# Frailty management:

# From the concept to the clinical practice

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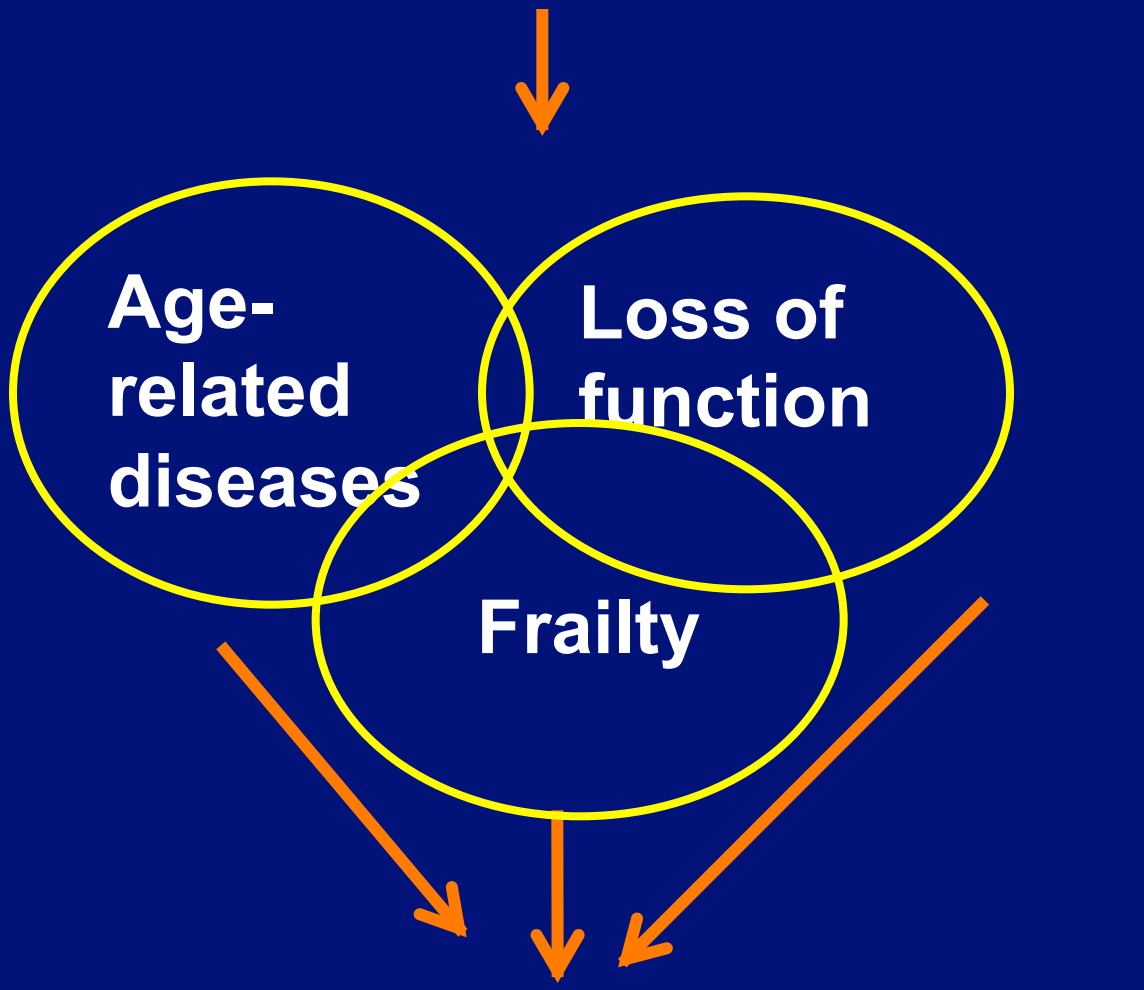
# Frailty management:

