

ISTITUTO SUPERIORE DI SANITÀ
Centro Nazionale per la Prevenzione delle malattie e la
Promozione della salute
Prevenzione e contrasto della fragilità nell'anziano

I sessione

**Attività fisica come importante determinante della
salute psico-fisica e utilizzo del PASE per la
misurazione dell'attività fisica**



Prof. P. Abete
Dipartimento di Scienze Mediche Traslazionali
Università di Napoli Federico II

The history of “Exercise Is Medicine” in ancient civilizations

Charles M. Tipton

Department of Physiology, University of Arizona, Tucson, Arizona



*“it should be taken every day”
but taken “only to half extent
of his capacity” as otherwise
“it may prove fatal”*

Susruta of India (600 BCE)

The first physician to prescribe
moderate daily exercise to his patients

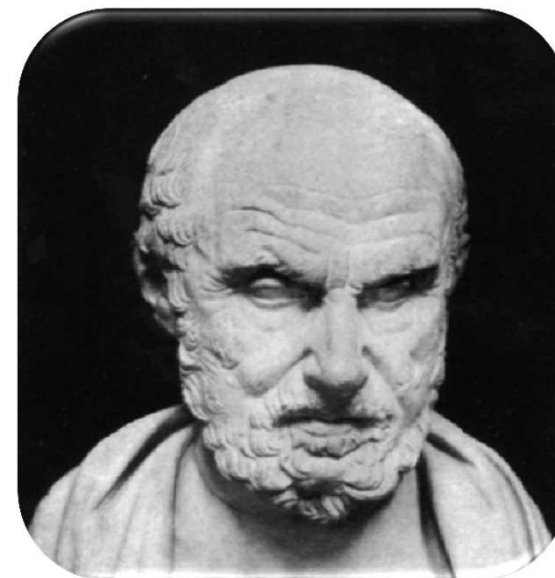
The history of “Exercise Is Medicine” in ancient civilizations

Charles M. Tipton

Department of Physiology, University of Arizona, Tucson, Arizona

“eating alone will not keep a man well, he must also take exercise”

“... food and exercise, while possessing opposite qualities, yet work together to produce health”



Hippocrates of Cos (460–370 BCE)

The first physician to provide a written exercise prescription for a patient with the disease of consumption

The history of “Exercise Is Medicine” in ancient civilizations

Charles M. Tipton

Department of Physiology, University of Arizona, Tucson, Arizona



“The form of exercise deserving our attention is therefore that which has the capacity to provide health of the body, harmony of the part, and virtue in the soul”

Claudius Galenus (129–210 CE)

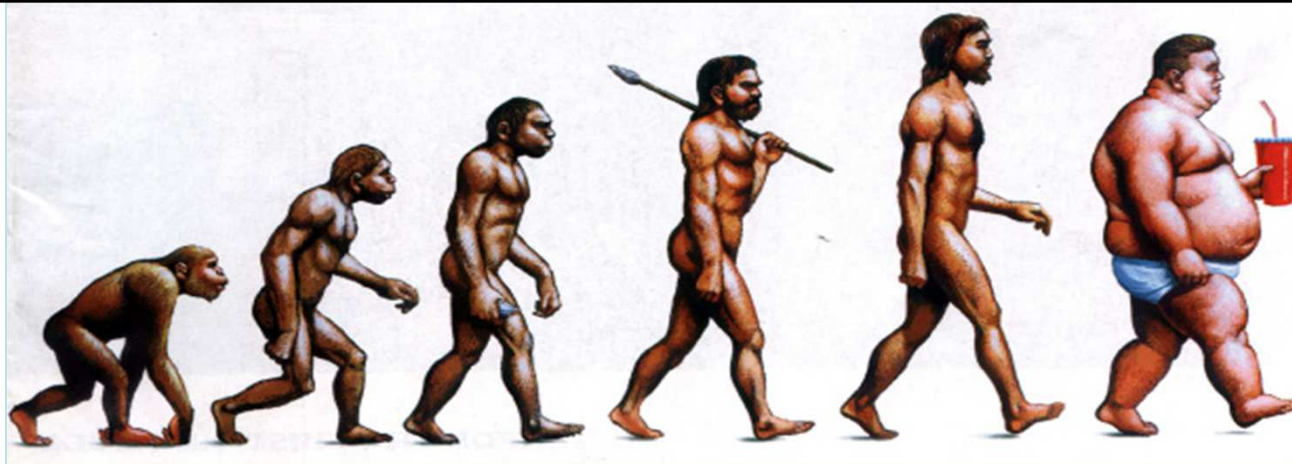
Prescribed exercise for weakened patients and for those with arthritis, depression, dropsy, epilepsy, gout, tuberculosis, or vertigo

Lack of exercise is a major cause of chronic diseases

Frank W. Booth, Ph.D.¹, Christian K. Roberts, Ph.D.², and Matthew J. Laye, Ph.D.³

Estimated historical reductions in daily steps by humans

Population	Year	Steps per day	
Paleolithic	(~20,000 BC)	~13,200–21,120 (men)	~10,560 (women)
Amish	(2002)	18,425 (men)	14,196 (women)
Mean of 26 studies	(1966–2007)		7,473 (mainly women)
Colorado	(2002)	6,733 (men)	6,384 (women)
US adults	(2010)	5,340 (men)	4,912 (women)





Prevenzione e contrasto della fragilità nell'anziano

Attività fisica come importante determinante della salute psico-fisica e utilizzo del PASE per la misurazione dell'attività fisica

4 febbraio 2020

-
- **Physical activity as a drug**
 - **Physical activity Assessment**
 - **Physical activity's questionnaires**
 - **PASE construction and validity**
 - **PASE results**
 - ***Conclusions***



