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LIFE-TRANSFORMING NUTRITION

DIETARY PROTEIN INTAKE & MUSCLE FUNCTION IN OLDER ADULTS

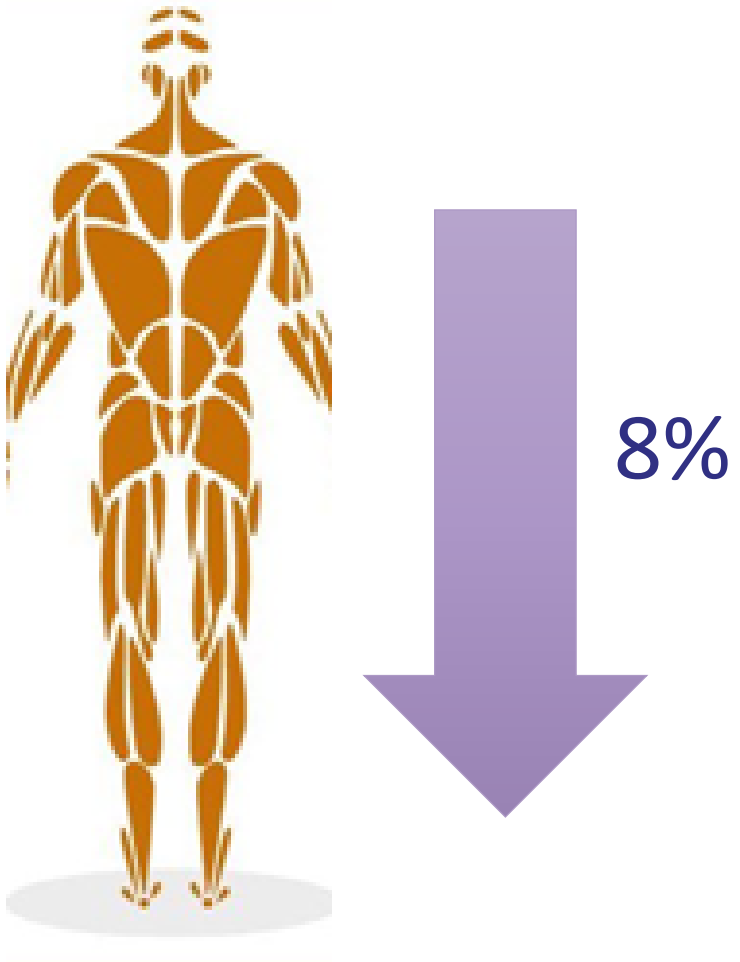
YOUR NUTRICIA CARE DIETITIANS
MARIA LUCEY
&
AIDEEN RYAN

AGING IN MOTION

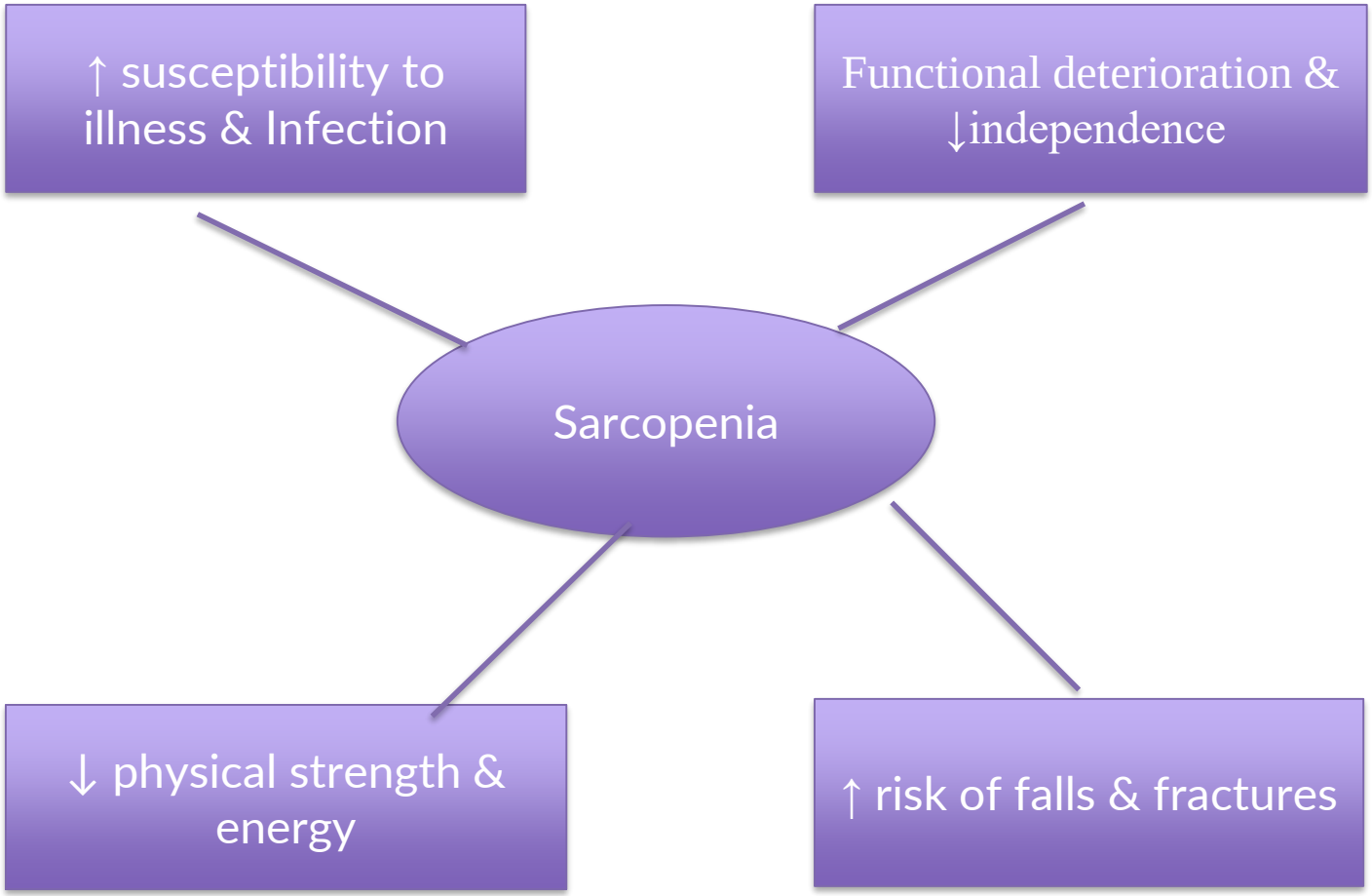
From the age of 40, adults lose 8% of their muscle mass per decade

