



# Actualització en patologies mèdiques prevalents

## Comorbiditats cardiovasculars en la Malaltia Pulmonar Obstructiva crònica (MPOC)

Komal Malik Khanam



**Hospital Universitari**  
**MútuaTerrassa**



# MPOC i Malaltia cardiovascular (MCV)

- Epidemiologia
- Fisiopatologia
- Nexes comuns entre malaltia cardiovascular i pulmonar
- Implicacions terapèutiques



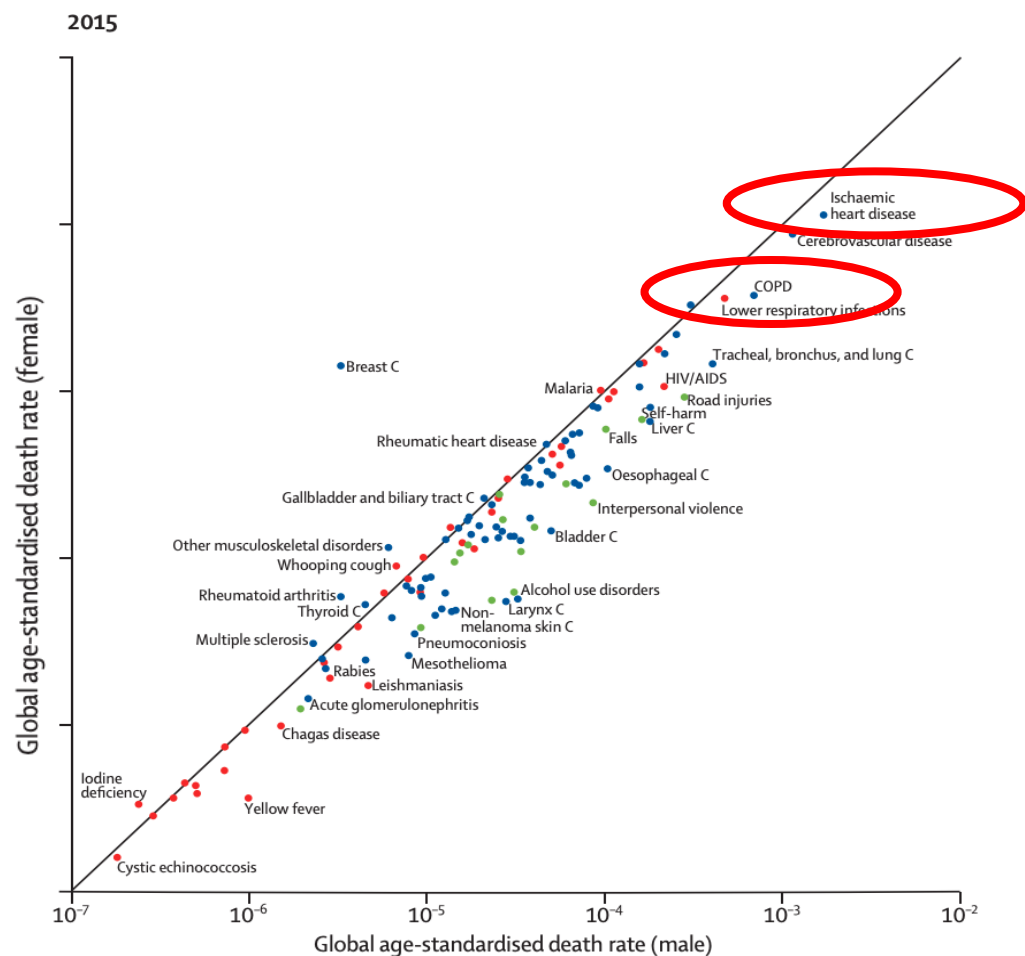
# Epidemiologia

Prevalença MPOC i insuficiència cardíaca

Prevalença MPOC i cardiopatia isquèmica



# Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015



## Leading causes of death globally



Source: WHO Global Health Estimates.



## Underdiagnosis in COPD: a battle worth fighting



\*Pere Almagro, Joan B Soriano

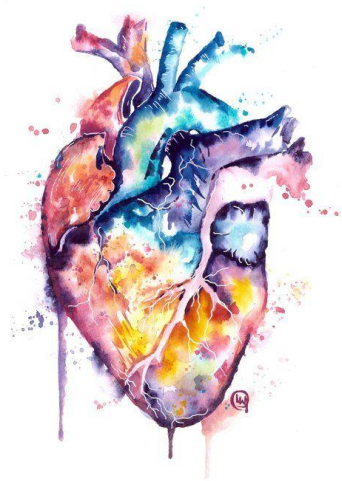
*Lancet Respir Med* 2017  
Published Online  
April 4, 2017  
[http://dx.doi.org/10.1016/S2213-2600\(17\)30133-9](http://dx.doi.org/10.1016/S2213-2600(17)30133-9)

COPD is a chronic disease universally undiagnosed. Findings from several epidemiological investigations have shown that 75% or more of patients with COPD remain undiagnosed, without substantial changes in recent years



*Almagro P. Lancet Respir Med 2017*





Dispnea paroxística nocturna

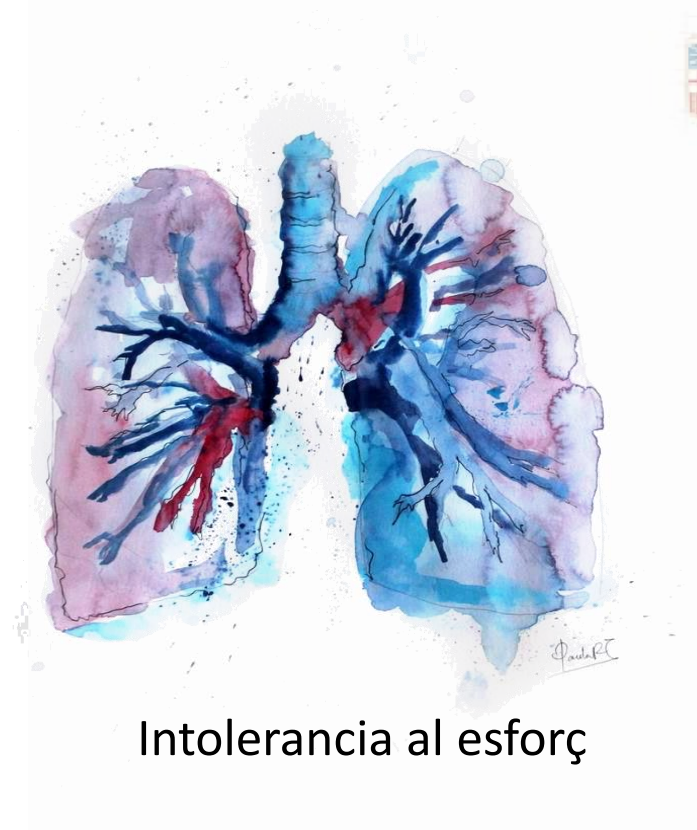
Crepitants

Ortopnea

Tos nocturna

Dispnea

Ansietat



Intolerancia al esforç

Depressió

Hipofonèsi



# Insuficiència cardíaca (IC) i MPOC

## Heart failure and chronic obstructive pulmonary disease: diagnostic pitfalls and epidemiology

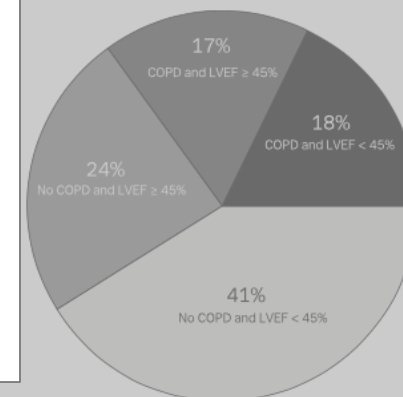
Nathaniel Mark Hawkins<sup>1\*</sup>, Mark C. Petrie<sup>2</sup>, Pardeep S. Khanna<sup>3</sup>, George W. Chalmers<sup>2</sup>, Francis G. Dunn<sup>4</sup>, and John V. Schirmer<sup>5</sup>

The reported prevalence of chronic obstructive pulmonary disease ranges from 11 to 52% in North American patients with heart failure and 11 to 35% in European cohorts (Table 2).

## Chronic obstructive pulmonary disease in patients admitted with heart failure

K. K. Iversen<sup>1</sup>, J. Kjaergaard<sup>1</sup>, D. Akkan<sup>1</sup>, L. Kober<sup>1</sup>  
The ECHOS-Lung Function Study Group\*

Aproximadament 30% de pacients amb  
IC → MPOC



## Occurrence and impact of chronic obstructive pulmonary disease in elderly patients with stable heart failure

PIERA BOSCHETTO,<sup>1</sup> ALESSANDRO FUCILI,<sup>1</sup> MARIARITA STENDARDO,<sup>1</sup> MICHELE MALAGÙ,<sup>1</sup>  
GIOVANNI PARRINELLO,<sup>3</sup> ENRICO CASIMIRRI,<sup>1</sup> ALFREDO POTENA,<sup>2</sup> LICIA BALLERIN,<sup>2</sup>  
LEONARDO M. FABBRI,<sup>4</sup> ROBERTO FERRARI<sup>1</sup> AND CLAUDIO CECONI<sup>1</sup>

30%

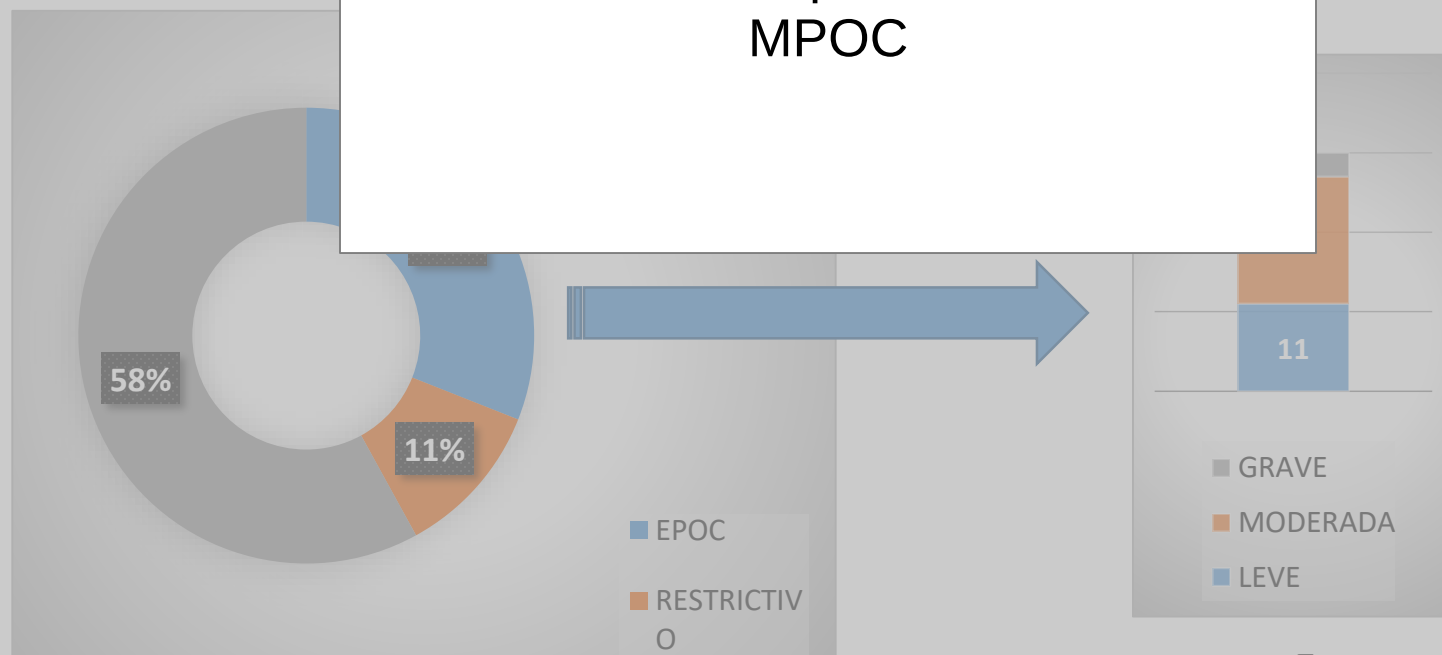


## ORIGINAL ARTICLE

Frits M. E. Franssen<sup>1\*</sup>, Joaquin Garcia-Rio<sup>7</sup>, Marlene C. Werner<sup>8</sup>, Alice Raillard<sup>11‡</sup>,  
Francisco García-Río<sup>7</sup>, Marlene C. Werner<sup>8</sup>, Alice Raillard<sup>11‡</sup>,  
Hana Muellerova<sup>4</sup>, and Johanna M. J. Halpern<sup>10</sup>

