

State of the Art: COPD in 2020

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B. Celli Disclaimer

No stocks or ownership in any company.

No Tobacco funds

Advisory boards: *GSK, B.I., Astra Zeneca, Novartis, Pulmonx, Chiesi, Menarini.*

Member of the Scientific and Executive Committee of GOLD

Agenda

- Describe the COPD landscape in the World
- Smoking, still a problem, but not the only one. The rise of e-injury!
- There are several “natural courses” to develop COPD
- Provide a practical approach to initiate and modify pharmacotherapy in patients with COPD.
- Review the tools available for patients on maximal therapy who remain functionally impaired
- Conclusions

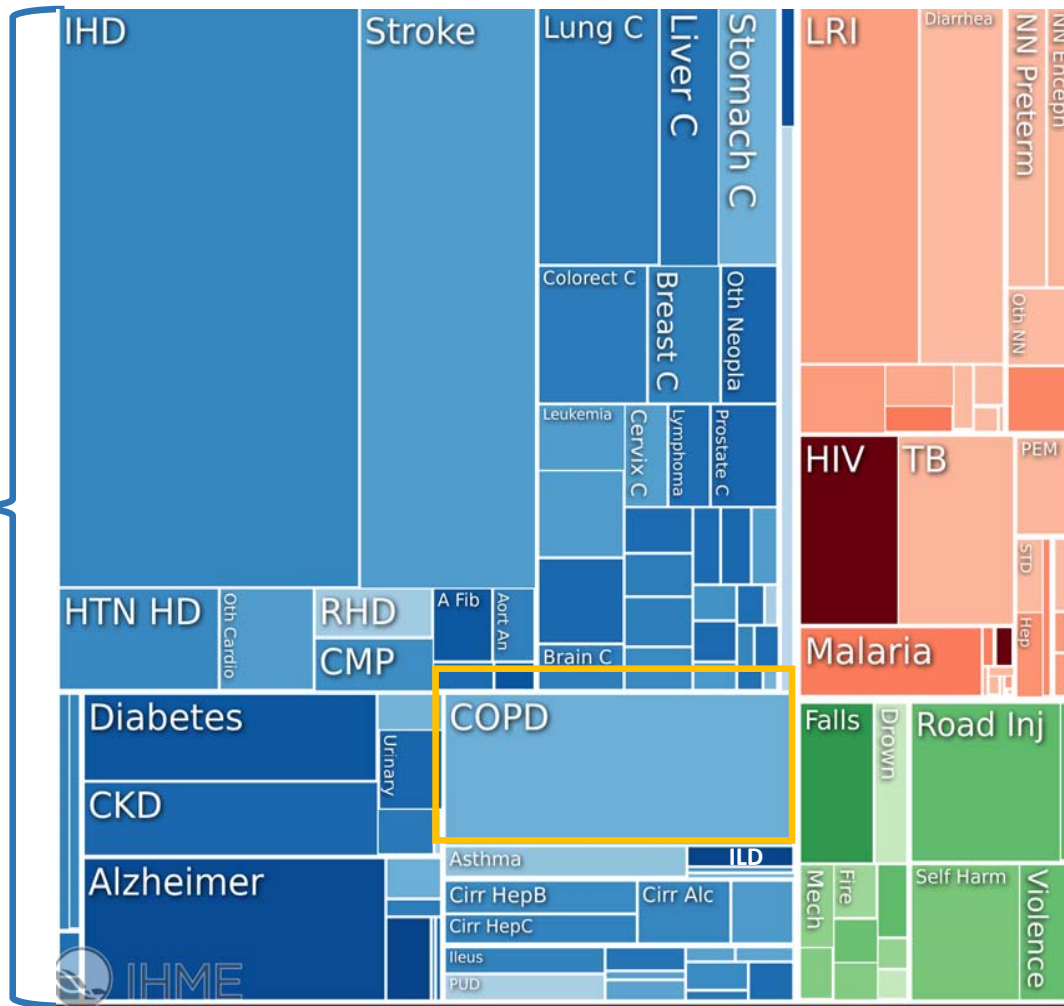
Agenda

- Describe the COPD landscape in the World

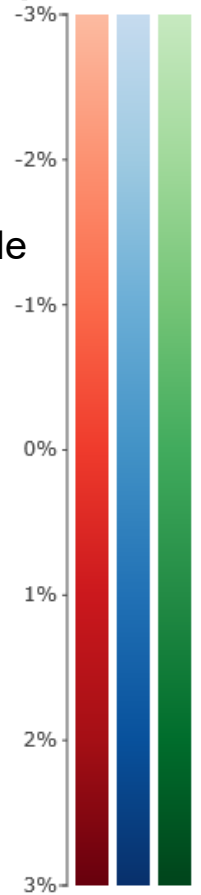
www.GBD
Accessed
2/2020



Non
Communicable



Annual % change
1990-2013
Death 100K
persons



Communicable

Injuries

www.GBD

Accessed
2/2020

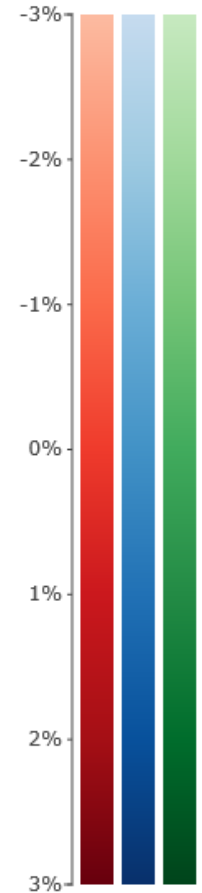


COPD

Percent of deaths: 5.36
Annual % change = -1.01

