Sociedad Médica Cuidados Paliativos Chile

¿Cómo estimar pronóstico en pacientes con EPOC avanzado?

Dra. Laura Mendoza Inzunza
Broncopoulmonar HCUCH y CAS
Profesora Asociada U de Chile
Magíster Epidemiología
Past President SER

¿Qué es la EPOC?

La EPOC es una condición común, prevenible y tratable que se caracteriza por síntomas crónicos persistentes y limitación del flujo aéreo no reversible, causada por alteraciones en vía aérea y anormalidades alveolares debido a exposición significativa a partículas nocivas o gases.

Estudio PLATINO

Ciudades	Población estudiada (N)	Prevalencia de subdiagnóstico (%)
San Pablo	961	13,8
Santiago	1.172	14,8
Ciudad de México	995	6,9
Montevideo	883	18,2
Caracas	1.292	10,5
Total	**5.303**	**12,7**

GOLD 2023, Meneses et al Lancet 2015

Carga de la EPOC

Mortalidad

- Ocupa el 4° lugar entre las principales causas de mortalidad
- Se estima que subirá al tercer lugar para el año 2030



Impacto en AVISA



Carga mundial de asma y EPOC

	Number of YLLs, all ages (thousands)	Number of YLDs, all ages (thousands)	Number of DALYs, all ages (thousands)	Percentage change in DALYs, 1990–2015, all ages	Percentage change in age-standardised DALY rates, 1990–2015
COPD					
Global	51 803 (49 898 to 53 611)	12 047 (10 207 to 13 725)	63 850 (61 215 to 66 289)	−1·0 (−7·1 to 6·2)	−43·7 (−47·0 to −39·8)
High SDI quintile	5914 (5762 to 6180)	2214 (1890 to 2545)	8128 (7755 to 8530)	12·7 (9·9 to 16·6)	−28·2 (−30·1 to −25·9)
High-middle SDI quintile	9058 (8693 to 9446)	2500 (2103 to 2882)	11 661 (11 093 to 12 226)	−19·8 (−25·0 to −14·2)	−58·5 (−61·2 to −55·6)
Middle SDI quintile	17 918 (16 979 to 18 887)	4050 (3422 to 4623)	21 812 (20 738 to 22 908)	−16·4 (−22·3 to −9·2)	−55·8 (−58·9 to −52·1)
Low-middle SDI quintile	17 444 (16 260 to 18 652)	2954 (2493 to 3345)	20 399 (19 079 to 21 673)	32·0 (8·0 to 61·0)	−27·0 (−40·0 to −10·6)
Low SDI quintile	1433 (1203 to 1685)	374 (316 to 429)	1806 (1559 to 2064)	55·7 (31·3 to 86·9)	−18·0 (−30·5 to −0·5)
Asthma					
Global	10 270 (9369 to 11 448)	15 899 (10 371 to 22 344)	26 169 (20 501 to 32 583)	−14·6 (−26·0 to 2·1)	−42·8 (−52·0 to −29·5)
High SDI quintile	384 (366 to 408)	2818 (1838 to 3905)	3203 (2221 to 4299)	−25·4 (−29·9 to −21·9)	−35·9 (−40·2 to −32·6)
High-middle SDI quintile	1227 (1130 to 1400)	3419 (2228 to 4795)	4766 (3508 to 6154)	−3·8 (−9·1 to 0·9)	−30·3 (−35·6 to −25·9)
Middle SDI quintile	2912 (2655 to 3223)	4061 (2657 to 5704)	6855 (5464 to 8453)	−12·5 (−22·9 to −0·7)	−40·7 (−49·3 to −30·2)
Low-middle SDI quintile	4327 (3728 to 5073)	4020 (2621 to 5682)	8350 (6705 to 10 088)	−27·4 (−44·6 to 9·1)	−60·8 (−71·8 to −31·9)
Low SDI quintile	1402 (1162 to 1692)	1563 (1009 to 2238)	2961 (2343 to 3687)	45·9 (27·2 to 67·9)	−31·4 (−41·2 to −18·4)

Data in parentheses are 95% uncertainty intervals. YLLs=years of life lost. YLDs=years lived with disability. DALYs=disability-adjusted life years. COPD=chronic obstructive pulmonary disease. SDI=Socio-demographic Index.

***Table 2*: YLLs, YLDs, and DALYs due to asthma and COPD in 2015 and percentage change in all-age counts and age-standardised DALY rates from 1990 to 2015 in locations grouped by SDI quintiles**

Vos et al Lancet 2017; 5: 691-706

REVIEW Open Access

Prognostic risk factors for moderate-to-severe exacerbations in patients with chronic obstructive pulmonary disease: a systematic literature review

Identificar pacientes de alto riesgo usando factores de riesgo medibles que se correlacionan con mal pronóstico puede ayudar a prevenir la carga de la enfermedad y prevenir un ciclo de declinación irreversible de mayor daño pulmonar, peor calidad de vida, mayor carga de la enfermedad, costos mayores de salud y mortalidad temprana.

Hurst *et al. Respiratory Research (2022) 23:213*

Pirámide poblacional

La pirámide poblacional de Chile evidencia el envejecimiento de la población

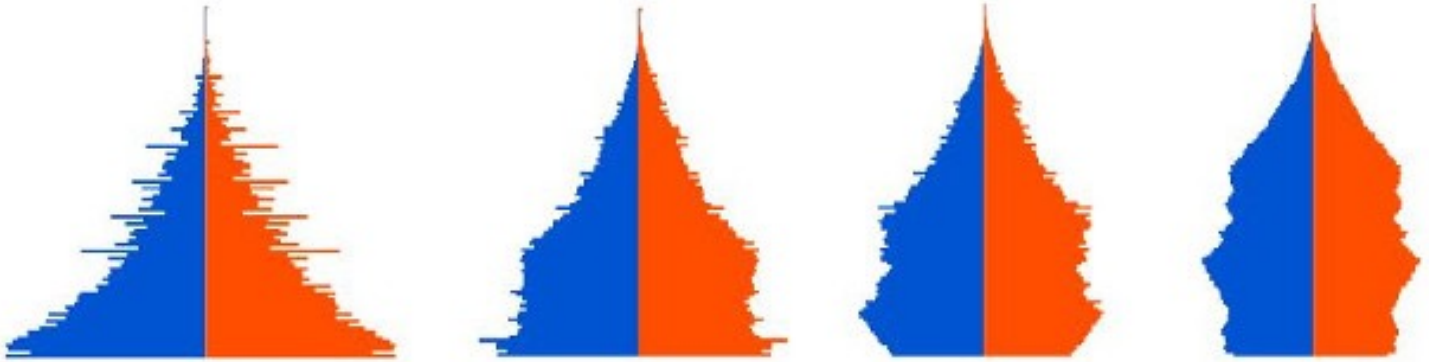
CENSO 2017

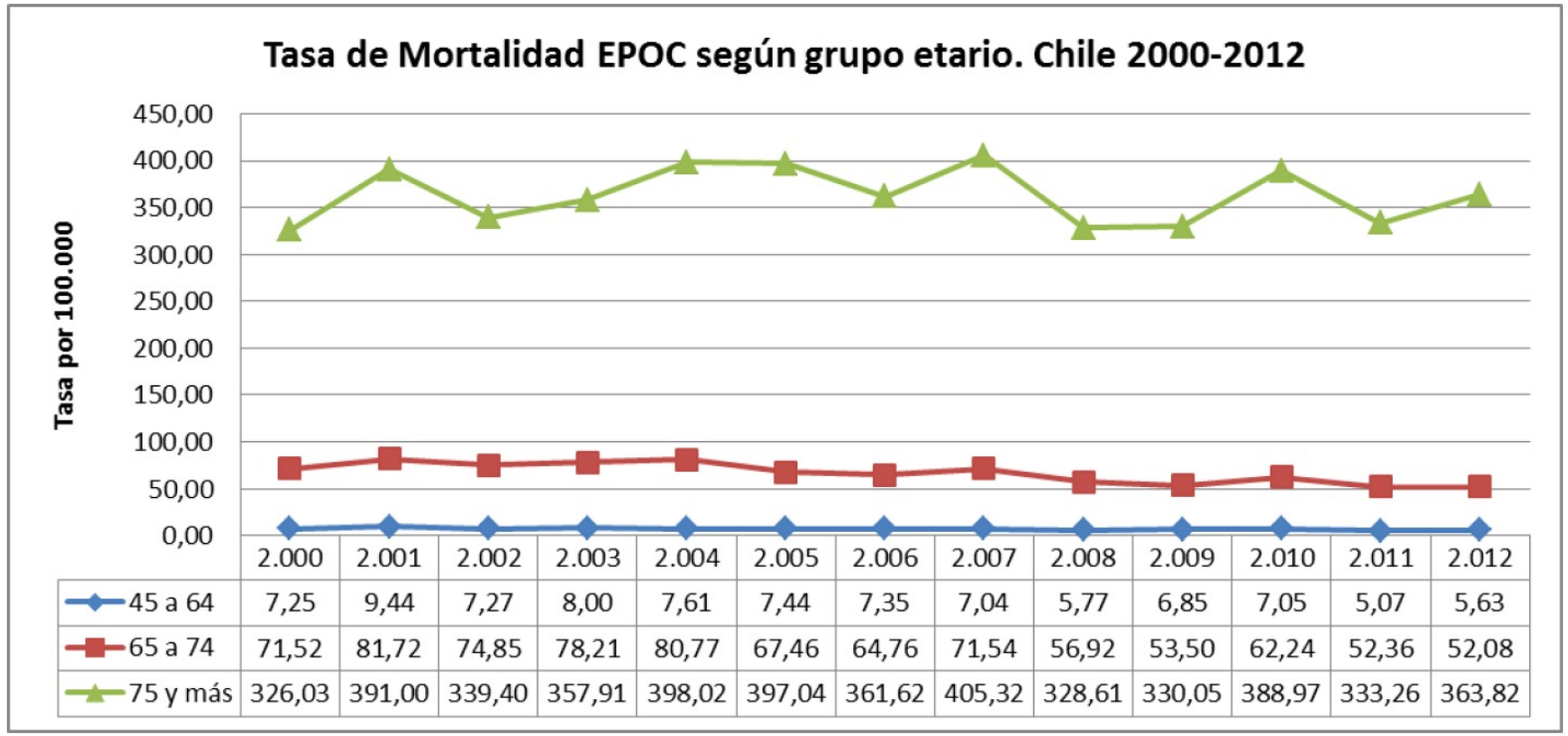
¿Cómo cambia la pirámide teórica cuando la población envejece?