**MAGNÒSTIC 71%**

Entre 10-34% de pacients amb CI → MPOC



Franssen FME. AMJRCCM 2016





# MPOC i MCV

Arch Bronconeumol. 2009;45(Supl 4):8-13

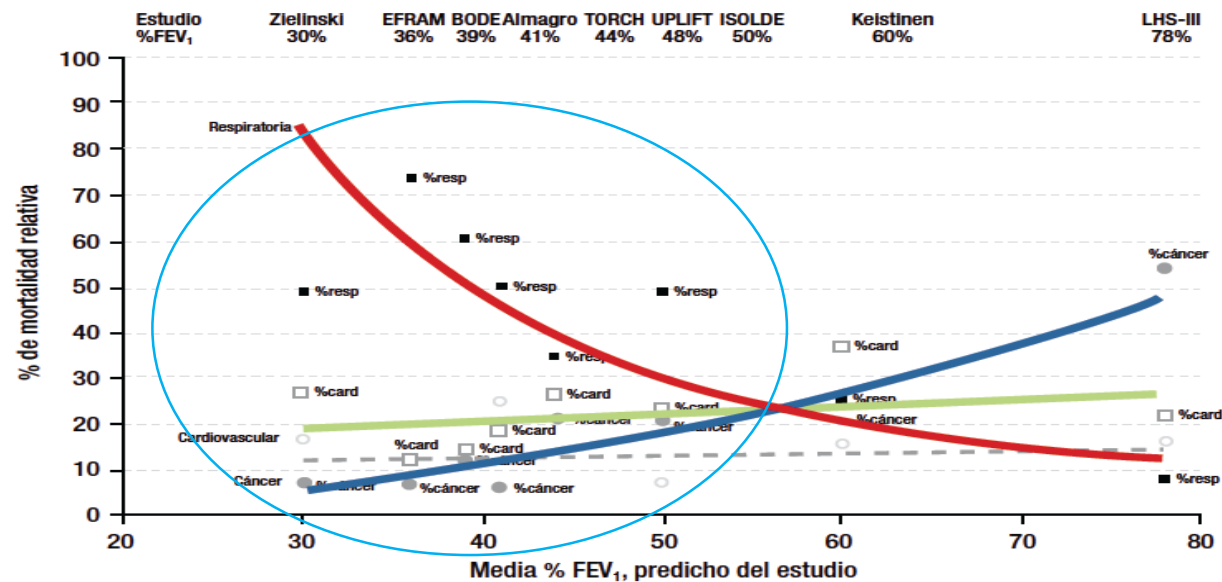
 **ARCHIVOS DE BRONCONEUMOLOGIA**

www.archbronconeumol.org



**Causas de mortalidad en la EPOC**

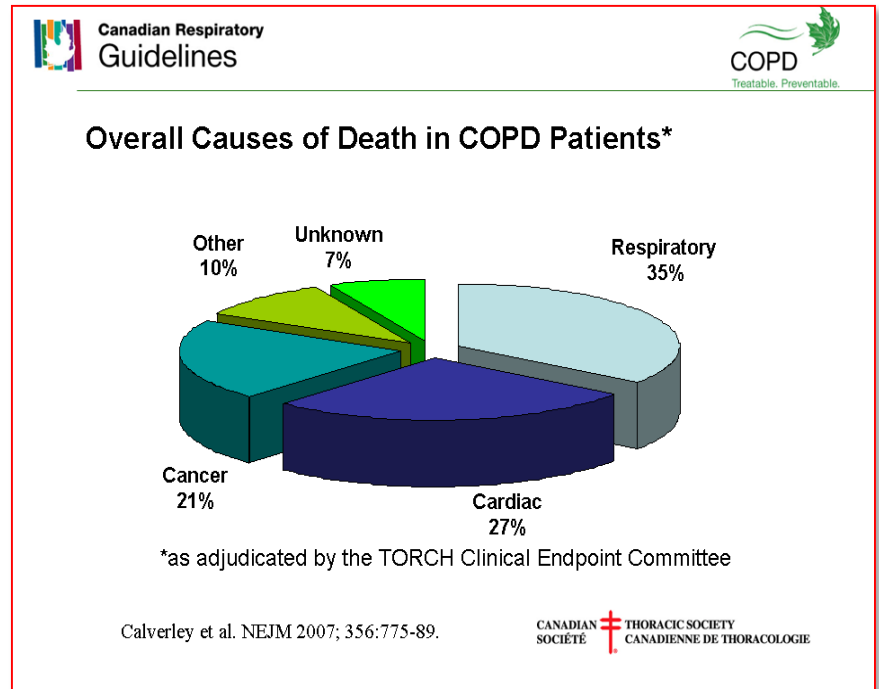
Joan B. Soriano Ortiz <sup>a,b,\*</sup>, Pere Almagro <sup>c</sup> y Jaume Saucedo Roig <sup>b,d</sup>



**The NEW ENGLAND JOURNAL of MEDICINE**

ESTABLISHED IN 1812 FEBRUARY 22, 2007 VOL. 356 NO. 8

**Salmeterol and Fluticasone Propionate and Survival in Chronic Obstructive Pulmonary Disease**





# CHEST

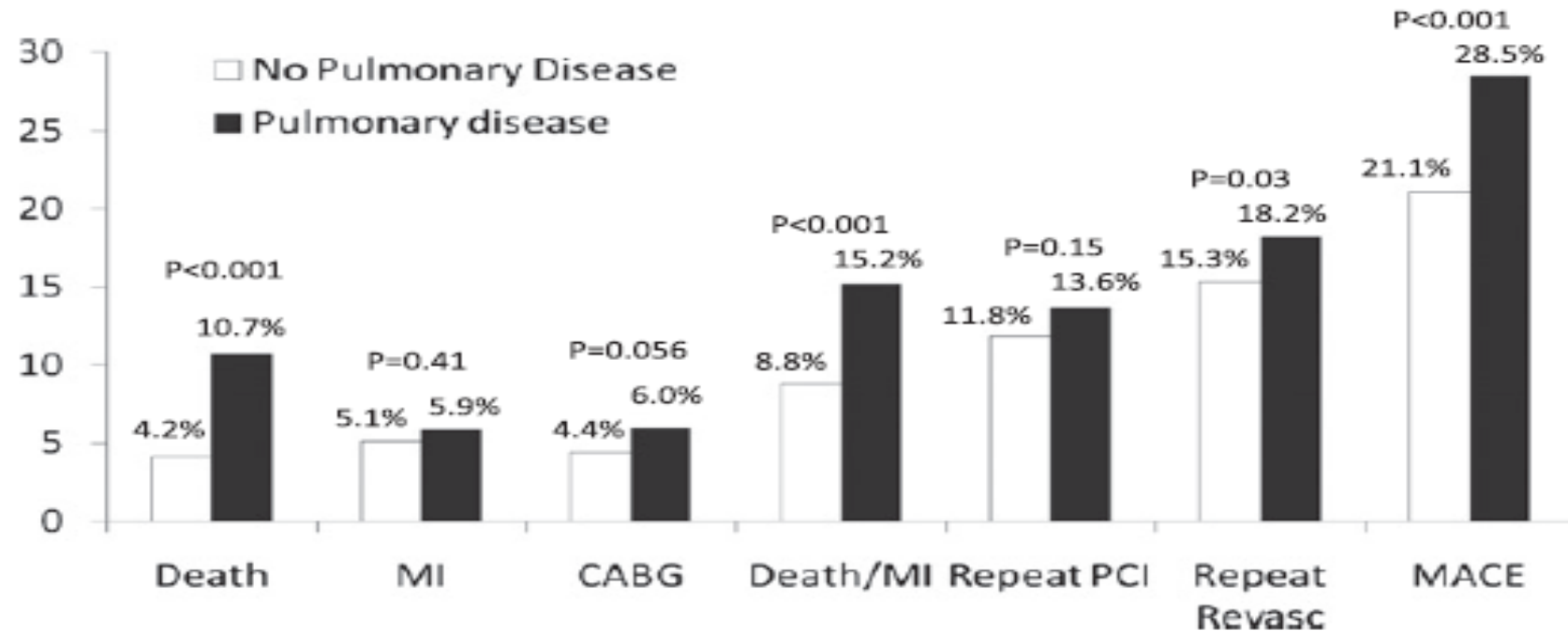
Original Research

COPD

## Increased Adverse Events After Percutaneous Coronary Intervention in Patients With COPD

Insights From the National Heart, Lung, and Blood Institute Dynamic Registry

*CHEST 2011; 140(3):604-610*



Enriquez JR. Chest 2011





**ESC**

European Society  
of Cardiology

European Heart Journal (2021) **42**, 3227–3337  
doi:10.1093/eurheartj/ehab484

**ESC GUIDELINES**

## **2021 ESC Guidelines on cardiovascular disease prevention in clinical practice**

Although COPD is recognized and thoroughly investigated as a CVD comorbidity, its role as an ASCVD risk factor is not well established. Nevertheless, COPD patients have a two- to three- fold increased risk of CVD compared with age-matched controls when adjusted for tobacco smoking.

### **Recommendations for cardiovascular disease risk assessment in specific clinical conditions**

It is recommended that all COPD patients be investigated for ASCVD and ASCVD risk factors.

**I**

**C**



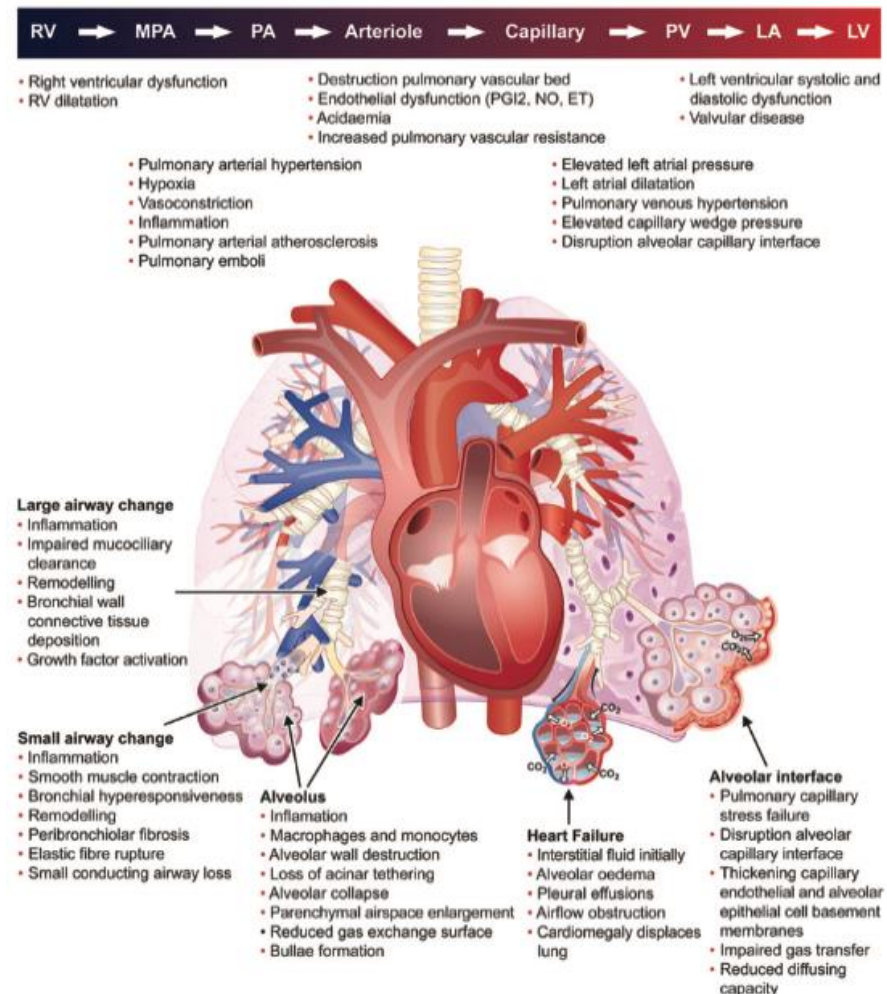
# MPOC i malaltia cardiovascular

Fisiopatologia

Nexes comuns



# Fisiopatologia



- Inflamació sistèmica crònica en pacients amb MPOC
- Disfunció endotelial
- Hipòxia
- Hipercàpnia
- Canvis estructurals
- Remodelament vascular
- Hiperinsuflació pulmonar



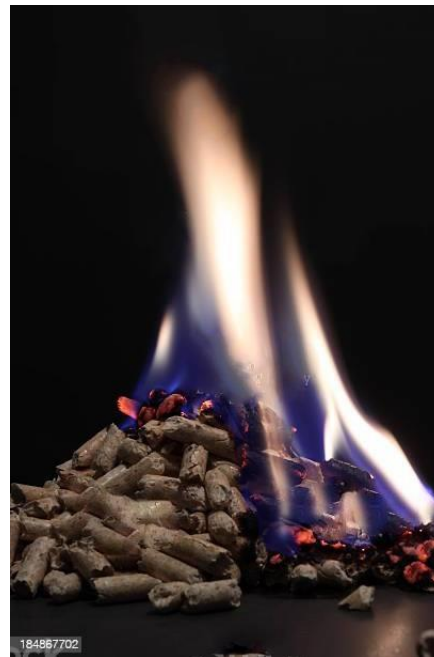
# Nexes comuns entre MPOC i MCV

- Tabaquisme
- Envelliment
- Factors de risc clàssics
- Lesió endotelial
- Disfunció plaquetar
- Rigidesa arterial
- Hiperinsuflació pulmonar
- Biomarcadors