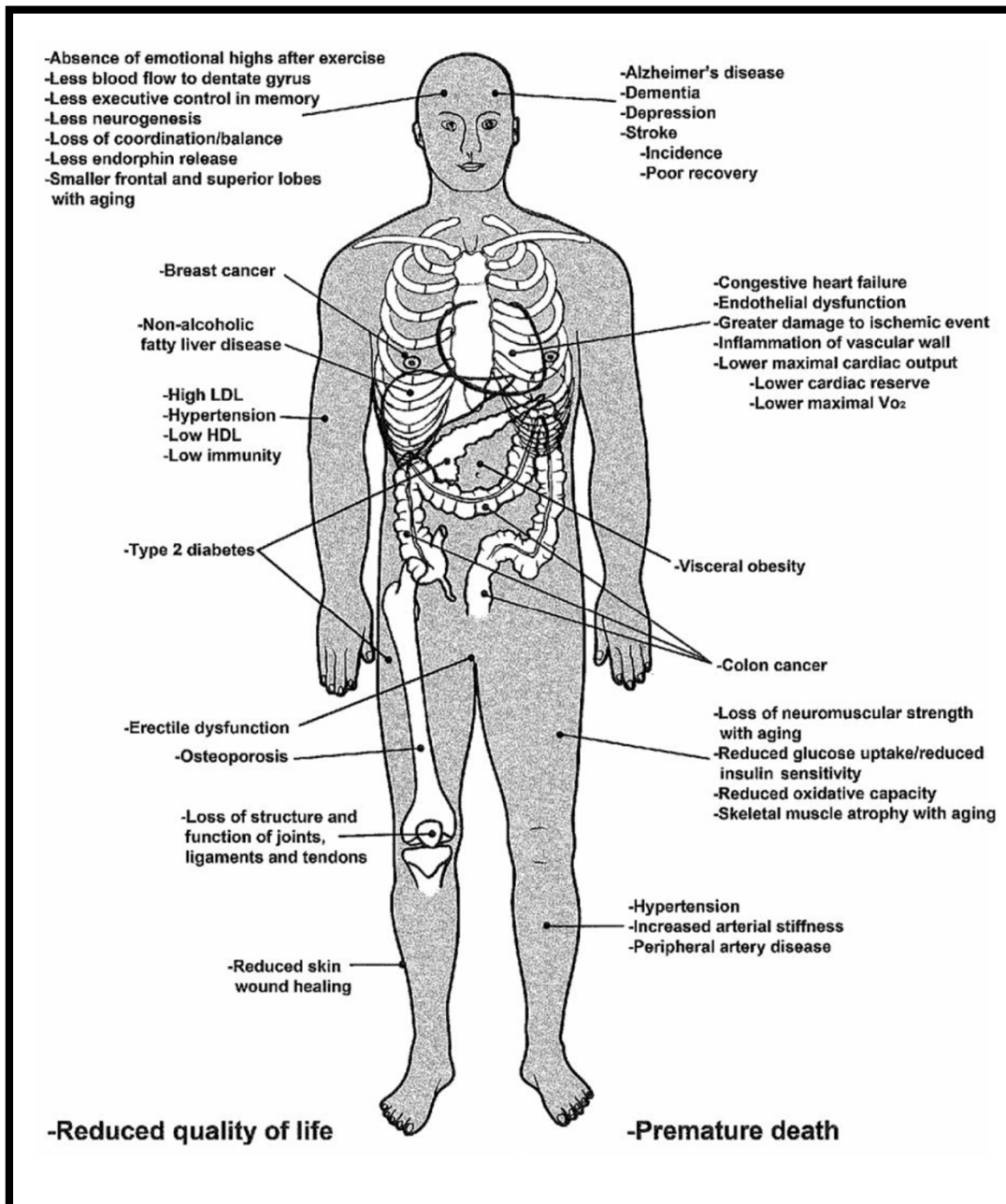
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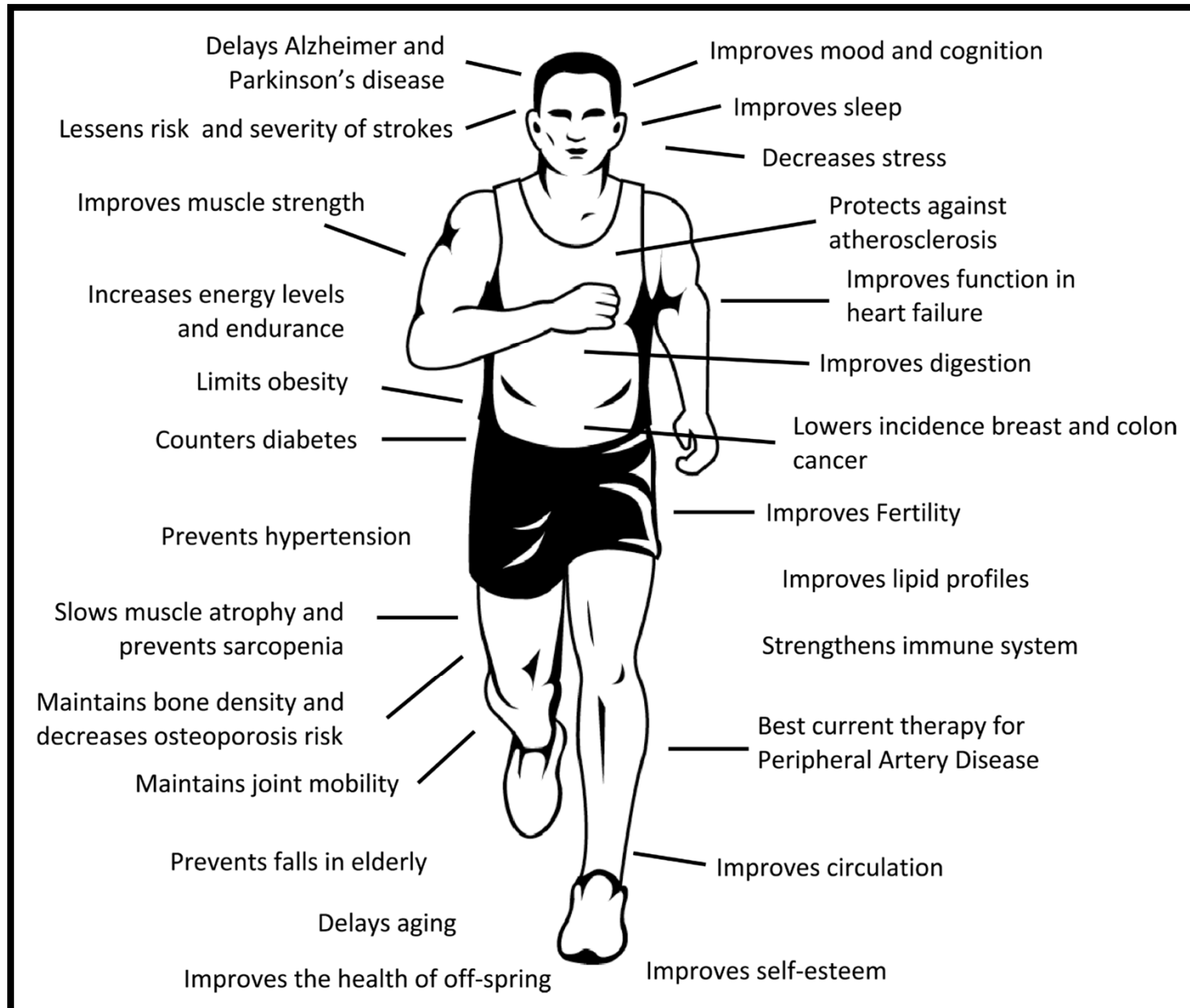
- **Physical activity as a drug**
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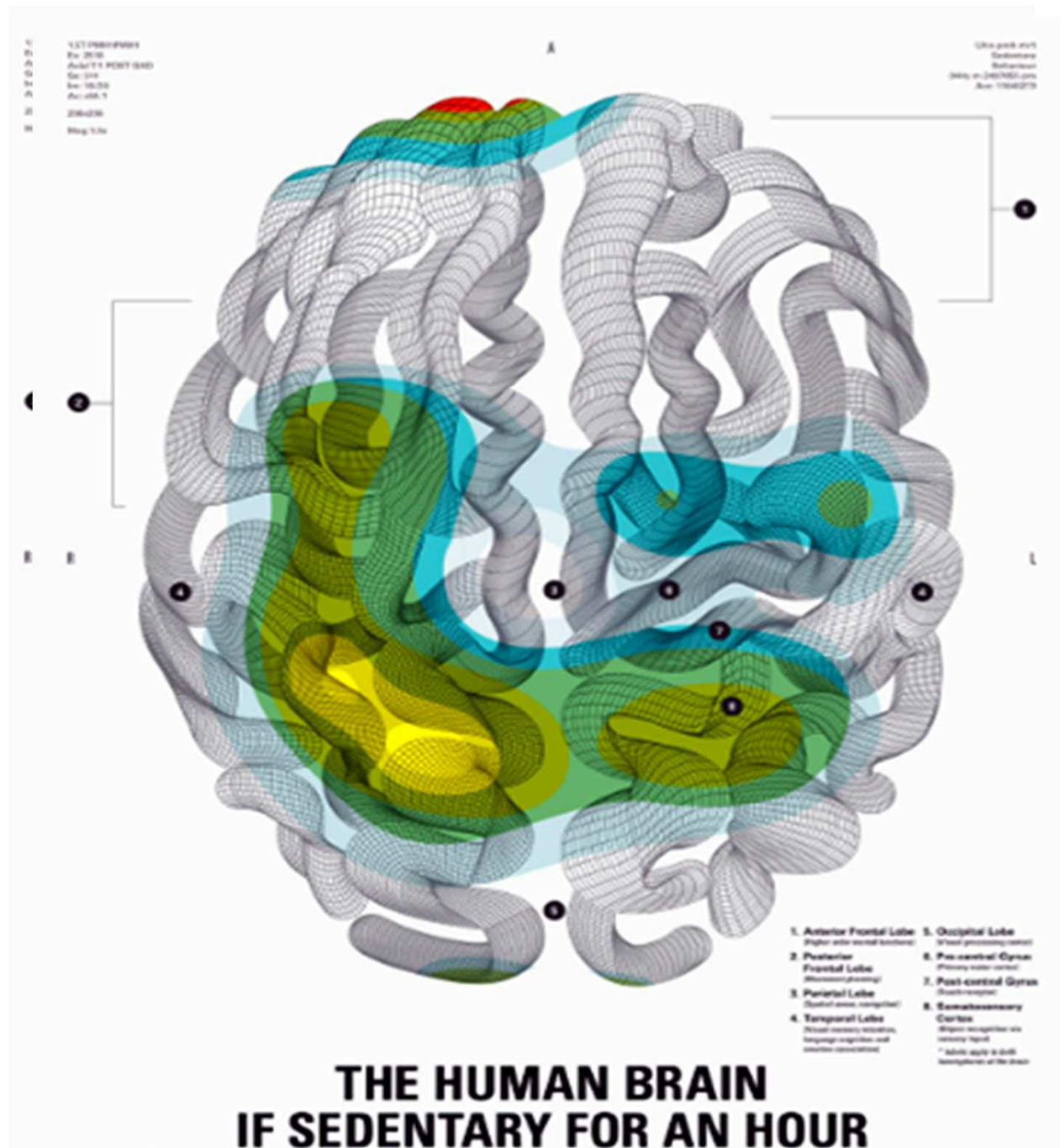
Lack of exercise is a major cause of chronic diseases



- Physical inactivity is the fourth leading risk factor for global mortality (6% of deaths globally)
- Annual cost in lives lost due to inactivity ranges from 200,000 to 300,000
- In the US, annual medical costs due to inactivity and its consequences are estimated at \$76 billion

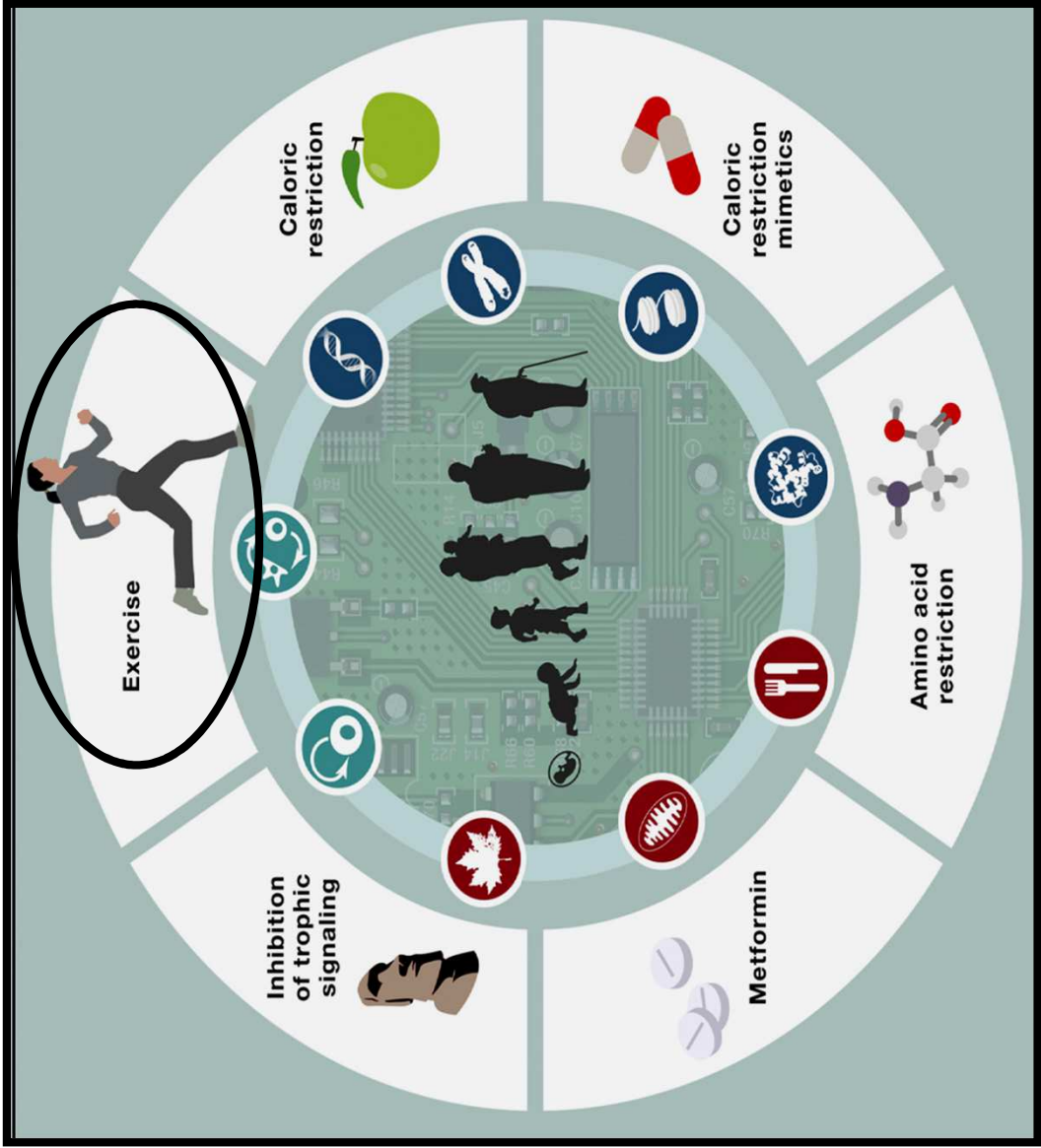
The many long-term benefits of regular exercise



