

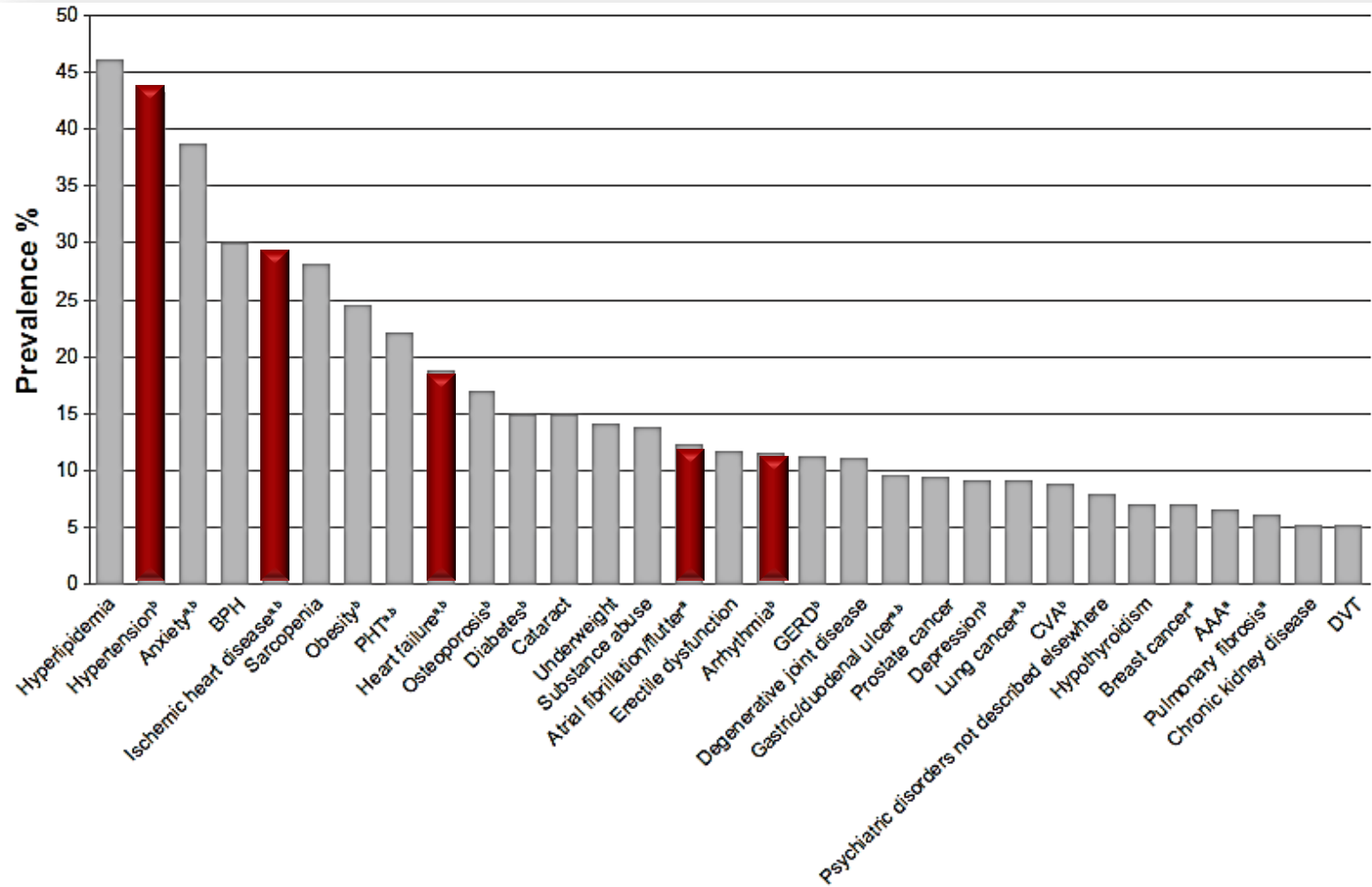
FORGOTTEN CO-MORBIDITIES IN COPD

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July 2016

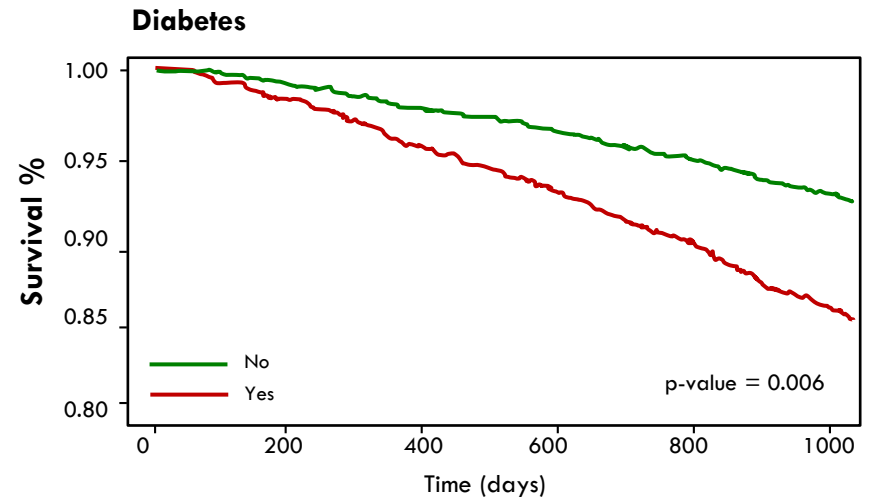
