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Update GOLD 2017

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Definition of COPD in GOLD 2017

GOLD 2016

COPD, a common preventable and treatable disease, is characterized by persistent airflow limitation that is ~~usually progressive~~ and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases.

GOLD 2017

COPD is a common, preventable and treatable disease that is characterize by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

Risk factors for COPD in GOLD 2017

GOLD 2016

Inhaled cigarette smoke and other noxious particles such as smoke from biomass fuels cause lung inflammation, a normal response that appears to be modified in patients who develop COPD.

GOLD 2017

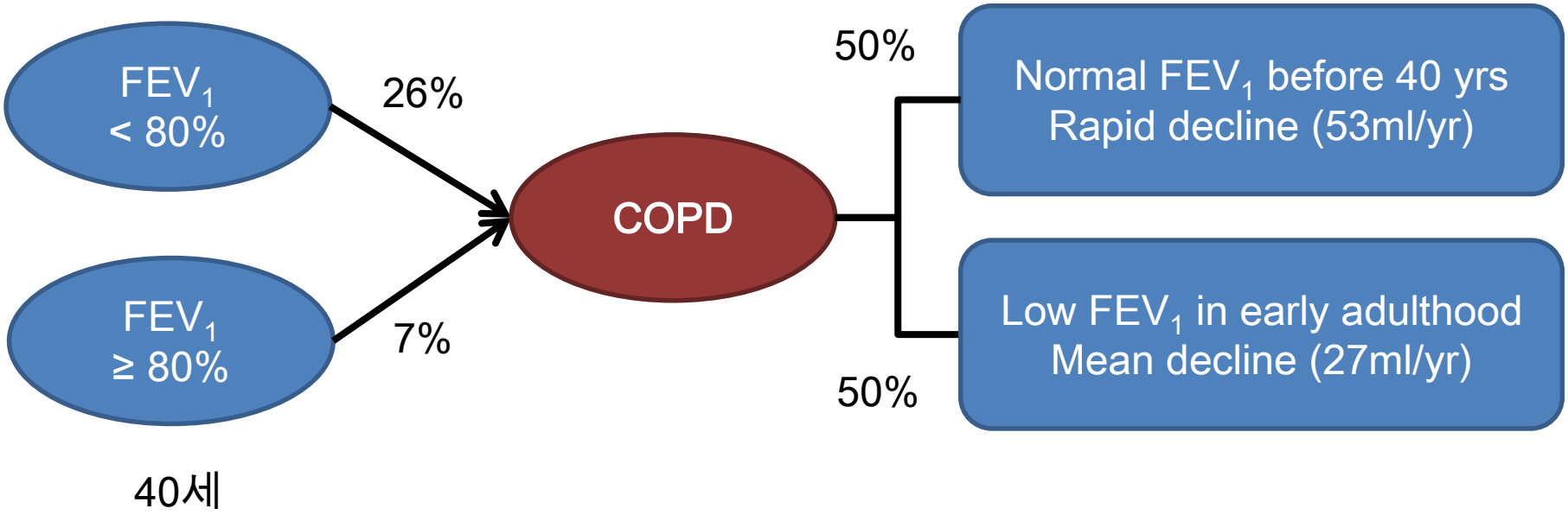
The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute. Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.

Lung Function Trajectories Leading to COPD

Lovelace Smoker cohort (n=1716)

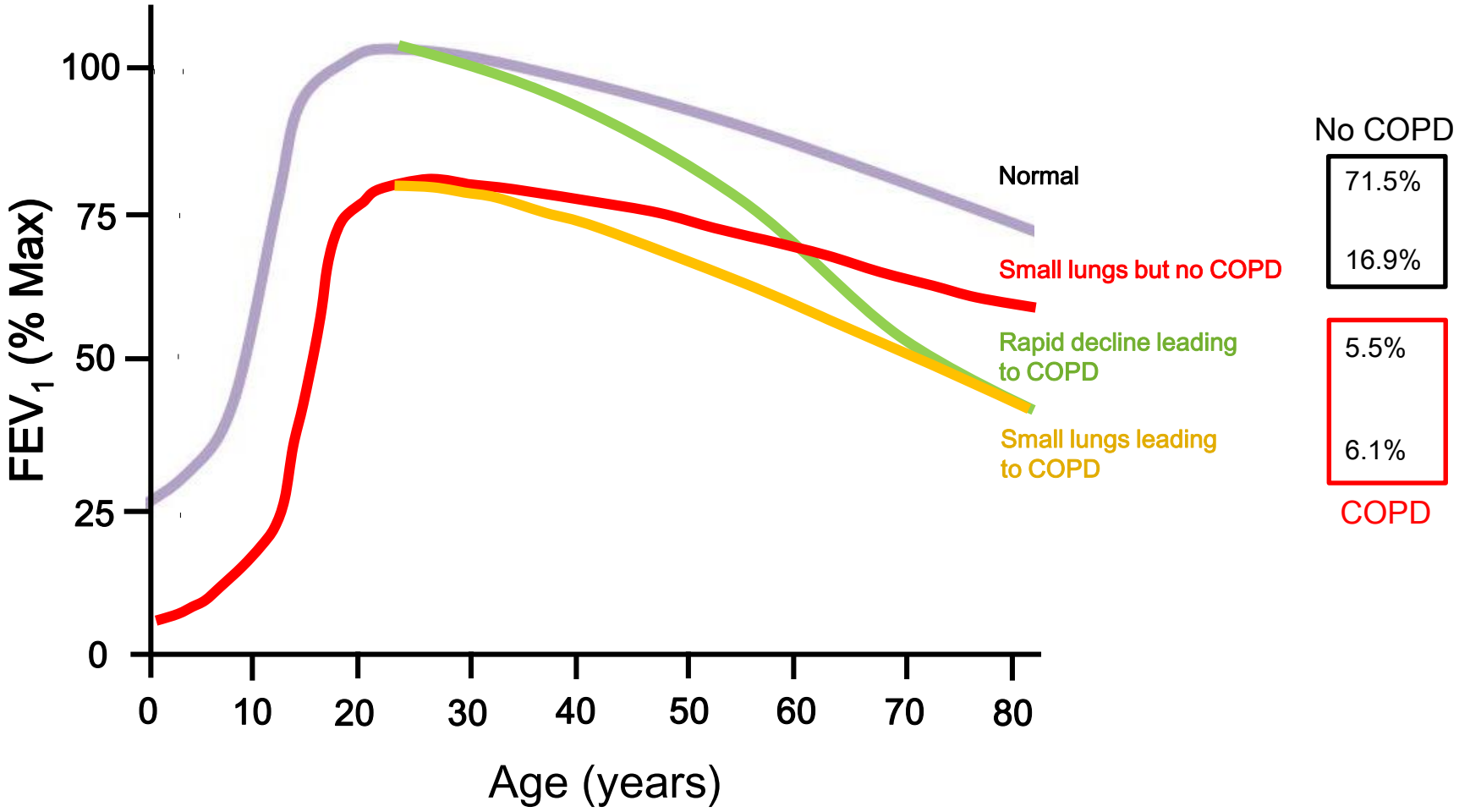
Framingham Offspring Cohort (n=1809)

