De Krijgskunst van het Leven

Actief en Gezond Ouder Worden

Prof. David Beckwée

VUB RERE REHABILITATION RESEARCH GROUP
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University of Antwerp
MOVANT | Movement Antwerp

Revalidatie en preventie in de context van Gezond Ouder Worden

Conflict of Interest

Geen financiële of persoonlijke relaties die kunnen worden opgevat als een potentieel belangenconflict.

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We streven ernaar om het beste wetenschappelijke bewijs te leveren voor **revalidatiestrategieën** om de **kwaliteit van leven** te verbeteren door het **fysiek functioneren** te optimaliseren.

Wij geloven dat levenslange **fysieke autonomie** haalbaar is.

Gezond ouder worden

Kwetsbaarheid

Sarcopenie

Fysieke activiteit – Oefenen

Gezond ouder worden

Kwetsbaarheid

Sarcopenie

Fysieke activiteit – Oefenen

Gezond ouder worden is het **proces** van ontwikkeling en behoud van

Functioneel vermogen

&

Intrinsieke capaciteiten

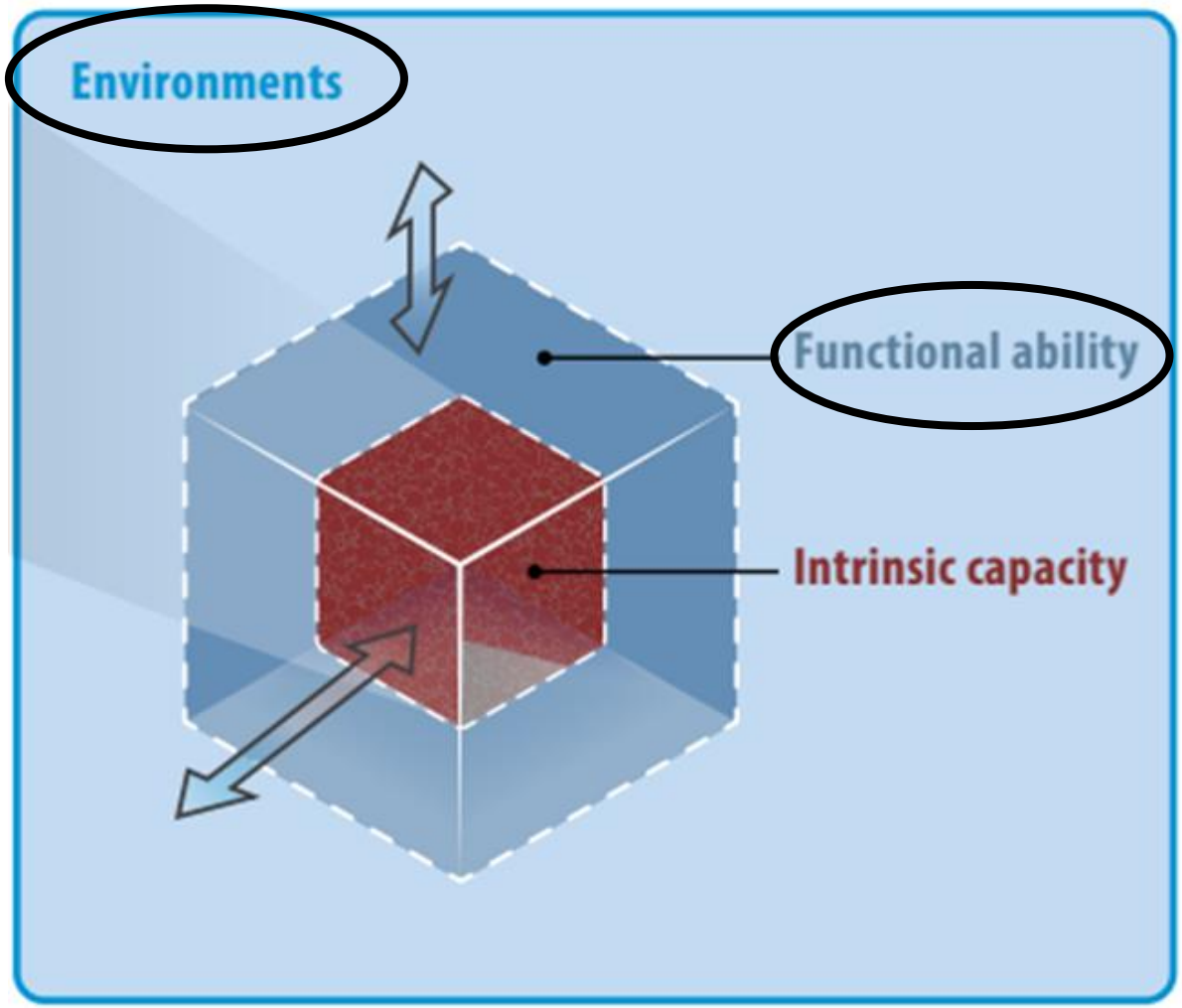
dat welzijn op oudere leeftijd mogelijk maakt.

World Health Organization

WORLD REPORT ON **AGEING AND HEALTH**

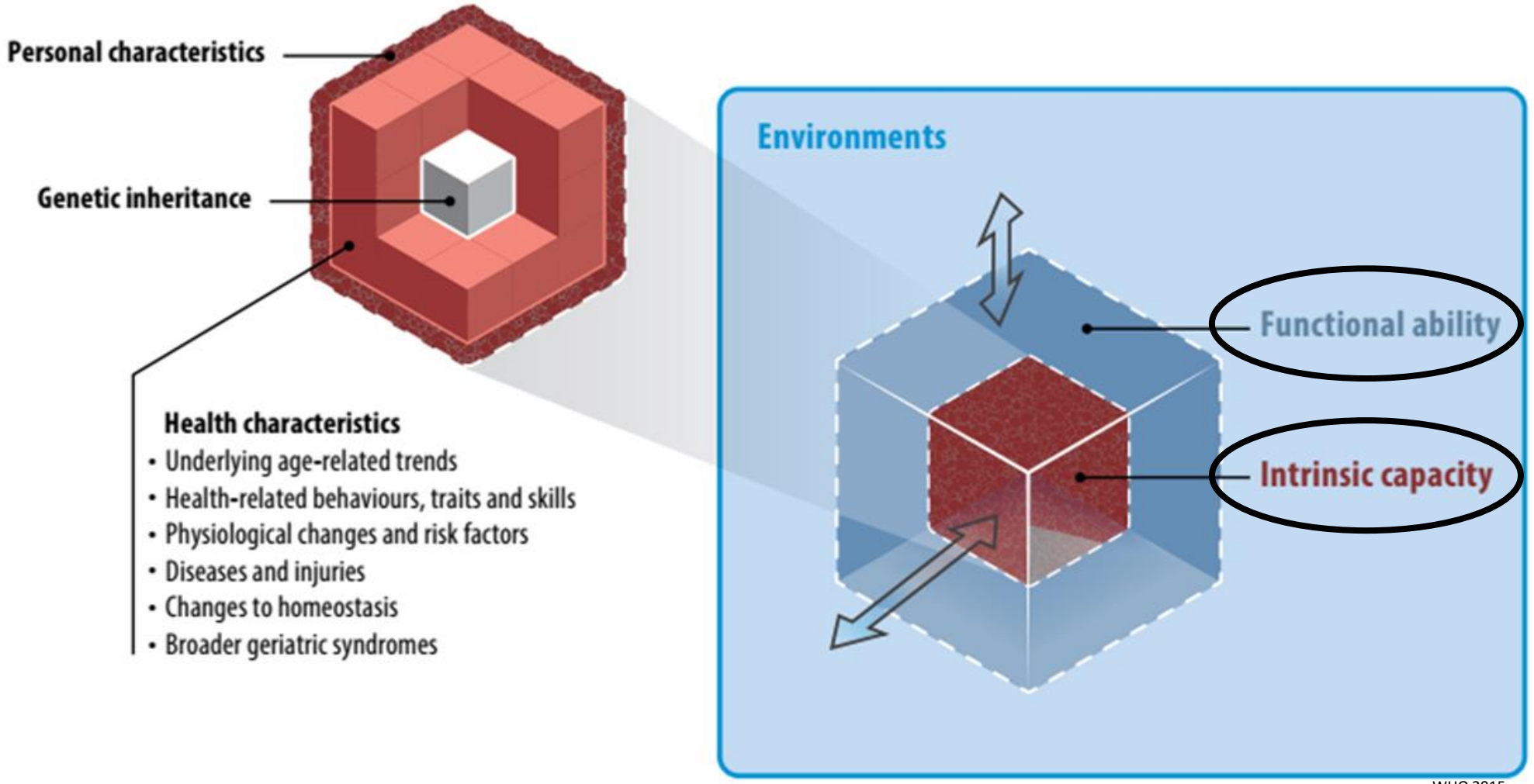
WHO 2015

Functioneel vermogen wordt bepaald door de omgeving en de interactie daarmee



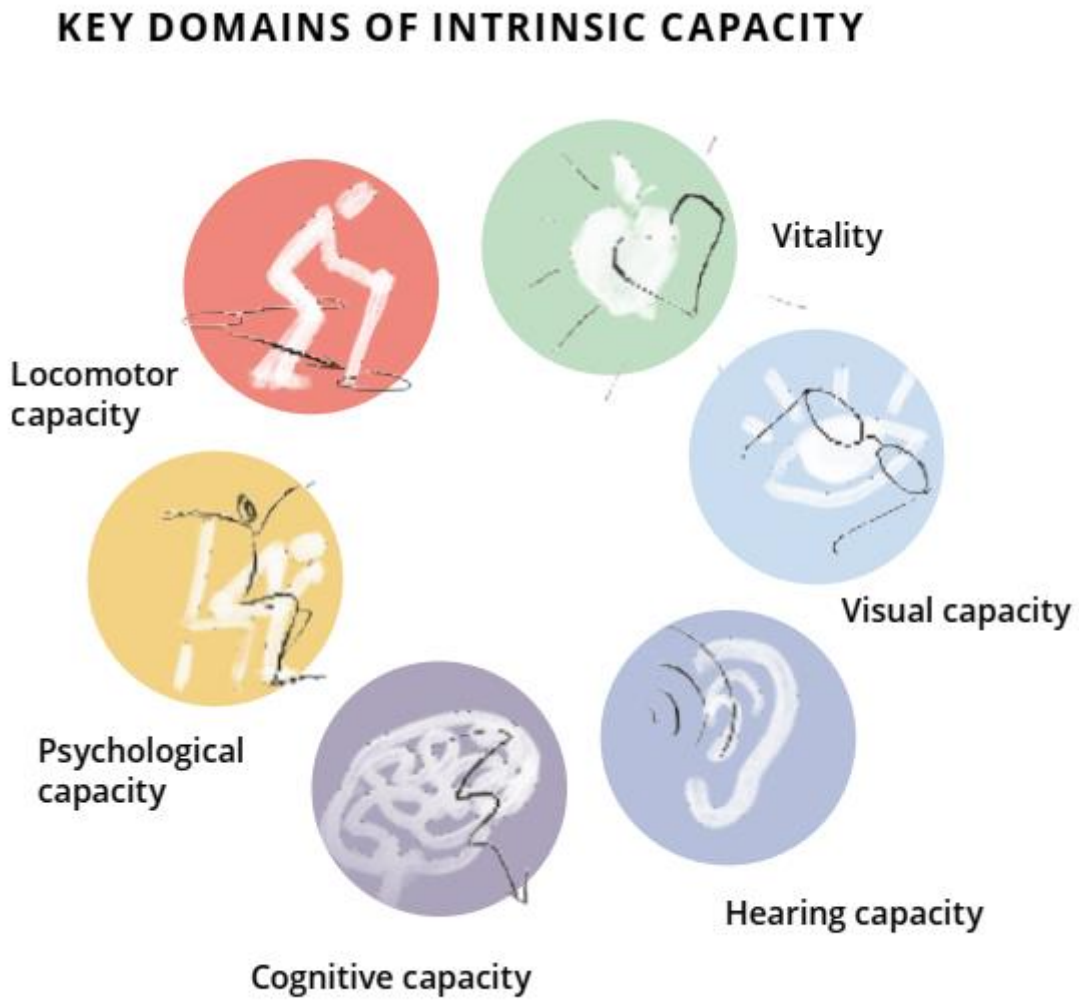
WHO 2015

Functioneel vermogen wordt ook bepaald door intrinsieke capaciteit



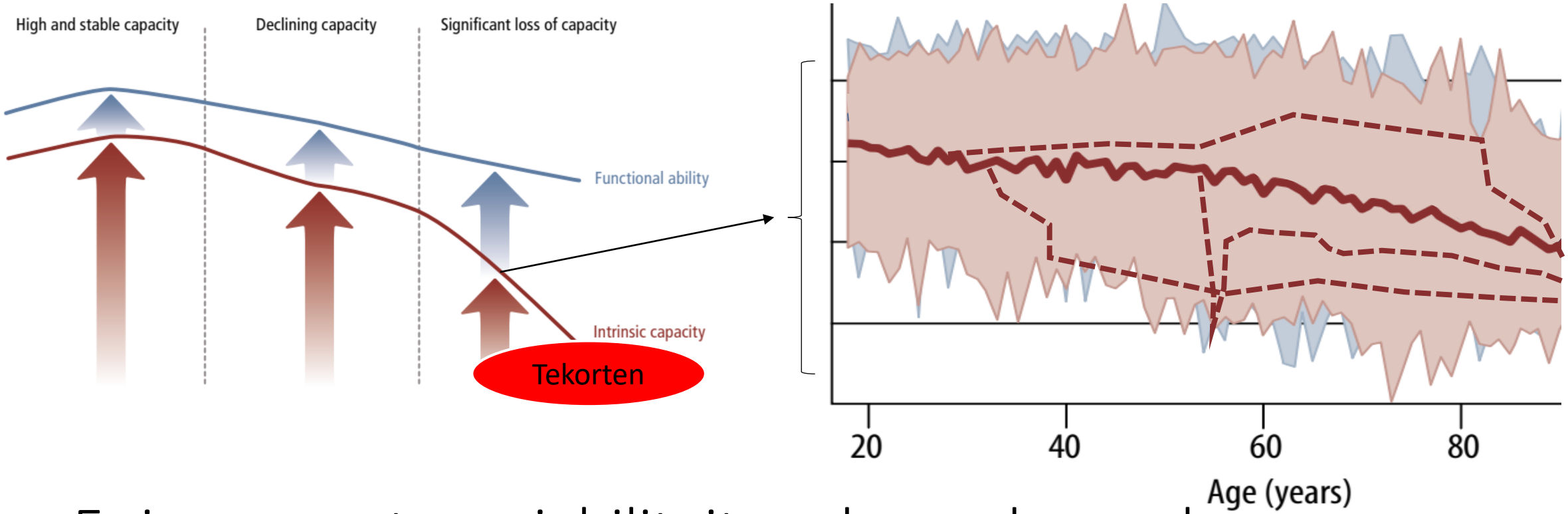
WHO 2015

Intrinsieke capaciteit is de samenstelling van fysieke en mentale capaciteiten van een persoon



