

# Nutrition Interventions

- *protein* -

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# Disclosures

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- **Dr. Paddon-Jones is a Research Investigator with funding from the National Institute of Health (NIH), Abbott Nutrition, National Cattlemens Beef Association (NCBA) and the National Space Biomedical Research Institute (NSBRI).**
- **Dr. Paddon-Jones is a member of the Scientific Advisory Board or Speaker's Bureau for the National Dairy Council, US Dairy Export Council, American Egg Board, Texas Beef Council and Abbott Nutrition.**

# Overview

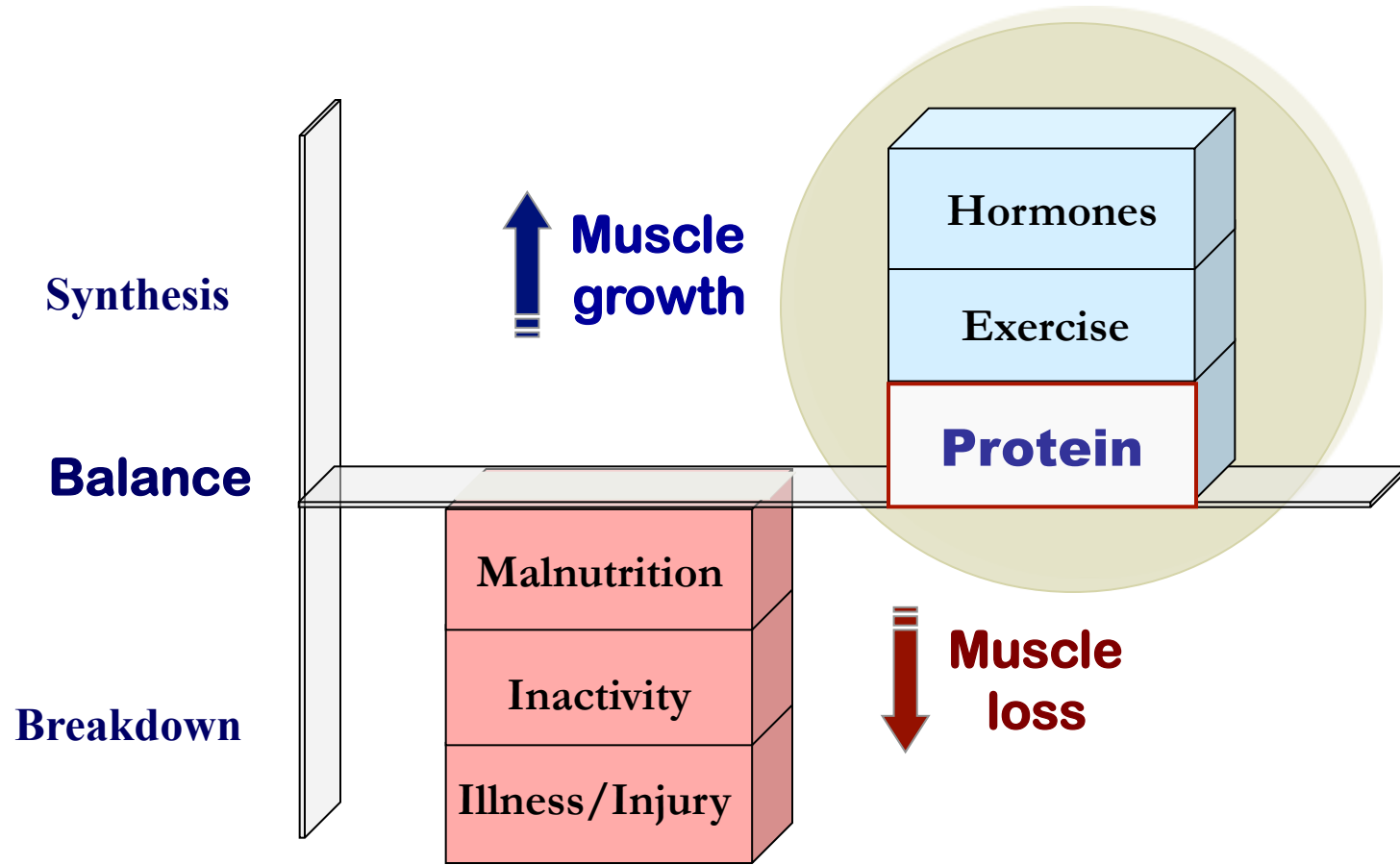
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1. building muscle in response to a protein-rich meal
2. priority areas: aging - physical inactivity – hospitalization
3. establishing a targeted nutritional intervention

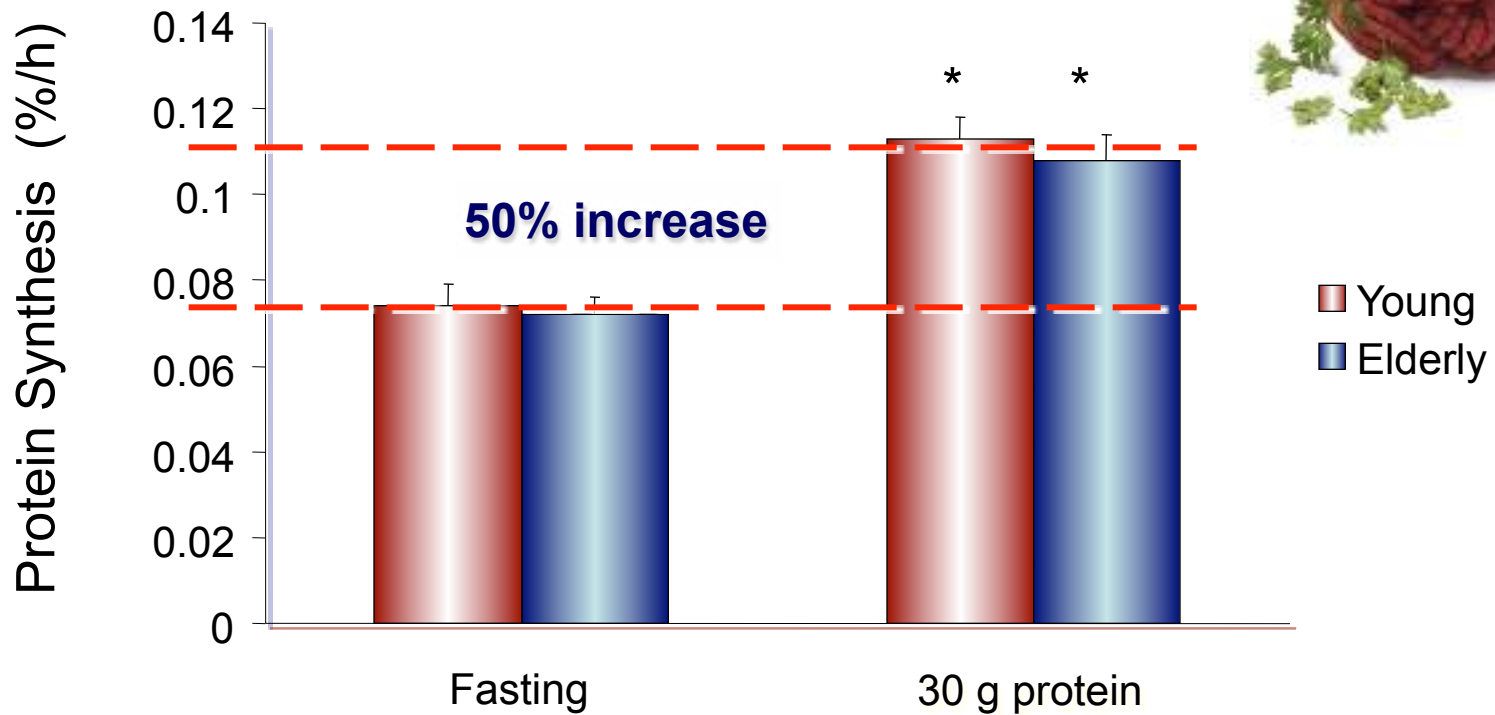


# Maintaining Muscle Mass and Function

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# Stimulating Muscle Growth with Protein

