Higher Education of Pain Medicine in Western Balcan Countries

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The model of frailty of general pratictioner services

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The demographic revolution in Italy, 1901-2030

Year	P_{65+}/P_T	P_{80+}/P_T	P_{65+}/P_{0-14}
1901	6,2	0,7	18,3
1921	6,8	0,7	21,6
1951	8,2	1,1	30,8
1961	9,6	1,4	38,2
1991	15,1	3,4	93,2
2001	18,5	4,2	129,2
2009	20,1	5,6	143,4
2030*	26,5	8,8	205,3

* Central projection

Human Mortality Database & ISTAT, 2010

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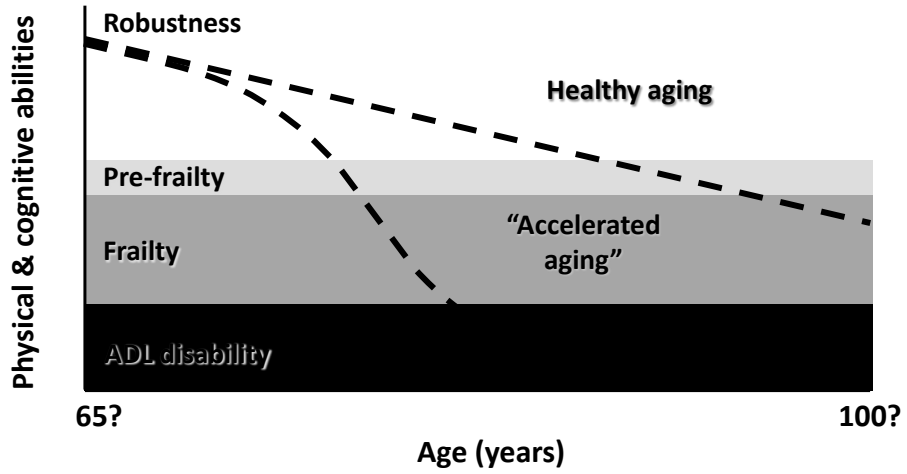
Models of age-related functional decline



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DISABILITY: "*Limitation in a functional activity or in a socially defined role or task*"

In the elderly, identified as need for help in:

(Basic) Activities of Daily Living - (B)ADL

(*Katz, 1963*)

- Bathing
- Dressing
- Going to the toilet
- Transfer (in/out bed/chair)
- Continence
- Feeding

Instrumental Activity of Daily Living - IADL

(*Lawton, 1969*)

- Using the telephone
- Shopping
- Cooking
- Housework
- Managing finances
- Use public transportations
- Managing drug therapy

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Nagi's Model of the Disabling Process

Pathology
↓
Impairments
↓
Functional Limitations
↓
Disability

- Disease, injury, congenital/development condition
- Dysfunction and structural abnormalities in specific body systems (musculoskeletal, cardiovascular, etc.)
- Restrictions in basic physical and mental actions (ambulate, reach, grasp, climb stairs, speak, see standard print)
- Difficulty doing activities of daily life (personal care, household management, job, hobbies)

Verbrugge LM, Jette AM. *Soc Sci Med*. 1994;38:1-4.

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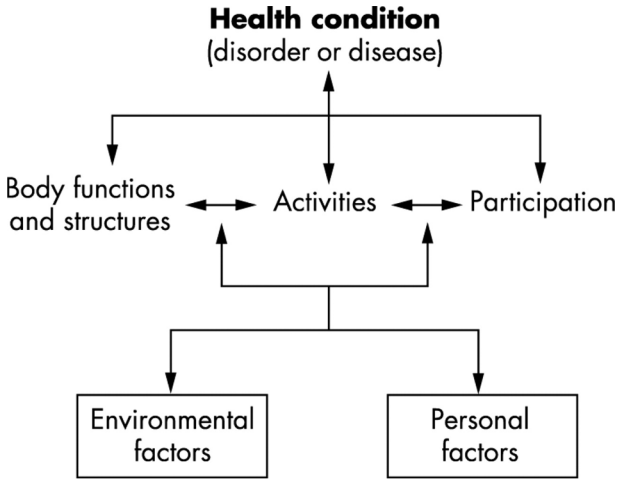
The International Classification of Functioning, Disability and Health (ICF) model – WHO



