



Scan the QR code or go to
<https://tago.ca/-ATS13> to access a
downloadable version of this presentation

Triple therapy treatment pathways in chronic obstructive pulmonary disease (COPD): a real-world predictive model

Bogart M¹, Oakland T², Liu Y², Enev T²

¹GlaxoSmithKline Research Triangle Park, NC, USA; ²GNS Healthcare, Somerville, MA, USA

Recording by Michael Bogart

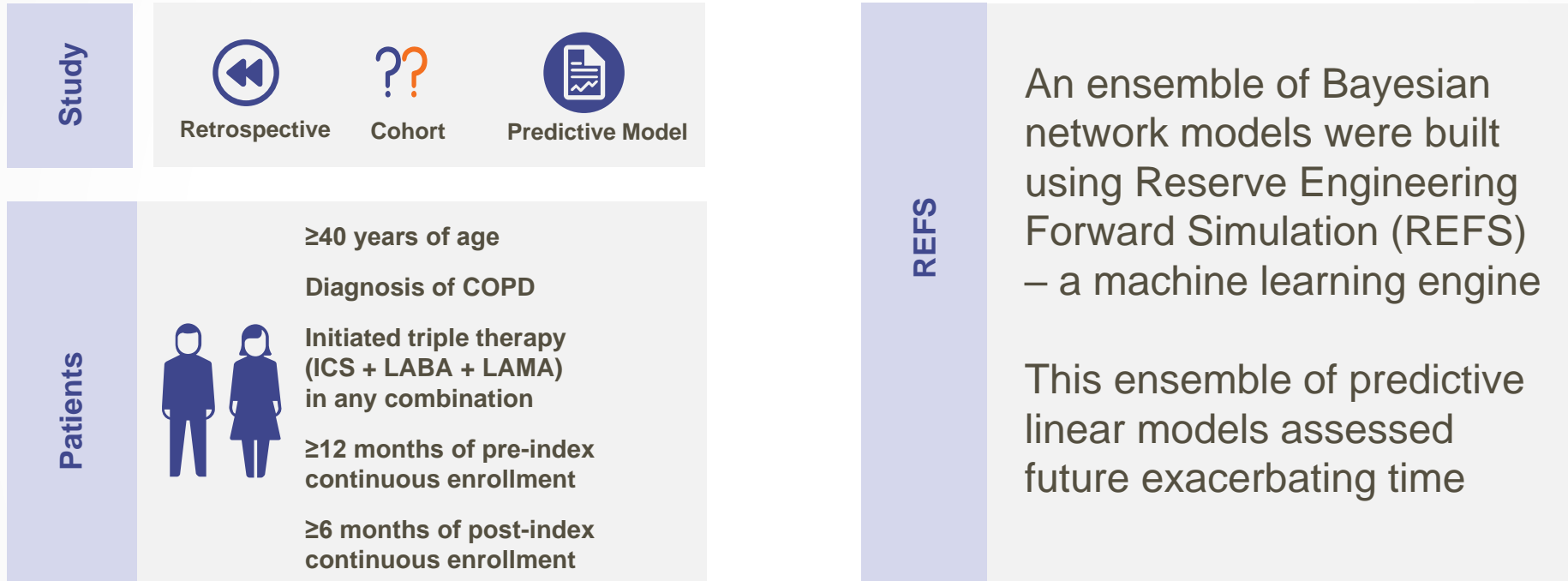
DISCLOSURES

- On behalf of all authors, and with their permission, these slides are presented by Michael Bogart, who did not receive any payment for this recording.
- This study was funded by GlaxoSmithKline (GSK ID: 213319).
- The authors declare the following real or perceived conflicts of interest in relation to this presentation:
 - MB: employee of and/or holds stocks/shares in GSK
 - TO, YL, TE: employee of GNS Healthcare, a consulting company that has received research funds from GSK
- Editorial support for these summary slides and recording (in the form of slide editing) was provided by Tony Reardon of Aura, a division of Spirit Medical Communications Ltd, and was funded by GSK

Background and objectives

- Exacerbations are the main driver of COPD-related healthcare costs.
- It is recommended that symptomatic COPD patients, at risk of future exacerbations, are escalated to triple therapy (TT) comprising long-acting muscarinic antagonists (LAMA), long-acting beta agonists (LABA) and inhaled corticosteroids (ICS).
- However, the patient characteristics that may contribute to future exacerbation risk are not well understood.
- This study aimed to identify patient predictors that contribute to future COPD exacerbations following TT initiation.

