

## COPD update: new GOLD guidelines and their implications for General Practitioners

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## Outline of talk

### Questions:

- What is GOLD?
- How common is COPD?
- What is it?
- How do the new GOLD guidelines 2017 change things?
- How do I distinguish COPD from asthma?
- Conclusions

## The Global Initiative for Chronic Obstructive Lung Disease (GOLD)



- January 1997:
  - COPD experts from several countries met in Brussels, Belgium, including representatives of the National Heart, Lung and Blood Institute (NHLBI, USA) and the World Health Organization (WHO).
  - They recommended establishment of a panel with expertise on a wide variety of COPD-related topics to prepare an evidence-based document on COPD.
- 2001: GOLD initiative launched in collaboration with NHLBI and WHO.
  - Project supported by unrestricted educational grants from many pharmaceutical companies.
- Goals of GOLD:
  1. To increase awareness of COPD and decrease morbidity and mortality from this disease
  2. To improve prevention and management of COPD through a concerted worldwide effort
  3. To encourage a renewed research interest in COPD

## World burden



- Burden of Obstructive Lung Disease (BOLD) international study:
  - 10% for people > 40 yrs.
  - In Australia, the prevalence of COPD was:
    - 7.5% for people aged >40
    - 30% for people aged > 75
- COPD is currently the fourth leading cause of death in the world.
- COPD is projected to be the 3rd leading cause of death by 2020.
- More than 3 million people died of COPD in 2012, accounting for 6% of all deaths globally.
- Globally, the COPD burden is projected to increase in coming decades because of continued exposure to COPD risk factors and aging of the population.

## How common is COPD in Australia? VERY common!



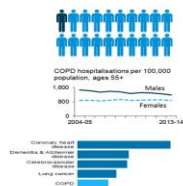
### COPD

#### COPD by numbers

**More than 1 in 20**  
Australians aged 55 and over have COPD, based on self-reported data. That's over 310,700 people.

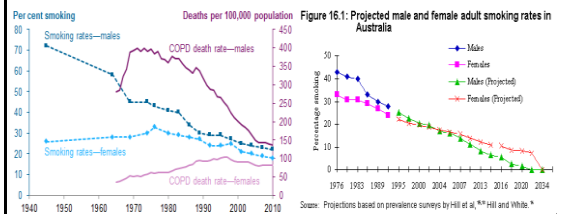
**58,872**  
Hospitalisations for COPD in 2013-14

**Fifth leading cause of death**  
With 6,462 deaths due to COPD in 2013



## COPD in Australia

### COPD deaths



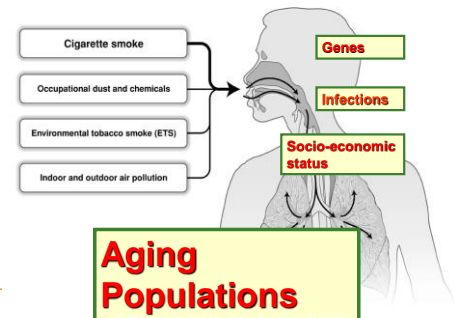
Source: AIHW [www.aihw.gov.au](http://www.aihw.gov.au)

## Has GOLD succeeded?

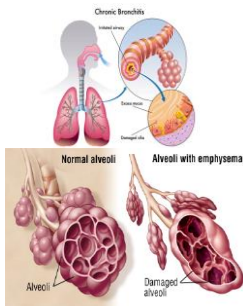


## Global Strategy for Diagnosis, Management and Prevention of COPD

### Risk Factors for COPD



## "Old" definition of COPD



- **Chronic bronchitis**
  - Chronic productive cough for more than 3 months of the year for two successive years
- **Emphysema**
  - A chronic, irreversible disease of the lungs characterized by abnormal enlargement of airspaces within the lungs and accompanied by destruction of the tissue lining the walls of the airspaces

## New Definition for COPD Moves beyond Breathlessness

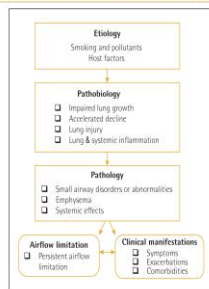
Emphasizes respiratory symptoms, lung tissue, and airway abnormalities in COPD development:

"Chronic obstructive pulmonary disease (COPD) is a common, preventable and treatable disease that is characterized 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."