Tipo de pirámide	Progresiva	Estacionaria	Regresiva
Tasa de natalidad	Muy alta	Reduciéndose	Baja
Tasa de mortalidad	Muy alta	Reducida	Baja
Esperanza de vida	Baja	Creciente	Alta
Grupos de edad	Población joven	Población madura	Población vieja

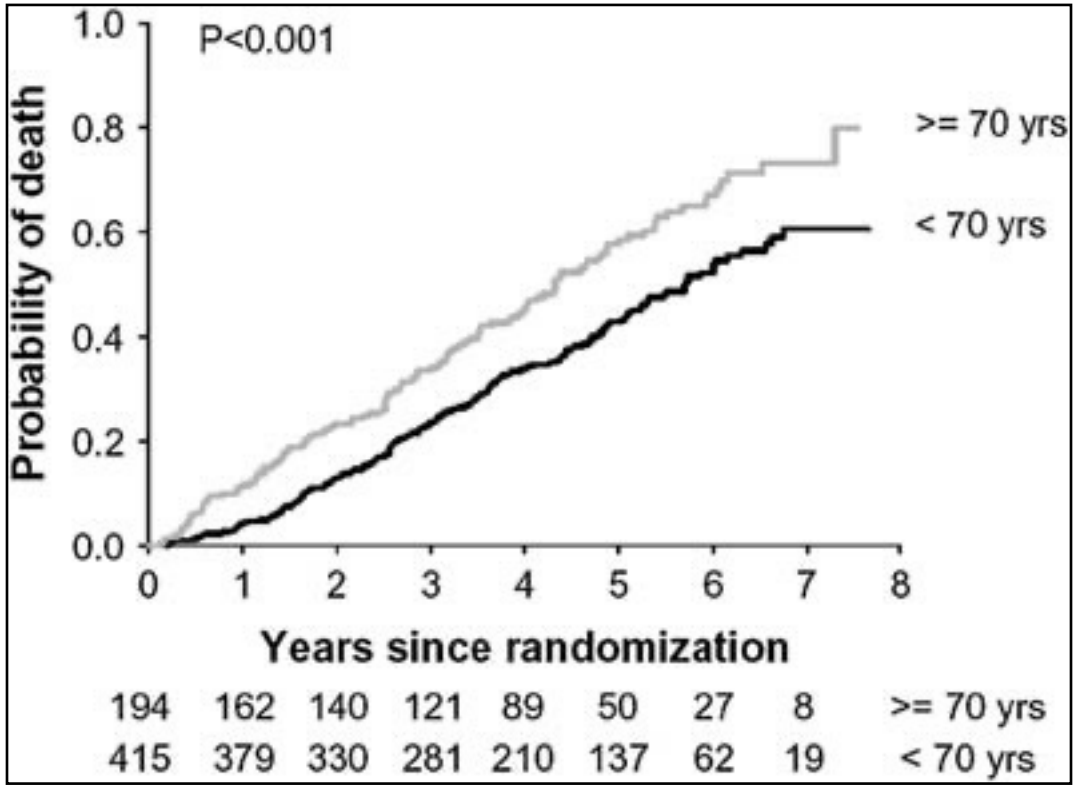
¿Cómo cambia la pirámide poblacional de Chile (transición demográfica)?





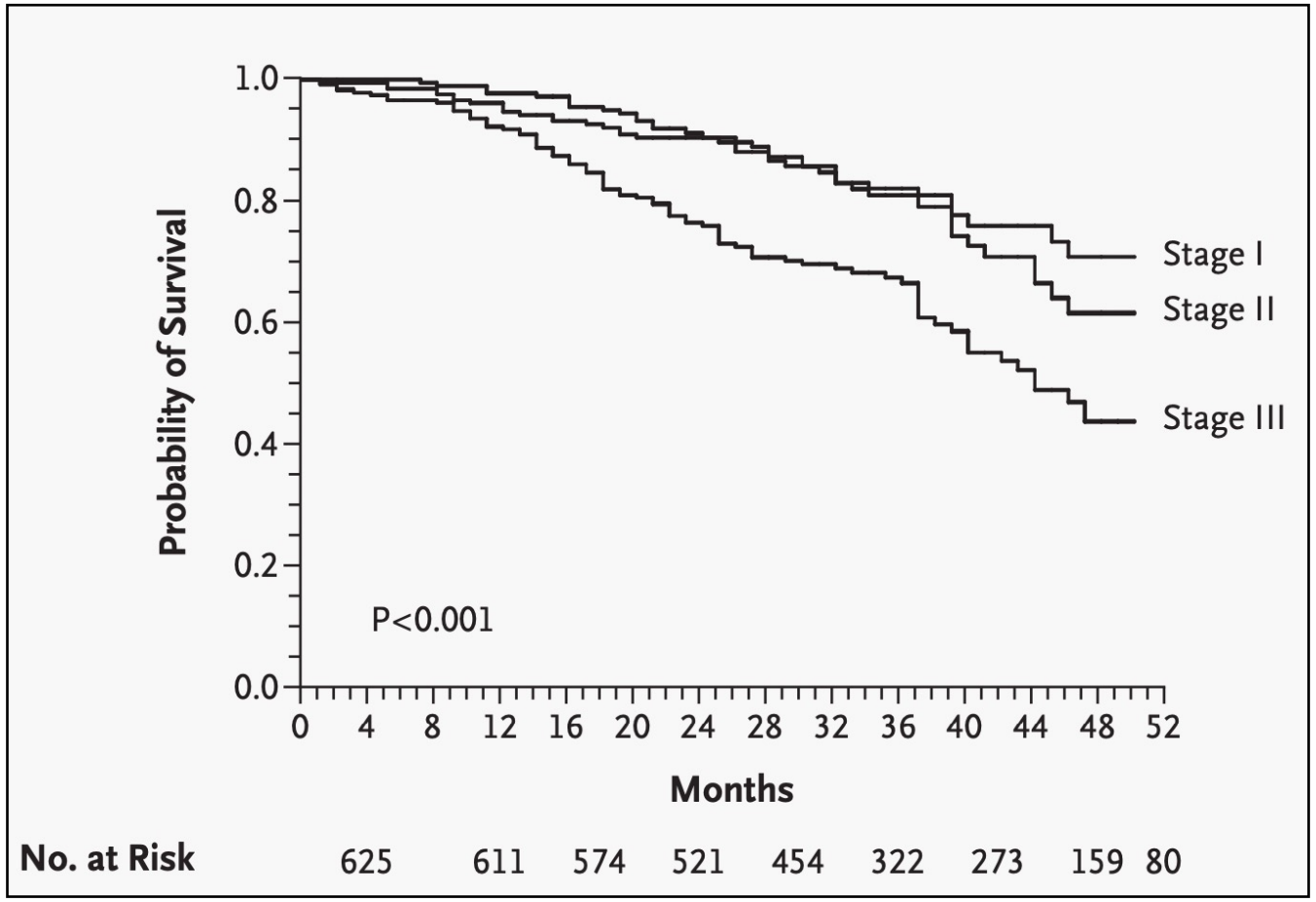
	2.000	2.001	2.002	2.003	2.004	2.005	2.006	2.007	2.008	2.009	2.010	2.011	2.012
45 a 64	7,25	9,44	7,27	8,00	7,61	7,44	7,35	7,04	5,77	6,85	7,05	5,07	5,63
65 a 74	71,52	81,72	74,85	78,21	80,77	67,46	64,76	71,54	56,92	53,50	62,24	52,36	52,08
75 y más	326,03	391,00	339,40	357,91	398,02	397,04	361,62	405,32	328,61	330,05	388,97	333,26	363,82

Predictors of Mortality in Patients with Emphysema and Severe Airflow Obstruction



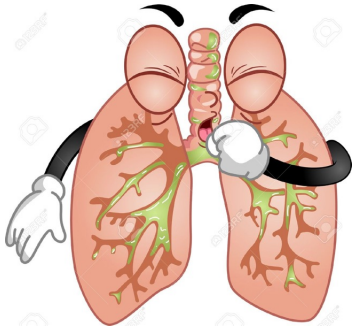
Martinez et al AJRCCM 2007

Rol pronóstico del VEF_1

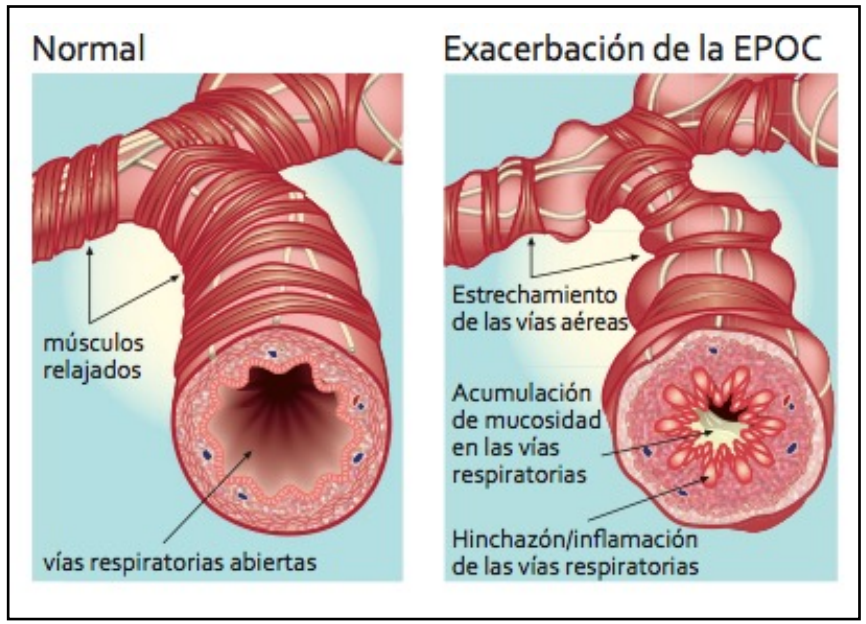


Celli et al NEJM 2005

Exacerbaciones agudas de la EPOC

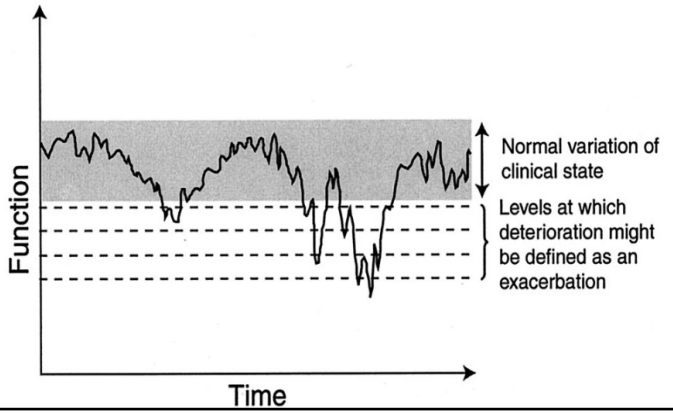


Episodios de aumento de los síntomas respiratorios de la EPOC



Aumento de inflamación:

- ✓ Generalmente de causa infecciosa:(infecciones virales o bacterianas)
- ✓ Contaminación ambiental o domiciliaria, etc



Rol pronóstico de las exacerbaciones

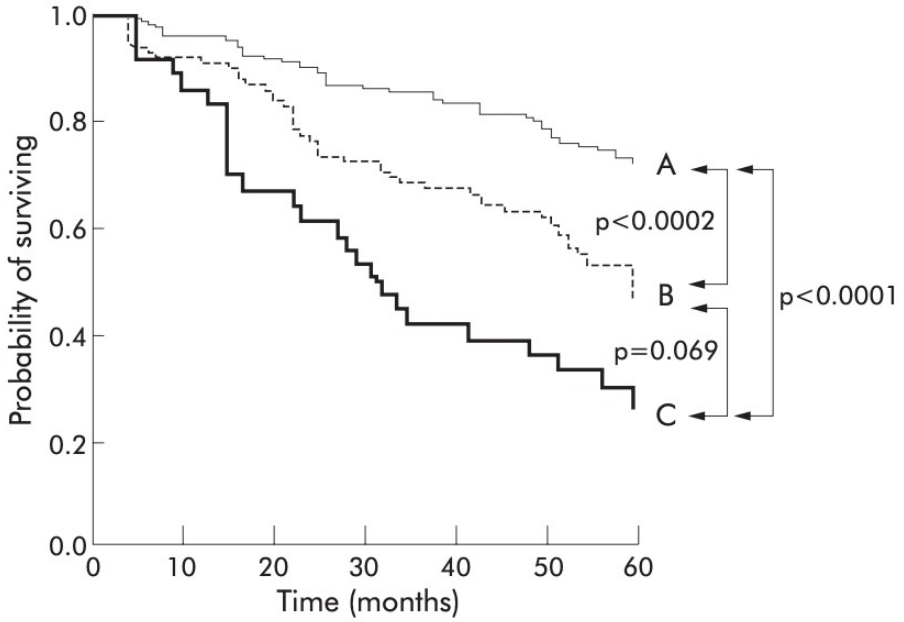


Figure 1 Kaplan-Meier survival curves by frequency of exacerbations in patients with COPD: group A, patients with no acute exacerbations of COPD; group B, patients with 1–2 acute exacerbations of COPD requiring hospital management; group C, patients with ⩾3 acute exacerbations of COPD.

