Simposio

Migliorare la prognosi nei pazienti con sarcopenia: nuove evidenze scientifiche sull'importanza della nutrizione

Misurazione della forza e della funzione muscolare nella pratica clinica: utilizzo delle nuove linee guida

Stefano Volpato

SOCIETÀ ITALIANA
DI GERONTOLOGIA
E GERIATRIA

Università degli Studi di Ferrara
Dipartimento di Scienze Mediche
SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero - Universitaria di Ferrara

Sarcopenia: due definizioni

- 2014 – ***FNIH Sarcopenia Project*: …limitazione funzionale in presenza di debolezza (ridotta forza) come conseguenza di ridotta massa muscolare…**

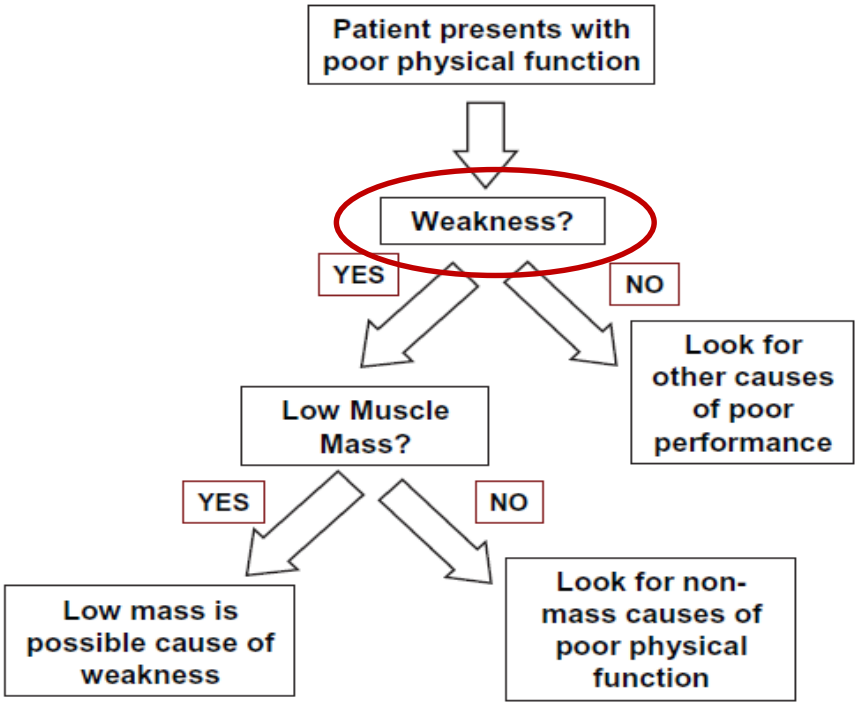
Studensky et al. JGMS 2014;69:547-558

- 2018- ***European Working Group on Sarcopenia in Older People:*** disordine progressivo e generalizzato della muscolatura scheletrica che si associa ad una aumentato rischio di eventi clinici avversi quali cadute, fratture, disabilità e morte

