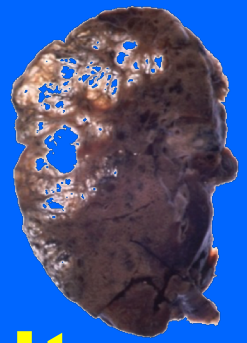

COPD Management: Inner City Perspective

Stephan F van Eeden

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pacificlung healthcentre

PROVIDENCE HEART + LUNG INSTITUTE AT ST. PAUL'S HOSPITAL

New solutions for health

Faculty/Presenter Disclosure

- **Faculty: Stephan van Eeden**
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  - **Grants/Research Support: BC Lung Association/CIHR**
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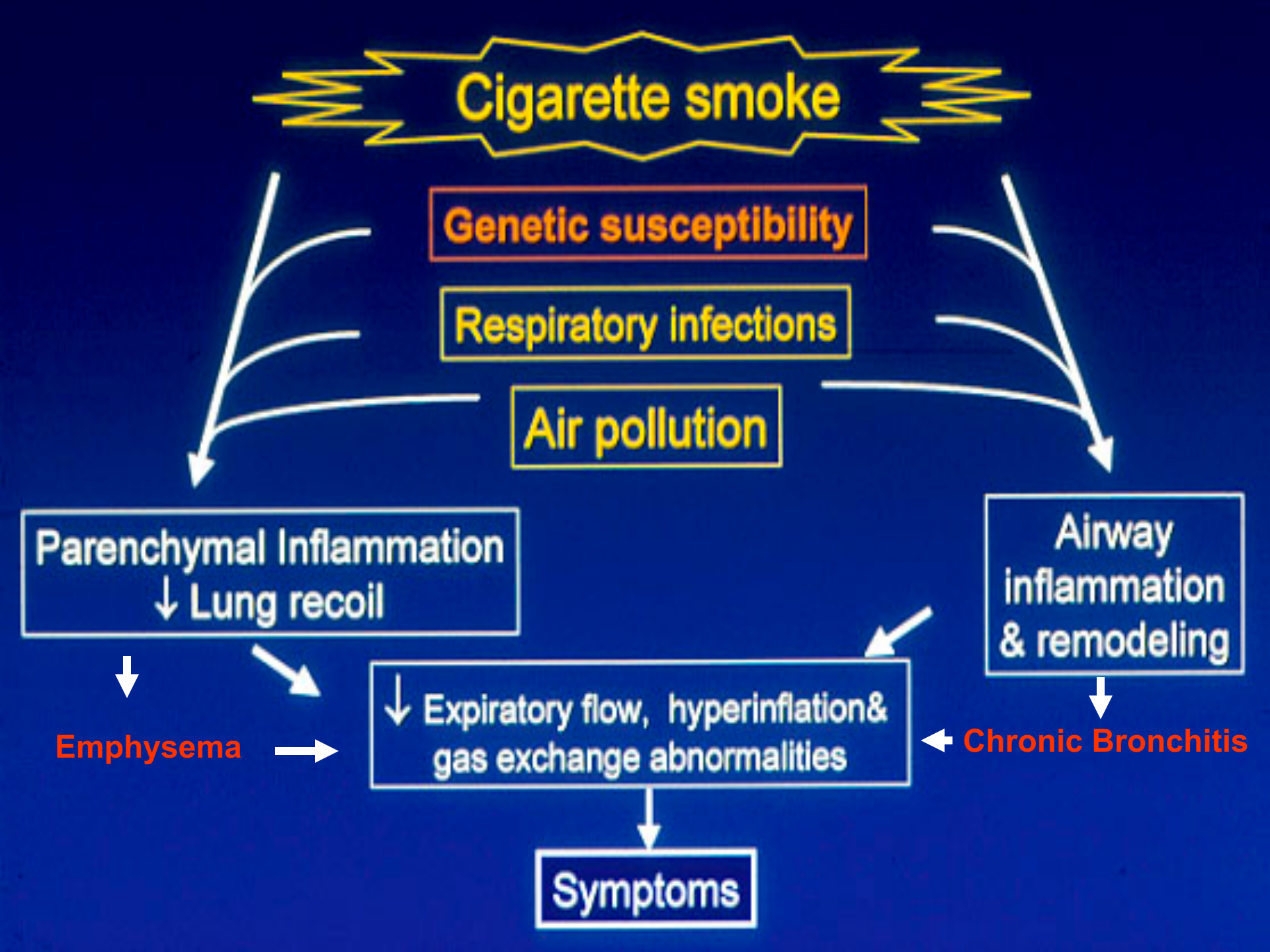
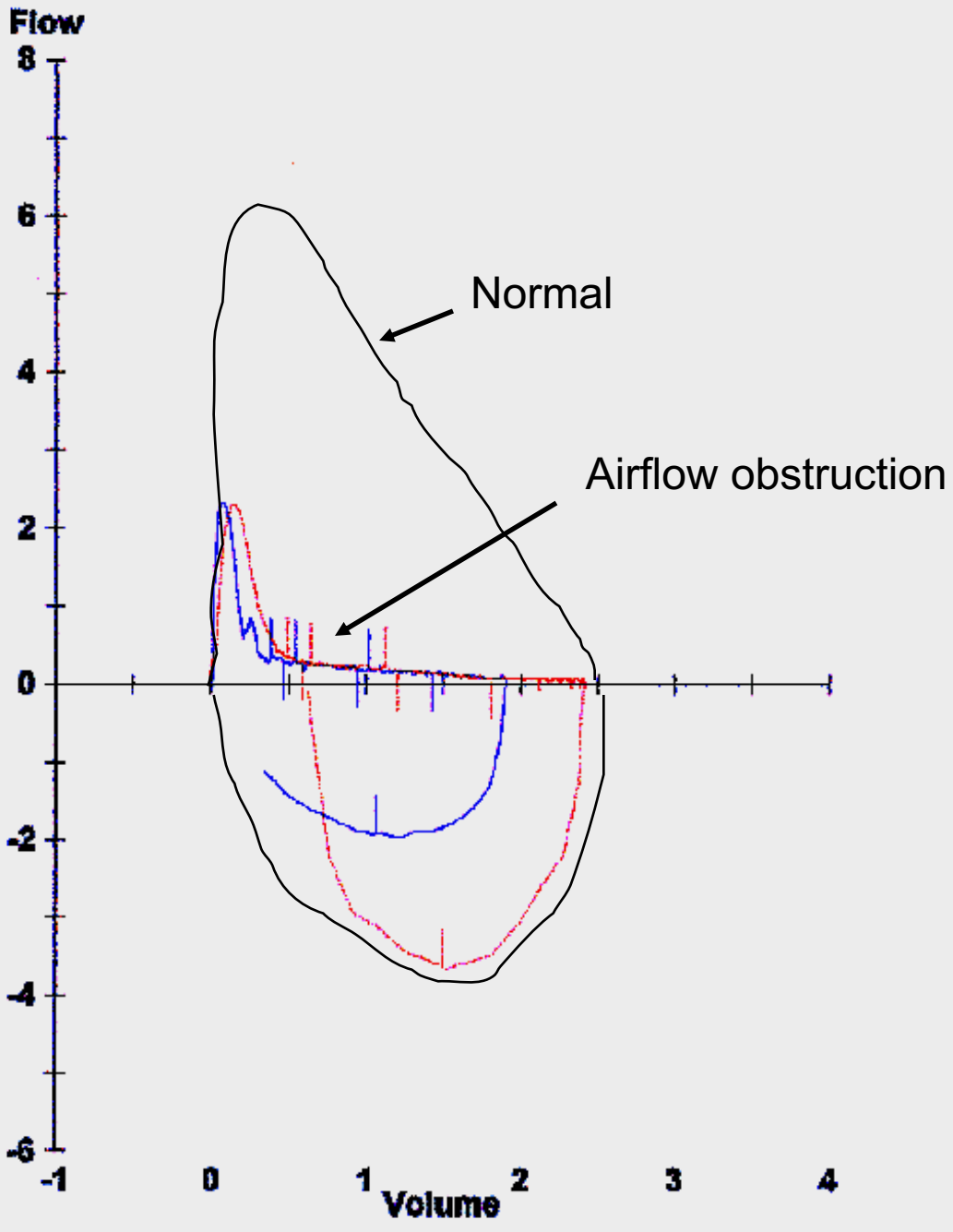
Summary

- Introduction
- Management of COPD
  - Foundation of management
  - Importance of phenotyping
  - What medication for what patient? (new guidelines)
  - What puffer for what patient?
  - Fourth line treatment
  - Special management issues in the Inner City population
- Conclusion & discussions


Cigarette smoke
Genetic susceptibility
Respiratory infections
Air pollution
Parenchymal Inflammation
↓ Lung recoil
Airway inflammation & remodeling
Emphysema
↓ Expiratory flow, hyperinflation& gas exchange abnormalities
Chronic Bronchitis
Symptoms


Flow
8
6
4
2
0
-2
-4
-6
-1
0
1
2
3
4
Volume
Normal
Airflow obstruction

GOLD: Classification of Severity of Airflow Limitation in COPD*

In patients with $FEV_1/FVC < 0.70$

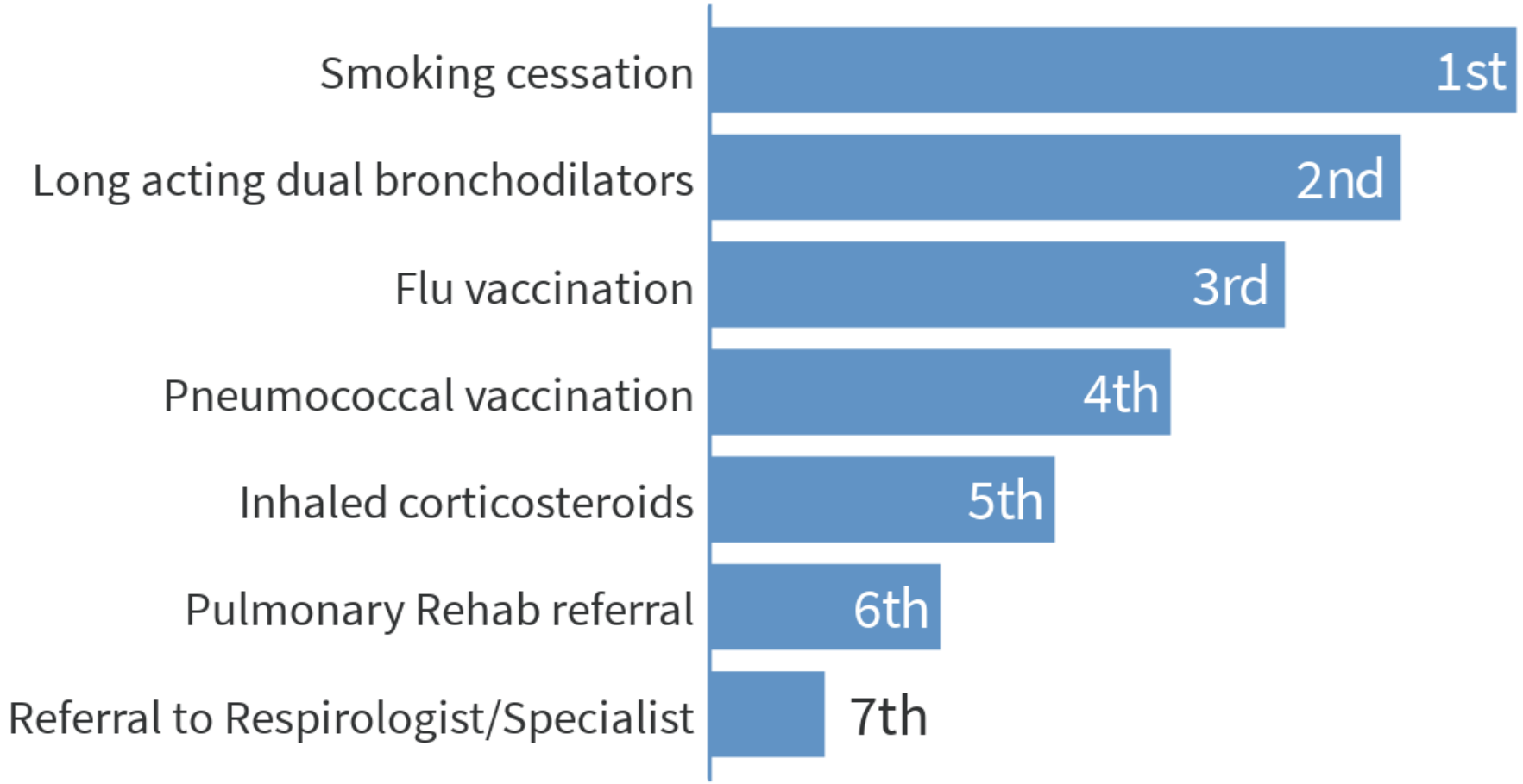
GOLD Stage	Severity	Degree of Airflow Limitation
1	Mild	$FEV_1 \geq 80\%$ predicted
2	Moderate	$50\% \leq FEV_1 < 80\%$ predicted
3	Severe	$30\% \leq FEV_1 < 50\%$ predicted
4	Very severe	$FEV_1 < 30\%$ predicted

*Based on post-bronchodilator FEV_1

COPD Cases 1

- Patient (65yrs) presented with cough and SOB (2 blocks). Smoker (50 pack years)
- Previous PFT's showed FEV1=35% predicted (FEV1/FVC ratio 57%).
- On SAB's (Sabutamol & Ipratropium) prn
- Patient has had one AE the last year
- **What management options will you suggest?**

Case 1: Management plan. Arrange in priority from top to bottom.



COPD Cases 1

- Smoking cessation/vaping/cannabis/recreational drugs
- Vaccination
  - Influenza
  - Pneumococcus
- Pulmonary Rehabilitation
- Treatment:
    - SAB vs LAB
    - LAMA
    - LAMA/LABA combination
    - ICS/LABA combination
    - LAMA + ICS/LABA
    - Theophylin/PDE4 inhibitors

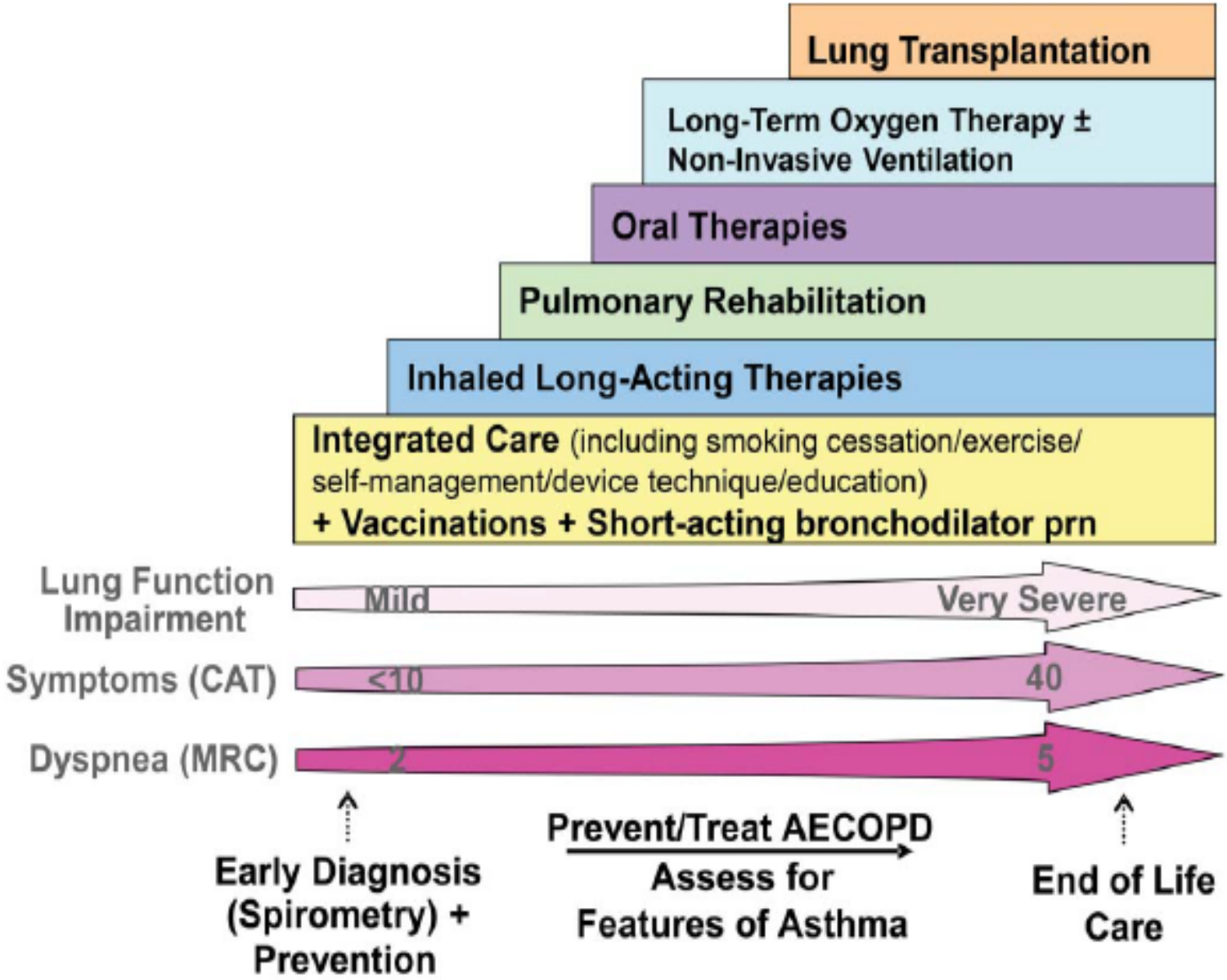
COPD Management

GOLD:
Multidimensional Treatment Goals

Airflow Obstruction	Slow down FEV_1 decline
Symptom Burden	Minimize symptoms
Functional Limitations	Improve QoL
Exacerbation Frequency	Prevent and manage exacerbations

Reduce mortality and hospital admissions

Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2014. www.goldcopd.org. Accessed 3/6/14.

