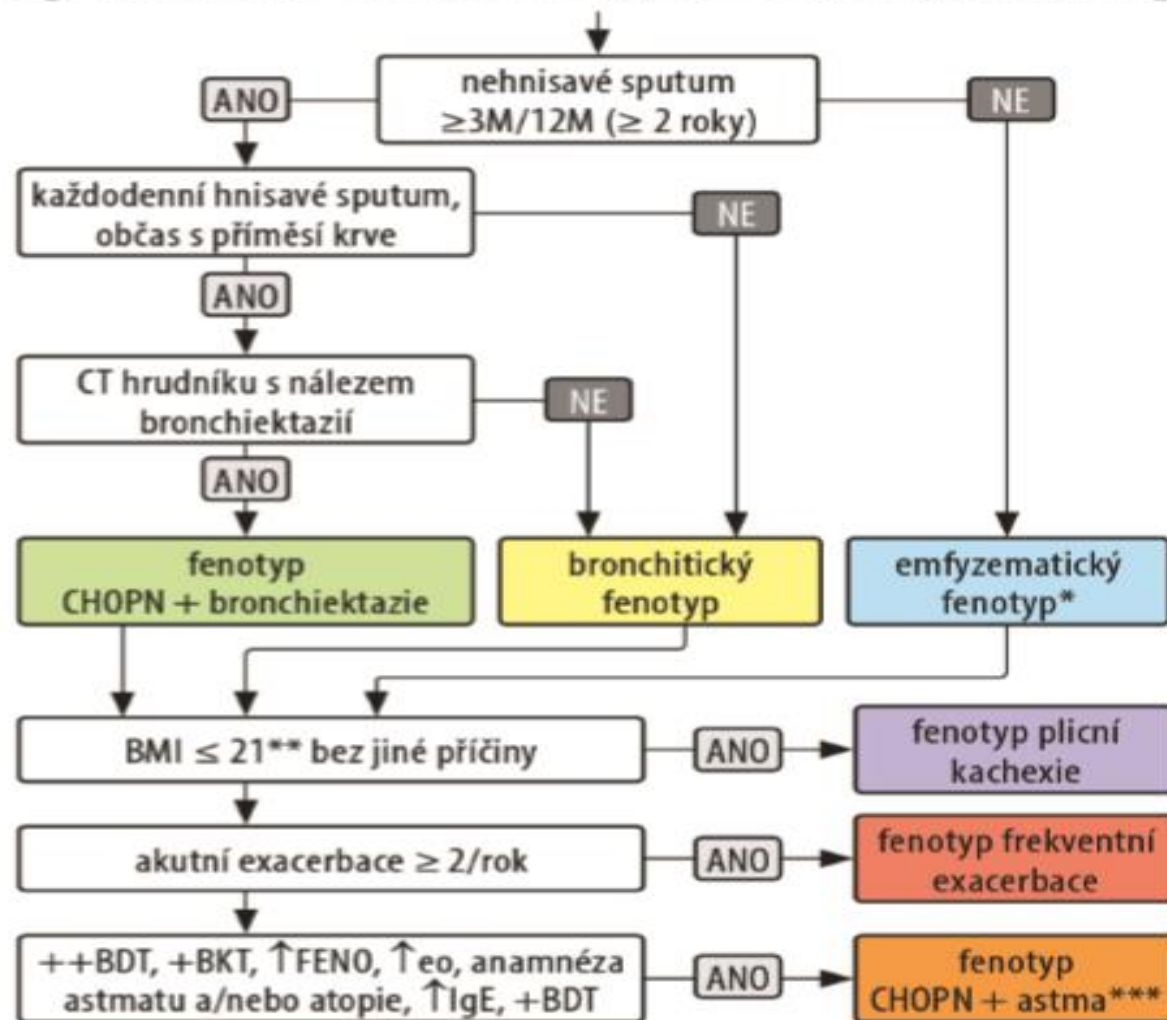
- Nová taxonómia pre CHOCHP?
- Ale- malý dopad na farmakoterapiu !!!

GOLD 2023 TAXONOMY (ETIOTYPES) FOR COPD

- COPD-G Genetic COPD (e.g. AATD)
- COPD-D Abnormal lung development (e.g. premature birth)
- COPD-C Cigarette exposure
- COPD-P Air pollution exposure (e.g. biomass smoke exposure)
- COPD-I Infections (e.g. tuberculosis)
- COPD-A COPD and asthma
- COPD-U Unknown cause

