

TARGETING MUSCLE IN MALNUTRITION RELATED CONDITIONS



Better Foods Better Health 2016

Johan de Vogel-van den Bosch

THE 'HIDDEN AND VISIBLE' PROBLEM OF MALNUTRITION

“Undernutrition does not show up in the streets in Europe. Instead undernutrition is a hidden health problem residing at home or in care homes”



“While overnutrition is apparently everywhere around us, with 29% of the world population overweight or obese”

WHAT IS MALNUTRITION....

Malnutrition

Imbalance intake/needs

Undernutrition

Insufficient intake to meet physiological requirement

Overnutrition

Too many calories or nutrients

Condition
related
elevated
need

Protein &
energy
malnutrition

Low diet
quality:
Low cal,
Low nutrient

Low diet
quality:
High cal,
Low nutrient

Overfeed-
ing

Toxicity

Malnutrition related conditions

EDUCATION NEEDED: AWARENESS AND RESPONSIBILITY UNDERNUTRITION CARE LOW!

Netherlands

UK

Limited undernutrition awareness

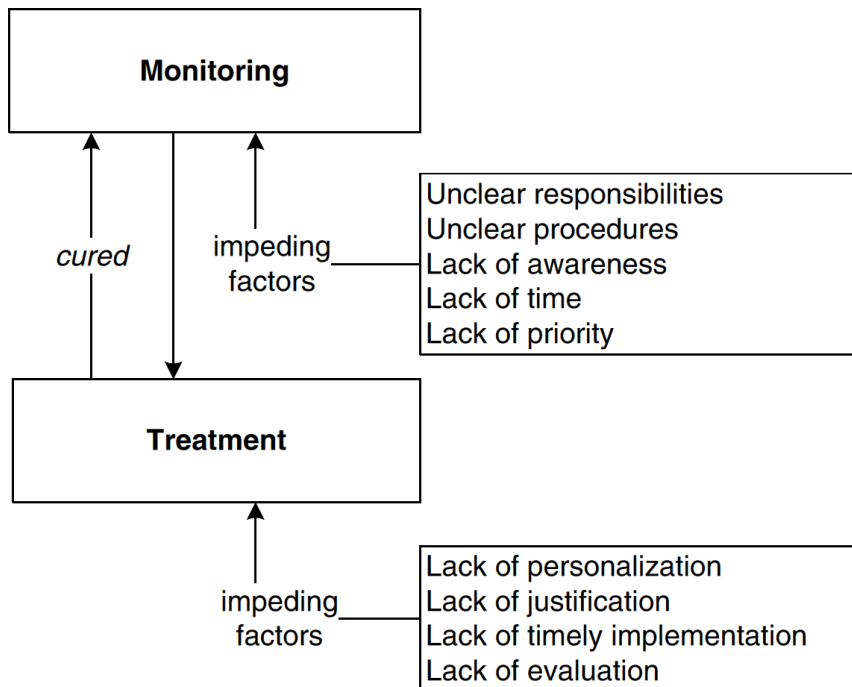


Fig. 1 Conceptual model of nutrition and care professionals' experiences regarding undernutrition management

Malnutrition is a neglected issue in elderly care: UK report



By Annie-Rose Harrison-Dunn+
02-Mar-2016
Last updated on 03-Mar-2016 at 09:29 GMT

3 comments



'Commissioners aren't necessarily thinking about tackling falls by tackling malnutrition,' says Age UK. © iStock.com / Attila Barabas

Related tags: Malnutrition, Nutrition, Hospital, Elderly, Medical, UK, Health, Risk, Ageing, Population, NHS, Care, Older, Diet, Supplements

Only half of UK health professionals think malnutrition is a priority in their organisations, a survey commissioned by charity Age UK has found.

PREVALENCE OF UNDERNUTRITION

Undernutrition is a major public health concern that frequently goes unrecognised and untreated

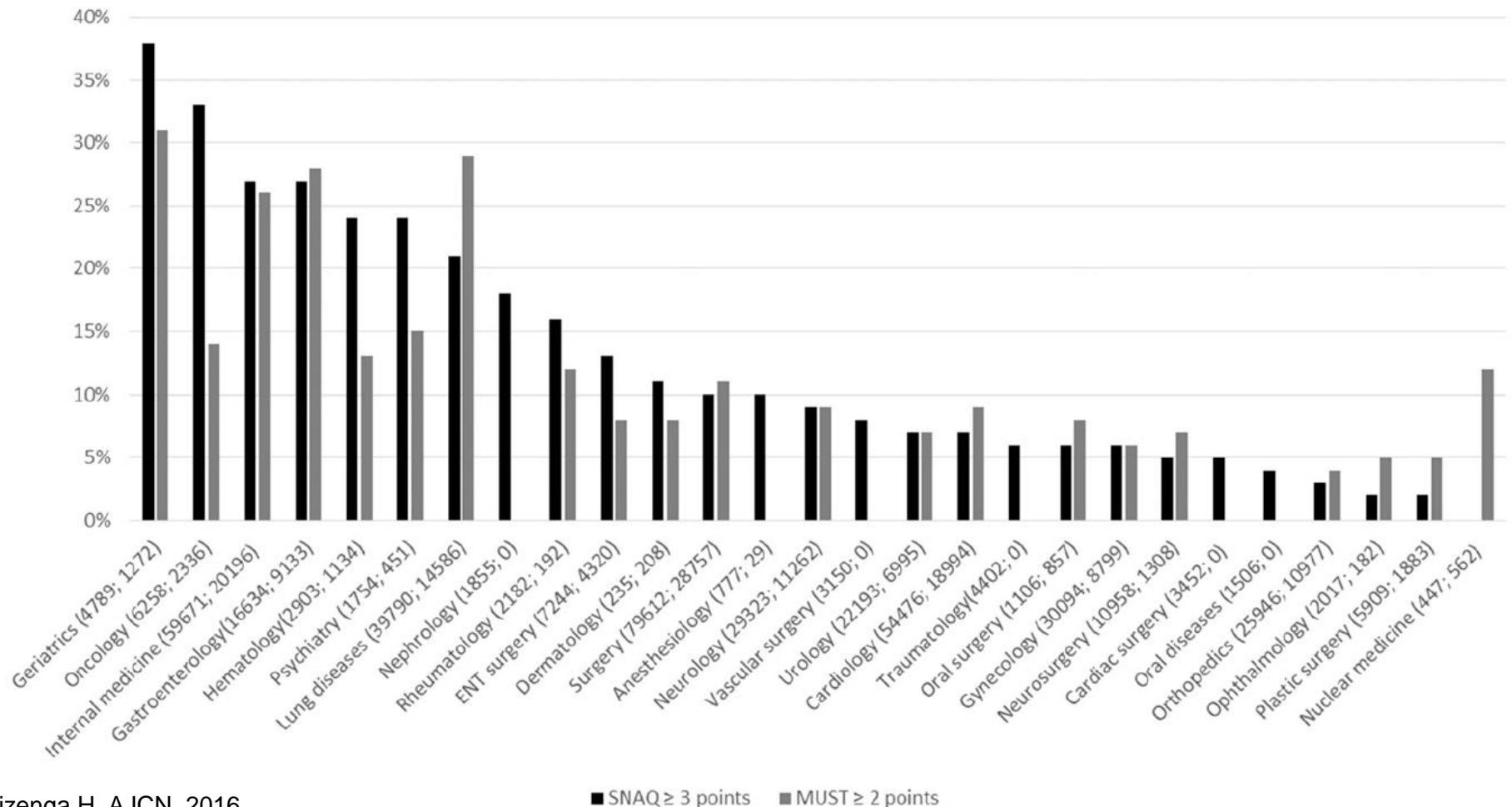
An estimated 33 million people in Europe are at risk of undernutrition¹

