

Management of COPD – a paradigm shift.

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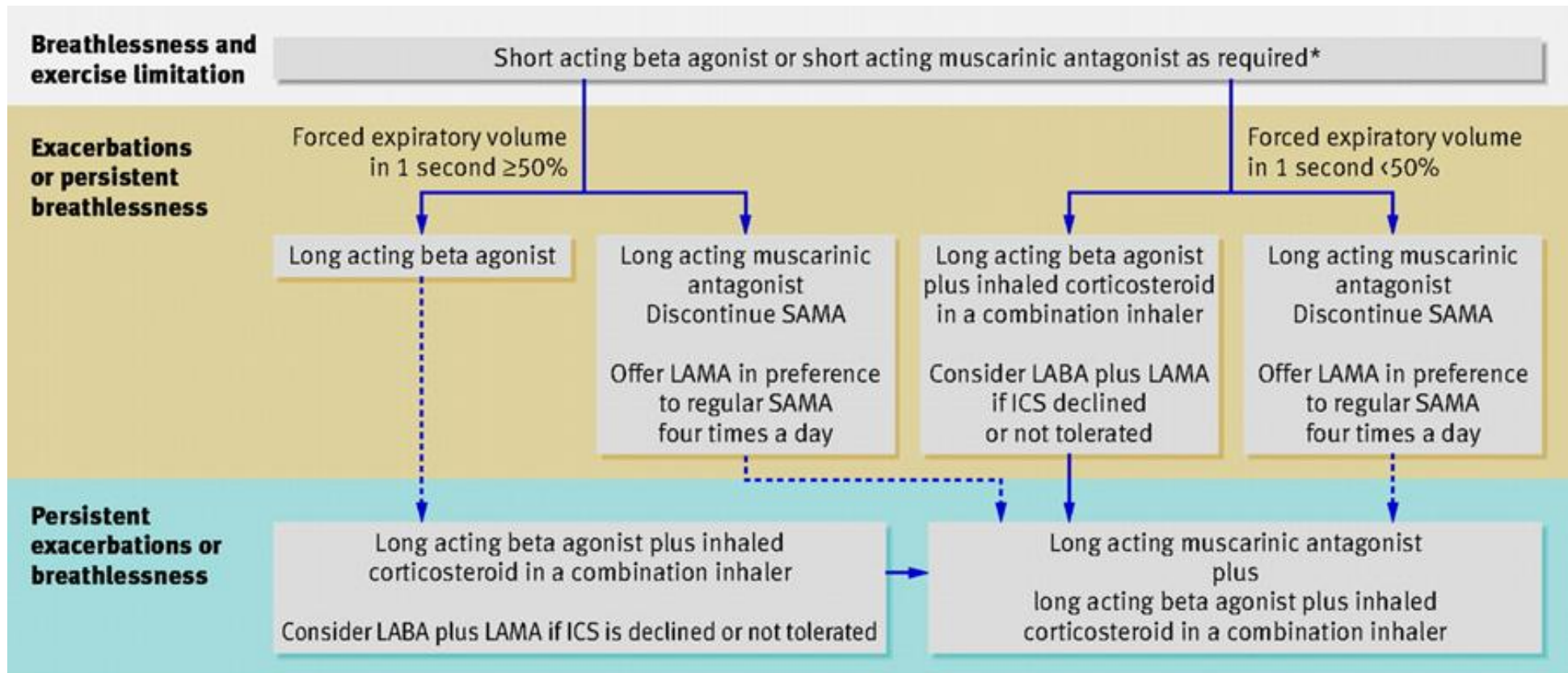
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COPD Management - ?confused



Abbreviations: SAMA = short acting muscarinic antagonist, LAMA = long acting muscarinic antagonist, LABA = long acting beta agonist, ICS = inhaled corticosteroid

* Short acting beta agonist (as required) may continue at all stages

—→ Offer therapy (strong evidence) - - - - -→ Consider therapy (less strong evidence)

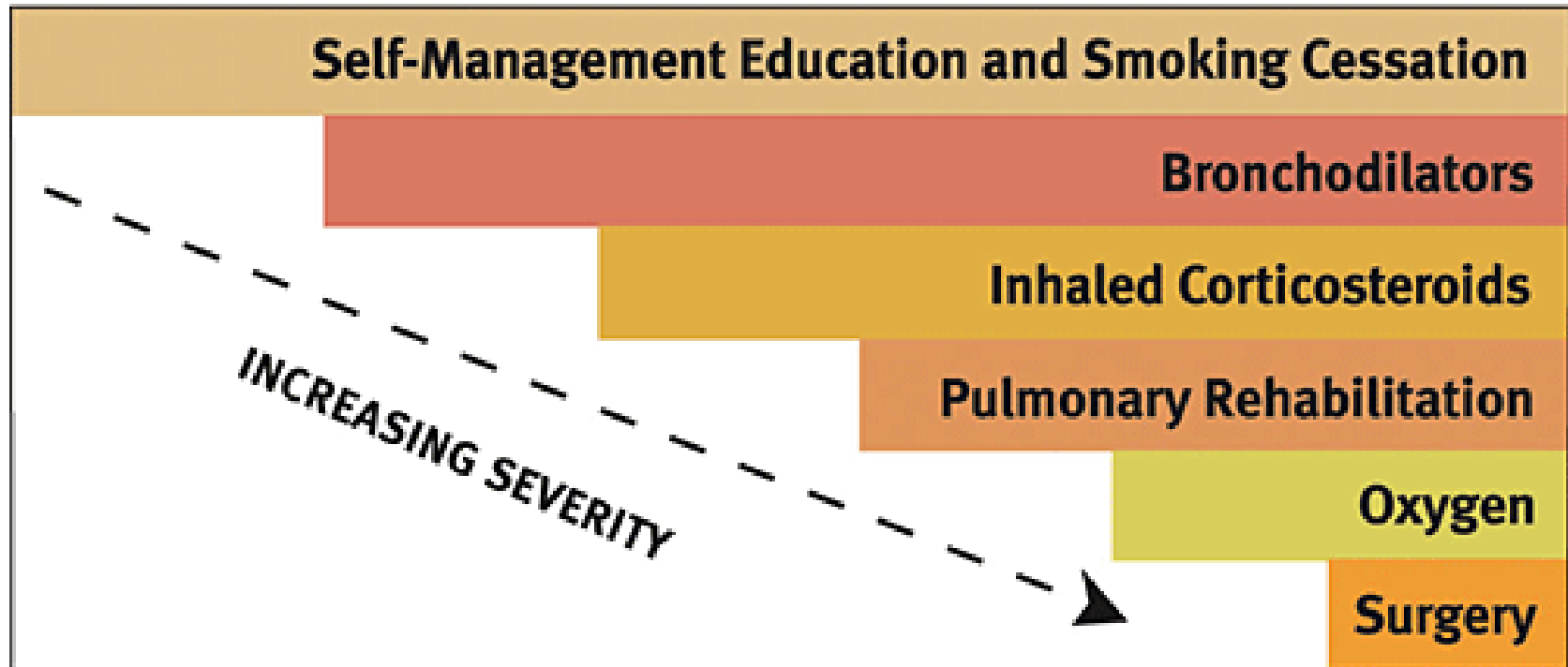
COPD Management - ?confused

Patient-centred management of stable COPD in primary care

For all patients:				
- provide smoking cessation advice - provide patient education/self management - assess co-morbidity - give dietary advice if BMI >25 kg/m² - promote exercise - offer pneumococcal vaccination - offer annual influenza vaccination - refer to a dietary specialist if BMI <20 kg/m²				
SYMPTOMS?	FUNCTIONAL LIMITATION?	EXACERBATIONS	HYPOXIA?	HOLISTIC CARE
BREATHLESSNESS Prescribe short-acting bronchodilators (beta ₂ agonist/ antimuscarinic) for relief of symptoms	MRC score ≥3 Optimise pharmacotherapy See NICE pharmacotherapy algorithm	(Oral steroids/ antibiotics/hospital admissions) Optimise pharmacological therapy	Oxygen saturation ≤92% at rest in air FEV ₁ <30% predicted Refer for oxygen assessment	Check social support (e.g. carers and benefits) Treat co-morbidities
PERSISTENT SYMPTOMS Offer pharmacotherapy in line with NICE guideline	Offer pulmonary rehabilitation Screen for anxiety/ depression	Discuss action plans including use of standby oral steroids and antibiotics		Consider palliative therapy or secondary care referral for resistant symptoms
PRODUCTIVE COUGH Consider use of mucolytics				Refer to specialist palliative care teams for end-of-life care

COPD - simplified

TREATMENT OPTIONS FOR COPD



But how do you define severity?

Topics

1. What is COPD and why diagnose it
2. Treatment options in COPD – a symptom based approach
3. Treatment options in COPD – when to add the inhaled steroids
4. Treatment options – beyond the airways

1. What is COPD and why diagnose it

“COPD is highly prevalent,
underdiagnosed, undertreated
and underpercieved”

Bart Celli 2008

What is COPD and why diagnose it

- Affects 8% of adult population (1 in 10)
- Affects 20% of adult smokers (1 in 5)
- Affects 30% of adult general medical admissions
- Affects 50% of pneumonia over 65 yrs old

COPD and asthma are very different diseases

Diagnosis, Assess & Management of COPD

- Diagnose - assess expiratory flow (spirometry, PEFr)
- Assess symptoms (CAT and MRC score)
- Assess exacerbation risk (PHx of exacerbation, FEV₁%pred)
- Assess COPD co-morbidities (anxiety/depression, muscle wasting/fatigue)
- Assess COPD-related co-morbidities (CHD/CHF, lung cancer, osteoporosis)
- Manage – reduce risk and reduce symptoms

Diagnosis, Assess & Manage COPD

- Diagnose - a (spirometry, PEFR)
- Assess symptoms
- Assess risk of (exacerbation)
- Assess COPD (depression, muscle wasting/fatigue)
- Assess COPD (CHD/CHF, lung cancer, osteoporosis)
- Manage – reduce risk and reduce symptoms

Diagnose

Assess

Manage

Diagnosis, Assess & Manage COPD

Diagnose

Assess

Manage

- Manage – reduce risk and reduce symptoms

expiratory flow (spirometry, PEEP)

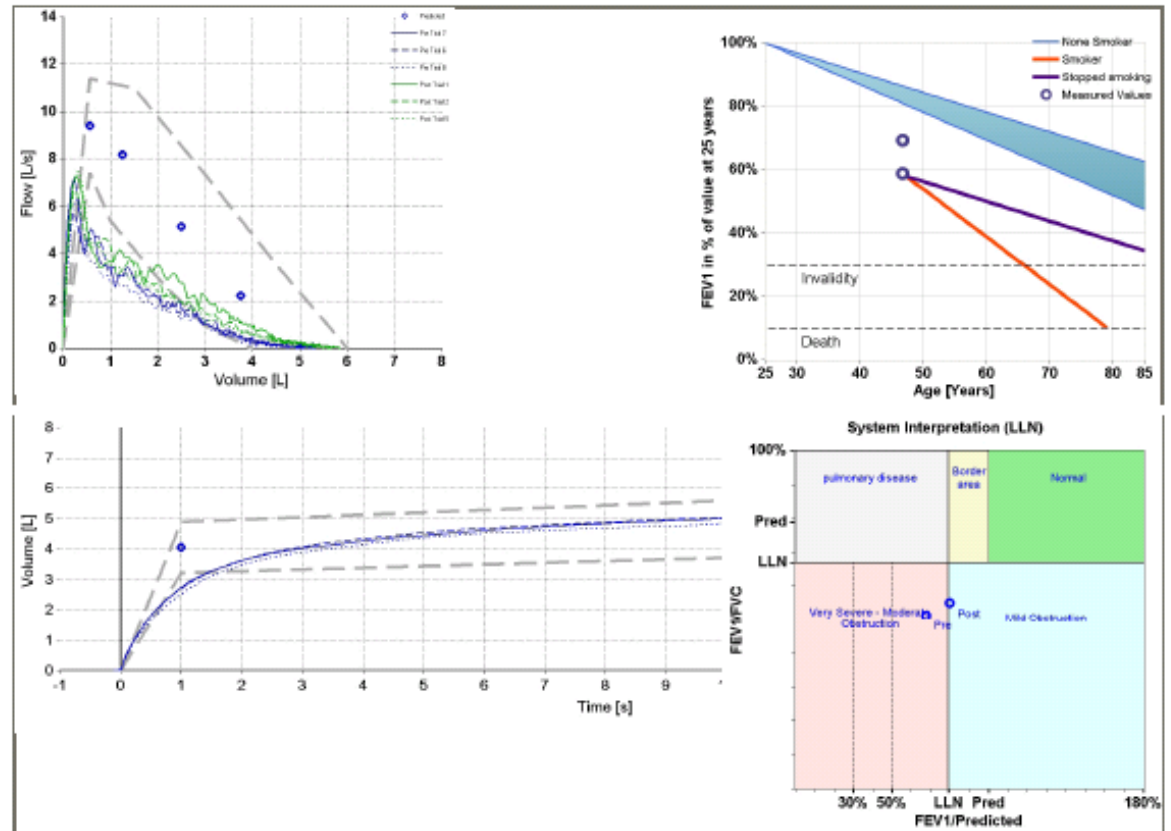
Symptom score

Expiratory flow

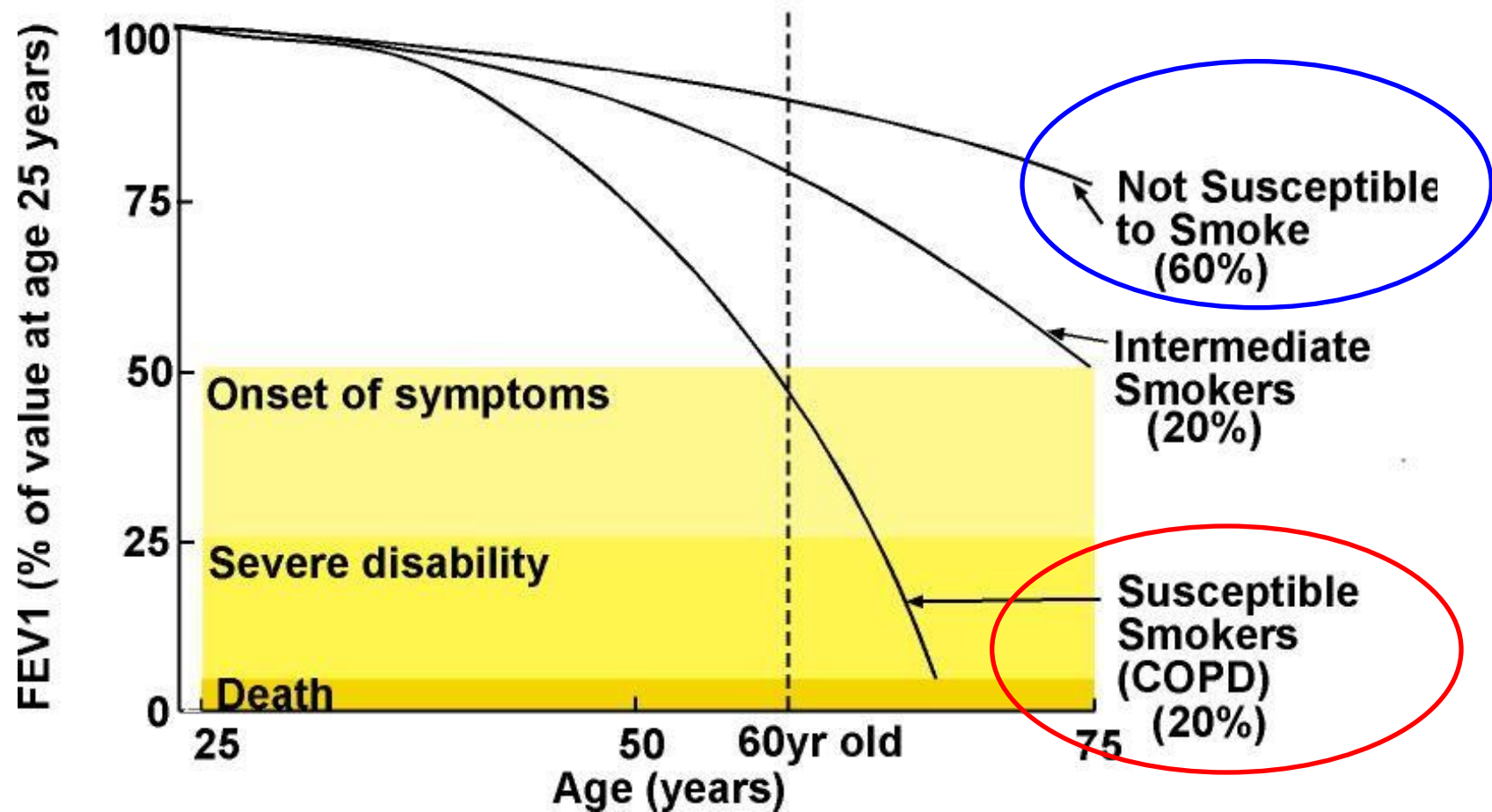
Xacerbation rate



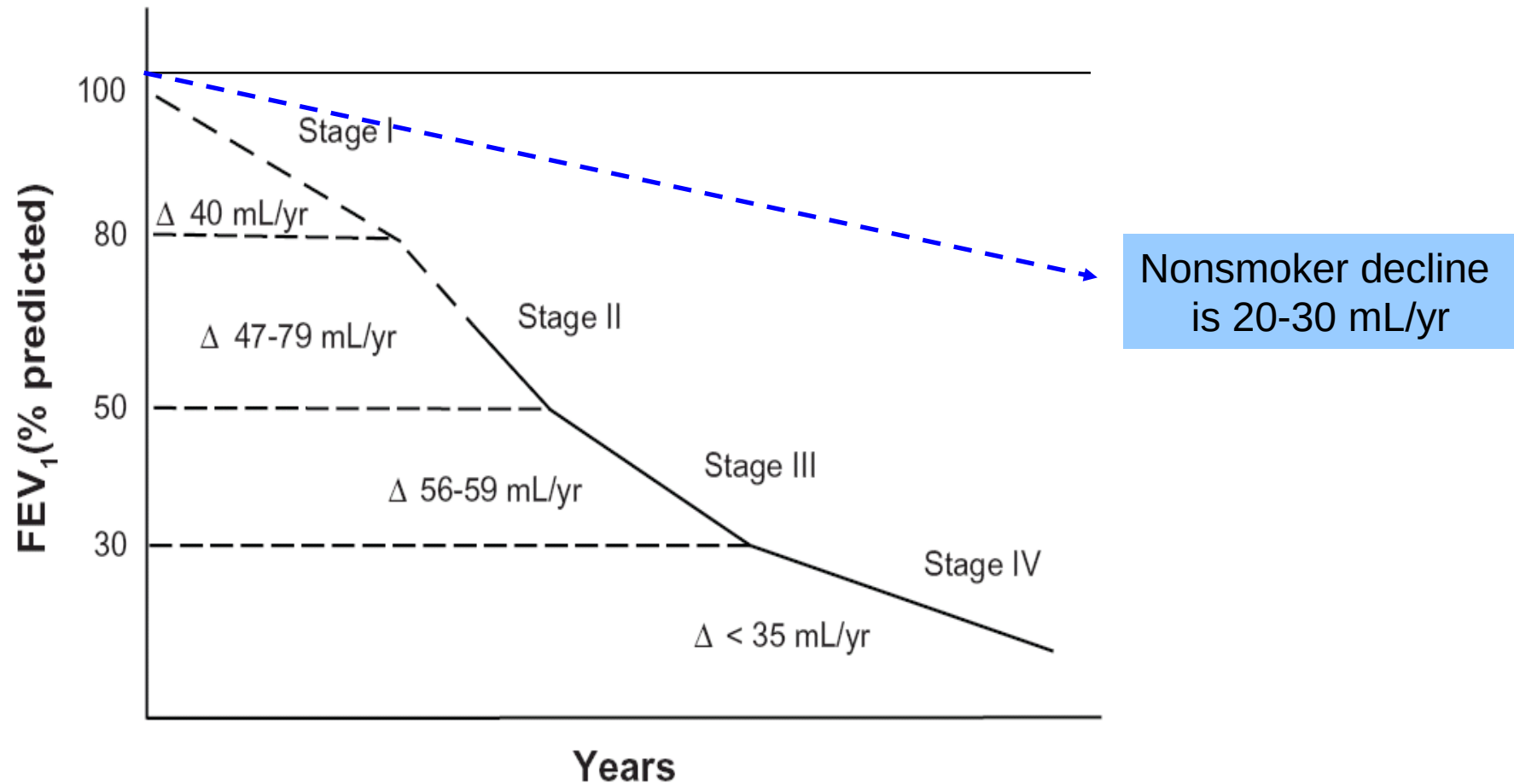
Spirometry and lung age



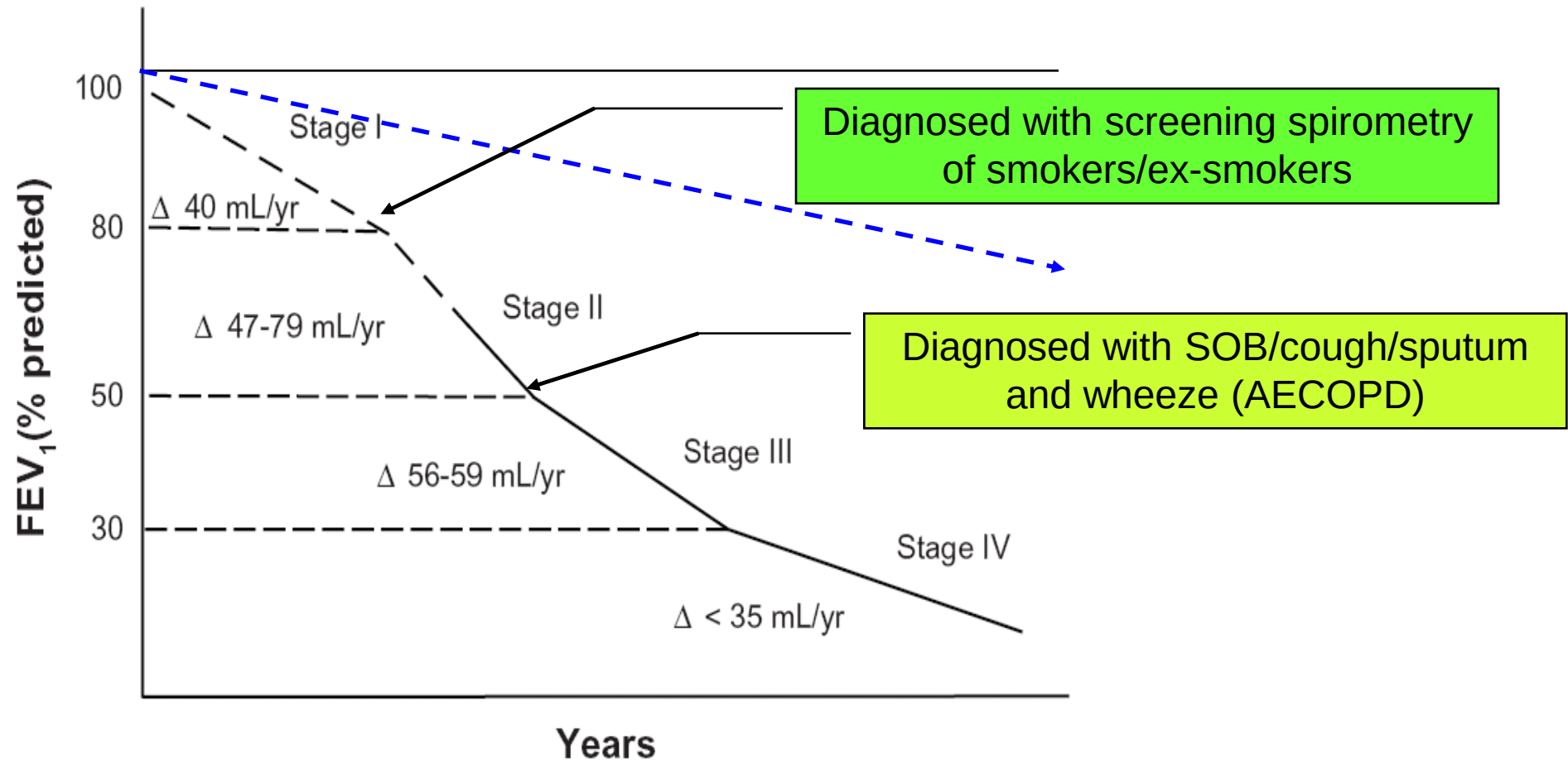
Decline of Lung Function: variable susceptibility



