

L'osteoporosi e le fratture da fragilità: una nuova sindrome geriatrica?



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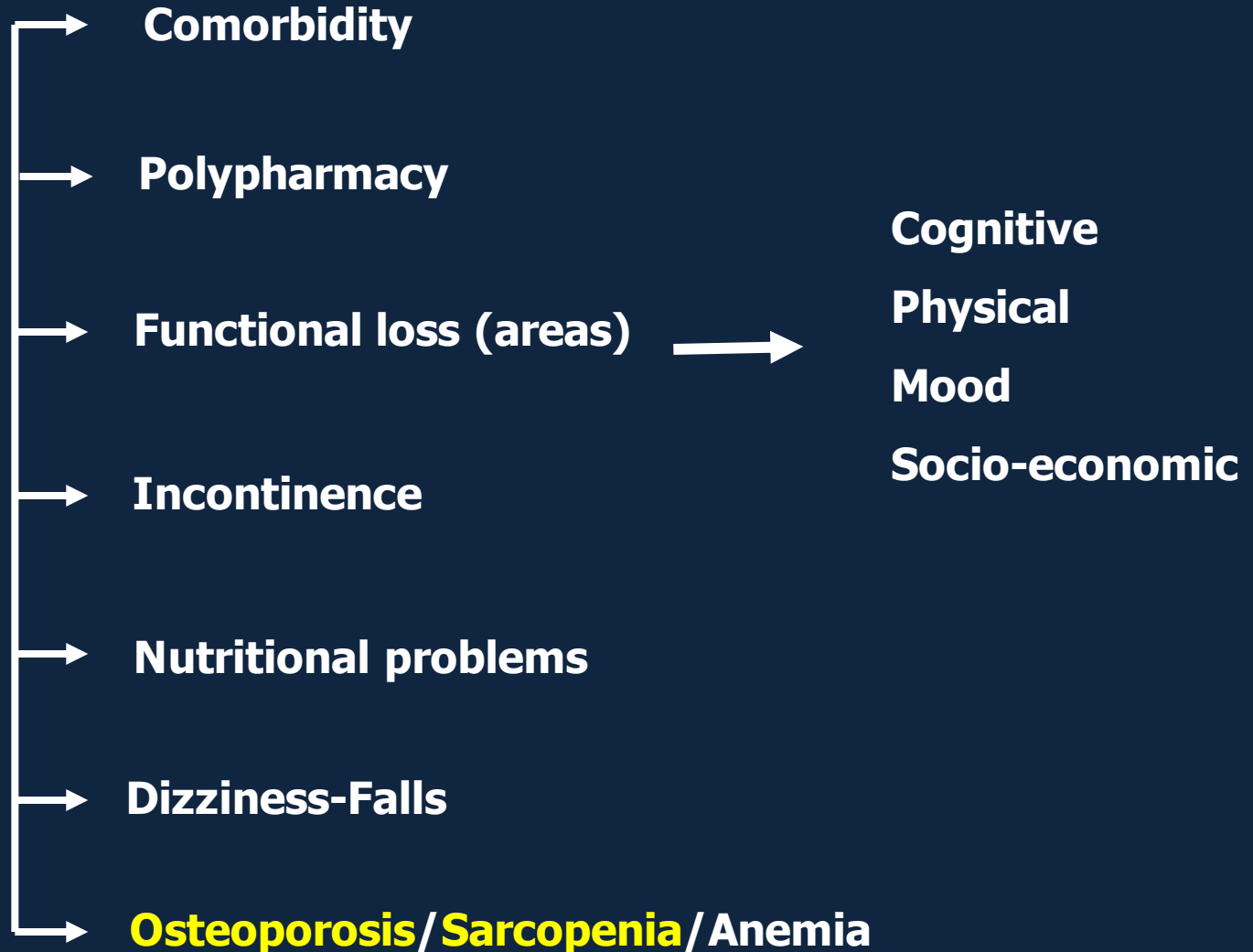
*Università degli Studi di Palermo. Facoltà di Medicina e Chirurgia
Scuola di Specializzazione in Geriatria, Unità Operativa di Geriatria*