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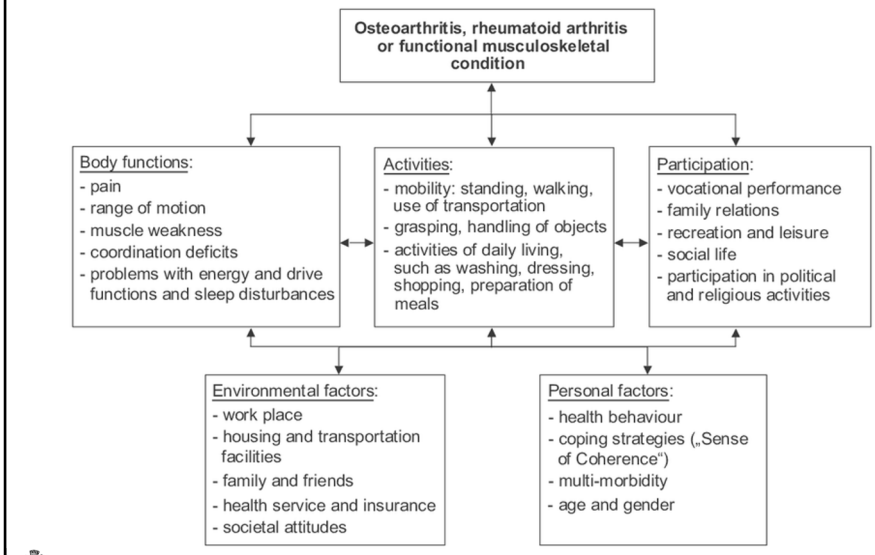
The WHO ICF model: an example



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Frailty: definition

- Multi-factorial syndrome, caused by a **reduction of the physiological reserve** and of the capability to resist stressful events (homeostatic capacity)
- Associated with an **increased risk of unfavorable clinical events**: disability, hospitalization, institutionalization, death
- Complex and dynamic condition, for which several models have been proposed

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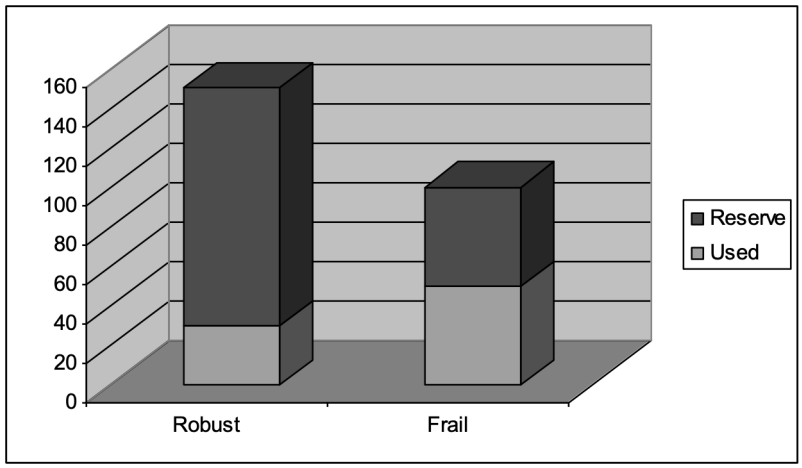
Frailty and physiological reserve



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Frailty in a snapshot

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Operational definition of frailty from the CHS database: the Phenotype Frailty Index (PFI)

1. Strength (handgrip) in lowest quintile
2. Gait speed in lowest quintile
3. Unintentional weight loss ≥4,5 kg during last year
4. Increased tendency to exhaustion
5. Usual physical activity in lowest quintile

PHENOTYPE FRAILTY INDEX
- **Frail: ≥3 components**
- **Pre-frail: 1 or 2 components**
- **Robust: 0 components**

PREDICTIVE OF:
- **Falls**
- **Functional decline (mobility, ADL)**
- **Hospedalization**
- **Death**