Population of Europe:
> 800 million

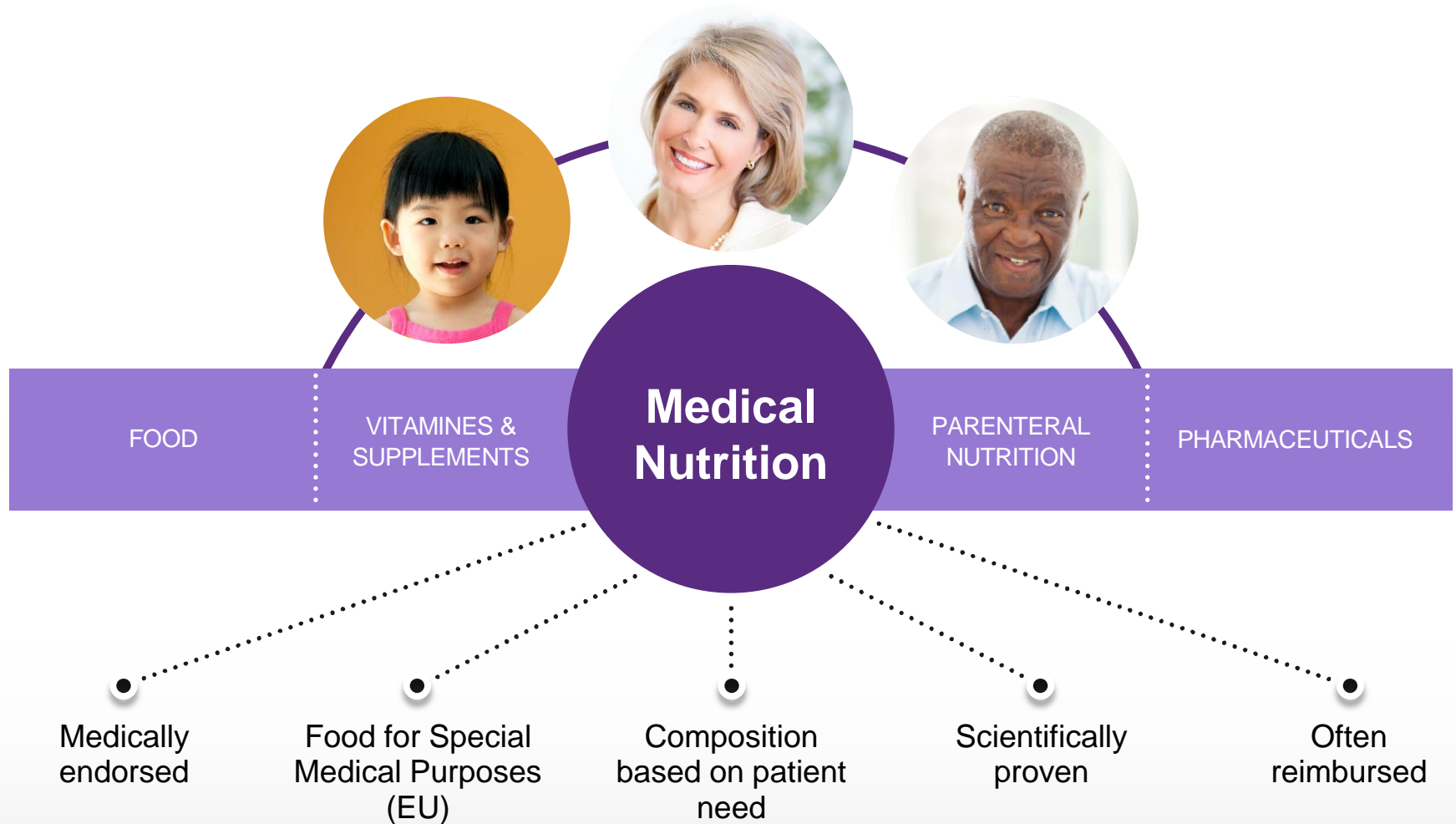


THE PERCENTAGE OF “SCREENING RESULT UNDERNOURISHED” PER MEDICAL SPECIALTY IN 564,000 PATIENTS

- HOSPITAL STAY WAS 1.4 DAY LONGER AMONG UNDERNOURISHED VS WELL NOURISHED



MEDICAL NUTRITION: A UNIQUE POSITION



USE OF MEDICAL NUTRITION CONTRIBUTES TO

Improved effectiveness
medicine

Strengthened physiological
