Associazione Geriatri Extraospedalieri

GERIATRIA ITALIANA TERRITORIALE

**11° Congresso Nazionale AGE**
**Roma, 18/21 marzo 2015**

# La terapia nutrizionale nel malato geriatrico


**Pietro Carideo**

UOS Nutrizione Artificiale e NAD

AORN *S.Anna e S.Sebastiano*

Caserta


SINPE
Società Italiana di Nutrizione Artificiale e Metabolismo
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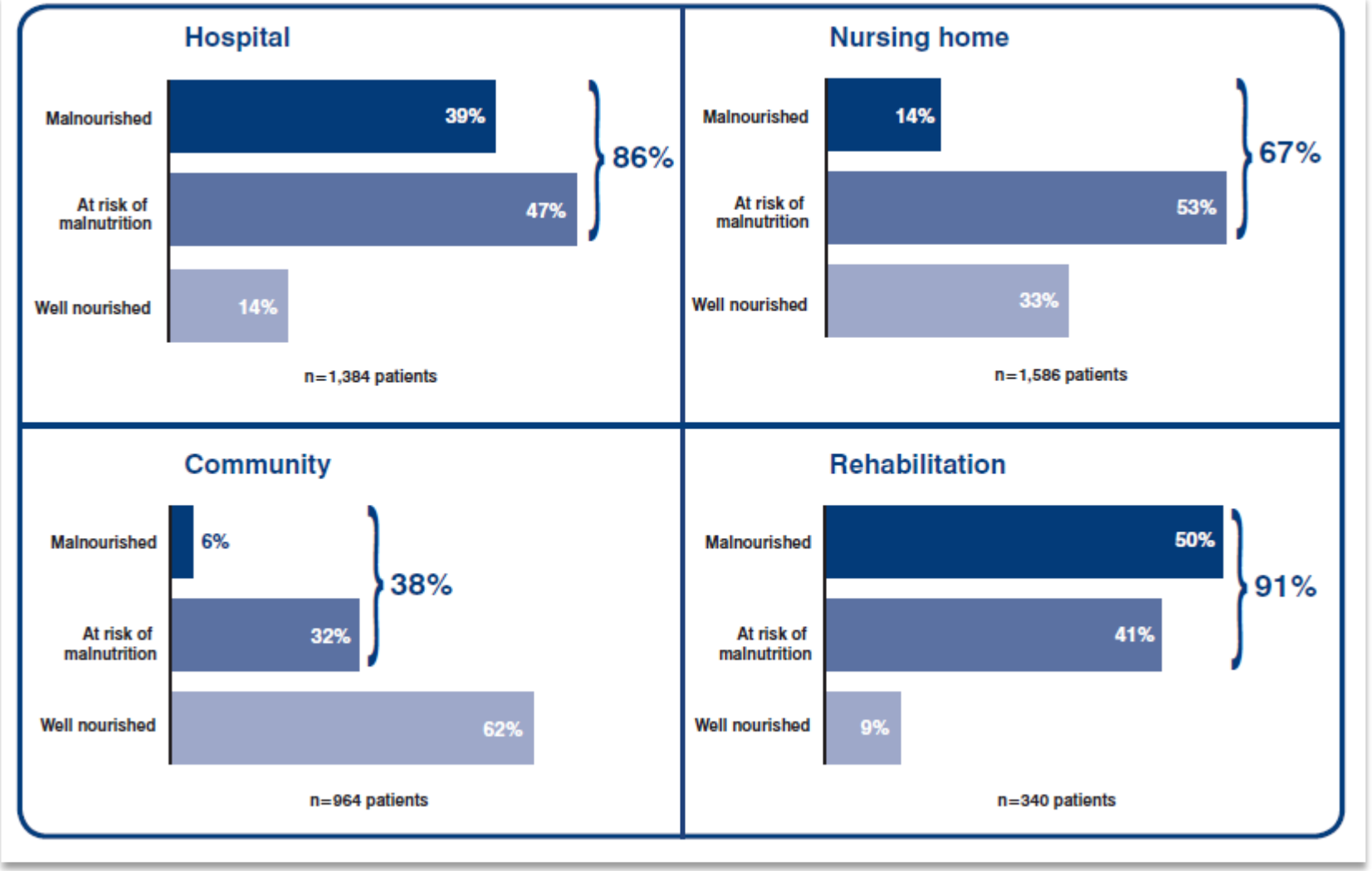
# Malnutrizione

Condizione di alterazione funzionale,
strutturale e di sviluppo dell'organismo
conseguente allo squilibrio tra i fabbisogni,
gli introiti e l'utilizzazione dei nutrienti
e tale da comportare un eccesso di morbilità
e mortalità o un'alterazione della qualità di vita.

SINPE
Società Italiana di Nutrizione Artificiale e Metabolismo

*RINPE* 2002; 20:S5.

# Prevalence of Malnutrition by Healthcare Setting




Kaiser MJ, et al. *Clin Nutr* 2009; 4(S2):113.

# Factors associated with increased risk of malnutrition

- Functional impairment
- Dementia or cognitive impairment
- Swallowing problem
- Depression or apathy
- Less frequent weight checks by staff
- Low facility daily food budget
- Social isolation
- Wound or pressure ulcer
- Recently hospitalized
- Receiving nutritional intervention
- Poor food intake
- Cardiovascular disease
- Stroke
- Smaller facility size
- African-American race

Bell LC, et al. *Curr Opin Clin Nutr Metab Care* 2014; 17.

# Factors associated with decreased risk of malnutrition

- Additional meals provided by family
- Higher staff ratios
- Activities of daily living independence
- Higher Mini-Mental Status Exam Score
- High BMI

Bell LC, et al. *Curr Opin Clin Nutr Metab Care* 2014; 17.

# In the Older Adult Population

- 50% eat less than the RDA for protein

  Kant AK, et al. *J of Amer Coll Nutr* 1999; 18:69-76.

- 90% are Vitamin D deficient

  Cherniack EP et al. *J of Nutr Health and Aging* 2008; 12;366-373.

- 30% are Vitamin B12 deficient

  Bates CJ et al. *J of Nutr Health and Aging* 2002; 6;103-116.

- 30% have inadequate Zinc and Selenium intake

  Abellan van Kan G, et al. *J of Nutr Health and Aging* 2008; 12: 355-364.

  Lauretani F et al. *Am J Clin Nutr* 2007; 86:347-352.

# Microbiota

- Changing microbiota with maturation and aging.
- Diversity is important for a healthy microbioma.

- The microbial community of people in long-stay care was found to be significantly less diverse than that of community dwellers, and the loss of community-associated microbiota correlated with increased frailty.

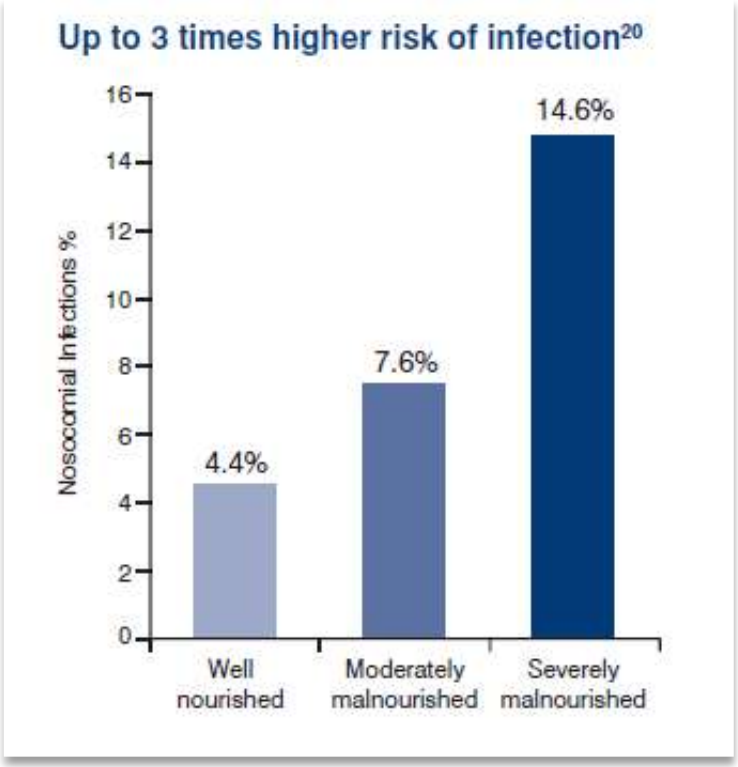
Claesson MJ, et al. *Nature* 2012; 488:178-184.

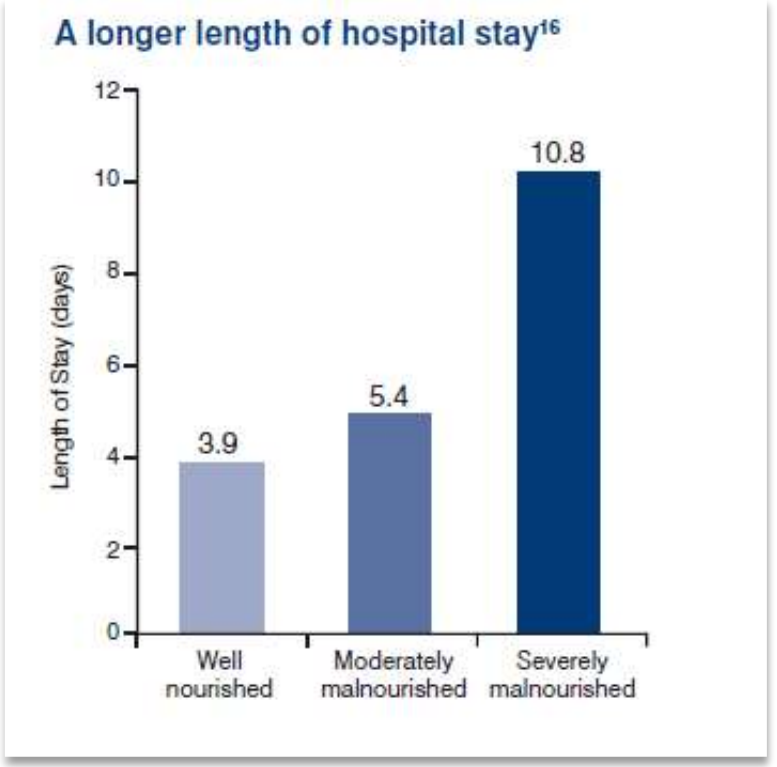
# What Problems does Malnutrition cause in Older Adults?

- Unintentional weight loss
- Tiredness and fatigue *(feeling out of energy)*
- Muscle weakness or loss of strength
- Depression
- Poor memory
- Weak immune system *(higher risk for infection)*
- Anemia
- A greater risk of falls

Johansson Y, et al. *Journal of Clinical Nursing* 2009;18:1354.