# Tabaquisme

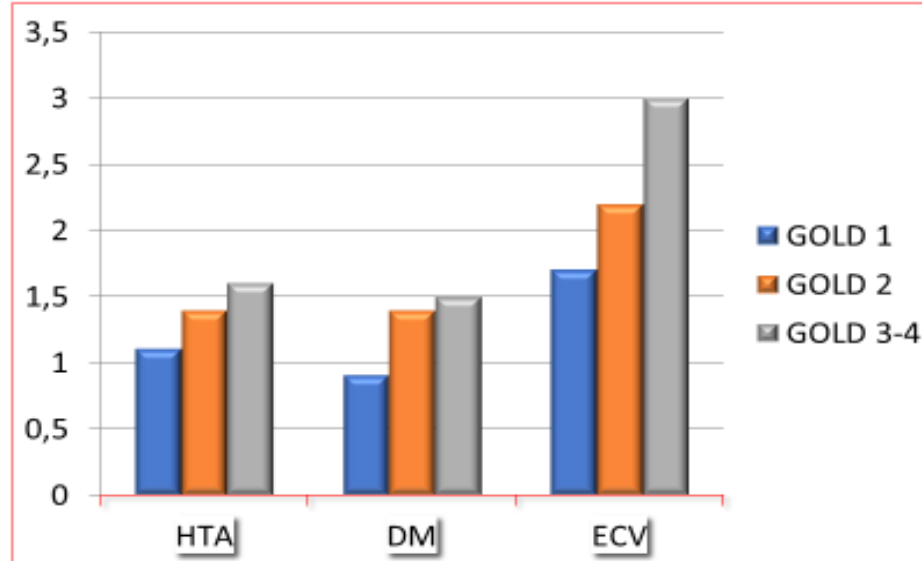


# Factors de risc cardiovascular clàssics

Eur Respir J 2008; 32: 962–969  
DOI: 10.1183/09031536.00012408  
Copyright ©ERS Journals Ltd 2008

## Prevalence and outcomes of diabetes, hypertension and cardiovascular disease in COPD

D.M. Mannino<sup>a</sup>, D. Thorn<sup>a</sup>, A. Swensen<sup>a</sup> and F. Holguin<sup>b</sup>

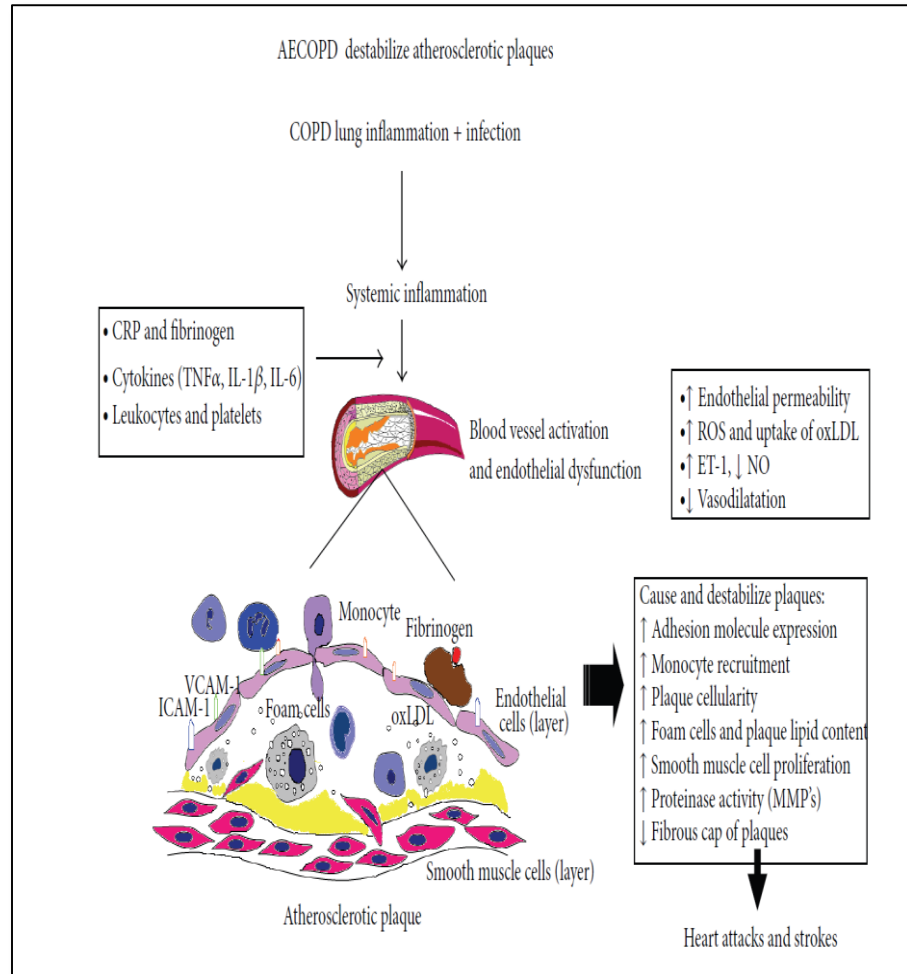


Adjusted for age, sex, race, smoking status, education level and body mass index from 20,296 study subjects from the Atherosclerosis Risk in Communities Study during 1986–1989 and the Cardiovascular Health Study during 1989–1990.





# Plaquettes



**International Journal of COPD**

**Dovepress**

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Open Access Full Text Article

ORIGINAL RESEARCH

## Impact of acute exacerbations on platelet reactivity in chronic obstructive pulmonary disease patients

*Muñoz-Esquerre M. IJCOPD 2018*

ORIGINAL ARTICLE

## Thrombocytosis is associated with increased short and long term mortality after exacerbation of chronic obstructive pulmonary disease: a role for antiplatelet therapy?

*Harrison MT. Thorax 2014*



## On-treatment platelet reactivity in patients with chronic obstructive pulmonary disease undergoing percutaneous coronary intervention

*Thorax* January 2014 Vol 69 No 1

| Variables          | without COPD (n=65) | With COPD (n=65) | p Value |
|--------------------|---------------------|------------------|---------|
| Baseline TRAP test | 953 (605–1104)      | 1119 (867–1388)  | 0.002   |
| ASPI test          | 235 (139–352)       | 349 (192–645)    | 0.02    |
| ADP test           | 504 (337–800)       | 679 (438–934)    | 0.03    |
| ADP HS test        | 317 (224–535)       | 514 (287–737)    | 0.01    |
| 1 month TRAP test  | 796 (589–908)       | 1054 (763–1123)  | <0.001  |
| ASPI test          | 137 (37–242)        | 352 (232–427)    | <0.001  |
| ADP test           | 309 (277–543)       | 677 (324–891)    | <0.001  |
| ADP HS test        | 212 (205–342)       | 567 (219–752)    | <0.001  |

TRAP: funció plaquetaria estimulada per trombina

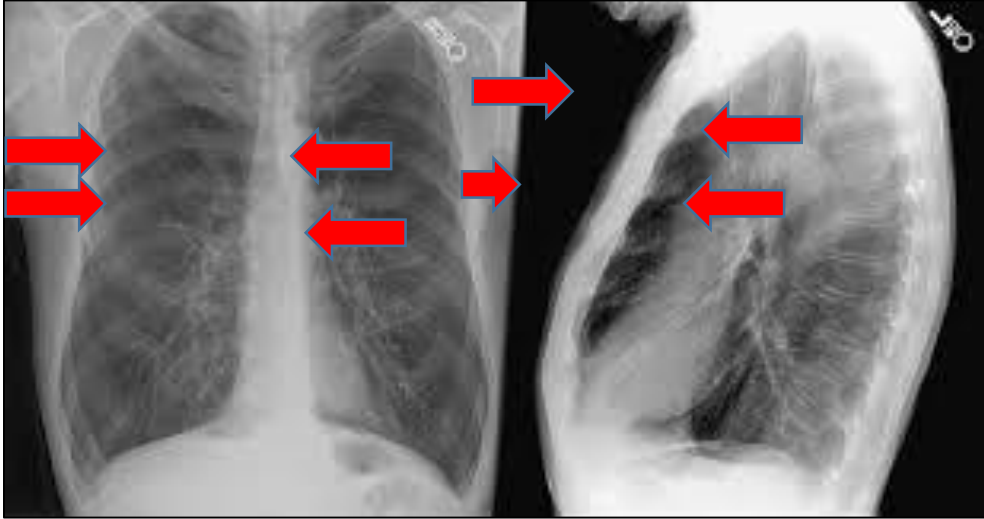
ASPI: funció plaquetaria inhibida per aspirina