Cruz-Jentoft A J et al. Age Ageing 2019;48:16-31

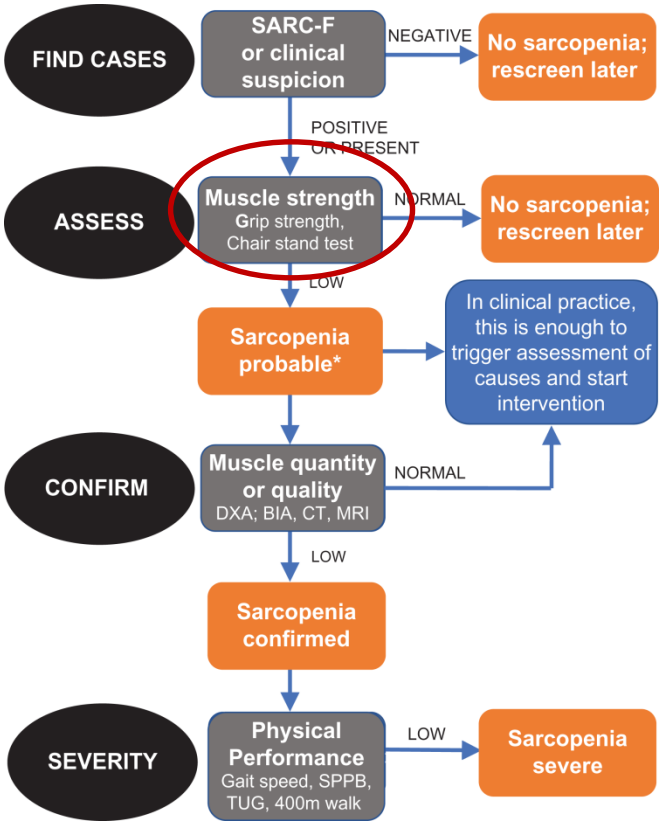
Sarcopenia: operational definitions

FNIH



Studensky et al. JGMS 2014;69:547-558

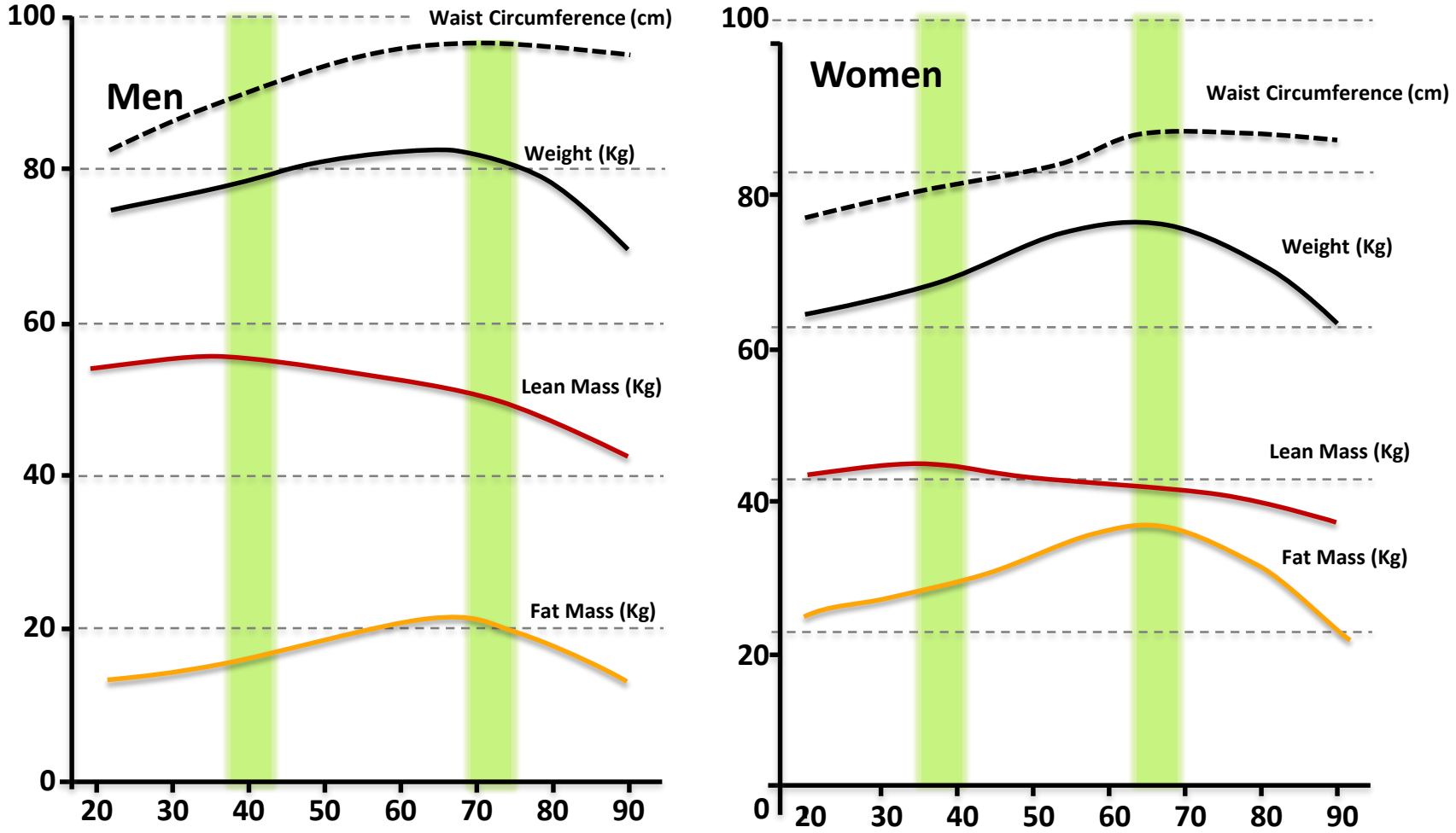
EWGSOP-2



Cruz-Jentoft A J et al. Age Ageing 2019;48:16-31

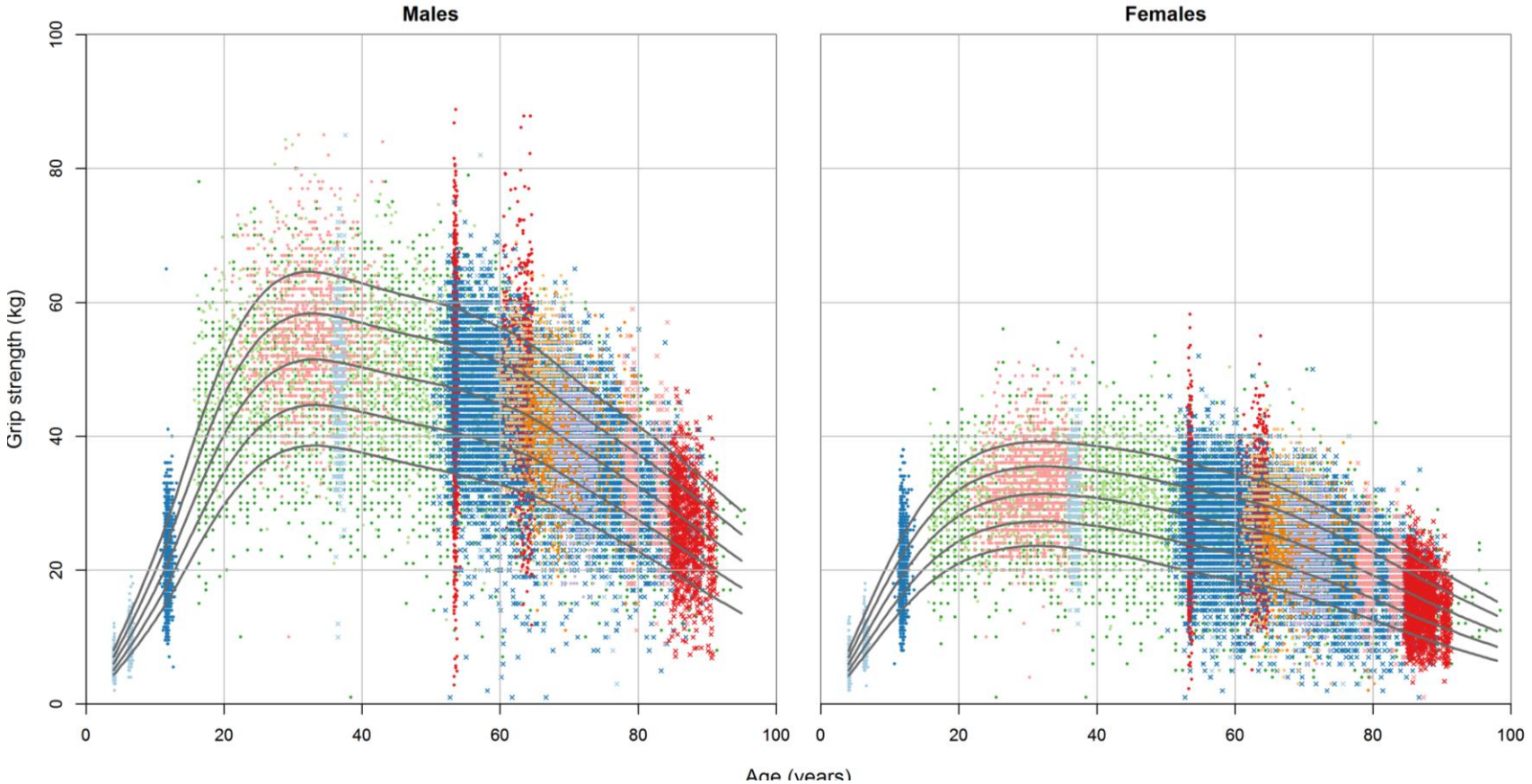
Weight, Muscle and Fat

Longitudinal Changes in Body Composition with Age



Ferrucci, L., Studenski, S.: Clinical Problems of Aging. In: Harrison's Principles of Internal Medicine, 18th Ed. Longo, Fauci, Kasper, Hauser, Jameson and Loscalzo. McGraw Hill 2011

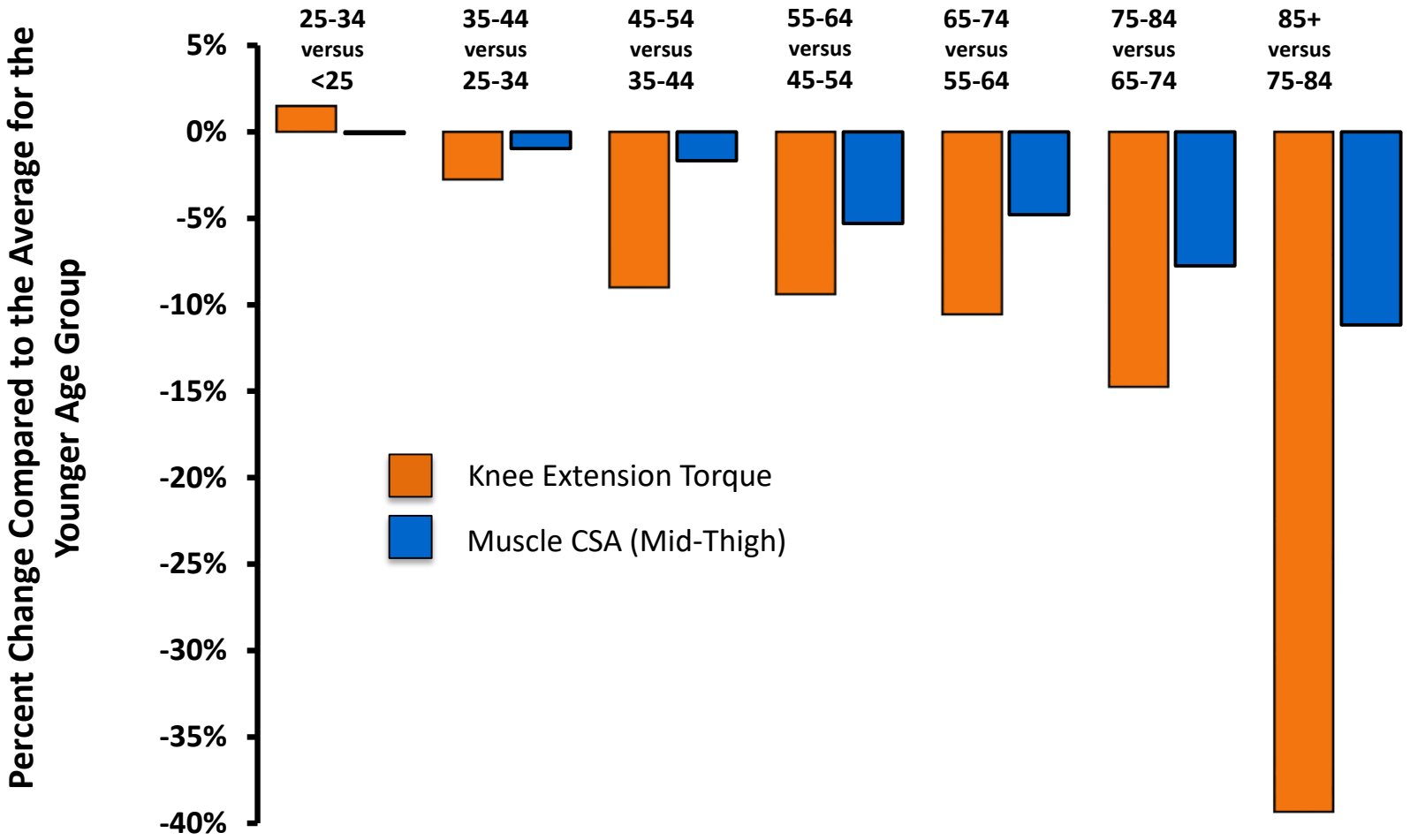
Grip strength across the life course in twelve British studies



