SICOM & AOCO 2024
SOMS International Conference on Obesity & Metabolism
in conjunction with Asia-Oceania Conference on Obesity
Hosted by
SOMS Society for Korean Obesity and Metabolism Studies
Co-Hosted by
Asia Oceania Association for the Study of Obesity
Empowering Health, Inspiring Change: Practical Solutions for Obesity
Date October 24 (Thu)~26 (Sat), 2024
Venue aT Center, Seoul, Republic of Korea (3F Segyero Room & 4F Changjo Room)

Implication of Sarcopenic Obesity in Clinical Practice

Hidenori Arai

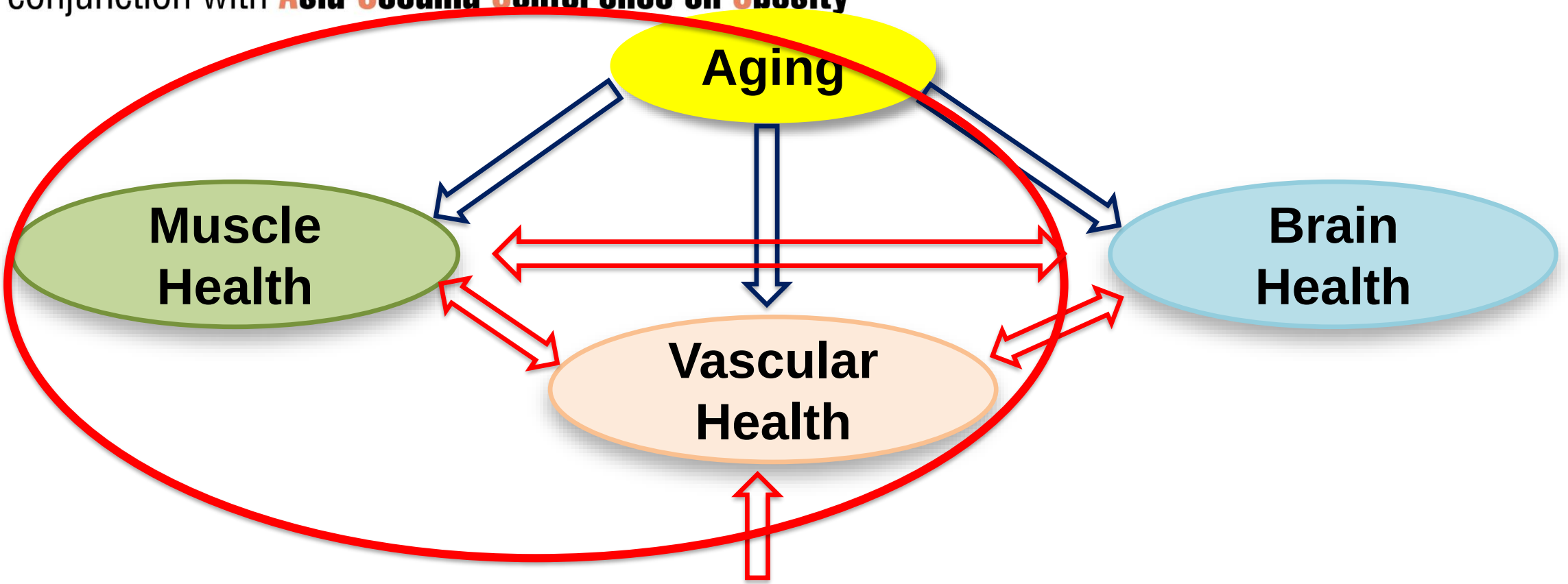
National Center for Geriatrics and Gerontology JAPAN

COI Disclosure

Presenter: Hidenori Arai

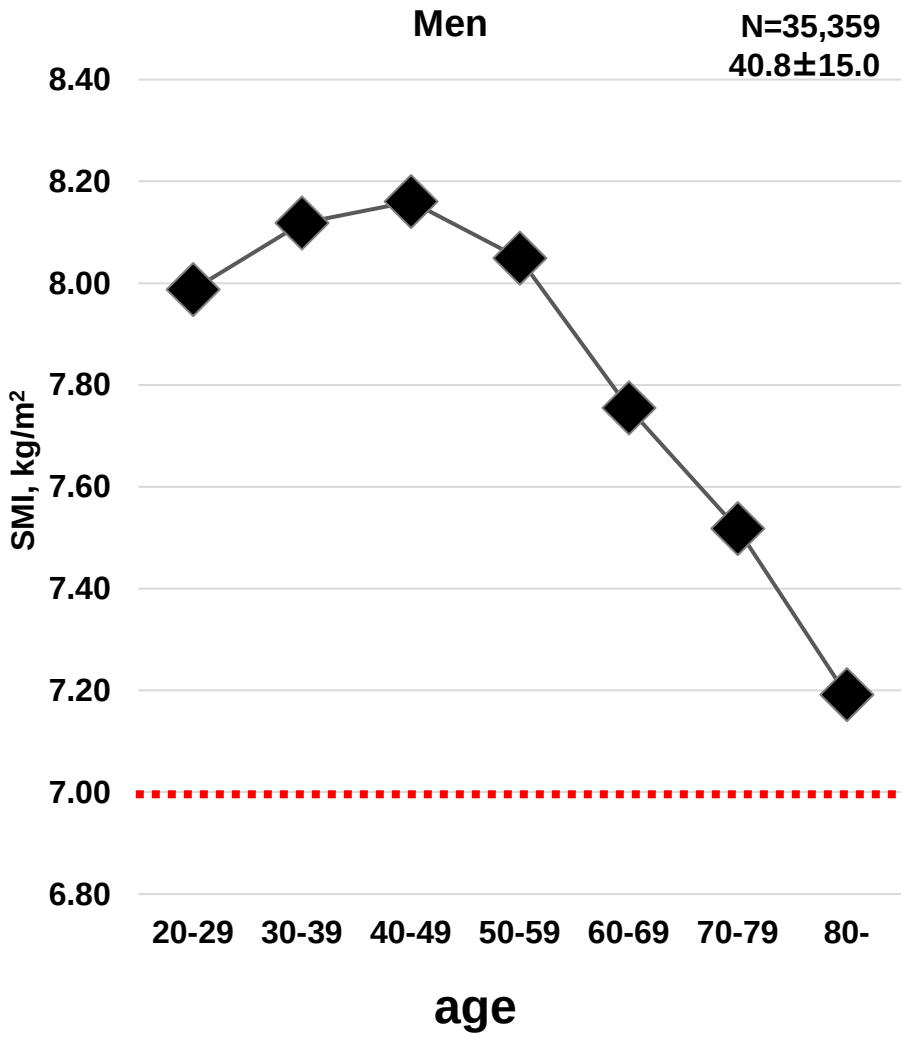
None

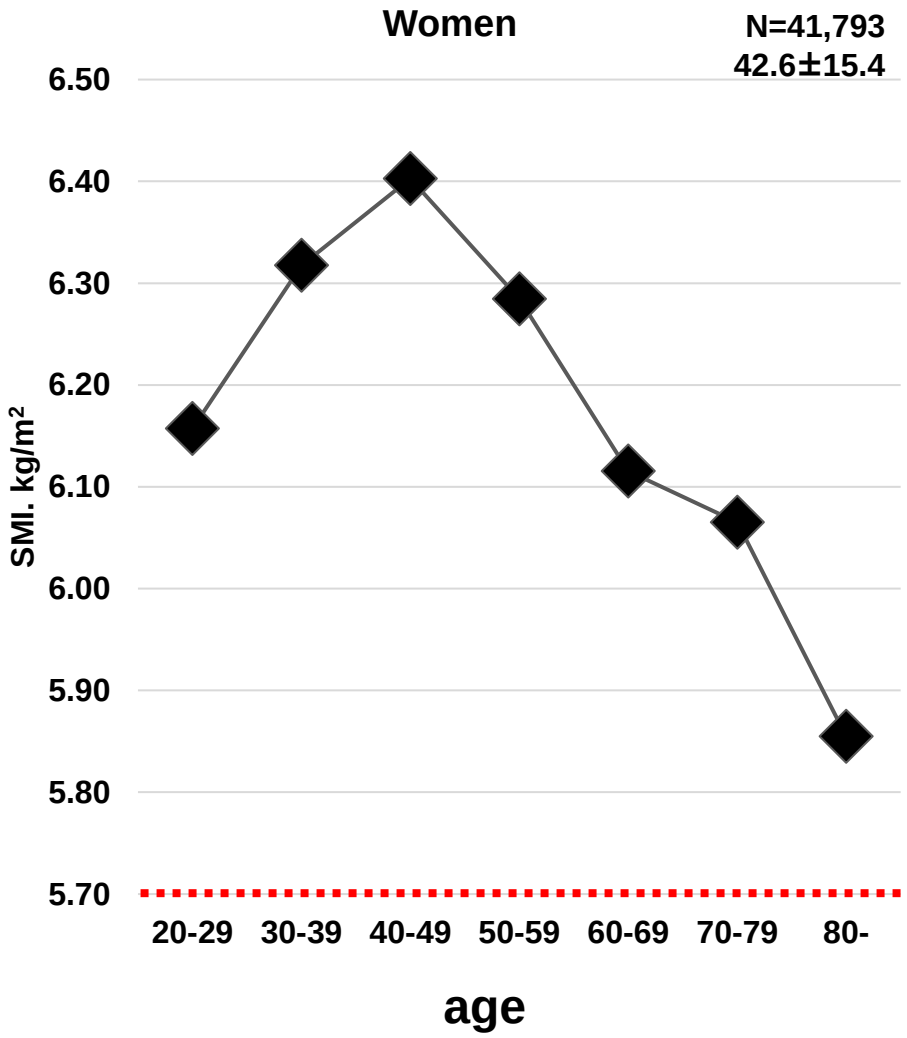
Population aging is a global phenomenon



Cardiometabolic risk management
(Diabetes, Dyslipidemia, Hypertension, Obesity)

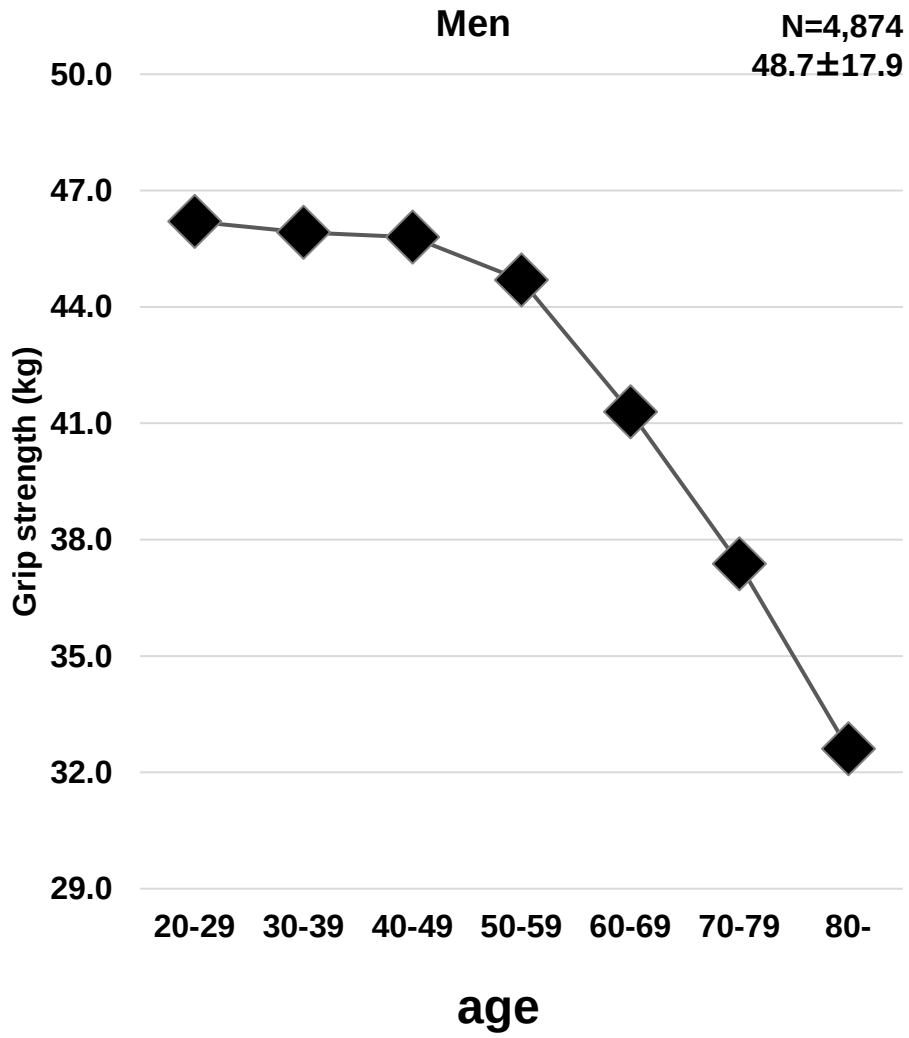
Age-dependent change of the appendicular skeletal muscle index of Japanese men and women