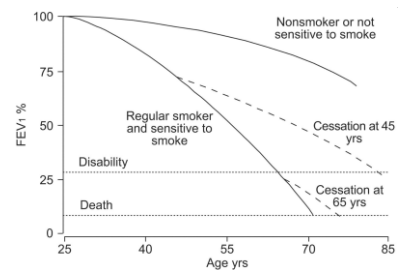
## Aetiology of COPD

Figure 1.1. Etiology, pathobiology and pathology of COPD leading to airflow limitation and clinical manifestations



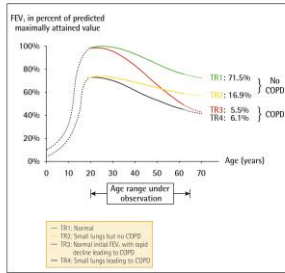
## The famous Fletcher curve

The natural history of chronic airflow obstruction. Br Med J 1977; 1: 1645-1648.



## Natural history of lung function: the importance of early loss of lung function

Figure 1.2. FEV<sub>1</sub> progression over time



## GOLD 2017: Updated COPD definition includes persistent respiratory symptoms

### GOLD 2016<sup>1</sup>

Chronic Obstructive Pulmonary Disease (COPD), a common preventable and treatable disease, is characterized by that is and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases

### GOLD 2017<sup>2</sup>

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases

COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease

1. GOLD 2016  
2. GOLD 2017

## Diagnosing COPD

Table 2.1. Key indicators for considering a diagnosis of COPD

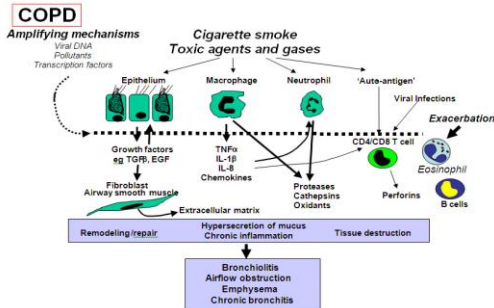
Consider COPD, and perform spirometry, if any of these indicators are present in an individual over age 40. These indicators are not diagnostic themselves, but the presence of multiple key indicators increases the probability of a diagnosis of COPD. Spirometry is required to establish a diagnosis of COPD.

Dyspnea that is:	Progressive over time. Characteristically worse with exercise. Persistent.
Chronic cough:	May be intermittent and may be unproductive. Recurrent wheeze.
Chronic sputum production:	Any pattern of chronic sputum production may indicate COPD.
Recurrent lower respiratory tract infections	
History of risk factors:	Host factors (such as genetic factors, congenital/developmental abnormalities etc.). Tobacco smoke (including popular local preparations). Smoke from home cooking and heating fuels. Occupational dusts, vapors, fumes, gases and other chemicals.
Family history of COPD and/or childhood factors:	For example low birthweight, childhood respiratory infections etc.

## Diagnosis and assessment

- ▶ COPD should be considered in any patient who has dyspnoea, chronic cough or sputum production, and/or a history of exposure to risk factors for the disease.
- ▶ Spirometry is required to make the diagnosis; the presence of a post-bronchodilator FEV<sub>1</sub>/FVC < 0.70 confirms the presence of persistent airflow limitation.
- ▶ The goals of COPD assessment are to determine the level of airflow limitation, the impact of disease on the patient's health status, and the risk of future events (such as exacerbations, hospital admissions, or death), in order to guide therapy.
- ▶ Concomitant chronic diseases occur frequently in COPD patients, including cardiovascular disease, skeletal muscle dysfunction, metabolic syndrome, osteoporosis, depression, anxiety, and lung cancer. These co-morbidities should be actively sought and treated appropriately when present as they can influence mortality and hospitalizations independently.