Fried L, et al. *J Gerontol* 2001

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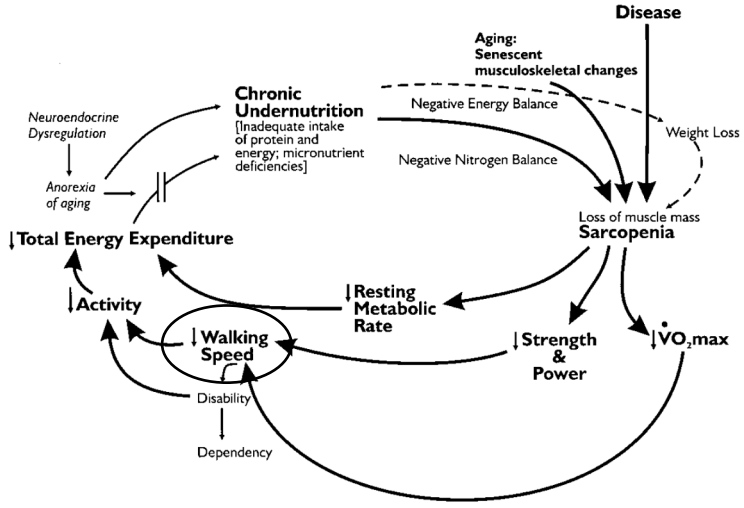
Meccanismi della fragilità nel modello fenotipico



Fried L, et al. *J Gerontol* 2001

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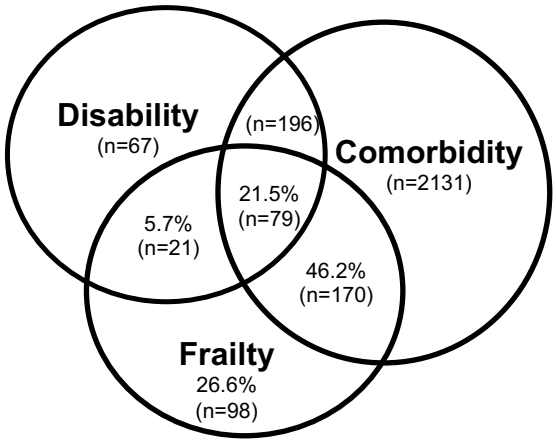
The relationship between frailty, disability and comorbidity according to the PFI – CHS



Fried L, et al. *J Gerontol* 2001

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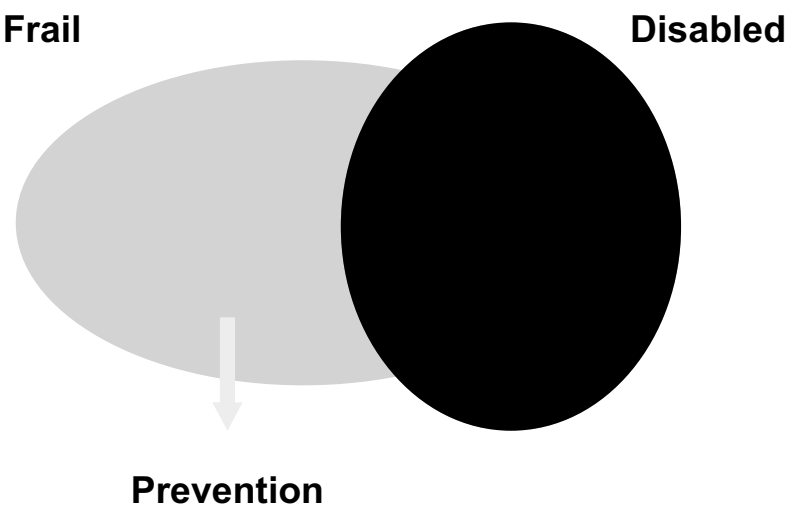