processes

Reduced risk of complications

Positive influence on recovery

Avoidance of specific food
components



Cancer

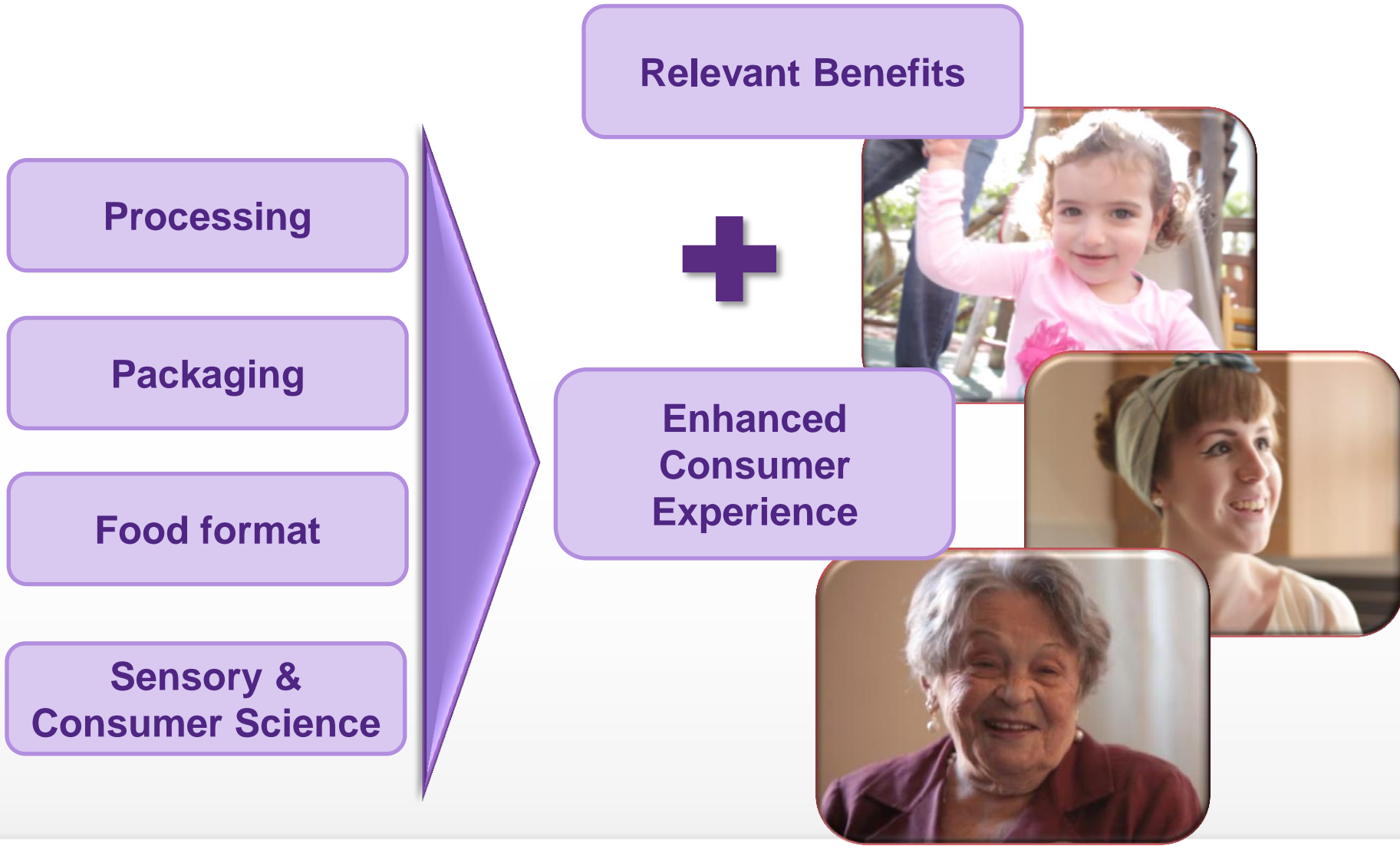


Surgery

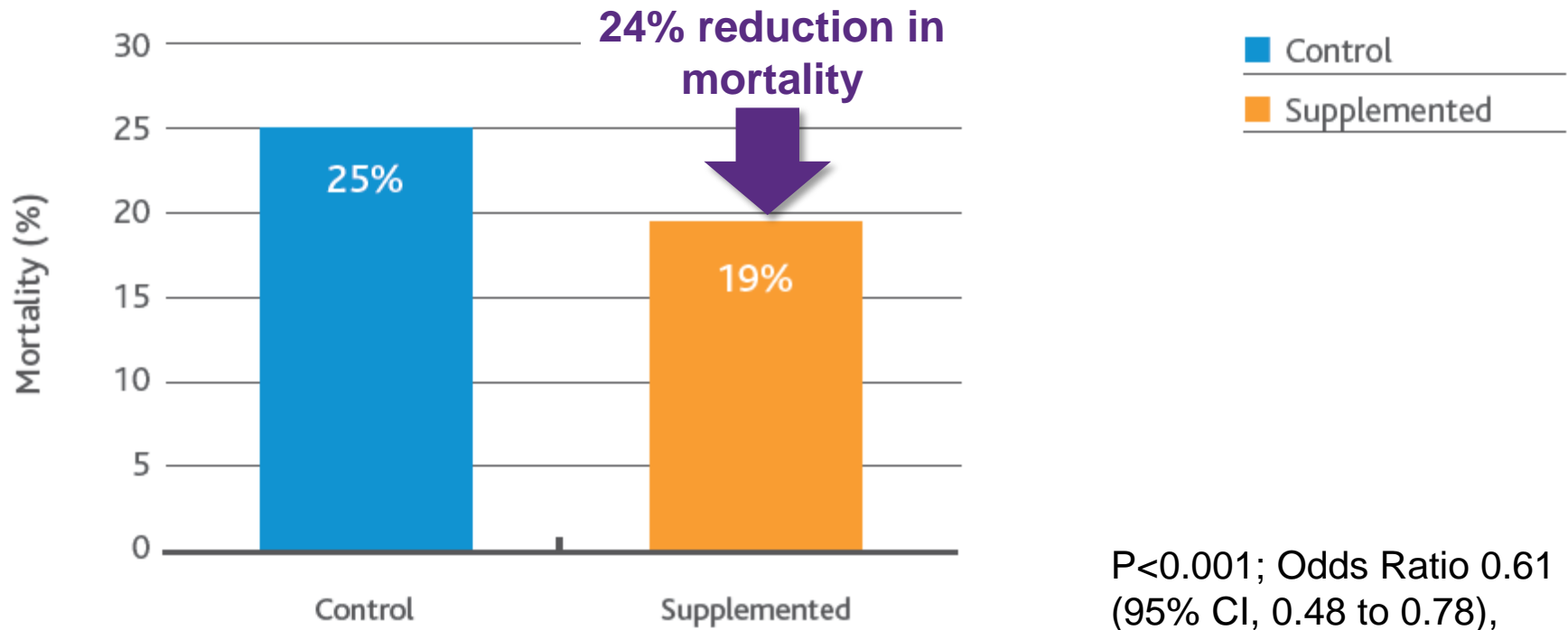


**Inborn Error
of metabolism
PKU**

TECHNOLOGY TO SERVE PATIENTS

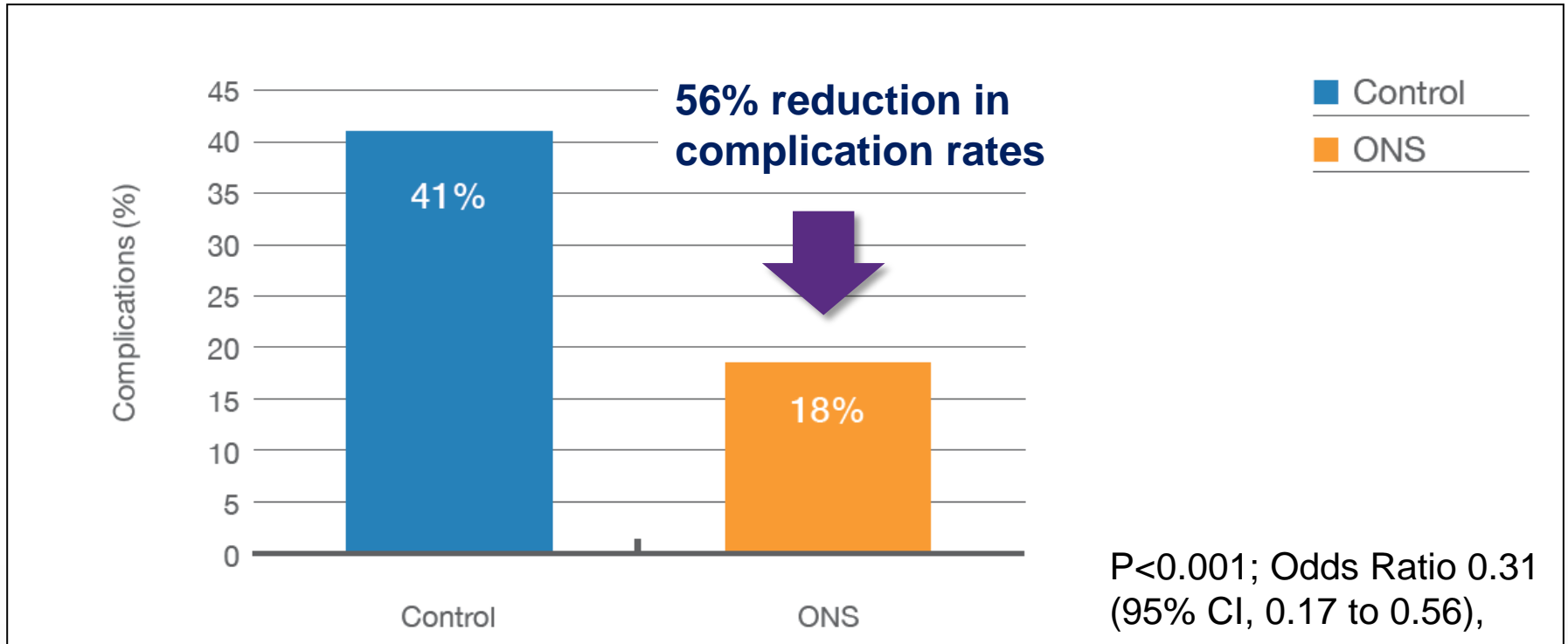


ORAL NUTRITIONAL SUPPLEMENTS (ONS) REDUCE MORTALITY IN HOSPITAL PATIENTS