Copenhagen City Heart Study (n=1387)



Lange P et al. NEJM 2015;

FEV_1 progression over time



Adapted from GOLD 2017

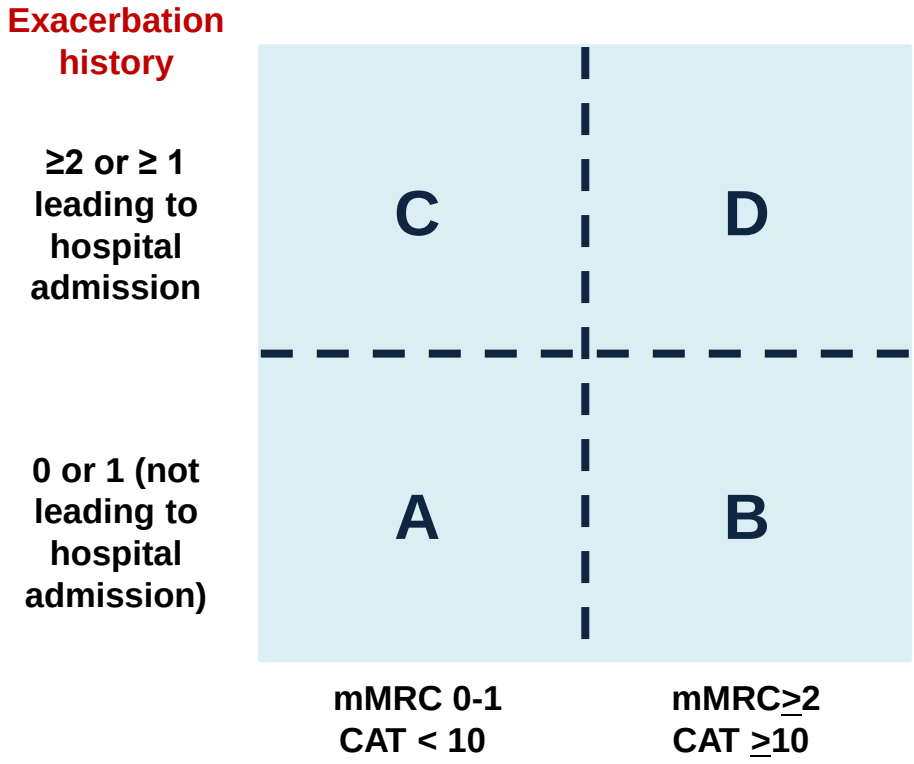
Refined ABCD assessment

Assessment of airflow limitation

→

Assessment of Symptoms/risk of exacerbations

	FEV_1 (% predicted)
GOLD 1	≥ 80
GOLD 2	50-79
GOLD 3	30-49
GOLD 4	< 30



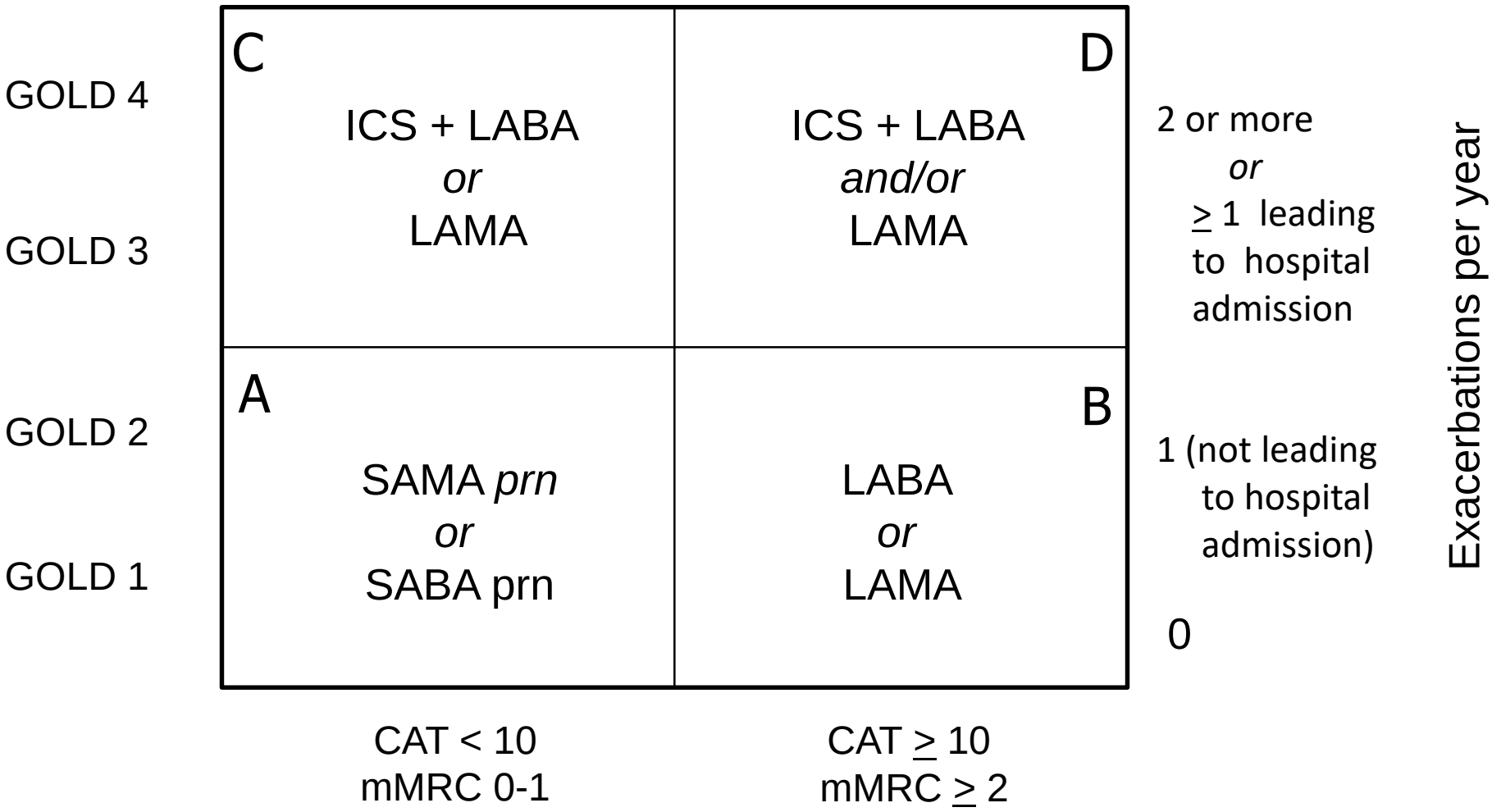
Role of Spirometry

- Diagnosis
- Assessment of severity of airflow obstruction (for prognosis)
- Follow-up assessment
  - Therapeutic decision
    - Pharmacological in selected circumstances
    - Alternative diagnoses when symptoms are disproportionate to degree of airflow obstruction
    - Non-pharmacological
  - Identification of rapid decline