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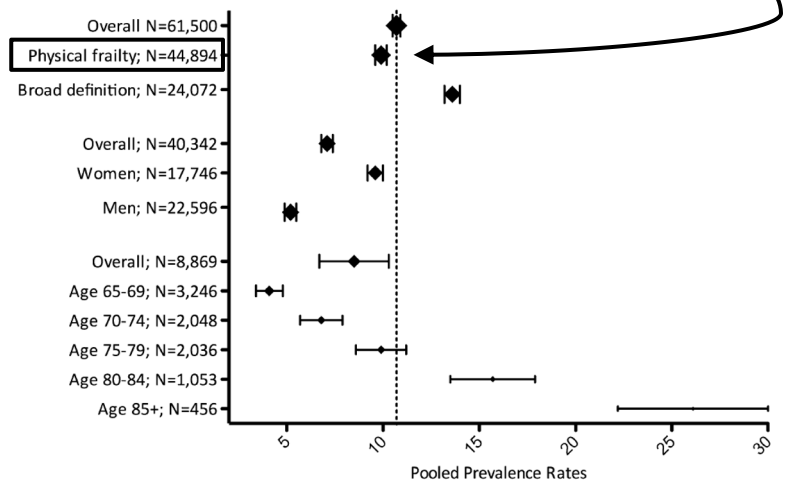
Prevalence of frailty: systematic revision

- 21 cross-sectional studies, N between 230 and 8914 participants
- Different definitions of frailty → Fried's the most frequent



Collard RM, et al. *JAGS* 2012

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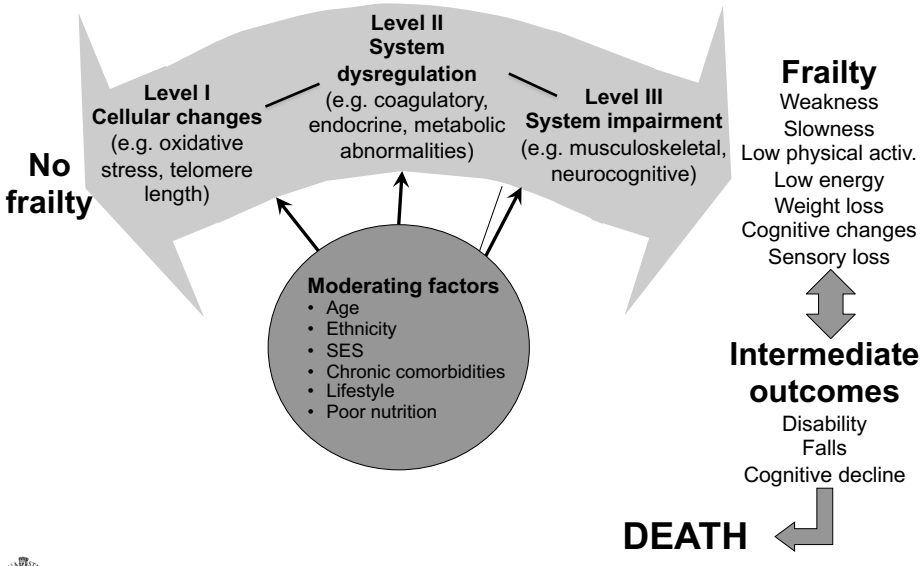
An integrated, pathophysiologic model of frailty



Zaslavsky O, et al. *Biol Res Nurs* 2013

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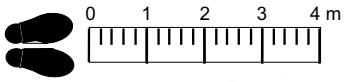
Reduced physical performance and frailty: the Short Physical Performance Battery (SPPB)

- Includes three tests:
  - **Standing balance** (up to 10 seconds for each item)
    - Side-by-side
    - Semi-tandem
    - Tandem
  - **Walking speed (4 meters)**



  - **5 chair standing**

- Score 0-4 for each test, total 0-12 range

Guralnik J, et al. *J Gerontol Med Sci* 1994; 49: 85

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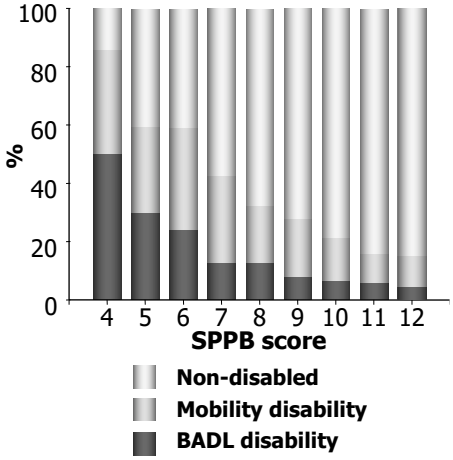
Predicting the risk of incident disability and death by SPPB score: population studies

N= 1122, FU 4 yrs.