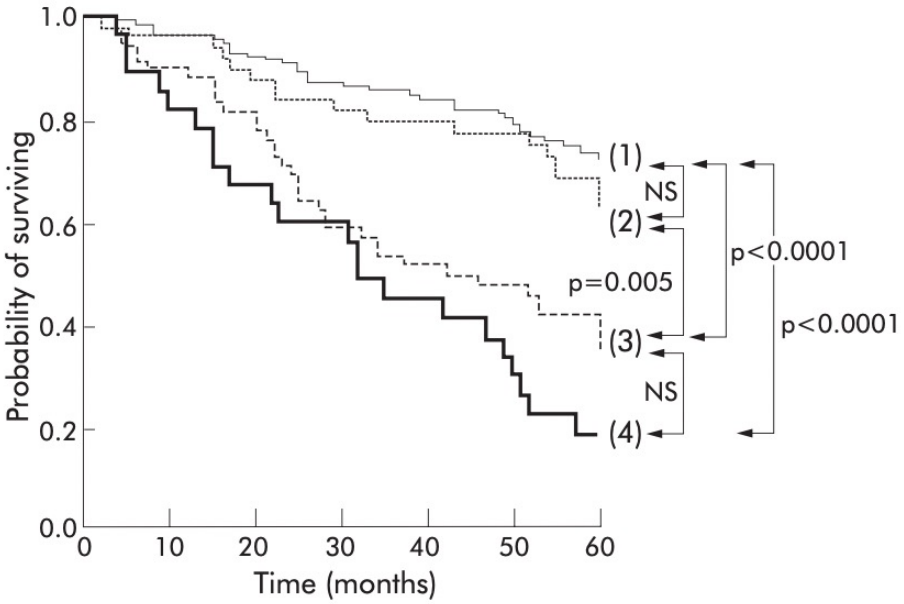
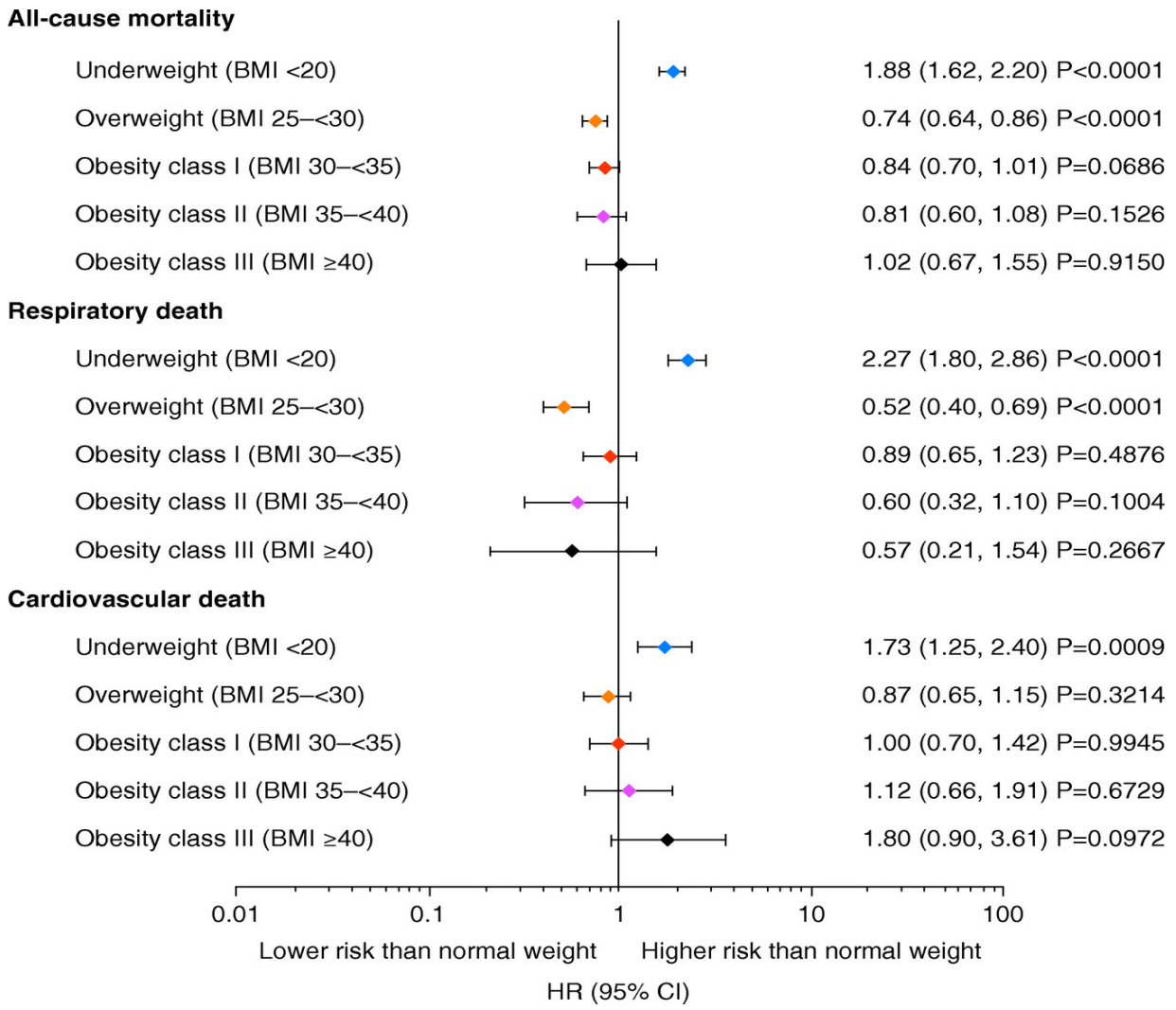


Figure 2 Kaplan-Meier survival curves by severity of exacerbations in patients with COPD: (1) no acute exacerbations of COPD; (2) patients with acute exacerbations of COPD requiring emergency service visits without admission; (3) patients with acute exacerbations of COPD requiring one hospital admission; (4) patients with readmissions.

Soler Cataluña Thorax 2005

Estado nutricional y pronóstico en la EPOC



Putcha et al Annals ATS 2022

Domiciliary oxygen for chronic obstructive pulmonary disease

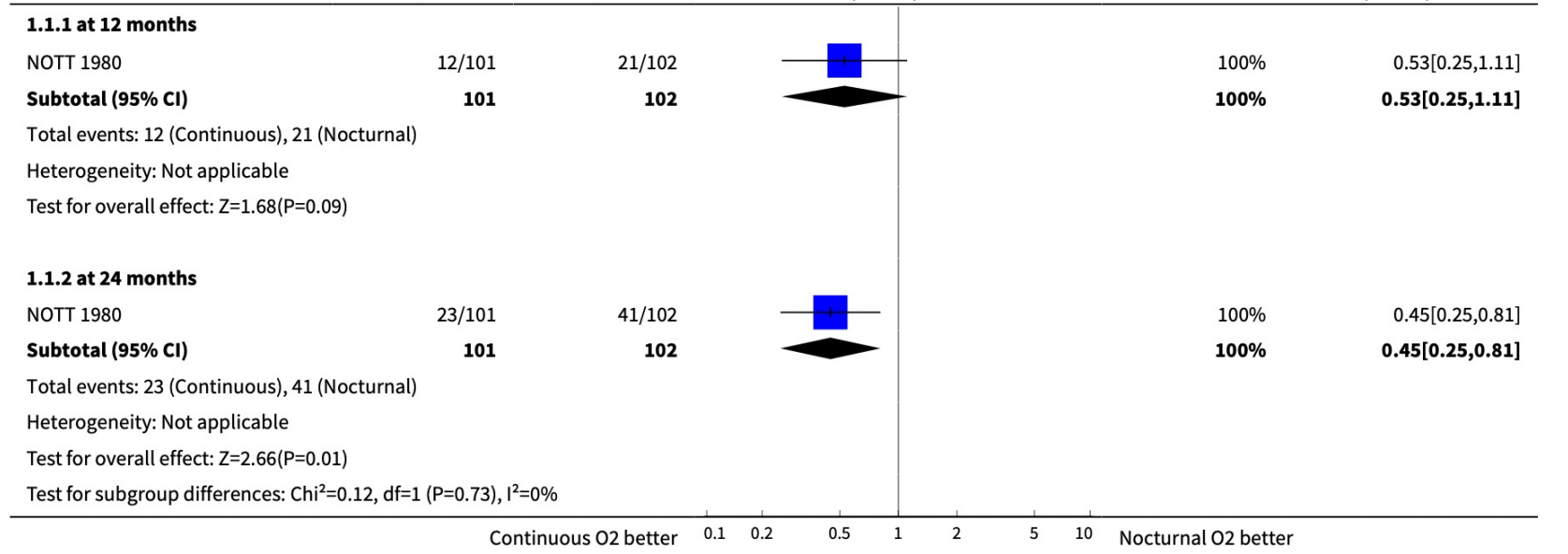
Cochrane Library

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Analysis 1.1. Comparison 1 Continuous oxygen therapy versus nocturnal oxygen therapy, Outcome 1 Mortality.

