La sindrome da Fragilità

Moving Frailty Toward Clinical Practice: NIA Intramural Frailty Science Symposium

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- *"The **lack of general consensus on the language used to describe frailty**, and the differing theories on the nature of frailty, present ongoing barriers to researchers and may discourage clinicians considering using frailty assessment in clinical practice"*

Journal of the American Geriatrics Society, 02 May 2019

Moving Frailty Toward Clinical Practice: NIA Intramural Frailty Science Symposium

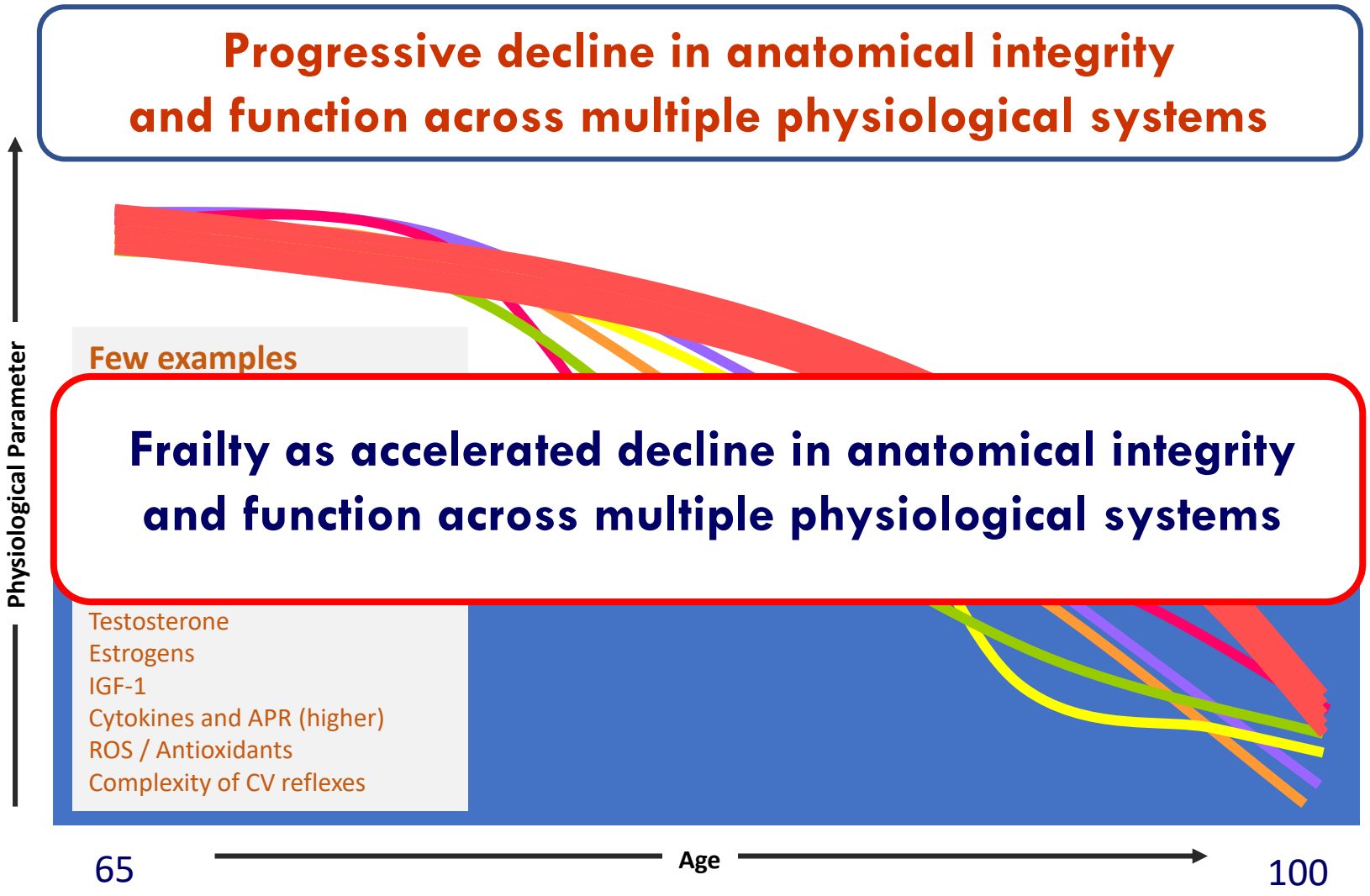
- *….the confusion as to **what frailty is** and how it can be best captured by a specific assessment….*
- *…The lack of clarity may be connected in part by the use of the word "**frailty" to indicate disparate conceptual frameworks, risk predictors, and assessments**…*
- *… Furthermore, related-and as of now, loosely defined-concepts of "**vulnerability**"and "**resiliency**" have further confused clinicians and researchers alike…*

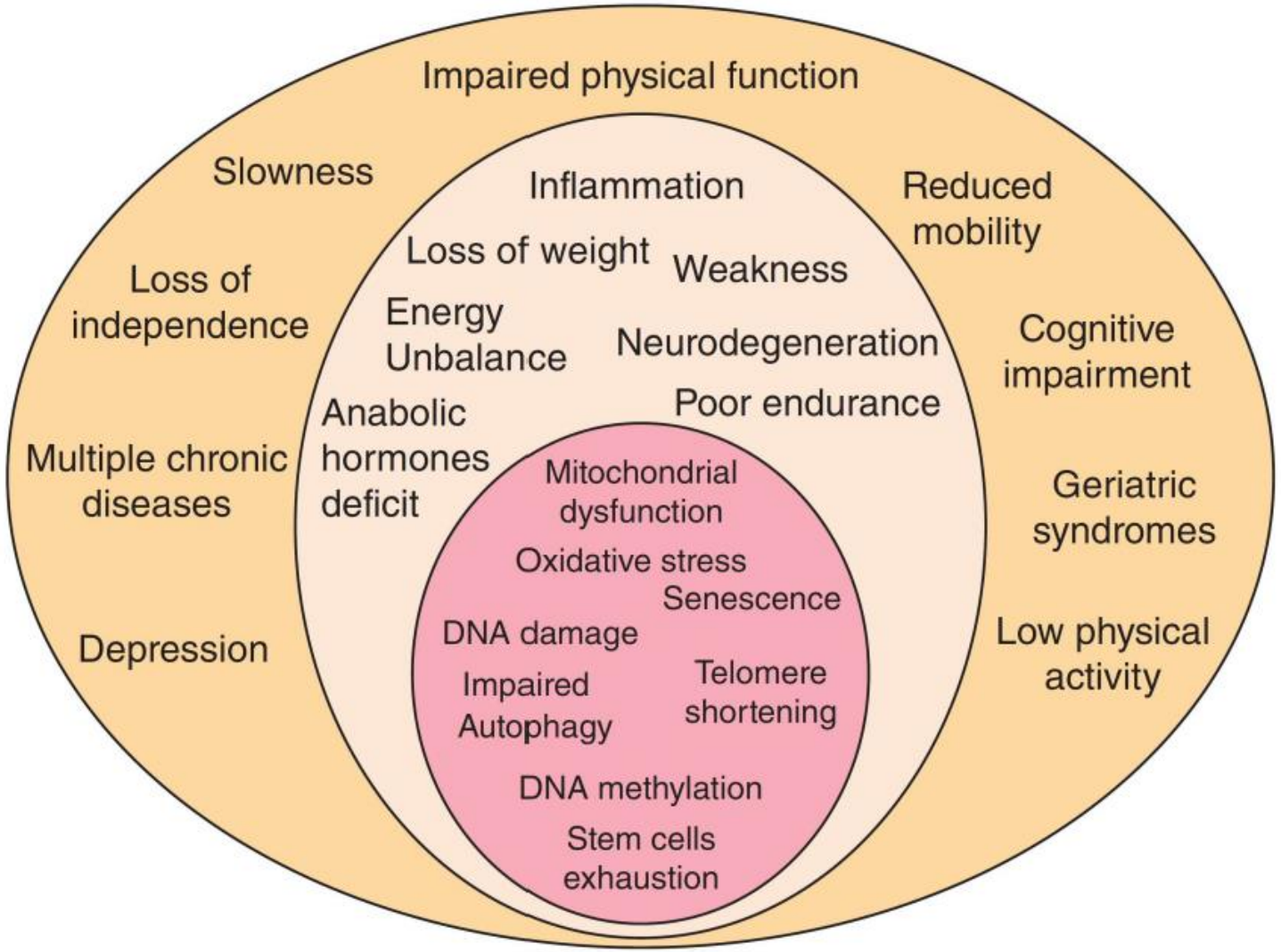
Journal of the American Geriatrics Society, 02 May 2019

