



Nutrition, Aging and Physical Function

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Acute Geriatrics

Physical Functional Performance in older adults (CS-PFP 10)

1. Pot Carry
2. Jacket On/Off
3. Scarf Pick-up
4. Maximal Reach
5. Floor Sweep
6. Laundry
7. Floor Down/Up
8. Stair Climb
9. Groceries
10. Six-Minute Walk



- Upper body strength
- Lower body strength
- Upper body flexibility
- Cardio-respiratory fitness
- Balance and coordination



Cress ME, Petrella JK, Moore TL, Schenkman ML. Continuous-Scale Physical Functional Performance Test: Validity, Reliability, and Sensitivity of for the Short Version. Phys Ther 2005;85:323-35.

Mobility assessment in older adults



Timed Up & Go Test



Podsiadlo D, Richardson S. The timed « Up & Go »: A test of basic functional mobility for frail elderly persons. J Am Geriatr Soc 1991; 39:142-148

< 20 sec good mobility

Importance of muscle strength



Get Up



Go

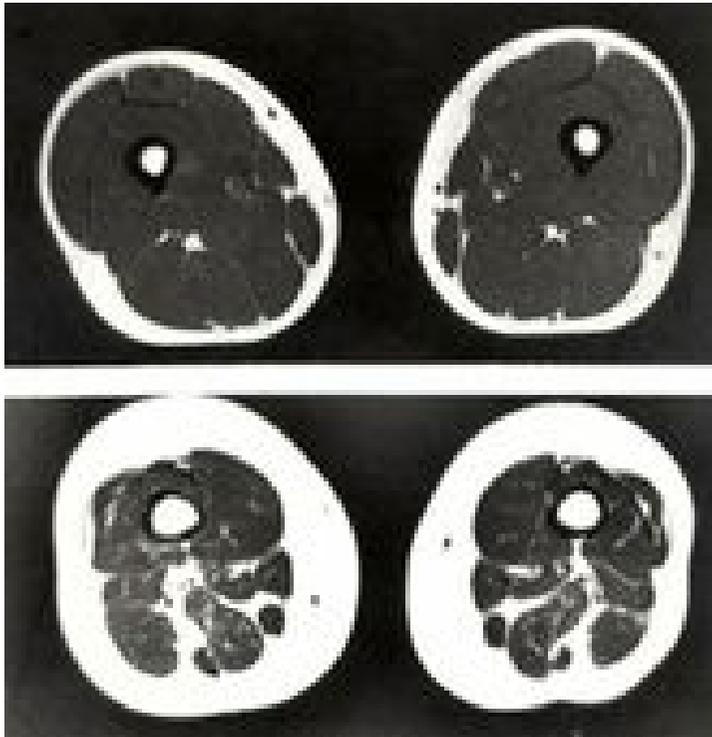


Turn

Podsiadlo D, Richardson S. J Am Geriatr Soc 1991; 39:142-148

Shumway-Cook A, Brauer S, Woollacott M. Phys Ther 2000; 80: 896-903.

Age-related Muscle Loss



Between the age 30 – 80 years:

30% loss of total muscle mass
(loss of lean body mass)

Loss of type II (fast) muscle fibers

Sarcopenia

Kressig R, Proust J. Physical Activity and Aging Process. Schweiz Med Wochenschr 1998;128:1181-6.

Roubenoff R. Physical activity, inflammation, and muscle loss. Nutr Rev 2007;S208-12.

Kirkendall DT et al. The effects of aging and training on skeletal muscle. Am J Sport Med 1998;

Sarcopenia: risk for falls

Risk factors for falls	Relative Risk
Muscle weakness	4.4
Gait disorders	2.9
Balance disorders	2.9

American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention. JAGS 2001;49:664-672.

Nutrition: what changes with advancing age?