Additional investigations

GOLD 2016	GOLD 2017
Imaging-CT	
Not routinely recommended except in doubt about diagnosis of COPD. Differential diagnosis	Not routinely recommended except for detection of bronchiectasis and lung cancer screening at risk
Oximetry and ABGA	
- **Oximetry** FEV_1< 35% or clinical signs of respiratory failure or RHF - **If SaO_2 < 92%** assess arterial blood gases	- **Oximetry** clinical signs of respiratory failure or RHF - **If SaO_2 < 92%** assess arterial or capillary blood gases

Manage Stable COPD: Pharmacologic Therapy RECOMMENDED FIRST CHOICE (GOLD 2016)

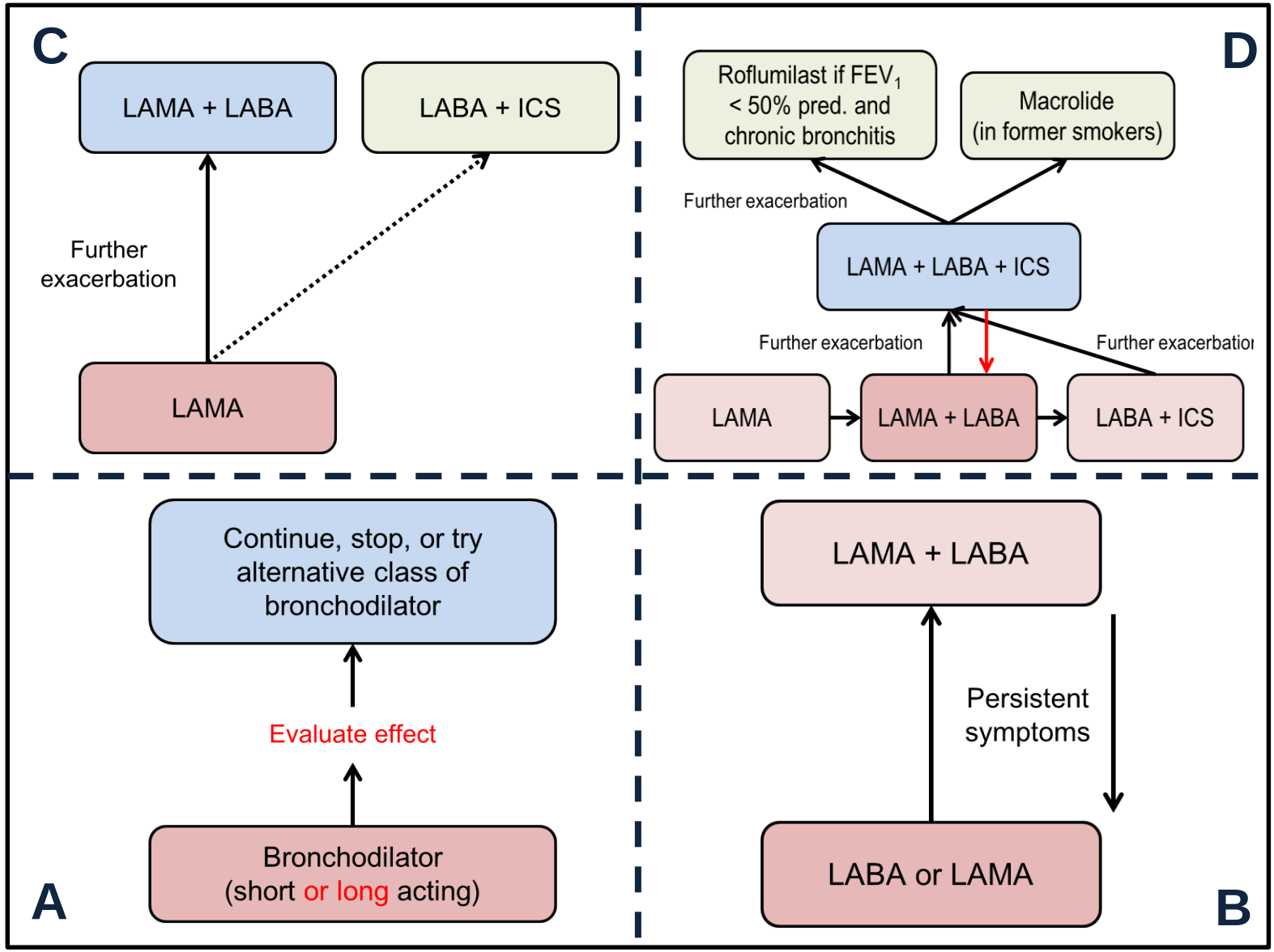


Adapted from GOLD 2016

Initial Pharmacologic Management of COPD (GOLD 2016)

