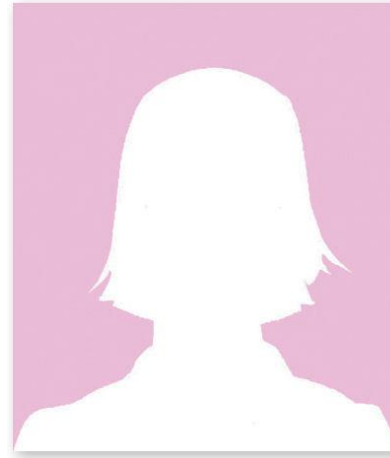




Professor Lutz Beckert

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Patricia Goulter

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Saturday, August 13, 2016

(Room 4)

8:30 - 9:25 WS #68: The Wonder Drug Exercise in COPD

9:35 - 10:30 WS #78: The Wonder Drug Exercise in COPD (Repeated)

The wonder drug exercise in COPD

- 6 minutes walk test or sit / stand test Lutz
- Historic background Trish
- Titrate exercise to Borg 3 – 4 Trish
- Quantity not quality matters Lutz

What is the role of the
sit / stand test?

What is the sit / stand test?

The wonder drug exercise in COPD

- Stand up – and sit down again five times
- Let me get my timer ready

The wonder drug exercise in COPD

- Stand up – and sit down again five times
- Let me get my timer ready
- **Start now!**

The wonder drug exercise in COPD

- An screening test to offer pulmonary rehabilitation
- 6MW and shuttle test are the Gold standards
- A simple screen: Stand up and sit five times
 - < 10 sec – 10,000 steps / day
 - > 18 sec – 2,000 steps / day
- Use the test to pick people who benefit most for rehabilitation

Field walking tests in chronic respiratory disease

- The 6-min walking distance (6MWD) is a valid test; i.e. there is a strong relationships with walk distance and physical activity.
- A lower 6MWD is strongly associated with increased risk of hospitalisation and mortality.
- The 6MWD exhibits good test–retest reliability.
- The 6MWD are responsive to treatment effects in people with chronic respiratory disease. A change of **25 – 33 meters** is meaningful
- The 6MWD is very sensitive to variations in methodology.

Which 'drug' improves 63 – 83% of patients?

For every 100 patients that completed either the 6MWT or the ISWT, both on initial assessment and discharge, the following responses were recorded:

- 63 improved after pulmonary rehabilitation by more than the MCID*
- 20 improved after pulmonary rehabilitation but by less than the MCID
- 17 had no change or a reduction



... they not only walk further, they also felt better

For every 100 patients that had a health status test (either CAT, SGRQ, or CRQ) both upon initial assessment and discharge, the following differences were recorded:

- 61 improved after pulmonary rehabilitation by more than the MCID†
- 13 improved after pulmonary rehabilitation but by less than the MCID
- 26 had no change or a worse score