WHO 2019

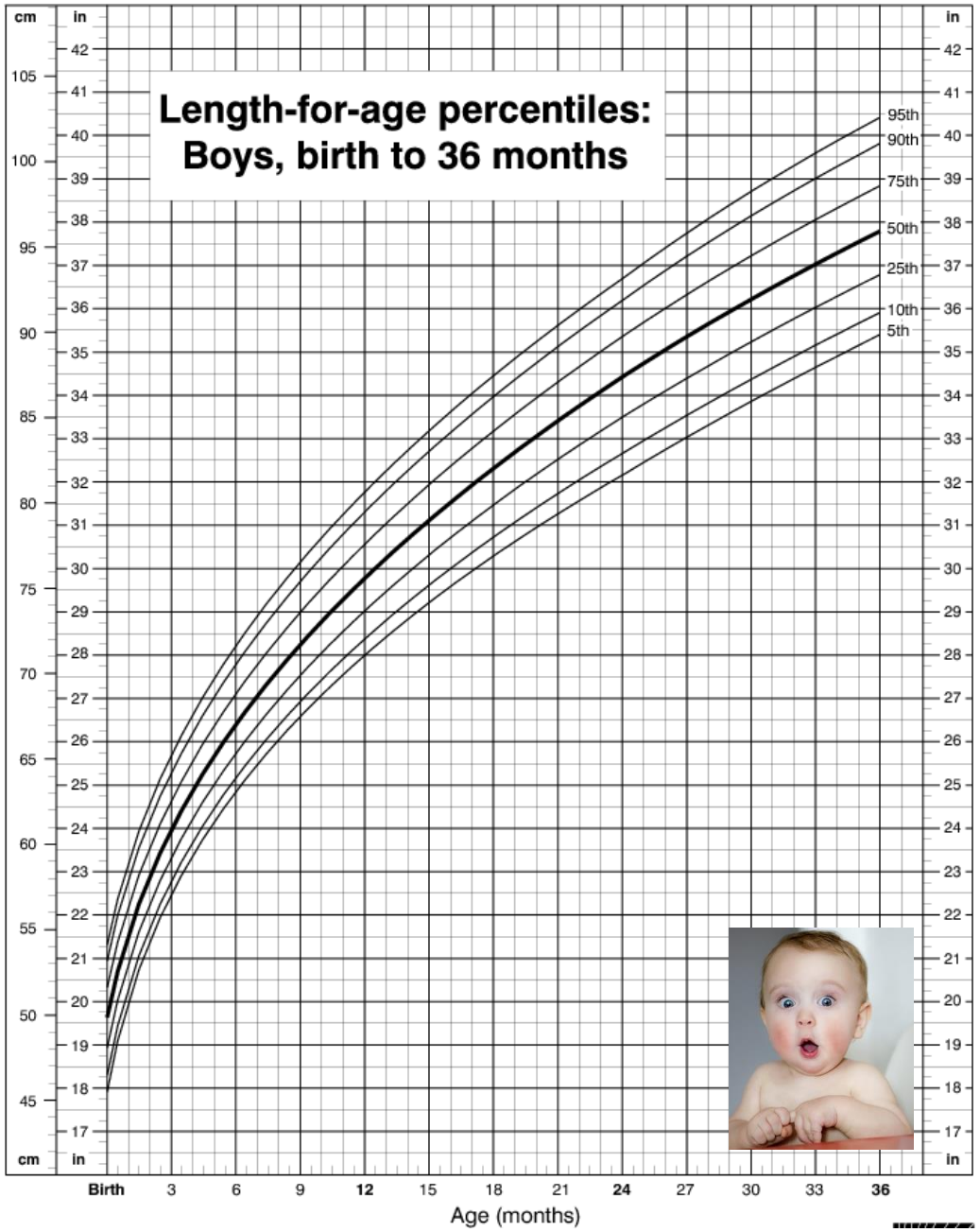
De intrinsieke capaciteit en het functioneel vermogen nemen af met de leeftijd als gevolg van het verouderingsproces/ziekte.

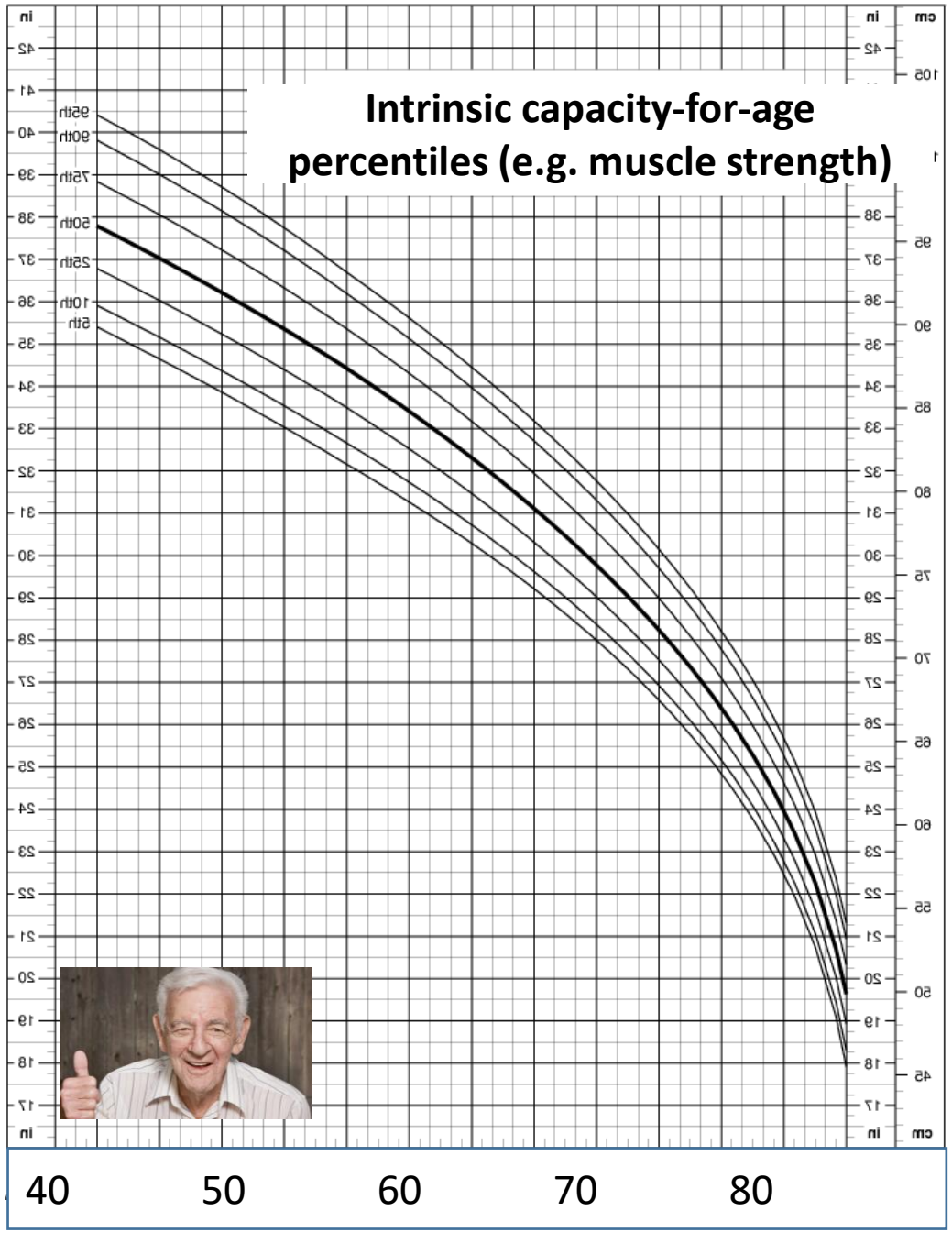


Er is een grote variabiliteit onder oudere volwassenen

→ Individuele trajecten

WHO 2015


Length-for-age percentiles:
Boys, birth to 36 months
95th
90th
75th
50th
25th
10th
5th
cm
in
Birth
3
6
9
12
15
18
21
24
27
30
33
36
Age (months)


Intrinsic capacity-for-age
percentiles (e.g. muscle strength)
40
50
60
70
80

Trajectories of Maintenance and Resilience in Healthful Eating and Exercise Behaviors in Older Adults

Journal of Aging and Health
2019, Vol. 31(5) 861–882

DOI: 10.1177/0898264317746264
journals.sagepub.com/home/jah
SAGE

Phillip G. Clark, ScD[1],
Geoffrey W. Greene, PhD, RD, LDN[1],
Bryan J. Blissmer, PhD[1], Faith D. Lees, MS[1],
Deborah A. Riebe, PhD[1],
and Karen E. Stamm, PhD[1]

Discriminating Heterogeneous Trajectories of Resilience and Depression After Major Life Stressors Using Polygenic Scores

Katharina Schultebraucks, PhD; Karmel W. Choi, PhD; Isaac R. Galatzer-Levy, PhD; George A. Bonanno, PhD

A LITERATURE REVIEW OF HEALTHY AGING TRAJECTORIES THROUGH QUANTITATIVE AND QUALITATIVE STUDIES: A PSYCHO-EPIDEMIOLOGICAL APPROACH ON COMMUNITY-DWELLING OLDER ADULTS

A. ZAMUDIO-RODRÍGUEZ[1], J.-F. DARTIGUES[1], H. AMIEVA[1], K. PÉRÈS[1]

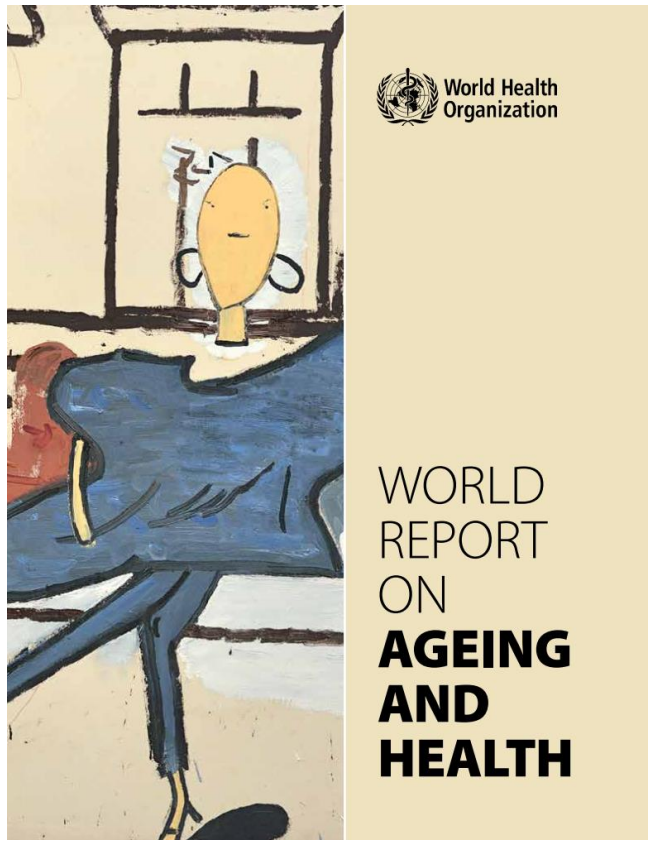
Cognitive, physical and disability trajectories in community-dwelling elderly people

Ottavia Eleonora Ferraro[1] · Antonio Guaita[2] · Simona Villani[1]