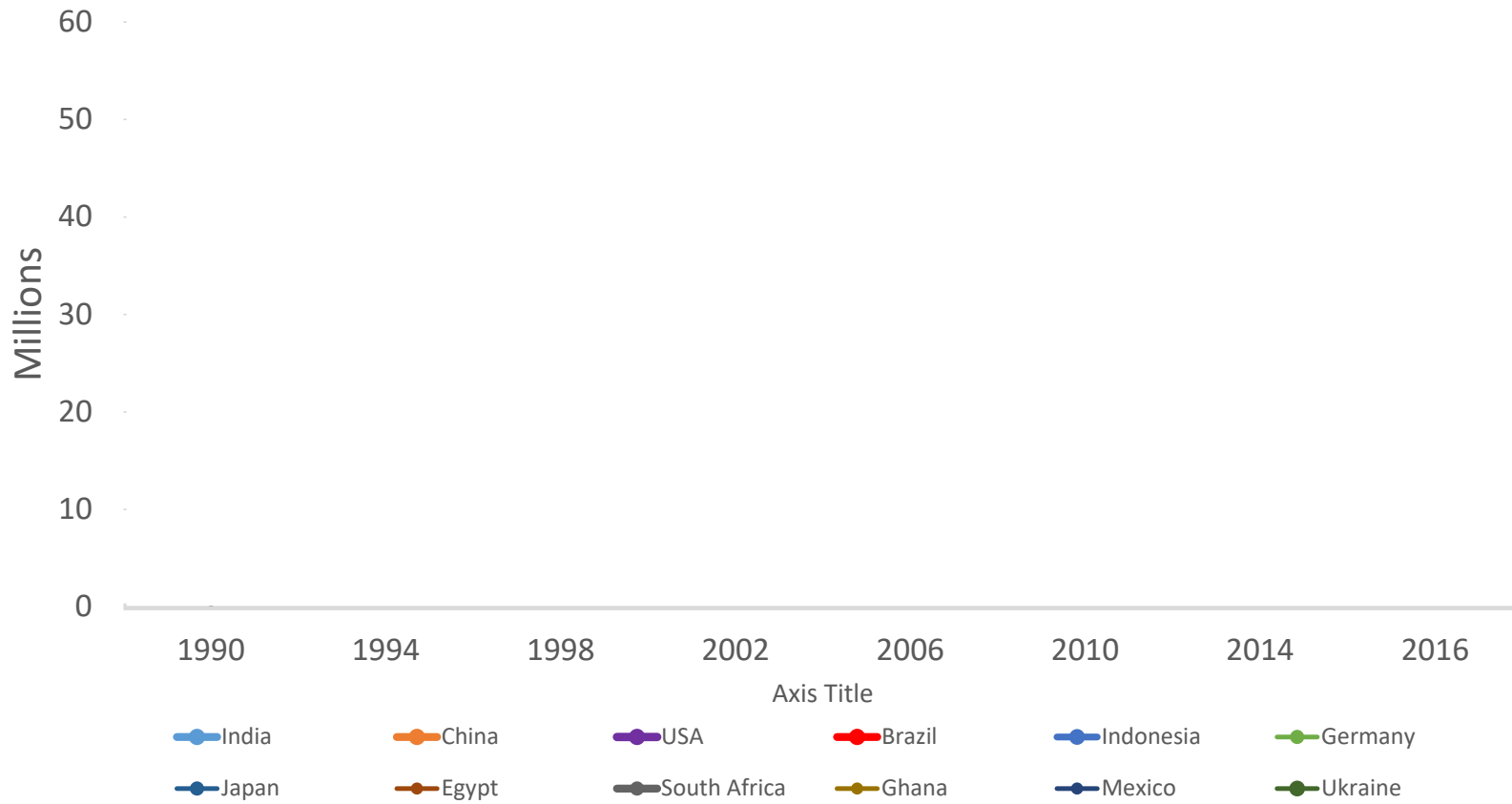


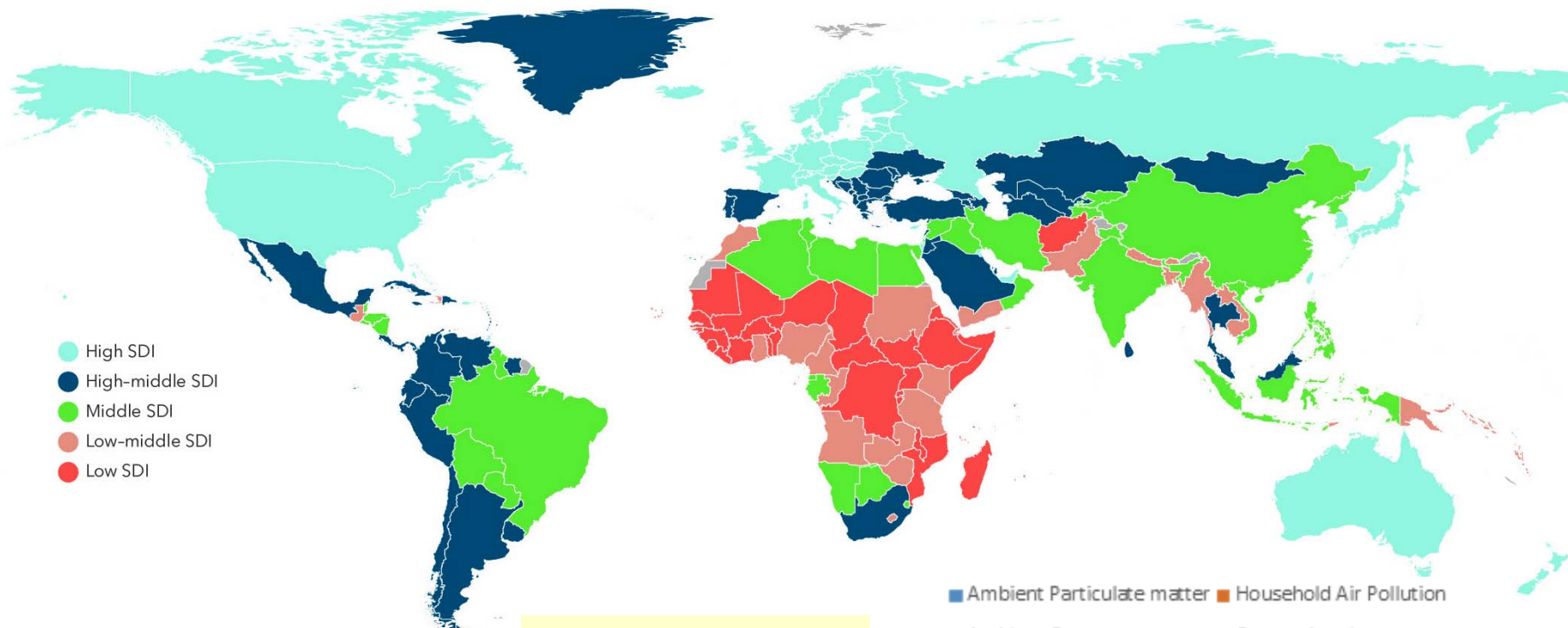
Annual % change
1990-2013
Death 100K persons



Burden of COPD

Absolute numbers 1990 to 2016





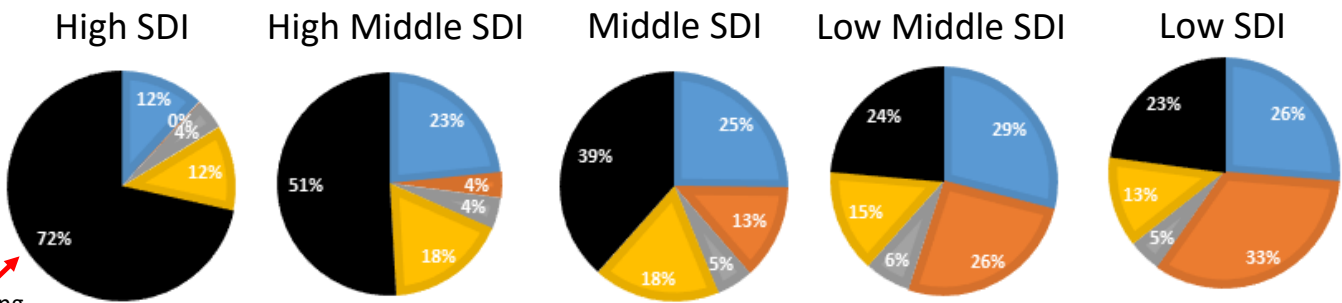
- High SDI
- High-middle SDI
- Middle SDI
- Low-middle SDI
- Low SDI

SDI: Socio-Demographic Index

- Ambient Particulate matter
- Ambient Ozone
- Smoking
- Household Air Pollution
- Occupational

Globally 65% Nonsmoking COPD
India 80% Nonsmoking COPD

Tobacco Smoking

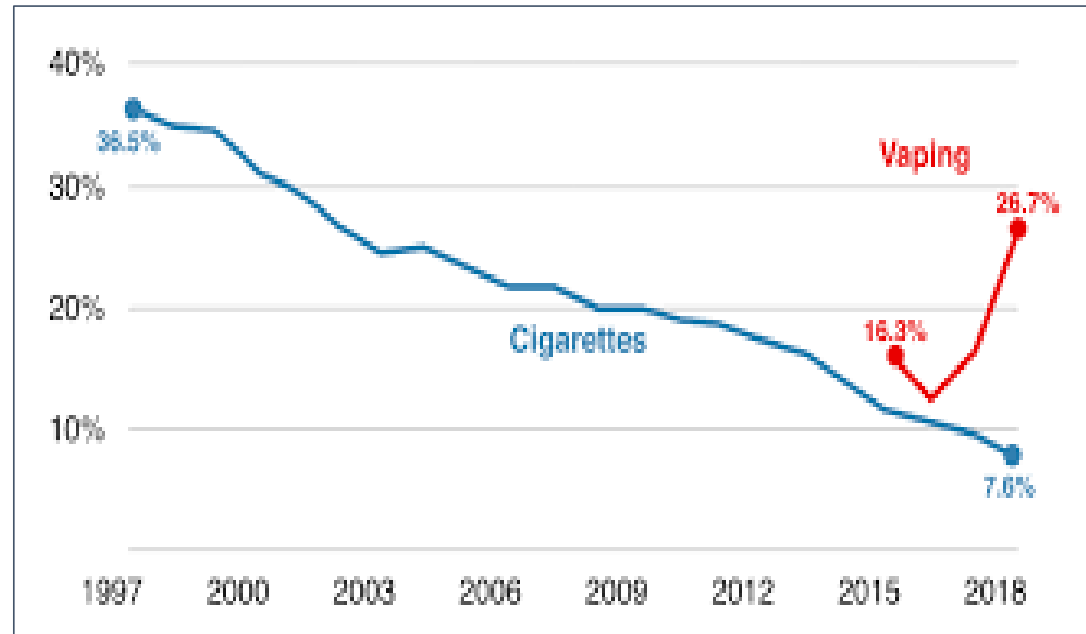


WWW.GBD. Accessed July 2019 (Courtesy Dr. Sundeep Salvi)

Agenda

- Smoking, still a problem, but not the only one. The rise of e-injury!

Smoking: much better but still a problem



44 Million

I'm the new kid on the block



TRY E-CIGARETTES
QUIT SMOKING & SATISFY YOUR CRAVING!



- ⊗ No Tar or Carbon Monoxide
- ⊗ No Ash, Stub or Terrible Smell
- ⊗ No Yellow Teeth or Bad Breath
- ✓ Virtually Odorless
- ✓ Same Nicotine Fix, Real Vapor
- ✓ Less Harmful To Yourself & Others

CLICK HERE...

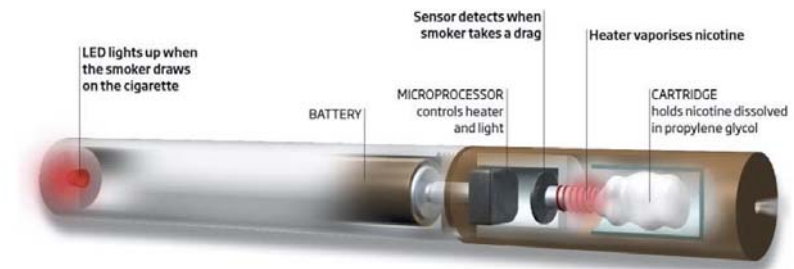
GET YOURS TODAY!




