La sarcopenia del paziente obeso: quale ruolo terapeutico per la nutraceutica

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Sarcopenia ed obesità

Wrong ideas about obesity & sarcopenia

Different trajectories

- Till the 2° World war and even till the 80s of last century we didn't have any problem with obesity
- Afterwards for 30 yrs, anyway, we thought that obesity & malnutrition were two different and separate fields
- Only very recently we noticed that obese sbj had nutritional problems related also to undernutrition

Different age groups

- We think that obesity and undernutrition affect different age groups

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Definition

- Sarcopenic obesity is characterized by the **simultaneous manifestation of excess FM and low muscle mass/strength** [Roubenoff R: Obes Res. 2004]

- **Lipid accumulation** not only in peripheral or visceral adipose tissue but also within the muscle (IMAT – intermuscular adipose tissue and/or IMLC - intra myocellular lipid content)

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Clinical Interventions in Aging
Dovepress
open access to scientific and medical research
Clinical Interventions in Aging 2015:10 1267–1282
REVIEW

Sarcopenic obesity and complex interventions with nutrition and exercise in community-dwelling older persons – a narrative review

Sabine Goisser[1]
Wolfgang Kemmler[2]
Simone Porzel[3]
Dorothee Volkert[1]
Cornel Christian Sieber[1,4]
Leo Cornelius Bollheimer[1,4]
Ellen Freiberger[1]

- Depending on the definition used a prevalence of SO between 4% and 20% has been estimated in the general older population. (Bouchonville MF, et al: *Curr Opin Endocrinol Diabetes Obes. 2013;* Prado CM, et al: *Am J Clin Nutr. 2014)*

- New data from NHANES III estimated the overall prevalence of sarcopenia as 35% in women and 75% in men, which increased with age. The prevalence of obesity based on percent fat mass was 61% and 54%, respectively. **SO prevalence was even estimated as 18% in women and 43% in men, and also increasing with age** (Batsis JA, et al: *Eur J Clin Nutr. 2014)*

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Longitudinal study of muscle strength, quality, and adipose tissue infiltration[1–3]

Am J Clin Nutr 2009;90:1579–85.

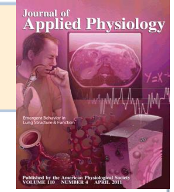
Matthew J Delmonico, Tamara B Harris, Marjolein Visser, Seok Won Park, Molly B Conroy, Pedro Velasquez-Mieyer, Robert Boudreau, Todd M Manini, Michael Nevitt, Anne B Newman, and Bret H Goodpaster for the Health, Aging, and Body Composition Study

- Fat infiltration of skeletal muscles is in part a physiological phenomenon linked to the ageing process but it may be further on triggered by **obesity** and other conditions.

⇐ **pluripotent capacity of progenitor cells of myocytes**, which can differentiate into other cell types, including **adipocytes**, in response to various stimuli, such as the denervation of muscle tissue that accompanies aging.

⇒ **insulin resistance**

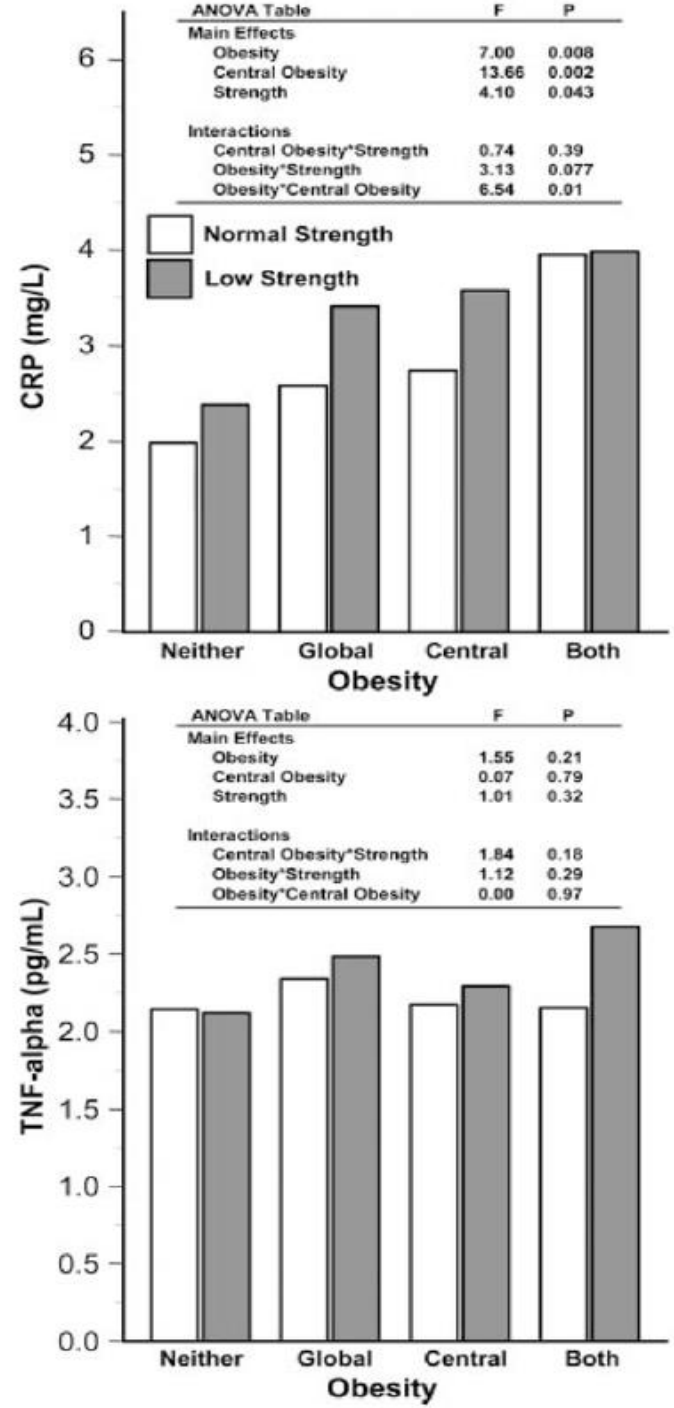
NIH Public Access
Author Manuscript
J Appl Physiol. Author manuscript; available in PMC 2009 February 20.
Published in final edited form as:
J Appl Physiol. 2007 March ; 102(3): 919–925. doi:10.1152/japplphysiol.00627.2006.



Sarcopenic obesity and inflammation in the InCHIANTI study

Matthew A. Schrager[1], **E. Jeffrey Metter**[1], **Eleanor Simonsick**[1], **Alessandro Ble**[1], **Stefania Bandinelli**[2], **Fulvio Lauretani**[3], and **Luigi Ferrucci**[1]

- After adjusting for age, sex, education, smoking history, physical activity, and history of comorbid diseases, components of sarcopenic obesity were associated with elevated **proinflammatory cytokines** (IL-6, CRP, IL-1 receptor antagonist, soluble IL-6 receptor)
- global obesity (in particular central obesity) directly affects **inflammation**, which in turn negatively affects **muscle strength**
- *proinflammatory cytokines may be critical in both the development and progression of sarcopenic obesity.*



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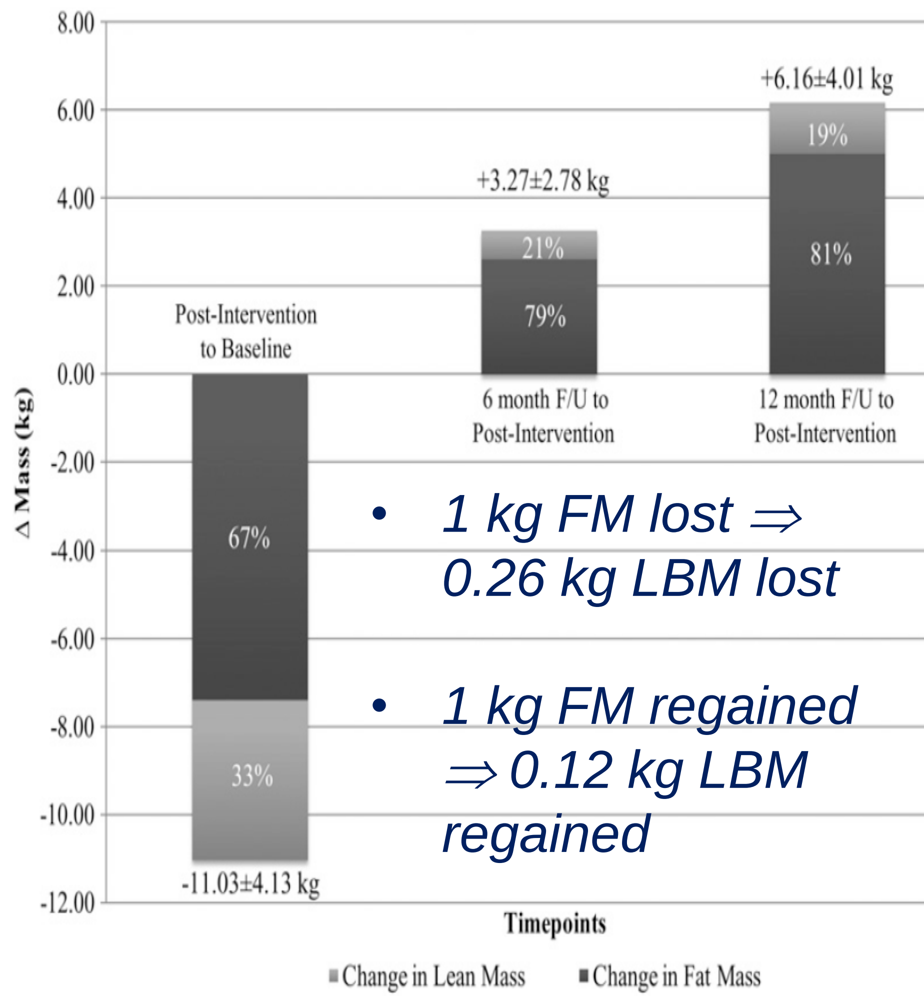
Is lost lean mass from intentional weight loss recovered during weight regain in postmenopausal women?[1–3]

Am J Clin Nutr 2011;94:767–74

Kristen M Beavers, Mary F Lyles, Cralen C Davis, Xuewen Wang, Daniel P Beavers and Barbara J Nicklas

- FU (6 & 12 months) to a RCT of weight loss in 78 postmenopausal women before the intervention:
  - more FM than LBM was lost with weight loss
  - in women who regained 2 kg body weight, **a decreasing trend in the LBM/FM ratio** was observed
- Conclusions: **FM is regained to a greater degree than is LBM in postmenopausal women who do experience some weight regain**



