XI CONGRESSO SIMI LAZIO-MOLISE
ROMA 31 MARZO 2017

LINEE GUIDA GOLD 2017 SU COPD E
COMORBIDITÀ’

Leonardo M. Fabbri, MD, FERS, AE
Professor of Respiratory and Internal Medicine (-2016)
University of Modena and Reggio Emilia
WHO IS MS/MR COPD?

MALE, SMOKERS OR EX-SMOKER

40 years old, mainly > 65

Dyspnea on exercise ± cough&sputum

Wheezing at night or after exercise

In-expiratory ronchi and/or wheezing

Acute exacerbations of symptoms (30%)

Invariably (> 80%) associated with other chronic diseases (chronic multimorbidity)
Definition and assessment of severity of COPD

Management of COPD

COPD as pulmonary component of multimorbidity

Treatment of concomitant chronic diseases in COPD

Conclusions
2011

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. Exacerbations and comorbidities contribute to the overall severity in individual patients.

2017

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.
Definition and Overview

Figure 1.2. FEV₁ progression over time

FEV₁ in percent of predicted maximally attained value

Age range under observation

Age (years)

TR1: Normal
TR2: Small lungs but no COPD
TR3: Normal initial FEV₁ with rapid decline leading to COPD
TR4: Small lungs leading to COPD

TR1: 71.5%
TR2: 16.9%
TR3: 5.5%
TR4: 6.1%
**SYMPTOMS**
- shortness of breath
- chronic cough
- sputum

**EXPOSURE TO RISK FACTORS**
- tobacco
- occupation
- indoor/outdoor pollution

**SPIROMETRY:** Required to establish diagnosis
Figure 2.4. The refined ABCD assessment tool

- Spirometrically confirmed diagnosis
- Assessment of airflow limitation
- Assessment of symptoms/risk of exacerbations

Exacerbation history

<table>
<thead>
<tr>
<th>FEV₁ (%) predicted</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 2 or ≥ 1 leading to hospital admission</td>
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<tr>
<td>0 or 1 (not leading to hospital admission)</td>
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Post-bronchodilator FEV₁/FVC < 0.7

<table>
<thead>
<tr>
<th>GOLD</th>
<th>FEV₁ (%)</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≥ 80</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>50-79</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>30-49</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>&lt; 30</td>
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</table>

Symptoms

<table>
<thead>
<tr>
<th>mMRC 0-1</th>
<th>CAT &lt; 10</th>
<th>mMRC ≥ 2</th>
<th>CAT ≥ 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
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COPD AS PULMONARY COMPONENT OF MULTIMORBIDITY
Leonardo M. Fabbri, MD, FERS

Definition and assessment of severity of COPD

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**GOLD 2017 THERAPEUTIC RECOMMENDATIONS**

**Group C**
- LAMA + LABA
- LABA + ICS
- Further exacerbation(s)
- LAMA

**Group D**
- Consider roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis
- Consider macrolide (in former smokers)
- LAMA + LABA + ICS
- Persistent symptoms/further exacerbations
- LAMA 
- LABA + ICS

**Group A**
- Continue, stop or try alternative class of bronchodilator
- Evaluate effect
- A bronchodilator

**Group B**
- LAMA + LABA
- Persistent symptoms
- A long-acting bronchodilator (LABA or LAMA)

*Roflumilast not available in Australia

GOLD 2017, www.gold.copd.org
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PATHOGENESIS OF COPD

Cigarette smoke or air pollutant

Alveolar macrophage

? 

CD8+ T-cell

CXCR3

CXCL-10

Alveolar wall destruction
EMPHYSEMA

Proteases

Mucus hypersecretion
BRONCHIOLITIS

Adapted from PJ Barnes, 2000; Fabbri, Sinigaglia, Papi, Saetta 2002; Cosio, Saetta and Cosio 2012
**GOLD Definition:** the presence of airflow limitation that is not fully reversible and a history of exposure to a noxious agent / risk factor (cigarette smoke)

**Airflow limitation**
- Small airways
  - Remodeling, fibrosis
- Alveoli: Emphysema
  - Destruction and enlargement of mature Airspace distal to terminal bronchioles
Inhaled particles: pulmonary and heart co-morbidity

Lung
- Inflammation
- Allergy - Sensitization
- Chronic lung diseases

Systemic effects mediated by
- Autonomic nervous system
- Translocation of particles
- Inflammatory mediators

Heart Attack
- Sudden cardiac death

Cardiovascular Effects of Fine and Ultrafine Particles

Courtesy of W MacNee
LEADING CAUSES OF DEATH IN U.S.