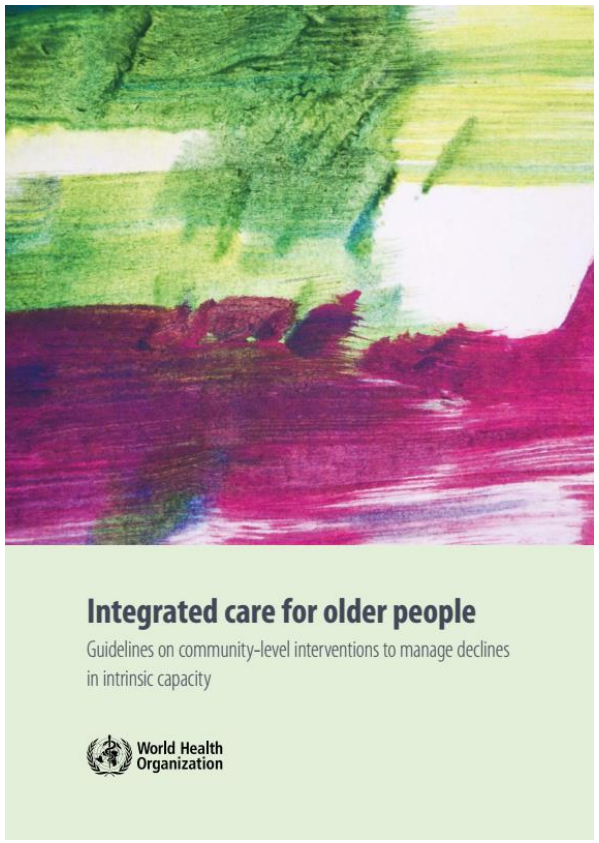
Trajectories of cognitive function in community-dwelling older adults: A longitudinal study of population heterogeneity

Zimu Wu[1] | Robyn L. Woods[1] | Rory Wolfe[1] | Elsdon Storey[1] | Trevor T. J. Chong[2,3,4] | Raj C. Shah[5] | Suzanne G. Orchard[1] | John J. McNeil[1] | Anne M. Murray[6] | Joanne Ryan[1] | the ASPREE Investigator Group[1]

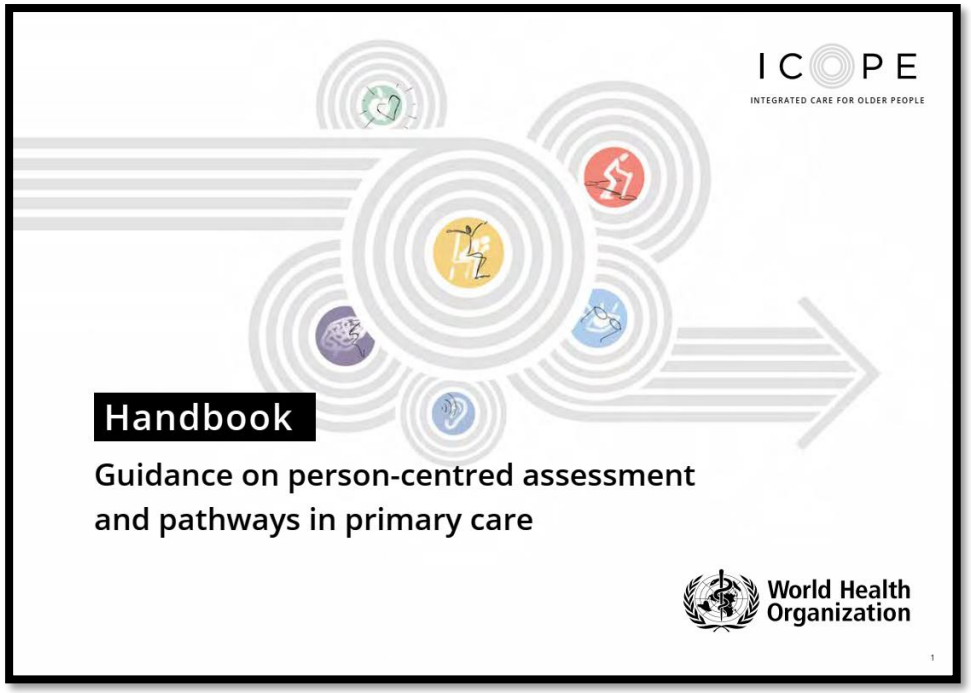
Healthy Ageing: van concept tot handboek



2015



2017



2019

Integrated care for older people

Guidelines on community-level interventions to manage declines in intrinsic capacity

World Health Organization

WHO 2017

De aanwezigheid van een capaciteitsvermindering leidt altijd tot een dringende verwijzing voor medische beoordeling

Recommendation 1

Multimodal exercise, including progressive strength resistance training and other exercise components (balance, flexibility and aerobic training), should be recommended for older people with declining physical capacity, measured by low gait speed, grip strength and other physical performance measures.

Quality of the evidence: ***moderate***
Strength of the recommendation: ***strong***

4

Cognitive capacity

Care pathways to mana cognitive decline

Simple memory and orientation

1. **Remembering three words:**
   Ask the person to remember three w
   that you will say. Use simple, concre
   such as *"flower", "door", "rice"*
2. **Orientation in time and space:**
   Then, ask, *"What is the full date today*
   "Where are you now?" (home, clinic, e
3. **Recalling three words:**
   Now ask the person to repeat the th
   that you mentioned

Pass or fail?
If a person cannot answer one of the two
about orientation **OR** cannot remember
words, **cognitive decline is likely** and f
assessment is called for

* Vitamin deficiency, electrolyte abnormality, severe dehydration

** Cardiovascular risk factors: hypertension, high cholesterol, diabetes, smoking, obesity, heart d previous stroke or transient ischaemic attack.
Risk reduction of cognitive decline and dementia: Guidelines – https://apps.who.int/iris/handle/10665

World Health

5

Locomotor capacity

Care pathways to improve mobility

Multimodal exercise → 5.1

A multimodal exercise programme fo
with limited mobility combines exerc
cross-training with emphasis on the
groups of back, thigh, abdomen and

A multimodal exercise programme sh
tailored to suit individual capacities
The **Vivifrail project** offers a practic
to developing an exercise programm
to capacities
http://www.vivifrail.com/resources

For WHO global recommendations
physical activity, see box, page 30

Specialized care needed

World Health

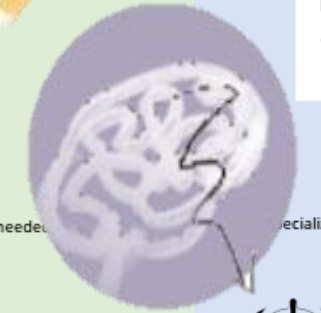
6

Vitality

Care pathways to mana ion

upplemental nutritic

al nutrition (OSN) pr
in, calories and ade
rals tailored to an i
limitations



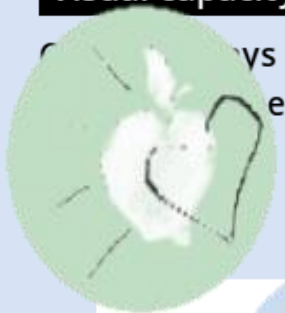
Specialized care needed

World Health

7

Visual capacity

ys to manage ent



Fail in distanc
for compreh

VISUAL IMP

Distance vision i

- Mild – visual acuity
- Moderate – acuity worse than 6/18
- Severe – acuity worse than 6/60
- Blindn than 3/60.

Near

6 or M.08

ecialized care n

World Health

8

Hearing capacity

Care pathways to manage hearing loss

Specialized care needed

World Health

9

Psychological capacity

Care pathways to manage depressive symptoms

Specialized care needed

* Older people use a wide variety of terms for low mood, like sadness, depressed, down, etc.

World Health

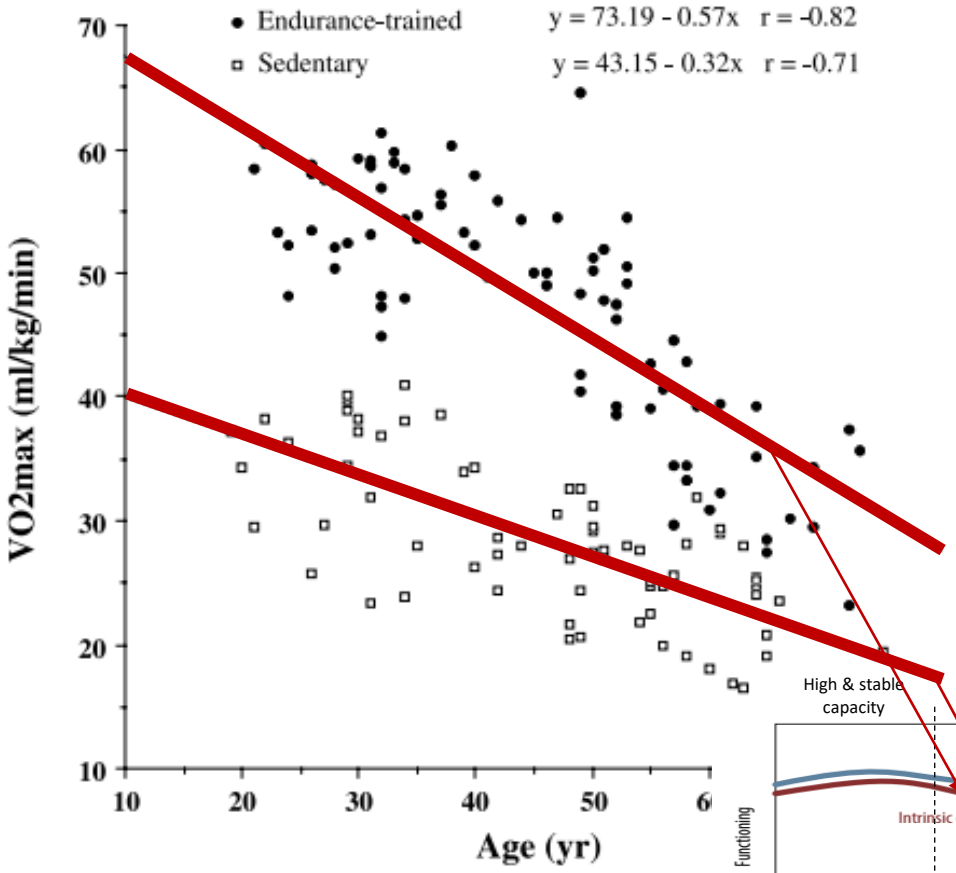
Gezond ouder worden

Kwetsbaarheid

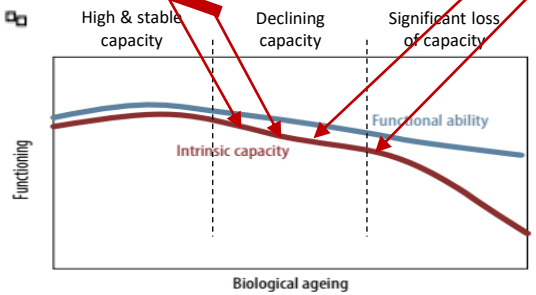
Sarcopenie

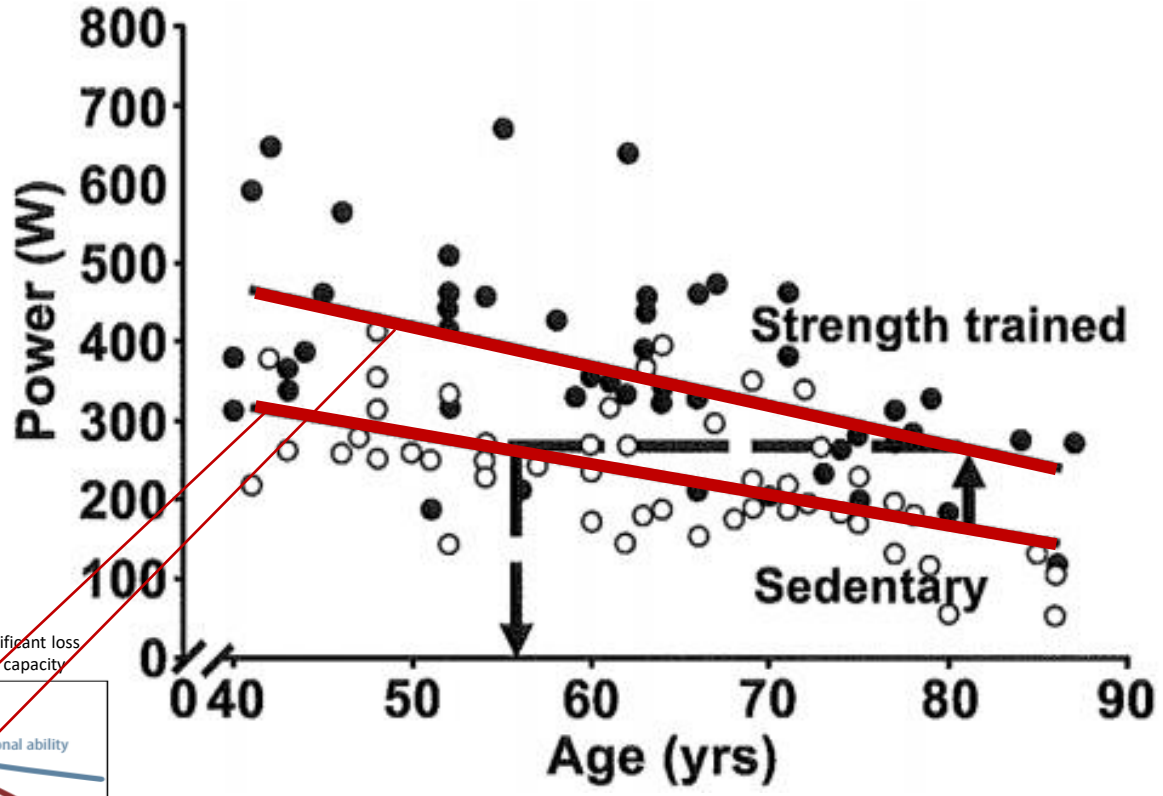
Fysieke activiteit – Oefenen

Toenemende leeftijd gaat gepaard met een verminderde functie van verschillende systemen