- *1 kg FM lost ⇒ 0.26 kg LBM lost*
- *1 kg FM regained ⇒ 0.12 kg LBM regained*

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Longitudinal study of muscle strength, quality, and adipose tissue infiltration[1–3]

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Matthew J Delmonico, Tamara B Harris, Marjolein Visser, Seok Won Park, Molly B Conroy, Pedro Velasquez-Mieyer, Robert Boudreau, Todd M Manini, Michael Nevitt, Anne B Newman, and Bret H Goodpaster for the Health, Aging, and Body Composition Study

Five-year changes in midthigh composition and muscle function of Health, Aging, and Body Composition (Health ABC) participants by sex group[1]

	Men (n = 813)			Women (n = 865)		
	Change	Percentage change	P value[2]	Change	Percentage change	P value[2]
Total thigh muscle area (cm^2)	−6.8 ± 10.0	−4.9 ± 7.4	<0.001	−3.2 ± 7.6	−3.2 ± 7.9	<0.001
Average maximal muscle torque (N-m)	−24.5 ± 28.1	−16.1 ± 20.6	<0.001	−12.7 ± 17.5	−13.4 ± 23.0	<0.001
Muscle quality (N-m/cm^2)[3]	−0.32 ± 0.41	−13.1 ± 20.4	<0.001	−0.26 ± 0.37	−11.1 ± 23.8	<0.001
Subcutaneous fat (cm^2)	−0.8 ± 9.1	−1.5 ± 19.8	0.020	−3.2 ± 16.6	−2.1 ± 16.9	<0.001
Intermuscular fat (cm^2)	3.1 ± 3.1	48.5 ± 59.6	<0.001	1.7 ± 3.0	29.0 ± 43.6	<0.001

[1] All values are means ± SDs. N-m, Newton meters.
[2] Derived by using paired-samples t tests.
[3] Muscle quality = torque/quadriceps muscle area.

- the increase in FM concerns in particular inter/intra-muscular fat more than subcutaneous fat
- age-related increase in fatty infiltration of muscle (increase in IMF) seems to mask the reduction of muscle mass and the decreases in strength is 2–5 times greater than the loss of muscle size

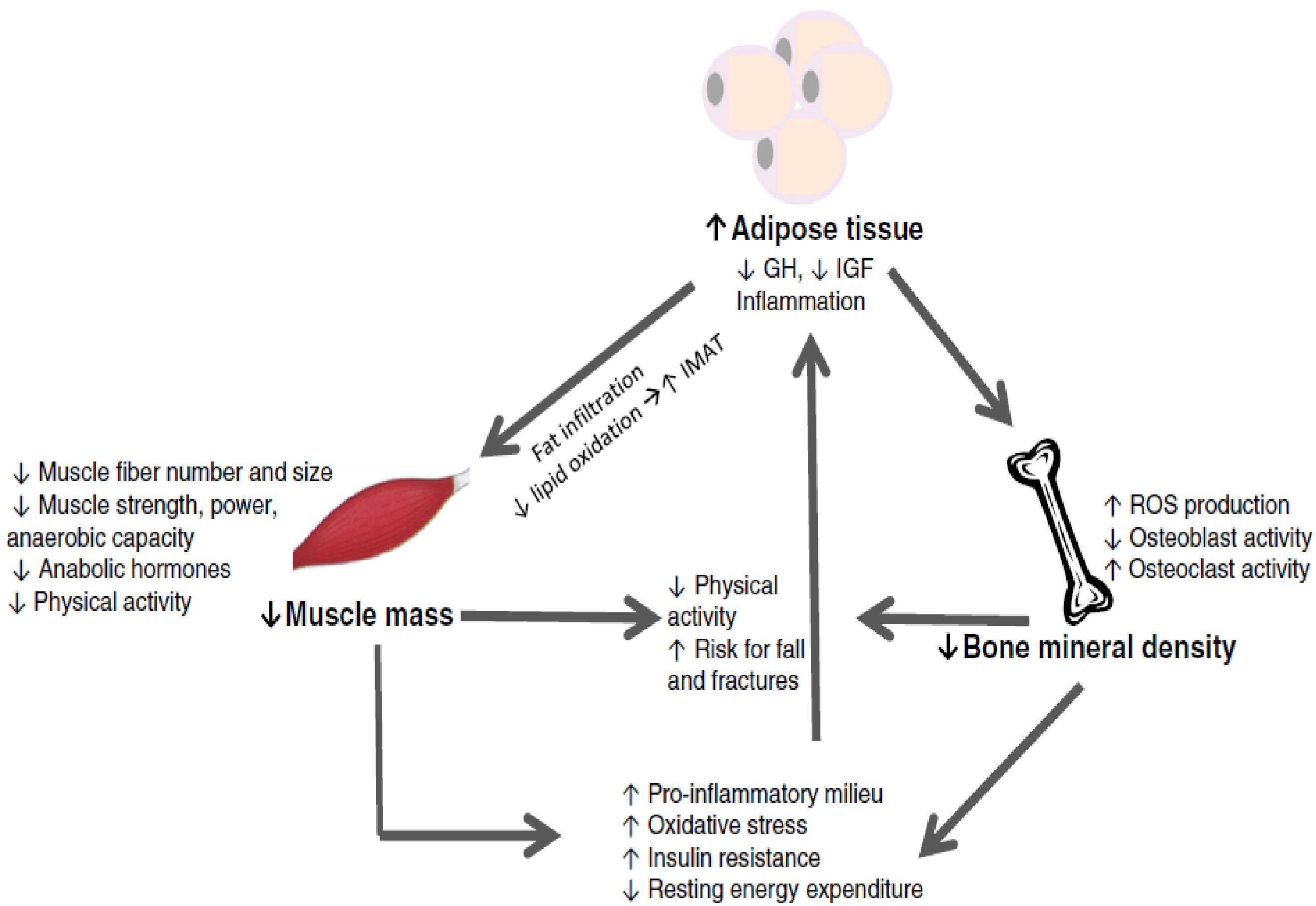
J Cachexia Sarcopenia Muscle (2014) 5:183–192
DOI 10.1007/s13539-014-0146-x

REVIEW

Osteosarcopenic obesity: the role of bone, muscle, and fat on health

Michael J. Ormsbee · Carla M. Prado · Jasminka Z. Ilich · Sarah Purcell · Mario Siervo · Abbey Folsom · Lynn Panton

Osteopenia/osteoporosis, sarcopenia, and obesity are commonly observed in the process of aging, and recent evidence suggests a potential interconnection of these syndromes with common pathophysiology.



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SARCOPENIC OBESITY AND METABOLIC SYNDROME IN ADULT CAUCASIAN SUBJECTS

E. POGGIOGALLE[1], C. LUBRANO[1], G. SERGI[2], A. COIN[2], L. GNESSI[1], S. MARIANI[1], A. LENZI[1], L.M. DONINI[1]

J Nutr Health Aging *In press*

Table 2
Prevalence of metabolic syndrome and sarcopenic obesity

		Sarcopenic obese subjects N= 418	Nonsarcopenic obese subjects N= 309	p
Single components of metabolic syndrome (%)	Abdominal obesity (WC > 102 cm in men; > 88 cm in women)	97.9	84.1	<0.001
	Triglycerides (≥ 150 mg/dl)	29.8	22.0	0.004
	HDL-cholesterol (< 40 mg/dl in men; < 50 mg/dl in women)	48.1	42.8	0.048
	Blood pressure (≥ 130/≥85 mmHg)	39.3	31.8	0.010
	Fasting glucose (≥ 110 mg/dl)	37.2	22.6	<0.001
Number of components of metabolic syndrome (%)	0	1.5	8.6	<0.001
	1	20.8	26.2	
	2	30.1	30.9	
	3	27.7	22.4	
	4	13.9	7.2	
	5	6	4.7	
Metabolic syndrome (%)	≥ 3 risk factors	47.6	34.3	<0.001

Journal of Gerontology: MEDICAL SCIENCES
Cite journal as: J Gerontol A Biol Sci Med Sci
2010 Vol. 65A, No. 1, 71–77
doi:10.1093/gerona/glp159

Advance Access published on November 3, 2009

Special Issue: Obesity in Older Persons

Dynapenic-Obesity and Physical Function in Older Adults

Danielle R. Bouchard[1] and Ian Janssen[1,2]

Table 3. Physical Function According to Obesity and Dynapenia Status

	Non-dynapenic and Non-obese	Obese Alone	Dynapenic Alone	Dynapenic-Obese
Men	$n = 437$	$n = 247$	$n = 246$	$n = 95$
Walking speed (m/s)				
Nonadjusted	1.09 ± 0.20	1.03 ± 0.18	0.99 ± 0.22	0.93 ± 0.21
Adjusted*	0.94 ± 0.38[b,c,d]	0.89 ± 0.32[a,d]	0.87± 0.30[a,d]	0.81 ± 0.24[a,b,c]
Adjusted**	0.96 ± 0.42[b,c,d]	0.91 ± 0.31[a,d]	0.89± 0.31[a,d]	0.82 ± 0.29[a,b,c]
Global subjective score (0–15)				
Nonadjusted	14.34 ± 3.19	13.80 ± 2.15	13.02 ± 2.54	12.42 ± 1.29
Adjusted*	12.95 ± 4.50[b,c,d]	12.32 ± 3.78[a,d]	11.90 ± 2.54[a]	11.33 ± 1.29[a,b,c]
Adjusted**	13.08 ± 4.60[b,c,d]	12.52 ± 3.93[a,d]	12.17 ± 3.61[a]	11.55 ± 2.92[a,b,c]
Women	$n = 427$	$n = 249$	$n = 249$	$n = 89$
Walking speed (m/s)				
Nonadjusted	1.03 ± 0.23	0.97 ± 0.28	0.95 ± 0.24	0.84 ± 0.20
Adjusted*	0.95 ± 0.63[b,c,d]	0.88 ± 0.52[a,d]	0.86 ± 0.50[a,d]	0.80 ± 0.35[a,b,c]
Adjusted**	0.98 ± 0.62[b,c,d]	0.92 ± 0.47[a,d]	0.90 ± 0.47[a,d]	0.82 ± 0.28[a,b,c]
Global subjective score (0–15)				
Nonadjusted	13.61 ± 3.87	12.01 ± 3.29	12.32 ± 3.29	10.53 ± 2.33
Adjusted*	12.10 ± 7.58[b,c,d]	10.86 ± 6.26[a,d]	11.22 ± 6.07[a,d]	9.57 ± 4.23[a,b,c]
Adjusted**	12.46 ± 9.09[b,c,d]	11.43 ± 6.31[a,d]	11.64 ± 6.00[a,d]	10.14 ± 4.15[a,b,c]

Notes: Data are presented as mean ± *SD*. Significantly different ($p \le .05$) from the: [a]non-dynapenic and non-obese group, [b]obese-alone group, [c]dynapenic-alone group, and [d]dynapenic-obese group. Generalized linear models were used to identify differences among the four groups. Bonferroni post hoc analyses were used to identify any group difference.