E cigarettes

Vaping

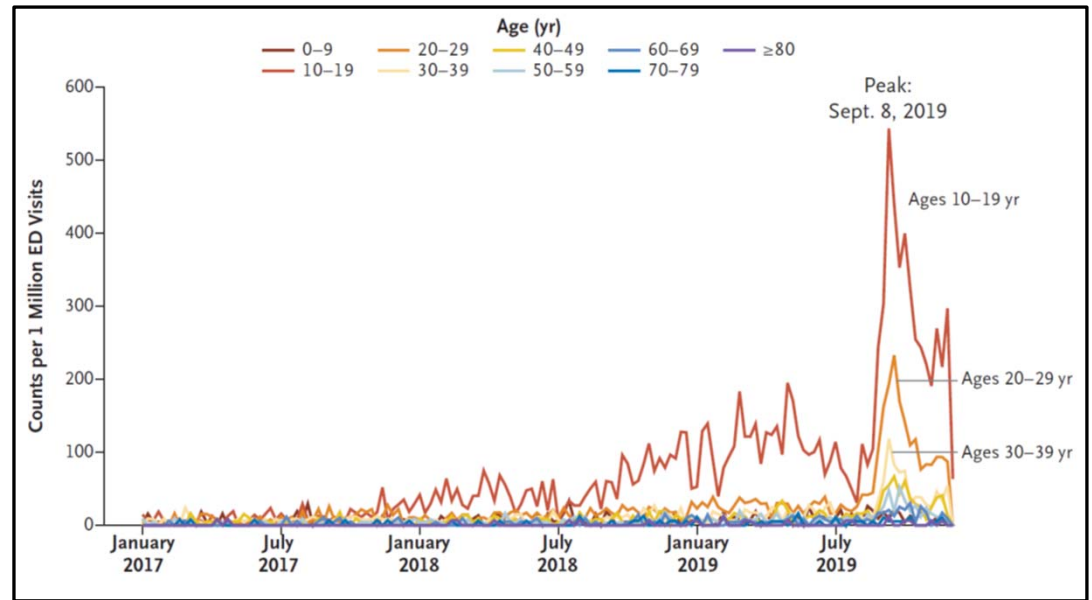
Upon inhalation the heater known as the atomiser vaporises the nicotine solution turning it into vapour. The user in turn inhales this to get the similar nicotine hit as a normal cigarette, and a real smoking satisfaction.



Sales in USA in 2018 \$ 4.2 billions

EVALI

Electronic Vaping Lung Injury



Harnett K et al NEJM 2020;382:766



Adolescents' Use of "Pod Mod" E-Cigarettes — Urgent Concerns

E cigarettes

Vaping

Delivers 2 to 10 times the
nicotine of regular e-cigarette



Juul Pod Mod.
A Juul's pod cartridge resembles a USB drive.



Barrington-Trimming J and Leventhal A NEJM 2018; 379:1099



The NEW ENGLAND JOURNAL of MEDICINE



Juul Pod Mod.
A Juul's pod cartridge resembles a USB drive.