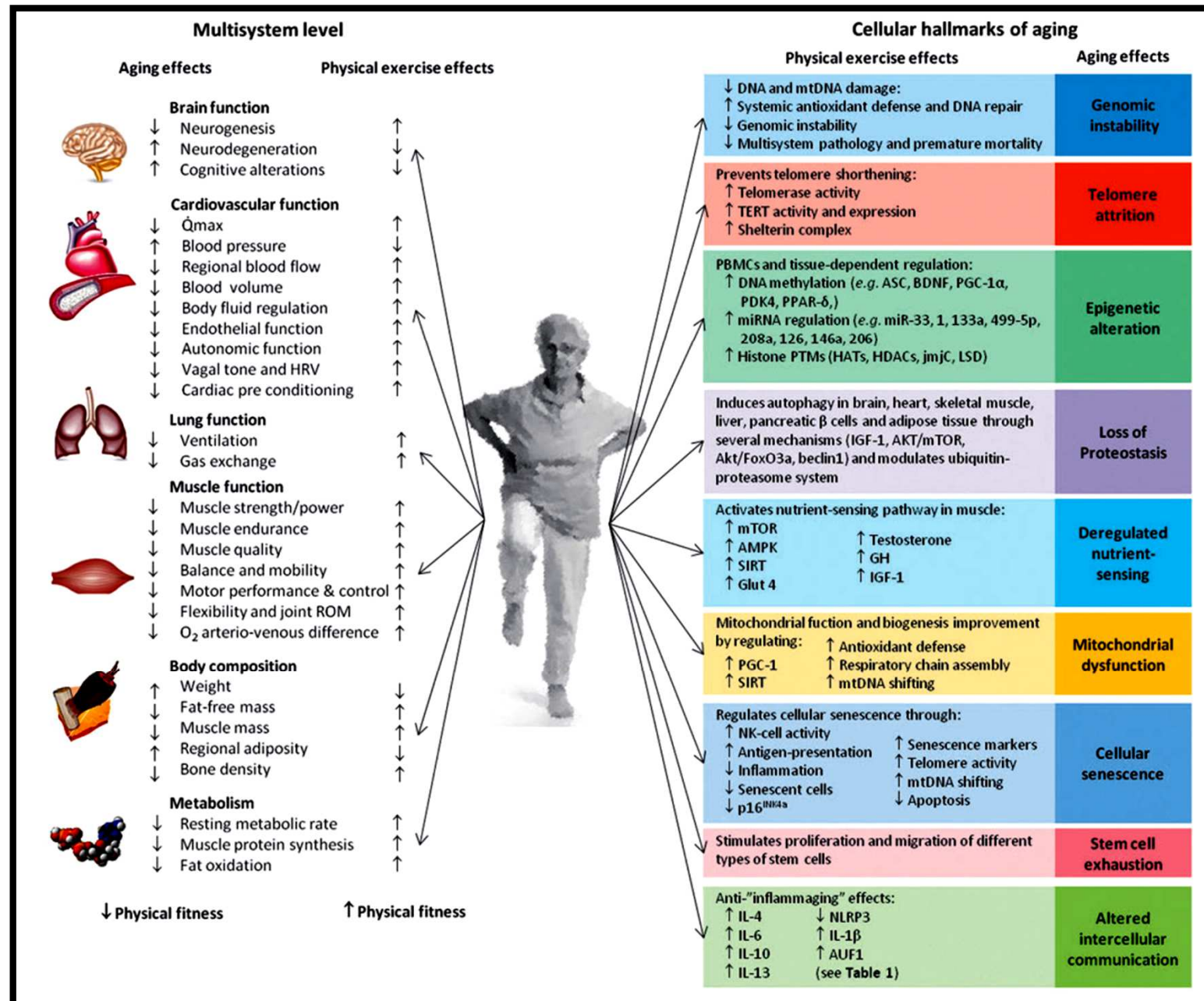


Metabolic Control of Longevity

Carlos López-Otín,^{1,*} Lorenzo Galluzzi,^{2,3,4,5,6,7} José M.P. Freije,¹ Frank Madeo,^{8,9} and Guido Kroemer^{3,4,5,6,10,11,12,*}



Exercise Attenuates the Major Hallmarks of Aging



November 10, 2015, Vol 314, No. 18



Exercise Is Medicine At Any Dose?

Thijs M. H. Eijsvogels, Paul D. Thompson



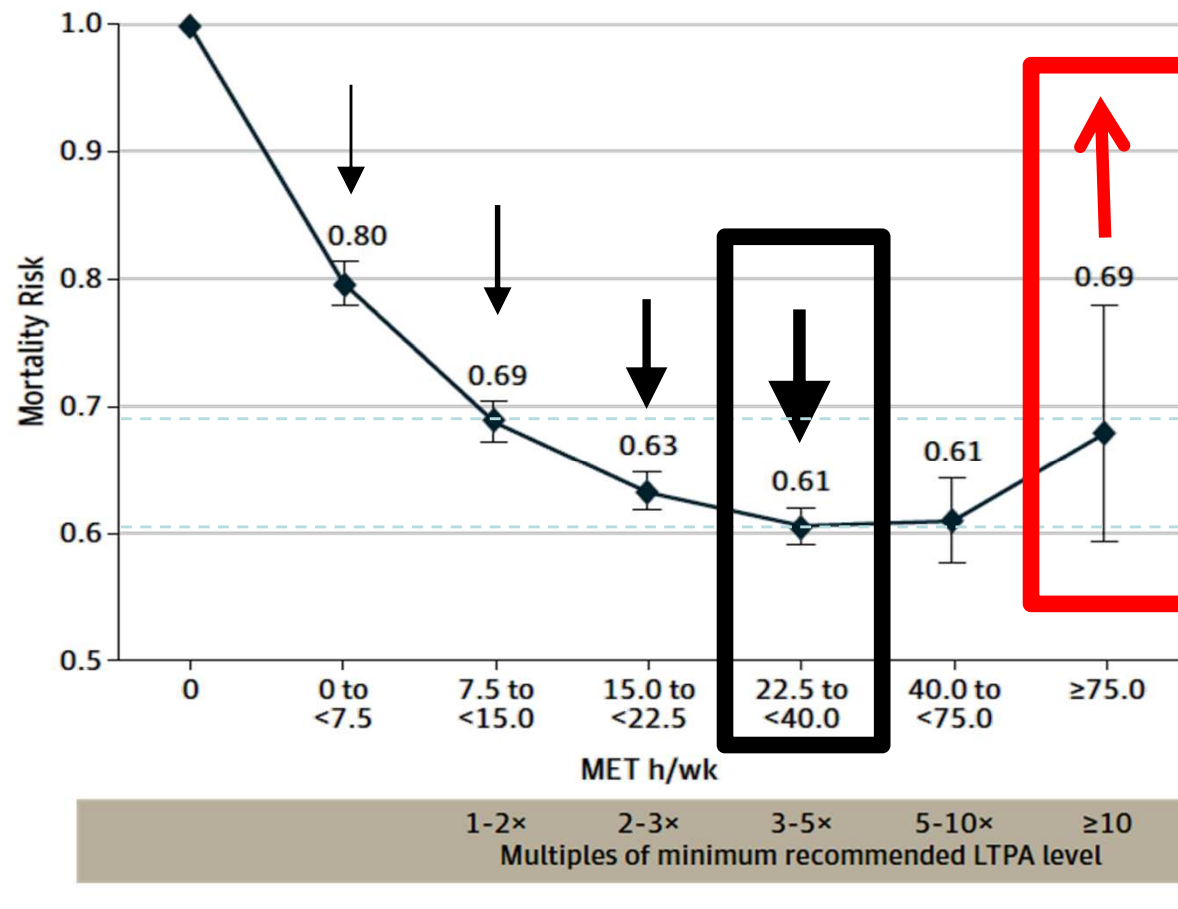
**The only prescription
with unlimited refills.**



Leisure Time Physical Activity and Mortality

A Detailed Pooled Analysis of the Dose-Response Relationship

Hannah Arem, MHS, PhD; Steven C. Moore, PhD; Alpa Patel, PhD; Patricia Hartge, ScD;
Amy Berrington de Gonzalez, DPhil; Kala Visvanathan, MBBS, MPH; Peter T. Campbell, PhD;
Michal Freedman, JD, PhD; Elisabete Weiderpass, MD, MSc, PhD; Hans Olov Adami, MD, PhD;
Martha S. Linet, MD; I.-Min Lee, MBBS, ScD; Charles E. Matthews, PhD



661,137 men and women
(median age: 62 years; range:
21-98 years); median follow-
up time: 14.2 years



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LIPPINCOTT
WILLIAMS & WILKINS



EUROPEAN
SOCIETY OF
CARDIOLOGY

Original Scientific Paper

How to assess physical activity? How to assess physical fitness?

Luc Vanhees^{a,d}, Johan Lefevre^b, Renaat Philippaerts^c, Martine Martens^a,
Wim Huygens^b, Thierry Troosters^a and Gaston Beunen^b

^aDepartment of Rehabilitation Sciences, ^bDepartment of Sport and Movement Sciences, Faculty of Kinesiology and Rehabilitation Sciences, K. U. Leuven, ^cDepartment of Movement and Sports Sciences, Ghent University, Belgium and ^dFaculty Chair 'Health and Lifestyle', Faculty of Health Care, Utrecht, The Netherlands.