*Adjusted for age, gender, race or ethnicity, alcohol intake, smoking status, and the five chronic conditions (visual problems, arthritis, diabetes, lung disease, and cardiovascular disease).

**Further adjusted for physical activity.

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Difficulties with physical function associated with obesity, sarcopenia, and sarcopenic-obesity in community-dwelling elderly women: the EPIDOS (EPIDemiologie de l'OSteoporose) Study[1–3]

Yves Rolland, Valérie Lauwers-Cances, Christelle Cristini, Gabor Abellan van Kan, Ian Janssen, John E Morley, and Bruno Vellas

Am J Clin Nutr 2009;89:1895–900.

Associations between purely sarcopenic, purely obese, or sarcopenic-obese subjects and self-reported difficulties with physical function[1]

	Purely sarcopenic[2] (n = 90)		Purely obese[3] (n = 435)		Sarcopenic-obese (n = 36)	
Physical function difficulty	OR	95% CI	OR	95% CI	OR	95% CI
Walking (n = 1252)	1.32	0.73, 2.38	1.38	0.97, 1.98	1.35	0.58, 3.17
Climbing stairs (n = 1258)	1.47	0.86, 2.51	1.79	1.28, 2.50	3.60	1.68, 7.74
Going down stairs (n = 1252)	0.98	0.54, 1.79	1.54	1.09, 2.18	3.35	1.59, 7.08
Rising from a chair or bed (n = 1259)	0.46	0.23, 0.93	1.09	0.76, 1.57	1.32	0.58, 3.01
Picking up object from floor (n = 1259)	1.12	0.63, 2.00	1.44	1.02, 2.02	1.99	0.91, 4.34
Lifting heavy objects or reaching an object (n = 1252)	1.03	0.61, 1.74	1.77	1.27, 2.46	1.92	0.89, 4.10
Moving difficulties (n = 1258)[4]	1.10	0.60, 1.99	1.75	1.22, 2.51	2.54	1.12, 5.75

[1] Healthy body composition served as the referent group [odds ratio (OR): 1.00] for the logistic regression analysis.

[2] Women were classified as sarcopenic if their relative skeletal muscle mass was <2 SD below the mean of a sample of 229 healthy young (18–40 y) adults. For women, this cutoff was 5.45 kg/m^2.

[3] Women were classified as obese if their percentage of body fat was above the 60th percentile of the study sample.

[4] Defined as ≥3 difficulties among the following physical functions: walking, climbing stairs, rising from a chair or a bed, picking up an object from the floor, and lifting heavy objects or reaching an object.

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Food and Nutrition Sciences, 2014, 5, 2020-2031
Published Online October 2014 in SciRes. http://www.scirp.org/journal/fns
http://dx.doi.org/10.4236/fns.2014.520213

Scientific Research

Sarcopenic Obesity: Correlation with Clinical, Functional, and Psychological Status in a Rehabilitation Setting

Lorenzo M. Donini[1*], Eleonora Poggiogalle[1], Silvia Migliaccio[2], Alessandro Pinto[1], Carla Lubrano[1], Andrea Lenzi[1]

		Real LBM/ideal LBM ratio		p
		≥0.9	<0.9	
	Subjects (n)	36	43	
	Age (years)	57.8 ± 11	60.9 ± 10.3	*
Anthropometric parameters	BMI (kg/m^2)	46.9 ± 8.3	44.24 ± 6.2	*
	FM (%)	45.4 ± 4.8	46.3 ± 4.1	NS
	FM (kg)	58.6 ± 14.6	52.9 ± 10.5	*
	LBM (kg)	70.9 ± 16.2	52.9 ± 9.4	*
	LBMI	25.7 ± 4	20.4 ± 2.4	*
Functional parameters	HGST (kg)	25.8 ± 11.2	18.9 ± 9.3	*
	6 MWT distance (m)[1,2]	159.4 ± 156.5	136.4 ± 126.4	NS
	6 MWT distance/predicted-6MWT distance[1,2]	0.46 ± 0.44	0.42 ± 0.38	NS
	TSD-OC test	55.9 ± 21.9	69.1 ± 20.6	*
	SPPB score	8.5 ± 3.0	7.9 ± 2.4	NS

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Scientific Research

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			Real LBM/ideal LBM ratio		p
			>0.9	<0.9	
Clinical and laboratory parameters	Charlson comorb index		2.6 ± 2	2.3 ± 2	NS
	Hemoglobin (g/dl)		12.9 ± 1.7	12.2 ± 1.3	*
	Lymphocytes (#/ml)		2157.6 ± 892.3	2100 ± 736.8	NS
	Transferrin (mg/dl)		259.4 ± 55.4	248.2 ± 50.6	NS
	Albumin (g/dl)		3.93 ± 0.3	3.82 ± 0.3	*
	Prealbumin (mg/dl)		23.1 ± 6.8	21.5 ± 5.7	NS
	Cholinesterase (U/l)		8191.1 ± 1718.2	8476.9 ± 1992.2	NS
	CRP-HS (mg/dl)		6.53 ± 7	7.9 ± 5.6	*
Anxiety, depression and quality of life	SF-36 questionnaire	PHI	31.3 ± 19.1	28 ± 16.1	*
		MHI	32.8 ± 20	31 ± 18.1	NS
		Total score	32.4 ± 19.6	29.8 ± 16.4	*
	SCL-90 questionnaire	Depression	0.8 ± 0.9	1.4 ± 0.8	*
		Anxiety	0.9 ± 0.8	1.6 ± 0.9	*
		Total score	76.2 ± 63.8	108.9 ± 59.4	*

Contents lists available at SciVerse ScienceDirect

Clinical Nutrition

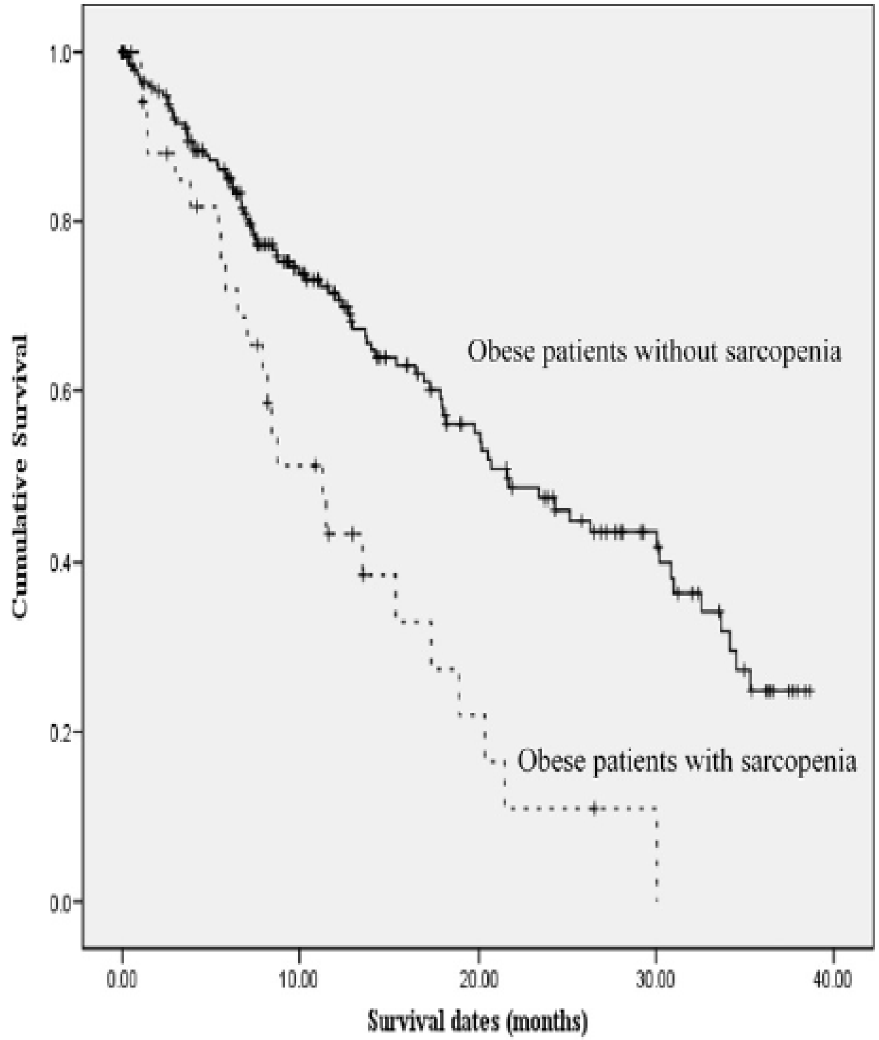
journal homepage: http://www.elsevier.com/locate/clnu

Review

Sarcopenic obesity: A Critical appraisal of the current evidence

C.M.M. Prado[a], J.C.K. Wells[b], S.R. Smith[c], B.C.M. Stephan[d], M. Siervo[e,*]

- In post-menopausal women SO was associated to **reduced cardio-pulmonary fitness** (peak VO_2 and ventilatory threshold) (Oliveira R et al, 2011) higher risk of **frailty** and **poorer quality of life** (Janssen I et al, 2004; Villareal DT et al 2004), **longer hospitalization** (Kyle UG et al, 2005) and **greater mortality rates** (Honda H et al, 2007; Prado CM et al, 2008)