1. Myocardial Infarction
2. Cancer
3. Cerebrovascular Diseases
4. COPD

Cigarette Related Diseases Leading Causes of Death Worldwide 2010
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THERAPEUTIC RECOMMENDATIONS

Group A
- Continue, stop or try alternative class of bronchodilator
- Evaluate effect
- A bronchodilator

Group B
- LAMA + LABA
- Persistent symptoms
- A long-acting bronchodilator (LABA or LAMA)

Group C
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- LABA + ICS
- Further exacerbation(s)
- LAMA

Group D
- Consider roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis
- Consider macrolide (in former smokers)
- LAMA + LABA + ICS
- Further exacerbation(s)
- Persistent symptoms/further exacerbations
- LAMA

GOLD 2017, www.goldcopd.org

*Roflumilast not available in Australia
• Male, 88 year
• Moderate dyspnea on exercise
  • No chronic bronchitis
• No occupational exposure
  • Ex-smoker (20 p/y).
• Diagnosis of COPD 6 months ago in conjunction with an AECOP requiring hospitalization
• Recommended regular inhalation treatment with aerosolied bronchodilator/steroids (not taken)
HOSPITALIZED AND TREATED FOR EXCERBATION OF COPD

• Three days admission 6 months ago, after few days of cough, sputum, dyspnea, fever
  • Normal chest X-Ray
• No fever, cyanosis, nor edema at admission
HOSPITALIZED AND TREATED FOR EXCERBATION OF COPD

- SaO2 87% (no arterial blood gases available)
- CRP 8.8 mg/dL (0-0.5) - < 0.6 at discharge
- proBNP ECLIA 2515 pico gr/ml (0-194)
- Troponin T hs 13 ng/L (50 ng/L)
- No spirometry before, during or after admission
COMORBIDITIES

- Obese (BMI=36)
- Diabetes
- Arterial hypertension
- Dyslipidemia
- Atrial fibrillation
- Ischaemic heart disease
- Heart failure with increased PaP (55mmHg)
- Benign Prostatic Hypertrophy
TREATMENT

• Metformin
• Olmesartan
• Medoximil
• Larcanedipin
• Carvedilol
• Finasteride
• Silodosin
• Warfain
Since 1 year:

- Moderate progressive dyspnoea on exercise (mMRC2)
- Dyspnea in the early morning
- Occasional cough, no purulent sputum

Reduced fremitus, in/espiratory ronchi, bilateral basal in/espiratory crackles
C.R. 20 October 2015

SPIROMETRY
(not diagnostic for COPD)

- FEV$_1$: 1.37 L (50% predicted)
- Post-BD FEV$_1$: 1.40 L (+2%)
- FVC: 2.05 L (54% predicted)
- FEV$_1$/FVC: 68%
- RV: 2.95 L (104% predicted)
  - RV/TLC: 59%
- 6MWT: 280 m, SaO2 95%-88%
SIX MINUTE WALKING TEST (6MWT)

SaO2 pre: 95%
SaO2 post: 88%
PA pre: 140/85 mm Hg
PA post: 160/80 mm Hg
FC pre: 70/min
FC post: 85/min
Meters: 280

Meters: ≥350 Good
250–349 Mild impairment
150–249 Moderate
≤149 Severe
CONCLUSIONS AND RECOMMENDATIONS AT FIRST VISIT

• Tiotropium 2.5 ug 2 inhalation in the evening

• Recommended rehabilitation, including weight reduction
  • Confirmed ongoing treatment of comorbidities
    • Weekly telephone contact
  • Hematochemical exams + chest X ray
    • Clinical control at 1 month
CONCLUSIONS AND RECOMMENDATIONS AT FOLLOW UP

• Tiotropium 2 inhalation in the evening
• Formoterol/budesonide combination bid

• Rehabilitation, weight reduction, exercise

• Confirmed ongoing treatment of comorbidities

• Monthly telephone contacts

• Clinical control at 3 months
COPD, a disease, is characterized by persistent airflow limitation, i.e., FEV1/FVC < 70%
REALITY
patient was being treated with

Tiotropium 2 inhalations in the morning
Formoterol/budesonide combination bid

Aspirin 75 mg 1 tablet OD

Valsartan 160 mg 1 cp al mattino

O₂ 1 L/min during exercise

No rehabilitation
FREQUENCIES OF OBJECTIFIED COMORBIDITIES

ASSOCIATION BETWEEN COMORBIDITIES OF COPD AND RISK OF > 2 EXACERBATIONS/YEAR

Westerik JAM et al, ERS congress 2016; poster PA871
The present study analysed data from 20,296 subjects aged >45 yrs at baseline in the Atherosclerosis Risk in Communities Study (ARIC) and the Cardiovascular Health Study (CHS).
COPD vs CHF

- Up to 1/5 of elderly pts. with COPD have CHF
- Up to 1/3 of elderly pts. with CHF have COPD

14 million Americans have COPD and 5 million have CHF.