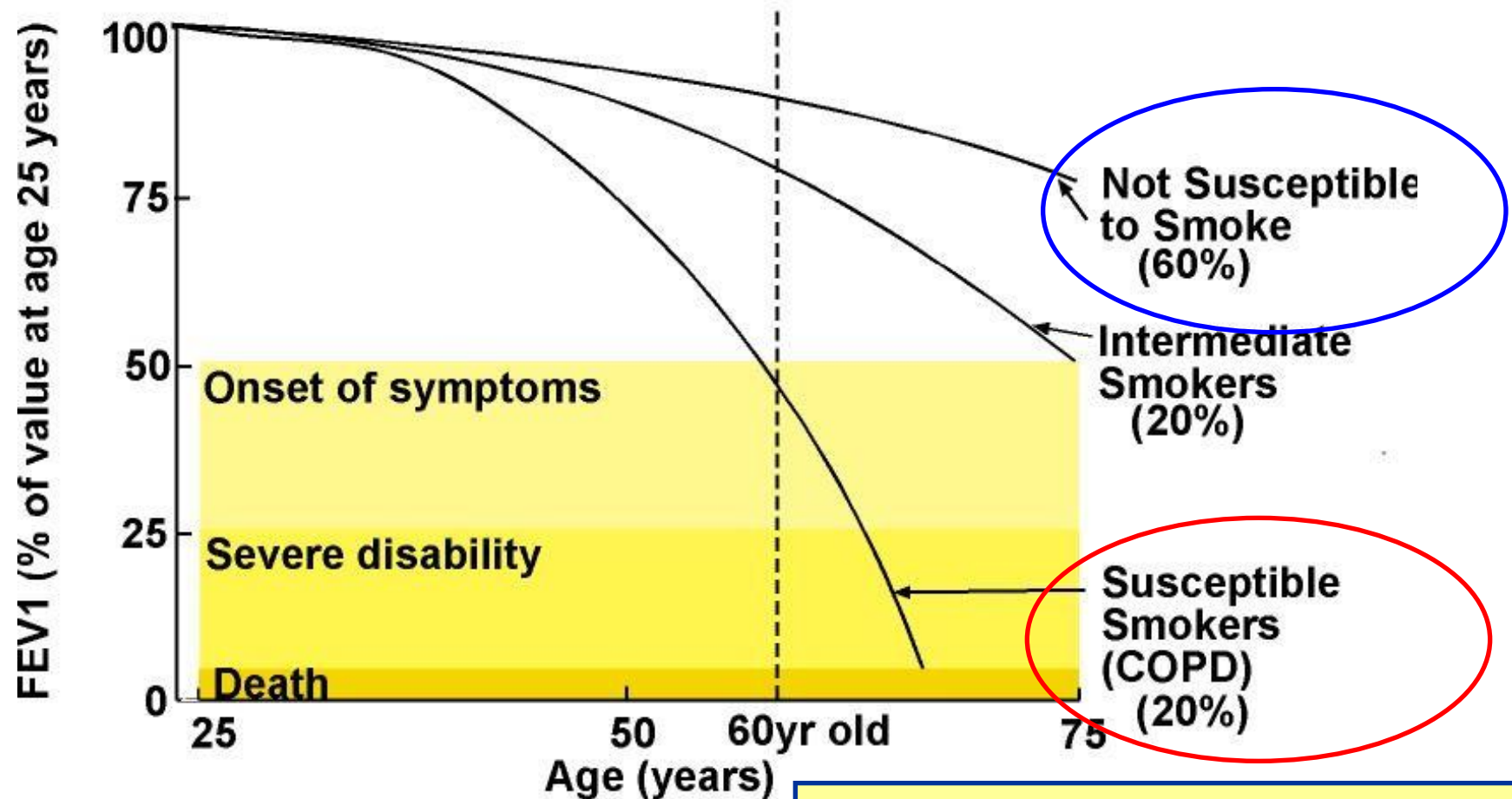
Decline in lung function with COPD severity



Decline in lung function with COPD severity



Decline of Lung Function: variable susceptibility



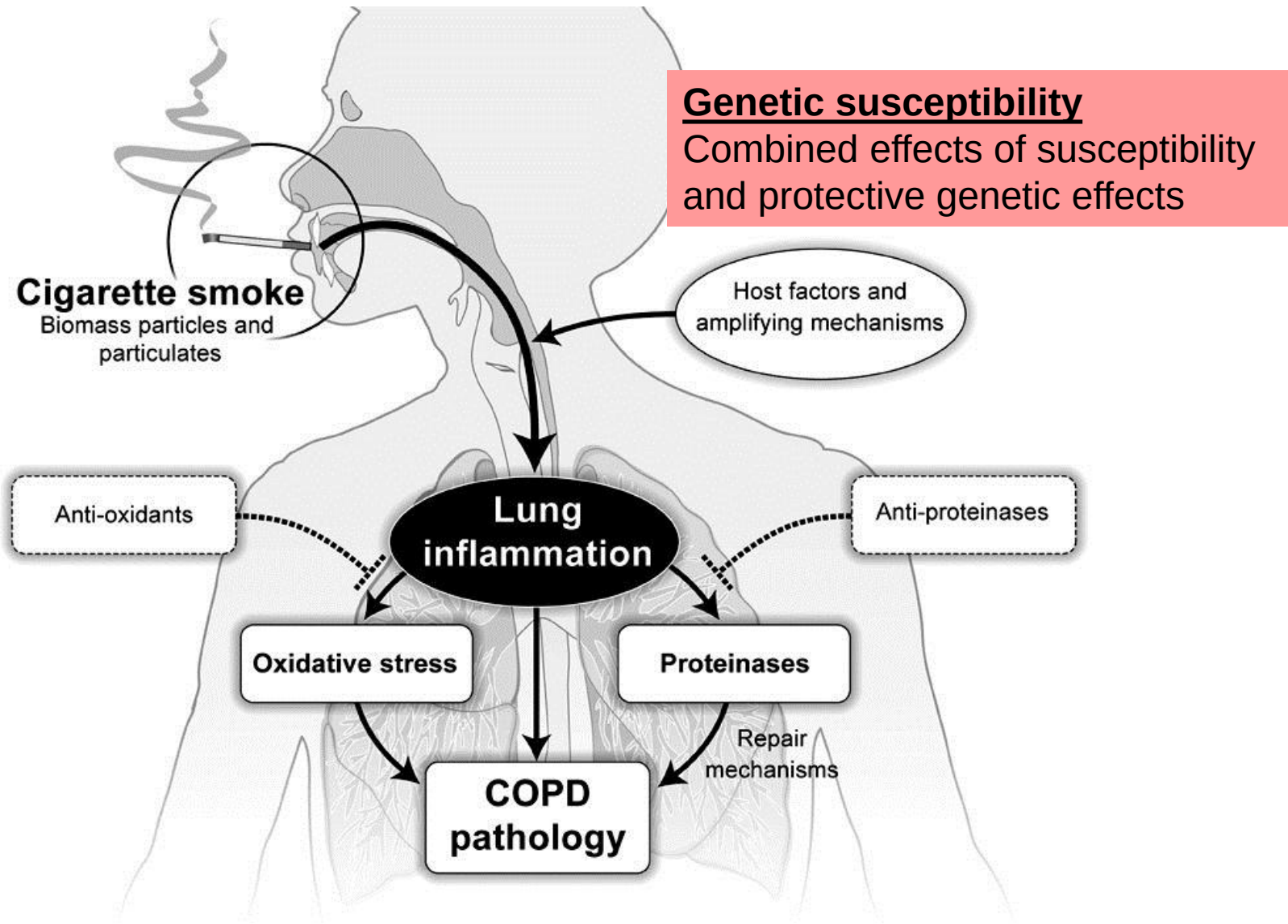
↓FEV1: other morbidities apart from COPD

- 5x ↑Lung cancer
- 5x ↑ heart attack
- 2-3x ↑ stroke (Young et al. ERJ 2007)

What is COPD and why diagnose it

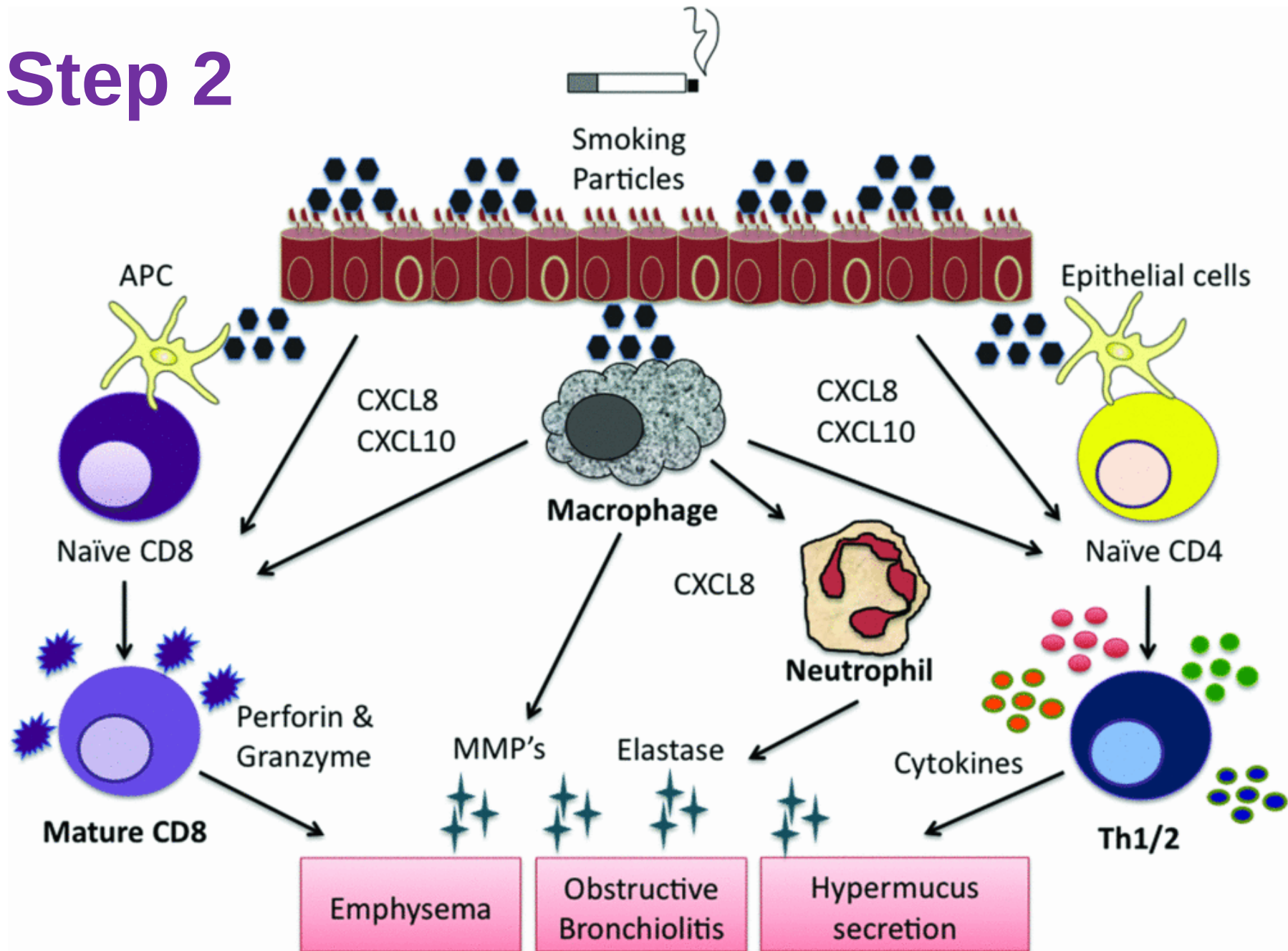
- Results from genetic susceptibility and aero-pollutant (smoking) exposure
- Neutrophilic airway inflammation
- Presents with
 - exertional breathlessness and LRTI (cough, sputum, wheeze and SOB)
 - Fatigue and poor exercise tolerance
- Systemic inflammation and co-morbidities
- Precursor illness to 70-80% of all lung cancer

Step 1



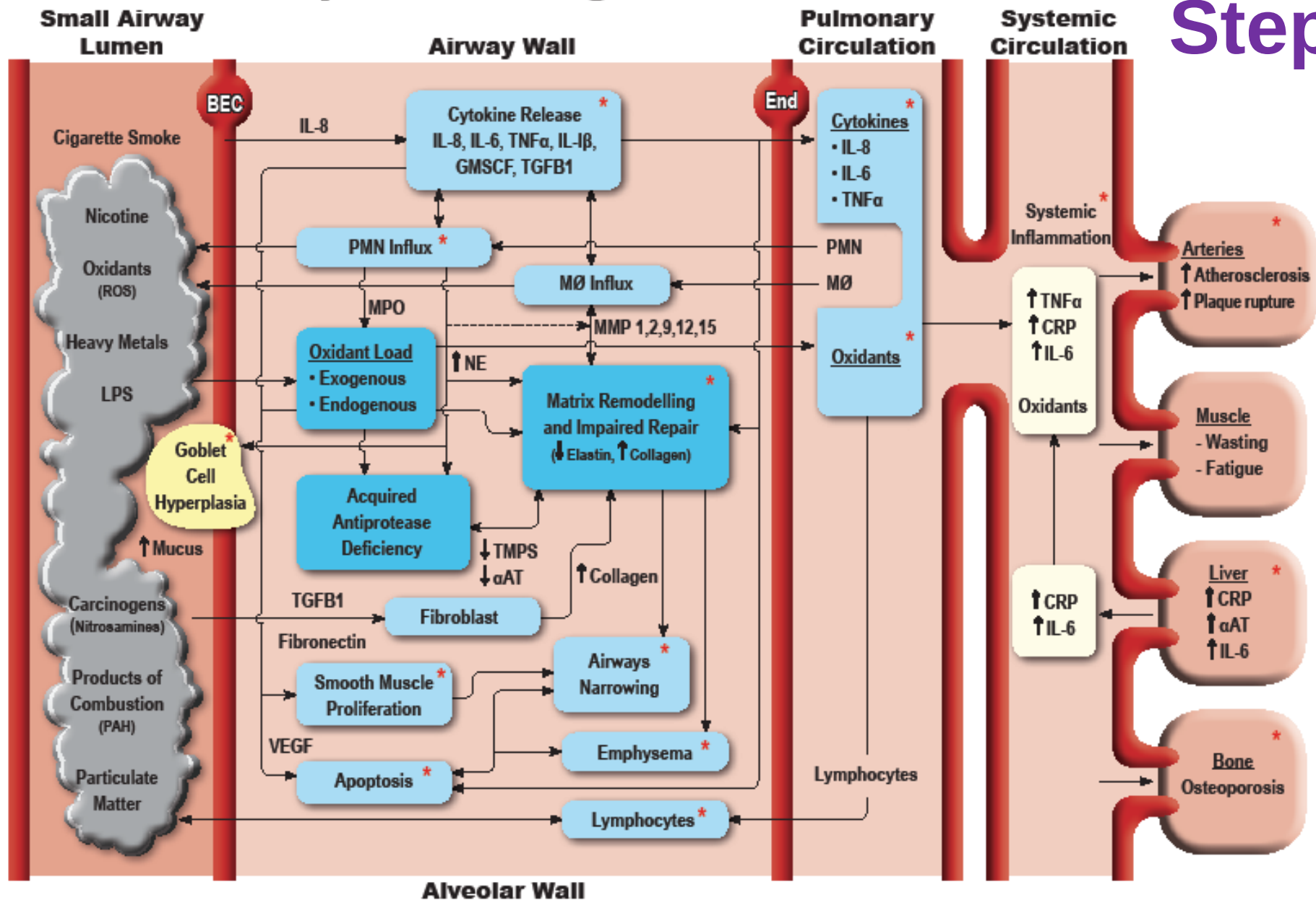
Reprinted with permission from the Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2009. Available from: <http://www.goldcopd.org>.

Step 2



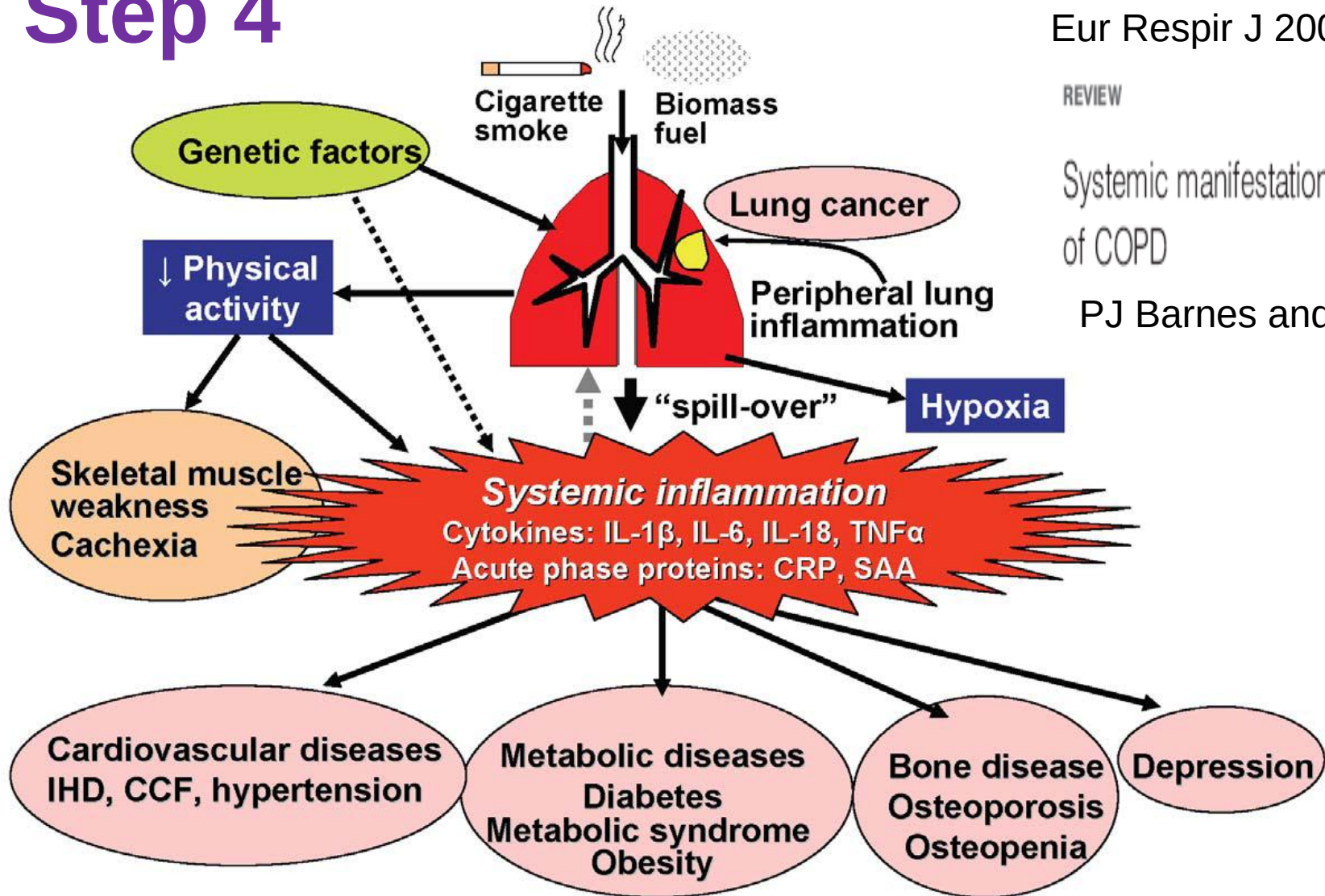
Proposed Pathogenesis of COPD

Step 3



Young RP, et al. (European Respir Review 2009)

Step 4



Eur Respir J 2009; 33: 1165-85.