- Research agenda for frailty in older adults: toward a better understanding of physiology and etiology: summary from the American Geriatrics Society/NIA Research Conference on Frailty in Older Adults

- **"A state of *increased vulnerability to stress* due to age-related declines in physiologic reserves across neuromuscular, metabolic, and immune systems"**

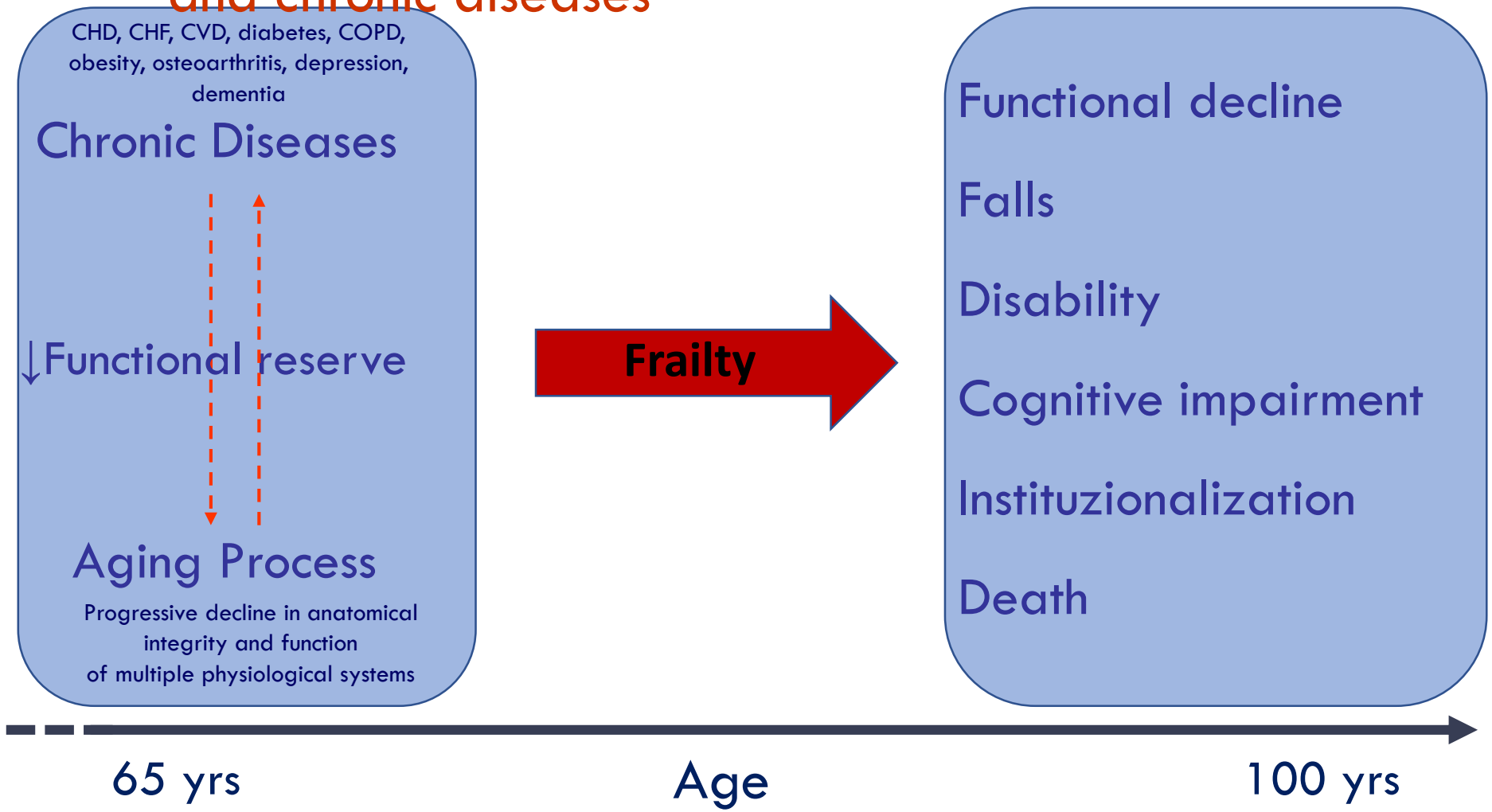
Watson J et al JAGS 2006


Progressive decline in anatomical integrity and function across multiple physiological systems
Physiological Parameter
Few examples
Frailty as accelerated decline in anatomical integrity and function across multiple physiological systems
Testosterone
Estrogens
IGF-1
Cytokines and APR (higher)
ROS / Antioxidants
Complexity of CV reflexes
65
Age
100



Ferrucci L. Hazzard's Geriatric Medicine and Gerontology, 7 th Edition

Interactions between age-related changes and chronic diseases



Clarification of conceptual frameworks
for commonly used Frailty models

1. **Physical Frailty**
   - ✓ CHS (Fried)
   - ✓ SOFT
   - ✓ others
2. **Defict accumulation Frailty**
   - ✓ CSA Fraitly Index
   - ✓ MPI
   - ✓ Silver code
   - ✓ others
3. **Pre-disability state**
   - ✓ SPPB
   - ✓ Physical Frailty and sarcopenia
   - ✓ others