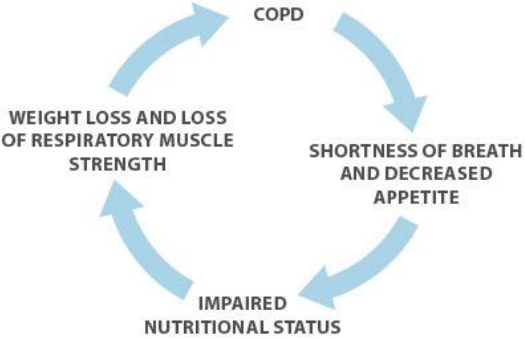
Hospitalised liver disease, orthopaedic, surgical patients, older people; meta-analysis of 11 trials, $n = 1965$; no significant heterogeneity between individual studies

ORAL NUTRITIONAL SUPPLEMENTS (ONS) REDUCE COMPLICATIONS IN HOSPITAL PATIENTS

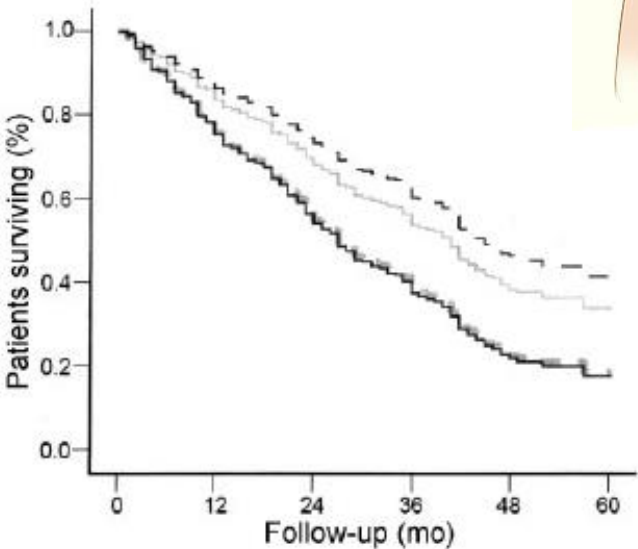
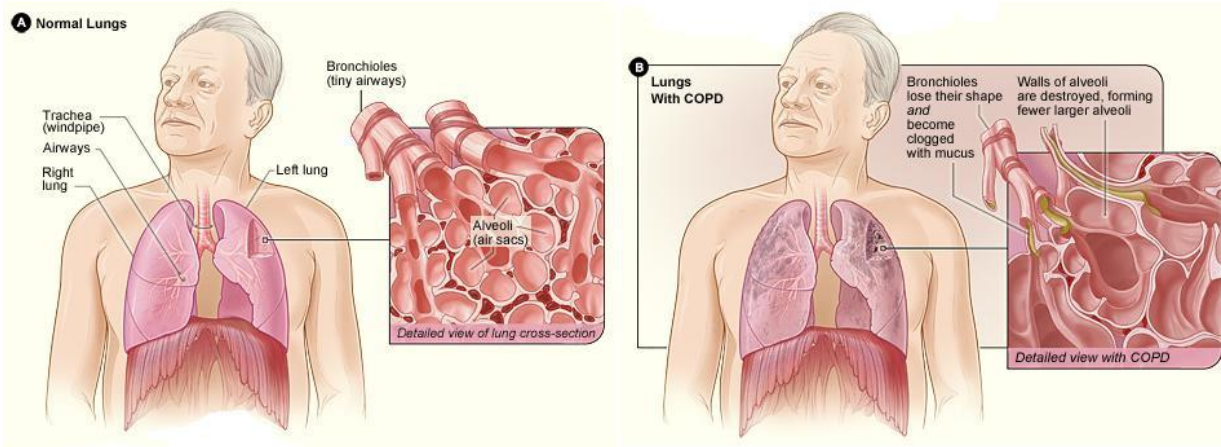