REVIEW

Systemic manifestations and comorbidities
of COPD

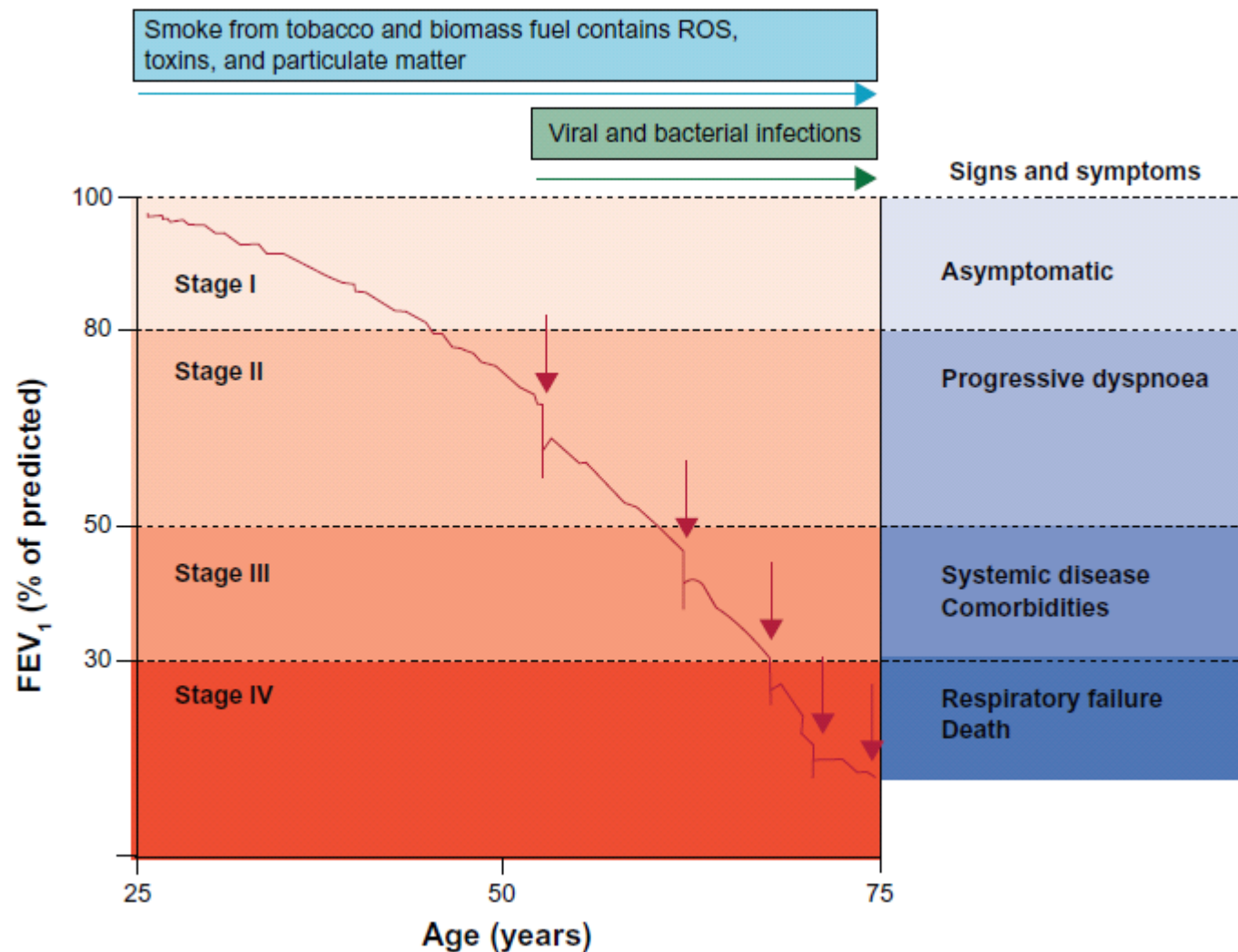
PJ Barnes and BR Celli

2. A symptom based approach

Management of COPD – the aims

Reduce symptoms	Relieve symptoms Improve exercise tolerance Improve health status
Reduce risk	Prevent disease progression Prevent and treat exacerbations Reduce mortality

Development and progression of COPD – FEV₁ vs symptoms

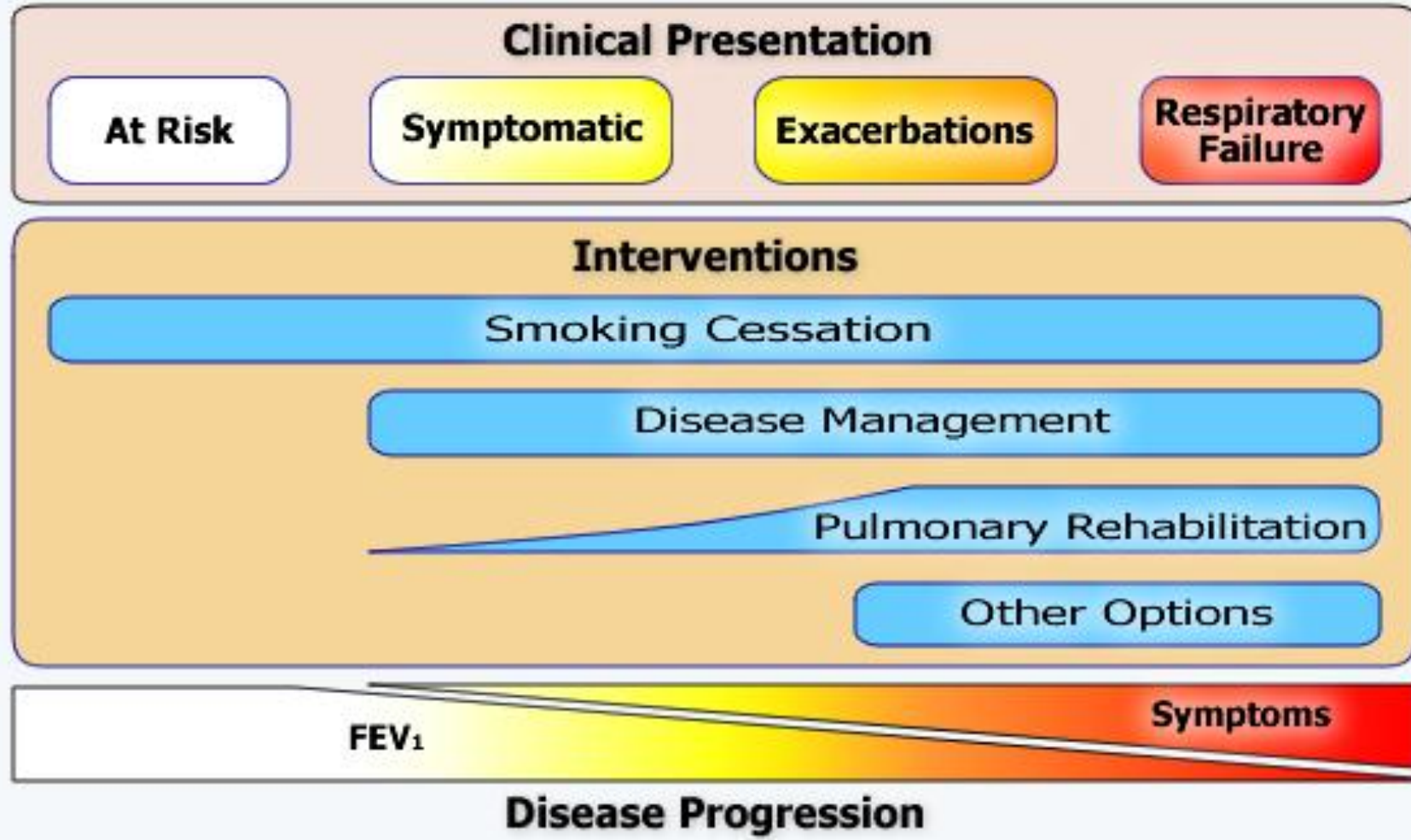


Treatment options in COPD – a symptom based approach

- Spirometry – document severity of airways obstruction (confirm diagnosis, end organ damage)
- Establish – symptom profile (CAT) , tendency to LRTI, AECOPD, hospitalisation for acute exacerbations (direct inhaler treatment).
- Consider COPD a CVS risk factor
- Consider COPD a precursor to lung cancer

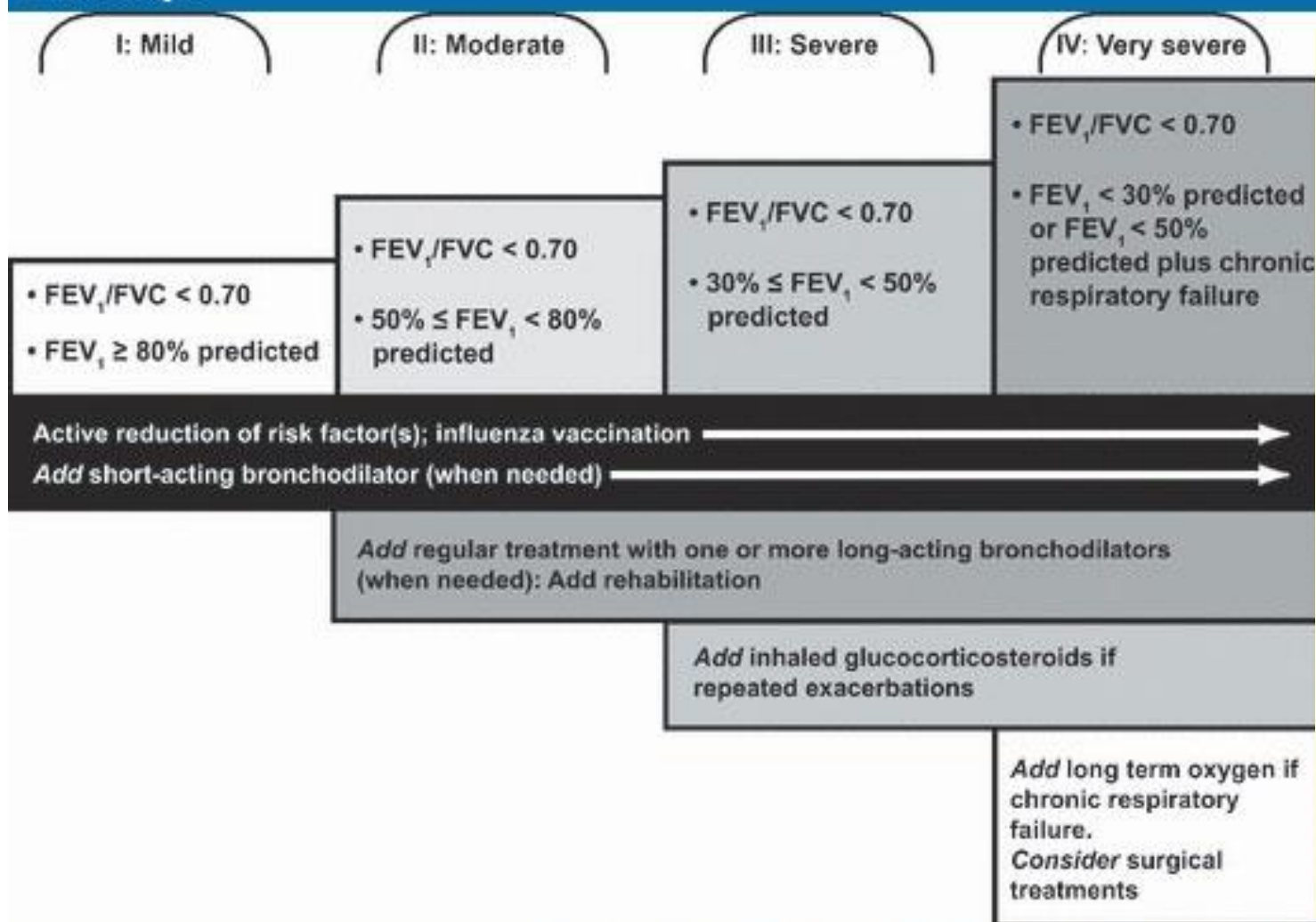


Standards for the Diagnosis and Management of Patients with COPD



A symptom based approach

- Smoking and aero-pollutant (dust) avoidance
- Yearly Flu vaccination, 5 yearly pneumococcal vaccination and regular exercise
- Exertional SOB- prn bronchodilators (SABA)
- Fatigue + poor ET – reg bronchodilators (LABA and LAMA (*FEV1<60% predicted for Tiotropium))
- LRTI/bronchitis/AECOPD – Inhaled corticosteroids with LABA or LAMA (*FEV1<60% predicted)
- 2+ Hospitalisations/yr – triple therapy



SABA prn

then LABA bd

then LABA + ICS bd

then LABA /ICS + LAMA

Plus

• Oral AB/Prednisone

• Pulmonary rehab

• LTOT and surgery/valves

Modified MRC Breathlessness Score

Grade	Description of Breathlessness
-------	-------------------------------

0	I only get breathless with strenuous exercise.
---	--

1	I get short of breath when hurrying on level ground or walking up a slight hill.
---	--

2	On level ground, I walk slower than people of the same age because of breathlessness, or have to stop for breath when walking at my own pace.
---	---

3	I stop for breath after walking about 100 yards or after a few minutes on level ground.
---	---

4	I am too breathless to leave the house or I am breathless when dressing.
---	--

A symptom based approach

HEED study

- Lung function alone is a poor predictor of symptoms
- Symptoms of COPD should be assessed regularly in patients with COPD (self administered CAT questionnaire, www.catestonline.co.uk)
- Reduced exercise tolerance was seen in 70% with mild disease (%predFEV1>80%) and 74% with moderate disease (%predFEV1 50-80%).

The CAT questionnaire (**download from - www.catestonline.co.uk**)

Cough	
I never cough	0 1 2 3 4 5 I cough all the time

Phlegm	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5 My chest is full of phlegm (mucus)

Tight	
My chest does not feel tight at all	0 1 2 3 4 5 My chest feels very tight

SOB	
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5 When I walk up a hill or one flight of stairs I am very breathless

Activity	
I am not limited doing any activities at home	0 1 2 3 4 5 I am very limited doing activities at home

Confidence	
I am confident leaving my home despite my lung condition	0 1 2 3 4 5 I am not at all confident leaving my home because of my lung condition

Sleep	
I sleep soundly	0 1 2 3 4 5 I don't sleep soundly because of my lung condition

Energy	
I have lots of energy	0 1 2 3 4 5 I have no energy at all

A symptom based approach – CAT

COPD **Self** Assessment Test

Score/40

- mild 0-10
- mod 10-15
- severe 15-25
- very severe 25-40

Basis on which to establish

- overall disability
- specific disabilities and
- response to treatments

The CAT questionnaire (**download from - www.catestonline.co.uk**)

The CAT questionnaire consists of eight horizontal bars, each representing a symptom. Each bar has a left and right statement with a 6-point scale (0-5) in between. A red bracket on the left side groups the first four bars under the label 'WET'.

Symptom	Left Statement	Scale (0-5)	Right Statement
WET	I never cough	0 1 2 3 4 5	I cough all the time
	I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is full of phlegm (mucus)
	My chest does not feel tight	0 1 2 3 4 5	My chest feels very tight
	When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless
Activity	I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home
	I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition
	I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition
	I have lots of energy	0 1 2 3 4 5	I have no energy at all

A symptom based approach – CAT

COPD Self Assessment Test

Score/40

- mild 0-10
- mod 10-15
- severe 15-25
- very severe 25-40

Basis on which to establish

- overall disability
- specific disabilities and
- response to treatments

CAT Score – patient data

WHEEZY

I never cough	0 1 2 3 4 5	I cough all the time	1
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	1
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	2
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	4
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	3
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	4
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	2
I have lots of energy	0 1 2 3 4 5	I have no energy at all	5
Scoring range 0-40		Total score	22

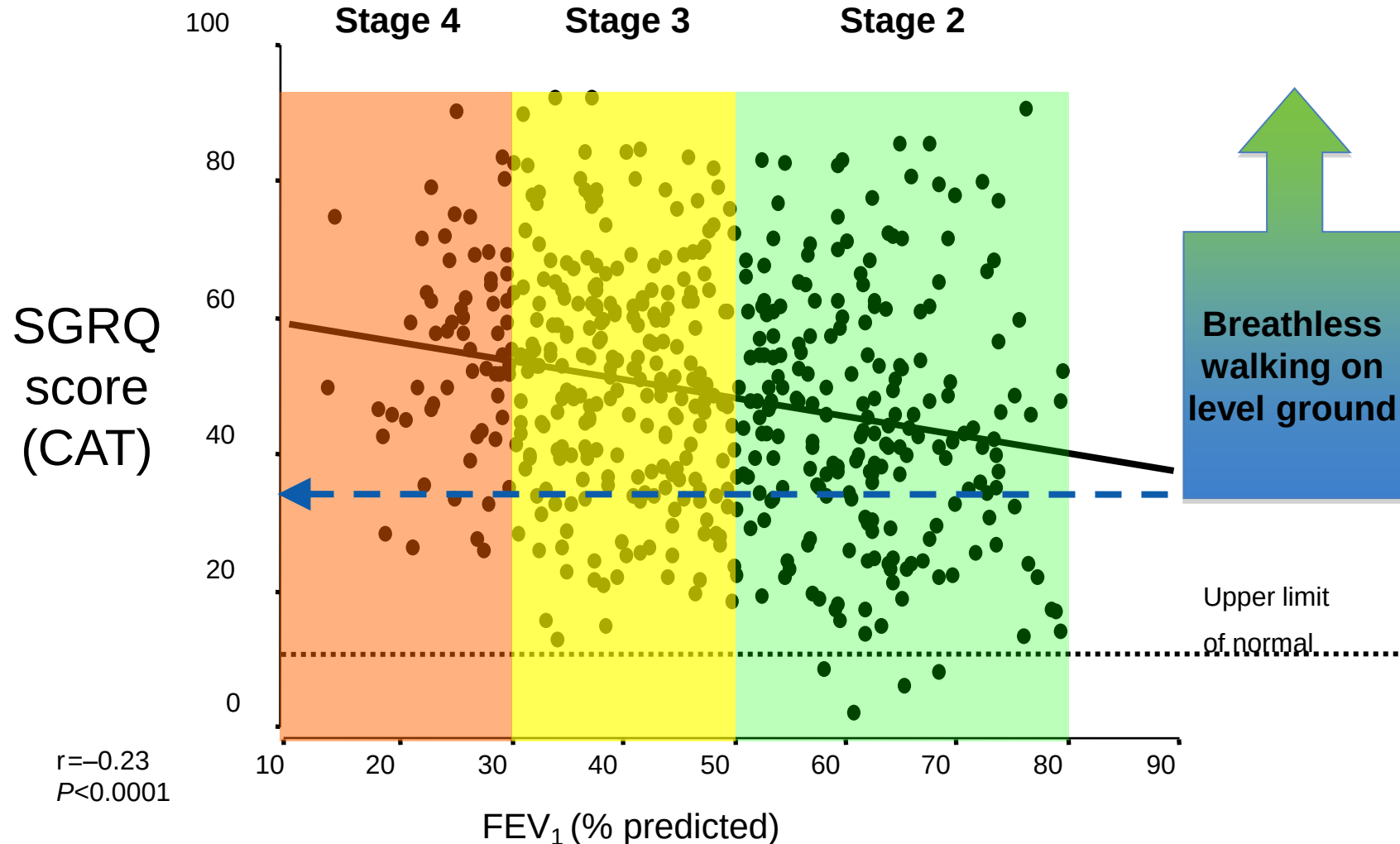
WEAK

CAT Score/40

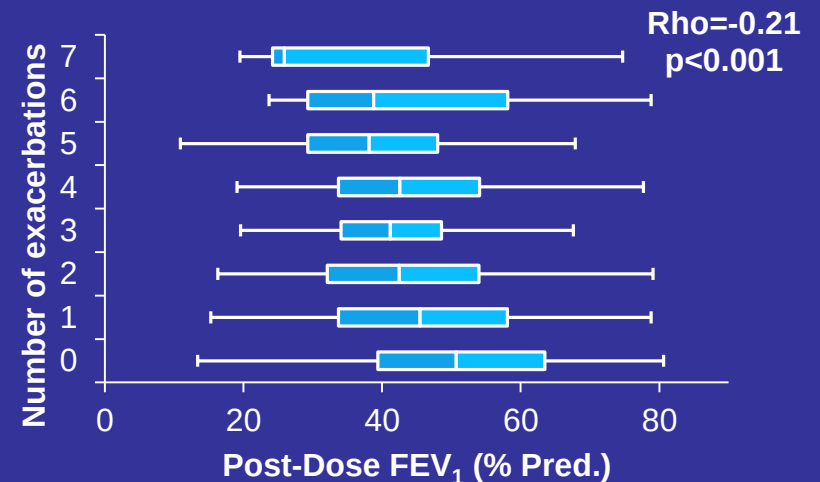
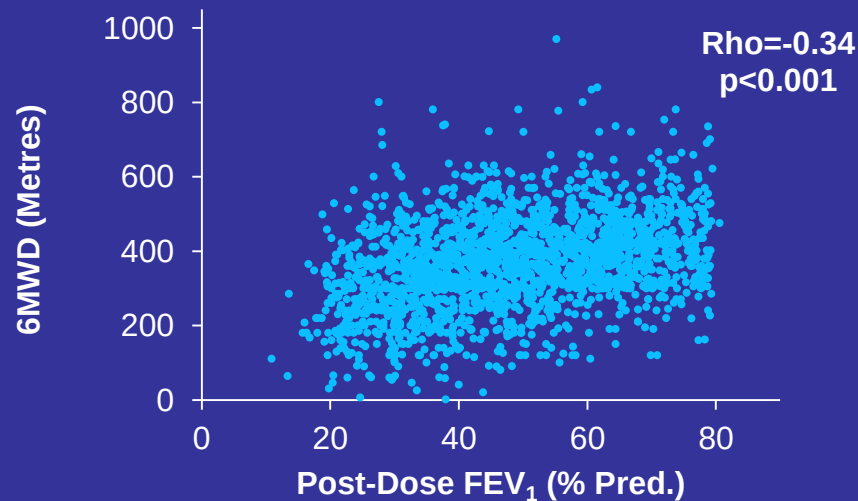
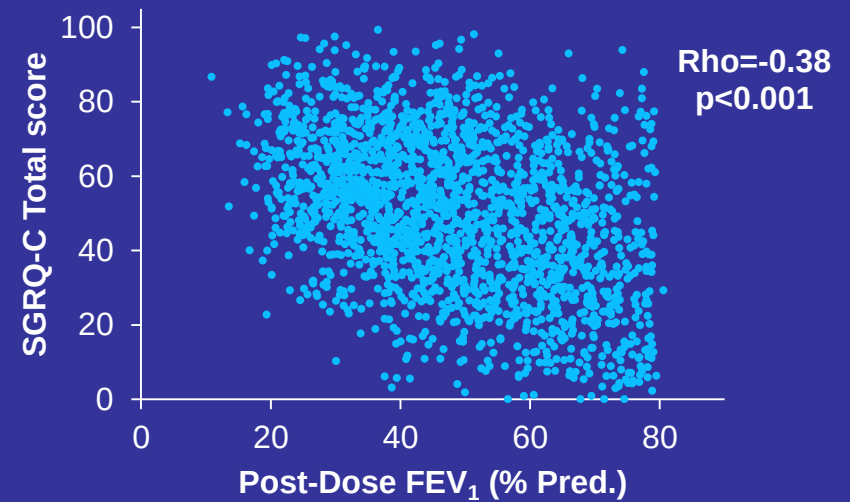
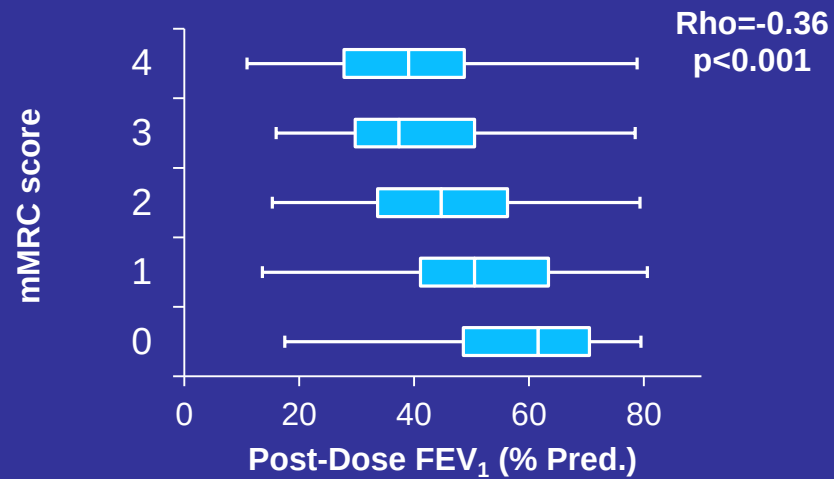
- mild 0-10
- mod 10-15
- severe 15-25
- very severe 25-40