Group	First Choice	Alternative Choice	Other Possible Treatments
A	SAMA or SABA prn	LAMA or LABA or SAMA+SABA	Theophylline
B	LAMA or LABA	LAMA and LABA	SABA and/or SAMA Theophylline
C	ICS+LABA or LAMA	LAMA + LABA or LAMA + PDE4i or LABA + PDE4i	SABA and/or SAMA Theophylline
D	ICS+LABA and/or LAMA	ICS+LABA+LAMA or ICS+LABA+PDE4i or LABA+LAMA or LAMA+PDE4i	Carbocysteine N-acetylcysteine SABA and/or SAMA Theophylline

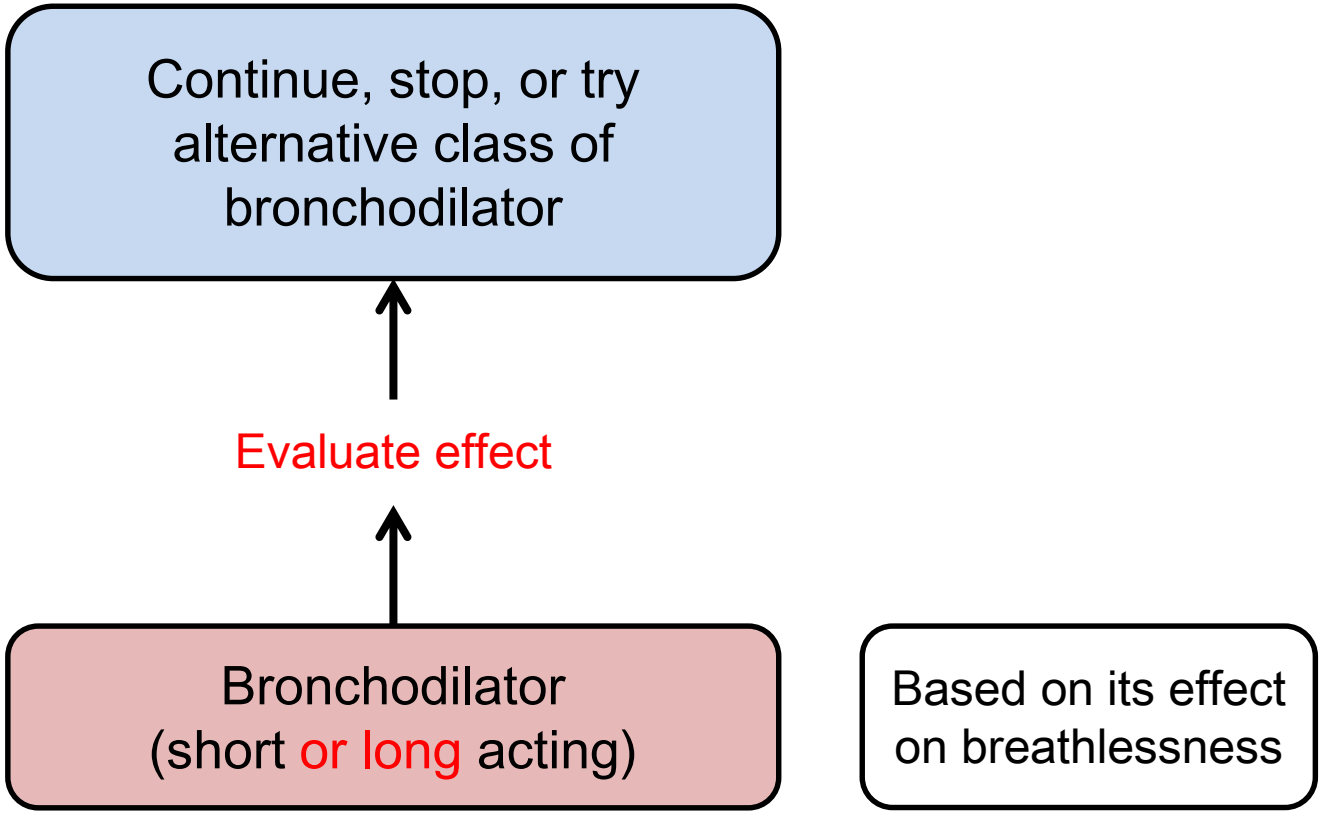
Adapted from GOLD 2016



Adapted from GOLD 2017

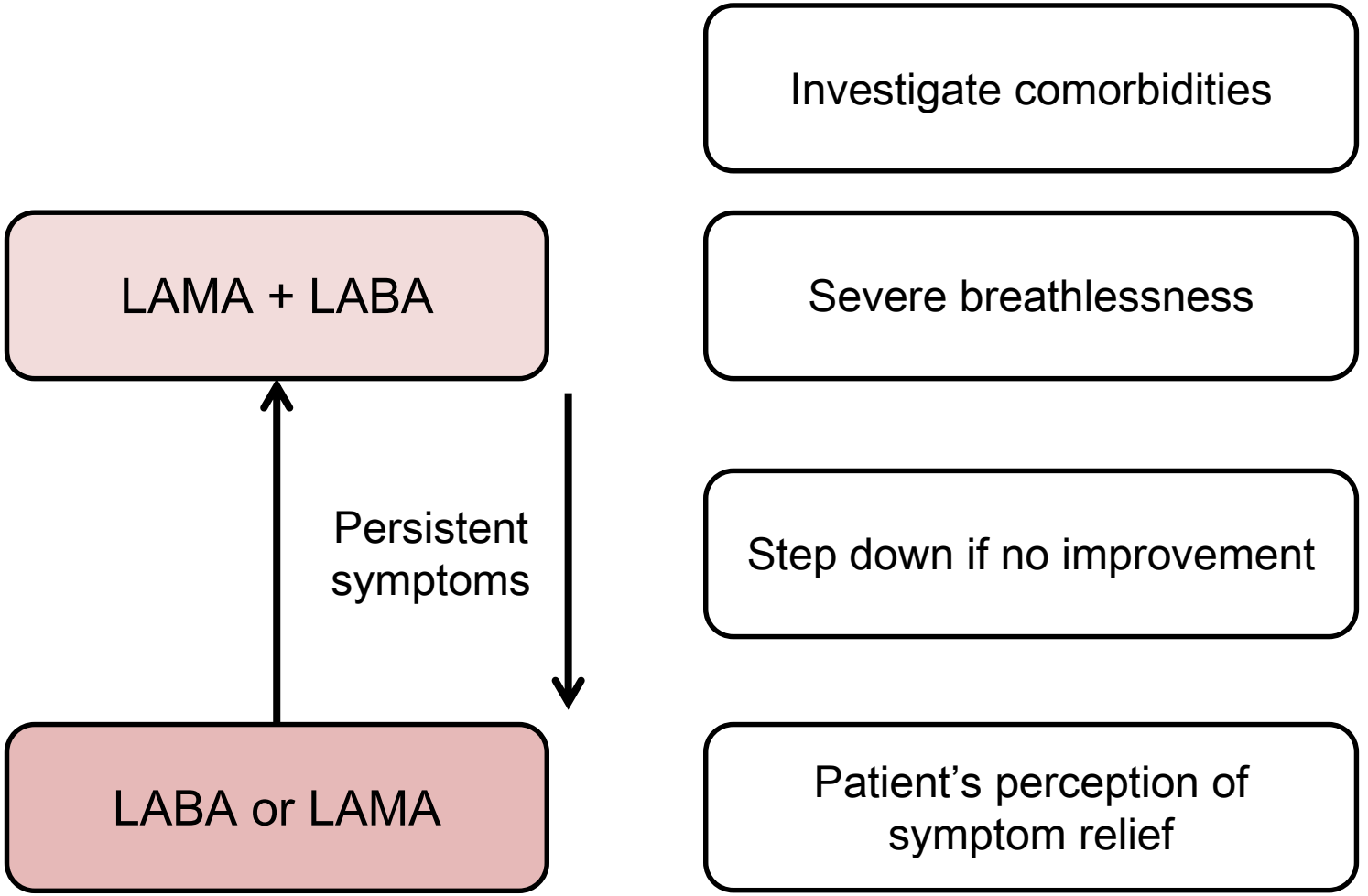
Group A

First Choice	Alternative Choice	Other Possible Treatments
SAMA or SABA prn	LAMA or LABA or SAMA+SABA	Theophylline



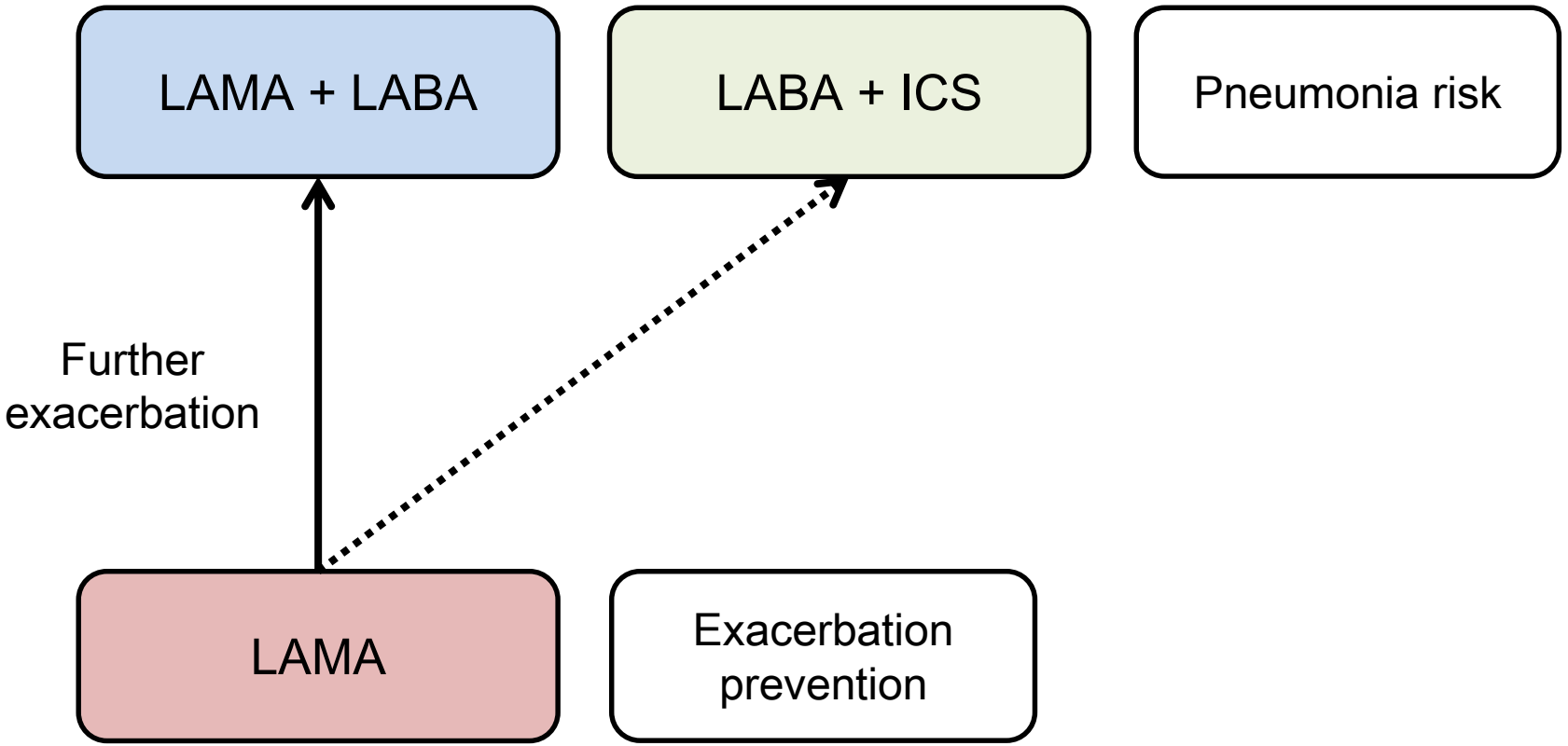
Group B

First Choice	Alternative Choice	Other Possible Treatments
LAMA or LABA	LAMA and LABA	SABA and/or SAMA Theophylline