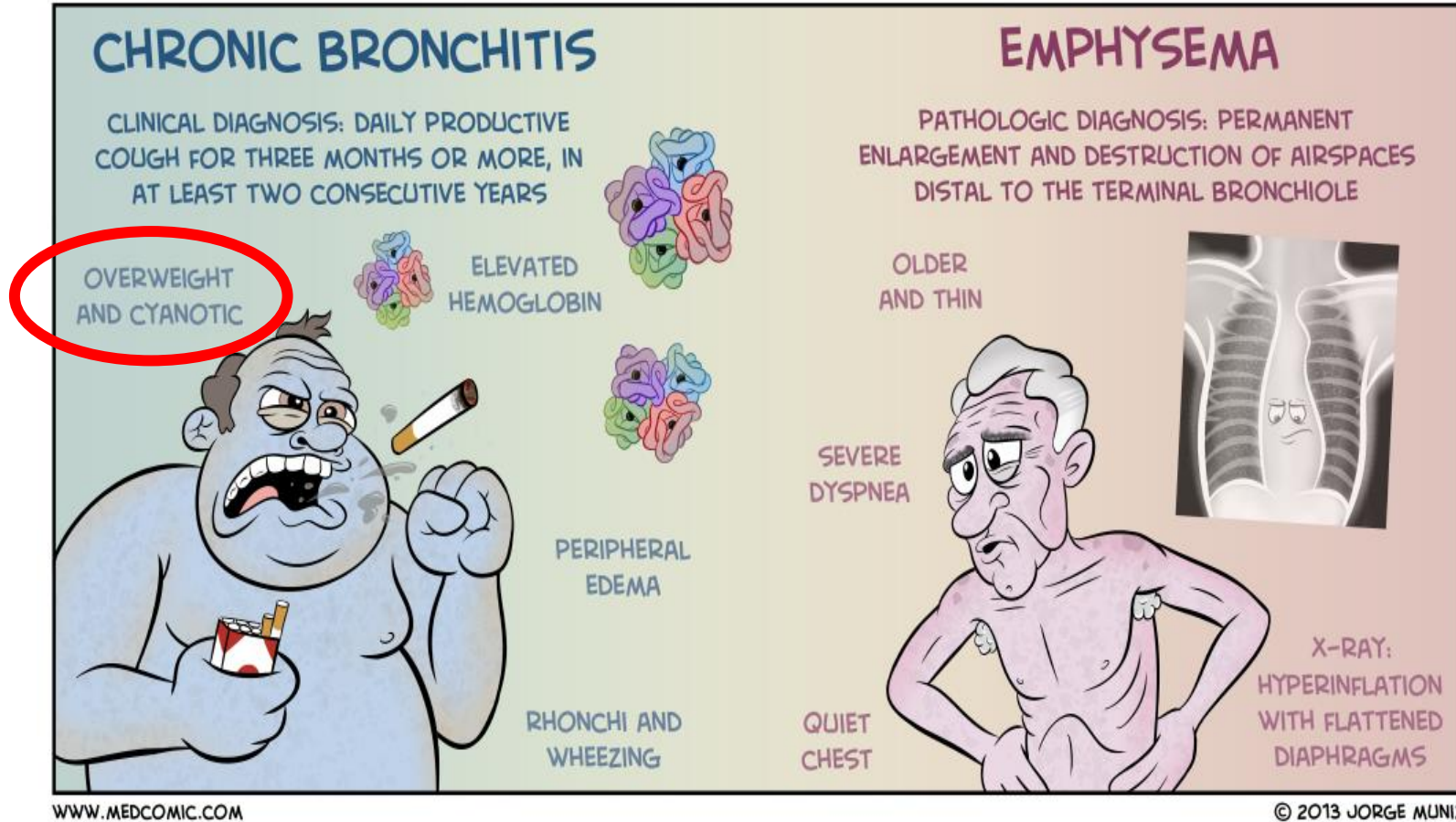
Fenotypový přístup?

Algoritmus pro určení fenotypu v ordinaci pneumologa

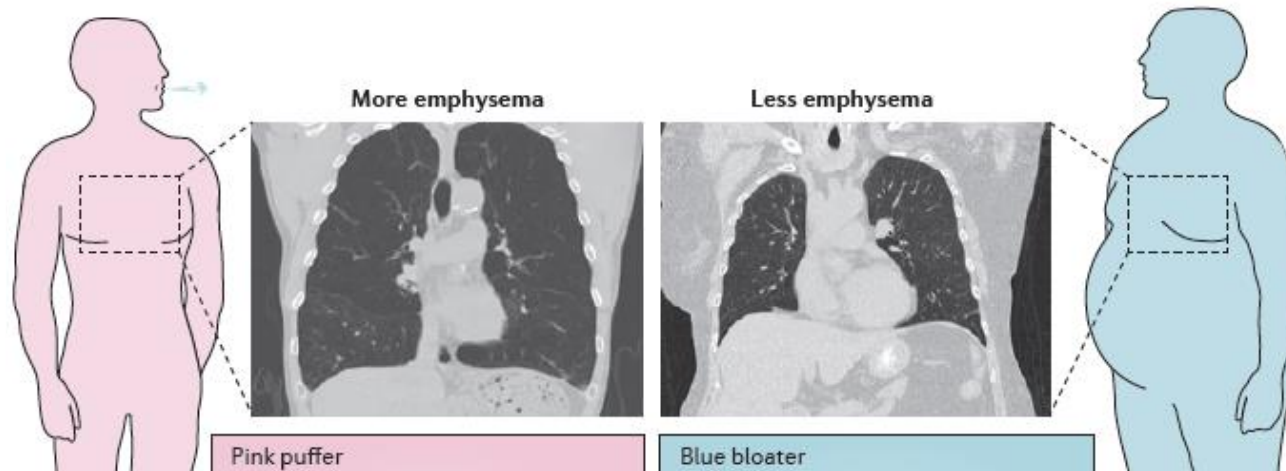


Fenotypy CHOCHP

Blue bloater a pink puffer?



Fenotypizácia pomocou CT



emfyzém
úbytok svalovej hmoty
kachexia
osteoporóza
dýchavica
znížená záťažová kapacita

menej pľúcnej hyperinflácie
akumulácia tuku (abdomen, krk)
metabolický syndróm
kardiovaskulárne komorbidity
exacerbácie „bronchitídy“
obštrukčné spánkové apnoe (overlap sy)

Overlap sy:

- častejšie exacerbácie CHOHP
- ↑ riziko respiračného zlyhania
- ↑ riziko pľúcnej hypertenzie

Český přístup k fenotypom CHOCHP

1. bronchitický 2. emfyzematický 3. plicní kachexie
4. častý exacerbátor 5. bronchiektázie 6. ACO (asthma-COPD overlap)
(Dokument: Doporučené postupy ČLS JEP, on-line 19.11.2018)

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STUD. PNEUMOL. PHTHISEOL., 79, 2019, č. 4, s. 129–133

Obézný pacient s CHOCHP – nový či opomenutý fenotyp CHOCHP?

P. Pobeha¹, P. Joppa¹, V. Koblížek²

¹Klinika pneumológie a ftizeológie, Lekárska fakulta Univerzity P. J. Šafárika
a Univerzitná nemocnica L. Pasteura, Košice;