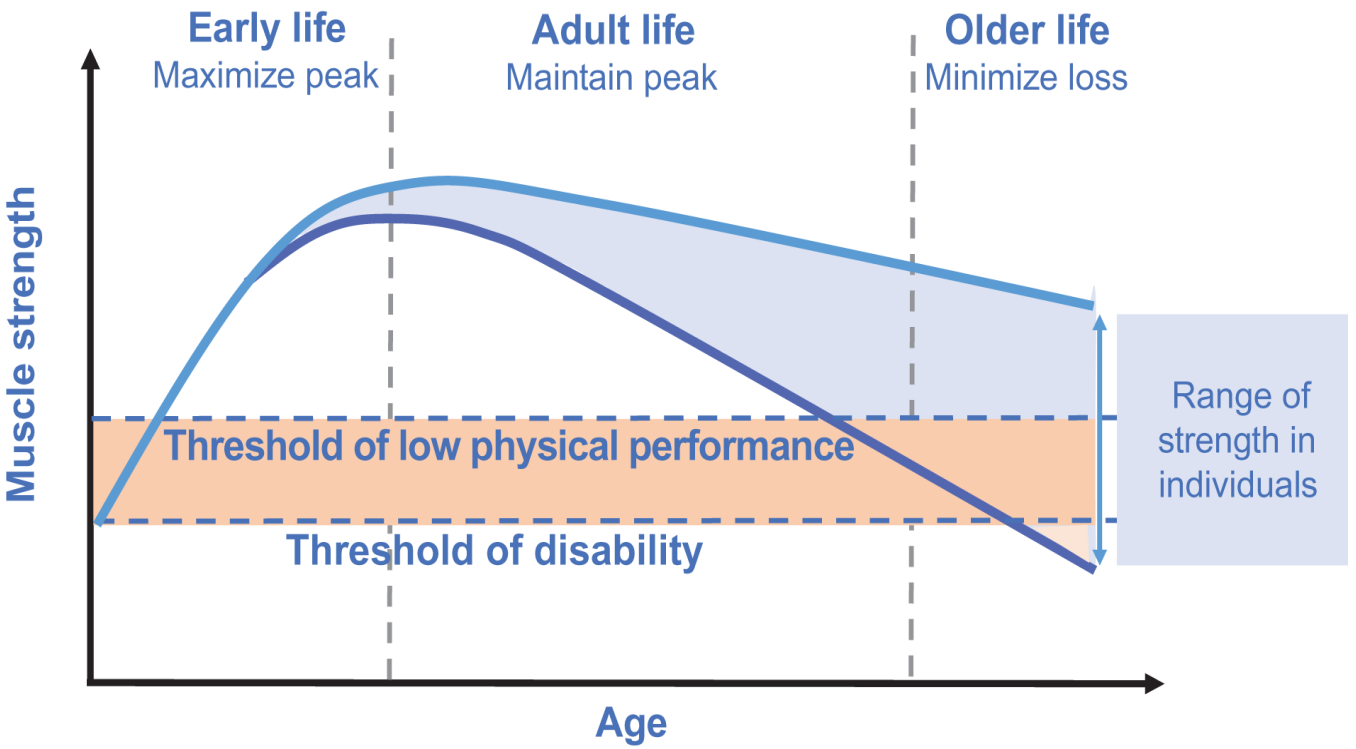
Dodds et al, *PLoS One* 2014;9(12):e113637

Muscle

Strength/ Mass Ratio in BLSA Participants 60-70 yrs Old



Muscle strength and the life course



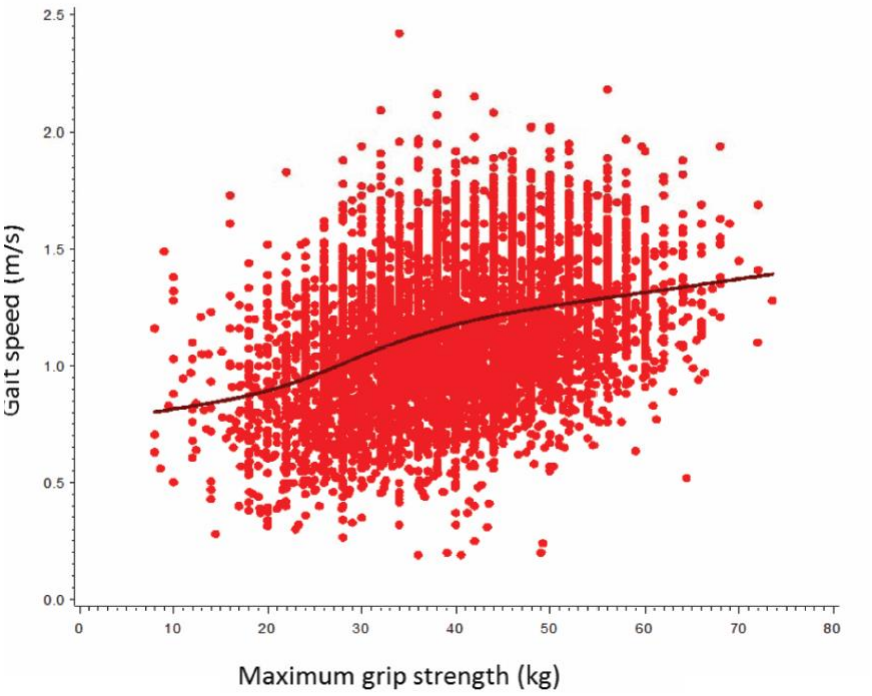
Cruz-Jentoft A J et al. Age Ageing 2019;48:16-31

Come misurare la forza e funzione muscolare in ambito clinico

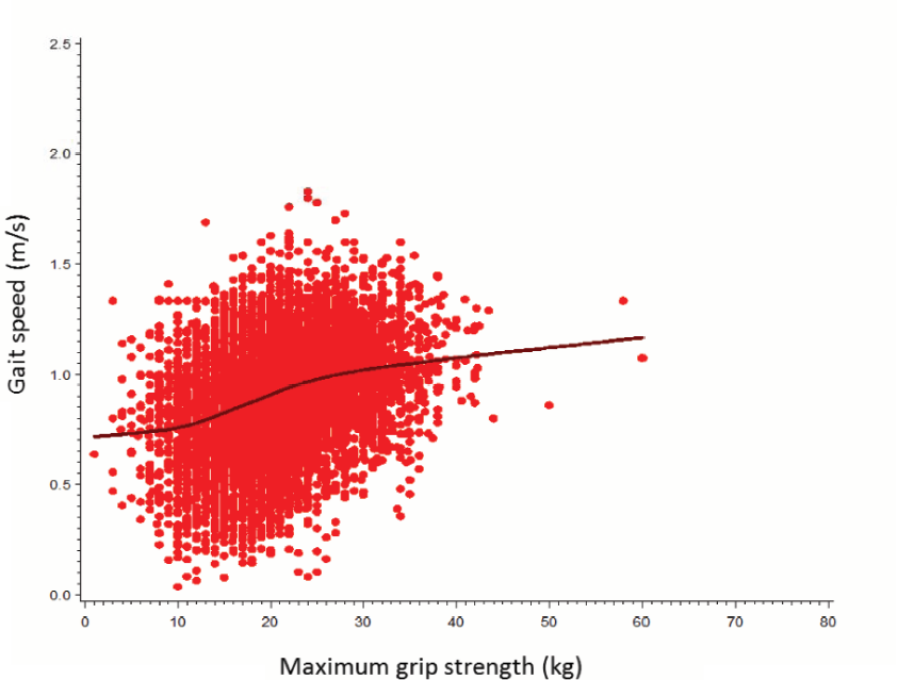
- **FNIH**
  - Hand grip strength
- **EWGSOP-2**
  - Hand grip strength
  - Repeated chair stand test