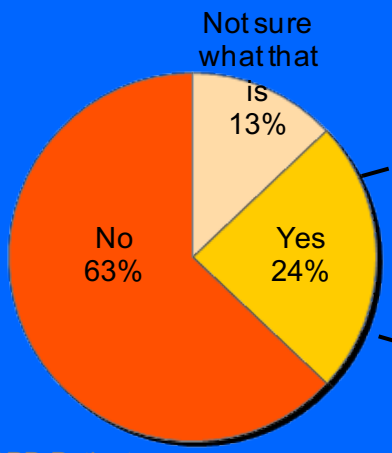

Lung Transplantation
Long-Term Oxygen Therapy ±
Non-Invasive Ventilation
Oral Therapies
Pulmonary Rehabilitation
Inhaled Long-Acting Therapies
Integrated Care (including smoking cessation/exercise/
self-management/device technique/education)
+ Vaccinations + Short-acting bronchodilator prn
Lung Function Impairment
Mild
Very Severe
Symptoms (CAT)
≤10
40
Dyspnea (MRC)
2
5
Early Diagnosis (Spirometry) + Prevention
Prevent/Treat AECOPD
Assess for Features of Asthma
End of Life Care

Foundation of COPD Management

- Education
- Smoking cessation
- Vaccination
- Lifestyle changes: activity & diet
- Pulmonary Rehabilitation

Pulmonary Rehabilitation

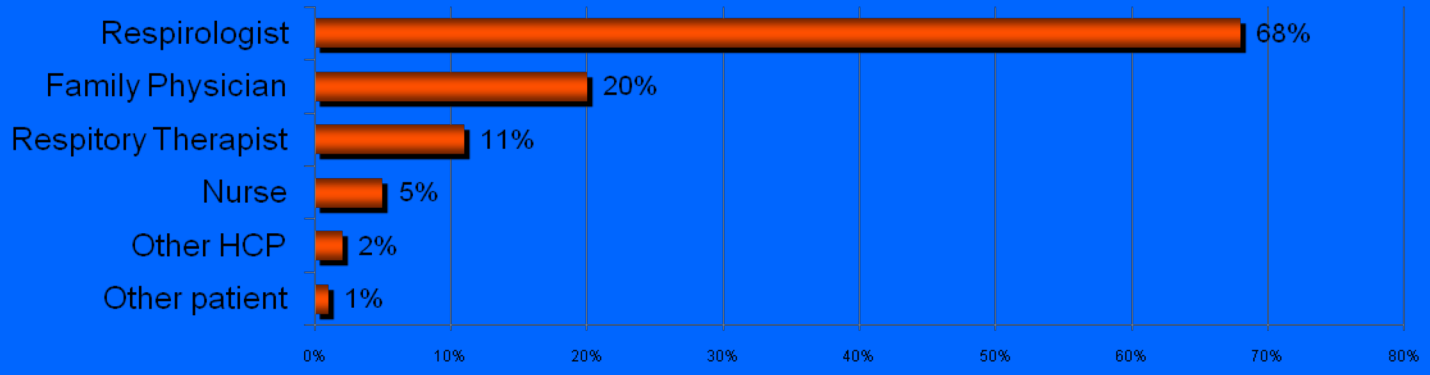
PATIENT SURVEY: Have you participated in a Pulmonary Rehab Program?



Those Participating by Severity			
Mild	Mod	Severe	Very Severe
29%	23%	30%	41%

Base: 536 COPD Patients

PATIENT SURVEY: Who referred you to a Pulmonary Rehab Program?



Base: 132 COPD Patients Referred

What medication for what patient?

Pharmacologic Options

Bronchodilators

Short-acting

β-Agonists (SABA):
Albuterol
Levalbuterol
Metaproterenol
Pirbuterol

Anticholinergic (SAMA):
Ipratropium

Long-acting

Anticholinergic (LAMA):
Tiotropium
Aclidinium
Umeclidinium*
Glycopyrronium

β-Agonists (LABA):
Salmeterol
Formoterol
Arformoterol
Indacaterol (ultra)

LABA + LAMA
Umeclidinium + vilanterol
Glycopyrronium +Indacaterol

Theophylline

Anti-inflammatory

ICS + LABA

Fluticasone + Salmeterol
Budesonide + Formoterol
Fluticasone + Vilanterol

PDE-4 inhibitors

Roflumilast

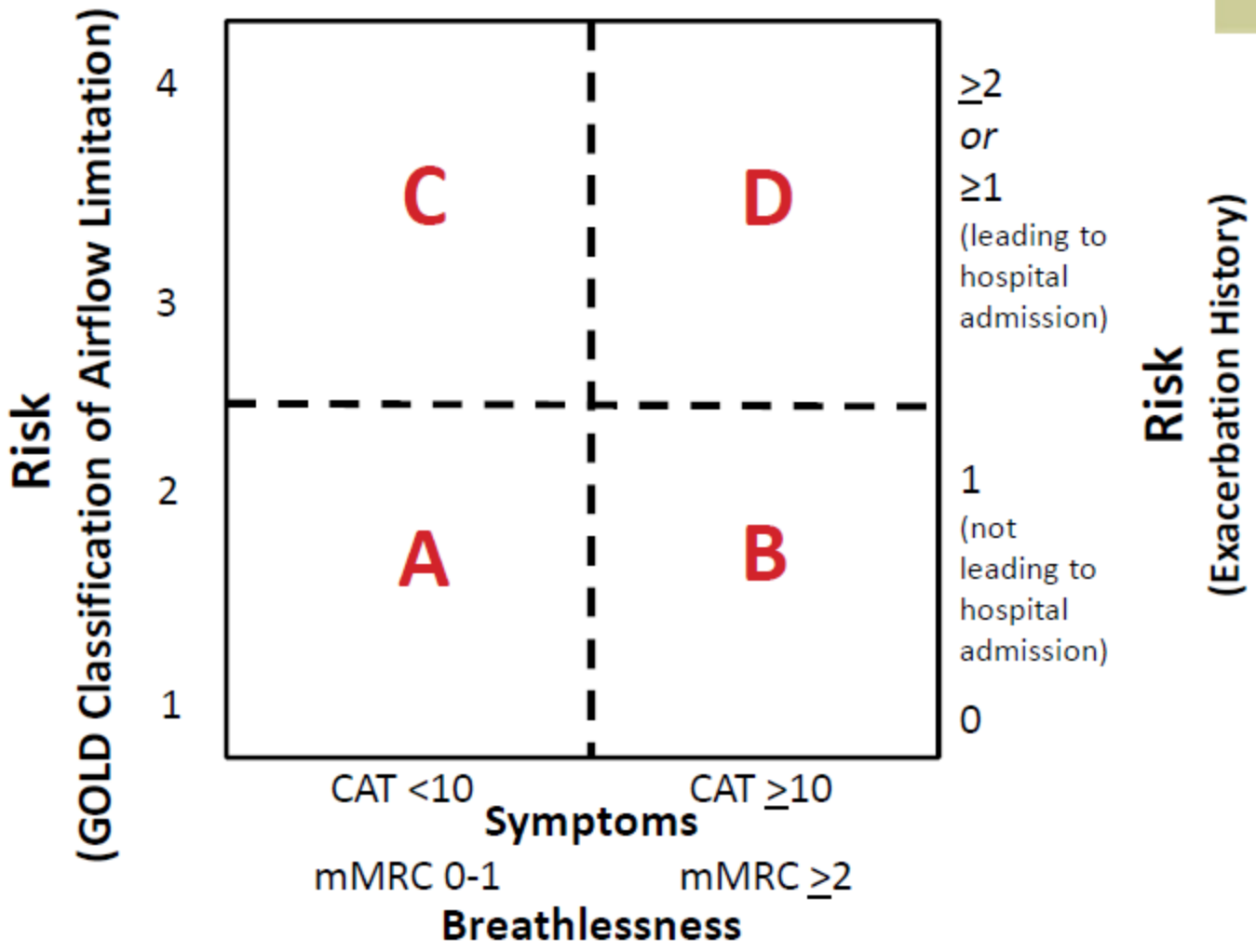
Oral steroids

Prednisone
Methylprednisolone

Macrolides

*Not discussed; FDA approval granted after the taping of this educational activity
Slide courtesy of Sanjay Sethi, MD

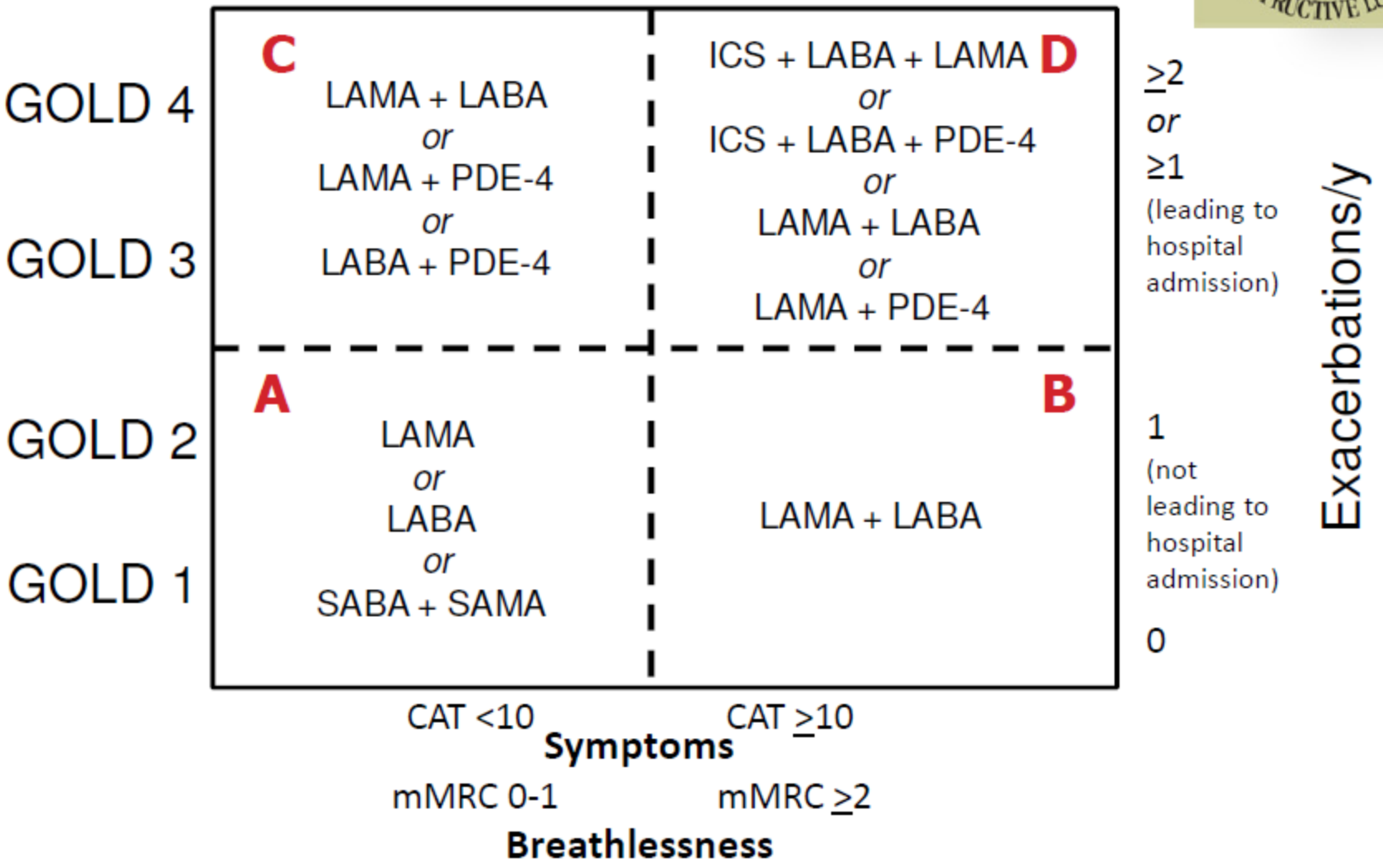
GOLD:
Combined Assessment of COPD



*Not leading to hospitalization

Used with permission from Global Strategy for Diagnosis, Management, and Prevention of COPD.

GOLD: Alternative Choice Management of Stable COPD



Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2014. www.goldcopd.org. Accessed 3/6/14.

Indacaterol–Glycopyrronium versus Salmeterol–Fluticasone for COPD

Jadwiga A. Wedzicha, M.D., Donald Banerji, M.D., Kenneth R. Chapman, M.D.,

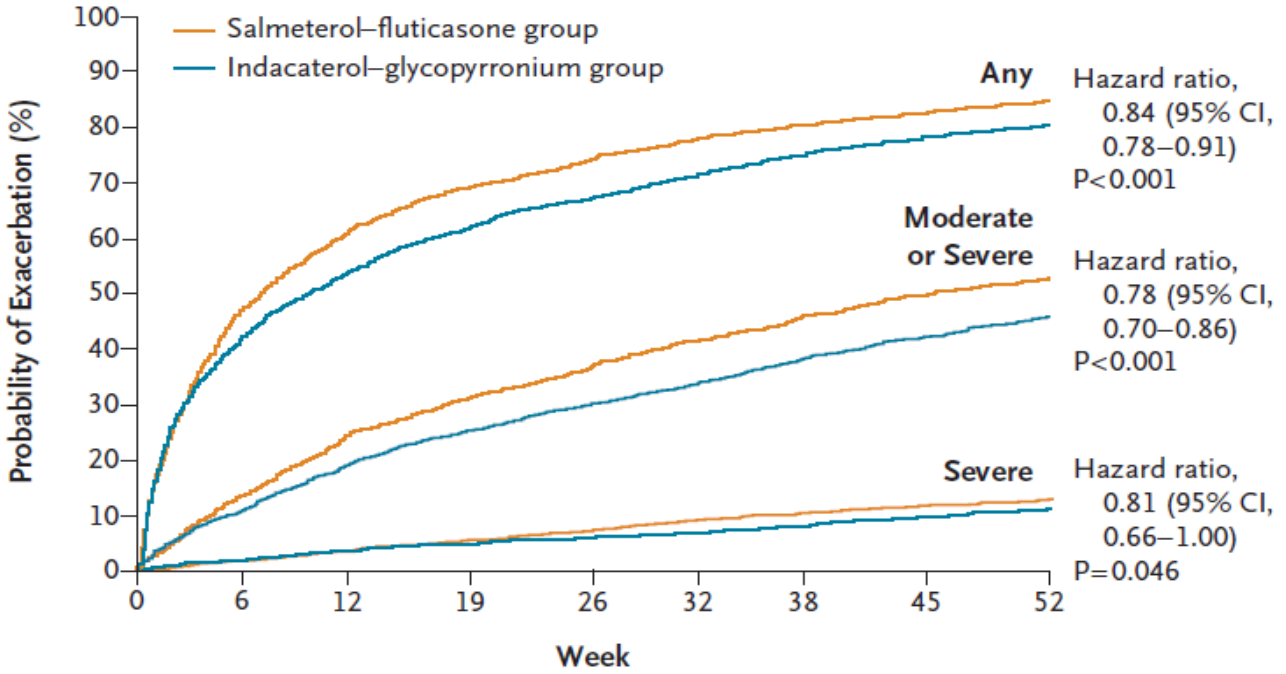
Table 1. Baseline Characteristics of the Patients.*

Characteristic	Indacaterol–Glycopyrronium Group (N=1680)	Salmeterol–Fluticasone Group (N=1682)	All Patients (N=3362)
Age — yr	64.6±7.9	64.5±7.7	64.6±7.8
Male sex — no. (%)	1299 (77.3)	1258 (74.8)	2557 (76.1)
Duration of COPD — yr	7.2±5.3	7.3±5.5	7.3±5.4
Use of inhaled glucocorticoids at screening — no. (%)	954 (56.8)	939 (55.8)	1893 (56.3)
Current smoker — no. (%)	664 (39.5)	669 (39.8)	1333 (39.6)
Severity of COPD — no. (%)†			
Group A	2 (0.1)	0	2 (0.1)
Group B	400 (23.8)	422 (25.1)	822 (24.4)
Group C	1 (0.1)	2 (0.1)	3 (0.1)
Group D	1265 (75.3)	1249 (74.3)	2514 (74.8)
Post-bronchodilator FEV_1 — liters	1.2±0.3	1.2±0.4	1.2±0.3
Post-bronchodilator FEV_1 — % of predicted value	44.0±9.5	44.1±9.4	44.1±9.5
Post-bronchodilator ratio of FEV_1 to FVC — %	41.7±9.8	41.5±9.9	41.6±9.9
Total score on the SGRQ-C‡	47.3±15.8	47.2±15.9	47.3±15.8

Indacaterol–Glycopyrronium versus Salmeterol–Fluticasone for COPD

Jadwiga A. Wedzicha, M.D., Donald Banerji, M.D., Kenneth R. Chapman, M.D., Jørgen Vestbo, M.D., D.M.Sc., Nicolas Roche, M.D., R. Timothy Ayers, M.Sc., Chau Thach, Ph.D., Robert Fogel, M.D., Francesco Patalano, M.D., and Claus F. Vogelmeier, M.D., for the FLAME Investigators*