ADP: funció plaquetaria inhibida pel clopidogrel

*Campo L. Thorax 2014*



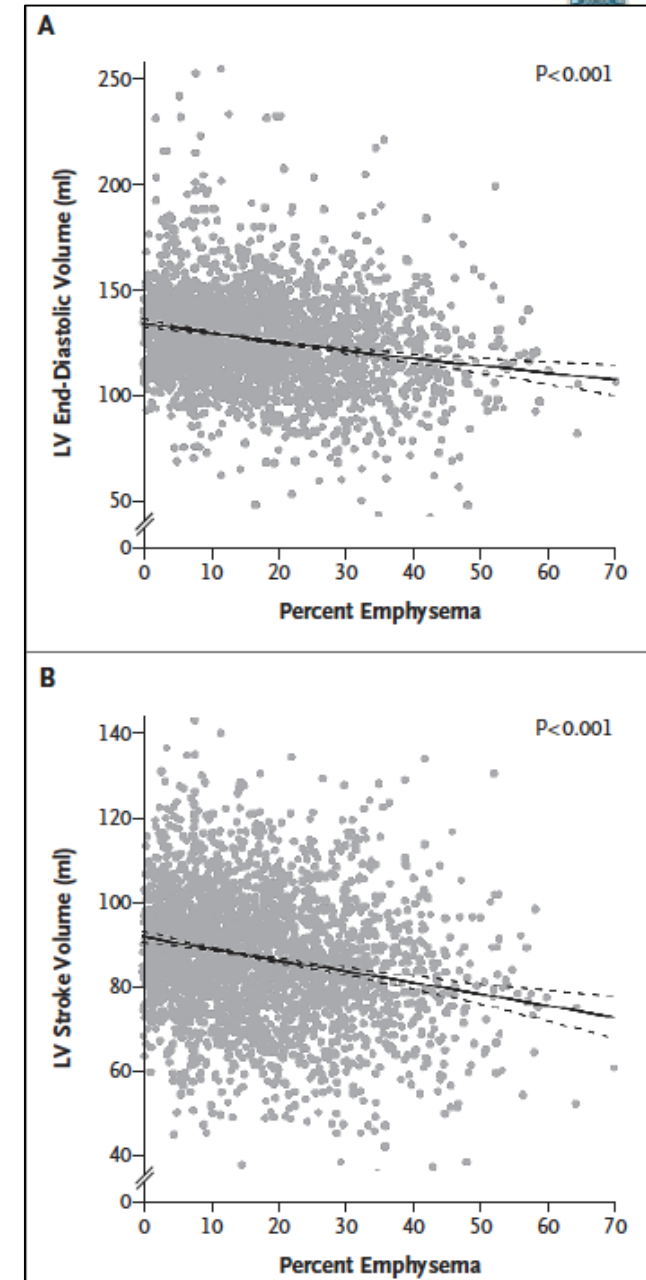
# Hiperinsuflació pulmonar



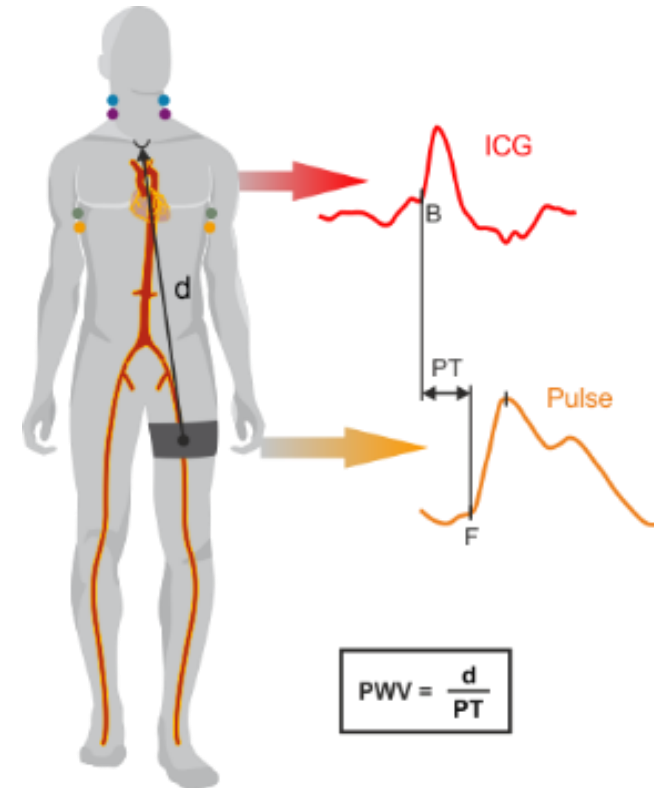
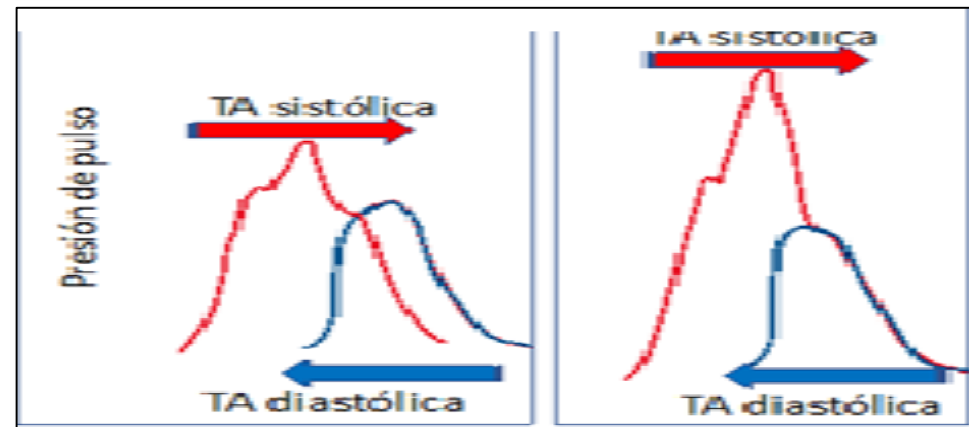
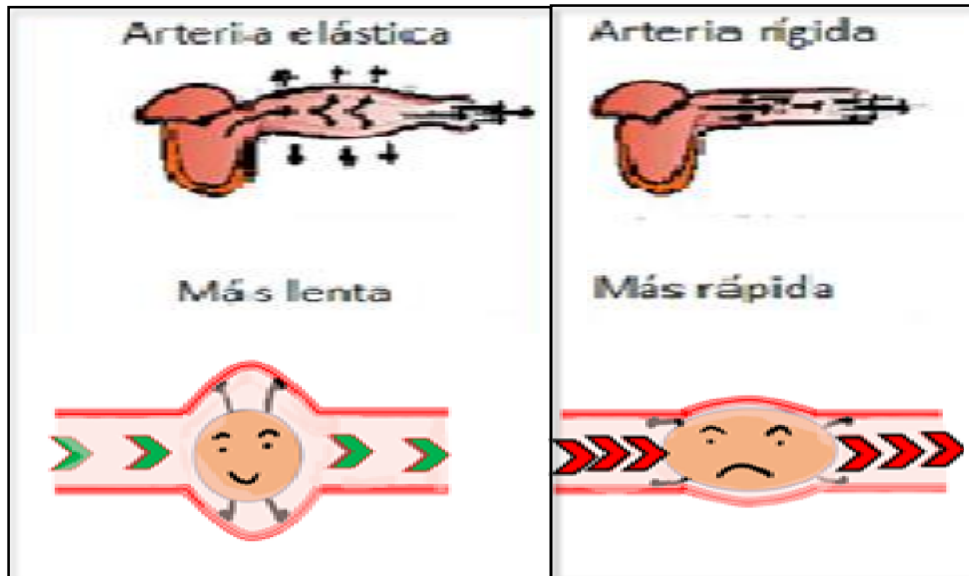
## ORIGINAL ARTICLE

### Percent Emphysema, Airflow Obstruction, and Impaired Left Ventricular Filling

R. Graham Barr, M.D., Dr.P.H., David A. Bluemke, M.D., Ph.D.,  
Firas S. Ahmed, M.D., M.P.H., J. Jeffery Carr, M.D., Paul L. Enright, M.D.,  
Eric A. Hoffman, Ph.D., Rui Jiang, M.D., Dr.P.H., Steven M. Kawut, M.D.,  
Richard A. Kronmal, Ph.D., João A.C. Lima, M.D., Eyal Shahar, M.D., M.P.H.,  
Lewis J. Smith, M.D., and Karol E. Watson, M.D., Ph.D.



# Rigidesa arterial



$$PWV = \frac{d}{PT}$$

SphygmoCor<sup>®</sup> XCEL Atcor

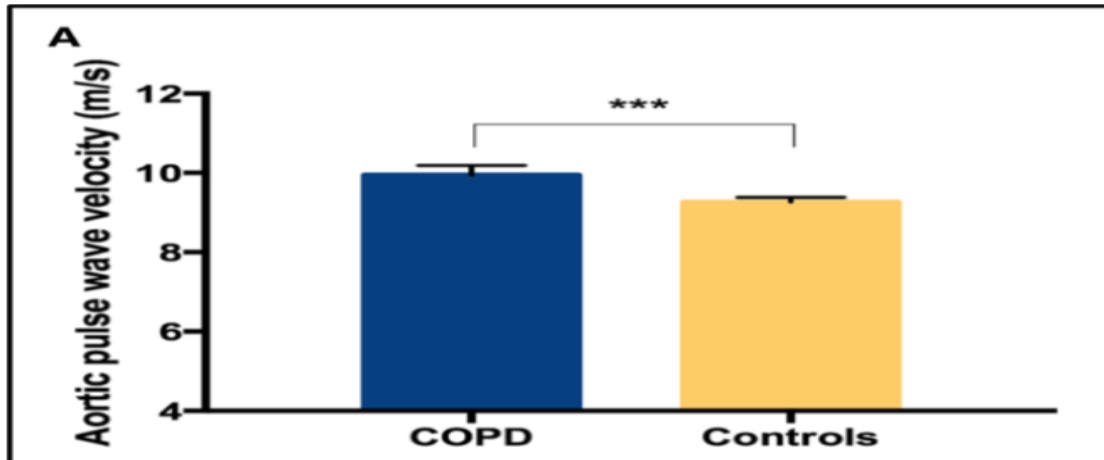


VaSera VS-1500N Fukuda Denshi



## Surrogate Markers of Cardiovascular Risk and Chronic Obstructive Pulmonary Disease

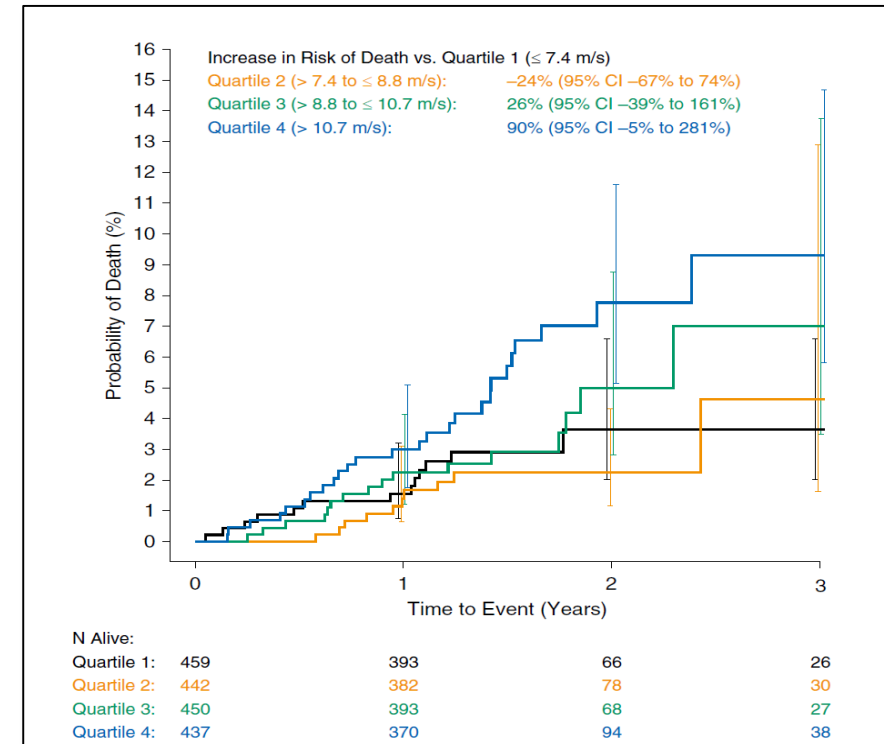
A Large Case-Controlled Study



| Variable                  | COPD<br>n=458 | Controls<br>n=1657 | P Value |
|---------------------------|---------------|--------------------|---------|
| Aortic PWV, m/s           | 10.33±2.48    | 9.15±2.22          | <0.001  |
| Adjusted aortic PWV, m/s* | 9.95±2.54     | 9.27±2.41          | <0.001  |

Fisk M, Hypertension 2018

## Pulse Wave Velocity in Chronic Obstructive Pulmonary Disease and the Impact of Inhaled Therapy (SUMMIT): A Randomized Double-Blind Clinical Trial



Crim C, AMJRCCM 2020



# Biomarcadors sèrics

Biomarcadors inflamatoris

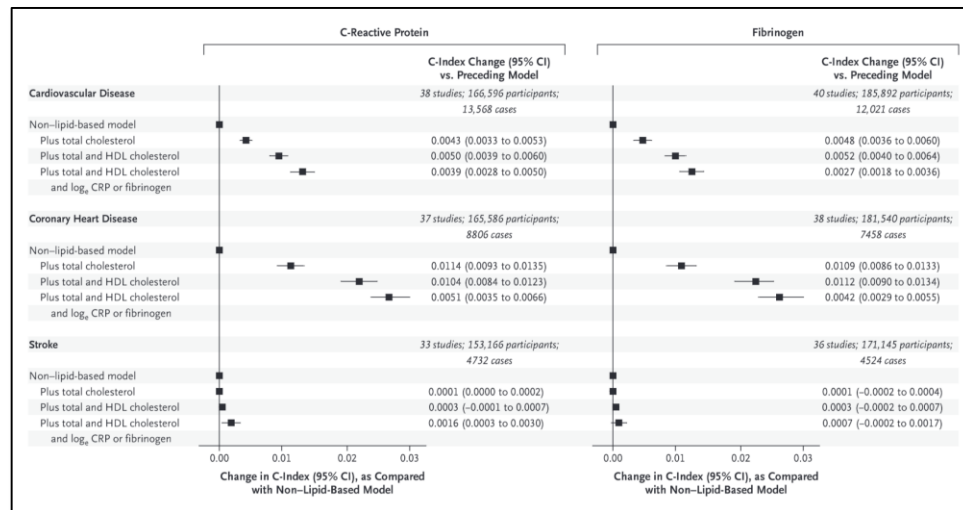
Biomarcadors de disfunció miocàrdica

Biomarcadors de dany pulmonar



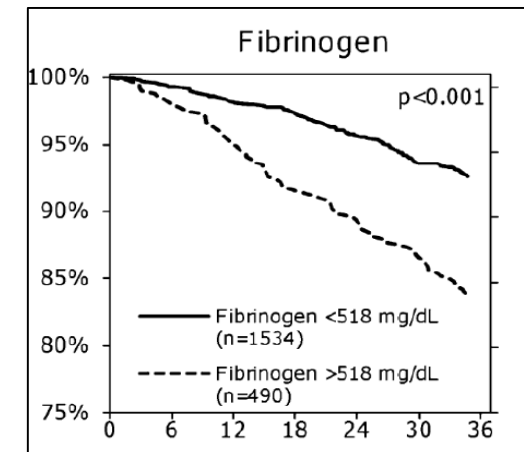
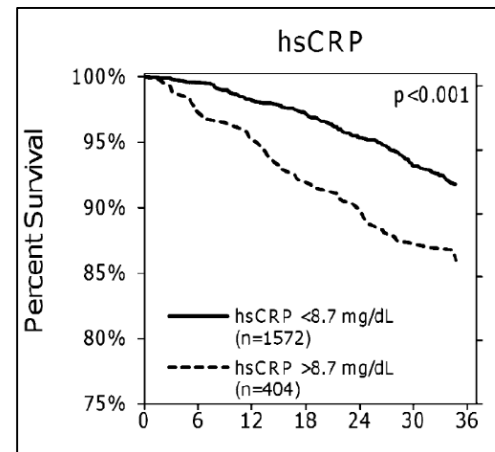
# Marcadors inflamatoris