## From the concept to the clinical practice

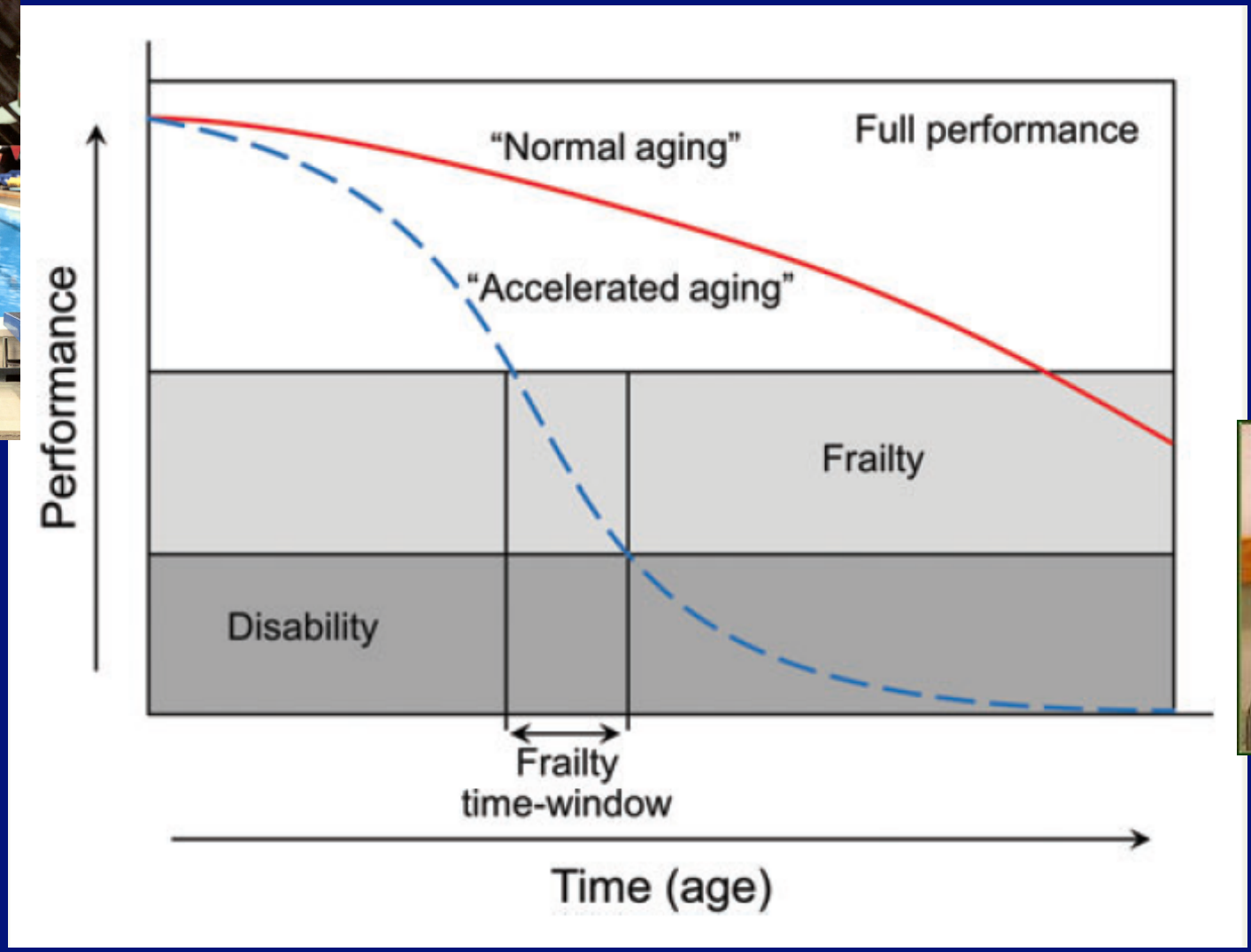
- Concept and epidemiology
- Detection in clinical practice
- Interest of assessing frailty status

# AGEING




**Hospitalizations -**
**Loss of autonomy - Death**

>80 Years




Ferrucci L, et al. Biomarkers of frailty in older persons. J Endocrinol Invest 2002

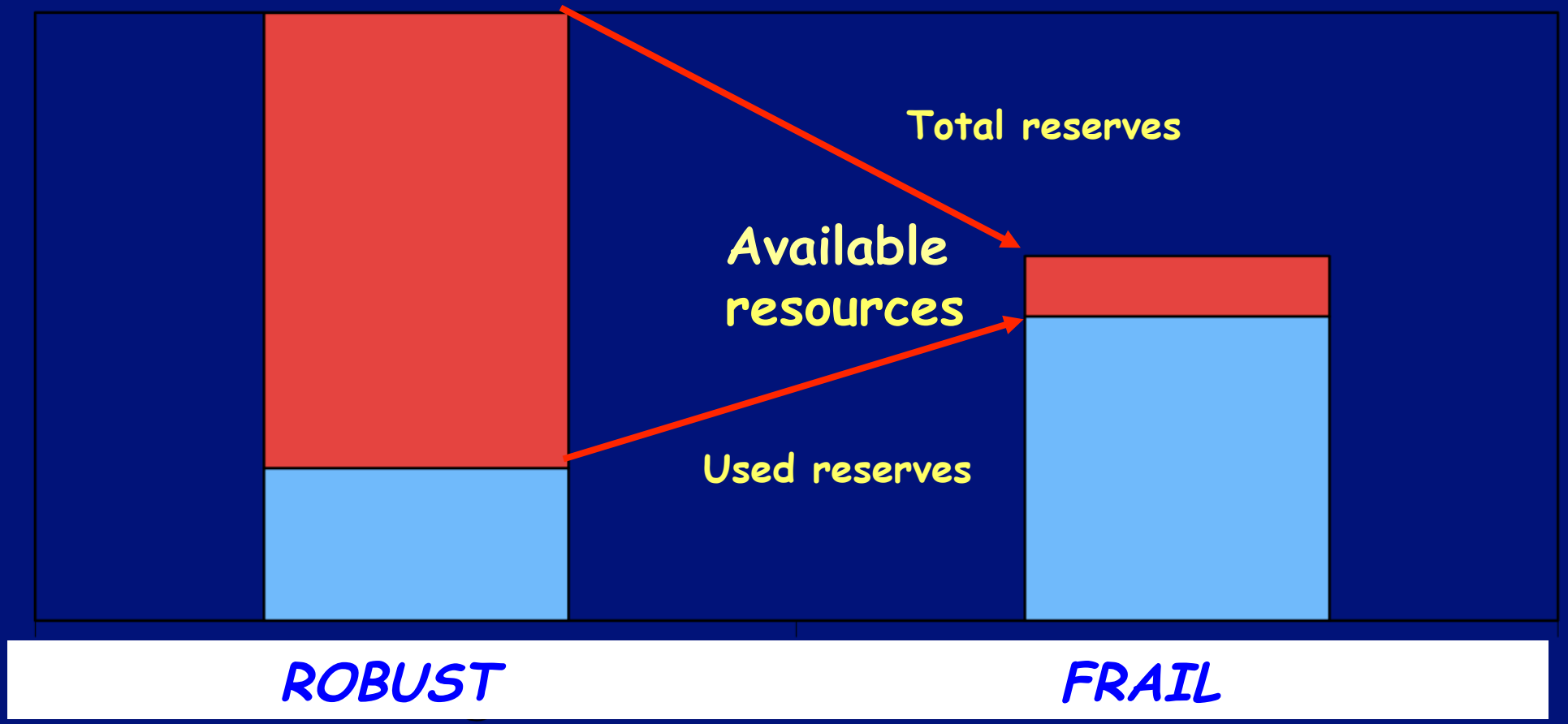
# Frailty

"A physiologic syndrome characterized by decreased reserve and resistance to stressors, resulting from cumulative decline across multiple physiologic systems, and causing vulnerability to adverse outcomes"

