Protein and Aging: Protecting Muscle Health with Nutrition

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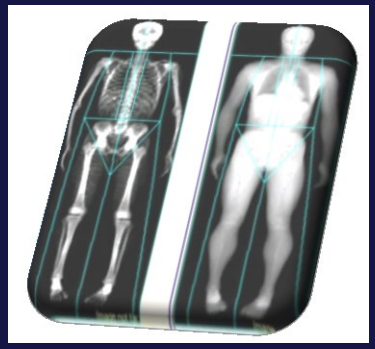
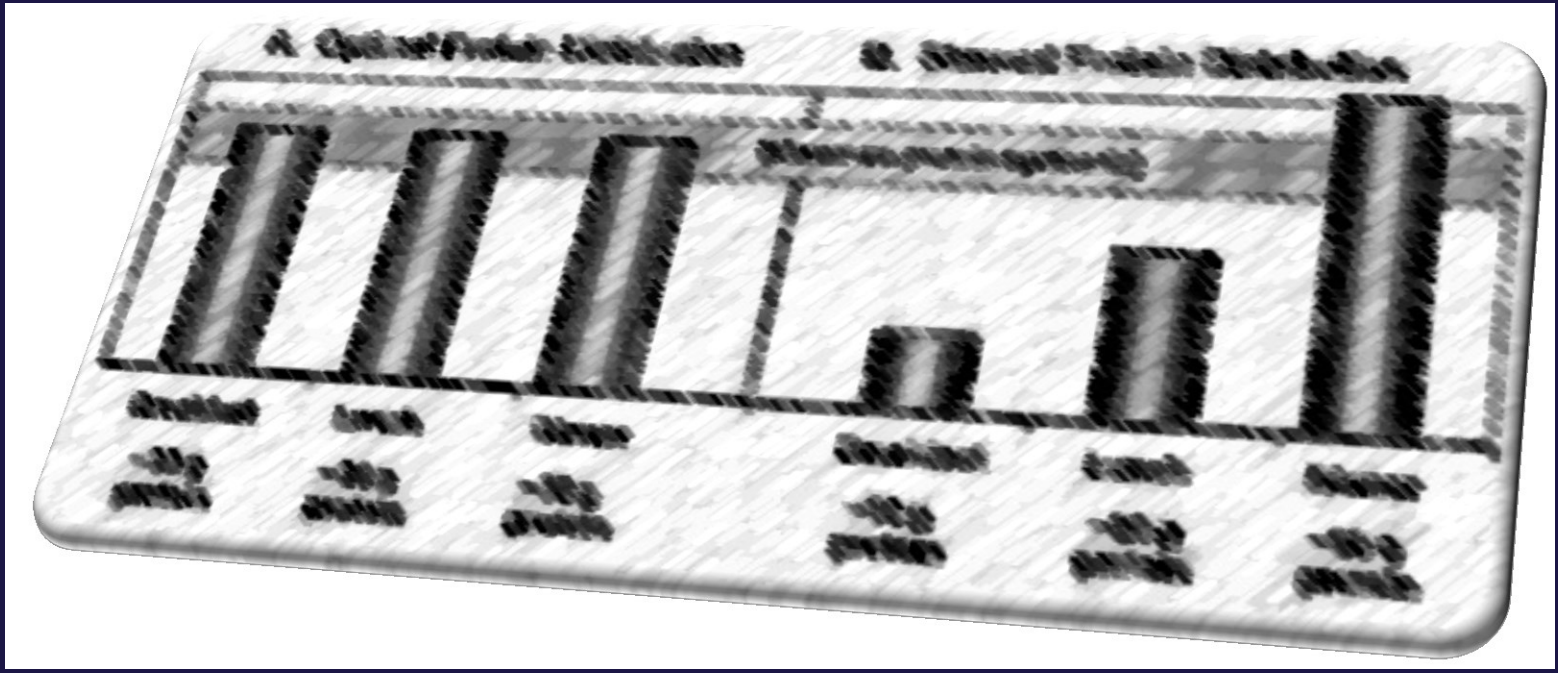


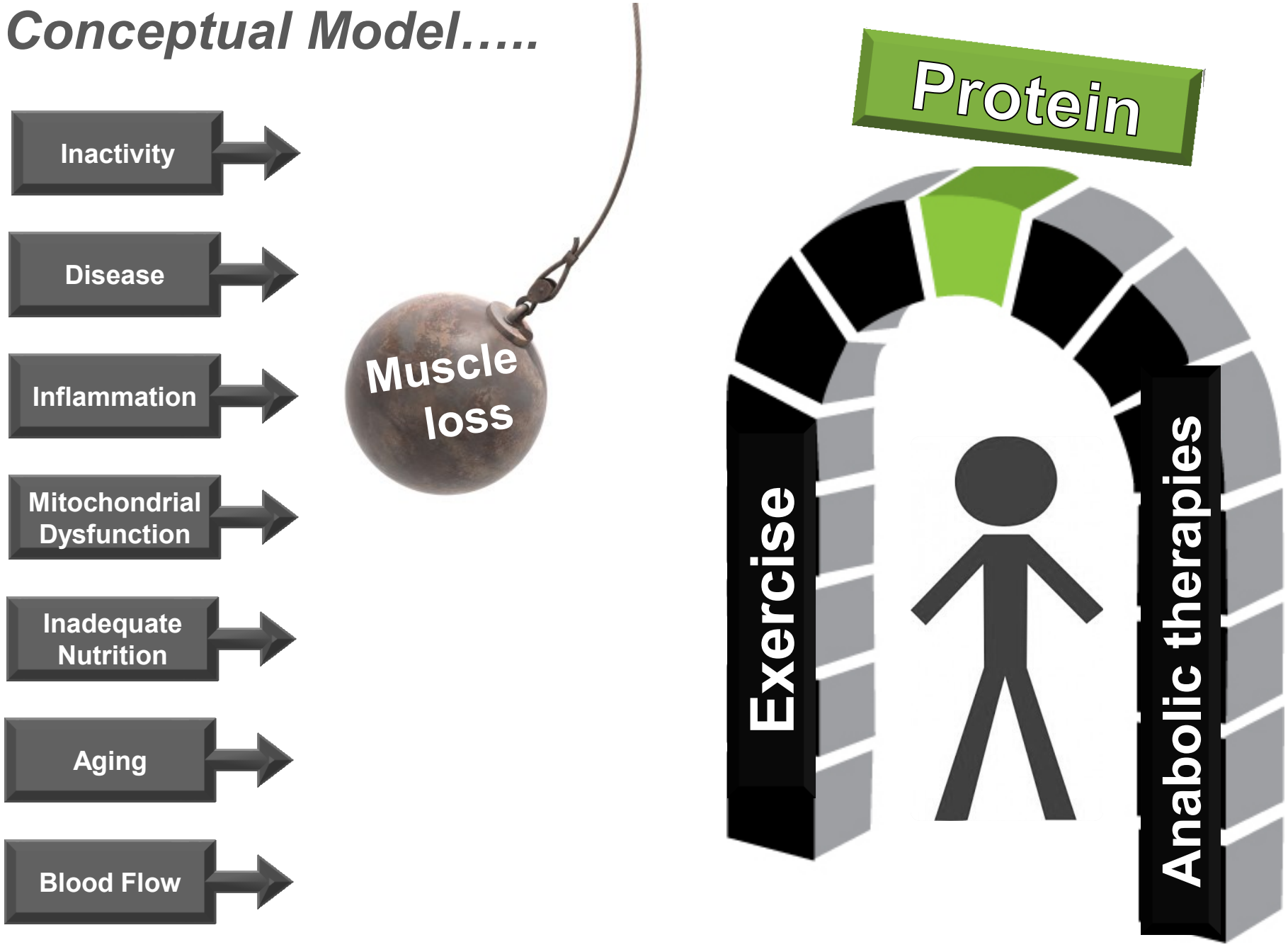
Overview

1. definitions and conceptual models
2. how much protein do we need – and when ?
3. priority areas: aging, inactivity and illness
4. recommendations

Definitions and a conceptual model



Conceptual Model…..



