

**16-17 ottobre 2020**

*Approcci interdisciplinari in reumatologia - 7<sup>a</sup> edizione*

# **MALATTIE REUMATICHE E DISORDINI ENDOCRINO-METABOLICI**

## **SARCOPENIA**

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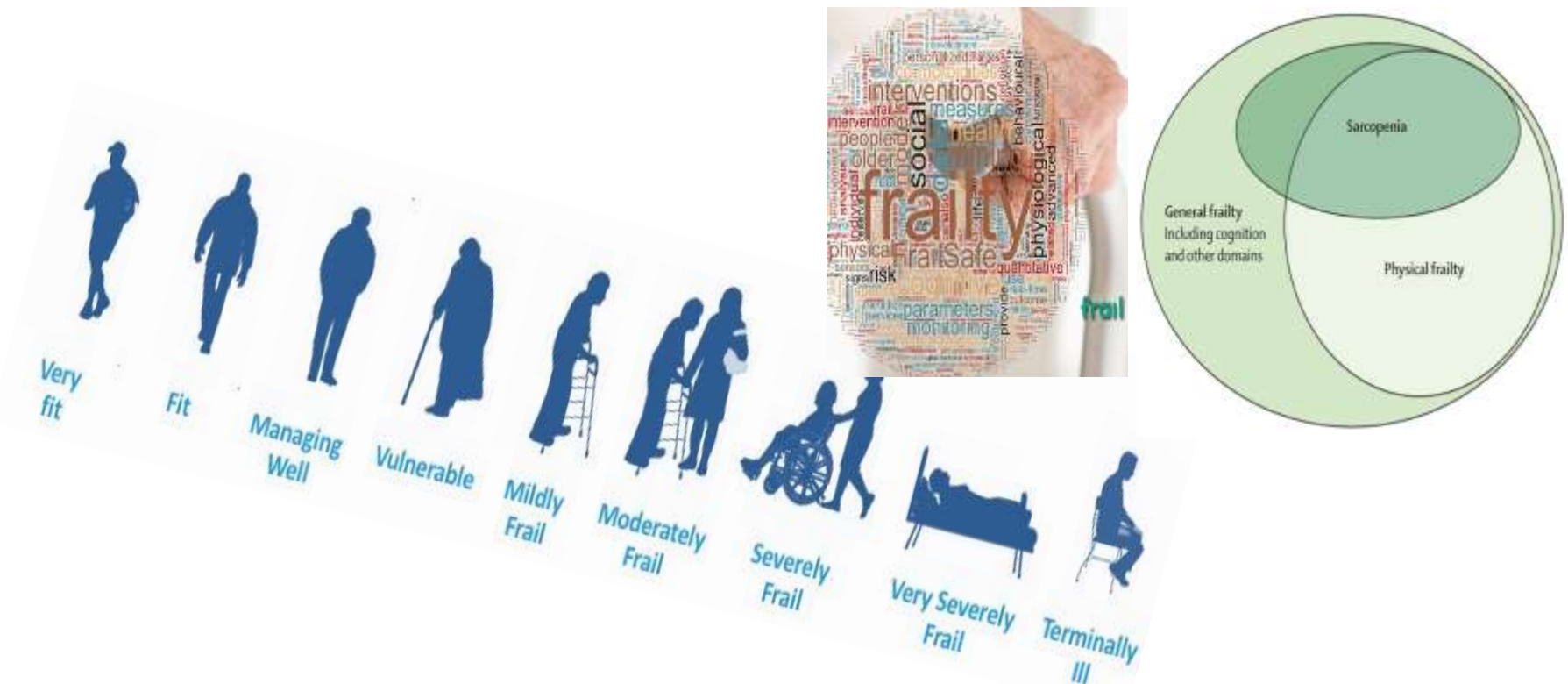
**D**IPARTIMENTO di  
**S**CIENZE  
**C**HIRURGICHE

**UNIVERSITA' DI TORINO**

*Divisione Universitaria di  
Medicina Fisica e Riabilitazione*

# Frailty in elderly people

**Sarcopenia** is regarded as a key component of **frailty**



# Sarcopenia: definition

The loss of skeletal muscle **mass** and **function**



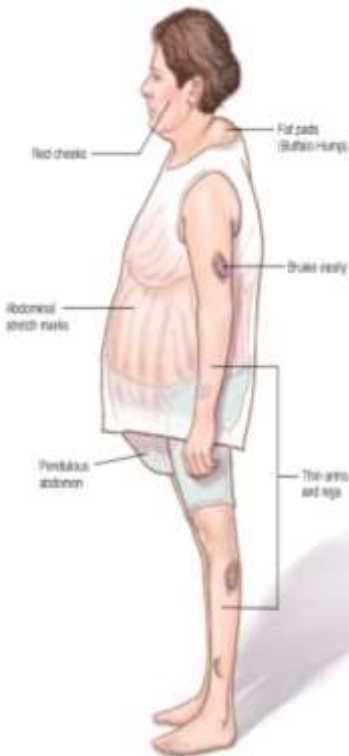
# Sarcopenia: definition

The loss of skeletal muscle mass and function that occurs during the ageing process (primary sarcopenia)