Clinical Nutrition (2005) 24, 133–142

ELSEVIER

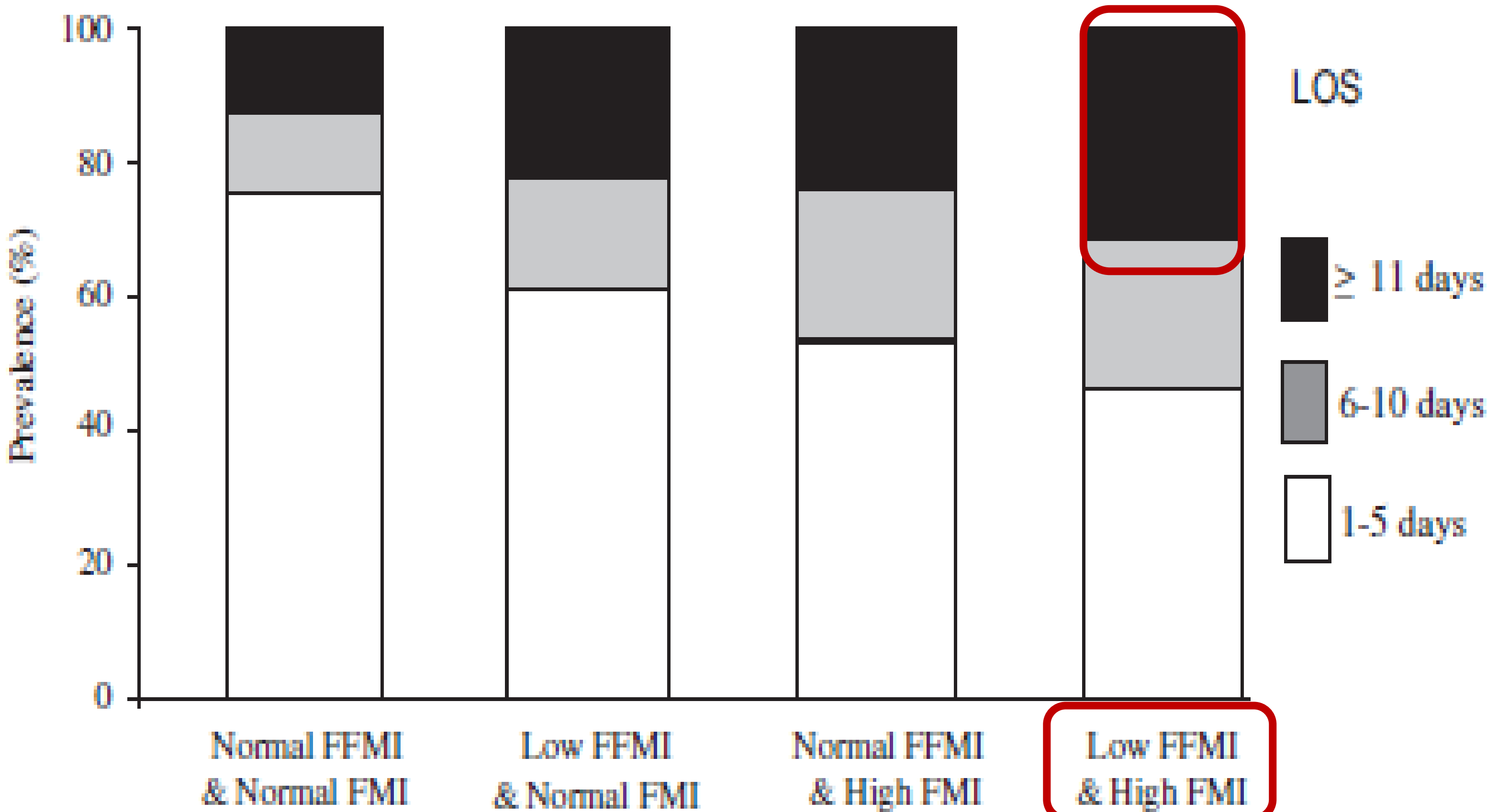
Clinical Nutrition

http://intl.elsevierhealth.com/journals/clnu

ORGINAL ARTICLE

Increased length of hospital stay in underweight and overweight patients at hospital admission: a controlled population study

Ursula G. Kyle[a], Matthias Pirlich[b], Herbert Lochs[b], Tatjana Schuetz[b], Claude Pichard[a,*]



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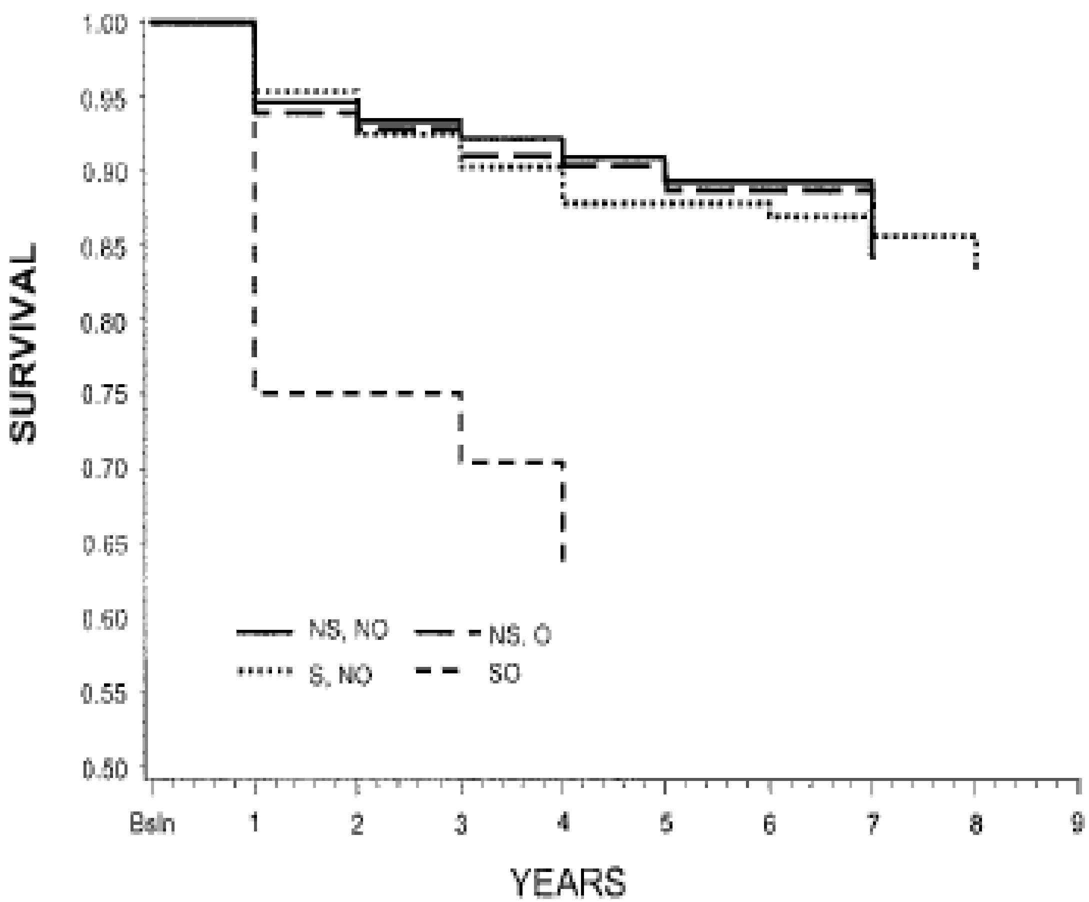
Sarcopenic Obesity Predicts Instrumental Activities of Daily Living Disability in the Elderly

OBESITY RESEARCH Vol. 12 No. 12 December 2004

Richard N. Baumgartner, Sharon J. Wayne,* Debra L. Waters,* Ian Janssen,† Dympna Gallagher,‡ and John E. Morley§*



OR for ≥ 2 self reported physical disabilities IADL

Obesity: 1.34 M; 2.15 F

Sarcopenia: 3.78 M; 2.96 F

SO: 8.72 M; 11.98 F

Kaplan-Meier survival curve for time to drop in IADL by body composition type. Adjusted for baseline. NS, NO: nonsarcopenic, nonobese; S, NO: sarcopenic, nonobese; NS, O: copenic, obese; S, O: sarcopenic, obese.

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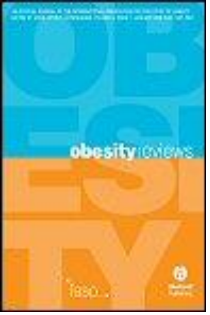
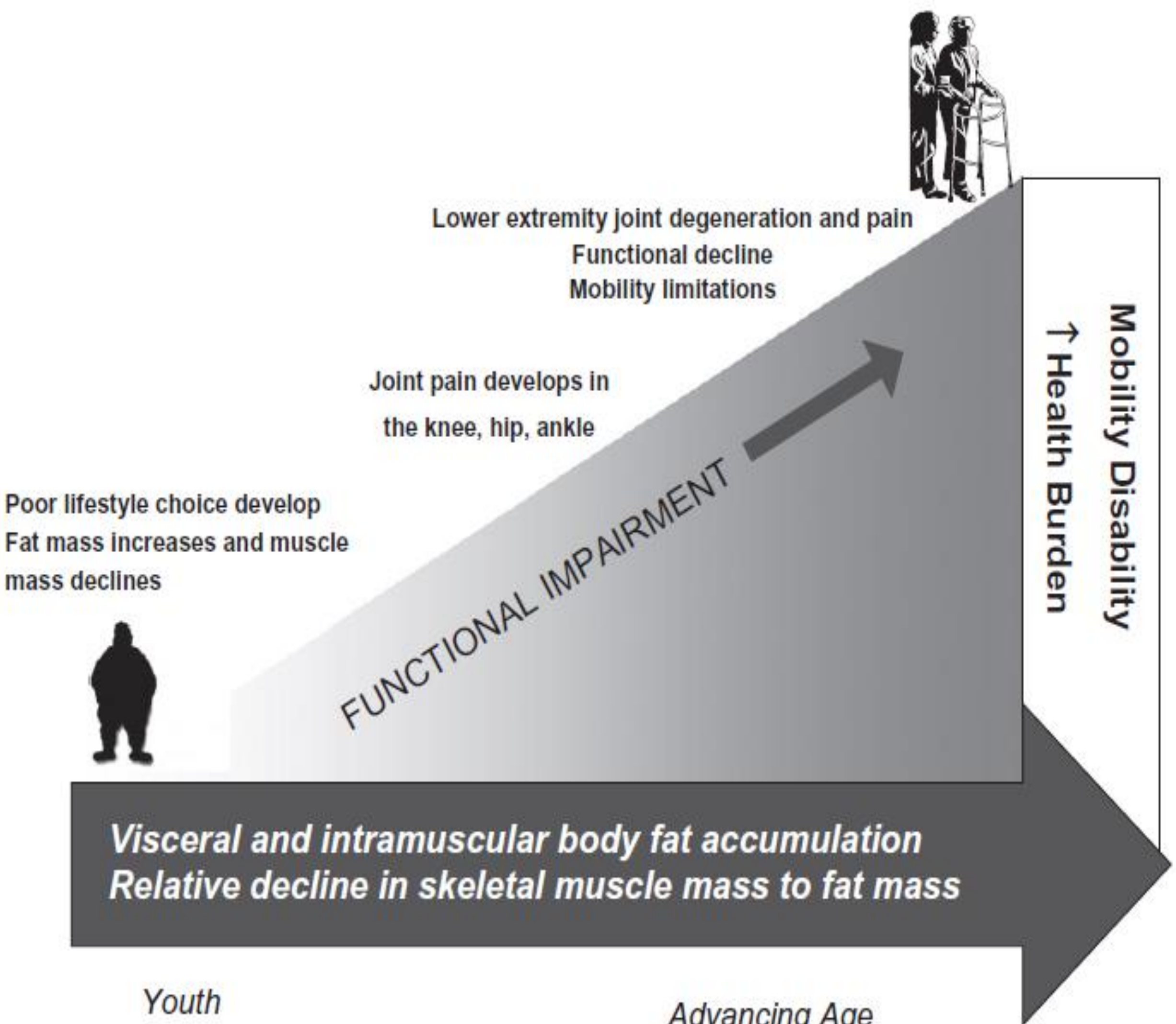


obesity reviews doi: 10.1111/j.1467-789X.2009.00703.x

Diagnostic in Obesity and Complications

Obesity and mobility disability in the older adult

H. K. Vincent, K. R. Vincent and K. M. Lamb



Obesity and sarcopenia can independently contribute to clinical and functional deterioration.