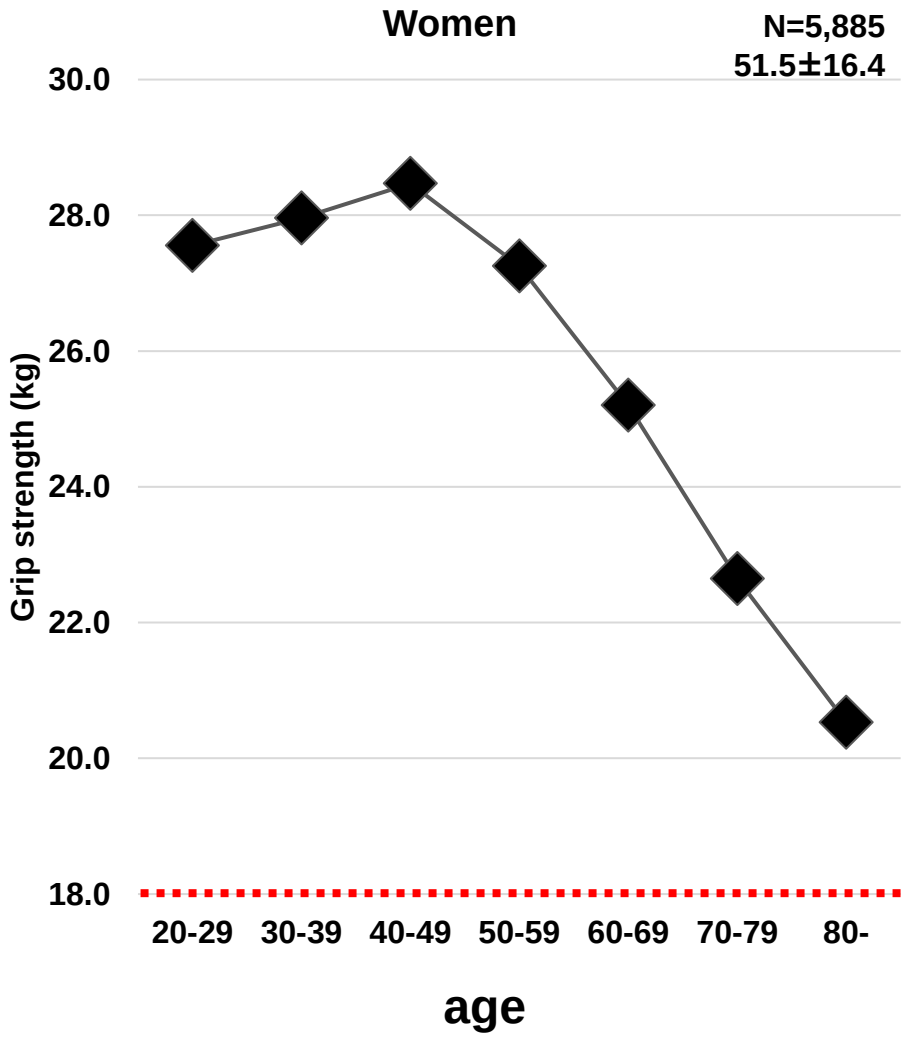




Yamada M and Arai H, Topics in Geriatric Rehabilitation, 2022

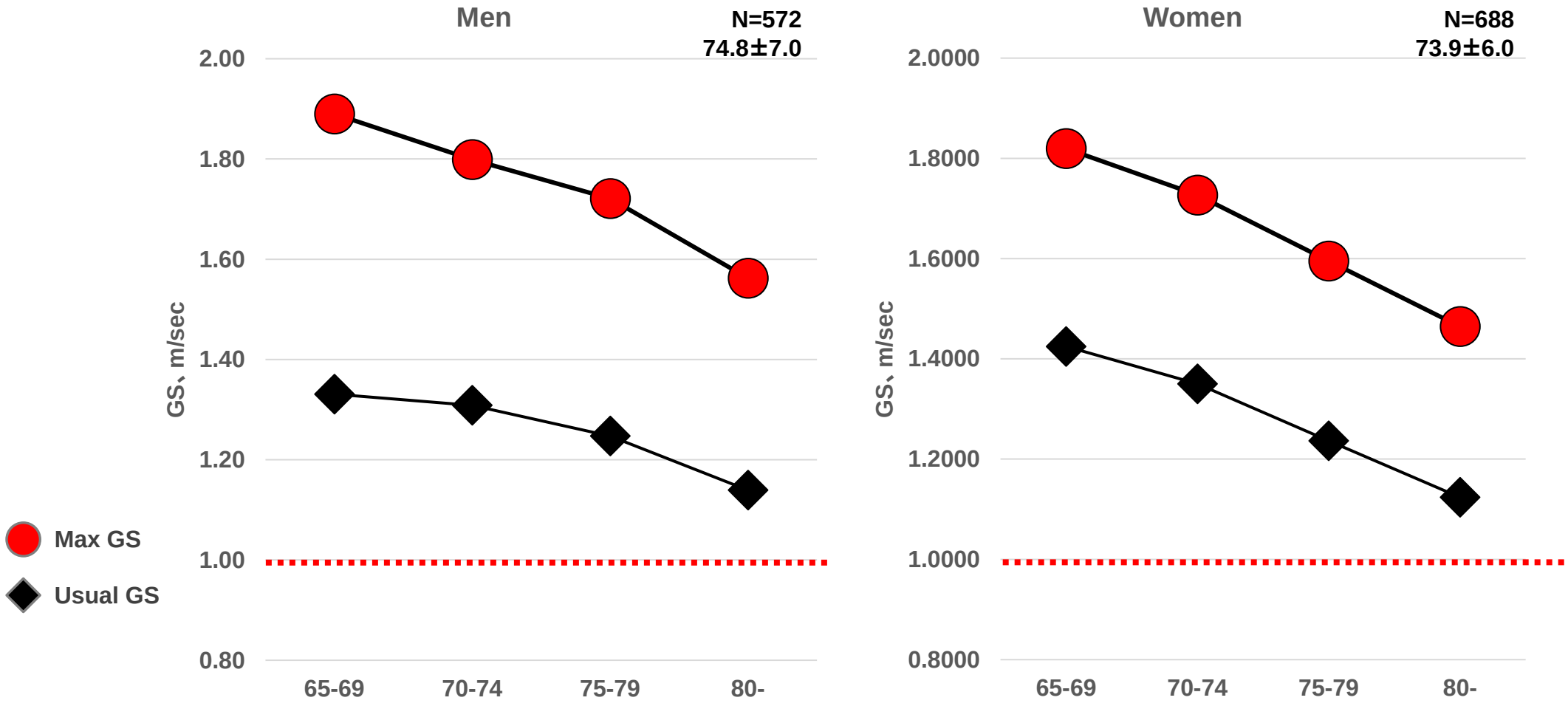
Age-dependent change of grip strength of Japanese men and women





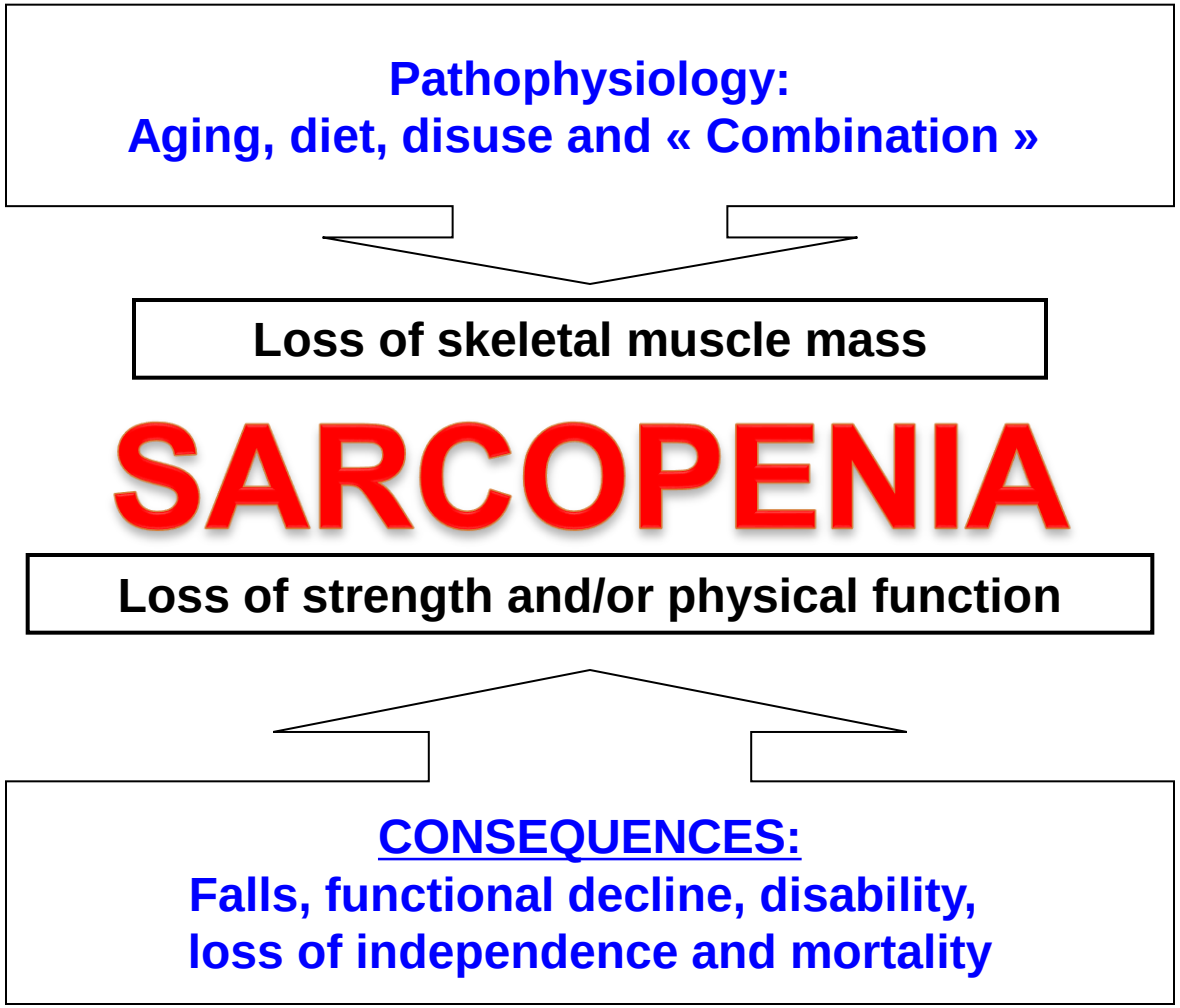
Yamada M and Arai H, Topics in Geriatric Rehabilitation, 2022