Study or subgroup	Continuous n/N	Nocturnal n/N	Peto Odds Ratio Peto, Fixed, 95% CI	Weight	Peto Odds Ratio Peto, Fixed, 95% CI
1.1.1 at 12 months					
NOTT 1980	12/101	21/102		100%	0.53[0.25,1.11]
Subtotal (95% CI)	**101**	**102**		**100%**	**0.53[0.25,1.11]**
Total events: 12 (Continuous), 21 (Nocturnal)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.68(P=0.09)					
1.1.2 at 24 months					
NOTT 1980	23/101	41/102		100%	0.45[0.25,0.81]
Subtotal (95% CI)	**101**	**102**		**100%**	**0.45[0.25,0.81]**
Total events: 23 (Continuous), 41 (Nocturnal)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.66(P=0.01)					
Test for subgroup differences: Chi^2=0.12, df=1 (P=0.73), I^2=0%					



Domiciliary oxygen for chronic obstructive pulmonary disease 2005 (Review)

Indices compuestos

BODE

BODex

The Body-Mass Index, Airflow Obstruction, Dyspnea, and Exercise Capacity Index in Chronic Obstructive Pulmonary Disease

Table 1. Characteristics of the First 207 Patients, According to Whether They Survived.*

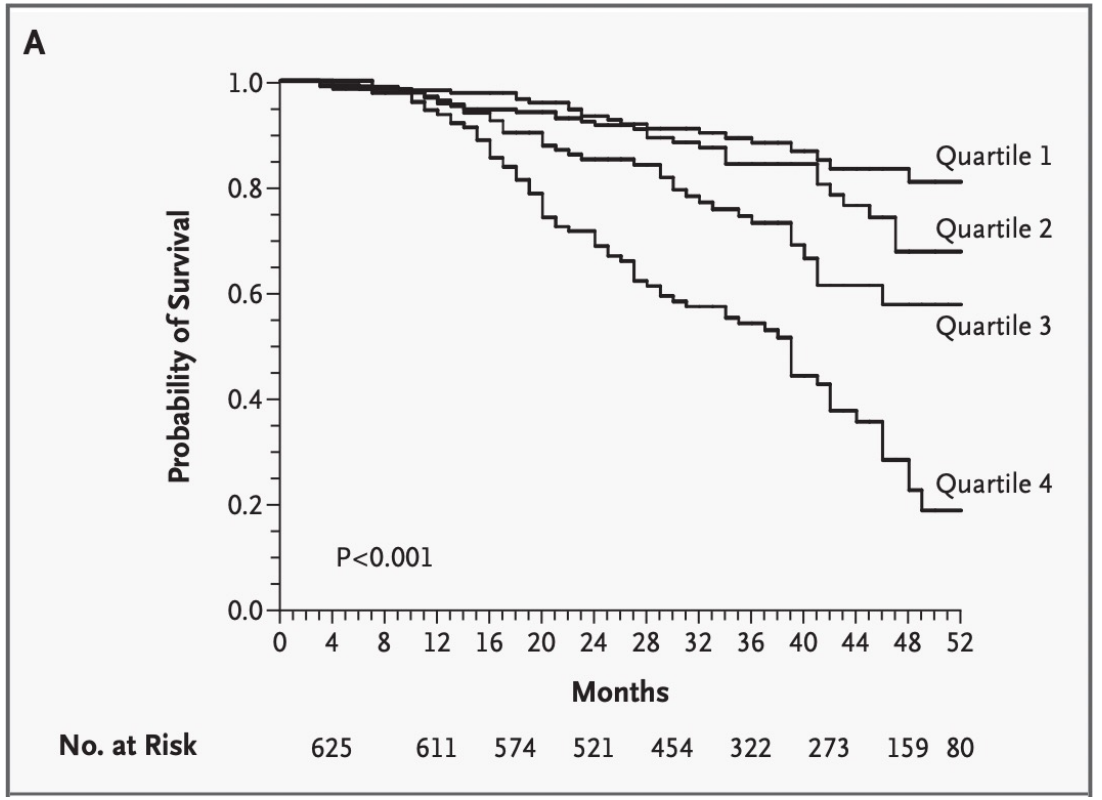
Characteristic	Survived (N=182)	Died (N=25)	P Value
	mean ±SD		
Age (yr)	66±9	70±7	0.03
FVC (liters)	2.78±0.89	2.27±0.57	0.04
FEV_1			
Liters	1.31±0.63	0.84±0.33	0.002
Percent of predicted	43±19	28±12	0.001
FRC (%)	150±43	170±52	0.12
Inspiratory capacity (liters)	2.0±0.7	1.6±0.5	0.007
MMRC dyspnea scale†	2.7±0.89	3.3±0.87	0.001
Distance walked in 6 min (m)	264±113	175±86	0.001
Body-mass index‡	26±5	23±5	0.002
Hematocrit (%)	42±5	39±5	0.01
Albumin (g/ml)	4.0±0.3	3.8±0.4	0.08
Smoking history (pack-yr)	88±48	77±48	0.36
Charlson index§	2.9±1.3	5.9±1.9	0.02

Celli et al NEJM 2005

The Body-Mass Index, Airflow Obstruction, Dyspnea, and Exercise Capacity Index in Chronic Obstructive Pulmonary Disease

Table 2. Variables and Point Values Used for the Computation of the Body-Mass Index, Degree of Airflow Obstruction and Dyspnea, and Exercise Capacity (BODE) Index.*

Variable	Points on BODE Index			
	0	1	2	3
FEV_1 (% of predicted)†	≥65	50–64	36–49	≤35
Distance walked in 6 min (m)	≥350	250–349	150–249	≤149
MMRC dyspnea scale‡	0–1	2	3	4
Body-mass index§	>21	≤21		



Celli et al NEJM 2005

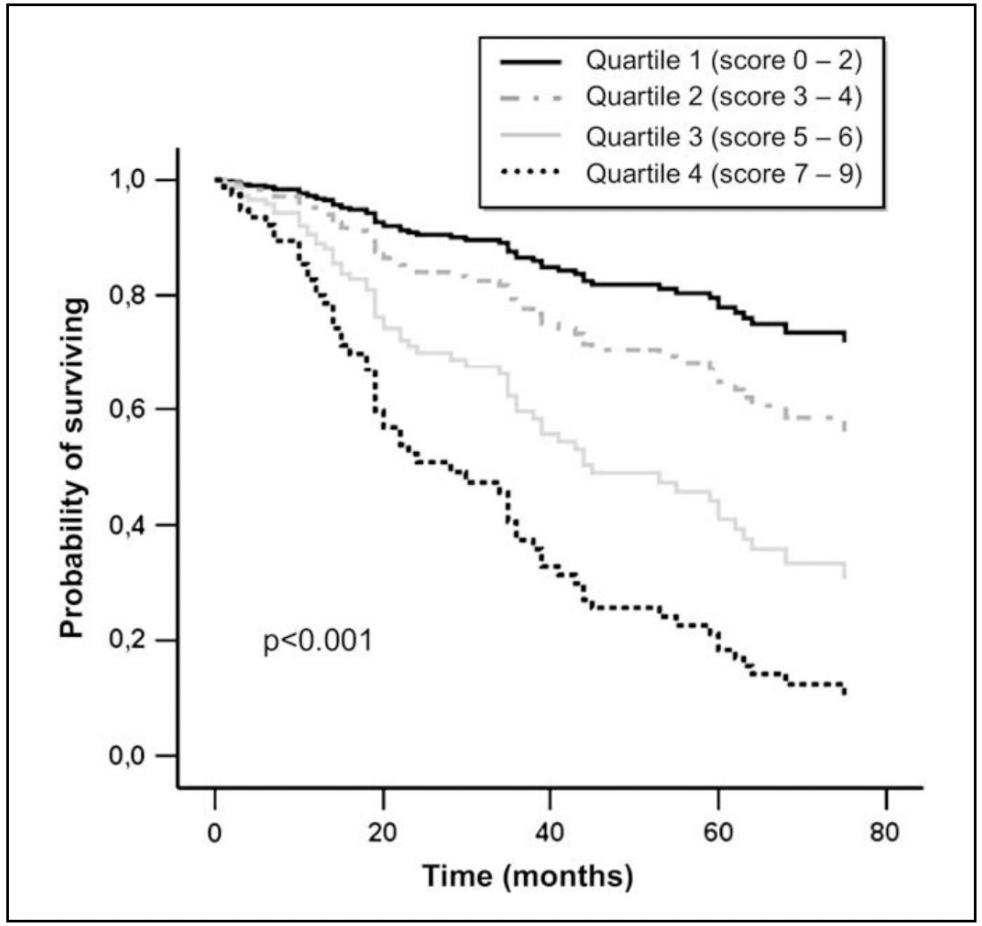
El cuartil mas alto (de 7 a 10) tiene una probabilidad de fallecer dentro de 1 año de 80%

Indice BODex

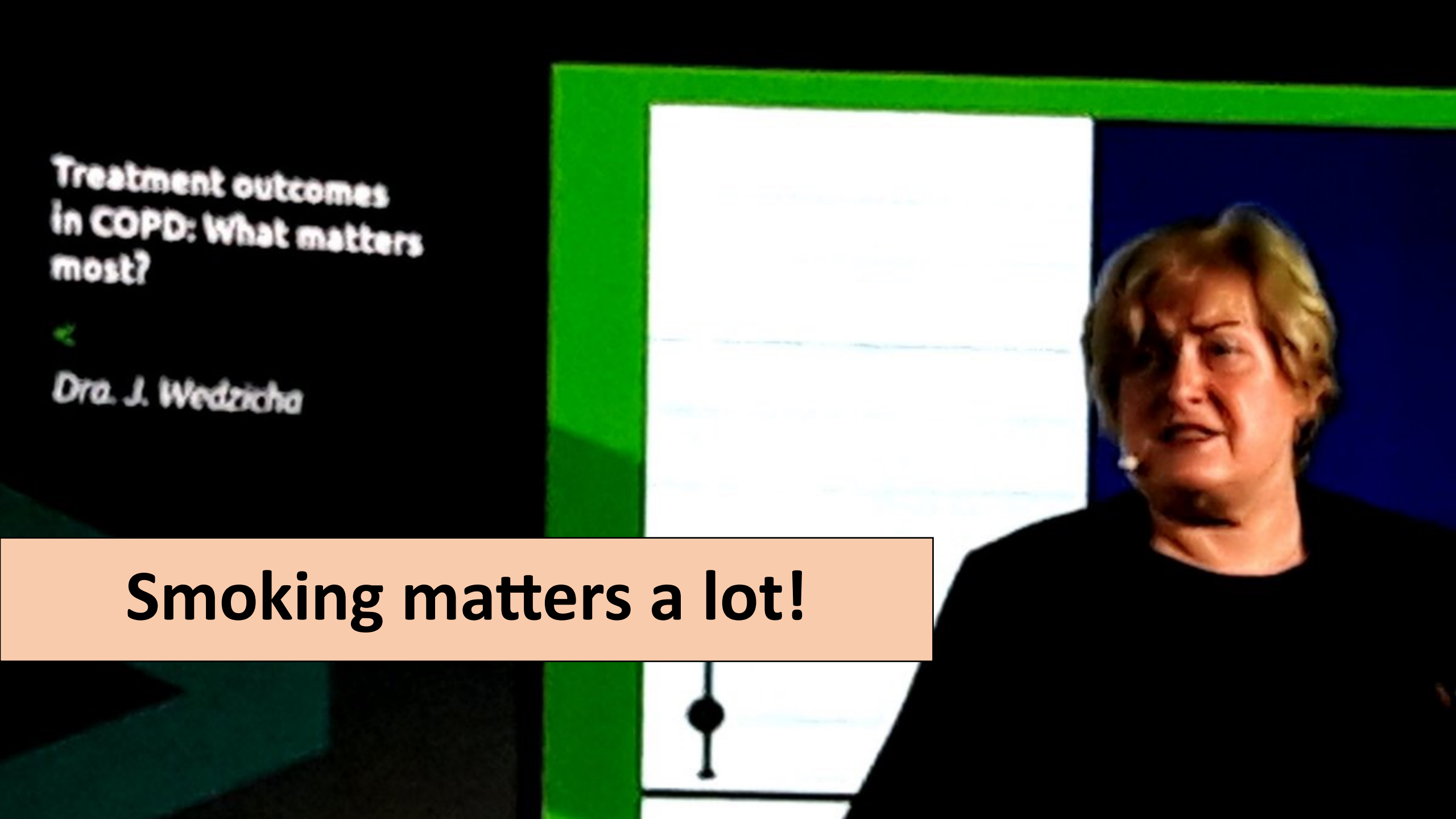
ÍNDICE BODEx					
Marcadores		Puntuación			
		0	**1**	**2**	**3**
B	IMC (kg/m^2)	>21	≤21		
O	FEV1 (%)	≥65	50-64	36-49	≤35
D	Disnea (mMRC)*	0-1	2	3	4
Ex	Exacerbaciones graves	0	1-2	≥3	