B Time to First Exacerbation



Patients at Risk

Any exacerbation					
Indacaterol–glycopyrronium group	1675	763	535	409	281
Salmeterol–fluticasone group	1679	642	415	313	217
Moderate or severe exacerbation					
Indacaterol–glycopyrronium group	1675	1299	1091	948	711
Salmeterol–fluticasone group	1679	1210	975	820	608
Severe exacerbation					
Indacaterol–glycopyrronium group	1675	1530	1434	1368	1138
Salmeterol–fluticasone group	1679	1507	1389	1303	1071

Summary

- Dual long acting bronchodilators (LABA/LAMA) is at least equal to ICS+LABA as treatment in subjects with moderate to severe COPD
- LABA/LAMA in equal to ICS+LABA to reduce COPD exacerbation and most likely better to reduce mild exacerbation
- No difference in “short-term” side effects
- Main critique:
  - Reduction in AECOPD was mainly mild to moderate exacerbation
  - Smallest effect in more severe exacerbation or in subjects with frequent exacerbations

Combinations of LAMA/LABA

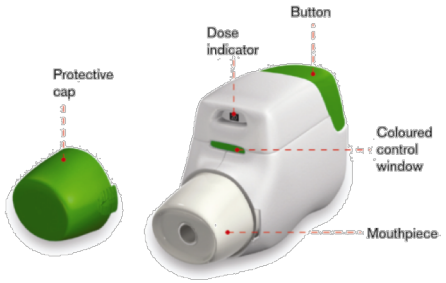
Currently FDA approved:

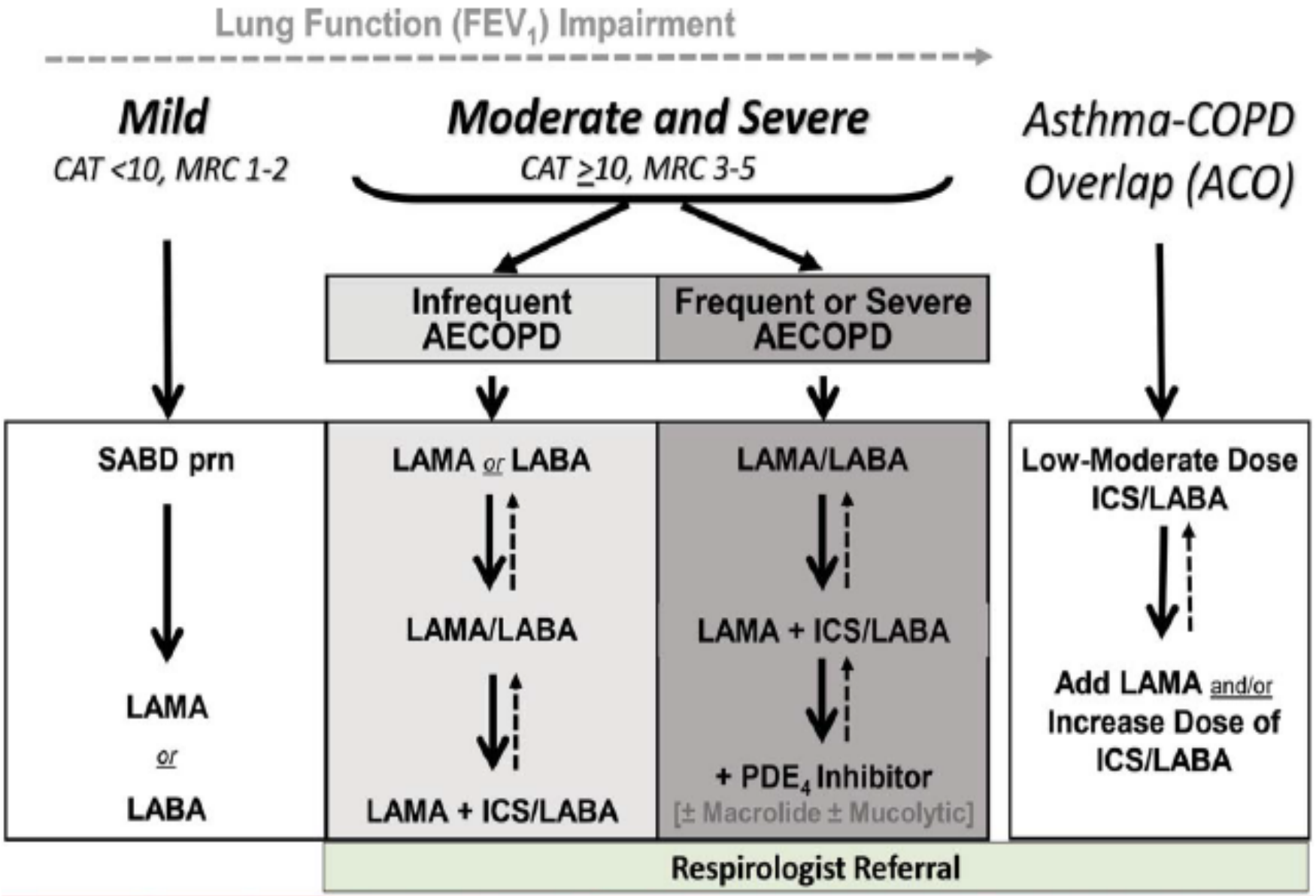
- **Anoro** (Umeclidinium/Vilanterol)

- **Ultibro** (Glycopyrronium/indacaterol)

- **Inspoilto** (Tiotropium/olodaterol)

- **Duaklir** (Aclidinium/formoterol)



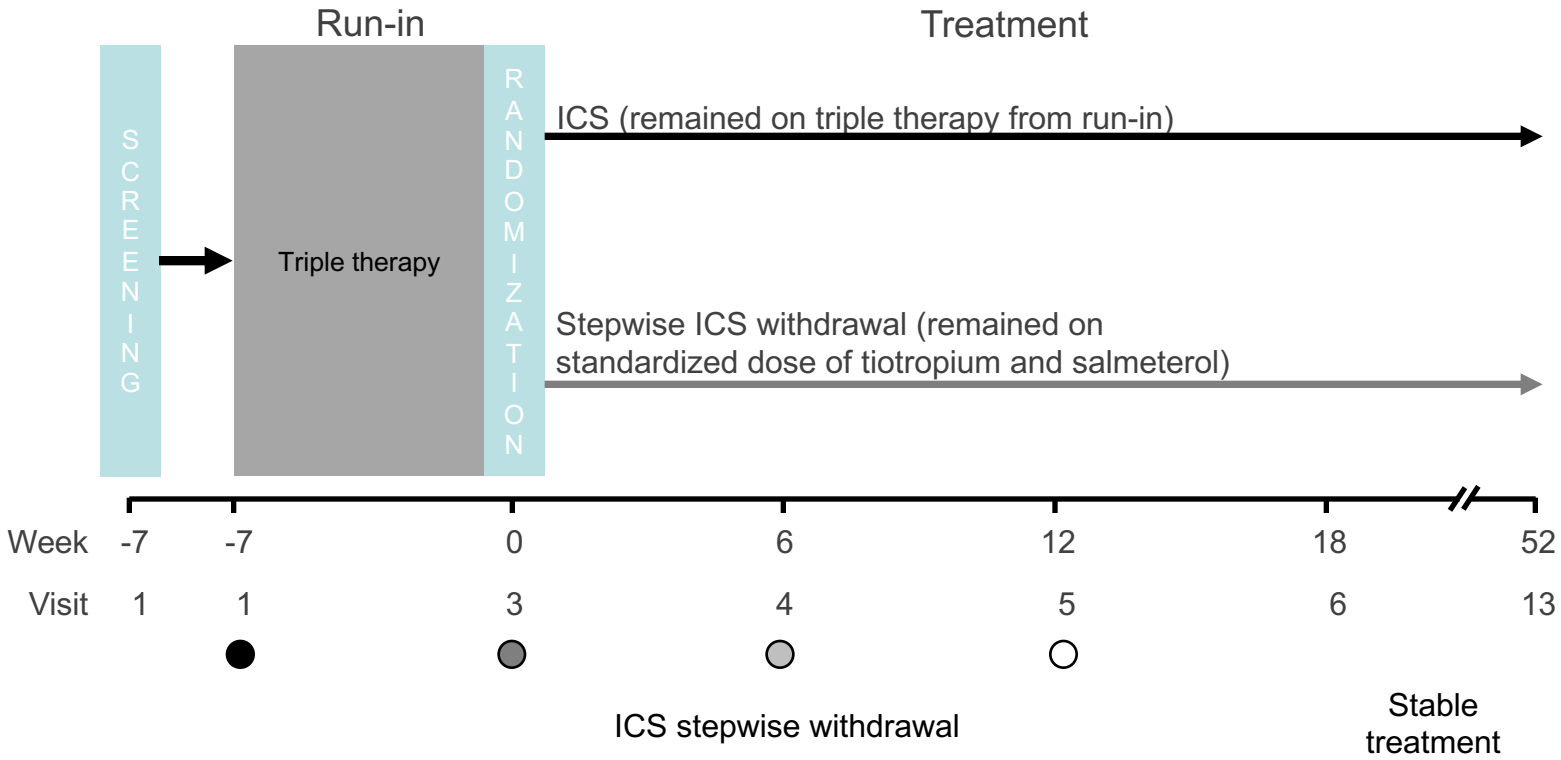

Lung Function (FEV_1) Impairment
Mild
CAT <10, MRC 1-2
Moderate and Severe
CAT ≥10, MRC 3-5
Asthma-COPD Overlap (ACO)
Infrequent AECOPD
Frequent or Severe AECOPD
SABD prn
LAMA
or
LABA
LAMA or LABA
LAMA/LABA
LAMA + ICS/LABA
LAMA/LABA
LAMA + ICS/LABA
+ PDE_4 Inhibitor
[± Macrolide ± Mucolytic]
Low-Moderate Dose ICS/LABA
Add LAMA and/or Increase Dose of ICS/LABA
Respirologist Referral
CANADIAN THORACIC SOCIETY

Can we safely stop inappropriate ICS treatment?

COPD case 2

- Patient (75yrs) with severe COPD (FEV1 32%)
- No exacerbations over the last 3 years
- On triple therapy for 10 yrs
- Recently develop vertebra fracture and also recently diagnose with DM type II
- Can you stop the ICS safely?

Stepwise Withdrawal of ICS Among patients Receiving Triple Therapy (WISDOM Study)

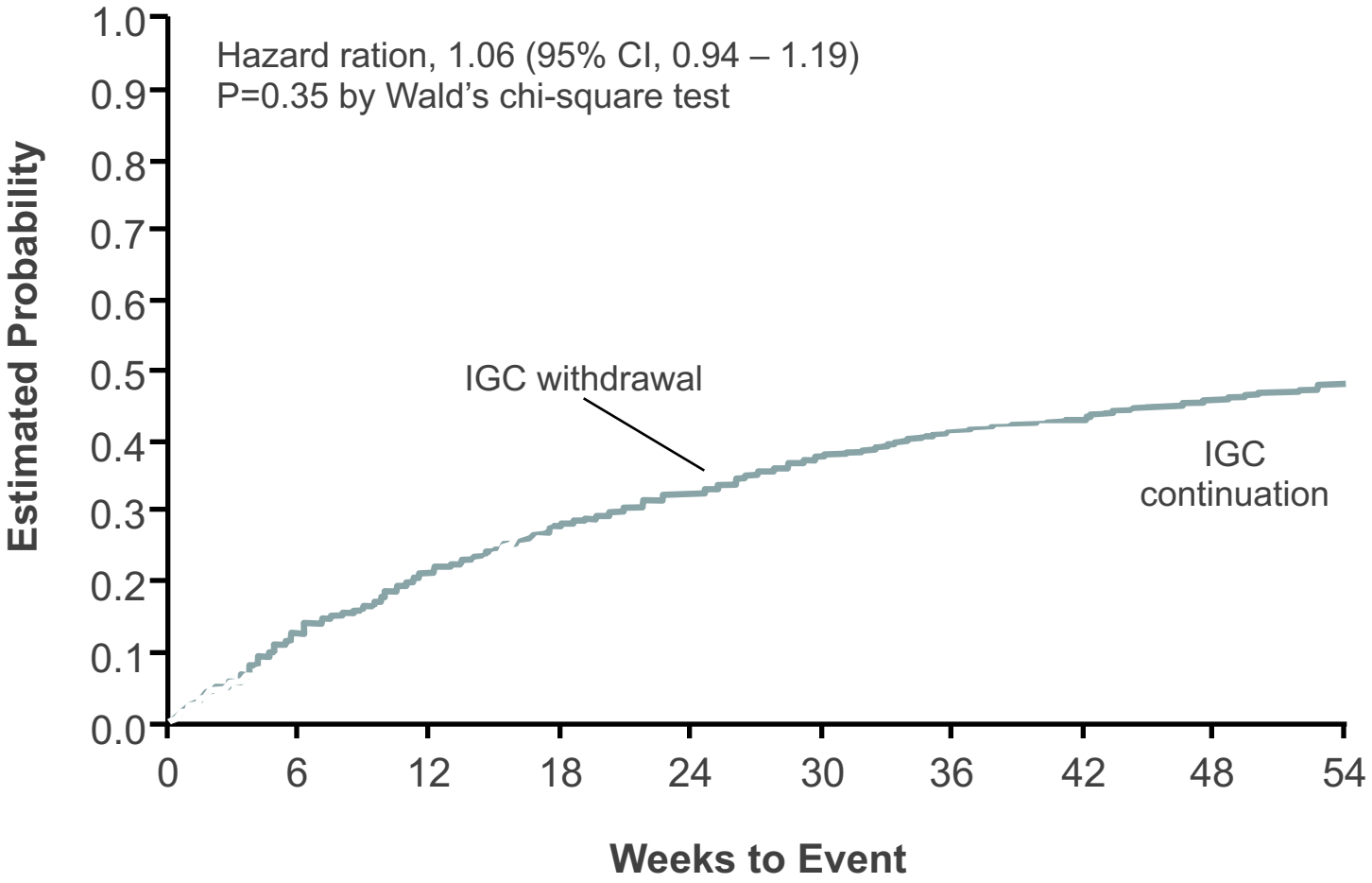


Triple therapy regimen
- Tiotropium 18 µg QD
- Salmeterol 50 µg BID
- Fluticasone 500 µg BID

Fluticasone 12-week withdrawal schedule
- 500µq BID
- Reduced to 250 µg BID
- Reduced to 100 µg BID
- Reduced to 0 µg (placebo)

Adapted from Magnussen H, et al. N Engl J Med 2014; 371(14):1285-94.

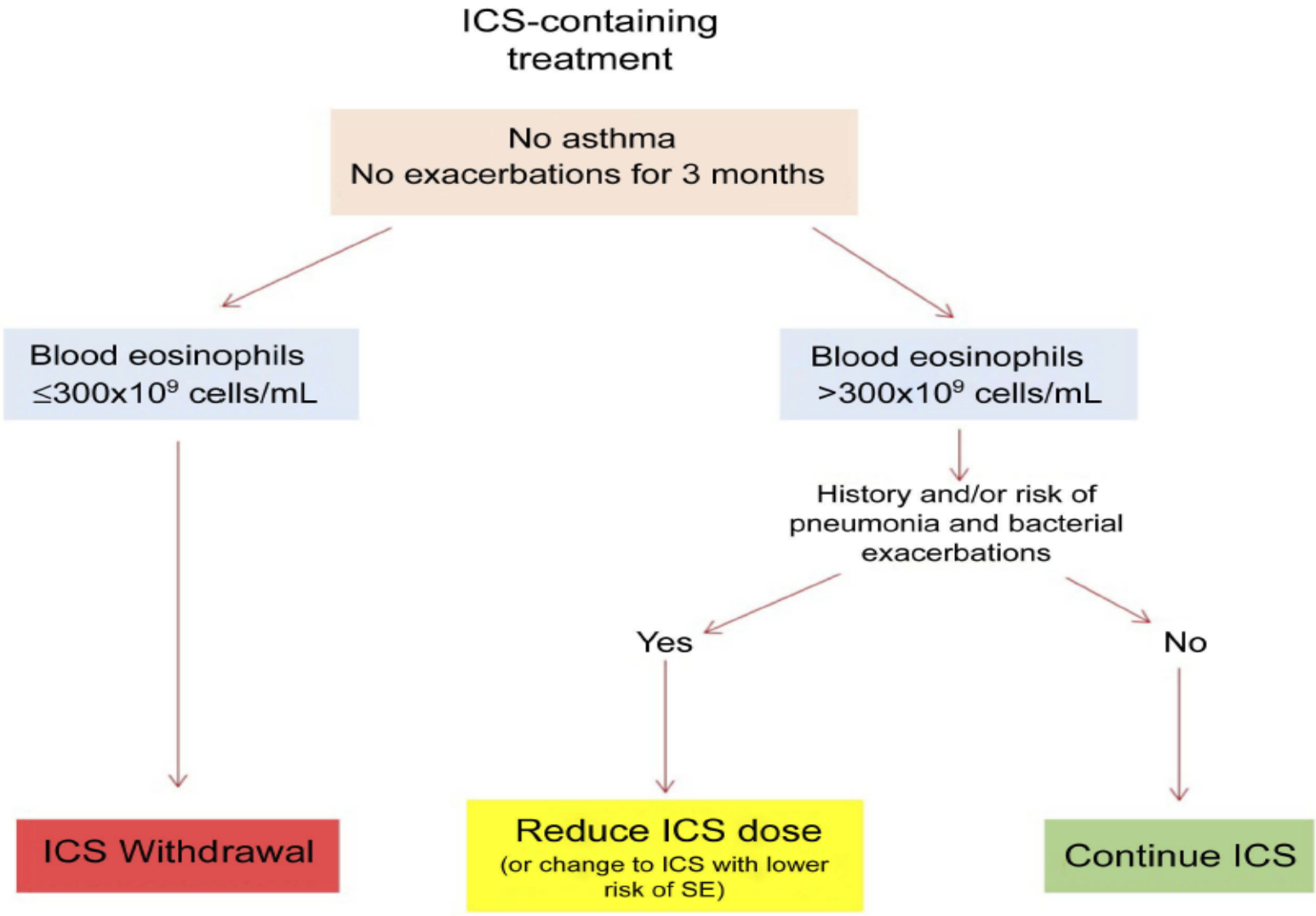
Withdrawal of ICS Patients on Triple Therapy: Moderate or Severe Exacerbations (WISDOM Study)



IGC = Inhaled corticosteroid fluticasone

Adapted from Magnussen H, et al. N Engl J Med 2014; 371(14):1285-94.