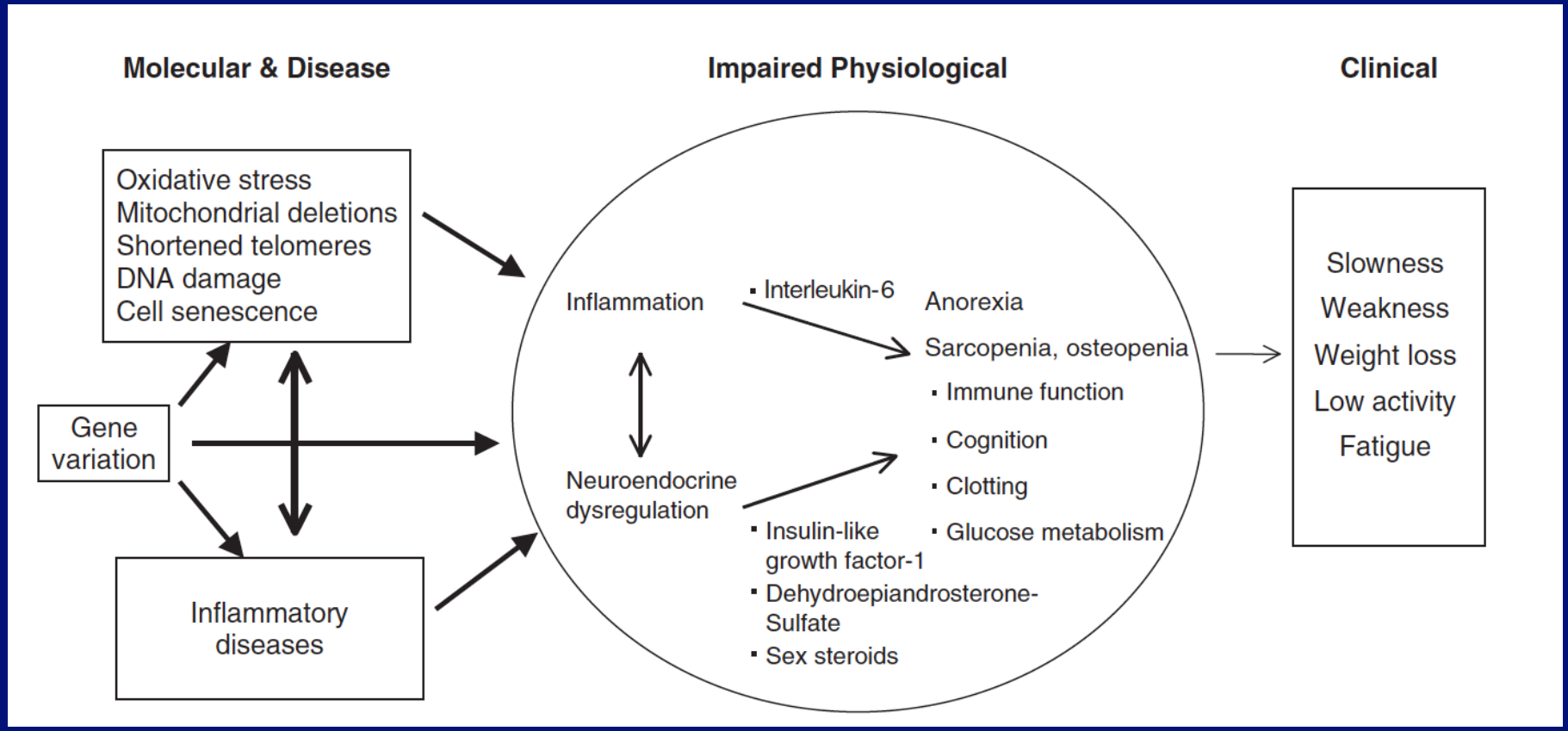
**L. Fried et al. 2003**

# PHYSIOLOGICAL RESOURCES AND AGEING

JM ROBINE et JP MICHEL 2001



# Hypothesized molecular, physiological, and clinical pathways leading to frailty




J. Walston JAGS 2006

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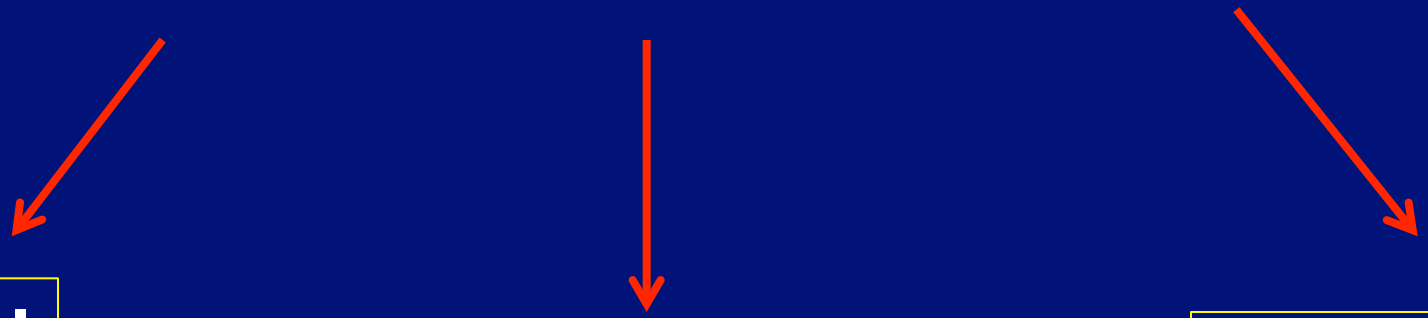
# Frailty assessment: different approaches