Surgical, orthopaedic, elderly and neurology hospital patients; meta-analysis of 7 trials, $n = 384$; no significant heterogeneity between studies

CONSEQUENCES OF MALNUTRITION CONDITIONS: - COPD -> LOSS OF MUSCLE MASS



The vicious cycle of malnutrition in COPD*



Normal FFMi (no impairment and semi-starvation)

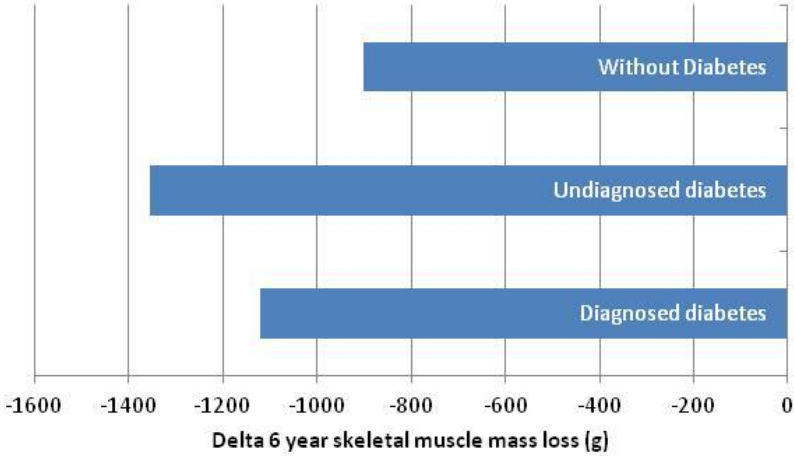
Low FFMi (muscle atrophy & cachexia)

Schols et al, Am J Clin Nutr. 2005

Fat-free mass (muscle mass) is an independent predictor of mortality irrespective of fat mass

CONSEQUENCE OF OVERNUTRITION CONDITION: - INSULIN RESISTANCE <-> LOSS OF MUSCLE MASS

25 – 50% higher loss skeletal muscle mass in older diabetes patient



Lower muscle mass associated with highest diabetes prevalence and poor insulin sensitivity

>50% higher prevalence of mobility disabilities

Prevalence %	Control	Diabetes
Difficulty walking 400m	30.3	51.2
Difficulty climbing steps	30	45.9
Difficulty performing household	27.6	43.6



Insulin Resistance (HOMA_IR)	2.62	2.06	2.02	1.56
Diabetes Prevalence (%)	40.6	31.4	33.8	24.9

(n=14000)

CONSEQUENCES OF MALNUTRITION CONDITION: - IMMOBILITY INDUCED MUSCLE LOSS



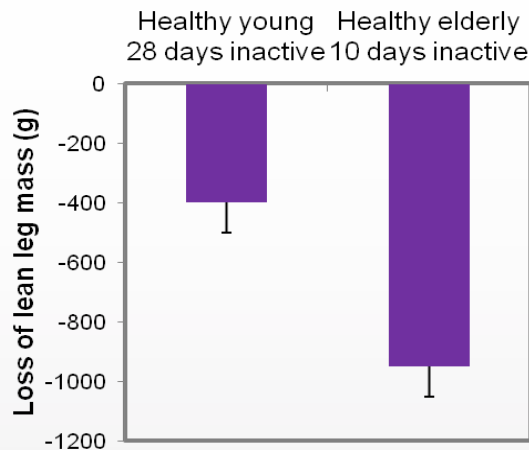
'Horrifying loss' of muscle mass should serve as wake-up call, academic

By Elaine Watson, 28-Jun-2011

Related topics: Research, Dairy-based ingredients, Proteins, peptides, amino acids

Bed rest studies revealing a "horrifying" loss of muscle mass in older people after just a few days of inactivity should serve as a wake-up call for industry to put tackling sarcopenia higher up the priority list, scientists have argued.

Paddon-Jones et al., *J Clin Endocrinol Metab* 2004
Kortebein et al., *JAMA* 2007