The risk ratio of developing HF in COPD pts is 4.5.

The rate-adjusted hospital prevalence of CHF is 3 times greater among pts. discharged with a diagnosis of COPD compared with patients discharged without mention of COPD.

405 elderly with a diagnosis of COPD, but no CHF by GPs

- COPD only: 194 (48%)
- CHF only: 33 (8%)
- COPD + CHF: 50 (12%)
- no CHF, no COPD: 128 (32%)

Rutten FH et al, Eur Heart J 2005
ECHOCARDIOGRAPHY, SPIROMETRY, AND SYSTEMIC ACUTE-PHASE INFLAMMATORY PROTEINS IN SMOKERS WITH COPD OR CHF: AN OBSERVATIONAL STUDY

66% of CHF patients

34% of CHF patients

Only 10 of 42 (<25%) pts. with both CHF and COPD were aware of airflow limitation and properly treated.

Beghé B et al. PlosOne 2013 Nov 11;8
LUNG FUNCTION ABNORMALITIES IN PATIENTS WITH ISCHEMIC HEART DISEASES

Recruited
\( n = 3,103 \)

Completed examinations
\( n = 3,056 \)

Spirometry conducted
\( n = 3,036 \)

Not fulfilling > 1 inclusion/exclusion criteria
\( n = 47 \)

No spirometry performed
\( n = 20 \)

No post-bronchodilator FVC
\( n = 105 \)

Spirometry not passing quality control
\( n = 201 \)

Evaluable population
\( n = 2,730 \)

Franssen et al, Am J Respir Cr Care Med 2016
LUNG FUNCTION ABNORMALITIES IN PATIENTS WITH ISCHEMIC HEART DISEASES

Franssen et al, Am J Respir Cr Care Med 2016

- Normal lung function (58.5%)
- Undiagnosed airflow limitation (21.5%)
- Previously diagnosed airflow limitation (9.0%)
- Restrictive lung function (11.0%)
IMPACT OF COPD ON LONG-TERM OUTCOME AFTER STEMI RECEIVING PRIMARY PCI

As compared to patients without COPD, patients with STEMI and concomitant COPD are at greater risk for

- death (25% vs 16.5%)
- hospital readmissions due to cardiovascular causes (recurrent MI, HF and bleedings)

Campio G. et al. Chest 2013;144:750-7
FROM COMORBIDITIES TO MULTIMORBIDITY

<table>
<thead>
<tr>
<th>Condition</th>
<th>&lt;20%</th>
<th>20-40%</th>
<th>40-60%</th>
<th>&gt;60%</th>
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<tr>
<td>Renal Impairment (n=47)</td>
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<td>Anemia (n=11)</td>
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<td>Hypertension (n=103)</td>
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<tr>
<td>Obesity (n=50)</td>
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<td>Underweight (n=30)</td>
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<tr>
<td>Muscle Wasting (n=60)</td>
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<td>Hyperglycemia (n=116)</td>
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<td>Dyslipidemia (n=77)</td>
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<td>Osteoporosis (n=66)</td>
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<td>Anxiety (n=43)</td>
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<td>Depression (n=33)</td>
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<td>Atherosclerosis (n=106)</td>
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<tr>
<td>Myocardial Infarction (n=19)</td>
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Vanfleteren LEGW et al. AJRCCM 2013 Apr;187(7):728-35
The aim of this review was to summarize the evidence on the relationship between COPD and the three most frequent and important cardiac comorbidities in COPD patients – i.e., ISCHAEMIC HEART DISEASE, HEART FAILURE, AND ATRIAL FIBRILLATION.

We believe that these cardiac disorders should always be searched for in COPD patients, and we provide up-to-date practical indications for treatment and management of patients with COPD and heart diseases.
In a large cohort of patients with COPD, 8.8% were diagnosed with PAD which is higher than the prevalence in non-COPD controls.

PAD was associated with a clinically relevant reduction in functional capacity and health status.
Obesity is prevalent (> 35%) among individuals with COPD and is associated with worse COPD-related outcomes, ranging from QOL and dyspnea to 6MWD and severe AECOPD.