**Physical function**

**A multi domain functional assessment: physical, cognitive psychological, social…**

**A sum of deficits and comorbidities**

# The physical function approach:

# FRIED'S CRITERIA

## Frail: at least 3 of the following criteria

- Weight loss
- Exhaustion
- Weakness
- Slow walking speed
- Diminished physical activity

Fried LP et al. J Gerontol A Biol Sci Med Sci 2001

# Fried criteria (practical details)

**Fried LP et al. J Gerontol A Biol Sci Med Sci 2001**

*1) Unintentional weight loss >4.5 kg in the past year*

**Question to the participant:** "Have you unintentionally lost more than 4.5 kg in the past year?" No/Yes/I don't know

*2) <20th population centile for grip strength* Dynamometer measured grip strength. Result outside the norms? Yes/No

*3) Self-reported exhaustion*

**Question to the participant:** "Do you feel significantly tired most of the time"? Yes/No

*4) Low physical activity such that persons would only rarely undertake a short walk:*

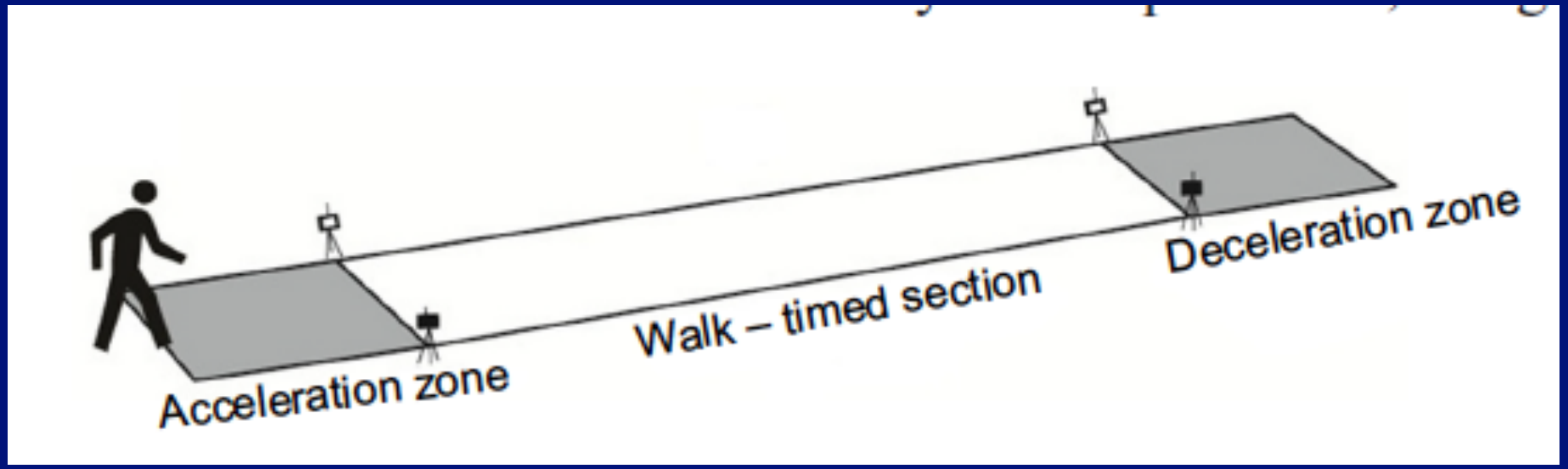
Question to the participant: "Have you significantly decreased your physical activity in the last 2 years?" Yes/No

*5) Slowed walking speed, defined as lowest population quartile on 4 minute walking test.*

**Extrapolated from previous walking test** No/Yes

# The physical function approach in its simplest version:

# 4-meter walk speed




**Speed:**
>1 m/sec Normal
< 0.80 m/sec Low speed
0.80-1.00 “zone grise”

# Frailty: somatic decline

- Slowness
- Low activity
- Balance
- Weight loss
- Malnutrition
- Sarcopenia
- Osteopenia