Guralnik J, et al. *N Engl J Med* 1995

N= 688, FU 8 yrs.

Table 4. Final Parsimonious Cox Proportional Hazard Models Predicting Death, Obtained Using Backward Deletion of Redundant Variables

Models and Variables	Hazard Ratio (95% Confidence Interval)	*P*-value
Model 3		
Index of Coexistent Diseases		.01*
Level 1	1	
Level 2	1.5 (0.9–2.4)	.10
Level 3	1.8 (1.1–3.1)	.02
Level 4	2.2 (1.3–3.6)	.002
Age	1.12 (1.11–1.15)	<.001
Sex (female vs male)	0.5 (0.4–0.6)	<.001
SPPB score	0.93 (0.88–0.99)	.008
MMSE	0.98 (0.94–0.996)	.03

Di Bari M, et al. *JAGS* 2006

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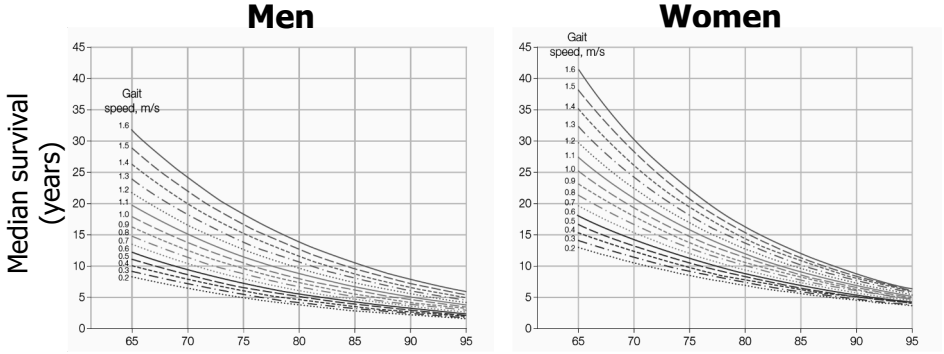
Gait speed and mortality: meta-analysis of 9 studies

N=34485 participants, age 65+ years



Gait speed>1 m/sec → good health status

Studenski S, et al. *JAMA* 2011

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"I don't think you're strong enough to get out of bed yet."

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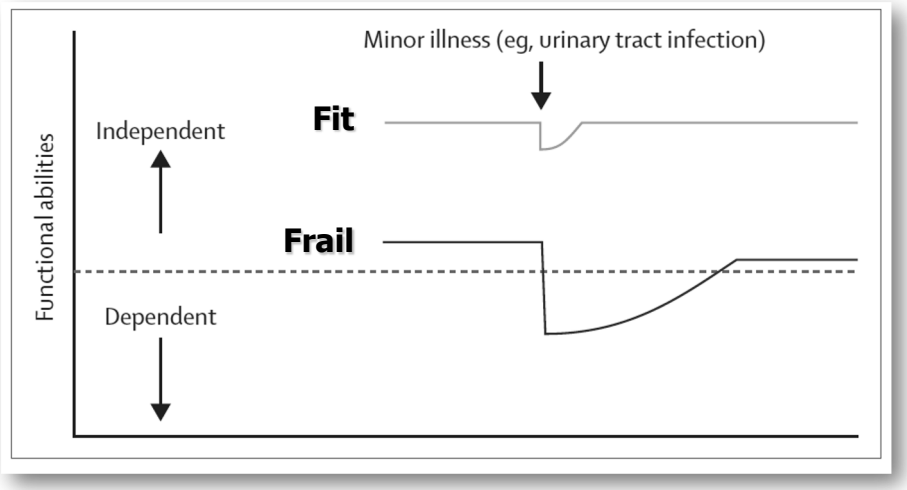
Frailty and clinical vulnerability