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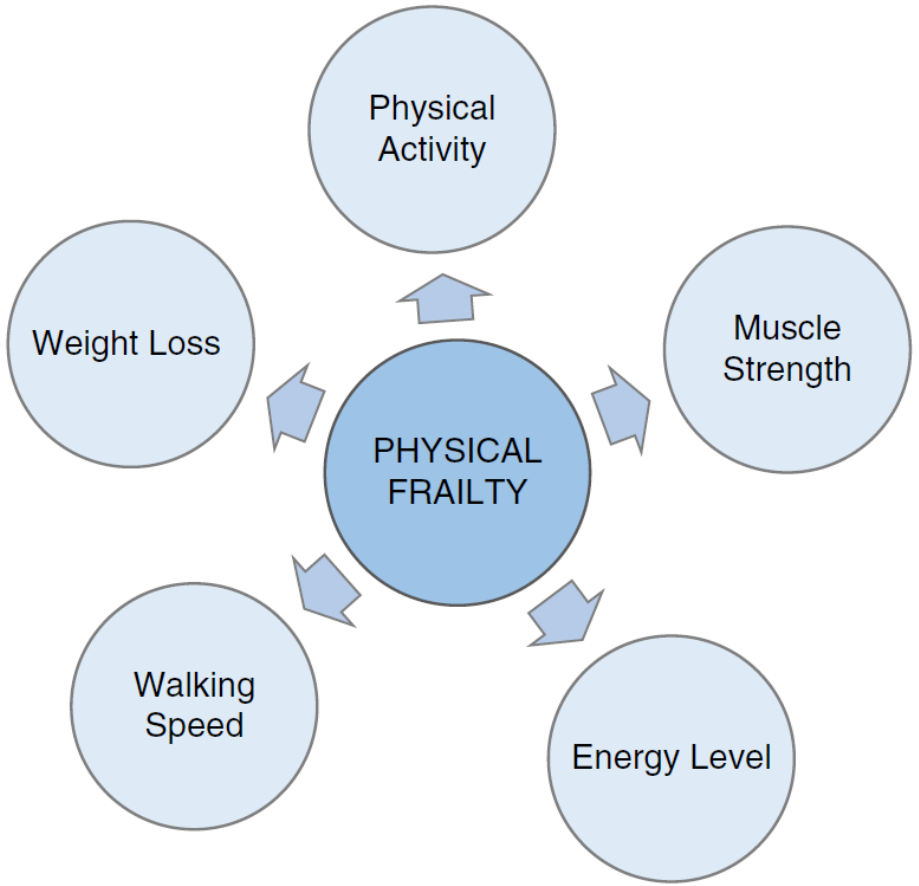
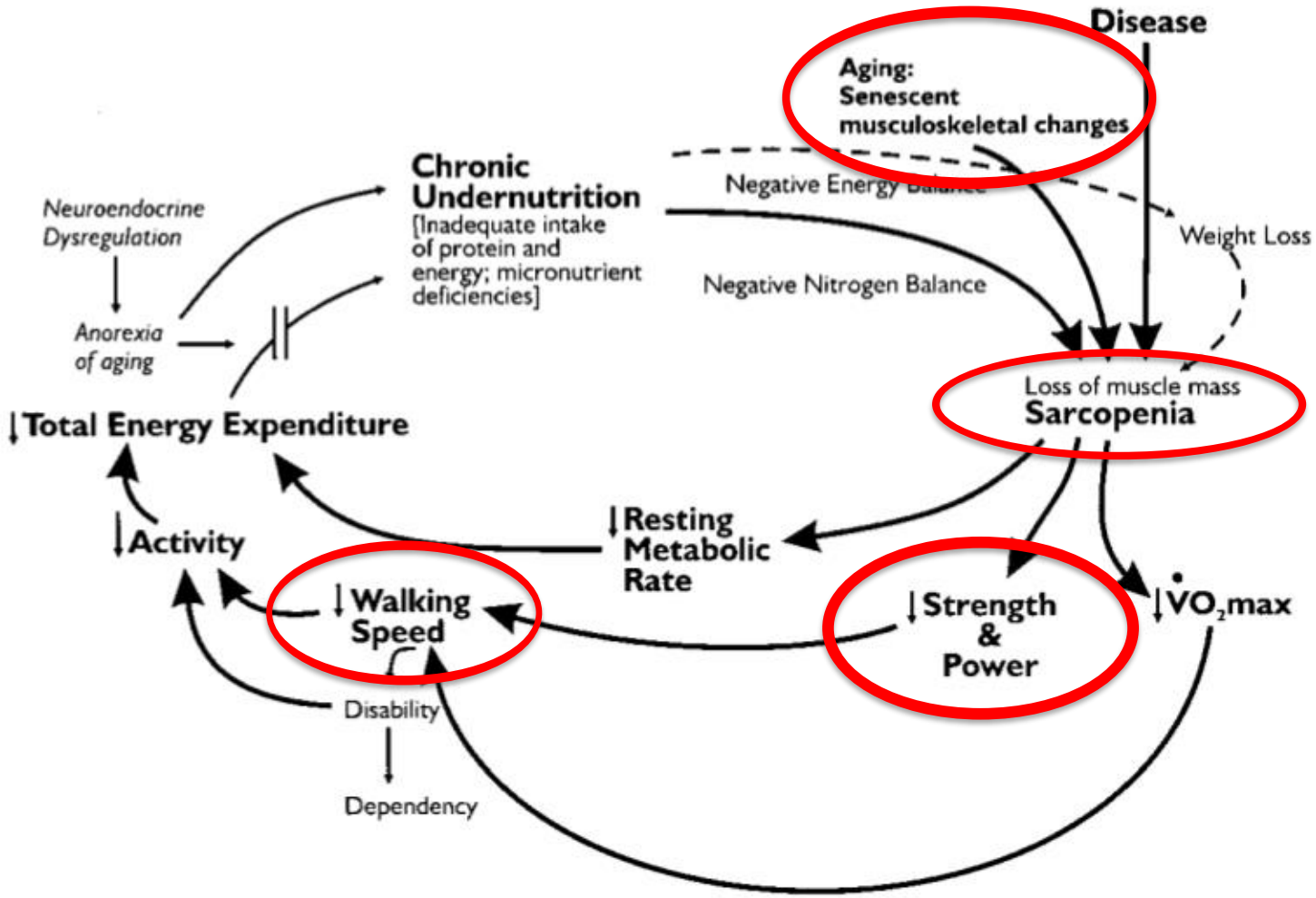
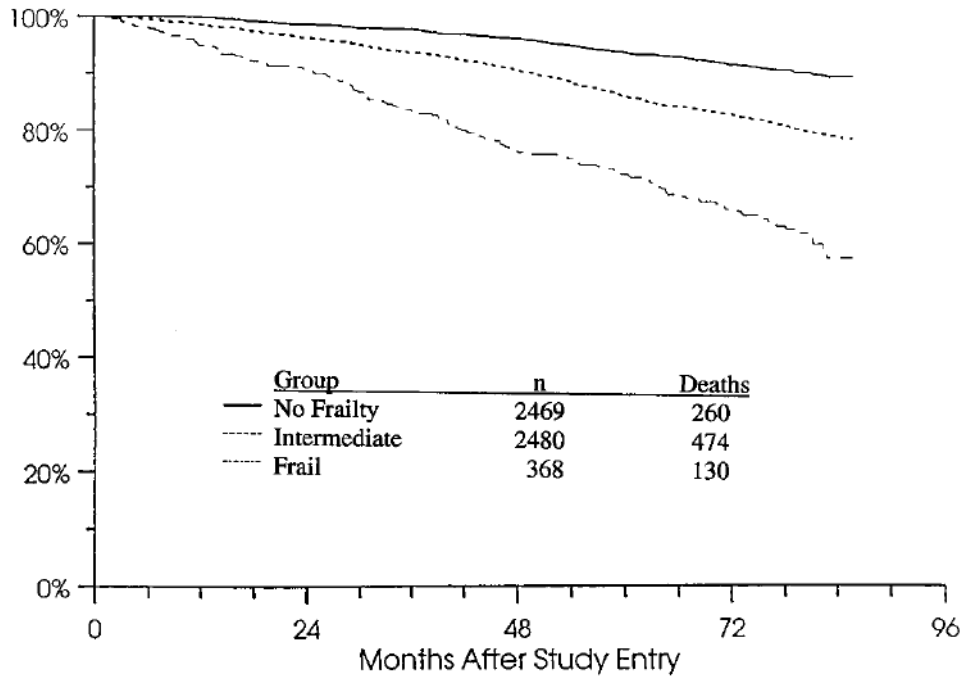
Physical Frailty Phenotype



The Cicle of Frailty



Walston J & Fried LP. Med Clin North Am 1999;83:1173-94



Frailty Status at Baseline	(*n*)	Died		First Hospitalization		First Fall		Worsening ADL Disability		Worsening Mobility Disability	
		3 yr %	7 yr %	3 yr %	7 yr %	3 yr %	7 yr %	3 yr %	7 yr %	3 yr %	7 yr %
Not Frail	(2469)	3	12	33	79	15	27	8	23	23	41
Intermediate	(2480)	7	23	43	83	19	33	20	41	40	58
Frail	(368)	18	43	59	96	28	41	39	63	51	71
$p^{\ddagger}$		<.0001		<.0001		<.0001		<.0001		<.0001	

*7-year estimates are only available for the first cohort.
†Only those evaluable for frailty are included.
‡*p* value is based on the 2 degree of freedom log rank test using all available follow-up.

Fried LP. J Gerontol Med Sci 2001

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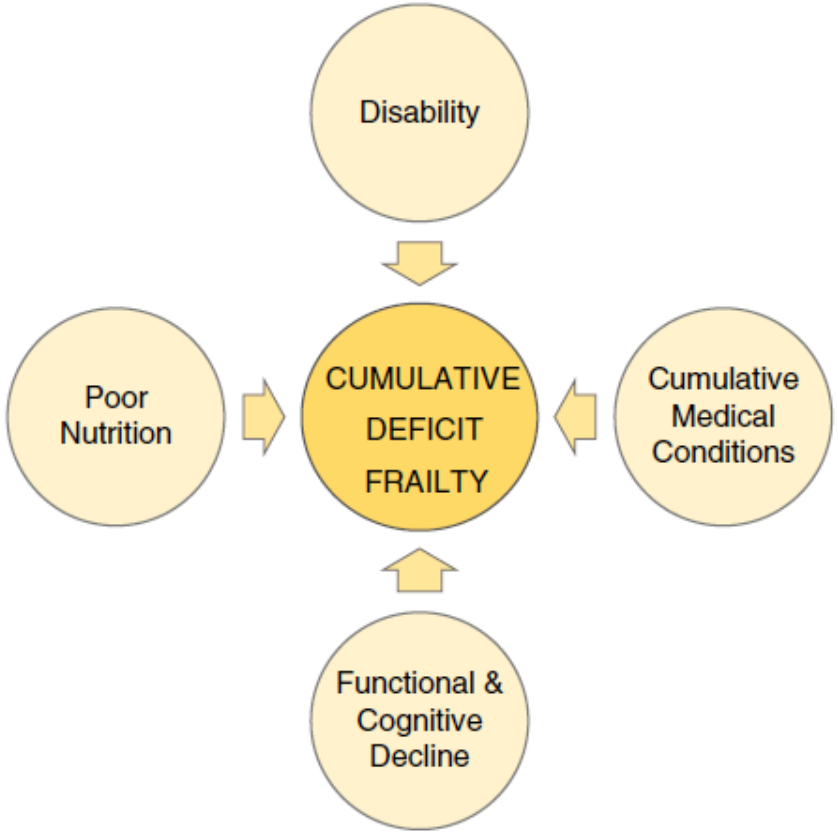
Frailty Index