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Historic background

Trish Goulter

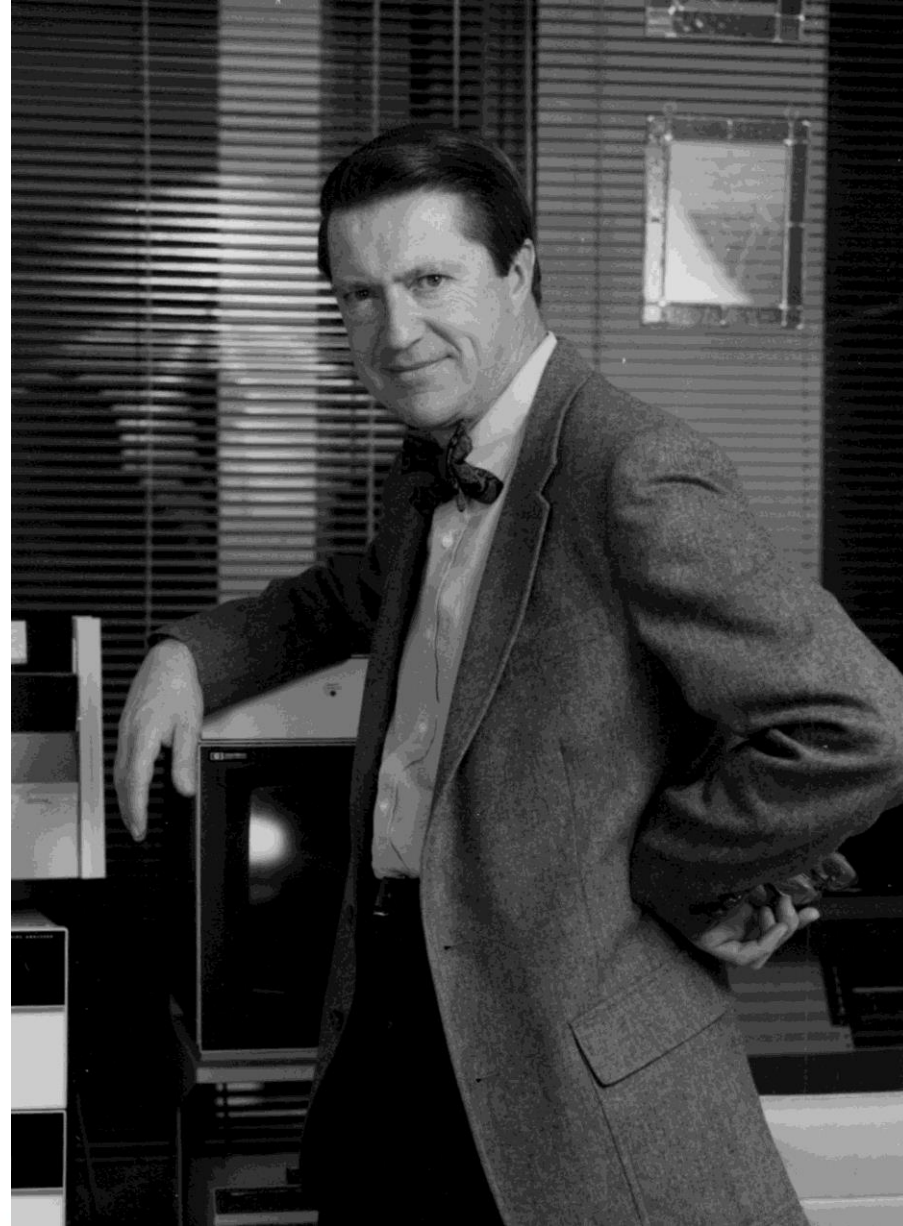


Of all the forms of Rehabilitation that are available in medicine,
pulmonary rehabilitation is a relative newcomer





FIG 1. THE LATE ALVAN BARACH MODELING A SMALL HIGH-PRESSURE OXYGEN CYLINDER CAPABLE OF BEING TRANSFILLED FROM A LARGER COMPRESSED GAS CYLINDER. (FROM REFERENCE 4.)