Severe

No correlation between QOL and FEV₁ severity

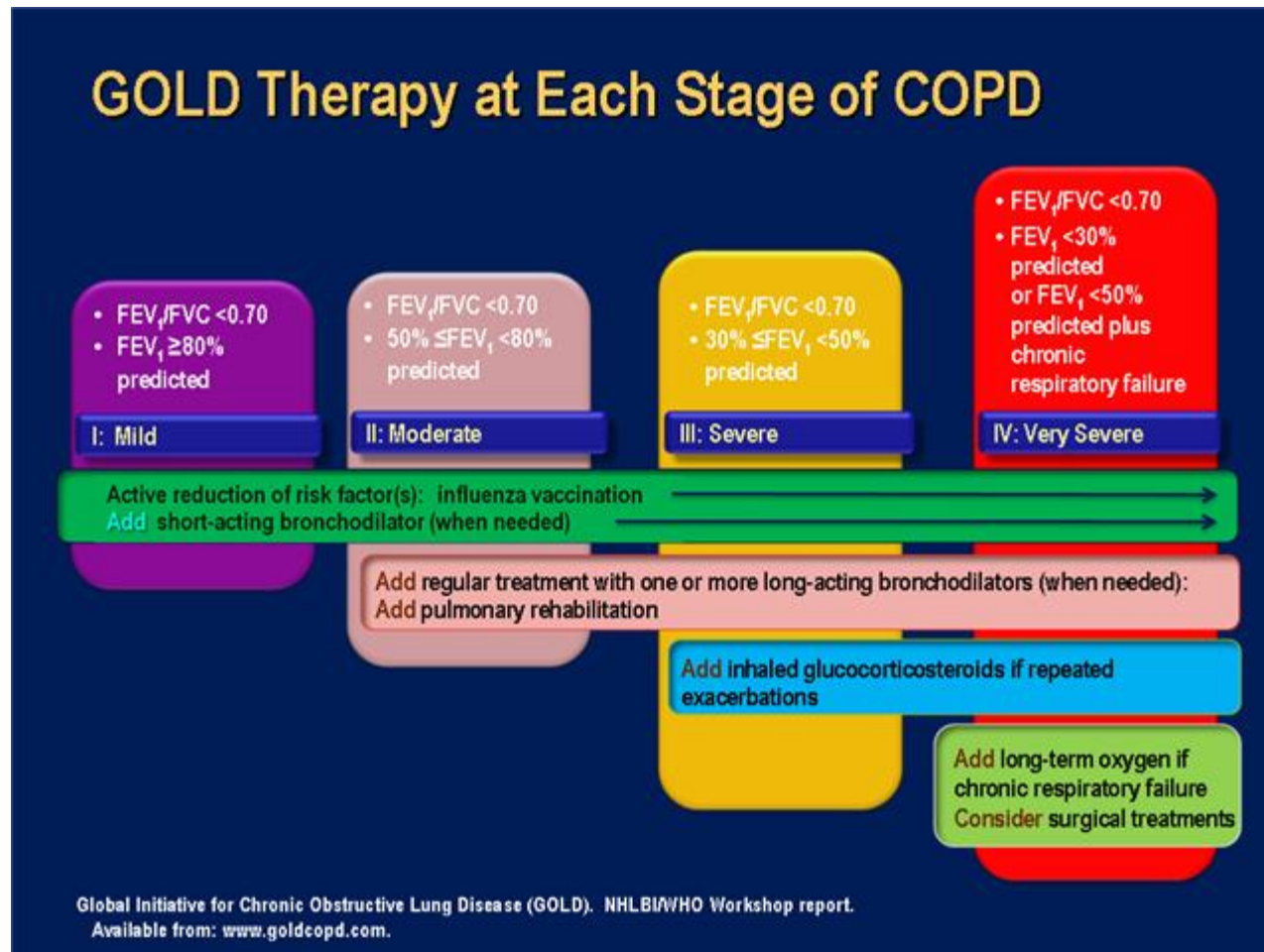


ECLIPSE showed weak correlation between disease outcome parameters & FEV₁



3. When to start long acting bronchodilators and when to add steroids

COPD Management – adding inhalers



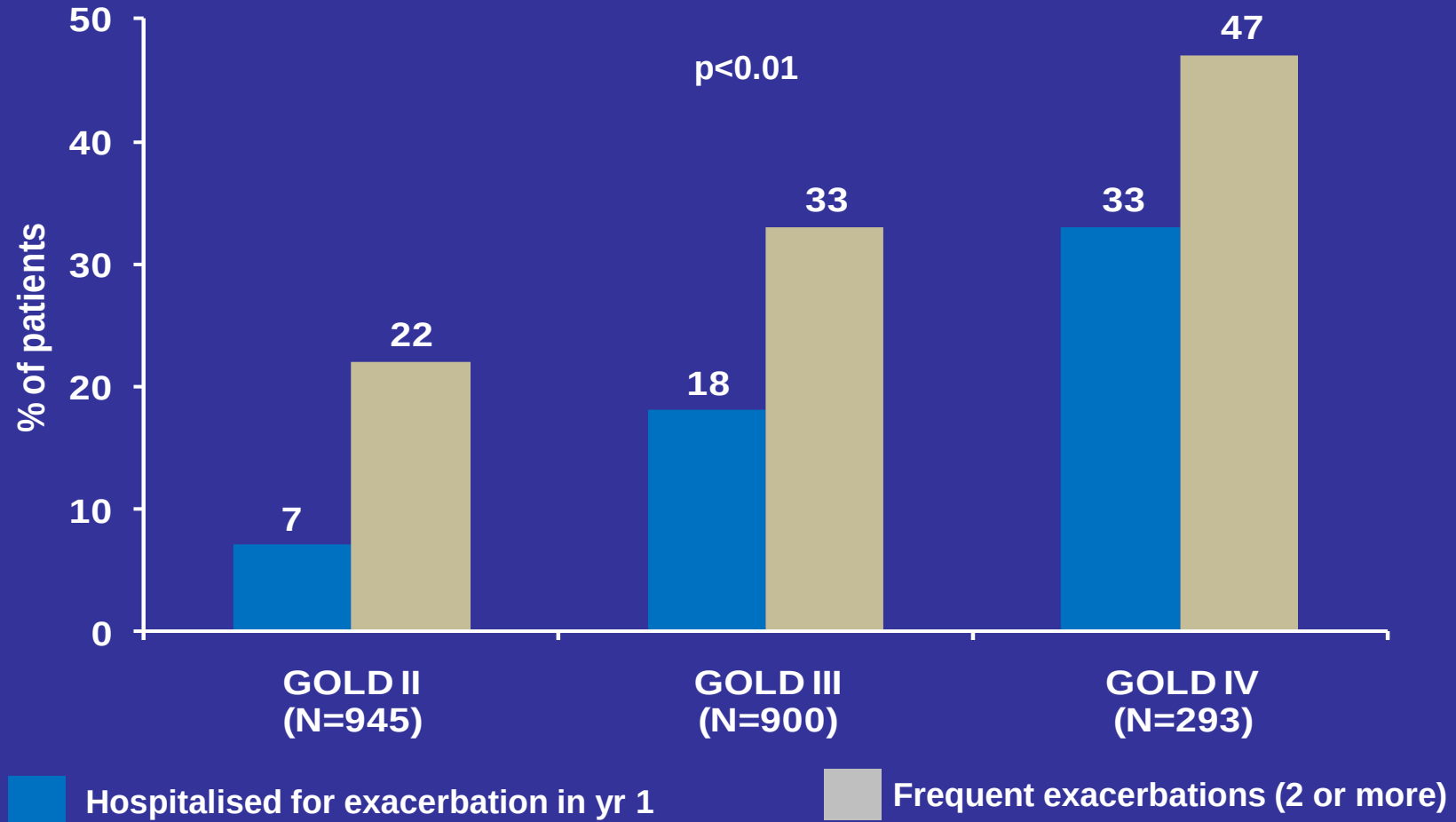
A symptom based approach

Eclipse study

- “Frequent exacerbator*” is a specific type of COPD that requires aggressive treatment with combination therapy (preferably fixed dose ICS and LABA)
- “Frequent exacerbators” may be found in those with moderate COPD (22%) and not just severe disease (30-50%).

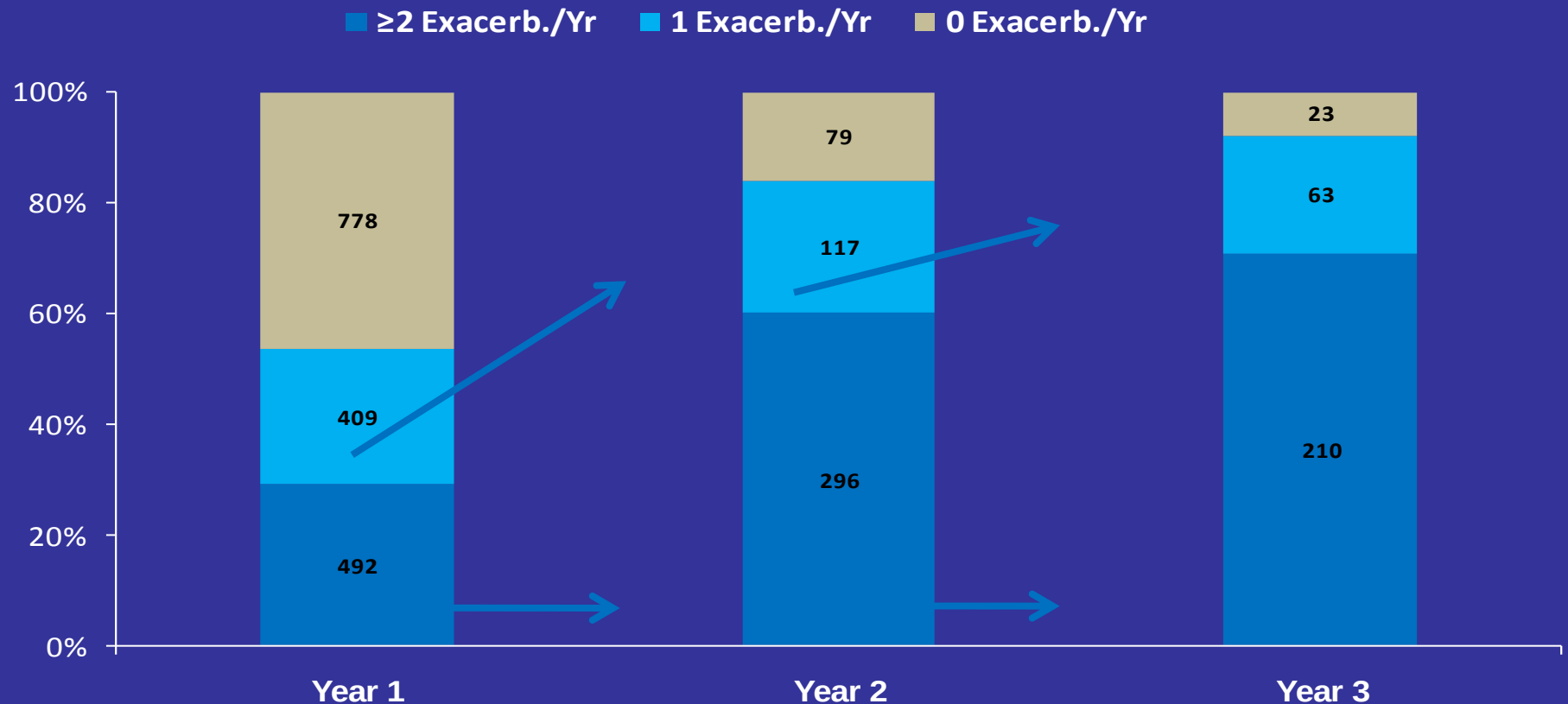
* 2+ exacerbations per year

The 'frequent exacerbator phenotype': Frequency/severity by GOLD Category (1)

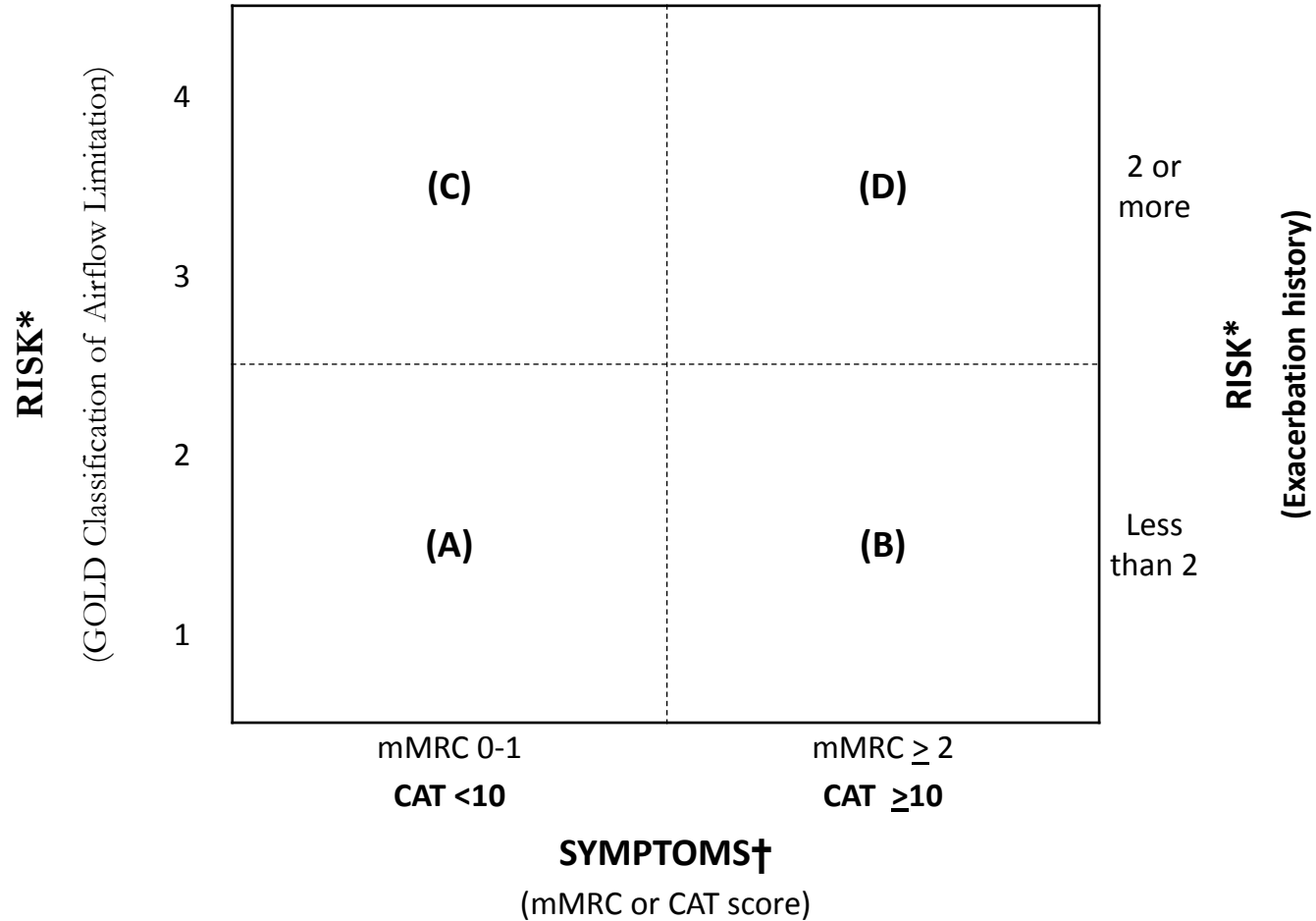


Frequent exacerbators represent stable COPD phenotype - independent of severity

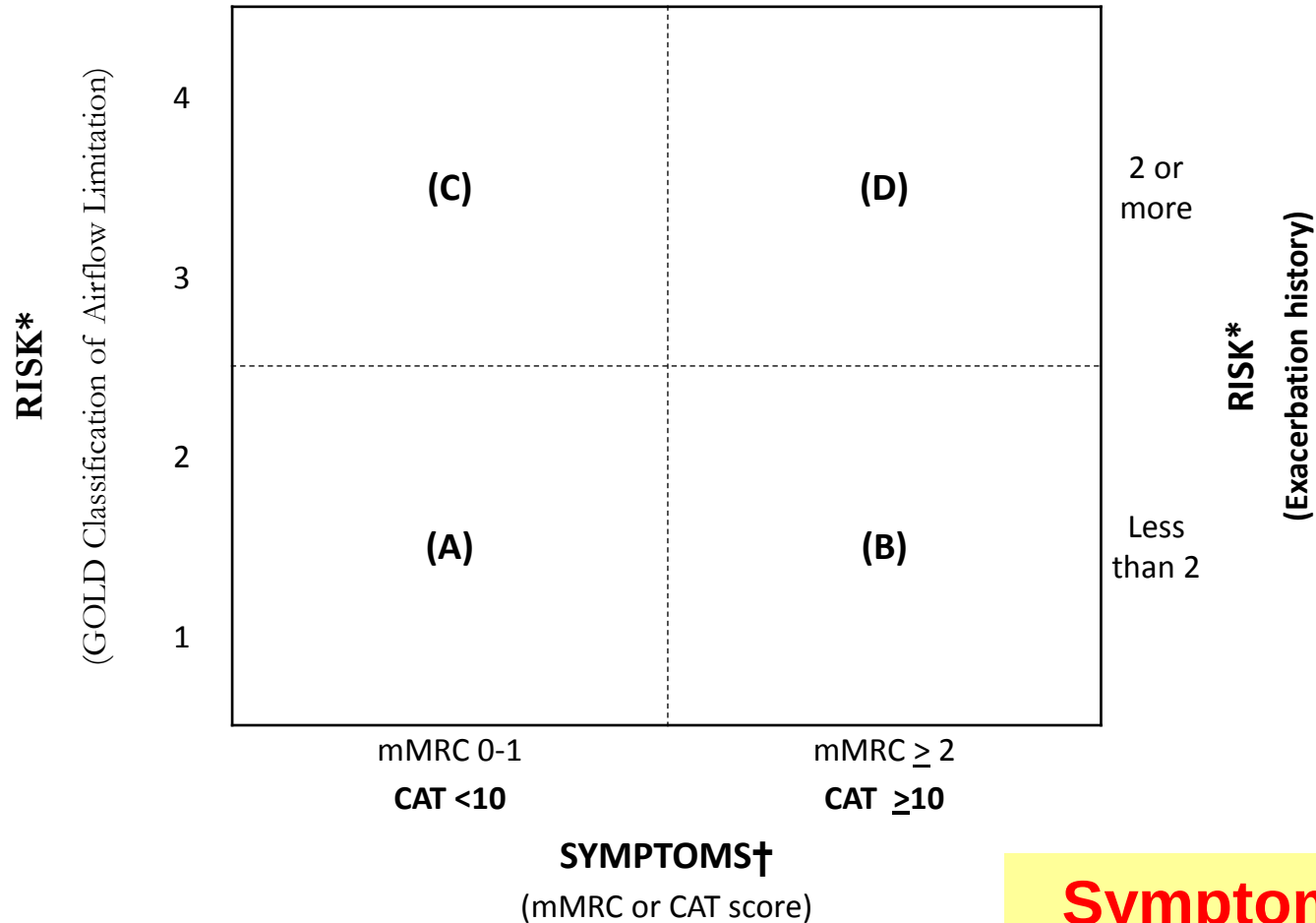
- Proportion of subjects experiencing ≥ 2 exacerbations/year increases year-on-year
- Stable population provides potential to understand the cause(s) of the phenotype