But when they are combined the effect is more evident.

Obesità sarcopenica e nutraceutica

Sapienza
Università di Roma

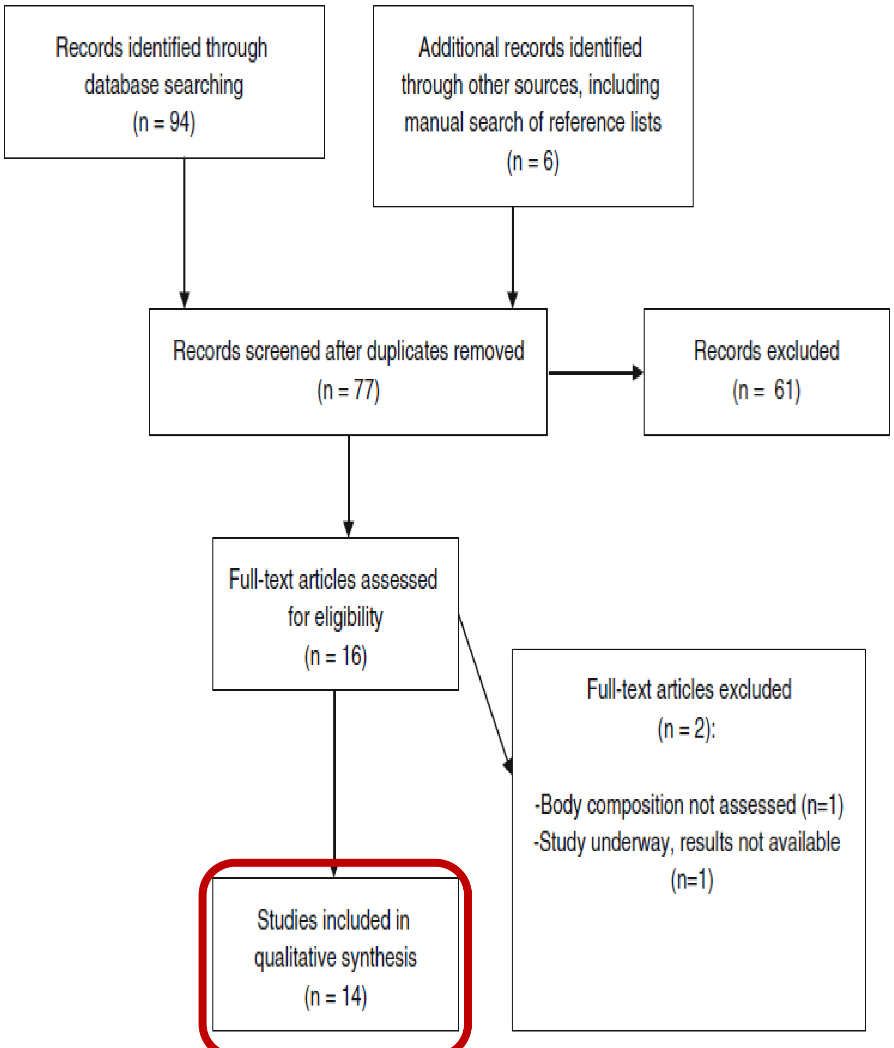
Endocrine
DOI 10.1007/s12020-014-0315-x

REVIEW

Published online: 22 June 2014

Treatment of body composition changes in obese and overweight older adults: insight into the phenotype of sarcopenic obesity

Eleonora Poggiogalle · Silvia Migliaccio ·
Andrea Lenzi · Lorenzo Maria Donini



effect of:

- diet/nutritional supplementation: *3 studies*
- exercise/physical activity: *1 study*
- pharmacological therapy: *2 studies*
- combined lifestyle interventions (diet and exercise): *8 studies*

Weight loss based on diet combined with exercise seems to be the best strategy to adopt for treatment of phenotypic aspects of SO, improving metabolic consequences related to excess fat, preserving lean mass, and
allowing functional recovery.

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Available online at www.sciencedirect.com

ScienceDirect

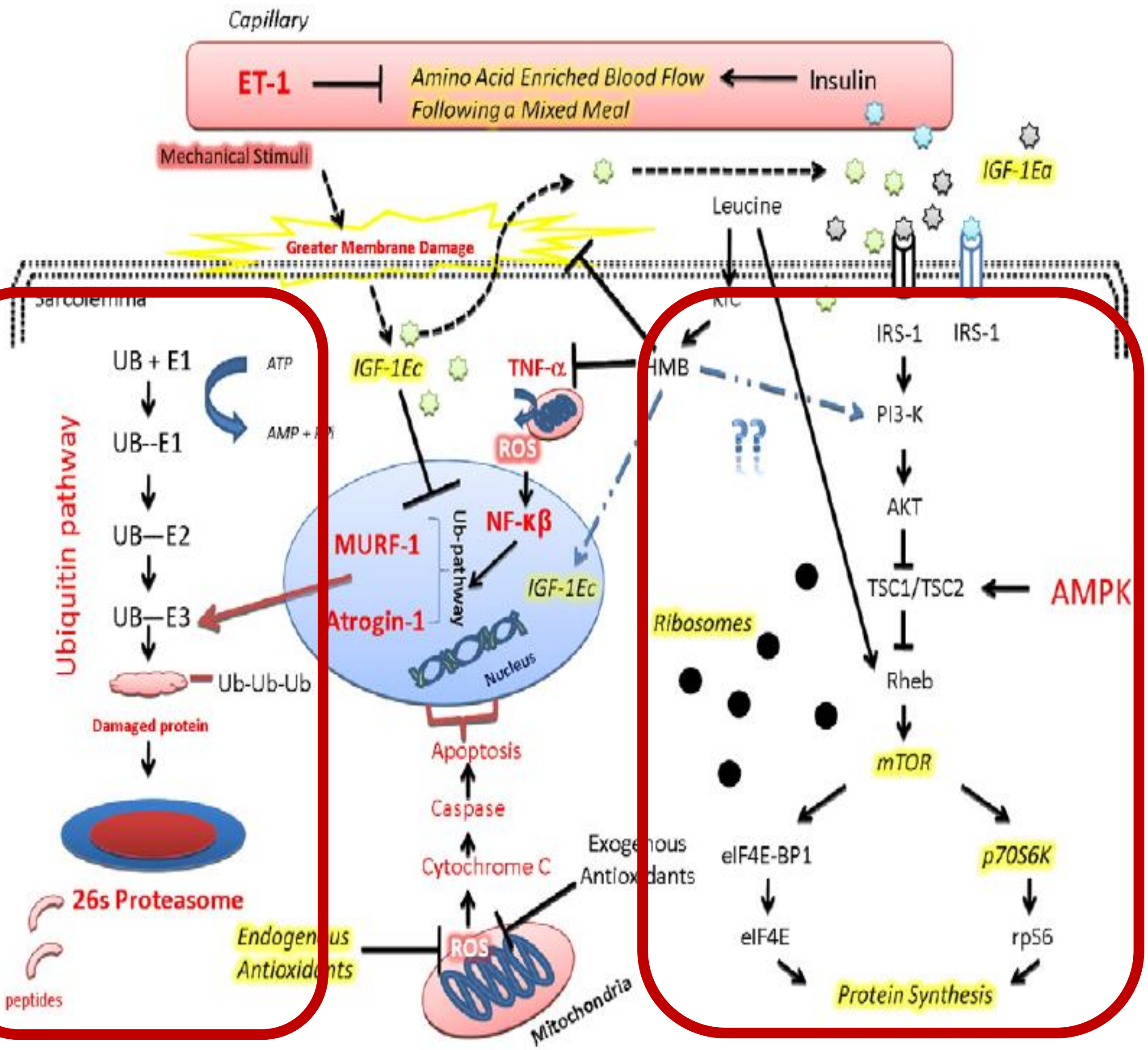
Journal of Nutritional Biochemistry 21 (2010) 1–13

Journal of Nutritional Biochemistry

REVIEWS: CURRENT TOPICS

Dietary implications on mechanisms of sarcopenia: roles of protein, amino acids and antioxidants

Jeong-Su Kim*, Jacob M. Wilson, Sang-Rok Lee



Leucine can activate the mTOR pathway and probably inhibit the ubiquitin pathway

Available online at www.sciencedirect.com
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Journal of Nutritional Biochemistry 21 (2010) 1 – 13
Journal of Nutritional Biochemistry