- PCR i Fibrinògen



Kaptoge S. NEJM 2010

## Inflammatory Biomarkers Improve Clinical Prediction of Mortality in Chronic Obstructive Pulmonary Disease



Celli BR. AMJRCCM 2012





# Biomarcadors sèrics

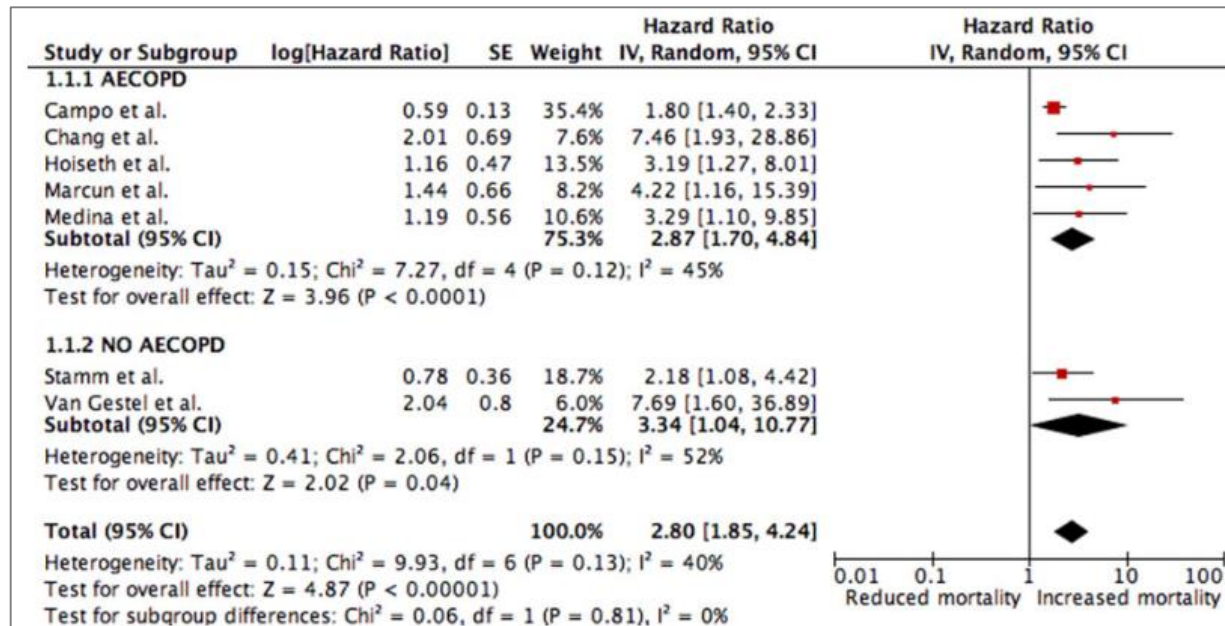
Biomarcadors inflamatoris

Biomarcadors de disfunció miocàrdica

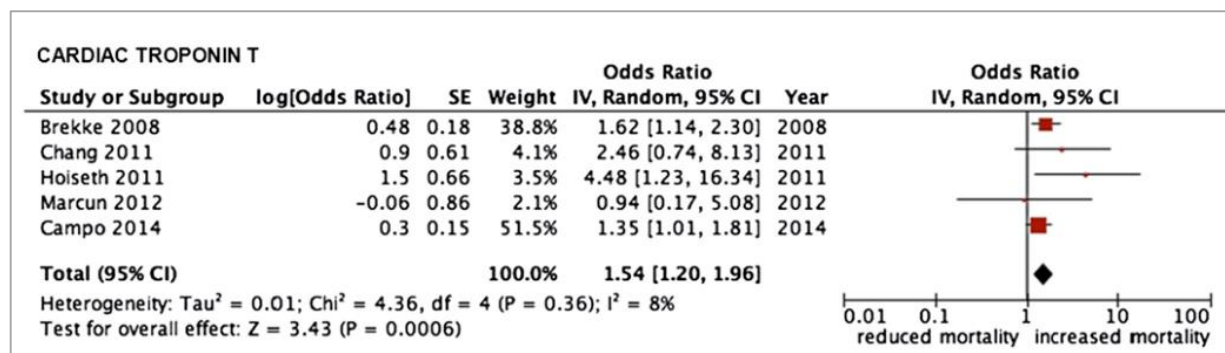
Biomarcadors de dany pulmonar



# Cardiac troponin elevation predicts all-cause mortality in patients with acute exacerbation of chronic obstructive pulmonary disease: Systematic review and meta-analysis



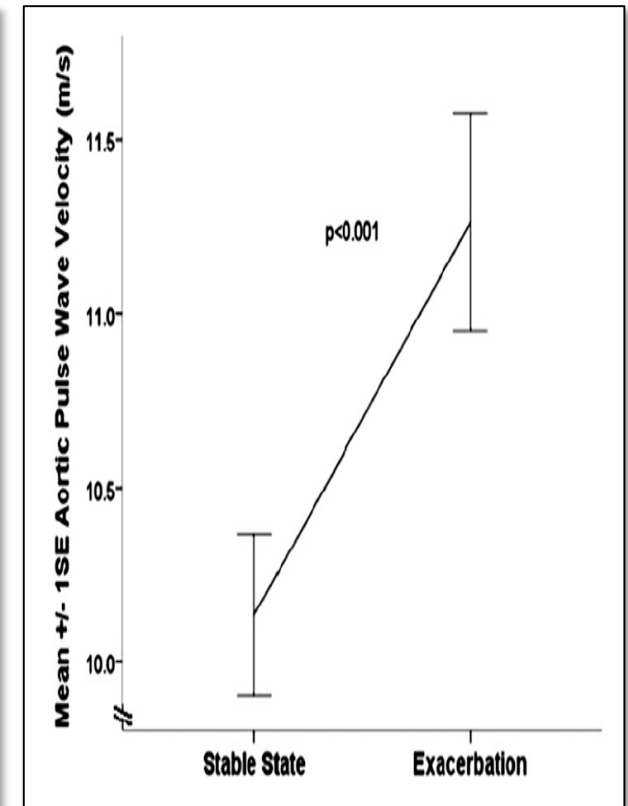
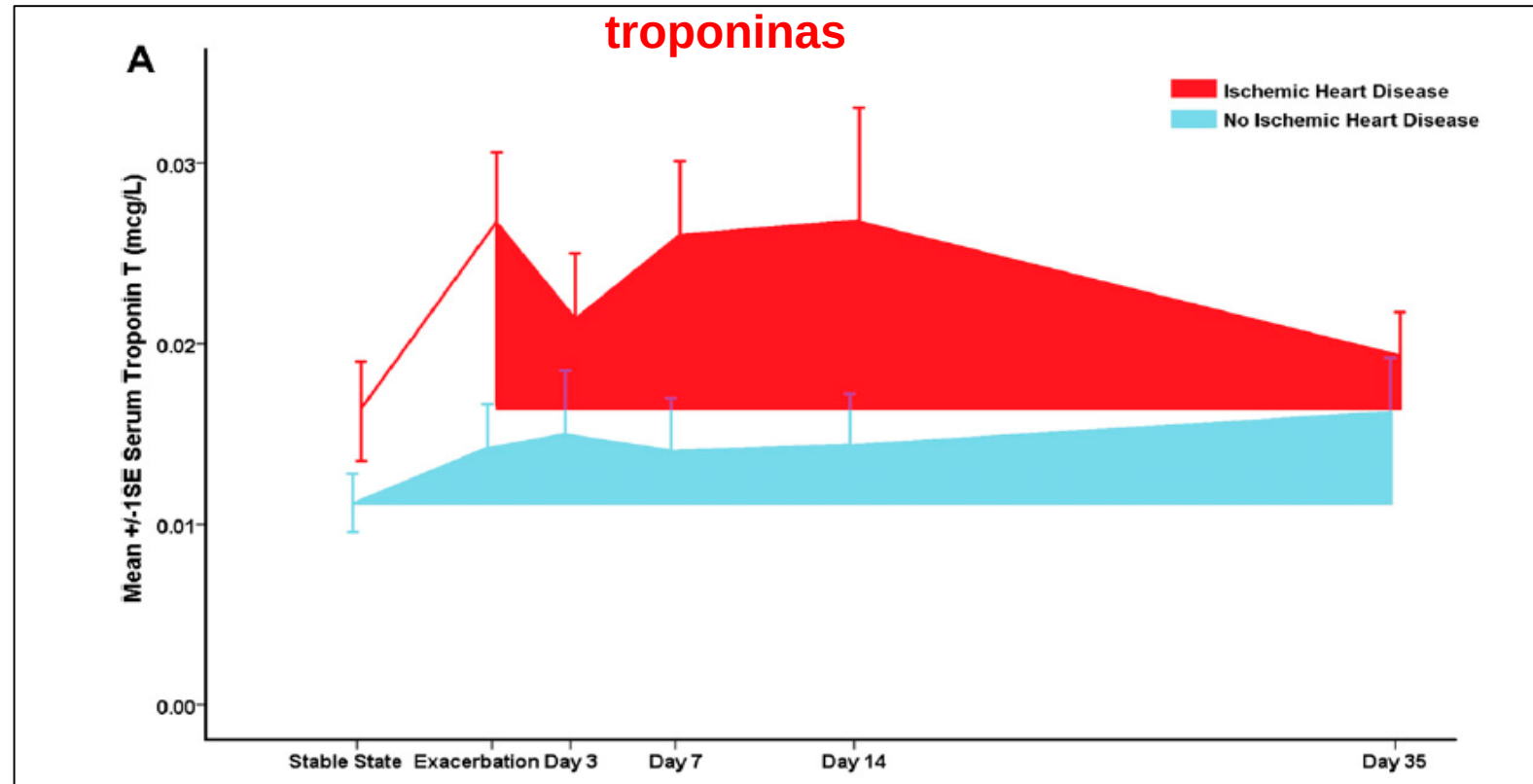
R. Pavasini *Int J Cardiol* 2015



R. Pavasini *Chron Respir Dis* 2017



# Cardiovascular Risk, Myocardial Injury, and Exacerbations of Chronic Obstructive Pulmonary Disease



International Journal of COPD

Dovepress

open access to scientific and medical research

 Open Access Full Text Article

ORIGINAL RESEARCH

# Invasive coronary angiography in patients with acute exacerbated COPD and elevated plasma troponin

88 pacientes con EPOC exacerbado y troponinas  $>0,05$  ng/ml, coronariografía antes de 72 horas

Estenosis coronaria  $>50\%$  en 67% pacientes

39% precisan intervención coronaria



# Biomarcadors sèrics

Biomarcadors inflamatoris

Biomarcadors de disfunció miocàrdica

Biomarcadors de dany pulmonar



# Biomarcadors de dany pulmonar

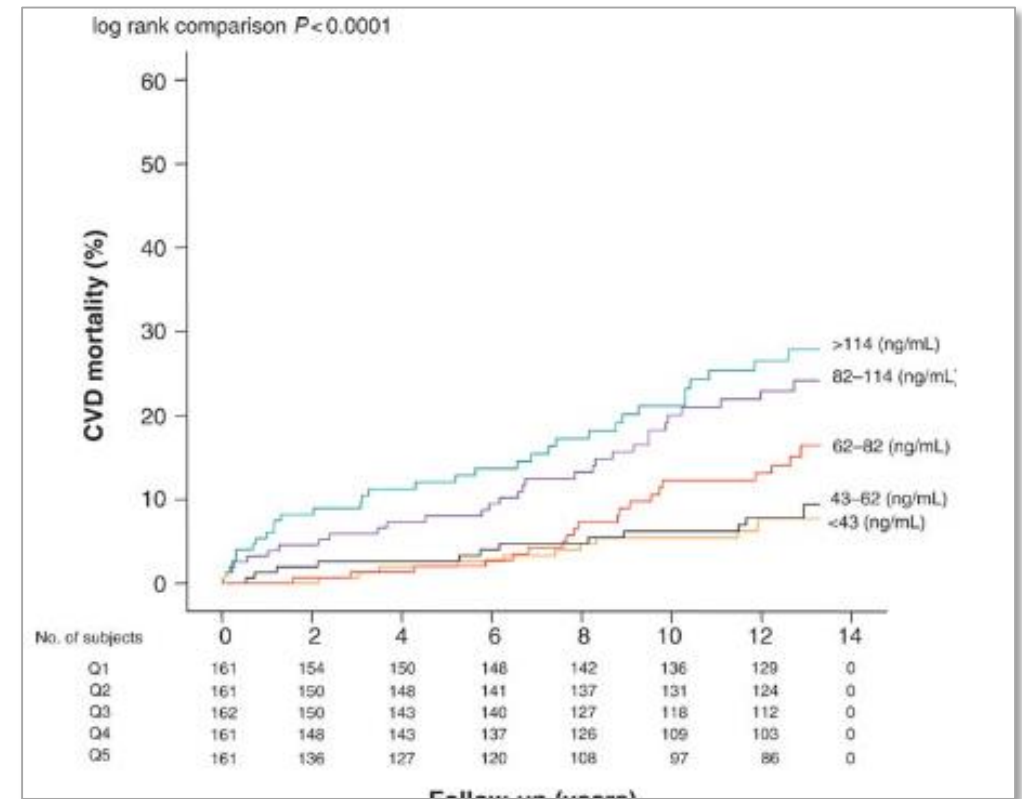
- Proteïna sulfatant D
- Desmosina
- Proteïnes de cèl·lules clares-16



European Heart Journal (2011) **32**, 1918–1925  
doi:10.1093/eurheartj/ehr124

**CLINICAL RESEARCH**  
*Prevention*

**Circulating surfactant protein-D and the risk of cardiovascular morbidity and mortality**



*J Hill Eur Heart J 2011*



# Implicacions terapèutiques



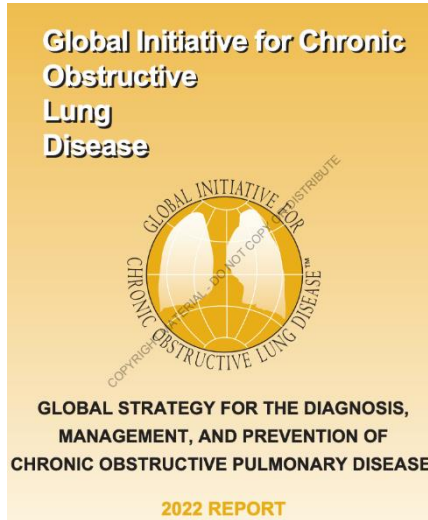


# $\beta$ -bloquejants

- Controversia pel possible efecte broncoconstrictor!!