Ageing is accompanied by a **progressive loss of skeletal muscle mass and strength**

- **This is termed ''Sarcopenia'**
- This leads to the **loss of functional capacity**



Consequences of Sarcopenia



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Muscle Loss & Protein Metabolism

Progressive loss of skeletal muscle mass does **NOT** appear to be due to major age-related changes in

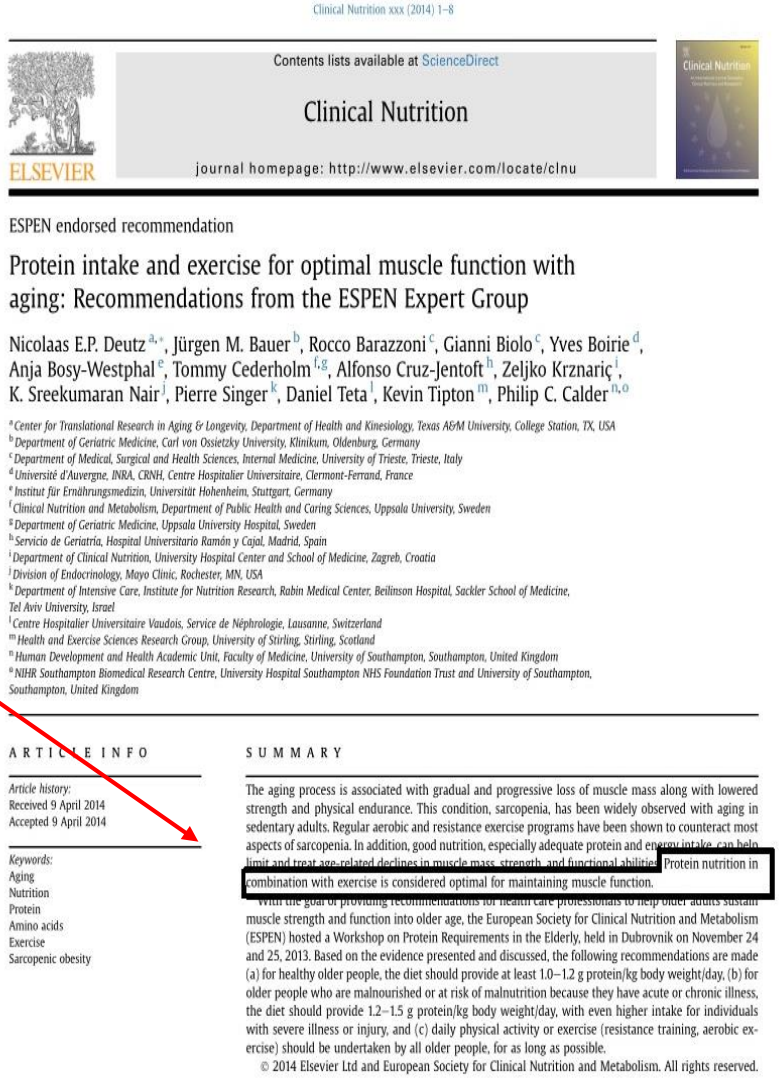
- Basal muscle protein synthesis
- Or rates of protein breakdown

Studies suggest that muscle protein synthesis in RESPONSE to anabolic stimuli is **blunted in elderly**

i.e. Response to food intake, protein intake, physical activity, insulin
'Anabolic Resistance'

Protein nutrition in combination with **exercise** is considered optimal for maintaining muscle function.