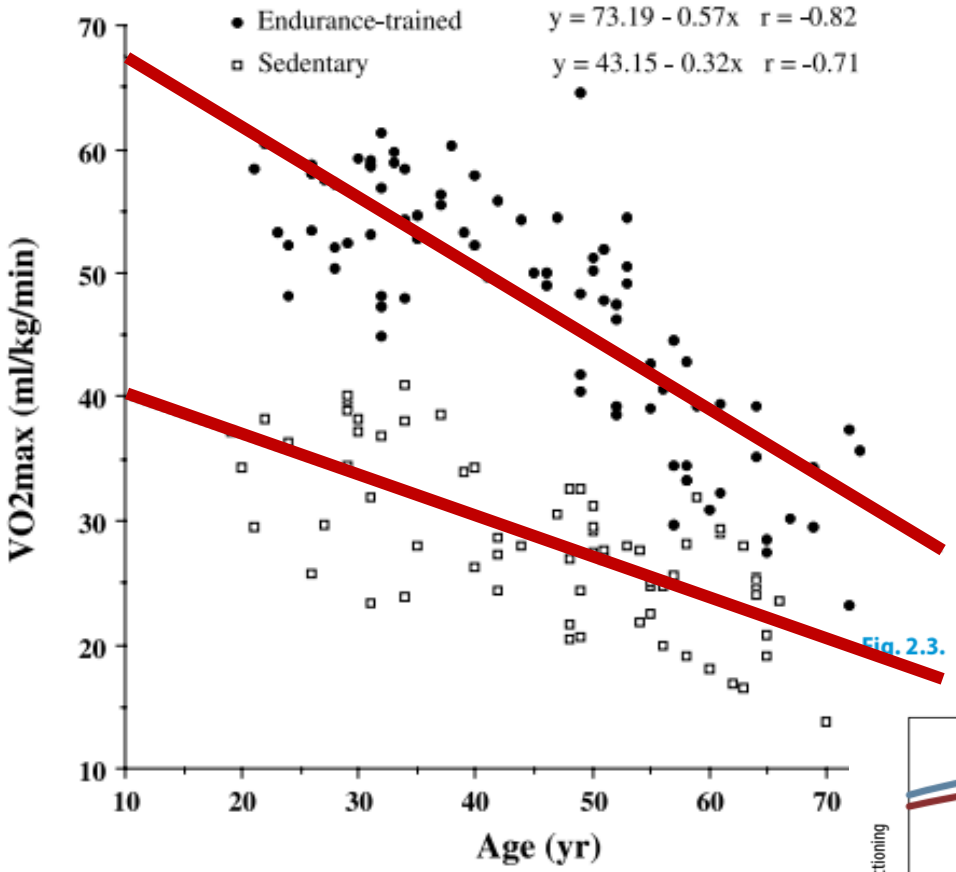
Uithoudingsvermogen





Spierkracht

Toenemende leeftijd gaat gepaard met een verminderde functie van verschillende systemen



Uithoudingsvermogen

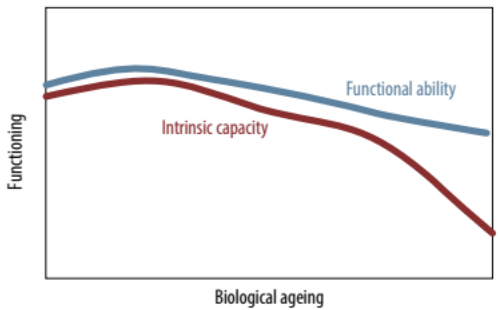
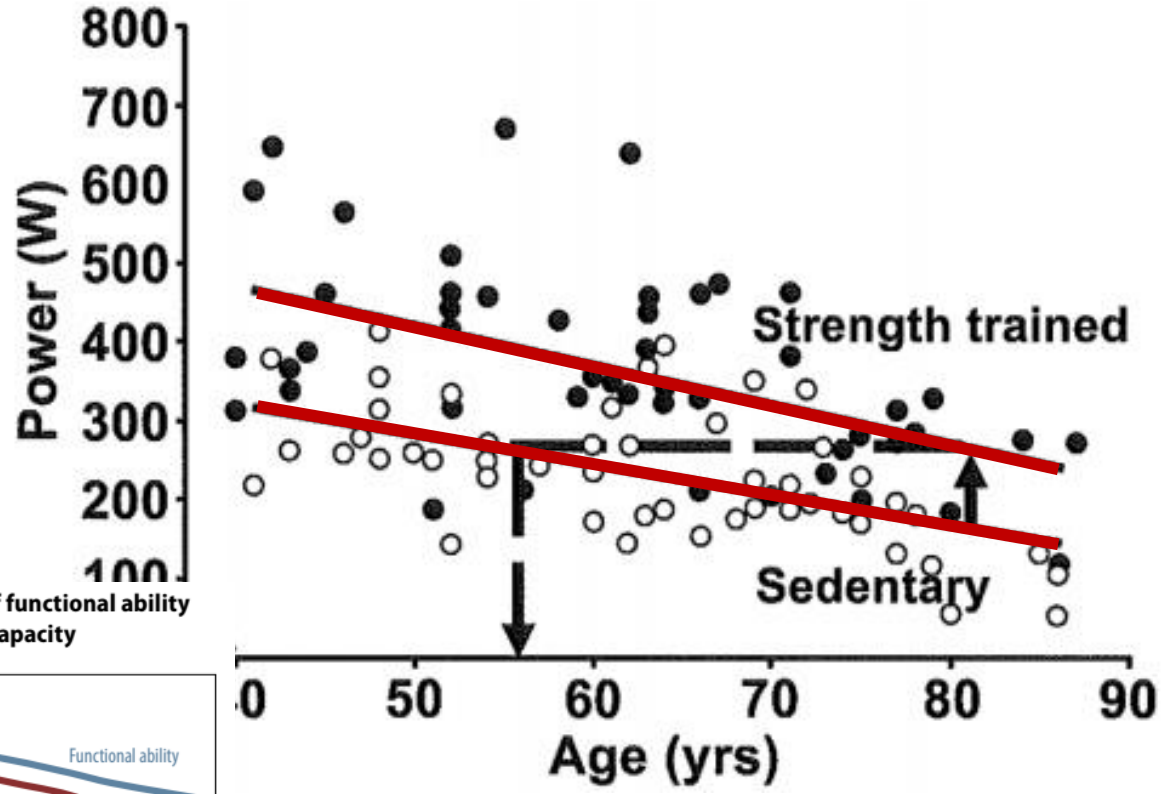
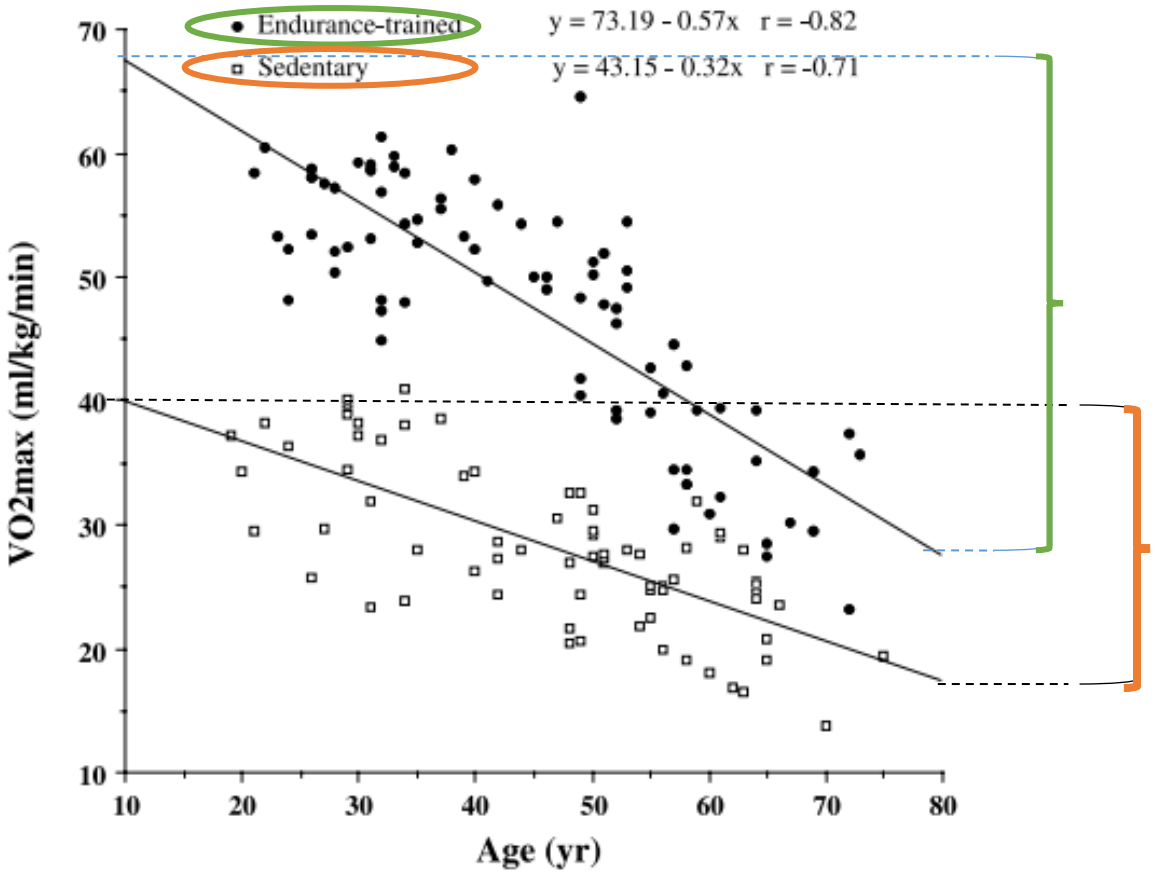


Fig. 2.3. Trajectories of functional ability and intrinsic capacity



Spierkracht

Uithoudingsvermogen neemt af met de leeftijd

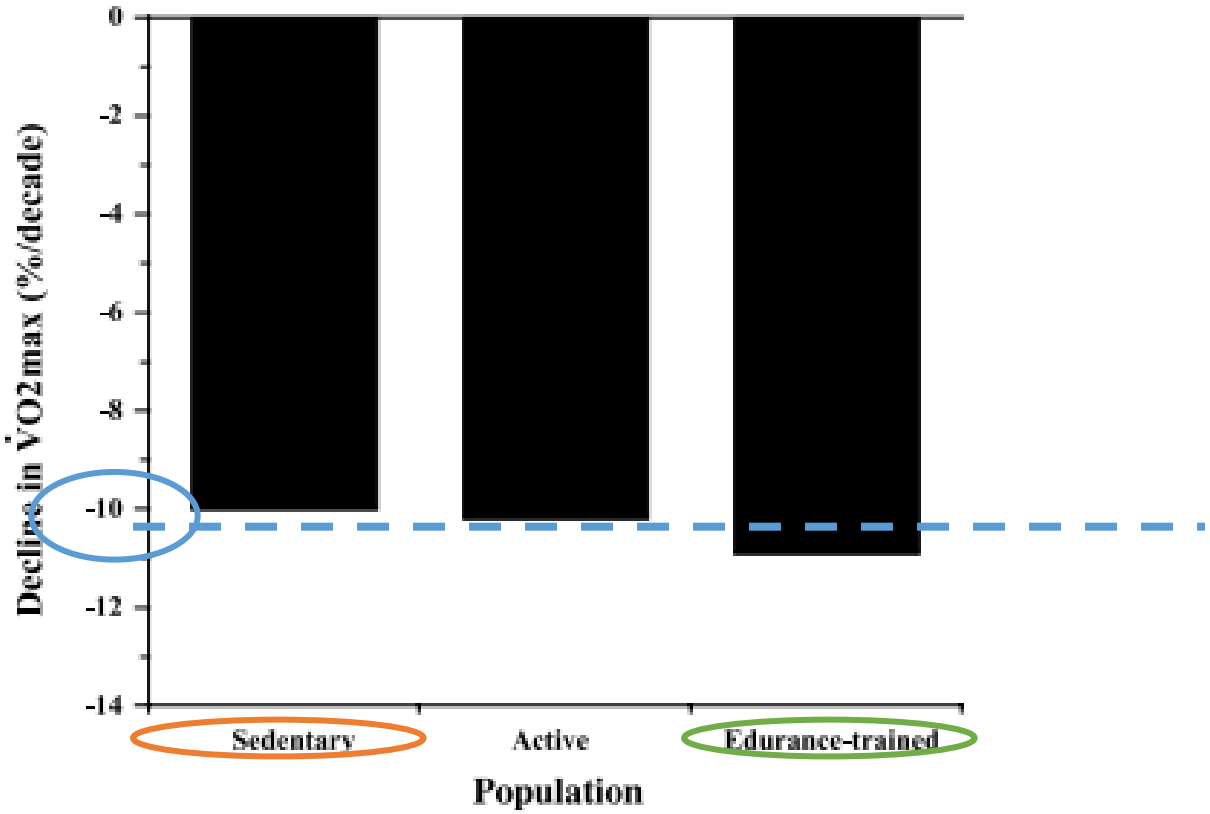


Uithoudingsvermogen

Actieve mensen verliezen meer uithoudingsvermogen in vergelijking met inactieve mensen