Zealots

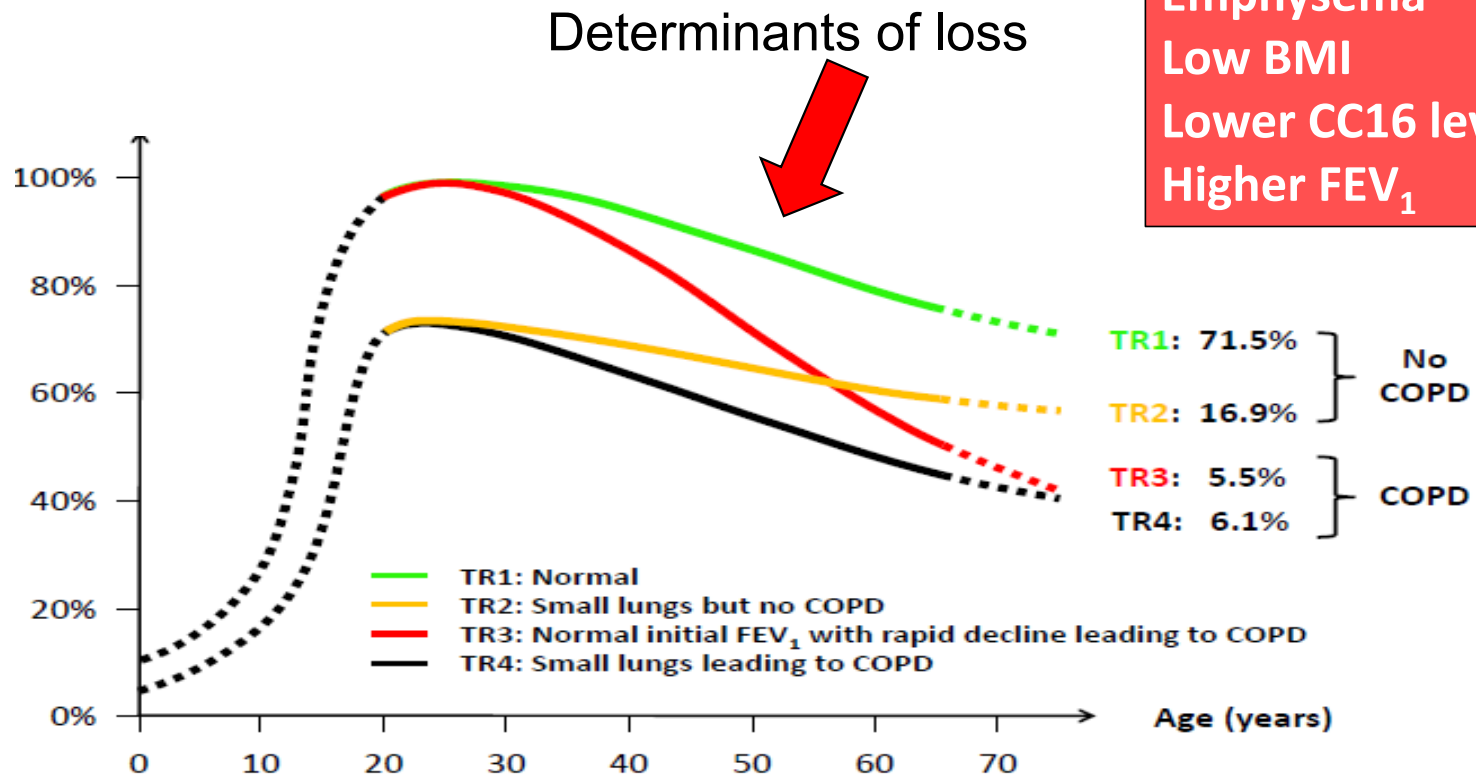


Moderates

Agenda

- There are several “natural courses” to develop COPD

Course of Lung Function

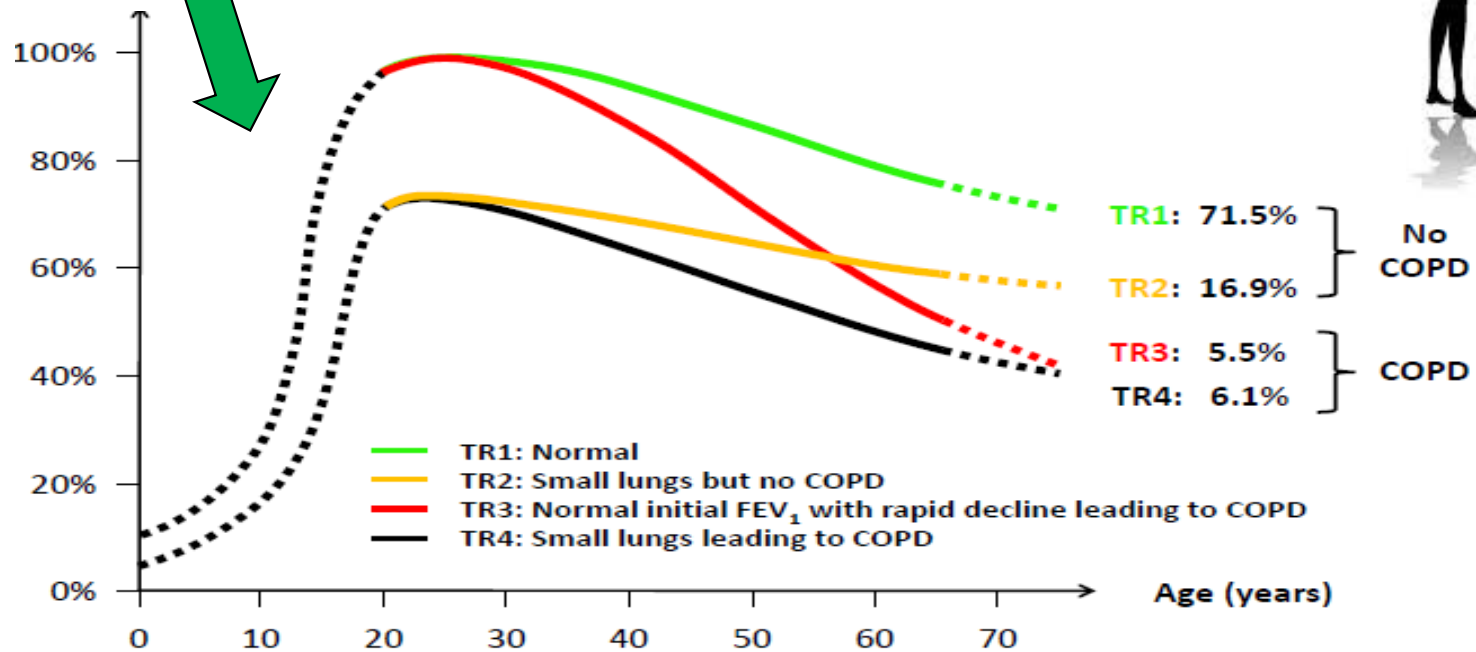


Current smoking
Male
Emphysema
Low BMI
Lower CC16 levels
Higher FEV₁

No pharmacological therapy
Exacerbations
Pollution
Poverty

Course of Lung Function

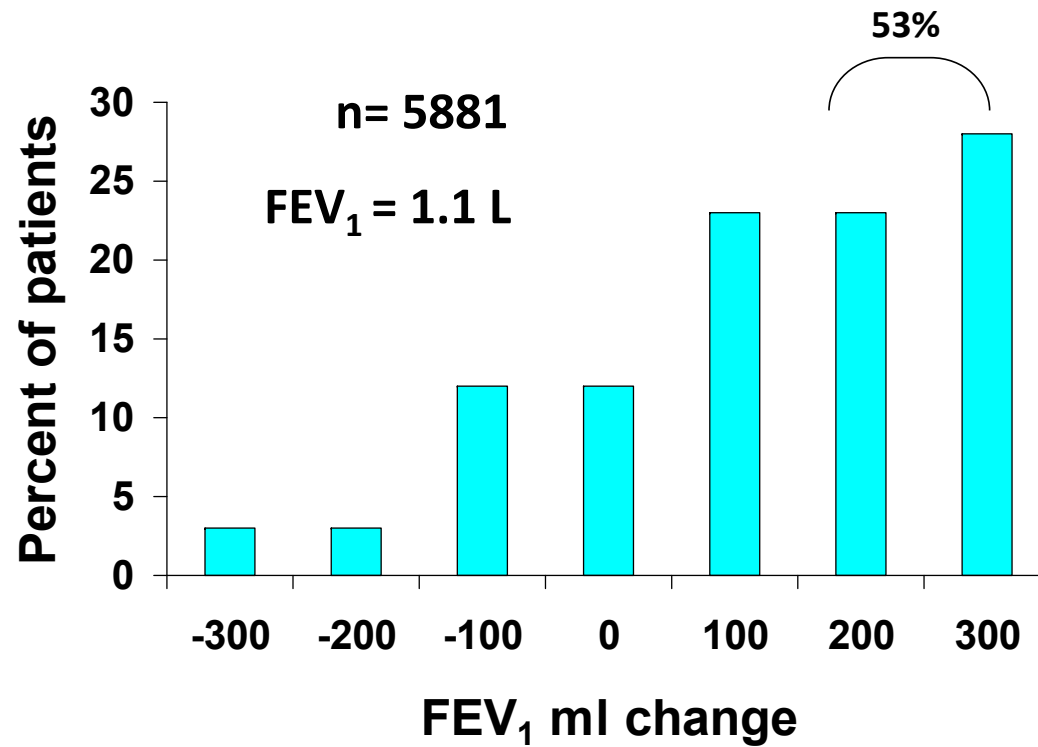
Determinants of gain



Agenda

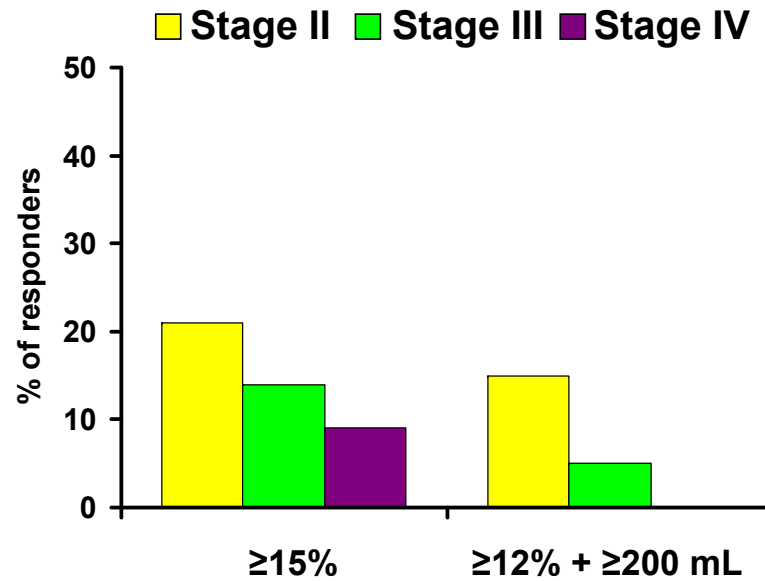
- Provide a practical approach to initiate and modify pharmacotherapy in patients with COPD.