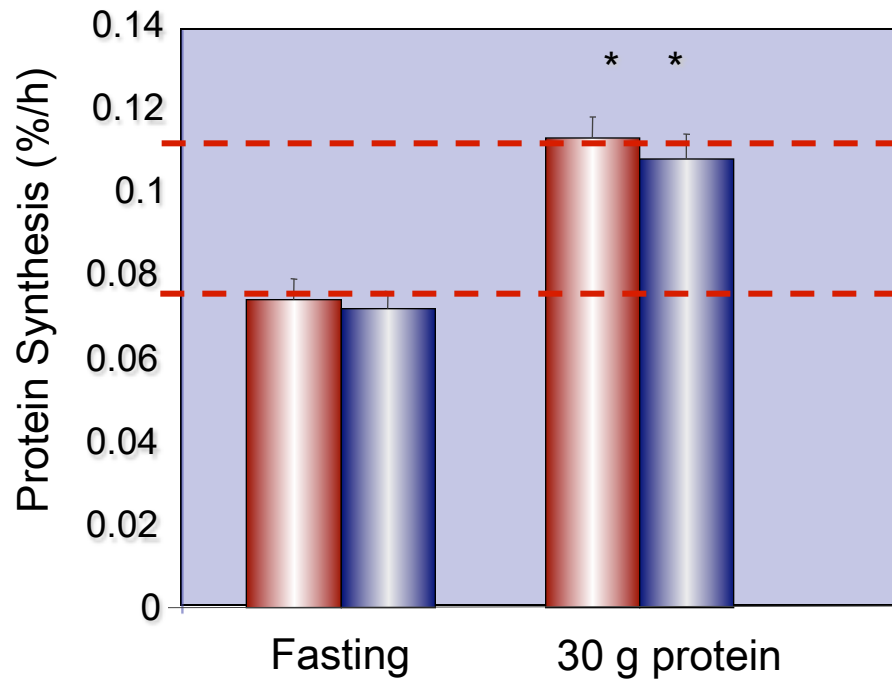


# Protein Synthesis and Portion Control

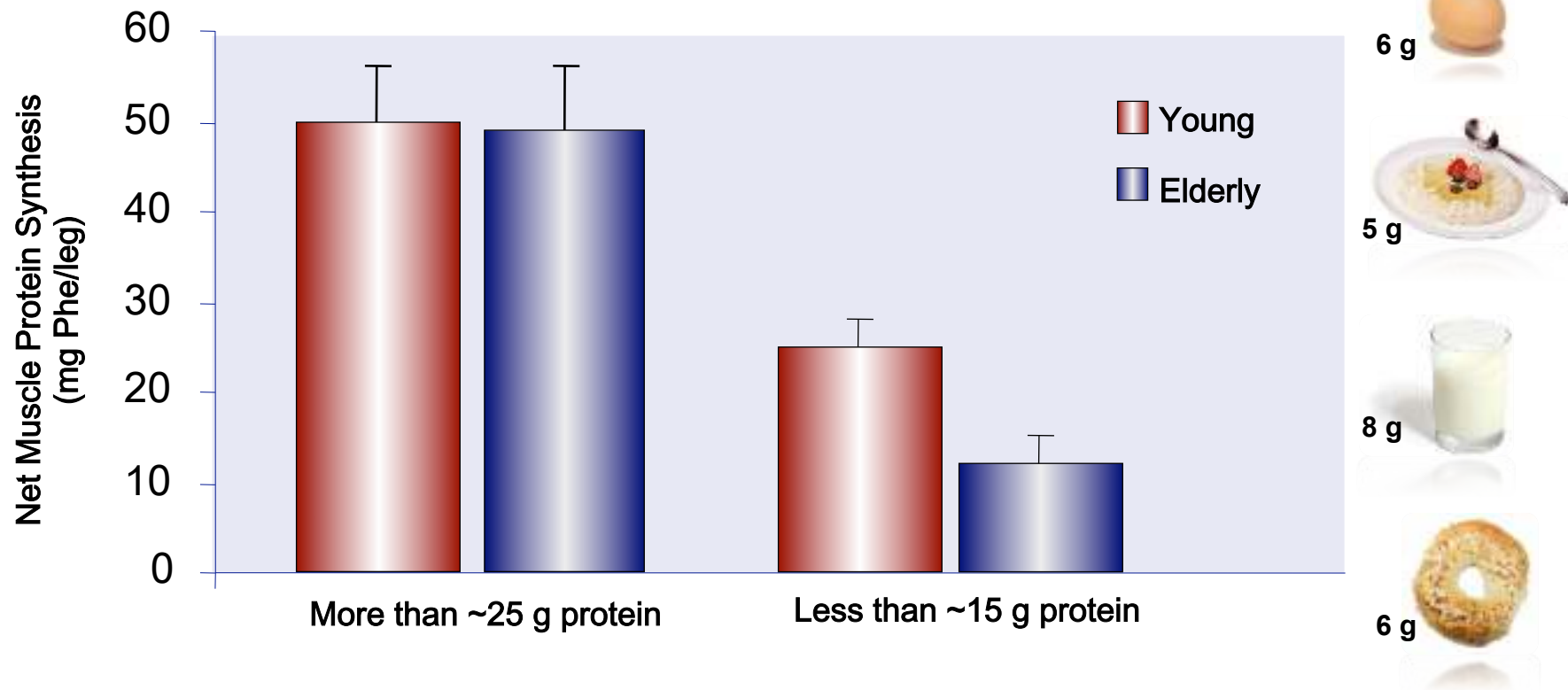
- a message of moderation -

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30 g protein



# Age-related protein dose-response

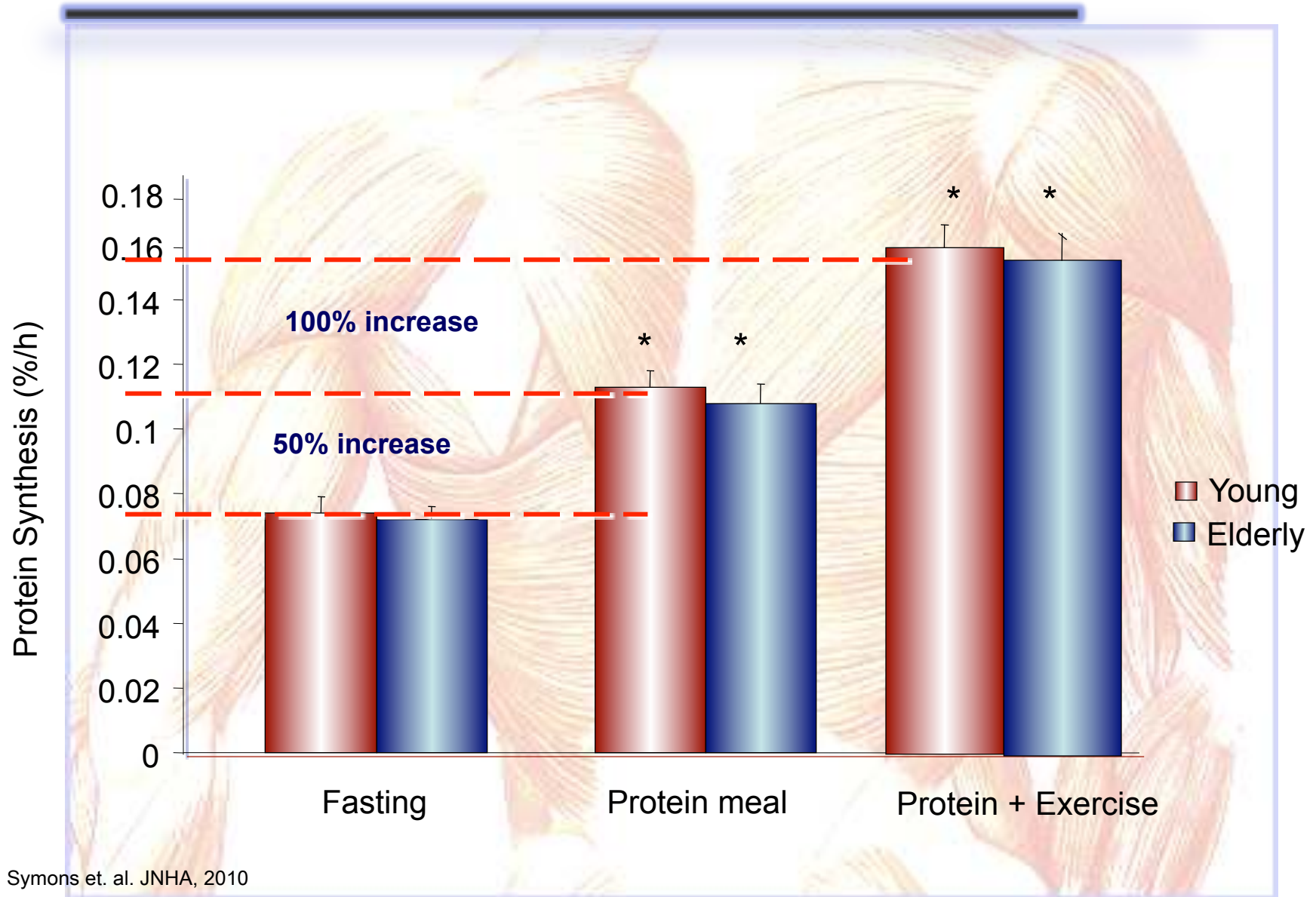