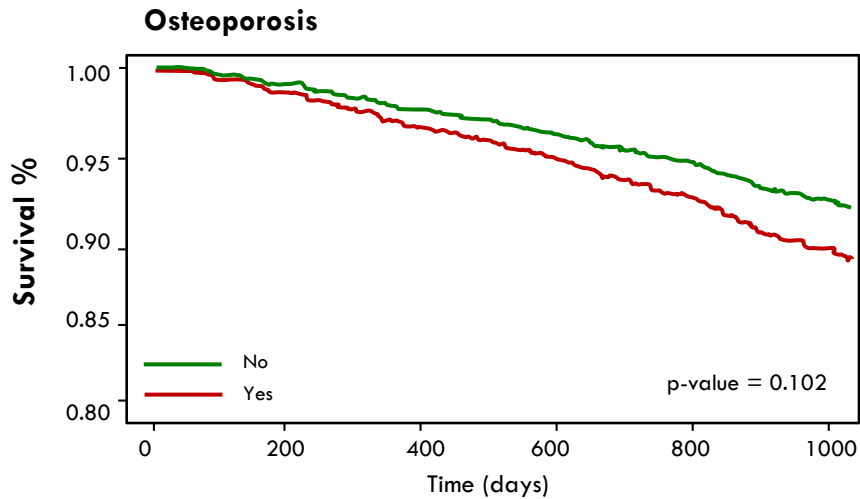
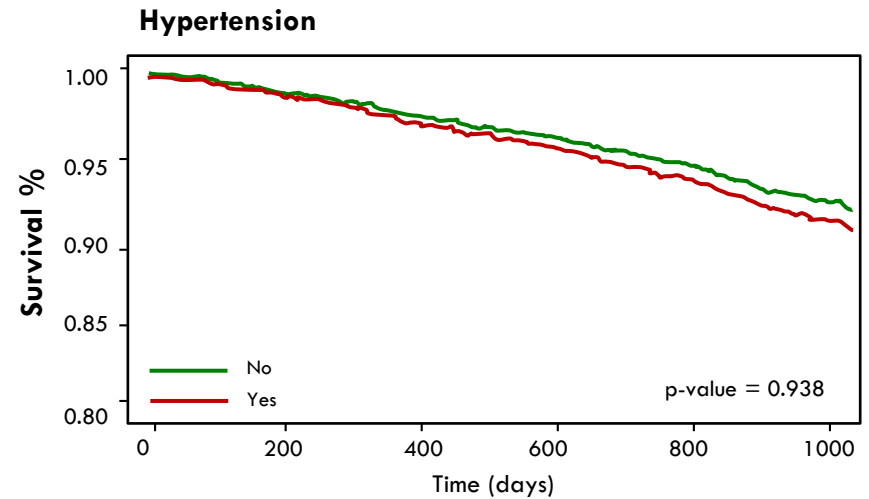
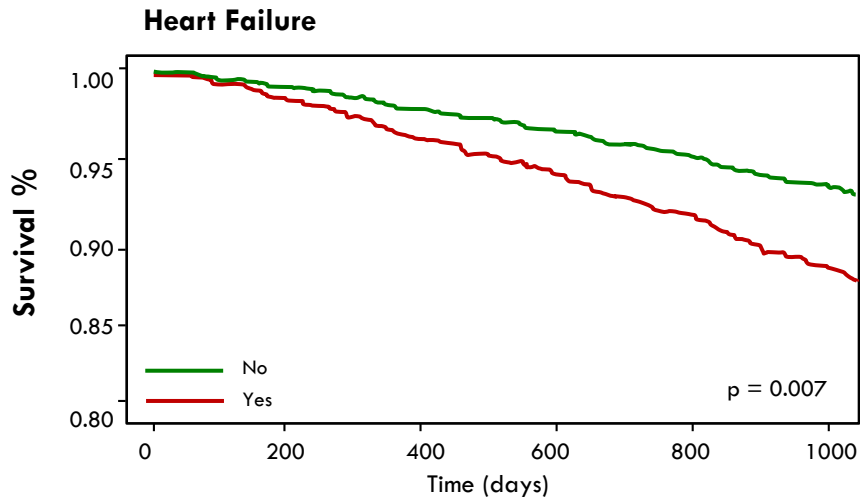
Multi-morbidity in COPD