These associations were strengthened when obesity was analyzed as a dose dependent response.

Obesity in patients with COPD may contribute to a worse COPD-related course.

METABOLIC SYNDROME IS FREQUENT IN PATIENTS WITH COPD

Consequences of Obstructive Sleep Apnoea

- Oxygen desaturation
- Arousal
- Intrathoracic pressure changes

Intermediate Mechanisms

- Sympathetic activation
- Endothelial dysfunction
- Hypercoagulability
- Inflammation
- Oxidative stress
- Metabolic dysregulation

Cardiovascular Diseases

- Systemic hypertension
- Heart failure
- Stroke
- Myocardial ischaemia and infarction
- Arrhythmia
- Sudden death

Figure: Obstructive sleep apnoea consequences and intermediate mechanisms that potentially contribute to risk of cardiovascular disease. The events associated with collapse of the upper airway lead to brain arousal, intrathoracic pressure changes, and hypoxaemia and reoxygenation. Several intermediate mechanisms link obstructive sleep apnoea with the initiation and progression of cardiovascular diseases. SaO2 – oxygen saturation. C3A2 and C4A1 – electroencephalographic channels.

SIMULTANEOUS DEVELOPMENT OF CHRONIC DISEASES
Multimorbidity: clinical assessment and management

Multimorbidity: assessment, prioritisation and management of care for people with commonly occurring multimorbidity

_NICE guideline_

Methods, evidence and recommendations

31 March – 12 May 2016

Commentary by Vanfleterern, Spruit and Franssen, Eur Resp J 2016, in press
Chronic diseases represent a huge proportion of human illness

58 million deaths in 2005:

- Cardiovascular disease 30%
- Cancer 13%
- Chronic respiratory diseases 7%
- Diabetes 2%

Noncommunicable diseases will be the predominant global public health challenge of the 21st century.

Prevention of premature deaths due to noncommunicable diseases and reduction of related health care costs will be the main goals of health policy.

Improving the detection and treatment of noncommunicable diseases and preventing complications and catastrophic events will be the major goals of clinical medicine.

NUMBER OF CHRONIC DISORDERS BY AGE-GROUP

Barnett, K et al, 2012 Jul 7;380(9836):37-43
Our findings challenge the single-disease framework by which most health care, medical research, and medical education is configured. A complementary strategy is needed, supporting generalist clinicians to provide personalised, comprehensive continuity of care, especially in socioeconomically deprived areas.

Barnett, K et al, 2012 Jul 7;380(9836):37-43
EXACERBATIONS OF RESPIRATORY SYMPTOMS IN PATIENTS WITH COPD MAY NOT BE EXACERBATIONS OF COPD

G.Z.L.

- Male, 72 year/old
- Lawyer
- Very heavy smoker (165 p/y).
- Very severe airflow limitation, GOLD D
- Arterial hypertension
- Treatment: lisinopril, frusemide, beclometasone/formoterol, tiotropium
CLINICAL HISTORY-1

Since 5-6 days:

- Increasing dyspnoea
- Cough and purulent sputum without chest pain
- Fever (temp 37.8 °C)
CLINICAL HISTORY-2

BP: 180/80 mmHg
HR 90/min
SpO2 89%
RR 25/min
BT 37.5°C

- Dyspnoea, fatigue, use of accessory muscles
- Chest auscultation: reduced breath sounds, diffuse expiratory wheezing
- Sinus tachycardia (110 bpm)
CLINICAL HISTORY

BLOOD TESTS
• WBC= 12,130
• HB = 15,9 gr/dl
• Creatinine: 0,8 mg/dl
• Troponin: 0,01 mg/dl
• CRP= 12,50 mg/dl
• D-Dimer 580 ng/ml

ARTERIAL BLOOD GASES
• PH= 7.40
• PO2= 57 mmHg
• PCO2= 50 mmHg
• HCO3 = 30 mmol/L
• Sat O2 88%
CT-SCAN before treatment
TREATMENT

- O2 therapy at 1 L/min, continuous
- Metylprednisolone 40 mg/die ev od
- Ampicillin/Sulbactam 1.5 g/die ev tid
- Nebulized beclomethasone 1 fl, ipratropium ½ fl, salbutamol 8 gtt qid
CT SCAN at follow up

CT SCAN at admission
Which treatment was effective?