Age-dependent change of max and usual gait speed

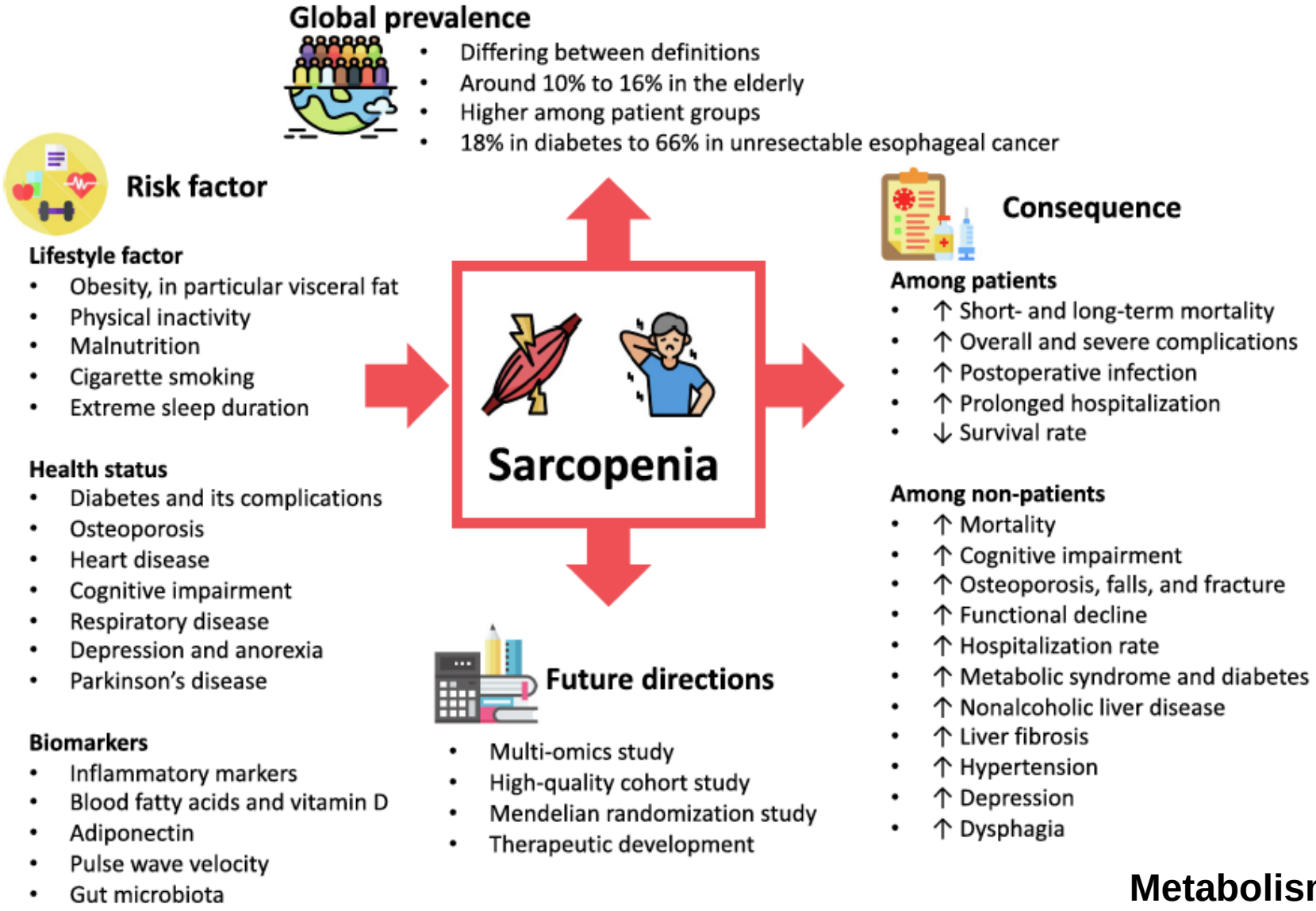


Yamada, Arai, et al, unpublished

Modern approach of sarcopenia

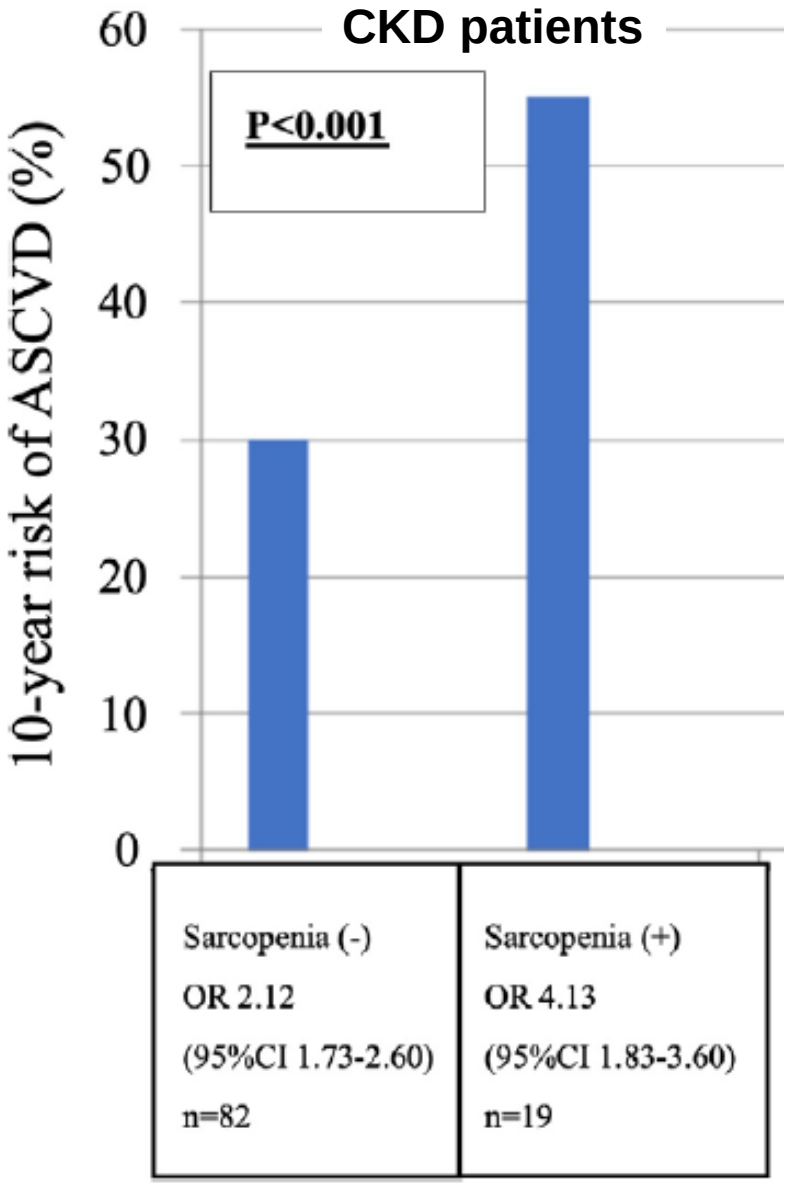


Summary of risk factors and consequences of sarcopenia



Metabolism 144 (2023) 155533

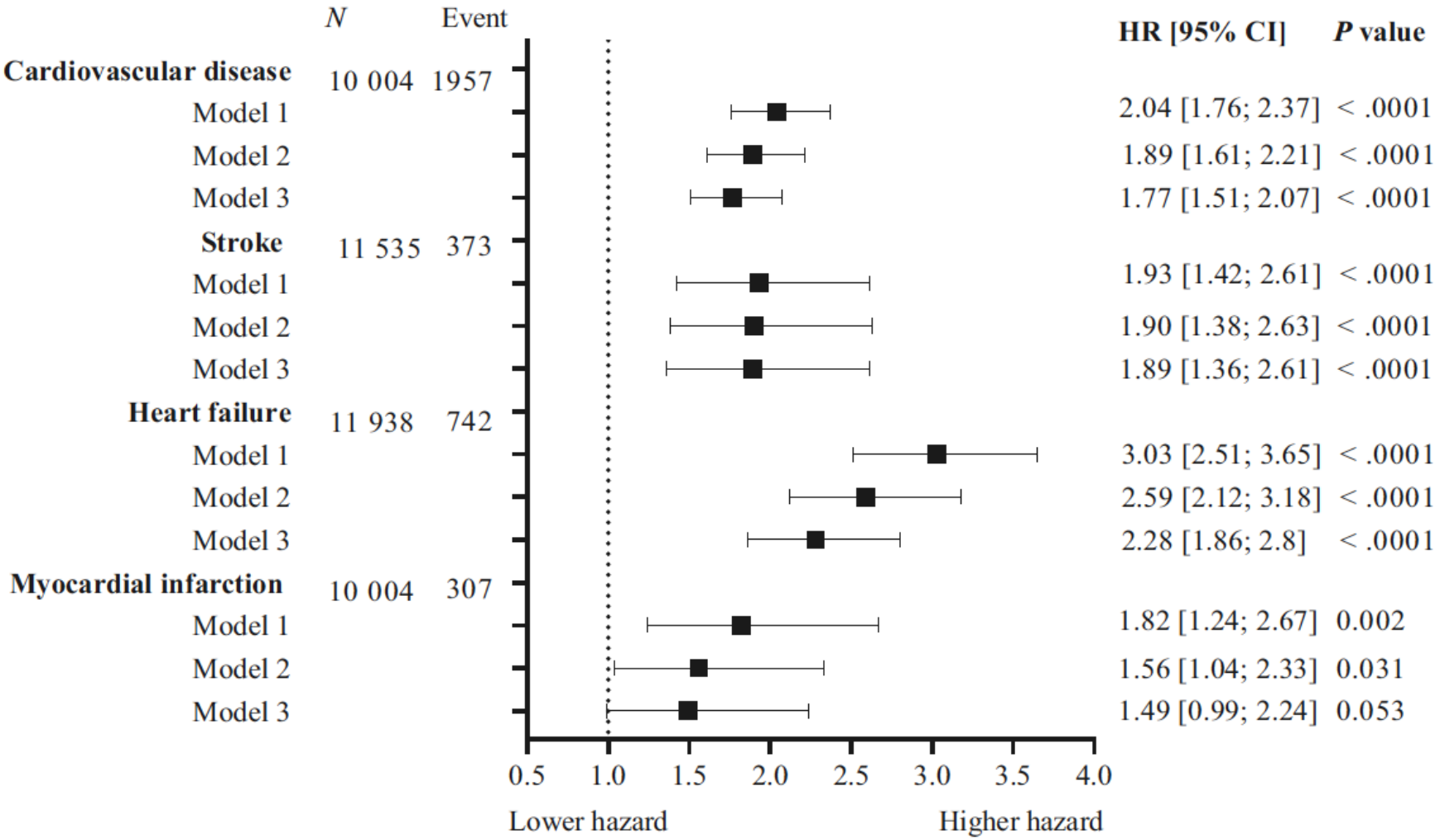
Sarcopenia increases the cardiometabolic risk



ASCVD risk factors	NON-sarcopenia N = 82	Sarcopenia N = 19
Obesity	1.00 (ref.)	4.36 3.48–5.50 *P* < .001
Hypertension	1.00 (ref.)	3.88 2.67–4.42 *P* < .001
Diabetes	1.00 (ref.)	3.62 4.47–7.28 *P* < .001
Hypercholesterolemia	1.00 (ref.)	3.15 2.45–3.54 *P* < .001

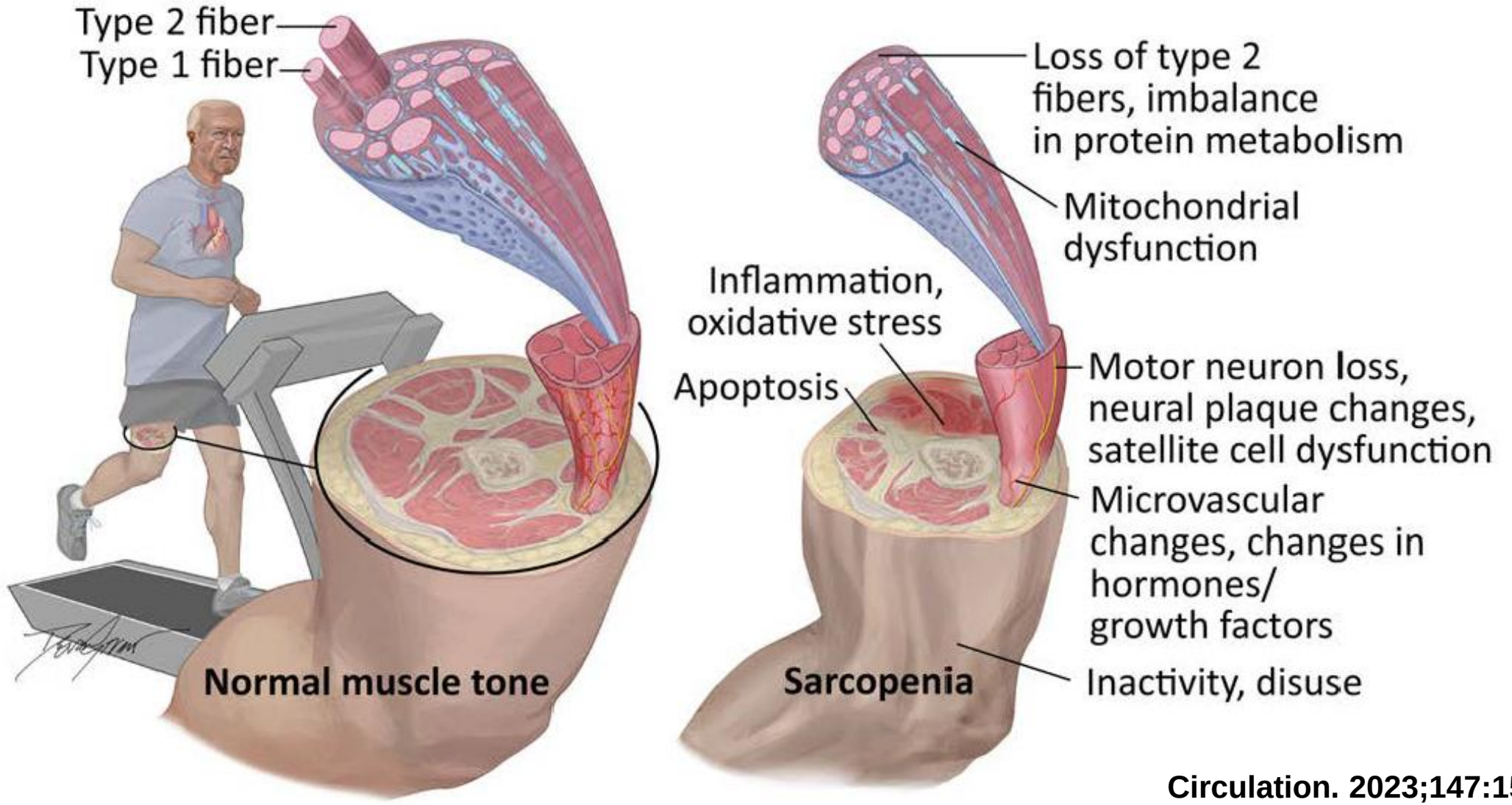
Xuan et al. Medicine (2023) 102:45

Association between sarcopenia and incidence of CVD, stroke, myocardial infarction, and heart failure in T2D



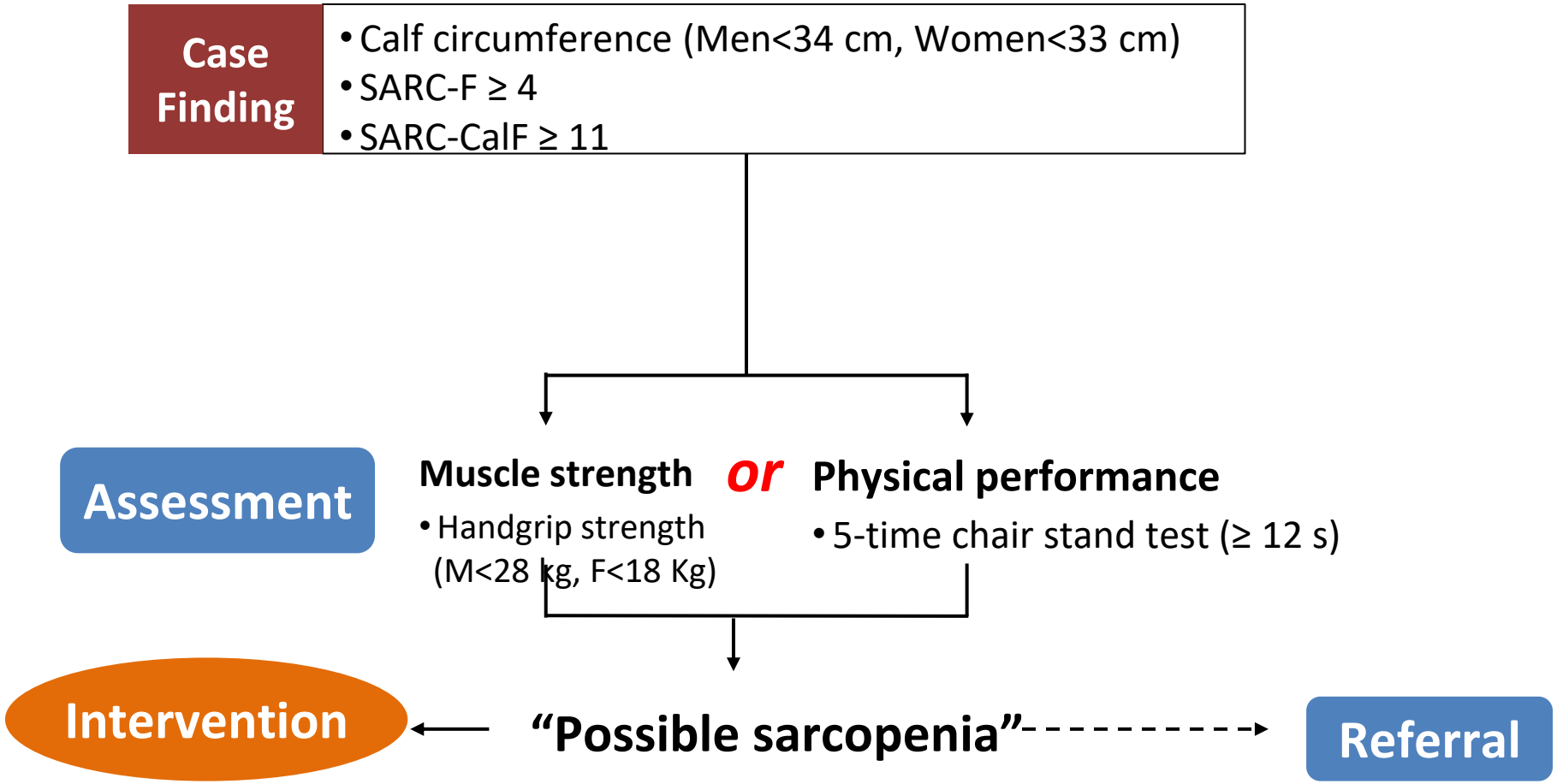
Diabetes Obes Metab. 2024;26:524–531

Pathophysiologic mechanisms for the development of sarcopenia in patients with cardiovascular disease