# Sarcopenia: definition

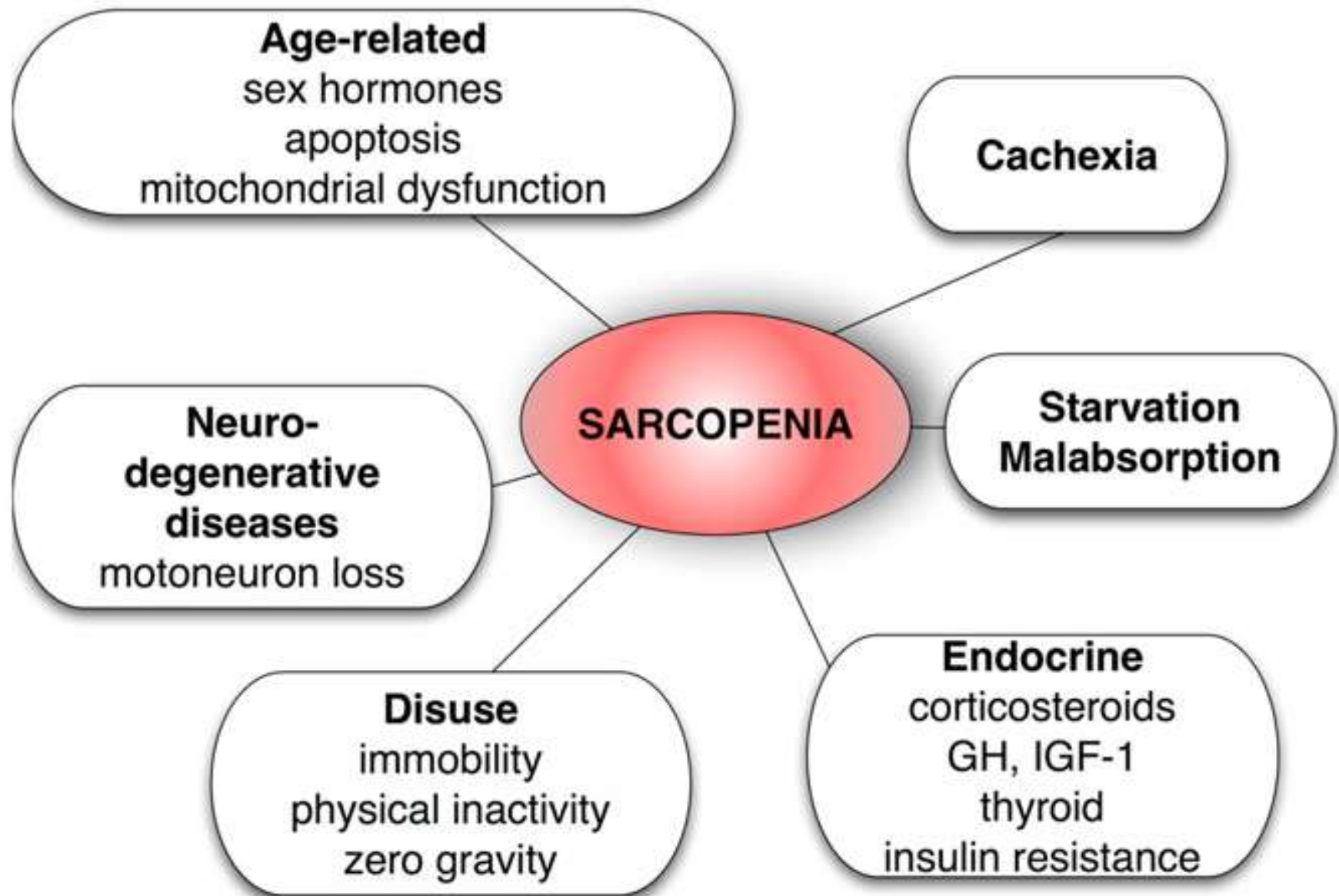
The loss of skeletal muscle mass and function that occurs due to the presence of an underlying disease or medication (secondary sarcopenia).



- ✓ *disuse atrophy*
- ✓ *disease-related sarcopenia (endocrine myopathies, cancer cachexia)*
- ✓ *nutrition-related sarcopenia*







*Age and Ageing* 2010; **39**: 412–423

## **Sarcopenia: European consensus on definition and diagnosis**

Report of the European Working Group on Sarcopenia in Older People

“A syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life, and death”.

**❑ EWGSOP 2010 - 2019**

**European Working Group on Sarcopenia in Older People**

**❑ IWGS 2011**

**International Working Group on Sarcopenia**

**❑ SSCWD 2011**

**Society of Sarcopenia; Cachexia and Wasting Disorders**

**❑ FNIH 2014**

**Foundation for the National Institutes of Health**

**❑ 2014**

**Sarcopenia Project Asian Working Group on Sarcopenia**



*Age and Ageing* 2010; **39**: 412–423

## **Sarcopenia: European consensus on definition and diagnosis**

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**Table 1.** Criteria for the diagnosis of sarcopenia

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Diagnosis is based on documentation of criterion 1 plus (criterion 2 or criterion 3)