# Protein-exercise interaction





# Synergistic Effect of Protein and Exercise



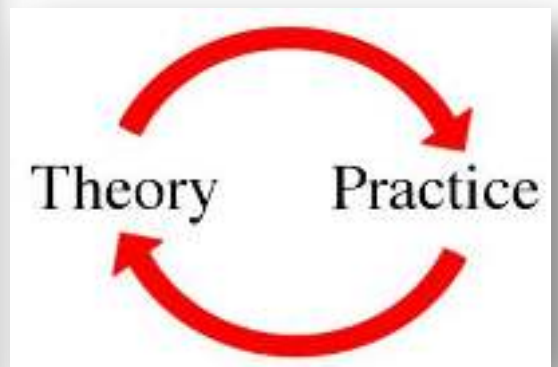
# Translation: Science → Practice

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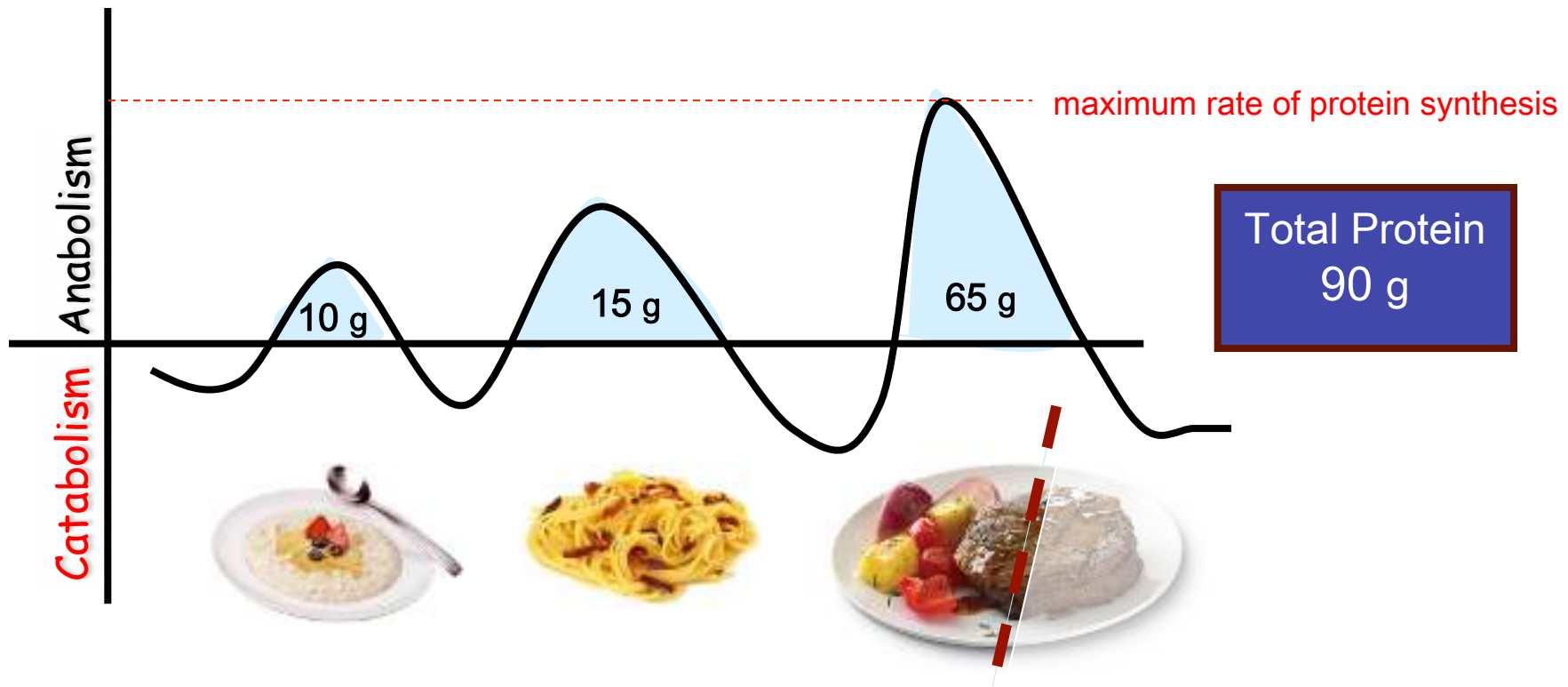


Healthy eating is becoming all about "molecular gastronomy".