Smith MC and Wrobel JP, Int J COPD 2014;9



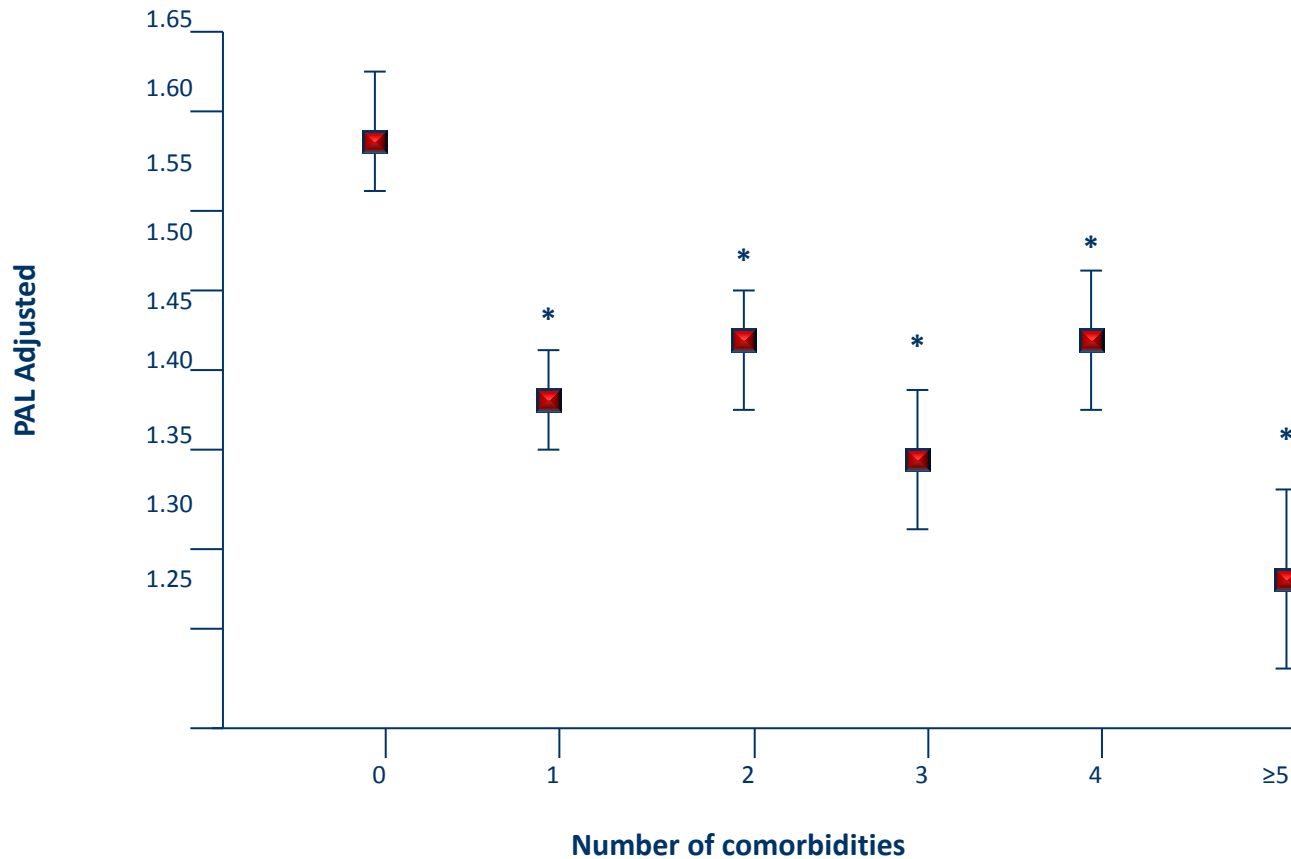
Survival Curves in COPD

Miller J, Respiratory Medicine 2013;107:1376



Adjusted for age, gender and pack years

Impact of Comorbidities on Physical Activity in COPD



Relevant comorbidities less considered

- Gastro-oesophageal reflux disease (GORD)
- Pain
- Postural abnormalities

Relevant comorbidities less considered

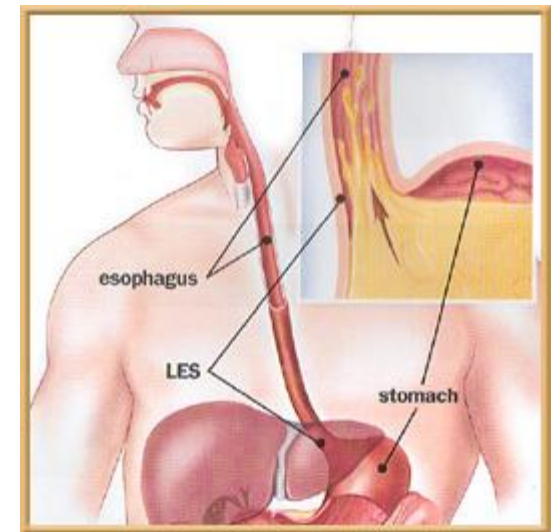


**Gastro-oesophageal reflux disease
(GORD)**

Gastro-oesophageal reflux disease (GORD)

- GOR: retrograde movement of stomach contents through lower oesophageal sphincter (LOS)
- GORD: results in troublesome symptoms or complications

- Prevalence in COPD: 17-78%¹⁻⁴
 - ▣ Acidic or non-acidic



¹Terada K, Thorax 2008;63:951, ²Kampainen R, Chest 2007;131:1666
³Lee A, Respirology 2014;19:211, ⁴Casanova C, Eur Respir J 2004; 23;841

Mechanisms of GORD

- Reduced tone of LOS (permanent or transient)

- Smoking History
 - ▣ LOS relaxation

- Respiratory medications ?
 - ▣ Bronchodilators, Corticosteroids, Anti-cholinergics^{2,3}
 - Altered oesophageal motility, LOS tone