Soler Cataluña et al Respiratory Medicine 2009

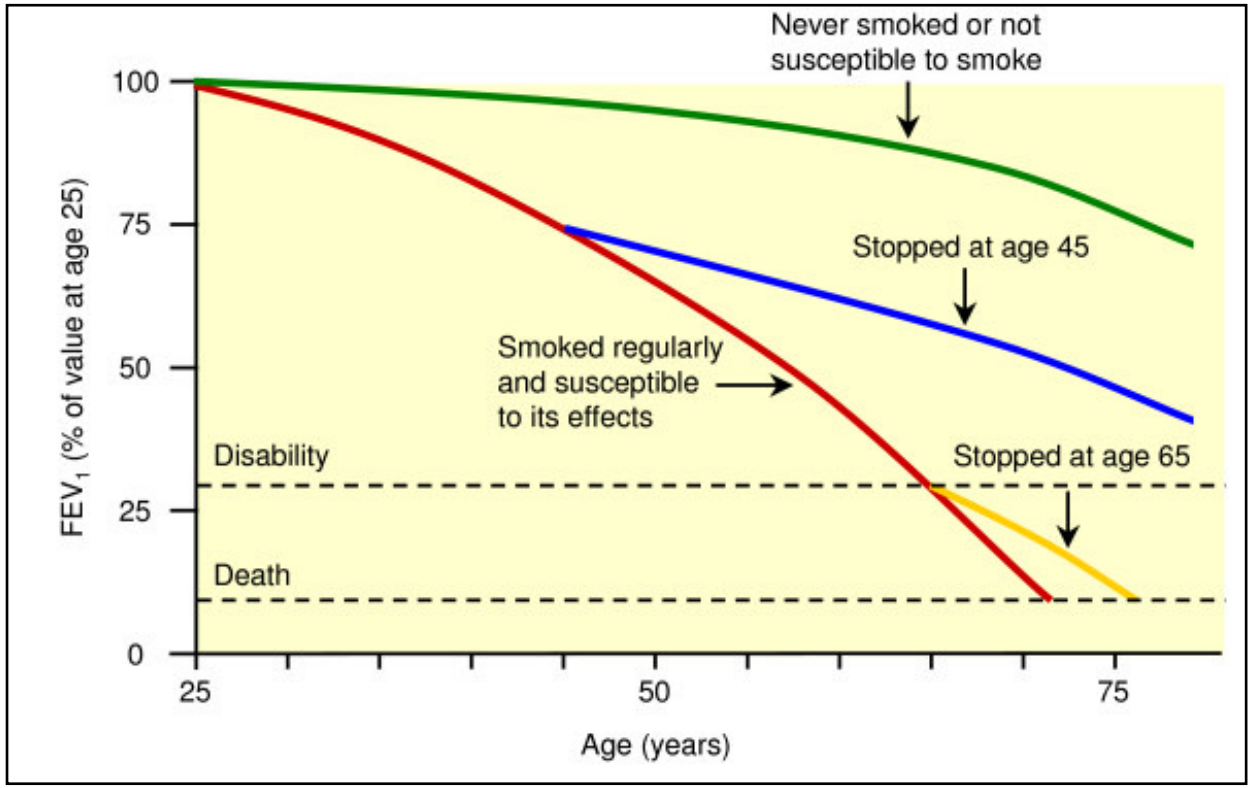
Indice BODex

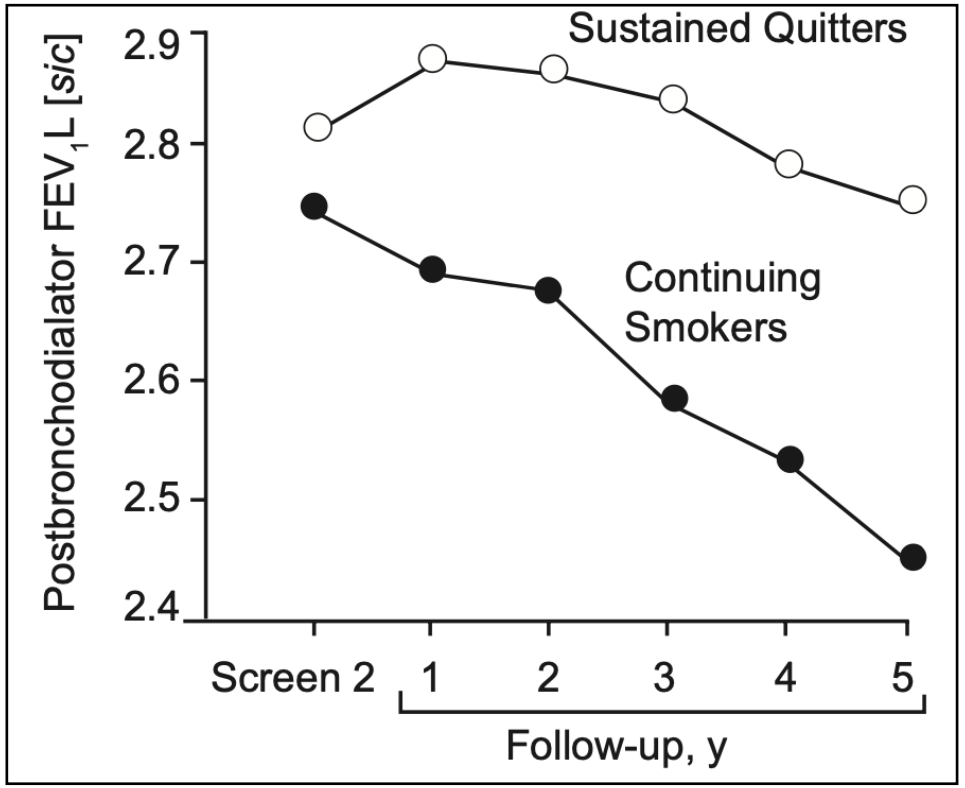


Soler Cataluña et al Respiratory Medicine 2009



Smoking matters a lot!





Fletcher & Peto BMJ 1977

Anthonisen et al, The Lung Health Study JAMA 1994

Estudio FLAME

Table 1. Baseline Characteristics of the Patients.*

Characteristic	Indacaterol–Glycopyrronium Group (N=1680)	Salmeterol–Fluticasone Group (N=1682)	All Patients (N=3362)
Age — yr	64.6±7.9	64.5±7.7	64.6±7.8
Male sex — no. (%)	1299 (77.3)	1258 (74.8)	2557 (76.1)
Duration of COPD — yr	7.2±5.3	7.3±5.5	7.3±5.4
Use of inhaled glucocorticoids at screening — no. (%)	954 (56.8)	939 (55.8)	1893 (56.3)
Current smoker — no. (%)	664 (39.5)	669 (39.8)	1333 (39.6)
Severity of COPD — no. (%)†			
Group A	2 (0.1)	0	2 (0.1)
Group B	400 (23.8)	422 (25.1)	822 (24.4)
Group C	1 (0.1)	2 (0.1)	3 (0.1)
Group D	1265 (75.3)	1249 (74.3)	2514 (74.8)
Post-bronchodilator FEV_1 — liters	1.2±0.3	1.2±0.4	1.2±0.3
Post-bronchodilator FEV_1 — % of predicted value	44.0±9.5	44.1±9.4	44.1±9.5
Post-bronchodilator ratio of FEV_1 to FVC — %	41.7±9.8	41.5±9.9	41.6±9.9
Total score on the SGRQ-C‡	47.3±15.8	47.2±15.9	47.3±15.8

Estudio DYNAGITO

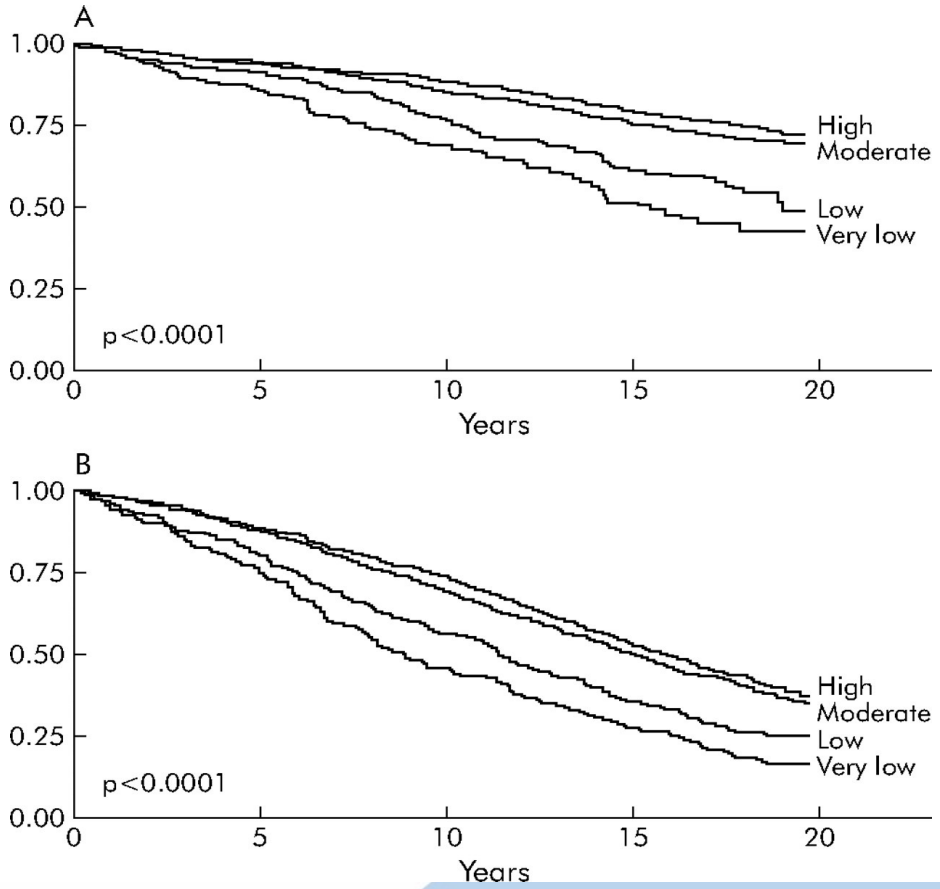
	Tiotropium–olodaterol group (n=3939)	Tiotropium group (n=3941)
Sex		
Male	2785 (71%)	2841 (72%)
Female	1154 (29%)	1100 (28%)
Race		
American Indian–Alaska Native	77 (2%)	64 (2%)
Asian	557 (14%)	607 (15%)
Black–African American	58 (2%)	52 (1%)
Native Hawaiian–Pacific Islander	3 (<1%)	5 (<1%)
White	3134 (80%)	3113 (79%)
Multiple	22 (1%)	20 (1%)
Missing*	88 (2%)	80 (2%)
Age (years)	66·5 (8·4)	66·3 (8·5)
Smoking status		
Current smoker	1434 (36%)	1478 (38%)
Ex-smoker	2505 (64%)	2462 (62%)
Never smoked†	0	1 (<1%)
Smoking history (pack-years)	44·8 (24·4)	44·7 (25·2)