Protein is like a **building block** in the body
It is essential for building up muscle tissue



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ESPEN endorsed recommendation

Protein intake and exercise for optimal muscle function with aging: Recommendations from the ESPEN Expert Group

Nicolaas E.P. Deutz [a,*], Jürgen M. Bauer [b], Rocco Barazzoni [c], Gianni Biolo [c], Yves Boirie [d], Anja Bosy-Westphal [e], Tommy Cederholm [f,g], Alfonso Cruz-Jentoft [h], Zeljko Krznariç [i], K. Sreekumaran Nair [j], Pierre Singer [k], Daniel Teta [l], Kevin Tipton [m], Philip C. Calder [n,o]

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ARTICLE INFO

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SUMMARY

The aging process is associated with gradual and progressive loss of muscle mass along with lowered strength and physical endurance. This condition, sarcopenia, has been widely observed with aging in sedentary adults. Regular aerobic and resistance exercise programs have been shown to counteract most aspects of sarcopenia. In addition, good nutrition, especially adequate protein and energy intake, can help limit and treat age-related declines in muscle mass, strength, and functional abilities. Protein nutrition in combination with exercise is considered optimal for maintaining muscle function.

With the goal of providing recommendations for health care professionals to help older adults sustain muscle strength and function into older age, the European Society for Clinical Nutrition and Metabolism (ESPEN) hosted a Workshop on Protein Requirements in the Elderly, held in Dubrovnik on November 24 and 25, 2013. Based on the evidence presented and discussed, the following recommendations are made (a) for healthy older people, the diet should provide at least 1.0–1.2 g protein/kg body weight/day, (b) for older people who are malnourished or at risk of malnutrition because they have acute or chronic illness, the diet should provide 1.2–1.5 g protein/kg body weight/day, with even higher intake for individuals with severe illness or injury, and (c) daily physical activity or exercise (resistance training, aerobic exercise) should be undertaken by all older people, for as long as possible.

How do we overcome this?

Fight Sarcopenia with Nutrition

Proposed Interventions

1: TOTAL PROTEIN INTAKE: PROTEIN REQUIREMENTS: FOR AN OLDER PERSON

Considerable evidence that protein requirement to preserve muscle mass and function in **older adults (>65 years) is higher** than the RDA

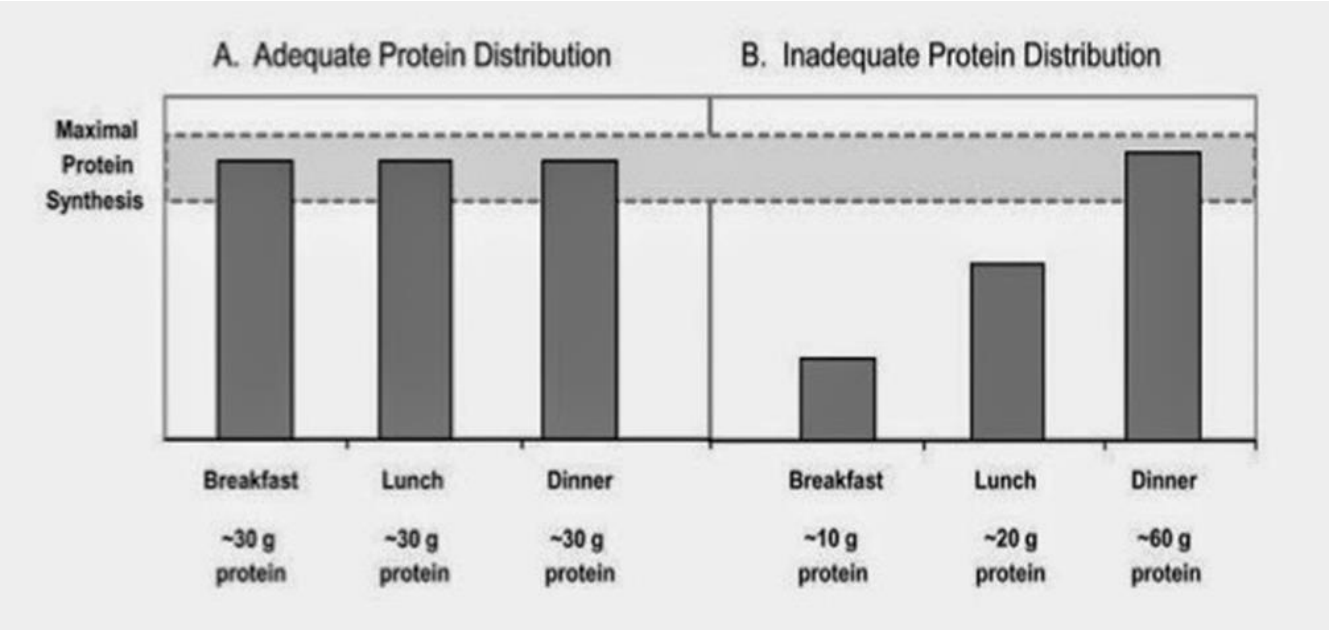
Adult	Recommended Protein intaje
Healthy	**1-1.2g/kg/day**
Acute or Chronic Illness	1.2-1.5g/kg/day
Severe Illness or Injury	>1.5g/kg/day