Association of grip strength and gait speed in the FNIH Sarcopenia Project

a. **Men (N=9897)**

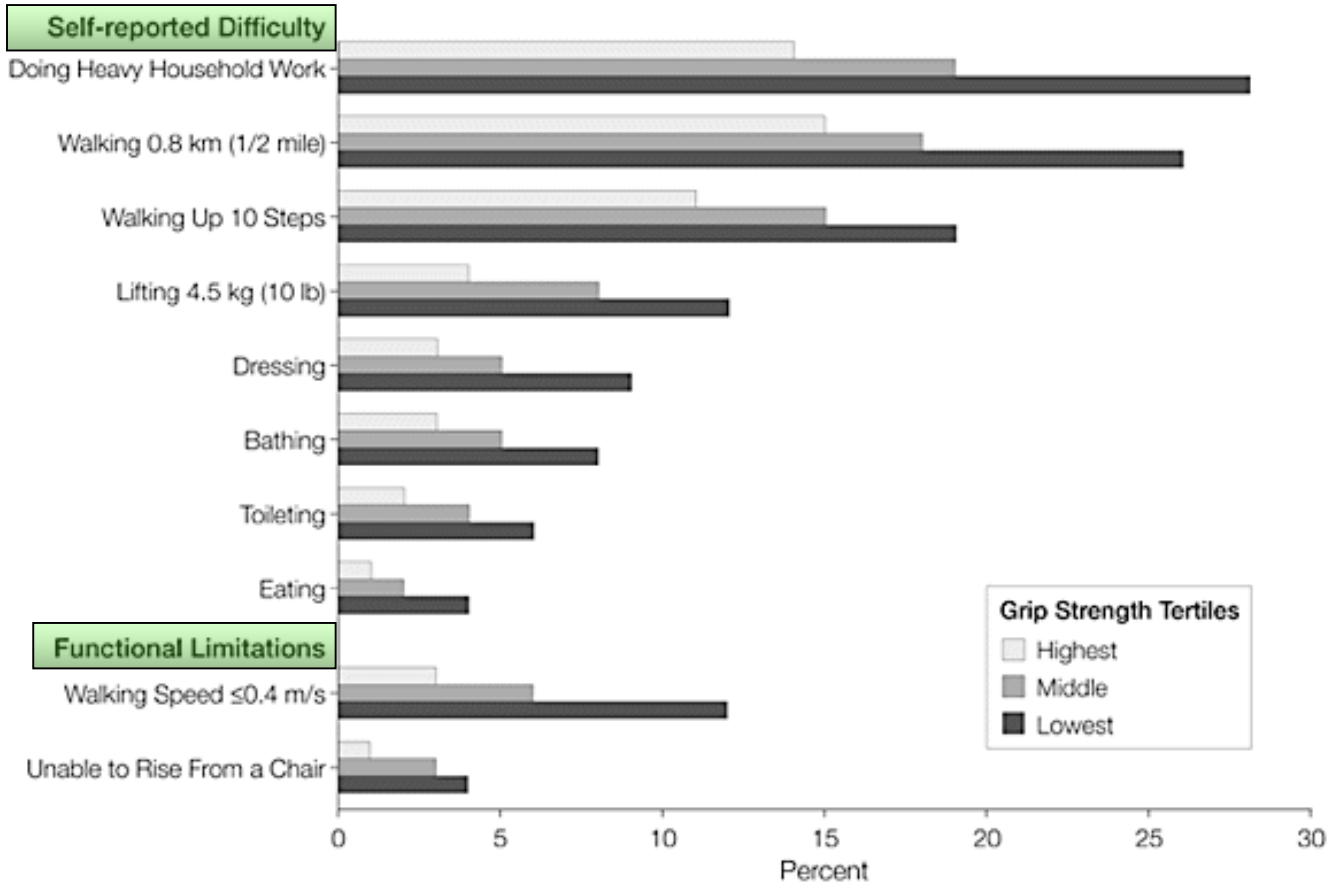


b. **Women (N=10950)**

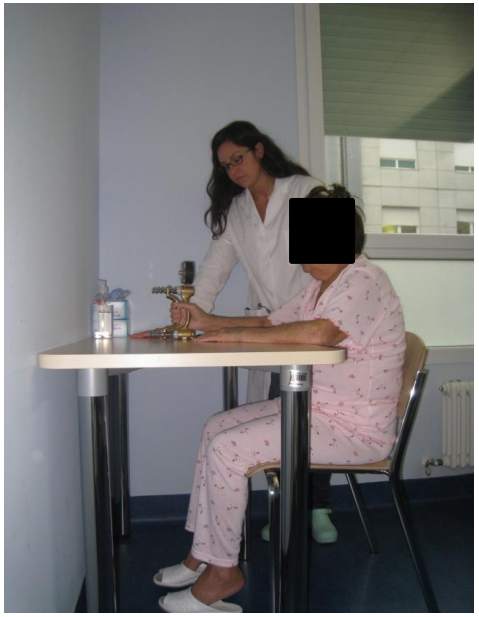


Alley DE et al. JGMS 2014;69:559-566

Midlife hand grip strength as a predictor of old age disability



Rantanen T. et al. JAMA 95: 1851-1860, 1999

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HGS assessment in different posizione: agreement between sitting and supine position

Table 3 Paired *T* test comparing the sitting and supine position

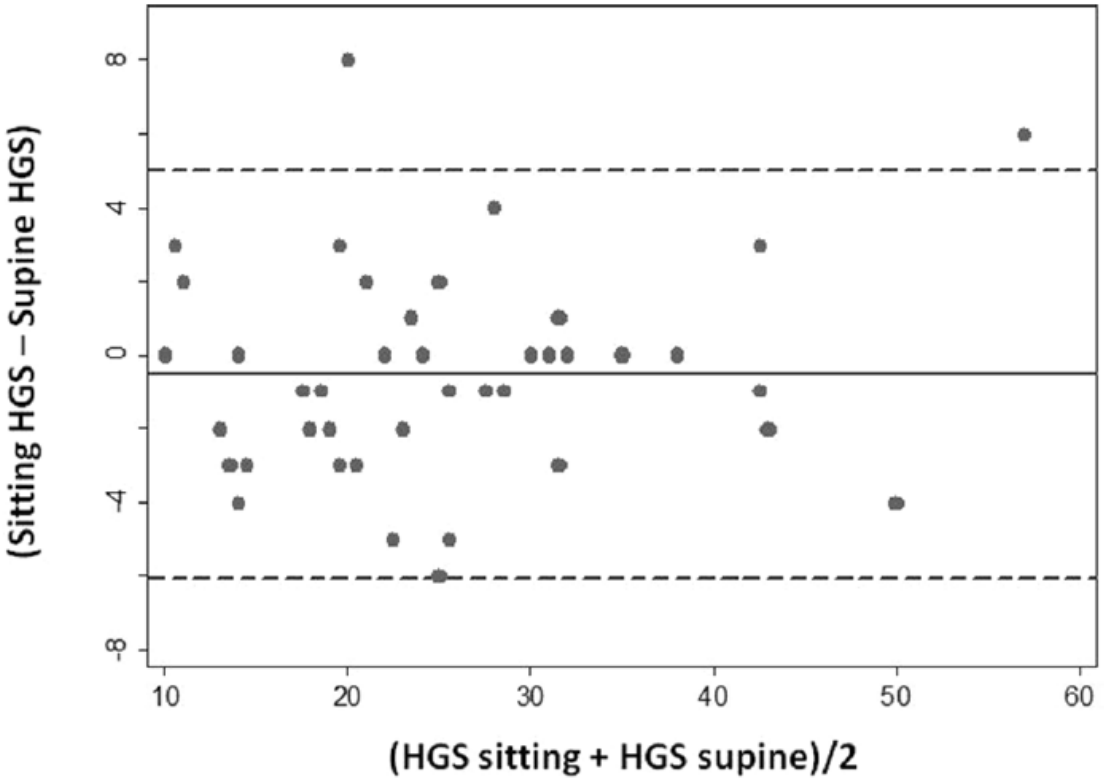
	HGS (kg) sitting position	HGS (kg) supine position	*P* value*
Total sample	24.7 ± 10.9	25.2 ± 10.5	0.897
Right hand	24.2 ± 11.1	24.5 ± 10.5	0.716
Left hand	21.6 ± 9.6	22.8 ± 10.0	0.988
Dominant hand	24.2 ± 11.2	24.4 ± 10.3	0.674
Other hand	21.6 ± 9.5	22.8 ± 10.2	0.990
Female	17.9 ± 6.2	18.4 ± 5.7	0.846
Male	30.9 ± 10.6	31.4 ± 10.0	0.784
MMSE < 24	21.5 ± 8.3	22.3 ± 7.9	0.972
MMSE ≥ 24	28.2 ± 12.4	28.4 ± 12.1	0.619

Table 2 Pearson linear correlation (ρ) and intra-class correlation (ICC) coefficients

HGS sitting vs HGS supine	ρ	ICC	ICC 95% CI
Total sample	0.97	0.96	0.94–0.98
Right hand	0.96	0.96	0.92–0.98
Left hand	0.94	0.94	0.90–0.97
Dominant hand	0.96	0.96	0.93–0.98
Other hand	0.94	0.94	0.89–0.97
Female	0.91	0.91	0.80–0.96
Male	0.95	0.95	0.89–0.98
MMSE < 24	0.97	0.97	0.93–0.99
MMSE ≥ 24	0.96	0.96	0.90–0.98

Govoni B et al. Eur Geriatr Med 2019 published online

Bland–Altman plot displaying differences in HGS between the two positions versus the mean of the two measurements