Decreased energy need (-25% Calories)

Maintained or increased need of nutrients such as:
Protein, Calcium, Vitamins D, B6, B12, C

Meals with enhanced „nutrients’ density“ needed



Link between mobility and nutrition at old age

Importance of proteins and Vitamin D

In community-dwelling Japanese seniors :

Low serum albumin and Vitamin D levels
associated with bad Timed Up & Go performance

Kwon J et al. Concomitant lower serum albumin and vitamin D levels are associated with decreased objective physical performance among Japanese community-dwelling elderly. *Gerontology* 2007;53:322-8.

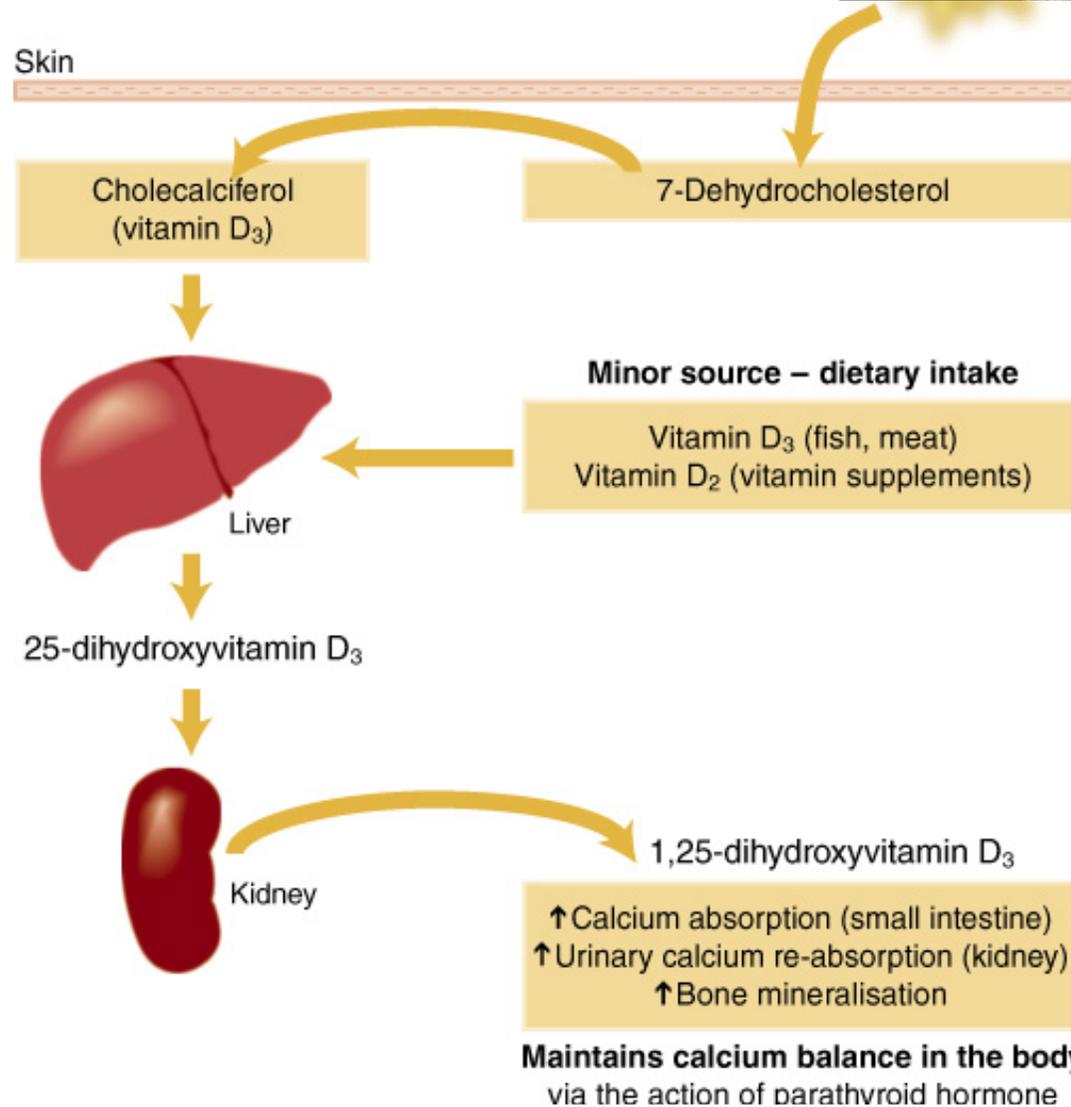
Vitamin D

Daily need: at least 800 IU/d



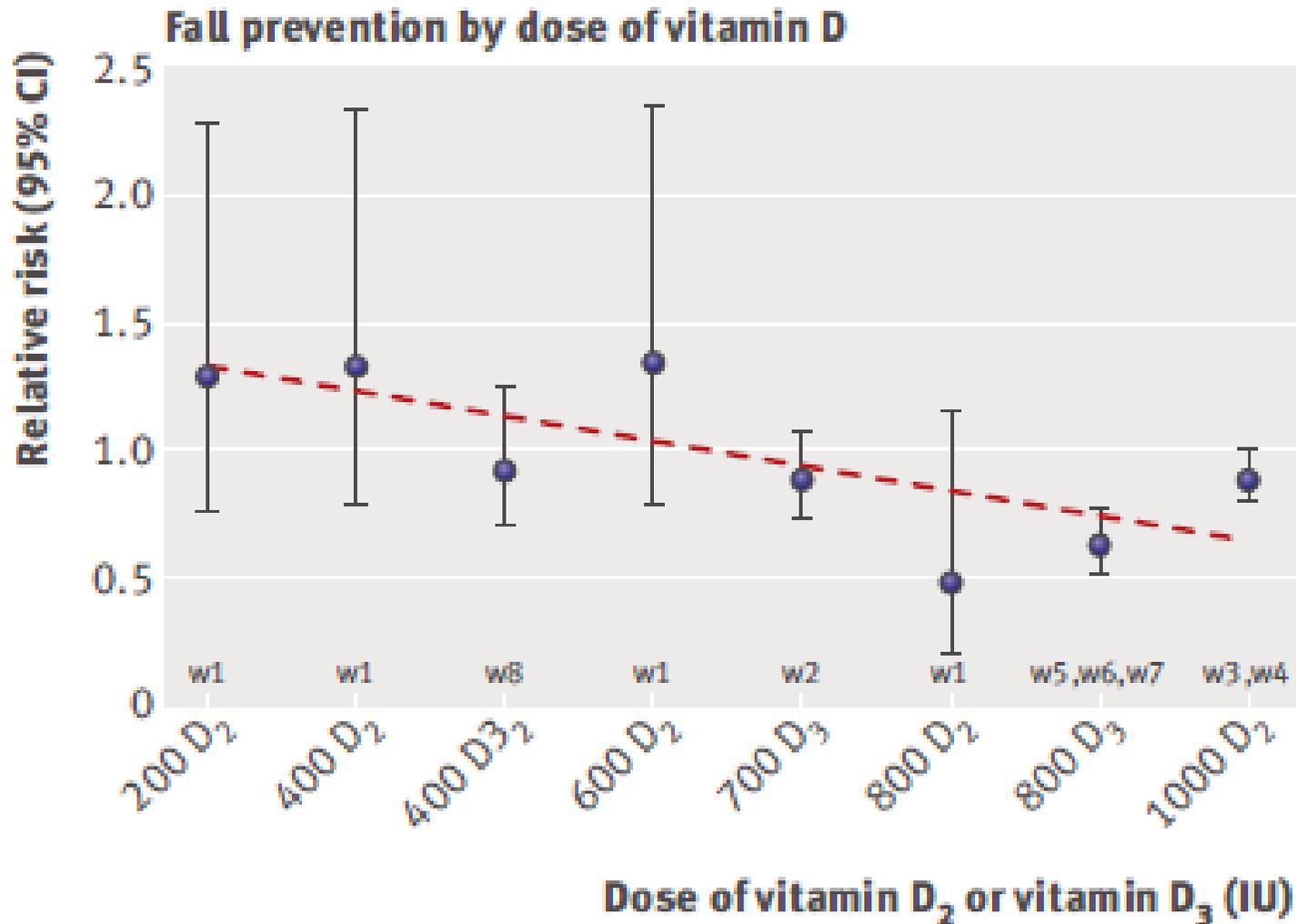