Appendix 1: List of variables used by the Canadian Study of Health and Aging to construct the 70-item CSHA Frailty Index

- Changes in everyday activities
- Head and neck problems
- Poor muscle tone in neck
- Bradykinesia, facial
- Problems getting dressed
- Problems with bathing
- Problems carrying out personal grooming
- Urinary incontinence
- Mood problems
- Feeling sad, blue, depressed
- History of depressed mood
- Tiredness all the time
- Depression (clinical impression)
- Sleep changes
- Restlessness
- Memory changes
- Seizures, partial complex
- Seizures, generalized
- Syncope or blackouts
- Headache
- Cerebrovascular problems
- History of stroke
- History of diabetes mellitus
- Arterial hypertension

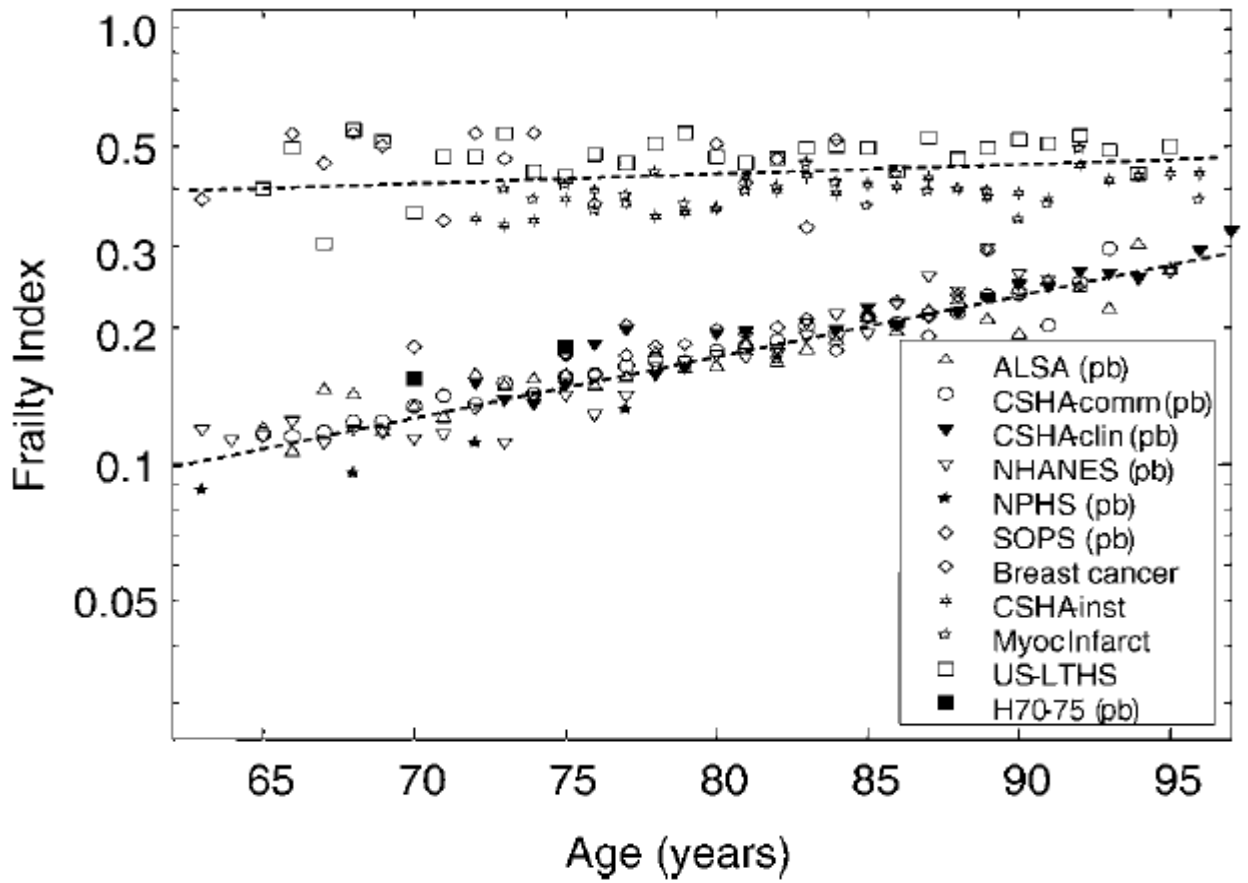
Ratio between the number of deficits detected and the number of conditions evaluated

- Sucking problems
- Problems going out alone
- Impaired mobility
- Musculoskeletal problems
- Bradykinesia of the limbs
- Poor muscle tone in limbs
- Poor limb coordination
- Poor coordination, trunk
- Poor standing posture
- Irregular gait pattern
- Falls
- Paranoid features
- History relevant to cognitive impairment or loss
- Family history relevant to cognitive impairment or loss
- Impaired vibration
- Tremor at rest
- Postural tremor
- Intention tremor
- History of Parkinson's disease
- Family history of degenerative disease
- Lung problems
- Respiratory problems
- History of thyroid disease
- Thyroid problems
- Skin problems
- Malignant disease
- Breast problems
- Abdominal problems
- Presence of snout reflex
- Presence of the palmomental reflex
- Other medical history

Rockwood et al. CMAJ 2005

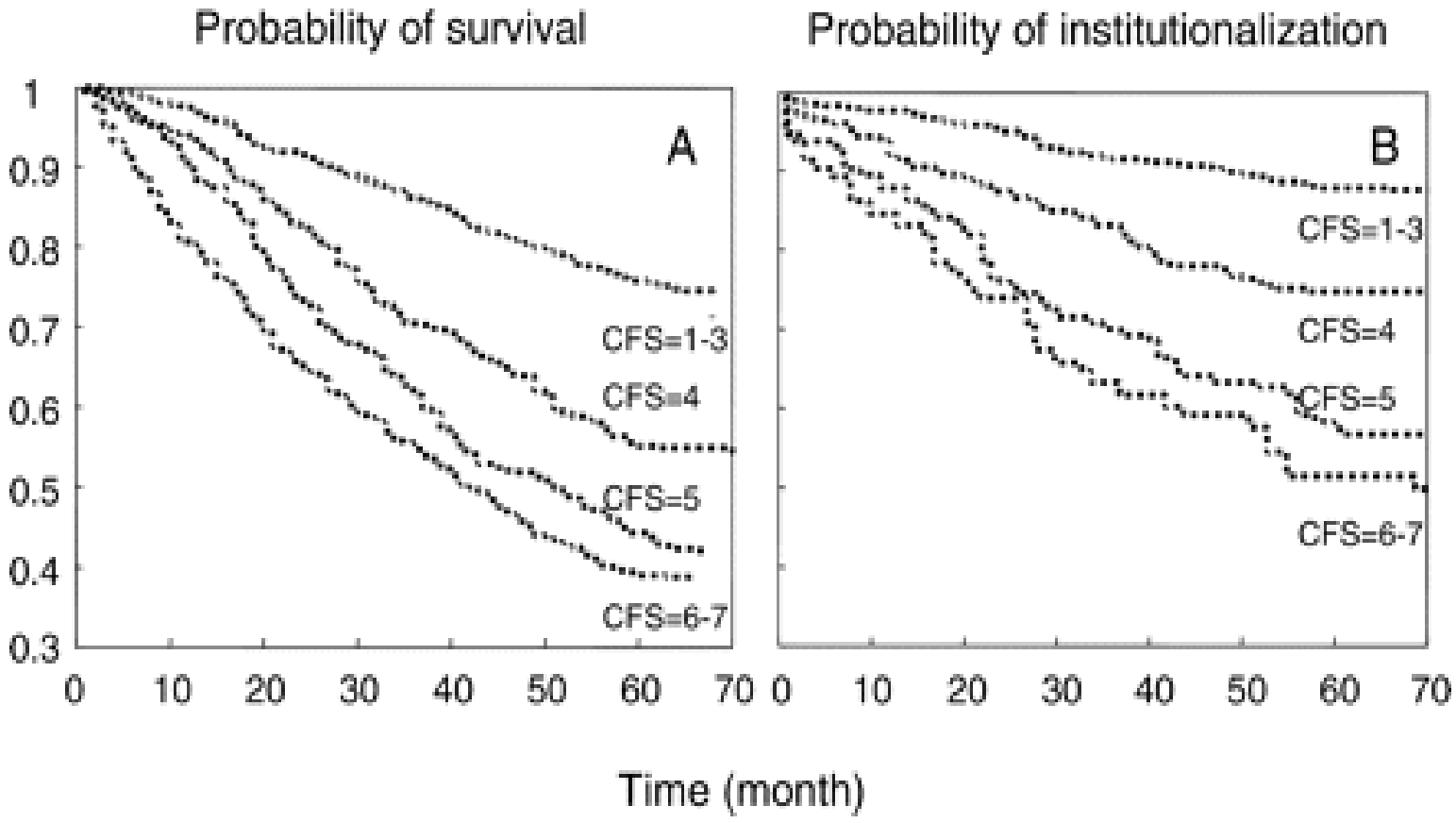
Frailty in Relation to the Accumulation of Deficits