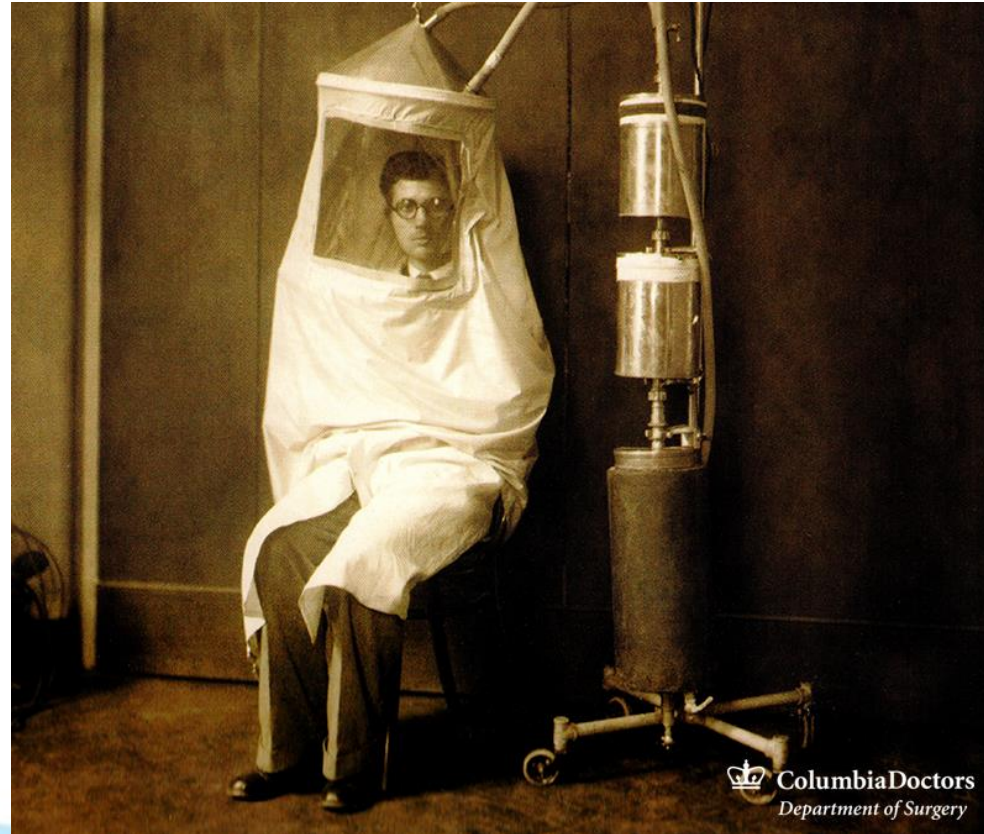


Conference & Medical Exhibition

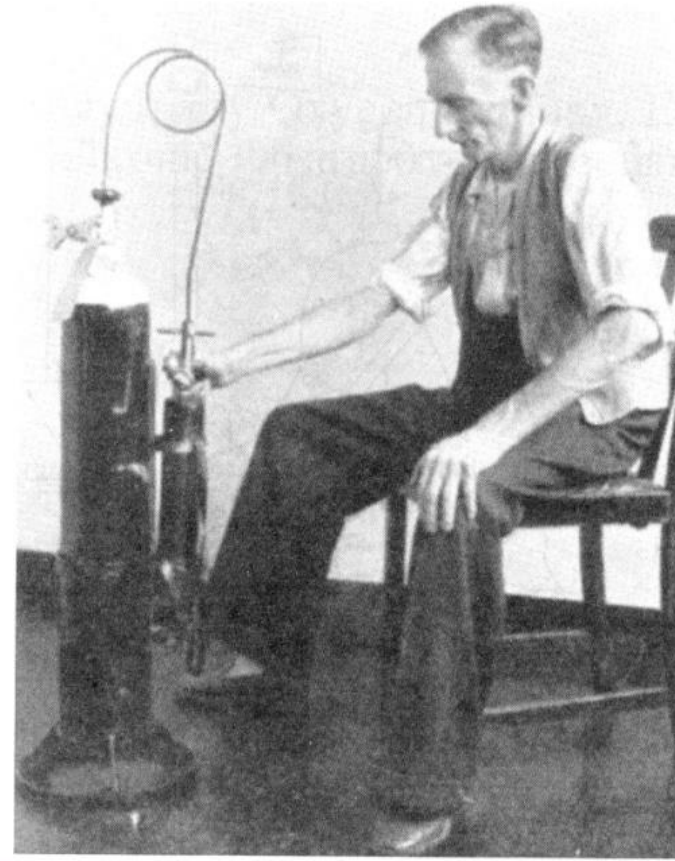
A: A class for COPD patients and their family members in the late 1960s.



Portable oxygen



Portable oxygen





South GP CME General Practice Conference & Medical Exhibition



The wonder drug exercise in COPD

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Outcome Measures

Which one matters

Outcome	Areas measured	Types of measures
Exercise capacity	Distance walked Oxygen consumption	6MWT ISWT Sit-to stand METs
Symptoms	Dyspnoea Fatigue	Symptoms specific questionnaires 5Q5D VAS BORG MRC dyspnoea scale
Health-related QOL	Several domains, varying by questionnaire	Chronic Respiratory Questionnaire (CRQ) St George's Respiratory Questionnaire (SGRQ) CAT (COPD Assessment Tool)

How do you feel today?