Bronchodilator responsiveness in COPD

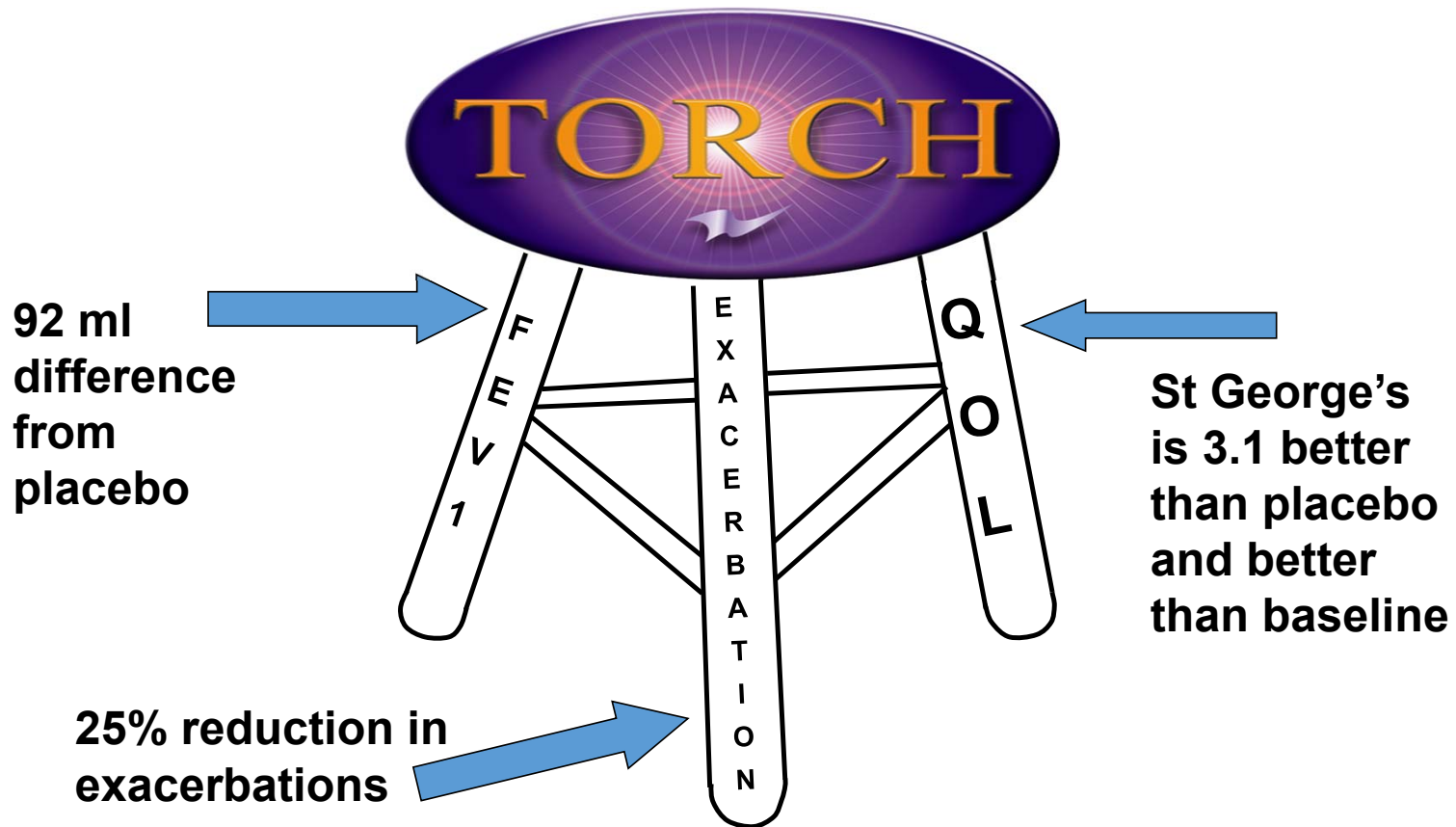


Bronchodilator responsiveness in COPD

**FEV₁, but not
FVC response**

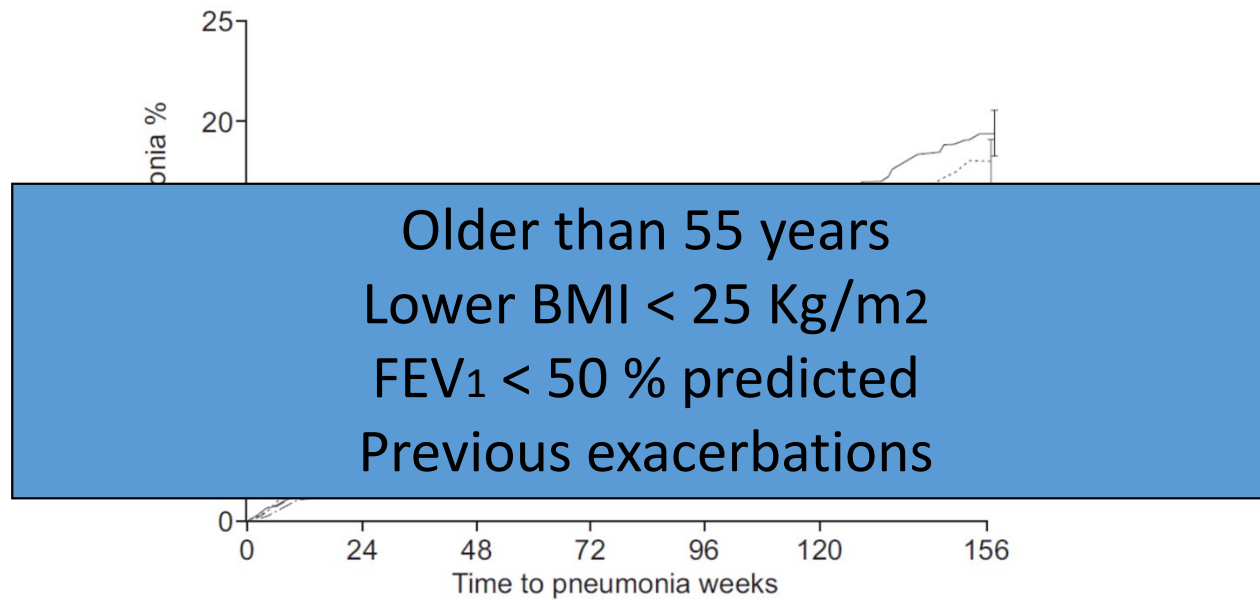


TORCH: DB, R, PC, 3 year trial. 6000 patients comparing F, S, SF, P
Outcome: Primary: Mortality Secondary: FEV1, QoL, Exacerbations



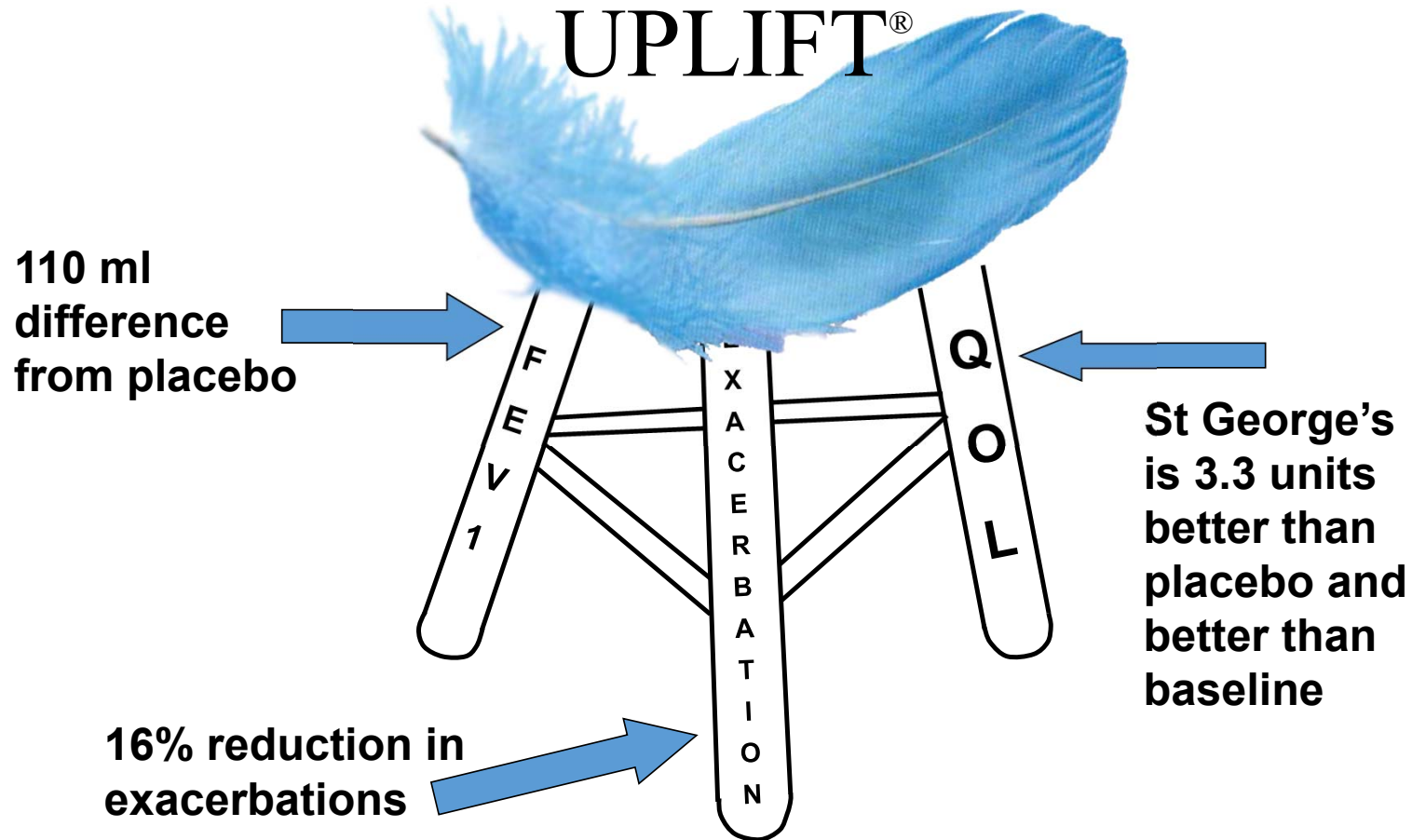
Calverley P et al NEJM 2007;22:356

Pneumonia Risk in TORCH



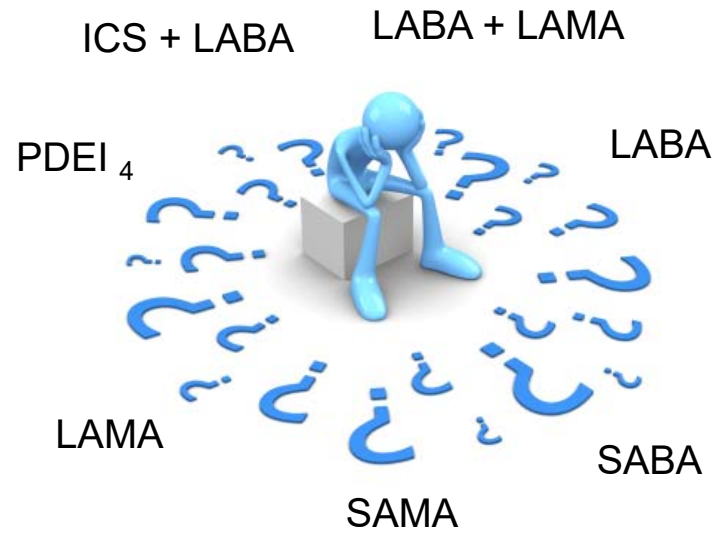
Patients n	0	24	48	72	96	120	156
SFC 1546	1546	1231	1034	631			
FP 1552	1552	1189	992	574			
SAL 1542	1542	1214	1024	645			
P 1544	1544	1117	947	587			

**UPLIFT: DB, R, PC, 4 year trial. 6000 patients. Tio vs Usual care
Outcome: Primary: FEV1 decline Secondary: QoL, AE, Mortality**

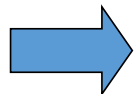


Tashkin D et al NEJM 2008;359:1543

How to approach?



Diagnosis

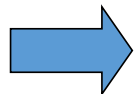


**Assessment
of airflow
limitation**

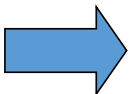
$FEV_1/FVC < 0.7$

Grade	FEV ₁ (% pred.)
1	≥80
2	50-79
3	30-49
4	<30

Diagnosis



**Assessment
of airflow
limitation**

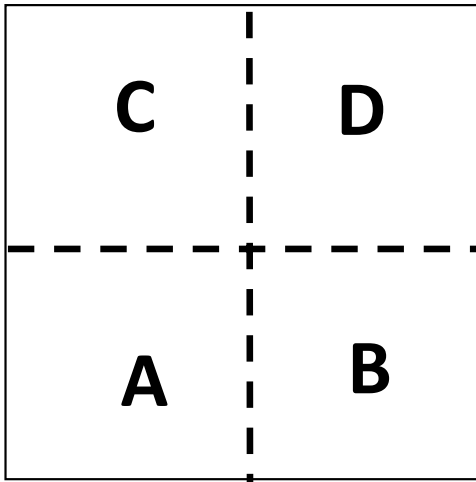


**Assessment of
symptoms/risk of
exacerbations**

FEV₁/FVC < 0.7

Grade	FEV ₁ (% pred.)
1	≥80
2	50-79
3	30-49
4	<30

Exacerbation history



2 or more
or
1 or more
hospitalization

0 or 1
(no
hospitalization)

mMRC 0-1
CAT < 10
CCQ < 1

mMRC 2+
CAT 10+
CCQ 1+

GOLD 2019: Initial Pharmacological Treatment

▶ INITIAL PHARMACOLOGICAL TREATMENT

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	Group C LAMA	Group D LAMA or LAMA + LABA* or ICS + LABA†
0 or 1 moderate exacerbation (not leading to hospital admission)	Group A A Bronchodilator	Group B A Long-acting Bronchodilator (LABA or LAMA)
	mMRC 0-1 CAT < 10	mMRC ≥ 2 CAT ≥ 10

ICS=inhaled corticosteroid; LABA=long-acting beta₂-adrenergic agonist; LAMA=long-acting muscarinic antagonist.