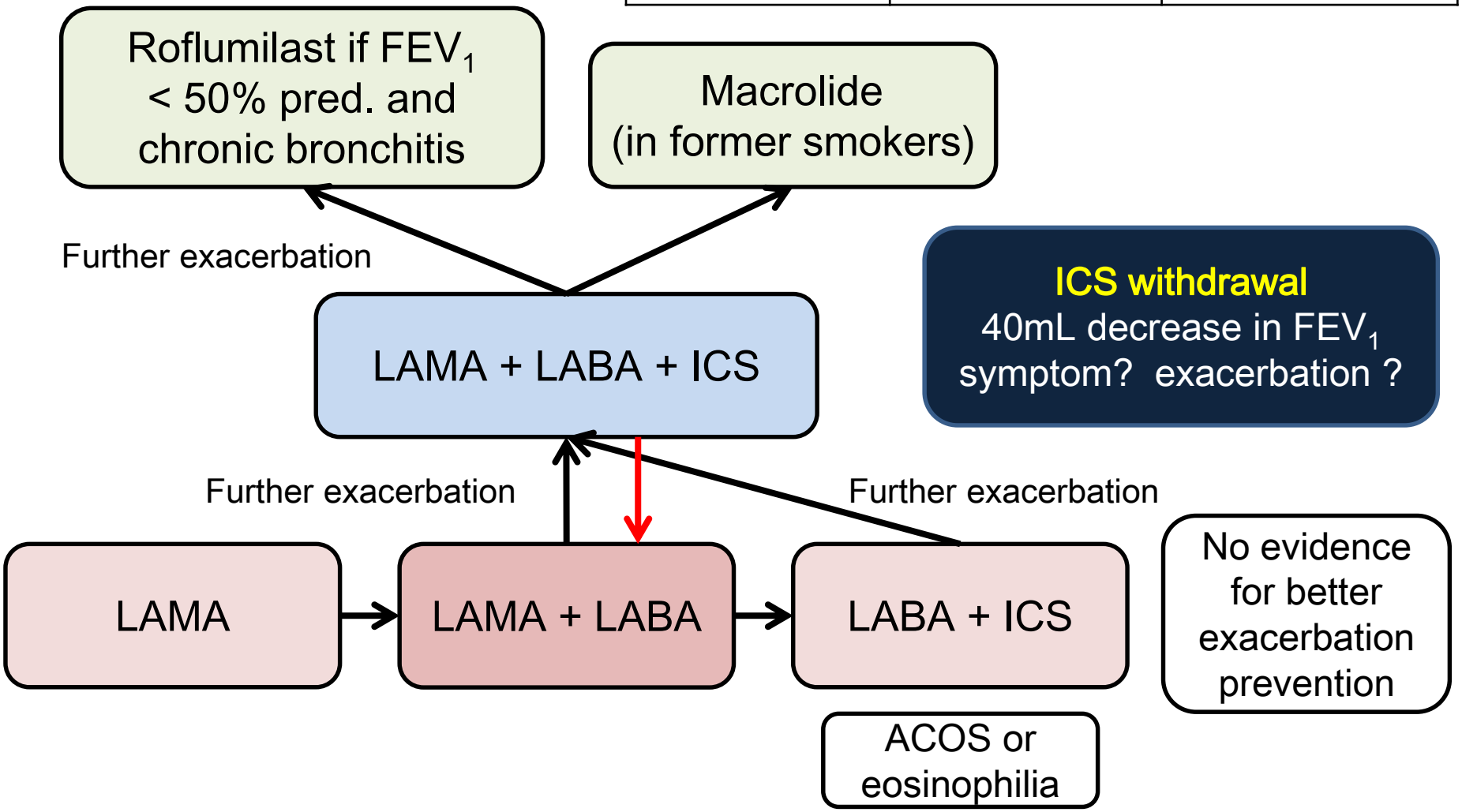
Group C

First Choice	Alternative Choice	Other Possible Treatments
ICS+LABA or LAMA	LAMA + LABA or LAMA + PDE4i or LABA+PDE4i	SABA and/or SAMA Theophylline



Group D

First Choice	Alternative Choice	Other Possible Treatments
ICS+LABA and/or LAMA	ICS+LABA+LAMA or ICS+LABA+PDE4i or LABA+LAMA or LAMA+PDE4i	Carbocysteine N-acetylcysteine SABA and/or SAMA Theophylline