Calverley et al Lancet Respiratory Medicine 2018

El nivel de actividad física es un predictor independiente de las hospitalizaciones y muertes en la EPOC en forma independiente de la etapa

Tiempo hasta
la primera **hospitalización**

Sobrevida

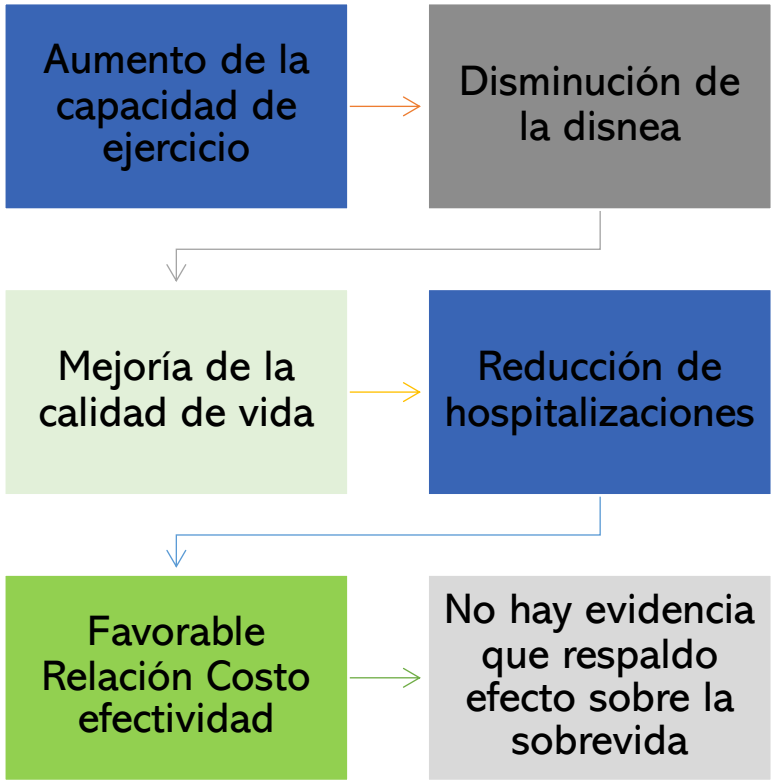


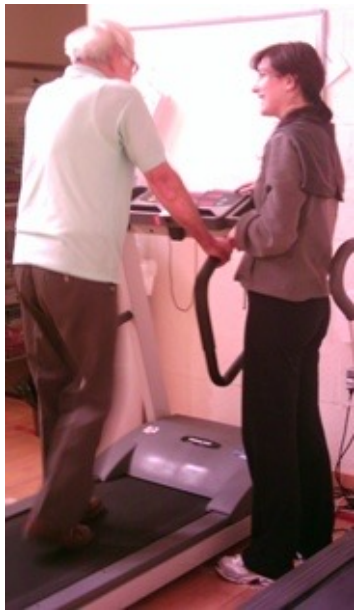
Garcia-Aymerich et al. Thorax. 2006;61:772-8.

Revisiones sistemáticas

Variable	RP
CRQ, unidades	+0,79
SGRQ, unidades	-6,89
ISWT, metros	+ 39,77
6MWT, metros	+43,93
Cap max ejercicio, watt	+ 6,77

Mc Carthy et al, Cochrane Rev 2015

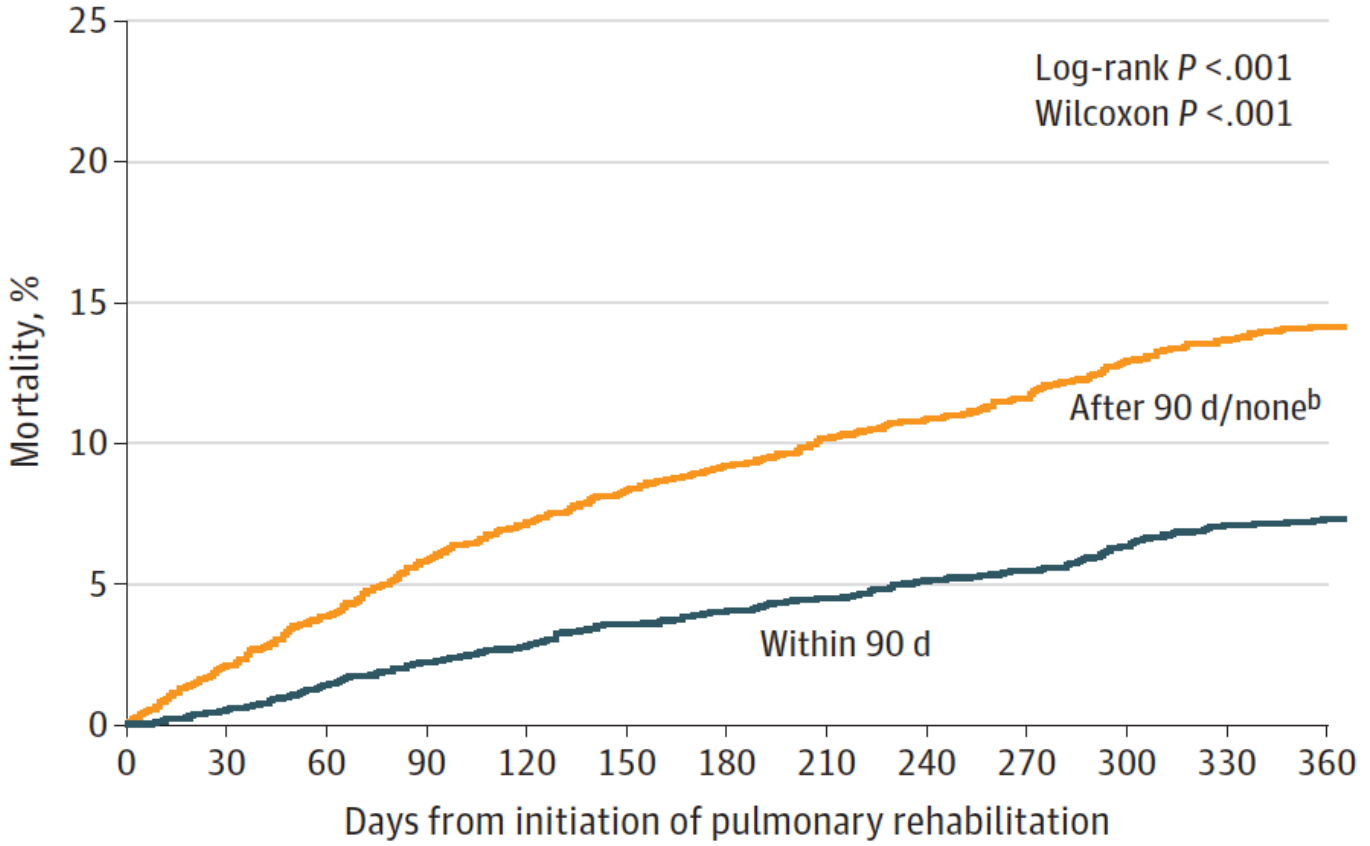




Cochrane Library

Rehabilitación pulmonar precoz: efecto sobre la mortalidad

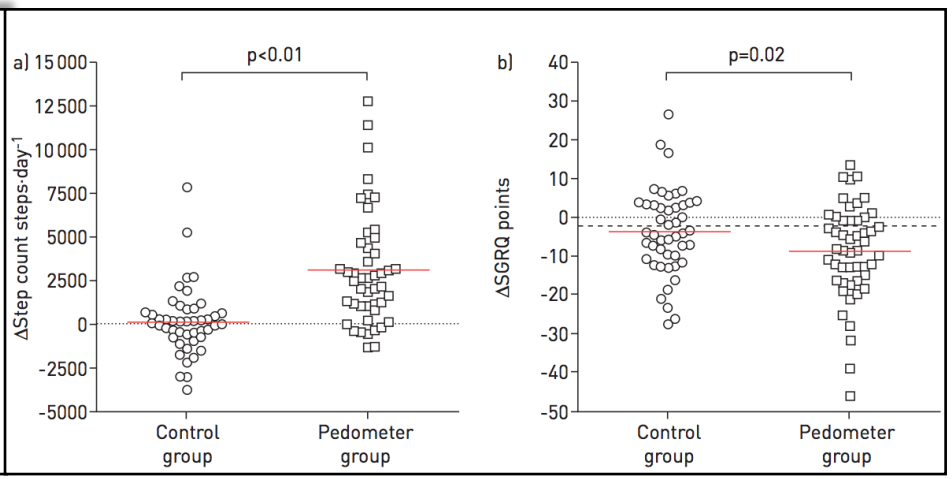
Figure 3. One-Year Mortality After Initiation of Pulmonary Rehabilitation in the Propensity-Matched Cohort[a]



Lindenauer et al, JAMA 2020

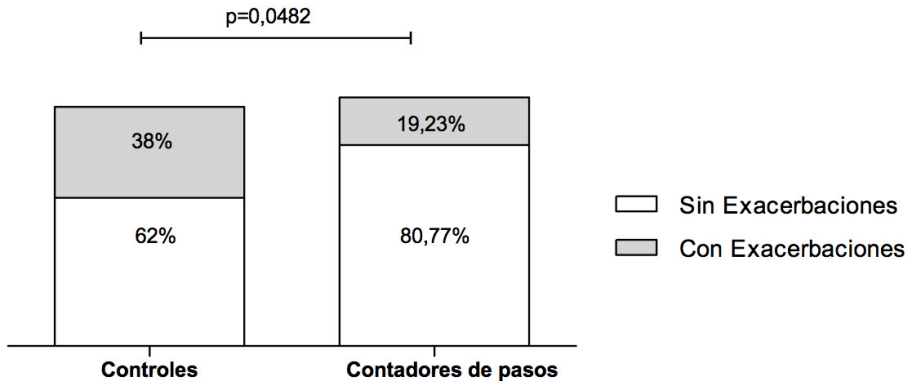
Pedometers to enhance physical activity in COPD: a randomised controlled trial

Laura Mendoza[1], Paula Horta[1], José Espinoza[1], Miguel Aguilera[1], Nicolás Balmaceda[1], Ariel Castro[1], Mauricio Ruiz[1], Orlando Díaz[2] and Nicholas S. Hopkinson[3]