Govoni B et al. Eur Geriatr Med 2019 published online

JAMDA 18 (2017) 88.e17–88.e24

JAMDA

journal homepage: www.jamda.com

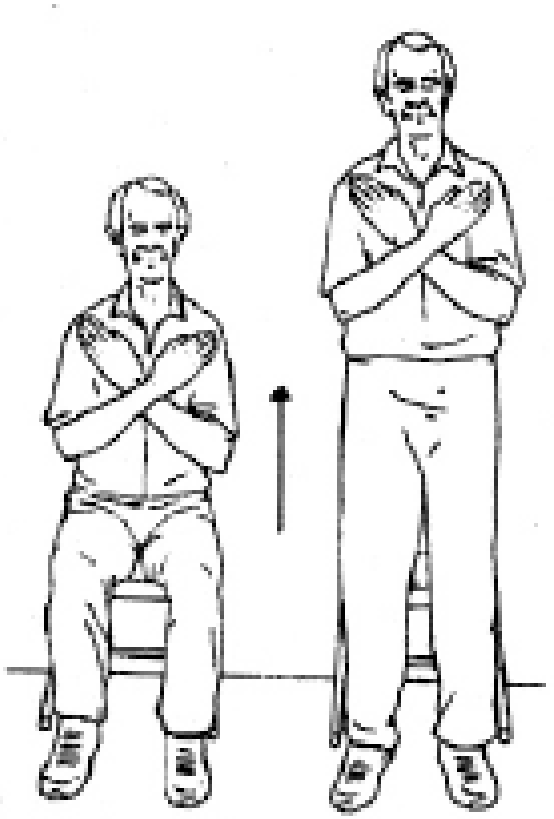
Original Study

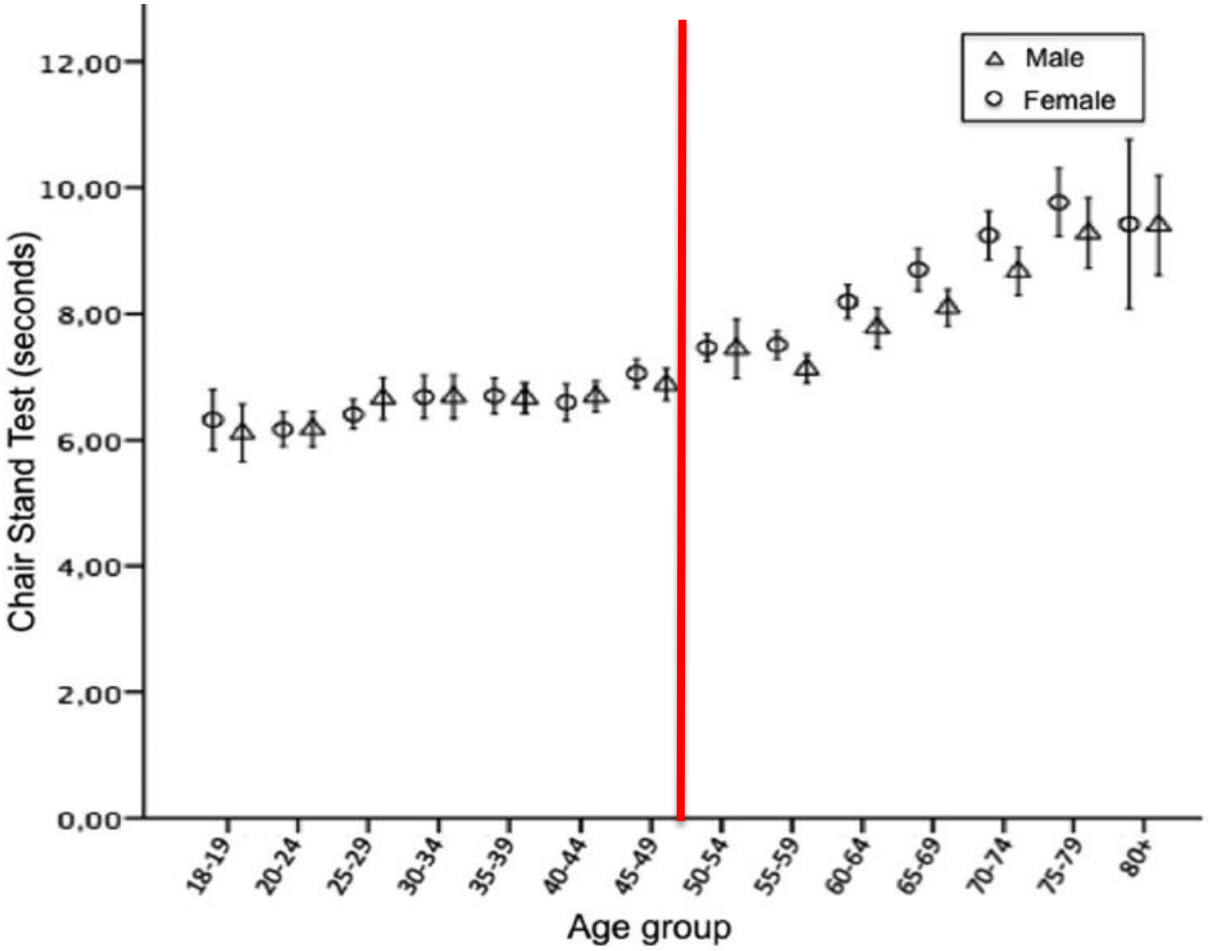
Age-Related Variations of Muscle Mass, Strength, and Physical Performance in Community-Dwellers: Results From the Milan EXPO Survey

Francesco Landi MD, PhD *, Riccardo Calvani PhD, Matteo Tosato MD, PhD, Anna Maria Martone MD, Domenico Fusco MD, PhD, MD, Alex Sisto BA, Elena Ortolani MD, Giulia Savera BS, Sara Salini MD, Emanuele Marzetti MD, PhD

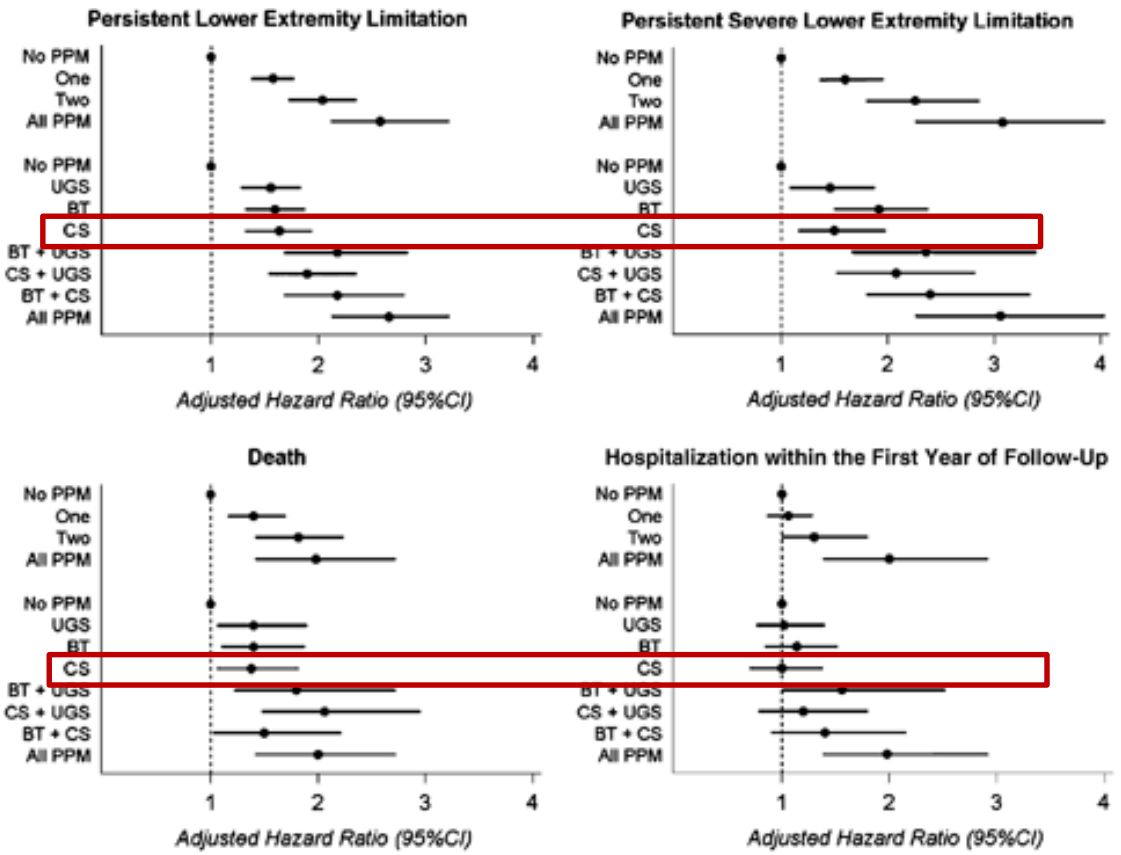
Department of Geriatrics, Neurosciences, and Orthopedics, Catholic University of the Sacred Heart, Rome, Italy