Geriatric patient

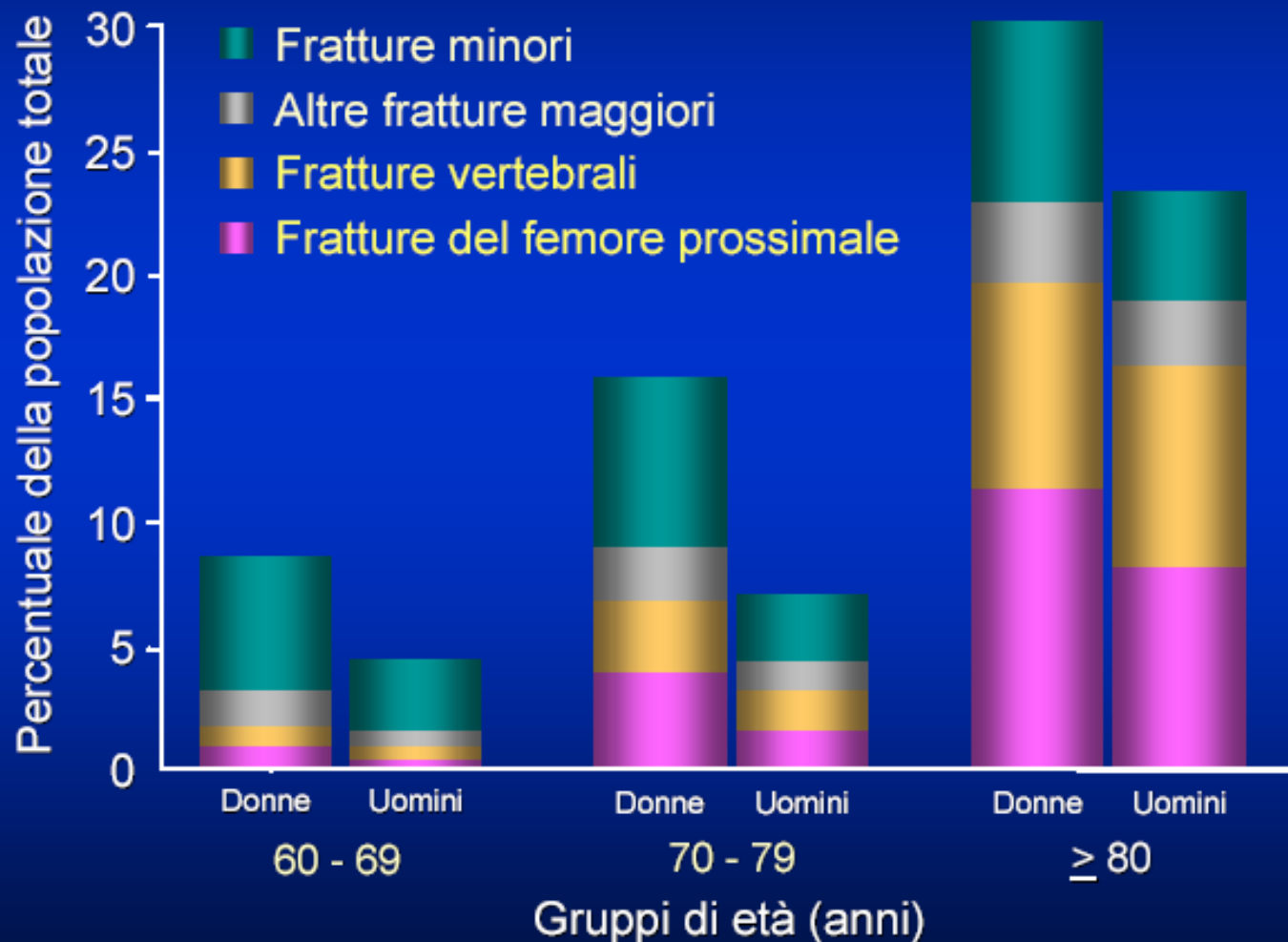
FRAILTY

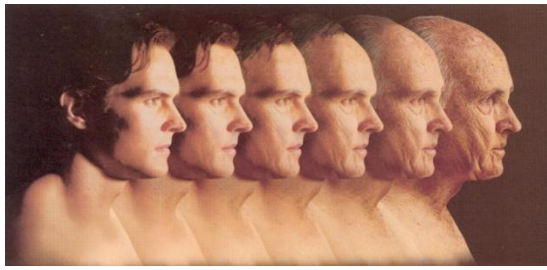


Fratture per sesso ed età

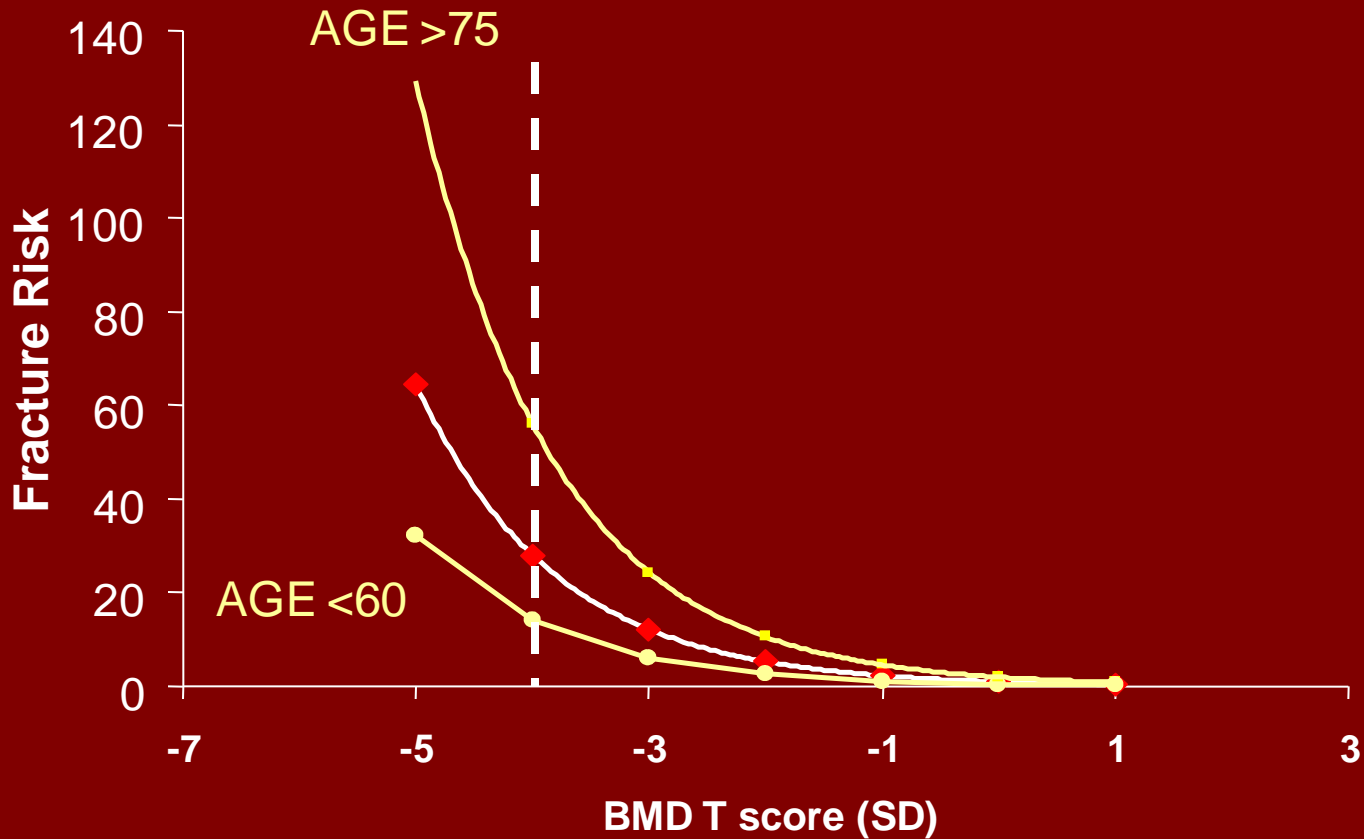
Dubbo Osteoporosis Epidemiology Study, 1989–1994

Center J et al. Lancet. 1999;353:878–882 (adattato)



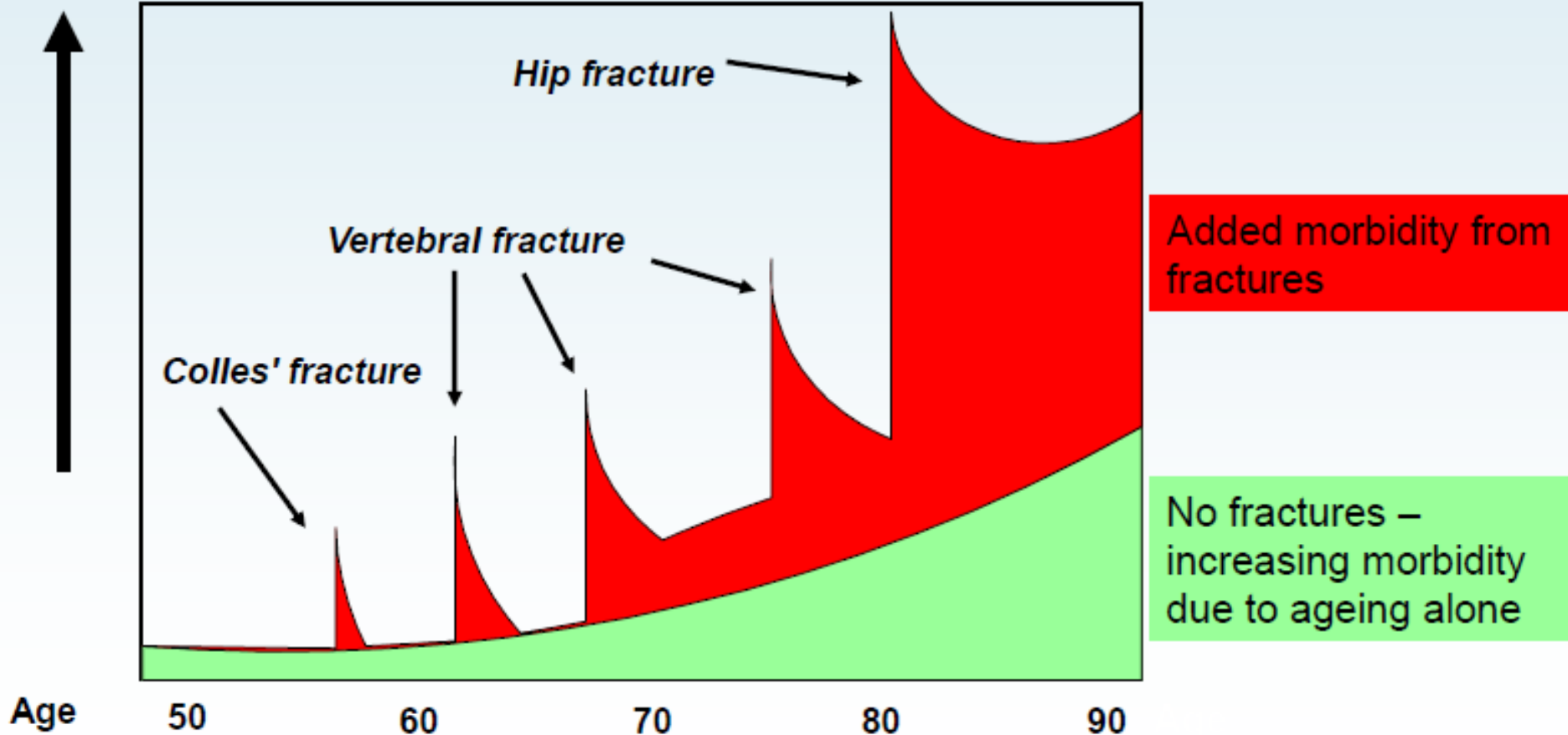


Age is an independent risk of fragility fractures



Fragility Fracture: a Chronic Disease

Dependence



Adapted from Kanis JA, Johnell O; 1999

The number of hip fractures depends on two factors

- Age-specific incidence
- Age structure of the population

Projected Osteoporotic Hip Fractures Worldwide

Total number of hip fractures:
1990 = 1.66 million
2050 = 6.26 million

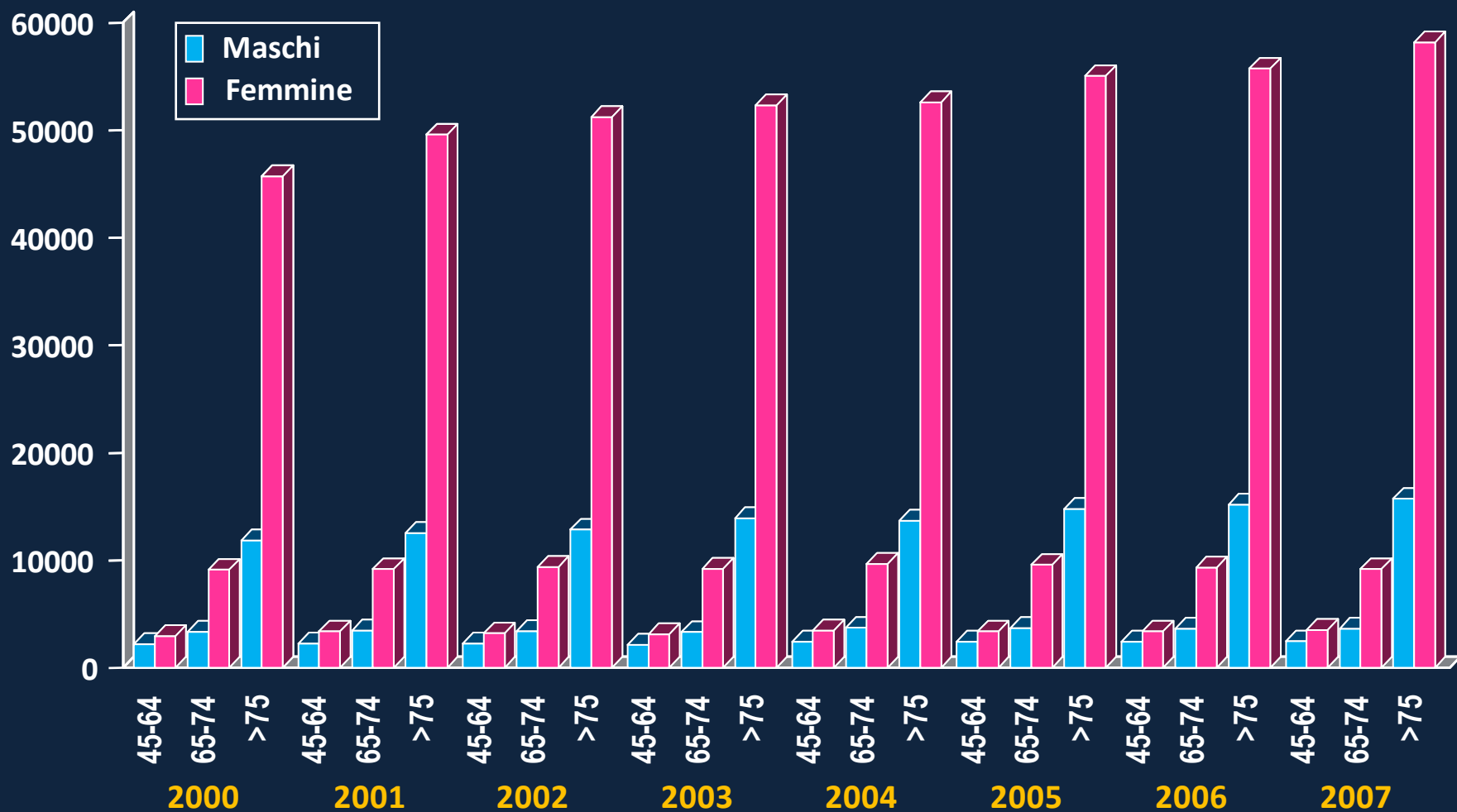


Adapted from Cooper C et al,
Osteoporosis Int, 1992; 2:285-9

FRATTURE DA FRAGILITÀ IN ITALIA

- ❑ Circa 80.000 fratture di femore/anno
 - 75 % nella popolazione femminile
 - 94 % nelle donne +65 anni
- ❑ 90 % conseguente a una caduta
- ❑ 1 % delle cadute determina una frattura femorale