New GOLD patient groups

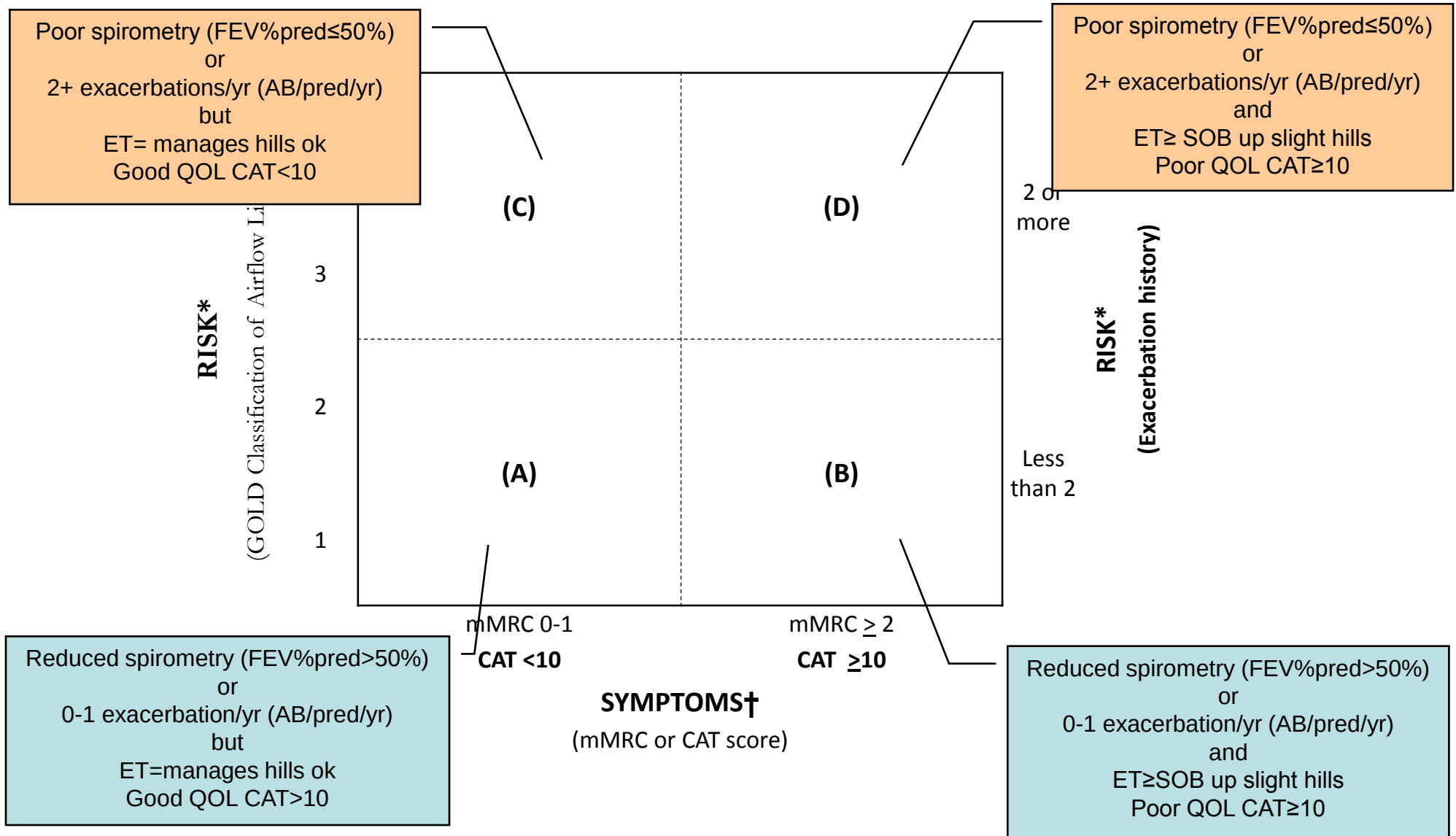


New GOLD patient groups

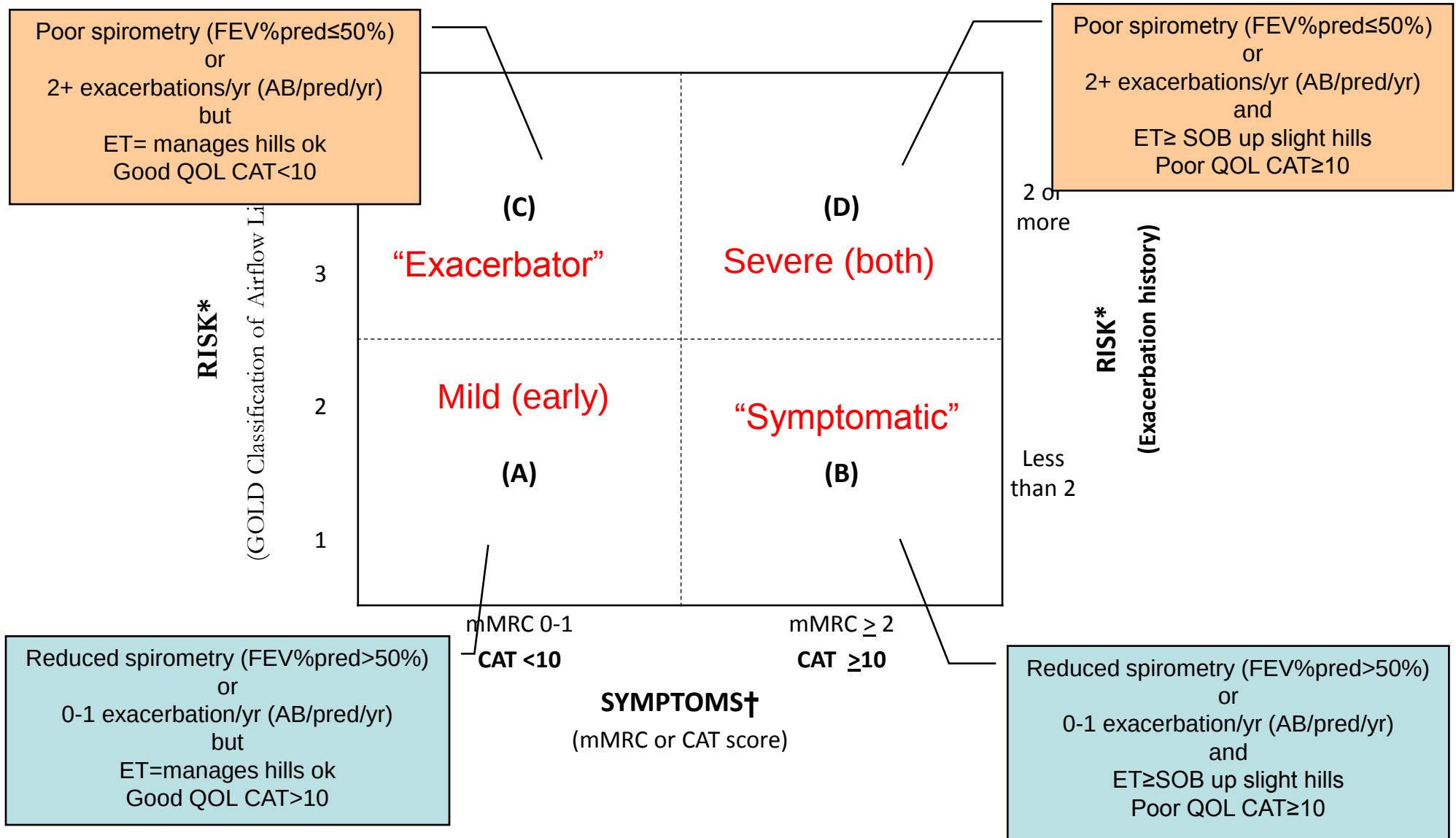


Symptoms and Risk

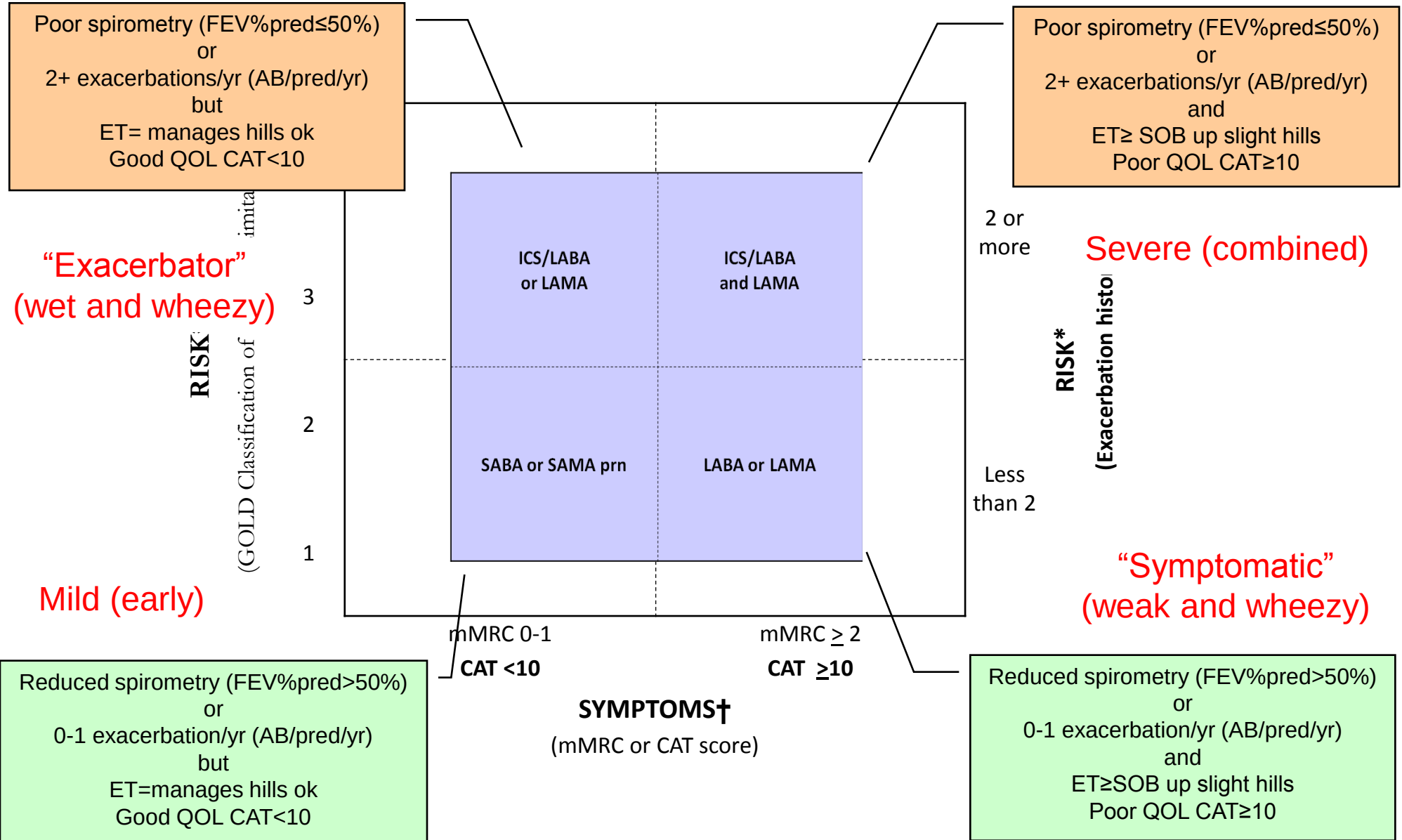
New GOLD-defined patient groups



New GOLD-defined patient groups



New GOLD-defined patient groups



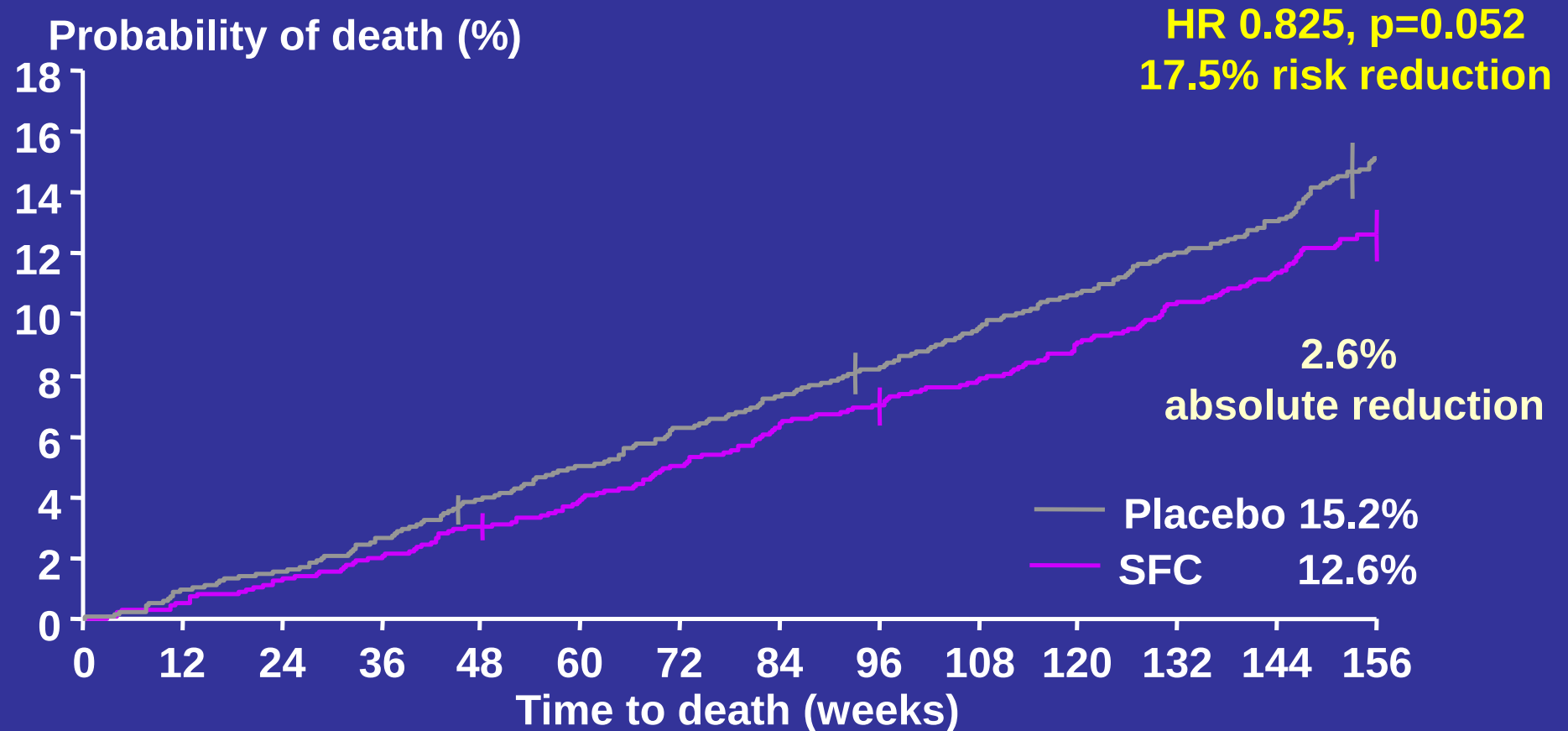
Summary table of new recommendations

Disease Severity	Phenotypic features	Treatment
A. Mild (early)	Low Sx score - mMRC 0-1, CAT<10 and Fair Spirometry - FEV ₁ GOLD 1-2, and Low exacerbation rate - 0-1/yr	SABA or SAMA (prn)
B. Moderate – symptomatic “Weak and Wheezy”	High Sx score - mMRC 2+, CAT≥10 and Fair Spirometry - FEV ₁ GOLD 1-2, or Low exacerbation rate - 0-1/yr	LABA or LAMA
C. Moderate – exacerbator “Wet and Wheezy”	Low Sx score - mMRC 0-1, CAT<10 and Poor Spirometry - FEV ₁ GOLD 3-4, or High exacerbation rate - 2+/yr	ICS/LABA or LAMA
D. Severe (advanced) “Wet, Weak and Wheezy”	High Sx score - mMRC 2+, CAT≥10 and Poor Spirometry - FEV ₁ GOLD 3-4, and High exacerbation rate - 2+/yr	ICS/LABA and LAMA
Exacerbation = symptoms of increased cough, SOB ± sputum that required a course of ABs ± prednisone Spirometry FEV ₁ /FVC<70% with FEV ₁ ≥ 50% predicted (GOLD1-2) or FEV ₁ <50% predicted (GOLD3-4)		

Summary table of new recommendations

Disease Severity	Phenotypic features	Treatment
A. Mild (early)	Low Sx score - mMRC 0-1, CAT<10 and Fair Spirometry - FEV ₁ GOLD 1-2, and Low exacerbation rate - 0-1/yr	SABA or SAMA (prn)
B. Moderate – symptomatic “Weak and Wheezy”	High Sx score Fair Spirometry Low exacerbation rate	Symptom score Expiratory flow Xacerbation rate
C. Moderate – exacerbator “Wet and Wheezy”	Low Sx score Poor Spirometry High exacerbation rate	
D. Severe (advanced) “Wet, Weak and Wheezy”	High Sx score Poor Spirometry High exacerbation rate - ≥ 2/yr	
Exacerbation = symptoms of increased cough, SOB ± sputum that required a course of ABs ± prednisone Spirometry FEV ₁ /FVC<70% with FEV ₁ ≥ 50% predicted (GOLD1-2) or FEV ₁ <50% predicted (GOLD3-4)		