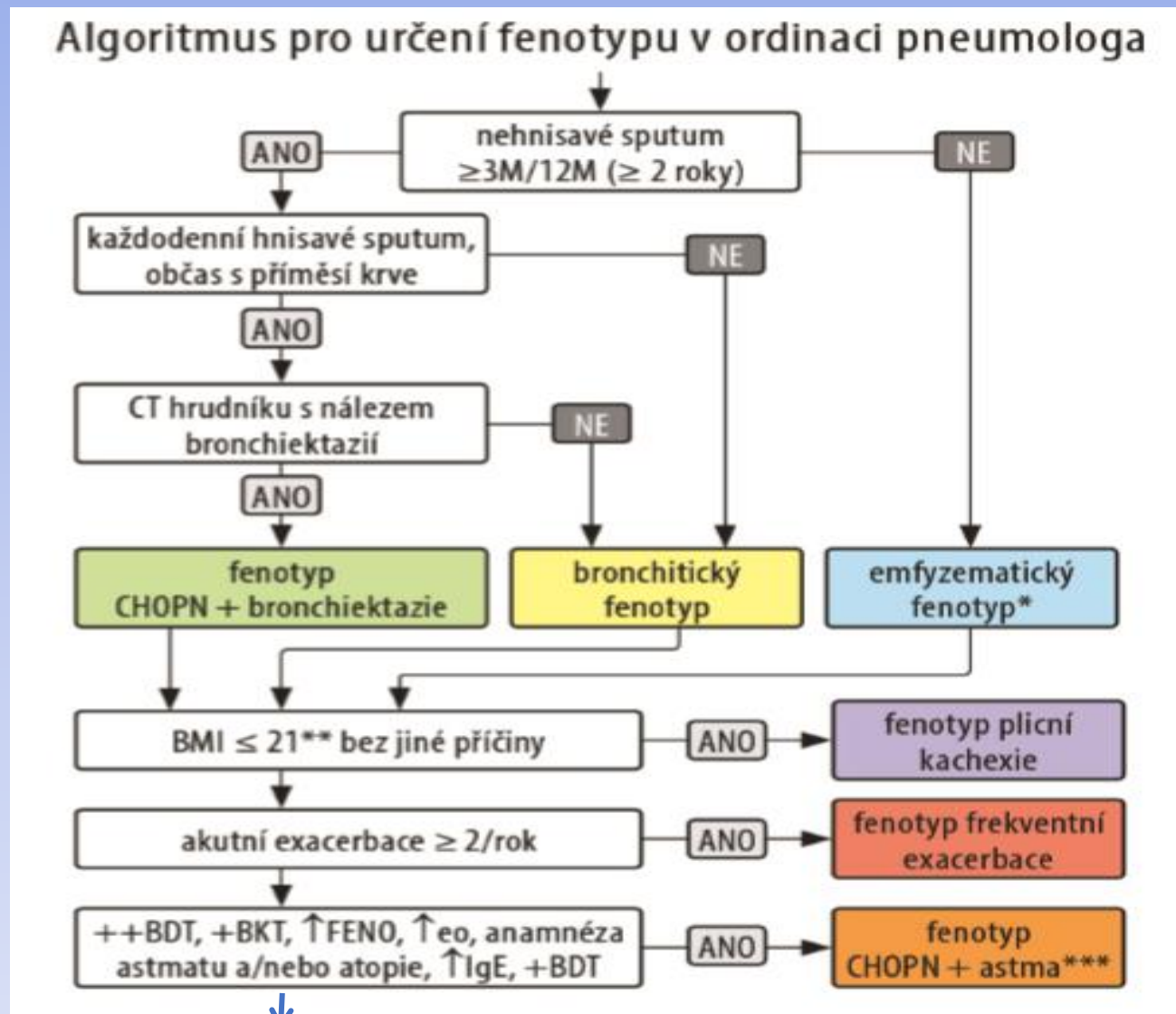
²Plicní klinika Lékařské fakulty UK a FN Hradec Králové

Tabuľka 1: Charakteristika fenotypu obézneho pacienta s CHOCHP

Obézný pacient s CHOCHP
• obezita – BMI nad 30 kg/m² • predominantne chronická bronchitída • periférne edémy, cyanóza • viac metabolických a kardiovaskulárnych komorbídít (diabetes mellitus, ICHS, pľúcna hypertenzia, CPCH) • menší stupeň hyperinflácie • viac exacerbácií • symptómy spánkového apnoe (denná ospalosť, chrápanie, prerušovaný neosviežujúci spánok a nočné dusenie) a/alebo hyperkapnické dychové zlyhávanie

Vysvetlivky: BMI – body mass index; ICHS – ischemická choroba srdca; CPCH – cor pulmonale chronicum

Možná podoba fenotypového přístupu



Pobeha P, Joppa P, Koblížek,
Studia pneumologica et pht. 2019

BMI > 30, chrápanie, nočné dyspnoe,
denná ospalosť, (respiračné
zlyhávane)

Fenotyp
Obézný pacient s CHOCHP

Príklad ignorácie liečiteľných vlastností a zvolenie „dáždnikového-umbrella“ prístupu

- Namiesto cieleného prístupu a vyhľadávania liečiteľných vlastností u liečby NIV pri CHOCHP...
- obéznych pacientov nad BMI 35- jednoducho vyradíme



Non-invasive positive pressure ventilation for the treatment of severe stable chronic obstructive pulmonary disease: a prospective, multicentre, randomised, controlled clinical trial

Thomas Köhnlein, Wolfram Windisch, Dieter Köhler, Anna Drabik, Jens Geiseler, Sylvia Hartl, Ortrud Karg, Gerhard Laier-Groeneveld, Stefano Nava, Bernd Schönhofer, Bernd Schucher, Karl Wegscheider, Carl P Criée, Tobias Welte

Summary

Lancet Respir Med 2014; **Background** Evidence is weak for the ability of long-term non-invasive positive pressure ventilation (NPPV) to improve

Methods

Study design and patients

Patients were ineligible if they had abnormalities of the thorax or the lung other than COPD, obesity with a body-mass index (BMI) ≥ 35 kg/m², or other conditions resulting in hypercapnia. Additional exclusion criteria were previously-initiated NPPV, malignant co-morbidities, severe heart failure (New York Heart Association stage IV), unstable angina, and severe arrhythmias. We did not

[JAMA](#). 2017 Jun 6; 317(21): 2177–2186.