Incidenza annuale delle fratture del femore prossimale in Italia



Incidenza e costi delle fratture di femore in Italia

Tabella V - Stima dei costi totali nel 2002 delle fratture femorali in Italia negli anziani >65 anni

Numero di ricoveri per frattura femorale	80.800
Costi diretti relativi ai ricoveri (euro)	394.000.000
Costi di 1 mese di riabilitazione postoperatoria (escluso 5% di mortalità acuta) (euro)	412.000.000
Costi sociali (pensioni d'invalidità ed accompagnamento per gli stimati 18000 pazienti disabili all'anno) (euro)	108.000.000
Costi indiretti (20% dei costi diretti totali) (euro)	
Stima dei costi totali delle fratture femorali (euro)	

1.097.000.000

Hip fractures in Italy: 2000-2005 extension study

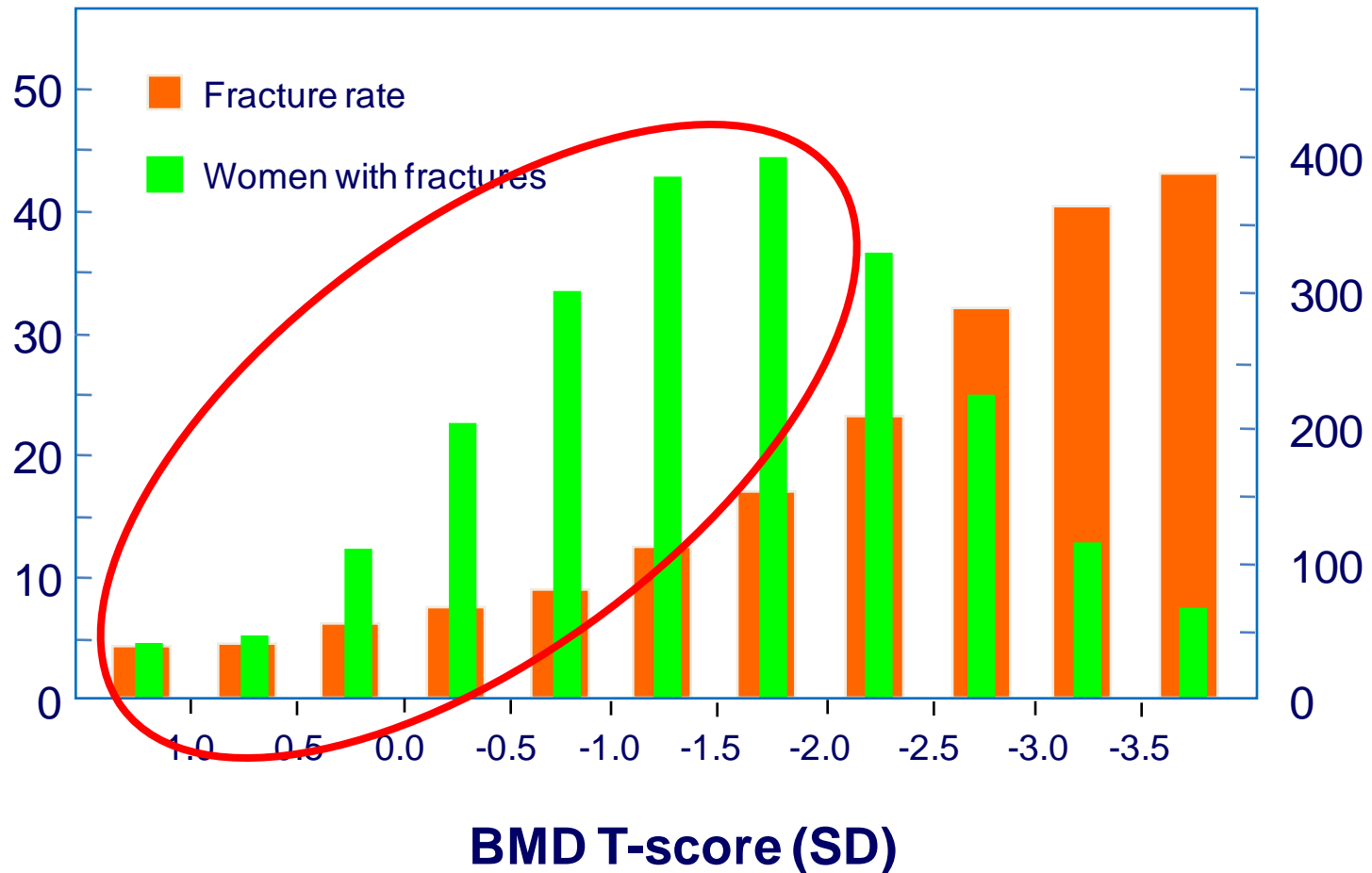
□ Hip fractures increased **+28.5%**
over 6 y

□ Hospitalization costs **(+36.1%)**
and rehabilitation costs **(+28.9%)**
increased over 6 y

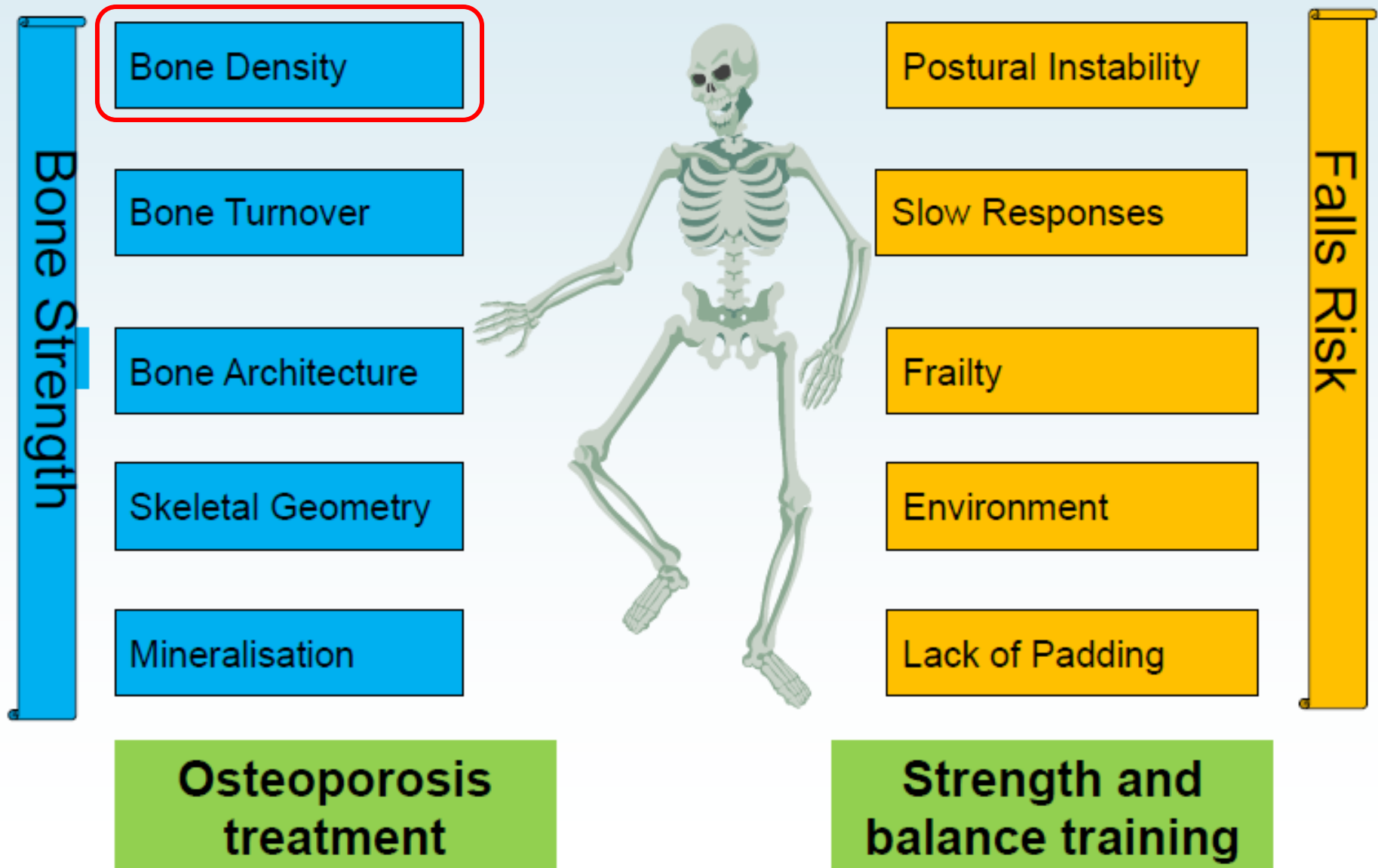
Osteoporotic fracture and BMD

Fractures per 1,000 person-years

Number of fractures



Risk of fragility fracture





Calculation Tool

Please answer the questions below to calculate the ten year probability



Weight Conversion:

pound:

[convert](#)

Height Conversion:

inch:

[convert](#)

Country : **Italy**

Name / ID :

[About the risk](#)

Questionnaire:

1. Age (between 40-90 years) or Date of birth

Age:

Date of birth:

Y:

M:

D:

2. Sex

Male

Female

3. Weight (kg)

4. Height (cm)

5. Previous fracture

No

Yes

6. Parent fractured hip

No

Yes

7. Current smoking

No

Yes

8. Glucocorticoids

No

Yes

9. Rheumatoid arthritis

No

Yes

10. Secondary osteoporosis

N

11. Alcohol 3 or more units per day

N

12. Femoral neck BMD (g/cm²)

Select DXA



Clear

C:

F

a

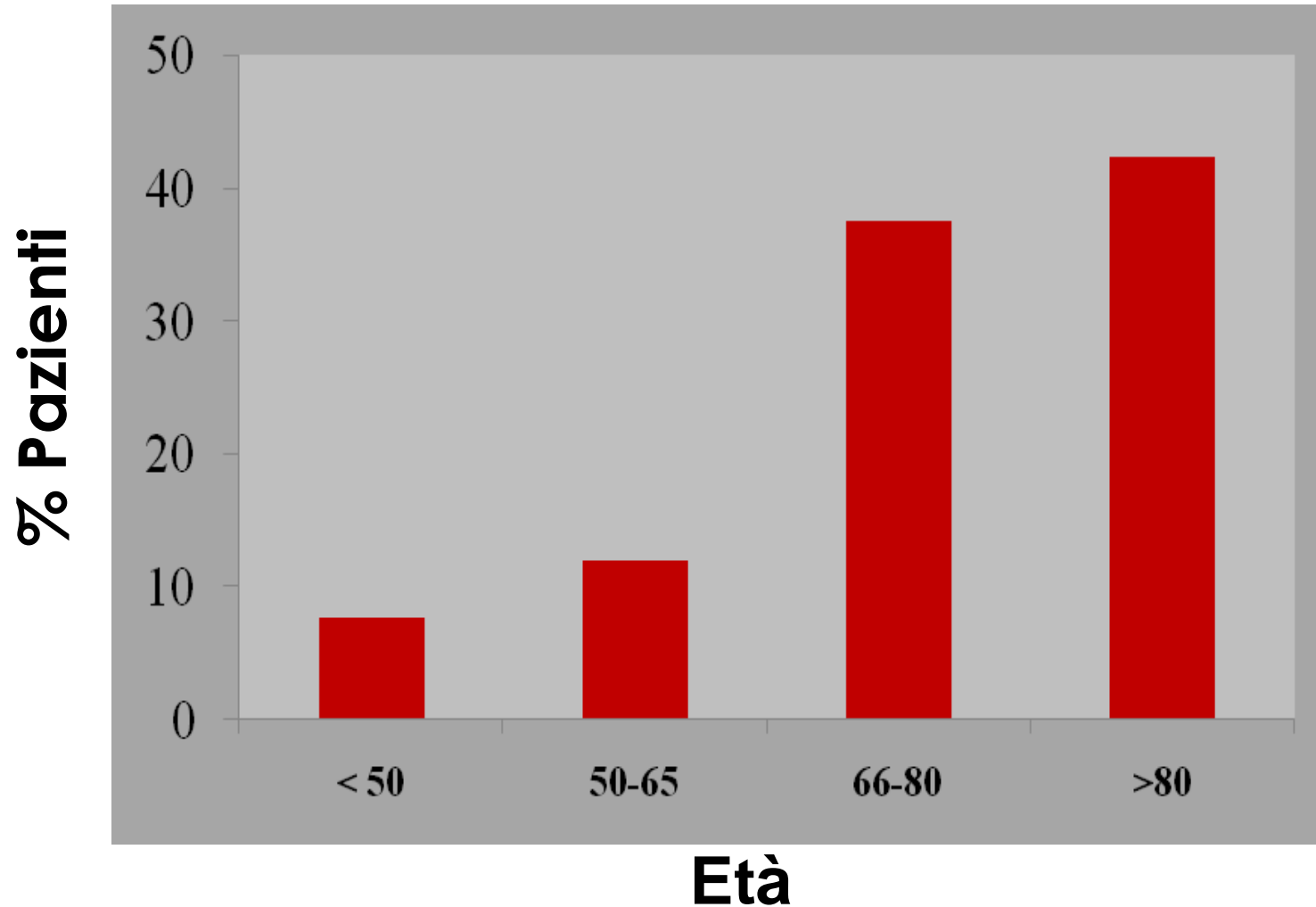
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Epidemiologia delle Cadute



Fattori di aumento del rischio di cadute negli anziani

- Riduzione forza muscolare
- Disturbi dell'equilibrio
- Ipotensione posturale
- Ipoglicemia ricorrente
- Uso di farmaci sedativo-ipnotici
- Disturbi della vista
- “Barriere architettoniche”
- IPOVITAMINOSI D**



Interventions for preventing falls in older people in nursing care facilities and hospitals

Main results

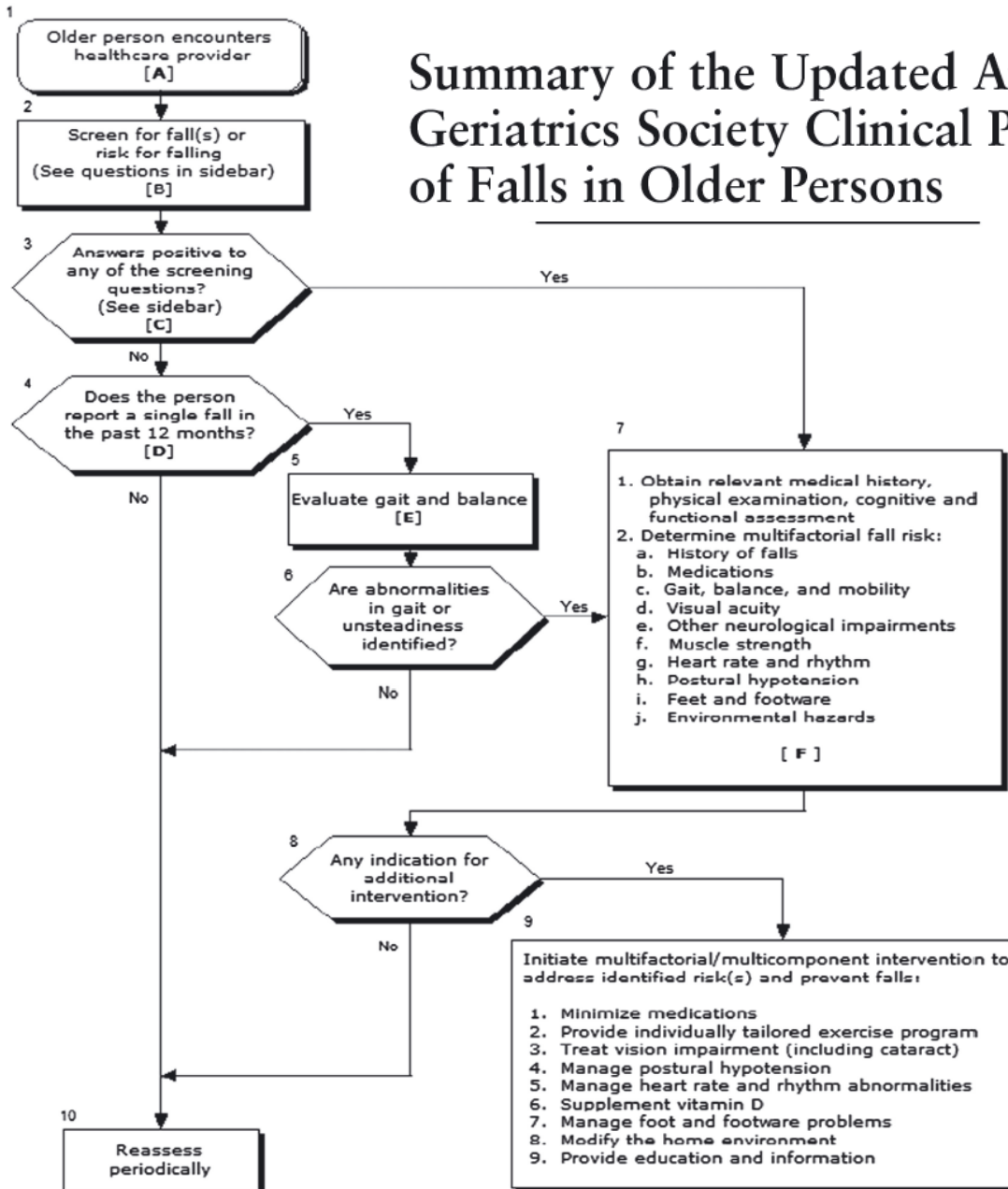
41 trials (25,422 participants).



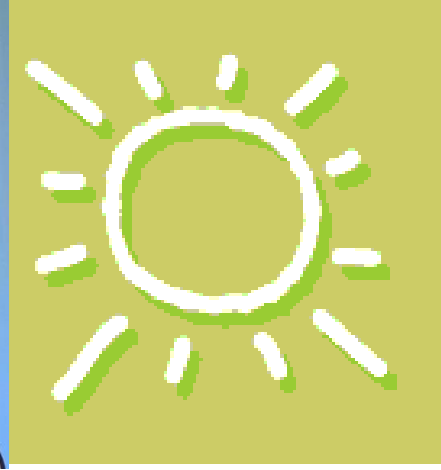
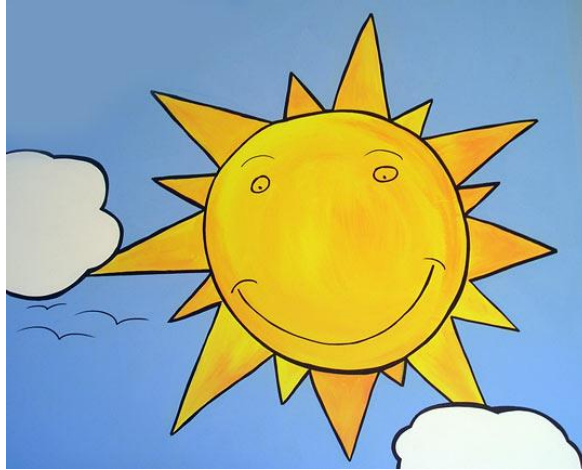
THE COCHRANE
COLLABORATION®

- There is evidence that **multifactorial interventions** reduce falls and risk of falling in hospitals and may do so in nursing care facilities.
- **Vitamin D supplementation** is effective in reducing the rate of falls in nursing care facilities. **Exercise** in subacute hospital settings appears effective but its effectiveness in nursing care facilities remains uncertain.