- Depression
- Cognitive decline
- Coping
- Social relations
- Social support

Michel JP et al, JAMA, 2008
Gobbens RJJ et al JNHA 2009

# FRAILTY INDEX.

## The sum of diseases and functions

| List of 40 Variables included in the frailty index | Cut Point |
|---|---|
| Help Bathing | Yes = 1, No = 0 |
| Help Dressing | Yes = 1, No = 0 |
| Help getting in/out of Chair | Yes = 1, No = 0 |
| Help Walking around house | Yes = 1, No = 0 |
| Help Eating | Yes = 1, No = 0 |
| Help Grooming | Yes = 1, No = 0 |
| Help Using Toilet | Yes = 1, No = 0 |
| Help up/down Stairs | Yes = 1, No = 0 |
| Help lifting 10 lbs | Yes = 1, No = 0 |
| Help Shopping | Yes = 1, No = 0 |
| Help with Housework | Yes = 1, No = 0 |
| Help with meal Preparations | Yes = 1, No = 0 |
| Help taking Medication | Yes = 1, No = 0 |
| Help with Finances | Yes = 1, No = 0 |
| Lost more than 10 lbs in last year | Yes = 1, No = 0 |
| Self Rating of Health | Poor = 1, Fair = 0.75, Good = 0.5, V. Good = 0.25, Excellent = 0 |
| How Health has changed in last year | Worse = 1, Better/Same = 0 |
| Stayed in Bed at least half the day due to health (in last month) | Yes = 1, No = 0 |
| Cut down on Usual Activity (in last month) | Yes = 1, No = 0 |
| Walk outside | <3 days = 1, ≤ 3 days = 0 |
| Feel Everything is an Effort | Most of time = 1, Some time = 0.5, Rarely = 0 |
| Feel Depressed | Most of time = 1, Some time = 0.5, Rarely = 0 |
| Feel Happy | Most of time = 0, Some time = 0.5, Rarely = 1 |
| Feel Lonely | Most of time = 1, Some time = 0.5, Rarely = 0 |
| Have Trouble getting going | Most of time = 1, Some time = 0.5, Rarely = 0 |
| High blood pressure | Yes = 1, Suspect = 0.5, No = 0 |
| Heart attack | Yes = 1, Suspect = 0.5, No = 0 |
| CHF | Yes = 1, Suspect = 0.5, No = 0 |
| Stroke | Yes = 1, Suspect = 0.5, No = 0 |
| Cancer | Yes = 1, Suspect = 0.5, No = 0 |
| Diabetes | Yes = 1, Suspect = 0.5, No = 0 |
| Arthritis | Yes = 1, Suspect = 0.5, No = 0 |
| Chronic Lung Disease | Yes = 1, Suspect = 0.5, No = 0 |
| MMSE | <10 = 1, 11–17 = 0.75, 18–20 = 0.5, 20–24 = 0.25, >24 = 0 |
| Peak Flow | See Table 2 |
| Shoulder Strength | See Table 2 |
| BMI | See Table 2 |
| Grip Strength | See Table 2 |
| Usual Pace | See Table 2 |
| Rapid Pace | See Table 2 |

The list of health deficit variables included in the FI and how they were coded as deficits.

# Frailty Index (FI)

K. Rockwood

BMC Geriatrics 2008, **8**:24

# Detection of frail people with a multi-domain rapid questionnaire

**(CARMI program, Benetos et al)**

1. Inadequate social support, unsuitable housing
2. Absence of social relations
3. Recent decrese in activities, transfer reduction, instability and slow walk speed
4. Environmental and personal negligence
5. Sensorial deficit (non-compensated)
6. Behavour and cognitive disorders (loss of motivation, cognitive decline, depression)
7. Loss of weight >5% during the last 6 months
8. Polymedication >4 drugs daily
9. Unprogrammed repetitive hospitalisations (>2 during the last 6 months)
10. Falls >2 during the last year.

Who: Nurse, GP, other care givers
Where: Where elderly people meet health care professionals
Duration: <10 min

- 4/10 of the criteria
- At least 1 during the last 6 months

# Frailty assessement: Practical issues

# Frailty:
# From the concept to the clinical practice

- Concept and epidemiology
- Detection in clinical practice
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# Interest for detecting frailty

A- evaluate the risks of functional decline, morbidity and mortality

B- define the risk/benefit balance of therapeutic strategies

C- propose specific actions to prevent or regress frailty.

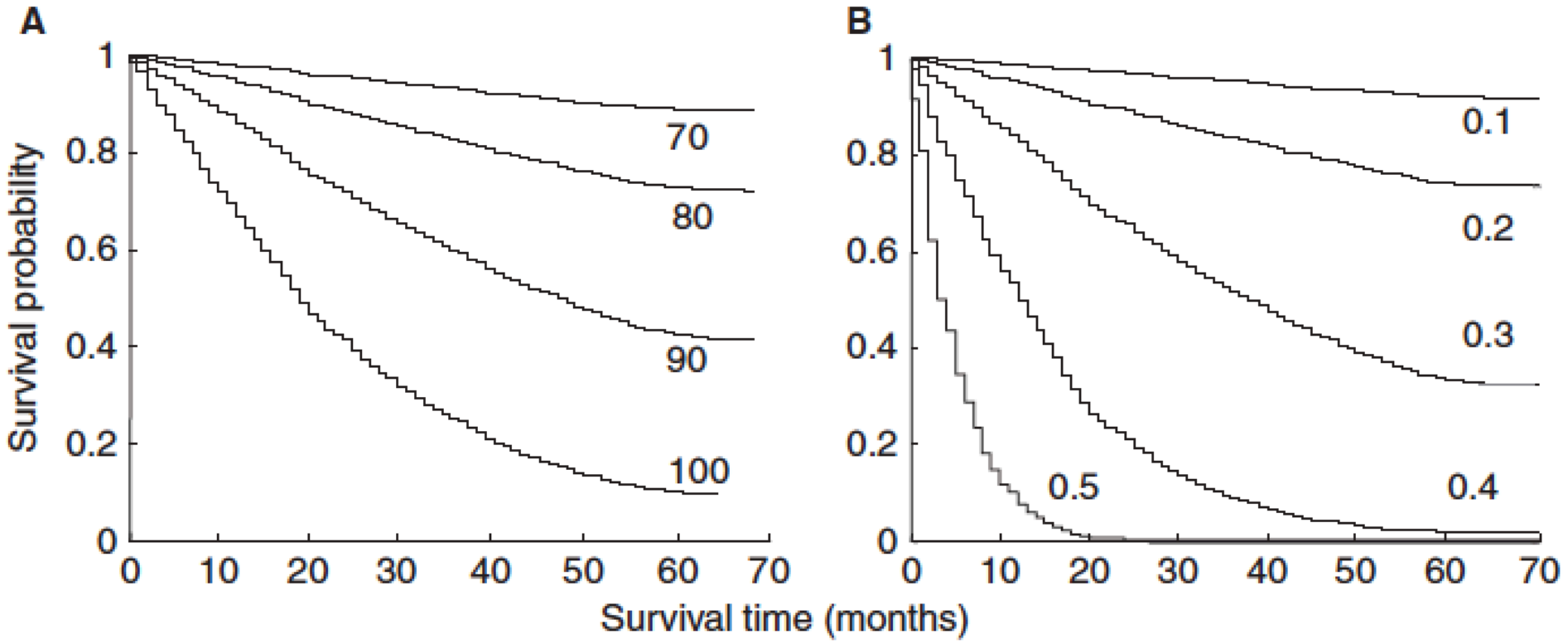
This new holistic approach is impossible wihout the collaboration of several health professionals.