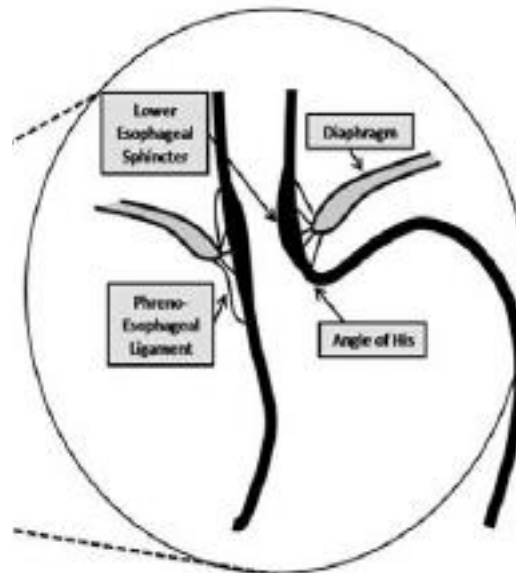
¹Garcia Rodriguez L, Chest 2008;134:1223, ²Martinez C, Respir Res 2014;15:62

Mechanisms of GORD

Turbyville J, Med Hypotheses 2010;74:1075

- With inspiration - ↑ intra abdominal pressure
 - ▣ Exacerbated by airway obstruction
 - ▣ Compromise anti-reflux barrier

Major Components of the
Anti-reflux Barrier

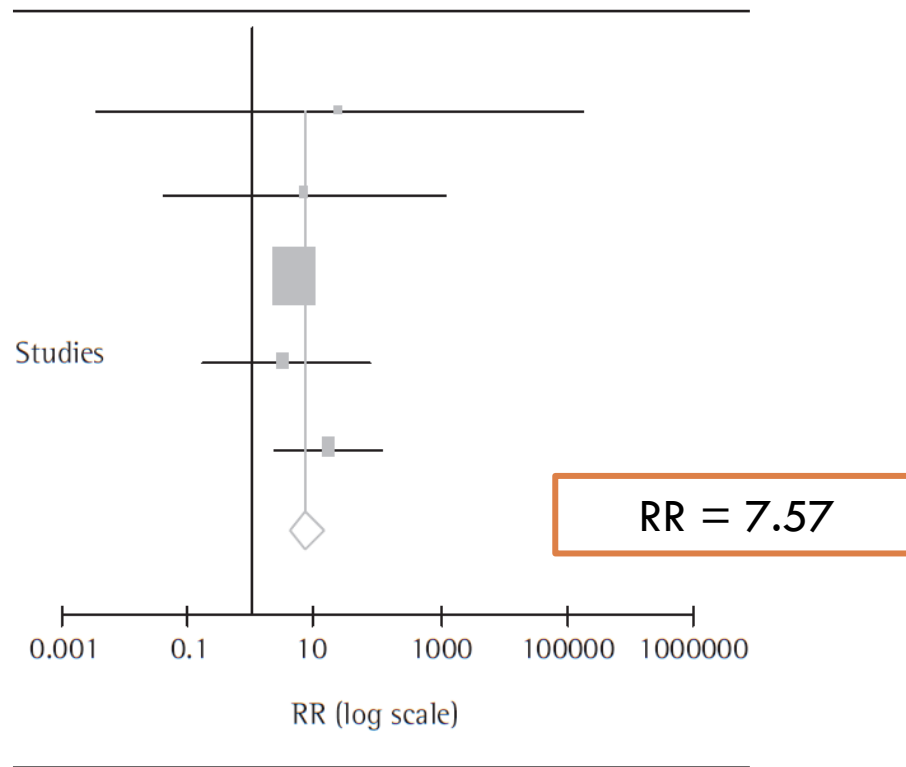


Clinical implications of GORD

- GORD may impact on the severity of lung disease via two mechanisms
 - ▣ Reflex bronchoconstriction
 - Airway irritation with inflammatory response
 - ▣ Pulmonary microaspiration
 - Refluxed gastric material into hypopharynx and beyond