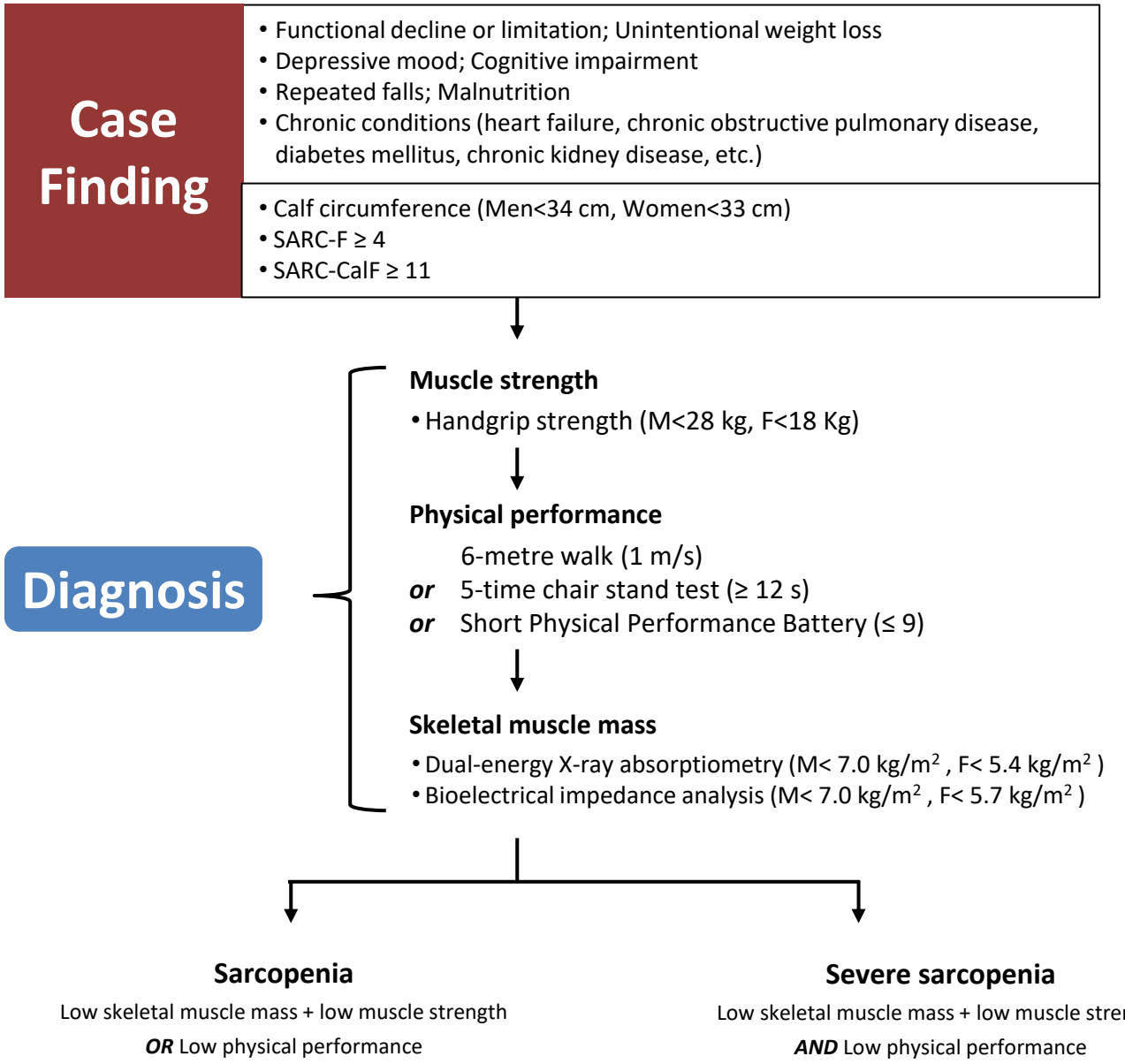
Circulation. 2023;147:1534–1553

Primary healthcare or community preventive services settings (AWGS 2019)



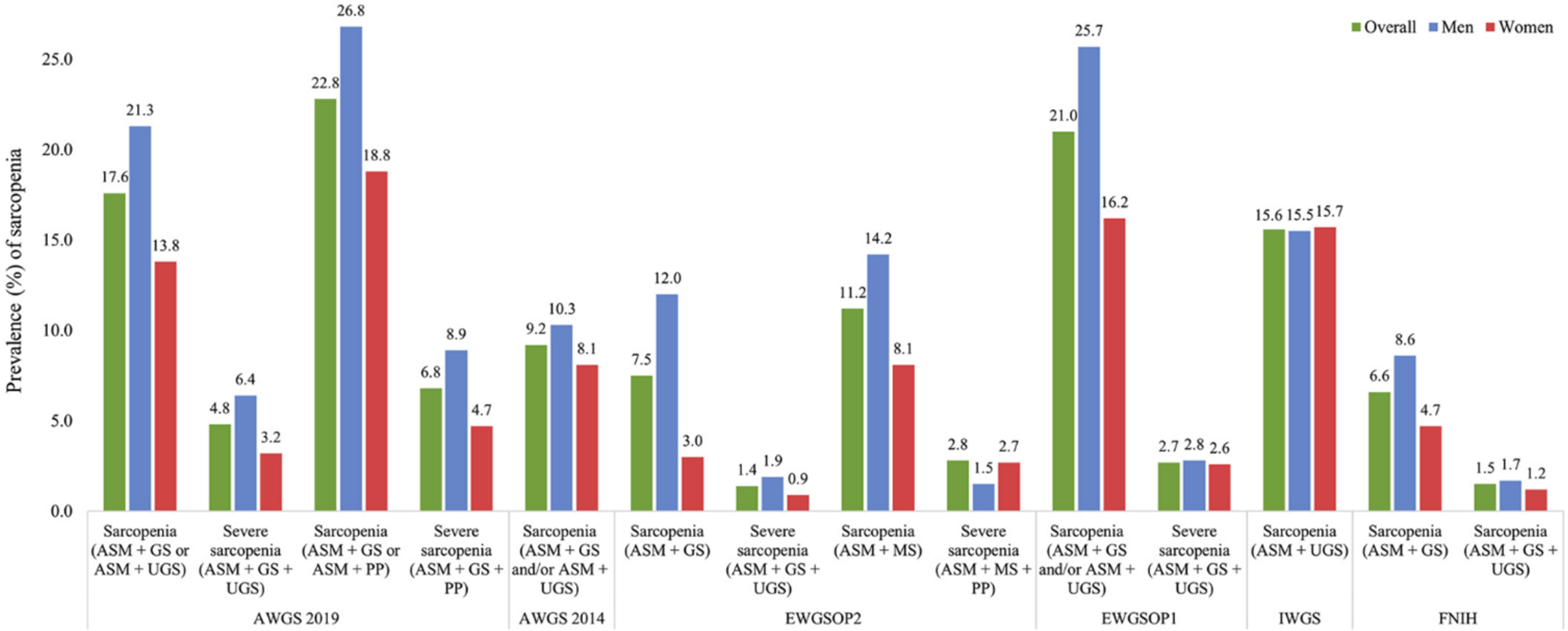
Chen LK, et al. JAMDA 2020

Healthcare or clinical research settings (AWGS 2019)



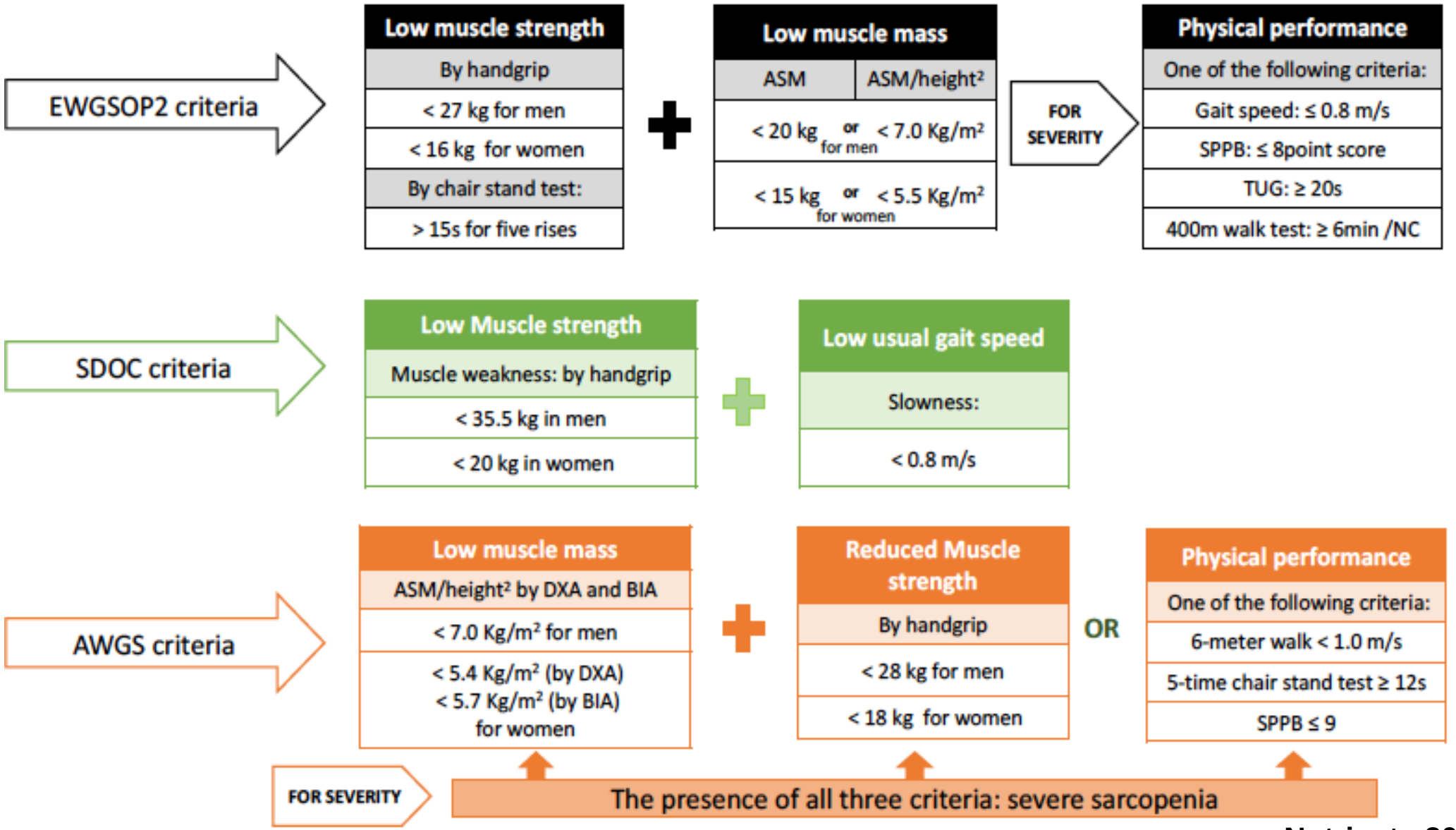
Chen LK, et al. JAMDA 2020

AWGS 2019 identifies more cases



Kim M, et al., J Am Med Dir Assoc 2020;21:752-758

Update of the sarcopenia diagnostic criteria



Nutrients 2021, 13, 761.

Global Leadership Initiative in Sarcopenia (GLIS)

- **GLIS is an international initiative aiming to produce an inclusive definition of sarcopenia that can be widely accepted by all the current consensus groups that have proposed the definitions that are used currently.**
- **Launched by consensus groups from America, Asia, Europe and Oceania, GLIS intends to involve experts from all fields related to sarcopenia and to produce a definition that can be used widely both in clinical practice and in research.**

SARCOPENIA GLOBAL DEFINITION Workflow

1. Informal meeting of members from former sarcopenia consensus group

(ANZSSFR, AWGS, EWGSOP, SDOC) 2019~2021

2. Constitution as initial steering committee: Sep. 2021

ANZSSFR – G Duque

AWGS – H Arai, LK Chen, J Woo

EWGSOP – AJ Cruz-Jentoft, F Landi, A Sayer, M Visser

SDOC – P Cawthon, R Fielding, S Bhasin

3. Involvement of organizations

Agreed to participate with different levels of involvement:

AAFS, AGS, ANZSFR, ESCEO, ESPEN, EuGMS, ICFSR, GSA, SCWD

Contacted: WHO. Not involved, but willing to promote an updated definition in future ICDs if suggested by a global group

European Geriatric Medicine (2022) 13:1239–1244
https://doi.org/10.1007/s41999-022-00706-5

SPECIAL ARTICLE

Defining terms commonly used in sarcopenia research: a glossary proposed by the Global Leadership in Sarcopenia (GLIS) Steering Committee

Peggy M. Cawthon[1,2] · Marjolein Visser[3,4] · Hidenori Arai[5] · José A. Ávila-Funes[6] · Rocco Barazzoni[7] · Shalender Bhasin[8] · Ellen Binder[9,10] · Olivier Bruyère[11] · Tommy Cederholm[12,13] · Liang-Kung Chen[14,15,16] · Cyrus Cooper[17,18] · Gustavo Duque[19,20] · Roger A. Fielding[21] · Jack G
Francesco Landi[26] · Avan A. Sayer[27] · Stephan Von Haehling[28,29] · Je