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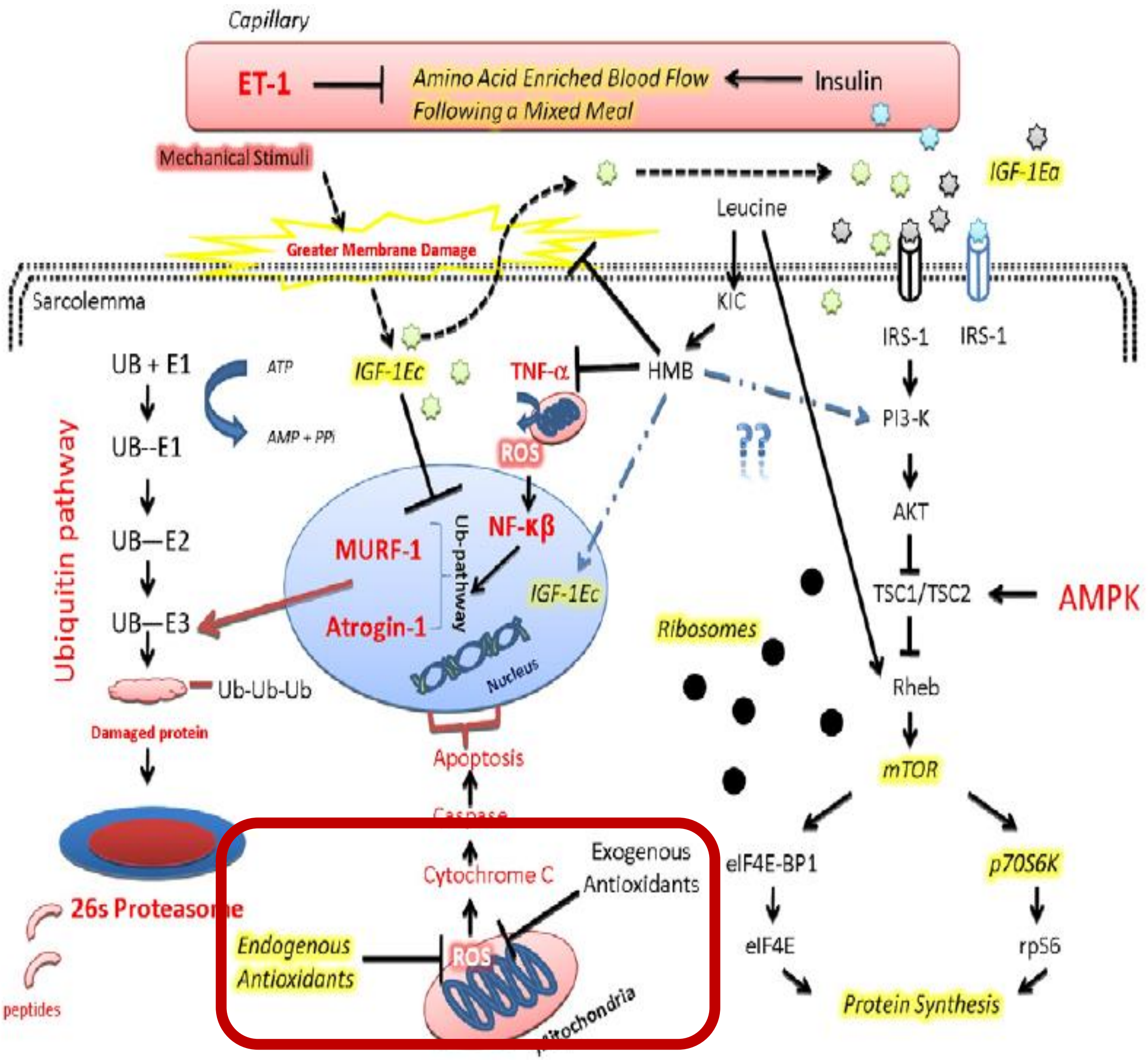

antioxidants can inhibit the ROS cascade

Available online at www.sciencedirect.com
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Journal of Nutritional Biochemistry 21 (2010) 1–13
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Dietary implications on mechanisms of sarcopenia: roles of protein, amino acids and antioxidants

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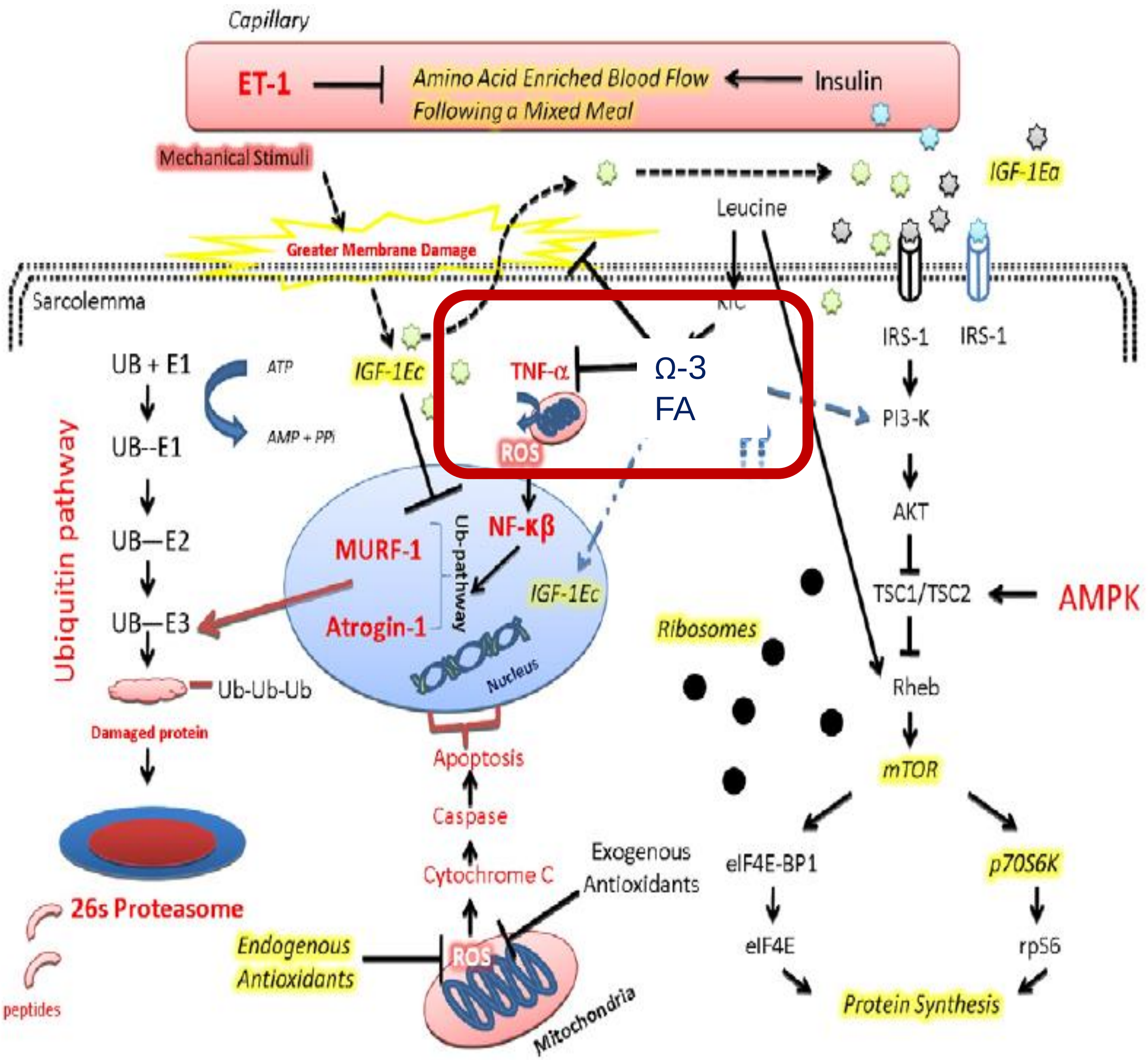

omega-3 FA can positively modulate the inflammatory process and the cytokines synthesis

Coker *et al. Nutrition Journal* 2012, **11**:105
http://www.nutritionj.com/content/11/1/105

NUTRITION JOURNAL

RESEARCH Open Access

Whey protein and essential amino acids promote the reduction of adipose tissue and increased muscle protein synthesis during caloric restriction-induced weight loss in elderly, obese individuals

- 12 elderly obese subjects
- 8 week caloric restriction diet (170 kcal x 5 servings/day + ~400 kcal/day of solid food that yielded ~1250 kcal/day)
- EAAMR group: whey protein + EAA vs CMR group designed to induce 7% weight loss
- Outcome measures: total body weight and body composition, acute change in the skeletal muscle FSR (fractional synthesis

	EAAMR	CMR
Calories	170	170
Total Fat (grams)	4	3
Saturated Fat (grams)	1	1
Trans Fat (grams)	0	0
Cholesterol (mg)	5	5
Sodium (mg)	220	220
Potassium (mg)	460	460
Total Carbohydrate	22	22
Fiber (grams)	1	1
Sugars (grams)	17	17
Protein (grams)	7	14
Essential amino acid formulation	6	0

Coker *et al. Nutrition Journal* 2012, **11**:105
http://www.nutritionj.com/content/11/1/105

NUTRITION JOURNAL

RESEARCH Open Access

Whey protein and essential amino acids promote the reduction of adipose tissue and increased muscle protein synthesis during caloric restriction-induced weight loss in elderly, obese individuals

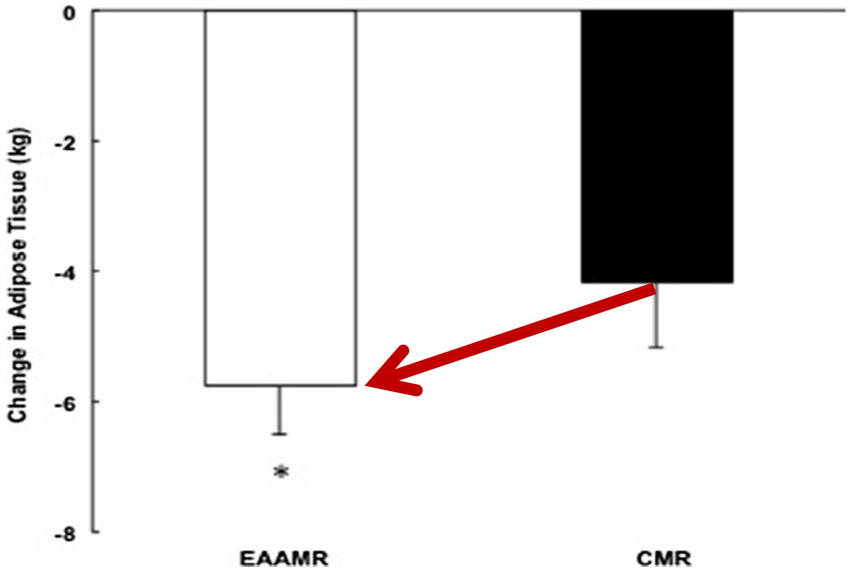

Figure 1 Change in adipose tissue in EAAMR and CMR following weight loss. * Denotes significance difference between groups.