# Malnourished Patients

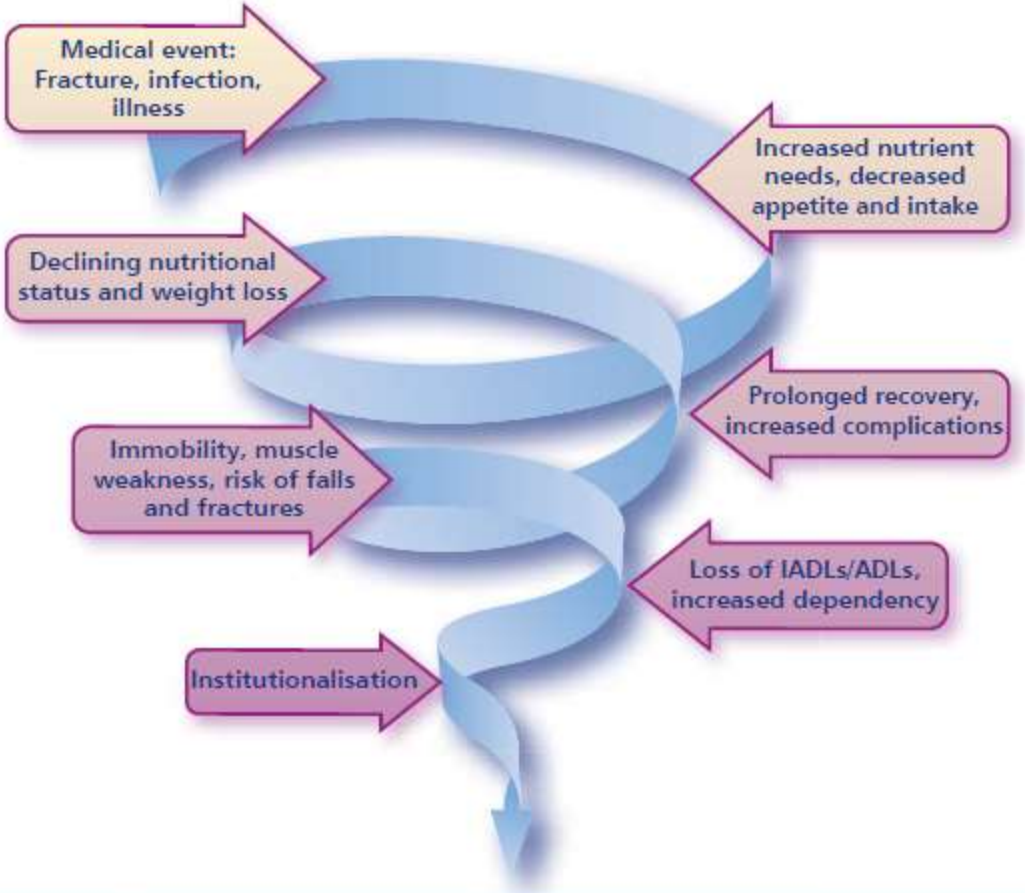



Schneider SM, et al. *Br J Nutr* 2004; 92:105-111.

Pichard C, et al. *Am J Clin Nutr 2004; 79:613-618.*

# Malnutrition and Disease -
## A Downward Spiral Towards Dependence



# The financial costs associated with malnutrition are huge.

It is estimated that the cost of malnutrition to the EU alone is a staggering **€170 billion**.

Ljungqvist O.
Presentation: *The Cost of Malnutrition*. June 11, 2009, Prague.

**Screening**

**Assessment**

**Intervention**

**Monitoring**

| Screening tool | Reference | Focused population/setting |
|---|---|---|
| MNA | Guigoz *et al.* [13,14] | Older adults/all settings |
| MNA-SF | Rubenstein *et al.* [15] | Older adults/all settings |
| Simplified Nutrition Appetite Questionnaire (US-SNAQ) | Wilson *et al.* [16] | Adults and older adults, long-term care and community |
| Short Nutritional Assessment Questionnaire (Dutch-SNAQ) | Kruizenga *et al.* [17] | Adults/hospital, outpatients, community and rehabilitation |
| Malnutrition Universal Screening Tool | Elia [18] | Adults/all settings |
| Nutritional Risk Screening (2002) | Kondrup *et al.* [19] | Adults/hospital |
| Subjective Global Assessment | Detsky *et al.* [20] | Adults/hospital |
| Geriatric Nutritional Risk Index | Bouillanne *et al.* [21] | Older adults/all settings |
| 'Determine your nutritional health checklist' (DETERMINE) | White *et al.* [22] | Older adults/community, hospital and long-term care |

Van Bokhorst de van der Schueren MAE, et al. *Clin Nutr* 2014; 33:39-58.

# A systematic review of screening tools in the hospital setting

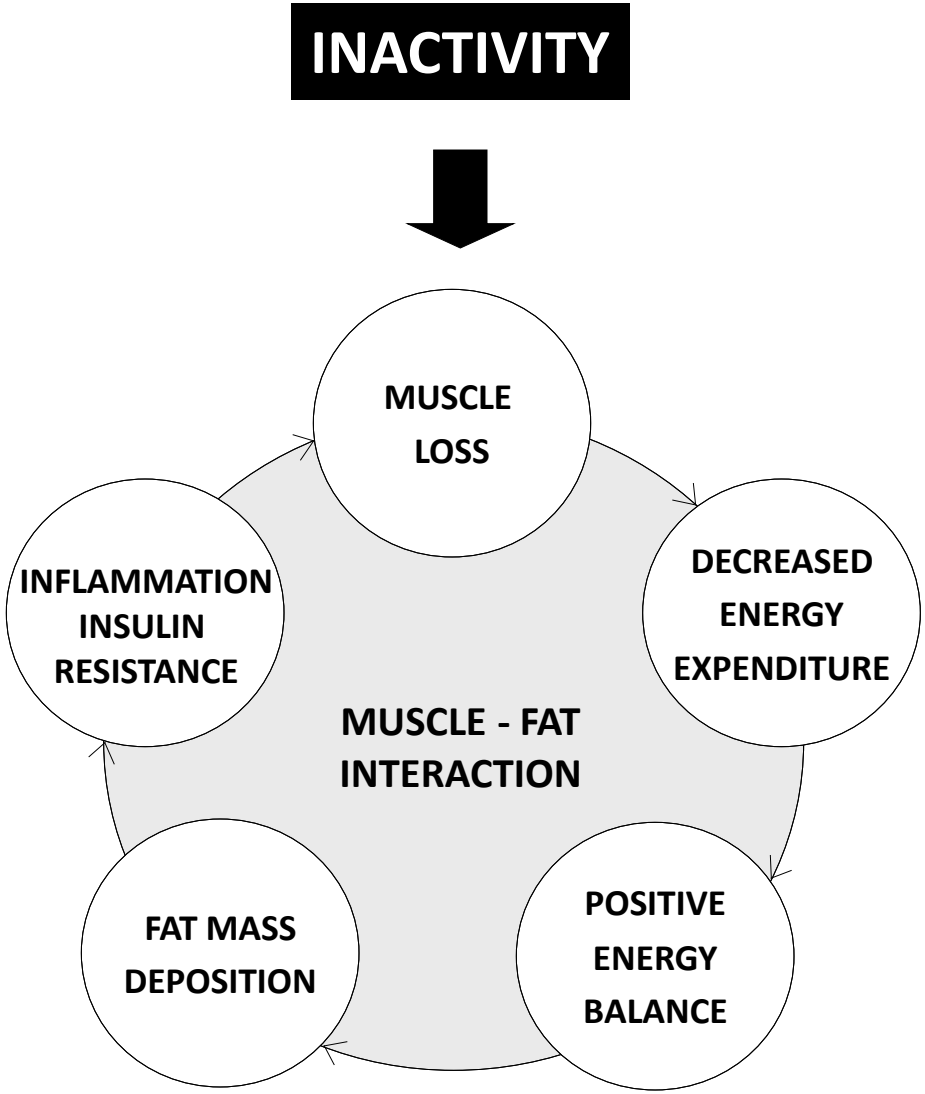
- Not one single screening or assessment tool is capable of adequate nutrition screening as well as predicting poor nutrition related outcome.
- For the older population, none of the tools scored well.
- Age per se is probably a better predictive factor than any of the tools.

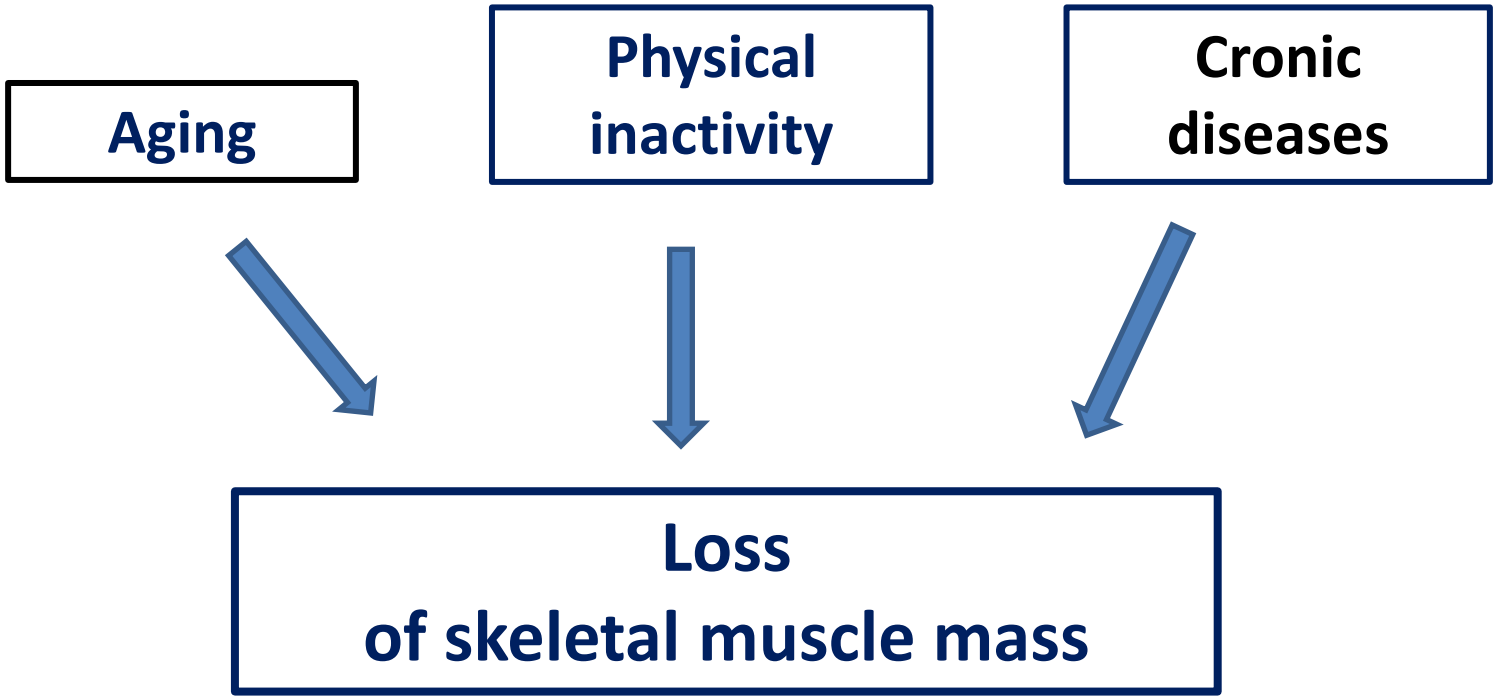
Van Bokhorst de van der Schueren MAE et al. *Clin Nutr* 2014; 33:39-58.