Tanaka 2003

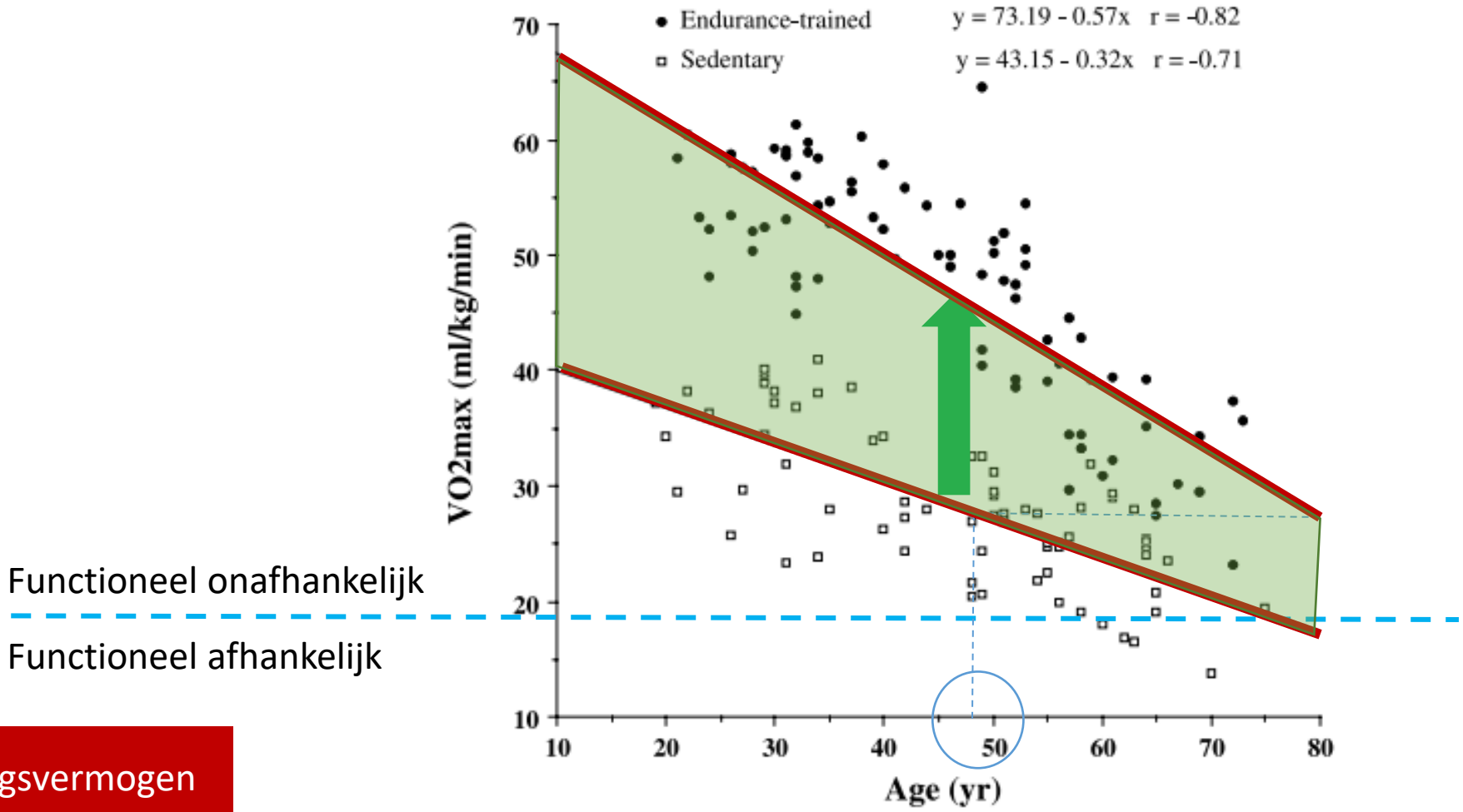
Actieve en inactieve personen verliezen uithoudingsvermogen (VO2max) in een vergelijkbaar tempo



Uithoudingsvermogen

Tanaka 2003

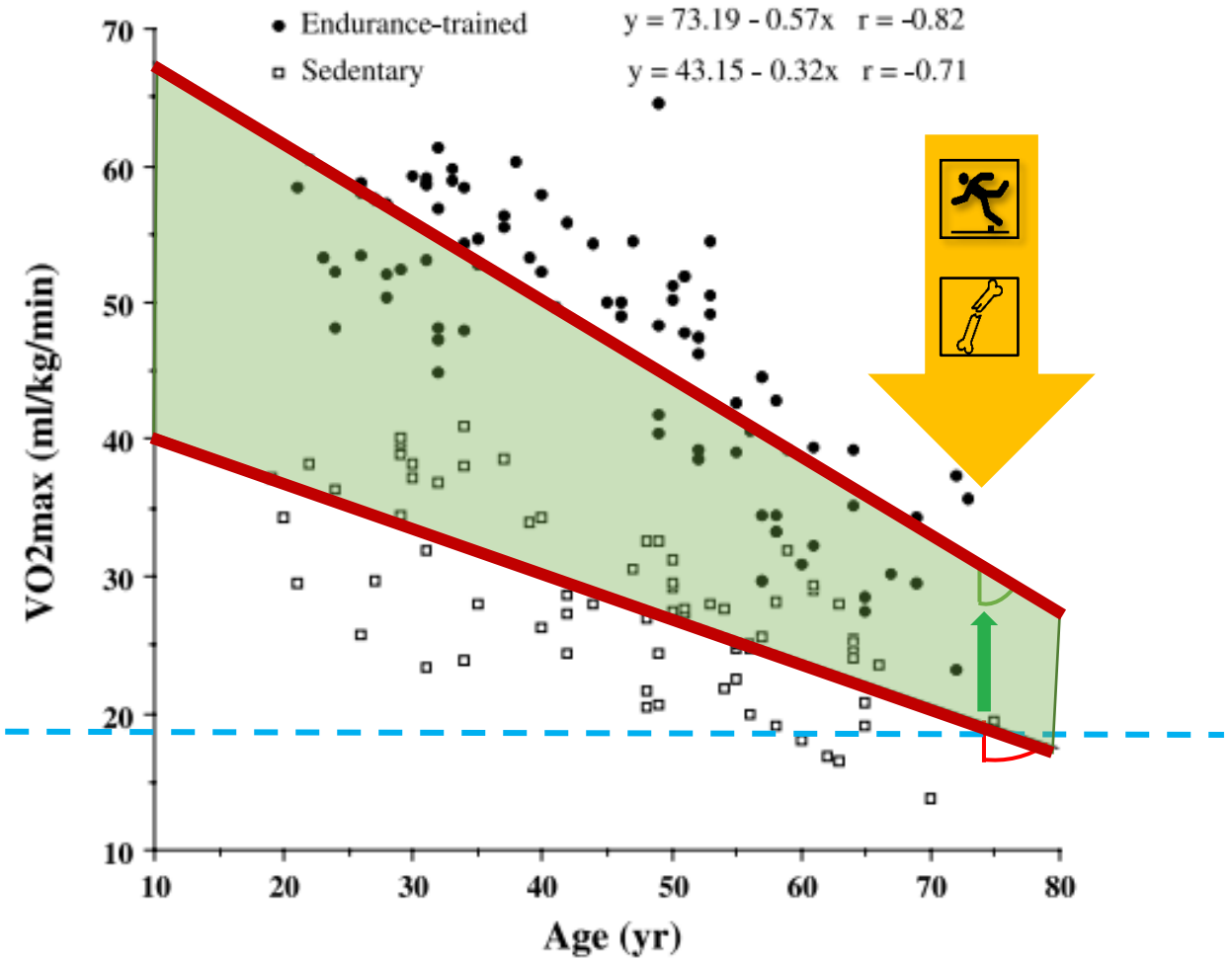
Actieve personen bouwen meer reservecapaciteit op dan inactieve mensen