PMCID: PMC5710342

Published online 2017 Jun 6. Prepublished online 2017 May 21. doi: [10.1001/jama.2017.4451](https://doi.org/10.1001/jama.2017.4451)

PMID: [28528348](https://pubmed.ncbi.nlm.nih.gov/28528348/)

Effect of Home Noninvasive Ventilation With Oxygen Therapy vs Oxygen Therapy Alone on Hospital Readmission or Death After an Acute COPD Exacerbation

A Randomized Clinical Trial

[Patrick B. Murphy](#), PhD,^{1,2} [Sunita Rehal](#), MSc,³ [Gill Arbane](#), BSc (Hons),¹ [Stephen Bourke](#), PhD,^{4,5}

Design, Setting, and Participants

A randomized clinical trial of patients with persistent hypercapnia ($\text{Paco}_2 > 53$ mm Hg) 2 weeks to 4 weeks after resolution of respiratory acidemia, who were recruited from 13 UK centers between 2010 and 2015. Exclusion criteria included obesity (body mass index [BMI] > 35), obstructive sleep apnea syndrome, or other causes of respiratory failure. Of 2021 patients screened, 124 were eligible.

Domiciliary long-term non-invasive ventilation in COPD: should we select subgroups with a better likelihood to respond to NIV in subsequent randomised controlled trials?

Jean-Christian Borel,^{1,2} Christophe Pison,^{3,4,5}
Jean-François Timsit,^{6,7} Jean-Louis Pepin^{1,8}

We recently showed that a reduction in risk of death and hospital readmission is obtained only in obese patients with COPD with NIV usage >5 h/day.² In the Struik study,¹ randomisation was stratified on body mass index although the mean body mass index of the whole cohort was 25 kgm⁻² (SD around 6 kgm⁻²). The majority of Struik's cohort had 'respiratory COPD' characterised by severe airflow limitation without obesity,⁴ a subgroup supposed to be less responsive to NIV.²

Obesity is a main risk factor of sleep apnoea, and patients with overlap syndrome (COPD+sleep apnoea) benefit from positive pressure treatment.⁵ We obtained positive results with NIV in obese patients with COPD after adjustment for all independent risk factors associated with prognosis, particularly sleep apnoea. This suggests that NIV, beyond correcting sleep apnoea, may also lessen the deleterious impact of nocturnal hypoventilation and improve respiratory mechanics.

In summary, we suggest that subsequent randomised controlled trials be conducted on specific COPD subgroups that have better likelihood of responding to NIV (ie, obese patients with comorbidities and moderate to severe airflow obstruction). This might represent a new approach to the challenging area of long-term NIV in stable patients with COPD.



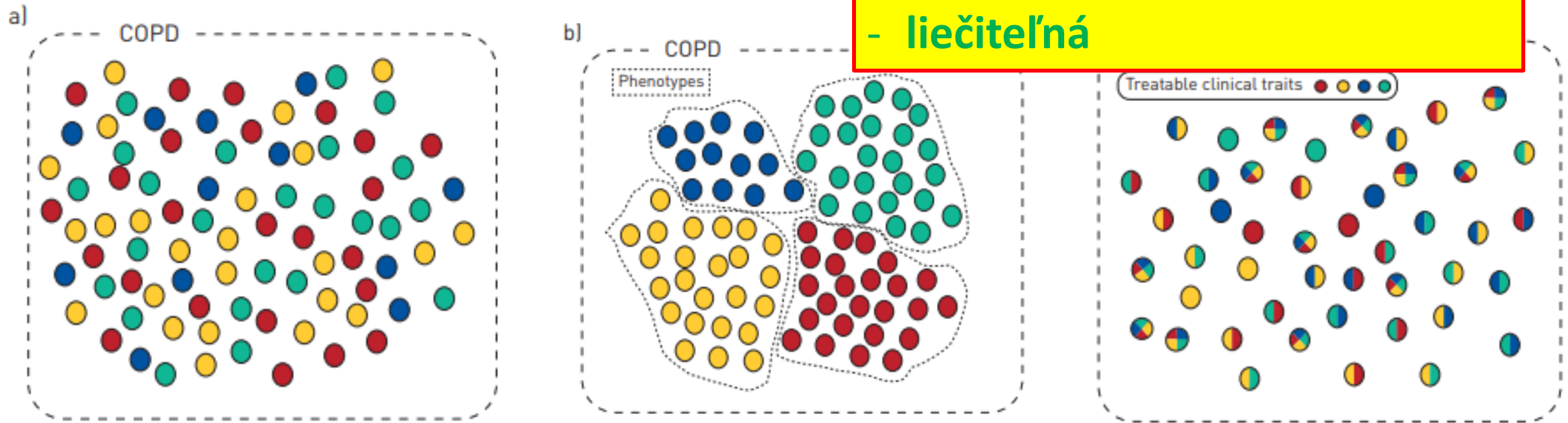
Precision medicine in airway diseases: moving to clinical practice

Alvar Agustí^{1,2}, Mona Bafadhel³, Richard Beasley⁴, Elisabeth
Rosa Faner², Peter G. Gibson⁶, Renaud Louis⁷, Vanessa M. M.
Peter J. Sterk⁵, Mike Thomas⁸, Claus Vogelmeier⁹ and Ian
on behalf of all participants in the seminar¹¹

Treatable trait
(liečbou ovplyvniteľná vlastnosť)

Musí byť:

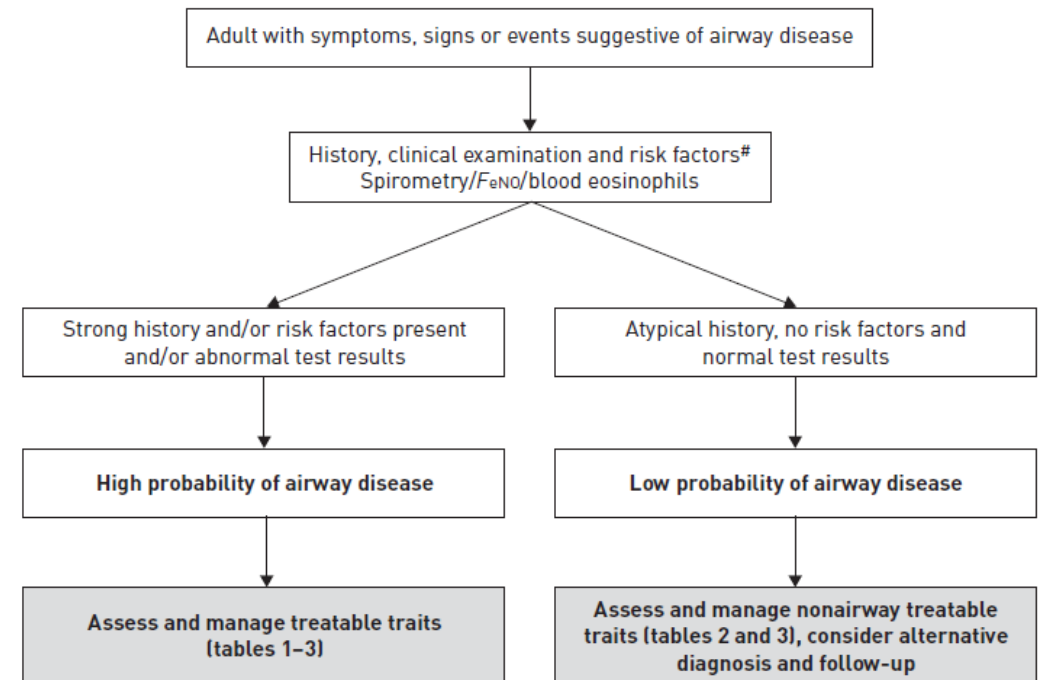
- Klinicky relevantná
- Identifikovateľná a merateľná
- liečiteľná