## Molecular mechanisms



## GOLD 2017 includes major revisions in key areas

- Definition of COPD
  - Refined to place more emphasis on symptoms and co-morbidities
- ABCD assessment tool
  - Refined to assess both symptom level and risk of future exacerbations following the revised role of spirometry in COPD
- Pharmacological management
  - Pharmacological algorithms added
  - Dual bronchodilation recommended as a first-line therapy for a majority of symptomatic patients
  - ICS therapy only recommended in a minority of patients as an alternative to preferred LABA/LAMA treatment
- Focus on inhaler technique
  - Emphasizes the importance of patient education
- Management of co-morbidities
  - Emphasizes the importance of identifying and treating co-morbidities

COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease  
LABA = long acting  $\beta_2$  agonist; LAMA = long acting muscarinic antagonist

GOLD 2017

## The goals of COPD treatment remain unchanged in GOLD 2017

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

COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease

GOLD 2017

## GOLD 2017 emphasizes the importance of proper inhaler technique

- Inhaler technique should be assessed regularly
- Determinants of poor inhaler technique in asthma and COPD patients include:
  - Older age
  - Use of multiple devices
  - Lack of previous education on inhaler technique
- Providing patients with quality education regarding proper inhaler technique is important
- KEEP IT AS SIMPLE AS POSSIBLE



COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease

GOLD 2017

## GOLD 2017: Identifying and treating co-morbidities is important in patients with COPD



- COPD often co-exists with other diseases that may have a significant impact on health status and prognosis
- Cardiovascular disease is a major comorbidity in COPD
  - The most frequent and most important co-morbid disease
- Other common co-morbidities include skeletal muscle dysfunction, metabolic syndrome, osteoporosis, depression, anxiety and lung cancer
- Co-morbidities should be actively sought and treated appropriately

COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease

GOLD 2017

## GOLD 2017



Table 2.2. Other causes of chronic cough

Intrathoracic
<ul style="list-style-type: none"> <li>• Asthma</li> <li>• Lung cancer</li> <li>• Tuberculosis</li> <li>• Bronchiectasis</li> <li>• Left heart failure</li> <li>• Interstitial lung disease</li> <li>• Cystic fibrosis</li> <li>• Idiopathic cough</li> </ul>
Extrathoracic
<ul style="list-style-type: none"> <li>• Chronic allergic rhinitis</li> <li>• Post nasal drip syndrome (PNDS)</li> <li>• Upper Airway Cough Syndrome (UACS)</li> <li>• Gastroesophageal reflux</li> <li>• Medication (e.g. ACE inhibitors)</li> </ul>

## GOLD 2017: Changed role for spirometry

- Post-bronchodilator spirometry is required for the diagnosis and assessment of COPD
- But: assessing the degree of reversibility of airflow limitation (e.g. measuring  $FEV_1$  before and after bronchodilator or corticosteroids) to inform therapeutic decisions is **no longer** recommended
- Spirometry remains key in the diagnosis, prognostication and treatment with non-pharmacological therapies

## Spirometry



Figure 2.2A. Spirometry - Normal Trace

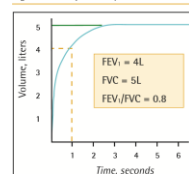
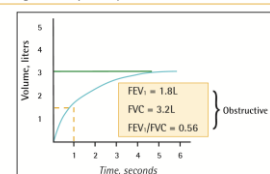


Figure 2.2B. Spirometry - Obstructive Disease

FVC = —  
FEV<sub>1</sub> = - - -

Predicted values: Global Lungs Initiative (GLI)



## GOLD 2017: Patient examples using the refined ABCD assessment tool



	Patient A	Patient B
FEV <sub>1</sub> (% predicted)	<30%	<30%
CAT score	18	18
Exacerbations in the past 12 months	0	3
GOLD 2016 classification	D	D
GOLD 2017 classification <sup>1</sup>	Group B	Group D

Removal of FEV<sub>1</sub> from the risk assessment may result in more patients being classified as GOLD B than when using previous GOLD criteria

- More than 50% of patients previously classified as GOLD D (based on airflow limitation alone) may now be classified as GOLD B<sup>2</sup>

CAT = COPD Assessment Test; FEV<sub>1</sub> = forced expiratory volume in 1 second