Major source – sunlight

Conversion to Vit D from sunlight ↓ by 4 with old age



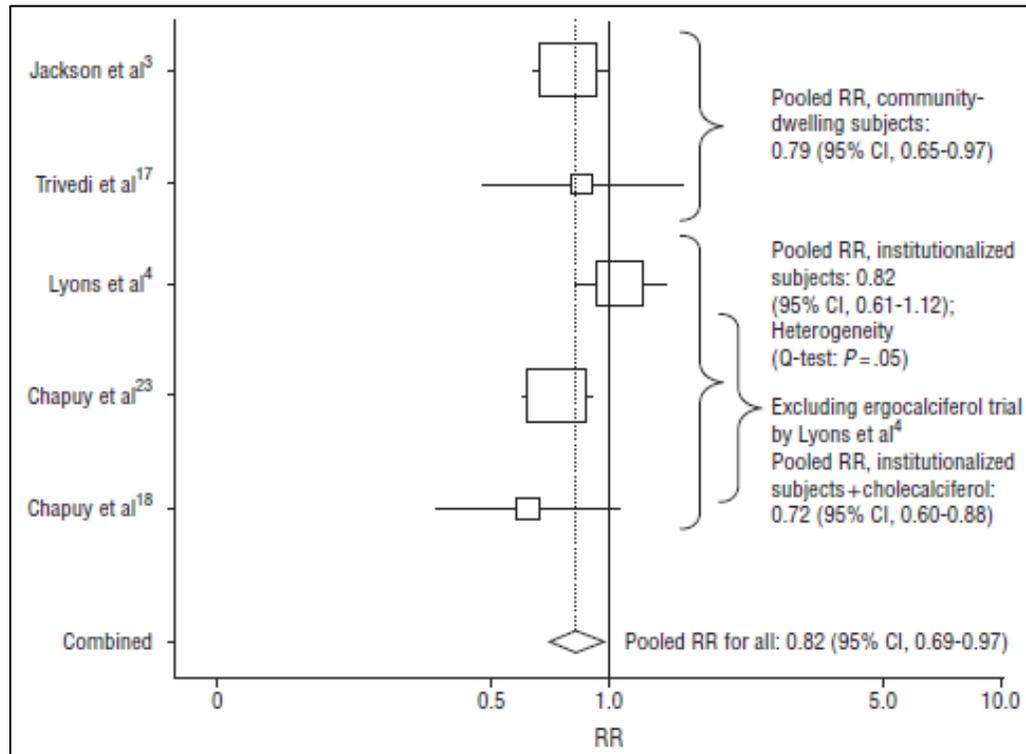
2 portions / day

Vitamin D reduces falls by 23%



Bischoff-Ferrari HA et al. Fall prevention with supplemental and active forms of vitamin D: a meta-analysis of randomised controlled trials. *BMJ*. 2009 Oct 1;339:b3692.