# Medical conditions have to be considered systematically

- Medications *(Digoxin, Theophyllin, Fluoxetin)*
- Emotional causes *(Depression)*
- Alcolholism
- Late-life paranoia
- Swallowing problems
- Oral problems
- Nosocomial infections *(Tb, Clostridium difficile, Helicobacter pylori)*
- Wandering and other behaviour associated with dementia
- Hyperthyroidism, Hypercalcemia, Hypoadrenalism
- Enteral problems
- Eating problems
- Low salt, low fat diet
- Shopping

Morley JE. *Clin Geriatr Med* 2002; 18:853-866.


INACTIVITY
MUSCLE LOSS
DECREASED ENERGY EXPENDITURE
POSITIVE ENERGY BALANCE
FAT MASS DEPOSITION
INFLAMMATION INSULIN RESISTANCE
MUSCLE - FAT INTERACTION


Aging
Physical inactivity
Cronic diseases
Loss
of skeletal muscle mass

*Age and Ageing* 2010; **39:** 412–423
doi: 10.1093/ageing/afq034
Published electronically 13 April 2010



**REPORT**

# Sarcopenia: European consensus on definition and diagnosis

## Report of the European Working Group on Sarcopenia in Older People

ALFONSO J. CRUZ-JENTOFT[1], JEAN PIERRE BAEYENS[2], JÜRGEN M. BAUER[3], YVES BOIRIE[4], TOMMY CEDERHOLM[5], FRANCESCO LANDI[6], FINBARR C. MARTIN[7], JEAN-PIERRE MICHEL[8], YVES ROLLAND[9], STÉPHANE M. SCHNEIDER[10], EVA TOPINKOVÁ[11], MAURITS VANDEWOUDE[12], MAURO ZAMBONI[13]

*European Geriatric Medicine Society*
*European Society for Clinical Nutrition & Metabolism*
*International Association of Gerontology & Geriatrics*
*International Association of Nutrition & Aging*

# Sarcopenia

## Definition

*Syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes (physical disability, poor quality of life and death)*

| Criteria for the diagnosis of sarcopenia |
| --- |
| **Diagnosis is based on documentation of criterion 1 + (criterion 2 or criterion 3)** |
| **1 Low muscle mass** |
| **2 Low muscle strength** |
| **3 Low physical performance** |

Cruz-Jentoft et al. *Age & Ageing* 2010.

# EWGSOP
# Conceptual Stages of Sarcopenia

| Stage | Muscle mass | Muscle strength | | Performance |
|---|---|---|---|---|
| Presarcopenia | ↓ | | | |
| Sarcopenia | ↓ | ↓ | Or | ↓ |
| Severe sarcopenia | ↓ | ↓ | | ↓ |

Cruz-Jentoft et al. *Age & Ageing* 2010.

**Sarcopenia** is now defined as

**decreased gait speed or grip strength**

**in a person with low muscle mass**.

Cederholma T, Morleyc JE. *Curr Opin Clin Nutr Metab Care* 2014; 17.

Age and Ageing 2014; **43:** 748–759
doi: 10.1093/ageing/afu115
Published electronically 21 September 2014



**SYSTEMATIC REVIEWS**

# Prevalence of and interventions for sarcopenia in ageing adults: a systematic review. Report of the International Sarcopenia Initiative (EWGSOP and IWGS)

Alfonso J. Cruz-Jentoft[1], Francesco Landi[2], Stéphane M. Schneider[3], Clemente Zúñiga[4], Hidenori Arai[5], Yves Boirie[6], Liang-Kung Chen[7], Roger A. Fielding[8], Finbarr C. Martin[9], Jean-Pierre Michel[10], Cornel Sieber[11], Jeffrey R. Stout[12], Stephanie A. Studenski[13], Bruno Vellas[14], Jean Woo[15], Mauro Zamboni[16], Tommy Cederholm[17]

**1–29%** in community-dwelling populations
**14–33%** in long-term care populations
**10%** in the acute hospital-care population

# Sarcopenia

Sarcopenia is correlated with:

- mobility disorders,
- ↑ risk falls and fractures,
- impaired ability to perform ADL,
- disabilities,
- loss of independence,
- poor outcome in hospitalized older adults,
- ↑ risk of death.

Cederholm T, Morley JE. *Curr Opin Clin Nutr Metab Care* 2015; 18:1-4.

# Frailty

The presence of three or more of the following five criteria characterise frailty:

- low muscle strength,
- unintentional weight loss,
- feeling of exhaustion,
- poor physical performance,
- reduced physical activity.

Fried LP, et al. *J Gerontol* 2001; 56:146-156.

*The Journal of Nutrition, Health & Aging©*
*Volume 17, Number 9, 2013*

# EDITORIAL

## FRAILTY AND COGNITION: LINKING TWO COMMON SYNDROMES IN OLDER PERSONS

T.K. MALMSTROM[1], J.E. MORLEY[2]

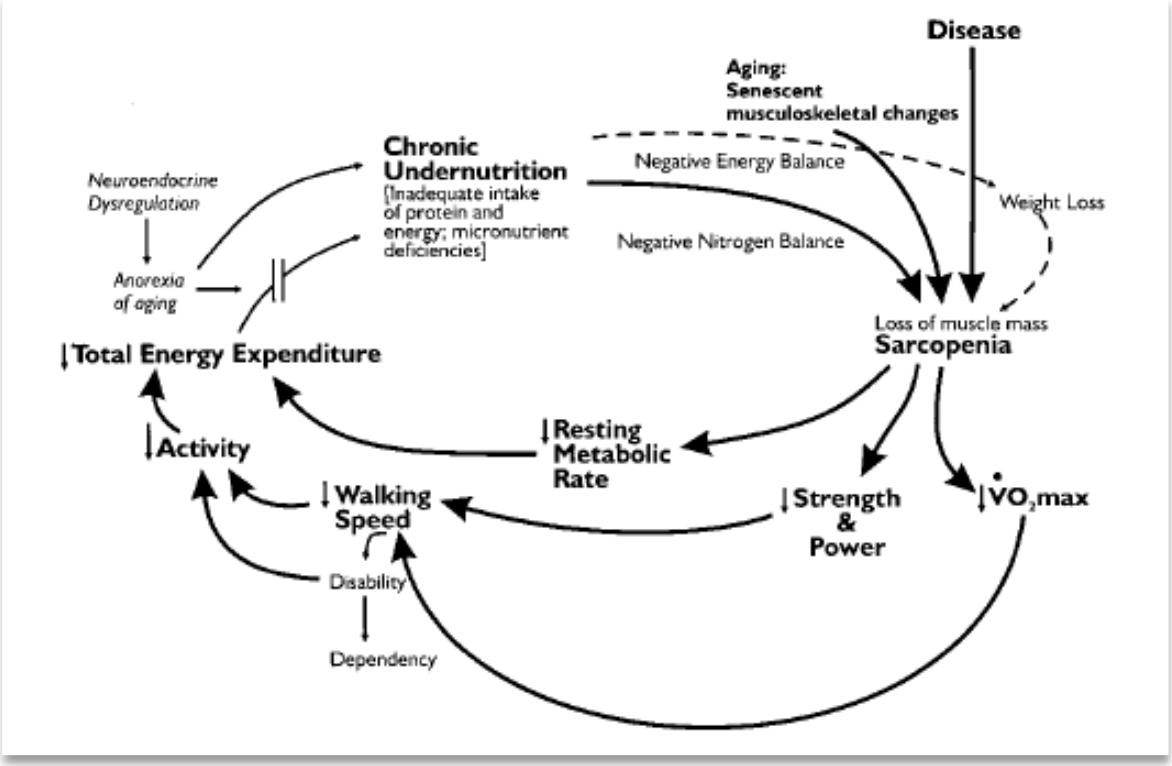
1. Department of Neurology & Psychiatry and Division of Geriatric Medicine, Saint Louis University School of Medicine, St. Louis, Missouri; 2. Divisions of Geriatric Medicine and Endocrinology, Saint Louis University School of Medicine, St. Louis, Missouri. Corresponding author: John E. Morley, MB, BCh, Director, Divisions of Geriatric Medicine and Endocrinology, Saint Louis University School of Medicine, 1402 S. Grand Blvd., M238, St. Louis, Missouri 63104, Email: morley@slu.edu

### The Simple "FRAIL" Questionnaire Screening Tool

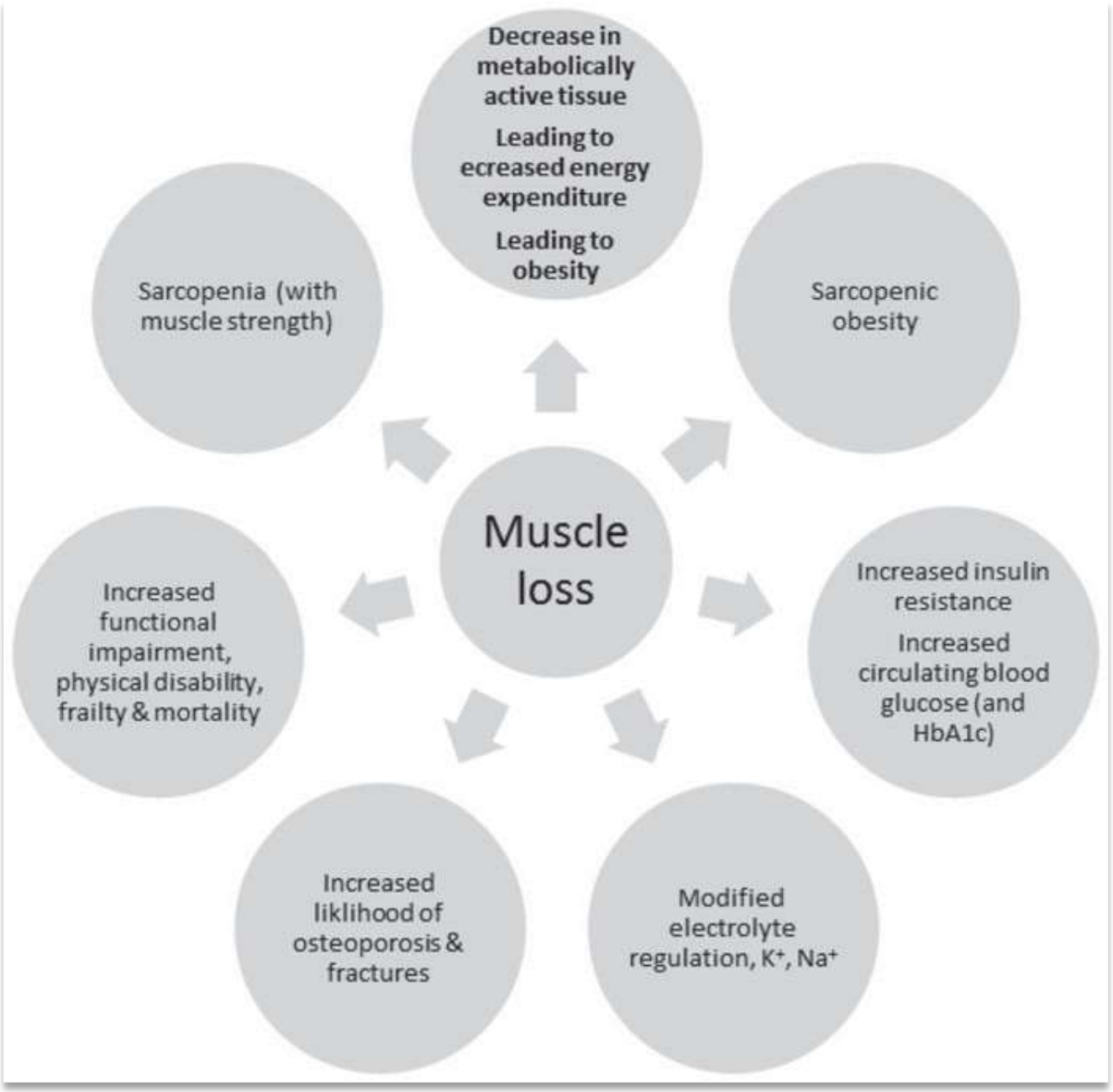
(3-5 = frail; 1-2 = prefrail)

**F**atigue: Are you fatigued?
**R**esistance: Cannot walk up one flight of stairs?
**A**erobic: Cannot walk one block?
**I**llnesses: Do you have more than 5 illnesses?
**L**oss of weight: Have you lost more than 5% of your weight in the last 6 months?