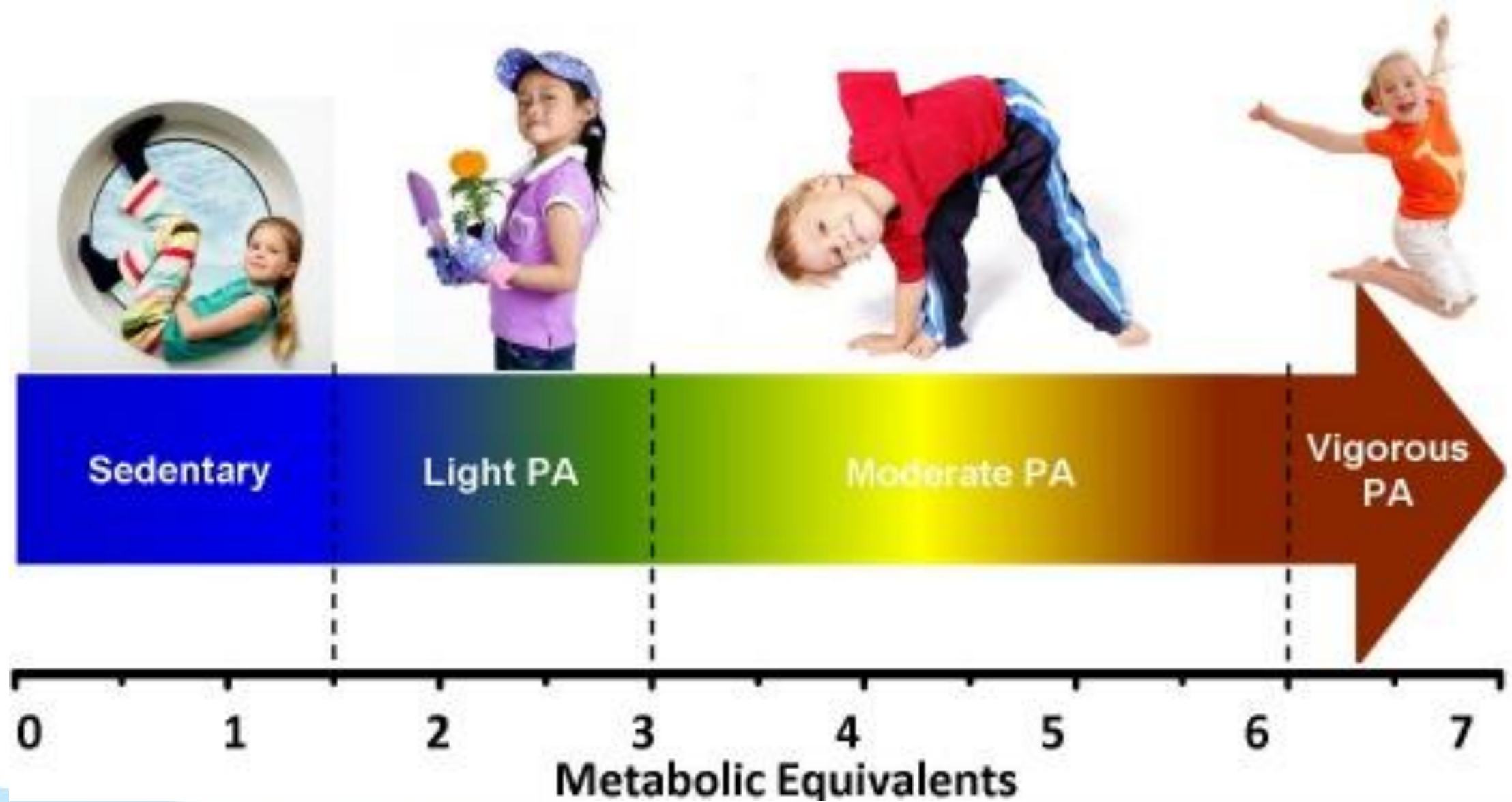
bad

good



Modified Borg Scale

0	Nothing at all
0.5	Very, very slight (just noticeable)
1	Very slight
2	Slight (light)
3	Moderate
4	Somewhat severe
5	Severe (heavy)
6	↓
7	Very severe
8	↓
9	↓
10	Very, very severe



Your name:

Today's date:



How is your COPD? Take the COPD Assessment Test™ (CAT)

This questionnaire will help you and your healthcare professional measure the impact COPD (Chronic Obstructive Pulmonary Disease) is having on your wellbeing and daily life. Your answers, and test score, can be used by you and your healthcare professional to help improve the management of your COPD and get the greatest benefit from treatment.

For each item below, place a mark (X) in the box that best describes you currently. Be sure to only select one response for each question.

Example: I am very happy 0 ☒ 1 2 3 4 5 I am very sad

			SCORE
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	
I have lots of energy	0 1 2 3 4 5	I have no energy at all	
			TOTAL SCORE



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The wonder drug exercise in COPD

- Fitbits are fun!