Received 6 January 2005 Revised 15 February 2005 Accepted 17 February 2005

“Criterion methods for validation”

Assessment method	Advantages	Disadvantages
<i>Doubly labelled water</i>	Accurate and valid measurement of EE; <i>Applicable for children and adults</i> ; induces no change in PA behaviour in daily free-living conditions	<u><i>Expensive</i></u> ; analysis requires expertise; no indication of specific activities, only total (daily); <i>not appropriate for large-scale studies</i>
<i>Indirect calorimetry</i>	Accurate and valid measurement of short term EE	<u><i>Expensive</i></u> ; limited to laboratory setting

PA=Physical Activity
EE=energy expenditure

“Objective methods”

Assessment method	Advantages	Disadvantages
<i>Pedometers</i>	Lightweight, portable around waist; simple and inexpensive; free living conditions	<i>No recording of horizontal or upper-body movements; only total (daily) PA</i>
<i>Accelerometers</i>	See pedometer	See pedometer
<i>Heart rate monitoring</i>	Lightweight and portable; directly related to physiological response to a PA	Measurement of EE, not of PA; <i>not suited for very low-intensity</i>

PA=Physical Activity
EE=energy expenditure

“Subjective methods”

Assessment method	Advantages	Disadvantages
Questionnaires	<u><i>Applicable in epidemiological studies;</i></u> Valid for gross classification of PA level for a population (e.g., low, moderate, highly active)	Limited validity; no detailed information of PA; depends on subject's memory, Not suited for PA assessment at the individual level

PA=Physical Activity
EE=energy expenditure



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RESEARCH ARTICLE

Open Access

Comparison of physical activity questionnaires for the elderly with the International Classification of Functioning, Disability and Health (ICF) – an analysis of content

Katharina G Eckert^{*†} and Martin A Lange[†]

Characteristics of included physical activity questionnaires for the elderly

PHYSICAL ACTIVITY QUESTIONNAIRE	Abbr.	Total items	Admin. mode	Studies on validity	Year	Target group (in years)
Yale Physical Activity Survey	YPAS	36	SA	Cr.V	1988	60 to 86
Baecke modified physical activity questionnaire for the elderly	Baecke modif.	12	SA	Cr.V	1991	63 to 80
PHYSICAL ACTIVITY SCALE FOR THE ELDERLY	PASE	19	SA	Cr.V	1993	65 and +
Community Healthy Activities Model Program for Seniors	CHAMPS	41	SA	n.s.	2001	65 to 90
Stanford Brief Activity Survey	SBAS	10	n.s.	Cr.V	2006	60 to 69

SA:Self-administered
Cr.V.: Criterion Validity

Eckert KG & Lange MA, BMC Public Health 2015

Estimated K coefficient confidence intervals (CI) at the 2nd (walking) and 3rd (long distance) levels of coding

Physical Activity Questionnaire	Abbr.	K 2 nd level	CI (95%)	K 3 rd level	CI (95%)
Baecke modified physical activity questionnaire for the elderly	Baecke modif.	0.651	0.410-0.891	0.603	0.383-0.823
Community Healthy Activities Model Program for Seniors	CHAMPS	0.736	0.606-0.867	0.625	0.496-0.754
PHYSICAL ACTIVITY SCALE FOR THE ELDERLY	PASE	0.777	0.631-0.923	0.596	0.450-0.741
Stanford Brief Activity Survey	SBAS	0.836	0.717-0.955	0.649	0.507-0.791
Yale Physical Activity Survey	YPAS	0.787	0.656-0.981	0.612	0.478-0.747

The International Classification of Functioning, Disability and Health (ICF)

Most linked ICF codes (98.8%) were related to:

- levels mobility (d4)
- domestic life (d6)
- major life areas (d8)
- community, social and civic life (d9).

**Only PASE out of elderly questionnaires
contain items referring to all four domains!!**

World Health Organization (WHO). International Classification of Functioning, Disability and Health: ICF. Geneva: World Health Organization; 2001



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The Physical Activity Scale for the Elderly (PASE): Evidence for Validity

Richard A. Washburn, Edward McAuley, Jeffrey Katula, Shannon L. Mihalko,
Richard A. Boileau*

DEPARTMENT OF KINESIOLOGY, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, URBANA, ILLINOIS

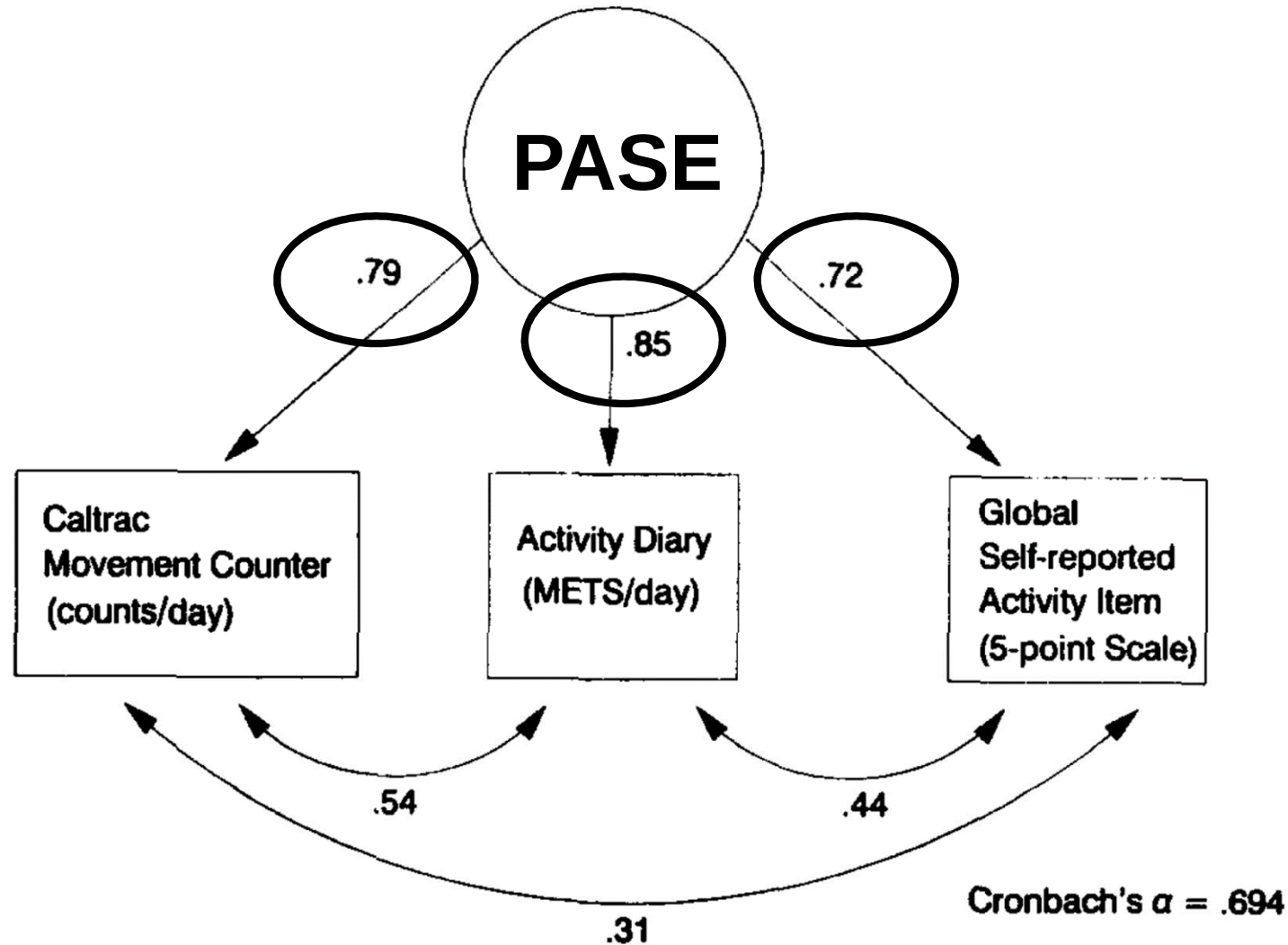
ABSTRACT. We assessed the validity of the Physical Activity Scale for the Elderly (PASE) in a sample of sedentary adults (56 men, 134 women, mean age $\pm$ [SD] 66.5 ± 5.3 years) who volunteered to participate in a randomized controlled trial on the effect of aerobic conditioning on psychological function. Construct validity was established by correlating PASE scores with physiologic and performance characteristics: peak oxygen uptake, resting heart rate and blood pressure, percent body fat, and balance. The mean PASE scores were higher in men than in women (men = 145.8 ± 78.0 ; women = 123.9 ± 66.3 , $P < 0.05$), and in those age 55–64 years compared with those age 65 years and over ($55-64 = 144.2 \pm 75.8$; 65 and over = 118.9 ± 63.9 , $P < 0.05$). PASE scores were also significantly higher in those who did not report a chronic health condition (cardiovascular disease, hypertension, cancer, or recent surgery). PASE scores were significantly associated ($P < 0.05$) with peak oxygen uptake ($r = 0.20$), systolic blood pressure ($r = -0.18$) and balance score ($r = 0.20$). No significant associations of PASE score and diastolic blood pressure, resting heart rate, or percent body fat were noted. These results provide additional evidence for the validity of the PASE as a measure of physical activity suitable for use in epidemiology studies on the association of physical activity, health, and physical function in older individuals. J CLIN EPIDEMIOL 52:7:643–651, 1999. © 1999 Elsevier Science Inc.

KEY WORDS. Aging, physical activity assessment, validity

PASE components

Walking (h/day)
Light sports (h/day)
Moderate sports (h/day)
Strenuous sports (h/day)
Muscular strength/endurance (h/day)
Job—standing or walking (h/day)
Light housework (%)
Heavy housework (%)
Home repair (%)
Lawn work/yard care (%)
Outdoor gardening (%)
Caring for another person (%)
Total PASE Score