*Consider if highly symptomatic (eg, CAT > 20)

†Consider if eosinophils ≥ 300

GOLD. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. 2019 Report. www.goldcopd.org. © 2018 Global Initiative for Chronic Obstructive Lung Disease, all rights reserved. Use is by express license from the owner.

▶ GOLD 2019: FOLLOW-UP PHARMACOLOGICAL TREATMENT

1. IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.

- 2. IF NOT:**
- ✓ Consider the predominant treatable trait to target (dyspnea or exacerbations)
 - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
 - ✓ Place patient in box corresponding to current treatment and follow indications
 - ✓ Assess response, adjust, and review
 - ✓ These recommendations do not depend on the ABCD assessment at diagnosis

DYSPNEA

EXACERBATIONS

*Consider if eosinophils ≥ 300 cells/ μ L or ≥ 100 cells/ μ L + ≥ 2 moderate exacerbations or 1 hospitalized exacerbation.

†Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication, or lack of response.

GOLD. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. 2019 Report. www.goldcopd.org. © 2018 Global Initiative for Chronic Obstructive Lung Disease, all rights reserved. Use is by express license from the owner.

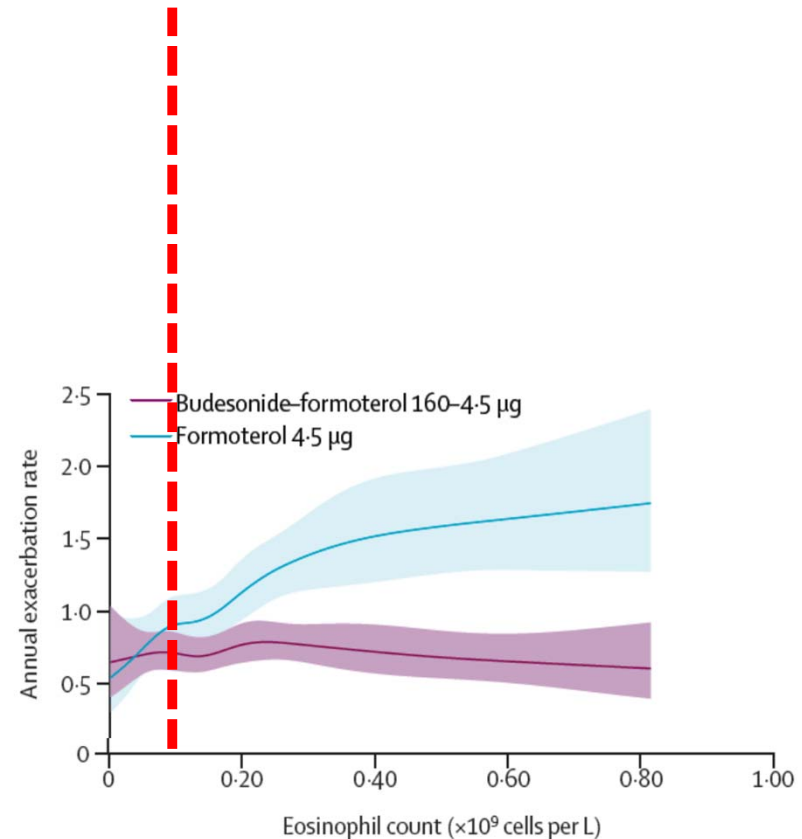
Exacerbations predictors: Post hoc analysis of budesonide in 3 RC COPD trials