GOLD = Global Initiative for Chronic Obstructive Lung Disease

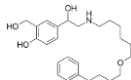
1. GOLD 2017

2. Agustí A, et al. Eur Respir J 2013

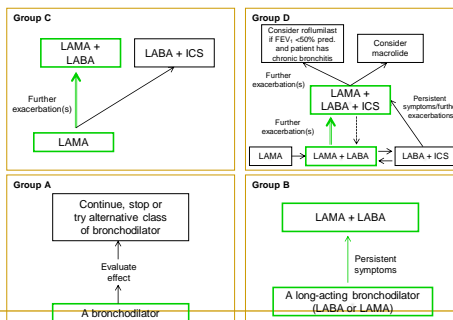
## New inhalers



## New inhalers



## GOLD 2017: summary of therapeutic recommendations by GOLD Group

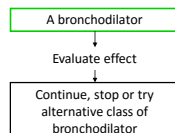


FEV<sub>1</sub> = forced expiratory volume in 1 second; GOLD = Global Initiative for Chronic Obstructive Lung Disease

ICS = inhaled corticosteroid; LABA = long-acting β<sub>2</sub>-agonist; LAMA = long-acting muscarinic antagonist

GOLD 2017

## GOLD 2017: Group A patients should be offered either a short- or long-acting bronchodilator

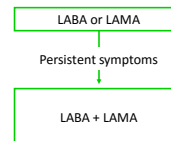


- Bronchodilator treatment should be continued if symptom benefit is seen

GOLD = Global Initiative for Chronic Obstructive Lung Disease

GOLD 2017

## GOLD 2017: Group B patients with persistent symptoms should be stepped up to a LABA/LAMA



- Bronchodilator selection (LABA vs LAMA) in patients with less severe symptoms should depend on the patient's perception of symptom relief
- Patients with persistent symptoms may be stepped up to LABA/LAMA
- Patients with severe breathlessness may be started on dual bronchodilation

More than 50% of GOLD B patients have CAT scores >20 (high symptom burden),<sup>2</sup> and therefore should receive LABA/LAMA as initial therapy, or be stepped up from monotherapy

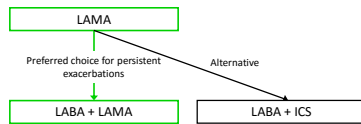
CAT = COPD Assessment Test; GOLD = Global Initiative for Chronic Obstructive Lung Disease

LABA = long-acting β<sub>2</sub>-agonist; LABA + LABA = long-acting muscarinic antagonist

1. GOLD 2017; 2. Adair Respiratory Disease

Specialty Programme 2016

## GOLD 2017: ICS are no longer the preferred choice for patients in GOLD Group C

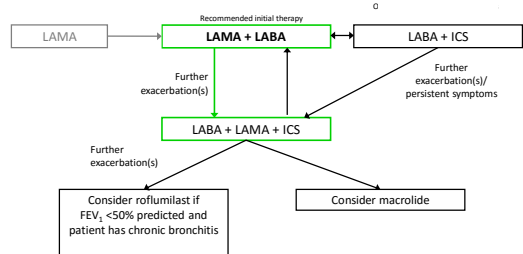


- Patients with persistent exacerbations may benefit from addition of LABA or a combination of LABA/ICS<sup>1</sup>
- LABA/LABA is the preferred choice due to pneumonia risk associated with ICS<sup>1</sup>
  - There is also no evidence to suggest superiority of LABA/ICS over LABA/LABA<sup>2</sup>
- Triple therapy is not recommended<sup>1</sup>

GOLD = Global Initiative for Chronic Obstructive Lung Disease; ICS = inhaled corticosteroid  
LABA = long-acting  $\beta_2$ -agonist; LAMA = long-acting muscarinic antagonist

1. Watzinger JA, et al. N Engl J Med 2015  
2. Watzinger JA, et al. N Engl J Med 2015

## GOLD 2017: Dual bronchodilation is the preferred initial therapy for pts in Group D



ACOS = asthma-COPD overlap syndrome; FEV<sub>1</sub> = forced expiratory volume in 1 second  
GOLD = Global Initiative for Chronic Obstructive Lung Disease; ICS = inhaled corticosteroid  
LABA = long-acting  $\beta_2$ -agonist; LAMA = long-acting muscarinic antagonist