Protocol for withdrawal of ICS in COPD



What benefit is their adding ICS to dual bronchodilator?

Once-Daily Single-Inhaler Triple versus Dual Therapy in Patients with COPD

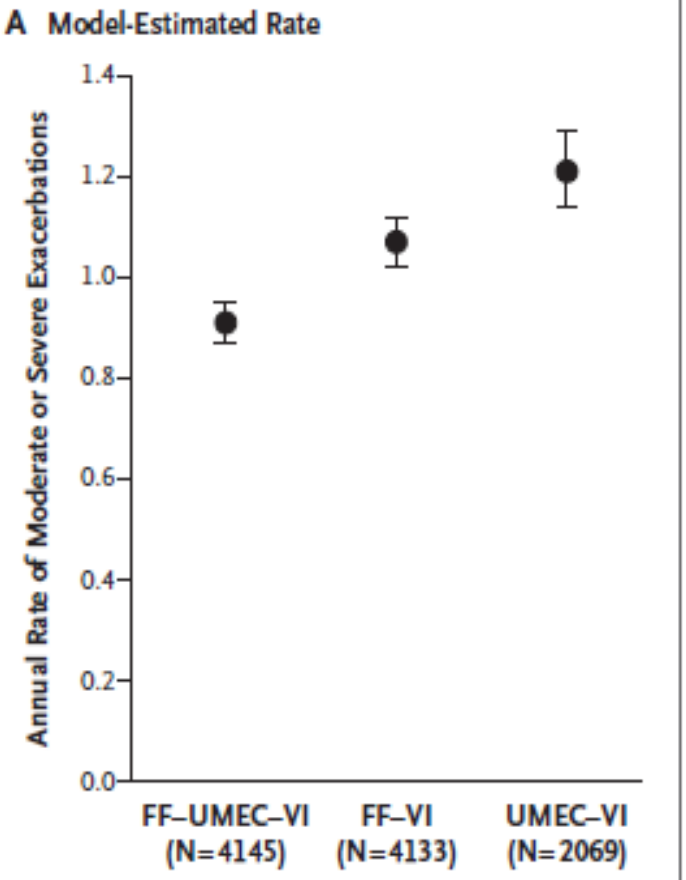
David A. Lipson, M.D., Frank Barnhart, D.V.M., Noushin Brealey, M.D.,

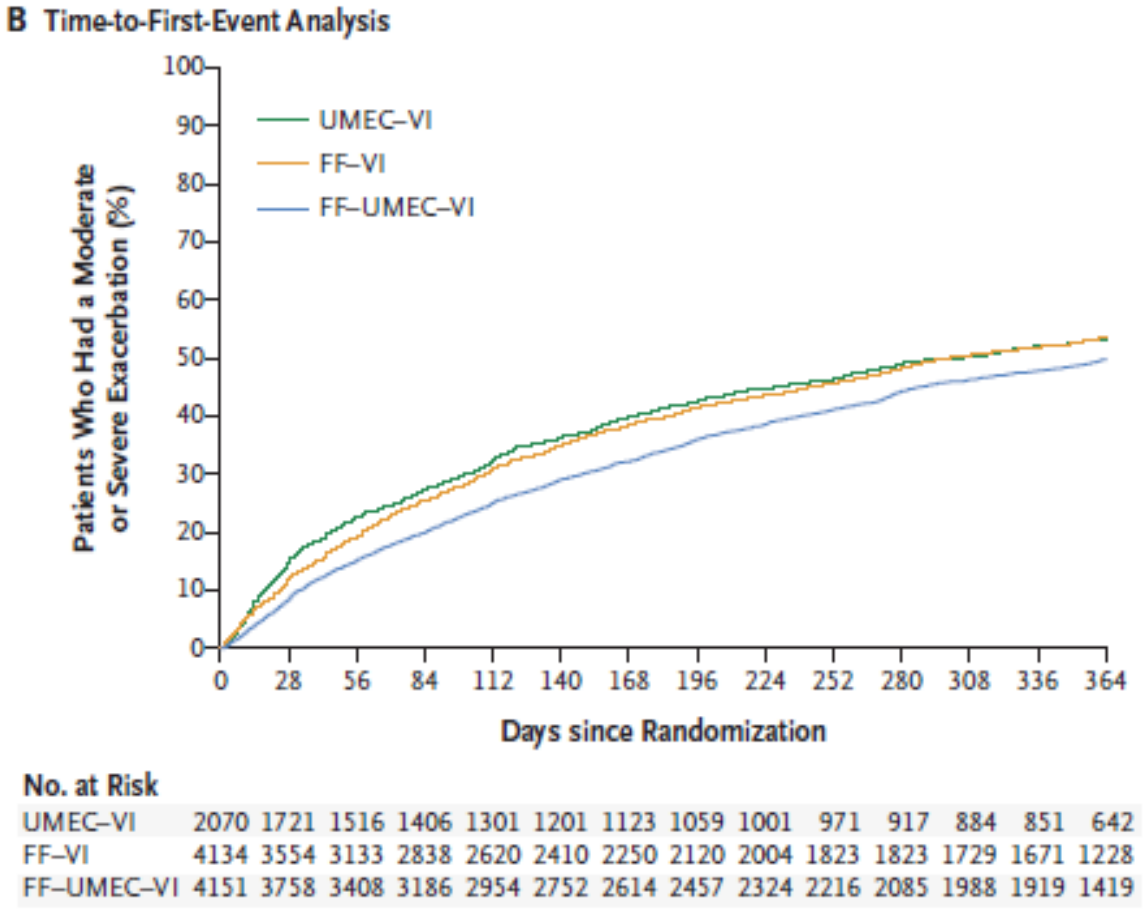
Table 1. Baseline Characteristics of the Patients (Intention-to-Treat Population).*

Characteristic	Triple Therapy (N=4151)	Fluticasone Furoate–Vilanterol (N=4134)	Umeclidinium–Vilanterol (N=2070)	Total (N=10,355)
Age — yr	65.3±8.2	65.3±8.3	65.2±8.3	65.3±8.3
Female sex — no. (%)	1385 (33)	1386 (34)	714 (34)	3485 (34)
Body-mass index†	26.6	26.7	26.6	26.6
Former smokers — no. (%)‡	2715 (65)	2711 (66)	1342 (65)	6768 (65)
Moderate or severe COPD exacerbations in the previous yr — no. (%)				
0	2 (<1)	5 (<1)	2 (<1)	9 (<1)
1	1853 (45)	1907 (46)	931 (45)	4691 (45)
2	1829 (44)	1768 (43)	890 (43)	4487 (43)
≥3	467 (11)	454 (11)	247 (12)	1168 (11)
≥2 Moderate COPD exacerbations in the previous yr — no. (%)	1967 (47)	1921 (46)	989 (48)	4877 (47)
≥1 Severe COPD exacerbation in the previous yr — no. (%)	1087 (26)	1069 (26)	515 (25)	2671 (26)
≥2 Severe COPD exacerbations in the previous yr — no. (%)	147 (4)	148 (4)	76 (4)	371 (4)
Postbronchodilator FEV_1 — % of predicted normal value	45.7±15.0	45.5±14.8	45.4±14.7	45.5±14.8
Mean score on the COPD Assessment Test at screening§	20.1±6.1	20.1±6.1	20.2±6.2	20.1±6.1

This article was published on April 18, 2018, at NEJM.org.

IMPACT-Study





No. at Risk

UMEC–VI	2070	1721	1516	1406	1301	1201	1123	1059	1001	971	917	884	851	642
FF–VI	4134	3554	3133	2838	2620	2410	2250	2120	2004	1823	1823	1729	1671	1228
FF–UMEC–VI	4151	3758	3408	3186	2954	2752	2614	2457	2324	2216	2085	1988	1919	1419

Figure 1. Moderate or Severe COPD Exacerbations (Intention-to-Treat Population).

I bars indicate 95% confidence intervals. COPD denotes chronic obstructive pulmonary disease, FF fluticasone furoate, UMEC umeclidinium, and VI vilanterol.

The IMPACT study:

10,355 patients
Primary endpoint reduction in rate of on-treatment moderate/severe exacerbations
FF/UMEC/VI (100/62.5/25mcg) when compared with two, once-daily dual COPD therapies

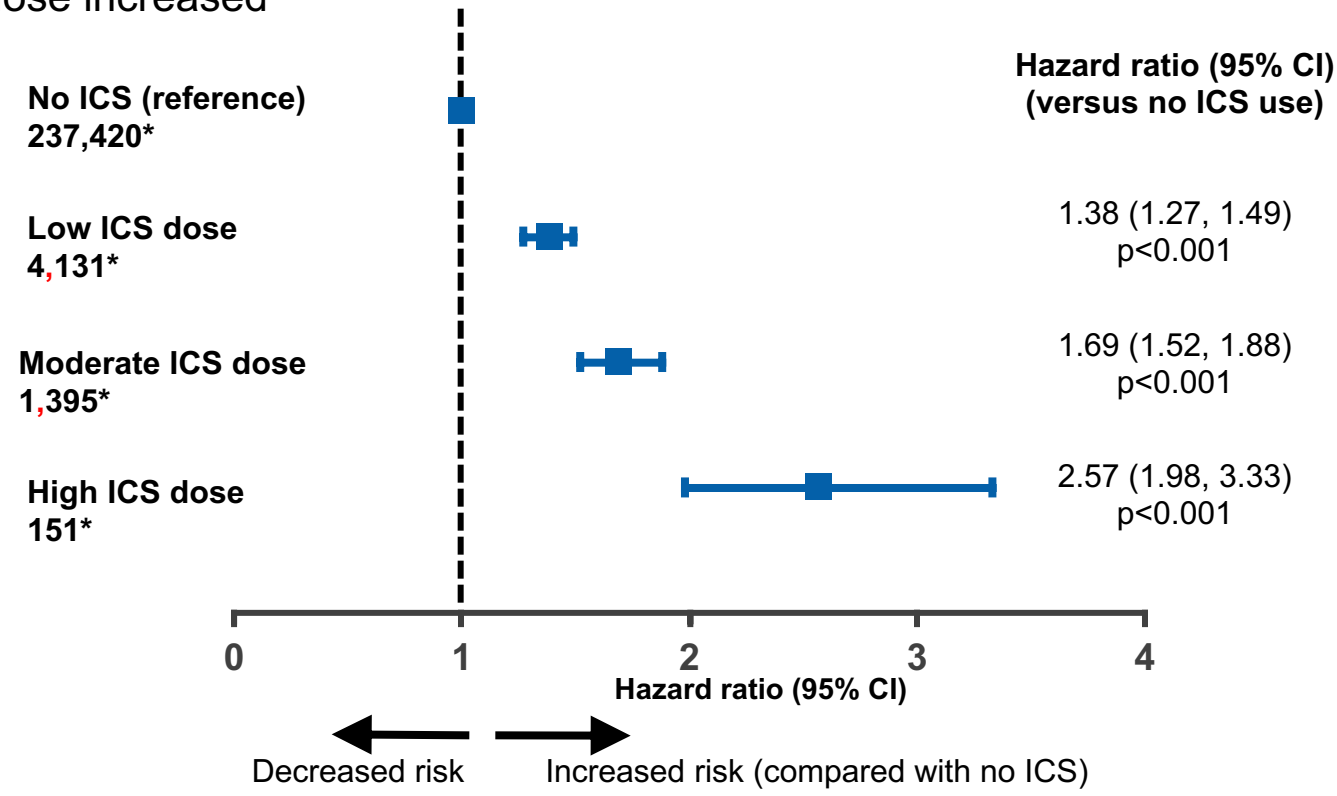
The study showed reduction AECOPD:

1) 15% reduction for FF/UMEC/VI compared with Breo Ellipta (FF/VI,100/25mcg); 0.91 vs 1.07 per year; $p<0.001$
2) 25% reduction for FF/UMEC/VI compared with Anoro Ellipta (UMEC/VI, 62.5/25mcg); 0.91 vs 1.21 per year; $p<0.001$

Risk of using ICS?

Risk of new-onset pneumonia increased with increasing ICS dose[1]

- This large (n=135,445), retrospective, cohort analysis of patients newly diagnosed with COPD (Jan 2005–Dec 2010) showed that risk of pneumonia increased as ICS dose increased



Pairwise comparisons between the three ICS dose levels were all significantly different at p<0.01

*Patient years

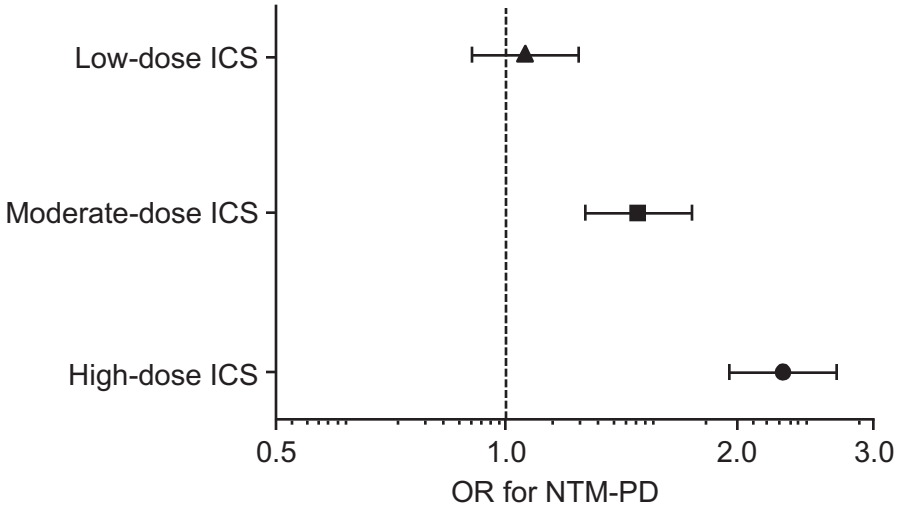
CI, confidence interval; COPD, chronic obstructive pulmonary disease; ICS, inhaled corticosteroid

Source: 1. Adapted from Yawn et al. Int J Chron Obstruct Pulmon Dis. 2013;8:295-304.

ICS use has been associated with an increased risk of NTM-PD[1]

- A population-based nested case–control study using linked laboratory and health administrative databases in Ontario, Canada analyzed 2,966 patients with NTM-PD and 327 patients with TB
- Current ICS use was associated with NTM-PD compared with nonuse (aOR 1.86, 95% CI 1.60, 2.15) and was statistically significant for fluticasone (aOR 2.09, 95% CI 1.80, 2.43) but not for budesonide (aOR 1.19, 95% CI 0.97, 1.45)
- A strong dose–response relationship between incident NTM-PD and cumulative ICS dose over 1 year was observed. However, no significant association between current ICS use and TB (aOR 1.43, 95% CI 0.95, 2.16) was observed

OR for NTM-PD by tertiles of cumulative ICS dose in the year prior to index date versus no ICS use



aOR, adjusted OR; CI, confidence interval; ICS, inhaled corticosteroid; NTM-PD, nontuberculous mycobacterial pulmonary disease; OR, odds ratio; TB, tuberculosis

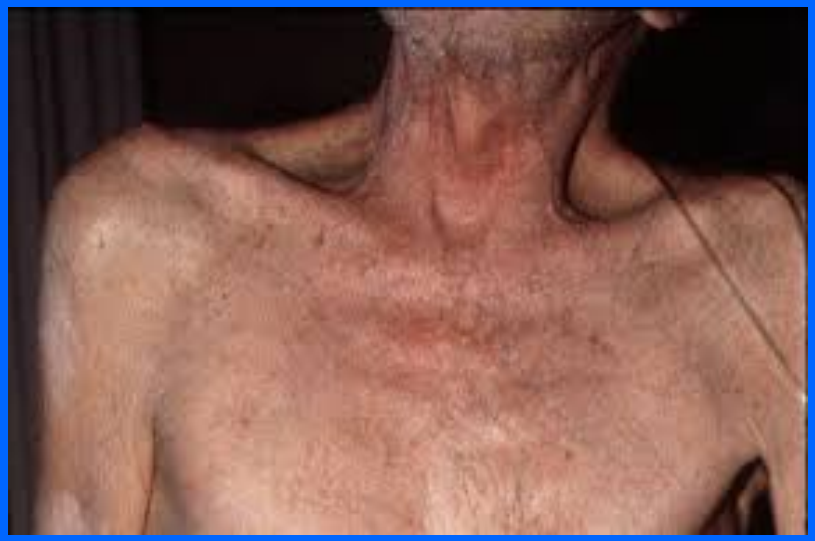
Source: 1. Brode et al. Eur Respir J. 2017 ;50:1700037

What puffer for what patient?