Data from 3 RC trials of:
B/F versus F alone who
had eosinophils measured

N = 4153 patients

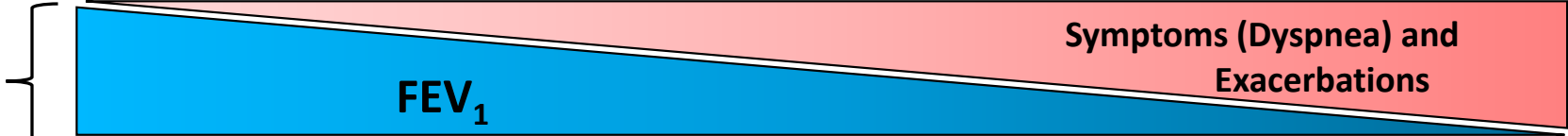
FEV₁ = 1 L 38% pred

Outcomes:
Exacerbations
FEV₁
QoL



Bafadhel M et al Lancet RM 2018;6:117

Make
diagnosis
and grade
risk factors



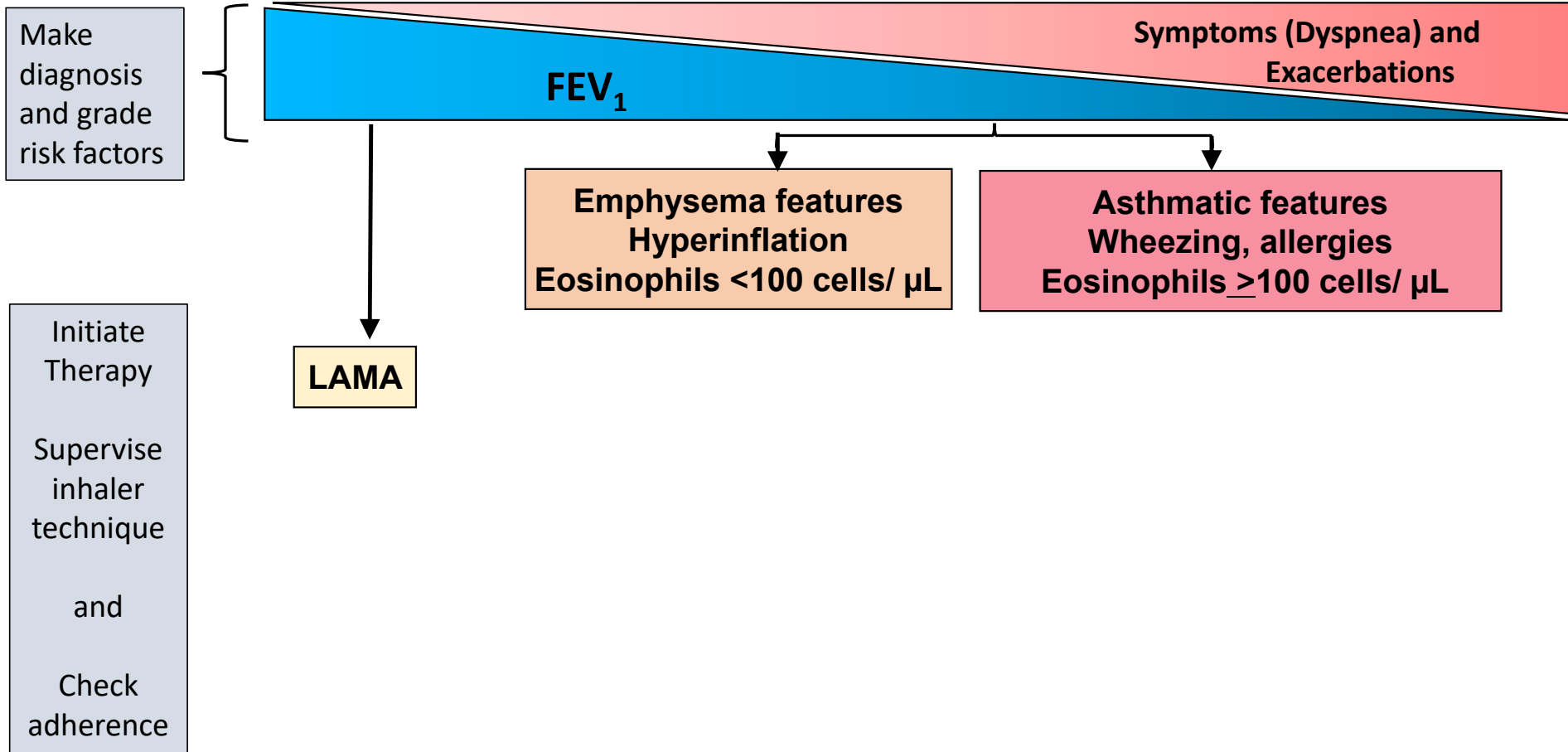
LAMA

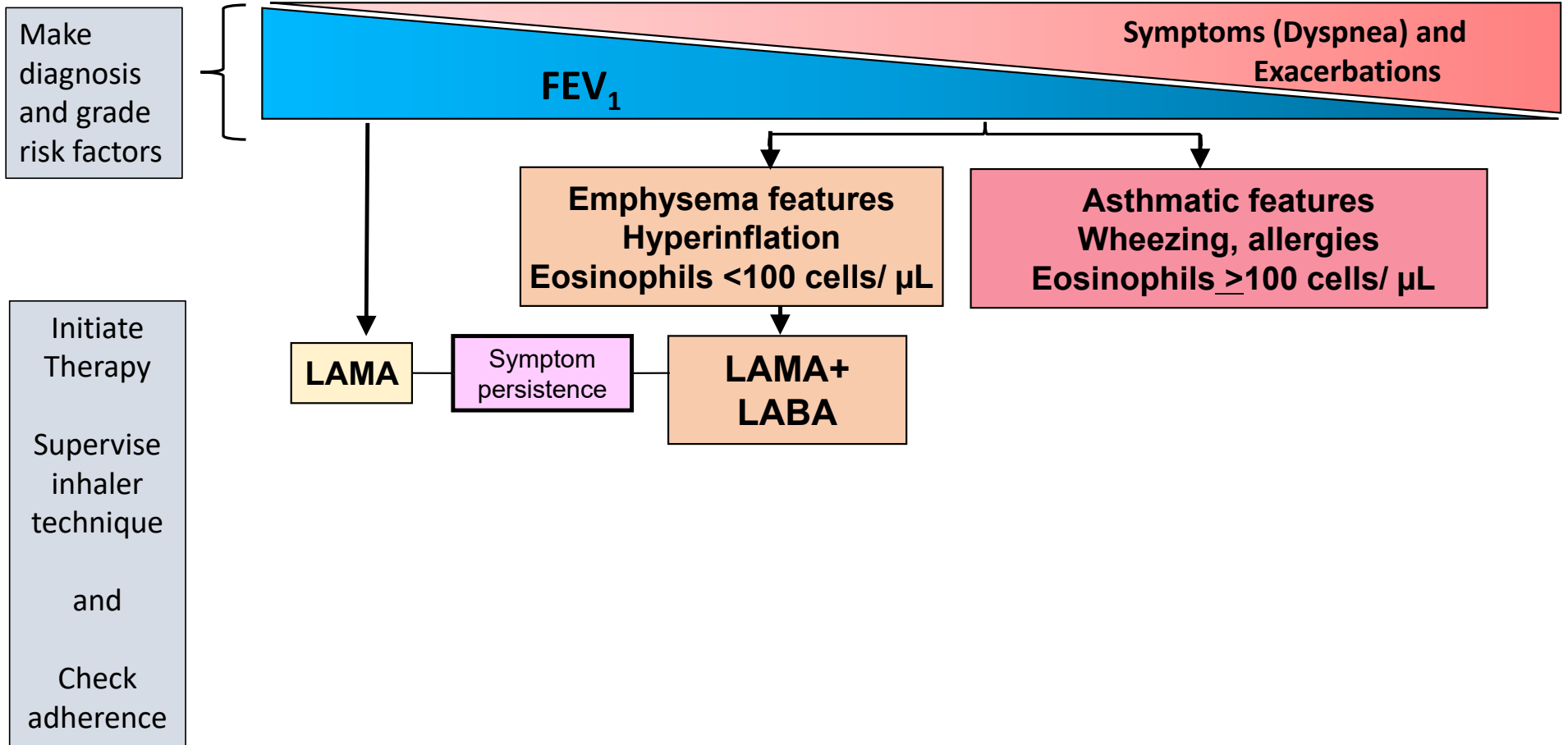
Initiate
Therapy

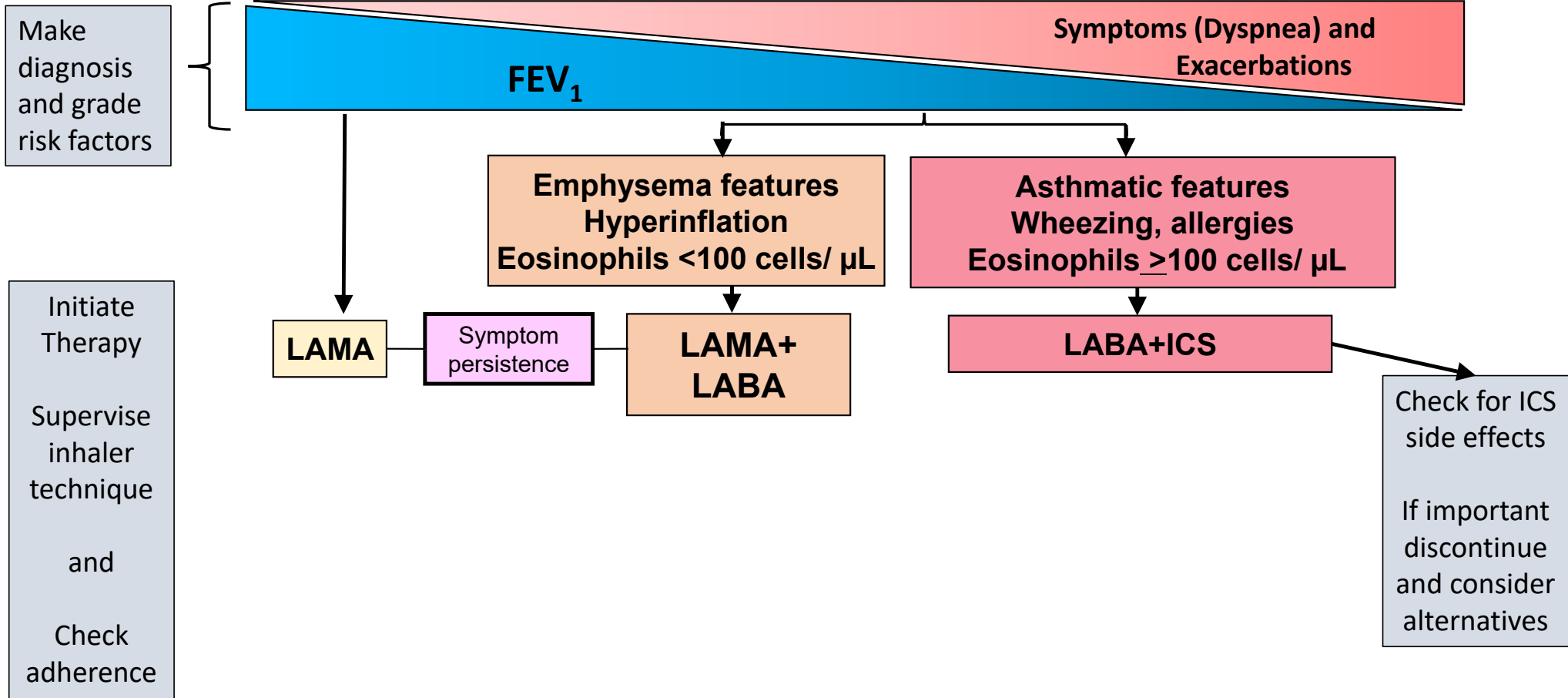
Supervise
inhaler
technique

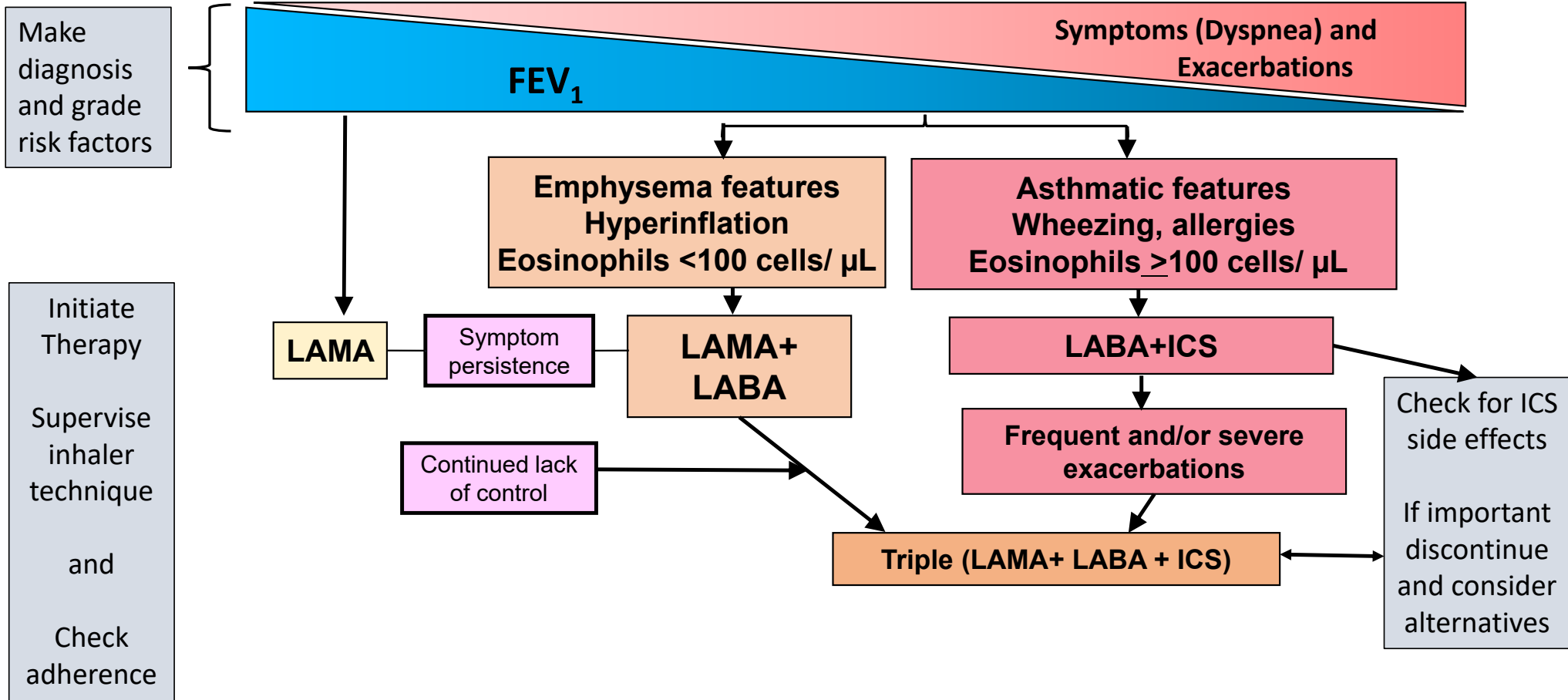
and

Check
adherence



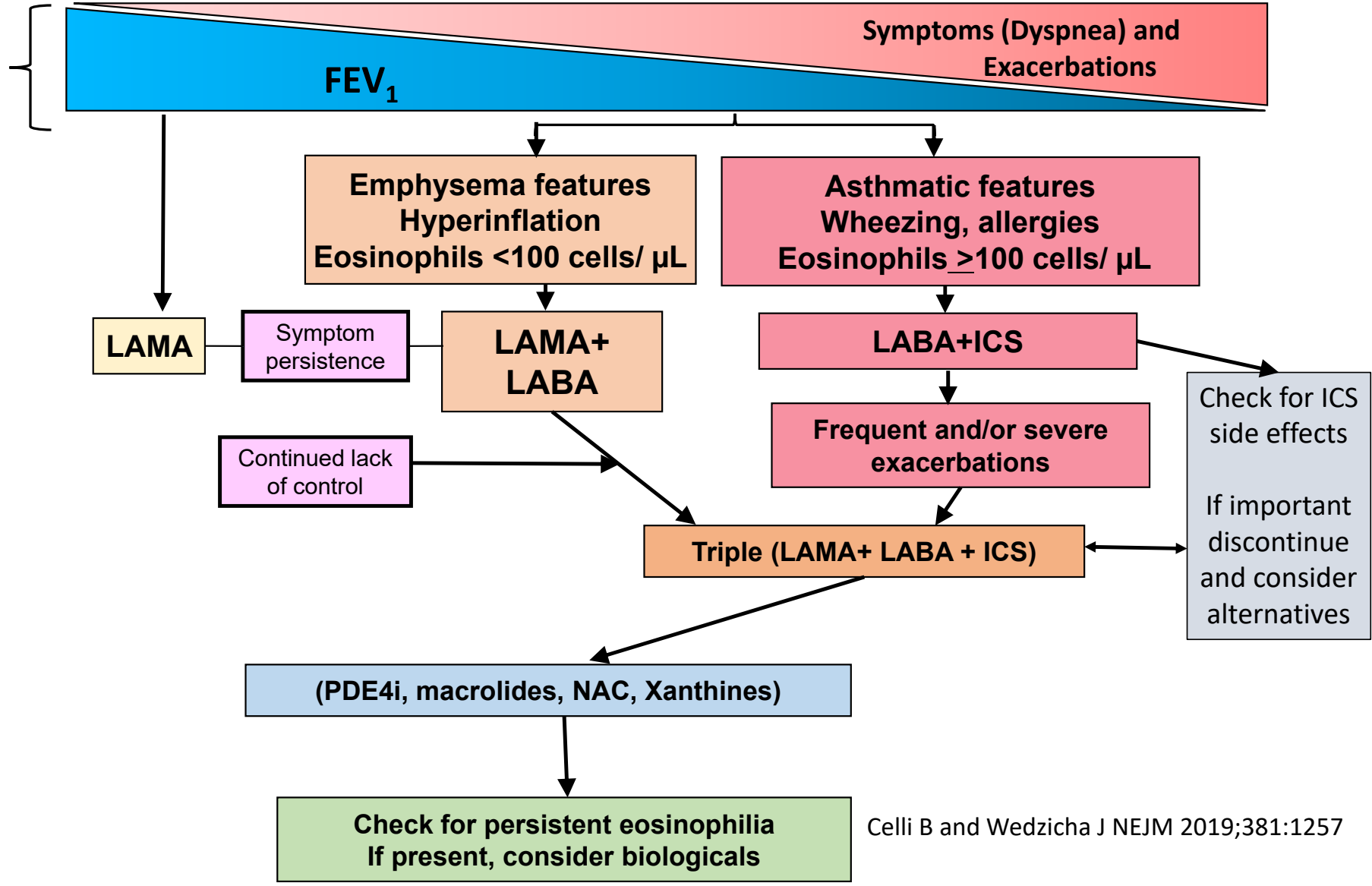






Make diagnosis and grade risk factors

Initiate Therapy
Supervise inhaler technique
and
Check adherence



Celli B and Wedzicha J NEJM 2019;381:1257

Agenda

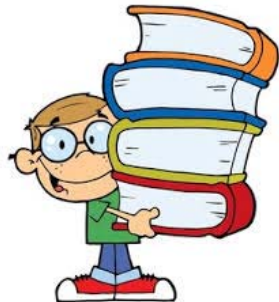
- Review the tools available for patients on maximal therapy who remain functionally impaired

Pulmonary rehabilitation for chronic obstructive pulmonary disease (Review)

McCarthy B, Casey D, Devane D, Murphy K, Murphy E, Lacasse Y



Along with 31 RCT's included in the 2006 Cochrane Review, the authors included 34 additional RCT's with a grand total of 3,822 participants



Conclusions



“We found statistically and clinically significant improvements in important domains of health related quality of life, including dyspnea, fatigue, emotional function and mastery as well as in the 6 MWD, a test of functional capacity”