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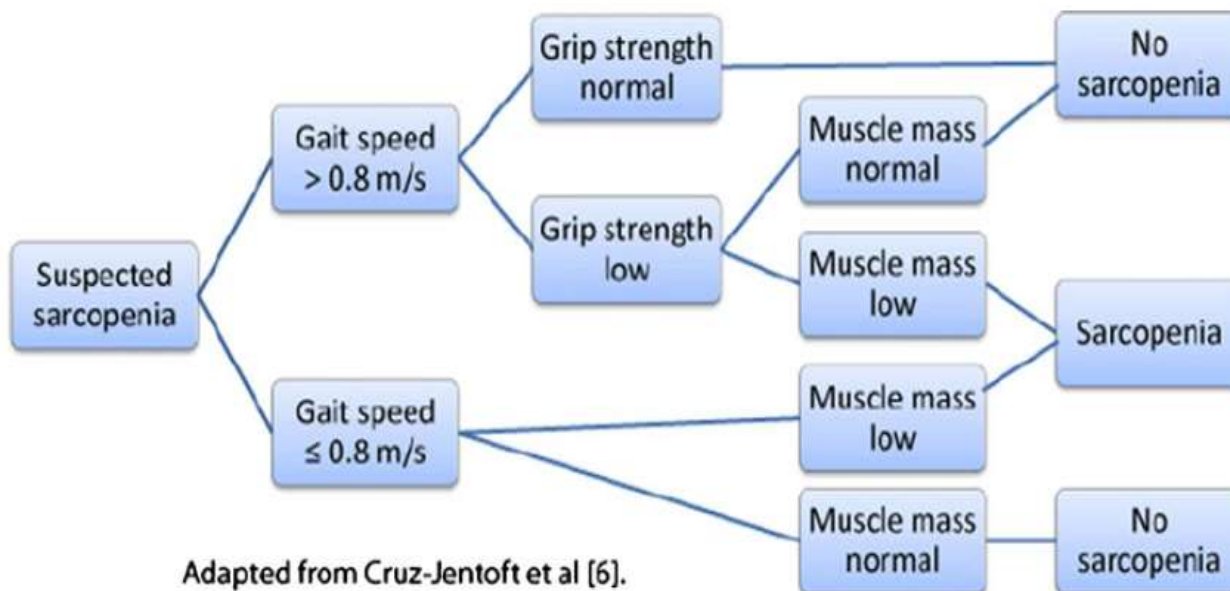
1. Low muscle mass
2. Low muscle strength
3. Low physical performance

# Sarcopenia: European consensus on definition and diagnosis

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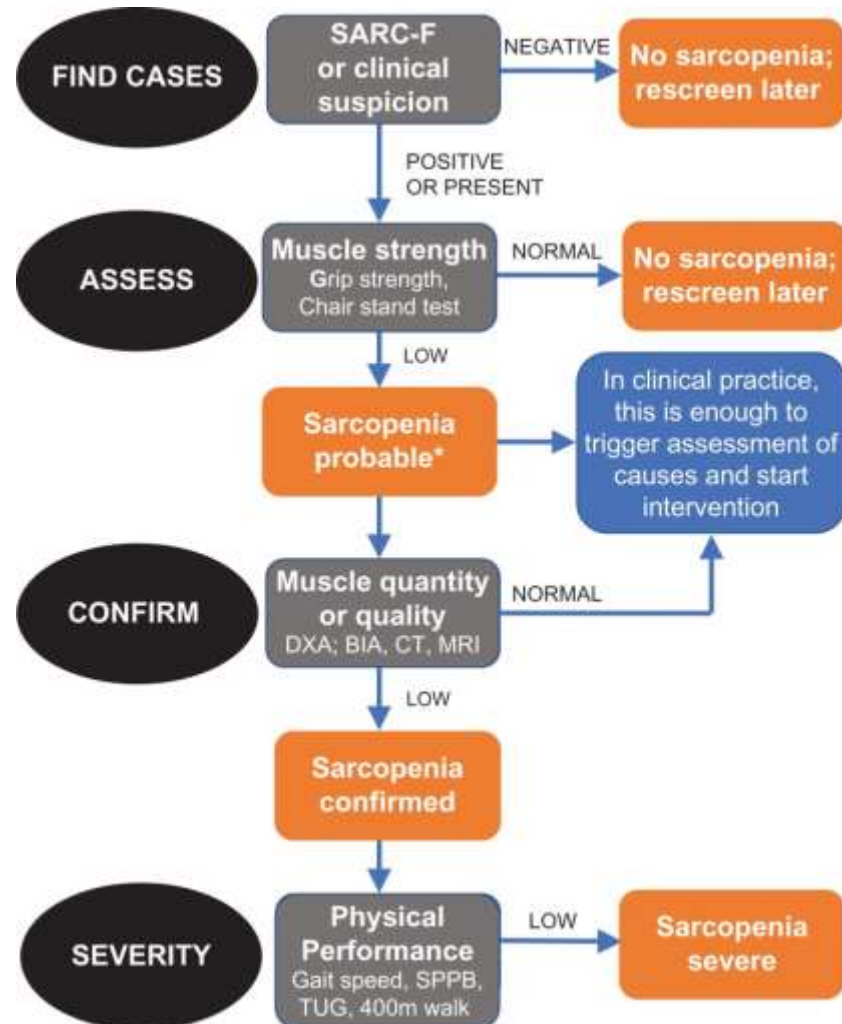
Table 3. EWGSOP conceptual stages of sarcopenia

Stage	Muscle mass	Muscle strength	Performance
Presarcopenia	↓		
Sarcopenia	↓	↓	Or ↓
Severe sarcopenia	↓	↓	↓



Adapted from Cruz-Jentoft et al [6].