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

Laura Mendoza¹, Paula Horta¹, José Espinoza¹, Miguel Aguilera¹, Nicolás Balmaceda¹, Ariel Castro¹, Mauricio Ruiz¹, Orlando Díaz² and Nicholas S. Hopkinson³

Affiliations: ¹Sección Neumología, Departamento de Medicina, Hospital Clínico Universidad de Chile, Santiago, Chile. ²Departamento de Enfermedades Respiratorias, Pontificia Universidad Católica de Chile, Santiago, Chile. ³National Institute for Health Research Respiratory Biomedical Research Unit, Royal Brompton and Harefield NHS Foundation Trust, Imperial College, London, UK.

Correspondence: Laura Mendoza, Hospital Clínico Universidad de Chile, Santos Dumont 999, Independencia, Santiago, Chile. E-mail: lmendoza08@gmail.com

ABSTRACT Physical inactivity is a cardinal feature of chronic obstructive pulmonary disease (COPD), and is associated with increased morbidity and mortality. Pedometers, which have been used in healthy populations, might also increase physical activity in patients with COPD.

COPD patients taking part in a 3-month individualised programme to promote an increase in their daily physical activity were randomised to either a standard programme of physical activity encouragement alone, or a pedometer-based programme. Assessments were performed by investigators blinded to treatment allocation. Change in average 1-week daily step count, 6-min walking distance (6MWD), modified Medical Research Council scale, St George's respiratory questionnaire (SGRQ) and COPD assessment test (CAT) were compared between groups.

102 patients were recruited, of whom 97 completed the programme (pedometer group: n=50; control group: n=47); 60.8% were male with a mean±SD age of 68.7±8.5 years, and forced expiratory volume in 1 s (FEV₁) 66.1±19.4% and FEV₁/forced vital capacity 55.2±9.5%. Both groups had comparable characteristics at baseline. The pedometer group had significantly greater improvements in: physical activity 3080±3254 steps·day⁻¹ versus 138.3±1950 steps·day⁻¹ (p<0.001); SGRQ -8.8±12.2 versus -3.8±10.9 (p=0.01); CAT score -3.5±5.5 versus -0.6±6.6 (p=0.001); and 6MWD 12.4±34.6 versus -0.7±24.4 m (p=0.02) than patients receiving activity encouragement only.

A simple physical activity enhancement programme using pedometers can effectively improve physical activity level and quality of life in COPD patients.

The wonder drug exercise in COPD

- Fitbits are fun!



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ABSTRACT Physical inactivity is a cardinal feature of chronic obstructive pulmonary disease (COPD) and is associated with increased morbidity and mortality. Pedometers, which are used to monitor physical activity in healthy populations, might also increase physical activity in COPD patients.

- Daily steps in the control group: 138 +/- 1950
- Daily steps with a pedometer: 3080 +/- 3254

COPD patients taking part in a physical activity programme using pedometers had significantly greater improvements in physical activity (3080±3254 steps-day⁻¹ versus 138.3±1950 steps-day⁻¹ (p<0.001); SGRQ -8.8±12.2 versus -3.8±10.9 (p=0.01); CAT score -3.5±5.5 versus -0.6±6.6 (p=0.001); and 6MWD 12.4±34.6 versus -0.7±24.4 m (p=0.02) than patients receiving activity encouragement only.

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A simple physical activity enhancement programme using pedometers can effectively improve physical activity level and quality of life in COPD patients.

The wonder drug exercise in COPD



Benefits of physical activity on COPD hospitalisation depend on intensity

David Donaire-Gonzalez^{1,2,3,4}, Elena Gimeno-Santos^{1,2,3}, Eva Balcells^{3,5,6,7}, Jordi de Batlle⁸, Maria A. Ramon^{5,9,10}, Esther Rodriguez^{5,9,10}, Eva Farrero^{11,12}, Marta Benet^{1,2,3}, Stefano Guerra^{1,2,3,13}, Jaume Sauleda^{5,14,15}, Antoni Ferrer^{3,5,7}, Jaume Ferrer^{5,9,10}, Joan A. Barberà^{5,16}, Robert Rodriguez-Roisin^{5,16}, Joaquim Gea^{3,5,6,7}, Alvar Agustí^{5,16}, Josep M. Antó^{1,2,3,6}, Judith Garcia-Aymerich^{1,2,3} and the PAC-COPD Study Group¹⁷