Kenneth Rockwood[1,2] and Arnold Mitnitski[2]



Rockwood et al. J Gerontol Med Sci 2007

Kaplan–Meier medium-term survival curves (adjusted for age and sex) for individuals with different values



Rockwood et al. J Gerontol A Med Sci 2007

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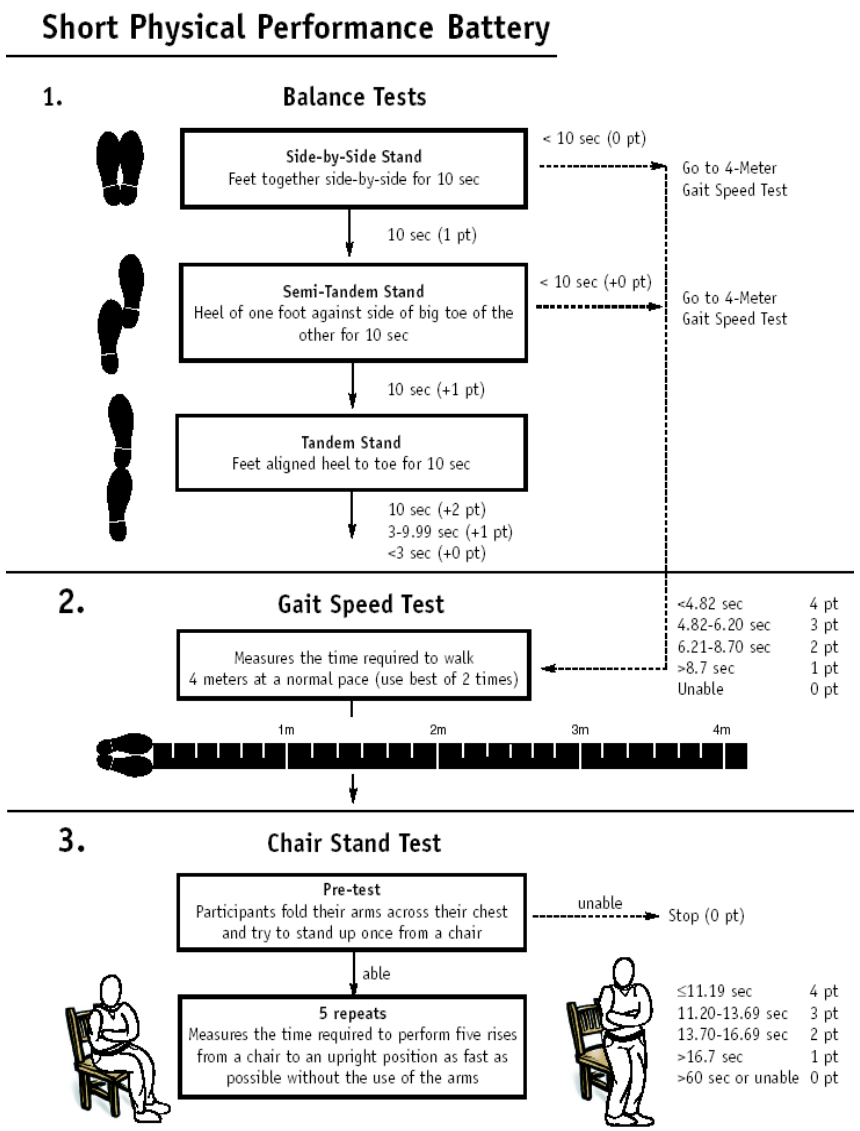
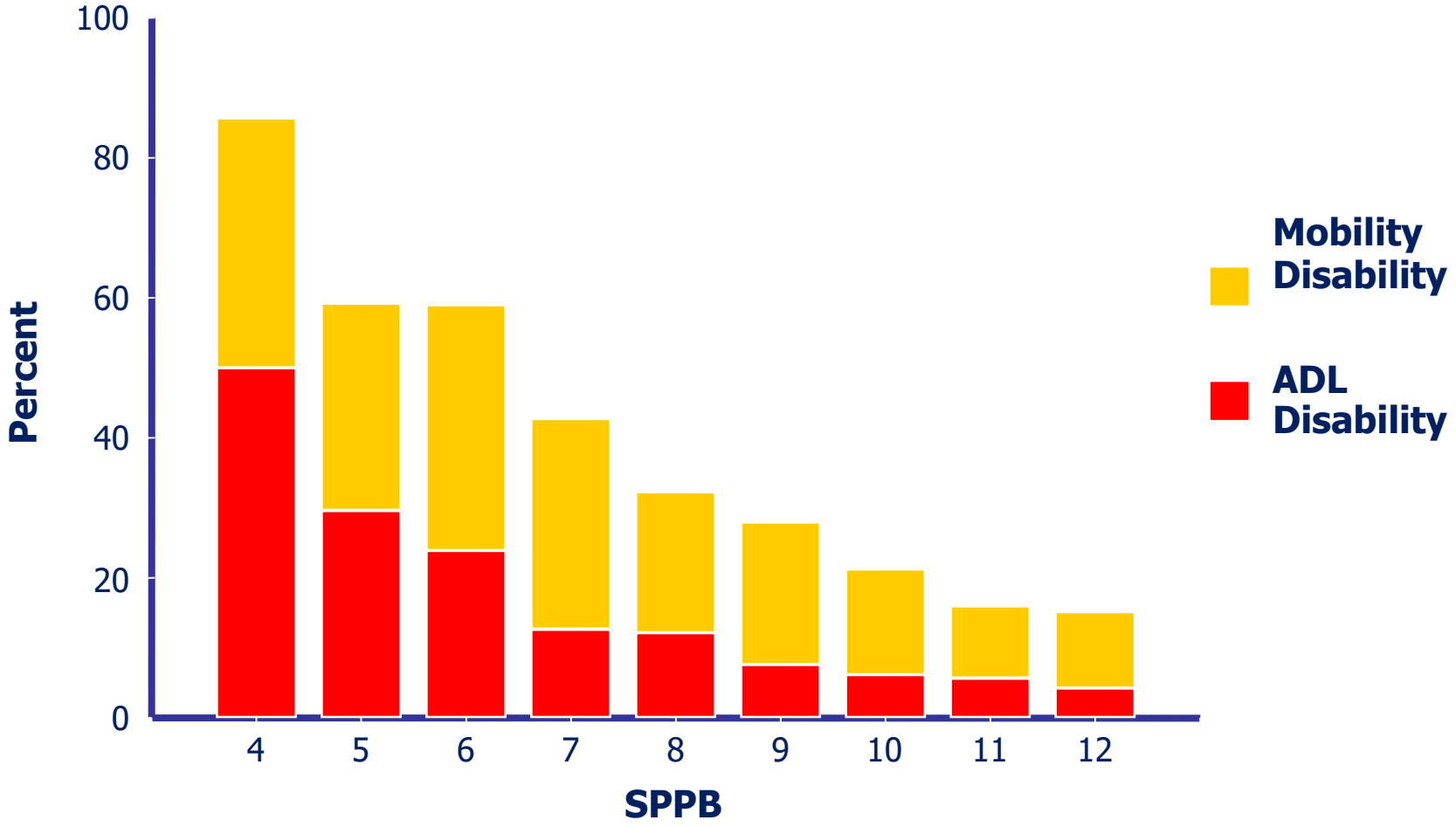