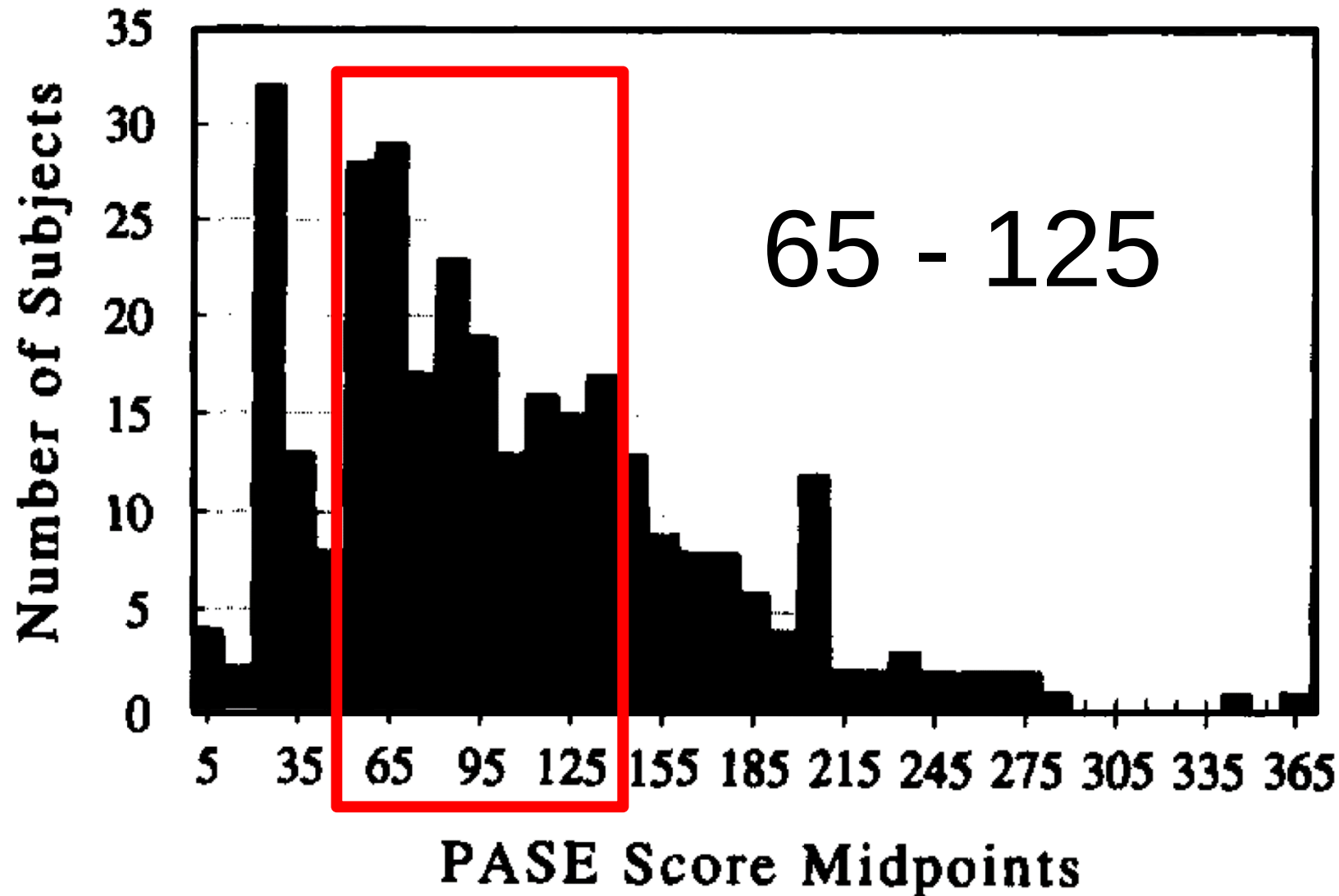
Relationships between PASE components and indicators of physical activity



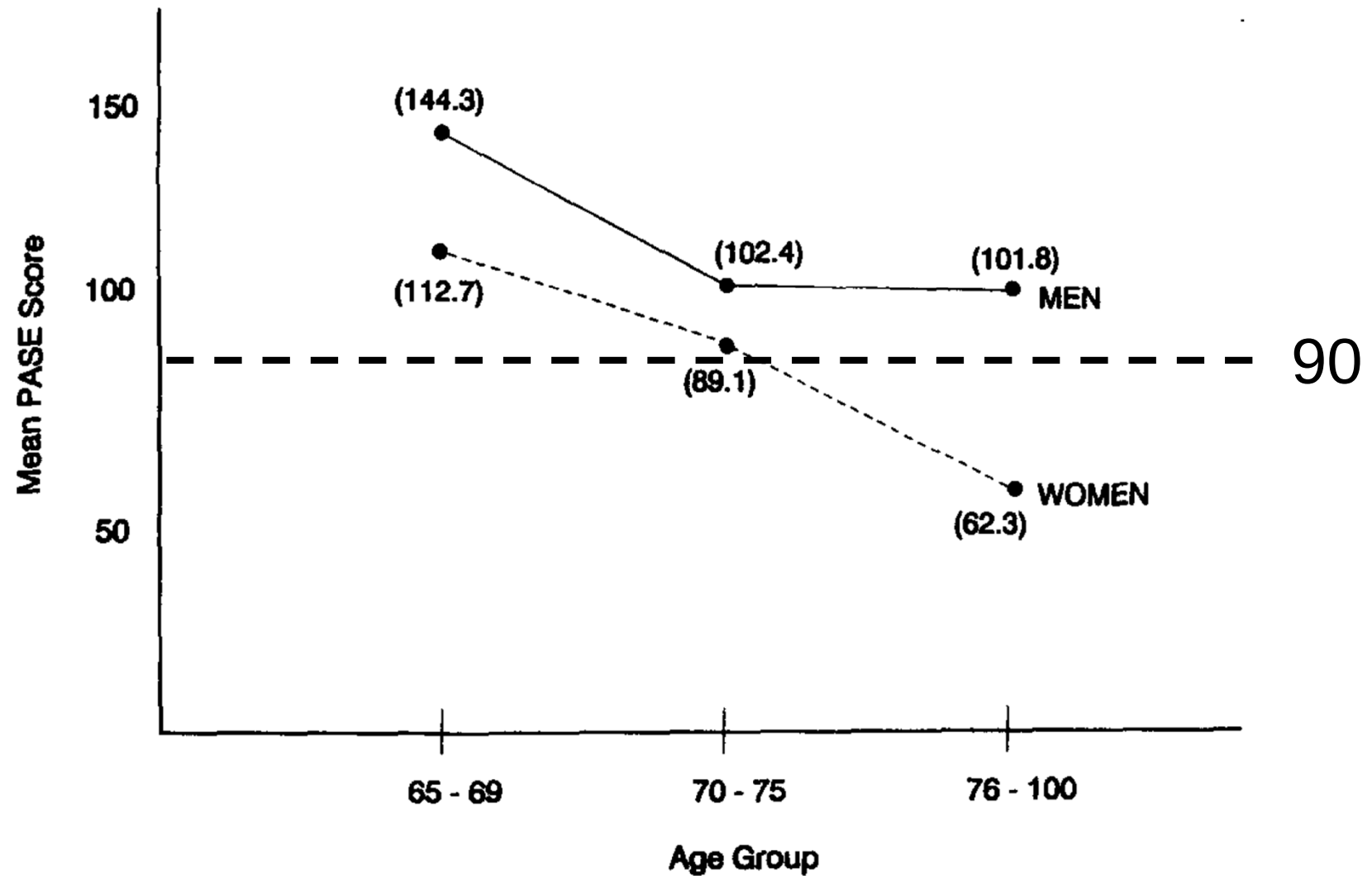
Contribution to total PASE Score by PASE components

PASE component	Weight	Contribution to total PASE Score
Walking (h/day)	20	8.8
Light sports (h/day)	21	2.3
Moderate sports (h/day)	23	0.92
Strenuous sports (h/day)	23	0.69
Muscular strength/endurance (h/day)	30	1.2
Job—standing or walking (h/day)	21	38.0
Light housework (%)	25	22.6
Heavy housework (%)	25	18.6
Home repair (%)	30	5.2
Lawn work/yard care (%)	36	15.2
Outdoor gardening (%)	25	5.1
Caring for another person (%)	35	12.7
Total PASE Score		131.3

Distribution of PASE scores in a general population age 65-100 yr.



Mean PASE score for men and women by age



Correlations between PASE scores and validation measures for all participants and for gender subgroups

Variable	All Subjects (<i>n</i> = 190)	Men (<i>n</i> = 56)	Women (<i>n</i> = 134)
Peak oxygen uptake (mL/kg/min)	0.20**	0.06	0.25**
Systolic blood pressure (mmHg)	−0.18*	−0.15	−0.23**
Diastolic blood pressure (mmHg)	0.003	0.12	−0.09
Resting heart rate (beats/min)	0.02	0.07	0.01
Body fat (%)	−0.01	0.25	0.03
Balance score	0.20**	0.15	0.23**

* $P < 0.05$.

** $P < 0.01$.

Ordinary least squares regression of PASE scores on socio-demographic factors and comorbidity

Variable	Unstandardized coefficient	Standard error
Age (y)	-0.46	1.09
Gender (1 = male, 2 = female)	-14.5	11.9
Education		
1 = HS graduate or less	2.4	8.5
2 = Some college		
3 = College graduate		
4 = Graduate school		
Hours worked per week	1.4	0.29**
Current smoker (1 = yes, 2 = no)	78.7	30.5*
Heart disease (1 = yes, 2 = no)	-13.9	21.0
Recent surgery (1 = yes, 2 = no)	-30.1	13.3*
Hypertension (1 = yes, 2 = no)	-20.1	11.9
Cancer (1 = yes, 2 = no)	-18.8	17.3
Arthritis (1 = yes, 2 = no)	0.31	13.3

*P < 0.001.

**P < 0.05.

Validity correlations by age group in muscle strength

		Age group	
Validation measures		65–70	71–99
→	Grip strength	0.26**	0.38**
	Balance	0.14	0.42**
→	Dominant leg strength	0.12	0.25**
→	Non-dominant leg strength	0.09	0.33**
	<i>n</i>	103	119

* $p < 0.05$ (1-tailed);

ORIGINAL REPORT

VALIDATION AND RELIABILITY OF THE PHYSICAL ACTIVITY SCALE FOR THE ELDERLY IN CHINESE POPULATION

Shirley P.C. Ngai, PhD¹, Roy T.H. Cheung, PhD², Priscillia L. Lam, MSc³,
Joseph K.W. Chiu, MSc⁴ and Eric Y.H. Fung, MSc⁵

From the ¹Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, China,

²Department of Physical Medicine & Rehabilitation, Harvard Medical School, Harvard University, USA,

³Physiotherapy Department, David Trench Rehabilitation Centre, ⁴Physiotherapy Department, Queen Mary Hospital and ⁵Physiotherapy Department, Caritas Medical Centre, Hong Kong, China



TÜBİTAK

Turkish Journal of Medical Sciences

<http://journals.tubitak.gov.tr/medical/>

Research Article

Turk J Med Sci
(2017) 47: 908-915
© TÜBİTAK
doi:10.3906/sag-1605-7

The Turkish version of the Physical Activity Scale for the Elderly (PASE): its cultural adaptation, validation, and reliability

Ender AYYAT*, Muhammed KILINÇ, Nuray KIRDI

Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Hacettepe University, Ankara, Turkey

ORIGINAL ARTICLE: EPIDEMIOLOGY, CLINICAL
PRACTICE AND HEALTH

Validity and reliability of the Physical Activity Scale for the Elderly (PASE) in Japanese elderly people

Akiko Hagiwara,^{1,*} Naomi Ito,^{2,*} Kazuhiko Sawai³ and Keiko Kazuma²

Hindawi
Current Gerontology and Geriatrics Research
Volume 2018, Article ID 8294568, 7 pages
<https://doi.org/10.1155/2018/8294568>



Physical Activity Scale for the Elderly: Translation, Cultural Adaptation, and Validation of the Italian Version

Antonio Covotta,¹ Marco Gagliardi,¹ Anna Berardi,¹ Giuseppe Maggi,²
Francesco Pierelli ,^{3,4} Roberta Mollica,⁵ Julita Sansoni,⁶ and Giovanni Galeoto ⁶

PASE
(PHYSICAL ACTIVITY SCALE FOR THE ELDERLY)
(riferita ad una settimana prima del ricovero)