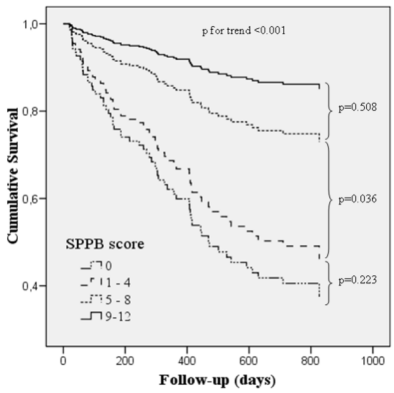


Clegg A, et al. *Lancet* 2013

Lower Extremity Performance Measures Predict Long-Term Prognosis in Older Patients Hospitalized for Heart Failure

DANIELA CHIARANTINI, MD,[1] STEFANO VOLPATO, MD, MPH,[2] FOTINI SIOULIS, MD,[2] FRANCESCA BARTALUCCI, MD,[1] LAURA DEL BIANCO, MD,[1] IRENE MANGANI, MD,[1] GIUSEPPE PEPE, MD,[3] FRANCESCA TARANTINI, MD, PhD,[1] ANDREA BERNI, MD,[4] NICCOLO MARCHIONNI, MD,[1] AND MAURO DI BARI, MD, PhD[1]

(*J Cardiac Fail 2010;16:390–395*)

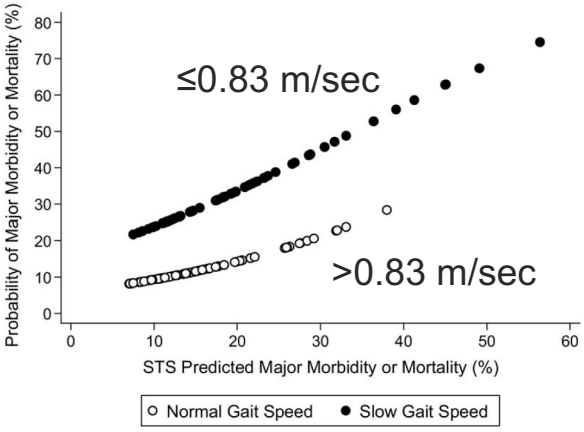


	HR (95% CI)	p value
SPPB		0.001*
0	6.1 (2.2-16.8)	0.001
1-4	4.8 (1.6-14.0)	0.004
5-8	2.0 (0.7-5.7)	0.223
9-12	Ref.	–
Sex (M vs. F)	1.2 (0.7-2.0)	0.583
Age (years)	0.98 (0.94-1.02)	0.355
Site (Ferrara *vs.* Florence)	1.9 (0.7-5.4)	0.216
LVEF (%)	0.97 (0.95-0.99)	0.005
CIRS-C	1.5 (1.1-1.98)	0.004
NYHA class	1.5 (1.1-2.2)	0.022

MMSE, depression, drug therapy and previous functional status deleted stepwise

* For trend

Gait speed (5 meters) predicts the prognosis in older patients after cardiac surgery



- 131 pts., age 76 years
- Pre-operative assessed with Society of Thoracic Surgeons (STS) risk score

≤0.83 vs. >0.83 m/sec: OR 3.1 (1.2-7.5), adjusted for STS score

Afilalo J, et al. *J Am Coll Cardiol* 2010

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Original Investigation

Effect of Structured Physical Activity on Prevention of Major Mobility Disability in Older Adults

The LIFE Study Randomized Clinical Trial

- Multicenter RCT, FU 2.6 years
- 635 participants, aged 70-89 years, sedentary, with functional limitations (SPPB<10) but able to walk 400 m → **frail elderly**
- **Intervention** (n=818): structured, moderate intensity physical activity, in the gym (2/7 days) and at home (3-4/7 days).
- **Control** (n=817): healthy aging education, upper extremities stretchiing exercises
- **Outcome**: mobility disability (inability to walk 400)