Beyond sarcopenia:

a tactical definition of aging and muscle loss ?

Sarcopenia

REPORT

Sarcopenia: European consensus on definition and diagnosis

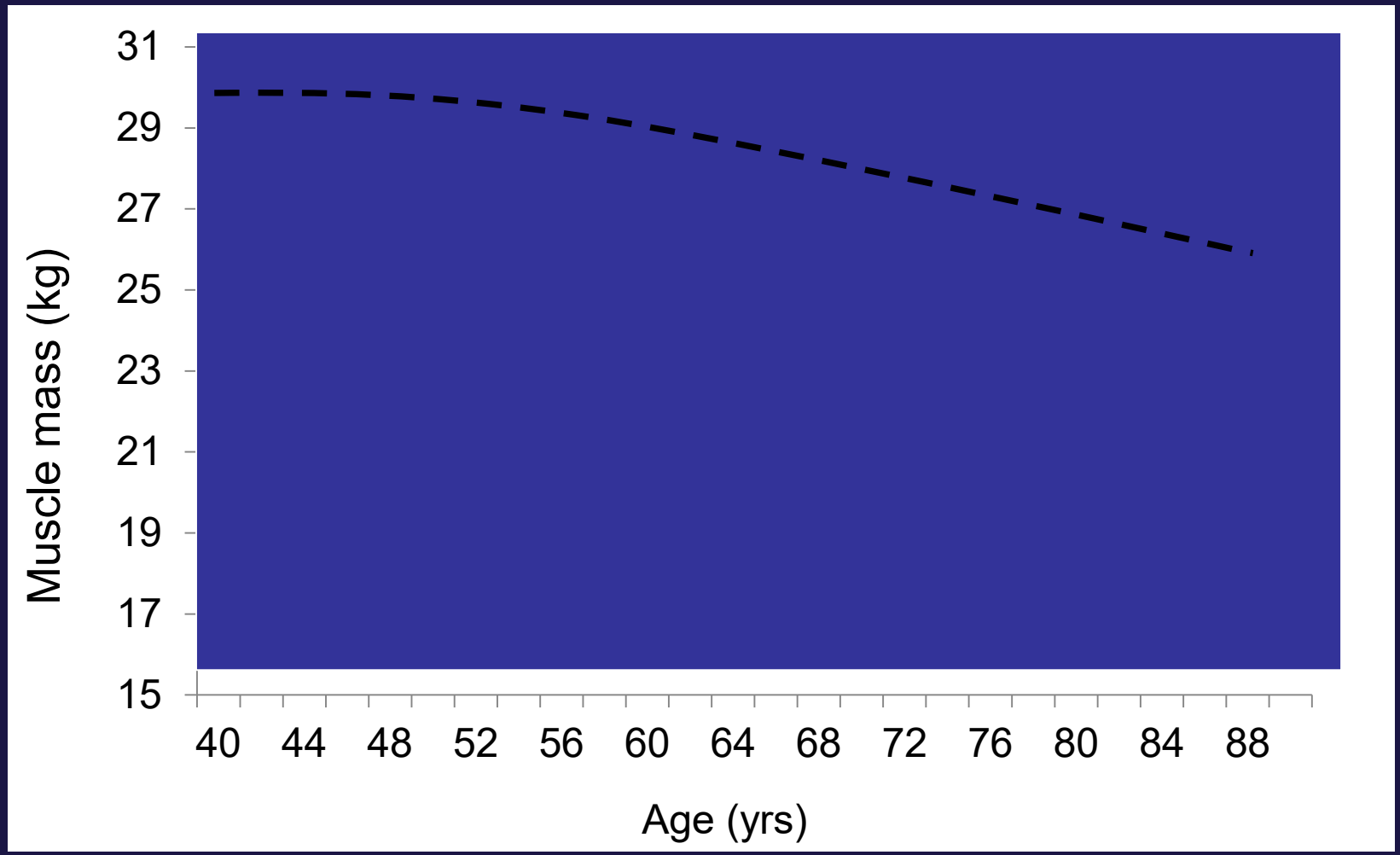
Report of the European Working Group on Sarcopenia in Older People

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]

Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death.

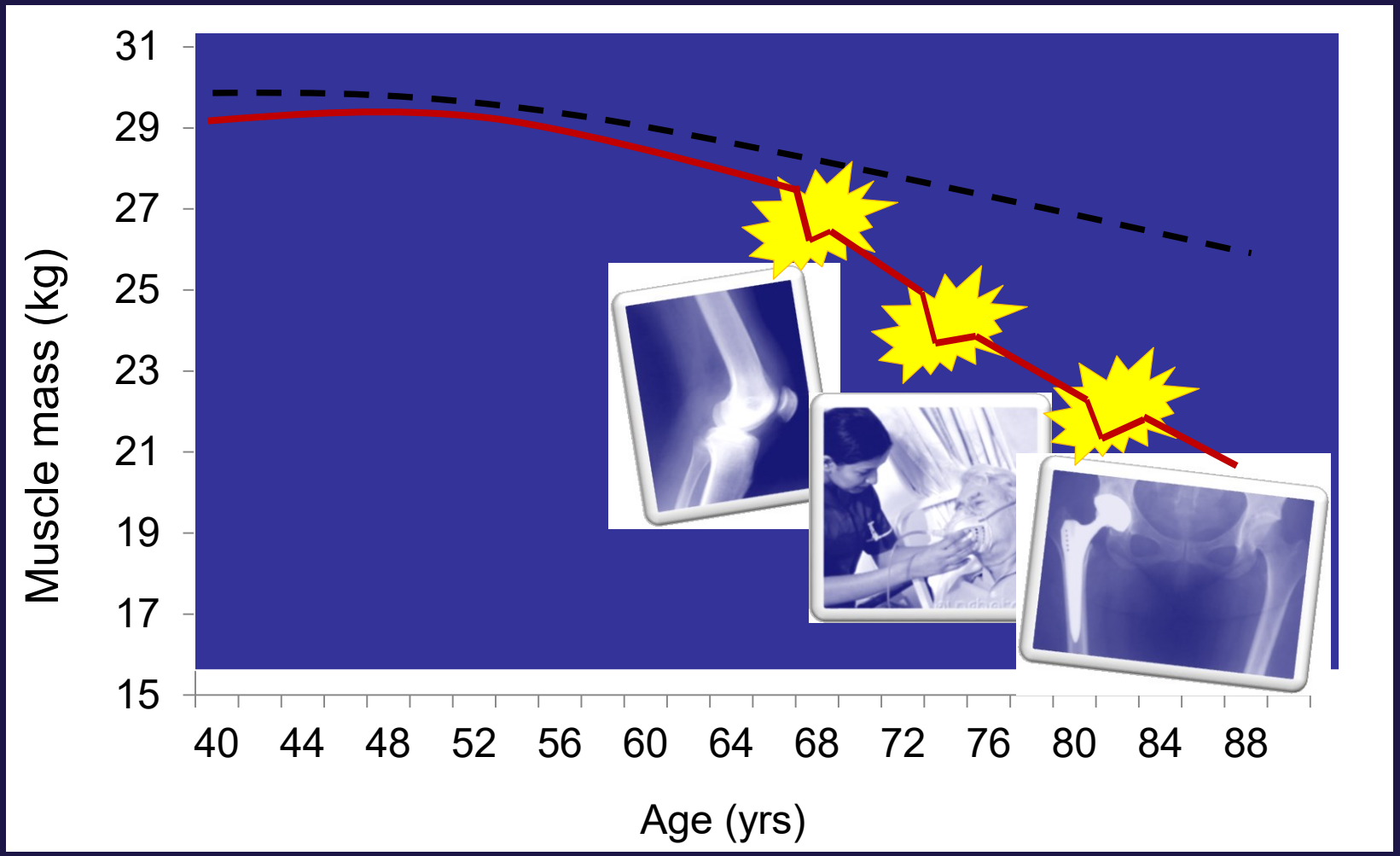
Cruz-Jentoft AJ et al. Sarcopenia: European consensus on definition and diagnosis. Report of the European Working Group on Sarcopenia in Older People. Age Ageing 2010