Ezran Kamal



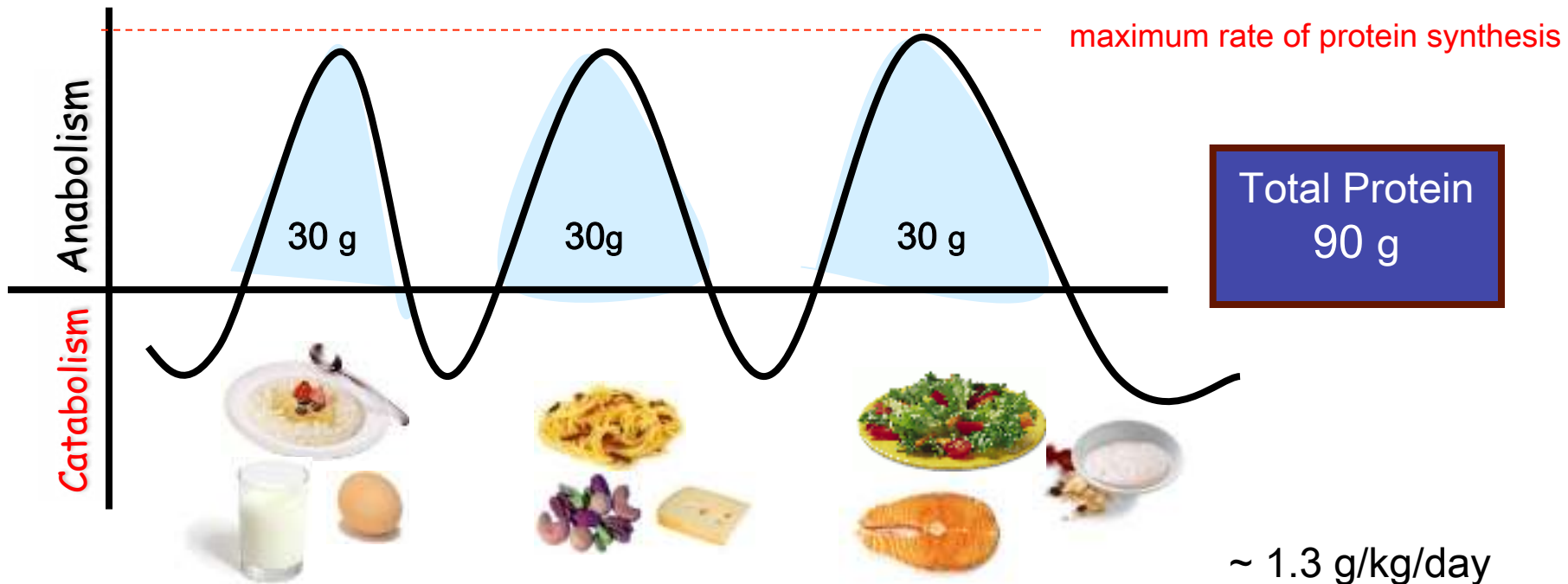
# Daily protein distribution - *typical* ? -



A skewed daily protein distribution fails to maximize potential for muscle growth

# Daily protein distribution

- *Optimal* -



Repeated maximal stimulation of protein synthesis  
→ increase / maintenance of muscle mass

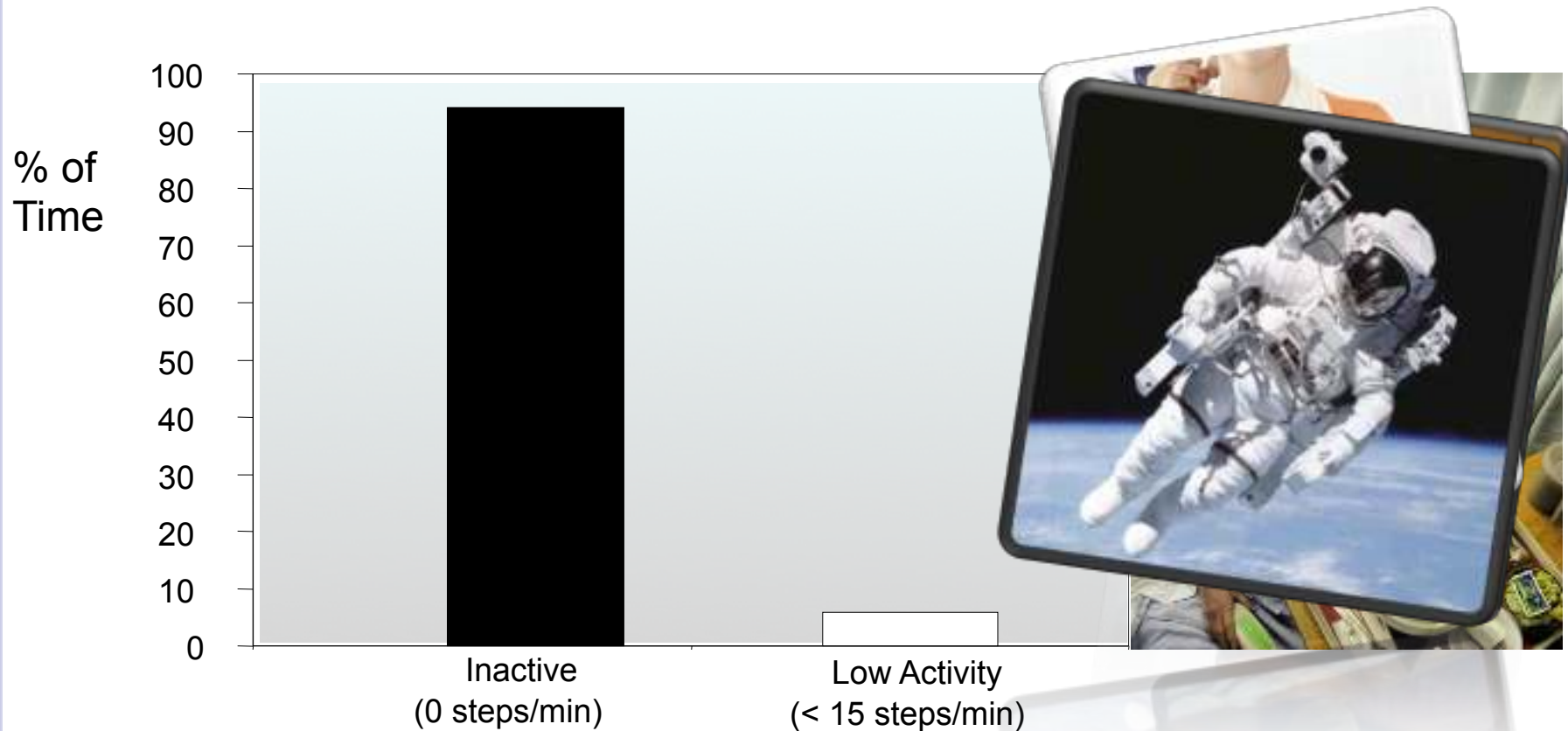
## 2. priority areas: aging - physical inactivity - hospitalization