Uithoudingsvermogen

Booth 2012, Tanaka 2003

Actieve personen bouwen meer reservecapaciteit op dan inactieve mensen



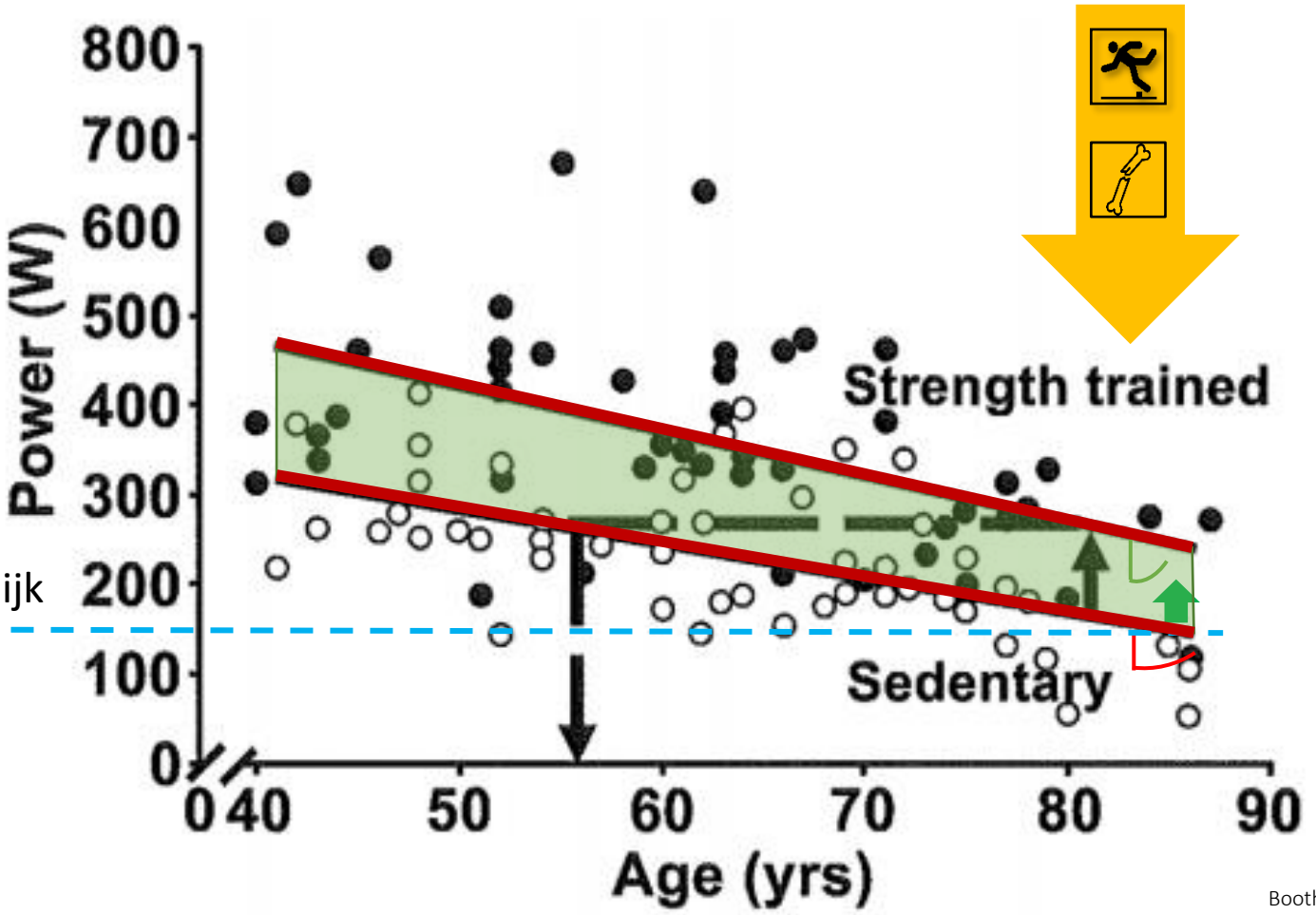
Functioneel onafhankelijk

Functioneel afhankelijk

Spierkracht

Booth 2012, Tanaka 2003

Actieve personen bouwen meer reservecapaciteit op dan inactieve mensen

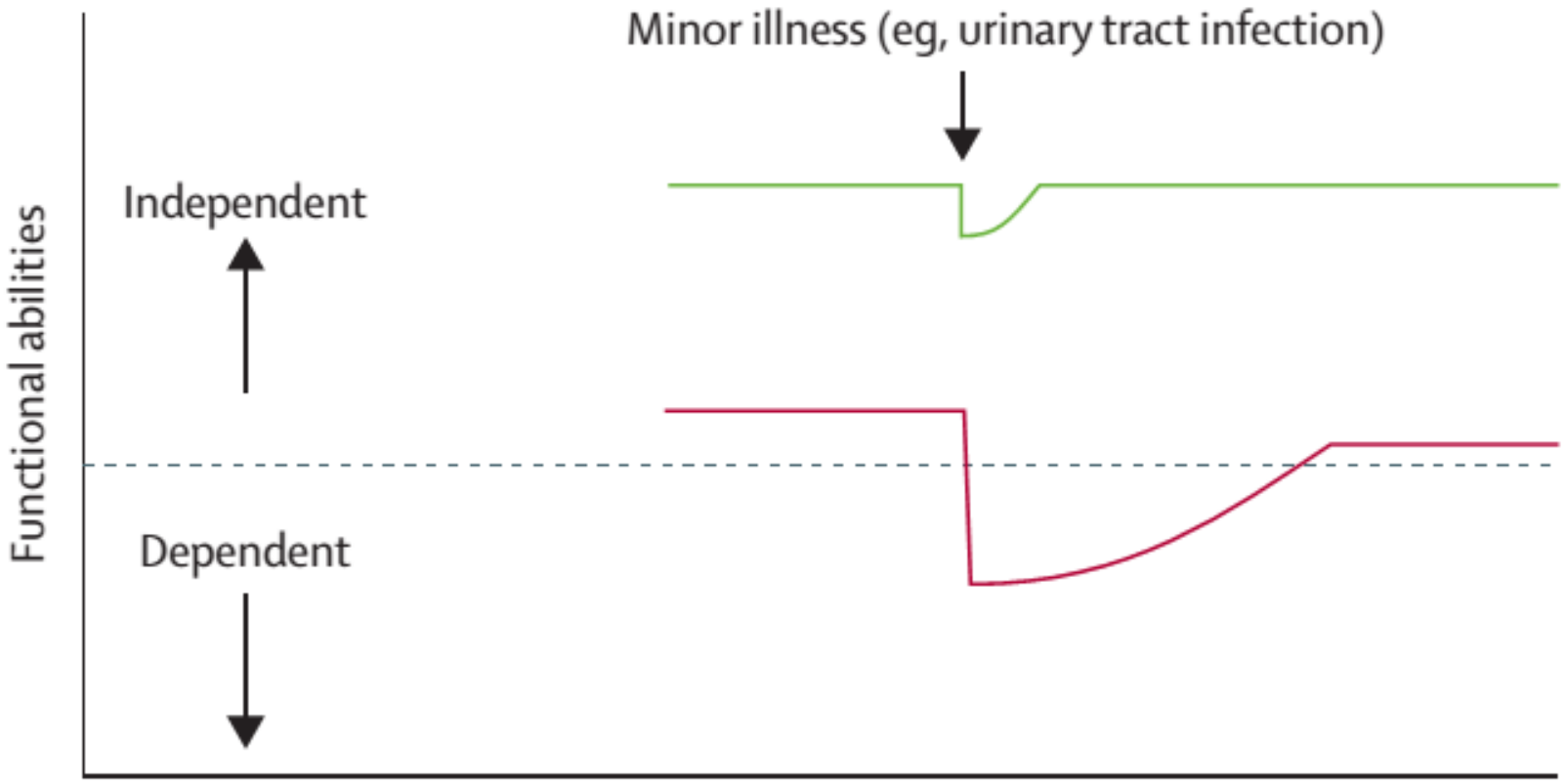


Spierkracht

Booth 2012

Kwetsbaarheid
is een syndroom
als gevolg van leeftijdsgebonden
afname van de reservecapaciteit
in meerdere fysiologische systemen

Clegg 2013


Minor illness (eg, urinary tract infection)
Independent
Functional abilities
Dependent

Clegg 2013

Er zijn verschillende modellen van kwetsbaarheid

The *phenotype model*[1] (FRIED)

The *cumulative deficit model*[2] (ROCKWOOD)

Derivates

Biomedical ←→bio-psychosocial

[1]Fried 2001; [2]Rockwood 1999

Verschillende klinische symptomen bij oudere volwassenen komen vaak samen voor → hypothetische cyclus

Journal of Gerontology: MEDICAL SCIENCES
2001, Vol. 56A, No. 3, M146–M156

Frailty in Older Adults: Evidence for a Phenotype

Linda P. Fried,[1] Catherine M. Tangen,[2] Jeremy Walston,[1] Anne B. Newman,[3] Calvin Hirsch,[4] John Gottdiener,[5] Teresa Seeman,[6] Russell Tracy,[7] Willem J. Kop,[8] Gregory Burke,[9] and Mary Ann McBurnie[2] for the Cardiovascular Health Study Collaborative Research Group

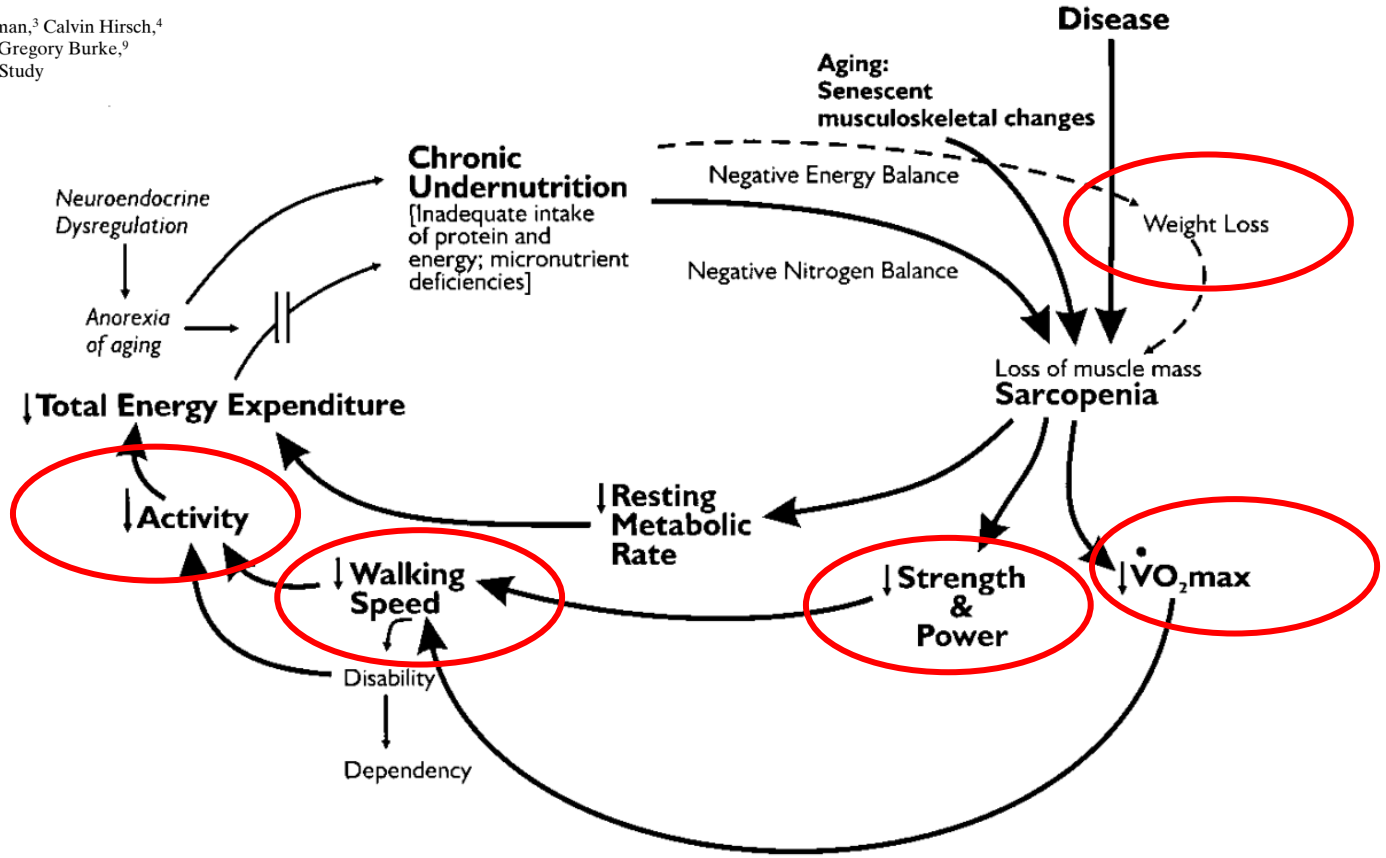


Figure 1. Cycle of frailty hypothesized as consistent with demonstrated pairwise associations and clinical signs and symptoms of frailty. Reproduced with permission from (14).

Fried 1998

Klinische symptomen werden geoperationaliseerd aan de hand van 5 variabelen die dichotoom worden beoordeeld

Weight loss
Self-reported weight loss of more than 4·5 kg or recorded weight loss of ≥5% per year

Self-reported exhaustion
Self-reported exhaustion on US Center for Epidemiological Studies depression scale[73] (3–4 days per week or most of the time)

Low energy expenditure
Energy expenditure <383 kcal/week (men) or <270 kcal/week (women)

Slow gait speed
Standardised cutoff times to walk 4·57 m, stratified by sex and height

Weak grip strength
Grip strength, stratified by sex and body-mass index

Gewichtsverlies

Zelfgerapporteerde vermoeidheid

Lage energie-uitgave

Langzame wandelsnelheid

Zwakke knijpkracht

Clegg 2013

Kwetsbaarheid werd geoperationaliseerd op basis van eerder onderzoek en klinische consensus

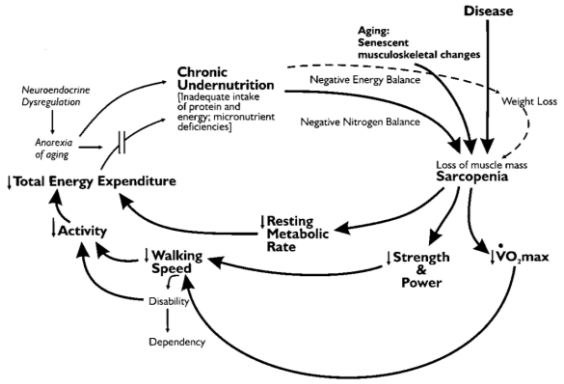


Table 1. Operationalizing a Phenotype of Frailty

A. *Characteristics of Frailty*	B. *Cardiovascular Health Study Measure**
Shrinking: Weight loss (unintentional) Sarcopenia (loss of muscle mass)	Baseline: >10 lbs lost unintentionally in prior year
Weakness	Grip strength: lowest 20% (by gender, body mass index)
Poor endurance; Exhaustion	"Exhaustion" (self-report)
Slowness	Walking time/15 feet: slowest 20% (by gender, height)
Low activity	Kcals/week: lowest 20% males: <383 Kcals/week females: <270 Kcals/week

C. *Presence of Frailty*

Positive for frailty phenotype: ≥3 criteria present

Intermediate or prefrail: 1 or 2 criteria present

Fried 2001

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Populatie			Metingen	Meetmomenten
Community dwelling 65^{+} [65;101] (N= 5317)			Frailty status Disease Hospitalisation Falls Functionality Mortality	Basis Na 3 & 7 jaren

Fried 2001

7% van de mensen waren kwetsbaar bij aanvang

# variables present	Frailty status
0	Not frail
1 of 2	Prefrail
≥ 3 /5	Frail

	Total (N = 5317)		Men (n = 3077)	Women (n = 2240)
Frequency of Frailty Components	%		%	%
Exhaustion	17		19	12
Weight loss	6		6	6
Low activity (kcals)	22		20	20
Slow walk (s)	20		20	20
Grip strength (kg)	20		20	20
Number of Frailty Components Present				
0	46		45	48
1	32	47%	32	33
2	15		15	14
3	6		6	6
4	1	7%	2	1
5	0.2		0.1	0.2

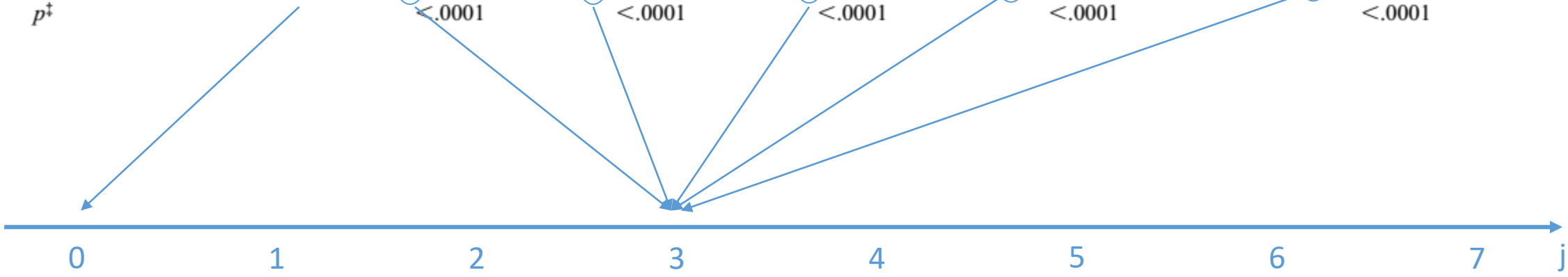
Table 3. Prevalence of Frailty Phenotype Components in Percentages: Cardiovascular Health Study