# Risks of Frailty in 3 Years

| Adverse Geriatric Outcomes | Hazards Ratio |
|---|---|
| Death | 2.24 |
| Worsening ADL | 1.98 |
| Worsening Mobility | 1.50 |
| Falling | 1.29 |
| Hospitalization | 1.29 |

Fried L et al: J Gerontol Med Sci 2001

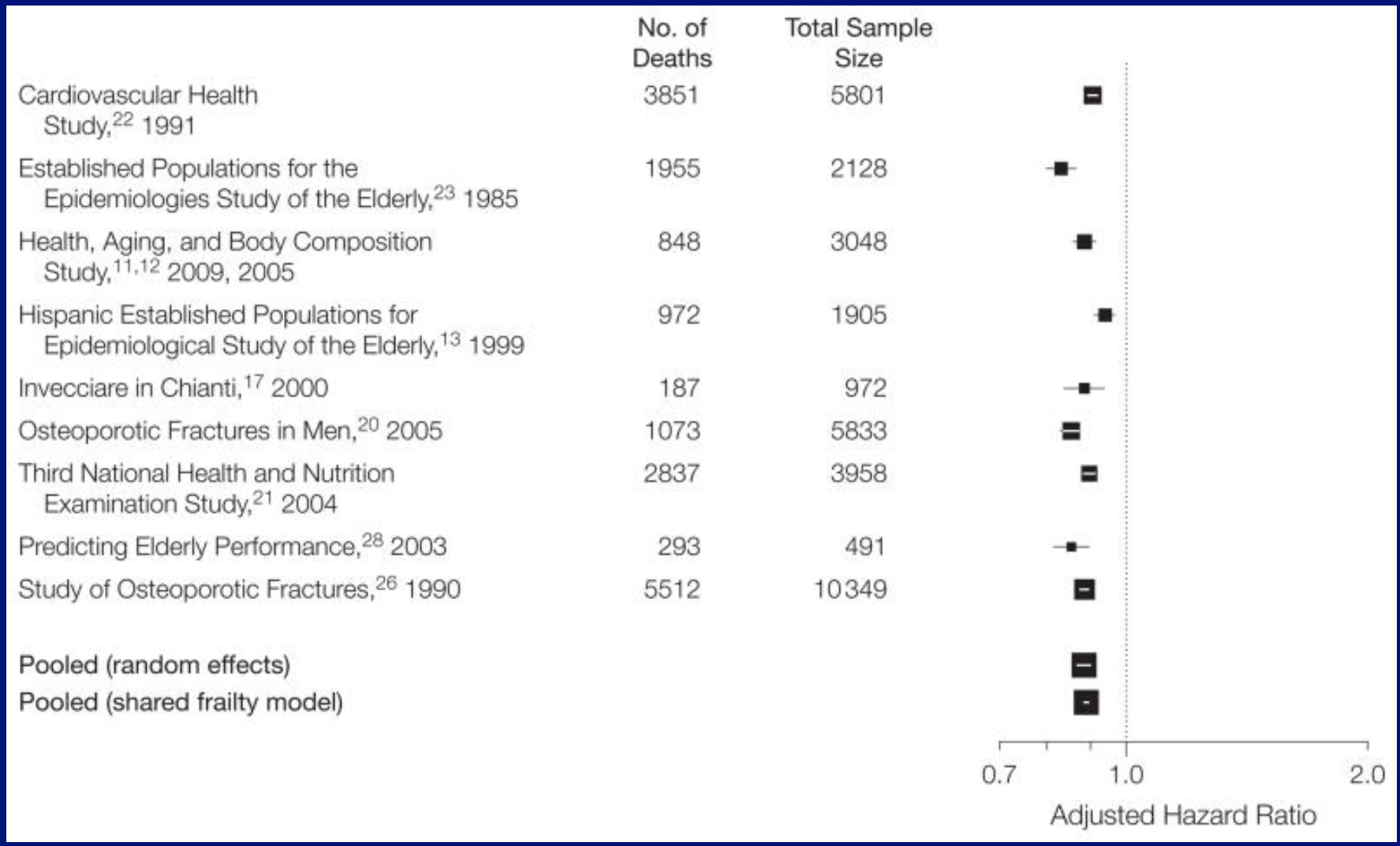
# Survival in relation to age and frailty index




A- With increasing age strata, survival declined.
B- With increasing values of the Frailty Index, survival declined.