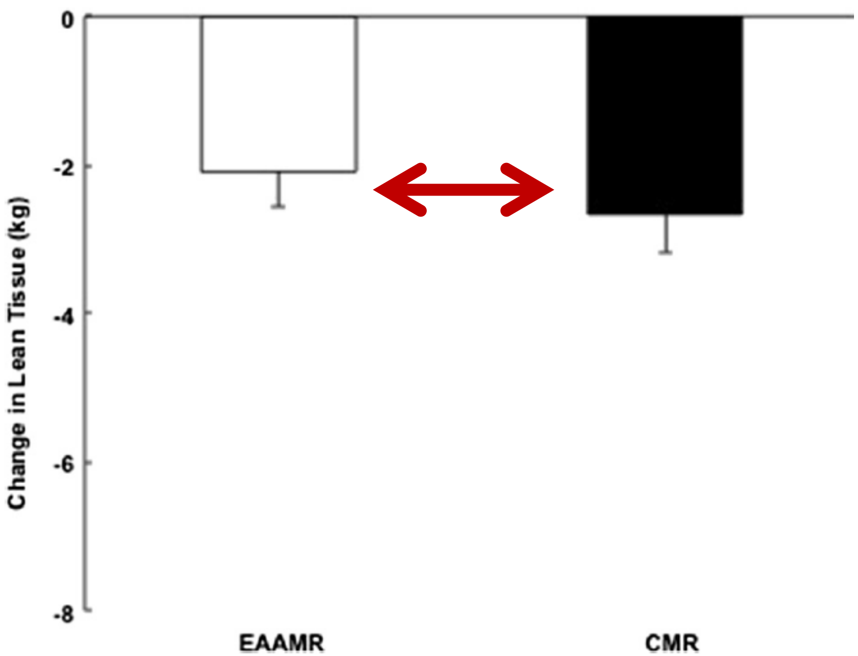

Figure 2 Change in lean tissue in EAAMR and CMR following weight loss.

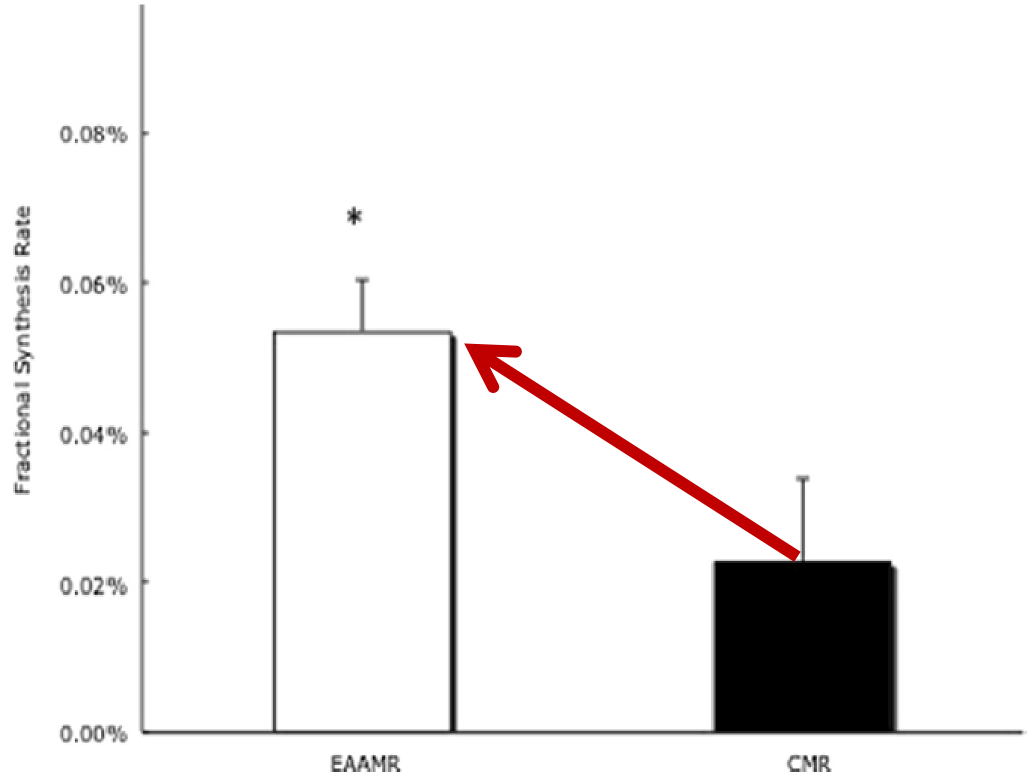

Figure 3 Change in feeding induced skeletal muscle FSR in EAAMR and CMR following weight loss. * Denotes significance difference between groups.

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Vitamin D and Sarcopenia/Falls

Joan M. Lappe,[*,1] *and Neil Binkley*[2]

Journal of Clinical Densitometry: Assessment & Management of Musculoskeletal Health, vol. 18, no. 4, 478–482, 2015

- Some small prospective studies do find **vitamin D supplementation to increase type II muscle fiber number and cross-sectional area**.
- In contrast, others find no association of 25(OH)D with muscle mass or strength.
- Meta-analyses are conflicting, finding supplemental vitamin D to have beneficial effects on strength and balance or no effect on strength .
- It is not surprising that meta-analyses have failed to clarify the role of vitamin D inadequacy with muscle function.
  - This lack of clarity likely reflects multiple confounders and design concerns in existing studies.
  - An important limitation of most studies is nonrecognition that the serum 25(OH)D response to vitamin D supplementation is highly variable. It is self-evident that individuals who receive vitamin D supplementation but do not alter their serum 25(OH)D would not be expected to experience a biologic effect.

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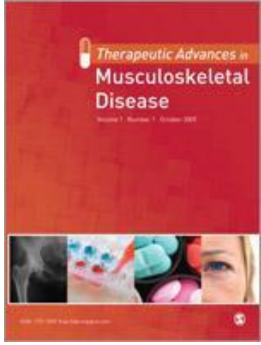
Therapeutic Advances in Musculoskeletal Disease

More than healthy bones: a review of vitamin D in muscle health

S. Bobo Tanner and Susan A. Harwell

Ther Adv Musculoskel Dis

2015, Vol. 7(4) 152–159



- Experimental techniques have allowed detection of the **VDR on skeletal muscle** and in cerebellar tissue

- These data suggest that **vitamin D supplementation** may contribute to the health and maintenance of muscle function.

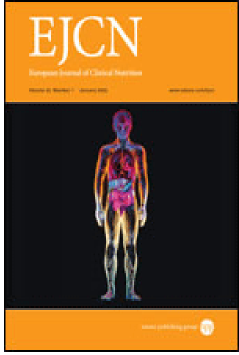
- The role of vitamin D in muscle health and function remains an exciting and growing area of research with substantial clinical implications.

European Journal of Clinical Nutrition (2007) 61, 1442–1444
 0954-3007/07 $30.00
www.nature.com/ejcn

SHORT COMMUNICATION

Six months of isoflavone supplement increases fat-free mass in obese–sarcopenic postmenopausal women: a randomized double-blind controlled trial

M Aubertin-Leheudre[2], C Lord, A Khalil[3] and IJ Dionne[1,2]



- 18 SO women (12 on isoflavones and six on placebo).
- **70 mg of isoflavones per day** (44mg of dia dzein, 16mg glycitein and 10mg genestein) or a placebo for 24 weeks.
- Results: **The isoflavone group increased significantly appendicular** (p=0.034), **leg** (p=0.016) **FFM and MMI** (p=0.037), but not the placebo group.

- **skeletal muscle is an important site of estrogen receptors** a (ERa) and -b (ERb) and phytoestrogens are known to have estrogenic properties.
- soy protein supplementation (40g/day for 24weeks) has an effect on hip lean mass in perimenopausal women (Moeller et al., 2003) and on LBM in elite athletes (1.5 g/kg/day for 8 weeks) (Dragan et al., 1992).

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Clinical Interventions in Aging
Dovepress
open access to scientific and medical research
Clinical Interventions in Aging 2015:10 1267–1282
REVIEW

Sarcopenic obesity and complex interventions with nutrition and exercise in community-dwelling older persons – a narrative review

Sabine Goisser[1]
Wolfgang Kemmler[2]
Simone Porzel[3]
Dorothee Volkert[1]
Cornel Christian Sieber[1,4]
Leo Cornelius Bollheimer[1,4]
Ellen Freiberger[1]

- **Exercise training** (ET) for health and function in older persons consists of different components: strength (or resistance) and power training, aerobic exercise, flexibility and balance/gait training.
- Elements of **strength/power** training are volume (e.g., number of repetitions), frequency (e.g., number of training sessions per week), and intensity (percentage of one repetition maximum).

(Montero-Fernandez N, et al: *Eur J Phys Rehabil Med. 2013;* Weinheimer EM, et al. *Nutr Rev. 2010;* Peterson MD, et al: *Med Sci Sports Exerc. 2011)*

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Med Sci Sports Exerc. 2008 July ; 40(7): 1213–1219. doi:10.1249/MSS.0b013e31816a85ce.