Population-Level Sarcopenia



Reference : English and Paddon-Jones. Curr Opin Clin Nutr Metab Care. 2010

Catabolic crisis model: something to work with

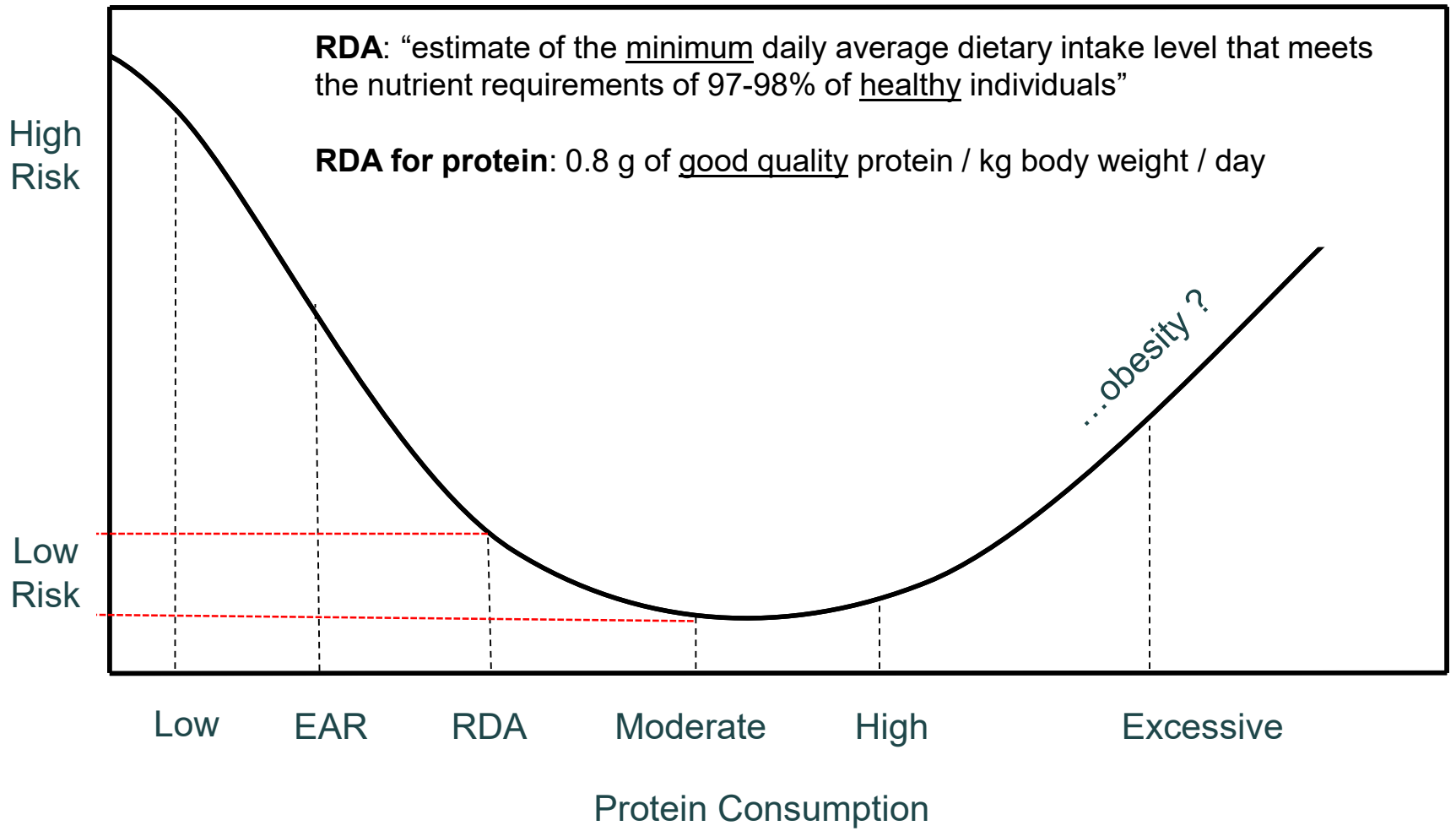


Reference : English and Paddon-Jones. Curr Opin Clin Nutr Metab Care. 2010

How much protein do we need ?

+ when, why, how and who....