Chair stand test




Male
Female
Chair Stand Test (seconds)
12,00
10,00
8,00
6,00
4,00
2,00
0,00
18-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80+
Age group

Added Value of Physical Performance Measures in Predicting Adverse Health-Related Events: Results from the HABC Study



Cesari M et al. J Am Ger Soc. 2009: 57:251-259

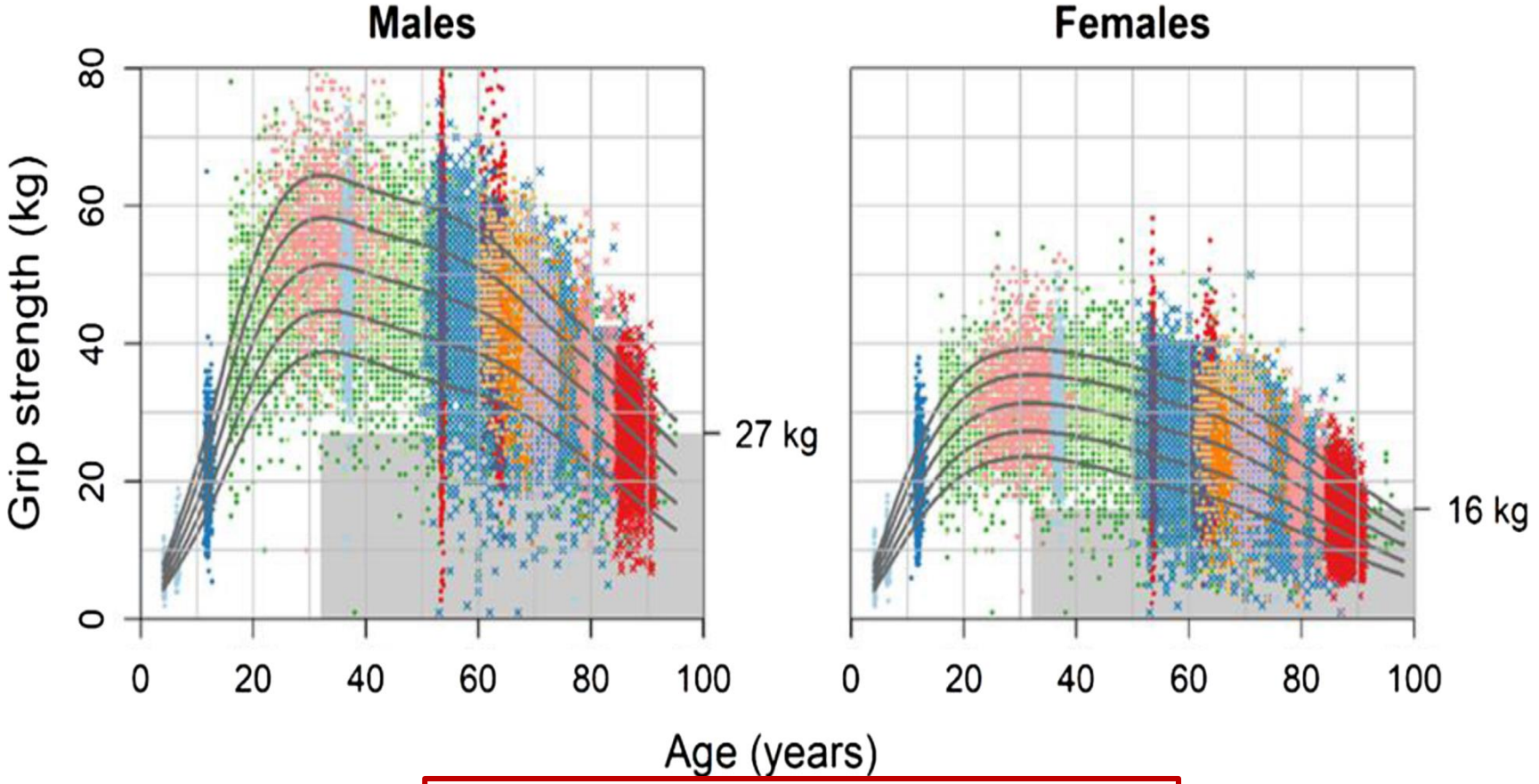
Cosa ci serve in clinica per misurare la forza e la funzione muscolare?

EWGSOP-2 sarcopenia cut-points

Test	Cut-off points for men	Cut-off points for women
EWGSOP2 sarcopenia cut-off points for low strength by chair stand and grip strength		
Grip strength	<27 kg	<16 kg
Chair stand	>15 s for five rises	
EWGSOP2 sarcopenia cut-off points for low muscle quantity		
ASM	<20 kg	<15 kg
ASM/height^2	<7.0 kg/m^2	<5.5 kg/m^2
EWGSOP2 sarcopenia cut-off points for low performance		
Gait speed	≤0.8 m/s	
SPPB	≤8 point score	
TUG	≥20 s	
400 m walk test	Non-completion or ≥6 min for completion	

Cruz-Jentoft A J et al. Age Ageing 2019;48:16-31

Normative data for grip strength across the life course in men and women in the UK



Cut-off points based on T-score of ≤ -2.5

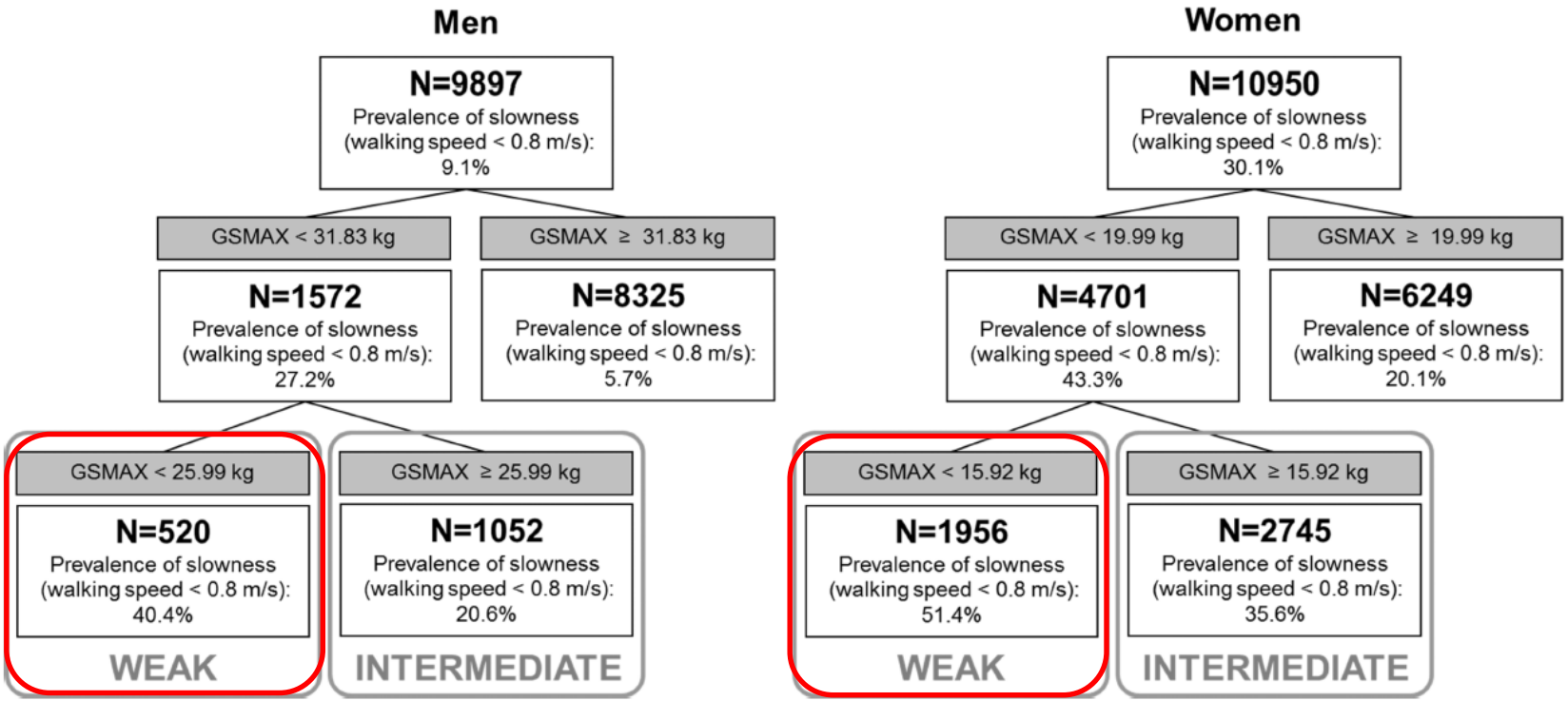
FNIH sarcopenia cut-points

Cutpoint	Men	Women
Weakness		
Recommended: grip strength (GSMAX)	<26 kg	<16 kg
Alternate: grip strength adjusted for BMI ($GSMAX_{BMI}$)	<1.0	<0.56
Appendicular lean body mass		
Recommended: ALM adjusted for BMI (ALM_{BMI})	<0.789	<0.512
Alternate: ALM	<19.75 kg	<15.02 kg

Notes: ALM = appendicular lean mass; BMI = body mass index.