Exacerbations of COPD

Sakae T, J Bras Pneumol, 2013;039:259



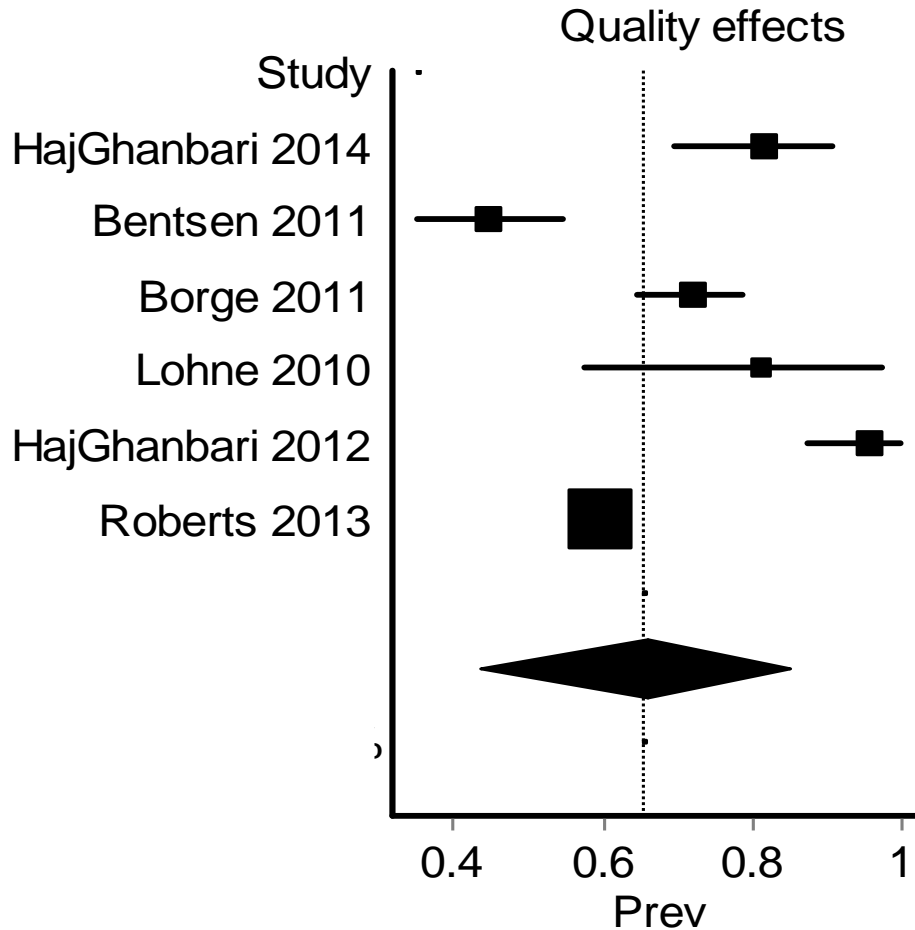
Relevant comorbidities less considered



Pain

Prevalence of pain

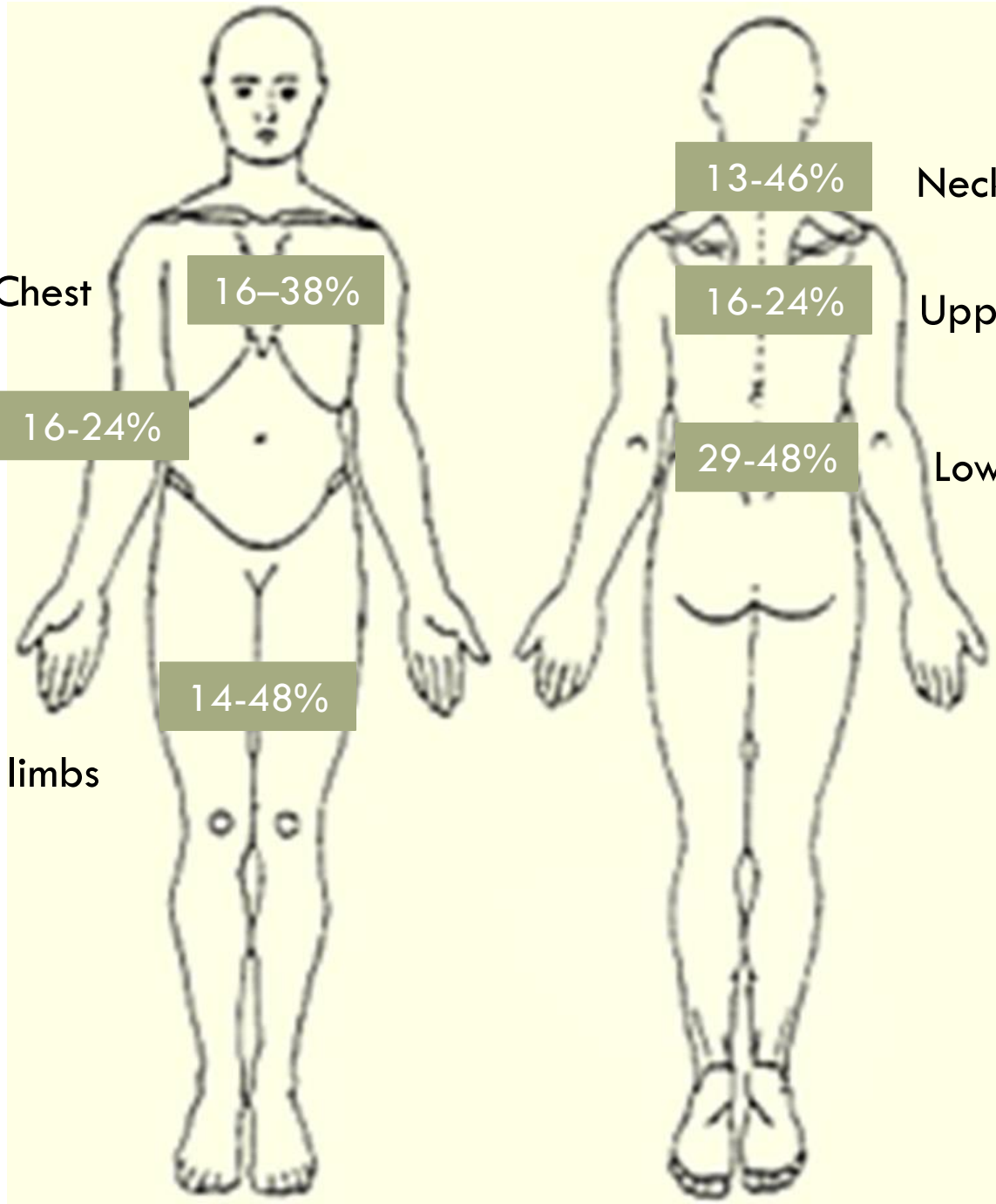
Lee A, Chest 2015;147:1246



66% (95% CI 44% to 88%)