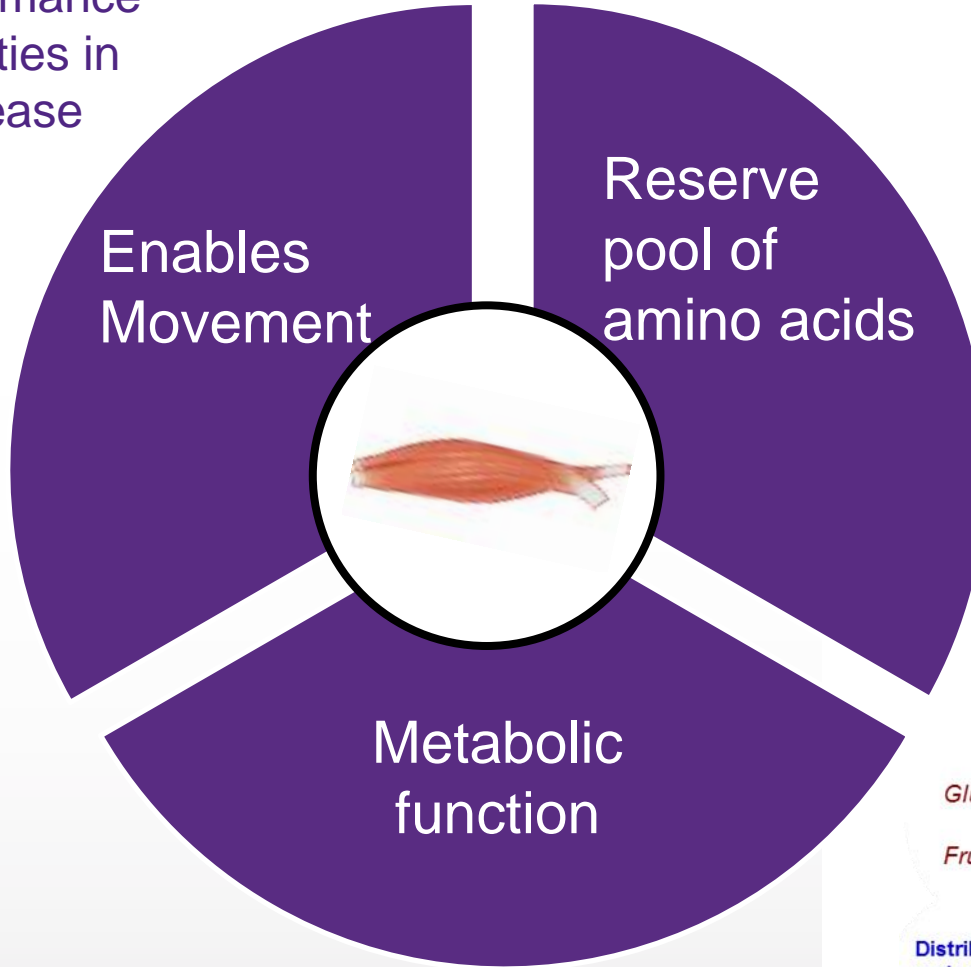
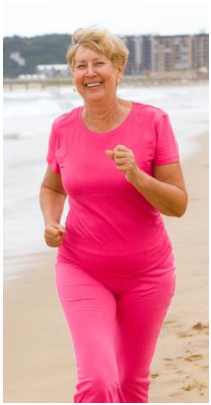
**10 day bedrest in healthy elderly:
~ 15% loss of muscle strength
→ difficult to restore**

Kortebein P et al, *JAMA*, 2007;297:1772-1774



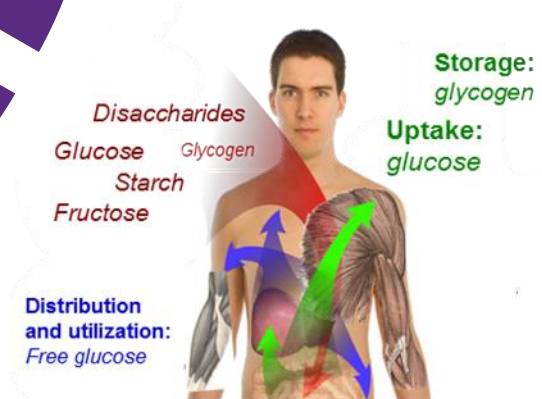
MUSCLE IS ONE OF OUR CORE AREAS TO SUPPORT

Physical performance and daily activities in health and disease



Immune system, recovery, complications wound healing, oncology

Burn energy + glucose control and insulin sensitivity



SARCOPENIA: LOW MUSCLE MASS AND LOW MUSCLE FUNCTION

- PROTEIN MALNUTRITION?

REPORT

Sarcopenia: European consensus on definition and diagnosis

Report of the European Working Group on Sarcopenia in Older People

ALFONSO J. CRUZ-JENTOF¹, JEAN PIERRE BAAYENS², JÜRGEN M. BAUER³, YVES BOIRIE⁴, TOMMY CEDERHOLM⁵, FRANCESCO LANDI⁶, FINBARR C. MARTIN⁷, JEAN-PIERRE MICHEL⁸, YVES ROLLAND⁹, STÉPHANE M. SCHNEIDER¹⁰, EVA TOPINKOVÁ¹¹, MAURITS VANDEWOUDE¹², MAURO ZAMBONI¹³