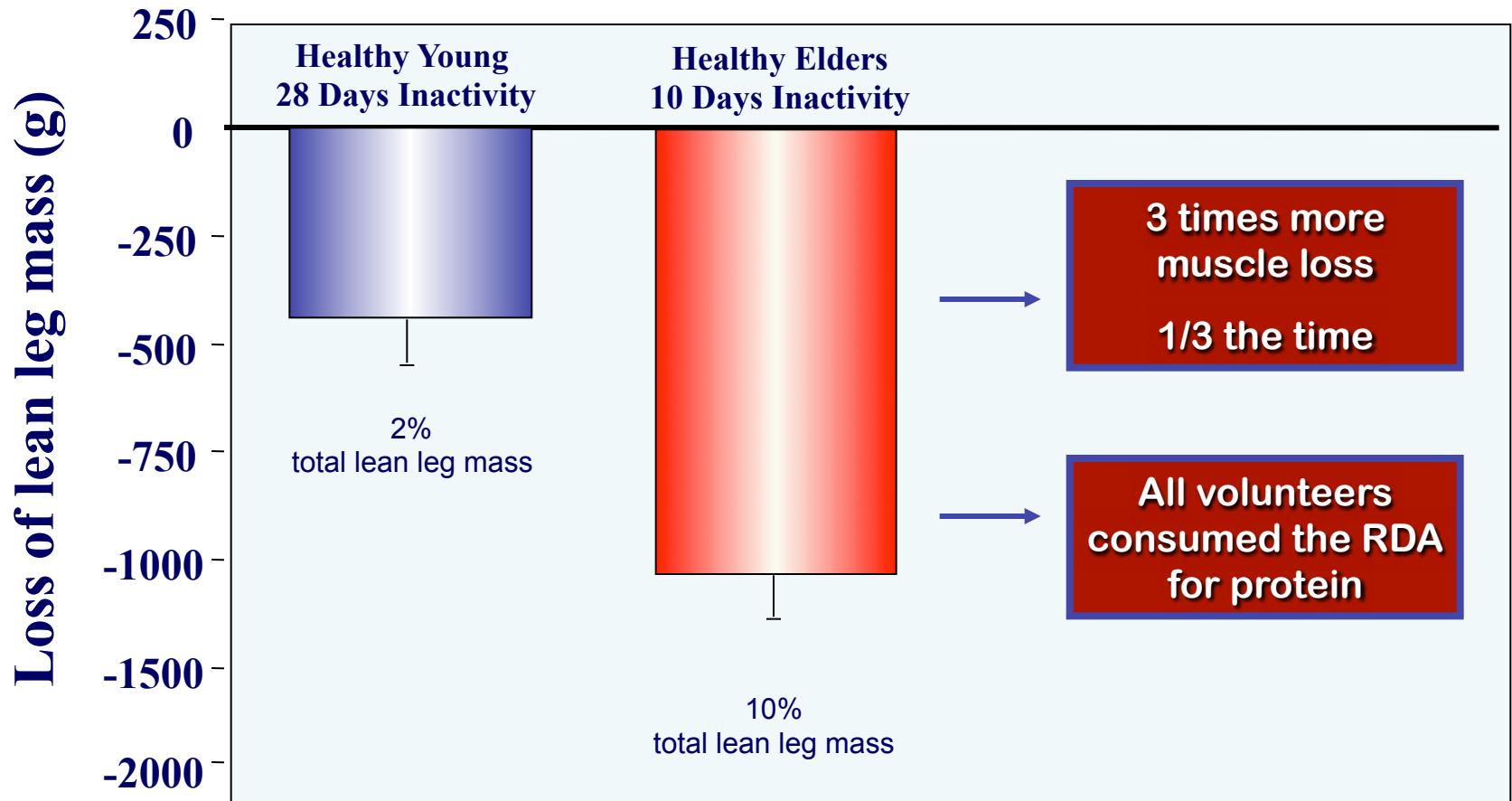
# Bed rest is a defacto treatment modality

*- if you're hospitalized you become inactive -*

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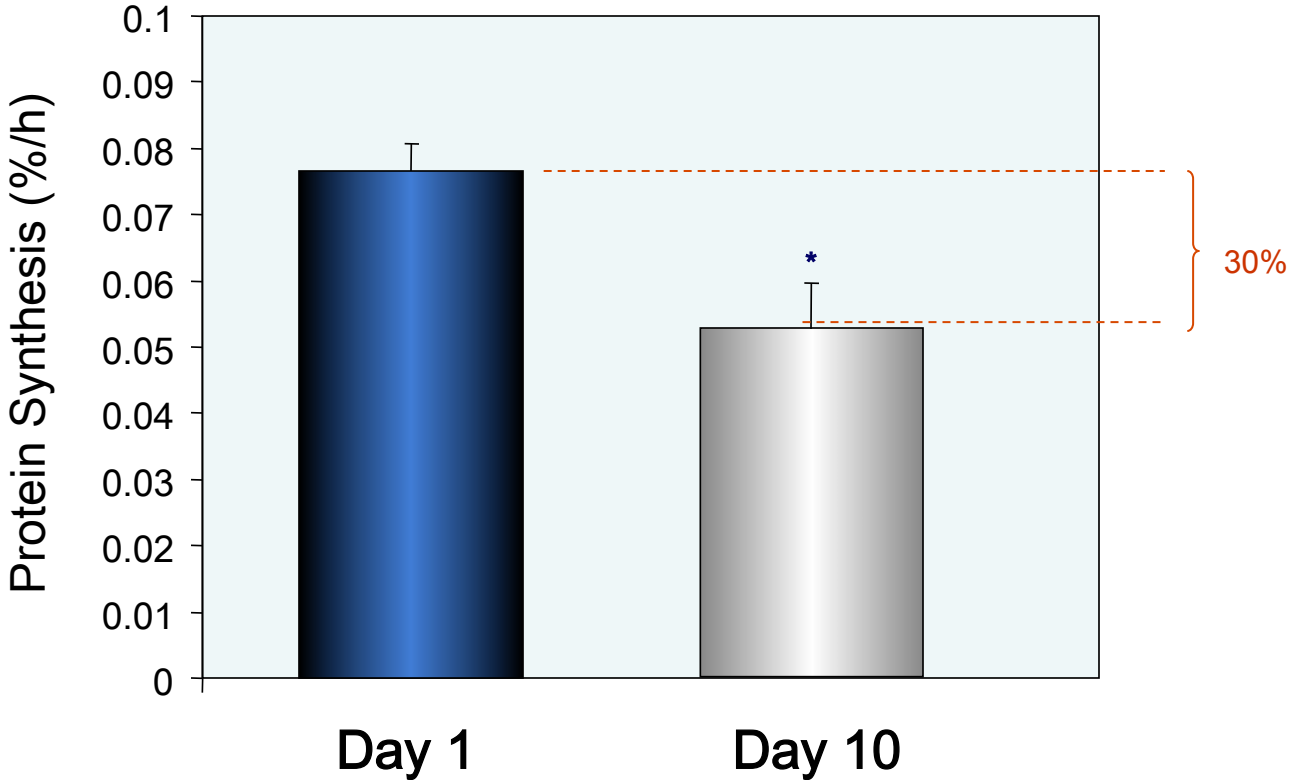