Diagnoses in COPD and General Population Experiencing Pain

CONDITIONS	COPD PATIENTS WITH PAIN (N = 45)		GENERAL POPULATION WITH PAIN (N = 333)		P VALUE
	N	%	N	%	
Heart attack	15	33	13	4	<.001
Angina	9	20	30	9	.034
Stroke	3	7	11	3	.225
Diabetes	6	13	17	5	.043
Cancer	7	16	20	6	.029
Osteoporosis	7	16	17	5	.015
Fibromyalgia	3	7	34	10	.598
Chronic pain	10	22	68	20	.844
Rheumatoid arthritis	1	2	33	10	.101
Arthritis	10	22	92	28	.591
Ankylosing spondylitis	1	2	1	.2	.224
Skeletal/muscle	11	24	79	24	1.000
Psychiatric diagnosis	5	11	29	9	.580
Gastrointestinal disease	7	16	59	18	.836
Asthma	20	45	38	11	<.001



Chest

16-38%

16-24%

Upper limbs

Lower limbs

14-48%

13-46%

Neck/cervical

16-24%

Upper back/thoracic

29-48%

Lower back/lumbar

Clinical impact: dyspnoea and fatigue

Lohne V, Heart Lung 2010;38:226

“It is not easy to live with pain and breathlessness at the same time. The pain is so severe that you hyperventilate..”

It's like a piercing, strenuous aching and I get so exhausted so I can never concentrate on anything, can't do a thing, I just have to go back to bed again”

Clinical impact

- Higher pain intensity associated with:
 - ▣ Greater anxiety ($r=0.41$) and depression ($r=0.32$)¹

**“Can hardly sleep. I don’t know.
I have entered a circle
where I lie down and listen to music. To let
my thoughts go away. Because when you
go to bed, then you can feel all the pain. Or
you are aching all over, and this catches
my thoughts”²**