Age and Ageing 2024; **53:** afae052
https://doi.org/10.1093/ageing/afae052

RESEARCH PAPER

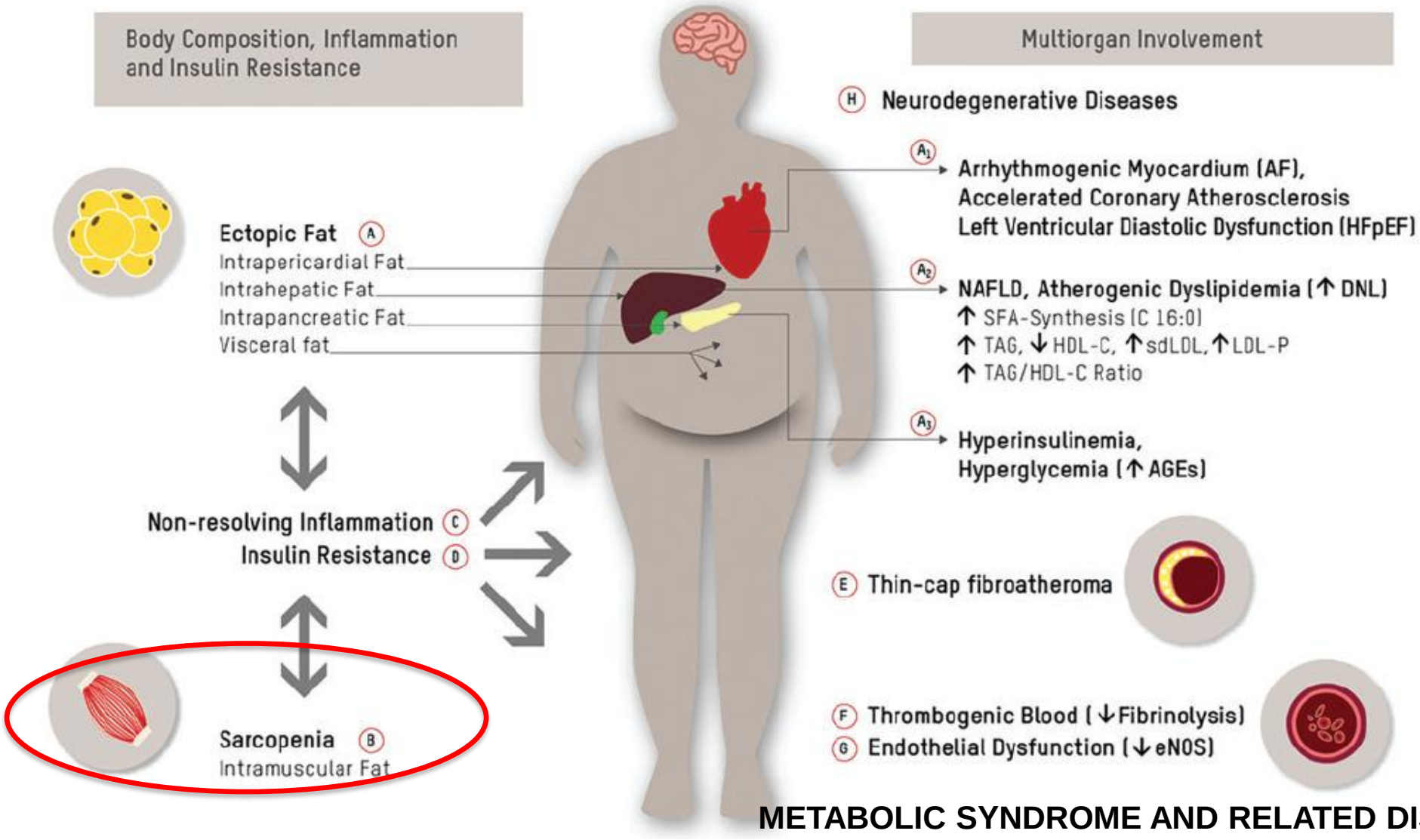
The Conceptual Definition of Sarcopenia: Delphi Consensus from the Global Leadership Initiative in Sarcopenia (GLIS)

Ben Kirk[1,2,†], Peggy M. Cawthon[3,4,†], Hidenori Arai[5], José A. Ávila-Funes[6,7], Rocco Barazzoni[8], Shalender Bhasin[9], Ellen F. Binder[10], Olivier Bruyere[11,12], Tommy Cederholm[13,14], Liang-Kung Chen[15,16], Cyrus Cooper[17,18], Gustavo Duque[19,20], Roger A. Fielding[21], Jack Guralnik[22], Douglas P. Kiel[23], Francesco Landi[24], Jean-Yves Reginster[25,26], Avan A. Sayer[27], Marjolein Visser[28,29], Stephan von Haehling[30,31], Jean Woo[32], Alfonso J. Cruz-Jentoft[33], The Global Leadership Initiative in Sarcopenia (GLIS) group[‡]

Graphical representation of the conceptual definition of sarcopenia

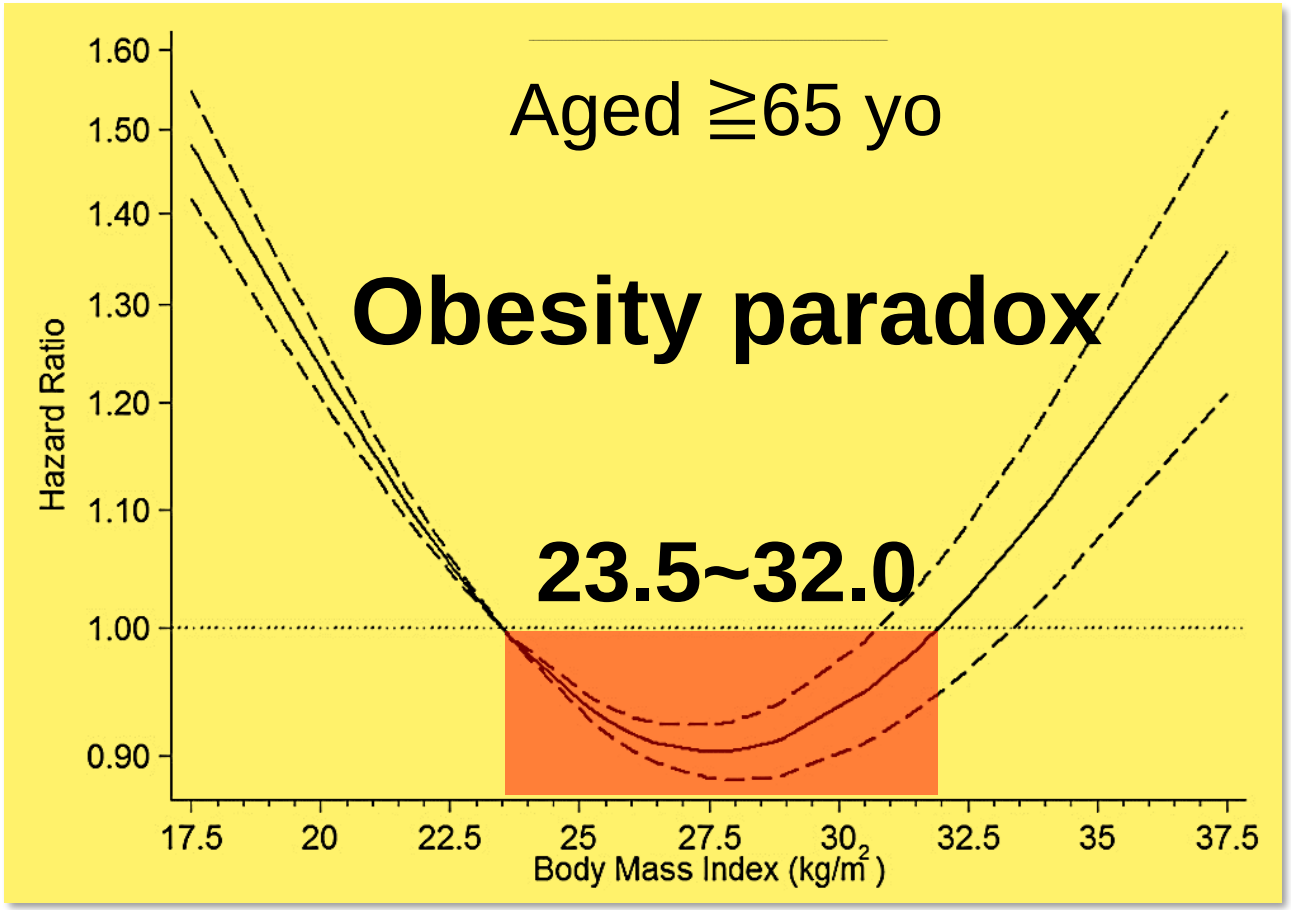
Kirk B, et al. Age and Ageing, 2024

Ectopic Adiposity Phenotype



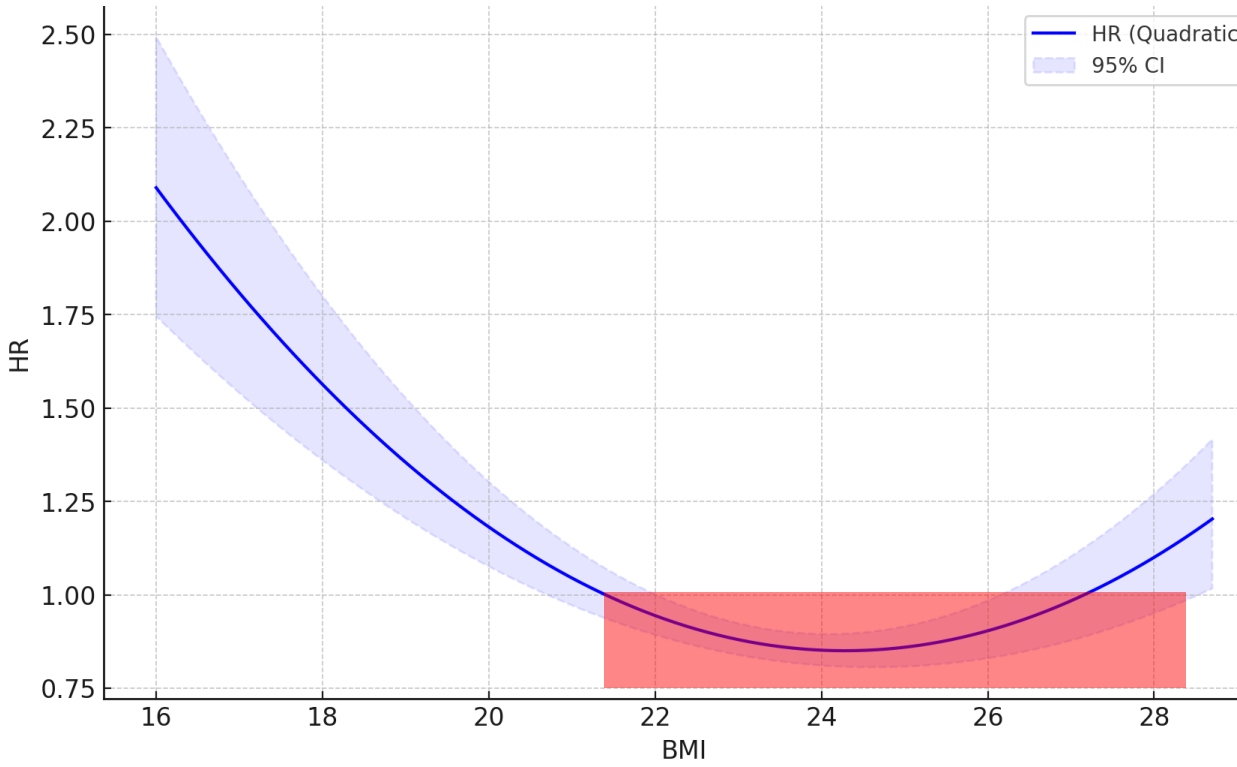
METABOLIC SYNDROME AND RELATED DISORDERS 18, 2020

Overweight-related low mortality



SR including 32 studies, n= 197,940
Community-dwelling OA
Mean follow-up 12y

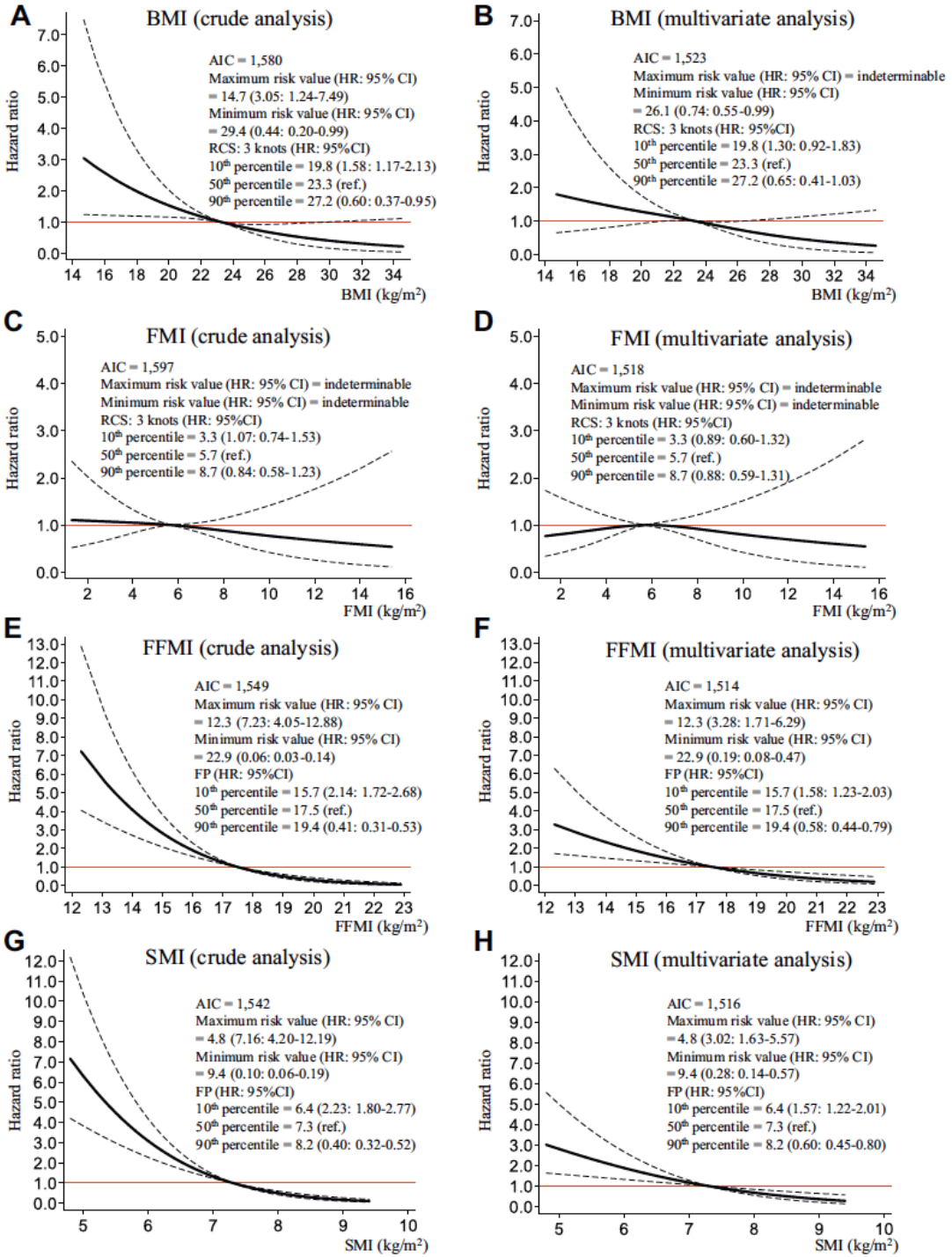
Winter JE, et al. Am J Clin Nutr. 2014;99(4):875-890.