# Inactivity and Aging Muscle





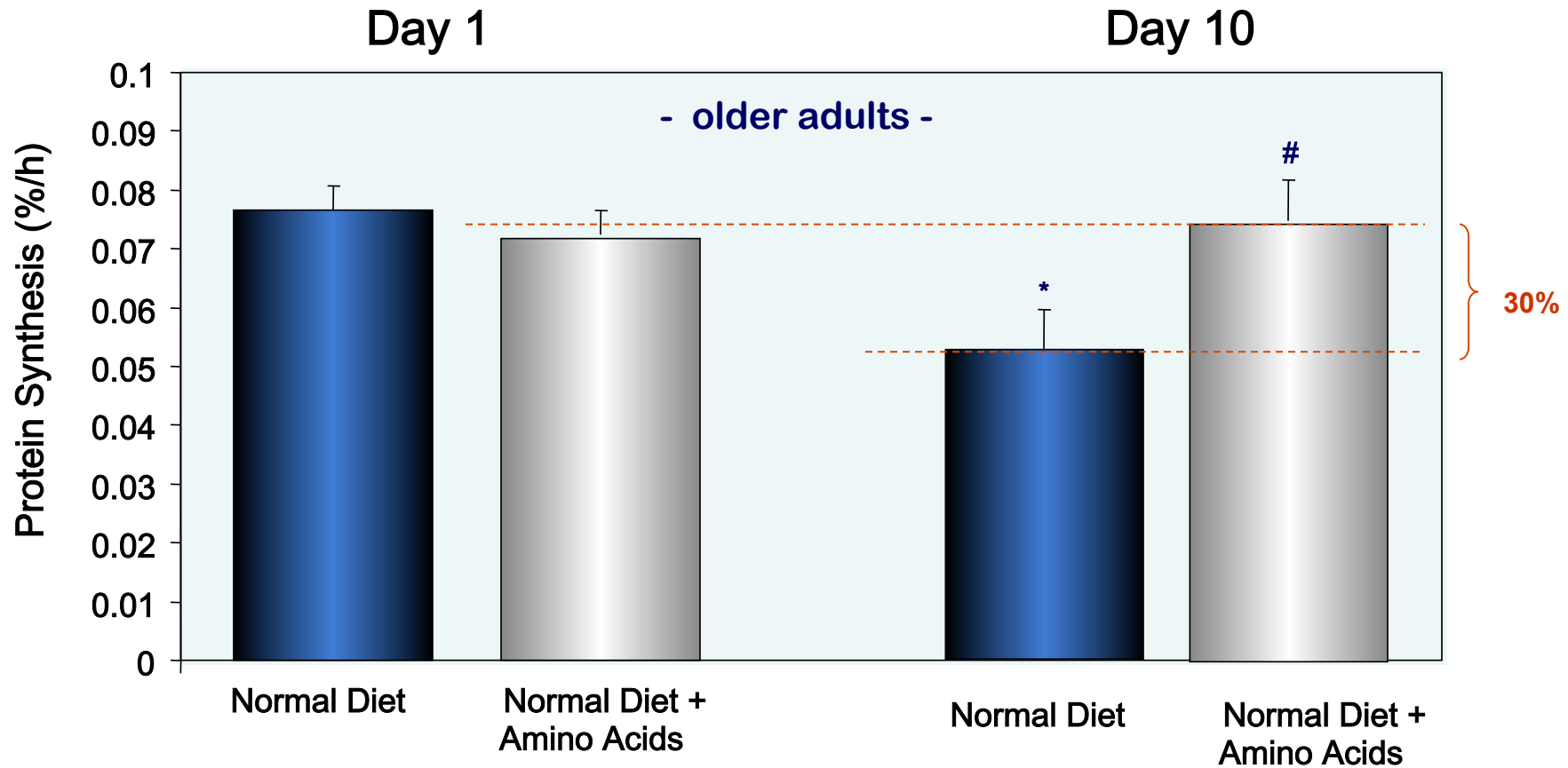
# Inactivity reduces muscle protein synthesis



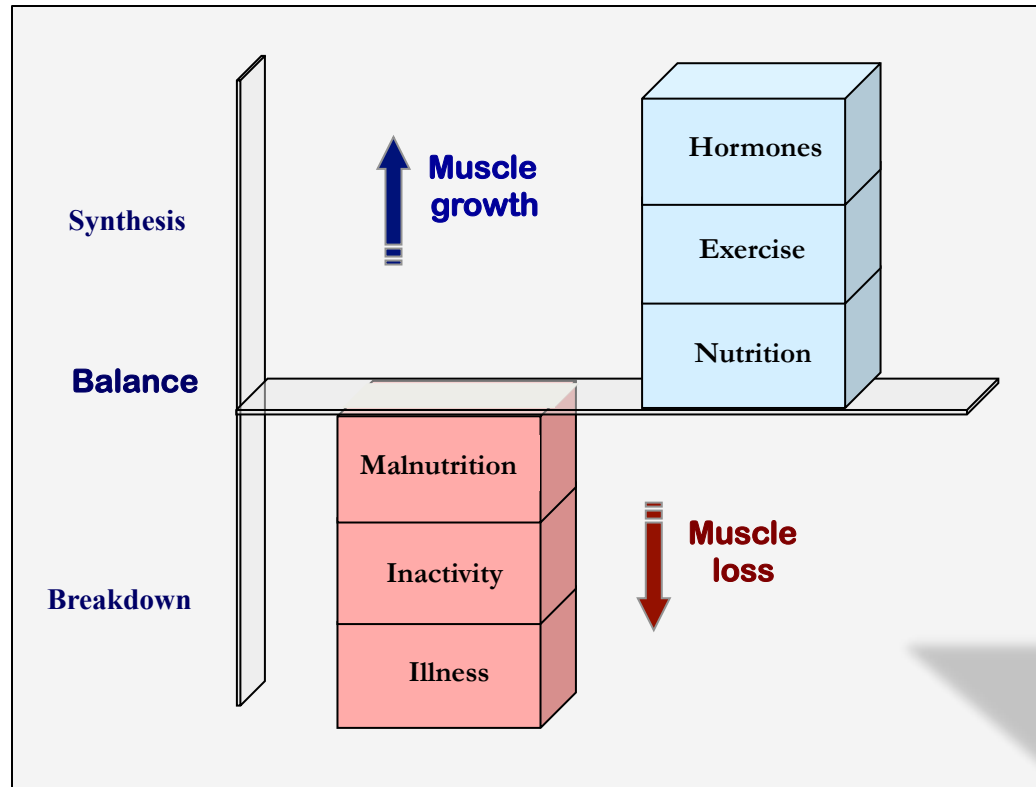
24 h muscle protein synthesis during 10 day of inactivity in elders  
(stable isotope methodology)