Interpreting Protein Recommendations

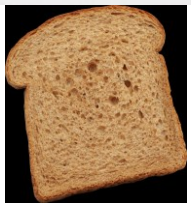


Protein Quality:

- lysine

- methionine & cysteine (soy)

- methionine / tryptophan



- ~~lysine~~
+ methionine

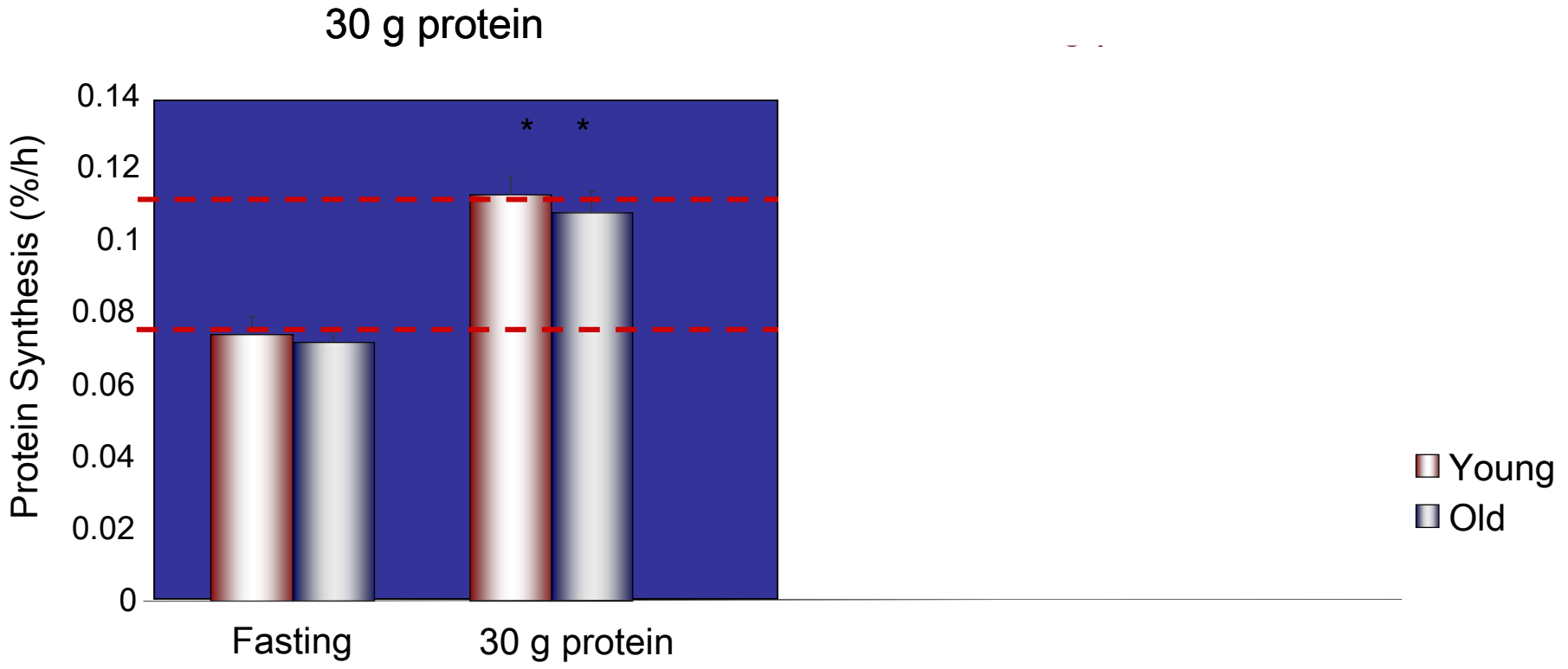
+

+ lysine
- ~~methionine~~

=

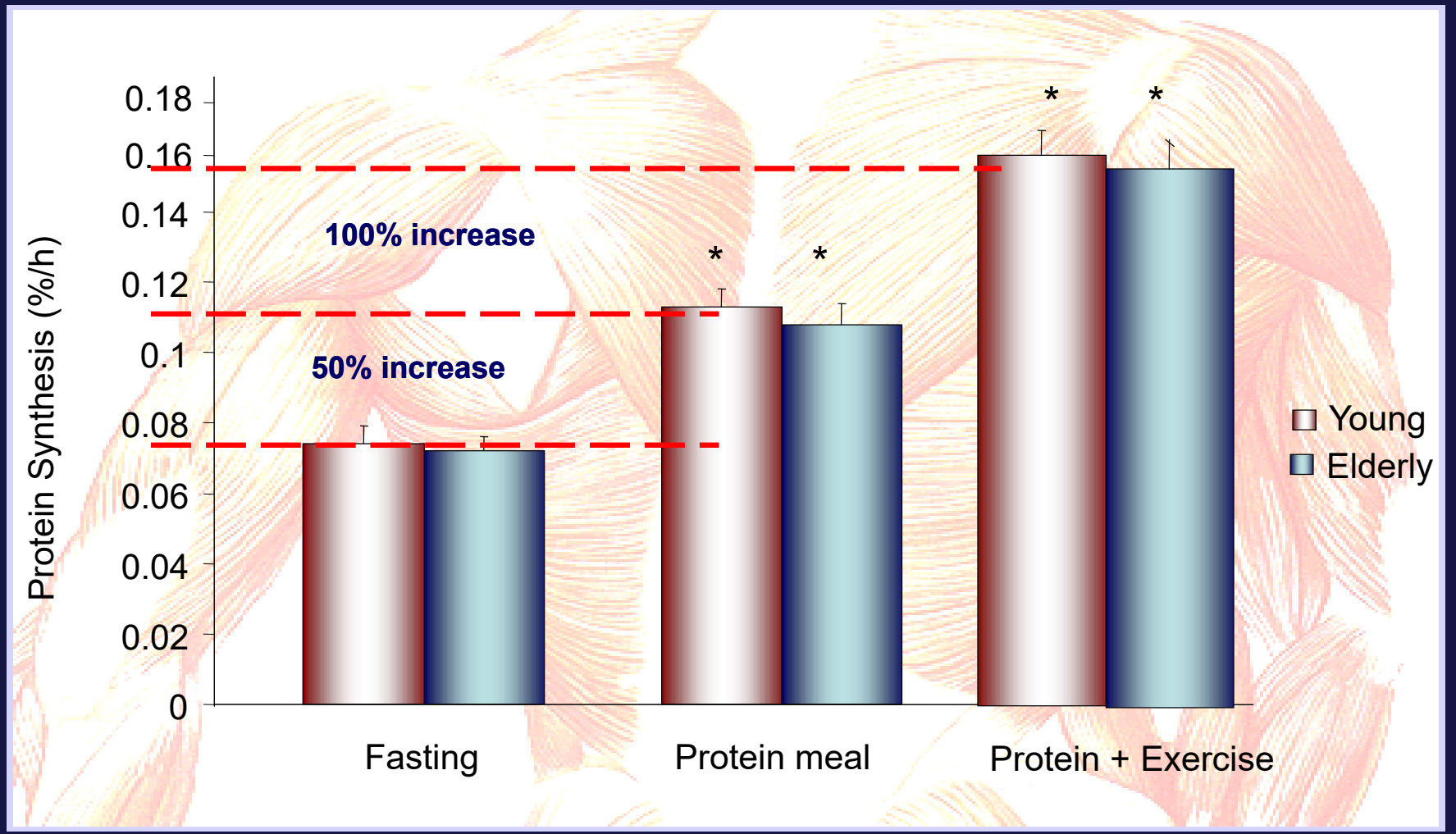
How much protein per meal do we need ?