Pahor M, et al. *JAMA* 2014

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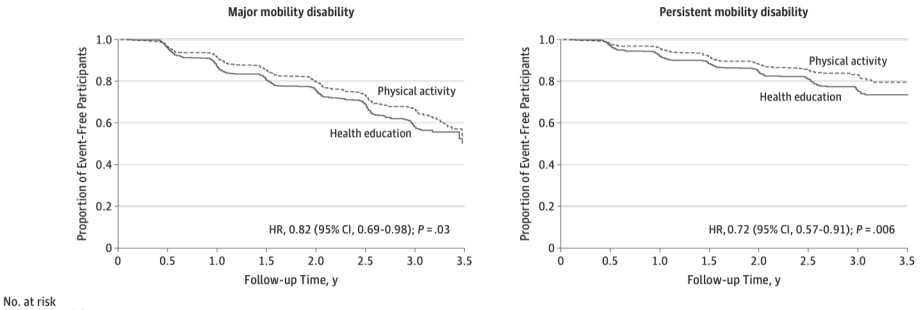
LIFE – Results: incidence of mobility disability



No. at risk								
Physical activity	818	758	706	646	559	378	182	11
Health education	817	765	680	617	540	358	162	13
Events								
Physical activity	0	29	67	115	155	197	224	246
Health education	0	33	105	155	190	232	277	286

818	761	726	673	579	393	188	12
817	762	707	655	567	371	178	10
0	18	32	64	88	104	113	120
0	25	64	91	118	138	158	162

Pahor M, et al. *JAMA* 2014

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BRIEF METHODOLOGICAL REPORTS

Screening for Frailty in Older Adults Using a Postal Questionnaire: Rationale, Methods, and Instruments Validation of the INTER-FRAIL Study

Mauro Di Bari, MD, PhD,† Francesco Profili, Stat,‡ Stefania Bandinelli, MD,§ Anna Salvioni, MD,¶ Enrico Mossello, MD, PhD,*† Carla Corridori, SW,** Matilde Razzanelli, PsyD,‡ Teresa Di Fiandra, PsyD,†† and Paolo Francesconi, MD, MS‡*

J Am Geriatr Soc 2014

dwelling individuals.
DESIGN: A questionnaire was developed on the basis of expert consensus and preliminarily tested against the occurrence of incident disability, in secondary analyses of previous epidemiological studies. The questionnaire was then mailed and its concurrent validity, defined from the association between its individual items and summary score and the presence of the Fried frailty phenotype (FFP), was subsequently evaluated cross-sectionally with in-person examination of initial participants.
SETTING: Community-based.
PARTICIPANTS: Individuals aged 70 and older living in two communities near Florence, Italy.
MEASUREMENTS: A home comprehensive geriatric assessment including the FFP was conducted in participants who screened positive for frailty and in a limited sample of negative responders.
RESULTS: A 10-item questionnaire, developed based on expert consensus, was preliminarily tested on preexisting epidemiological data and showed an area under the receiver operating characteristic curve (AUC) of 0.716 versus incident disability. The questionnaire was then mailed to 15,774 subjects, whose response rate was 53.6%. Of the

tionnaire summary score to predict frailty was adequate, with an AUC of 0.695, a sensitivity of 71%, and a specificity of 58%.
CONCLUSION: A simple questionnaire delivered by mail was able to identify FFP in the community. This would facilitate large-scale screening for frailty in older persons. J Am Geriatr Soc 2014.

Key words: screening; postal questionnaire; frailty

Although most persons remain autonomous and healthy until late life, after age 75 many experience chronic multimorbidity, cognitive impairment, and declining physical functioning, leading to disability. Age-related functional decline is usually slow[1] and includes a preclinical phase during which individuals at risk can be identified and referred for preventive interventions. The Fried frailty phenotype (FFP)[2] is particularly useful for this purpose, because it sees disability and frailty as independent, although sometimes overlapping, conditions and does not incorporate disability items as diagnostic clues for frailty. Accordingly, population-wide screening and prevention programs of nondisabled, frail older adults would be highly desirable to reduce the burden of disability and associated healthcare expenditures, a particularly important goal in the current era of resource constraints across Europe.[3,4]

In 2009, the Italian Center for Prevention and Disease Control (Centro per la Prevenzione e il Controllo delle Malattie) funded a project, proposed by the Regional Health Agency (Agenzia Regionale di Sanità) of Tuscany, to develop screening programs for intercepting frailty (INTER-FRAIL) in the population and suggest interventions to slow the progression from frailty to disability. The present report