GOLD 2017

## GOLD 2017: Dual bronchodilator treatment is the preferred initial therapy for patients in Group D

- GOLD recommends LABA/LAMA as primary-choice treatment for Group D patients<sup>1</sup>
  - LABA/LAMA has demonstrated superiority versus bronchodilator monotherapy and LABA/ICS in exacerbation prevention<sup>2,3</sup>
- LABA/ICS may be first choice in patients with a history of and/or features suggestive of asthma-COPD overlap<sup>1</sup>
- Treatment should be escalated to triple therapy in patients who experience further exacerbations despite treatment with LABA/LAMA or LABA/ICS<sup>1</sup>
  - There is currently no evidence to support the efficacy of triple vs LABA/LAMA
- If further exacerbations develop despite treatment with triple therapy, the addition of a macrolide or roflumilast\* may be considered<sup>1</sup>
  - (roflumilast not available in Australia)
- GOLD also suggests the withdrawal of ICS if exacerbations persist on triple therapy

FEV<sub>1</sub> = forced expiratory volume in 1 second  
GOLD = Global Initiative for Chronic Obstructive Lung Disease; ICS = inhaled corticosteroid  
LABA = long-acting  $\beta_2$ -agonist; LAMA = long-acting muscarinic antagonist

1. Watzinger JA, et al. Lancet Respir Med 2013  
2. Watzinger JA, et al. N Engl J Med 2015  
3. Watzinger JA, et al. N Engl J Med 2015



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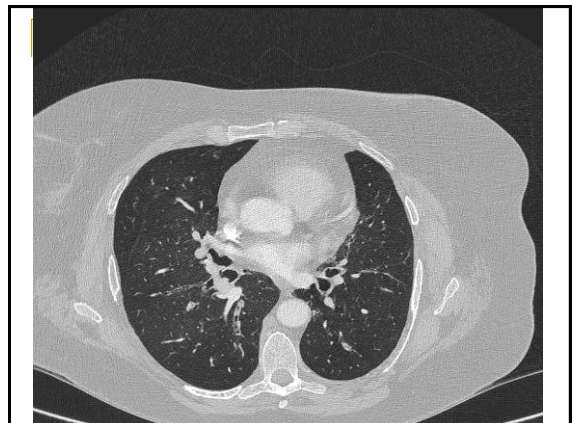
## RESPIRATORY MEDICATIONS

RELIEVERS	INITIAL CONTROLLER(S)	CONTROLLERS/MAINTENANCE	COMBINATION ICS/LABA	COMBINATION LABA/LAMA
Short-acting $\beta_2$ -agonist (SABA)	Initial Controller(s) ICS	Long-acting $\beta_2$ -agonist (LABA)	Combination ICS/LABA	Combination LABA/LAMA

## Differential diagnosis

Diagnosis	Suggestive Features
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/day morning. Allergy, rhinitis, and/or eczema also present. Family history of asthma. Obesity coexistence.
Congestive Heart Failure	Chest X-ray shows dilated heart, pulmonary edema. Pulmonary function tests indicate volume restriction, not airflow limitation.
Bronchiectasis	Large volumes of purulent sputum. Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	Onset all ages. Chest X-ray shows lung infiltrate. Microbiological confirmation. High local prevalence of tuberculosis.
Obstructive Bronchiolitis	Onset at younger age, nonsmokers. May have history of rheumatoid arthritis or acute fume exposure. Seen after lung or bone marrow transplantation. CT on expiration shows hyperdense areas.
Diffuse Panbronchiolitis	Predominantly seen in patients of Asian descent. Most patients are male and nonsmokers. Almost all have chronic sinusitis. Chest X-ray and HRCT show diffuse small centrilobular nodular opacities and hyperinflation.

These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking), asthma may develop in adults and even in elderly patients.







