

Optimal Nutrition in Prehabilitation April 2021 - Sjors Verlaan

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Recovery from a surgery is a marathon



....and it starts with a optimal preparation



Optimal nutrition

- Protein
- Fat
- Carbohydrates
- Fibers
- Vitamins and Minerals





Verlaan et al., 2016



Muscle is essential for physical function, resilience and metabolism

Physical function

- Daily activities
- Exercise
- Rehabilitation Movements of posture
- Mobility

Resilience

- Immune system
- Wound healing
- Complications Reserve poor
 - Recovery

Metabolic function

Burn energy

• Uptake and oxidation of carbs and fat

amino acids

Glucose control and insulin sensitivity



Low **muscle** mass, strength and nutritional status at hospital admission predict short-term and long-term **mortality**

The Journal of Frailty & Aging@

ORIGINAL RESEARCH

MUSCLE MEASURES AND NUTRITIONAL STATUS AT HOSPITAL ADMISSION PREDICT SURVIVAL AND INDEPENDENT LIVING OF OLDER PATIENTS – THE EMPOWER STUDY

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JAMDA

journal homepage: www.jamda.com

Original Study

Sarcopenia, Low Handgrip Strength, and Low Absolute Muscle Mass Predict Long-Term Mortality in Older Hospitalized Patients: An Observational Inception Cohort Study

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no no yes **Probable sarcopenia** 1.00.8**Cumulative survival** 0.6 0.40.21 2 3 4 Sarcopenia 1.00.8 **Cumulative survival** 0.6 0.40.21 2 3 4

Follow up (years)



^a Departmen Netherlands

Loss of muscle mass and strength during hospitalization



10 day bedrest in healthy elderly:~ 15% loss of muscle strength



'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.





Muscle loss is associated with worsened **health outcomes**







Physical Activity & Nutrition required to build and maintain muscle

(Resistance) Exercise + Protein



Gelders dagblad 31/3/2021

Quantity

- 0.8 g/kg BW/d for adults
- Expert recommendations for elderly and patients: 1.0-1.5 g/kg/d

Quality

- Essential amino acids including Leucine
- Digestibility



Protein intake in older patients is often inadequate for optimal recovery





Weijzen et al., 2020

Multiple moments of high quality protein intake distributed evenly over the day maximizes **muscle protein synthesis**



Intake of **30 grams of high quality protein** per meal required to maximize muscle protein synthesis in older patients



Patients and elderly need more high-quality protein per meal

Schematic representation of muscle protein metabolism in response to anabolic stimuli (exercise and/or amino acid ingestion) in young and elderly





Elderly require higher levels of essential amino acids including Leucine to stimulate muscle protein synthesis (MPS): anabolic resistance



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Targets are challenging: opportunities for products rich in high-quality protein?



Paddon Jones et al., 2009







Medical Nutrition is targeting Disease Related Malnutrition



- High in energy
- High in (high-quality) protein
- Complete micronutrient profile
- `sole source of nourishment'

Reimbursed



ESPEN Endorsed Recommendation

GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community *

Phenotypic Criteria ^g		
Weight loss (%)	Low body mass index (kg/m ²)	Reduced muscle mass ^a
>5% within past 6 months, or >10% beyond 6 months	<20 if < 70 years, or <22 if >70 years Asia: <18.5 if < 70 years, or <20 if >70 years	Reduced by validated body composition measuring techniques ^a

- Main drivers: weight loss and reduced muscle mass
- Protein-energy malnutrition/undernutrition



FrieslandCampina Ingredients



- Provide product prototypes as clinical study products for prehabilitation clinical trials
- Nutritional value of dairy proteins

Outrition to get the most out of life. Always. Image: Performance Nutrition Image: Performance Nutrition

Conclusions and next steps

- Prehabilitation combining exercise with optimal nutrition – including high-quality protein – prepares people for their surgery
- **Optimal nutrition**: Diet + Supplements

Questions:

- Implementation of prehabilitation in practice: multidisciplinary
- Who will provide diet and/or supplements?
- What kind of diets/concepts/formats/products?
- Dietary support and education?
- Who will pay for it? Business models?