COPD Phenotypes

Blue Blowers

Pink Puffers



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Susceptibility to Exacerbation in Chronic Obstructive Pulmonary Disease

John R. Hurst, M.B., Ch.B., Ph.D., Jørgen Vestbo, M.D., Antonio Anzueto, M.D.,

Table 3. Factors Associated with Increased Exacerbation Frequency in the Stepwise Multivariate Model.*

Factor	Number of Exacerbations						P Value for Overall Model
	≥2 vs. 0		1 vs. 0		≥2 vs. 1		
	odds ratio (95% CI)	*P value*	*odds ratio (95% CI)*	*P value*	*odds ratio (95% CI)*	*P value*	
Exacerbation during previous yr — any vs. none	5.72 (4.47–7.31)	<0.001	2.24 (1.77–2.84)	<0.001	2.55 (1.96–3.31)	<0.001	<0.001
FEV_1 — per 100-ml decrease	1.11 (1.08–1.14)	<0.001	1.06 (1.03–1.08)	<0.001	1.05 (1.02–1.09)	<0.001	<0.001
SGRQ score for COPD — per increase of 4 points	1.07 (1.04–1.10)	<0.001	1.01 (0.99–1.04)	0.38	1.06 (1.03–1.09)	<0.001	<0.001
History of reflux or heartburn — yes vs. no	2.07 (1.58–2.72)	<0.001	1.61 (1.23–2.10)	<0.001	1.29 (0.97–1.70)	<0.005	<0.001
White-cell count — per increase of $1\times10^3/mm^3$	1.08 (1.03–1.14)	0.002	1.02 (0.97–1.08)	0.45	1.06 (1.01–1.12)	<0.001	0.007

* FEV_1 denotes forced expiratory volume in 1 second, and SGRQ St. George's Respiratory Questionnaire.

International Journal of COPD

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ORIGINAL RESEARCH

Predicting frequent COPD exacerbations using primary care data

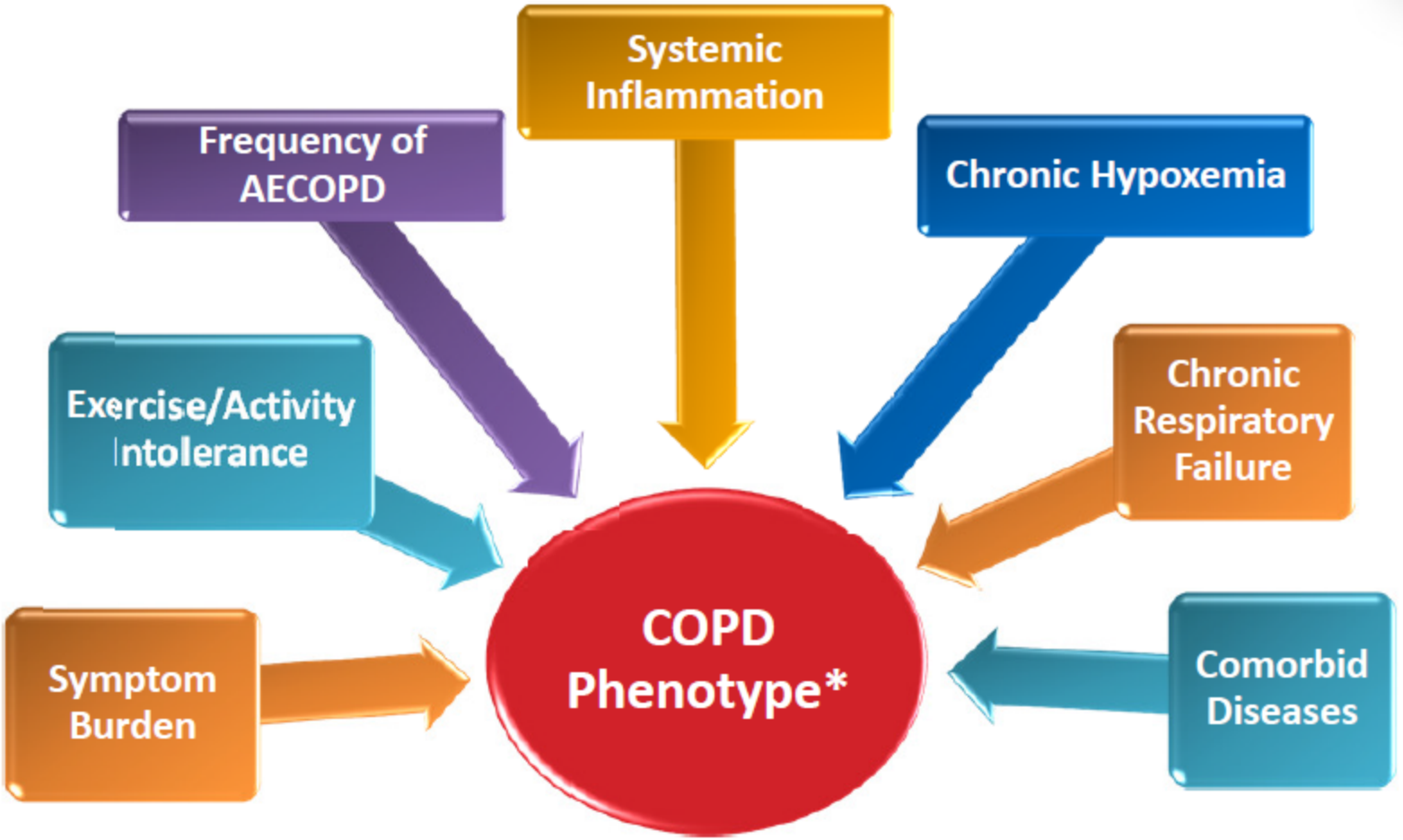
This article was published in the following Dove Press journal:
International Journal of COPD
9 November 2015

Table 4 Significant multivariable predictors of two or more COPD exacerbations in the outcome year in the total population data set (N=16,565)

Covariate	Odds ratio (95% CI)
Exacerbations in the baseline year	
0	1.00
1	2.42 (2.18–2.69)
2	4.39 (3.89–4.95)
3	7.28 (6.25–8.48)
≥4	17.83 (15.12–21.03)
FEV_1% predicted (per 10% decrease)	1.10 (1.07–1.12)
Age (per 10 years)	1.43 (0.92–2.23)
Age^2 (per 10 years)	0.97 (0.93–1.00)
Height (per 10 cm)	0.89 (0.85–0.93)
Eosinophilia in noncurrent smokers	1.29 (1.10–1.51)
Asthma	1.34 (1.23–1.46)
Nonallergic rhinitis	1.35 (1.15–1.59)
Nasal polyps	1.39 (1.09–1.78)
Ischemic heart disease	1.12 (1.01–1.25)
Anxiety or depression	1.11 (1.02–1.22)
GERD	1.18 (1.05–1.34)
Model *C* statistic (95% CI)	0.751 (0.742–0.761)

Note: Noncurrent smokers included ex-smokers and never smokers.
Abbreviations: CI, confidence interval; FEV_1, forced expiratory volume in 1 second; GERD, gastroesophageal reflux disease.

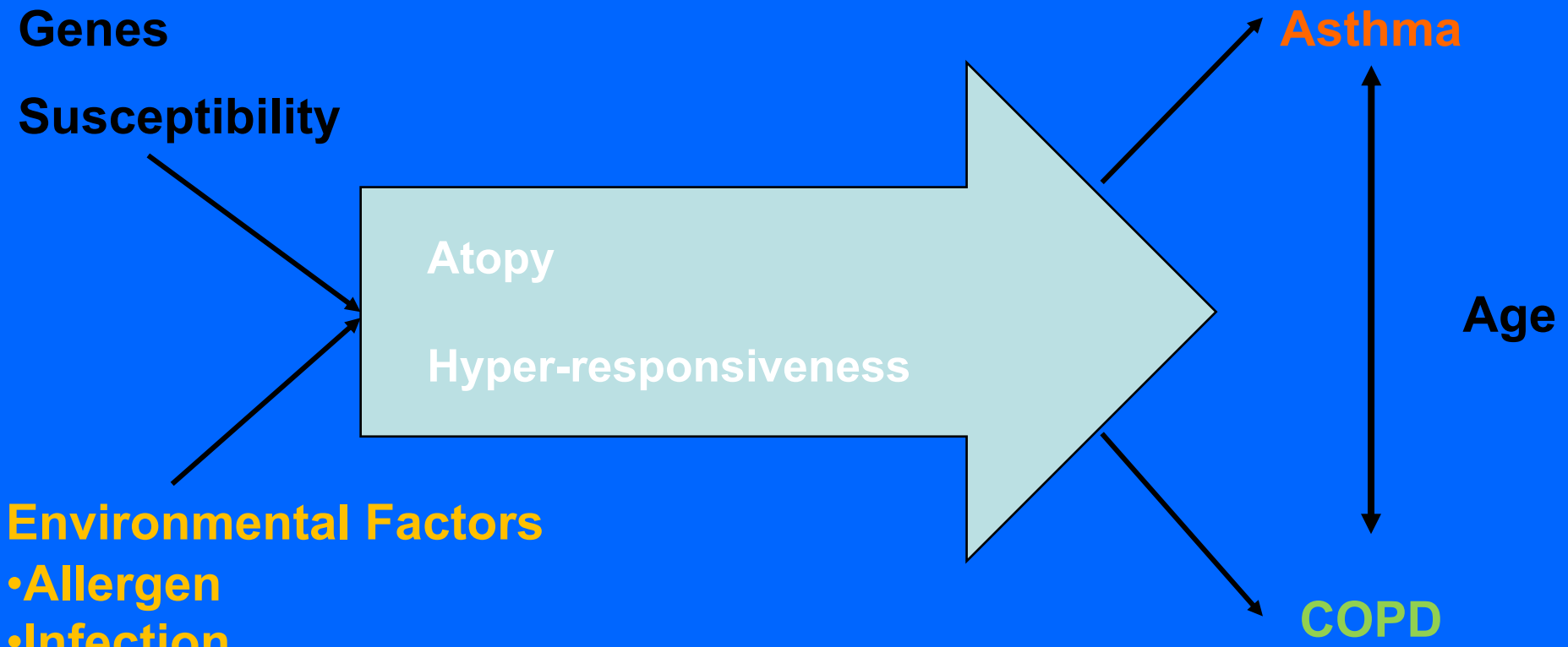
COPD: Moving Beyond the FEV_1



*Disease attributes that describe the diverse symptoms and outcomes of patients with COPD

Chen X et al. *Front. Med.* 2013;7(4):425-432. Oga T et al. *Chest*. 2005;128:62-69. Westwood M et al. *Respir Res*. 2011;12:40.

The Dutch Hypothesis



Oxidative stress switches off HDAC2
so it cannot protect against inflammation

P3333. Postma DS. Genetics of asthma and COPD.


TRELEGY
30

Training Patients on Correct Device Technique

Why is it important?

- High rate of inhaler technique errors
  - Patients don't recognize their technique errors
  - Most errors can be easily corrected
- HCP assessment identifies incorrect technique *and* patients who warrant device change
  - Important, given diversity of delivery systems and patients

How should it be done?

- Quickly, at outpatient visits
- ***Continually***
  - Successful technique not durable
  - Across care settings/ during transitions of care
- Combining verbal coaching/ technique demonstration

HCP, healthcare professional

4th Line Treatment

Effect of Roflumilast and Inhaled Corticosteroid/Long-Acting β_2-Agonist on Chronic Obstructive Pulmonary Disease Exacerbations (RE^{2}SPOND)

A Randomized Clinical Trial

Fernando J. Martinez[1], Klaus F. Rabe[2,3,4], Sanjay Sethi[5], Emilio Pizzichini[6], Andrew McIvor[7], Antonio Anzueto[8,9], Vijay K. T. Alagappan[10], Shahid Siddiqui[10], Ludmyla Rekeda[11], Christopher J. Miller[10], Sofia Zetterstrand[12], Colin Reisner[13], and Stephen I. Rennard[14,15]

Am J Respir Crit Care Med Vol 194, Iss 5, pp 559–567, Sep 1, 2016

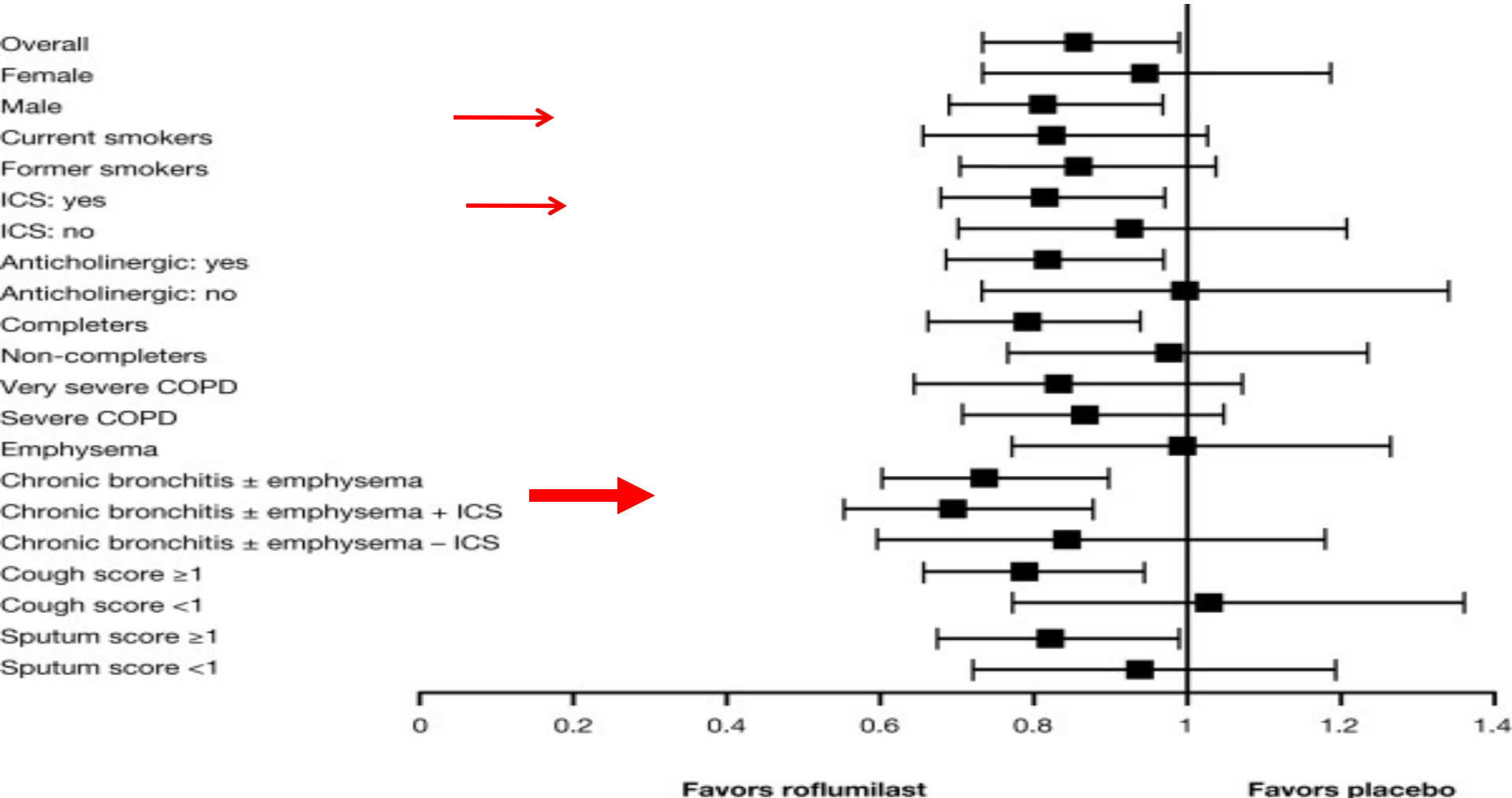
Rennard *et al. Respiratory Research* 2011, **12**:18
http://respiratory-research.com/content/12/1/18