¹Borge C, J Adv Nurs 2010;66:2688, ²Lohne V, Heart Lung 2010;38:226

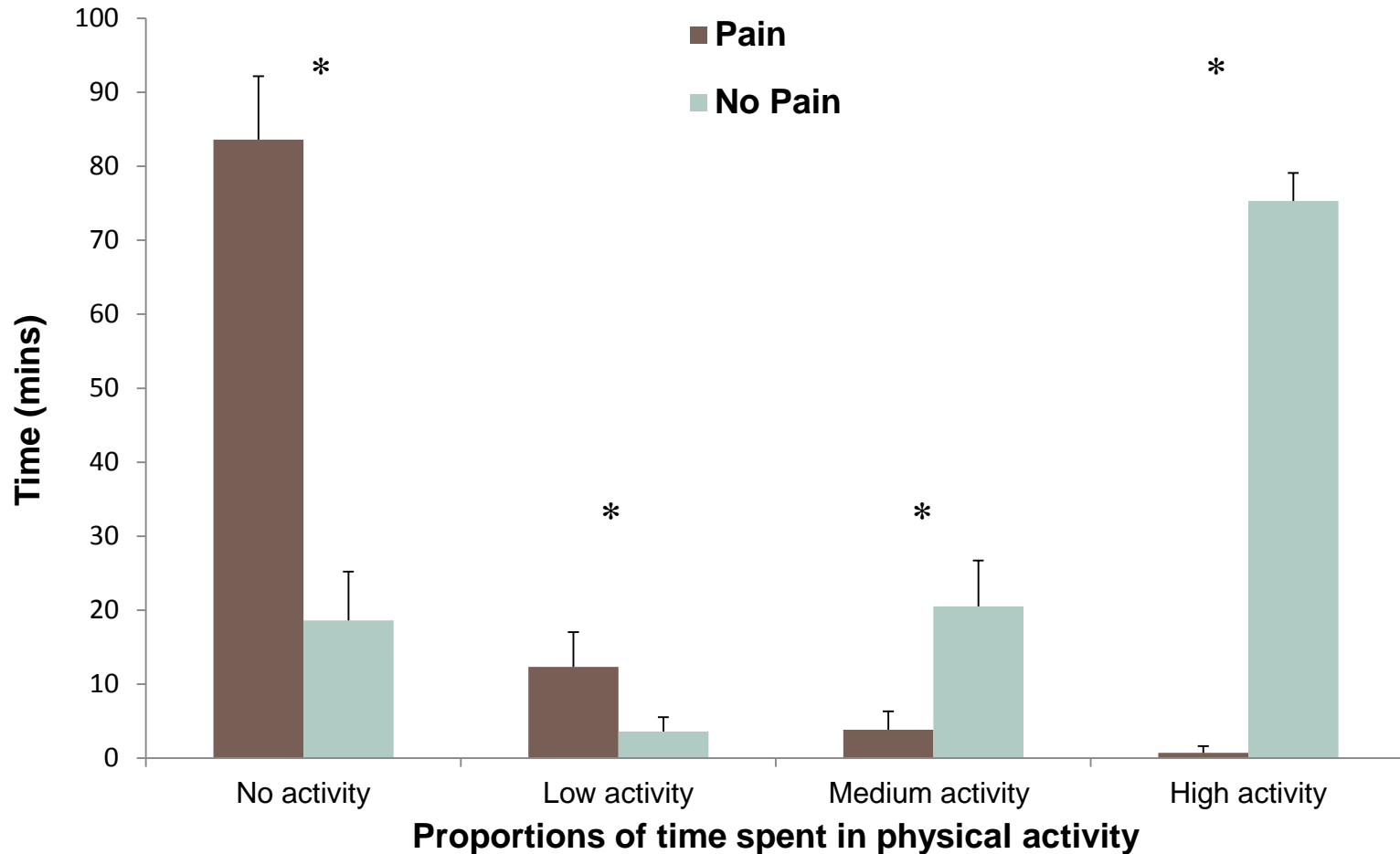
Clinical impact: Activity and PR

- Qualitative study of non-completers of PR¹
 - ▣ Identified pain (legs, spine) as a reason for non-completion
 - ▣ Associated with non-COPD medical conditions

- National Canadian survey 2006²
 - ▣ Higher proportion of people with COPD vs general population reported disability or activity limitations caused by pain

¹Keating A, J Physio 2011;57:183, ²Goodridge D (submitted)

Clinical impact: Activity



* $p < 0.05$

Lee A, (submitted) 2016

Clinical impact: HRQOL

	Correlation between Pain intensity and QOL
Borge 2011¹	Disease-specific QOL: $r = 0.32$
HajGhanbari 2012²	SF-36 PCS with MPQ: $r = - 0.45$ SF-36 PCS with BPI: $r = - 0.61$

- ↑ dyspnoea (CRDQ) in those with pain¹

¹Borge C, Heart Lung 2011;40:90,

²HajGhanbari B, Respir Med 2012;106:998

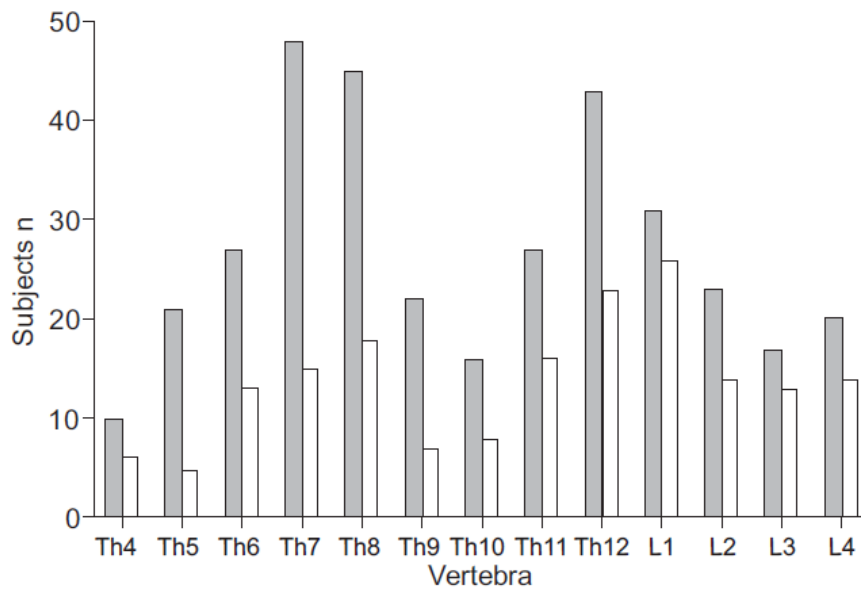
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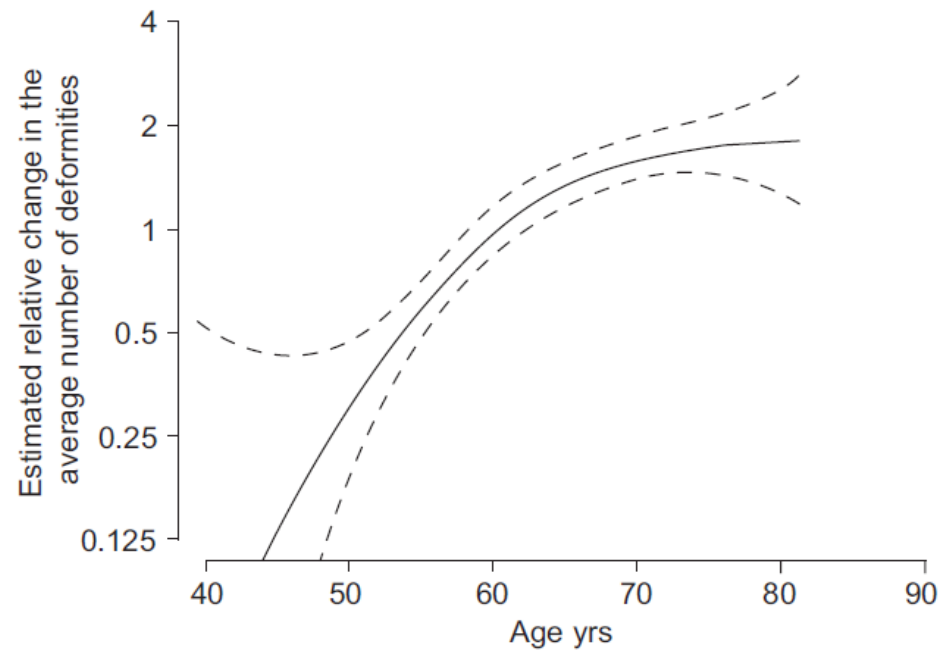
Postural Abnormalities