Studensky et al. JGMS 2014;69:547-558

Classification tree for gait speed <0.8 m/s inthe FNIH Sarcopenia Project



Alley DE et al. JGMS 2014;69:559-566

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400 m walk test	Non-completion or ≥6 min for completion	

GLISTEN Study

Multicenter observational study on sarcopenia in a sample of hospitalized geriatric patients

Inclusion criteria

- Age ≥ 65 yrs
- Able to understand the IC
- Possibility to perform BIA

Methods – Sarcopenia diagnosis

FNIH

Muscle mass : Appendicular lean mass-to-BMI ratio (ALM_{BMI})

Women: <0.512 ***Men: <***0.789

Muscle strength: Grip strength

Women: *<16 Kg* ***men:*** *<26 Kg*

EWGSOP-2

Muscle mass : Appendicular lean mass-to-height^2 ratio ($ALM_{heigth2}$)

Women: <5.5 ***Men: <***7

Muscle strength: Grip strength

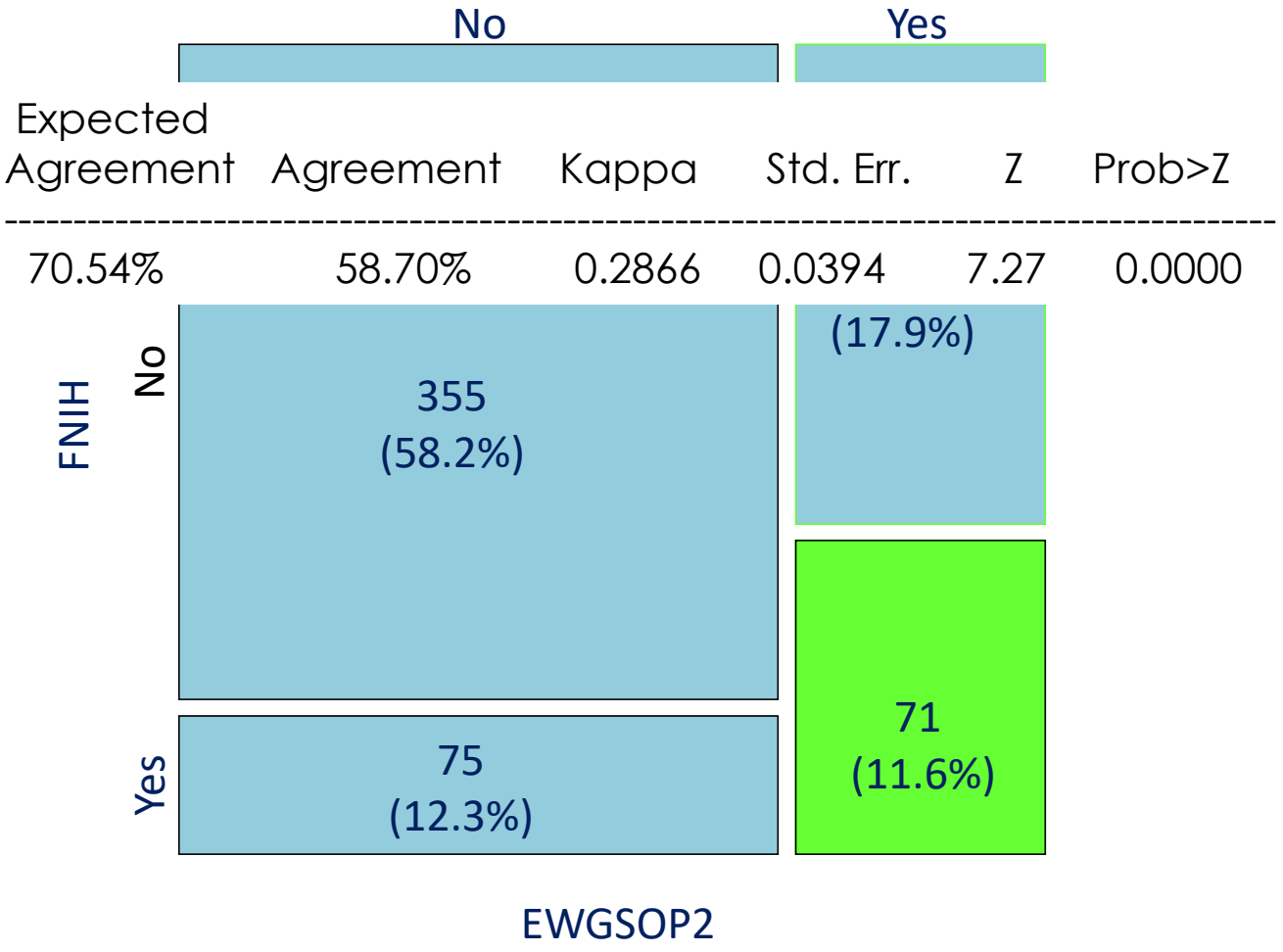
Women: *<16 Kg* ***men:*** *<27 Kg*

Selected baseline characteristics

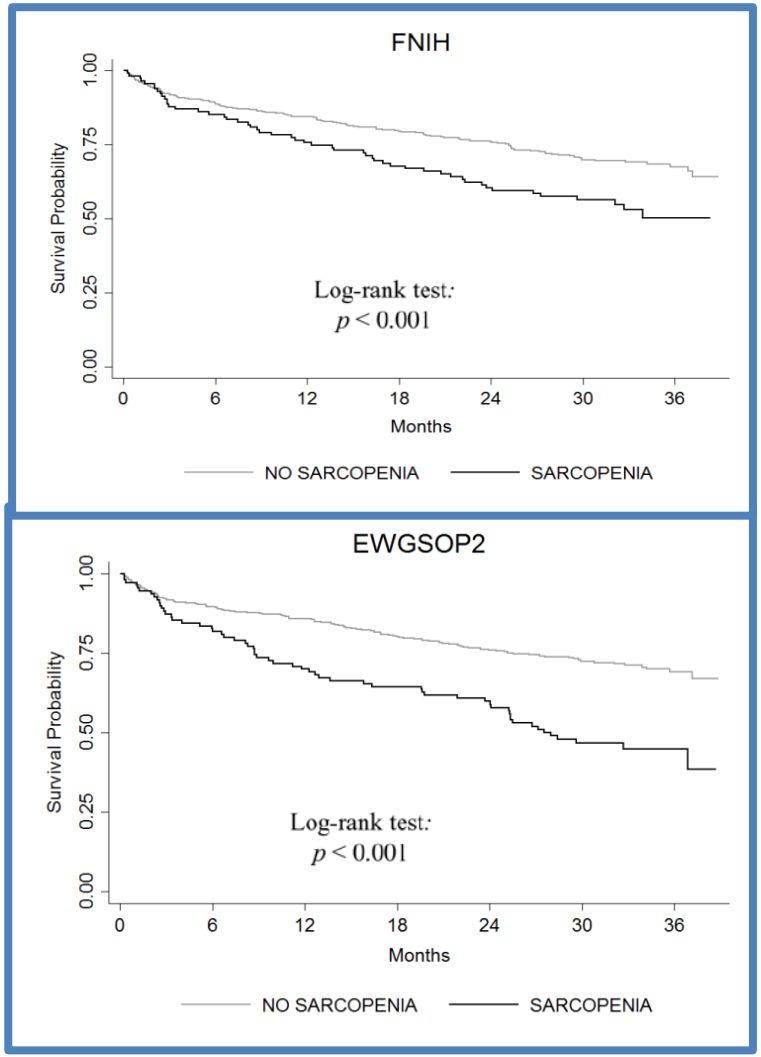
	EWGSOP-2 (N.610)			FNIH (N.610)		
	No Sarcopenia	Sarcopenia	P	No Sarcopenia	Sarcopenia	P
n (%)	471 (77.2)	139 (22.8)		464 (75.9)	146 (23.9)	
Age, mean ± SD	80.2 ± 6.5	82.4 ± 6.8	<0.001	80.6 ± 6.6	80.9 ± 6.7	0.627
Men, %	44.2	64.0	<0.001	42.0	67.1	<0.001
BMI, mean ± SD	27.6 ± 4.9	22.5 ± 3.1	<0.001	25.8 ± 4.8	28.2 ± 5.4	<0.001
Weigth loss, %	39.1	56.1	0.003	44.2	41.5	0.571
Disability, %	21.4	30.2	<0.001	20.0	34.2	<0.001
SPMSQ, med [IQR]	2 [1; 3]	2 [1; 4]	0.001	2 [1, 4]	3 [1, 4]	0.027
Charlson I. med [IQR]	3 [2,5]	3 [2,4]	0.705	3 [1,4]	3 [2,5]	0.027
CHF, %	16.4	19.4	0.397	16.8	17.8	0.780
Diabetes, %	30.8	23.7	0.101	26.9	36.3	0.030
COPD, %	26.5	26.6	0.869	23.7	35.6	0.004
N. of medications	6.1±2.9	6.1±2.7	0.837	5.9±2.9	6.5±2.7	0.450