# Sarcopenia: revised European consensus on definition and diagnosis



# Sarcopenia: revised European consensus on definition and diagnosis

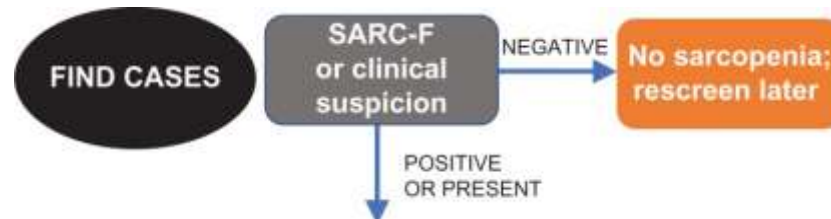
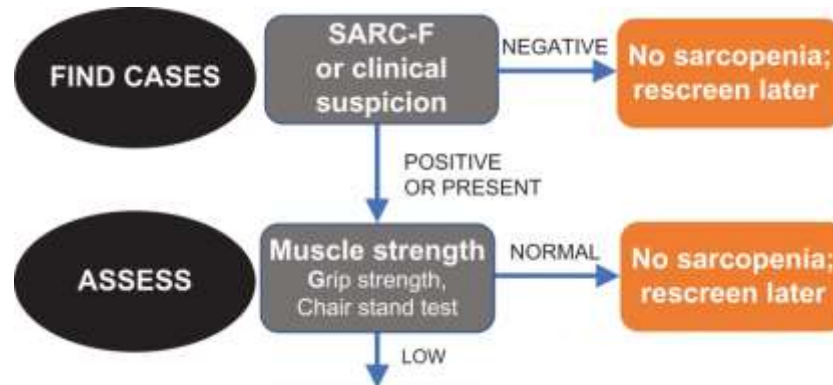


TABLE. The Simple "SARC-F" Sarcopenia Questionnaire (0-10 points)<sup>3</sup>

Component	Question	Scoring
Strength	How much difficulty do you have in lifting and carrying 10 pounds?	None = 0 Some = 1 A lot or unable = 2
Assistance in walking	How much difficulty do you have walking across a room?	None = 0 Some = 1 A lot, use aids, or unable = 2
Rise from a chair	How much difficulty do you have transferring from a chair or bed?	None = 0 Some = 1 A lot or unable without help = 2
Climb stairs	How much difficulty do you have climbing a flight of 10 stairs?	None = 0 Some = 1 A lot or unable = 2
Falls	How many times have you fallen in the last year?	None = 0 1-3 falls = 1 4 or more falls = 2

*SARC-F scores  $\geq 4$  were associated with having more activity of daily living deficits*

# Sarcopenia: revised European consensus on definition and diagnosis



## HANDGRIP STRENGTH TEST



**Males**  
 **$\geq 27$  kg**  
**Females**  
 **$\geq 16$  kg**

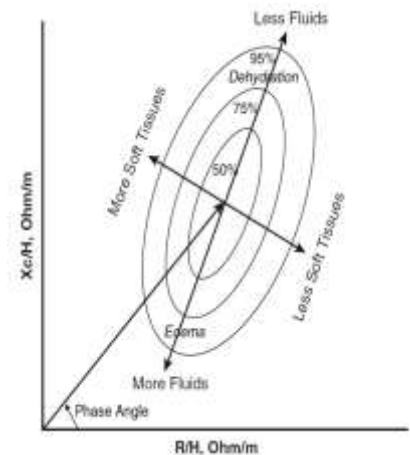
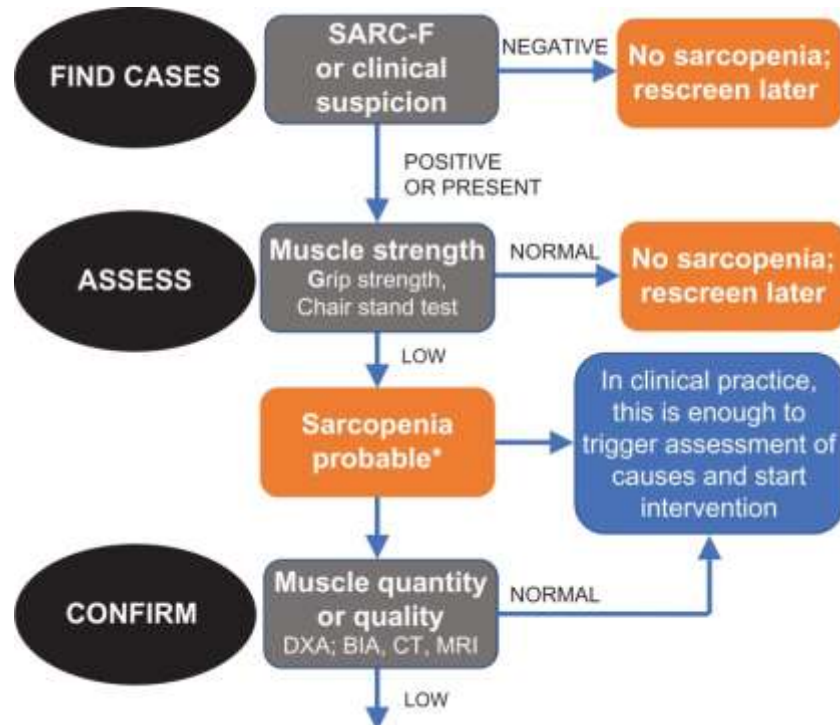
## CHAIR STAND TEST (5-TIMES SIT-TO-STAND)