Japanese cohort, n= 9,070
Community-dwelling OA 65-79y
Mean follow-up 11y

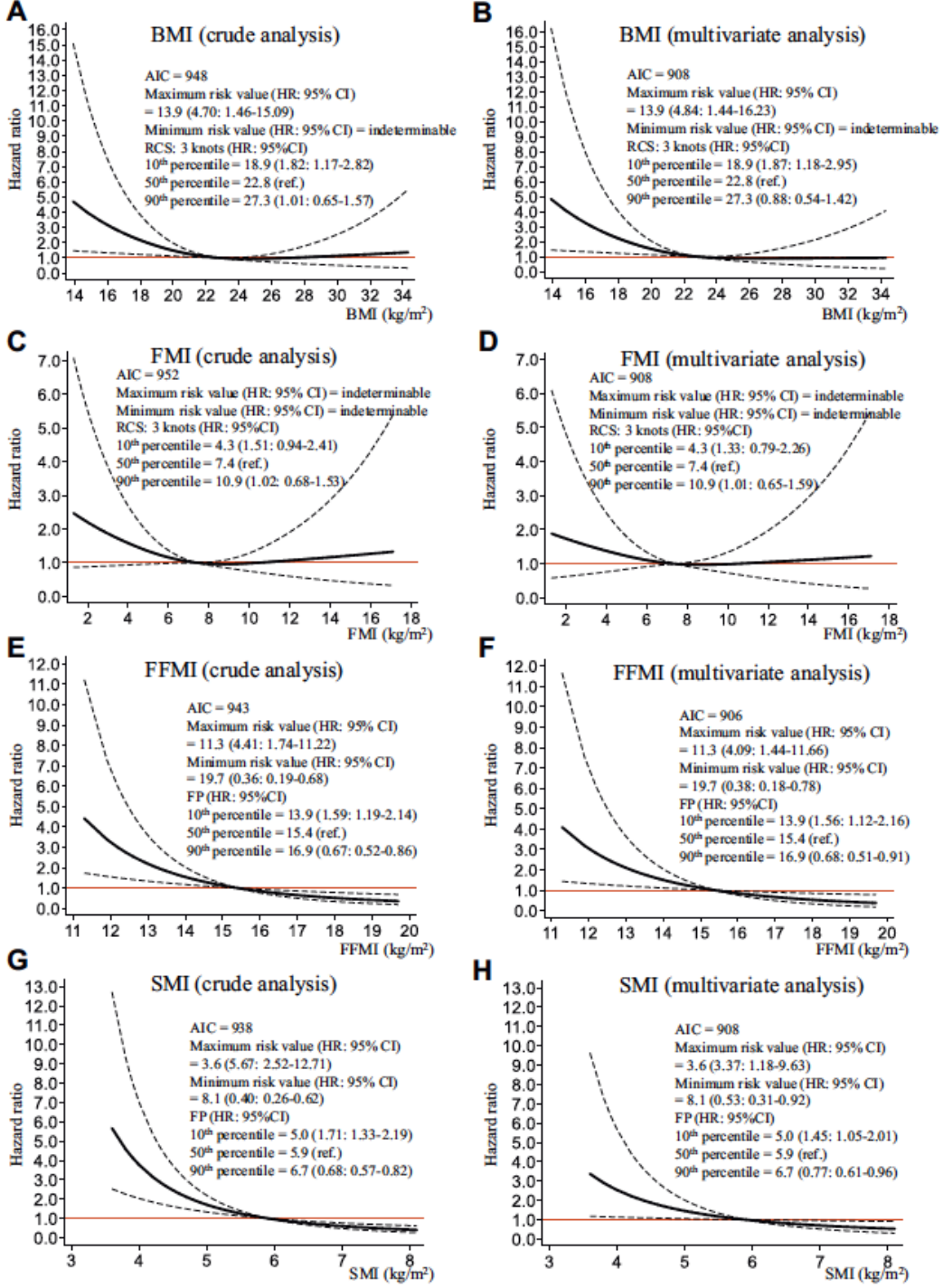
Tamakoshi A, et al. Obesity. 2010;18(2):362-9.

Dose-response relationships between body composition indices and mortality in older men



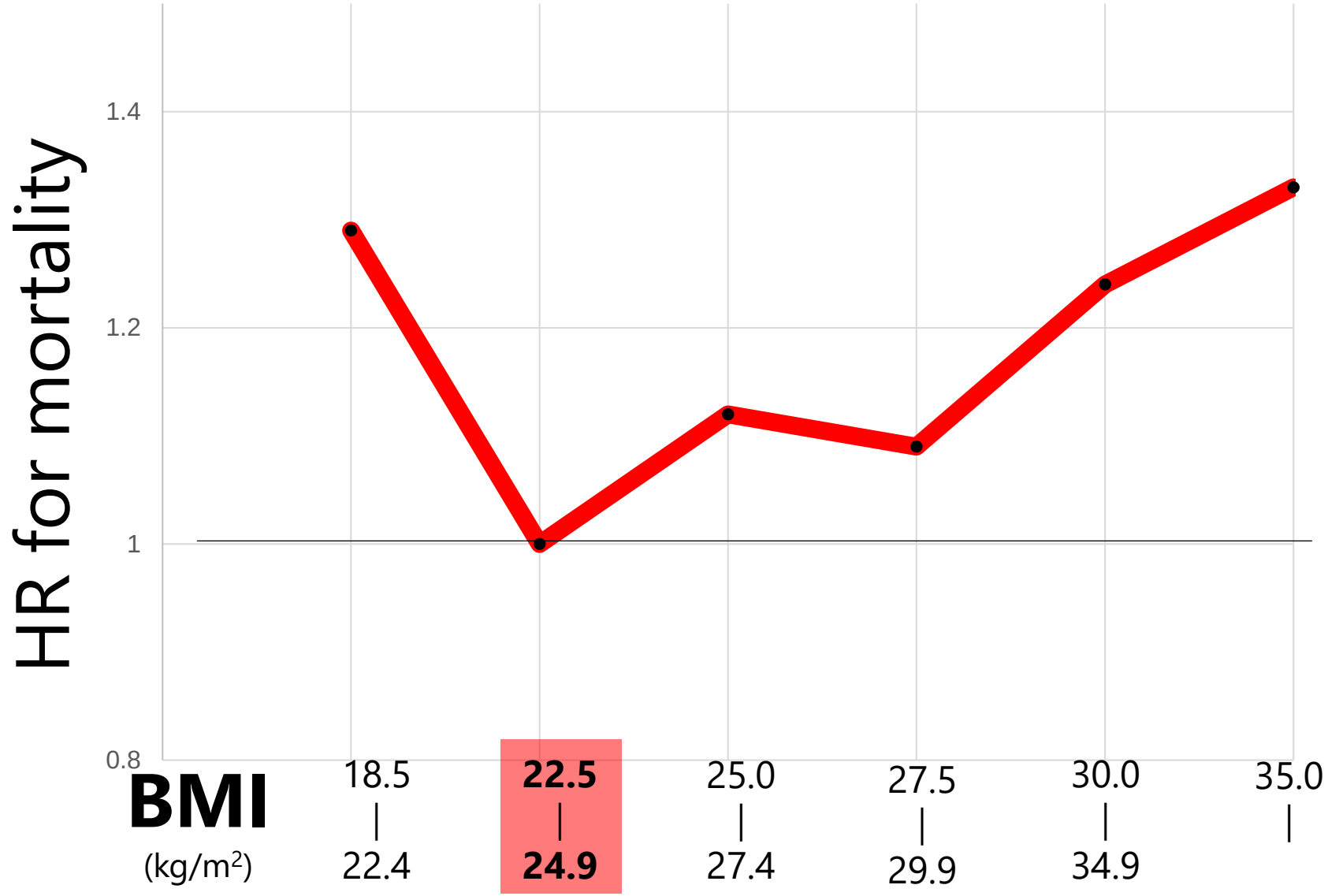
JAMDA 21 (2020) 726e733

Dose-response relationships between body composition indices and mortality in older women



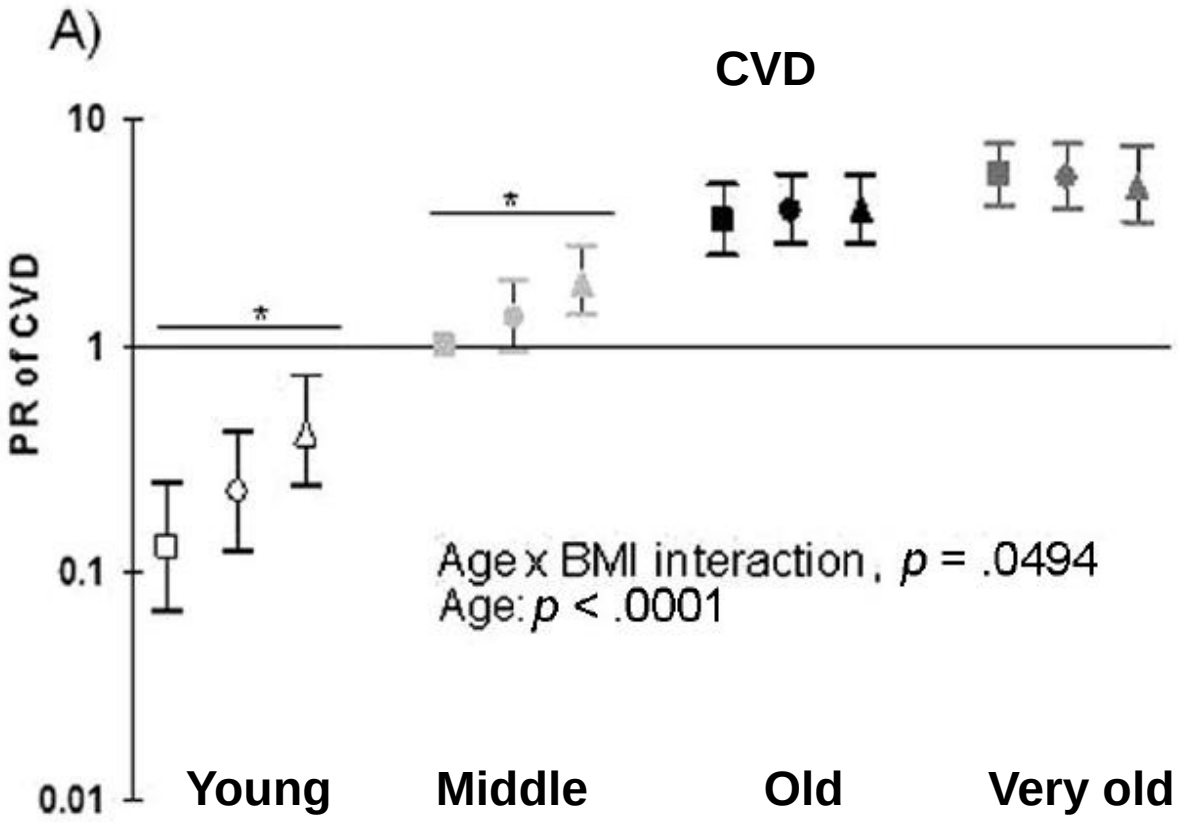
JAMDA 21 (2020) 726e733

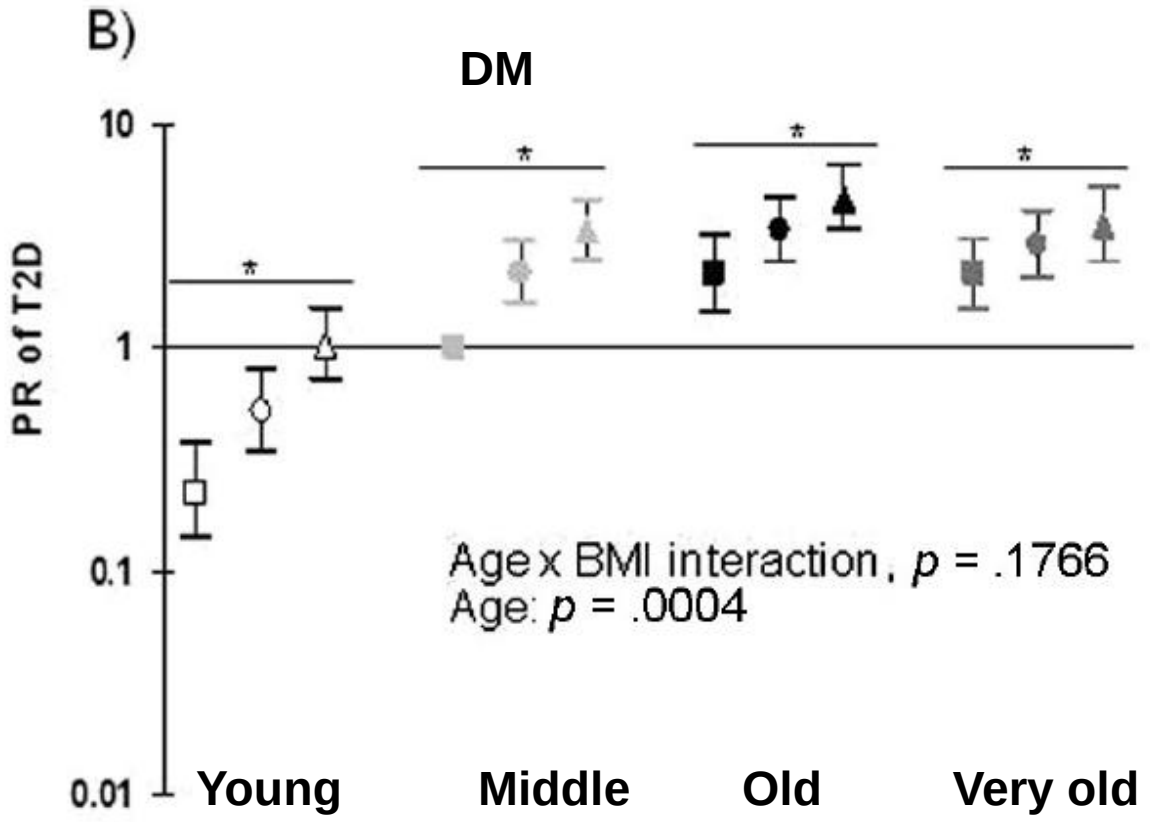
Obesity is not good in DM



Tobias DK, et al. N Engl J Med. 2014;370(3):233-44.