PERSPECTIVE
PRECISION MEDICINE FOR AIRWAY DISEASES

Treatable traits: toward precision medicine of chronic airway diseases

Alvar Agusti¹, Elisabeth Bel², Mike Thomas³, Claus Vogelmeier⁴,
Guy Brusselle^{5,6}, Stephen Holgate⁷, Marc Humbert⁸, Paul Jones⁹,
Peter G. Gibson¹⁰, Jørgen Vestbo¹¹, Richard Beasley¹² and Ian D. Pavord¹³



Agustí et al, ERJ 2016

Pľúcne TT

TABLE 1 Pulmonary treatable traits of airway diseases						
Treatable traits (can coexist)	Imp.	Rec.	Diagnostic criteria	Treatment		Main expected benefit
				Efficacy	Second choice	
Airflow limitation [9]	+++	+++	FEV ₁ /FVC <0.7 (or of normal)			S
Airway smooth muscle contraction	++	+++	Bronchodilator peak expiratory position			
Loss of elastic recoil (emphysema)	+++	++	Chest compliance Dl _{CO}			
Airway mucosal oedema	++	+	Chest compliance spirometry bronchodilation			
Eosinophilic airway inflammation [55, 56]	+++	+++	Sputum eosinophils eosinophilic inflammation			
Chronic bronchitis	++	+++	Cough 3 months eosinophilic inflammation			
Airway bacterial colonisation [#]	++	++	Sputum quantitative culture			
Bronchiectasis [#]	++	++	Chest compliance spirometry bronchodilation			
Cough reflex hypersensitivity [49, 57]	++	+++	Capsaicin challenge, cough sensitivity			
Pre-capillary pulmonary hypertension [#]	++	++	Doppler echocardiography brain natriuretic peptide			
Chronic respiratory failure [#] Arterial hypoxaemia	+++	+++	PaO ₂			
Arterial hypercapnia	+++	+++	PaCO ₂			

Mimopľúcne TT

TABLE 2 Extrapulmonary treatable traits of airway diseases						
Treatable traits (can coexist)	Imp.	Rec.	Diagnostic criteria	Treatment		Main expected benefit
				First choice	Efficacy	Second choice
Deconditioning	+	+	Cardio-pulmonary exercise testing, 6-min walking distance	Exercise, reha		
Obesity	+	+++	Body mass index			
Cachexia	+	+++	Body mass index			
Obstructive sleep apnoea syndrome	+	++	Questionnaire polysomnography			
Cardiovascular disease	++	+++	Electrocardiogram Doppler echocardiography natriuretic peptide			
Gastro-oesophageal reflux disease [59]	+	++	Gastrointestinal endoscopy, pH monitoring			
Upper airway diseases: rhino-sinusitis	+	++	History and examination imaging			
Upper airway diseases: inducible laryngeal obstruction (vocal cord dysfunction)	++	+	Fibre optic laryngoscopy flow-volume curves dynamic neck computed tomography			
Psychiatric disorders: depression	++	++	Questionnaire psychologist/psychiatrist assessment			
Psychiatric disorders: anxiety/other behavioural aspects including breathing pattern disorders	++	++	Questionnaire psychologist/psychiatrist assessment			
Persistent systemic inflammation [60, 61]	++	++	High-sensitivity C-reactive protein			

Rizikové faktory prostredia/životného štýlu

TABLE 3 Treatable behaviour/lifestyle risk factors of airway diseases							
Treatable traits (can coexist)	Imp.	Rec.	Diagnostic criteria	Treatment			Main expected benefit
				First choice	Efficacy	Second choice	
Smoking and other exposures (biomass, workplace, others)	+++	+++	Cotinine, exhaled concentration of carbon monoxide	Cessation support, nicotine replacement, avoid environmental exposures	++	Antidepressants	S, E, P
Exposure to sensitising agents/pollution	++	++	Radio allergen absorbance test, skin-prick testing	Avoidance, desensitisation	+	Air filtration systems	S, E
Symptom perception	++	+	Mismatch between subjective and objective findings	Reassurance, breathing exercises	++		S
Side-effects of other treatments	+	++	Monitored withdrawal	Treatment optimisation	+	Change device	S
Inhaler device polypharmacy	++	++	Three or more different types of inhaler devices being used	Medication review and device rationalisation	+		S
Adherence to treatment	+++	++	Prescription refill rate, chipped inhalers	Education, self-management support	+		S, E
Poor inhalation technique	++	++	Observation, training devices	Education	+		S, E
Family and social support	++	++		Family therapy	+		S, E

Prestaneme pacientov škatuľkovať na astmu, CHOCHP, ..?

Should the terms “asthma” and “COPD” be abandoned?