*Time  $\leq 15$  s*    *normal*  
*Time  $> 15$  s*    *weak*





# Sarcopenia: revised European consensus on definition and diagnosis



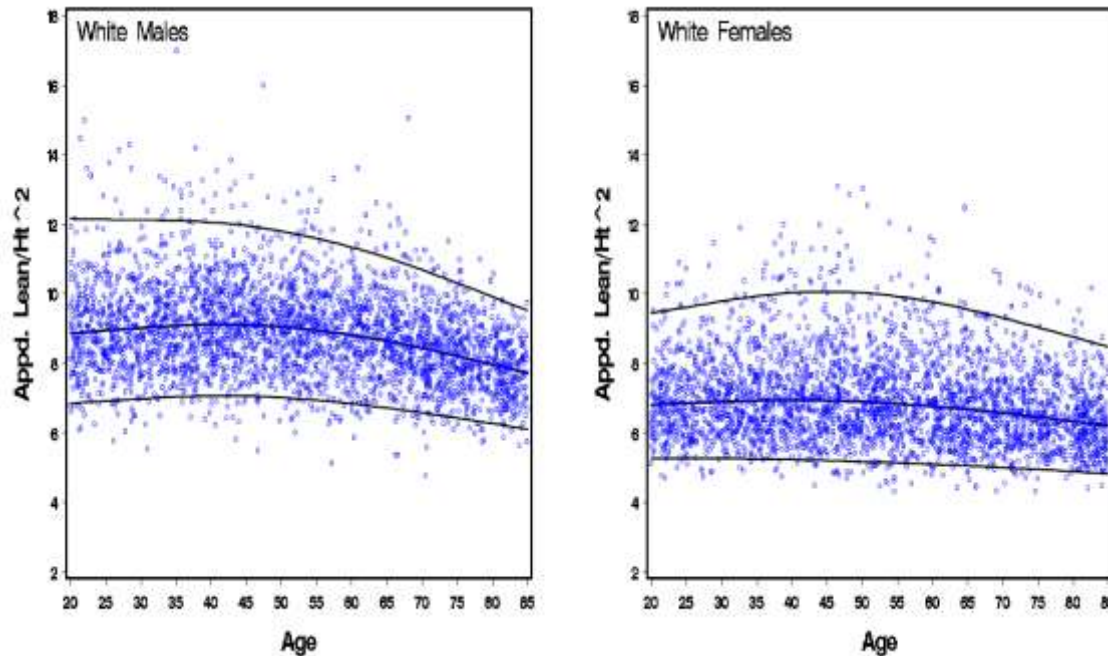


# Dual Energy X-Ray Absorptiometry Body Composition Reference Values from NHANES



Thomas L. Kelly<sup>1\*</sup>, Kevin E. Wilson<sup>1</sup>, Steven B. Heymsfield<sup>2</sup>

September 2009 | Volume 4 | Issue 9 | e7038



Appendicular Lean Mass /  $Ht^2$  ( $kg/m^2$ ) vs age in adults. Solid lines indicate the 3rd, 50th, and 97th percentiles.

**Baumgartner et al. (1998)**

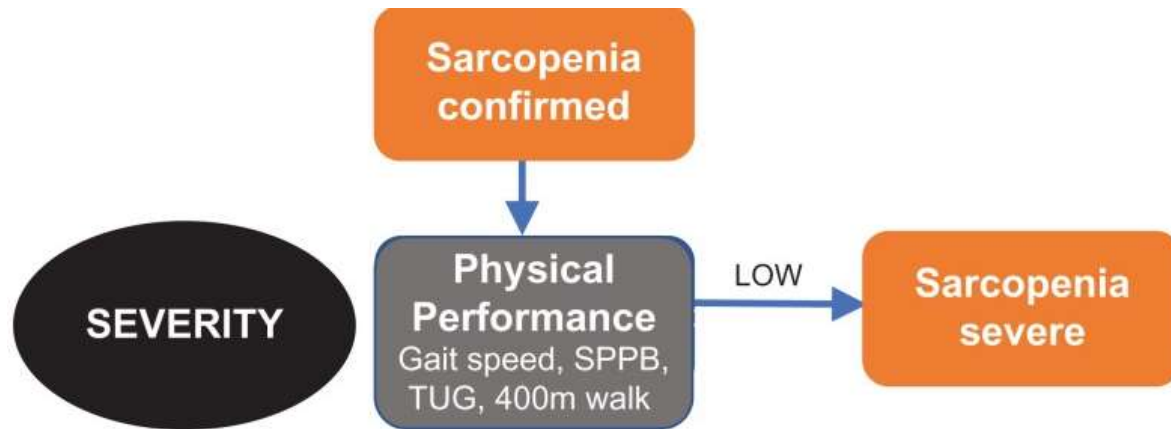
**vn UOMINI:  $>7.26 kg/m^2$ ; vn DONNE:  $>5.45 kg/m^2$**