1. ATTIVITA' RICREAZIONALI DEL TEMPO LIBERO	Ore/die (Q)	Giorni/settimana	QxG/7	Peso Item (I)	Punteggio: QxG/7 x I
Per quante ore al giorno cammina o va in bicicletta?	0.5	6	0.5	20	10
Pratica attività sportive? Se si quali e per quante ore al giorno?					
1) Cyclette, andare a caccia, bocce	0	0	0	21	0
2) Ginnastica, nuoto	0	0	0	23	0
3) Tennis, calcio, basket, sci, altro	0	0	0	23	0
Esegue esercizi in palestra?				30	0
2. ATTIVITA' DOMESTICHE	PARTECIPAZIONE			Peso Item (I)	Punteggio : SI x I
Esegue un lavoro che richiede di stare in piedi o camminare?	SI			21	21
Esegue lavori casalinghi quali lavare piatti, spolverare, spesa?	Si			25	25
Esegue lavori casalinghi quali lavare indumenti, pavimenti, pulire tappeti?	SI/NO			25	0
Esegue riparazioni domestiche?	SI/NO			30	0
Lavora nei campi?	SI/NO			36	0
Esegue lavori di giardinaggio?	SI/NO			20	0
Si prende cura di qualcuno? ←	SI →			35	35
TOTALE					91



Azienda Ospedaliera Universitaria Federico II

Dipartimento assistenziale ad attività integrata di
EMERGENZE CARDIOVASCOLARI, MEDICINA CLINICA e
dell'INVECCHIAMENTO

Napoli, _____

VALUTAZIONE MULTIDIMENSIONALE GERIATRICA

Nome e Cognome _____
Nato il _____ a _____ Età _____ anni
Residente in _____
Telefono casa _____ telefono cellulare _____
Documento di riconoscimento (o n° di Cart.cl.): _____
Rilasciato da: _____ il: _____ Valido fino al _____
Peso _____ kg; Altezza _____ cm; BMI _____ kg/m²; Circ.addominale _____ cm
Clinostatismo: PA sitolica _____ diastolica _____ mmHg; FC _____ bmp
Ortostatismo: 1° min.: PA sitolica _____ diastolica _____ mmHg; FC _____ bmp
3° min.: PA sitolica _____ diastolica _____ mmHg; FC _____ bmp
5° min.: PA sitolica _____ diastolica _____ mmHg; FC _____ bmp

TEST	Punteggio
Ipotensione ortostatica (si/no)	
Mini Mental State Examination (MMSE)	/30
Hachinski Ischemic Score	/17
Geriatric Depression Scale (GDS)	/15
Basic Activity Daily Living perse (BADL)	/6
Instrumental Acitivity Daily Living perse (IADL)	/8
Scala di TINETTI	/28
Short Performance Physical Battery	/12
Mini Nutritional Assessment (MNA)	/30
Cumulative Illness Rating Scale Cumulative (CIRS-C)	
Cumulative Illness Rating Scale Severity (CIRS-S)	
Numero di farmaci	
SARCOPENIA (se BMI<30) – SMI 2	g/m ²
SARCOPENIA (se BMI<30) – SMI 1	g/m²
Physical Activity Scale for the Elderly (PASE)	
Supporto sociale	/17
INDICE DI FRAGILITÀ'	/40

Esito della VMD:

Il Geriatra _____ firma _____ 1



Prevenzione e contrasto della fragilità nell'anziano

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Myocardial Infarction

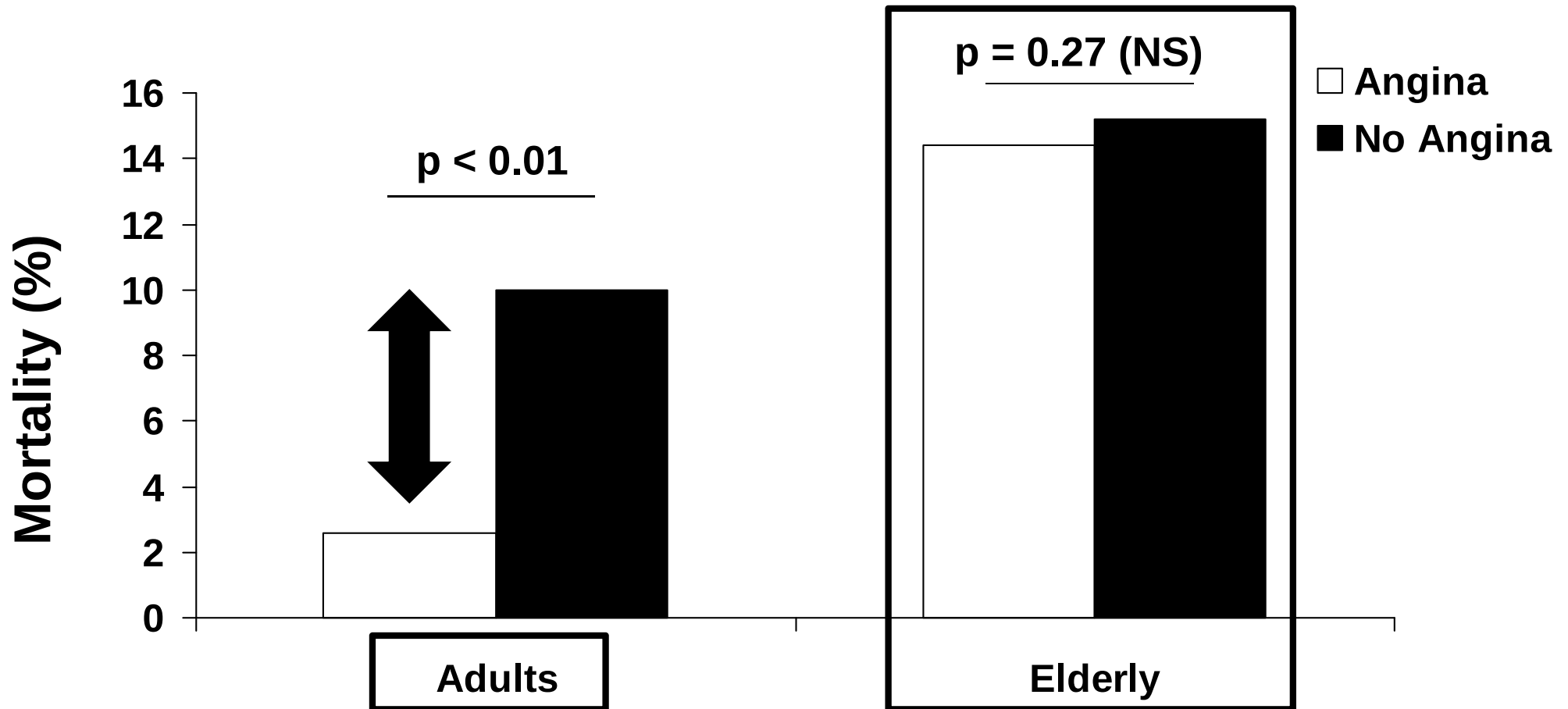
High Level of Physical Activity Preserves the Cardioprotective Effect of Preinfarction Angina in Elderly Patients

Pasquale Abete, MD, PhD,* Nicola Ferrara, MD,†§ Francesco Cacciatore, MD, PhD,*|| Elio Sagnelli, MD,*
Maria Manzi, MD,* Vincenzo Carnovale, MD,* Claudio Calabrese, MD,*|| Domenico de Santis, MD,*
Gianluca Testa, MD,* Giancarlo Longobardi, MD,§ Claudio Napoli, MD, PhD, FACA,†¶
Franco Rengo, MD*§

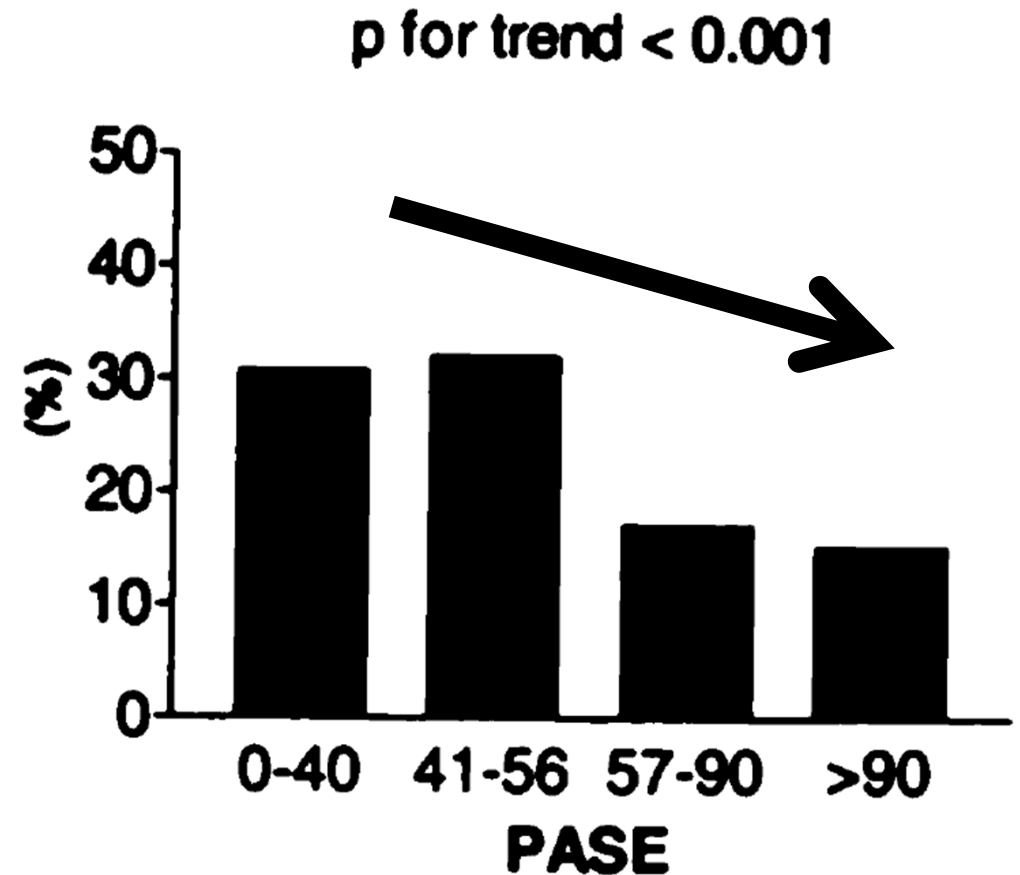
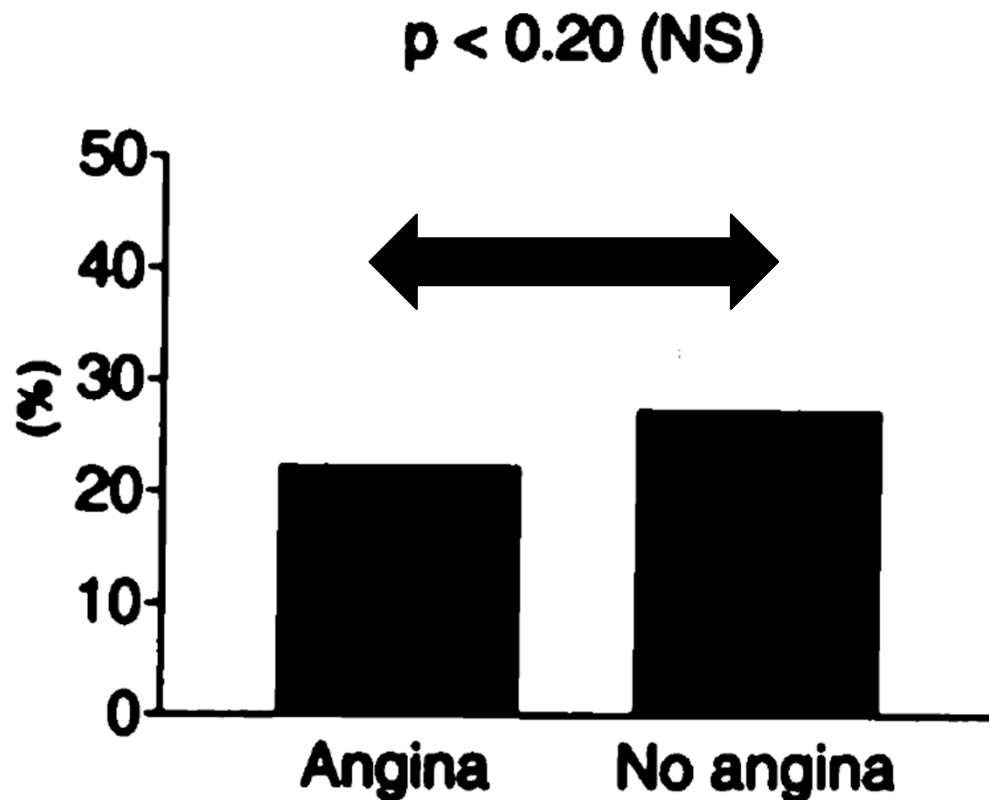
Naples, Benevento and Larino/Termoli, Italy; and San Diego, California