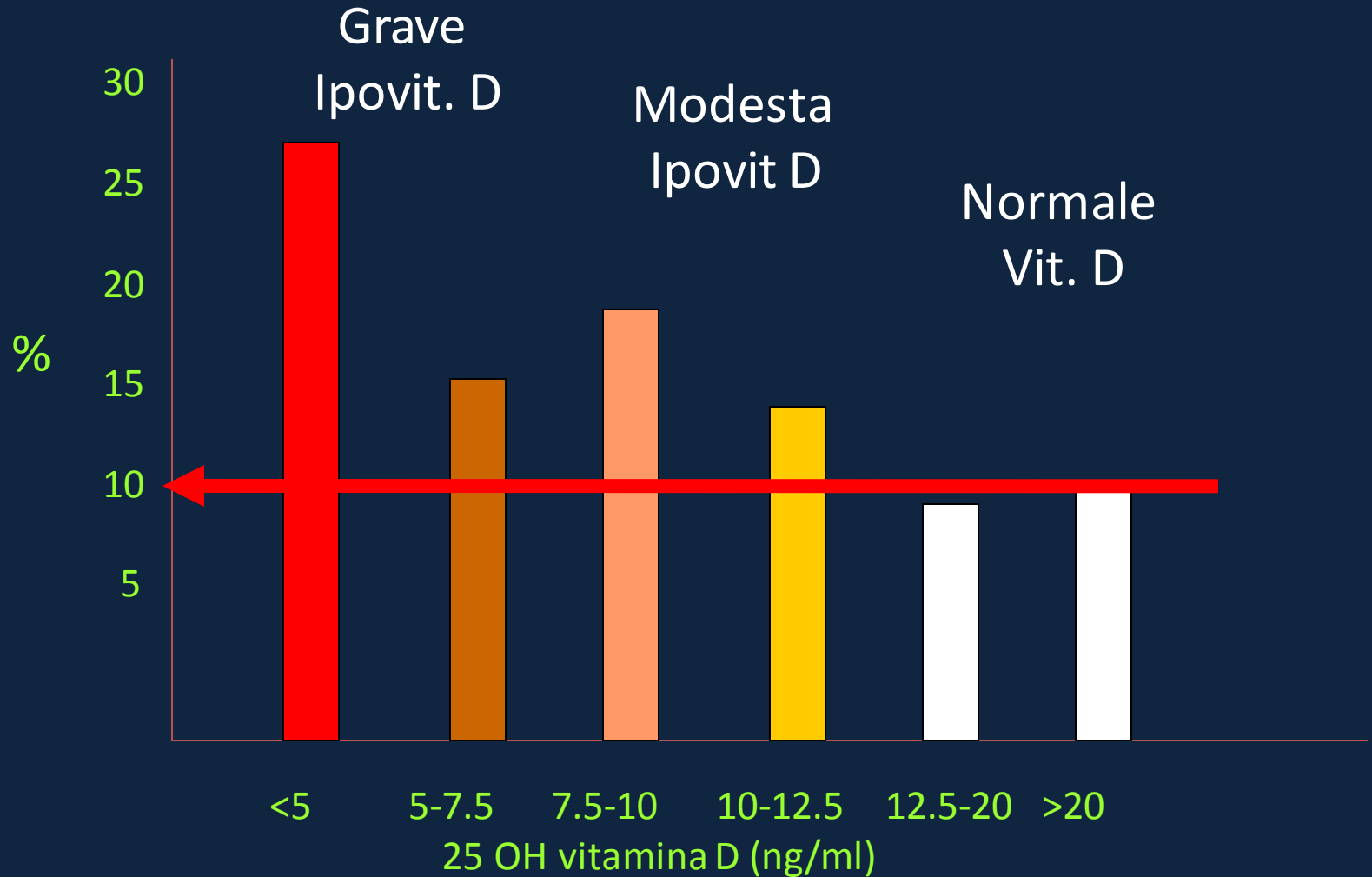
Summary of the Updated American Geriatrics Society/British Geriatrics Society Clinical Practice Guideline for Prevention of Falls in Older Persons



Vitamin D



Distribuzione percentuale dei livelli plasmatici di 25-Idrossivitamina D nelle donne italiane



Nutrition & Fragility Fractures

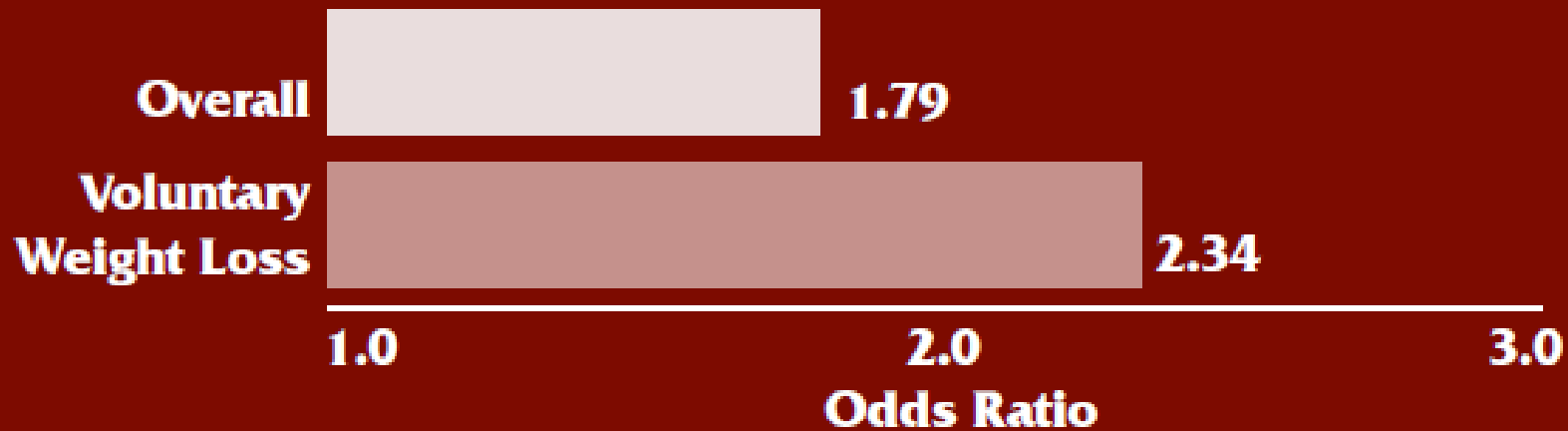
Fattori Nutrizionali Associati ad Osteoporosi

- ◆ **Ridotto apporto di calcio**
- ◆ **Ridotto apporto di vitamina D**
- ◆ **Malnutrizione proteico-calorica**
- ◆ **Inadeguato apporto di proteine o fosfati**
- ◆ **Elevato apporto di sodio, alcool o caffeina**
- ◆ **Ridotto apporto di fluoruri**
- ◆ **Altri possibili fattori dietetici (magnesio, zinco, vitamina K, vitamina C, vitamina B₁₂, vitamina B₆)**