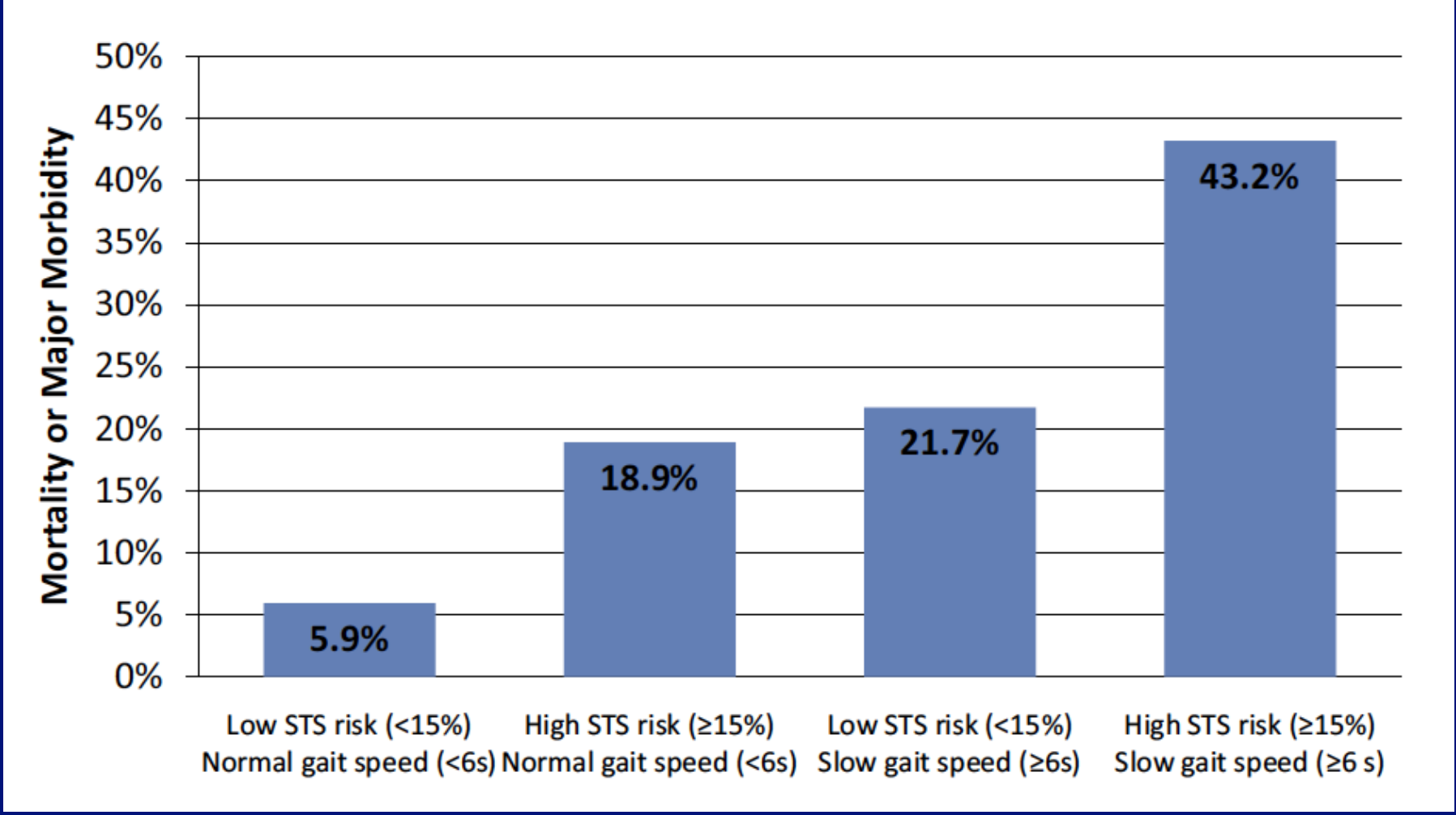
Rockwood et al JAGS 58:318–323, 2010

# Age-adjusted HR for death per 0.1 m/s higher gait speed




Studenski et al, JAMA 2011;305:50-58

# Predicted probability of mortality or major morbidity according to gait speed* and the Society of Thoracic Surgeons (STS) Risk Score in subjects undergoing cardiac surgery




* 5m, >6 sec

J Afilalo et al, J. Am. Coll. Cardiol. 2010;56;1668-1676

# Hypoglycemia Is Independently Associated with Multidimensional Impairment in Elderly Diabetic Patients

- 1342 patients with type 2 diabetes (DM), 65 years old or over (73.3 ± 5.5 years) , and treatment with oral antidiabetic medications.
- Multidimensional impairment was assessed using the MPI evaluating functional, cognitive, and nutritional status; risk of pressure sores; comorbidity; number of drugs taken; and cohabitation status.
- Multivariate analysis showed that advanced age, female gender, hypoglycemic events, and hospitalization for glycemic decompensation were independently associated with a worse MPI score

**Stratification of elderly diabetic patients using the MPI might help to identify those patients at highest risk who need better-tailored treatment**

Pilotto et al; BioMed Research International 2014

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# Evaluation of Multidimensional Geriatric Assessment as a Predictor of Mortality and Cardiovascular Events After Transcatheter Aortic Valve Implantation

Stefan Stortecky, MD,* Andreas W. Schoenenberger, MD,† André Moser, PHD,‡ Bindu Kalesan, PHD,‡ Peter Jüni, MD,‡ Thierry Carrel, MD,§ Seraina Bischoff, RN,* Christa-Maria Schoenenberger, RN,* Andreas E. Stuck, MD,† Stephan Windecker, MD,* Peter Wenaweser, MD*