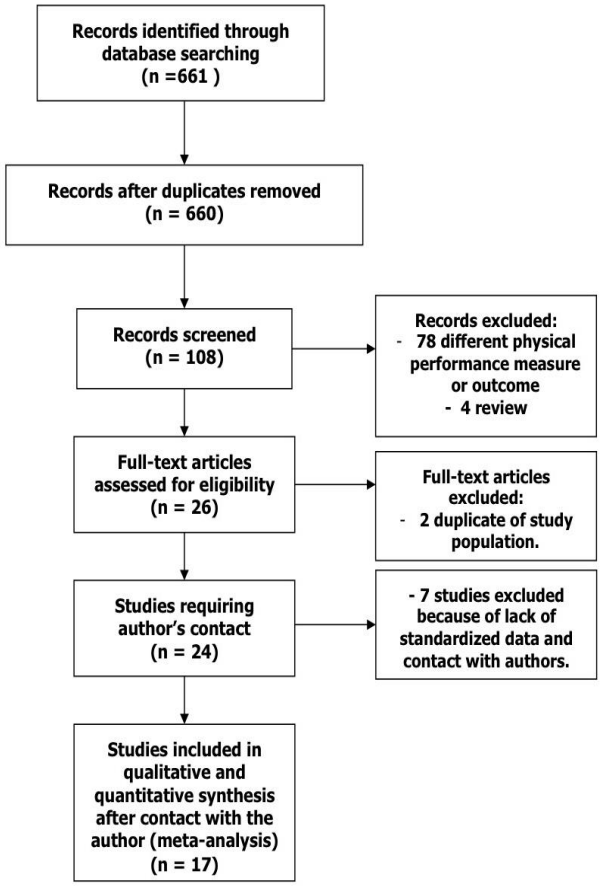
Guralnik et al. J Gerontol Med Sci 1994

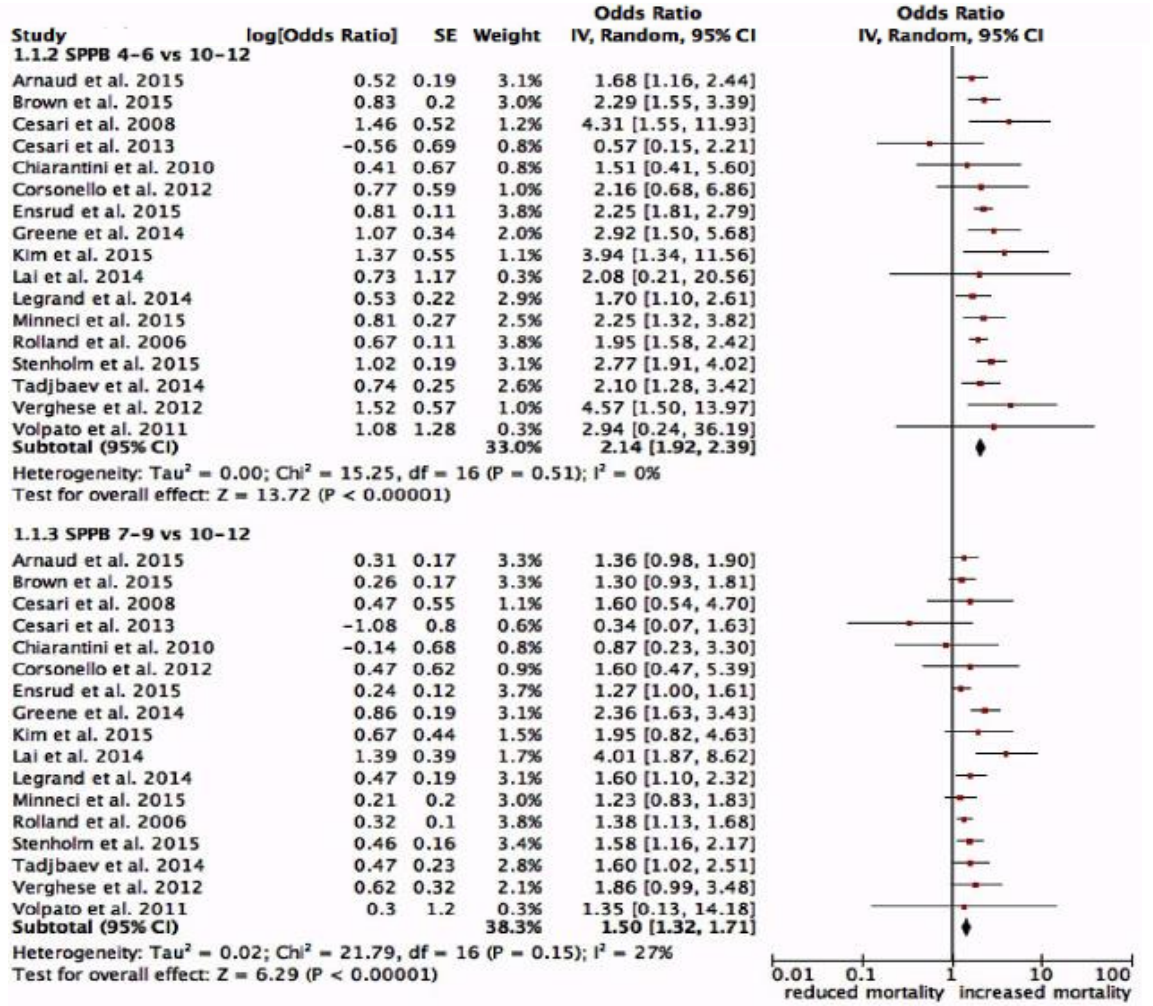
SPPB and risk of Mobility and ADL disability over 4-year FU (EPESE)



Guralnik et al. N Engl J Med 1995

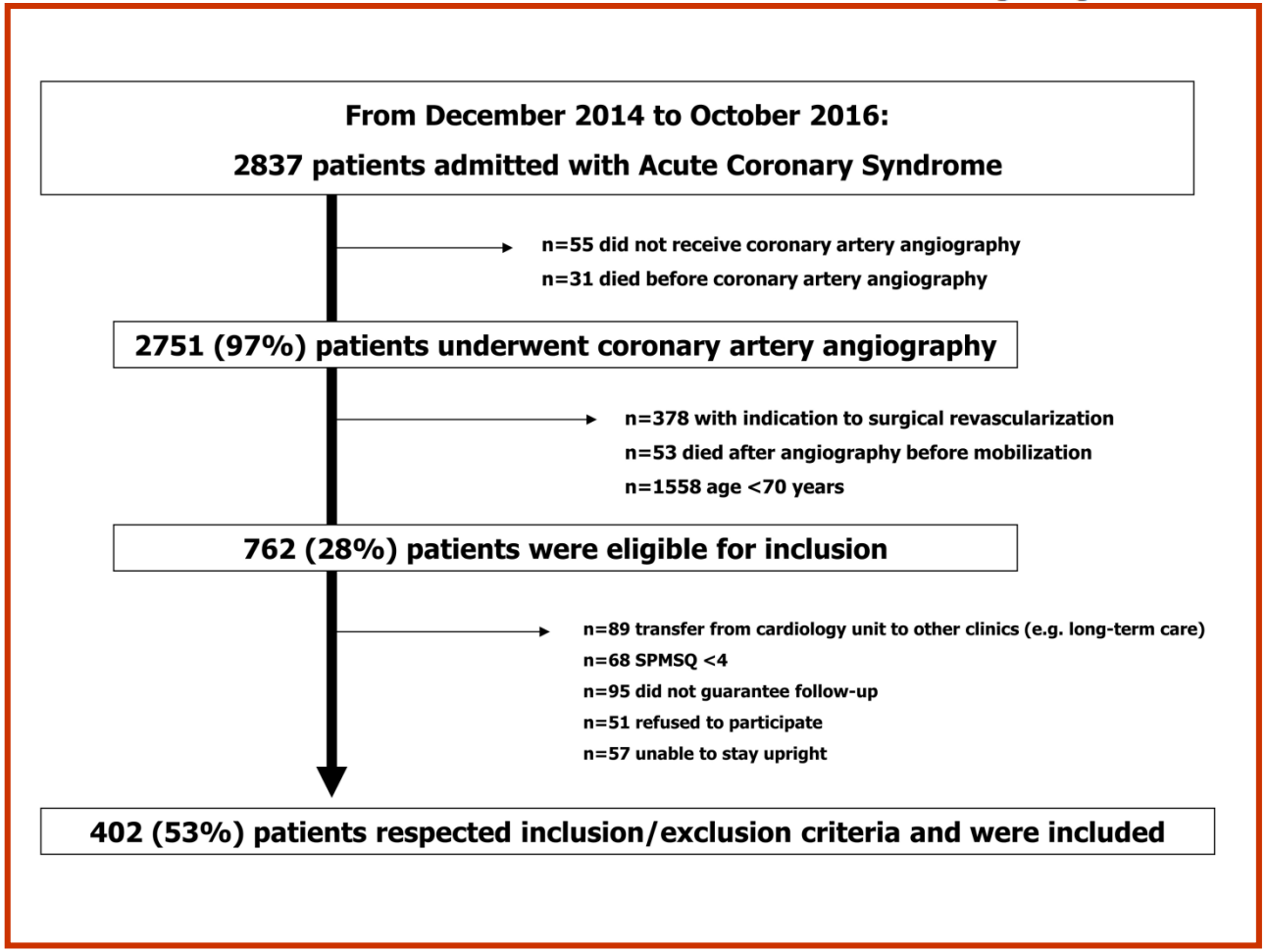
SPPB and all-cause Mortality: Systematic Review and Meta-analysis