Preinfarction angina protects against death in adults but not in elderly patients with myocardial infarction

Reduction of ischemic preconditioning in aging heart



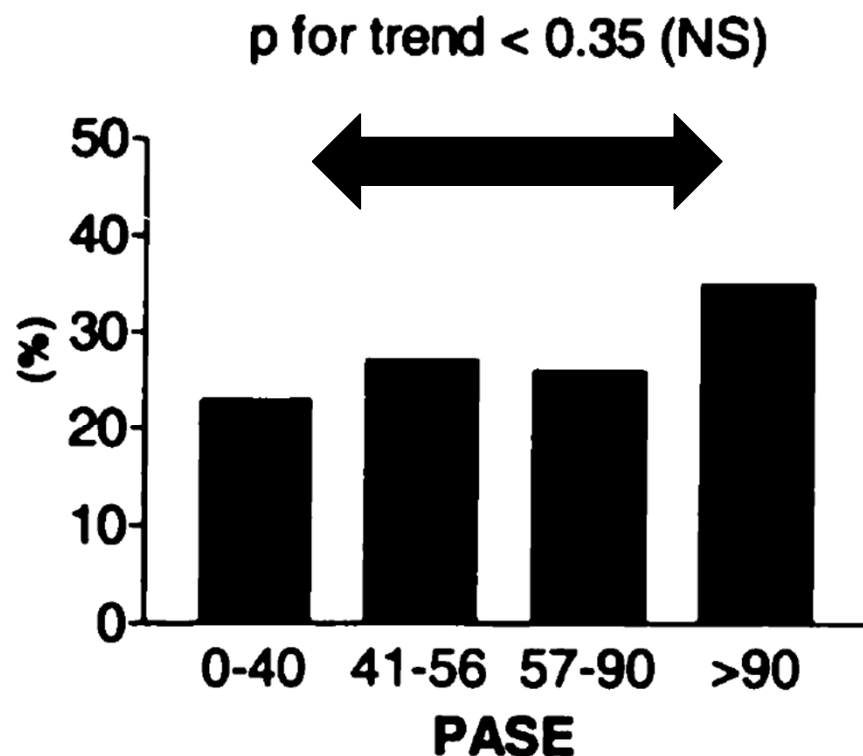
Death in elderly patients with and without preinfarction angina and according to the quartiles of physical activity (PASE)



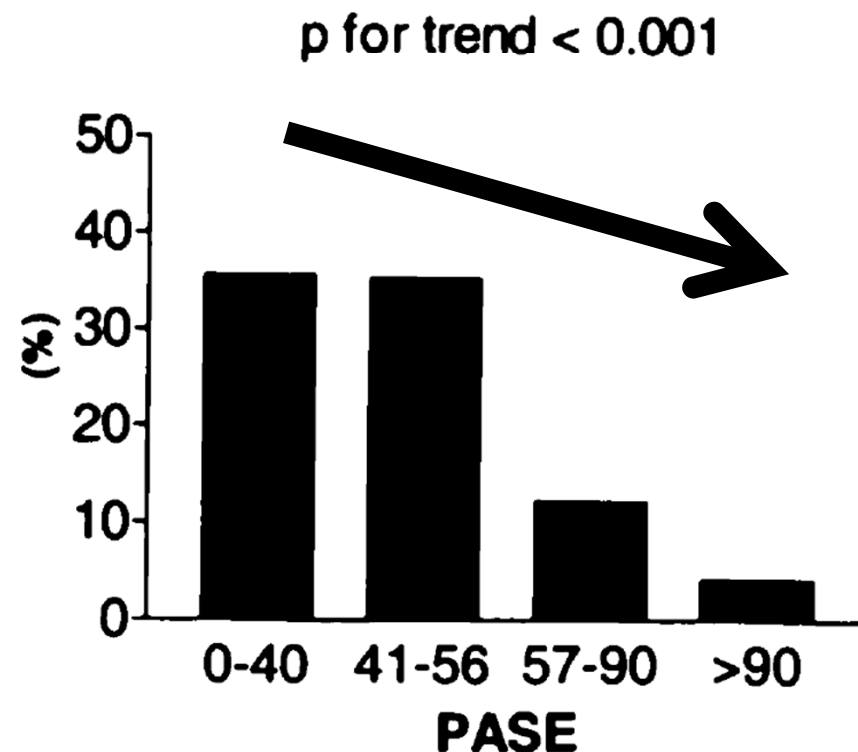
Death, in elderly patients with and without preinfarction angina according to the quartiles of physical activity (PASE)

NO ANGINA

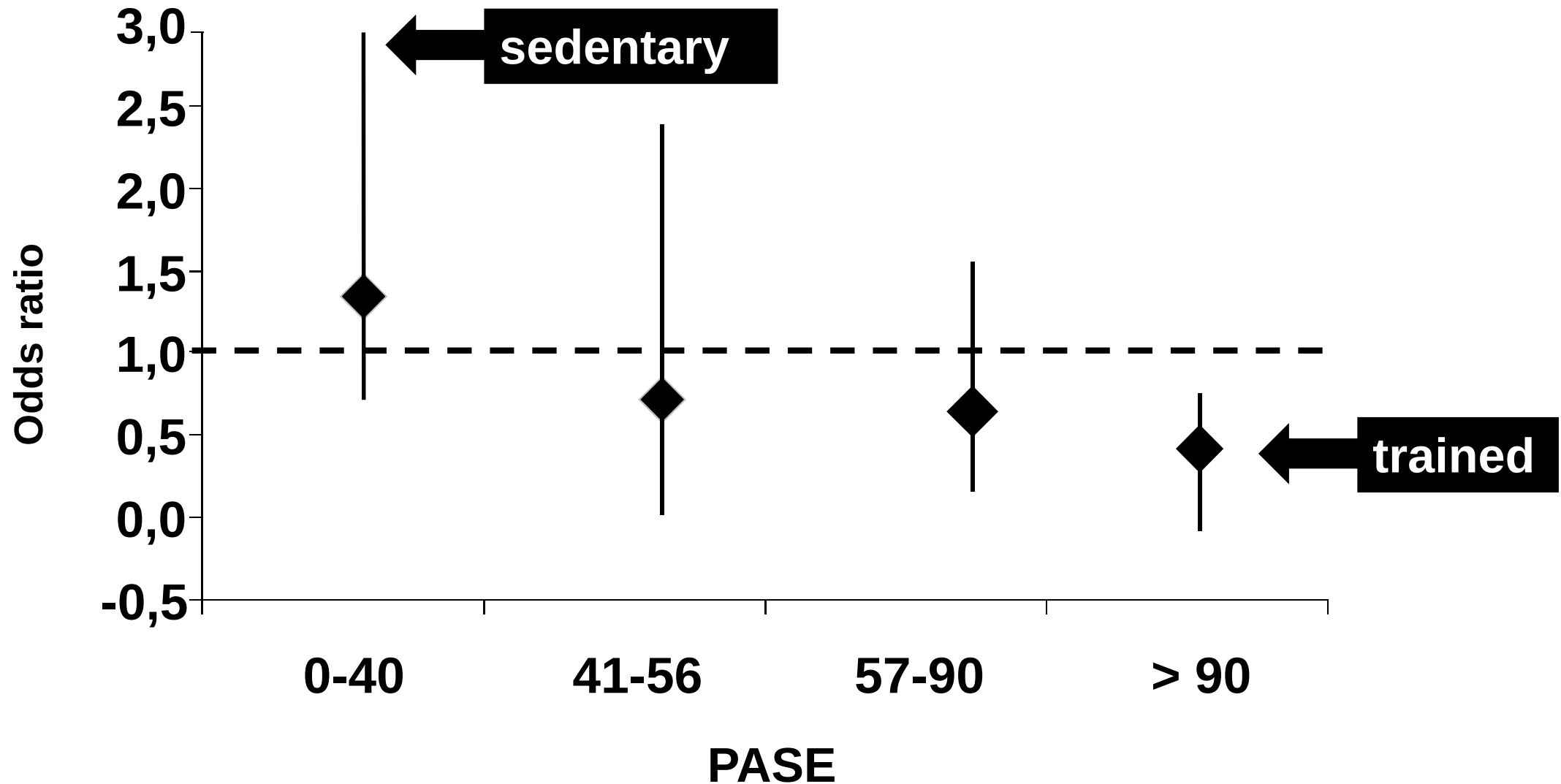
DEATH



ANGINA



Role of “*preinfarction angina*” on mortality in elderly patient with acute myocardial infarction stratified for physical activity (PASE)