**vn UOMINI:  $>7.00 kg/m^2$ ; vn DONNE:  $>5.50 kg/m^2$**

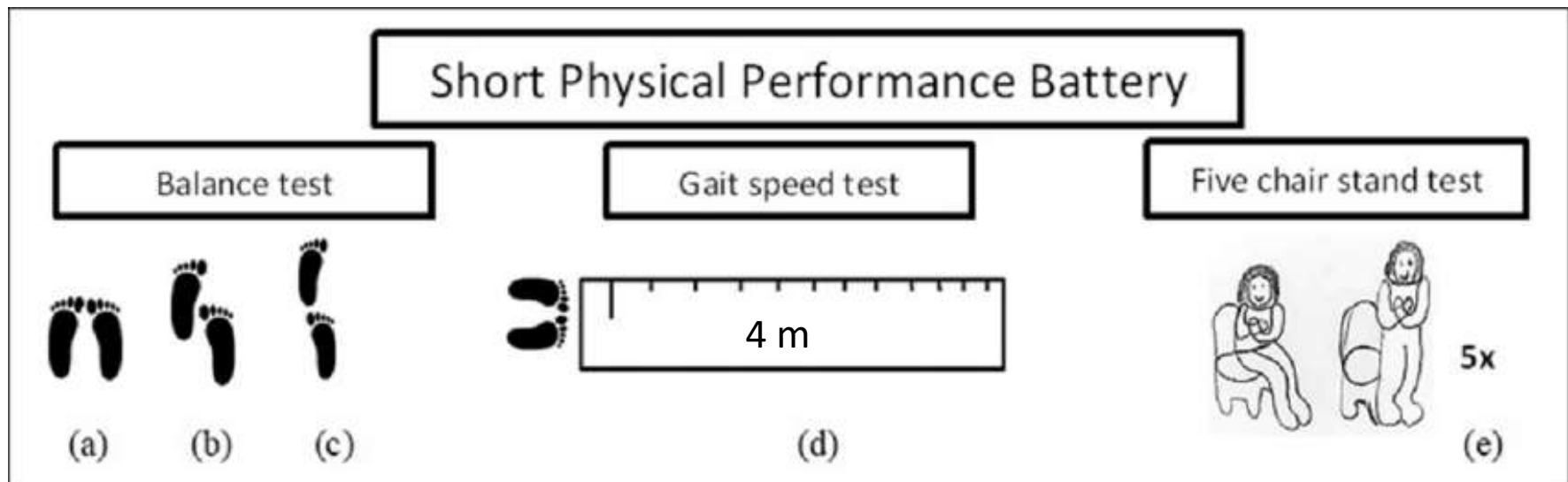
**EWGSOP-2 (2019)**

# Sarcopenia: revised European consensus on definition and diagnosis

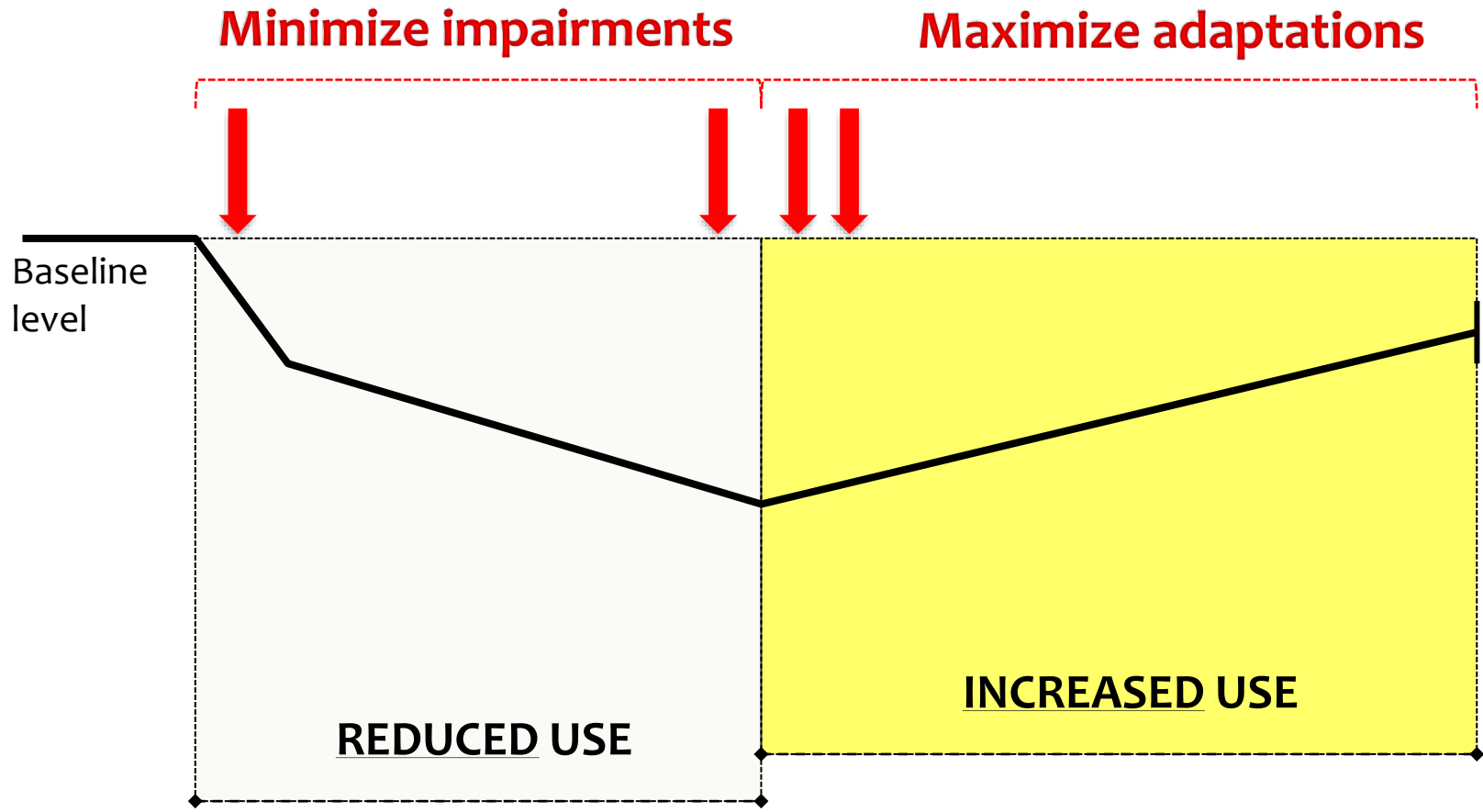
Walking speed  $\leq 0.8$  m/s



SPPB  $\leq 8$  points



Knowledge of neuromuscular plasticity is required to propose the most appropriate interventions/treatments at the proper time