The proposal outlined in this Perspective, *i.e.* to manage patients with airway disease based on those treatable traits present in each individual and to abandon the traditional diagnostic labels, is a paradigm change. We are firmly convinced that it better reflects the clinical and biological complexity of airway diseases, and may eventually result in better patient management than the current “label-based” approach. However, we also acknowledge that it is only partially based on evidence, *e.g.* treatment guided by sputum eosinophils (a phenotype traditionally related to “asthma”) improves clinical outcomes in smokers with fixed airflow limitation (labelled as “COPD”) [65]. Hence, before our proposal can be fully implemented in clinical practice, it requires time to generate experimentally the scientific evidence that supports it (or not), as discussed below. In the meantime, we propose that the concept of treatable traits in airway disease should “complement and refine” the diagnostic labels of asthma and COPD (as used in the respective GINA (Global Initiative for Asthma) and GOLD (Global Initiative for Obstructive Lung Disease) reports). Using the treatable trait approach proposed here, there will be patients with absolutely classical asthma, *i.e.* eosinophilic airway disease with bronchial hyperresponsiveness and complete reversibility of the airflow limitation, who would be characterised as such according to this new paradigm, likewise COPD patients with irreversible airflow limitation and chronic neutrophilic airway disease. However, many patients will incompletely fit these two extreme patterns or will have additional complicating factors. In these patients, a wider and more precise assessment may enable treatment to be better targeted. Thus, until the required evidence is fully available to completely eliminate the old labels (asthma and COPD), we would have to continue using them, but now with added terms (*e.g.* “Severe asthma, with a degree of fixed airflow limitation likely due to smoking, high risk of exacerbations, absence of eosinophilia, but high expression of XX”, provided that XX is “treatable”!) [66].

- Potenciálna zmena paradigmy
- opustenie iniciálnych diagnóz CHOCHP, astma, ACO ?
- dg. Chronické ochorenie DC ?



GOLD

GINA

Treatable traits u astmy- U - biopred kohorta

TABLE 1 Treatable traits and defining criteria

Treatable trait category	Treatable trait	Defining criteria
Pulmonary	Fixed airflow limitation	Postbronchodilator FEV ₁ /FVC < 0.7
	Bronchodilator reversibility	Postbronchodilator increase in FEV ₁ AND/OR FVC ≥12% AND ≥200 ml
	Type 2 inflammation	Sputum eosinophil count ≥ 2% AND/OR blood eosinophils ≥ 450 cells per ul AND/OR FeNO > 50 ppb
	Neutrophilic inflammation	Sputum neutrophil count > 60%
	Cough	Asthma Quality of Life Questionnaire (AQLQ) Question 12 score ≤ 4 AND/OR Sino-Nasal Outcomes Test (SNOT-20) Question score 4 ≥ 3
	Exercise-induced respiratory symptoms	Medical history finding of "routine physical activity and/or physical exercise as asthma trigger"
	Bronchitis	Medical history finding of "Current AND/OR chronic bronchitis"
Extra-pulmonary	Rhinosinusitis	Medical history finding of "Allergic/Non-allergic rhinitis active AND/OR sinusitis active"
	Nasal polyps	Medical history finding of "Nasal polyps active"
	Obese	BMI > 30
	Underweight	BMI < 18.5
	Obstructive sleep apnoea	Epworth sleepiness scale score ≥ 11
	Reflux	Medical history finding of "Reflux active"
	Vocal cord dysfunction	Medical history finding of "Vocal Cord Dysfunction active"
	Osteoporosis	Medical history finding of "Osteoporosis active"
	Cardiovascular disease	Medical history finding of "Coronary disease active"
	Eczema	Medical history finding of "Eczema active"
Behavioural/psychosocial	Atopic	Positive skin prick test AND/OR blood IgE result
	Smoking	Medical history finding of "Current smoker"
	Poor medication adherence	Medication Adherence Rating Scale (MARS) mean score <4.5
	Psychiatric disease	Medical history finding of "Psychiatric disease active"
	Depression	Hospital Anxiety and Depression (HADS) depression domain score ≥ 11
	Anxiety	Hospital Anxiety and Depression (HADS) anxiety domain score ≥ 11

Treatable traits presented here are based on that of Agusti et al.² BMI, body mass index; FeNO, fraction of exhaled nitric oxide; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity.

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WILEY Allergy

LETTERS TO THE EDITOR

DOI: 10.1111/all.13629

Simpson AJ, et al. Allergy 2019

Treatable traits in the European U-BIOPRED adult asthma cohorts

Identifikovaných **23 treatable traits (TT)**:

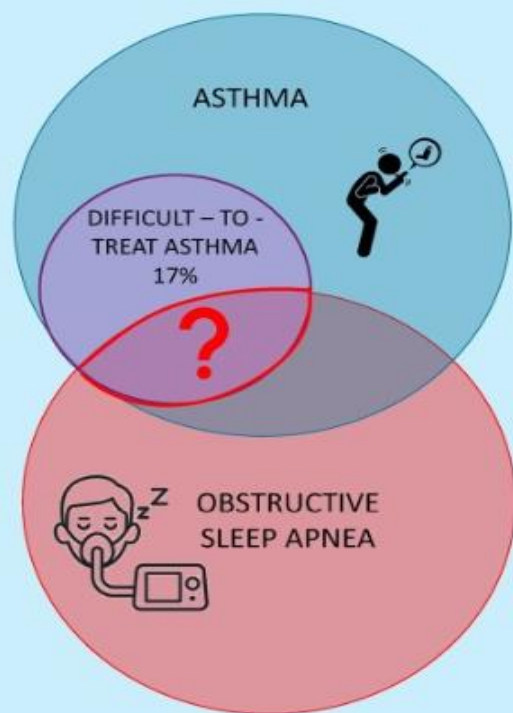
- 7 pľúcnych
- 11 mimopľúcnych
- 5 behaviorálnych /psychosociálnych

TABLE 2 Frequency of treatable traits in severe and mild/moderate asthma, ordered by trait category and then trait frequency in severe asthma cohort