Vertebral deformities in COPD

Kjensli A, Eur Respir J 2009; 33:1018



COPD vs non-COPD



Postural changes in COPD

Heneghan N, Inter J Ther Rehabil 2015;22:119

Table 3. Descriptive characteristics of participants with COPD and matched controls

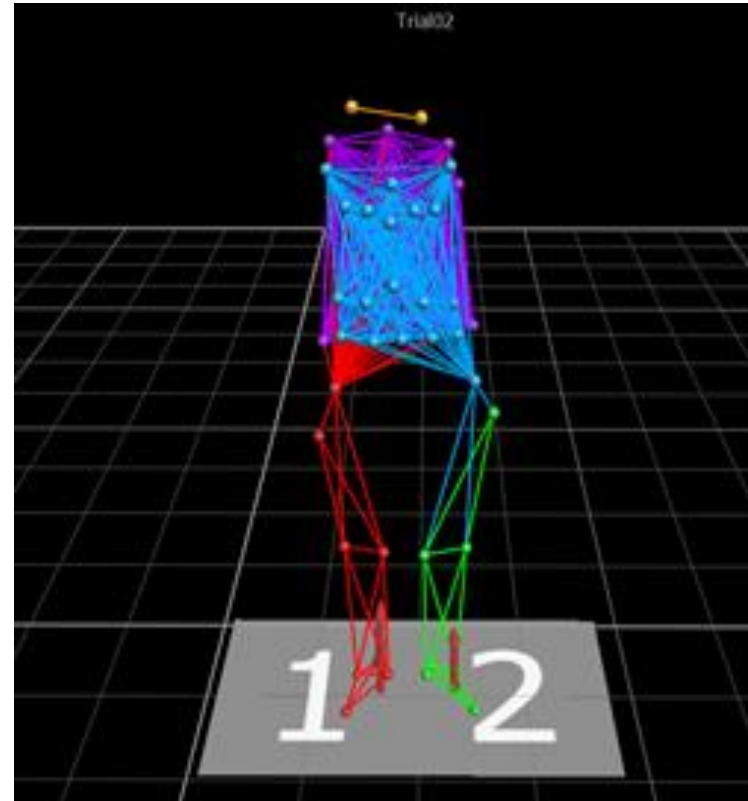
Characteristic	Control (n=55)	COPD (n=55)	p value (95% CI)
Joint (degrees)			
Cervical spine rotation	124.30 (24.69)	109.85 (26.56)	0.01 (-25.57, -3.33)*
Cervical spine lateral flexion	79.44 (24.67) [†]	76.71 (22.39) [§]	0.61 (-13.32, 7.85)
Thoracic spine rotation	54.01 (15.67)	38.77 (12.59)	<0.001 (-21.64, -8.86) [†]
Posture (degrees)			
T8-C7 to vertical	25.72 (4.99)	27.01 (6.00)	0.30 (-1.17, 3.74)
C7-tragus to vertical	45.99 (6.37)	49.22 (10.05)	0.12 (-0.88, 7.33)
Tragus-eye to vertical	72.73 (7.60)	73.40 (8.51)	0.72 (-2.96, 4.29)

- Increased spinal stiffness: upper Cx and Tx spine
- No difference in Tx kyphosis or Cx lordosis

3D motion capture of posture



Anatomical landmarks



Force platform and 3D motion capture image

Measures of posture in COPD

- 21 participants with COPD / 21 healthy, age, BMI, gender and comorbidity-matched controls

	COPD (n=21)	Controls (n=21)	Group differences (p value)
COP AP Amplitude, cm	1.9 ± 0.8	2.2 ± 0.4	0.202
COP ML Amplitude, cm	4.8 ± 0.2	3.1 ± 1.8	0.001
Spinal alignment			
(C7-S1) (deg)	29.8 ± 27.9	19.2 ± 19.3	0.159
Pelvic rotation (deg)	-0.4 ± 4.5	2.9 ± 6.9	0.67
Pelvic tilt (deg)	0.9 ± 2.4	1.1 ± 6.6	0.91
Thoracic kyphosis (deg)	51.8 ± 11.4	34.0 ± 18.7	0.001

Summary

- GORD is common in COPD
 - ▣ In the event of frequent acute exacerbations without an identified cause - ? Consider GORD

- Pain is common and associated with multi-morbidity
 - ▣ Pain has negative clinical effects

- Postural deficits may be present
 - ▣ Clinical implications to be determined