Perdita di peso e fratture femorali negli anziani

Weight Loss Leads to Hip Fracture

Ensrud *et al*, JAGS 51:1740, 2003

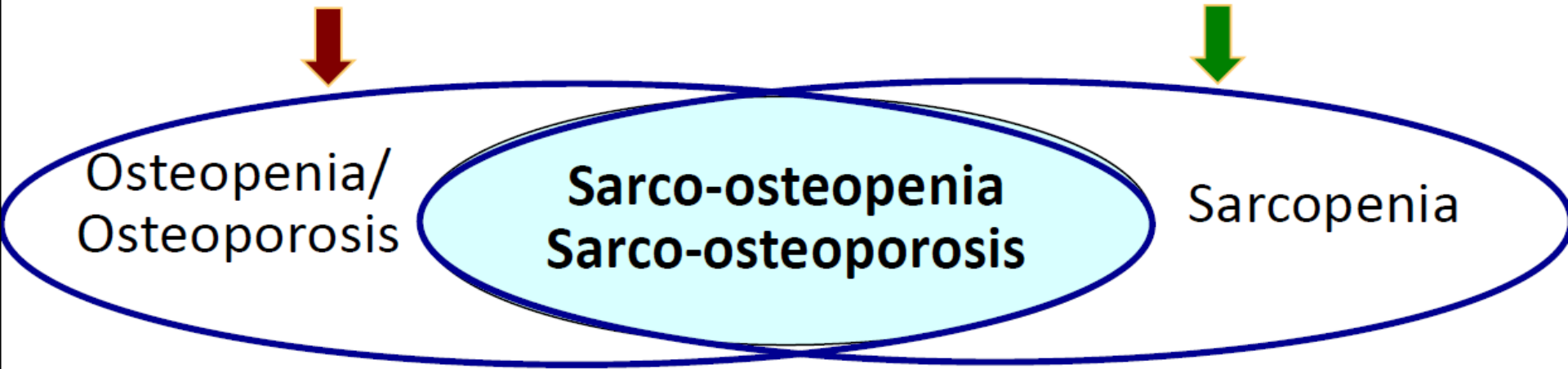




Sarco-Osteopenia

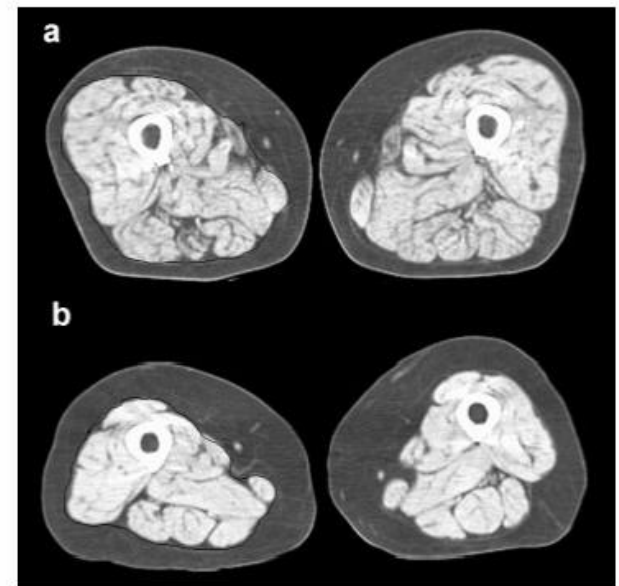
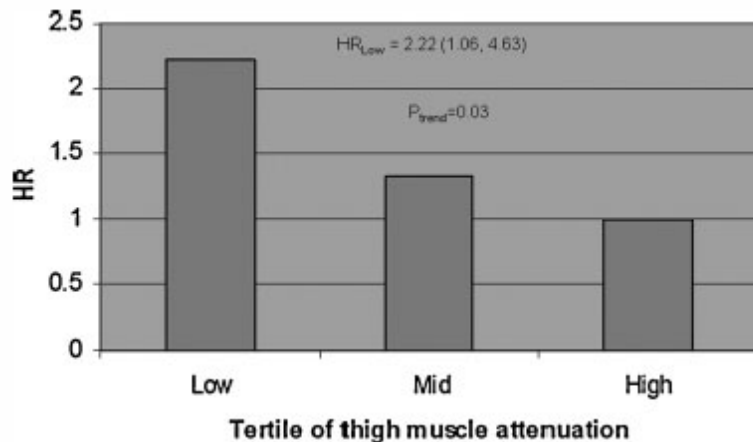
Age-related Loss of Bone
Mass Quality & Strength

Age-related Loss of Muscle
Mass Quality & Strength



Computed Tomographic Measurements of Thigh Muscle Cross-Sectional Area and Attenuation Coefficient Predict Hip Fracture: The Health, Aging, and Body Composition Study

Thomas Lang,¹ Jane A Cauley,² Frances Tyllavsky,³ Douglas Bauer,⁴ Steven Cummings,⁵ and Tamara B Harris⁶ for the Health ABC Study



Multimorbidity

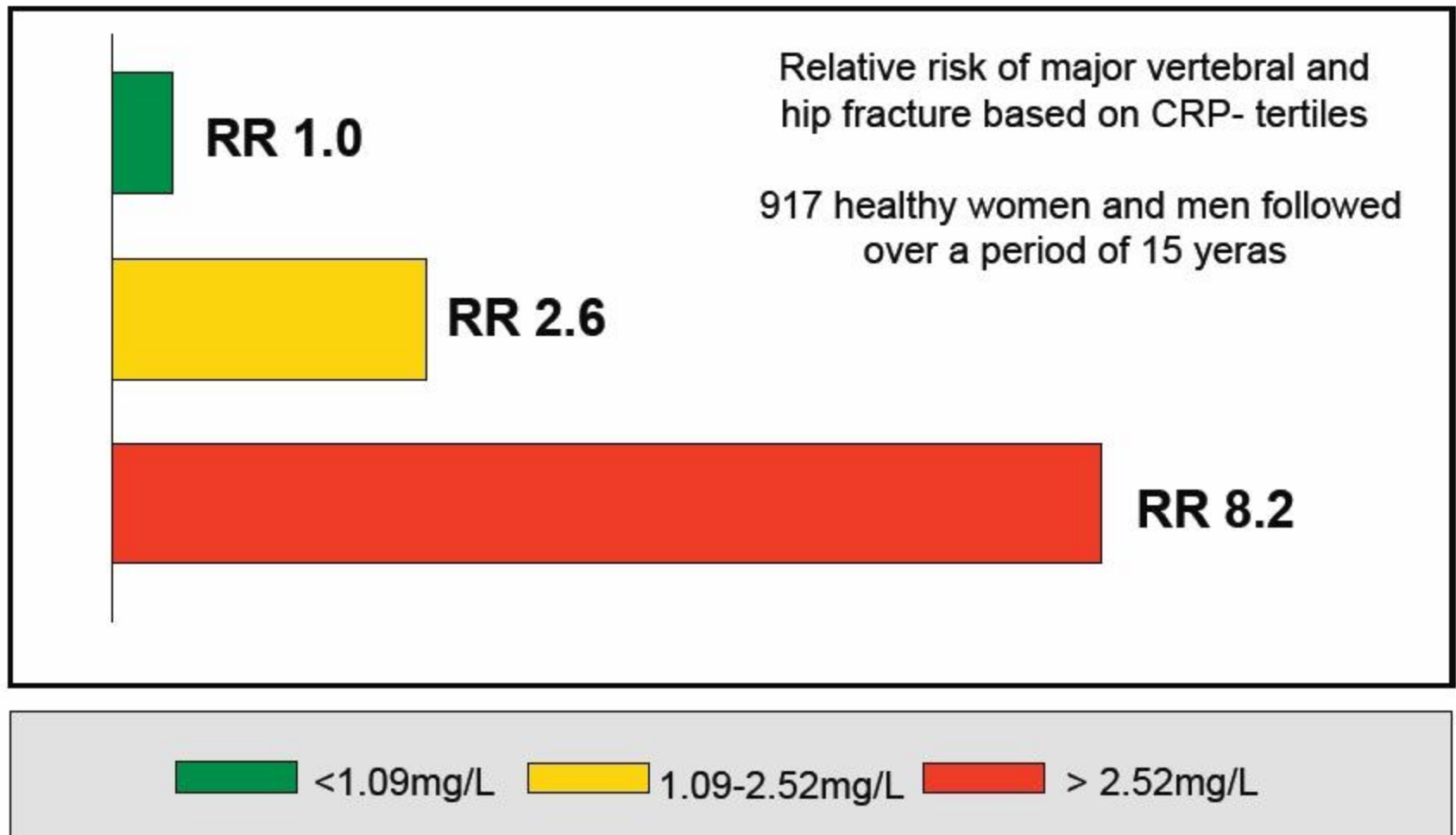
Fragility Fractures are associated with Diverse Chronic Diseases

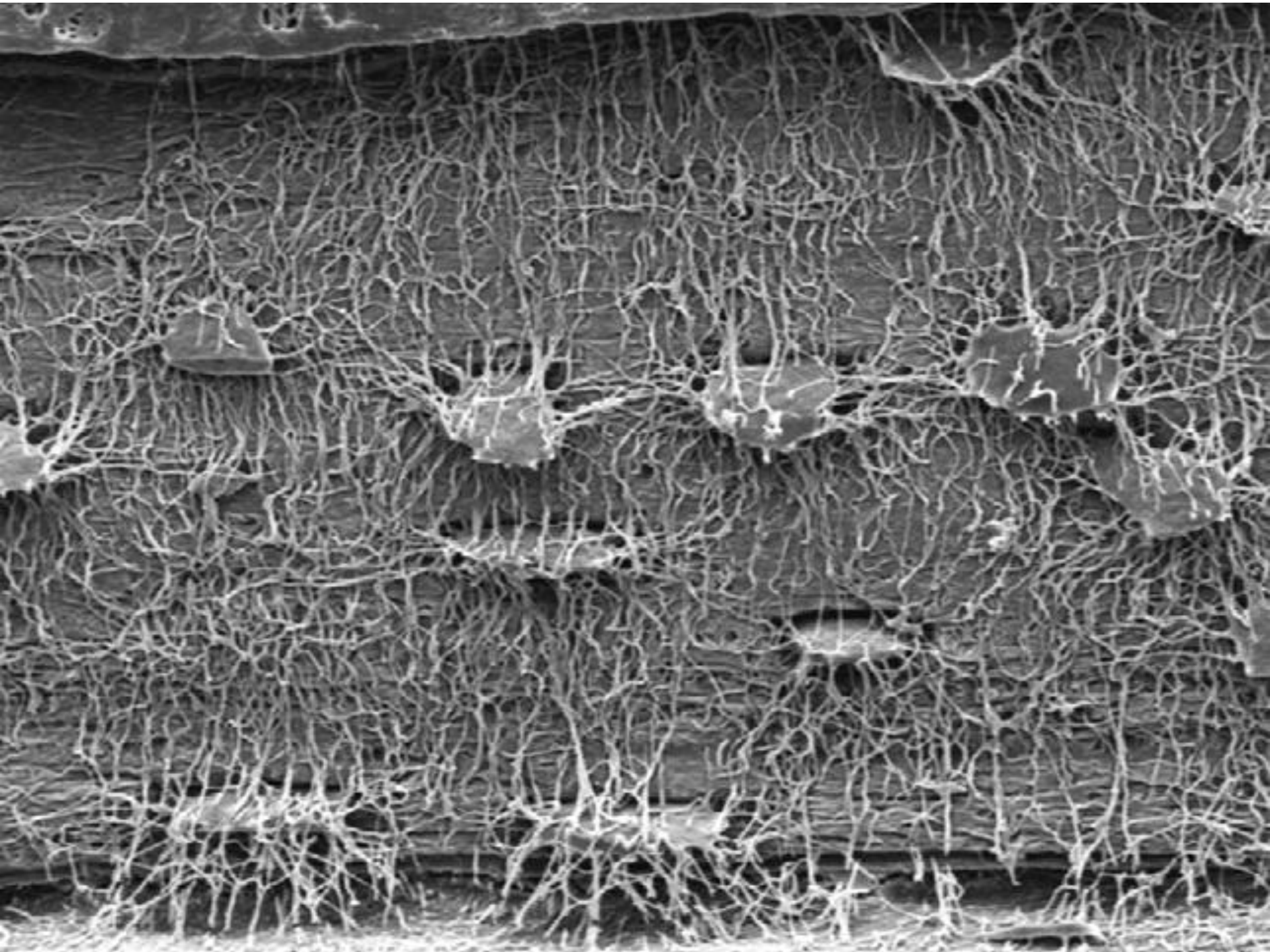
- Diabetes
- COPD
- Stroke
- Parkinson
- Dementia
- CVD
- Depression
- CKD
- CLD