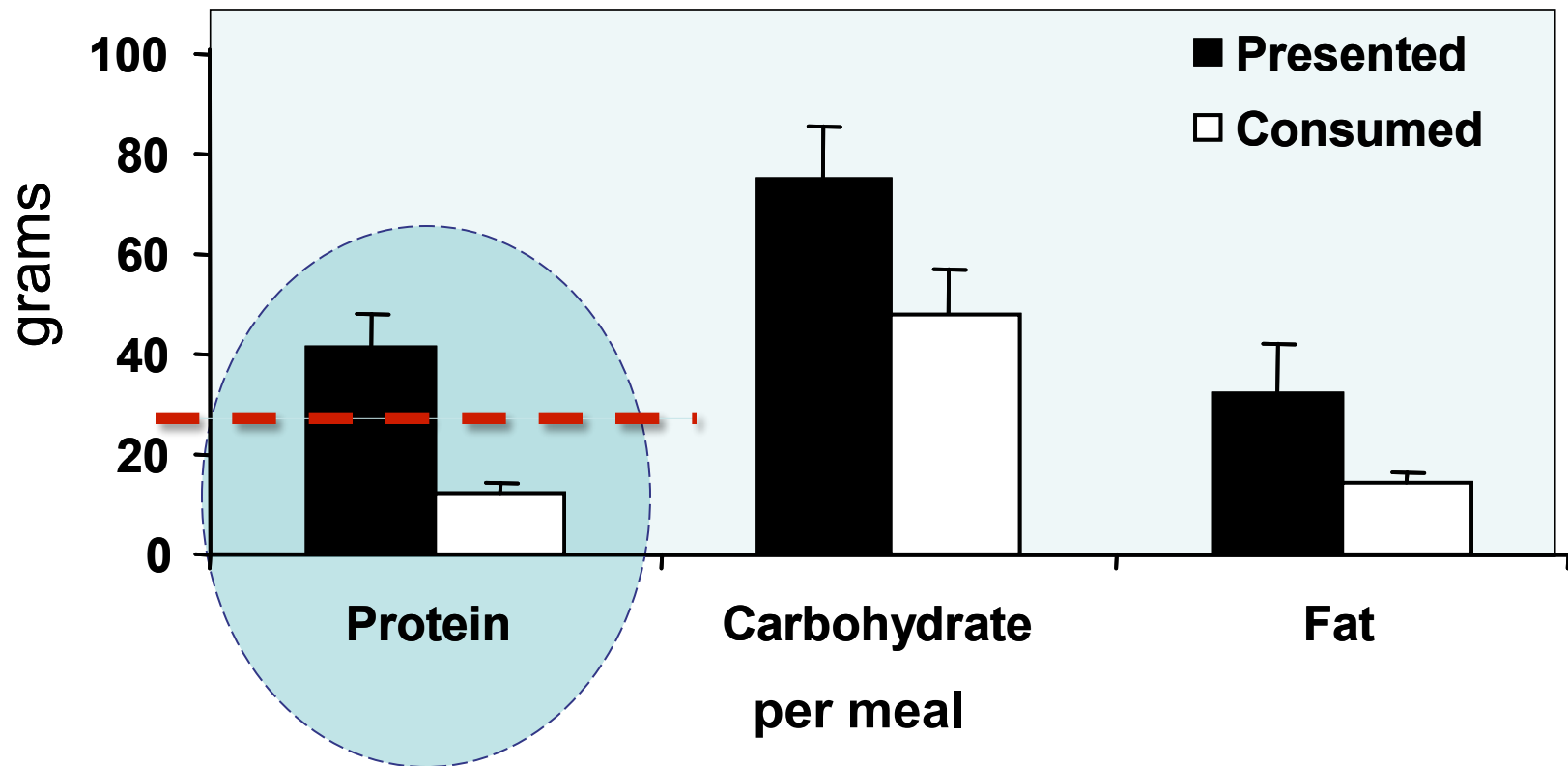
# Protein combats inactivity-induced muscle loss



# Combined catabolic insults: *the inpatient experience*



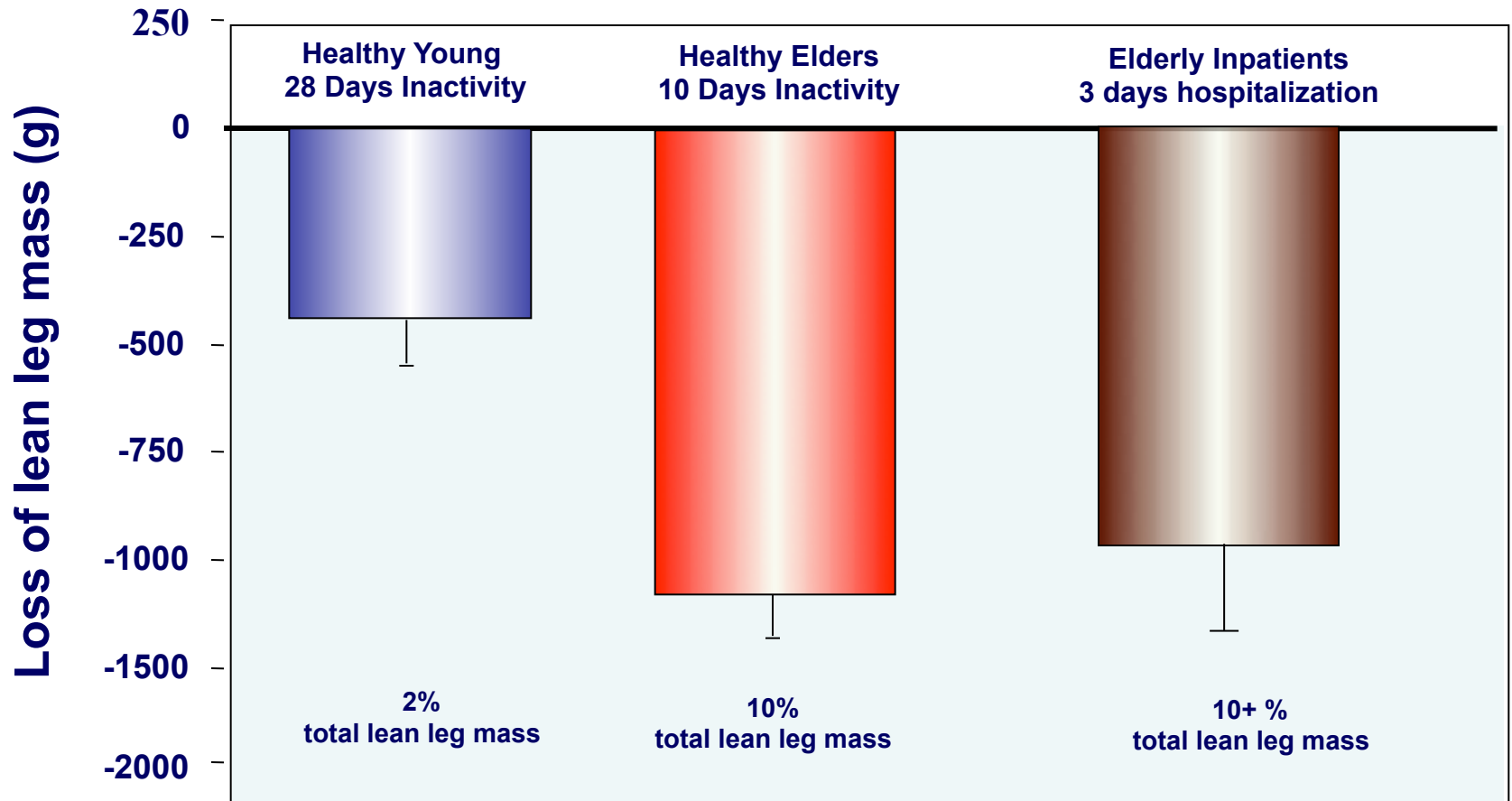
# Are our older inpatients eating enough ?