# Cycle of Frailty




Fried LP, et al. *J Gerontol* 2001; 56:146-156.




Welch AA. *Proc Nutr Soc* 2014; 73:16–33.

JAMDA 14 (2013) 542–559

JAMDA

journal homepage: www.jamda.com

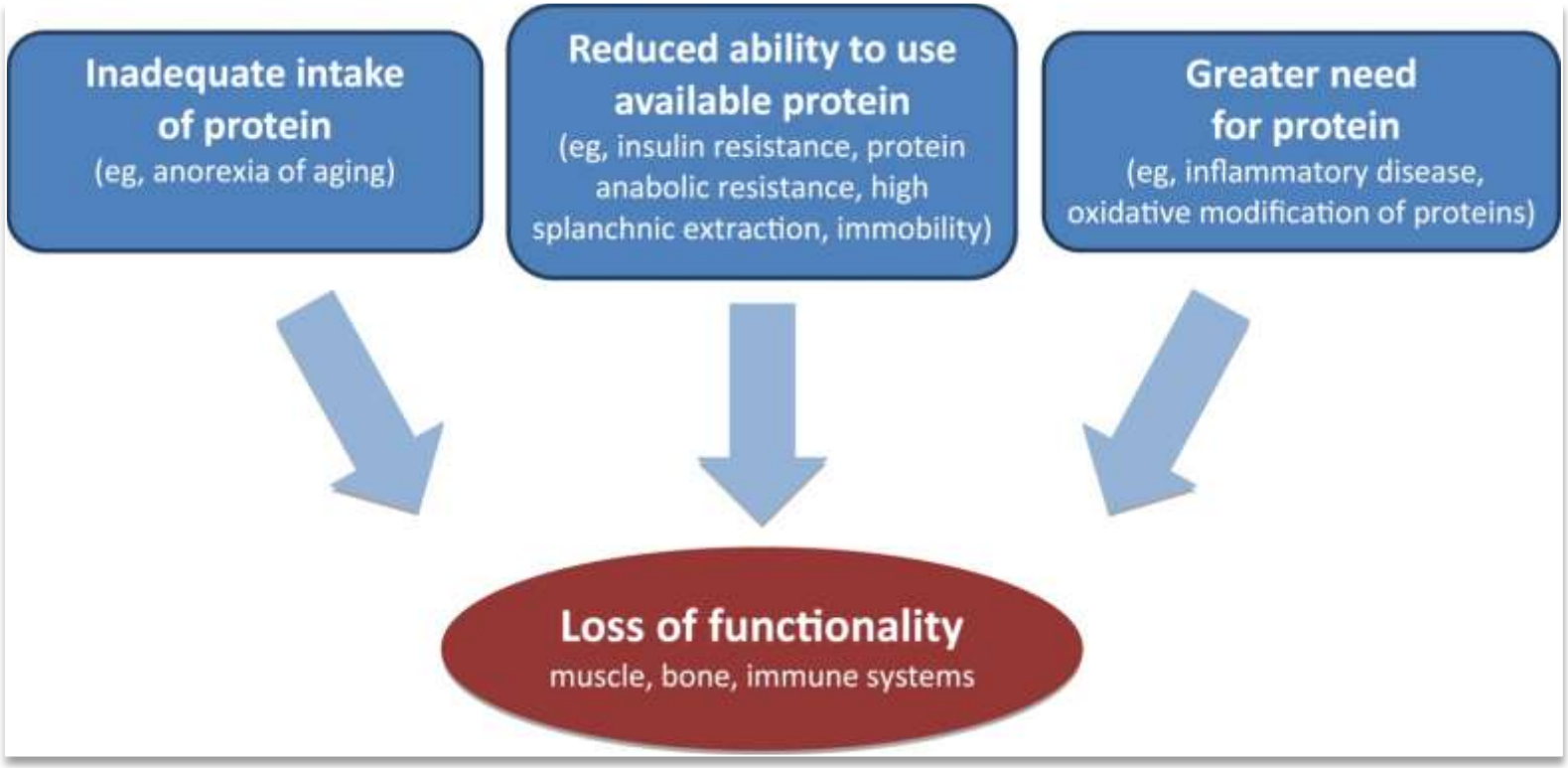
Special Article

# Evidence-Based Recommendations for Optimal Dietary Protein Intake in Older People: A Position Paper From the PROT-AGE Study Group

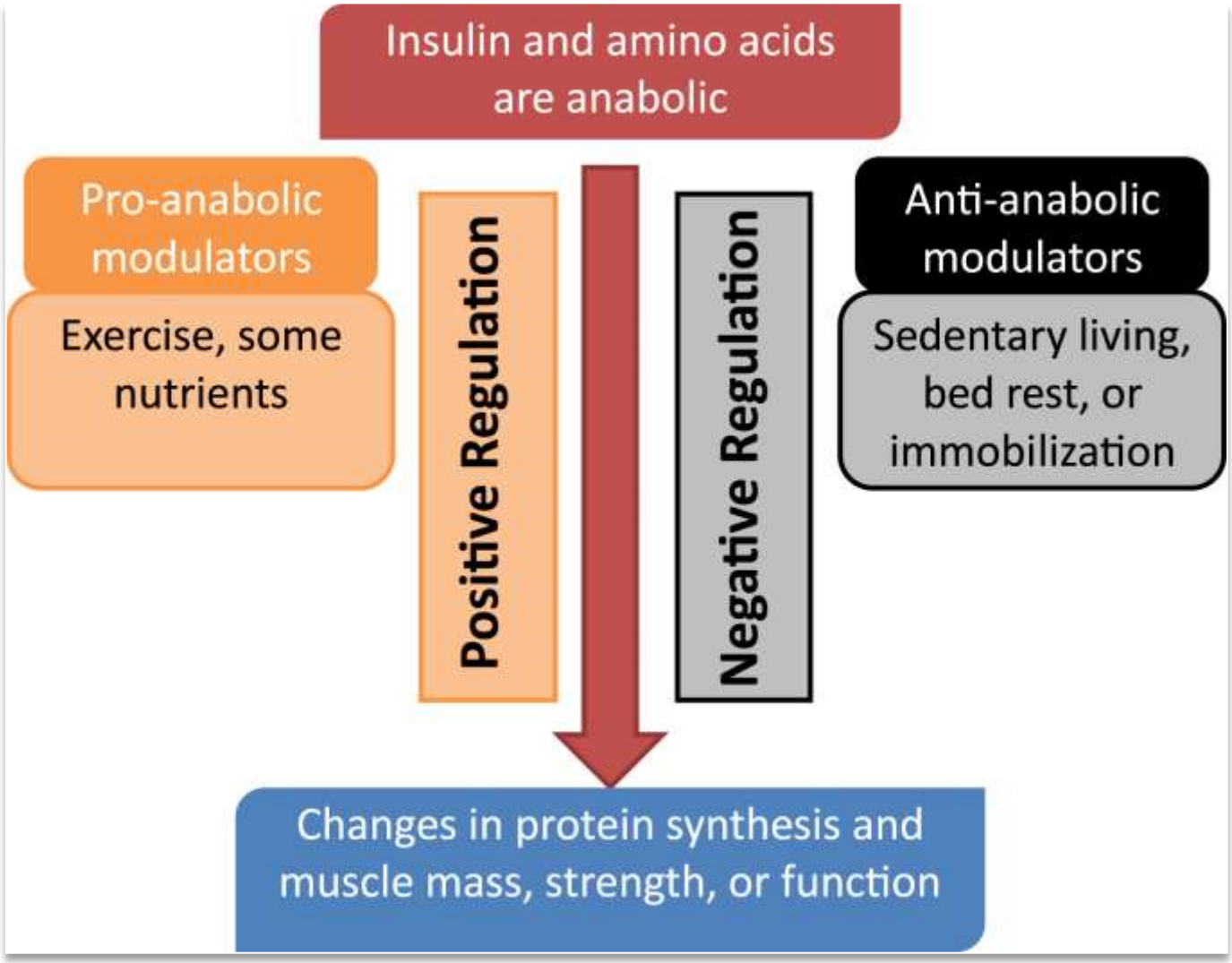
Jürgen Bauer MD [a,*], Gianni Biolo MD, PhD [b], Tommy Cederholm MD, PhD [c], Matteo Cesari MD, PhD [d], Alfonso J. Cruz-Jentoft MD [e], John E. Morley MB, BCh [f], Stuart Phillips PhD [g], Cornel Sieber MD, PhD [h], Peter Stehle MD, PhD [i], Daniel Teta MD, PhD [j], Renuka Visvanathan MBBS, PhD [k], Elena Volpi MD, PhD [l], Yves Boirie MD, PhD [m]

[a] *Geriatric Centre Oldenburg, Oldenburg, Germany*
[b] *University of Trieste, Trieste, Italy*
[c] *Uppsala University, Uppsala, Sweden*
[d] *Université de Toulouse III Paul Sabatier, INSERM UMR1027, Toulouse, France*
[e] *Hospital Universitario Ramón y Cajal, Madrid, Spain*
[f] *Saint Louis University School of Medicine, St Louis, MO*
[g] *McMaster University, Hamilton, Ontario, Canada*
[h] *Friedrich-Alexander-University Erlangen-Nürnberg, Nürnberg, Germany*
[i] *University of Bonn, Bonn, Germany*
[j] *Centre Hospitalier Universitaire Vaudois, Service de Néphrologie, Lausanne, Switzerland*
[k] *University of Adelaide, Adelaide, Australia*
[l] *University of Texas Medical Branch, Galveston, TX*
[m] *Université d' Auvergne, INRA, CRNH, Centre Hospitalier Universitaire, Clermont-Ferrand, France*