- a message of moderation -



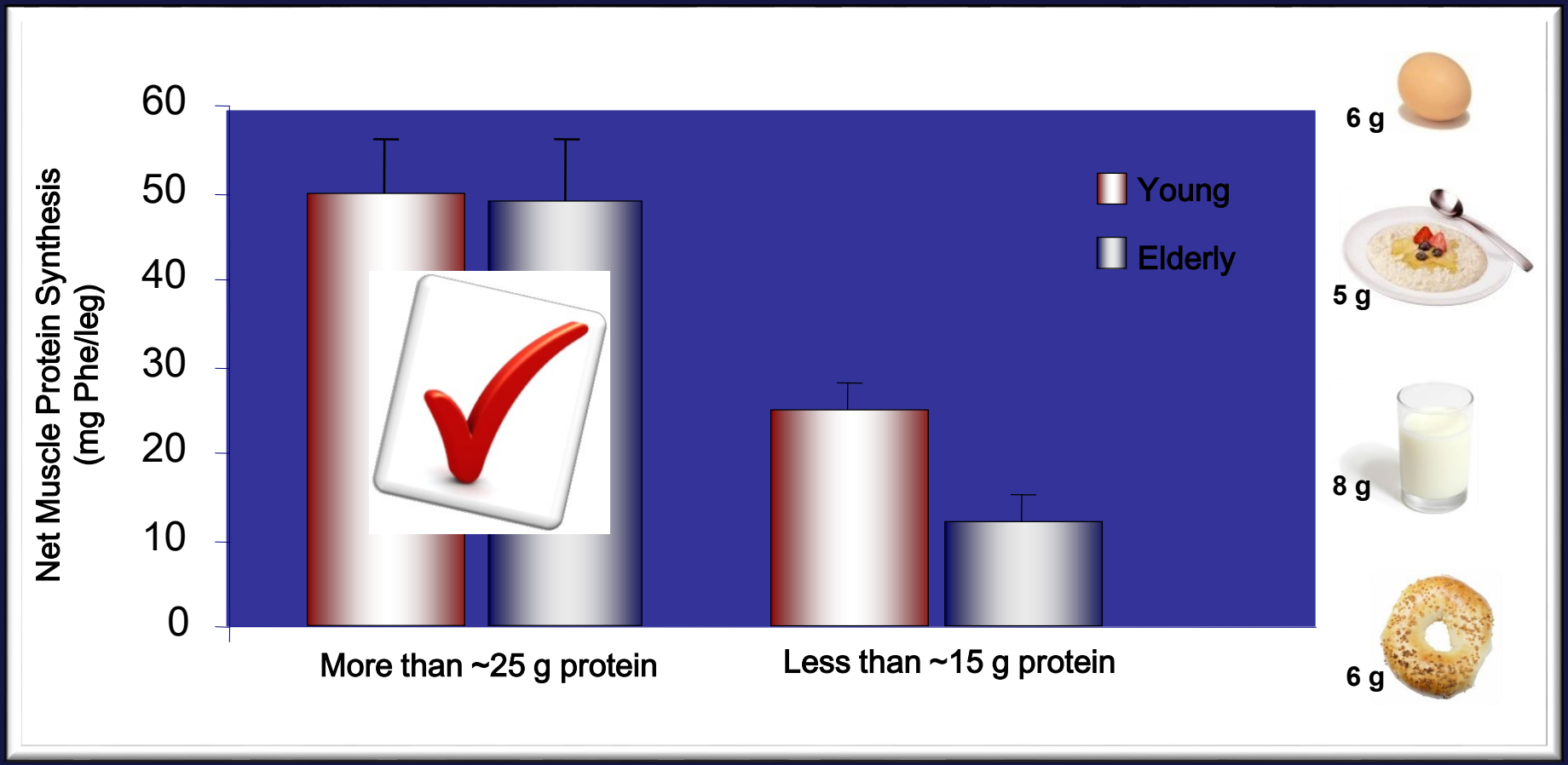
References: Symons et. al. AJCN, 2007
Symons et. al. JADA. 2009