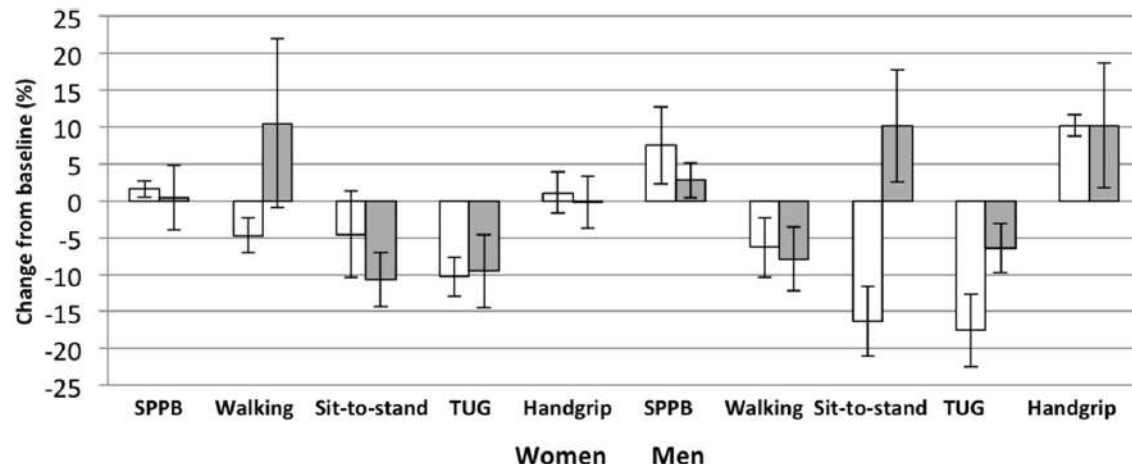
# (1) EXERCISE

*S. Vikberg et al.*

JAMDA 20 (2019) 28–34

Effects of Resistance Training on Functional Strength and Muscle Mass in 70-Year-Old Individuals With Pre-sarcopenia: A Randomized Controlled Trial

- ❑ *RT group (n=36) vs control group (n=34)*
- ❑ *Intervention duration: 10 weeks*
- ❑ *3 sessions (45 min each) per week*
- ❑ *Instructor-led RT program*



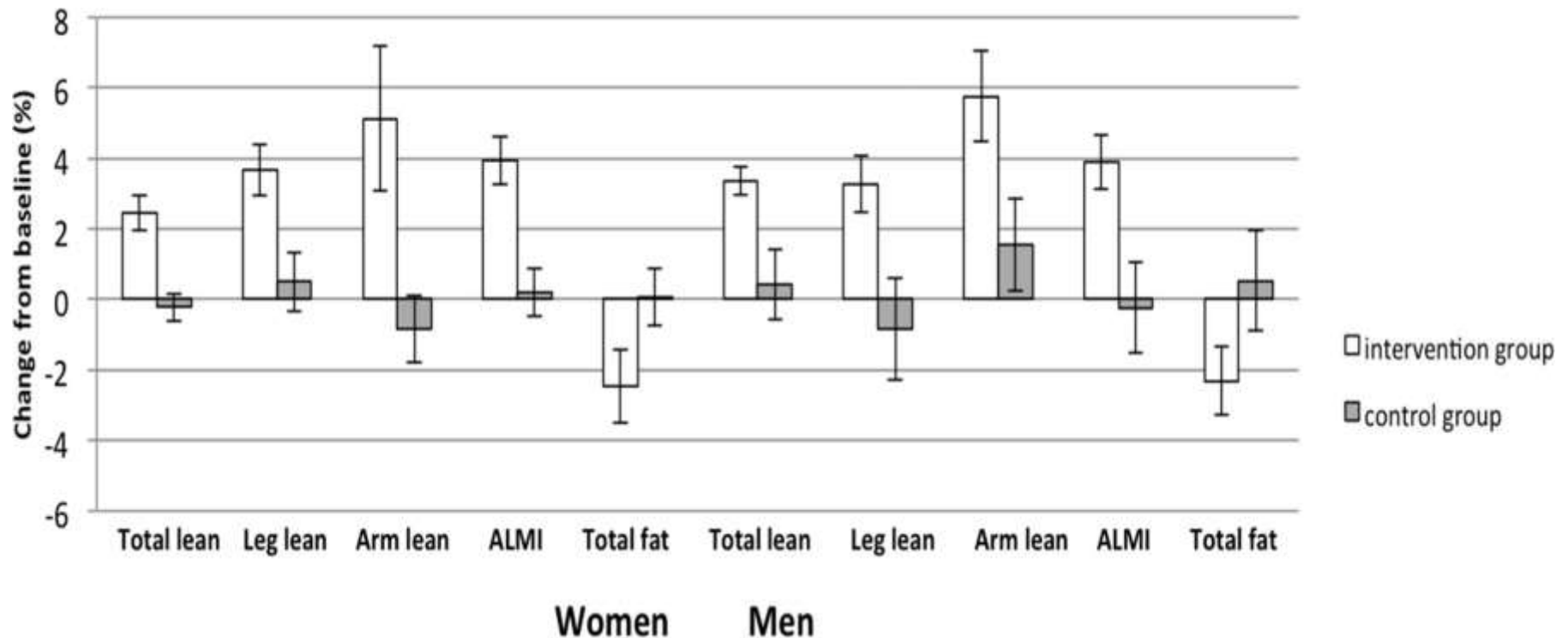
- ✓ Squats
- ✓ Chair stands
- ✓ Half lunges
- ✓ Biceps rowing
- ✓ Push-ups
- ✓ Bridges