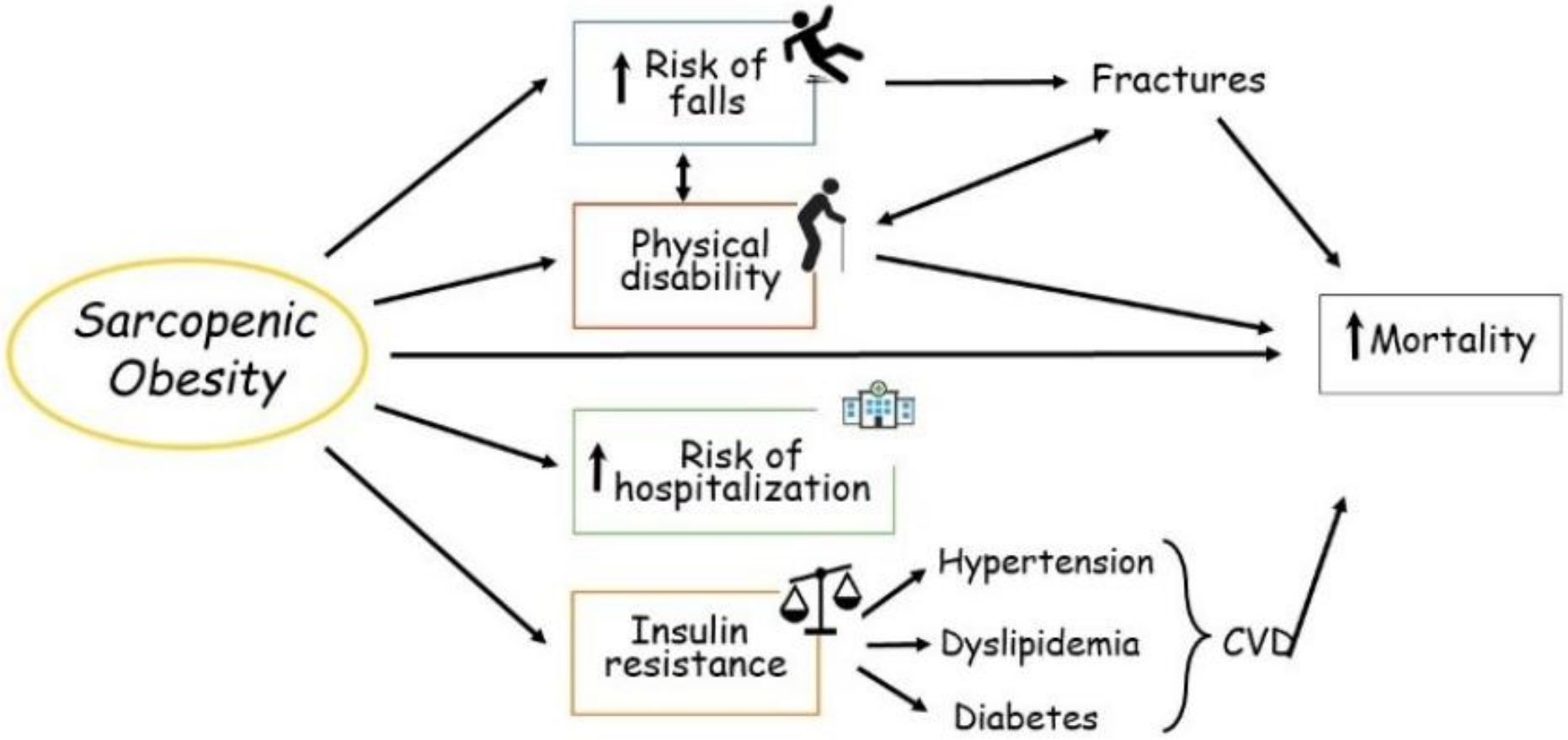
Relationship between CVD/DM and obesity in each age group





Canning KL, et al. J Gerontol A Biol Sci Med Sci. 2014;69(1):87–92

Consequences of sarcopenic obesity in older people with CVD



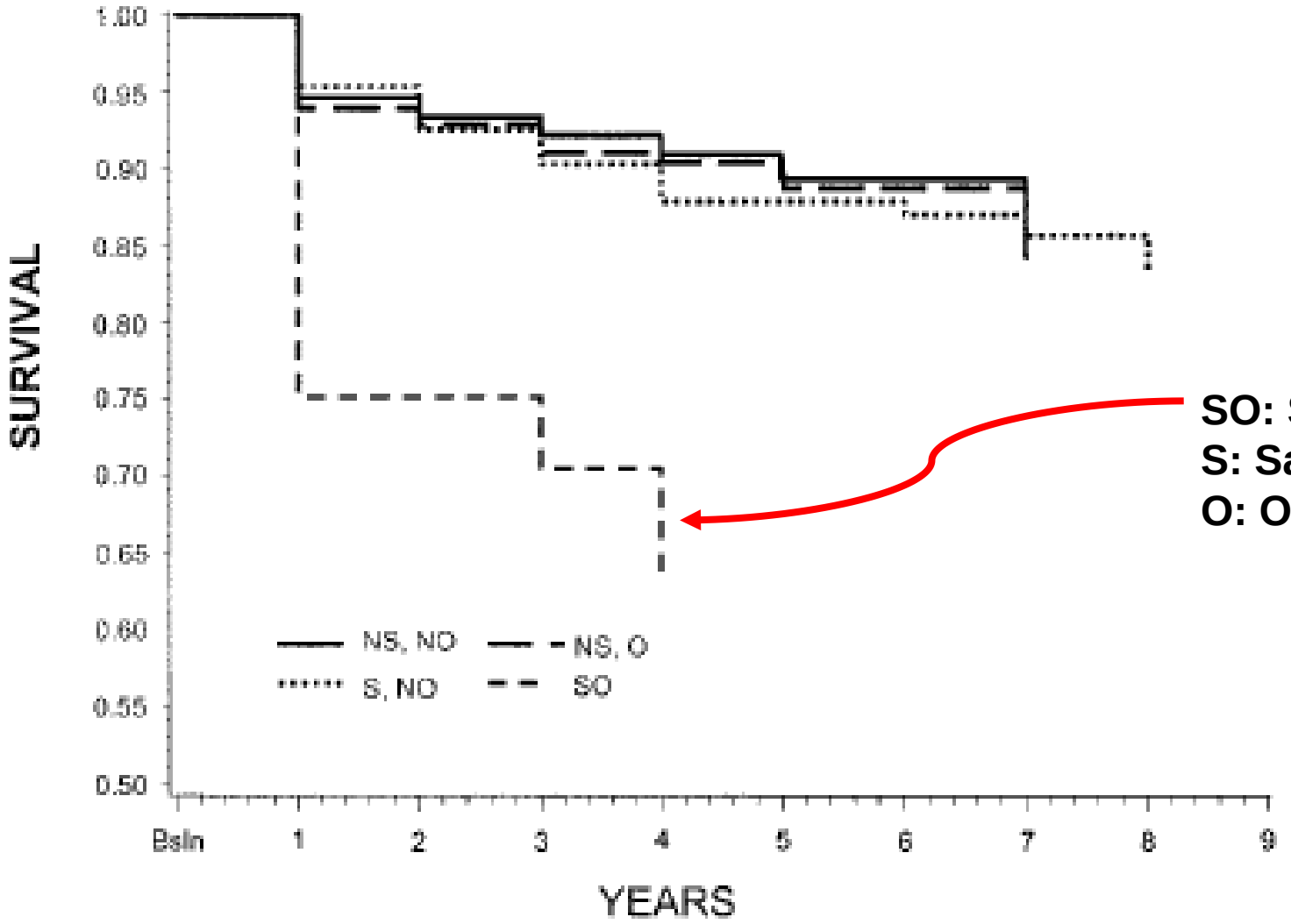
Cells 2022, 11, 3361

Prevalence of Sarcopenic Obesity in Selected Large Epidemiologic Community-Based Cohorts

References	Background	Sarcopenia	Obesity	Prevalence (%)
Baumgartner, 2000 *(13)*	New Mexico Aging Process Study (N = 831; aged 60 yr and older)	ASM/height^2 = <2.0 SD below young reference population	Fat mass = men, >27%; women, >38%	Men = 4%, women = 3%
Davison et al, 2002 *(14)*	National Health and Nutrition Examination Survey III (N = 2917; aged 70 yr and older)	Muscle mass lowest 40%	Fat mass = top 40%	7.3%
Newman et al, 2003 *(15)*	Health ABC Study (N = 2984; aged 70–79 yr)	1. ASM/height^2 2. ASM adjusted for fat and height	BMI = >30 kg/m^2	1. 0% 2. Men, 11.5%; women, 14.5%
Baumgartner, 2004 *(16)*	New Mexico Study (N = 451, 172 [men] and 279 [women]; mean age = 72.8 yr)	ASM/height^2 = <2.0 SD below young reference population	Fat mass = men, >27%; women, >38%	Men + women = 5.8%
Schrager et al, 2007 *(17)*	InCHIANTI study (N = 871, men, 378; women, 493; aged 70 yr and older)	Grip strength = lowest tertile	Waist circumference: upper tertile BMI ≥30 kg/m^2	Waist circumference = men, 11% and women, 12% BMI = men, 5% and women, 11%
Stenholm et al, 2008 *(3)*	Baltimore Longitudinal Study on Aging (N = 1826; mean age: 75.8)	Grip strength = lowest sex-specific tertile Men, <33 kg Women, <20 kg	BMI = ≥30 kg/m^2	Men, 3.5% and women, 6.6%
Stenholm et al, 2008 *(3)*	Longitudinal Aging Study Amsterdam (N = 1189; mean age: 75.8)	Grip strength = lowest sex-specific tertile	BMI = ≥30 kg/m^2	Men, 5.1% and women, 5.9%
Bouchard et al, 2009 *(18)*	Nutrition as a determinant of successful aging (N = 894; 62–82)	ASM/height^2 = <2.0 SD	Percent body fat = men, >28% and women, >35%	Men, 19% and women, 11%
Rolland et al, 2009 *(19)*	Elderly French women EPIDemiologie de l'OSteoporose Study (N = 1308; aged 75 yr and older)	ASM/height^2 = <2.0 SD	Percent body fat = >40%	Women, 2.7%
Kim et al, 2012 *(20)*	Fourth Korean National Health and Nutrition Examination Surveys (N = 3196; aged 50 yr and older)	1. ASM/height^2 2. ASM/weight Both ≤2.0 SD	Waist circumference = men, >90 cm; women, >85 cm	1. Men, 0.2%; women, 0% 2. Men, 7.6%; women, 9.1%

Cauley JA. Journal of Clinical Densitometry: Assessment & Management of Musculoskeletal Health, 2015

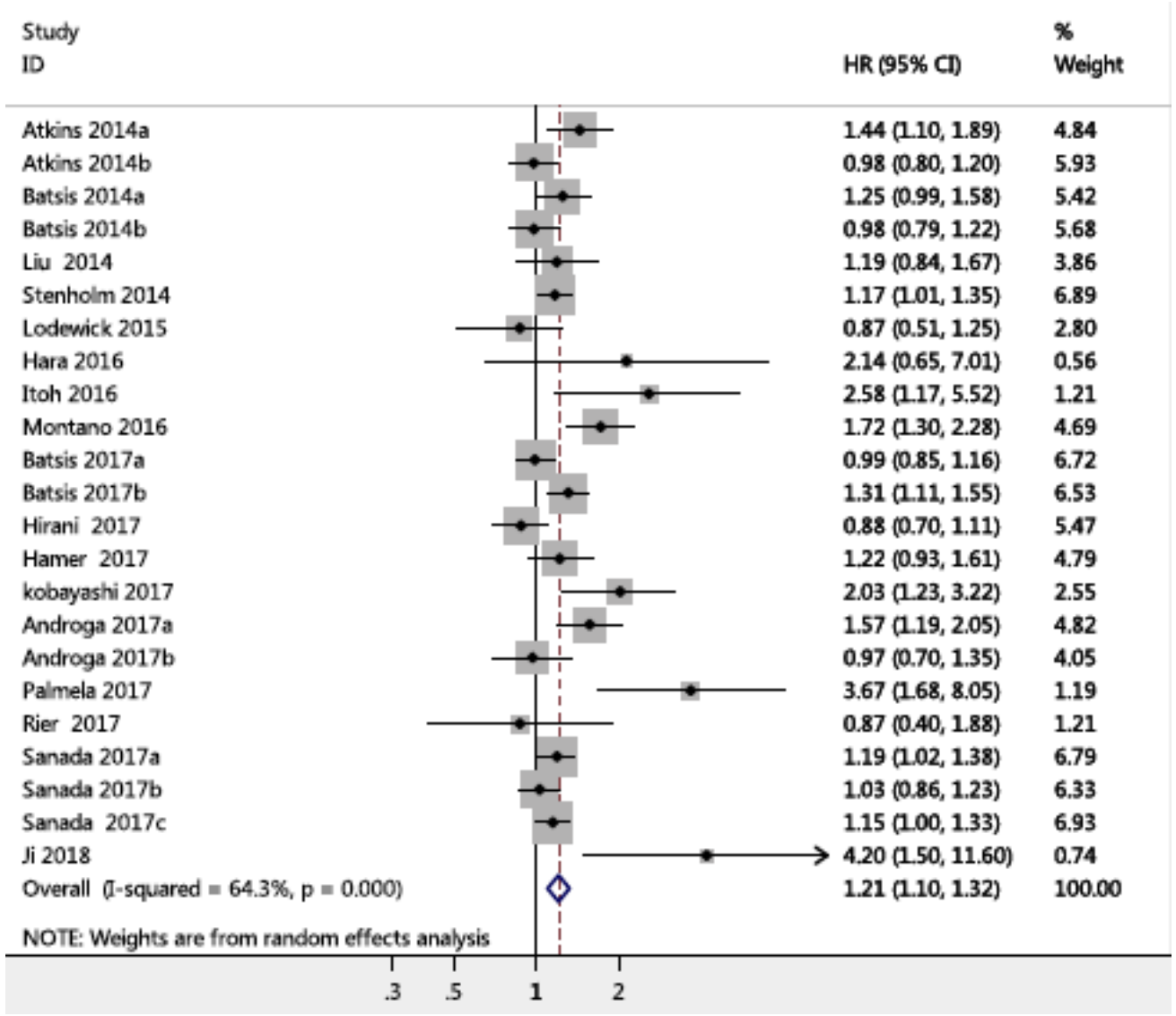
Kaplan-Meier survival curve for time to drop in IADL by body composition type