**Dessert (banana cream pie) = 50% of protein**

# Muscle Loss in Hospitalized Elders

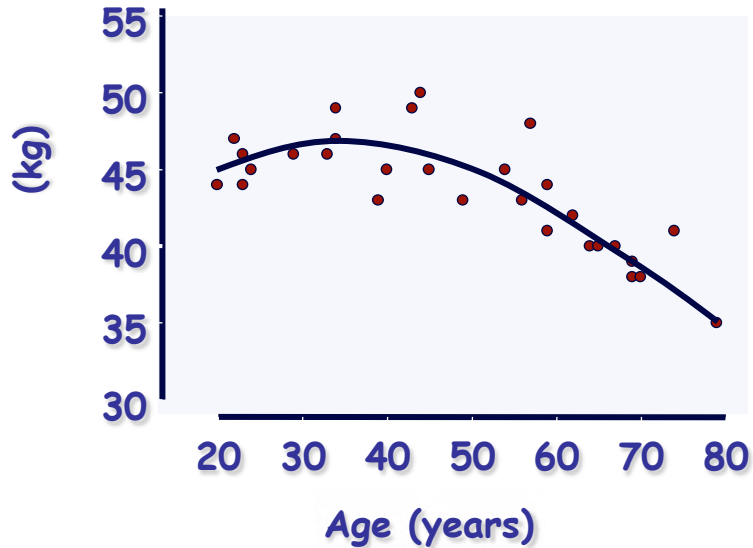


### 3. establishing a targeted nutritional intervention

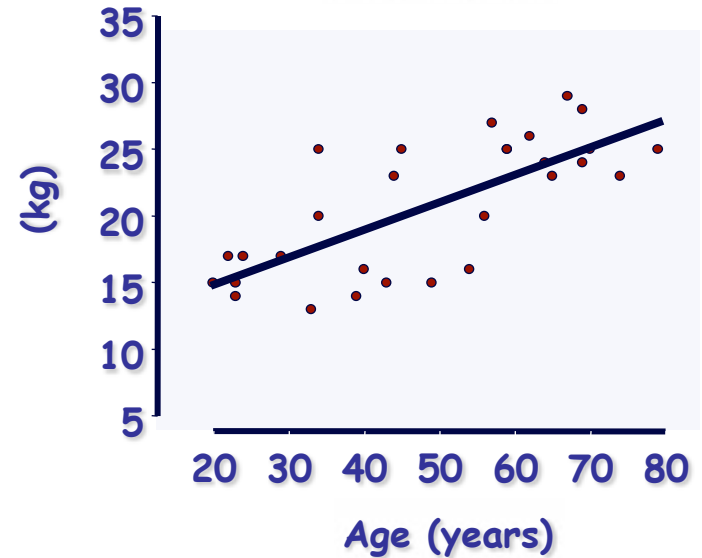


# Sarcopenia: - traditional model -

## Lean Body Mass

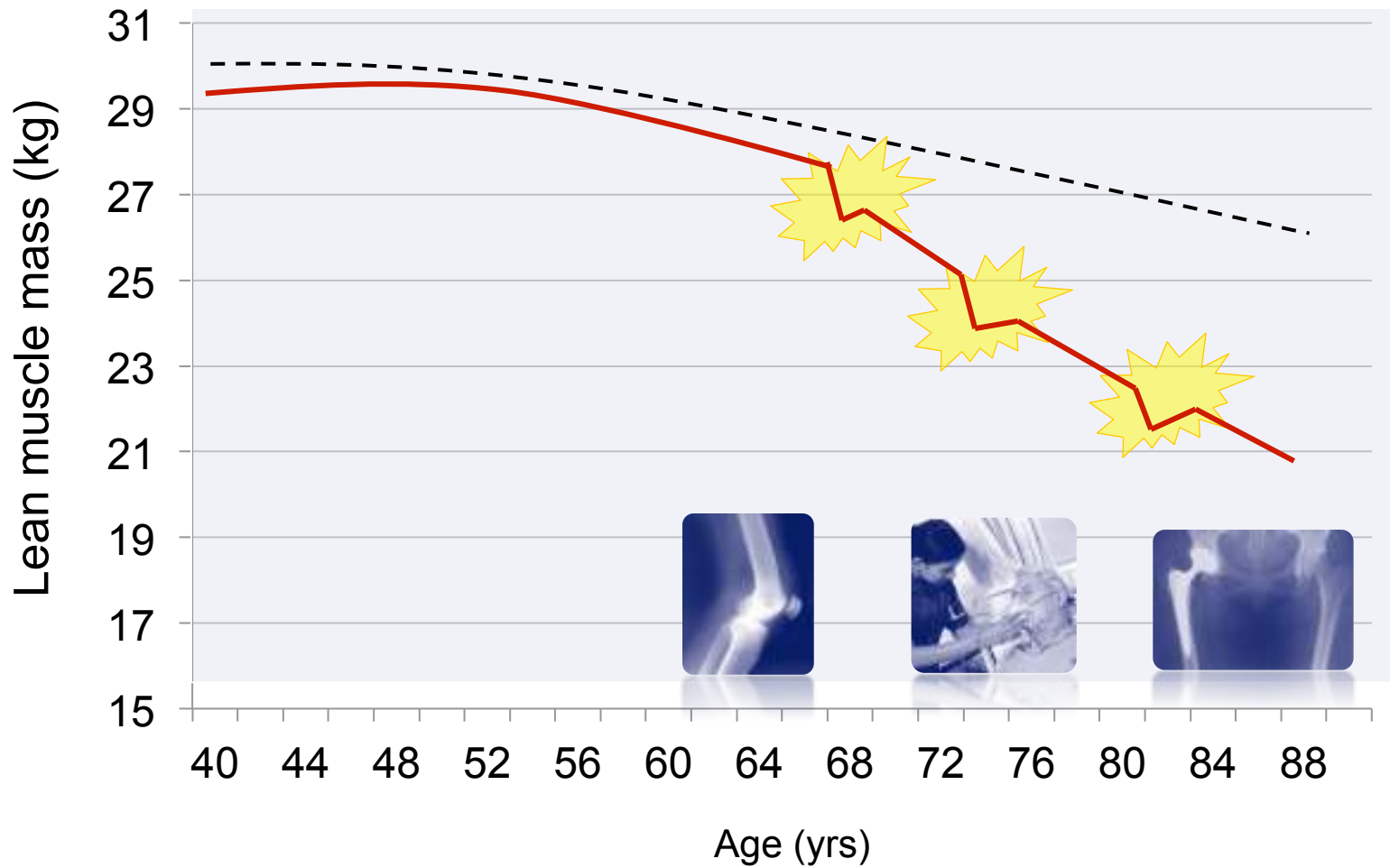


## Fat Mass



# Alternate model of muscle loss

- developing tactical nutrition interventions -





# Prevention and treatment strategies

- muscle mass & function -

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## PREVENTION:

- a). Consume a moderate amount of high-quality protein, 3-times per day
- b). Consume protein in close proximity to physical activity

## TREATMENT:

- a). React aggressively with nutritional support to reduce the rapid loss of muscle and strength associated with physical inactivity



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