RESPIRATORY RESEARCH

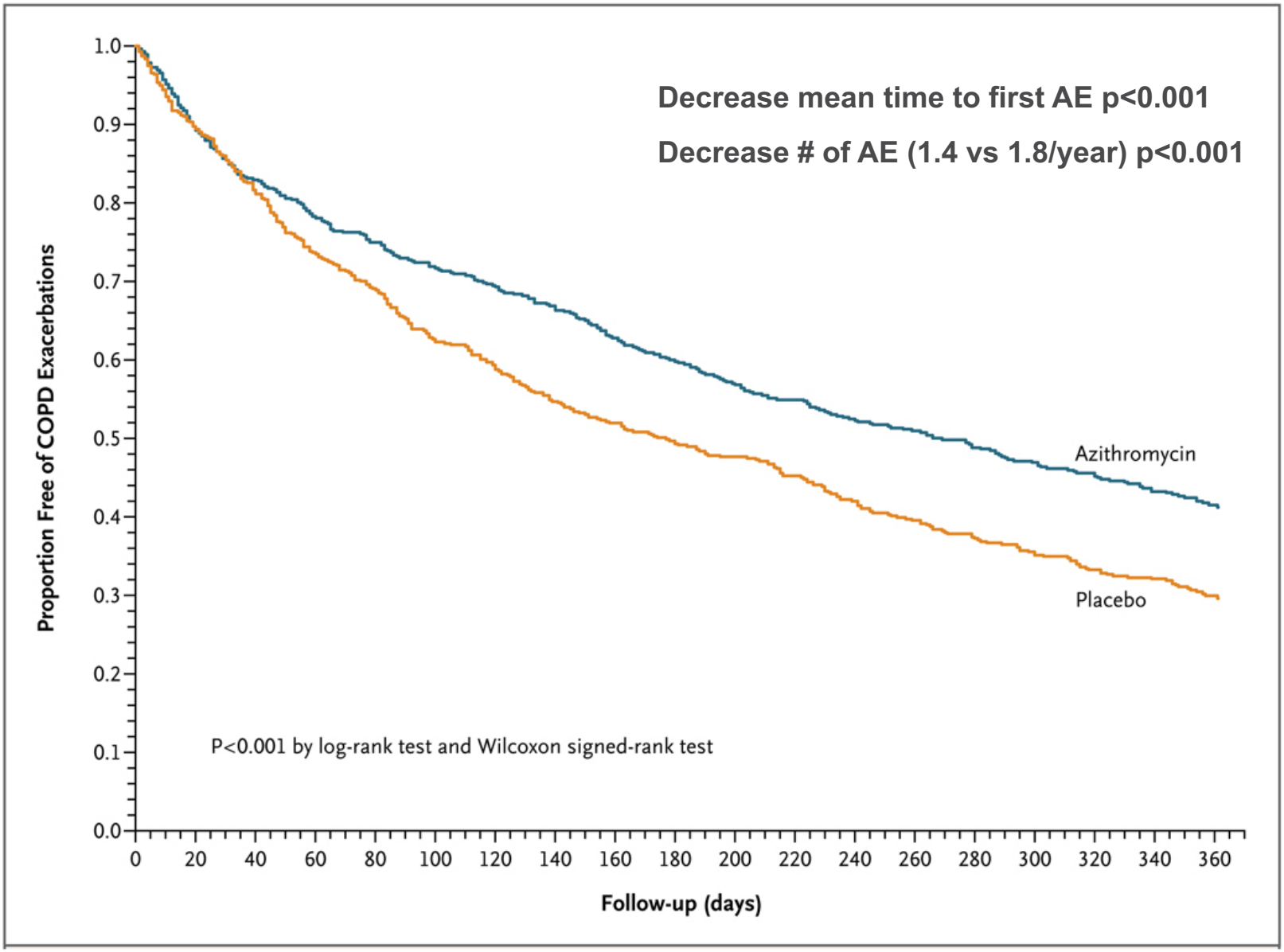
RESEARCH Open Access

Reduction of exacerbations by the PDE4 inhibitor roflumilast - the importance of defining different subsets of patients with COPD

Stephen I Rennard[1*], Peter MA Calverley[2], Udo M Goehring[3], Dirk Bredenbröker[3], Fernando J Martinez[4]



Azithromycin for Prevention of Exacerbations of COPD



NEJM 2011:565:689

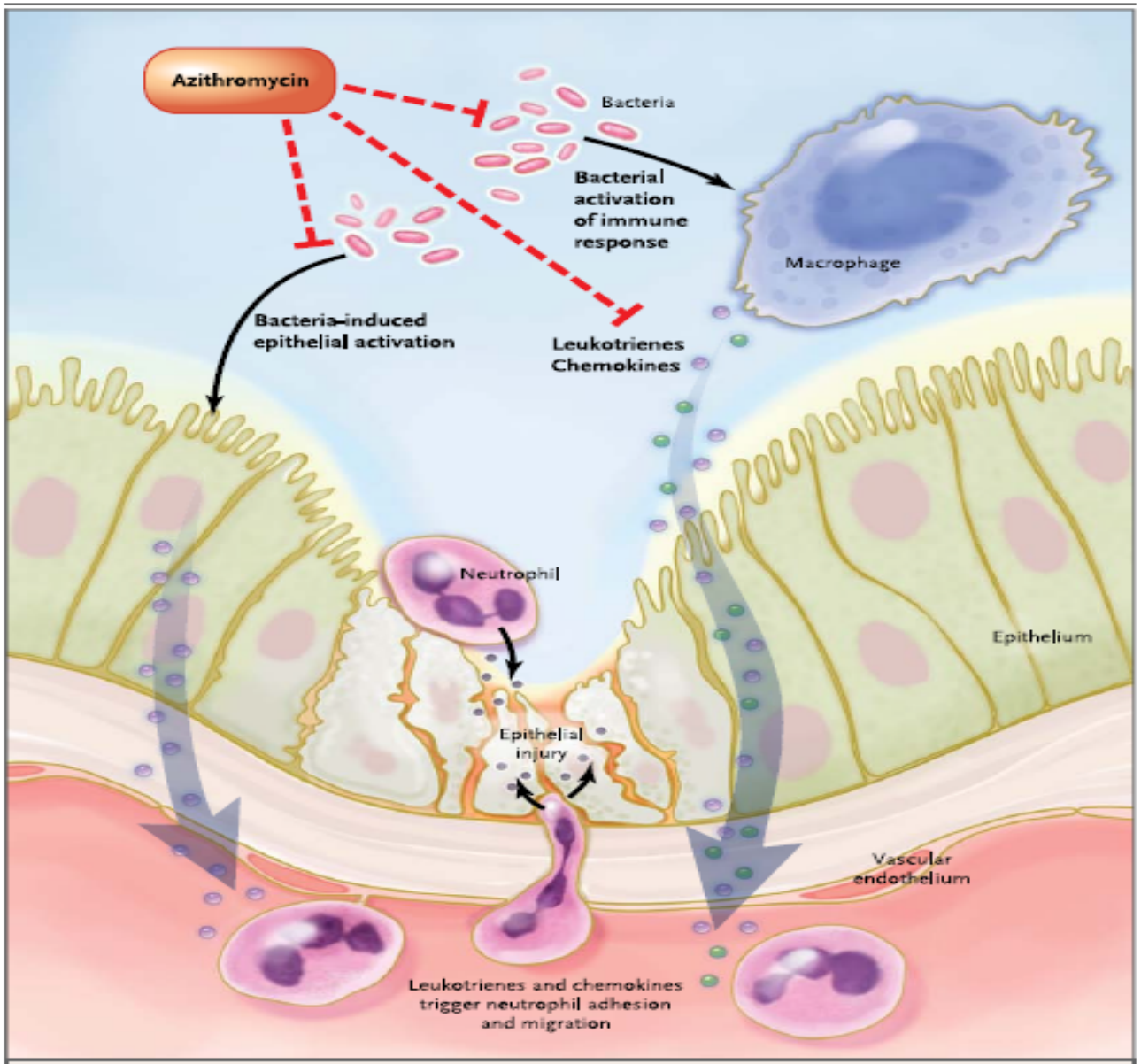


Figure 1. Activation of the Immune Response by Bacteria or Viruses within the Airway of Patients with COPD.

Pathogens in the luminal airway induce the secretion of chemokines (tumor necrosis factor α, interleukin-6, and interleukin-8) and leukotrienes by both macrophages and airway epithelium. This process triggers vascular adhesion and migration of neutrophils into the wall of the airway and into airway lumens. Serine proteases and other mediators that are secreted by migrating neutrophils both inflame the airways and destroy bronchial epithelium, leading to clinical exacerbation. Azithromycin inhibits bacteria and down-regulates certain key parts of the immune response, thus providing a protective activity when used prophylactically.

ATS/ERS: "Action plans" for COPD

- The following guidelines are recommended:
  - Educational component of pulmonary rehabilitation should emphasize self-management skills
  - Self-management should include action plan for early recognition and treatment of exacerbation

Self-management And Hospitalization

Bourbeau J, et al. *Arch Int Med*. 2003;163:585-591.

COPD ACTION PLAN

Client Name:_____ Date:_____

Physician:_____ Phone#:_____

After Hours Phone #:_____

You have been diagnosed with COPD (chronic obstructive pulmonary disease).

COPD has 2 states:

1. You are stable
2. You are having a flare up

How to tell if you are having a flare up

A flare up may occur after you get a cold, get run down or are exposed to air pollution or very hot or cold weather. There are 3 things that define a flare up:

1. Increased shortness of breath from your usual level
2. Increased amount of sputum from your normal level
3. Sputum changes from its normal colour to yellow, green or rust colour

If any 2 or all of these symptoms persist for 48 or more hours do the following:

(Your physician will check the desired action plan components and prescribe as selected)

- ☒ Take your rescue inhaler 2-4 puffs as needed (up to 4-6 times per day) for shortness of breath.
- ☐ Contact your family doctor immediately.
- ☐ Take your prescribed antibiotic for a COPD flare up (see over).
- ☐ Take your prescribed prednisone for a COPD flare up (see over).
- ☒ Contact your doctor if you feel worse or do not feel better after 48 hours of treatment
- ☐ Other _____

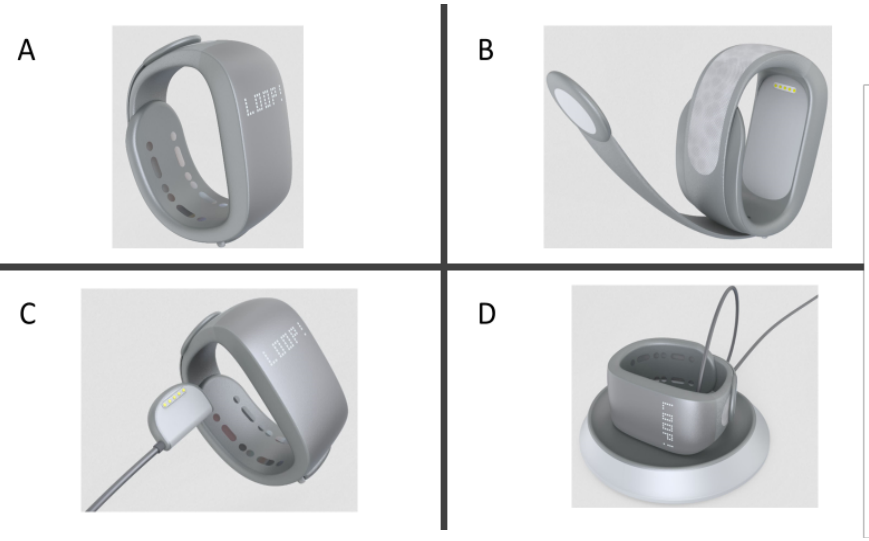
_____

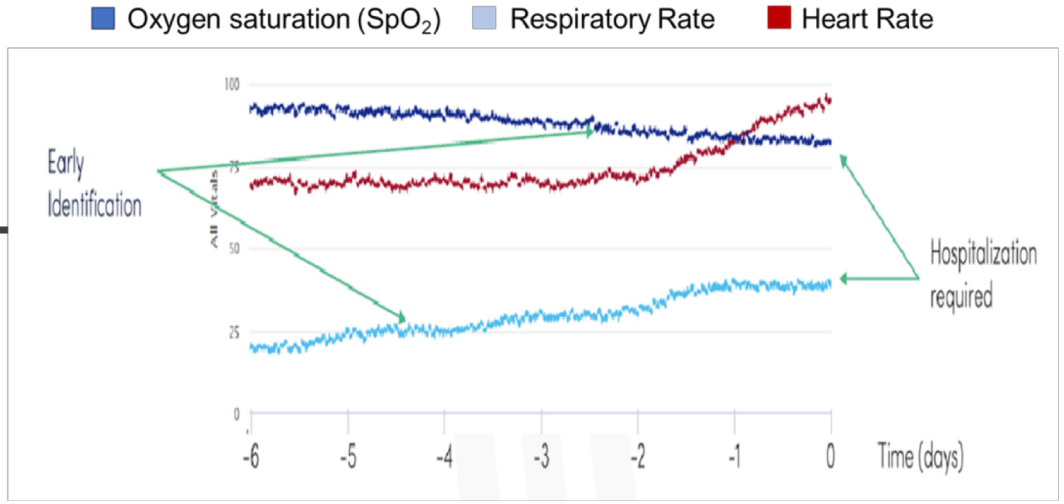
If you are extremely breathless, anxious, panicky, confused, agitated, fearful or drowsy, call 911 for an ambulance to take you to the emergency room.

Physician Signature_____

Client/Caregiver Signature_____ ***Please turn over***

Vitals signs as early indicators of AECOPD

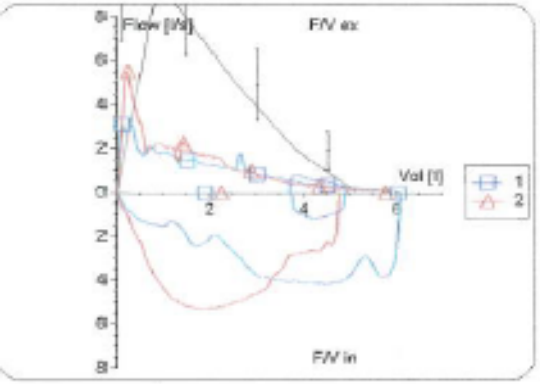


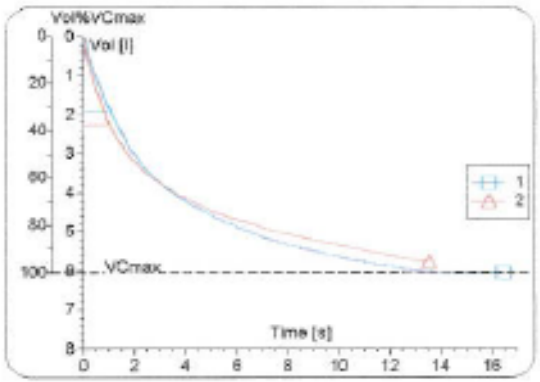


COPD case 3

- Patient (48yrs), heavy smoker with frequent “winter chest colds”
- Morning sputum (clear, couple of tablespoons full) with recent problems doing stairs & hills
- ROS: hayfever in spring
- GP diagnose with asthma: on ICS & Ventolin

	Pred	Pre Meas	%Pred	Post Meas	Post/pred	%Chng
Date		2003/01/15		2003/01/15		
Spirometry						
FVC [l]	5.15	6.04	117	5.76	112	-5
FEV 1 [l]	4.01	1.90	47	2.24	56	18
FEV 1 % FVC [%]	77.75	31.39	40	38.94	50	24
FEF 75-25 [l/s]	3.68	0.73	20	0.71	19	-3
PEF [l/s]	9.27	3.14	34	5.52	60	76
FVC IN [l]	5.15	6.05	118	4.72	92	-22
Bodyplethysmography						
VC [l]	5.15	6.02	117			
IC [l]		4.99				
ERV [l]	1.46	1.02	70			
RV [l]	2.50	5.20	208			
TGV (FRC) [l]	4.01	6.23	155			
TLC [l]	7.26	11.22	155			
RV % TLC [%]	36.59	46.38	127			
Diffusion SB						
DLCO SB [ml/min/mmHg]	30.53	16.88	55			
DLCO/VA [ml/min/mmHg/l]	4.32	2.22	51			
VA [l]	7.47	7.61	102			
VIN [l]	5.15	5.64	110			
Airways Resistance						
R tot [cmH2O*s/l]	3.06	4.87	159			
G tot [l/(cmH2O*s)]	0.33	0.21	63			
SR tot [cmH2O*s]	12.00	33.49	279			
SG tot [1/(cmH2O*s)]	0.08	0.03	36			





What is the diagnosis and how are going to treat the patient

COPD Case 3

- About 15% of COPD patients
- Have a significant reversible component to airways obstruction (400ml or 15% or 200ml and 12% on 2 occasions)
- May have eosinophilia (3%+) and increase IgE (>100)
- Tend to have more AE
- Prognosis similar or even better than pure COPD

Defining the Asthma-COPD overlap syndrome in a COPD cohort

Borja G Cosio, MD, Joan B Soriano, MD, Jose Luis Lopez-Campos, MD, et al

Table 1. Major and minor criteria used to define ACOS

Major criteria	Minor criteria
Previous history of asthma	Immunoglobulin E>100 IU, or
Bronchodilator response to salbutamol	History of atopy,
higher than 15% and 400 ml	Two separated bronchodilator responses to salbutamol higher than 12% and 200 ml
	Blood eosinophils>5%

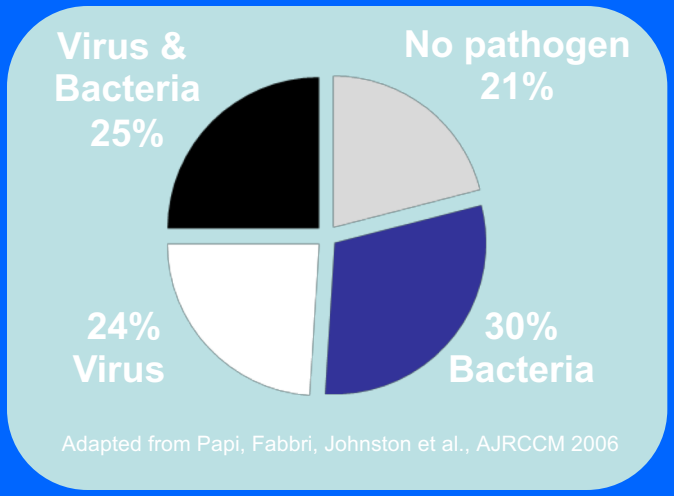
Chest. 2015 Aug 20. doi: 10.1378/chest.15-1055