Proyecto FONIS 2019

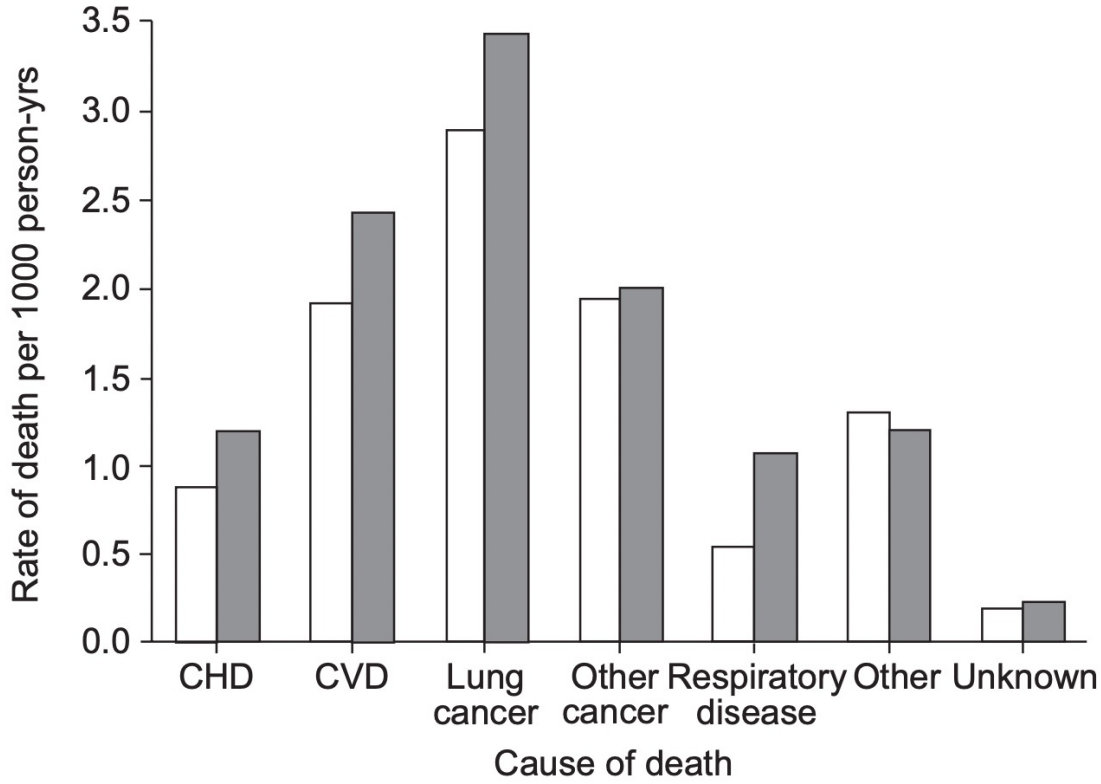
Prevención de las exacerbaciones agudas en pacientes con EPOC mediante programa de incentivo de AF apoyado con contadores de pasos: Un ensayo clínico randomizado controlado multicéntrico





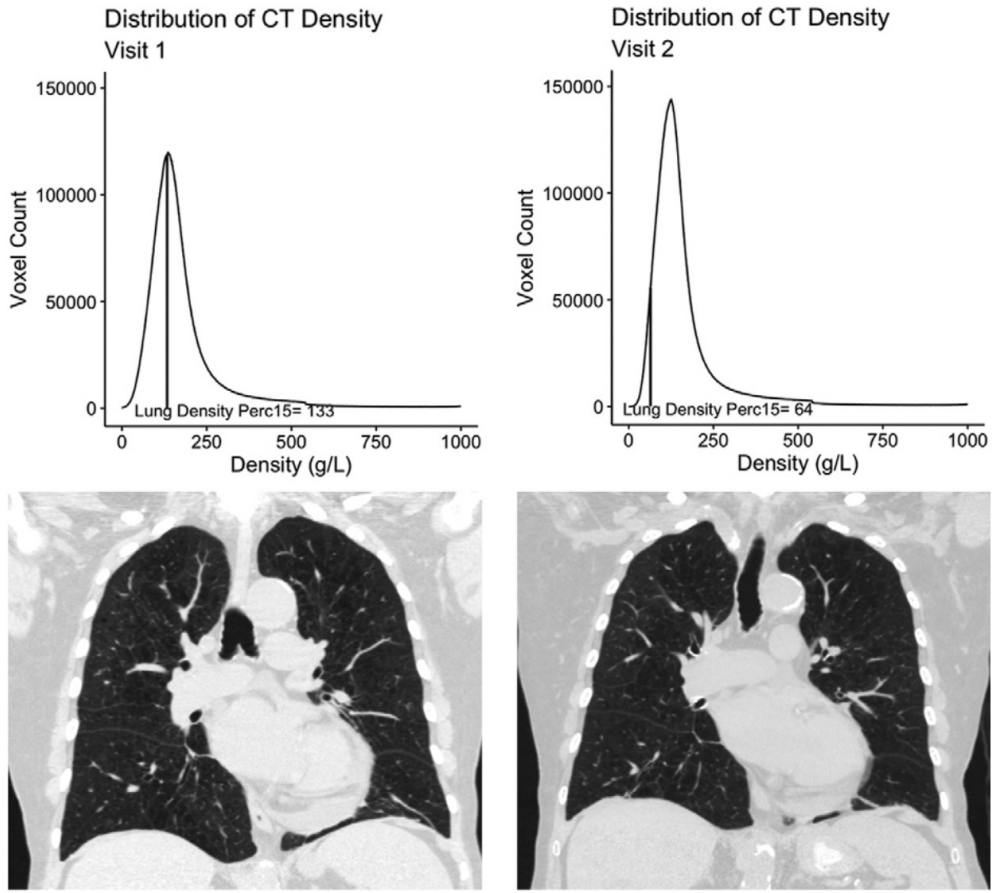
Mendoza *et al*, Eur Respir J 2015, 45: 347-54

¡Comorbilidades!



Sin Mortality in COPD- role of comorbidities. ERJ 2006.

Imageneología



Ash et al Radiology 2021

Capacidad funcional

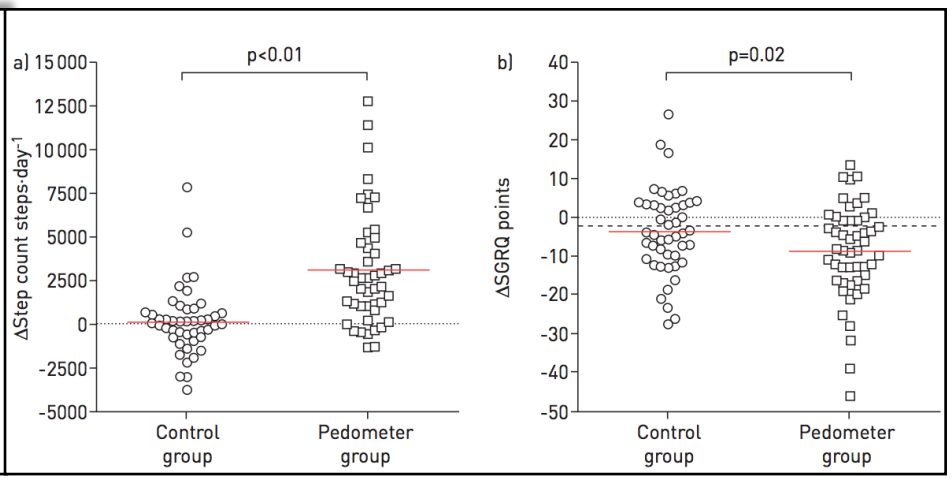
- Caminata de 6 minutos

- Otras pruebas de campo:
  - Sit to stand
  - Test de los 4 metros
  - Test de ejercicio cardiopulmonar



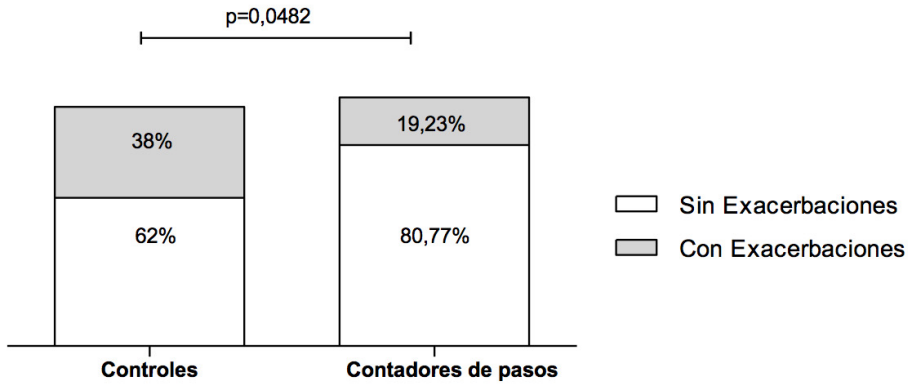
Pedometers to enhance physical activity in COPD: a randomised controlled trial

Laura Mendoza[1], Paula Horta[1], José Espinoza[1], Miguel Aguilera[1], Nicolás Balmaceda[1], Ariel Castro[1], Mauricio Ruiz[1], Orlando Díaz[2] and Nicholas S. Hopkinson[3]



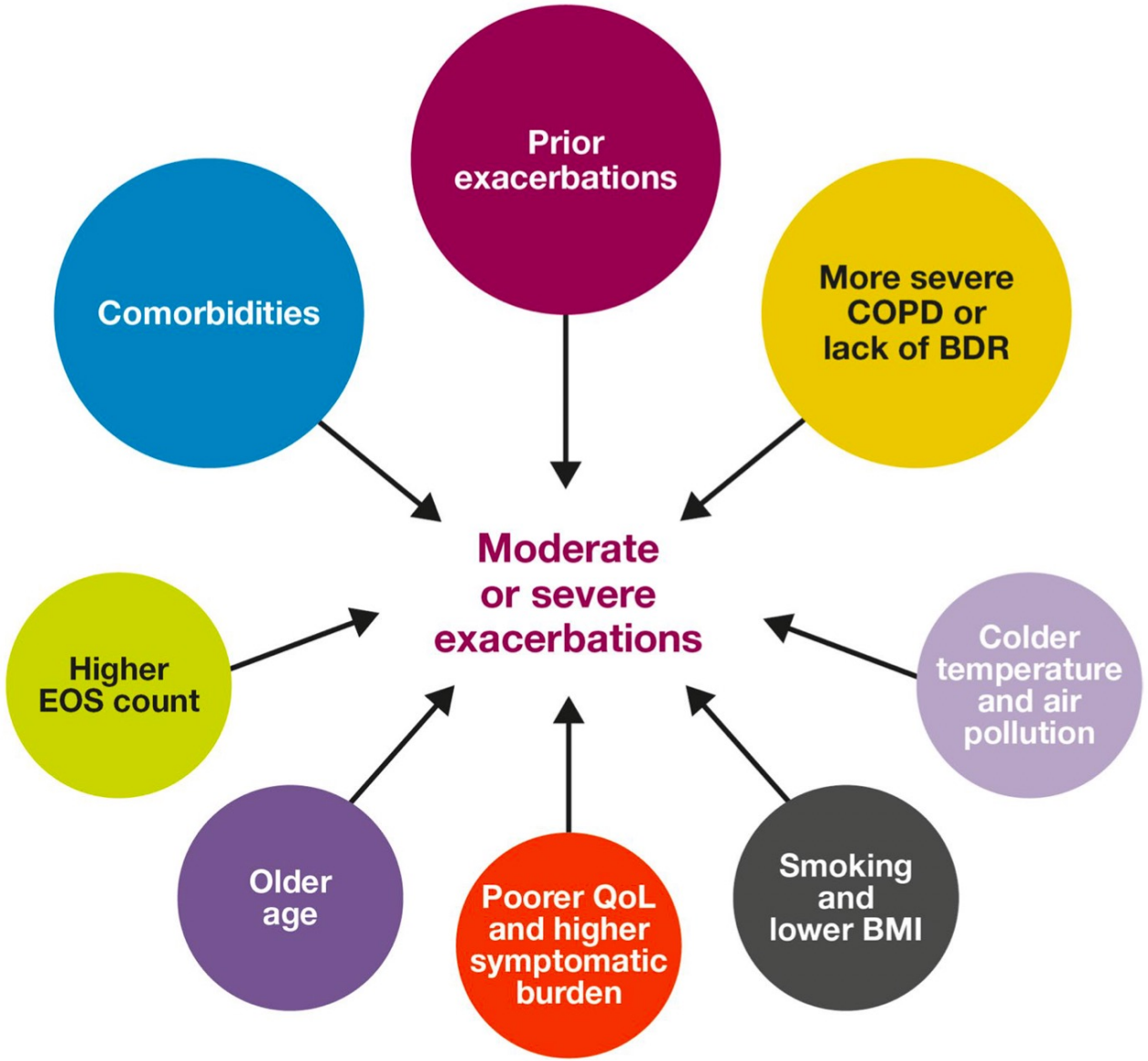
Proyecto FONIS 2019

Prevención de las exacerbaciones agudas en pacientes con EPOC mediante programa de incentivo de AF apoyado con contadores de pasos: Un ensayo clínico randomizado controlado multicéntrico