**Long-Term Care
Residents**

Inflammation

INFLAMMATION AND FRACTURE RISK

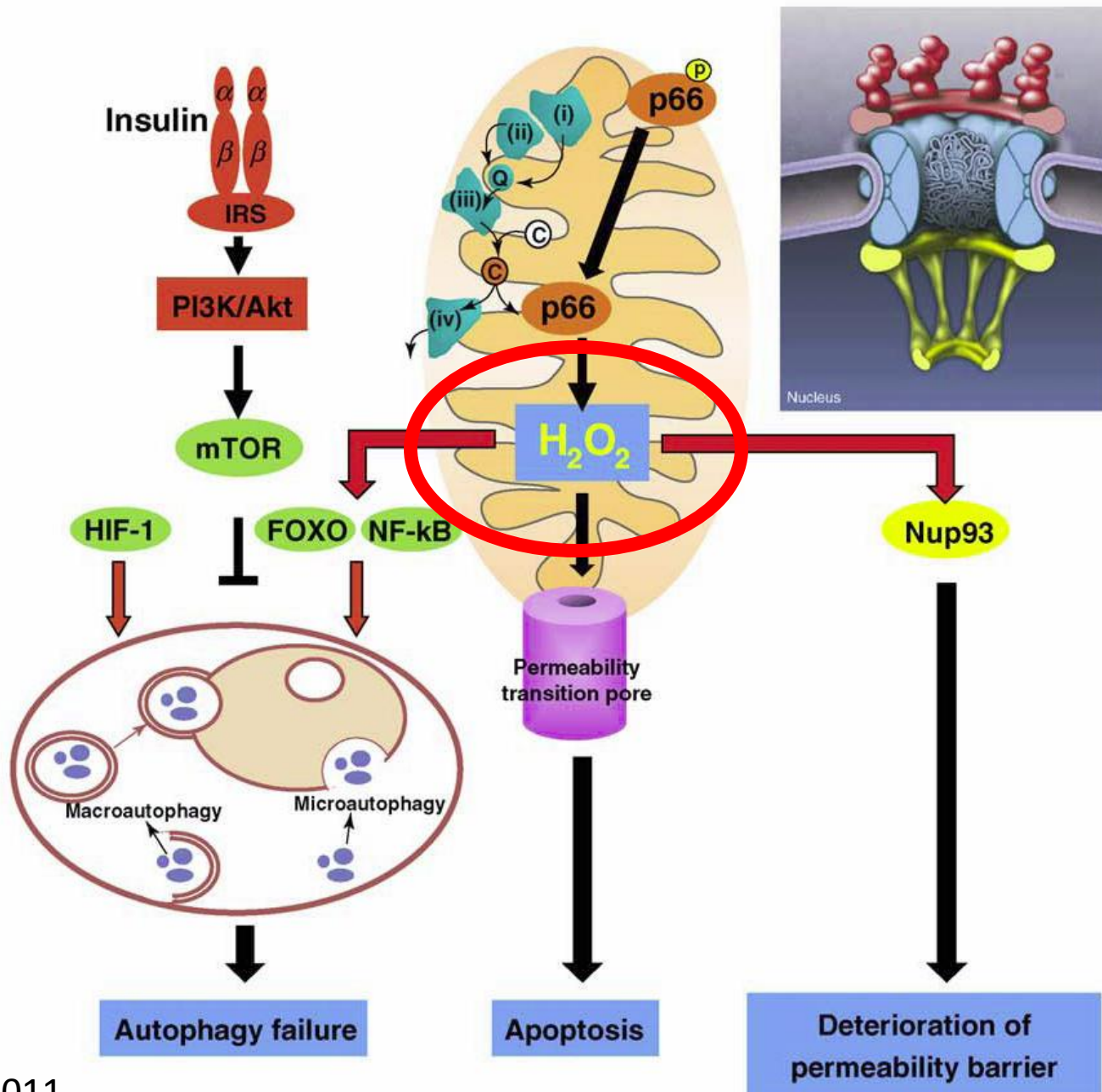




Hypoxia/Insulin resist.

Oxidative stress

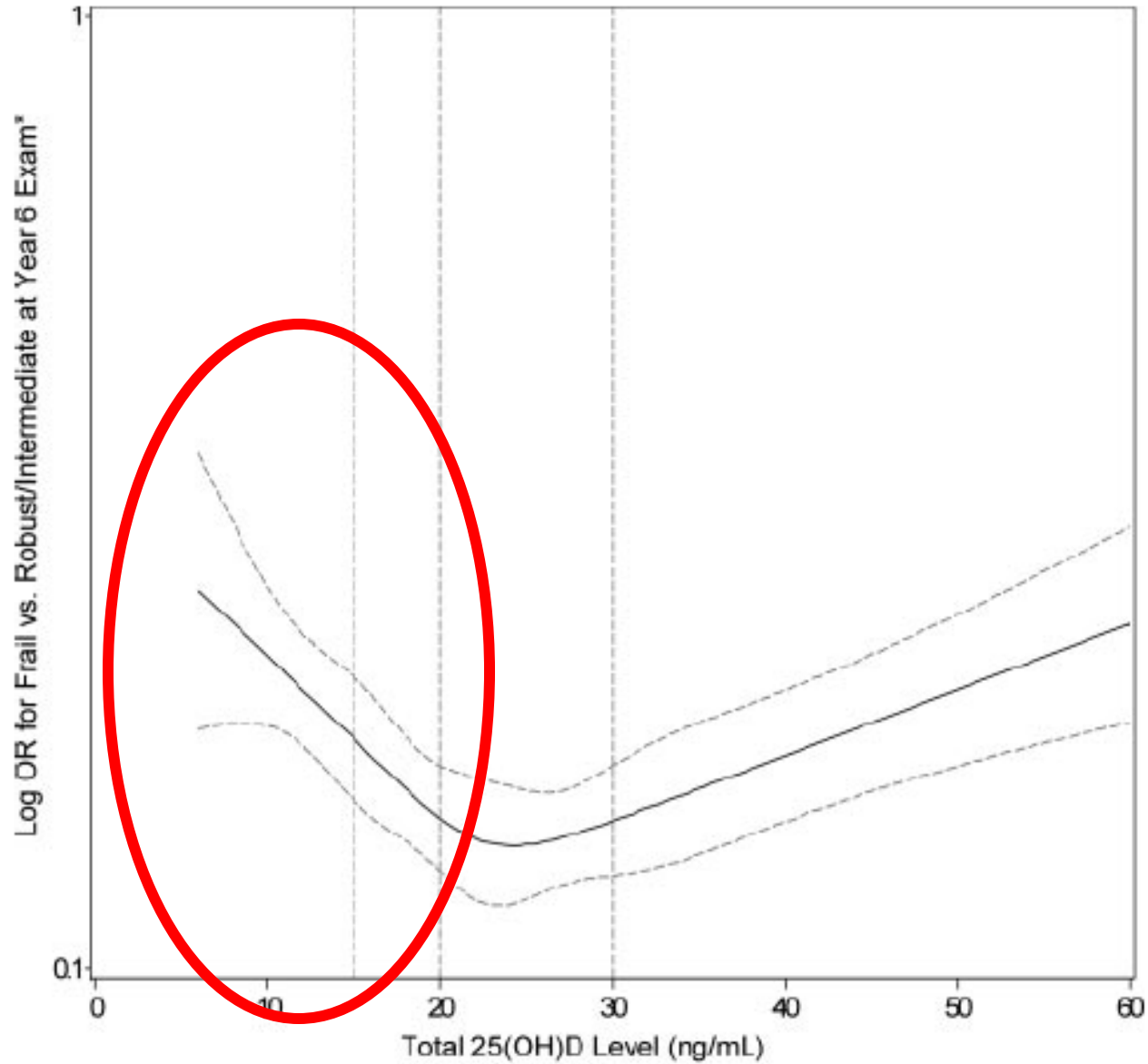
Nuclear pore "leakiness"