Deutz, et al. Clin Nutr. 2014;33:929-36

2: PER MEAL PROTEIN INTAKE

- Older adults typically consume their daily protein in **'SKEWED' pattern;** consuming the majority of their daily protein in the evening dinner meal (~40-50%) with smaller amounts typically consumed at breakfast (~15%) and the midday meal (~28%), and as snacks.

- Growing appreciation for the need to consider protein intake on **a per-meal basis** (vs total daily intake)
- **Saturable** dose-response relationship between quantity of protein consumed in a single meal and the subsequent rate of muscle protein synthesis (MPS)



3:HOW TO ADD MORE PROTEIN INTO YOUR MEALS & SNACKS

- Make fruit smoothies with milk or yogurt
- Include hard boiled eggs/chicken/salmon in salads
- Drink a glass of milk with meals
- Have yogurt as a snack or add to fruit or cereal

Add:

- legumes e.g. beans & lentils to soups, casseroles
- cheese to vegetables, salads, sandwiches, potatoes, rice, pasta, and casseroles.
- peanut butter to sandwiches, toast, crackers, or muffins or use as a dip
- powdered milk to cream soups, mashed potatoes, casseroles, puddings, and milk-based desserts.

WHEN TO SUPPLEMENT

2018 ESPEN GUIDELINES ON CLINICAL NUTRITION & HYDRATION IN GERIATRICS[1]

- Older persons with malnutrition or at risk of malnutrition with chronic conditions shall be offered ONS when dietary counselling and food fortification are not sufficient to increase dietary intake and reach nutritional goals

- Offer ONS to geriatric hip fracture patients, **regardless of their nutritional state**. ONS shall always be offered in combination with other interventions to increase oral intake as part of a multidisciplinary approach

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ESPEN Guideline

ESPEN guideline on clinical nutrition and hydration in geriatrics

Dorothee Volkert [a, *], Anne Marie Beck [b], Tommy Cederholm [c], Alfonso Cruz-Jentoft [d], Sabine Goisser [e], Lee Hooper [f], Eva Kiesswetter [g], Marcello Maggio [h, i], Agathe Raynaud-Simon [j], Cornel C. Sieber [a, k], Lubos Sobotka [l], Dieneke van Asselt [m], Rainer Wirth [n], Stephan C. Bischoff [o]

ARTICLE INFO

SUMMARY

1.ESPEN Guideline on Clinical Nutrition and Hydration in Geriatrics, 2018 https://www.clinicalnutritionjournal.com/article/S0261-5614(18)30210-3/pdf

WHAT TO SUPPLEMENT

•ONS offered to an older person with malnutrition or at risk of malnutrition, shall provide at least **400kcal/day including 30g or more of protein/day**[1]

•Compliance with high energy, low volume (125ml) ONS is significantly greater than with standard energy 200ml ONS[2]

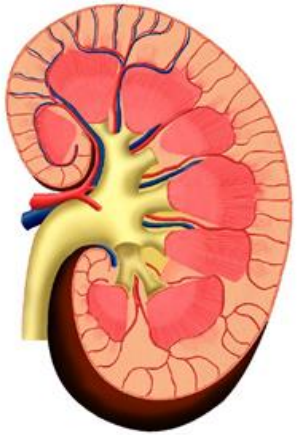
1.ESPEN Guideline on Clinical Nutrition and Hydration in Geriatrics, 2018 https://www.clinicalnutritionjournal.com/article/S0261-5614(18)30210-3/pdf
2:.Hubbard, et al. Proc Nutr Soc 2010;**69**(OCE2): E164

The *Only* High Protein Compact Available

- ✓ 300kcal/bottle
- ✓ 125mls/bottle
- ✓ 18g protein/bottle
- ✓ Available in 7 flavours
- ✓ Most Protein in Smallest Bottle