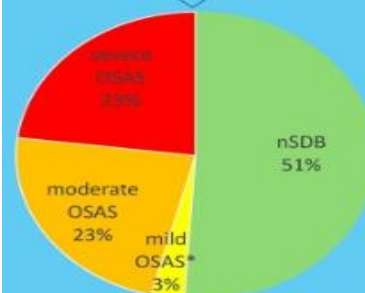
Trait category	Treatable trait	Severe asthma (combined)	Severe smoking/ex-smoking asthma	Severe nonsmoking asthma	Mild/moderate nonsmoking asthma	Severe smoking/ex-smoking vs severe nonsmoking asthma	Mild/moderate vs severe nonsmoking
Pulmonary	Subjects, n	421	110	311	88		
	Exercise-induced respiratory symptoms, n (%)	352/421 (84)	91/110 (83)	261/311 (84)	56/88 (64)	<i>P</i> = 0.085	<i>P</i> < 0.001
	Cough, n (%)	246/387 (64)	65/98 (66)	181/289 (63)	19/87 (22)	<i>P</i> = 0.511	<i>P</i> < 0.001
	Fixed airflow limitation, n (%)	245/415 (59)	73/109 (67)	172/306 (56)	17/85 (20)	<i>P</i> = 0.050	<i>P</i> < 0.001
	Bronchodilator reversibility, n (%)	244/415 (59)	74/109 (68)	170/306 (56)	33/85 (39)	<i>P</i> = 0.025	<i>P</i> = 0.006
	Bronchitis, n (%)	214/421 (51)	57/110 (52)	157/311 (51)	16/88 (18)	<i>P</i> = 0.810	<i>P</i> < 0.001
	Type 2 inflammation, n (%)	184/421 (44)	50/110 (45)	134/311 (43)	30/88 (34)	<i>P</i> = 0.667	<i>P</i> = 0.130
	Neutrophilic inflammation, n (%)	73/181 (40)	20/53 (38)	53/128 (41)	13/43 (30)	<i>P</i> = 0.647	<i>P</i> = 0.193
Extra-pulmonary	Atopic, n (%)	298/421 (71)	68/110 (62)	230/311 (74)	79/88 (90)	<i>P</i> = 0.016	<i>P</i> = 0.002
	Rhinosinusitis, n (%)	204/421 (48)	48/110 (44)	156/311 (50)	35/88 (40)	<i>P</i> = 0.239	<i>P</i> = 0.085
	Obese, n (%)	164/421 (39)	44/110 (40)	120/311 (39)	16/88 (18)	<i>P</i> = 0.794	<i>P</i> < 0.001
	Reflux, n (%)	152/421 (36)	50/110 (46)	102/311 (33)	10/88 (11)	<i>P</i> = 0.018	<i>P</i> < 0.001
	Obstructive sleep apnoea, n (%)	95/372 (26)	26/95 (27)	69/277 (25)	9/85 (11)	<i>P</i> = 0.635	<i>P</i> = 0.005
	Osteoporosis, n (%)	94/421 (22)	24/110 (22)	70/311 (23)	3/88 (3)	<i>P</i> = 0.881	<i>P</i> < 0.001
	Eczema, n (%)	76/421 (18)	19/110 (17)	57/311 (18)	10/88 (11)	<i>P</i> = 0.805	<i>P</i> = 0.123
	Nasal polyps, n (%)	58/421 (14)	14/110 (13)	44/311 (14)	1/88 (1)	<i>P</i> = 0.710	<i>P</i> = 0.001
	Vocal cord dysfunction, n (%)	17/421 (4)	5/110 (5)	12/311 (4)	1/88 (1)	<i>P</i> = 0.753	<i>P</i> = 0.204
	Cardiovascular disease, n (%)	9/421 (2)	5/110 (5)	4/311 (1)	0/88 (0)	<i>P</i> = 0.042	<i>P</i> = 0.285
	Underweight, n (%)	2/421 (1)	0/110 (0)	2/311 (1)	2/88(2)	<i>P</i> = 0.399	<i>P</i> = 0.175
Behavioural/psychosocial	Poor medication adherence, n (%)	147/372 (40)	38/94 (40)	109/278 (39)	44/84 (52)	<i>P</i> = 0.835	<i>P</i> = 0.032
	Anxiety, n (%)	65/295 (22)	16/72 (22)	49/223 (22)	4/70 (6)	<i>P</i> = 0.965	<i>P</i> = 0.002
	Depression, n (%)	39/295 (13)	13/72 (18)	26/223 (12)	2/70 (3)	<i>P</i> = 0.164	<i>P</i> = 0.029
	Smoking, n (%)	42/421 (10)	42/110 (38)	-	-	-	-

INTRODUCTION

Obstructive sleep apnoea (OSA) and asthma are the commonest chronic respiratory disorders. OSA is potential contributing factor for poor symptom control in patients with difficult-to-treat asthma. The aim of this study was to assess prevalence of OSA in patients with difficult-to-treat asthma.



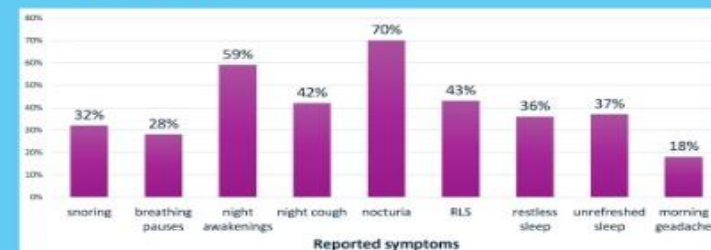
- 108 patients
- 55 (51%) men
- 57.9 ± 12.6 years
- 42 (39%) obese
- AHI >5/h 95 pts (88%)



* Mild OSAS = 5/h < AHI < 15/h + ESS > 10

In multivariate logistic regression analysis adjusted to gender, age, AH, obesity, snoring, breathing pauses, ESS > 10; **gender** (OR 4.9, CI 1.6-14.7) **age** (OR 1.06, CI 1.0-1.1) **obesity** (OR 8.9, CI 2.7-29.5) **ESS > 10** (OR 31.1, CI 2.4-406.6) **predicted OSA**.

RESULTS



	nSDB	OSAS	p-value
Men [%]	39%	60%	0.029
Age [years]	55.5±14	60.7±10.0	0.004
Allergic rhinitis [%]	39%	39%	NS
Arterial hypertension [%]	24%	55%	0.002
Diabetes [%]	10%	17%	NS
Coronary artery disease [%]	2%	5%	NS
Hypothyroidism [%]	12%	5%	NS
GERD [%]	31%	34%	NS
Obesity [%]	20%	55%	<0.001
Snoring [%]	24%	43%	0.025
Breathing pauses [%]	16%	36%	0.026
Night awakenings [%]	55%	61%	NS
Night cough [%]	39%	44%	NS
Nocturia [%]	63%	76%	NS
Restless leg syndrome [%]	39%	46%	NS
Headache [%]	24%	14%	NS
ESS > 10 [%]	2%	13%	0.0031

Clinically important OSA is present in 49% of patients with difficult-to-treat asthma. Male sex, higher age, obesity, and ESS > 10 predict OSA in these patients.