Fried 2001

Kwetsbare oudere volwassenen hadden meer negatieve gezondheidsresultaten dan hun robuuste tegenhangers

Table 6. Incidence of Adverse Outcomes Associated With Frailty: Kaplan-Meier Estimates at 3 Years and 7 Years* After Study Entry for Both of the Cohorts† ($N = 5317$)

		Died		First Hospitalization		First Fall		Worsening ADL Disability		Worsening Mobility Disability	
Frailty Status at Baseline	(*n*)	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‡		<.0001		<.0001		<.0001		<.0001		<.0001	



Fried 2001

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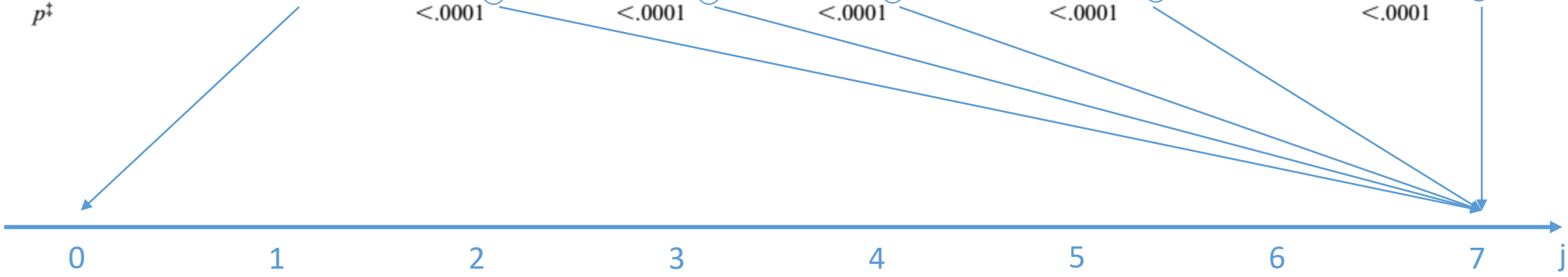
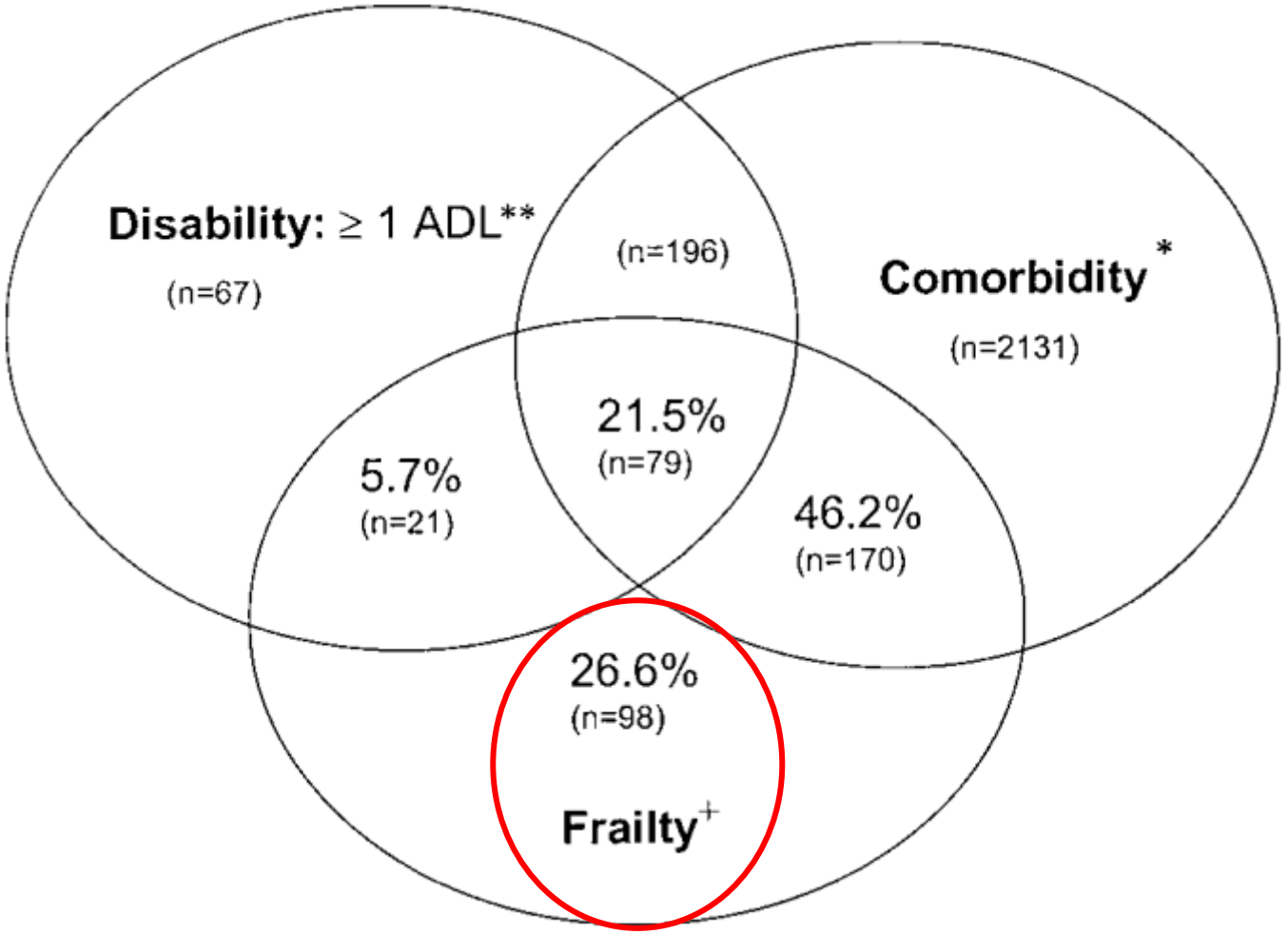
p‡			<.0001		<.0001		<.0001		<.0001		<.0001

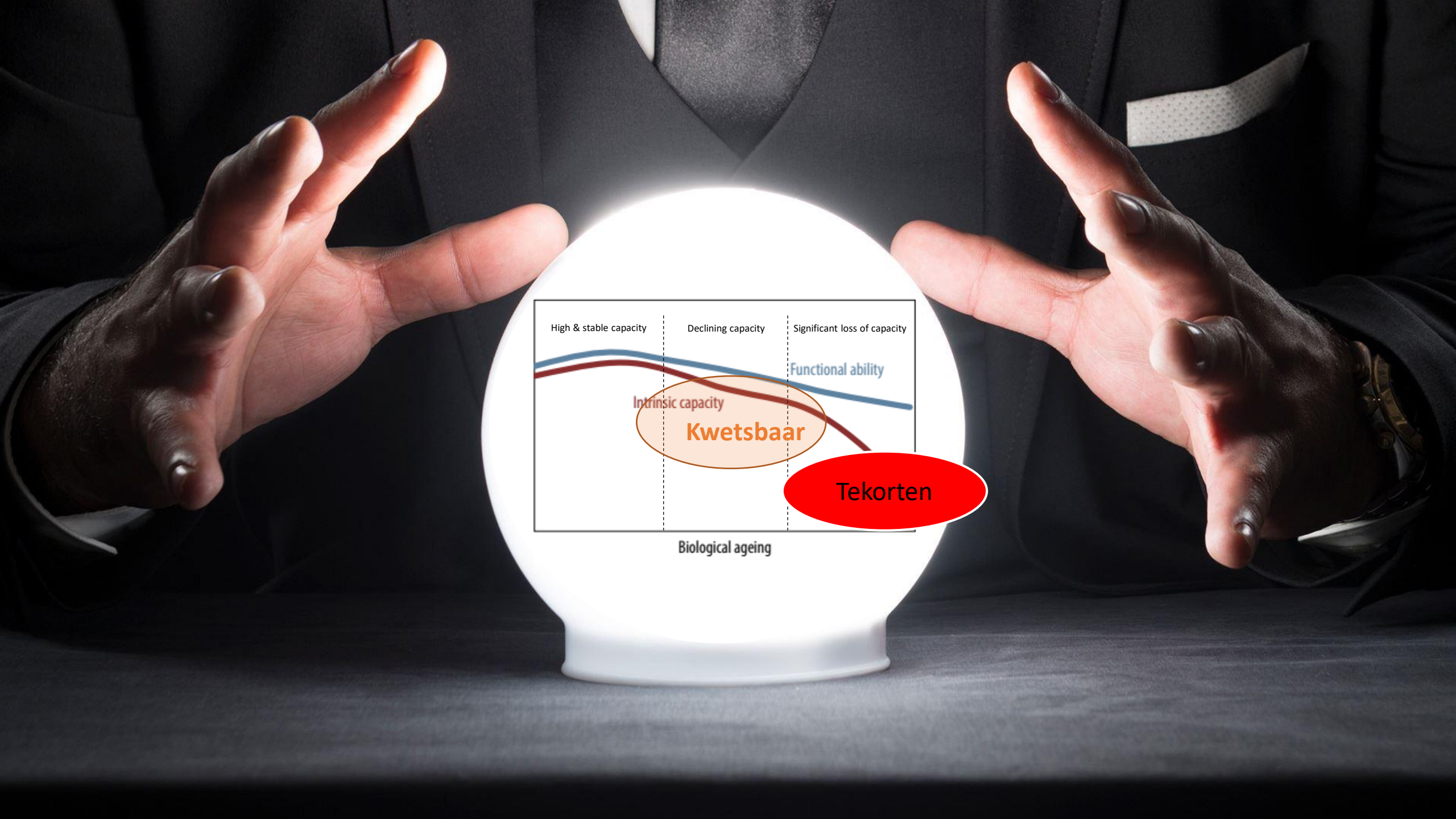


Fried 2001

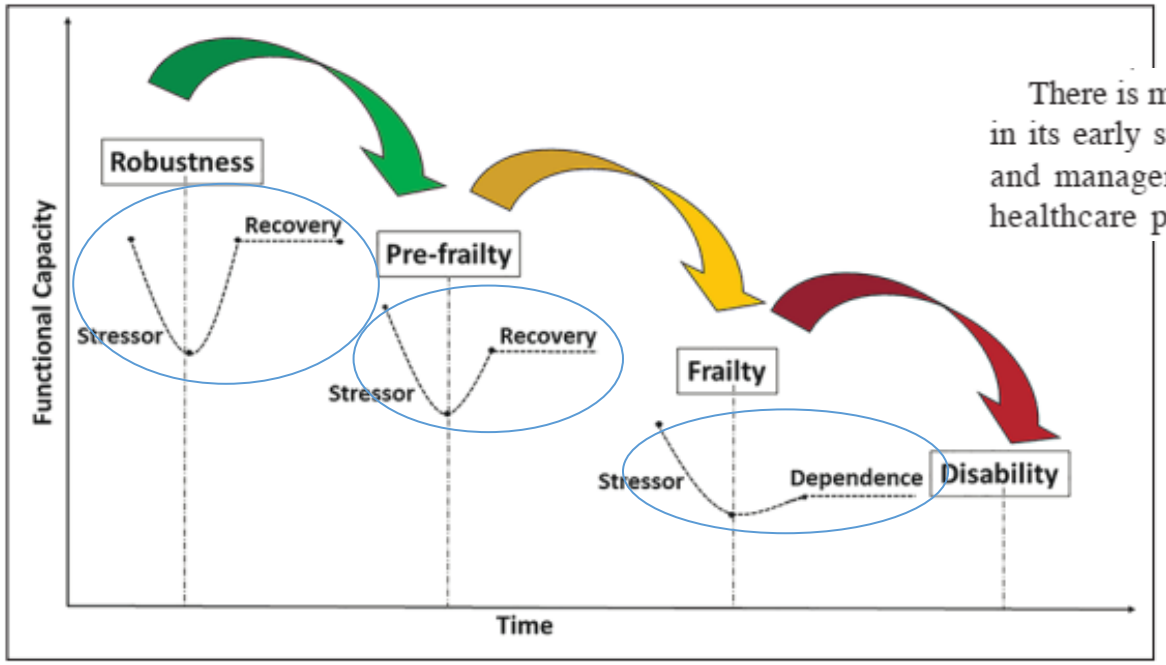
Oudere volwassenen kunnen kwetsbaar worden zonder enige beperking of ziekte te hebben



Fried 2001


High & stable capacity
Declining capacity
Significant loss of capacity
Functional ability
Intrinsic capacity
Kwetsbaar
Tekorten
Biological ageing

TAKE HOME BERICHT: Screening / case finding is belangrijk



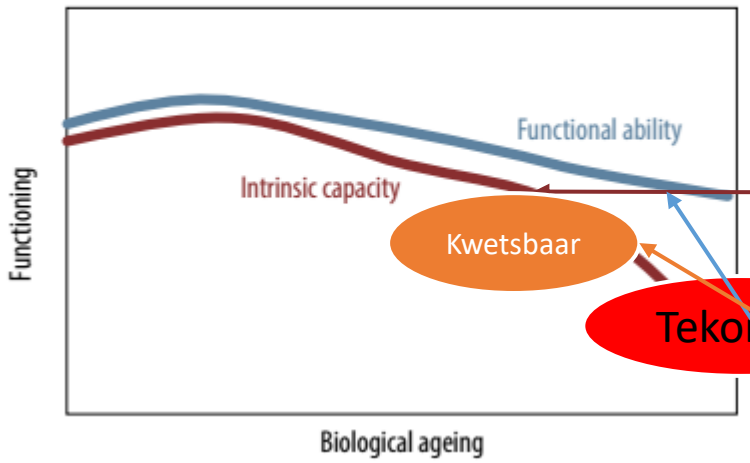
There is much potential for frailty to be reversed, particularly in its early stages (28-30). For that reason, early identification and management of frailty is an important priority for both healthcare providers and healthcare policy makers (31-33).