# Aging-related causes of protein shortfall.

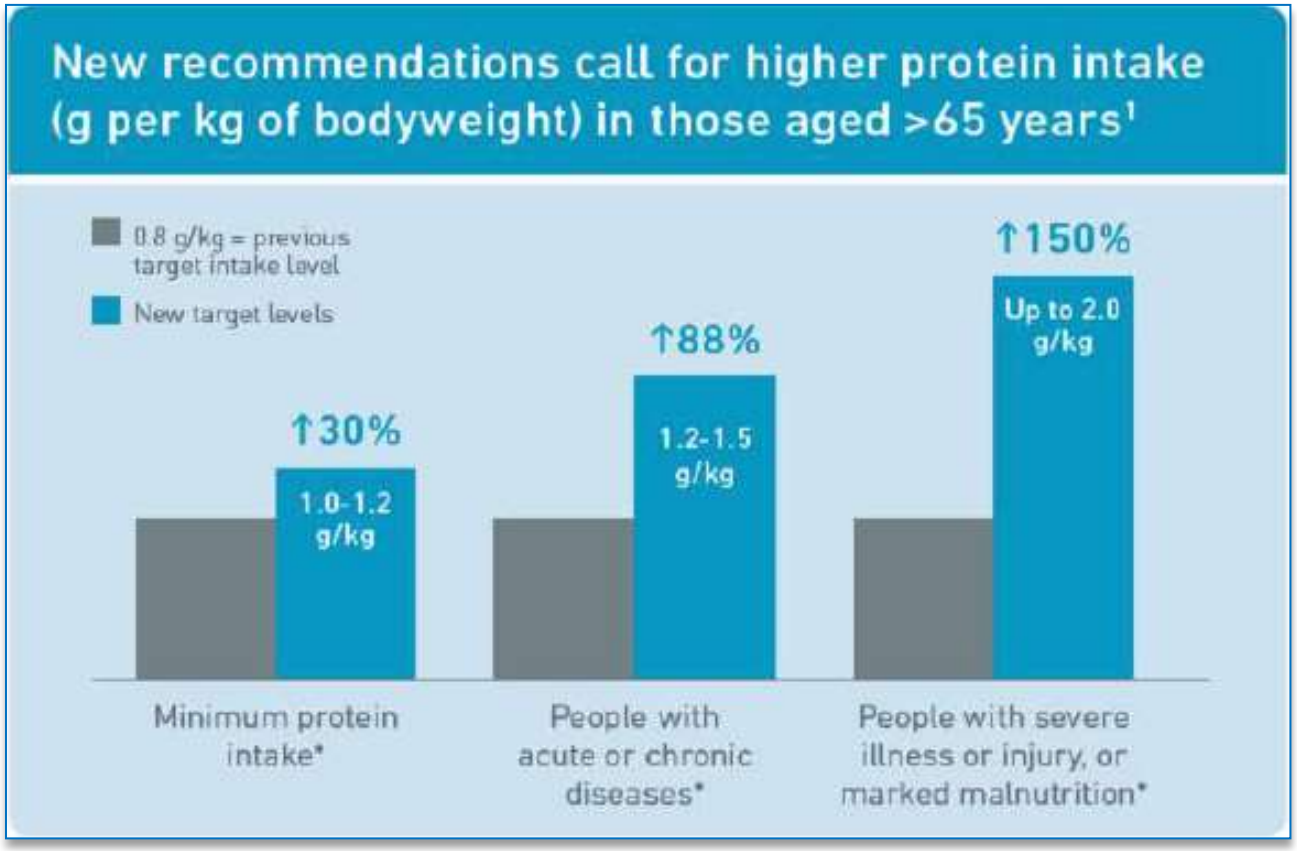



Bauer J, et al. *JAMDA* 2013;14: 542-559.



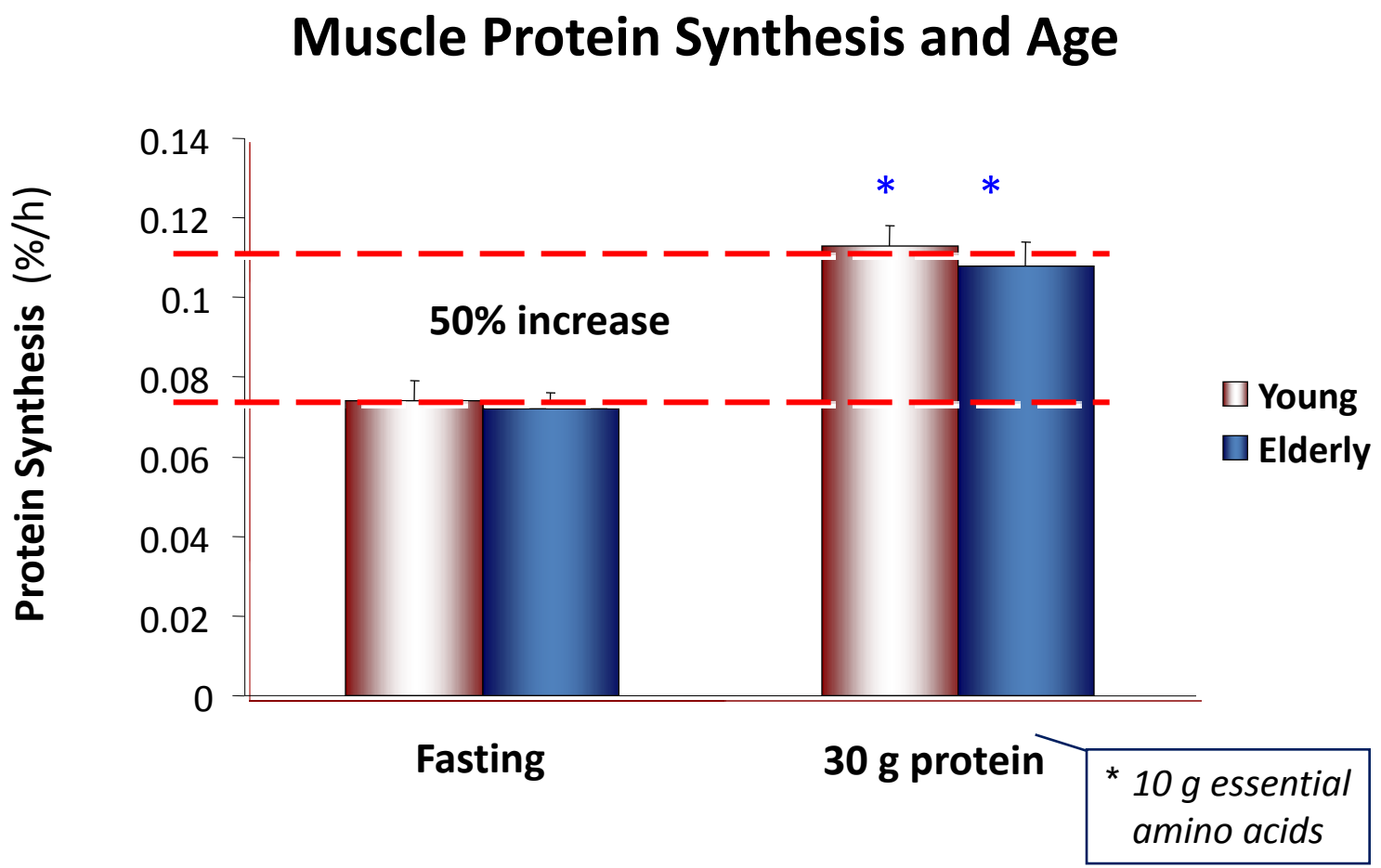

Bauer J, et al. *JAMDA* 2013;14: 542-559.

# PROT-AGE summary




Bauer J, et al. *J Am Med Dir Assoc* 2013; 14:542-559.

# Building muscle in response to protein




Symons TB, et al. *Am J Clin Nutr* 2007; 86:451-456.

The Journal of Nutrition. First published ahead of print June 11, 2014 as doi: 10.3945/jn.114.194217.

The Journal of Nutrition
Nutrient Physiology, Metabolism, and Nutrient-Nutrient Interactions

# Skeletal Muscle Disuse Atrophy Is Not Attenuated by Dietary Protein Supplementation in Healthy Older Men[1,2]

Marlou L. Dirks,[3] Benjamin T. Wall,[3] Rachel Nilwik,[3] Daniëlle H.J.M. Weerts,[4] Lex B. Verdijk,[3] and Luc J.C. van Loon[3]*

[3]NUTRIM School for Nutrition, Toxicology, and Metabolism, Maastricht University, Maastricht, The Netherlands; and [4]Department of Surgery, Maastricht University Medical Center, Maastricht, The Netherlands

→ **Dietary protein supplementation** *(~20 g twice daily)*
**does not attenuate muscle loss**
**during short-term muscle disuse in healthy older men.**

# Oral Supplements

- Meta-analysis (55 studies, 9187 older patients) indicated the oral nutritional intervention in hospitalized older patients

  ↓ 34% mortality and ↓ 28% morbidity.

  Milne AC, et al. *Ann Intern Med* 2006; 144:37-48.

- Review (62 trials, 10187 older patients) indicated the oral nutritional intervention produced weight changes.

  ↓ Mortality significant in undernourished patients.

  Milne AC, et al. *Cochrane Database of Systematic Reviews 2009, Issue 2.*

# Oral Supplements

- Supplements should not replace meals but rather be provided between meals but not within the hour preceding a meal and at bedtime.
- Ensure that oral supplement is at appropriate temperature.
- Ensure that oral supplement packaging is able to be opened by the patients.
- Monitor the intake of the prescribed supplement.
- Promote a sip style of supplement consumption.
- Include supplements as part of the medication protocol.

Capra S, et al. *Best Practice* 2007; 11:14.

Wilson MG, et al. *Nutrition* 2002;75,944–947.