*Bern, Switzerland*

JACC 2012

**Table 2. Baseline Results of Global and MGA-Based Risk Scores**

| Risk Score | Result | Interpretation | Proportion of Patients, n (%) (n = 100) |
|---|---|---|---|
| Global risk scores | | | |
| STS score | ≥5% | At risk of higher mortality | 56 (56.0%) |
| Logistic EuroSCORE | ≥15% | At risk of higher mortality | 72 (72.0%) |
| MGA-based risk scores | | | |
| MMSE | <27 points | Cognitive impairment probable | 32 (32.0%) |
| MNA | <12 points | Malnutrition probable | 44 (44.0%) |
| TUG | ≥20 s | Moderate or severe limitation of mobility | 38 (38.0%) |
| BADL | ≥1 point | At least 1 basic activity with limitation | 29 (29.0%) |
| IADL | ≥1 point | At least 1 instrumental activity with limitation | 58 (58.0%) |
| Pre-clinical mobility disability | Present | Pre-clinical mobility disability | 60 (60.0%) |
| Frailty index | ≥3 points | Frailty | 49 (49.0%) |

BADL = Basic Activities of Daily Living; IADL = Instrumental Activities of Daily Living; MGA = Multidimensional Geriatric Assessment; MMSE = Mini Mental State Examination; MNA = Mini Nutritional Assessment; STS = Society of Thoracic Surgeons; TUG = Timed Get Up and Go test.

JACC 2012

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frailty index | | | | | | | | |
| Linear (OR per 1 point increase) | 2.18 (1.32–3.61) | 0.002 | 1.66 (1.14–2.44) | 0.01 | 1.80 (1.31–2.47) | <0.001 | 1.80 (1.33–2.45) | <0.001 |
| Dichotomized (≥3 vs. <3 points) | 8.33 (0.99–70.48) | 0.03 | 4.78 (0.96–23.77) | 0.05 | 3.68 (1.21–11.19) | 0.02 | 4.89 (1.64–14.60) | 0.003 |

## Conclusions

This study shows that MGA-based risk scores predict all-cause mortality and MACCE in elderly patients undergoing TAVI.

This study also shows that risk prediction of other global risk scores may be improved using MGA-based scores. Larger studies are needed to optimize MGA-based scores for use in clinical routine.

*JACC 2012*

# Detection and management of frailty in community living persons

- 3-step approach:

1. Detection of frail people
2. Comprehensive Geriatric Assessment (CGA)
3. Personalized preventive and therapeutic actions

# Canadian Study of Health and Ageing Score:

## Rockwood et al: CMAJ 2005;173:489-495

### Clinical Frailty Scale

**1 Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

**2 Well** – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

**3 Managing Well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

**4 Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up", and/or being tired during the day.

**5 Mildly Frail** – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

**6 Moderately Frail** – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

**7 Severely Frail** – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

**8 Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

**9 Terminally Ill** – Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

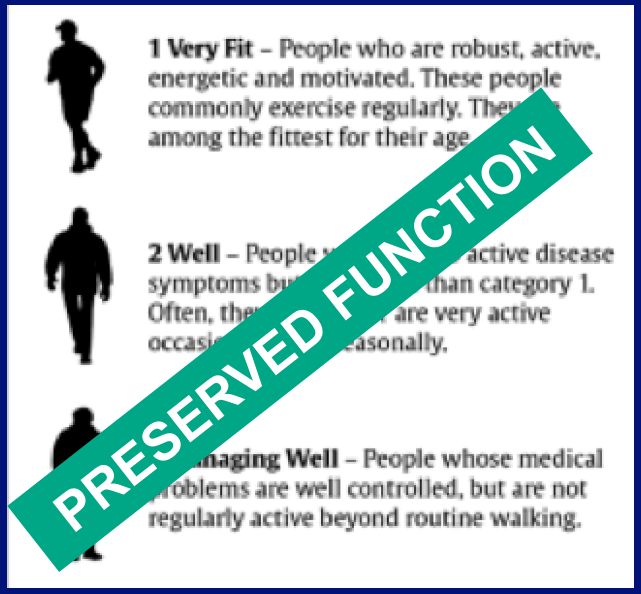
**Scoring frailty in people with dementia**

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia,** recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia,** they cannot do personal care without help.

# ‘VISUAL’ EVALUATION: THREE PROFILES ACCORDING TO FUNCTION/AUTONOMY STATUS



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**Managing Well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

PRESERVED FUNCTION

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LOSS OF FUNCTION/ PRESERVED AUTONOMY

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LOSS OF AUTONOMY

Benetos A, Petrovic M, Strandberg T, to be submitted

# Step 1- Detection of frail people

Who: Nurse, GP, other care givers
Where: Where elderly people meet health care professionals
Duration: <10 min

- 4/10 of the criteria
- At least 1 during the last 6 months

# Step 2- Comprehensive Geriatric Assessment (CGA)

Who: nurse and physician specialized in geriatric medicine

Where: In primary care centers

Duration: 2-3 hours

# CGA (specilaized personnel)

- Pain
- Nutrition
- Gait and walk speed
- Autonomy evaluation ADL-IADL
- Environment, housing, family, social net
- Evaluation of physical and social activities

# CGA (physician)

- Physical examination
- Cognitive functions evaluation:
- Mood: GDS 15 items
- Drug Prescription reevaluation
- Synthesis,  elaboration personalized care plan

# Step 3- Personalized care plan according to the results of the CGA

Who: Specialist physician who performed the CGA in accordance with the GP of the individual.

Where: Memory clinic, Physiotherapist, Nutritionist, Phychologist, Social services, etc...

# Detection and management of frail subjects

## THM

1- Detection of frailty and CGA are useful in order to:
a- evaluate the risks of functional decline, morbidity and mortality
b- define the risk/benefit balance of therapeutic strategies
c- propose specific actions to prevent or regress frailty

2- This new holistic approach is impossible wihout the collaboration of several health professionals.