Pavasini R et al. BMC Med 2016

The Assessment of Scales of Frailty and Physical Performance Improves Prediction of Major Adverse Cardiac Events in Older Adults with Acute Coronary Syndrome



Campo G & Volpato S. J Gerontol Med Sci 2019 May 10

The Assessment of Scales of Frailty and Physical Performance Improves Prediction of Major Adverse Cardiac Events in Older Adults with Acute Coronary Syndrome

Table 4. Multivariable Analysis Including Scales of Frailty and Physical Performance and Incremental Value

	Adjusted OR (95% CI)*	Δ C-Statistic	*p* Value	IDI	*p* Value	NRI	*p* Value
MACCE							
SPPB	0.79 (0.70–0.89)	0.044	.04	0.054	.001	0.752	<.0001
Columbia	1.17 (1.03–1.33)	0.019	.2	0.016	.2	0.248	.1
Edmonton	1.34 (1.15–1.56)	0.017	.4	0.073	<.0001	0.505	.001
Grip strength (kg)	0.96 (0.92–0.99)	0.008	.6	0.018	.04	0.316	.052
Fried	1.36 (1.04–1.79)	0.011	.5	0.019	.02	0.319	.047
Rockwood CFS	1.07 (0.76–1.49)	0.001	.9	0.001	.4	0.100	.5
MPI	1.61 (2.70–9.61)	0.020	.1	0.020	.1	0.277	.08
All-cause mortality							
SPPB	0.74 (0.63–0.85)	0.063	.02	0.061	<.0001	1.022	<.0001
Columbia	1.13 (0.97–1.30)	0.005	.5	0.013	.05	0.012	.9
Edmonton	1.33 (1.13–1.56)	0.037	.07	0.045	.004	0.646	.0003
Grip strength (kg)	0.98 (0.94–1.02)	−0.008	.4	0.010	.01	0.358	.047
Fried	1.58 (1.14–2.18)	0.020	.3	0.033	.002	0.371	.035
Rockwood CFS	1.34 (0.94–1.92)	0.005	.7	0.015	.08	0.420	.017
MPI	1.25 (0.01–113)	−0.001	.5	0.0002	.78	−0.061	1

Note: CFS = Clinical frailty scale; IDI = Integrated discrimination improvement; MACCE = Major adverse cardio cerebrovascular event; MPI = Multidimensional prognostic index; NRI = Net reclassification improvement; OR = Odds ratio; SPPB = Short physical performance battery.

*Multivariable analysis obtained after the insertion of the scale in the baseline model (Table 3).

Δ C-Statistic, IDI, NRI: the values are referred for the comparison between the baseline model (Table 3) and the same model with the addition of frailty scale.

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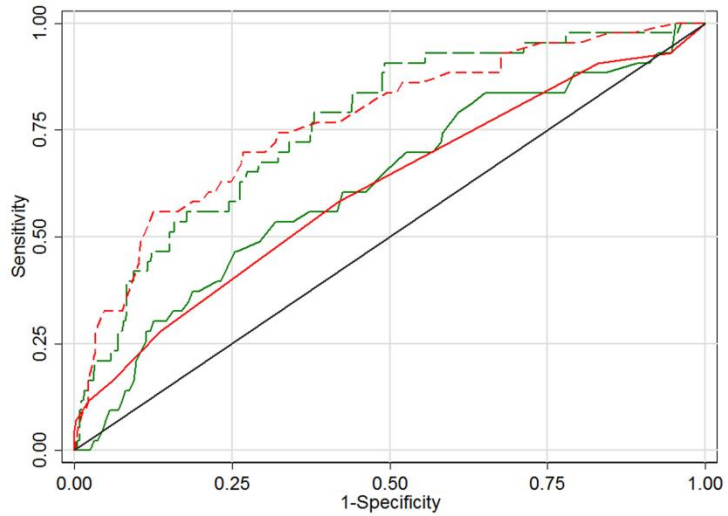
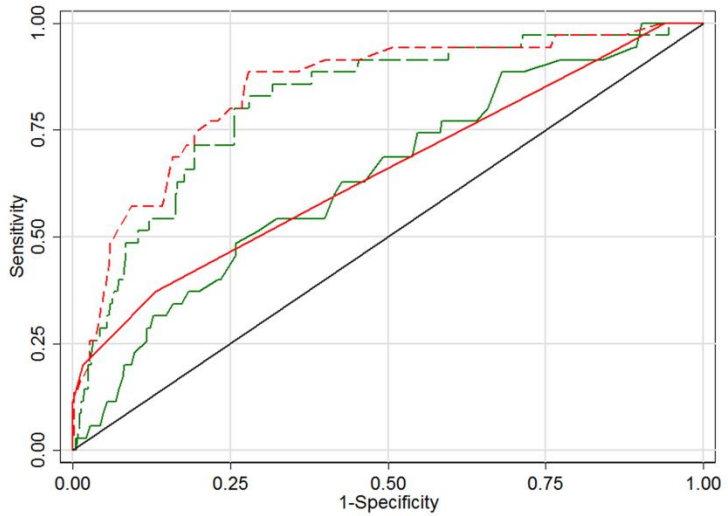
The Assessment of Scales of Frailty and Physical Performance Improves Prediction of Major Adverse Cardiac Events in Older Adults with Acute Coronary Syndrome

A: MACCE



	C-statistics (95%CI)	Δ C-Statistic	IDI	NRI
GRACE	0.620 (0.581-0.663)			
GRACE + SPPB	0.763 (0.726-0.801)	0.143	0.083 (p<0.001)	0.853 (p<0.001)
TIMI	0.610 (0.575-0.645)			
TIMI + SPPB	0.768 (0.736-0.803)	0.158	0.083 (p<0.001)	0.692 (p<0.001)

B: All-cause mortality



	C-statistics (95%CI)	Δ C-Statistic	IDI	NRI
GRACE	0.640 (0.601-0.683)			
GRACE + SPPB	0.816 (0.777-0.859)	0.176	0.115 (p<0.001)	1.050 (p<0.001)
TIMI	0.651 (0.586-0.656)			
TIMI + SPPB	0.879 (0.814-0.884)	0.228	0.102 (p<0.001)	0.937 (p<0.001)