Age and Ageing 2010; 1–12
doi: 10.1093/ageing/afq034

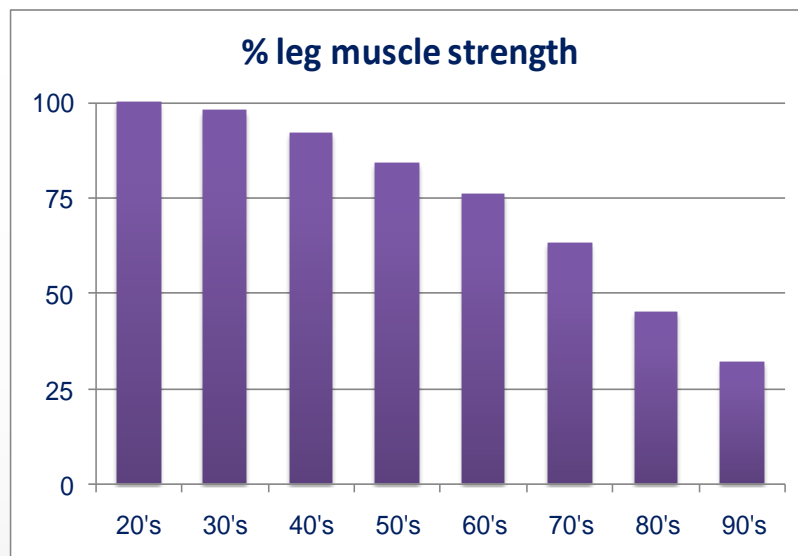
Images of mid-thigh



25-y



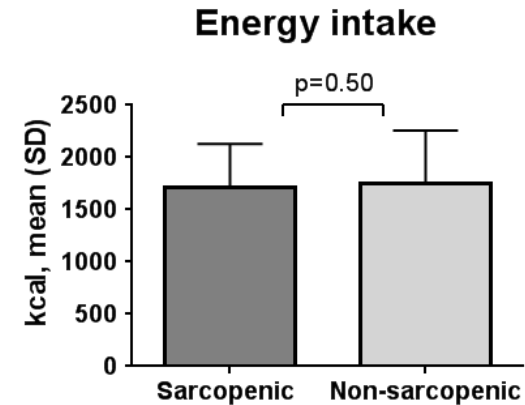
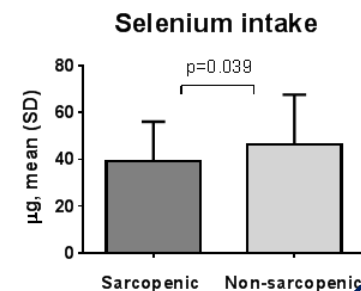
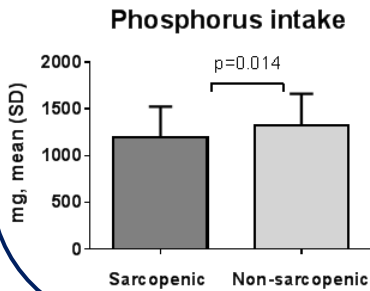
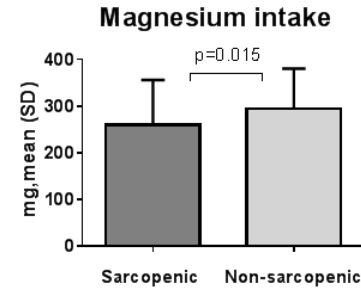
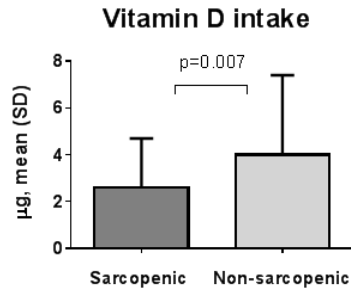
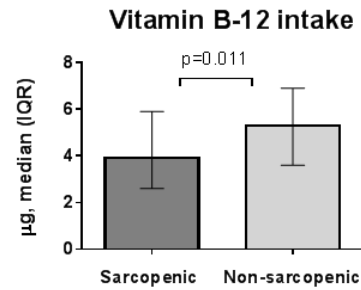
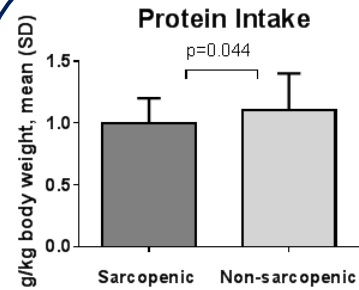
65-y



Less circumference, less muscle, more fat



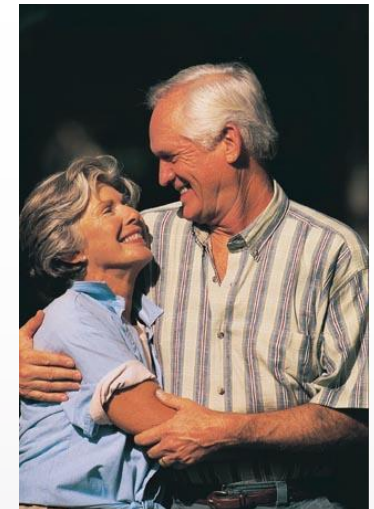
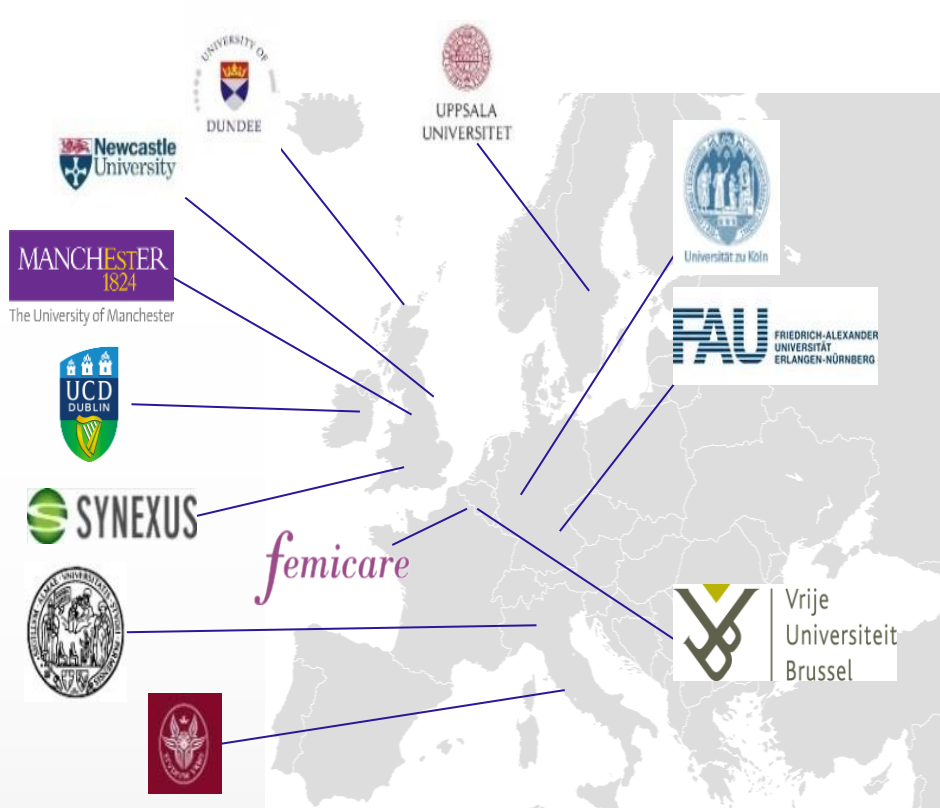
CASE-CONTROL OBSERVATIONAL COHORT WITH SARCOPENIC AND NON-SARCOPENIC ELDERLY