# Specific supplements

- Low volumes and different textures
- Sarcopenia/Frailty
- Pressure ulcers

# Low Volumes/Texture Modified Supplements

↑ Compliance

↑ Nutritional status

↑ Functional capacity

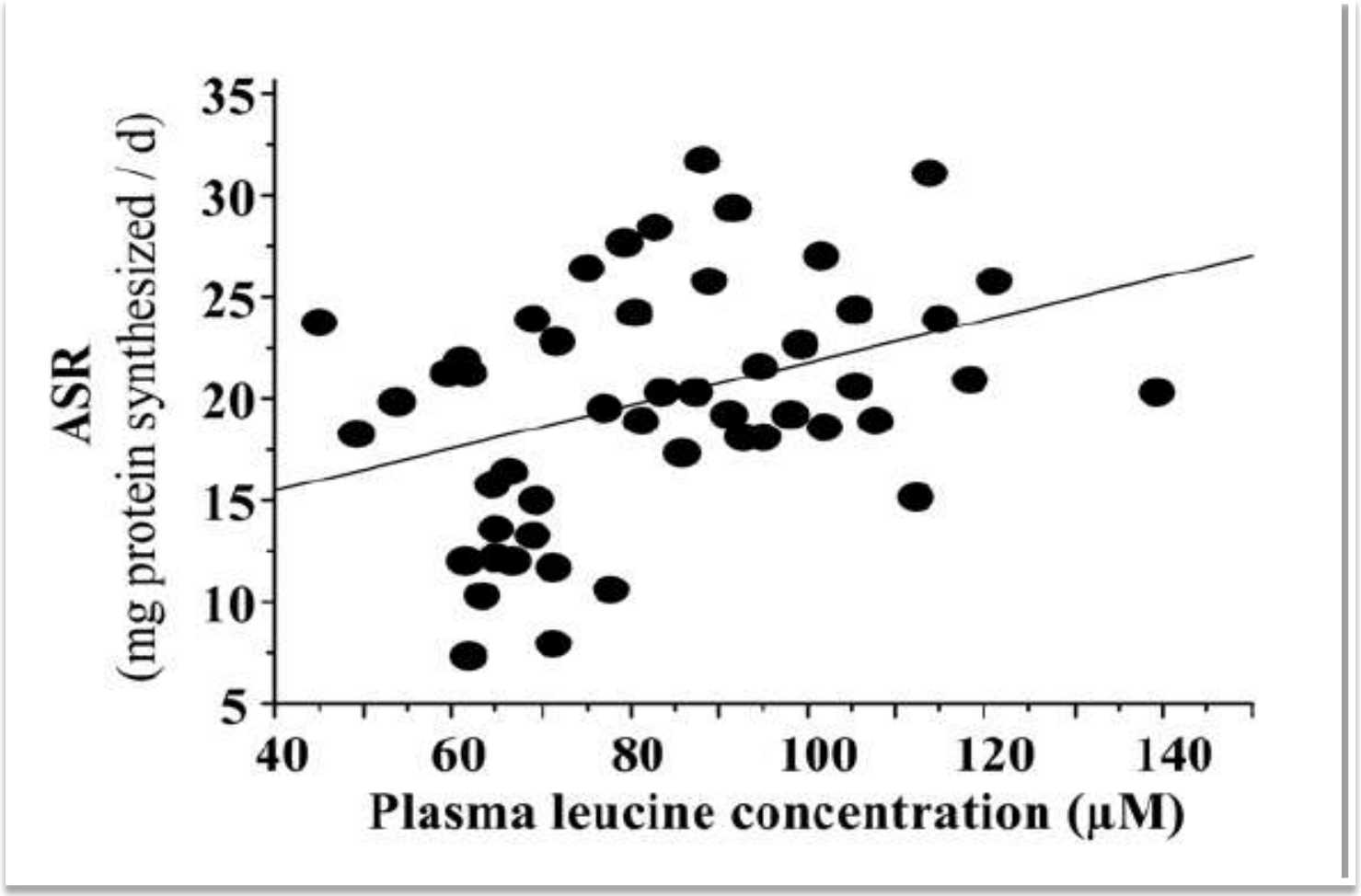
↑ Quality of life

Stange I, et al. *JAMDA* 2013; 14:1-8.

# Specific Supplements for Patients with Sarcopenia

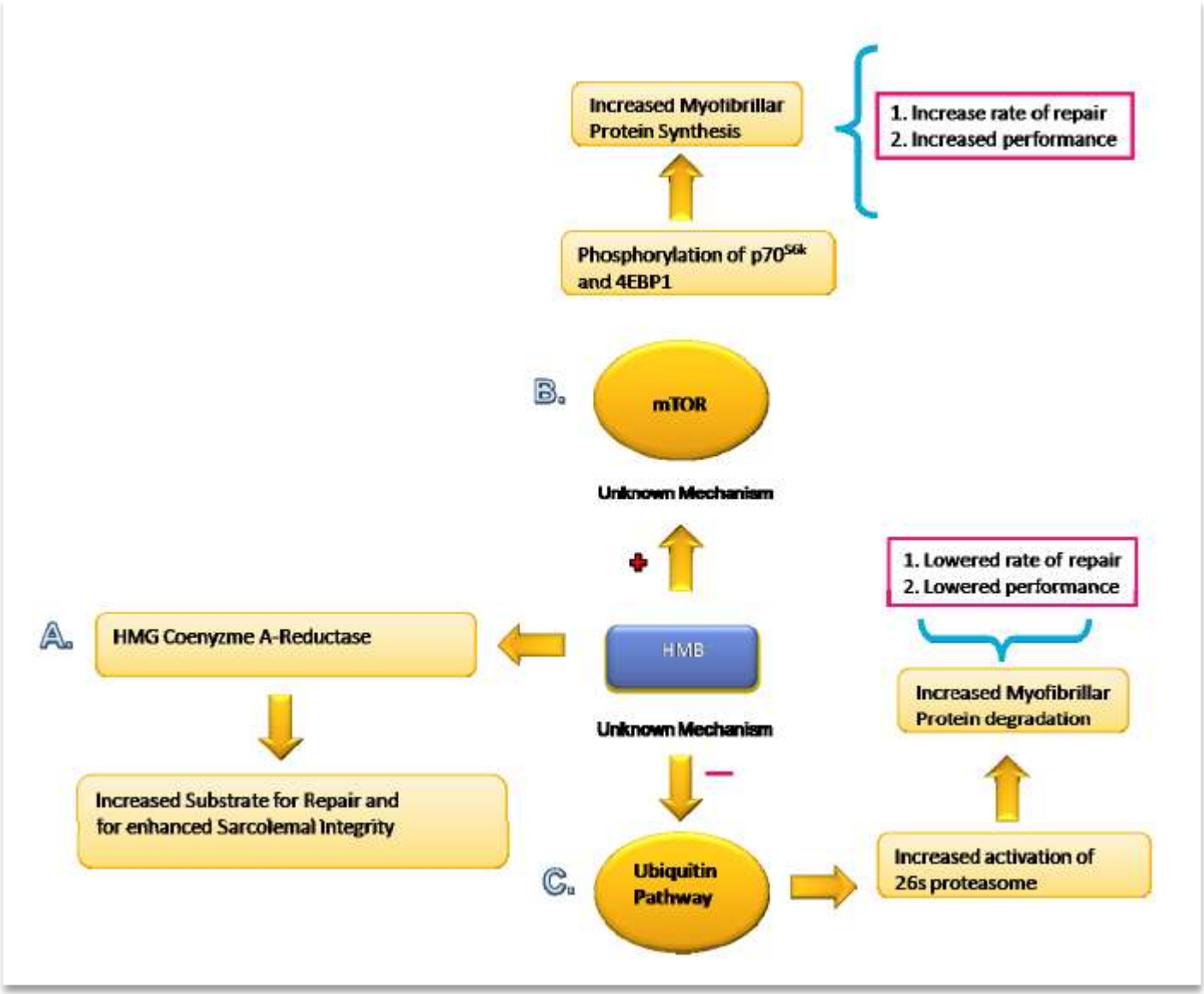
- Hyperproteic-hypercaloric supplement,
  β-HMB + Vit D/$Ca^{+}$ enriched
- Hyperproteic supplement,
  β-HMB + Vit D/$Ca^{+}$ enriched
- Hyperproteic supplement,
  ω-3 FA + Vit D/$Ca^{+}$ enriched
- Hyperproteic supplement,
  Leucine ± Vit D/$Ca^{+}$ enriched

# Plasma leucine concentration and protein synthesis rate




Rieu I, et al. *Nutrition* 2007; 23:323-331.

# Possible Mechanisms of HMB action




Wilson GJ, et al. *Nutrition & Metabolism* 2008; 5:1-17.

*Age and Ageing* 2014; **43:** 748–759
doi: 10.1093/ageing/afu115
Published electronically 21 September 2014



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- Moderate quality evidence suggests that **exercise interventions** improve muscle strength and physical performance.

- **Essential amino acid supplements**, including 2.5 g of leucine, and **β-hydroxy β-methylbutyric acid** (HMB) **supplements**, show some effects in improving muscle mass and function parameters.

# ESSENTIAL AMINO ACIDS AND HMB WITH EXERCISE

| Authors (year) | Design | Sample size (n) | Type of patients | Population age (y) Mean ± SD Sex (m/w) | Duration (wk) | Measurement of body composition | Strength measurement | Quantity and type of intervention | Main Outcomes |
|---|---|---|---|---|---|---|---|---|---|
| Baldi et al. (2010) | RCT | n=28 | Elderly with COPD and loss BW 6 month previous | 73.1 ±6 IG 70.1±6 CG (20/8) | 12 weeks | DXA | NO | EEA (leucine) 200 ml twice a day CG: placebo Both groups exercise rehabilitation | ↑ Fat free mass in intervention group (significant). ↑ Body weight |
| Kim et al. (2012) | RCT | n=155 | Sarcopenic older women | >75 | 12 weeks | BIA | YES | 4 groups: 1- EEA (leucine) + exercise 2- Exercise 3- EEA supplements 4- Health Education | ↑ walking speed in all 3 interventions. ↑ leg mass (1 and 2) ↑ strength group 1 |
| Vukovich et al. (2001) | RCT (db) | n=31 | Healthy older adults | 70 ±1 (15/16) | 8 weeks | DXA | YES | HMB 3g/day CG: placebo + exercise training | ↑ FFM IG vs CG ↑ strength in IG No significant differences |
| Stout et al. (2014) | RCT (db) Two Phases | n P1=43 n P2=36 | Healthy older adults | | | DEXA | YES | Phase 2 IG: HMB 3g/day CG: placebo + resistance exercise | Total leg and arm leg mass ↑ in both groups (↑ placebo). ↑ In strength in both group. |