Exercise Attenuates the Weight-Loss-Induced Reduction in Muscle Mass in Frail Obese Older Adults

TIFFANY N. FRIMEL[1], DAVID R. SINACORE[1,2], and DENNIS T. VILLAREAL[1,2]

30 frail older (age, 70 ± 5 yr) obese adults

6 m diet/behavioral therapy *or diet or behavioral* therapy plus exercise that incorporated progressive resistance training

• diet and the diet + exercise groups had *similar decreases in weight and FM*

• diet + exercise group lost less FFM and had *greater increases in percent of weight as FFM*

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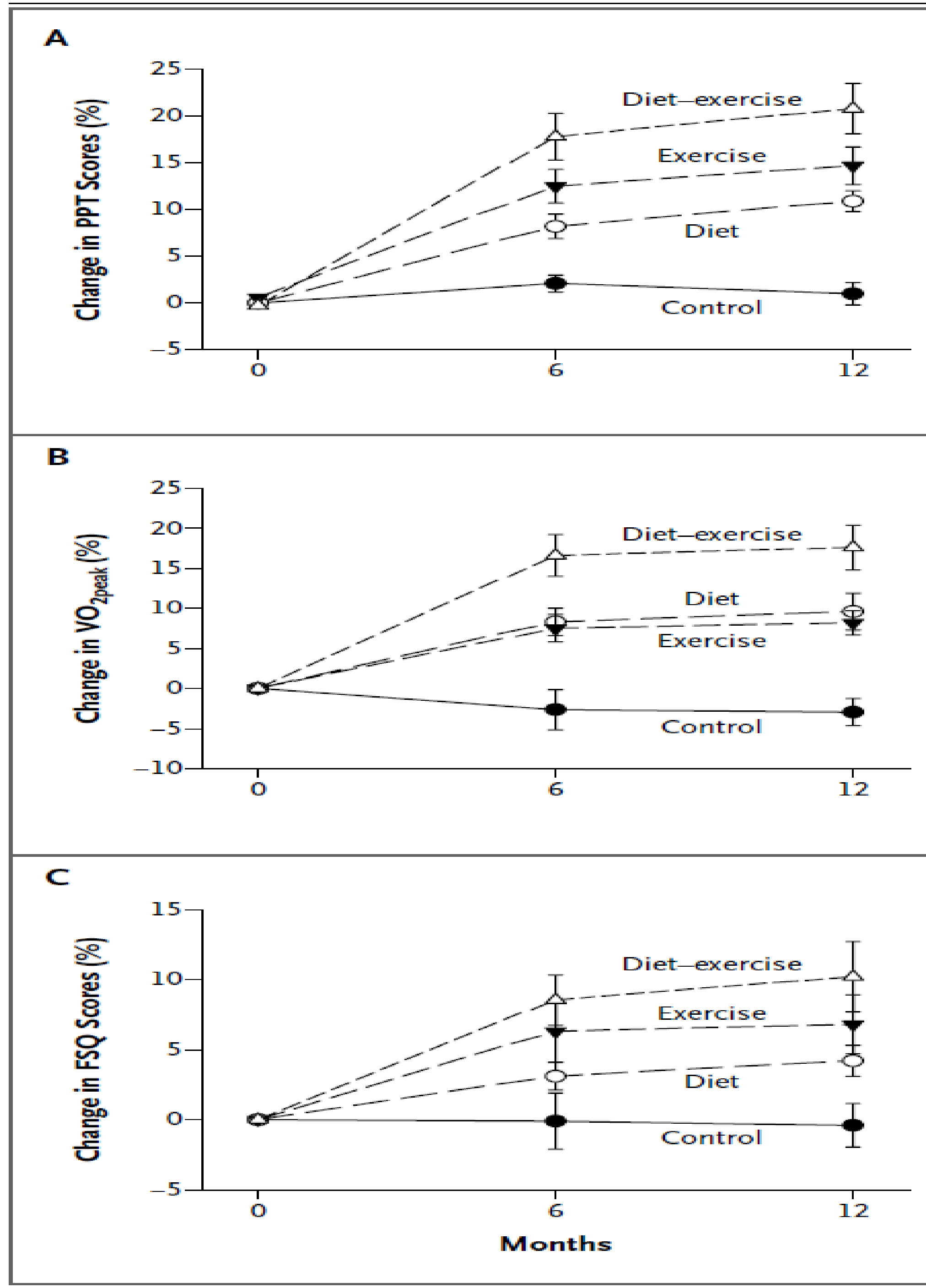
The NEW ENGLAND JOURNAL of MEDICINE

N ENGL J MED 364;13 NEJM.ORG MARCH 31, 2011

ORIGINAL ARTICLE

Weight Loss, Exercise, or Both and Physical Function in Obese Older Adults

Dennis T. Villareal, M.D., Suresh Chode, M.D., Nehu Parimi, M.D., David R. Sinacore, P.T., Ph.D., Tiffany Hilton, P.T., Ph.D., Reina Armamento-Villareal, M.D., Nicola Napoli, M.D., Ph.D., Clifford Qualls, Ph.D., and Krupa Shah, M.D., M.P.H.



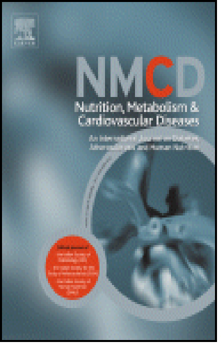
Effect of Weight Loss and Exercise on Frailty in Obese Older Adults

Arch Intern Med. 2006;166:860-866

Dennis T. Villareal, MD; Marian Banks, DNS, RN; David R. Sinacore, PhD, PT; Catherine Siener, PT; Samuel Klein, MD

- 40 obese older volunteers
- 6 months of
  - **diet** (E deficit 750 kcal vs REE*1.3; diet contained approximately 30% of E as fat, 50% as CHO, 20% as protein)
  - **weekly behavioral therapy**
  - **exercise training** (3 nonconsecutive days each week supervised by a physical therapist aimed at improving flexibility, endurance, strength, and balance; 90 mn sessions: 15 mn warm-up flexibility exercises, 30 mn endurance exercise, 30 mn strength training, 15 mn balance exercises)

Variable Control	Control Group	Treatment Group	P Value
Fat mass, kg			
Baseline	47.5 ± 8.9	42.6 ± 7.9	
Final	49.1 ± 13.4	35.9 ± 10.1†	
Absolute change	1.7 ± 4.1	−6.6 ± 3.4	<.001
% Change	2.6 ± 6.9	−17.1 ± 11.3	
Fat-free mass, kg			
Baseline	55.7 ± 13.1	57.1 ± 10.9	
Final	54.7 ± 12.8	55.9 ± 10.9‡	
Absolute change	−1.0 ± 3.5	−1.2 ± 2.1	.75
% Change	−1.5 ± 5.3	−2.1 ± 3.7	
Functional Status			
Questionnaire score			
Baseline	32.9 ± 1.9	31.0 ± 4.0	
Final	32.7 ± 4.5	33.9 ± 3.2‡	
Change	−0.2 ± 3.9	2.9 ± 3.7	.02
% Change	−0.8 ± 123	10.7 ± 14.7	
Physical function (36-Item Short-Form Health Survey)			
Baseline	67.0 ± 15.1	60.0 ± 21.0	
Final	69.5 ± 22.1	83.2 ± 13.9†	
Change	2.5 ± 26.4	23.2 ± 20.9	.03



Nutrition, Metabolism & Cardiovascular Diseases (2008) 18, 388–395

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/nmcd

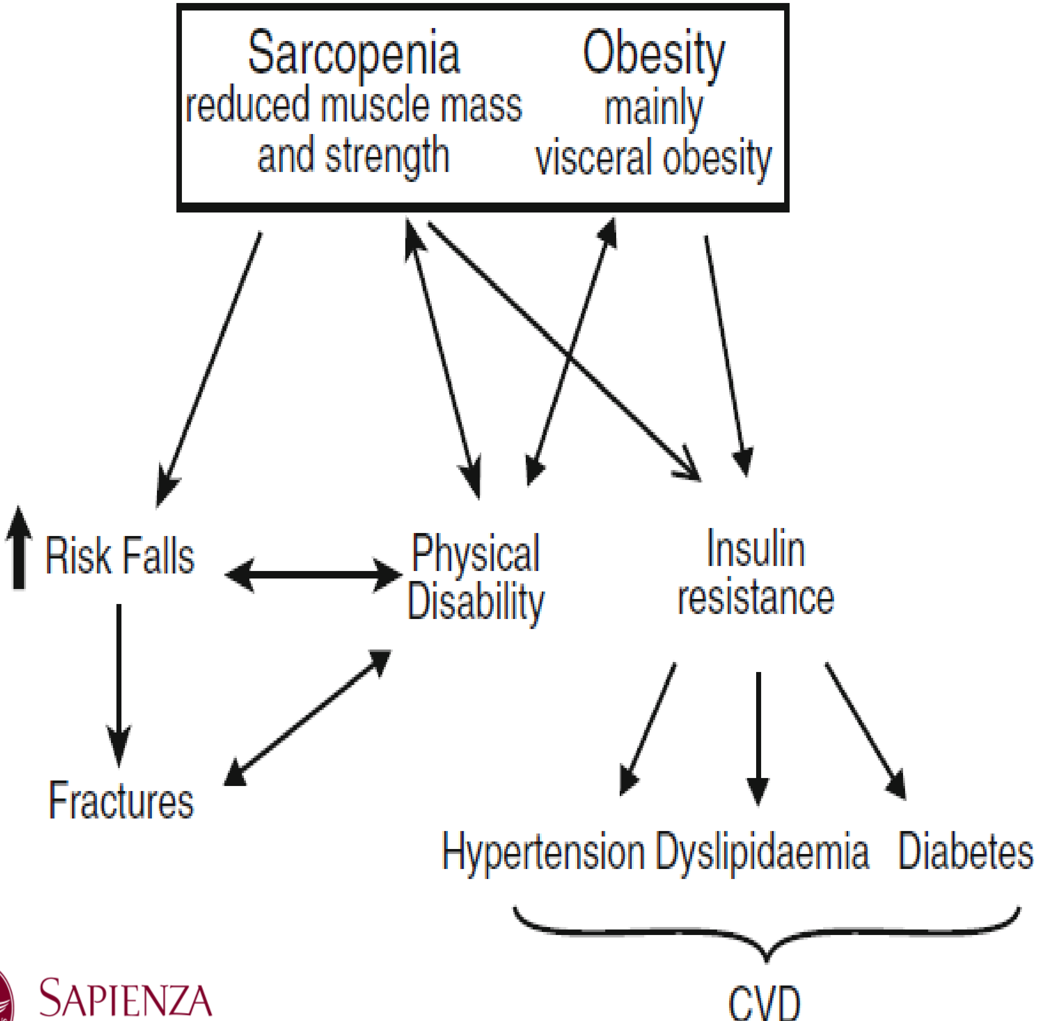
ELSEVIER

Nutrition, Metabolism & Cardiovascular Diseases

REVIEW

Sarcopenic obesity: A new category of obesity in the elderly

Mauro Zamboni*, Gloria Mazzali, Francesco Fantin, Andrea Rossi, Vincenzo Di Francesco



Clinical and functional consequences are tightly linked together in SO subjects.

Although most frequent in the elderly, **SO is not necessarily related to the geriatric age**.

It is not clear how to **modulate macronutrient intake** in the nutritional treatment of SO. The need to reduce body fat while preserving or even increasing lean body mass makes the very complex dietary intervention.

In this situation the **nutraceutical** can play an important role

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Innovation is a profoundly human act that originates from our everlasting dissatisfaction, our desire to do even better.
Creating and distributing new objects, new processes and new services are intended to improve our existence.
In a word, evolve.

As to whether we should be wary of innovation, this returns us to the purpose of the object, the use we make of the innovation.
And here it is up to each individual to invent a response to this question.

Atomium – Bruxelles