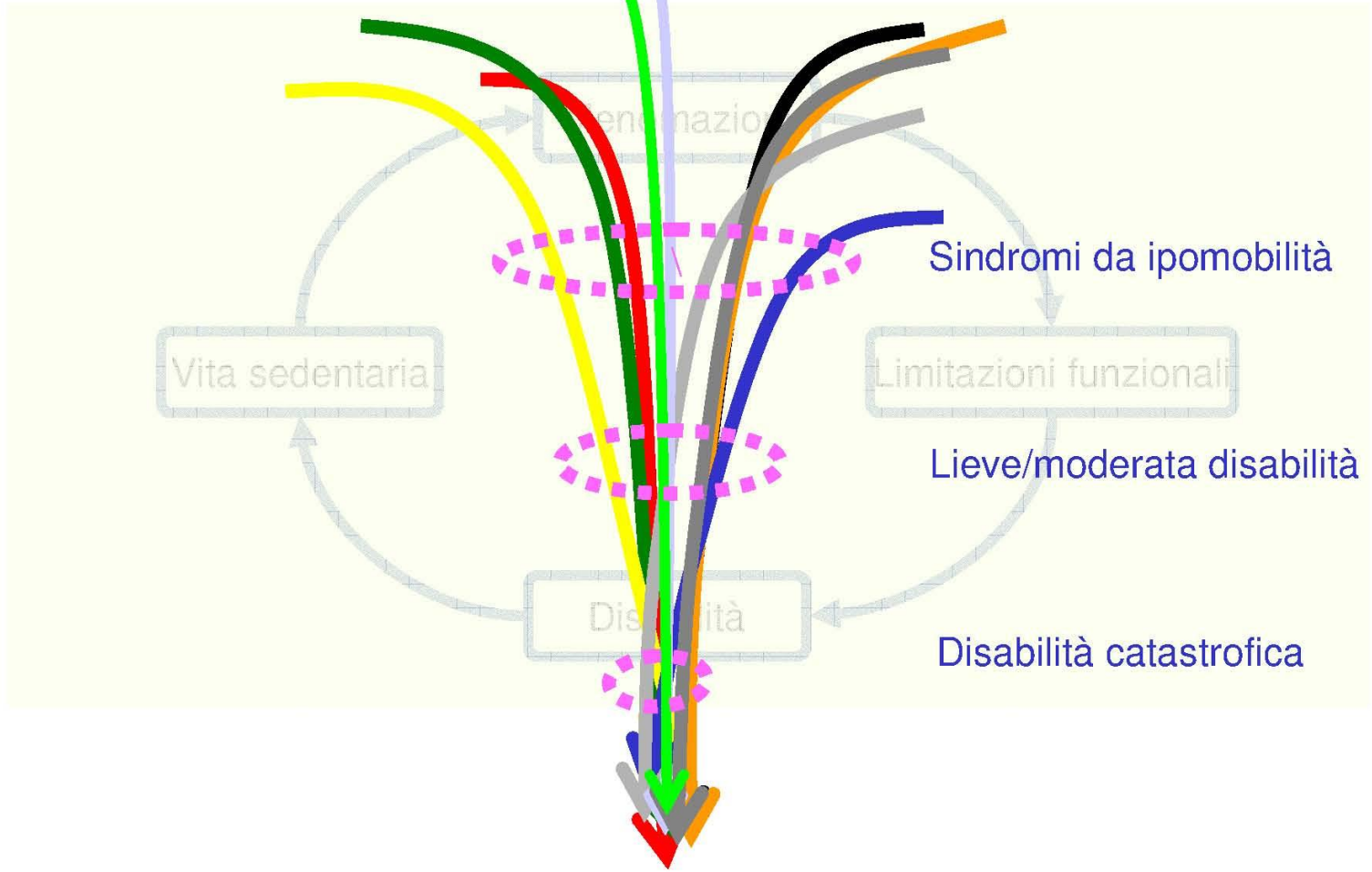
Frailty

25-OH-D and Frailty Status in Older Women

OR for being Frail



*Adjusted for age, site, season, and BMI



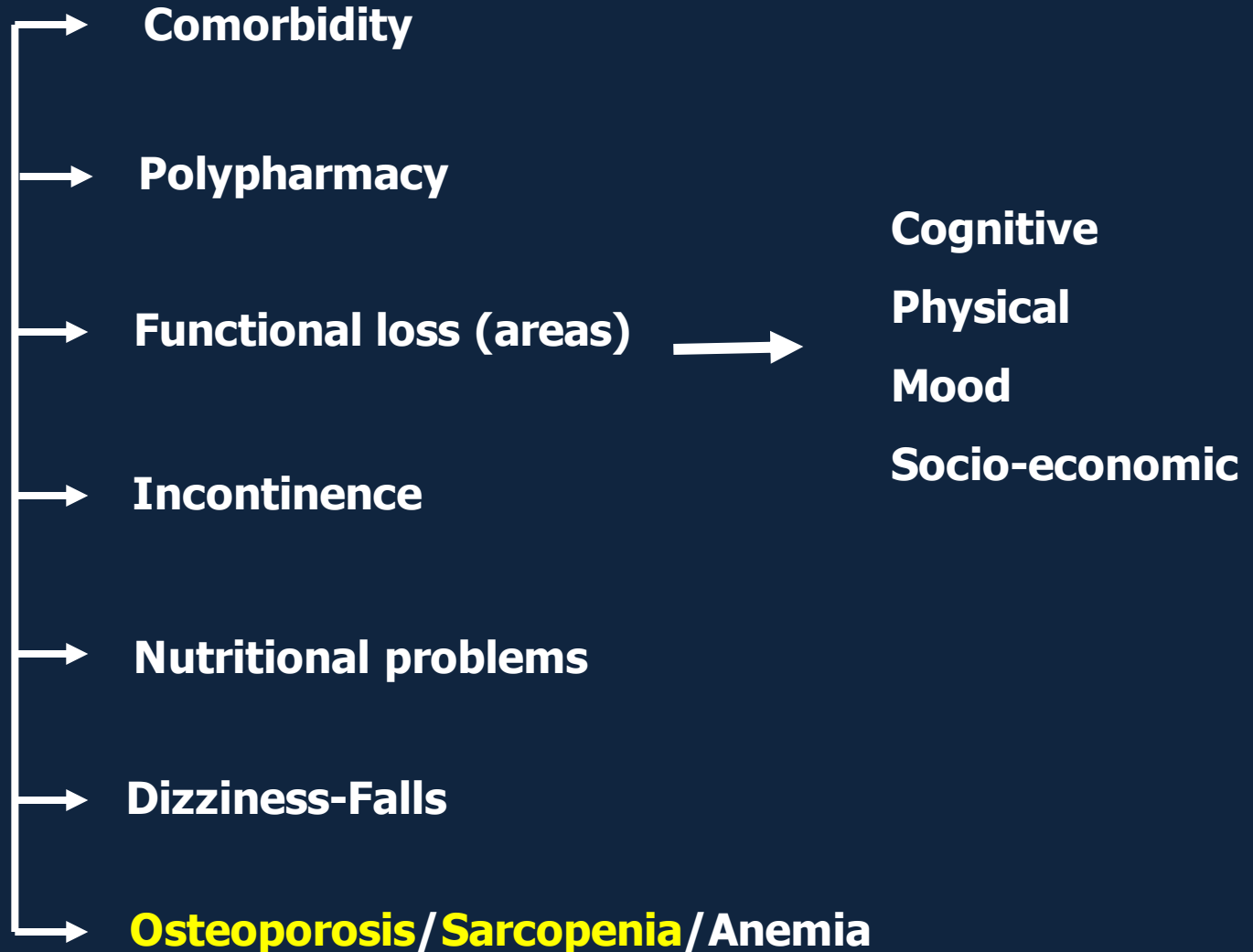
SARCOPENIA

FRAGILITY FRACTURES

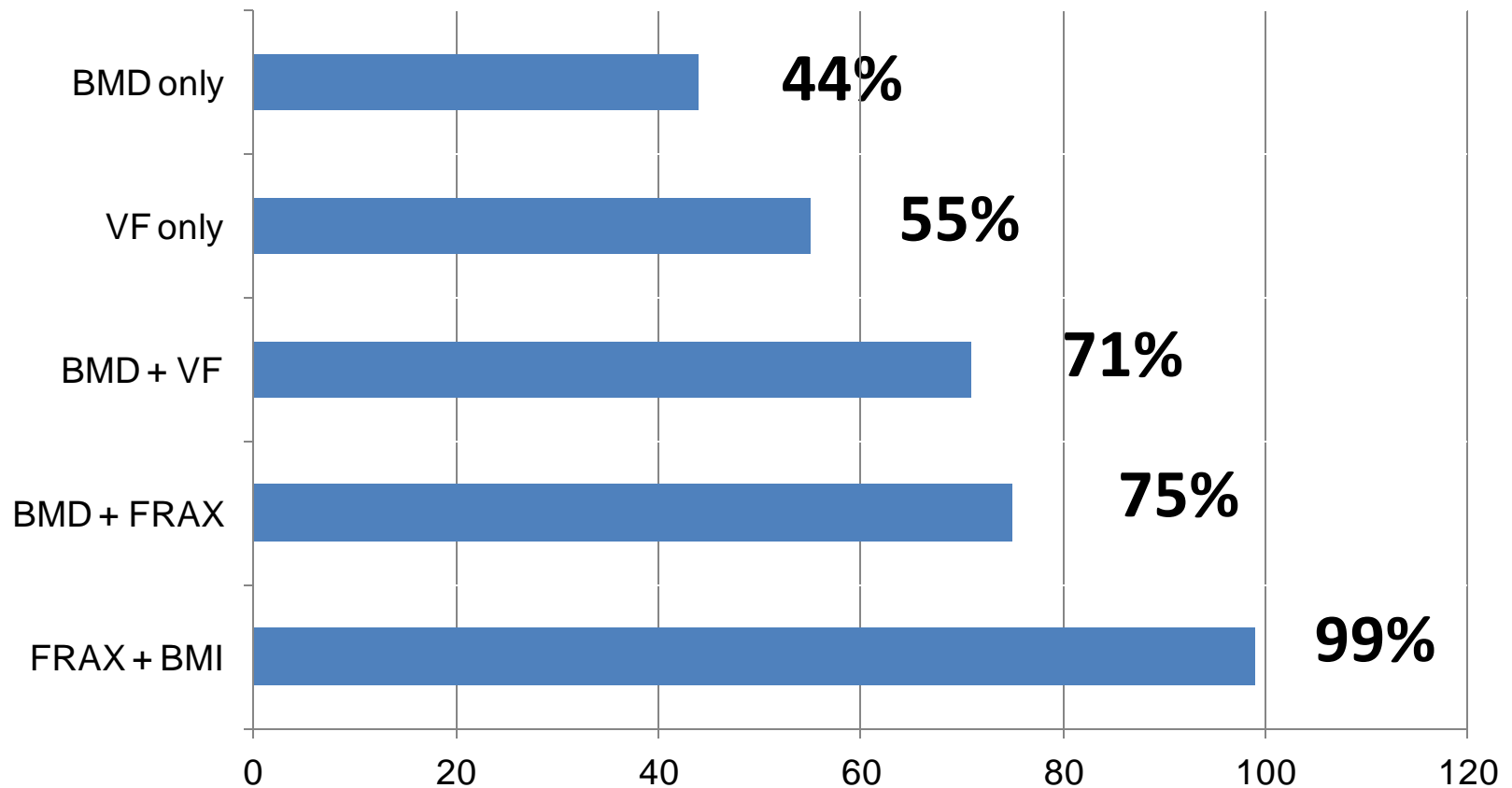
OSTEOPOROSI

Geriatric patient

FRAILTY



Patients in NH Eligible for Treatment According to Screening Strategy



Rehabilitation

Rehabilitation

Rehabilitation

Rehabilitation

Rehabilitation

**Mi hanno vaccinato contro la polio e gli orecchioni.
Mi hanno vaccinato contro la varicella, la tosse
canina e il morbillo. Poi sono caduto dalle scale.**

Charlie Brown - Charles M. Schulz