Methods



PATIENTS

- A total of 73,625 patients met the selection criteria

Demographic characteristics

	Overall		With COPD Exacerbation		Without COPD Exacerbation		P-value ²
	N	%	N	%	N	%	
Number of patients (N)	73,625	100.00	51,650	70.15	21,975	29.85	
Age (Mean, SD)	70.06 (9.9)		70.07 (9.9)		70.04 (9.8)		0.86
Gender							
Female	40,629	55.18	29,512	57.14	11,117	50.59	<0.0001
Male	32,996	44.82	22,138	42.86	10,858	49.41	
Smoking History³							
Yes	36,065	48.98	26,599	51.50	9,466	43.08	<0.0001
No	37,560	51.02	25,051	48.50	12,509	56.92	
Race							
Asian	1,308	1.78	847	1.64	461	2.10	<0.0001
Black	8,639	11.73	6,213	12.03	2,426	11.04	
Hispanic	4,806	6.53	3,292	6.37	1,514	6.89	
White	58,872	79.96	41,298	79.96	17,574	79.97	
Region							
Midwest	16,220	22.03	11,508	22.28	4,712	21.44	<0.0001
Northeast	8,361	11.36	5,745	11.12	2,616	11.90	
South	30,797	41.83	22,347	43.27	8,450	38.45	
West	18,247	24.78	12,050	23.33	6,197	28.20	
Insurance type							
Commercial	18,228	24.76	12,283	23.78	5,945	27.05	<0.0001
Medicare	55,397	75.24	39,367	76.22	16,030	72.95	
Low Income Subsidy							
Yes	18,449	25.06	13,728	26.58	4,721	21.48	<0.0001

Data Source: Optum Clinformatics Datamart, 01/01/2007 - 03/31/2019

Abbreviations: COPD, Chronic Obstructive Pulmonary Disease

¹ Study outcome of COPD exacerbation is defined in the 12-month period after the initiation of triple therapy. Covariates are assessed in the 12-month pre-index period (excluding index date) unless indicated otherwise.

² P-value for the comparison between patients with COPD exacerbation and no exacerbation. For continuous variables, the p-value was calculated using a Wilcoxon-Mann-Whitney test. For categorical variables, chi-squared test was used.

³ A set of diagnosis codes and medical services and procedures are used to define smoking history in the claims database

⁴ Other plan types include: Exclusive Provider Organization, National Ancillaries Contracted for all Products, Indemnity, no industry product code and other.

Top predictors of exacerbation



COPD-Related Events

Variable	HR
ER Visits	
1 ER visit in past year	1.66
2+ ER visits in past year	2.88
Inpatient Visits	
1 inpatient visit in past year	0.28
2+ inpatient visits in past year	27.05
Outpatient Visits	
13 – 21 Outpatient visits	1.63
22 – 35 Outpatient visits	3.05
>35 Outpatient visits	4.28
Exacerbations	
1 COPD exacerbation episode	5.51
2 COPD exacerbation episodes	11.69
3 COPD exacerbation episodes	18.80
4+ COPD exacerbation episodes	32.42



Characteristics

Variable	HR
Age (in years) at index date	0.24
Airflow test	-2.03
Pneumonia	1.94
Respiratory failure	3.17
Esophageal disorders	2.18
Rheumatoid arthritis	6.39
Bacterial infection	3.67
Acute post-hemorrhagic anemia	-5.68
Anxiety disorders	3.58
Chest X-ray procedure	1.49



Medications

Variable	HR
Antibiotics	5.32
LABA	2.90
Anti-Infectives	0.88
Glucocorticoids	1.00
Bisphosphonates	3.13
HMG-CoA Reductase Inhibitors	-1.61
Xanthines	11.54
Leukotriene Receptor Antagonists	1.35
Anticonvulsants	2.73
Potassium	2.53
Anti-Infectives (Throat)	5.22
Oral Corticosteroid	-3.43
Oxygen Therapy	5.48
Oxygen Therapy (1 month pre-index)	8.55
SABA	2.26
SABA (1 month pre-index)	2.51
SABA/SAMA	3.15
SABA/SAMA (1 month pre-index)	4.70

The hazard ratio indicates the number of exacerbating days that the variable contributes to the model



Prior exacerbation was the strongest factor in predicting future exacerbation



Other healthcare resource use, such as airflow tests, chest x-rays, and oxygen therapy, was also predictive



Co-morbidities, including rheumatoid arthritis, esophageal disorders, and anxiety disorders, contributed to risk of future exacerbation



Use of rescue medications also contributed to exacerbation risk