# (1) EXERCISE

*S. Vikberg et al.*

JAMDA 20 (2019) 28–34

Effects of Resistance Training on Functional Strength and Muscle Mass in 70-Year-Old Individuals With Pre-sarcopenia: A Randomized Controlled Trial



***The intervention group improved in all measures of body composition, including high gains in LBM, compared with the control group.***

## (2) ELECTROSTIMULATION

Application of trains of stimuli to nerves or muscles via surface electrodes positioned over the skin, to generate relatively strong muscle contractions, most often in isometric tetanic conditions

- ✓ Particularly effective in case of immobilization
- ✓ Considerable contribution of the CNS
- ✓ Key factors: muscle tension and contraction intensity



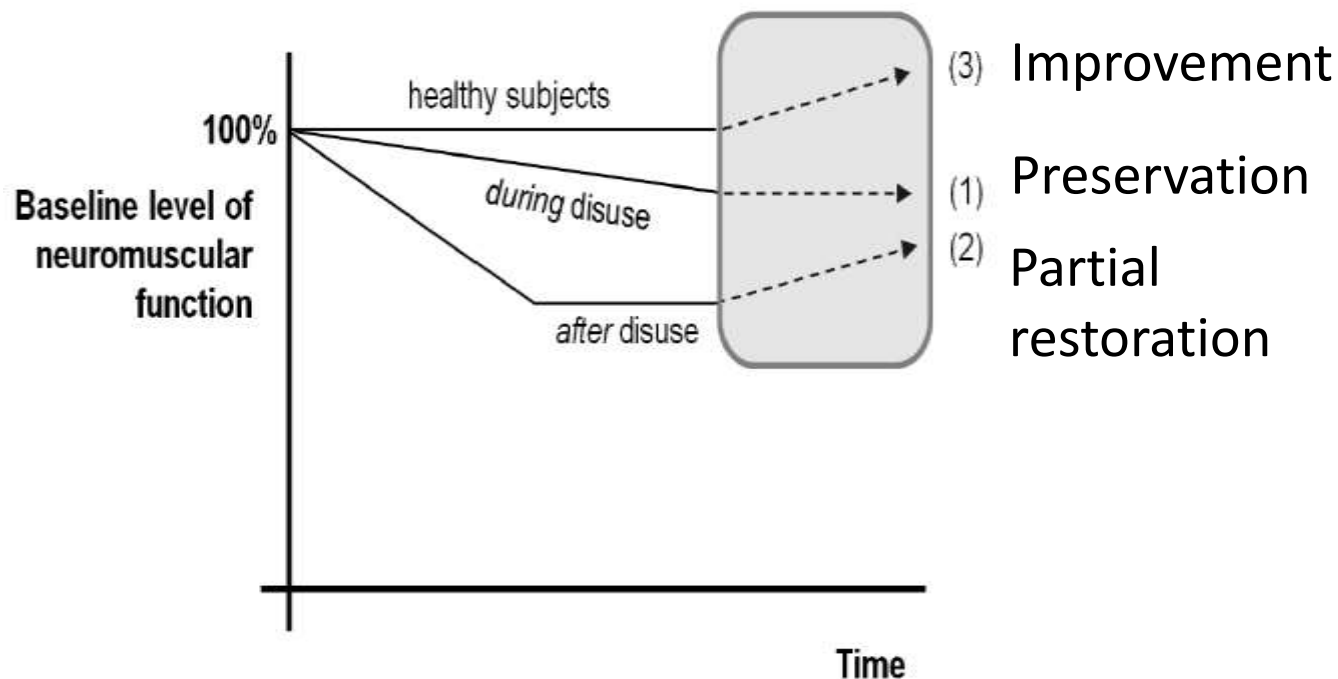


SPECIAL COMMUNICATION

# Clinical Use of Neuromuscular Electrical Stimulation for Neuromuscular Rehabilitation: What Are We Overlooking?



Nicola A. Maffiuletti, PhD,<sup>a</sup> Julien Gondin, PhD,<sup>b</sup> Nicolas Place, PhD,<sup>c</sup>  
Jennifer Stevens-Lapsley, MPT, PhD,<sup>d,e</sup> Isabelle Vivodtzev, PhD,<sup>f</sup> Marco A. Minetto, MD<sup>g</sup>



### (3) FOCAL MUSCLE VIBRATION

**Focal application of mechanoacoustic vibratory stimulation to the skin above the muscle(s) of interest**



Chronic use elicited neurophysiological responses which may underlie the clinical improvements of patients

# Sarcopenia *Lancet* 2019; 393: 2636–46

*Alfonso J Cruz-Jentoft, Avan A Sayer*

## Treatment: pharmacological approaches

No specific drugs have been approved for the treatment of sarcopenia. An umbrella review has brought together

**Vitamin D**, especially in older women, and **testosterone** in older men with low testosterone levels can be justified in daily clinical practice to improve muscle mass and function in sarcopenic patients

**Torino**

13 novembre 2020

Aula Magna, Presidio CTO

Via Zuretti 24



# Osteoforum

la salvaguardia dell'osso  
e del muscolo nel  
paziente con fragilità  
muscolo-scheletrica





**This is how we see it. Thank you!**