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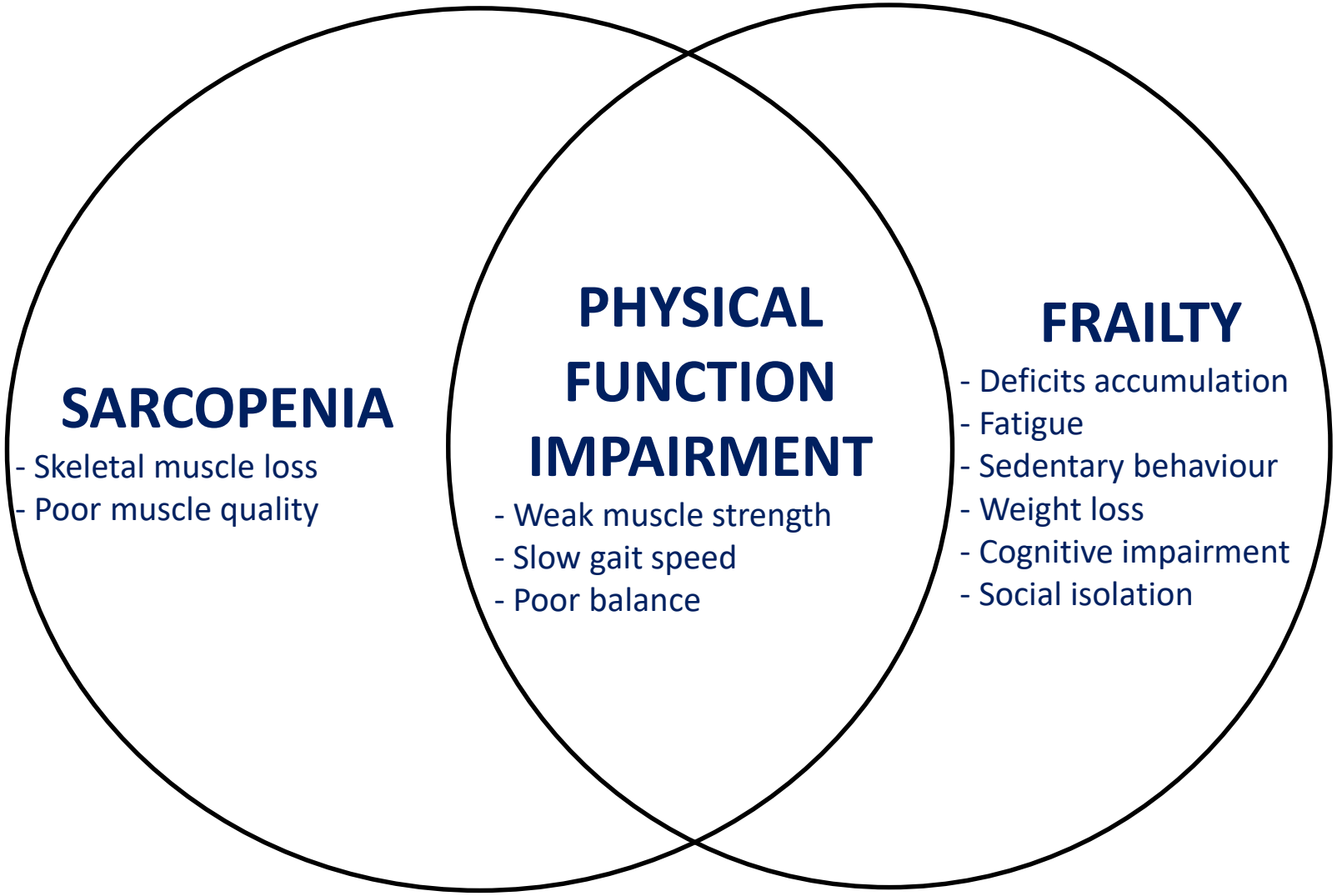
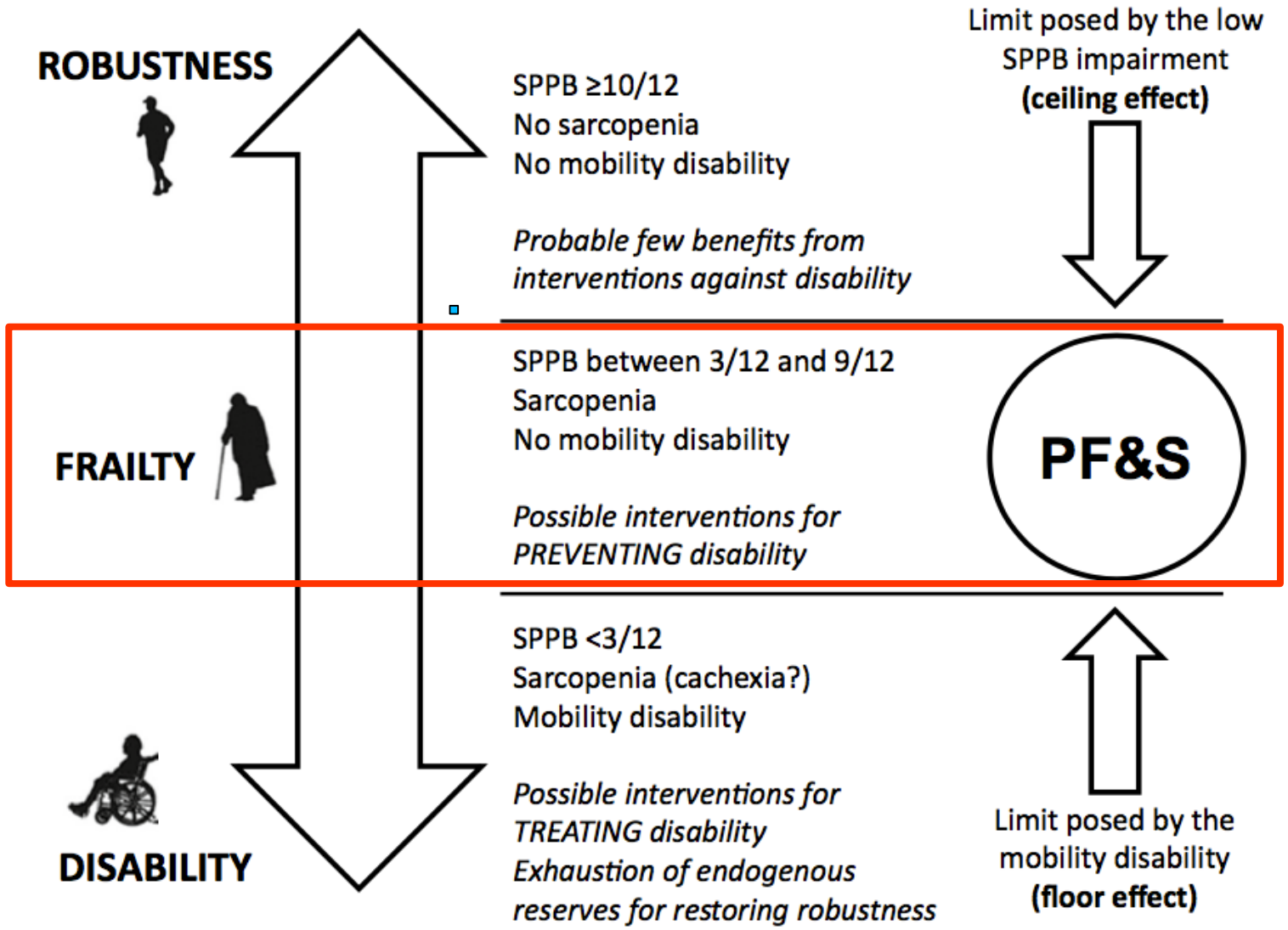
Ability to discriminate haemorrhagic events of risk scores and scales of frailty or physical performance

	BARC 3-5		BARC 2	
	C-statistic (95%CI)	p-value	C-statistic (95%CI)	p-value
Risk scores				
Paris	0.74 (0.61-0.86)	0.002	0.52 (0.46-0.57)	0.817
PRECISE-DAPT	0.79 (0.66-0.91)	<0.001	0.55 (0.50-0.61)	0.332
BleeMACS	0.77 (0.60-0.93)	<0.001	0.54 (0.50-0.60)	0.434
Scales of frailty/physical performance				
SPPB	0.75 (0.64-0.86)	0.002	0.53 (0.47-0.58)	0.632
Columbia	0.67 (0.54-0.80)	0.013	0.53 (0.48-0.59)	0.555
Edmonton	0.75 (0.62-0.89)	<0.001	0.50 (0.44-0.55)	0.961
Grip strength, (Kg)	0.64 (0.53-0.76)	0.088	0.57 (0.51-0.62)	0.189
Fried	0.66 (0.55-0.78)	0.067	0.55 (0.50-0.61)	0.343
Rockwood CFS	0.71 (0.58-0.84)	0.005	0.57 (0.52-0.62)	0.225
MPI	0.60 (0.44-0.76)	0.243	0.56 (0.51-0.61)	0.267



Cesari M et al. Front Aging Neurosci 2014



Cesari M, et al. Aging Clin Exp Res
2017;29:81-88

Using Frailty models in clinical practice:

1. Frailty as a preclinical state: a condition that can be prevented, slowed or even reversed

2. Frailty as a prognostic and stratification factor that orients the treatment plan

3. Use different model according to the clinical aim

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