Primary analysis: all-cause mortality at 3 years



Number alive
1524
1533

1464
1487

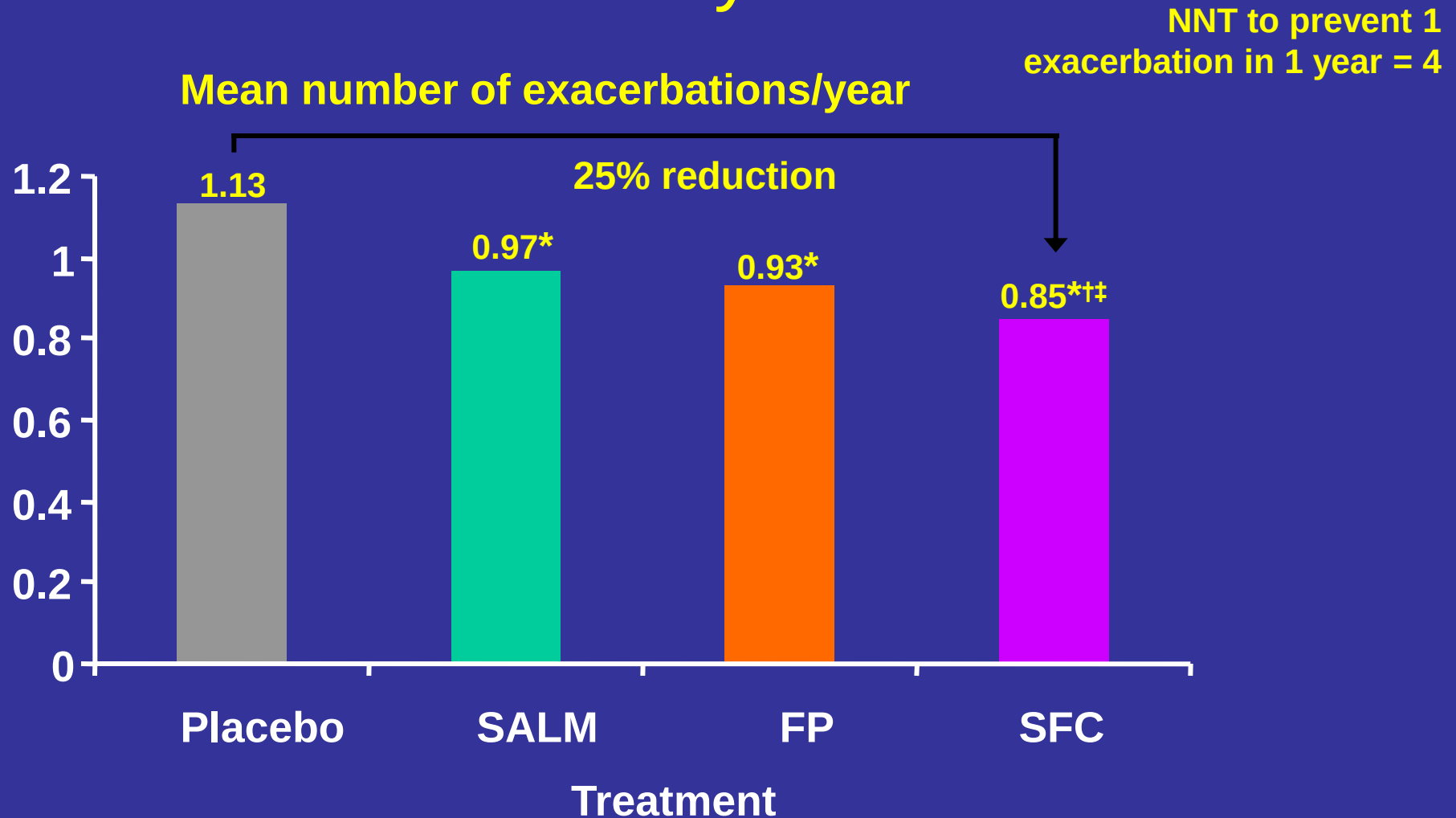
1399
1426

1293
1339

Vertical bars are standard errors

Calverley et al. NEJM 2007

Rate of moderate and severe exacerbations over three years

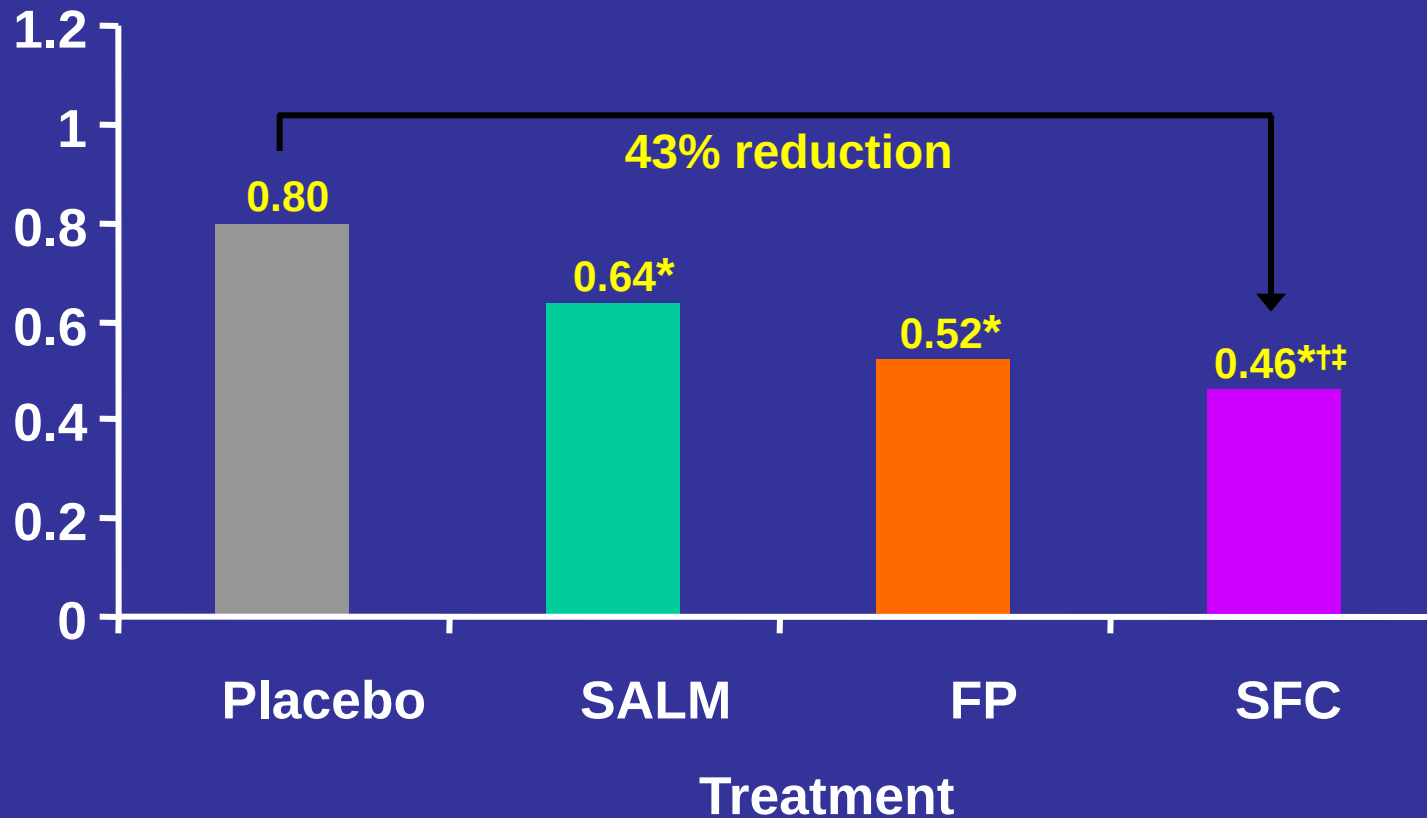


Calverley *et al.* NEJM 2007

* $p < 0.001$ vs placebo; † $p = 0.002$ vs SALM; ‡ $p = 0.024$ vs FP

Rate of exacerbations requiring systemic corticosteroids over three years

Mean number of exacerbations/year



*p < 0.001 vs placebo; †p < 0.001 vs SALM; ‡p = 0.017 vs FP

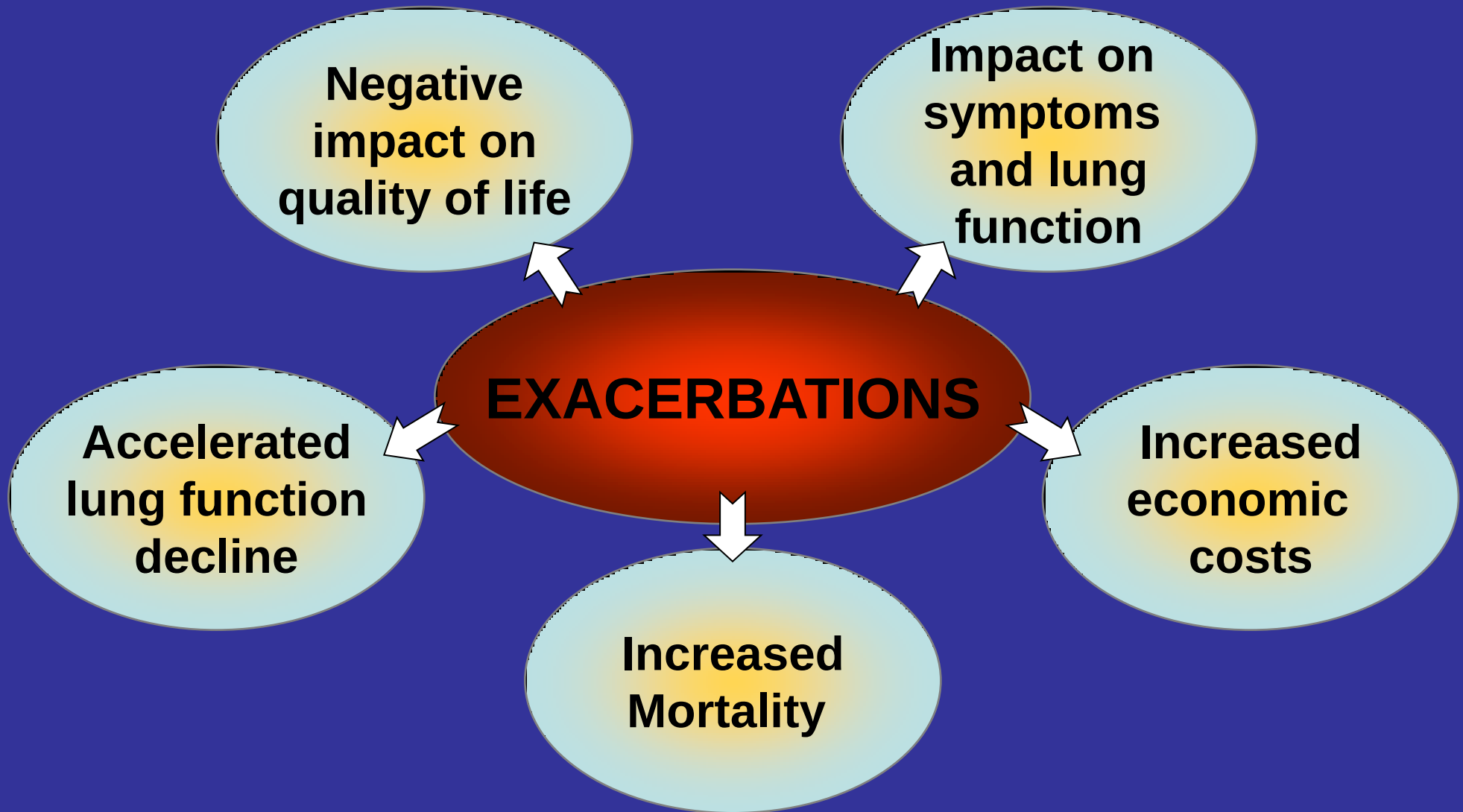
Calverley *et al.* NEJM 2007

TORCH: Results summary

SFC 50/500, in COPD patients with $FEV_1 < 60\%$ predicted

- Had a trend towards improved survival vs placebo
- Significantly maintains and improves health status vs placebo and components
- Significantly reduces the rate of exacerbations vs placebo and components
- Significantly improves lung function vs placebo and components
- Is generally well tolerated over 3 years with a lack of significant effect on systemic effects of steroids such as bone and eye disorders in COPD patients
- Led to increase in cases of pneumonia, but with no corresponding increase in mortality with SFC treatment

Consequences of COPD exacerbations



COPD Phenotypes and treatment

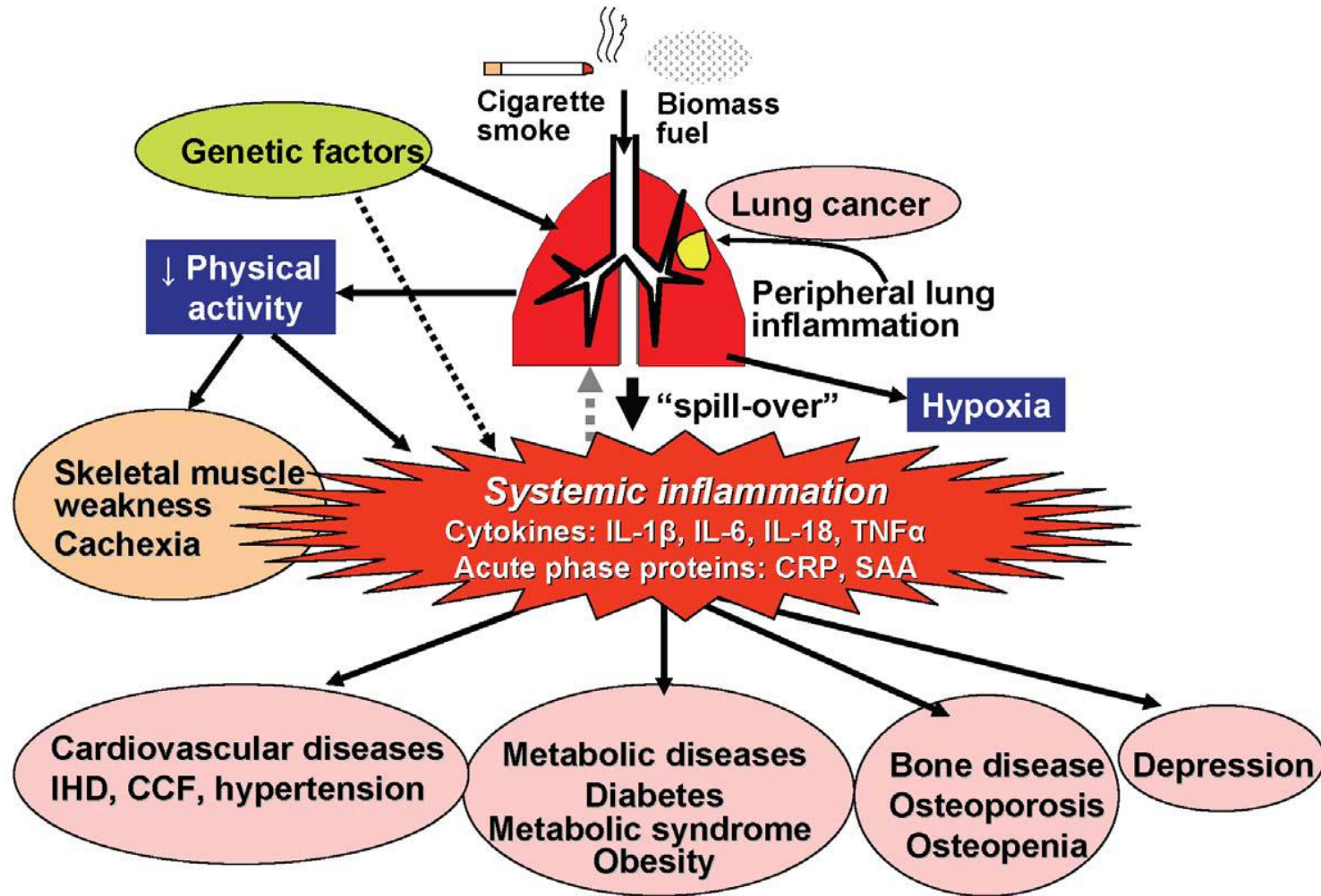
- Mild disease ($FEV1\%pred > 50\%$) - few Sx (SABA/SAMA)
- Mild disease ($FEV1\%pred > 50\%$) - persisting Sx (LABA or LAMA) or 2+ exacerbations/yr (ICS/LABA)
- Mod-Sev disease ($FEV1\%pred \leq 50\%$) - few Sx (ICS/LABA or LAMA)
- Mod-Sev disease ($FEV1\%pred \leq 50\%$) - persisting Sx (ICS/LABA and LAMA) and 2+ exacerbations/yr (ICS/LABA and LAMA)

When to add the steroids

- ICS are needed when patients suffer recurrent exacerbations characterised by productive cough and SOB.
- ICS with LABA are superior to ICS alone and shown to improve lung function, quality of life and survival as do LAMA (TORCH/UPLIFT study).
- Oral steroids for 3-10 days are useful for exacerbations characterised by SOB with productive cough.

4. COPD - Beyond the airways

COPD - Beyond the airways



Beyond the airways

- Muscle fatigue, muscle weakness and cachexia (pulmonary rehab and optimised nutrition)
- Cardiovascular disease, stroke, CHF, pulmonary hypertension (aspirin, statin and β -blockers)
- Insulin resistance, metabolic syndrome, obesity (exercise, calorie restriction, weight loss)
- Osteoporosis (bisphosphonates)

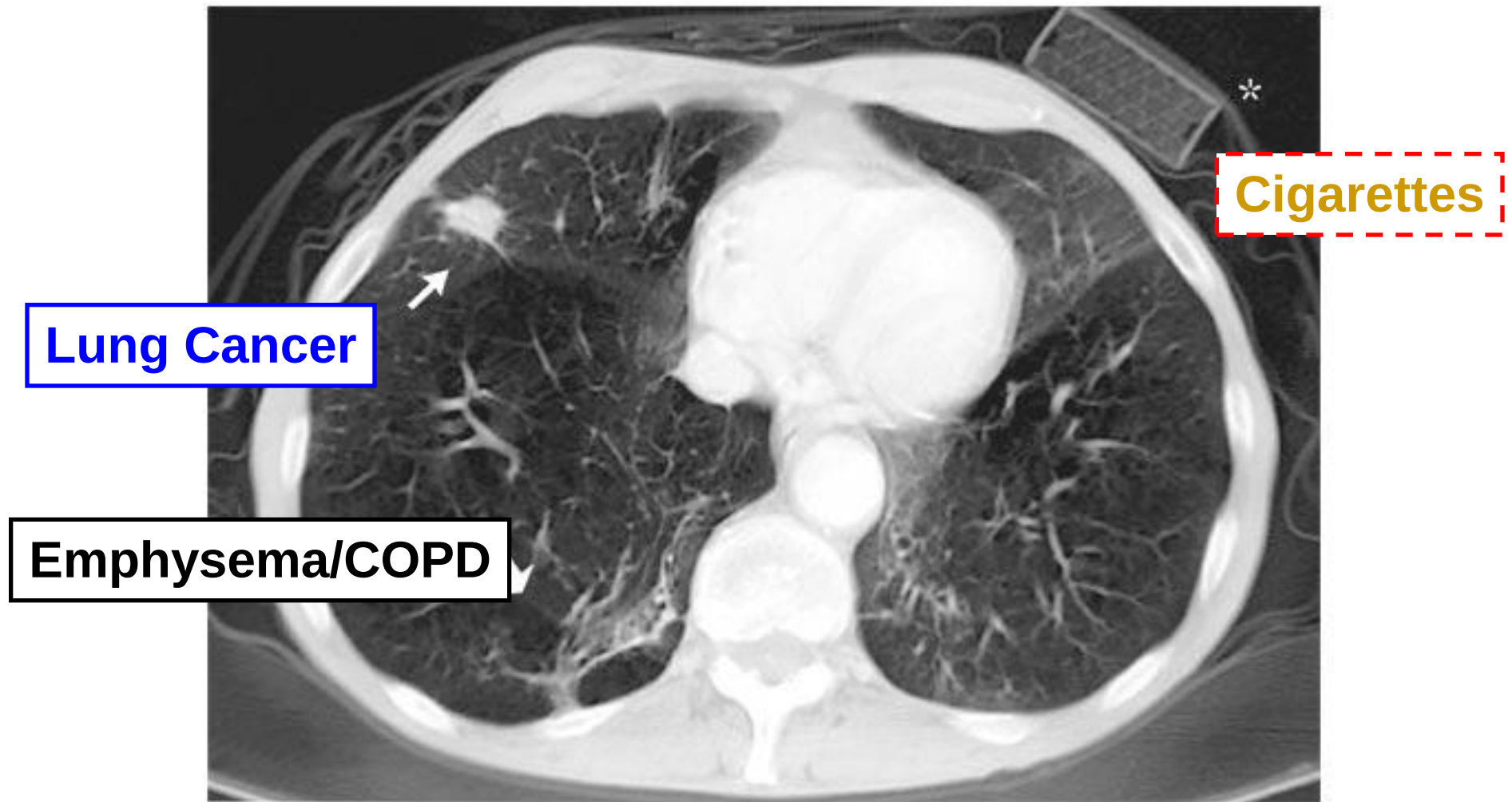
Beyond the airways

- Future treatments will look to reduce [dynamic] hyperinflation measured as IC/TLC ratio rather than to use FEV_1 as a measure of outcome.
- Recent studies suggest that statins reduce hyperinflation by reducing inflammation, improving endothelial function and dilating small airways (clinical trial underway).
- Role of cardiovascular drugs in reducing CVS risk during COPD exacerbations

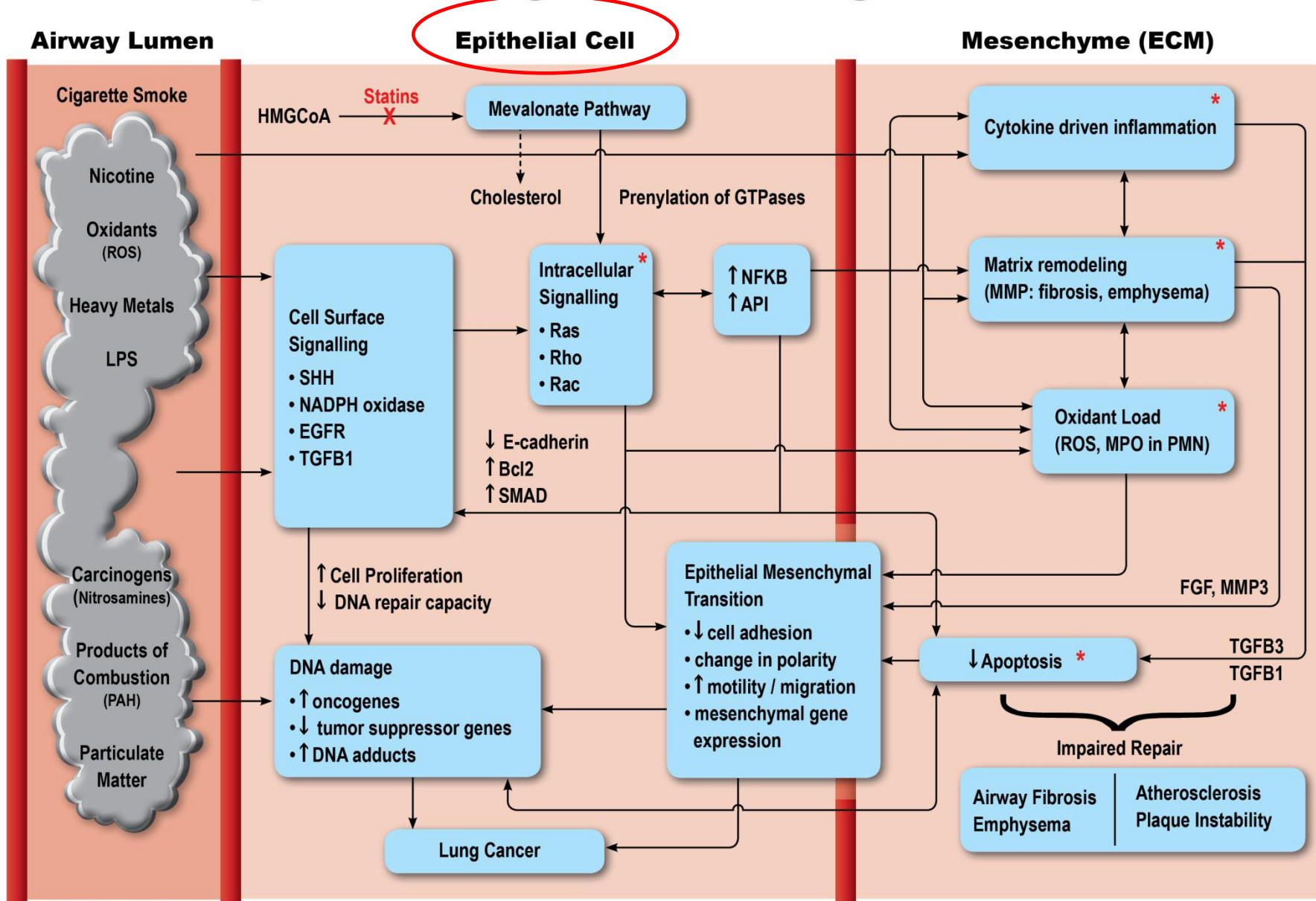
COPD and lung cancer

- COPD increases the risk of lung cancer by 4-6 fold compared to smokers with normal lung function.
- 70-80% of lung cancer has pre-existing COPD
- 20-30% of deaths in COPD are from lung cancer

COPD overlap with lung cancer



Proposed Pathogenesis of Lung Cancer

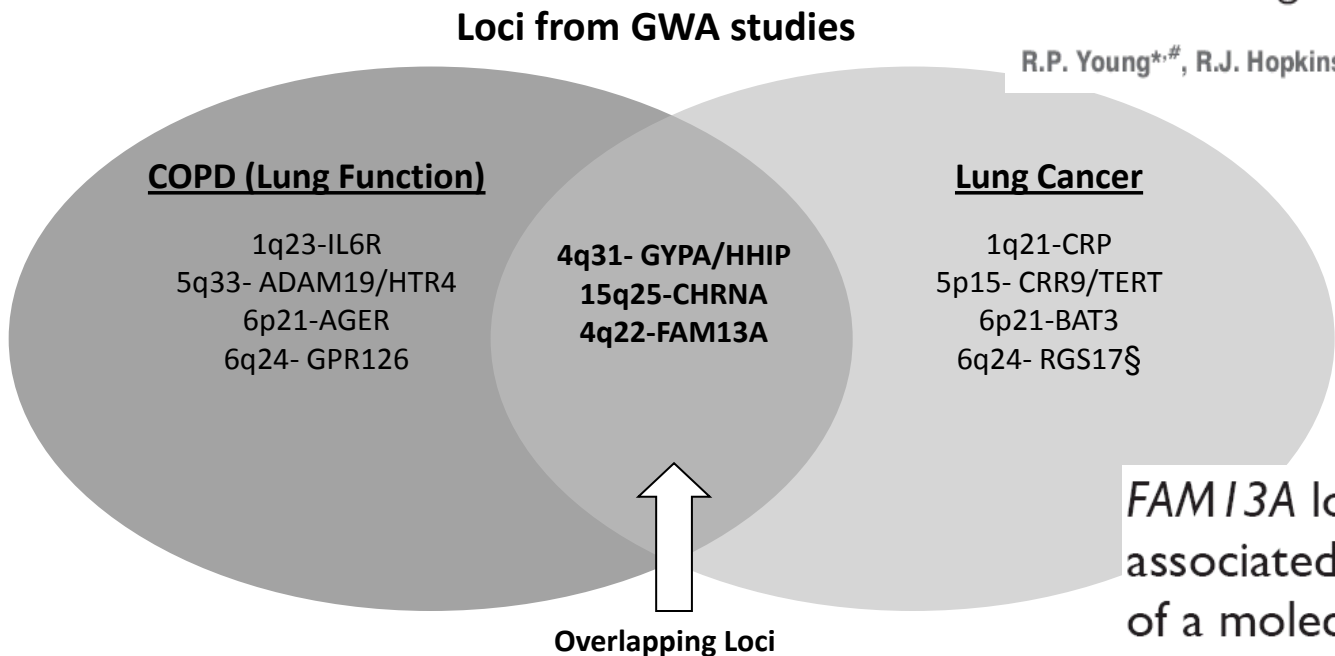


Young RP, et al. (European Respiratory Review 2009)