Affiliations: ¹Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain. ²CIBER Epidemiología y Salud Pública (CIBERESP), Barcelona, Spain. ³Departament de Ciències Experimentals i de la Salut, Universitat Pompeu Fabra, Barcelona, Spain. ⁴Physical Activity and Sports Sciences Department, Fundació Blanquerna, Barcelona, Spain. ⁵CIBER de Enfermedades Respiratorias (CIBERES), Madrid, Spain. ⁶Hospital del Mar Medical Research Institute (IMIM), Barcelona, Spain. ⁷Department of Pneumology, Hospital del Mar IMIM, Barcelona, Spain. ⁸Section of Nutrition and Metabolism, International Agency for Research on Cancer (IARC), Lyon, France. ⁹Department of Pneumology, Hospital Universitari Vall d'Hebron, Barcelona, Spain. ¹⁰Departament de Medicina, Universitat Autònoma de Barcelona, Barcelona, Spain. ¹¹Department of Pneumology, Hospital Universitari de Bellvitge, Barcelona, Spain. ¹²Institut d'Investigació Biomèdica de Bellvitge (IDIBELL), Barcelona, Spain. ¹³Arizona Respiratory Center, University of Arizona, Tucson, AZ, USA. ¹⁴Department of Pneumology, Hospital Universitari Son Espases, Palma de Mallorca, Spain. ¹⁵Institut d'Investigació Sanitària de Palma (IdISPa), Palma de Mallorca, Spain. ¹⁶Servei de Pneumologia (Thorax Institute), Hospital Clínic, Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), Universitat de Barcelona, Barcelona, Spain. ¹⁷A full list of the PAC-COPD Study Group members and their affiliations can be found in the Acknowledgements section.

Correspondence: Judith Garcia-Aymerich, Centre for Research in Environmental Epidemiology (CREAL), Dr. Aiguader 88, 08003 Barcelona, Spain. E-mail: jgarcia@creal.cat

ABSTRACT The present study aims to disentangle the independent effects of the quantity and the intensity of physical activity on the risk reduction of chronic obstructive pulmonary disease (COPD) hospitalisations.

177 patients from the Phenotype Characterization and Course of COPD (PAC-COPD) cohort (mean±sd age 71±8 years, forced expiratory volume in 1 s 52±16% predicted) wore the SenseWear Pro 2 Armband accelerometer (BodyMedia, Pittsburgh, PA, USA) for eight consecutive days, providing data on quantity (steps per day, physically active days and daily active time) and intensity (average metabolic equivalent tasks) of physical activity. Information on COPD hospitalisations during follow-up (2.5±0.8 years) was obtained from validated centralised datasets.

During follow-up 67 (38%) patients were hospitalised. There was an interaction between quantity and intensity of physical activity in their effects on COPD hospitalisation risk. After adjusting for potential confounders in the Cox regression model, the risk of COPD hospitalisation was reduced by 20% (hazard ratio (HR) 0.79, 95% CI 0.67–0.93; p=0.005) for every additional 1000 daily steps at low average intensity. A greater quantity of daily steps at high average intensity did not influence the risk of COPD hospitalisations (HR 1.01, p=0.919). Similar results were found for the other measures of quantity of physical activity.

Greater quantity of low-intensity physical activity reduces the risk of COPD hospitalisation, but high-intensity physical activity does not produce any risk reduction.

The wonder drug exercise in COPD



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Correspondence: Judith Garcia-Aymerich, Dr. Aiguader 88, 08036 Barcelona, Spain.

- For each additional 1000 steps, the risk of hospital admission was reduced by 20%!
- Higher intensity physical activity does not produce any additional risk reduction.

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Greater quantity of low-intensity physical activity reduces the risk of COPD hospitalisation, but high-intensity physical activity does not produce any risk reduction.

The wonder drug exercise in COPD

Original Investigation

Effect of Moderate to Vigorous Physical Activity on All-Cause Mortality in Middle-aged and Older Australians

Klaus Gebel, PhD; Ding Ding, PhD; Tien Chey, MAppStats; Emmanuel Stamatakis, PhD; Wendy J. Brown, PhD; Adrian E. Bauman, PhD

[Related article page 959](#)

IMPORTANCE Few studies have examined how different proportions of moderate and vigorous physical activity affect health outcomes.