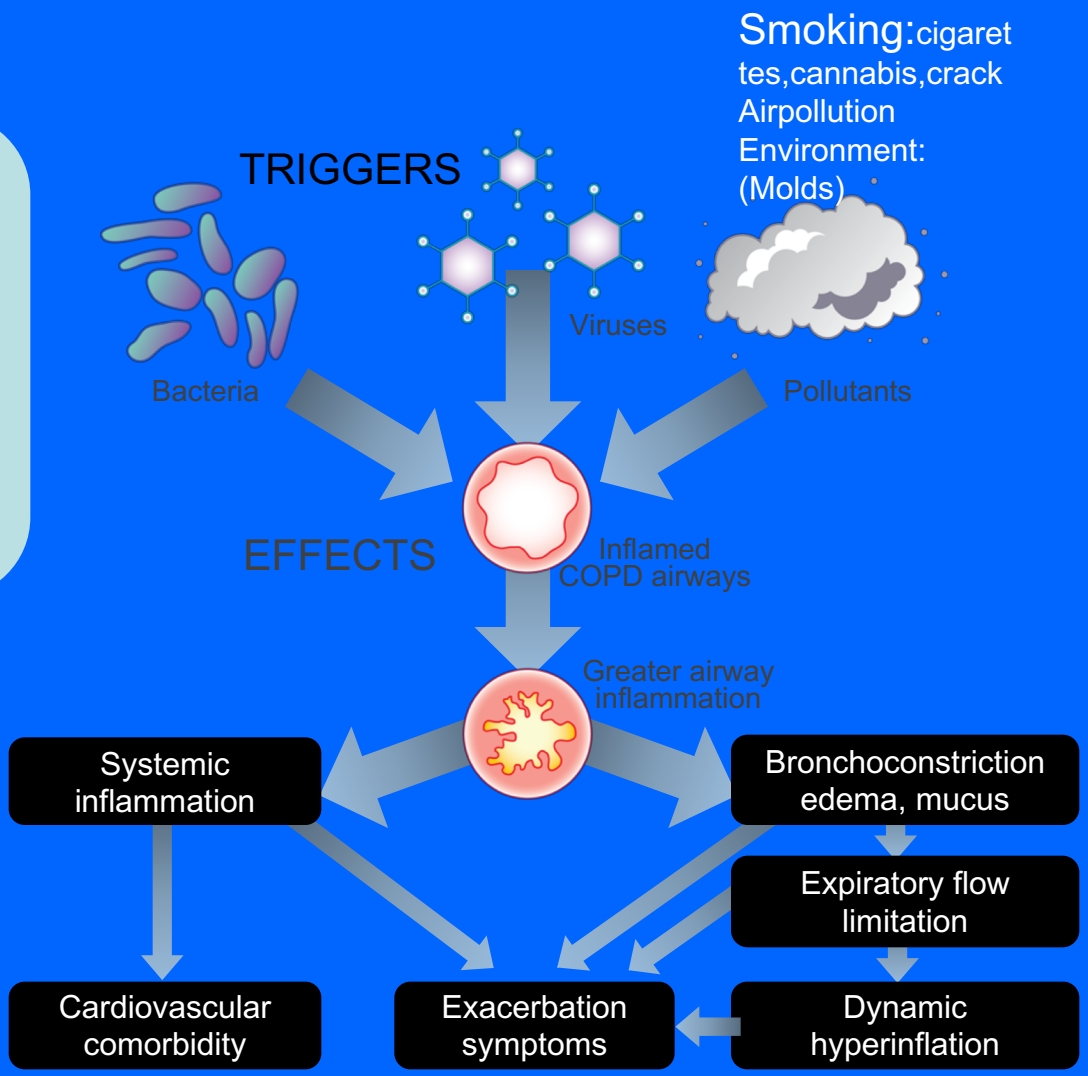
Unique issues in COPD Management in the Inner City

Complex Lung disease

- Smoking related COPD/chronic bronchitis
- Bronchiectasis from frequent destructive infections
- Interstitial lung fibrosis smoking “drugs”
- HIV related lung disease
  - Emphysema, pulmonary hypertension, infections (PJP, fungal)
- Dysregulated control of breathing

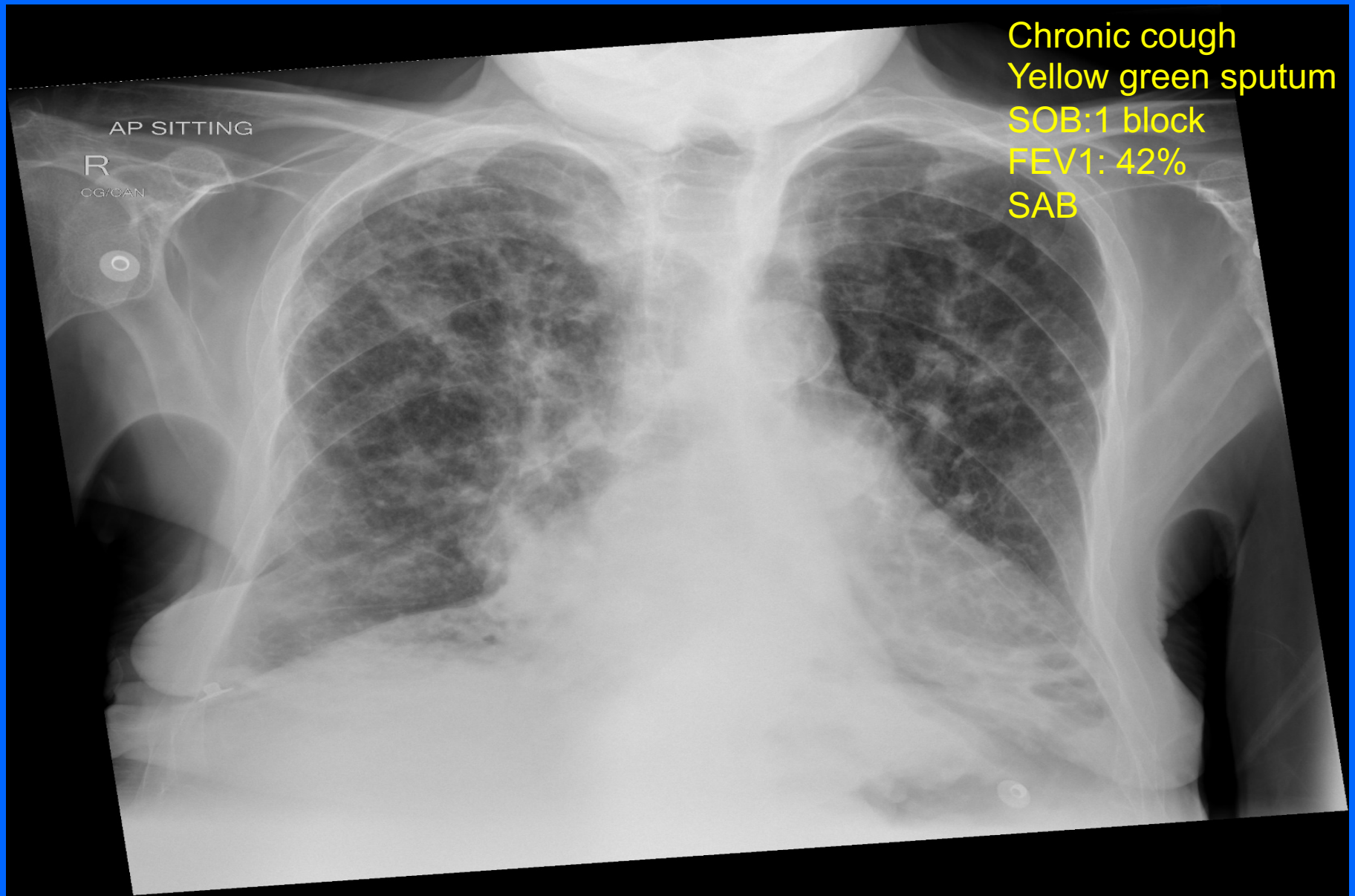
Acute exacerbations of COPD: what pulls the trigger?



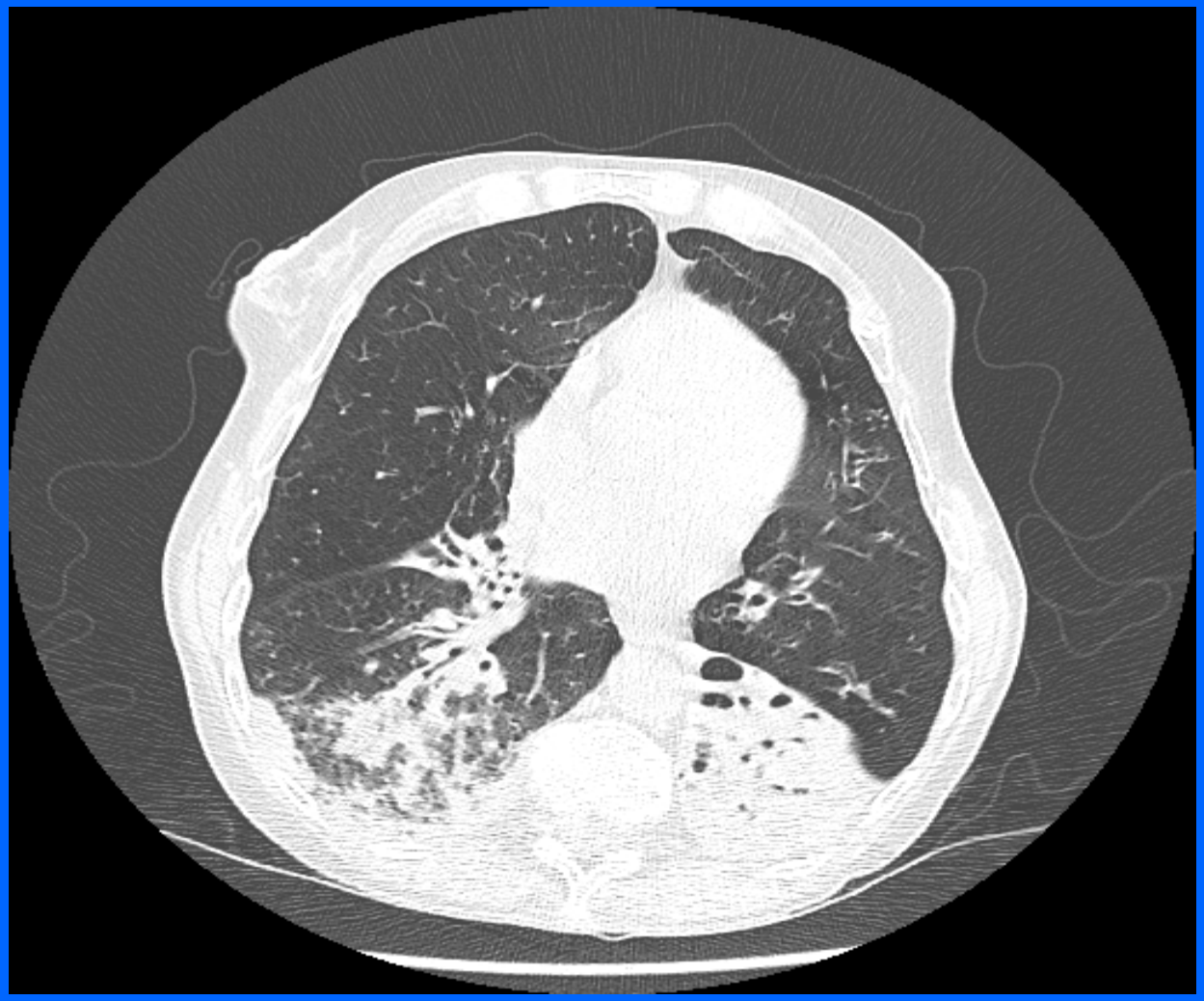


Adapted from Wedzicha JA and Seemungal TA, Lancet 2007;370:786-796

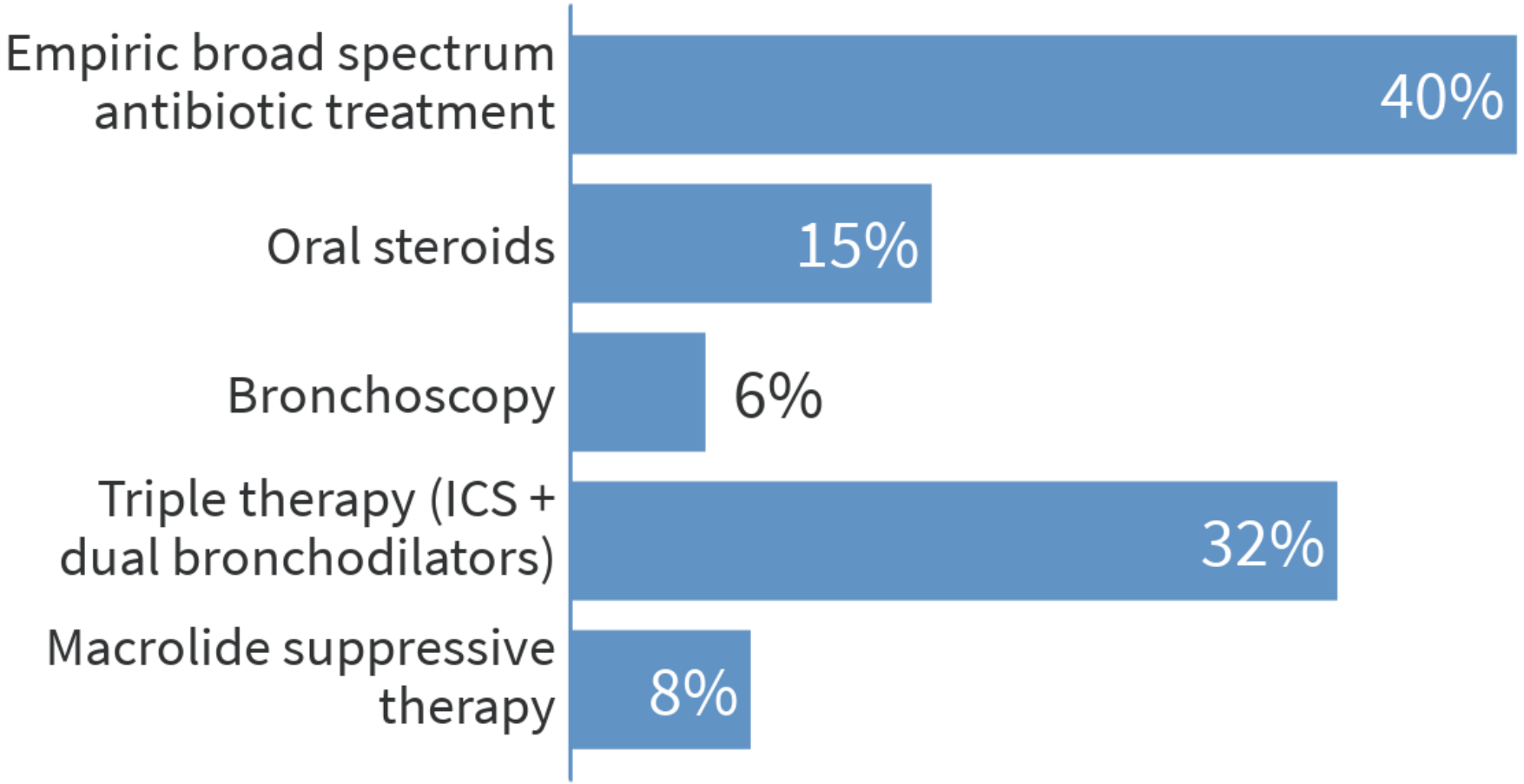
53 yr Female with history of SUD/HIV+



53 yr Female with history of SUD/HIV+



Management strategy. Choose one or any number if appropriate.