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Aim

To create and test a questionnaire, to be sent by mail, to screen for frailty* unselected older persons → intercepting older persons with no current ADL disability but at an increased risk for disability

*Fried LP et al. Frailty in older adults: Evidence for a phenotype. J Gerontol A Biol Sci Med Sci 2001;56;M146-M156

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Methods

15.774 questionnairs mailed

8.451 respondents (54%)

3.633 (43%) scoring positive (score 4+)

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INTER-FRAIL: revision of postal questionnaire *vs.* fragilità secondo Fried

- **Simplification:** backward deletion of redundant variables
- **Weighting:** predictive value of each variable weighted agains that of the least significant predictor

Item	B±SE	p	Weighted score*
Poor sight	0.507±0.219	0.021	1.5
Self-report of exhaustion	1.047±0.189	<0.001	3
Memory problems	0.383±0.149	0.01	1
Fall in prior year	0.574±0.165	0.001	1.5
Taking 5+ drugs	0.359±0.156	0.021	1

Mossello E, et al. *Age Ageing* 2016

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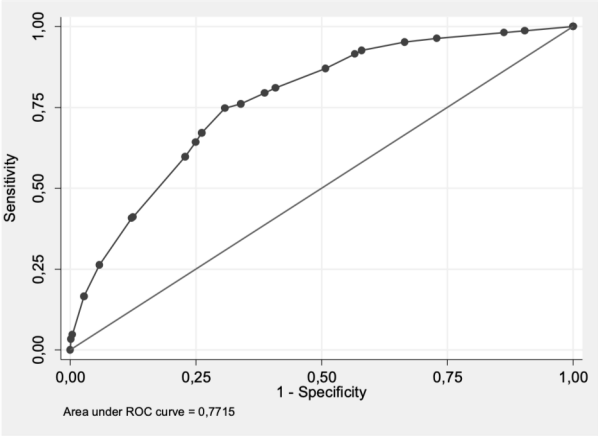
Current validity of the revised postal questionnaire postale rivisto *vs.* Fried's frailty



- AUC=0.772
- Sensitivity=75%
- Specificity=69%

Mossello E, et al. *Age Ageing* 2016

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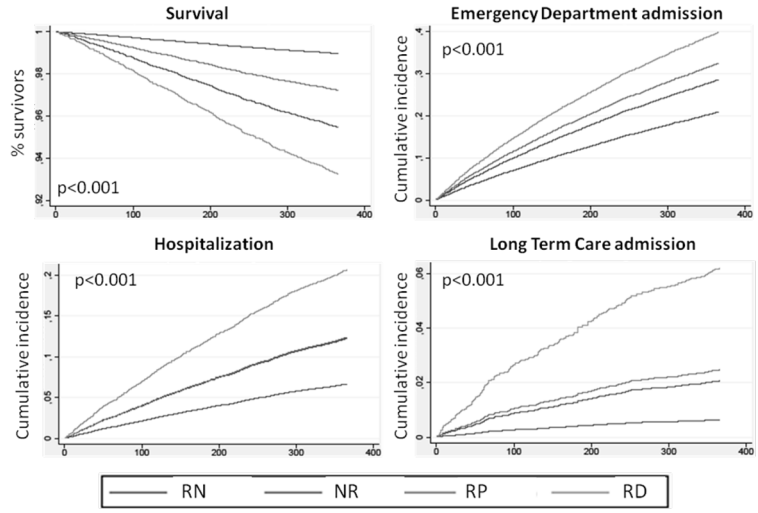
Long-term outcomes of the questionnaire outcomes – Predictive validity



RN= Responders Negative; NR=Non-responders; RP=Responders Positive; RD=Responders disabled

Mossello E, et al. *Age Ageing* 2016

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Conclusions

- **Frailty:**
  - Is an important determinant of health status in the elderly
  - Is an independent predictor of poor outcomes in different care settings and clinical conditions
  - Can be easily identified, also in the hospital, with the SPPB
- **Physical activity** may prevent disability in frail older persons
- **Postal screening** of frailty is feasible and effective

MMSE, depression, drug therapy and previous functional status detected stepwise

* For trend

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