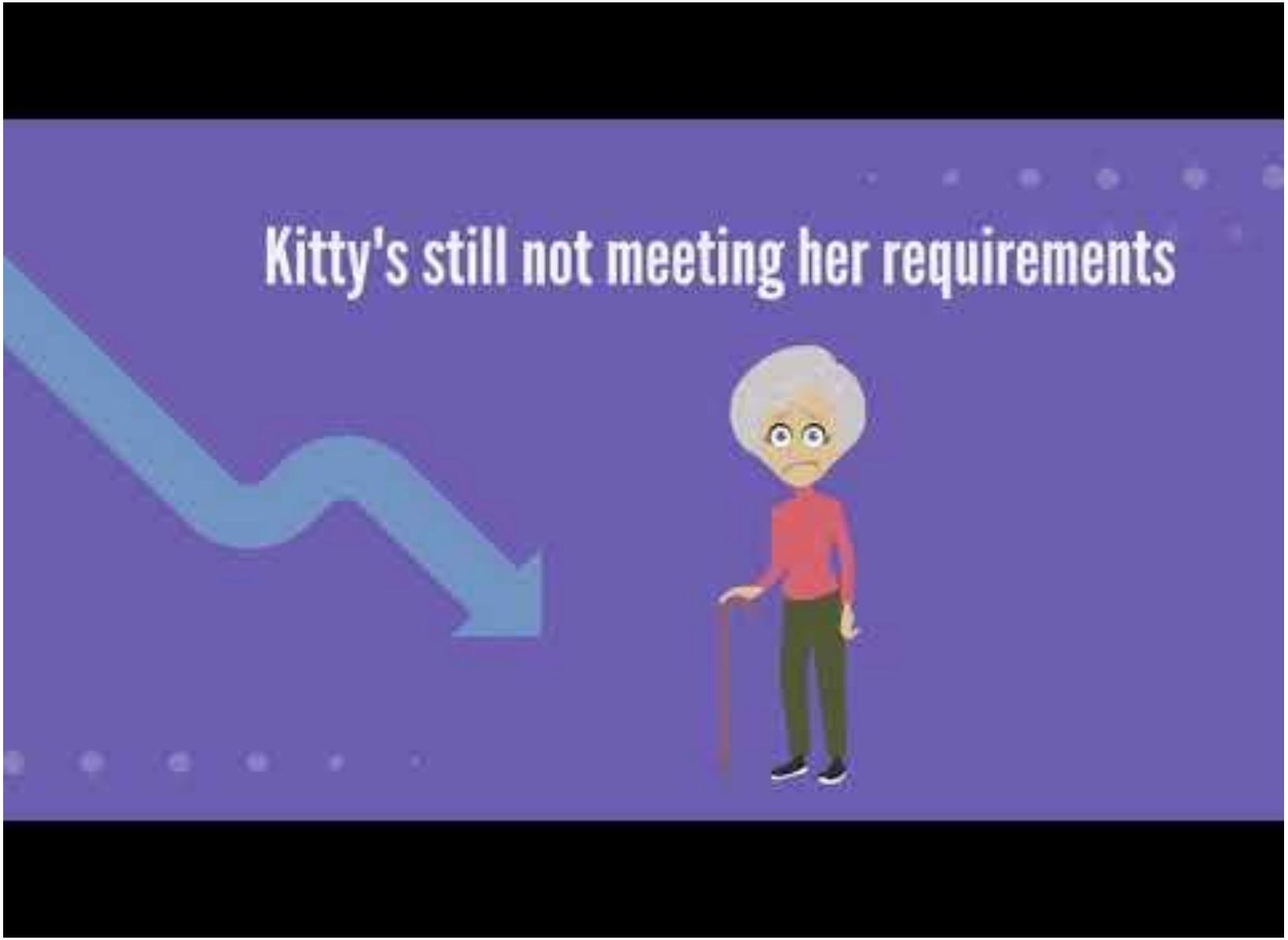
CONCERNS ABOUT NEGATIVE EFFECTS OF HIGH PROTEIN INTAKES IN OLDER ADULTS

- Moderatly impaired GFR customarily assess
- Severe CKD usual to recommend a lower protein intake



WEIGHT REDUCING DIETS IN THE OLDER ADULT

- In **overweight** older persons weight-reducing diets **shall be avoided** in order to prevent loss of muscle mass and accompanying functional decline.
- In **obese** older persons with weight-related health problems, weight-reducing diets shall only be considered after careful and **individual** weighing of benefits and risks.


Kitty's still not meeting her requirements

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DANONE

ONE PLANET. ONE HEALTH

4: CALCIUM & VITAMIN D

OSTEOPOROSIS : INCREASED FRACTURE RISK

- Women have a higher risk of osteoporosis
- Over and underweight: ↑ risk of falls
- Iincreased calcium and vitamin D intake, in addition to physical activity, may decrease fracture rates over time. (WHO, 2002)

Calcium: 700mg/d (Gandy, 20014), or 800-1200mg/d (WHO, 200)2.

Vitamin D: 10µg/day Older people are particularly vulnerable to deficiency due to less sunlight, poor consumption of oily fish

Dietary potassium and vitamin K are also beneficial to bone health alongside calcium and D.