- Bronchodilators and steroids
- Antibiotics
- Diuretics
- All of the above
- We don’t know!
COMORBIDITIES AND SUBGROUPS OF PATIENTS SURVIVING SEVERE ACUTE HYPERCAPNIC RESPIRATORY FAILURE IN THE ICU

- 67% had COPD, only 19 previously diagnosed
- Non-COPD patients were primarily obese
- Obstructive sleep apnea was 51% in COPD and 81% in non-COPD patients
- Previously undiagnosed cardiac dysfunction with preserved ejection fraction was highly prevalent (44%), as well as hypertension (67%)

Brochard L et al, Am J Respir Cr Care Med, 12 Feb 2017, on line
COMORBIDITIES AND SUBGROUPS OF PATIENTS SURVIVING SEVERE ACUTE HYPERCAPNIC RESPIRATORY FAILURE IN THE ICU

- Multimorbidity was associated with longer time to hospital discharge

- Hospital readmission or death occurred in 46% of patients over 3.5 months post-discharge

- Multi-morbidity is common, most often unrecognized, and may be associated with poor outcome

Brochard L et al, Am J Respir Cr Care Med, 12 Feb 2017, on line
EXACERBATIONS OF RESPIRATORY SYMPTOMS IN PATIENTS WITH COPD MAY NOT BE EXACERBATIONS OF COPD

Exacerbation of COPD

Airway and lung inflammation

Exacerbations of respiratory symptoms in patients with COPD

Exacerbation of coexistent non-respiratory diseases
- Hypertension
- Heart failure
- Ischaemic heart disease
- Pulmonary embolism
- Stroke
- Depression

Exacerbation of coexistent respiratory diseases
- Asthma
- Pneumonia
- Bronchiectasis
- Interstitial lung diseases
- Pneumothorax

DIFFERENTIAL DIAGNOSIS OF ACUTE EXACERBATIONS OF COPD

• AECOPD is a clinical diagnosis, defined as worsening of respiratory symptoms and change in medication and/or hospital admission

• However, there is no defined etiology (usually, airway inflammation and bronchitis)

• Role of cardiac comorbidities as putative triggers of AECOPD is currently under investigation

RISK OF MORTALITY IN PATIENTS WITH OR WITHOUT HISTORY OF HOSPITALIZATIONS DUE TO COPD EXACERBATIONS IN THE ECLIPSE STUDY

<table>
<thead>
<tr>
<th>Baseline status</th>
<th>N (censored)</th>
<th>Year 3 survival</th>
<th>95% CI, year 3 survival</th>
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</thead>
<tbody>
<tr>
<td>No COPD hosp</td>
<td>1813 (1669)</td>
<td>92.0%</td>
<td>(90.8%, 93.3%)</td>
</tr>
<tr>
<td>≥1 COPD hosp</td>
<td>325 (267)</td>
<td>82.1%</td>
<td>(78.1%, 86.4%)</td>
</tr>
</tbody>
</table>

Mullerova et al, Chest 2014, published on line November 6, 2014
Elevated levels of NT-proBNP and troponin T are strong predictors of early mortality among patients admitted to hospital with acute exacerbations of COPD independently of other known prognostic indicators.

The pathophysiological basis for this is unknown, but indicates that cardiac involvement in exacerbations of COPD may be an important determinant of prognosis.
BIOCHEMICAL MARKERS OF CARDIAC DYSFUNCTION PREDICT MORTALITY IN ACUTE EXACERBATIONS OF COPD

> troponin

Chest pain

ECG changes

Raised troponin, chest pain and serial ECG changes are common in patients admitted to hospital with exacerbation of COPD.

Overall, 20/242, ie 1/12 patients with ECOPD met the criteria for myocardial infarction.

Whether these patients would benefit from further cardiac investigation is unknown.

Raised troponin, chest pain and serial ECG changes are common in patients admitted to hospital with exacerbation of COPD.

Overall, 20/242, i.e., 1/12 patients with ECOPD met the criteria for myocardial infarction.

Whether these patients would benefit from further cardiac investigation is unknown.