Bianchi et al, J Gerontol A Biol Med Sci 2019 Oct 19

Agreement between EWGSOP2 and FNIH definitions



Survival estimates according to sarcopenia definitions

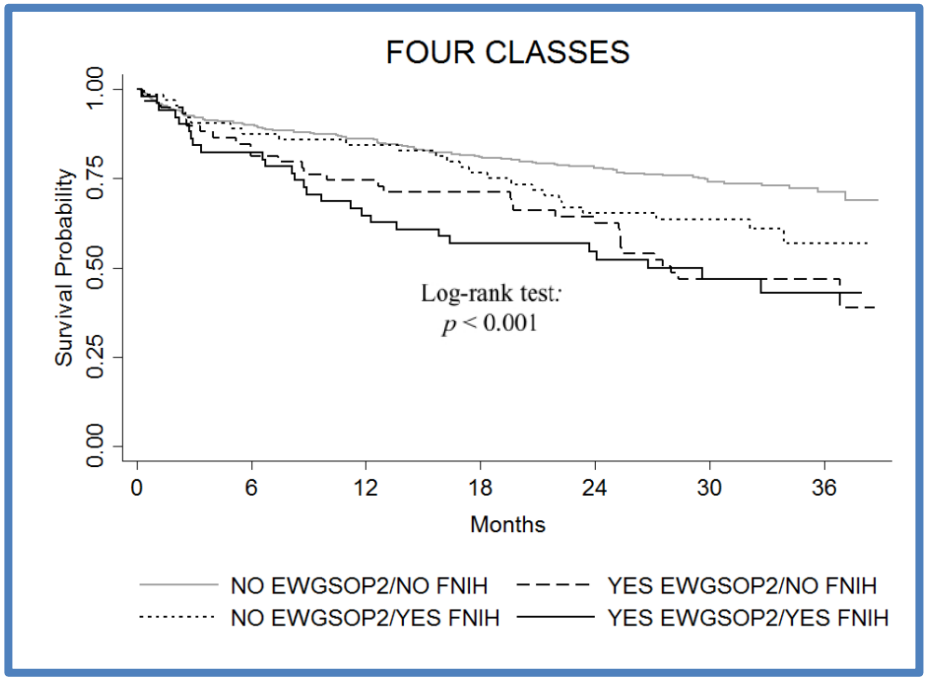


Adjusted HR: 1.26 (0.89-1.79)

Adjusted HR: 1.84 (1.33-2.57)

Bianchi et al, J Gerontol A Biol Med Sci 2019 Oct 19

Kaplan-Meier survival estimates according to sarcopenia definitions

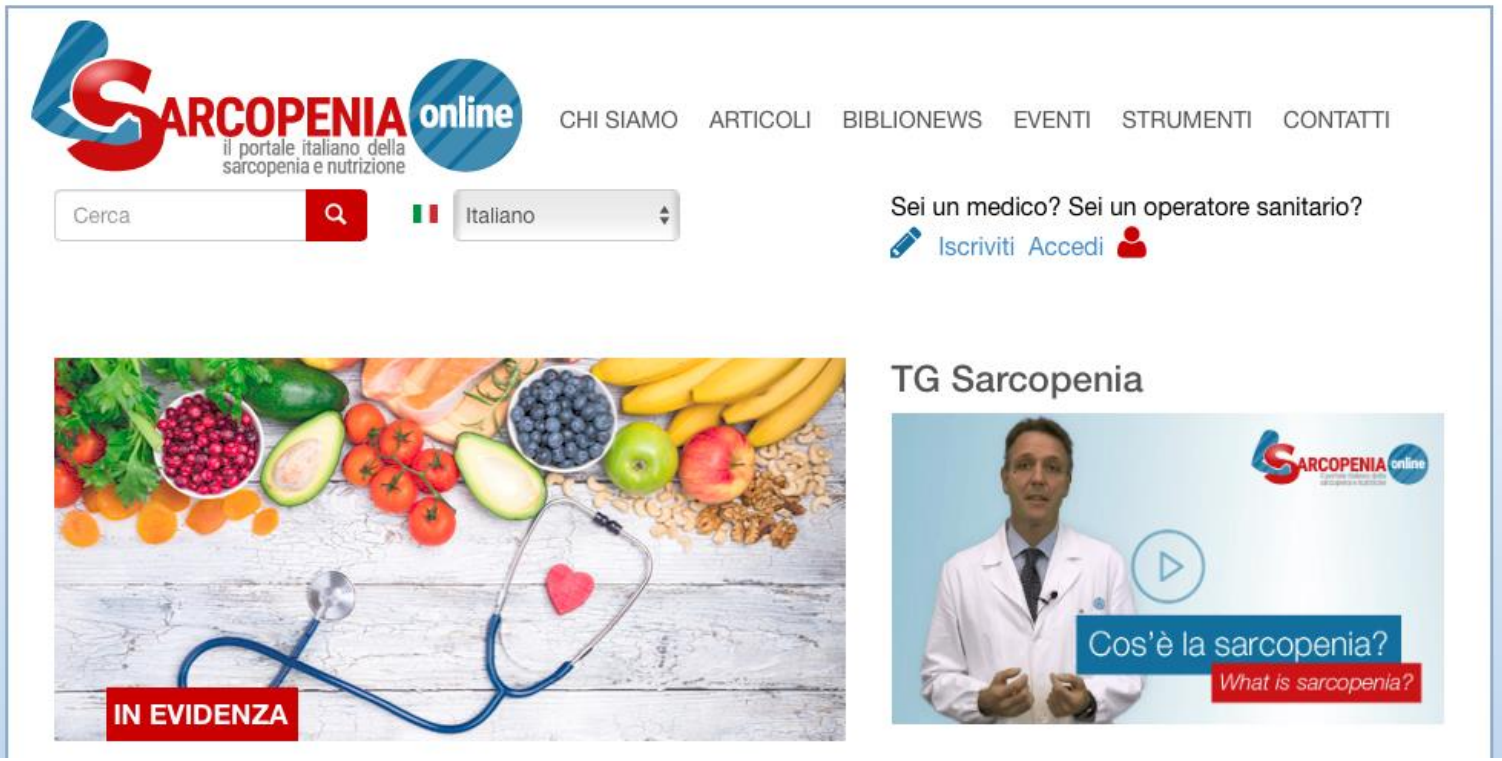


E-2/FNIH	Adj. HR (95% C.I.)
No-No	1
Yes-No	2.08 (1.38-3.16)
No-Yes	1.25 (0.79-1.98)
Yes-Yes	1.75 (1.11-2.79)

Bianchi et al, J Gerontol A Biol Med Sci 2019 Oct 19

Take home messages

- La valutazione della forza muscolare rappresenta il cardine dell'algoritmo diagnostico della sarcopenia
- La forza di prensione della mano è il metodo raccomandato da tutte le linee guida internazionali
- Il test di alzata ripetuta dalla sedia rappresenta un'alternativa valida raccomandata da EWGSOP
- La valutazione della forza muscolare fornisce importanti informazioni prognostiche anche in assenza di valutazione della massa muscolare e dovrebbe essere effettuata in tutti i pazienti geriatrici
  - Ulteriore segno vitale?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