# Vitamin D

BMJ

RESEARCH

## Fall prevention with supplemental and active forms of vitamin D: a meta-analysis of randomised controlled trials

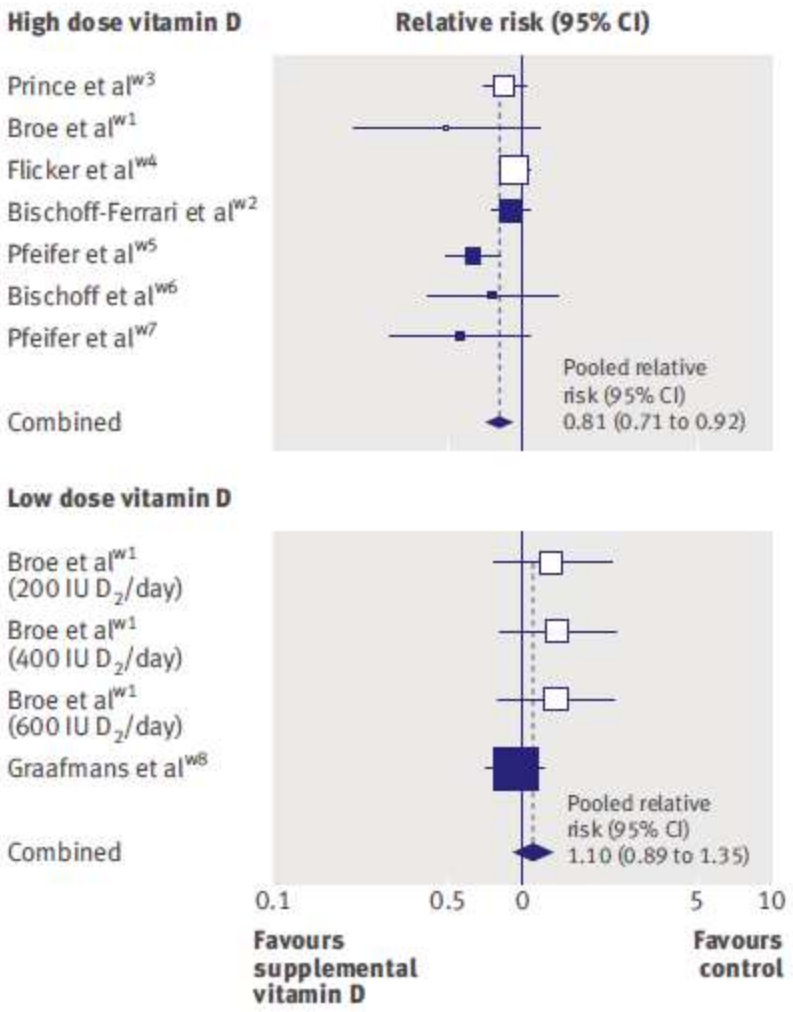
H A Bischoff-Ferrari, director of centre on aging and mobility,[1,2] B Dawson-Hughes, director of bone metabolism laboratory,[3] H B Staehelin, professor emeritus ,[4] J E Orav, associate professor of biostatistics,[5] A E Stuck, professor of geriatrics,[6] R Theiler, head of rheumatology,[7] J B Wong, professor of medicine ,[8] A Egli, fellow,[1] D P Kiel, associate professor of medicine,[9] J Henschkowski, fellow[1,6]

BMJ 2009;339:b3692

- **Vitamin D** has a direct beneficial effect on muscle, and improved strength and balance in several trials in older person.

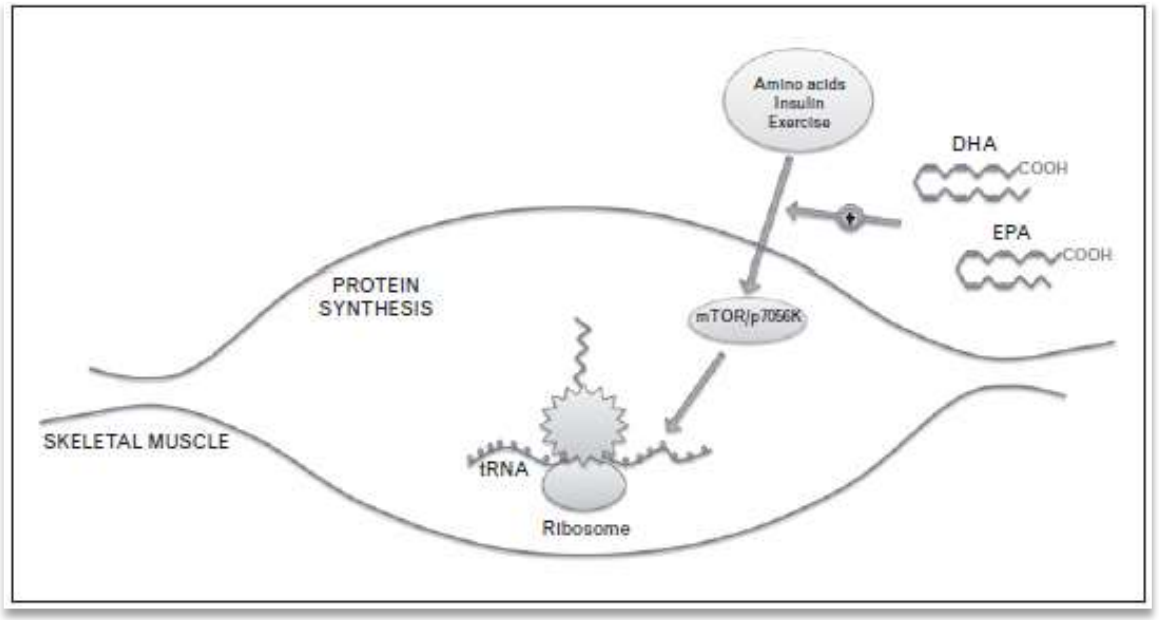
- A dose of **700-1000 UI** supplemental vitamin D a day reduced falls by 19%, and by up to 26% with vitamin $D_3$, within 2-5 months of treatment initiation.

- Vitamin D may not reduce falls at doses of less than 700 UI a day.



# ω-3 Fatty Acids

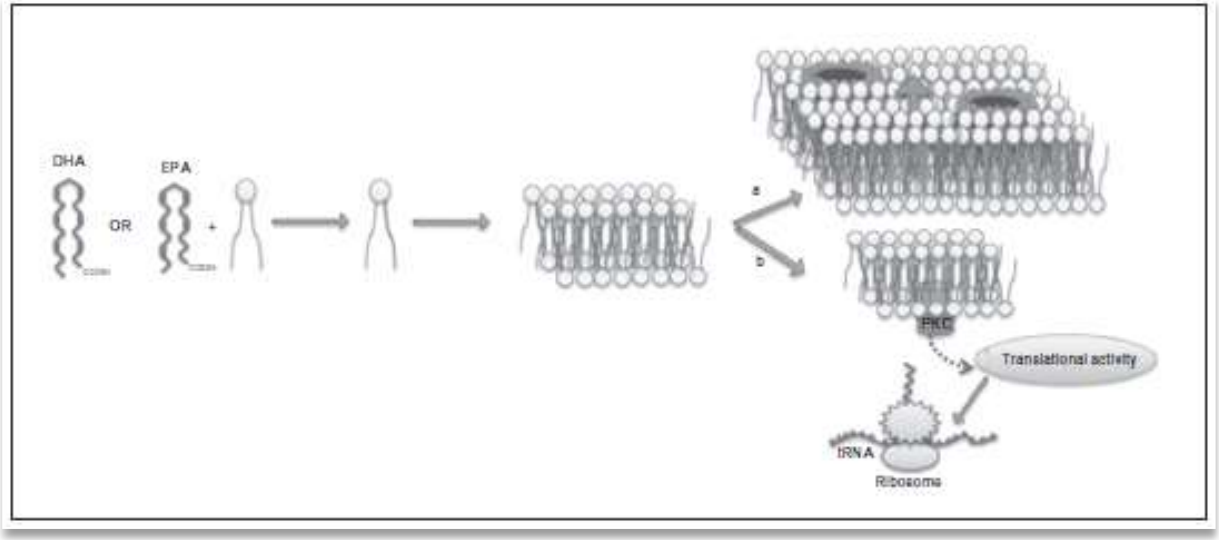
Indirect anabolic effect through mTOR/p70s6k pathway.




Di Girolamo FG, et al. *Curr Opin Clin Nutr Metab Care* 2014; 17:145-150.

# ω-3 Fatty Acids

Indirect anabolic effects
through cell memmbranes composition changes.




Di Girolamo FG, et al. *Curr Opin Clin Nutr Metab Care* 2014; 17:145-150.

# ω-3 Fatty Acids

- 16 healthy older adults. IG: ω-3FA, CG: corn oil.
  Duration 8 weeks.
  ↑Protein synthesis in IG with adequate anabolic stimulus.

  Smith GI, et al. *Am.J.Clin Nutr* 2011;93:402-412.

- 45 older women. IG: ω-3FA (2 g/d) + exercise training,
  CG: exercise training alone. Duration 12 weeks.
  Additional ↑ in muscle strenght and functional capacity.

  Rodacki CL, et al. *Am J Clin Nutr* 2012; 95:428-436.

- 128 post-menopausal women. IG: ω-3FA (1 g/d), CG: olive oil.
  Duration 6 months.
  Increased DHA in IG, ↑ walking speed and ↓ frailty.

  Hutchins-Wiese HL, et al. *J Nutr Health Aging* 2013; 17:76-80.

# Specific Supplements for older patients with PU

**Figure 5. Forest plot of comparison: 4 Treatment with mixed nutritional supplements: arginine-enriched mixed nutritional supplement versus standard hospital diet, outcome: 4.1 PUSH score.**

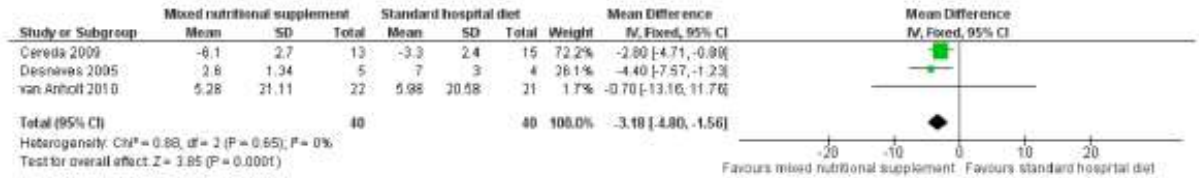
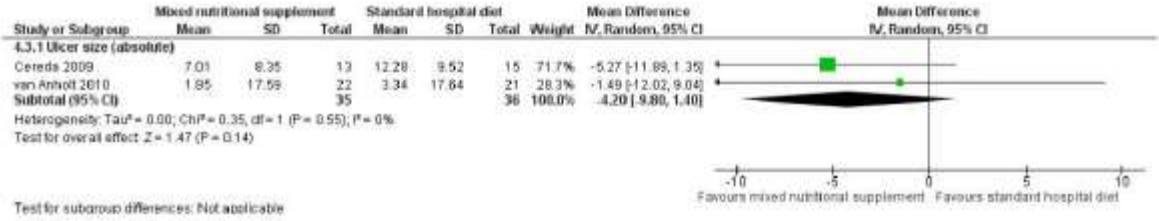