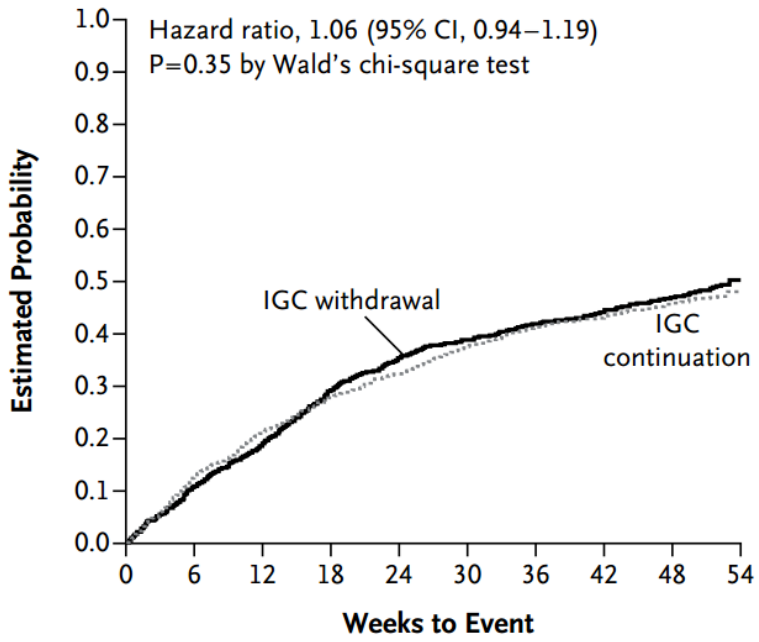
WISDOM

Triple therapy vs LAMA/LABA

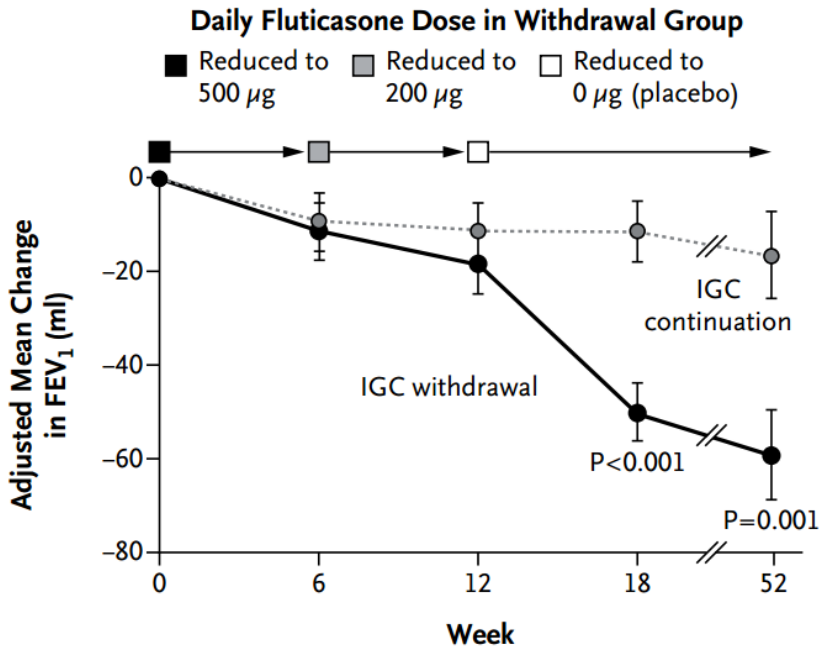
Inclusion: : FEV_1 < 50% pred, ≥ 2 mMRC, ≥ 1 COPD AE
- Tiotropium/fluticasone/salmeterol 18/500/50ug(n=1016)
- Fluticasone withdrawal (12wks) (n=1011)

Duration: 1yr

Moderate or Severe Exacerbation



Change from baseline in trough FEV_1



Magnussen H, et al. N Engl J Med 2014

Vaccination

- **Influenza vaccination**
  - All COPD
- **Pneumococcal vaccination**
  - ≥ 65 years old
    - PPSV23 or PCV 13
    - PCV13: Bacteremia and serious invasive pneumococcal disease ↓
  - < 65 years old
    - PPSV23: CAP ↓ in < 65 years with FEV_1< 40% pred.

Surgical Intervention

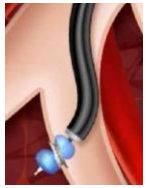
- **Lung volume reduction surgery**
  - Upper lobe dominant emphysema and low post-rehabilitation exercise capacity: survival benefit
- **Bullectomy**
  - In selected patient: dyspnea ↓, lung function ↑, exercise tolerance ↑
- **Lung transplantation**
  - 70% (bilateral), 30% (unilateral)
  - Medial survival: 5 years for unilateral, 7 years for bilateral

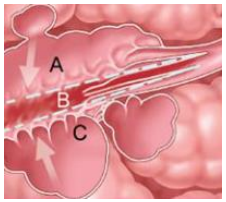
Surgical and Bronchoscopic Intervention

GOLD 2016
Non-surgical bronchoscopic lung volume reduction techniques should not be used outside clinical trials until more data are available.
GOLD 2017
In selected patients with advance emphysema refractory to optimized medical care, surgical or bronchoscopic interventional treatments may be beneficial.

Bronchoscopic Intervention

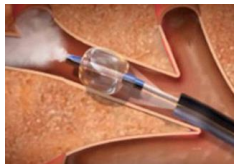
- **Bronchial stents**
  - RCT: no effect



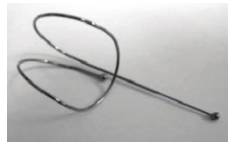


- **Lung sealants**
  - Multi-center; benefit but discontinued, morbidity and mortality ↑

- **Thermal vapour**
  - RCT: lung function and health status ↑
    but exacerbation → clinically unavailable



- **Coils**
  - Multicenter trials: 6MW distance, FEV_1, SGRQ ↑
  - Pneumonia, pneumothorax, hemoptysis, COPD AE ↑