Vitamin D reduces hip fractures



Nursing home:

- 28 %

At home:

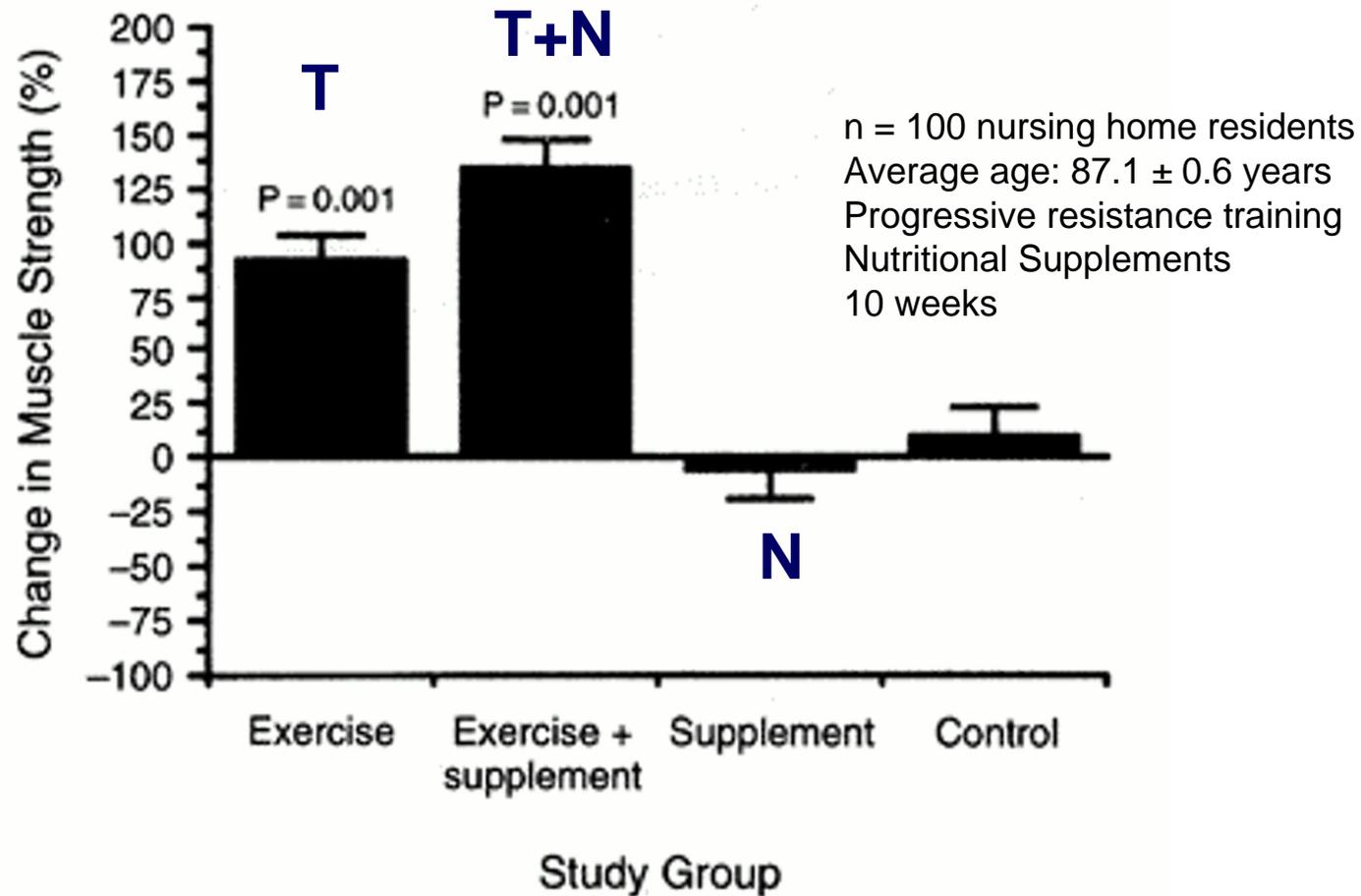
- 21 %

Increase of muscle strength with resistance training and nutritional supplements



Fiatarone MA et al. Exercise training and nutritional supplementation for physical frailty in very elderly people. N Engl J Med 1994;1769-75.

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Summary

Aging: Role of Nutrition and Functionality

- Need of higher nutrient density due to body muscle changes
- Close link between physical function and nutrition at old age (particular importance of proteins and vitamin D)
- Improved physical function only when combining exercise and nutrition