# $\beta$ -bloquejants



- ▶ Treatment with  $\beta_1$ -blockers improves survival in heart failure and is recommended in patients with heart failure who also have COPD. Selective  $\beta_1$ -blockers should be used, and only used, to treat patients with COPD for approved cardiovascular indications; not solely for the purpose of preventing exacerbations of COPD.<sup>(17)</sup>
- ▶ Acute heart failure should be treated according to usual heart failure guidelines since there is no evidence to support an alternative management strategy.



European Heart Journal (2021) 42, 3599–3726  
doi:10.1093/eurheartj/ehab368

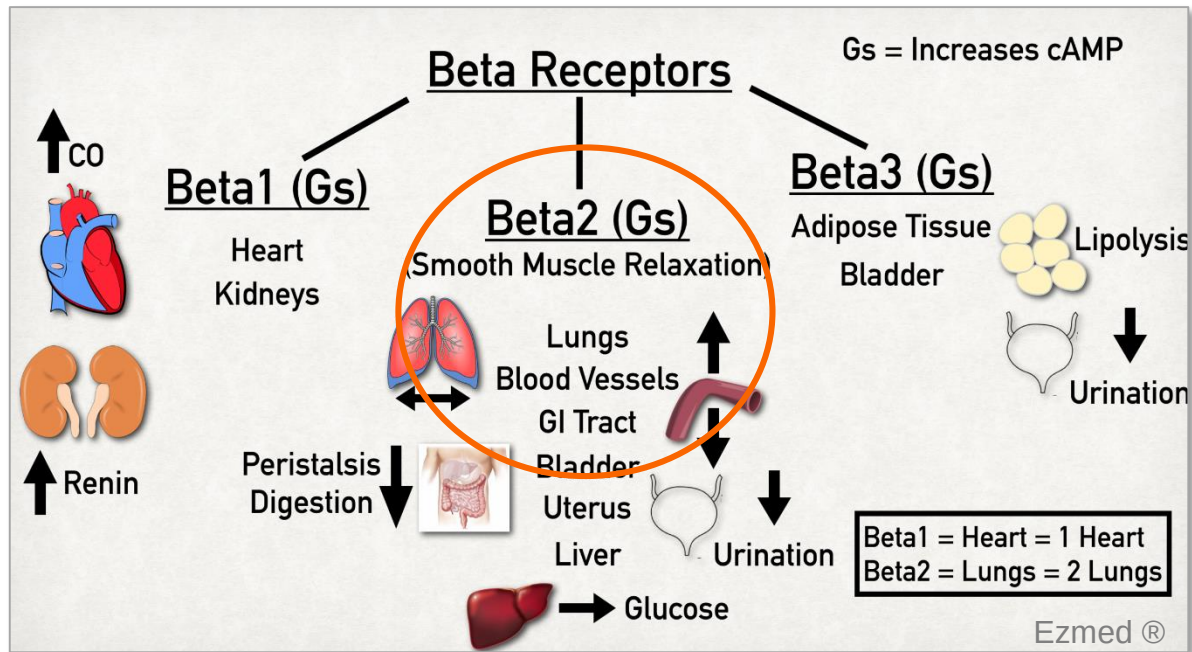
## ESC GUIDELINES

### 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Treatment of HF is generally well tolerated in COPD.<sup>800</sup> Beta-blockers can worsen pulmonary function in individual patients but are not contraindicated in either COPD or asthma, as stated in the Global initiative for chronic Obstructive Lung Disease (GOLD) and the Global INitiative for Asthma (GINA), respectively.<sup>801,802</sup> GINA states that asthma should not be regarded as an absolute contraindication to the use of cardioselective beta-blockers (bisoprolol, metoprolol succinate, or nebivolol) with consideration of relative risks and benefits. |



# β-bloquejants



European Heart Journal (2021) 42, 3599 – 3726  
doi:10.1093/eurheartj/ehab368

**ESC GUIDELINES**

## 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

### Beta-blockers

|                              |                        |                                 |
|------------------------------|------------------------|---------------------------------|
| Bisoprolol                   | 1.25 mg o.d.           | 10 mg o.d.                      |
| <b>Carvedilol</b>            | <b>3.125 mg b.i.d.</b> | <b>25 mg b.i.d.<sup>e</sup></b> |
| Metoprolol succinate (CR/XL) | 12.5 – 25 mg o.d.      | 200 mg o.d.                     |
| Nebivolol <sup>d</sup>       | 1.25 mg o.d.           | 10 mg o.d.                      |



## $\beta$ -Blocker Therapy and Risk of Chronic Obstructive Pulmonary Disease – A Danish Nationwide Study of 1·3 Million Individuals

Anne Orholm Nielsen <sup>a</sup>, Lars Pedersen <sup>b</sup>, Birgitte Fischer Sode <sup>c</sup>, Morten Dahl <sup>a,\*</sup>

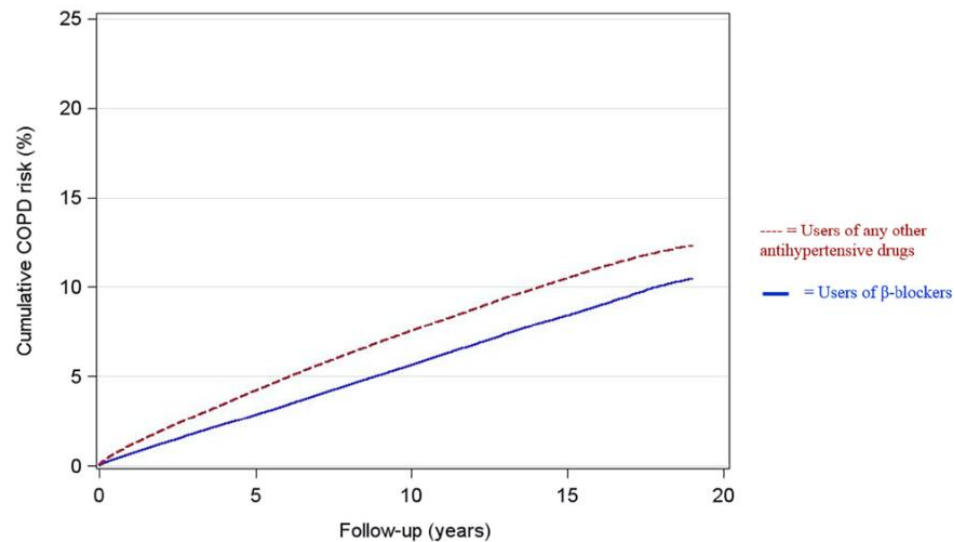
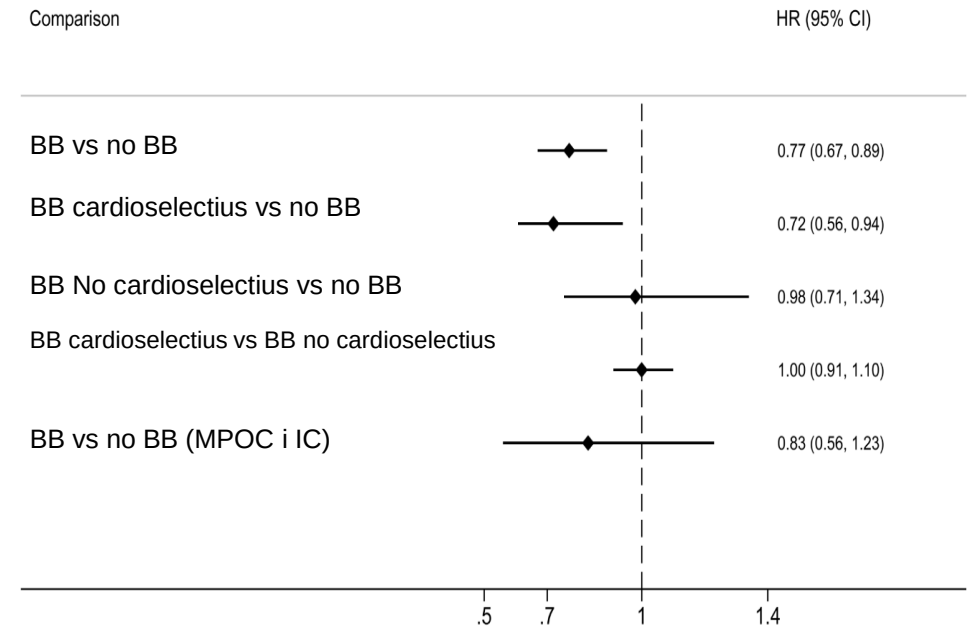


Fig. 1. Cumulative risk of COPD hospitalizations.

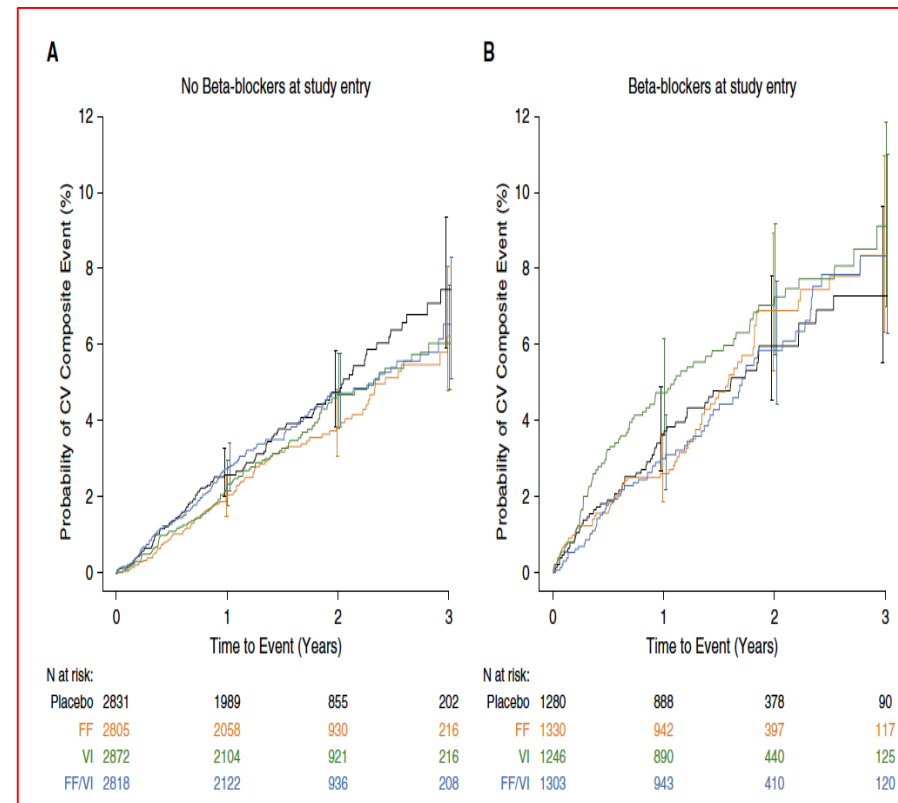
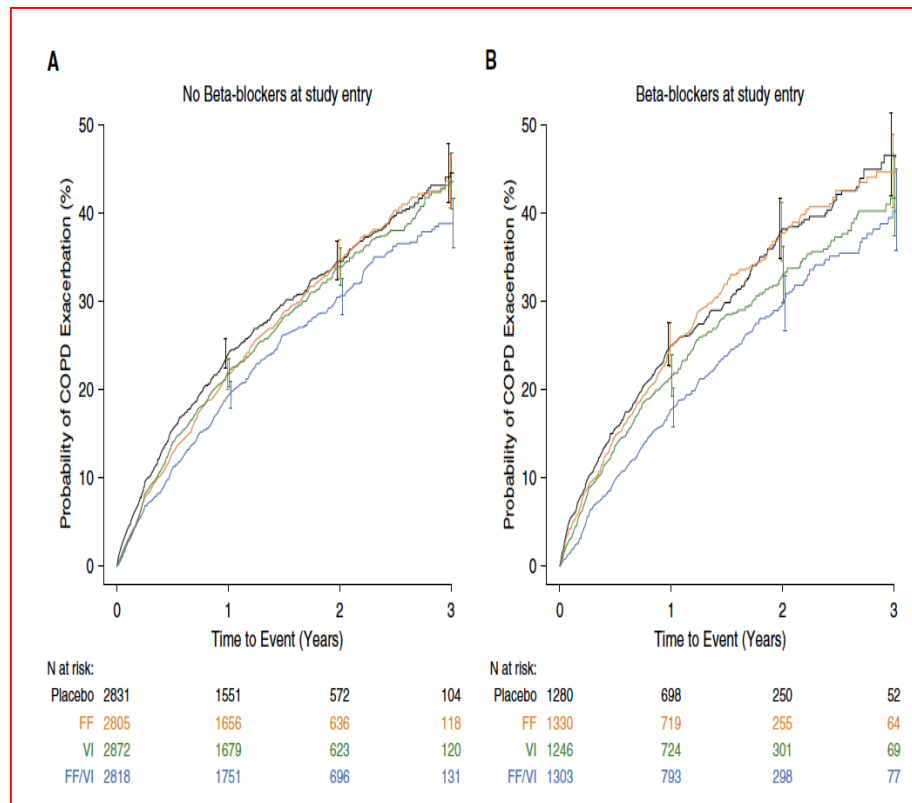
## Association of $\beta$ -blocker use with survival and pulmonary function in patients with chronic obstructive pulmonary and cardiovascular disease: a systematic review and meta-analysis