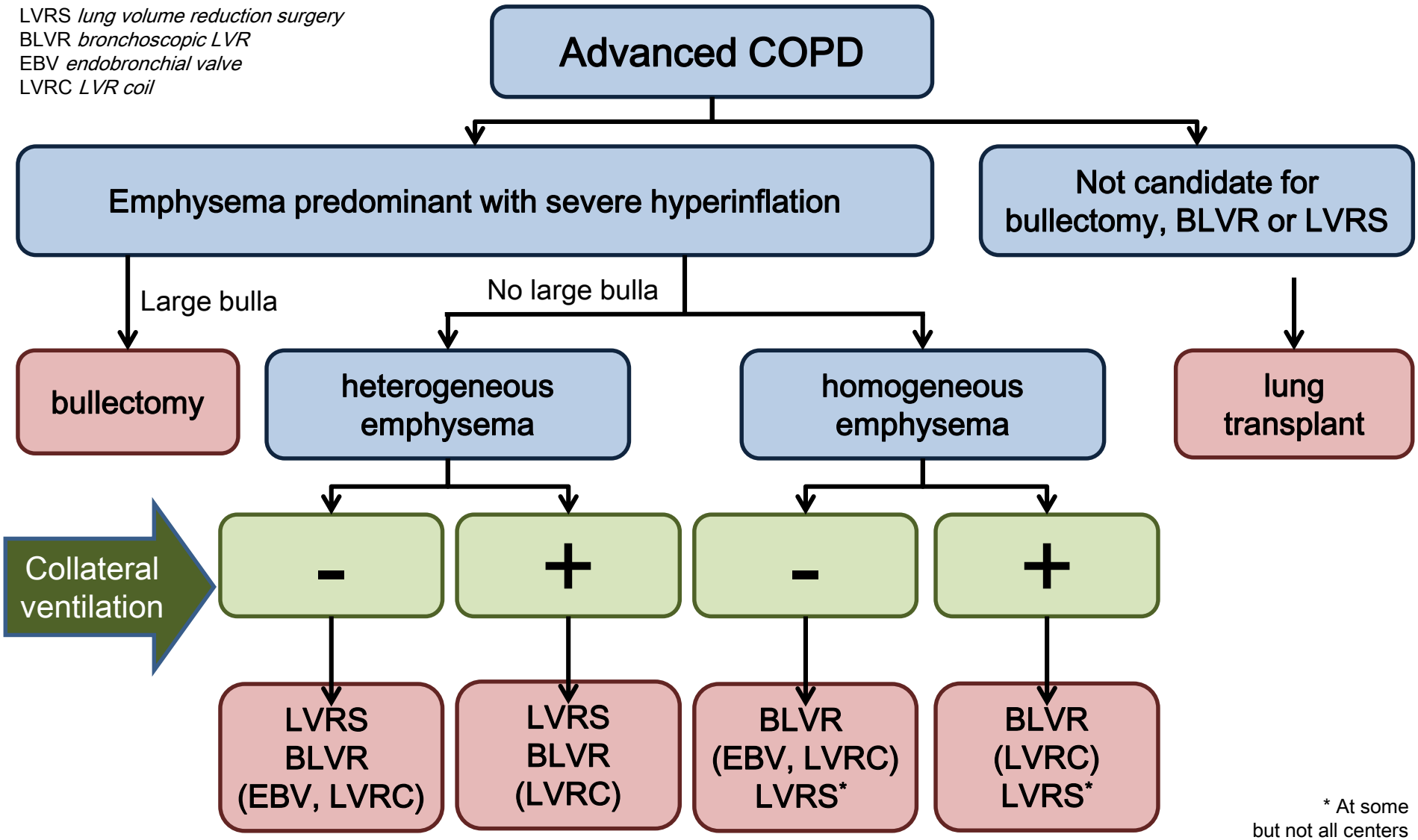


Bronchoscopic Intervention

- **Endobronchial valve**
  - Multicenter RCT
    - FEV_1, 6MWD ↑ at 6 months
    - Not clinically meaningful
  - Collateral ventilation (+) included study
    - FEV_1 at 3months : no significant increase
  - Collateral ventilation (-)
    - FEV_1, 6MWD ↑ at 6 months
    - Heterogeneous > homogenous
    - Pneumothorax risk
  - Homogenous + collateral ventilation (-)
    - FEV_1, 6MWD, health status ↑ at 6 months

Interventional Bronchoscopic and Surgical Treatments for COPD

LVRS *lung volume reduction surgery*
BLVR *bronchoscopic LVR*
EBV *endobronchial valve*
LVRC *LVR coil*



* At some but not all centers

Exacerbation

- **Bronchodilators**
  - LA-bronchodilator with/without ICS ASAP before hospital discharge (no clinical studies)
- **Systemic steroid**
  - 40mg of prednisone per day for 5 days
- **Antibiotics**
  - For 5-7 days (⇦ 5-10days)
- **Oxygen Therapy**
  - Venous blood gas analysis to assess bicarbonate levels and pH

Follow-up after Exacerbation

Early follow-up (1-4 wks)

- Less exacerbation-related readmission
- Decrease 90-day mortality
- Review of discharge therapy (steroid, antibiotic, oxygen therapy)
- Comorbidities

Late follow-up (12-16 wks)

- Ensure return to stable clinical state
- Review of patient's symptom, lung function (by spirometry), prognosis assessment
- Oxygen therapy
- CT for anatomical abnormality for those with recurrent exacerbation/hospitalization)
- Comorbidities

Oxygen Therapy

- Chronic respiratory failure with severe resting hypoxemia

PaO_2 < 55mmHg or SaO_2 < 88%
or
55 < PaO_2 > 60 mmHg with RHF or erythrocytosis

- Resting or exercise-induced moderate arterial oxy desaturation

Resting: 89% ≤ SaO_2 ≤ 93%
or
Exercise: 6MWT; SaO_2 ≥ 80% (≥ 5 min) and < 90% (≥ 10 sec)

No time benefit to death or 1st hospitalization

Oxygen Therapy

- **Air travel**
  - At least 50mmHg of in-flight PaO_2
    - Nasal cannulae 3 L/min or Venturi facemask 31%
    - For moderate to severe hypoxemia at sea level

GOLD 2016	GOLD 2017
PaO_2 > 70 mmHg at sea level ➡ Safe to fly without supplementary oxygen	Resting > 95% SaO_2 and 6MW SaO_2 > 85% ➡ No further assessment

Comorbidities

- **Heart failure/Ischemic Heart Disease**
  - Selective β_1-blockers should be used
- **Arrhythmia (atrial fibrillation)**
  - Acceptable safety profile for LABA, LAMA, ICS
  - Caution: SABA, theophylline
- **Peripheral vascular disease**
- **Hypertension**

Comorbidities

- **Lung cancer**
  - Main cause of death in COPD
  - Associated more with emphysema than airflow limitation
  - LDCT screening is recommended

- **Bronchiectasis**
  - ICS may not be indicated in COPD with bacterial colonization or recurrent lower respiratory tract infection

Comorbidities

- Obstructive sleep apnea
  - Profound hypoxemia, more arrhythmias, pulmonary hypertension
- Osteoporosis
- Anxiety and depression
- Metabolic Syndrome and Diabetes
- GERD

E-cigarette

- As a form of nicotine replacement therapy
- Efficacy: controversial
- Safety: not well defined

Rehabilitation

- Optimum duration of program
  - 6-8 weeks
  - No evidence of advantages on extending to 12 weeks or longer

Summary

- **Definition**
  - Symptom
- **Risks**
  - Not only smoking but also…
- **Assessment**
  - Separation of FEV_1
- **Pharmacological management**
  - Clarification of steps
  - Escalation and de-escalation
  - Benefits of ICS in selected patients
- **Non-pharmacological management**

경청해주셔서 감사합니다.