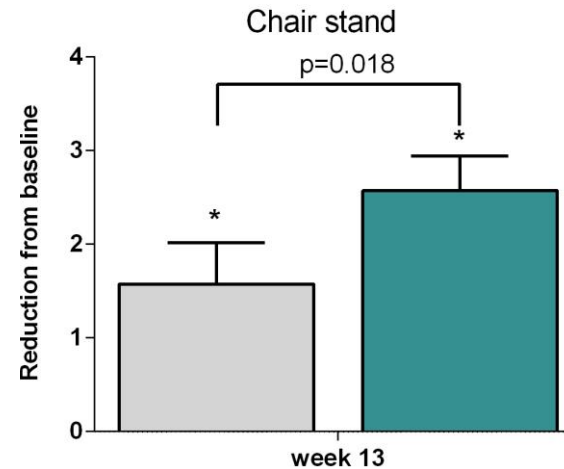
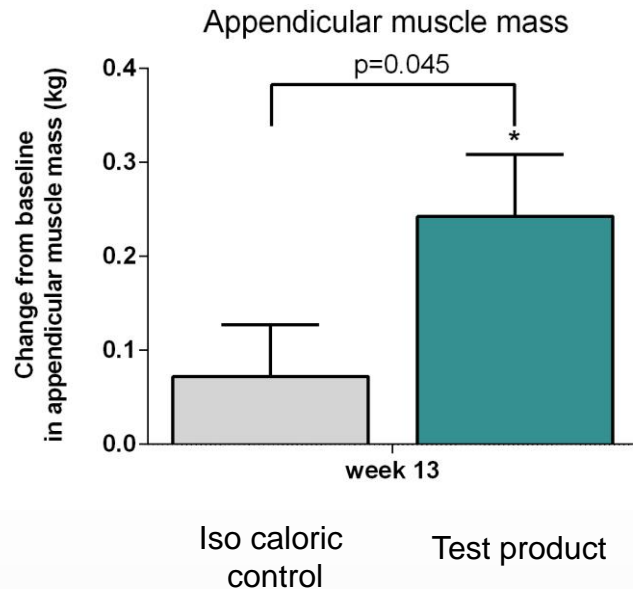
**LOWER NUTRIENT INTAKE
IN SARCOPENIC ELDERLY**

EFFECT OF VIT D AND LEUCINE-ENRICHED WHEY PROTEIN SUPPLEMENT IN OLDER ADULTS WITH MOBILITY IMPAIRMENTS

- MULTICENTER, DOUBLE BLIND, RCT, N=300

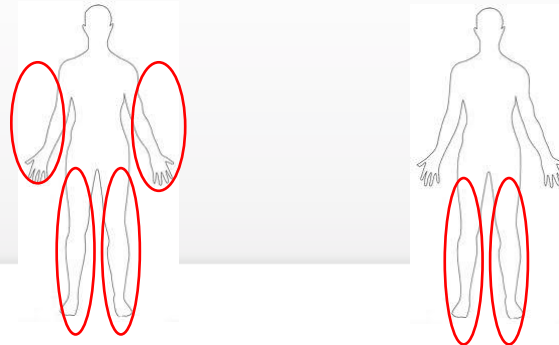
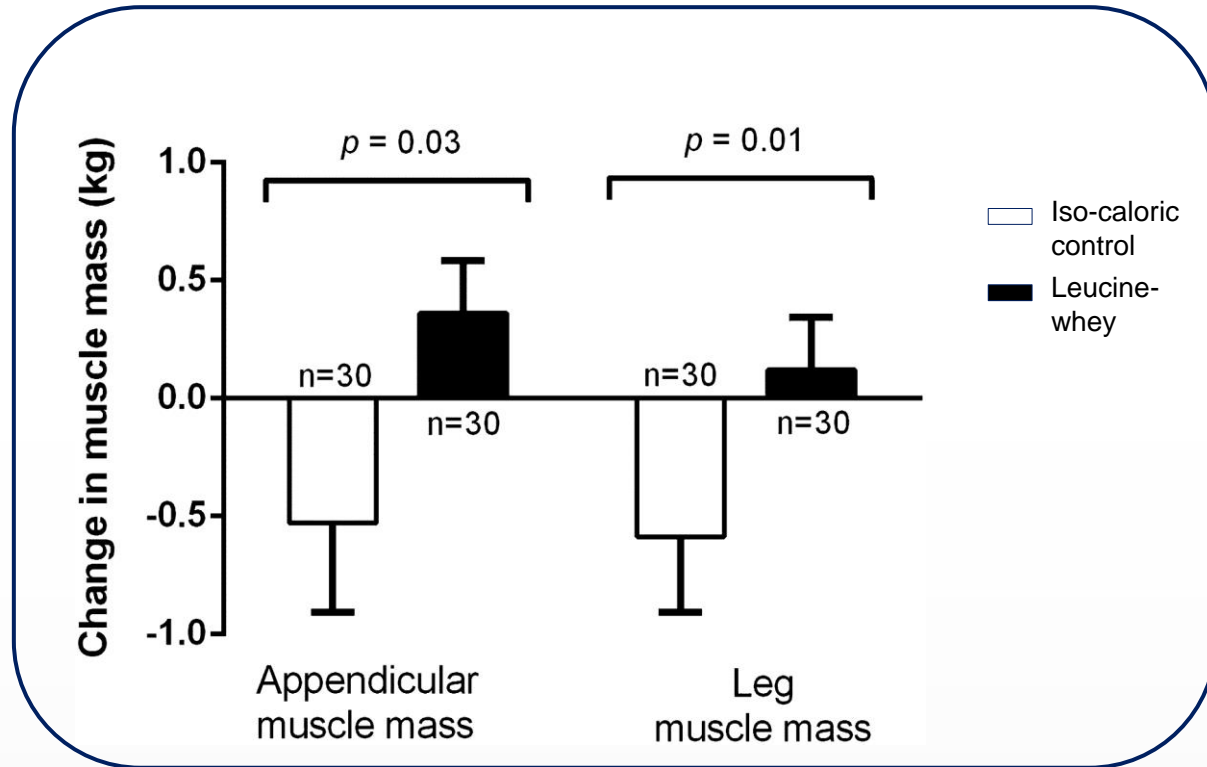


MUSCLE MASS AND LOWER EXTREMITY FUNCTION IMPROVED SIGNIFICANTLY



**Proof-of-principle:
Targeted nutritional supplementation might benefit geriatric patients**

VIT D AND LEUCINE-ENRICHED WHEY SUPPLEMENT PRESERVES MUSCLE MASS DURING A 3 MONTH INTENTIONAL WEIGHT LOSS RCT IN OBESE OLDER ADULTS



SUMMARY: MANY FACETS OF 'MAL-NUTRITION'

- Under-nutrition still an enormous problem, in elderly and children
- Over-nutrition and obesity strongly linked to chronic disease
- Specific disease-related nutritional deficiencies need to be identified
- Continue to build nutritional awareness and management as integrated part of patient care
- We might need to move from body weight management to body composition management