Cochrane Database of Systematic Reviews 2015, Issue 2. Art. No.: CD003793.
DOI: 10.1002/14651858.CD003793.pub3.

Hyperinflation in a 63 year old man with mMRC dyspnea of 3



FEV₁ = 32 %

FRC = 192 %

DLCO = 49 %

Endobronchial Valves (EBV)

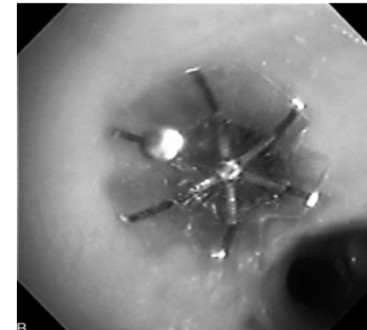
- Zephyr (Pulmonx)

- silicone based mounted in a nitinol stent one way valve



- Spiration (Olympus)

- 6 Nitinol struts and polyurethane umbrella shape unidirectional valve

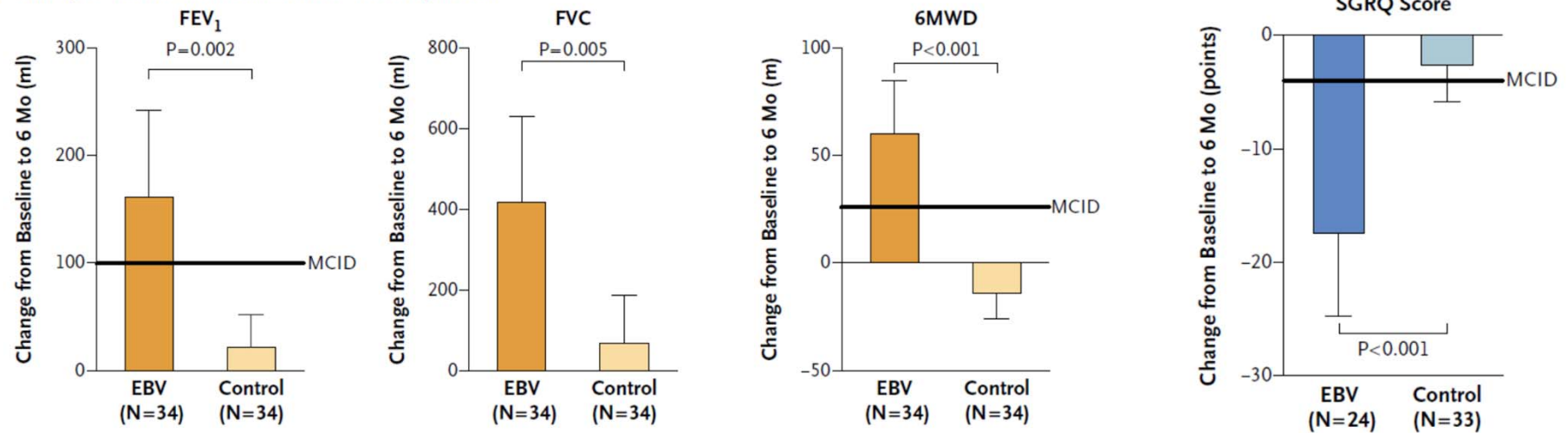


ORIGINAL ARTICLE

Endobronchial Valves for Emphysema without Interlobar Collateral Ventilation

Karin Klooster, Nick H.T. ten Hacken, M.D., Ph.D., Jorine E. Hartman, Ph.D.,
Huib A.M. Kerstjens, M.D., Ph.D., Eva M. van Rikxoort, Ph.D.,
and Dirk-Jan Slebos, M.D., Ph.D.

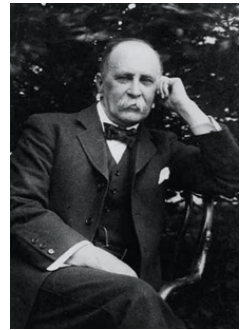
A Primary Outcomes in the Intention-to-Treat Population



Conclusions

- COPD is an important health problem worldwide
- Although cigarettes remain an important cause, this is not so for the majority of countries in the world
- E-cigarettes are a major problem requiring some regulation
- Well applied pharmacotherapy works
- In patients with persistent symptoms consider rehabilitation
- Check for emphysema and hyperinflation for potential LVR
- A nihilistic approach is not justified!

“If it were not for the great variability among individuals, medicine might as well be a science and not an art”



William Osler