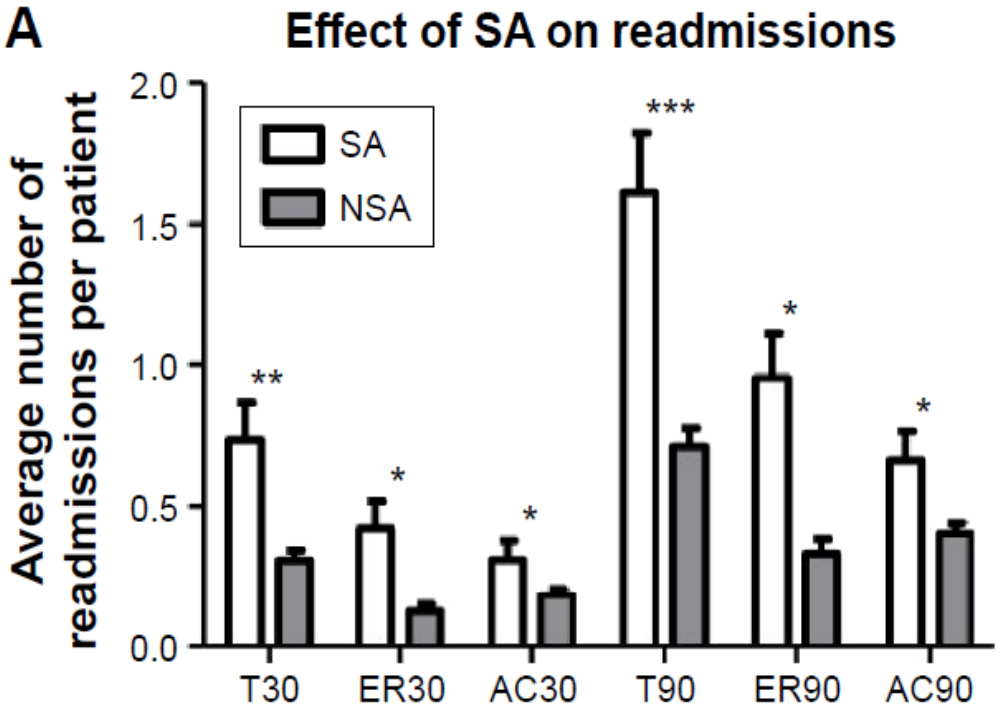


Management Strategy

- Identify micro-organism(s) involved in AE
  - Sputums (also AFB's)
  - Induced sputum/Bronchoscopy
- Treat for at least 2 weeks with appropriate AB
- Consider suppressive therapy if frequent AE (macrolides/doxy) on appropriate COPD treatement
- Manage co-morbidities
- Diet and social support

Substance Abuse Disorder and COPD

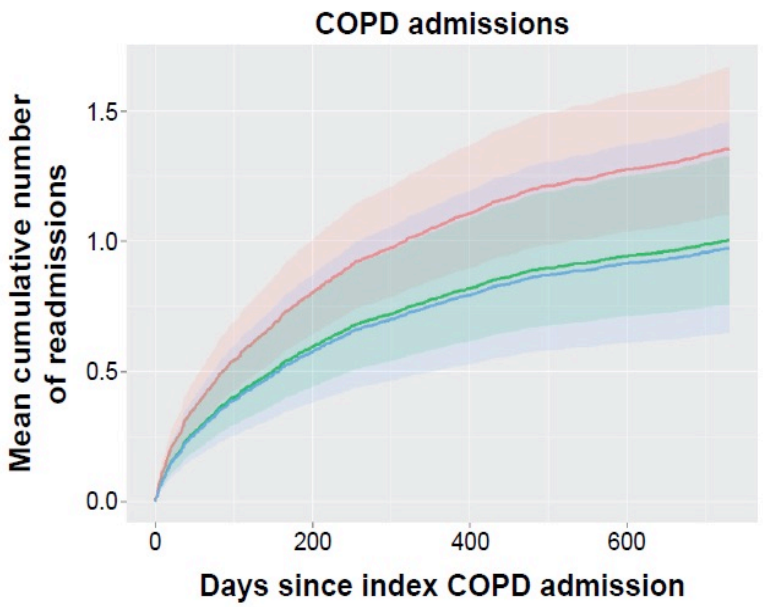
Adamson et al International Journal of COPD 2016:11 61–71

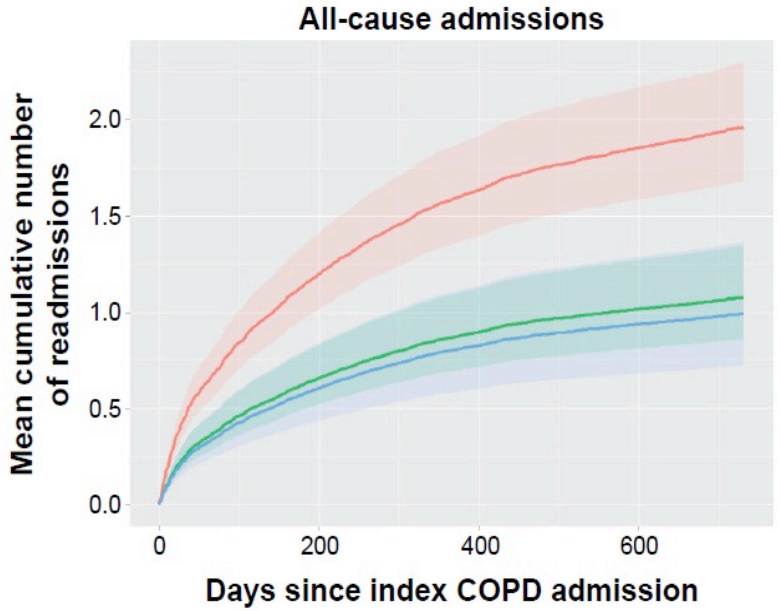


Management of Inner-city COPD

- Team approach:
  - Family physician/nurse practitioner
  - Specialist/GIM or Respirogist
  - Respiratory therapist
  - Dietician
  - Social worker
  - Addiction specialist
  - Mental health specialist

Impact of a COPD comprehensive case management program on hospital length of stay and readmission rates





1564 admissions over 2 years

Alshabanat et al International Journal of COPD 2017:12 961–971

Trends in Management of COPD:

Individualized treatment

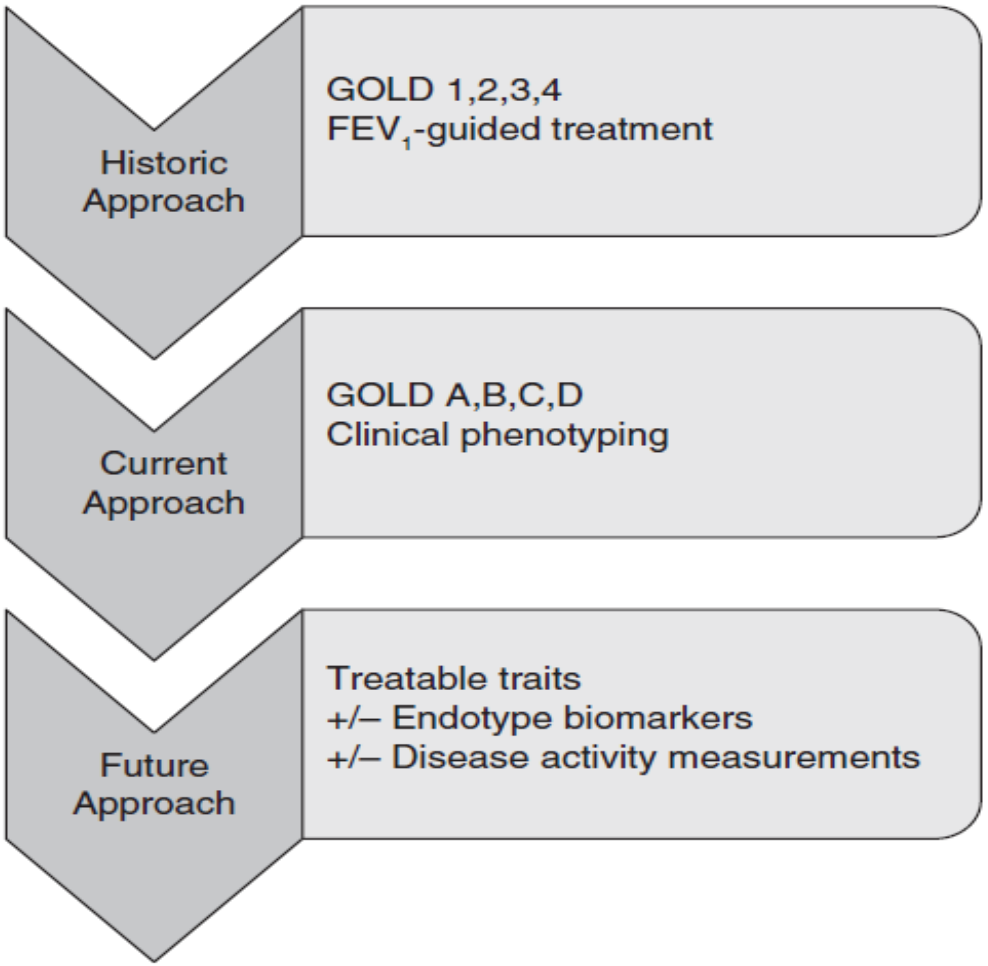
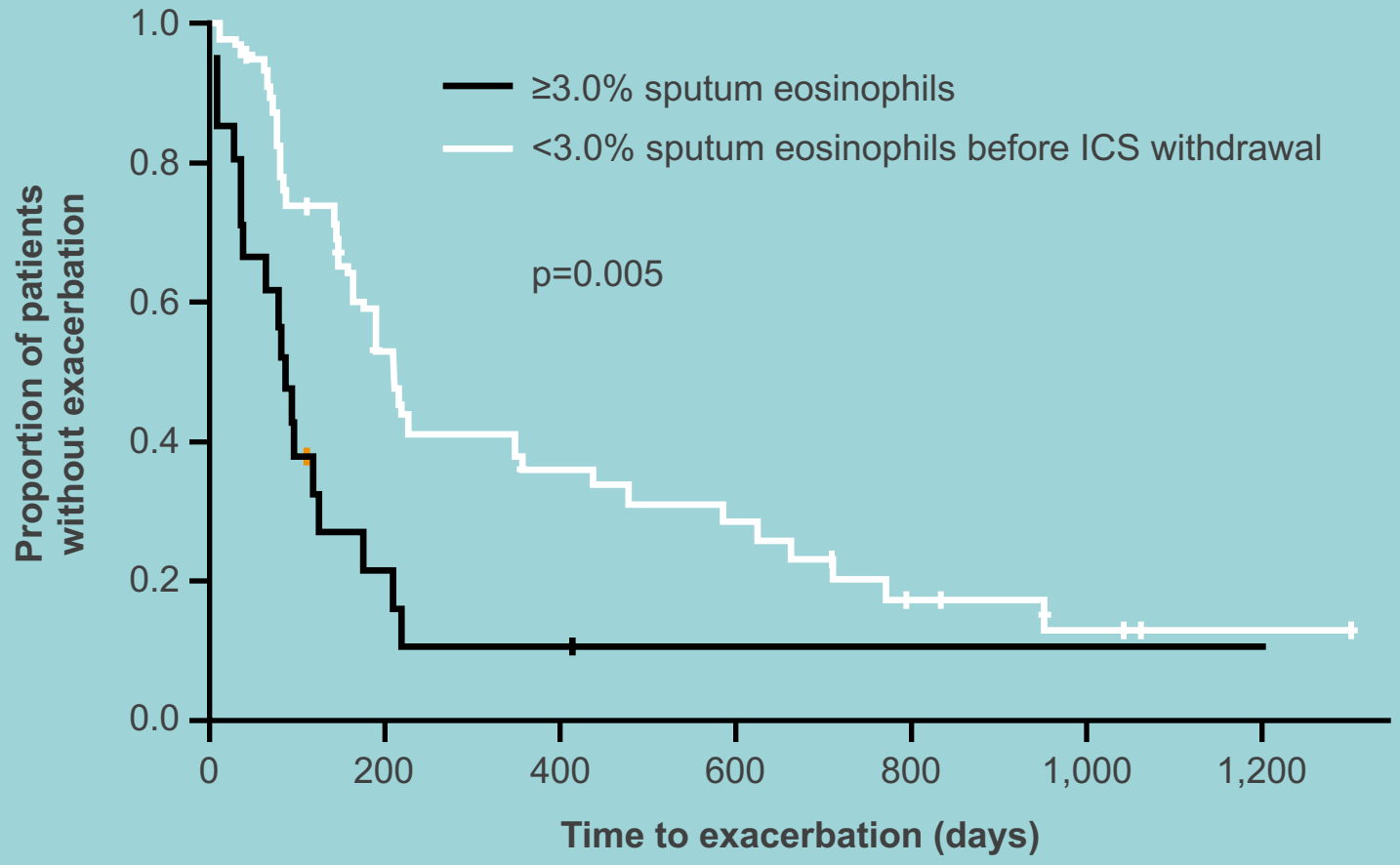


Figure 3. Changing approaches to chronic obstructive pulmonary disease pharmacotherapy. Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2006 recommended an FEV_1-based approach for assessment and treatment, whereas GOLD 2011 recommended a clinical phenotyping approach. In the future, treatable traits may be used, with endotype and/or disease activity biomarkers.

Biomarkers: Can eosinophils inform treatment choice and ICS use in COPD?

Higher sputum eosinophils are associated with increased COPD exacerbation risk

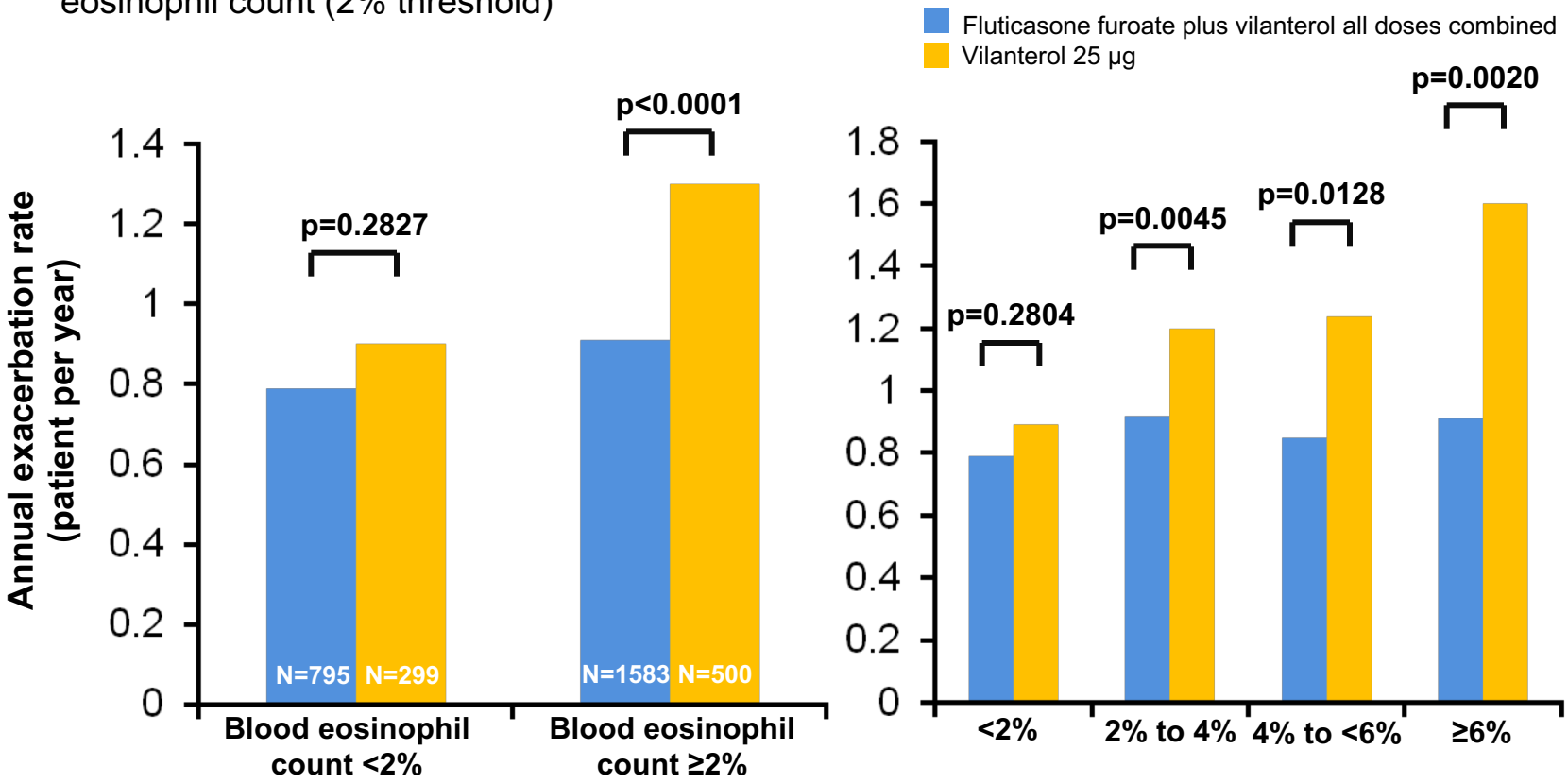


ICS = inhaled corticosteroid

Adapted from Liesker et al. Respir Med 2011

Blood eosinophil level could be a potential biomarker of response to ICS in COPD

- Post-hoc analysis of data from 2 randomized, double-blind, 1-year studies of FF/VI (50/25, 100/25, and 200/25 µg q.d.) versus VI 25 µg q.d.
- Study assessed treatment differences in exacerbation rates after stratifying by blood eosinophil count (2% threshold)



COPD, chronic obstructive pulmonary disease; FF, fluticasone furoate; ICS, inhaled corticosteroid; q.d., once daily; VI, vilanterol

Adapted from Pascoe at al. Lancet Respir Med. 2015;3(6):435-42

Summary

- COPD is currently the commonest reason for visiting ER in BC
- Management is multi-layered and patient specific
- ICS's is over-used and has significant side effects
- Management of co-morbidities is part & parcel of the management plan
- "Inner city COPD" is complex and need a team approach


Breathing Clean Air Promotes Heart & Lung Health

Antibiotic Prevention of Acute Exacerbations of COPD

Richard P. Wenzel, M.D., Alpha A. Fowler III, M.D., and Michael B. Edmond, M.D., M.P.H., M.P.A.

N Engl J Med 2012;367:340-7.

Table 1. Proposed Criteria for Selecting Patients with COPD for Long-Term Azithromycin Prophylaxis.

History of COPD with ≥2 acute exacerbations in the previous year
Compliance with current drug regimen and proper use of inhaler
Pulse <100 beats per minute
Corrected QT interval of <450 msec on electrocardiography
Aminotransferase levels <3 times the upper limit of normal range
No use of drugs known to cause QT prolongation
No decrement in hearing on formal audiography
No allergy to macrolides
Sputum culture negative for mycobacteria
No high baseline risk of cardiovascular disease