COPD-Lung Cancer Genetic overlap

Lung cancer gene associated with COPD: triple whammy or possible confounding effect? 2008

R.P. Young^{*,#}, R.J. Hopkins^{*}, B.A. Hay^{*}, M.J. Epton[†], P.N. Black^{*} and G.D. Gamble^{*}



FAM13A locus in COPD is independently associated with lung cancer – evidence of a molecular genetic link between COPD and lung cancer

2011

This article was published in the following Dove Press journal:
The Application of Clinical Genetics
21 December 2010
Number of times this article has been viewed

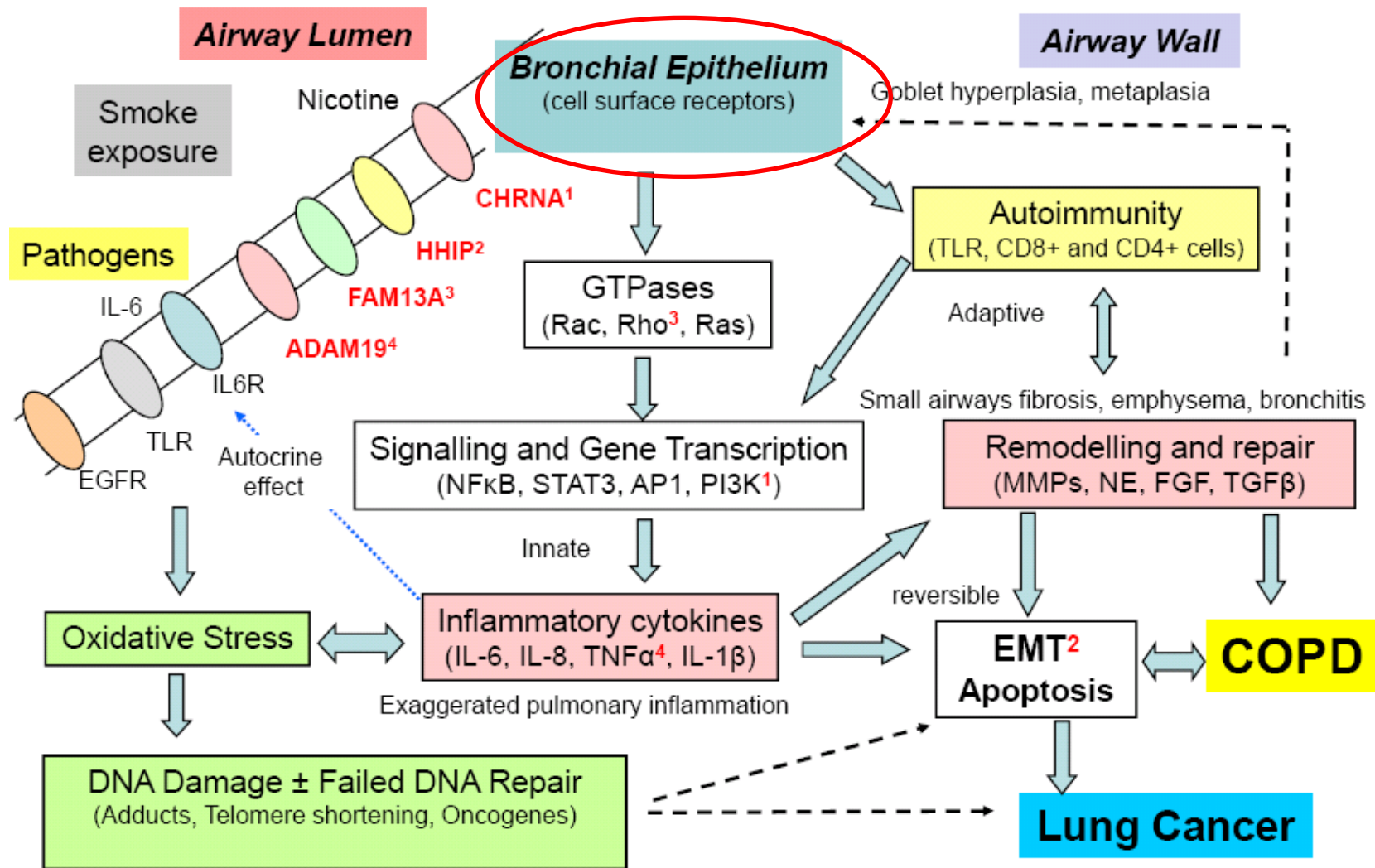
R.P. Young^{*,#}, C.F. Whittington^{*}, R.J. Hopkins^{*}, B.A. Hay^{*}, M.J. Epton[†], P.N. Black^{*,†} and G.D. Gamble^{*}

2010

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Michael J Epton²
Gregory D Gamble¹

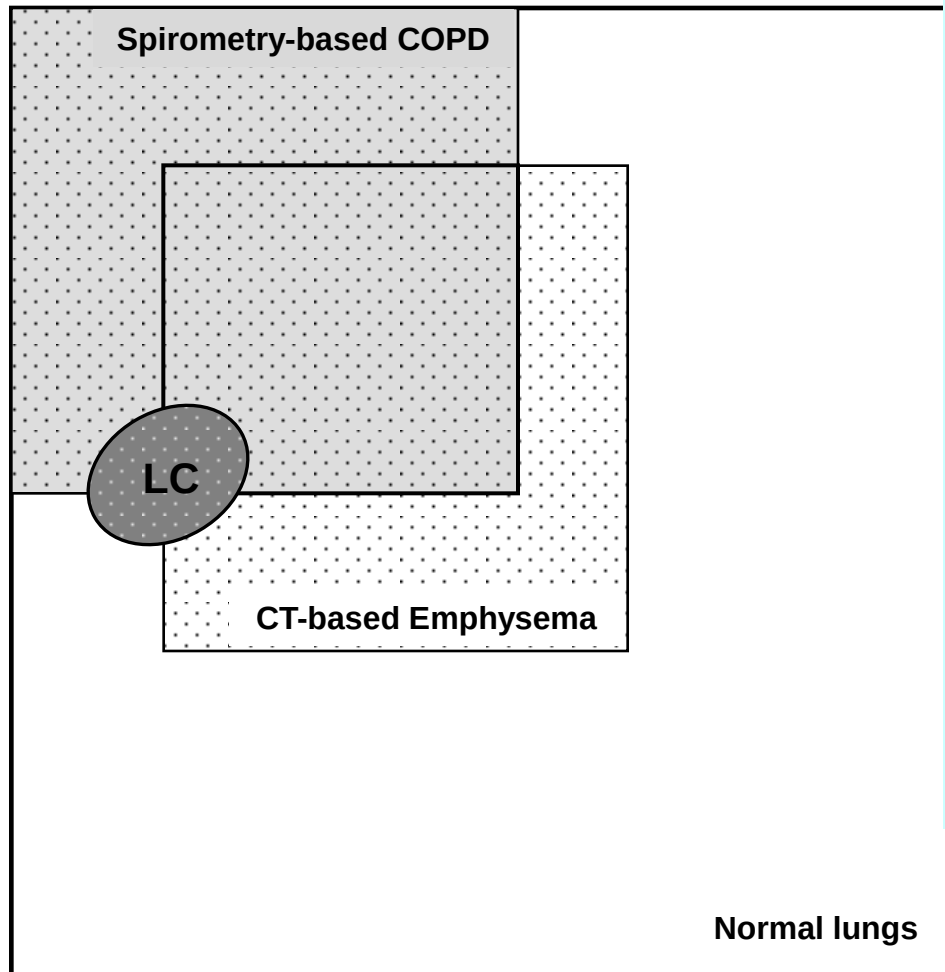
Abstract: Recent genome-wide association studies have reported chromosome 4q22.1 is associated with lung function and COPD. In a case-control study of current or former smokers with chronic disease (COPD, n = 458), lung cancer (n = 454), or normal lung function and smoking history were comparable between groups. We found (rs7671167) confers a protective effect on smoking-related COPD (OR = 0.70, P = 0.013, and CC genotype OR = 0.71, P = 0.024).

COPD and lung cancer overlap: Underlying biology?



COPD and lung cancer

Current and former smokers recruited for CT screening
of lung cancer and CT detected lung cancer (LC)



70% of all lung cancer
from people with COPD

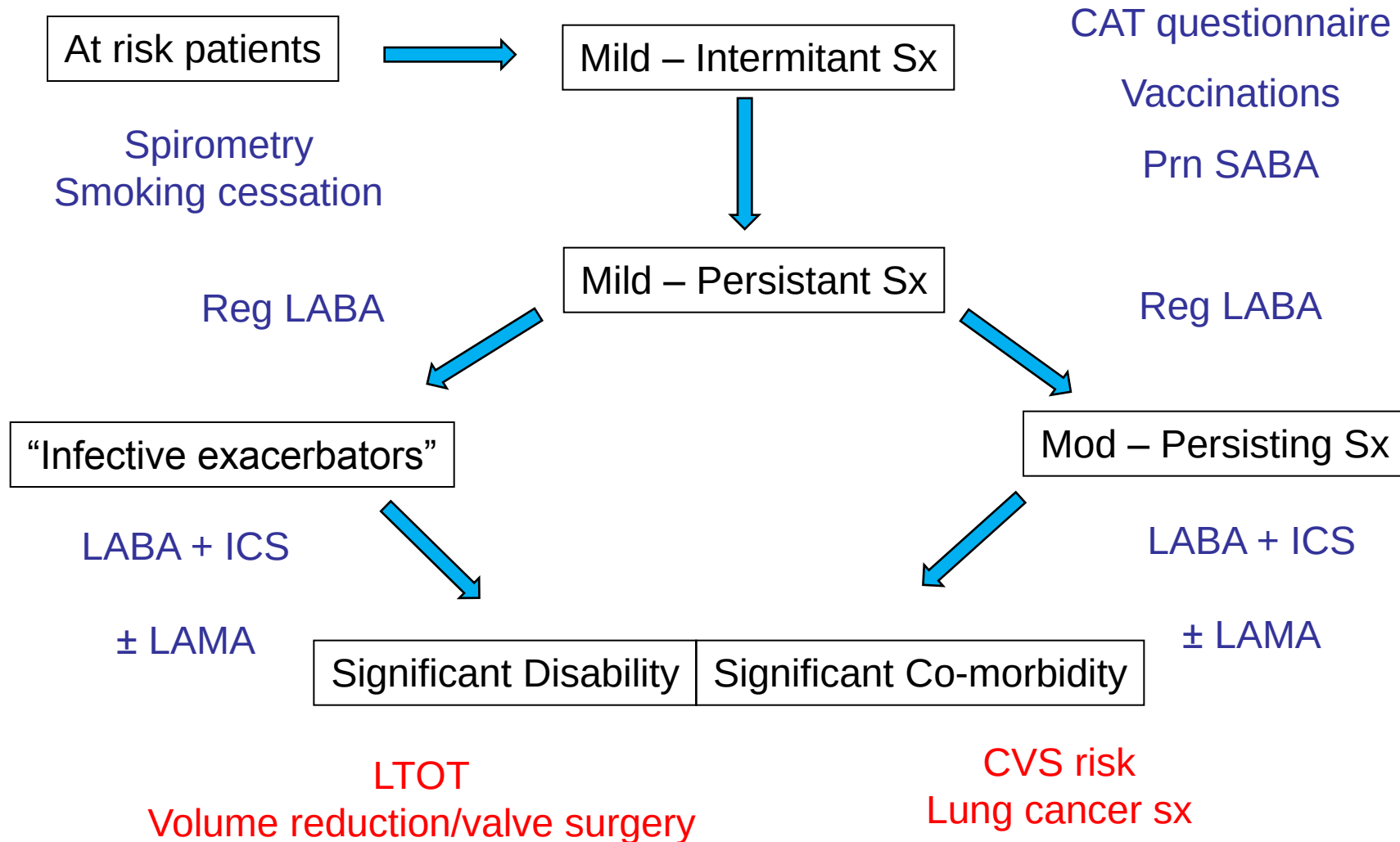
90% of all lung cancer
from COPD $\pm$ emphysema

Diagnosis of lung cancer delayed

- Sx appear like COPD
- CT delayed (CXR poor for early stage)

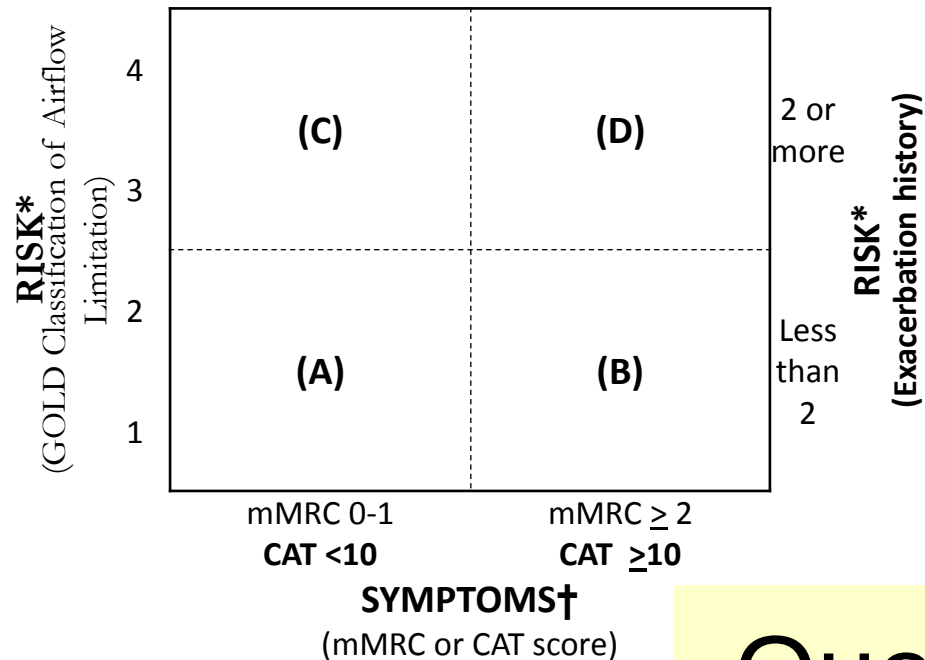
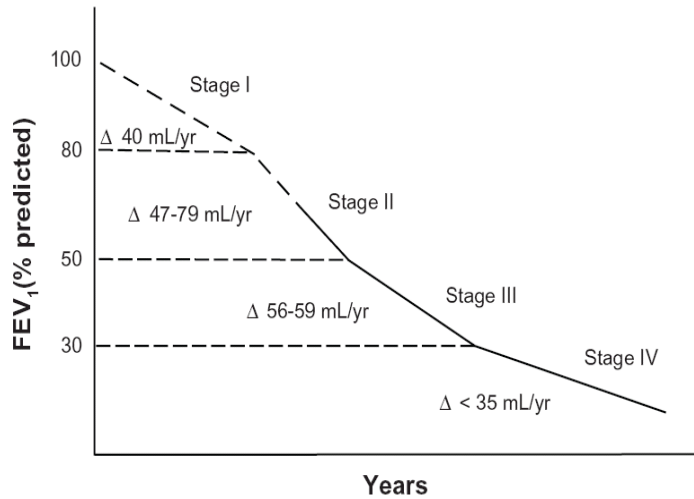
Management of COPD - Summary

Management of COPD - summary



Summary table of new recommendations

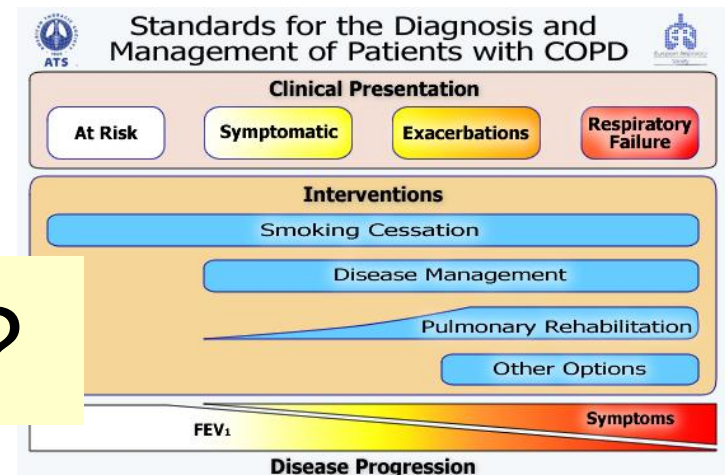
Disease Severity		Phenotypic features	Treatment
A. Mild (early)	S E X	Low Sx score - mMRC 0-1, CAT<10 and Fair Spirometry - FEV ₁ GOLD 1-2, and Low exacerbation rate - 0-1/yr	SABA or SAMA (prn)
B. Moderate – symptomatic “Weak and Wheezy”	S E X	High Sx score - mMRC 2+, CAT≥10 and Fair Spirometry - FEV ₁ GOLD 1-2, or Low exacerbation rate - 0-1/yr	LABA or LAMA
C. Moderate – exacerbator “Wet and Wheezy”	S E X	Low Sx score - mMRC 0-1, CAT<10 and Poor Spirometry - FEV ₁ GOLD 3-4, or High exacerbation rate - 2+/yr	ICS/LABA or LAMA
D. Severe (advanced) “Wet, Weak and Wheezy”	S E X	High Sx score - mMRC 2+, CAT≥10 and Poor Spirometry - FEV ₁ GOLD 3-4, and High exacerbation rate - 2+/yr	ICS/LABA and LAMA
Exacerbation = symptoms of increased cough, SOB ± sputum that required a course of ABs ± prednisone Spirometry FEV ₁ /FVC<70% with FEV ₁ ≥ 50% predicted (GOLD1-2) or FEV ₁ <50% predicted (GOLD3-4)			



I never cough	0 1 2 3 4 5	I cough all the time	1
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	1
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	2
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	4
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	3
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	4
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	2
I have lots of energy	0 1 2 3 4 5	I have no energy at all	5

Scoring range 0-40

Total score 22



Questions?

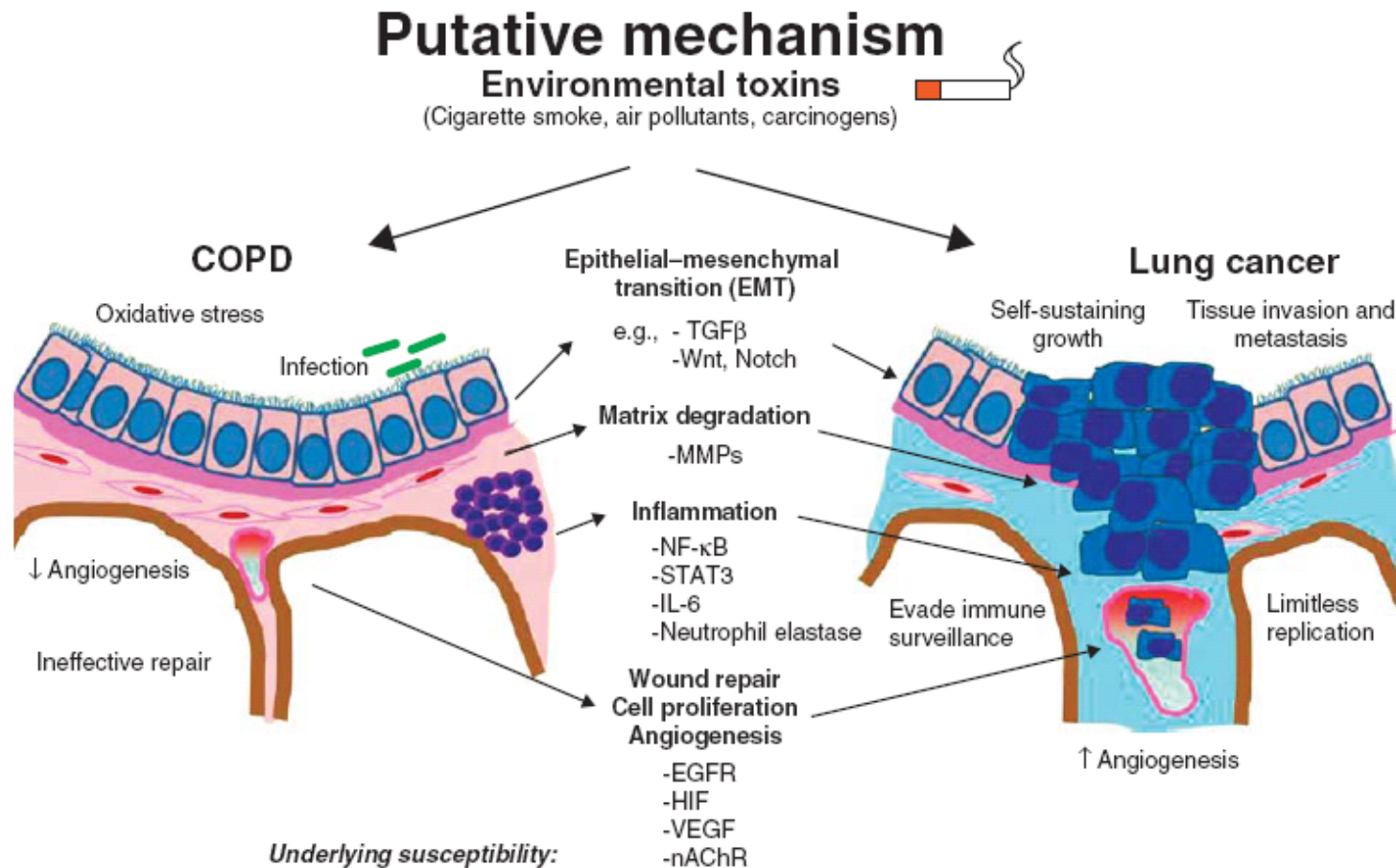
5. Management options in the future

Common pathogenic mechanisms and pathways in the development of COPD and lung cancer

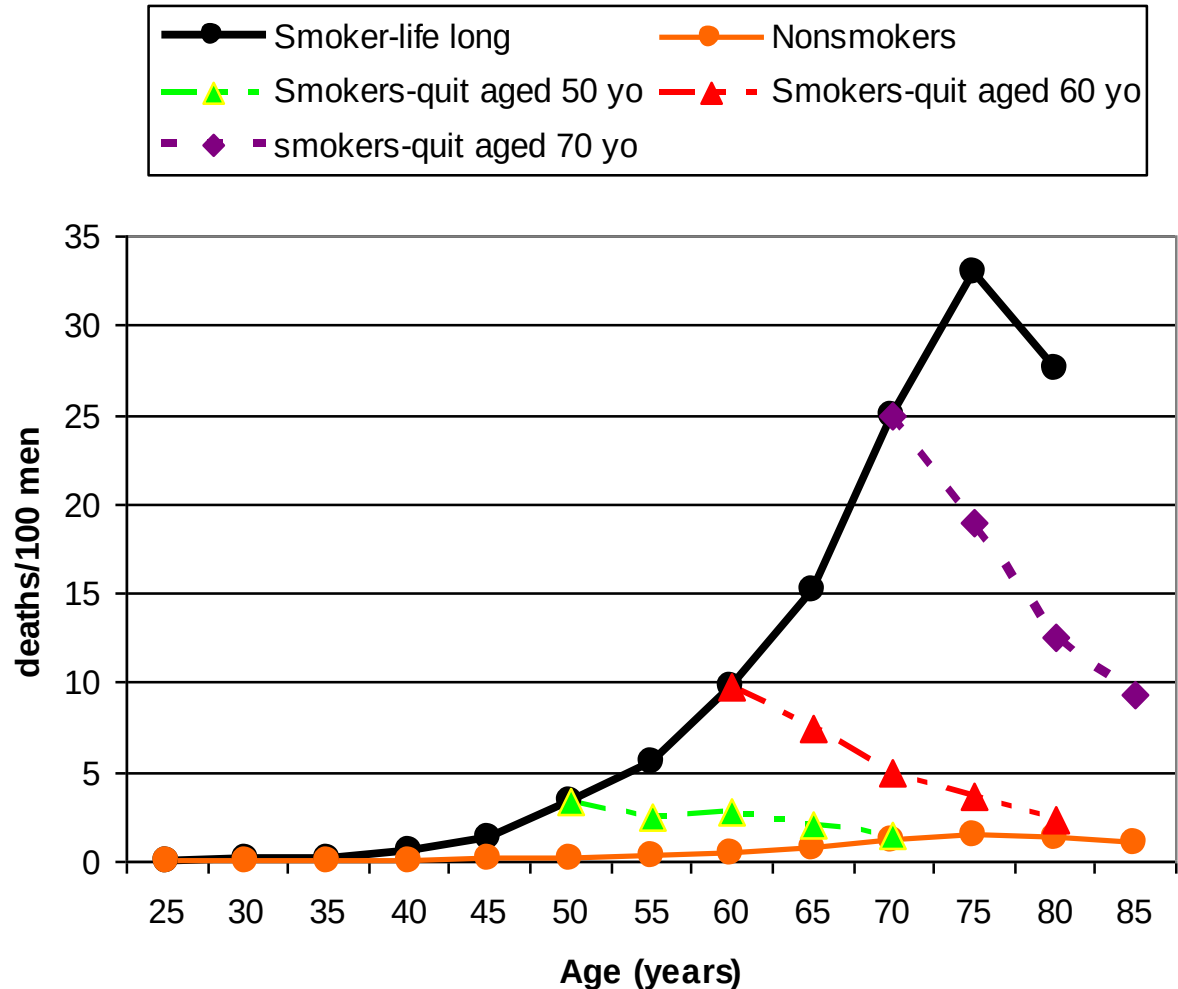
2011 Exp Opin Ther Targets
Yang IA, et al.