Synergistic Effect of Protein and Exercise



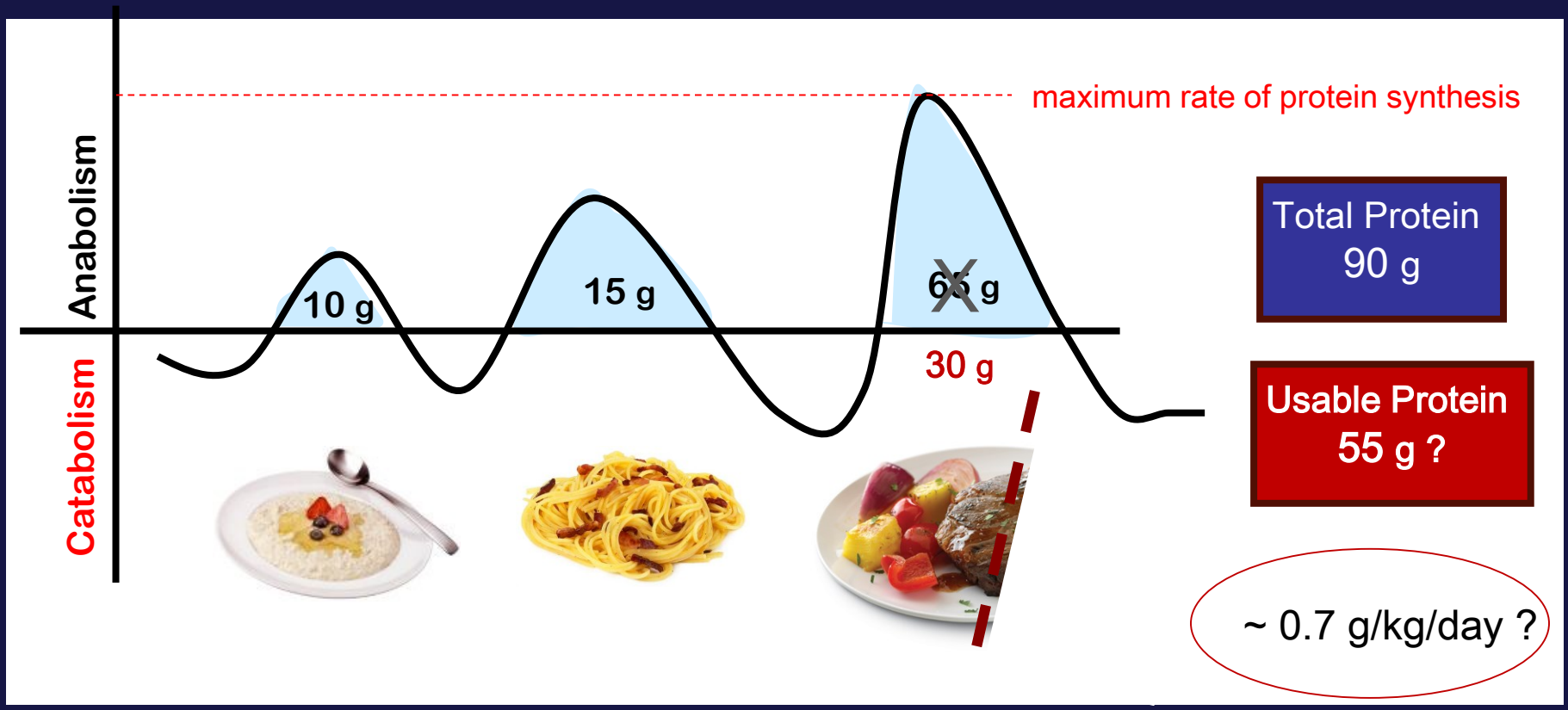
Reference: Symons et. al. JNHA, 2010

Reality: Age-related dose-response



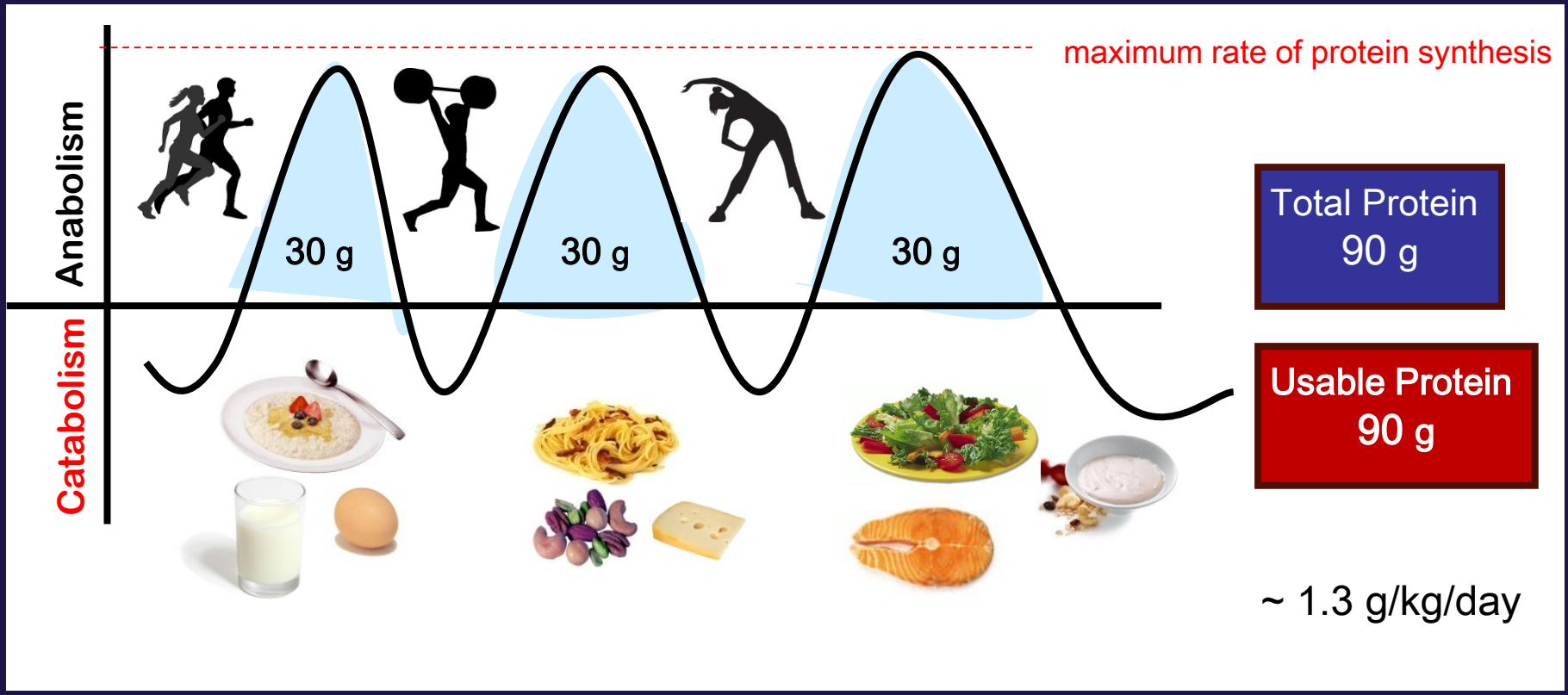
Reference: Katsanos et. al. AJCN, 2005

How much protein: daily vs. per meal ?



Reference: Paddon-Jones and Rasmussen 2009

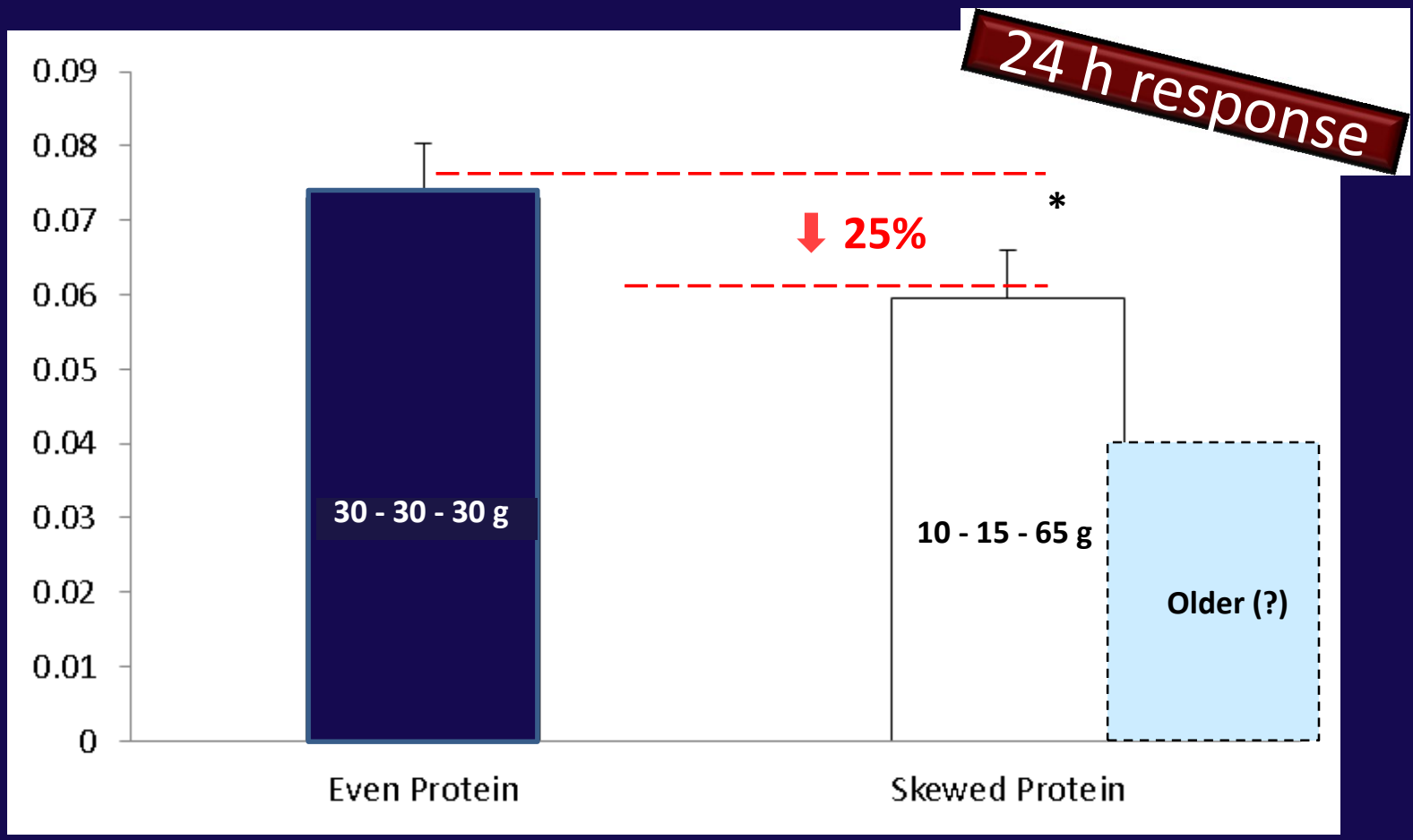
Concept: Optimizing protein at each meal ?