SEVERE ASTHMA: INFLAMMATORY PHENOTYPES

3-5% asthma: blood/sputum eosinophils, FeNO

T2 high

T2 low (30-50% severe asthma)

Eosinophilic



Corticosteroids

Anti-eosinophils

Anti-IgE

Anti-IL-5

Anti-IL-4R α

Anti-TSLP

Anti-IL-33

DP₂ antagonists

Dexpiropemexole

Neutrophilic

(Steroid

Anti-neu

Macrol

CXCR2 a

p38 MA

PDE4 in

Anti-TN

Anti-IL-1

Anti-IL-1

Masitin

Paucigranulocytic

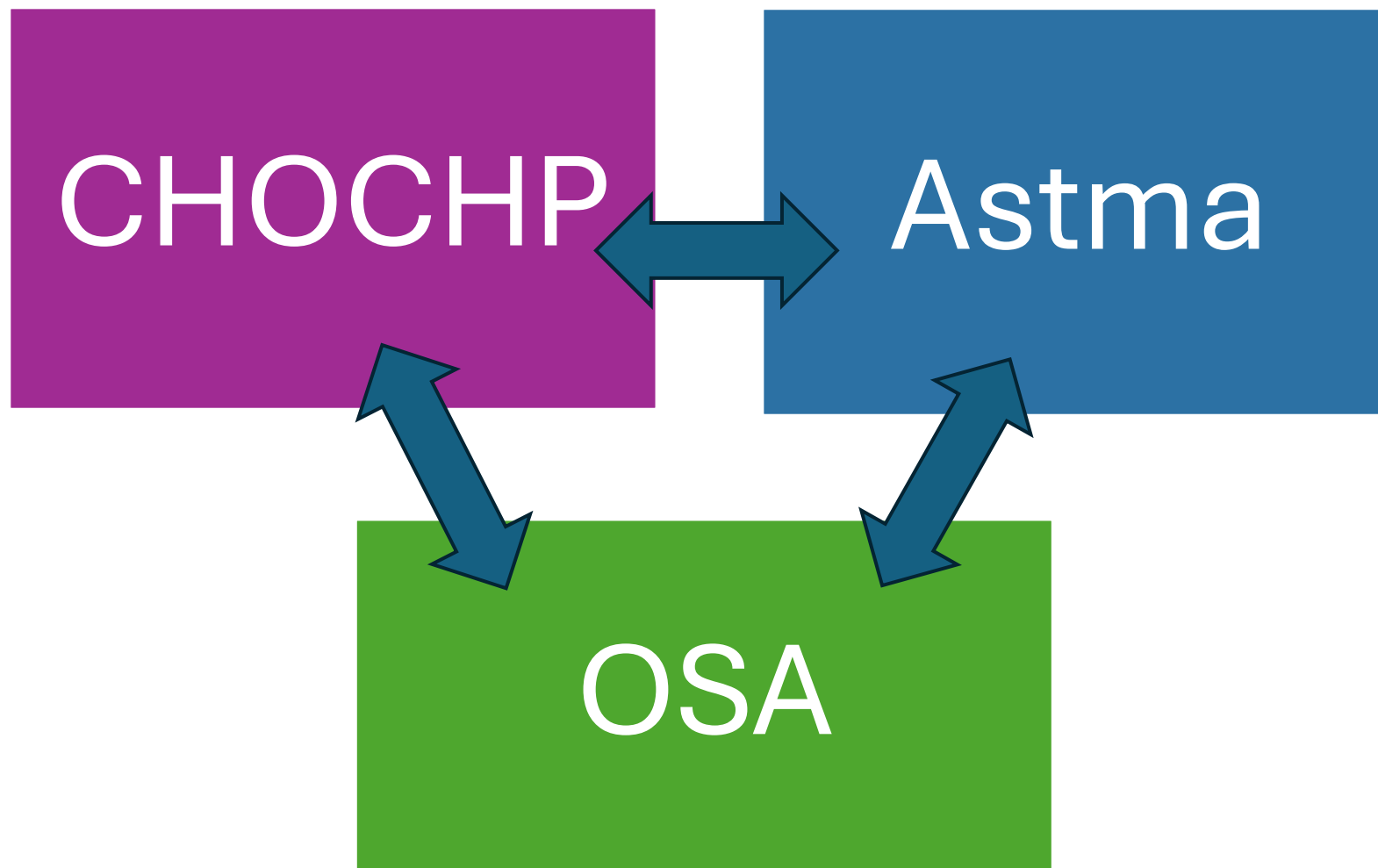
ive)

ibo
(triple)

oplasty
nerve



Vzájomné interakcie



Vzájomné interakcie : OSA- astma

- **OSA** - Müllerov manéver- GERD- mikroaspirácie- provokácia astmy
 - stimulácia parasymptiku- n. vagus- bronchokonstria
 - negatívny vnútrohrudníkový tlak- ↑ intravaskulárneho objemu- kongesia
 - chronický zápal- systémové zmeny
- **Astma**- alergia, alerg. nádcha- predispozícia k OSA, tolerancia CPAP...
 - chronický zápal- systémové zmeny
 - astma asociovaná s obezitou- leptín- prozápalový peptid
 - nočná astma- prebudenia v noci- vedú k zvýšenej kolapsibilite HDC

Valipour et al, 2010

Agustí et al, ERJ 2007

Zielinsky J Clin Psych 2000

Záver

Zameranie sa na liečbou ovplyvniteľné vlastnosti („charakteristiky“) môže byť efektívnou cestou adresnej diagnostiky a liečby chronických respiračných ochorení

Stratégia rozpoznávania „treatable traits“ vedie k precíznej personalizovanej medicíne

U astmy a CHOCHP sú poruchy dýchania v spánku často prehliadanou liečiteľnou komorbiditou, ktorá môže mať významnejší dopad na zdravotný stav ako samotná „hlavná“ diagnóza

Ďakujem za pozornosť