Ian A Yang[†], Vandana Relan, Casey M Wright, Morgan R Davidson,

Common pathogenic mechanisms and pathways in the development of COPD and lung cancer



10 year mortality for lung cancer by smoking status



Lung cancer risk and clinical utility

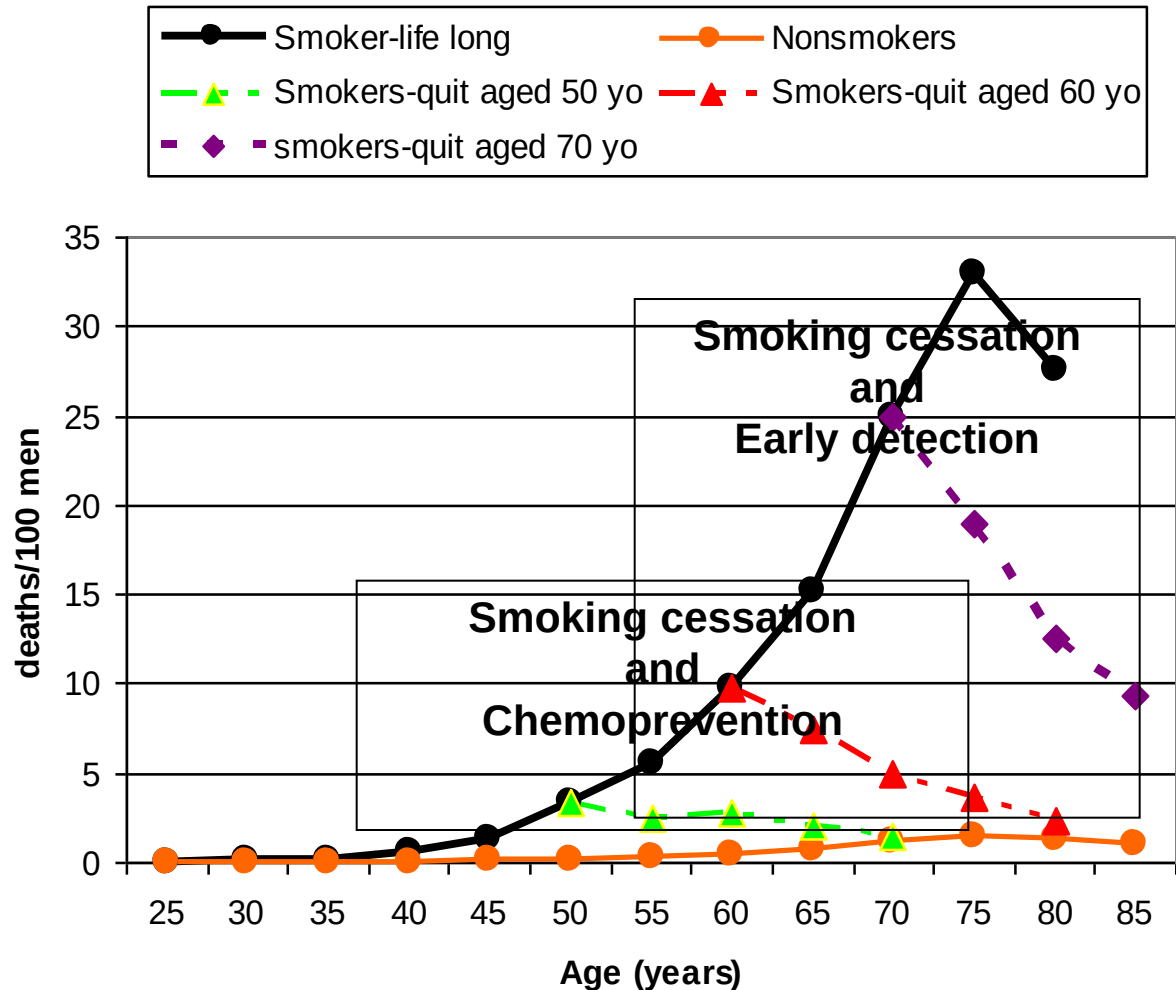
Prevention:
Smoking cessation

Early Detection:
Pre-malignant, imaging

Chemoprevention:
NSAID, Iloprost, Statins

**Optimised by gene
based risk tools**

10 year mortality for lung cancer by smoking status



Lung cancer risk and clinical utility

Prevention:
Smoking cessation

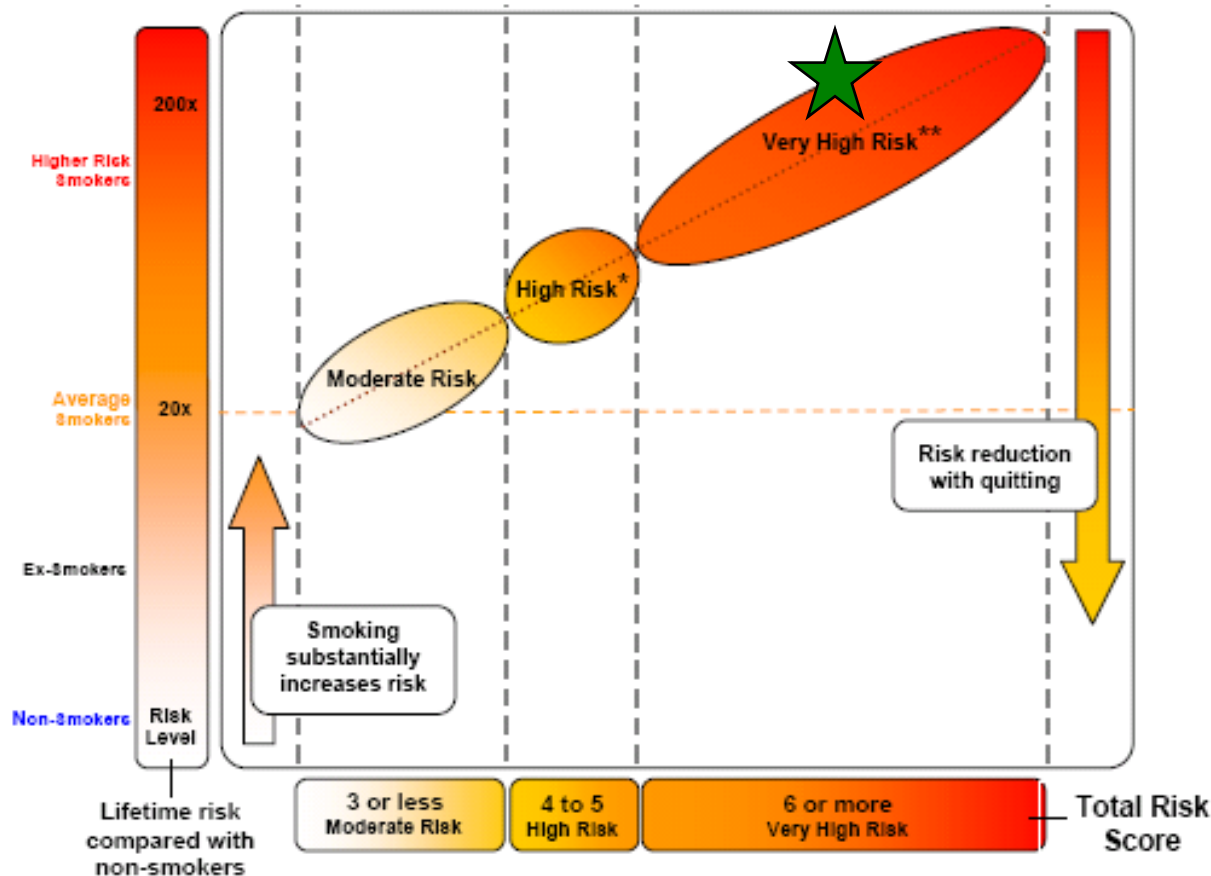
Early Detection:
Pre-malignant, imaging

Chemoprevention:
NSAID, Iloprost, Statins

Optimised by gene based risk tools

Lung cancer susceptibility score:

Lung cancer risk score: **Very High Risk** (6 or more)



* High Risk = 4 x the Average Smokers' Risk

** Very High Risk = 10 x the Average Smokers' Risk

In addition to smoking, the risk of lung cancer is further increased by

- ♦ genetic factors
- ♦ how much you smoked
- ♦ age
- ♦ COPD.

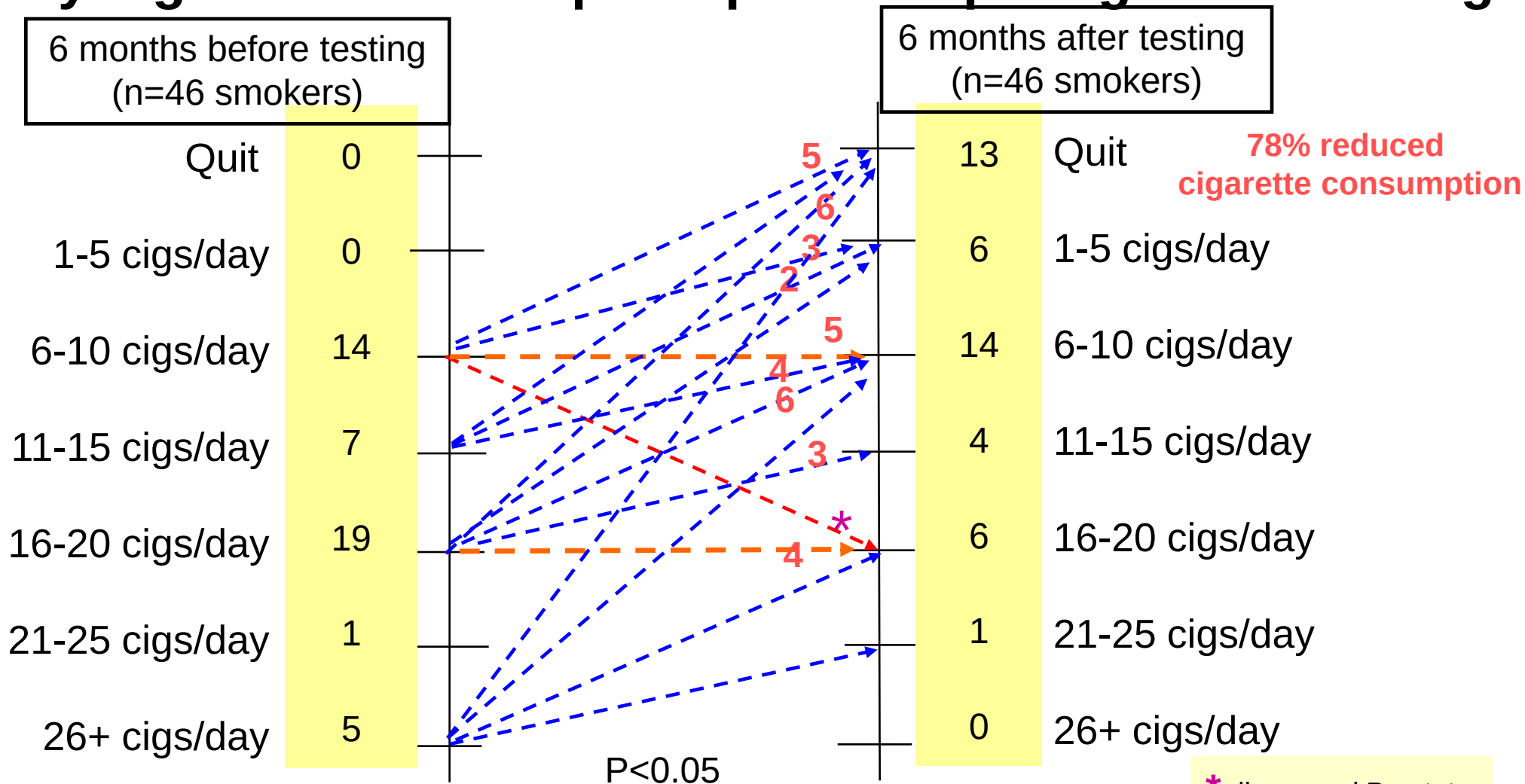
Respiragene Test* identifies those at greatest risk based on the above factors.

Life-long Smoker – has on average a 1 in 10 (10%) lifetime chance of getting lung cancer.

Non-smoker – has on average a 1 in 200 (0.5%) lifetime chance of getting lung cancer.

*Young RP, et al. PlosOne 2009; April 23.

Daily cigarette consumption pre- and post genetic testing



After genetic testing changes in cigs/day:

Overall 78% decreased cigs/day (blue), 13 (28%) Quit smoking, 2 lost to follow up, while 9 (20%) no change (orange) and 1 (2%) increased (red) consumption *

CT screening for lung cancer

NLST trial (November, 2010, NEJM July 2011)

- RCT of >50,000 current and former smokers in the US aged 55-74 yr and with 30+ pack year history
- Compared yearly CT screening with CXR screening over 3 years
- Showed a 20% reduction in lung cancer mortality
- Concerns remain over low pick up rates, costs and harms from radiation and unnecessary investigation of low risk smokers → **need to better target high risk smoker**

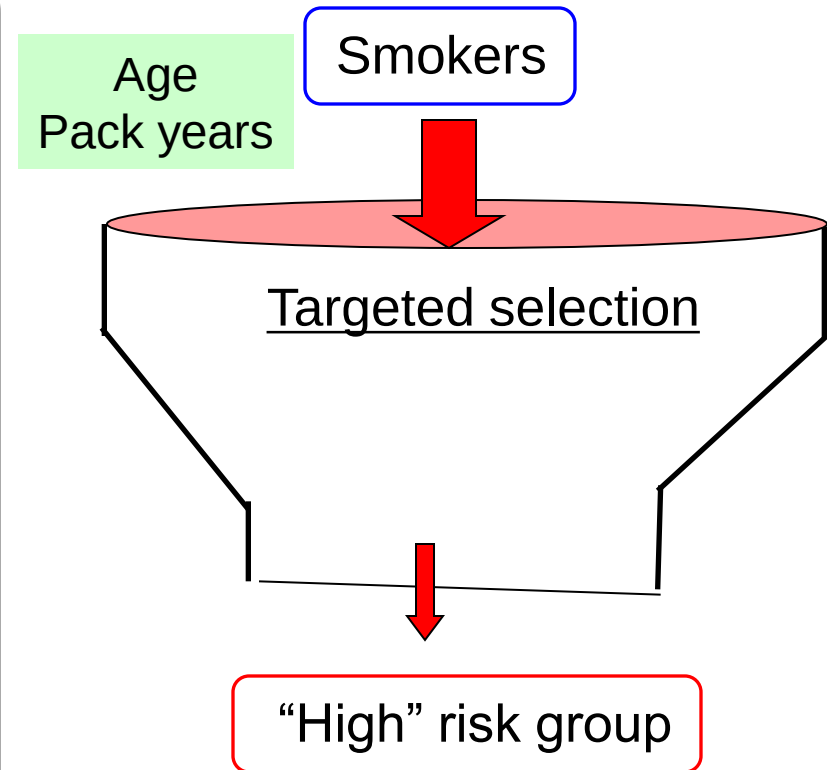
CT Screening for Lung cancer – current approach

Factors to target (Bechtel et al. Chest 2005; 127: 1140)

- Age >50 yo (90% of LC aged over 50 yr)
- Smoking Exposure (>30 pack years)
- COPD (affects 60-80% of LC cases, 5x ↑risk)
- Family Hx (2-3x ↑risk)
- Genetic factors (?2-10x ↑risk)
- Emphysema on baseline CT (?2x ↑risk)

Non-targeted CT screening

- Low pick up – 1% annual scanning
- Too costly
- Harm (radiation, unnecessary procedures) > benefit



Not cost effective CT screening

Lung cancer Screening – Must be Highly Targeted

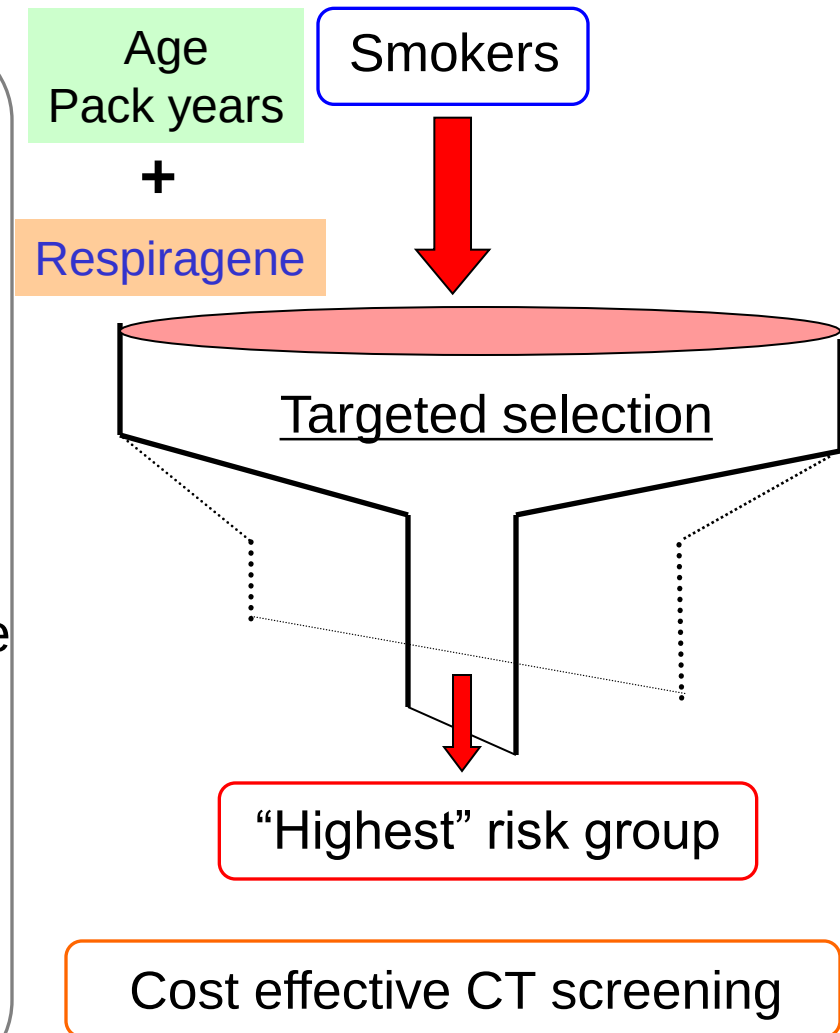
Factors to target

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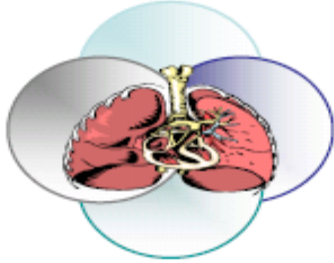
Respiragene - Lung Cancer Susceptibility score
- **utilises top 5 variables above**

Non-targeted CT screening

- Low pick up
- Too costly
- Harm > benefit



Maximise specificity over sensitivity – identify more cancers per person screened



Lung Health Clinic (Auckland)

**Contact us: Ph 0800 789999 or 09 630 9967 or Fax 09 623 6456
or email: lunghealthclinic@adhb.govt.nz**

For assessment of patients with breathlessness or suspected of asthma or COPD (especially those exposed to smoking or aero-pollutants).

For lung function testing, medication review, smoking cessation, inhaler technique, COPD unresponsive to treatment and lung cancer screening.

Refer your patient for a personal consultation with **Raewyn Hopkins** (BN, MPH) or **Associate Professor Robert Young**, Consultant Physician (FRACP, PhD)

COPD overlap with lung cancer