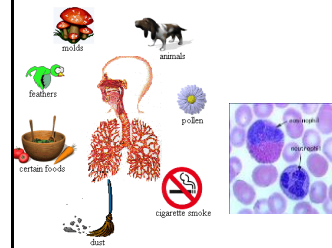
## Sinuses



## Lung emphysema software



## What about asthma?

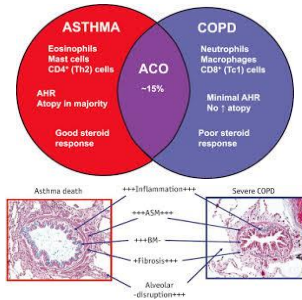


Exercise-induced wheeze



Reversible

## Asthma/COPD overlap



## 'Asthma-COPD overlap' (GINA Update Feb 2017)

- The word 'syndrome' has been removed from the previous term 'asthma-COPD overlap syndrome (ACOS)' because:
  - The term asthma-COPD overlap does not describe a single disease entity
  - This term was being commonly used in the respiratory community as if it was a single disease ('the asthma-COPD overlap syndrome')
  - There are two medically-accepted definitions of 'syndrome'
- The aim is to focus attention back on the original issues
  - These patients are commonly seen in clinical practice
  - They are almost always excluded from the RCTs which provide the evidence base for treatment recommendations, and from studies of underlying mechanisms
  - Current guidelines have opposite safety-based recommendations
    - Asthma: never use LABA without ICS
    - COPD: start treatment with LABA and/or LAMA, without ICS



## GOLD 2017: exacerbations



- ▶ COPD exacerbations are defined as an acute worsening of respiratory symptoms that result in additional therapy.
- ▶ Classified as:
  - **Mild** (treated with SABAs only)
  - **Moderate** (treated with SABAs plus antibiotics and/or oral corticosteroids) or
  - **Severe** (patient requires hospitalization or visits the emergency room). Severe exacerbations may also be associated with acute respiratory failure. Antibiotics, steroids, bronchodilators, oxygen
- ▶ Blood eosinophil count may also predict exacerbation rates (in patients treated with LABA without ICS).

## COPD exacerbations

**Table 3.2. Discharge criteria and recommendations for follow-up**

- Full review of all clinical and laboratory data.
- Check maintenance therapy and understanding.
- Reassess inhaler technique.
- Ensure understanding of withdrawal of acute medications (steroids and/or antibiotics).
- Assess need for continuing any oxygen therapy.
- Provide management plan for comorbidities and follow-up.
- Ensure follow-up arrangements: early follow-up < 4 weeks, and late follow-up < 12 weeks as indicated.
- All clinical or investigational abnormalities have been identified.

### 1-4 Weeks Follow-Up

- Evaluate ability to cope in higher usual environment.
- Review and understand treatment regimen.
- Reassessment of inhaler techniques.
- Reassess need for long-term oxygen.
- Document the capacity to do physical activity and activities of daily living.
- Document symptoms, CAT or mMRC.
- Determine status of comorbidities.

### 12-16 Weeks Follow-Up

- Evaluate ability to cope in higher usual environment.
- Review understanding treatment regimen.
- Reassessment of inhaler techniques.
- Reassess need for long-term oxygen.
- Document the capacity to do physical activity and activities of daily living.
- Measure spirometry: FEV<sub>1</sub>.
- Document symptoms, CAT or mMRC.
- Determine status of comorbidities.

## COPD exacerbations

**Table 5.8. Interventions that reduce the frequency of COPD exacerbations**

Intervention class	Intervention
Bronchodilators	LABAs
	LAMAs
	LABA + LAMA
Corticosteroid-containing regimens	LABA + ICS
	LABA + LAMA + ICS
Anti-inflammatory (non-steroid)	Roflumilast
Anti-infectives	Vaccines
	Long term macrolides
Mucoregulators	N-acetylcysteine
	Carbocysteine
Various others	Smoking cessation
	Rehabilitation
	Lung volume reduction

## Summary: GOLD 2017

- LAMAs in fashion
- LABAs second-in-command
- GCS out except for asthma & asthma /COPD overlap
- Exacerbation treatment unchanged but down-titrate afterwards
- Remember prevention!