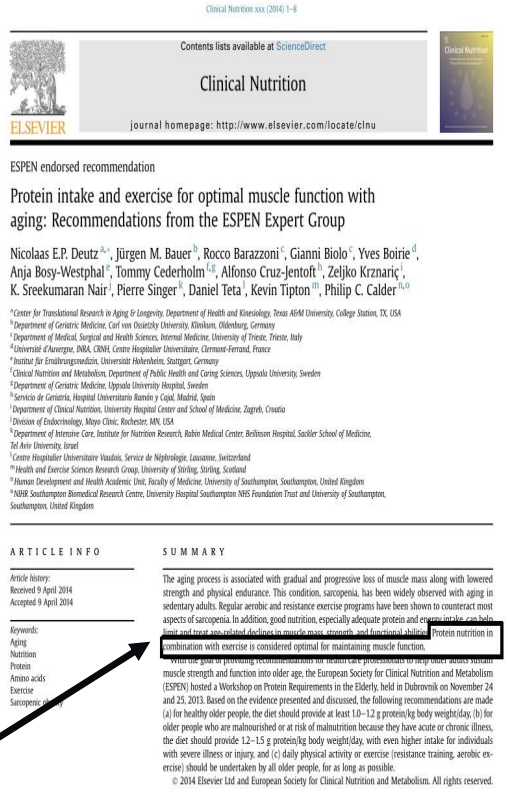
OVERVIEW

Ageing is accompanied by a **progressive loss of skeletal muscle mass and strength**

➢ **This is termed ''Sarcopenia'**

This leads to the **loss of functional capacity**

Preservation of muscle function is crucial for **maintaining independent living**



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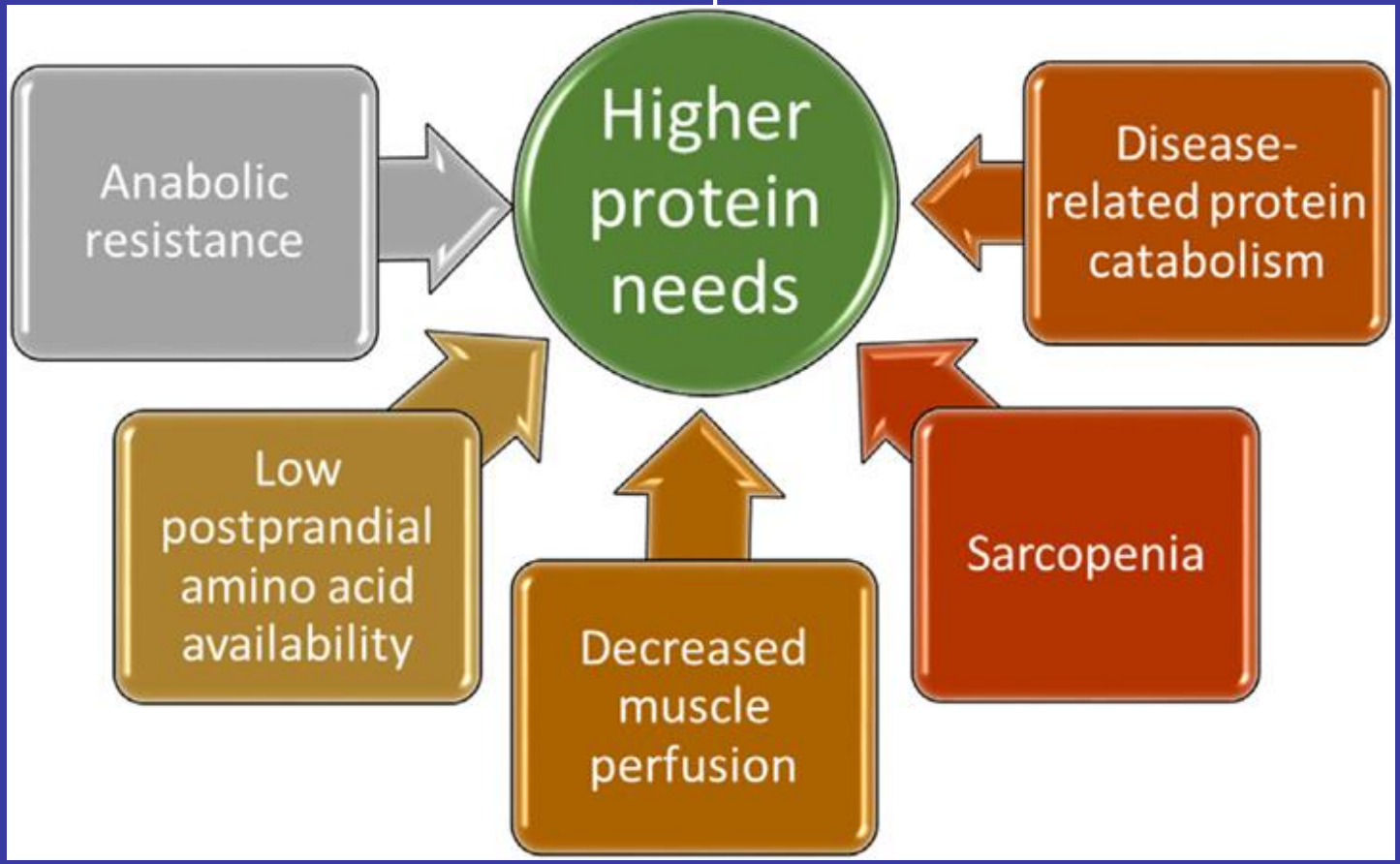
MECHANISMS UNDERLYING MUSCLE LOSS IN AGEING