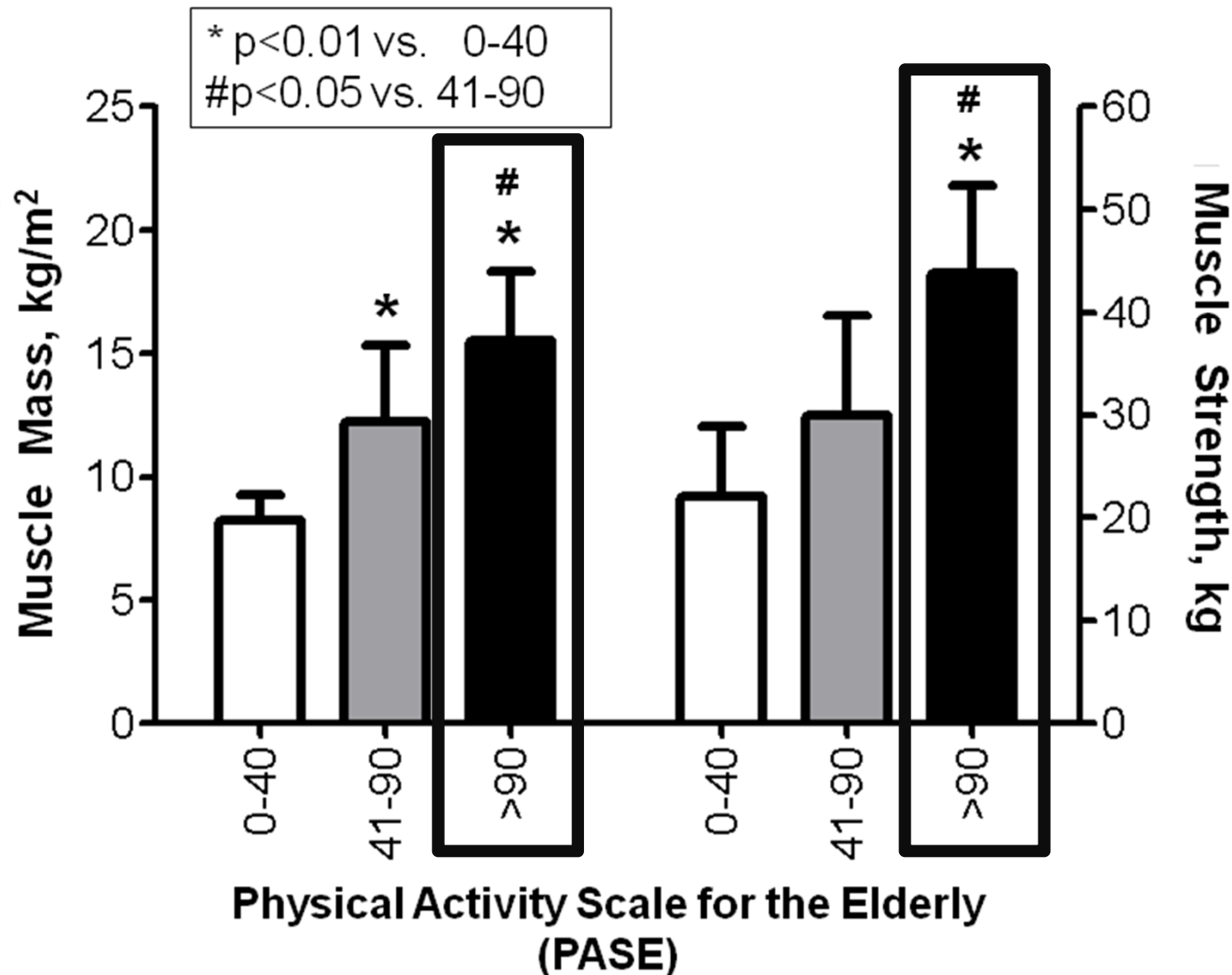


Research Report

PASE (Physical Activity Scale for the Elderly) Score Is Related to Sarcopenia in Noninstitutionalized Older Adults

Francesco Curcio, MD¹; Ilaria Liguori, MD¹; Michele Cellulare, MD¹;
Giuseppe Sasso, MD¹; David Della-Morte, MD, PhD^{2,3}; Gaetano Gargiulo, MD⁴;
Gianluca Testa, MD, PhD^{1,5}; Francesco Cacciatore, MD, PhD^{1,6};
Domenico Bonaduce, MD¹; Pasquale Abete, MD, PhD¹

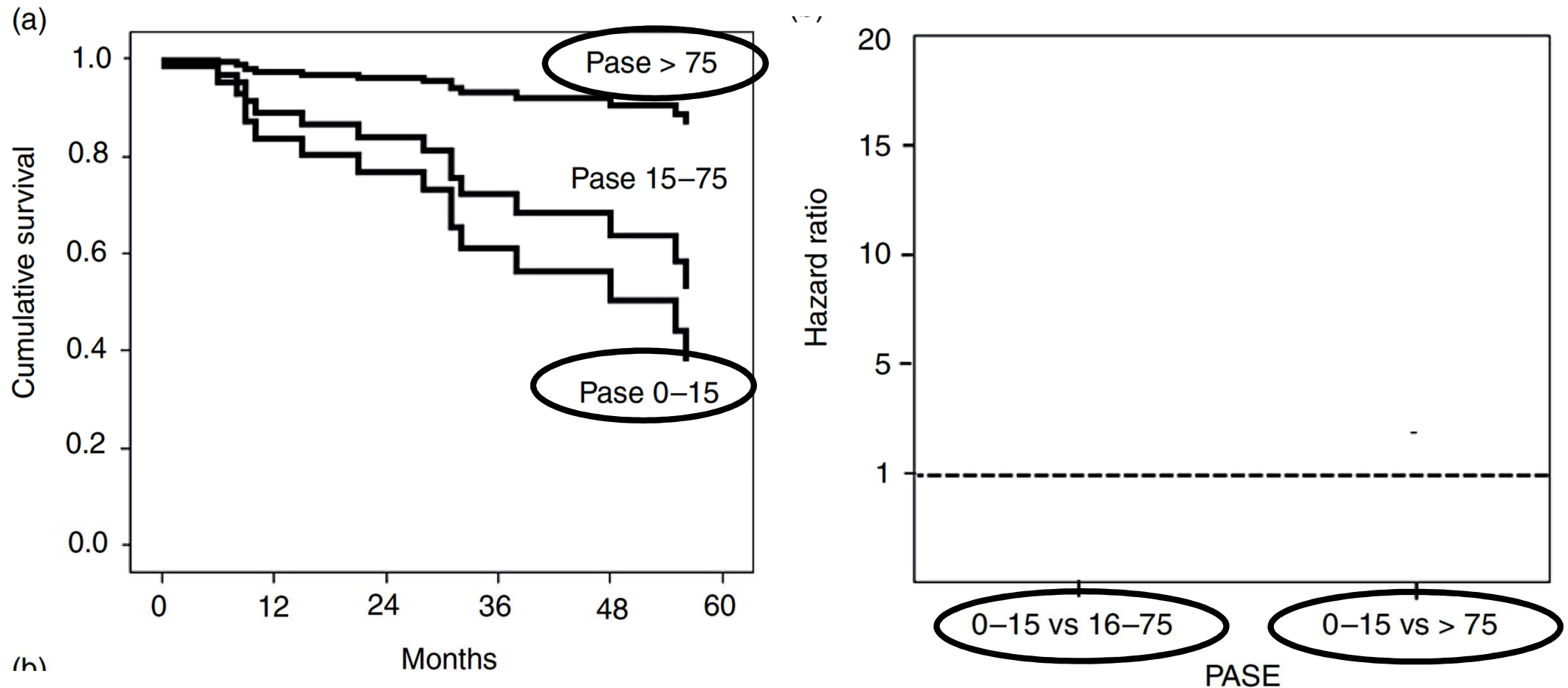
Muscle mass and strength stratified by Physical Activity Scale for the Elderly (PASE) in non institutionalized elderly people



Protective effect of physical activity on mortality in older adults with advanced chronic heart failure: A prospective observational study

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Cox regression analysis of Physical Activity Scale for the Elderly (PASE) score stratified in tertiles (A) and as a dummy variable (0–15 vs. 16–75) and (0–15 vs. >75) (B) on mortality (A)



Support Care Cancer (2015) 23:3211–3218

DOI 10.1007/s00520-015-2707-8

ORIGINAL ARTICLE

The self-reported Physical Activity Scale for the Elderly (PASE) is a valid and clinically applicable measure in lung cancer

Catherine L Granger^{1,2,3} · Selina M Parry¹ · Linda Denehy^{1,3}

Research Report

Physical Therapy, 2015;95:86-94

Reproducibility and Validity of the Physical Activity Scale for the Elderly (PASE) Questionnaire in Patients After Total Hip Arthroplasty

Nicola C. Casartelli, Sylvain Bolszak, Franco M. Impellizzeri, Nicola A. Maffioletti

Prevalence of Aging-Associated Cognitive Decline in an Italian elderly population: results from cross-sectional phase of Italian PROject on Epidemiology of Alzheimer's disease (IPREA)

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¹¹University of Catania, ¹²USL Bologna Nord, ¹³INRCA, Fermo (AP), ¹⁴University of Naples, Italy

PASSI d'Argento (Silver Steps): the main features of the new nationwide surveillance system for the ageing Italian population, Italy 2013-2014

Benedetta Contoli¹, Patrizia Carrieri^{2,3,4}, Maria Masocco¹, Luana Penna¹, Alberto Perra¹ and
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Prevenzione e contrasto della fragilità nell'anziano

Attività fisica come importante determinante della salute psico-fisica e utilizzo del PASE per la misurazione dell'attività fisica

4 febbraio 2020

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- Physical activity as a drug
 - Physical activity Assessment
 - Physical activity's questionnaires
 - PASE construction and validity
 - PASE results
 - ***Conclusions***

Take home messages

- Physical activity is actually used as a drug in order to antagonize diseases and aging
- The assessment of physical activity is difficult, especially at advancing age
- Among questionnaires, Physical Activity Scale for the Elderly (PASE) seems to be the more appropriate, also in clinical practice
- PASE has been validated and utilized in several national and international studies with good result.