OBJECTIVE To examine whether the proportion of total moderate to vigorous activity (MVPA) that is achieved through vigorous activity is associated with all-cause mortality independently of the total amount of MVPA.

DESIGN, SETTING, AND PARTICIPANTS We performed a prospective cohort study with activity data linked to all-cause mortality data from February 1, 2006, through June 15, 2014, in 204 542 adults aged 45 through 75 years from the 45 and Up population-based cohort study from New South Wales, Australia (mean [SD] follow-up, 6.52 [1.23] years). Associations between different contributions of vigorous activity to total MVPA and mortality were examined using Cox proportional hazards models, adjusted for total MVPA and sociodemographic and health covariates.

EXPOSURES Different proportions of total MVPA as vigorous activity. Physical activity was measured with the Active Australia Survey.

MAIN OUTCOMES AND MEASURES All-cause mortality during the follow-up period.

RESULTS During 1 444 927 person-years of follow-up, 7435 deaths were registered. Compared with those who reported no MVPA (crude death rate, 8.34%), the adjusted hazard ratios for all-cause mortality were 0.66 (95% CI, 0.61-0.71; crude death rate, 4.81%), 0.53 (95% CI, 0.48-0.57; crude death rate, 3.17%), and 0.46 (95% CI, 0.43-0.49; crude death rate, 2.64%) for reporting 10 through 149, 150 through 299, and 300 min/wk or more of activity, respectively. Among those who reported any MVPA, the proportion of vigorous activity revealed an inverse dose-response relationship with all-cause mortality: compared with those reporting no vigorous activity (crude death rate, 3.84%) the fully adjusted hazard ratio was 0.91 (95% CI, 0.84-0.98; crude death rate, 2.35%) in those who reported some vigorous activity (but <30% of total activity) and 0.87 (95% CI, 0.81-0.93; crude death rate, 2.08%) among those who reported 30% or more of activity as vigorous. These associations were consistent in men and women, across categories of body mass index and volume of MVPA, and in those with and without existing cardiovascular disease or diabetes mellitus.

CONCLUSIONS AND RELEVANCE Among people reporting any activity, there was an inverse dose-response relationship between proportion of vigorous activity and mortality. Our findings suggest that vigorous activities should be endorsed in clinical and public health activity guidelines to maximize the population benefits of physical activity.

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Related

- During 1,444,927 person-year follow-up, 7435 death occurred.
 - Death rate without any moderate – vigorous physical activity: 8.34%
 - Death rate when walking 300min / week: 2.35%
- Moderate – vigorous exercise reduced our risk of dying by > 350%

KEY OUTCOMES AND MEASURES All-cause mortality during the follow-up period.

RESULTS During 1 444 927 person-years of follow-up, 7435 deaths were registered. Compared with those who reported no MVPA (crude death rate, 8.34%), the adjusted hazard ratios for all-cause mortality were 0.66 (95% CI, 0.61-0.71; crude death rate, 4.81%), 0.53 (95% CI, 0.48-0.57; crude death rate, 3.17%), and 0.46 (95% CI, 0.43-0.49; crude death rate, 2.64%) for reporting 10 through 149, 150 through 299, and 300 min/wk or more of activity, respectively. Among those who reported any MVPA, the proportion of vigorous activity revealed an inverse dose-response relationship with all-cause mortality: compared with those reporting no vigorous activity (crude death rate, 3.84%) the fully adjusted hazard ratio was 0.91 (95% CI, 0.84-0.98; crude death rate, 2.35%) in those who reported some vigorous activity (but <30% of total activity) and 0.87 (95% CI, 0.81-0.93; crude death rate, 2.08%) among those who reported 30% or more of activity as vigorous. These associations were consistent in men and women, across categories of body mass index and volume of MVPA, and in those with and without existing cardiovascular disease or diabetes mellitus.

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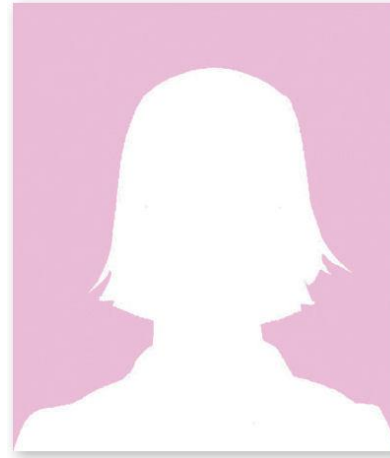
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