Mendoza *et al*, Eur Respir J 2015, 45: 347-54

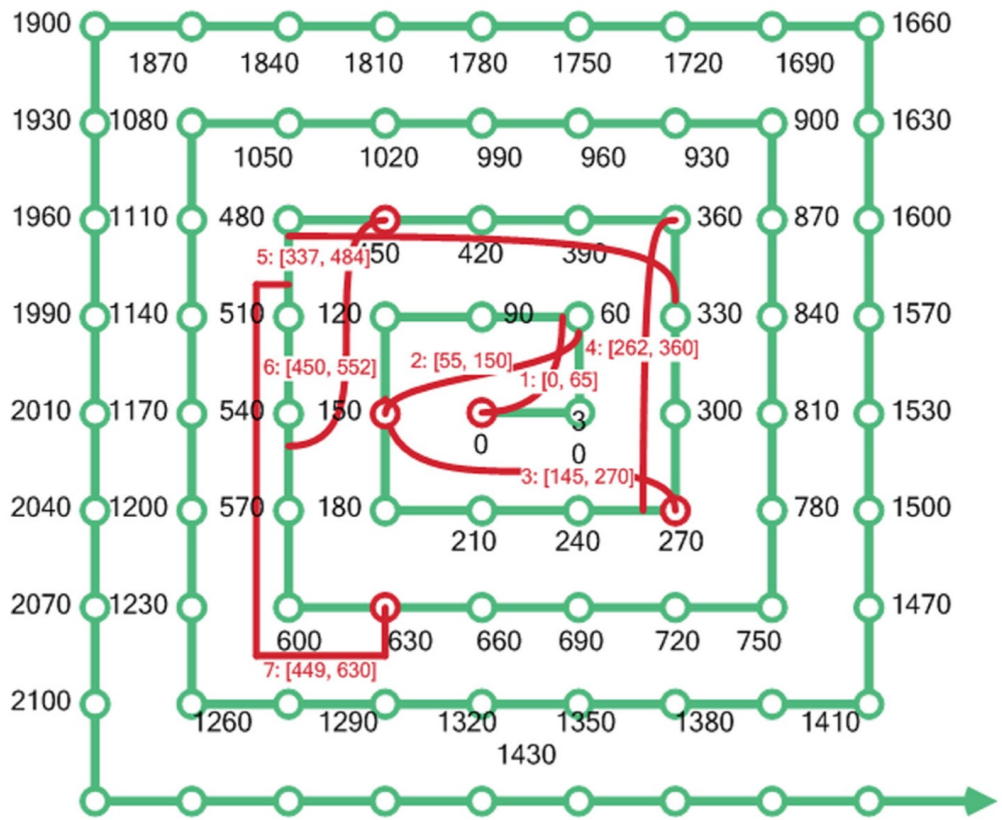


Hurst *et al. Respiratory Research 2022*

“The unpredictable death”—The last year of life for patients with advanced COPD: Relatives’ stories

Ek et al Palliative and Supportive Care, page 1 of 10, 2014.

A temporal visualization of chronic obstructive pulmonary disease progression using deep learning and unstructured clinical notes



1. Los datos demuestran un VEF_1 muy disminuido
2. Los GSA demuestran alcalosis respiratoria con un gradiente A-a elevado
3. Se observa CVF muy disminuida (< 35% predicho)
4. VEF_1, VEF_1/CVF y CVF disminuidos, no hay respuesta al BD
5. La DLCO se encuentra disminuida
6. Hay taquicardia sinusal
7. Hay caída del VEF1 (21% caída)

Tang *et al* BMC Medical Informatics and Decision Making 2019

Evidence Supporting a Reduction in Mortality with Pharmacotherapy and Non-pharmacotherapy in COPD Patients

Table 3.6

Therapy	RCT*	Treatment effect on mortality	Patient characteristics
Pharmacotherapy			
LABA+LAMA+ICS[1]	Yes	Single inhaler triple therapy compared to dual LABD therapy relative risk reduction: IMPACT: HR 0.72 (95% CI: 0.53, 0.99)[1a] ETHOS: HR 0.51 (95% CI: 0.33, 0.80)[1b]	Symptomatic people with a history of frequent and/or severe exacerbations
Non-pharmacological Therapy			
Smoking cessation[2]	Yes	HR for usual care group compared to intervention group (smoking cessation) HR 1.18 (95% CI: 1.02, 1.37)[2]	Asymptomatic or mildly symptomatic
Pulmonary rehabilitation[3#]	Yes	Old trials: RR 0.28 (95% CI 0.10, 0.84)[3a] New trials: RR 0.68 (95% CI 0.28, 1.67)[3b]	Hospitalized for exacerbations of COPD (during or ≤ 4 weeks after discharge)
Long-term oxygen therapy[4]	Yes	NOTT: ≥ 19 hours of continuous oxygen vs ≤ 13 hours: 50% reduction[4a] MRC: ≥ 15 hours vs no oxygen: 50% reduction[4b]	PaO_2 ≤ 55 mmHg or < 60 mmHg with *cor pulmonale* or secondary polycythemia
Noninvasive positive pressure ventilation[5]	Yes	12% in NPPV (high IPAP level) and 33% in control HR 0.24 (95% CI 0.11, 0.49)[5]	Stable COPD with marked hypercapnia
Lung volume reduction surgery[6]	Yes	0.07 deaths/person-year (LVRS) vs 0.15 deaths/person-year (UC) RR for death 0.47 (p = 0.005)[6]	Upper lobe emphysema and low exercise capacity

*RCT with pre-specified analysis of the mortality outcome (primary or secondary outcome); #Inconclusive results likely due to differences in pulmonary rehabilitation across a wide range of participants and settings.

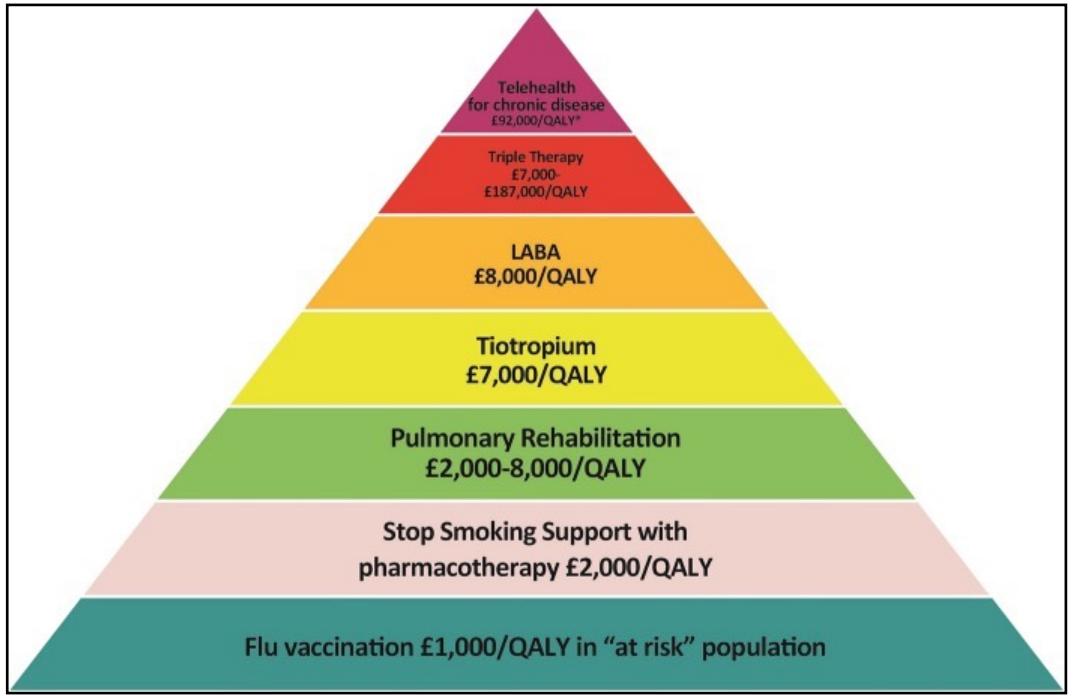
1. a) IMPACT trial (Lipson et al. 2020) and b) ETHOS trials (Martinez et al. 2021); 2.Lung Health Study (Anthonisen et al. 2005); 3. a) Puhan et al. (2011) and b) Puhan et al. 2016; 4. a) NOTT (NOTT, 1980) and b) MRC (MRC, 1981); 5. Kohlein trial (Kohlein et al. 2014); 6. NETT trial (Fishman et al. 2003)

ICS: inhaled corticosteroid; IPAP: inspiratory positive airway pressure; LABA: long-acting beta$_2$-agonist; LABD: long-acting bronchodilator; LAMA: long-acting anti-muscarinic; LTOT: long-term oxygen therapy; NPPV: noninvasive positive pressure ventilation; LVRS: lung volume reduction surgery; UC: usual treatment control group.

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Guías GOLD 2023

The COPD pyramid of value



Zoumot *et al* Thorax 2014

Conclusiones

- Existen factores pronósticos importantes en la EPOC que representan mayor mortalidad y AVISA
- Dichos factores tienen diversidad en sus características, impacto y posibilidad de intervención
- Hay algunos factores pronósticos que cuentan con intervenciones efectivas que pueden reducir el impacto y carga de la EPOC

Clínica Alemana
Departamento Desarrollo Académico e Investigación

Facultad de Medicina
Clínica Alemana - Universidad del Desarrollo

Jornadas de Avances en Enfermedades Respiratorias

Clínica Alemana Santiago - Royal Brompton Hospital



FECHA

Jueves 05 y viernes 06 de octubre 2023

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Aula Magna
Clínica Alemana Santiago,
Av. Manquehue Norte 1410, Vitacura

CONTACTO

educacioncontinuadai@alemana.cl

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¡Muchas gracias!