Yan-Li Yang<sup>1</sup>, Zi-Jian Xiang<sup>2</sup>, Jing-Hua Yang<sup>2</sup>, Wen-Jie Wang<sup>2</sup>, Zhi-Chun Xu<sup>2</sup>, and Ruo-Lan Xiang<sup>3\*</sup>



# **$\beta$ -Blocker Therapy and Clinical Outcomes in Patients with Moderate Chronic Obstructive Pulmonary Disease and Heightened Cardiovascular Risk**

## **An Observational Substudy of SUMMIT**





# β-bloquejants

## β-Blockers and All-Cause Mortality in Adults with Episodes of Acute Bronchitis: An Observational Study

Frans H. Rutten\*, Rolf H. H. Groenwold, Alfred P. E. Sachs, Diederick E. Grobbee, Arno W. Hoes

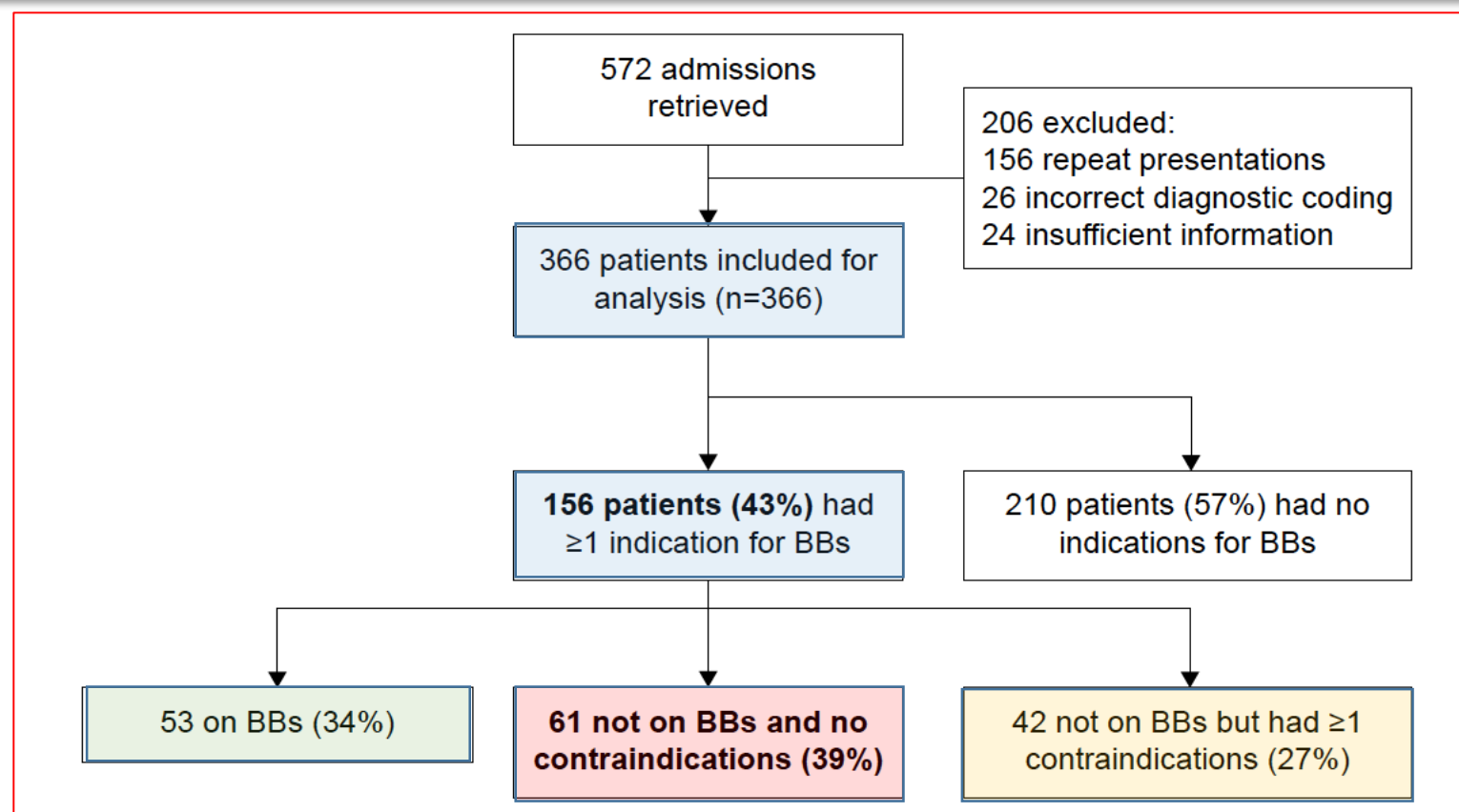
**Association of β-blocker use with survival and pulmonary function in patients with chronic obstructive pulmonary and cardiovascular disease: a systematic review and meta-analysis**

Yan-Li Yang<sup>1</sup>, Zi-Jian Xiang<sup>2</sup>, Jing-Hua Yang<sup>2</sup>, Wen-Jie Wang<sup>2</sup>, Zhi-Chun Xu<sup>2</sup>, and Ruo-Lan Xiang<sup>3\*</sup>

| Outcome             | Samples | Number of Studies included | Comparison                     | Patients | HR [95% CI]           |
|---------------------|---------|----------------------------|--------------------------------|----------|-----------------------|
| COPD exacerbation   | 183685  | 17                         | BB vs no BB                    | COPD+CVD | 0.77 [0.67, 0.89]     |
|                     | 17834   | 7                          | selective BB vs no BB          | COPD+CVD | 0.72 [0.56, 0.94]     |
|                     | 17455   | 5                          | nonselective BB vs no BB       | COPD+CVD | 0.98 [0.71, 1.34]     |
|                     | 41183   | 4                          | selective BB vs nonselective B | COPD+CVD | 1.00 [0.91, 1.10]     |
|                     | 20252   | 4                          | BB vs no BB                    | COPD+CHF | 0.83 [0.56, 1.23]     |
| Hospital mortality  | 108459  | 5                          | BB vs no BB                    | COPD+CVD | 0.67 [0.46, 0.99]     |
|                     | 335419  | 22                         | BB vs no BB                    | COPD+CVD | 0.69 [0.58, 0.81]     |
|                     | 44775   | 8                          | selective BB vs no BB          | COPD+CVD | 0.60 [0.48, 0.76]     |
| All-cause mortality | 17624   | 4                          | nonselective BB vs no BB       | COPD+CVD | 0.72 [0.58, 0.91]     |
|                     | 30691   | 6                          | BB vs no BB                    | COPD+CHF | 0.62 [0.53, 0.74]     |
|                     | 33067   | 4                          | BB vs no BB                    | COPD+MI  | 0.87 [0.82, 0.91]     |
| Outcome             | Samples | Number of Studies included | Comparison                     | Patients | MD [95% CI]           |
| Heart rate          | 5473    | 5                          | BB vs no BB                    | COPD+CVD | -7.87 [-11.12, -4.62] |



# Beta-blocker under-use in COPD patients





# $\beta$ -bloquejants

- Sense contraindicació en MPOC
- Escollir els  $\beta$ -bloquejants cardioselectius
- No augmenta el risc d'exacerbacions
- Possible reducció de mortalitat en pacients MPOC i MCV
- Infratractament amb Beta-bloquejants en pacients MPOC



# Antiagregants

- Només estudis amb anàlisis post-hoc i observacionals

**Effects of Cardiovascular Drugs on Mortality in Severe Chronic Obstructive Pulmonary Disease**  
A Time-Dependent Analysis

Magnus P. Ekström<sup>1,2</sup>, Anna Bornefalk Hermansson<sup>3</sup>, and Kerstin E. Ström<sup>1,2</sup>

Thrombocytosis is associated with increased short and long term mortality after exacerbation of chronic obstructive pulmonary disease: a role for antiplatelet therapy?

Michelle T Harrison,<sup>1</sup> Philip Short,<sup>1,2</sup> Peter A Williamson,<sup>1,3</sup> Aran Singanayagam,<sup>4</sup> James D Chalmers,<sup>1,2</sup> Stuart Schembri<sup>1</sup>

- No hi ha prou evidència per recomenar-ho de manera sistemàtica en pacients amb MPOC.



# ARA II / IECA

- Probable efecte protector contra progressió de MPOC
- Probable benefici en hipertensió pulmonar

CHEST

Original Research

COPD

**Rapid Lung Function Decline in Smokers Is a Risk Factor for COPD and Is Attenuated by Angiotensin-Converting Enzyme Inhibitor Use**

*Petersen, Chest 2014*



# Estatines

## Overview of the pharmacological challenges facing physicians in the management of patients with concomitant cardiovascular disease and chronic obstructive pulmonary disease

Gianluca Campo<sup>1,2</sup>, Rita Pavasini<sup>1</sup>, Simone Biscaglia<sup>1</sup>, Marco Contoli<sup>3</sup>, and Claudio Ceconi<sup>1,2\*</sup>

**Table 3** Main studies evaluating the role of statins in chronic obstructive pulmonary disease patients

| References                     | Patients (n)                   | COPD diagnosis                            | Study population characteristics                                                              | Design                                                            | Main findings                                                                                                                                                                                                                                                                           |
|--------------------------------|--------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mancini et al. <sup>21</sup>   | 5853 cases<br>116 871 controls | Previous prescription of LABA, ICS, ACh   | Cohort high CV risk (previous MI and/or CR); cohort low CV risk (absence of previous factors) | Retrospective                                                     | Significant reduction in mortality:<br>– high CV risk receiving ICS (HR 0.5; 95% CI 0.4–0.62)<br>– high CV risk not receiving ICS (HR 0.53; 95% CI 0.45–0.65)<br>– low CV risk receiving ICS (HR 0.53; 95% CI 0.44–0.64)<br>– low CV risk not receiving ICS (HR 0.49; 95% CI 0.41–0.58) |
| Soyseth et al. <sup>13</sup>   | 854                            | Previous diagnosis of COPD (ICD 9 and 10) | Hospitalization for AECOPD                                                                    | Retrospective cohort study                                        | Reduction in mortality (HR 0.57; 95% CI 0.38–0.87)                                                                                                                                                                                                                                      |
| Mortensen et al. <sup>20</sup> | 11212                          | Previous diagnosis of COPD (ICD 9)        | Hospitalization for AECOPD                                                                    | Retrospective                                                     | Reduction in 90 days mortality (OR 0.51, 95% CI 0.4–0.64)                                                                                                                                                                                                                               |
| Sheng et al. <sup>14</sup>     | 1717                           | Previous diagnosis of COPD (ICD 9 and 10) | Outpatients                                                                                   | Retrospective cohort study                                        | Primary prevention:<br>– all-cause mortality reduction (HR 0.6; 95% CI 0.43–0.85)<br>Secondary prevention:<br>– all-cause mortality reduction (HR 0.58; 95% CI 0.35–0.97)<br>– CV mortality reduction (HR 0.32, 95% CI 0.13–0.7)                                                        |
| Lawes et al. <sup>39</sup>     | 1687                           | Diagnosis of COPD (ICD 10)                | Outpatients                                                                                   | Cohort study                                                      | All-cause mortality reduction (HR 0.69; 95% CI 0.58–0.84)                                                                                                                                                                                                                               |
| Ekström et al. <sup>11</sup>   | 2249                           | Physician diagnosed COPD                  | Patients starting long-term oxygen therapy for COPD                                           | Prospective multicentre study                                     | No significant reduction in mortality                                                                                                                                                                                                                                                   |
| Lahousse et al. <sup>40</sup>  | 363 cases vs. 2345 controls    | Spirometric data                          | Outpatients                                                                                   | Nested case–control analysis from a population-based cohort study | Reduction in mortality (RR 39; 95% CI 0.38–0.99)<br>Patients with CRP > 3 mg/L: RR 78% (95% CI 0.06–0.74)                                                                                                                                                                               |

COPD, chronic obstructive pulmonary disease; LABA, long-acting  $\beta_2$  agonists; ICS, inhaled corticosteroids; ACh, inhaled anti-cholinergic; AECOPD, acute exacerbation of COPD; HR, hazard ratio; CI, confidence interval; CV, cardiovascular; GOLD, global initiative for chronic obstructive lung disease; ICD, international classification of disease; CRP, C-reactive protein; RR, relative risk.

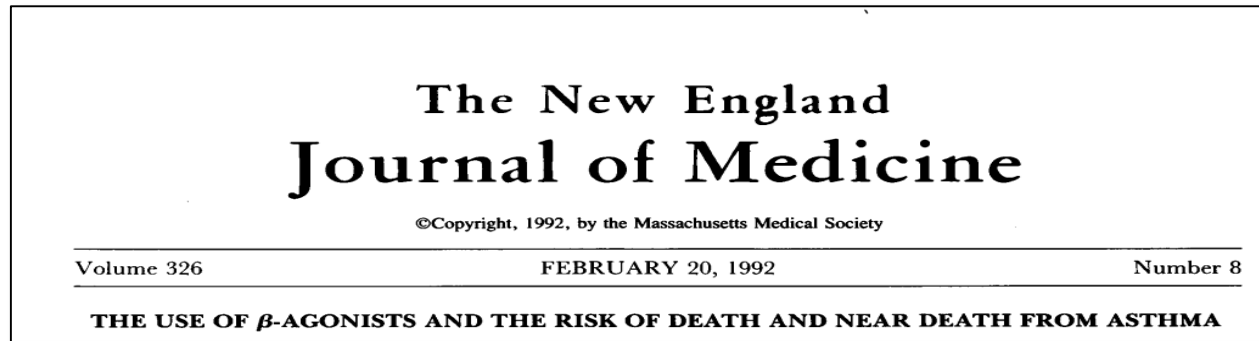


# Broncodilatadors

- Efecte proarrítmic? Taquicardia?
- Augment de mortalitat en pacients amb MCV??