→ greater 24 h protein synthesis response ?

Reference: Paddon-Jones and Rasmussen 2009

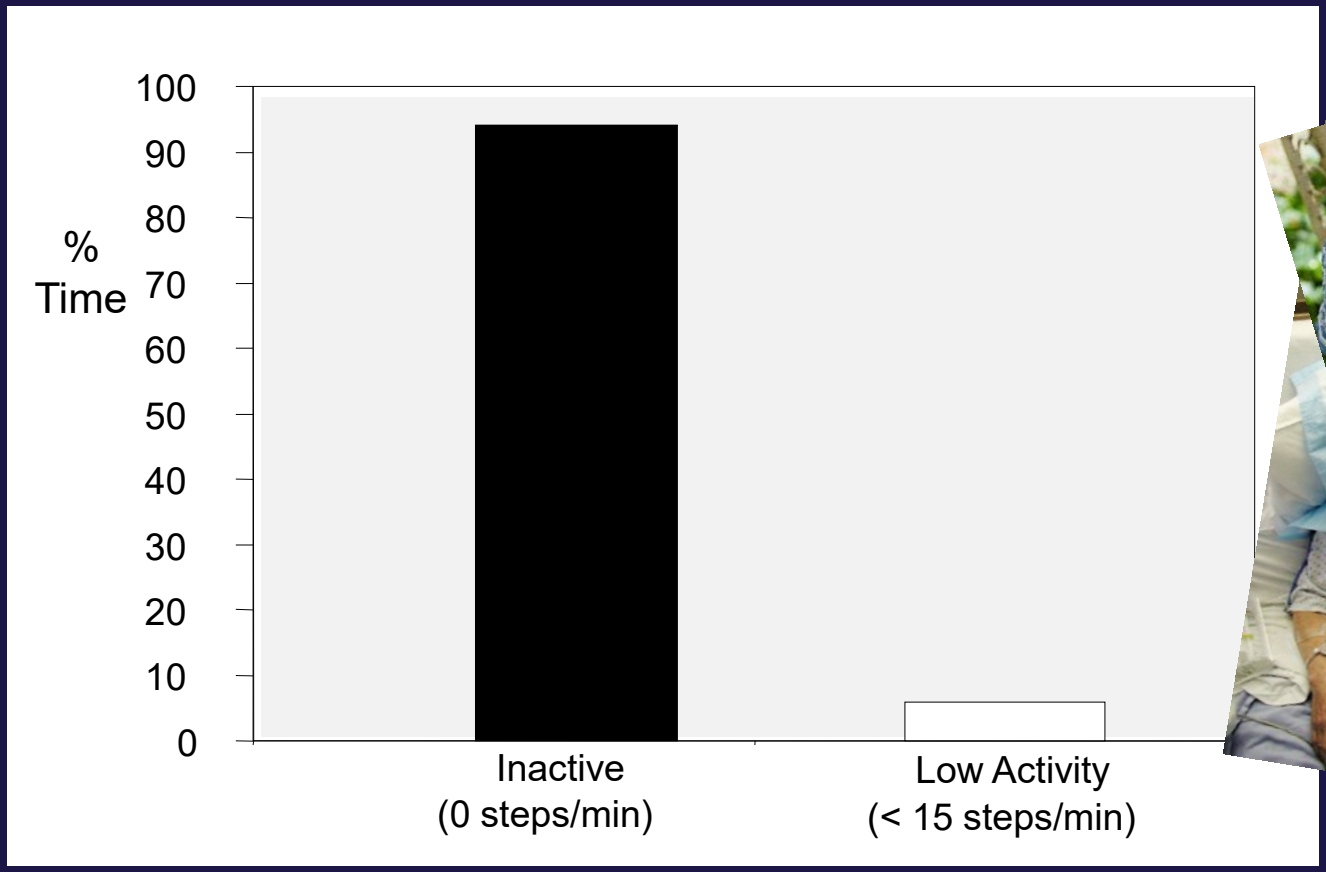
Protein distribution impacts muscle protein synthesis



Reference: Mamerow, et.al. J. Nutr. 2014

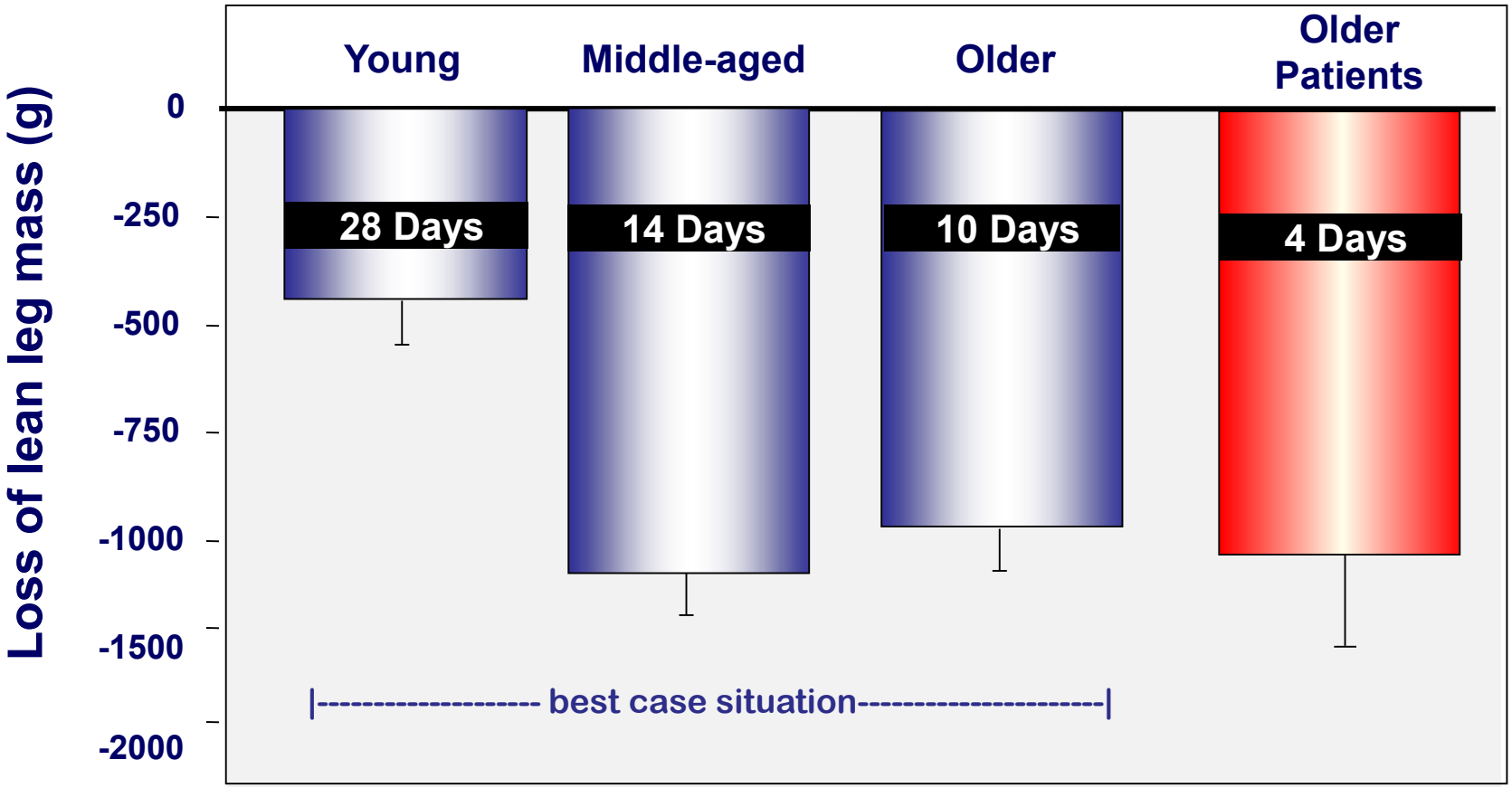
Protecting muscle health during inactivity