Changes in BNP or NT-proBNP following treatment should be considered an important part of the pre-discharge decision making for patients hospitalized with AHF.
Manage COPD Exacerbations

BRONCHODILATORS

STEROIDS

ANTIBIOTICS

OXYGEN/NON INVASIVE VENTILATION

MECHANICAL VENTILATION
**Group A**

- Continue, stop or try alternative class of bronchodilator

- Evaluate effect

- A bronchodilator

**Group B**

- **LAMA + LABA**

- Persistent symptoms

- **A long-acting bronchodilator (LABA or LAMA)**

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*Roflumilast not available in Australia*
COPD AS THE PULMONARY COMPONENT OF MULTIMORBIDITY

We compared the angiotensin receptor–neprilysin inhibitor LCZ696 with enalapril in patients who had heart failure with a reduced ejection fraction. LCZ696 was superior to enalapril in reducing the risks of death and of hospitalization for heart failure.
ANGIOTENSIN–NEPRILYSIN INHIBITION VERSUS ENALAPRIL IN HEART FAILURE

Sacubitril/valsartan combines a neprilysin inhibitor with an angiotensin receptor blocker.

As an inhibitor of neprilysin, an enzyme that degrade biologically active natriuretic peptides, this first-in-class therapy increases levels of circulating natriuretic peptides resulting in natriuretic, diuretic, and vasodilatory effects.

American College of Cardiology/American Heart Association/Heart Failure Society of America recently updated guideline recommendations for Stage C patients with heart failure with reduced ejection fraction to recommend angiotensin converting enzyme inhibitors, angiotensin receptor blockers or sacubitril/valsartan in conjunction with other evidence-based therapies to reduce morbidity and mortality.
Una nuova analisi condotta in un sottogruppo di pazienti con insufficienza cardiaca e ridotta frazione di eiezione (HFrEF) e diabete, suggerisce che il trattamento con sacubitril/valsartan migliora il controllo glicemico rispetto all’ACE inibitore enalapril.

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GLOBAL STRATEGY FOR DIAGNOSIS, MANAGEMENT AND PREVENTION OF COPD

DEFINITION OF COPD 2011

2011

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Diagnosis of COPD

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- shortness of breath
- chronic cough
- sputum

EXPOSURE TO RISK FACTORS
- tobacco
- occupation
- indoor/outdoor pollution

SPIROMETRY: Required to establish diagnosis

© 2017 Global Initiative for Chronic Obstructive Lung Disease
ABCD Assessment Tool

Figure 2.4. The refined ABCD assessment tool

1. Spirometrically confirmed diagnosis
2. Assessment of airflow limitation
3. Assessment of symptoms/risk of exacerbations

Post-bronchodilator FEV₁/FVC < 0.7

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</tr>
<tr>
<td>2</td>
<td>50-79</td>
</tr>
<tr>
<td>3</td>
<td>30-49</td>
</tr>
<tr>
<td>4</td>
<td>&lt; 30</td>
</tr>
</tbody>
</table>

Exacerbation history
- ≥ 2 or ≥ 1 leading to hospital admission
- 0 or 1 (not leading to hospital admission)

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mMRC 0-1 CAT &lt; 10</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Symptoms</td>
</tr>
</tbody>
</table>
GOLD 2017 THERAPEUTIC RECOMMENDATIONS

Group C

- LAMA + LABA
- LABA + ICS

Further exacerbation(s)

LAMA

Group D

- Consider roflumilast if FEV₁ < 50% pred. and patient has chronic bronchitis

Consider macrolide (in former smokers)

Further exacerbation(s)

LAMA + LABA + ICS

Persistent symptoms/further exacerbations

LAMA  →  LAMA + LABA  →  LABA + ICS

Group A

- Continue, stop or try alternative class of bronchodilator

- Evaluate effect

- A bronchodilator

Group B

- LAMA + LABA

Persistent symptoms

A long-acting bronchodilator (LABA or LAMA)

*Roflumilast not available in Australia

GOLD 2017, www.gold.copd.org
COPD AS THE PULMONARY COMPONENT OF MULTIMORBIDITY

EXACERBATIONS OF RESPIRATORY SYMPTOMS IN PATIENTS WITH COPD MAY NOT BE EXACERBATIONS OF COPD

Exacerbation of COPD

Airway and lung inflammation

Exacerbations of respiratory symptoms in patients with COPD

Exacerbation of coexistent non-respiratory diseases
- Hypertension
- Heart failure
- Ischaemic heart disease
- Pulmonary embolism
- Stroke
- Depression

Exacerbation of coexistent respiratory diseases
- Asthma
- Pneumonia
- Bronchiectasis
- Interstitial lung diseases
- Pneumothorax

XI CONGRESSO SIMI LAZIO-MOLISE
ROMA 31 MARZO 2017

LINEE GUIDA GOLD 2017 SU COPD E COMORBIDITA’

Leonardo M. Fabbri, MD, FERS, AE
Professor of Respiratory and Internal Medicine (-2016)
University of Modena and Reggio Emilia