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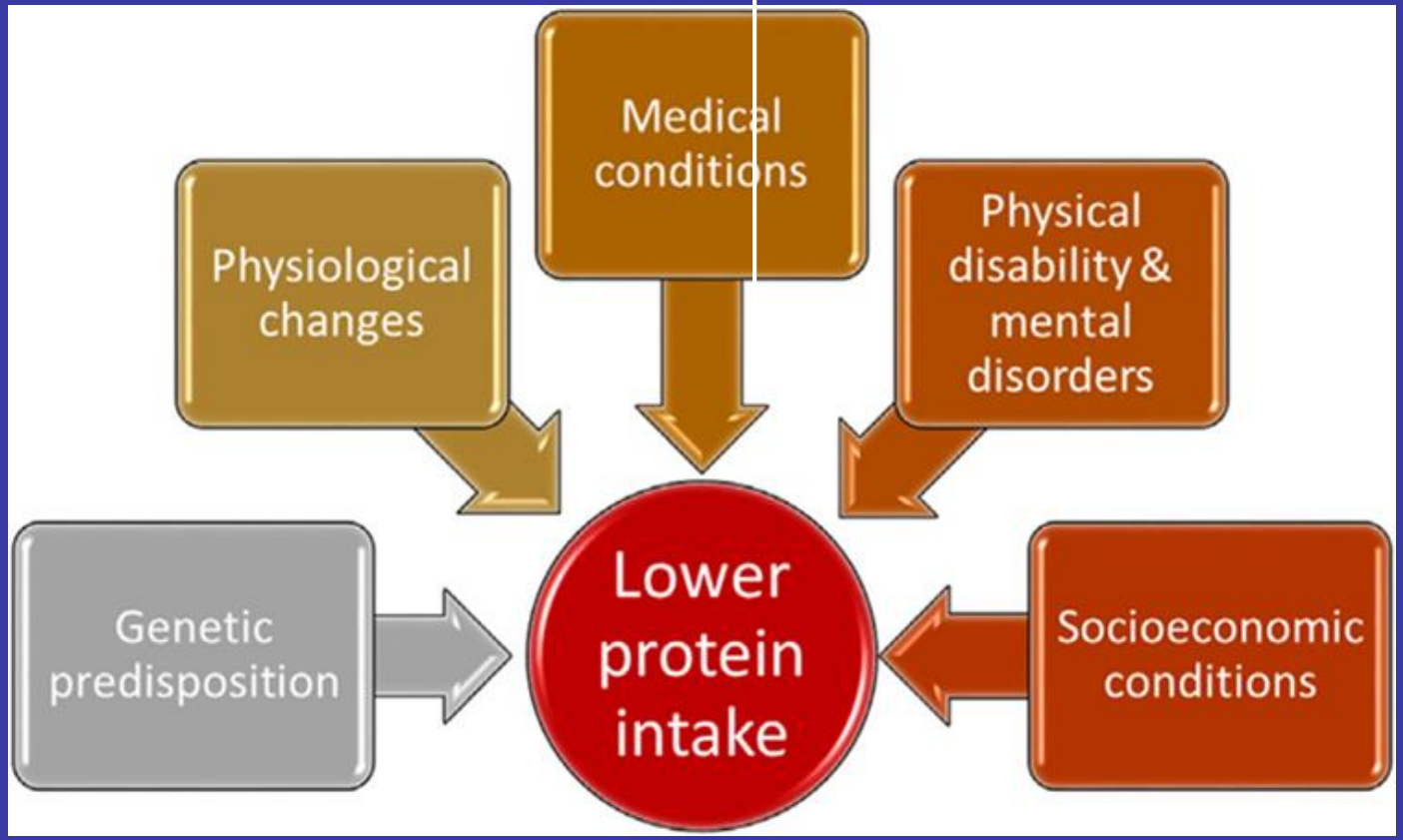
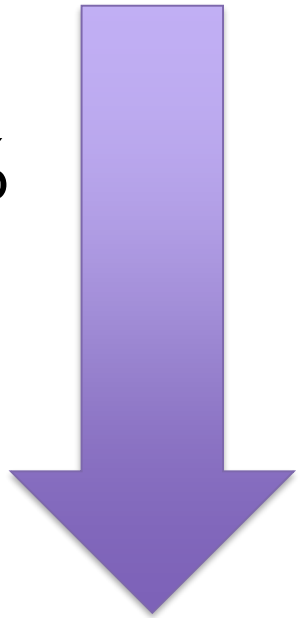


Aging in Motion

From the age of 40, adults lose 8% of their muscle mass per decade

8%



Lean Muscle Mass

- Contributes up to 50% of total body mass of a young adult
- May decline to 25% by 75–80 yrs to add text

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Consequences of Protein-Energy Malnutrition

- Impaired Muscle Function
- ↓ Bone Mass
- Anaemia
- Reduced Cognitive Function
- Poor Wound Healing
- Impaired Immune Response
- Delayed recovery from surgery
- ↑ Morbity and Mortality

(Donini et al, 2003).