If you are hospitalized - you are put in bed



Inactivity in a research setting

- Bed Rest -

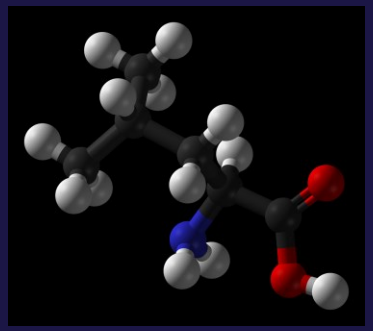


Paddon-Jones et. al. 2004
English et al., 2014
Kortebein et al. 2007
Paddon-Jones , Pilot Data

Protecting Muscle with Nutrition

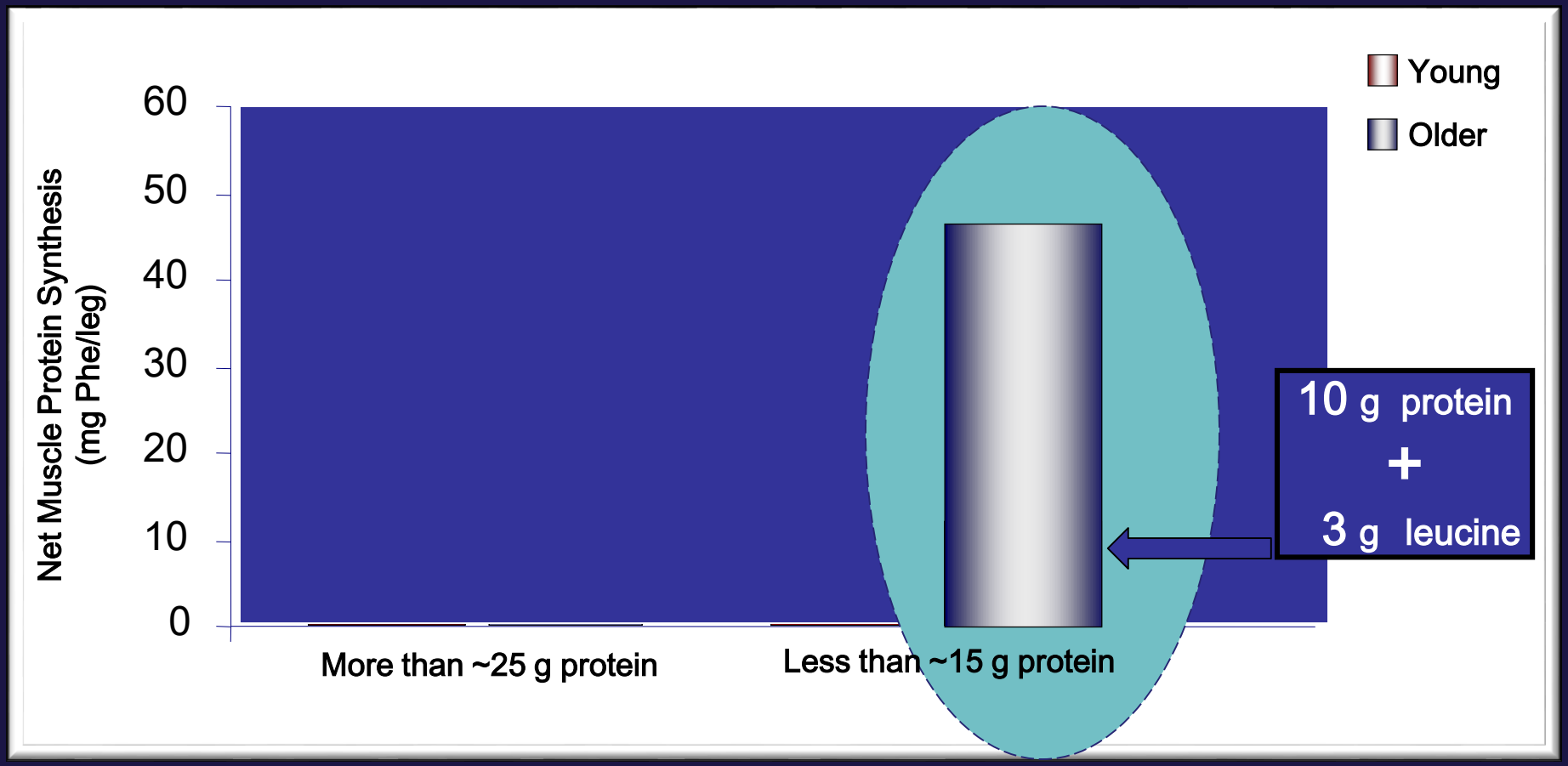
Leucine has a key regulatory role on muscle protein synthesis

…you may not need extra though



Smaller protein meal

-- the role of protein quality & leucine --



Summary and recommendations

Quality Protein

it doesn't have to be complicated!

Recommendations: *Prevention* and Treatment

For all healthy adults….

Establish a dietary framework that includes a ***moderate*** amount of ***high quality*** protein at ***each meal***.

Modify as necessary to accommodate individual needs:

- *energy requirements*
- *physical activity*
- *health status*
- *body composition goals*
- *dentition, satiety, taste preference*

Recommendations: Prevention and *Treatment*

React aggressively with [...with nutrition, exercise, pharmacology] to reduce the rapid loss of muscle and strength associated with short-term physical inactivity or catabolic crisis.

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- Sneha Nagamma

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- Adam Wacher
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- James Pattarini
- Charles Mathers

Colleagues
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- Blake Rasmussen
- Wayne Campbell
- Don Layman
- Thomas Lang
- Aaron Russell / Severine Lamon

utmb Health
Center for Recovery, Physical Activity and Nutrition

utmb Health
Sealy Center on Aging

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