# Broncodilatadors $\beta$ -2 agonistes



*Spitzer WO. NEJM 1992*



*Nelson HS. Chest 2006*



The NEW ENGLAND  
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FEBRUARY 22, 2007

VOL. 356 NO. 8

Salmeterol and Fluticasone Propionate and Survival  
in Chronic Obstructive Pulmonary Disease

*Calverley PMA. NEJM 2007*

The NEW ENGLAND  
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ESTABLISHED IN 1812

MAY 3, 2018

VOL. 378 NO. 18

Once-Daily Single-Inhaler Triple versus Dual Therapy  
in Patients with COPD

*Lipson DA. NEJM 2018*

Fluticasone furoate and vilanterol and survival in chronic  
obstructive pulmonary disease with heightened  
cardiovascular risk (SUMMIT): a double-blind randomised  
controlled trial



*Vestbo J. Lancet 2016*

Early View

Research letter

Inhaled corticosteroid containing combinations  
and mortality in COPD

*Vestbo J. ERJ 2018*

**Reduced All-Cause Mortality in the ETHOS Trial of  
Budesonide/Glycopyrrolate/Formoterol for Chronic Obstructive  
Pulmonary Disease**

A Randomized, Double-Blind, Multicenter, Parallel-Group Study

*Martinez FJ. AJRCCM 2021*





# Fàrmacs respiratoris, hiperinsuflació i funció cardíaca

## ORIGINAL ARTICLE

**Lung Deflation and Cardiovascular Structure and Function in Chronic Obstructive Pulmonary Disease**  
A Randomized Controlled Trial **2015**

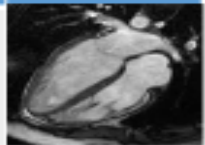
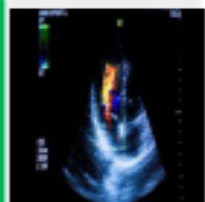
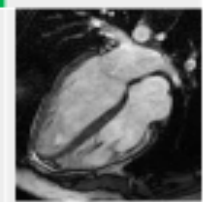
Article

**The Impact of Bronchodilator Therapy on Systolic Heart Failure with Concomitant Mild to Moderate COPD** **2015**

**Effect of indacaterol on lung deflation improves cardiac performance in hyperinflated COPD patients: an interventional, randomized, double-blind clinical trial** **2017**

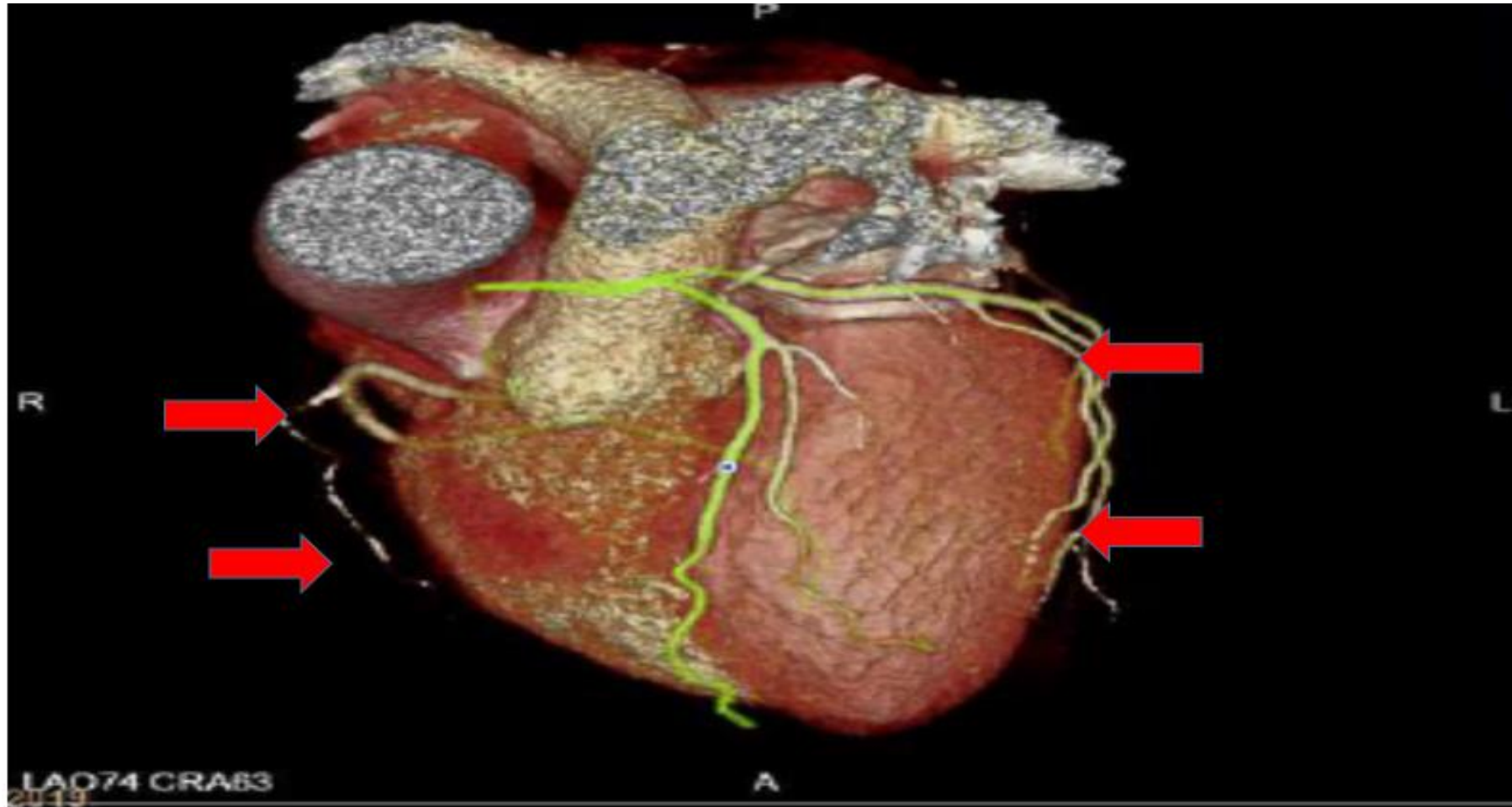


**Effect of lung deflation with indacaterol plus glycopyrronium on ventricular filling in patients with hyperinflation and COPD (CLAIM): a double-blind, randomised, crossover, placebo-controlled, single-centre trial** **2018**

|            | VDI | VOL_LAT | FEVI% |                                                                                       |
|------------|-----|---------|-------|---------------------------------------------------------------------------------------|
| VIL-FF     |     |         |       |    |
| TIO        |     |         |       |    |
| INDA       |     |         |       |   |
| INDA-GLYCO |     |         |       |  |



## Fàrmacs respiratoris, hiperinsuflació i funció cardíaca



# Broncodilatadors anticolinèrgics (LAMA)

## **Mortality in the 4-Year Trial of Tiotropium (UPLIFT) in Patients with Chronic Obstructive Pulmonary Disease**

Bartolome Celli<sup>1</sup>, Marc Decramer<sup>2</sup>, Steven Kesten<sup>3</sup>, Dacheng Liu<sup>3</sup>, Sunil Mehra<sup>4</sup>, and Donald P. Tashkin<sup>5</sup>, on behalf of the UPLIFT Study Investigators\*

### *The* NEW ENGLAND JOURNAL *of* MEDICINE

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#### **Tiotropium Respimat Inhaler and the Risk of Death in COPD**

Robert A. Wise, M.D., Antonio Anzueto, M.D., Daniel Cotton, M.S., Ronald Dahl, M.D., Theresa Devins, Dr.Ph., Bernd Disse, M.D., Daniel Dusser, M.D., Elizabeth Joseph, M.P.H., Sabine Kattenbeck, Ph.D., Michael Koenen-Bergmann, M.D., Gordon Pledger, Ph.D., and Peter Calverley, D.Sc., for the TIOSPIR Investigators\*



# Broncodilatadors

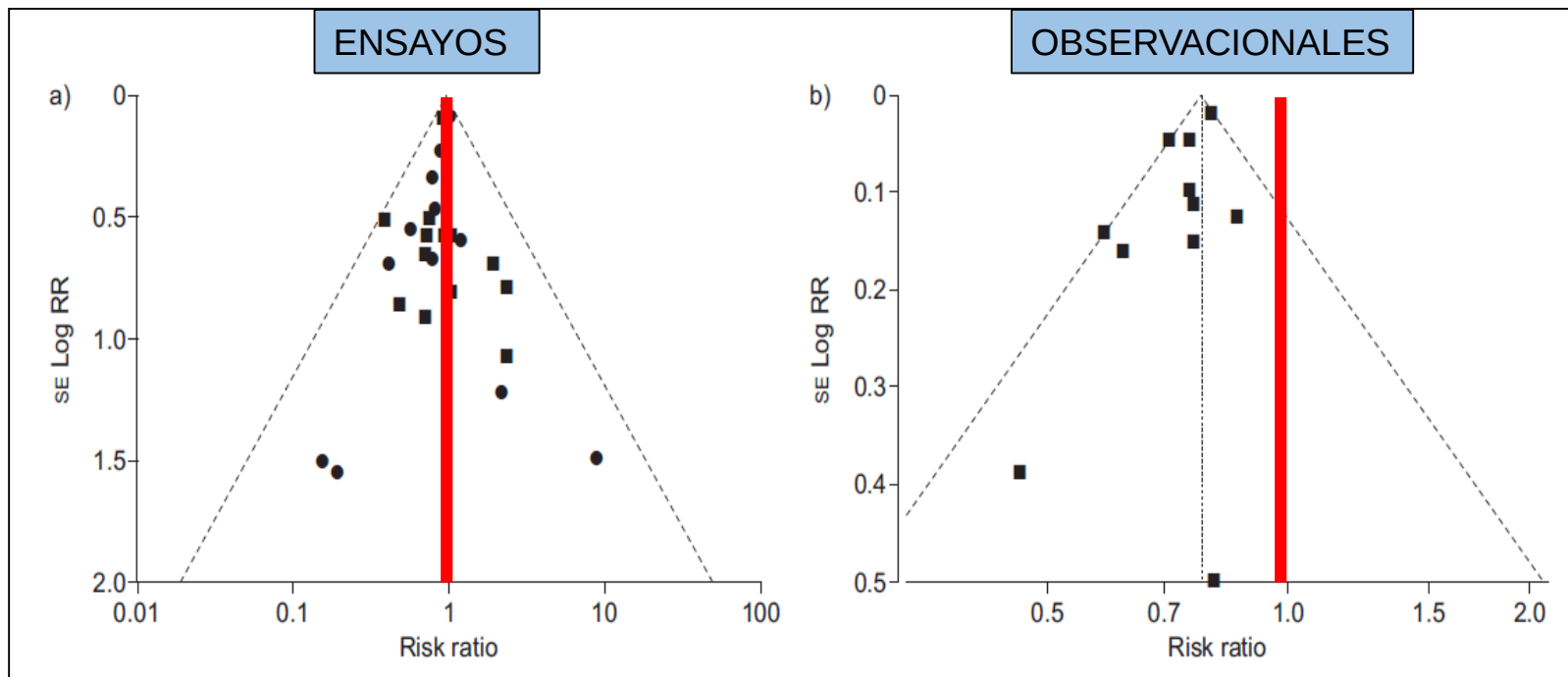
- Fàrmacs segurs!! amb o sense comorbiditat cardiovascular
- No hi ha evidència que suggereixi canviar el tractament si apareixen arítmies (fibril·lació auricular)
- Probable efecte sobre millora d'hiperinsuflació pulmonar i millorade funció cardíaca
- Probable efecte sobre reducció de mortalitat



# Corticoides inhalats

Eur Respir J 2010; 35: 1003–1021  
DOI: 10.1183/09031936.00095909  
Copyright ©ERS Journals Ltd 2010

Risk of myocardial infarction and  
cardiovascular death associated with  
inhaled corticosteroids in COPD



CI+LABA vs. LABA

Loke YK. ERJ 2010



# Take home messages!!

- Associació entre MPOC i MCV!
- Infradiagnòstic de les dues malalties
- Factors en comú
- Augment de mortalitat en pacients MPOC i malaltia cardiovascular
- En pacients amb MCV, sospitar i buscar MPOC
- En pacients amb MPOC pensar en buscar altres factors de risc cardiovascular.
- Tractament farmacològic de MPOC es segur tot i tenir MCV concomitant
- Tractament farmacològic de MCV es segur en pacients amb MPOC



Moltes gràcies