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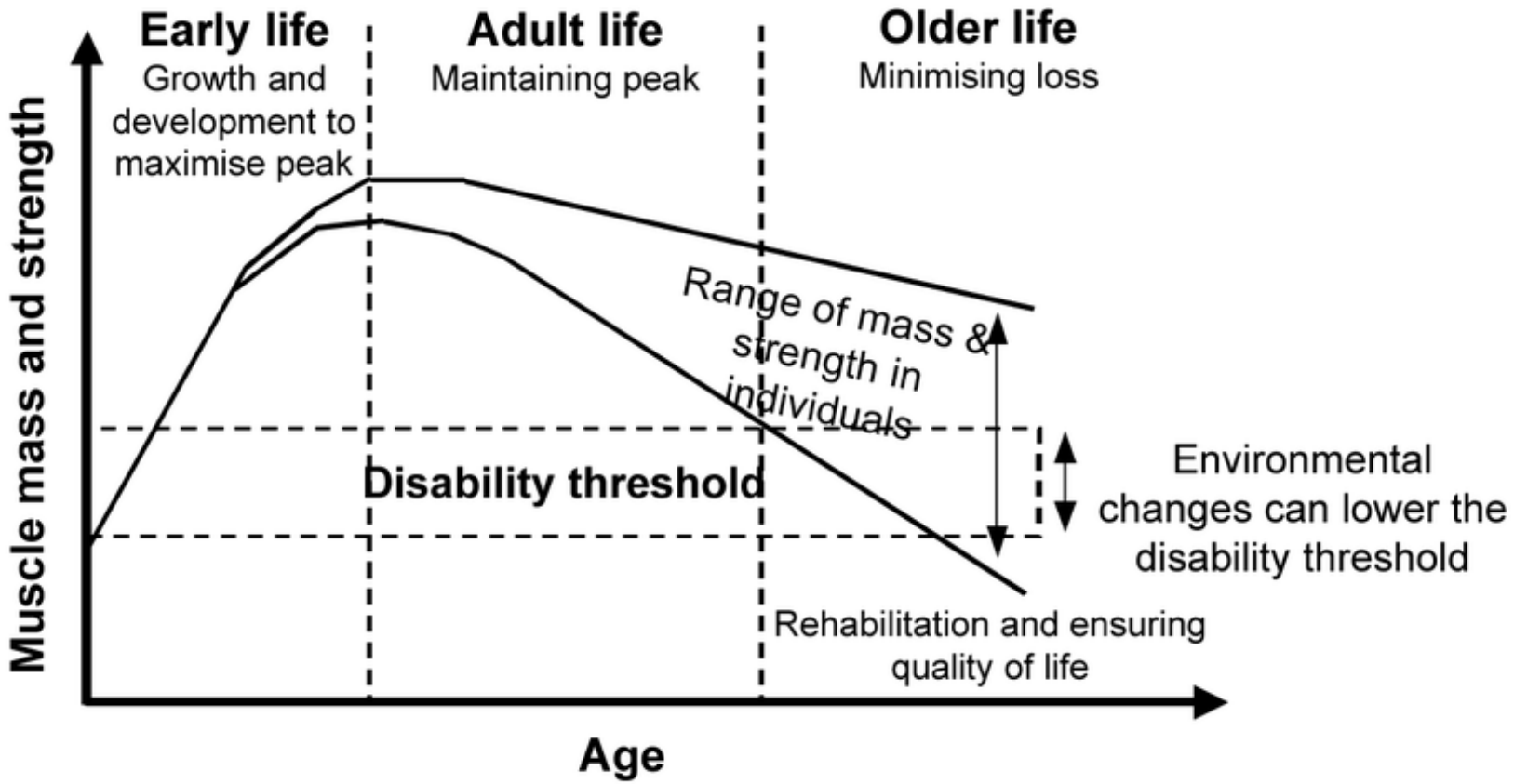
Consequences of Sacropenia

- Major cause of **falls** and **functional deterioration** in older persons

- Loss of muscle mass is commonly associated with loss of bone, high risk for **hip fractures**.



Modified WHO/HPS, Geneva 2000

What is Sarcopenia?

- Decline in walking speed or grip strength associated with low muscle mass
- Present in 5-10 % of persons over 65 years of age.
- Caused by disease, **decreased caloric intake**, poor blood flow, decline in anabolic hormones and increase in proinflammatory cytokines

3: SOURCES OF PROTEIN

12g Protein

15g Protein

16g Protein

7g Protein

7g Protein