SO: Sarcopenic Obesity
S: Sarcopenia
O: Obesity

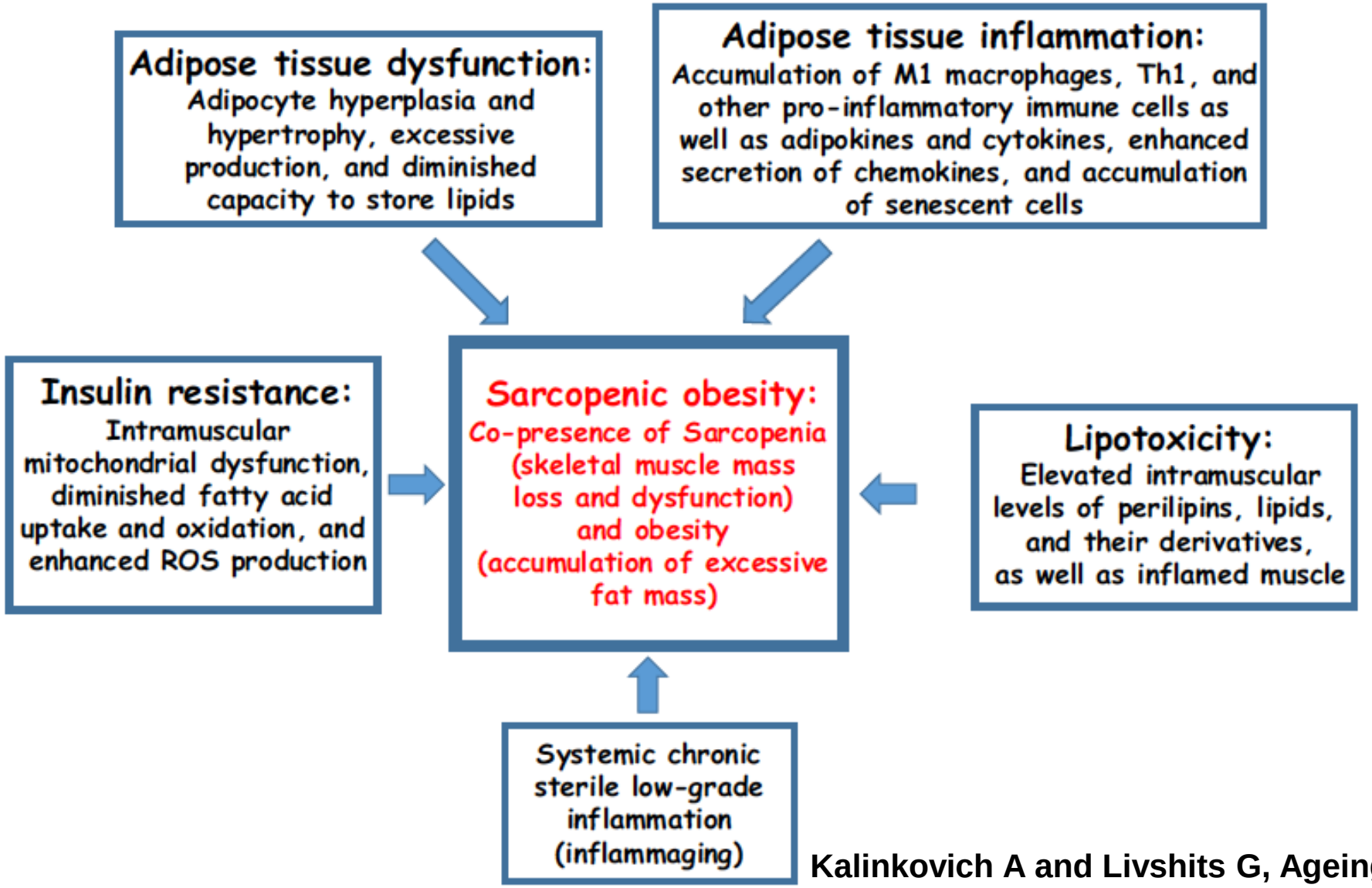
Baumgartner RN, et al. Obesity Res, 2004

Increased risk of death by Sarcopenic obesity



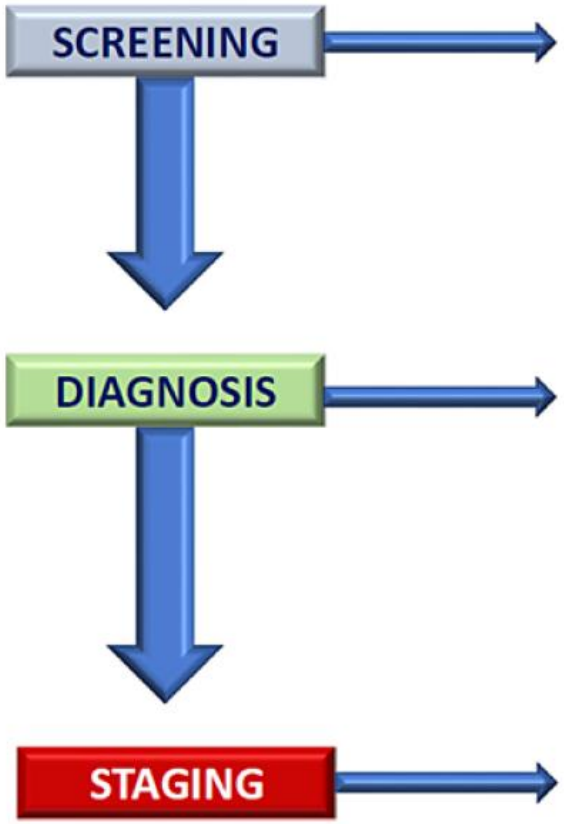
Zhang X, et al. BMC Geriatrics 2019;183

Mechanisms involved in sarcopenic obesity pathogenesis



Kalinkovich A and Livshits G, Ageing Research Reviews

Diagnostic procedure for the assessment of sarcopenic obesity (ESPEN and EASO)



- High **BMI or WC** (based on ethnic cut-points)
- **Surrogate parameters for sarcopenia** [clinical symptoms, clinical suspicion or questionnaires (e.g. SARC-F in older subjects)]

Both conditions *must be present to proceed with the diagnostic process.*

It will be performed in ***two steps:***

1. ALTERED SKELETAL MUSCLE FUNCTIONAL PARAMETERS considering **strength** (HGS, chair stand test)

If muscle functional parameters suggest the presence of SO, the diagnostic process will continue considering body composition.

2. ALTERED BODY COMPOSITION: increased FM (FM%) and **reduced muscle mass** assessed as ALM/W by DXA or as SMM/W by BIA

Both ***altered body composition*** *and* ***altered skeletal muscle functional parameters*** *should be present to assess the presence of SO.*

A two-level STAGING should be performed, based on the presence of complications **resulting from high FM and low ASMM,** to better mirror the progression/severity of SO:

- **STAGE I: NO complications**
- **STAGE II: presence of at least one complication attributable to SO** (e.g. metabolic diseases, functional disabilities, cardiovascular and respiratory diseases).

Obes Facts 2022;15:321–335

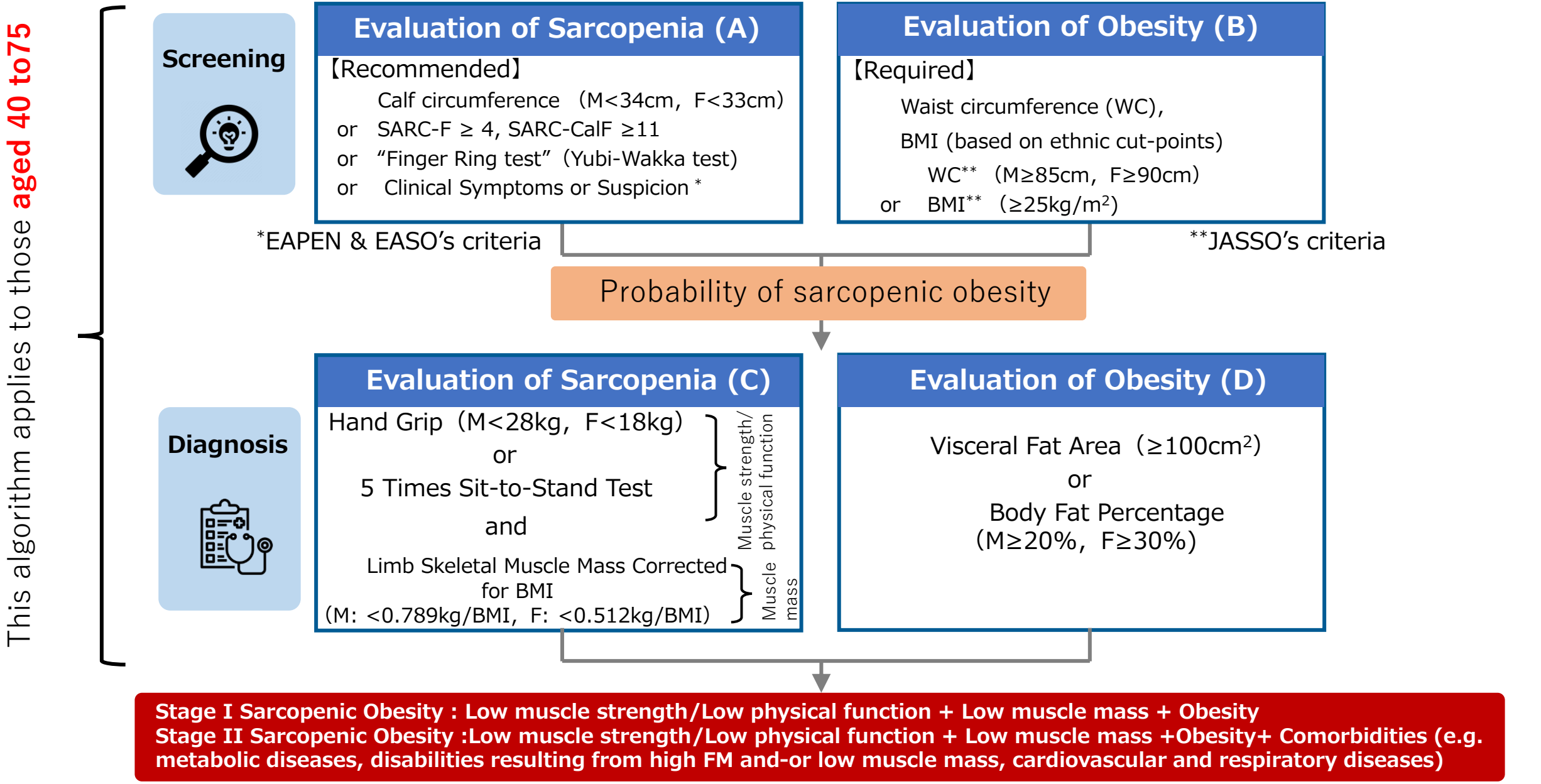
Working Group on Sarcopenic Obesity

Japanese Association on Sarcopenia and Frailty (JASF)

Japan Society for the Study of Obesity (JASSO)

Chairman: Kojiro Ishii

Members: Hidenori Arai, Kojiro Ueki, Hidetaka Wakabayashi, Minoru Yamada, Yutaka Kimura, Yoshifumi Tamura, Wataru Ogawa, Toru Kusakabe, Kiyoshi Sanada, Ryo Miyazaki, Yuya Watanabe, Yuki Someya



Diagnostic Algorithm for Sarcopenic Obesity in Japan

By Joint Committee of the Japan Society for the Study of Obesity (JASSO) and the Japanese Association on Sarcopenia and Frailty (JASF)

Sarcopenic obesity

?

Sarcopenia + obesity

Osteosarcopenia

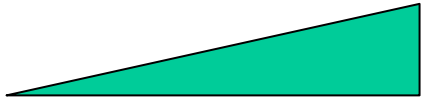
?

Osteoporosis or osteopenia + sarcopenia

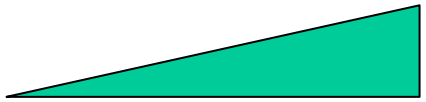
Sarcopenia vs. Sarcopenic obesity

Etiology: aging, physical inactivity, low nutritional intake, chronic inflammation

Insulin resistance

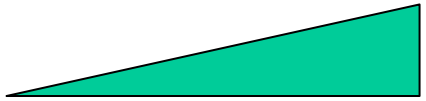


Intramuscular fat infiltration



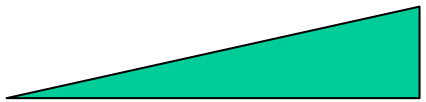
Outcomes: disability, falls, fractures, mortality

CVD

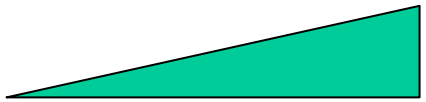


Interventions: diet and exercise

Weight reduction



CVD prevention



Take home message

- **Sarcopenia is one of the important geriatric diseases that need to be addressed for healthy longevity.**
- **Sarcopenia is commonly accompanied by cardiometabolic diseases and is associated with several clinical outcomes such as cardiovascular diseases, falls, fractures, disability, and mortality.**
- **The diagnostic algorithm has been established by the Asian Working Group for Sarcopenia (AWGS) in Asia, and GLIS has now developed the global consensus.**
- **Sarcopenic obesity is also associated with cardiovascular outcomes, and a consensus needs to be developed for the diagnosis.**

Acknowledgments

- Minoru Yamada, Tsukuba University
- Members of AWGS, JWGSO, and GLIS

Thank you very much for your kind attention