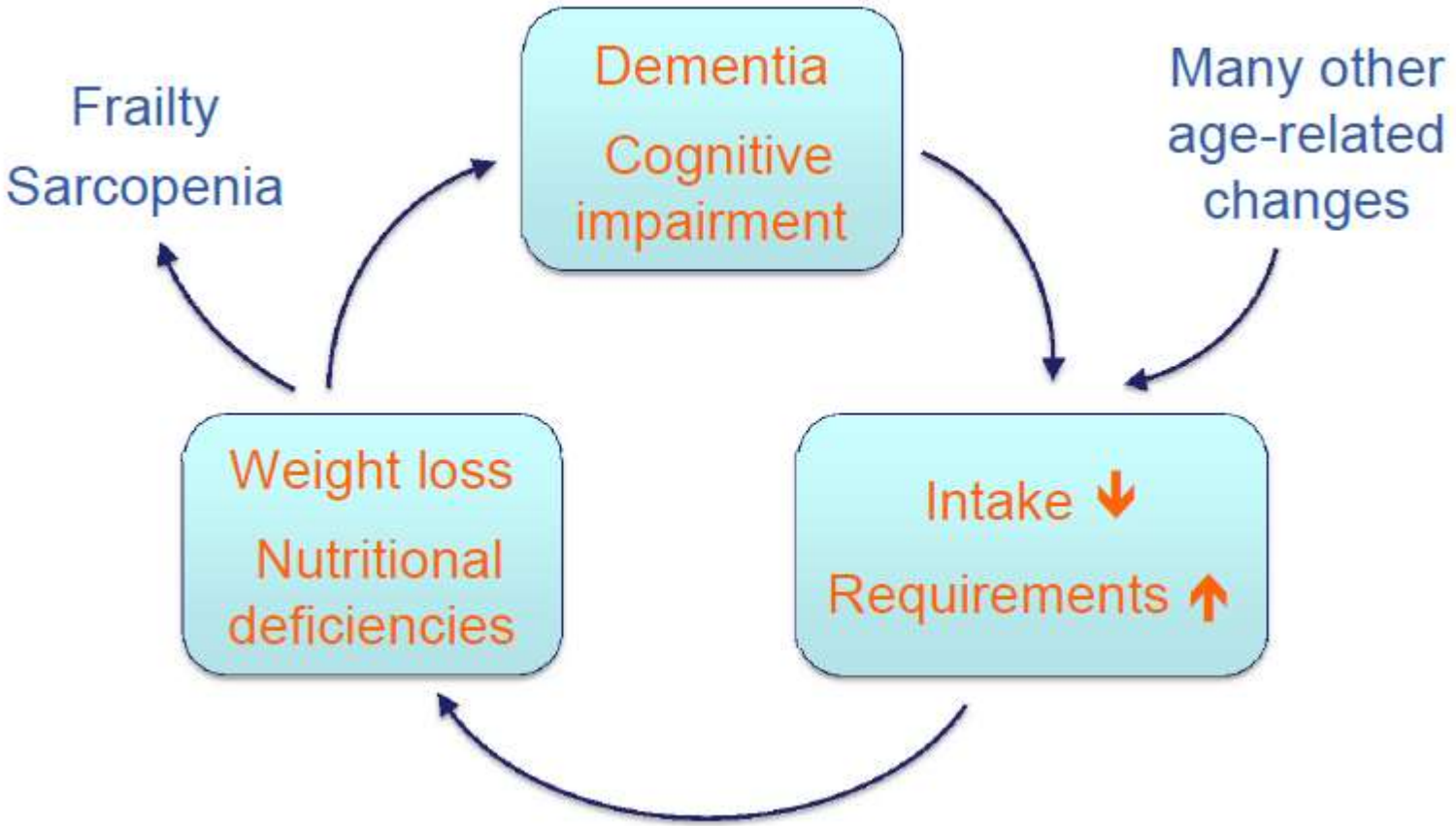

**Figure 6. Forest plot of comparison: 4 Treatment with mixed nutritional supplements: arginine-enriched mixed nutritional supplement versus standard hospital diet, outcome: 4.3 Ulcer size.**




Langer G, Fink A. *Cochrane Data Base Syst Rev* 2014; 6.

THE COCHRANE COLLABORATION®

# Vicious cycle of malnutrition and dementia



# Nutritional problems in dementia

| Nutritional problem | Stage of dementia |
|---|---|
| Olfactory and taste dysfunction | Preclinical and early |
| Executive planning difficulties (shopping, preparing food) | Mild to moderate |
| Attention deficits | Mild to moderate |
| Dyspraxia | Mild to moderate |
| Agnosia | Mild to moderate |
| Behavioural problems | Moderate to severe |
| Oropharyngeal dysphagia | Severe |
| Refusal of eating and drinking | Severe |

# ESPEN Guideline Dementia

- **We recommend to screen every dementia patient for malnutrition and other specific nutritional problems. In case of positive screening, assessment has to follow.**

  *Tools*

  - Mini Nutritional Assessment (MNA)
  - Adverse Feeding Behaviour Inventory (Blandford Scale)
  - Edinburgh Feeding Evaluation in Dementia Questionnaire

  *When?*

  - At the time of diagnosis
  - In hospitals at admission and at discharge

- **We recommend monitoring and documentation of weight every month.**

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# **Strategies to support oral nutrition** - 1

We recommend ...

… to provide meals in a pleasant, homelike atmosphere; (B)

… to provide adequate food according to individual needs and preferences; (D)

… to encourage adequate food intake and to provide adequate support; (D)

... to eliminate potential causes of malnutrition as far as possible; (D)

… avoiding dietary restrictions. (D)

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# **Strategies to support oral nutrition** - 2

We recommend *against the use of* ***appetite stimulants.***

(D)

- Small studies with **dronabinol and megestrol acetate**
- No consistent effects on outcomes
- Potentially harmful side effects

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# **Strategies to support oral nutrition** - 3

We suggest **education of caregivers to ensure basic** knowledge about nutritional problems related to dementia and about possible strategies to intervene. (C)

- Training for family caregivers and staff
- Improvements of knowledge & attitudes of caregivers and of nutritional status of demented persons

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# **Supplementation** -1

- We recommend correcting nutritional deficiencies by supplementation. (D)
- We recommend ONS for demented persons with malnutrition. (B)
  Moderate evidence for improvement of nutritional status.
- We recommend *against the use of ONS for* prevention or correction of cognitive or functional decline. (B)
  Moderate evidence for lacking effects regarding function.

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# **Supplementation** -2

- We recommend *against the systematic use of **special*** **medical foods for prevention or correction of cognitive**, functional or nutritional decline.
- Some products specifically designed for cognitve improvement.
- Limited evidence for small effects in early disease stages.

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# **Supplementation** -3

- We recommend *against the use of **any other*** **nutritional product.**

  Polypeptides, Homotaurine, Lecithin, Curcumin ...

  Available studies do not show any benefit

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# **Tube feeding** (TF)

- We recommend *against the initiation of TF* in **severe dementia.** (A)

  High evidence for lacking benefit – relevant potential risks.

- We suggest TF for a limited period of time in patients with **mild or moderate dementia** if malnutrition is predominantly caused by a potentially reversible condition to overcome a crisis situation with markedly insufficient oral intake. (D)

  No evidence for benefit but also no reason for different proceeding in patients with and without dementia.

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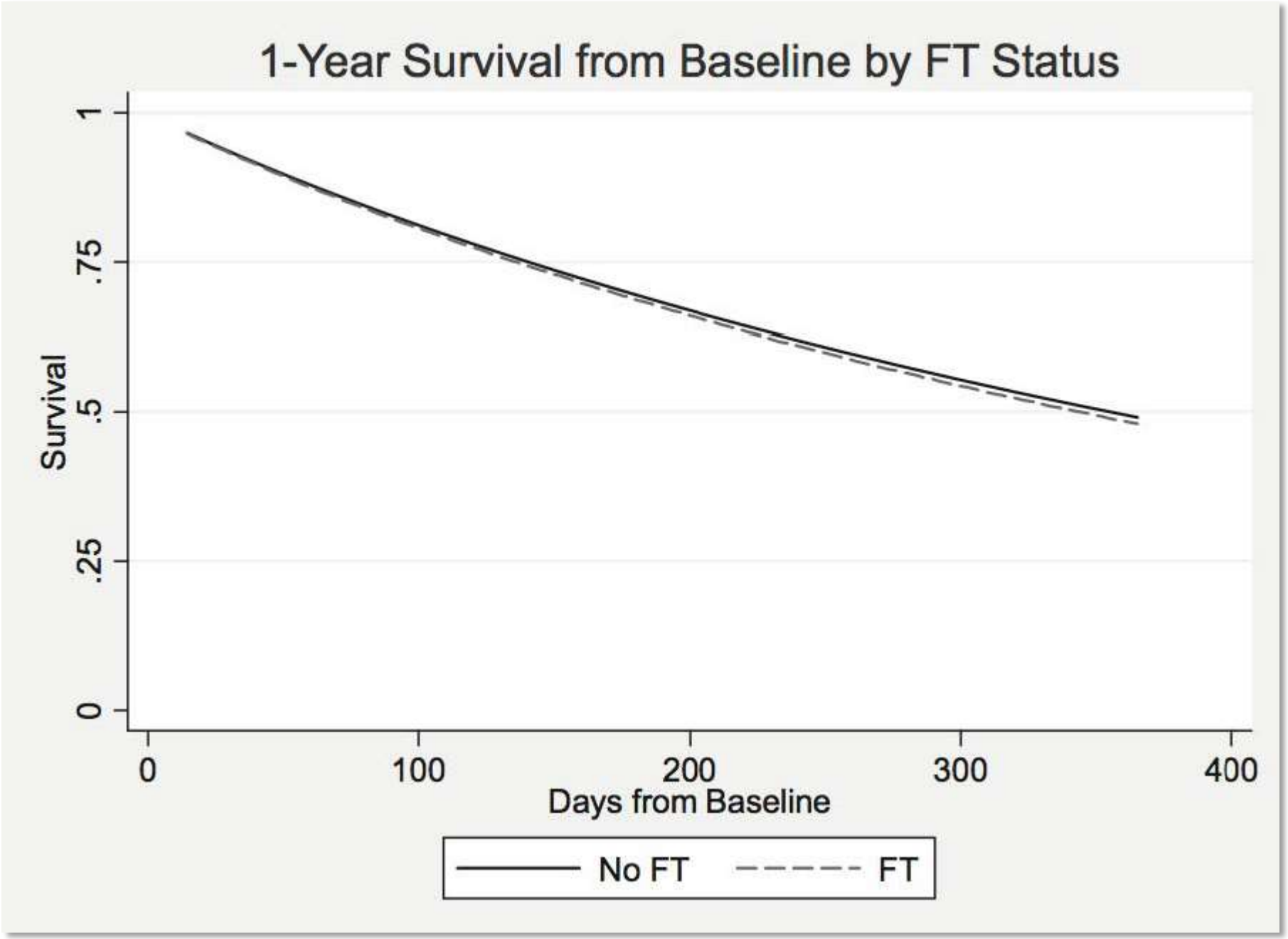


Teno JM, et al. *J Am Geriatr Soc* 2012; 60:1918-1921.

# Parenteral nutrition

- We suggest **PN** as an alternative
  if there is an indication for artificial nutrition,
  as described above, but enteral feeding
  is contraindicated or not tolerated. (D)

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# Parenteral fluid

- We suggest parenteral fluids, preferably via the **subcutaneous route, for a limited period of time** in periods of insufficient fluid intake to overcome a crisis situation. (D)

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# Artificial nutrition

- We recommend against the use of EN, PN and PF in the **terminal phase of life.** (D)
- We recommend that each decision for or against artificial nutrition in dementia patients is made on an individual basis with respect to general prognosis and patients' preferences. (D)

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# ESPEN expert group
## Maintaining muscle health

## DIETARY PROTEIN INTAKE

- Older adults have greater protein needs to compensate for anabolic resistance and hypermetabolic disease.
- Older adults may also have decreased intake due to age-related appetite loss, medical conditions, financial limits.
- Optimale intake of at least **1.0 to 1.5 g protein/kg BW/day** is recommended; individual needs depend upon the severity of malnutrition risk.

## EXERCISE

- **Regular exercise** helps maintain skeletal muscle strength and function in older adults.
- Resistance training has limited but positive effects on recovery of muscle in older people.
- A combination of resistance training and adequate dietary protein/aminoacid intake for healthy muscle aging is recommended.

# Grazie per l'attenzione