	Recommendation	Grade	Certainty of Evidence
Frailty Screening			
1	All adults aged 65 years and over should be offered screening for frailty using a validated rapid frailty instrument suitable to the specific setting or context	Strong	Low
Frailty Assessment			
2	Clinical assessment of frailty should be performed for all older adults screening as positive for frailty or pre-frailty	Strong	Low

PHYSICAL FRAILTY: ICFSR INTERNATIONAL CLINICAL PRACTICE GUIDELINES FOR IDENTIFICATION AND MANAGEMENT

E. DENT[1,2], J.E. MORLEY[3], A.J. CRUZ-JENTOFT[4], L. WOODHOUSE[5], L. RODRÍGUEZ-MAÑAS[6], L.P. FRIED[7], J. WOO[8], I. APRAHAMIAN[9], A. SANFORD[3], J. LUNDY[10], F. LANDI[11], J. BEILBY[1], F.C. MARTIN[12], J.M. BAUER[13], L. FERRUCCI[14], R.A. MERCHANT[15], B. DONG[16], H. ARAI[17], E.O. HOOGENDIJK[18], C.W. WON[19], A. ABBATECOLA[20], T. CEDERHOLM[21], T. STRANDBERG[22,23], L.M. GUTIÉRREZ ROBLEDO[24], L. FLICKER[25], S. BHASIN[26], M. AUBERTIN-LEHEUDRE[27], H.A. BISCHOFF-FERRARI[28], J.M. GURALNIK[29], J. MUSCEDERE[30], M. PAHOR[31], J. RUIZ[32], A.M. NEGM[33], J.Y. REGINSTER[34], D.L. WATERS[35], B. VELLAS[36]

Fig. 2.3. Trajectories of functional ability and intrinsic capacity



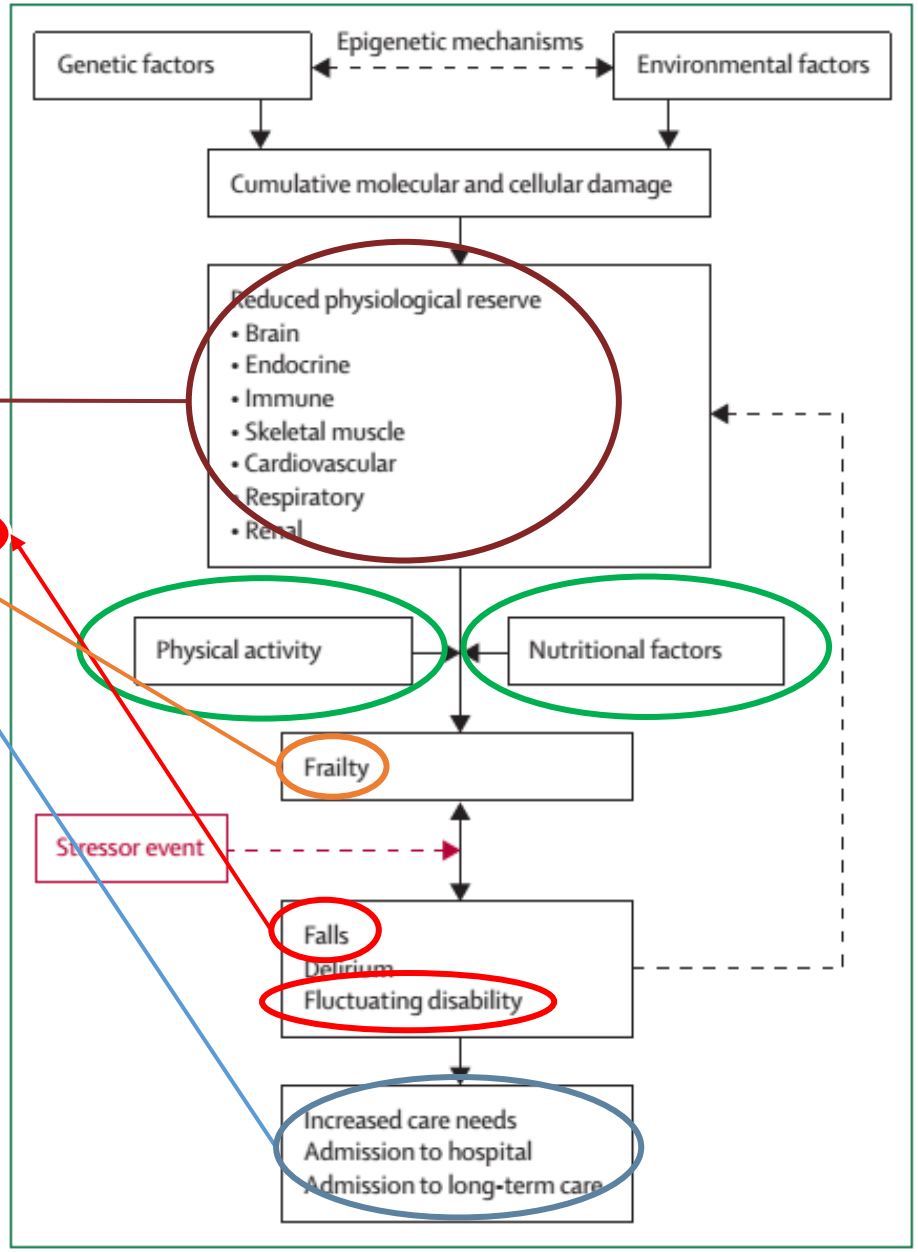


Figure 2: **Schematic representation of the pathophysiology of frailty**

Cleeg 2013

Gezond ouder worden

Kwetsbaarheid

Sarcopenie

Fysieke activiteit – Oefenen

SARCOPENIE: fysieke kwetsbaarheid

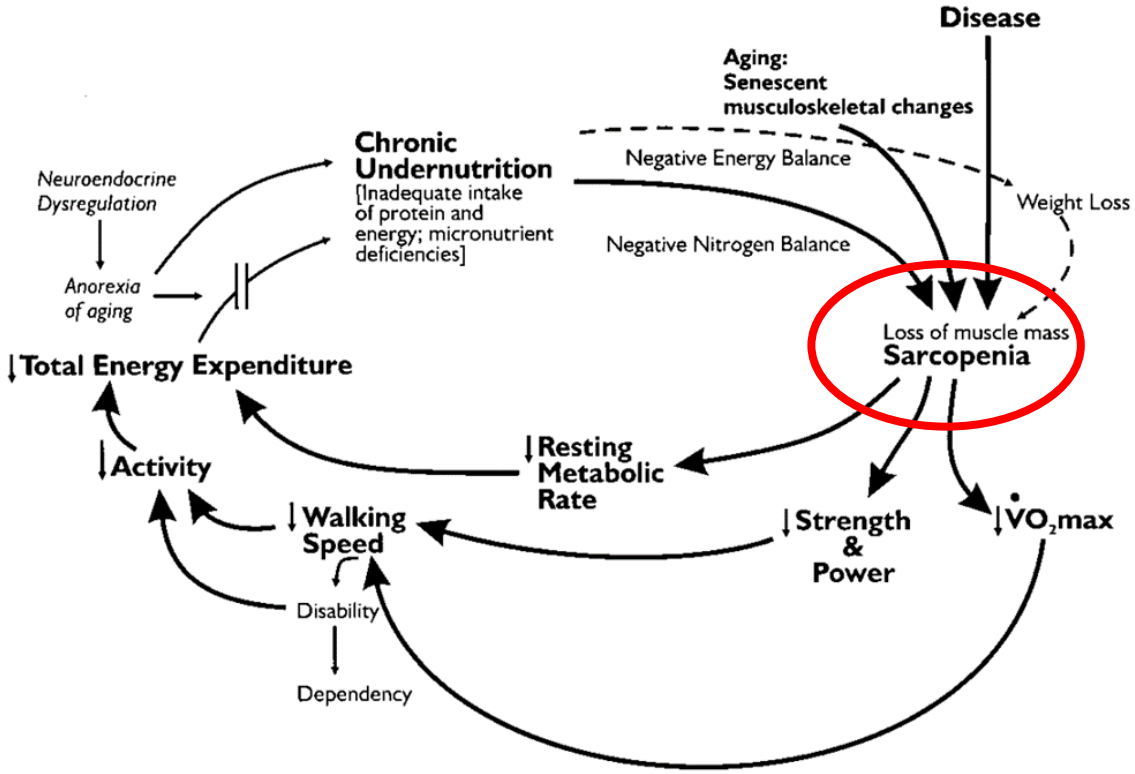
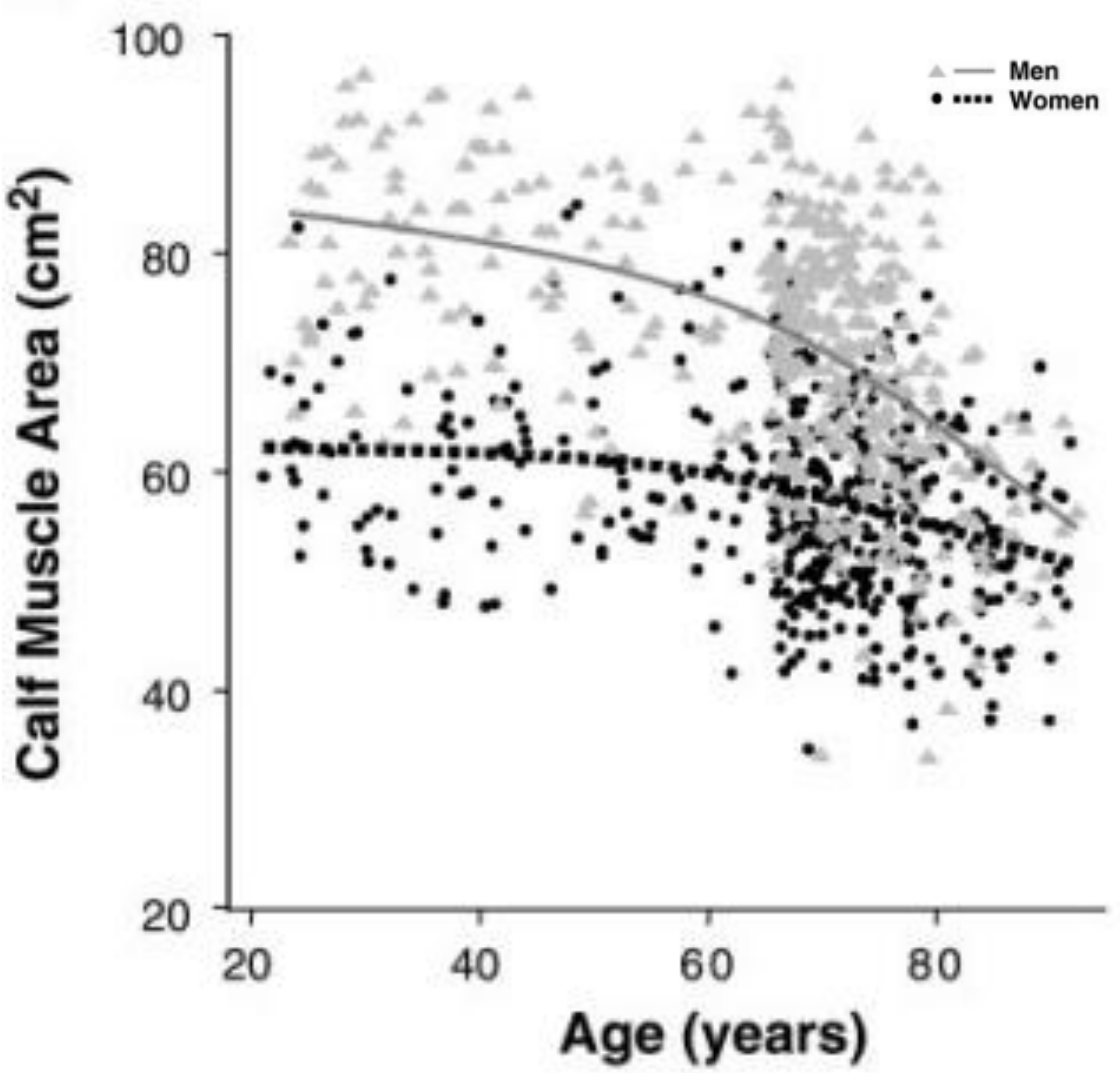
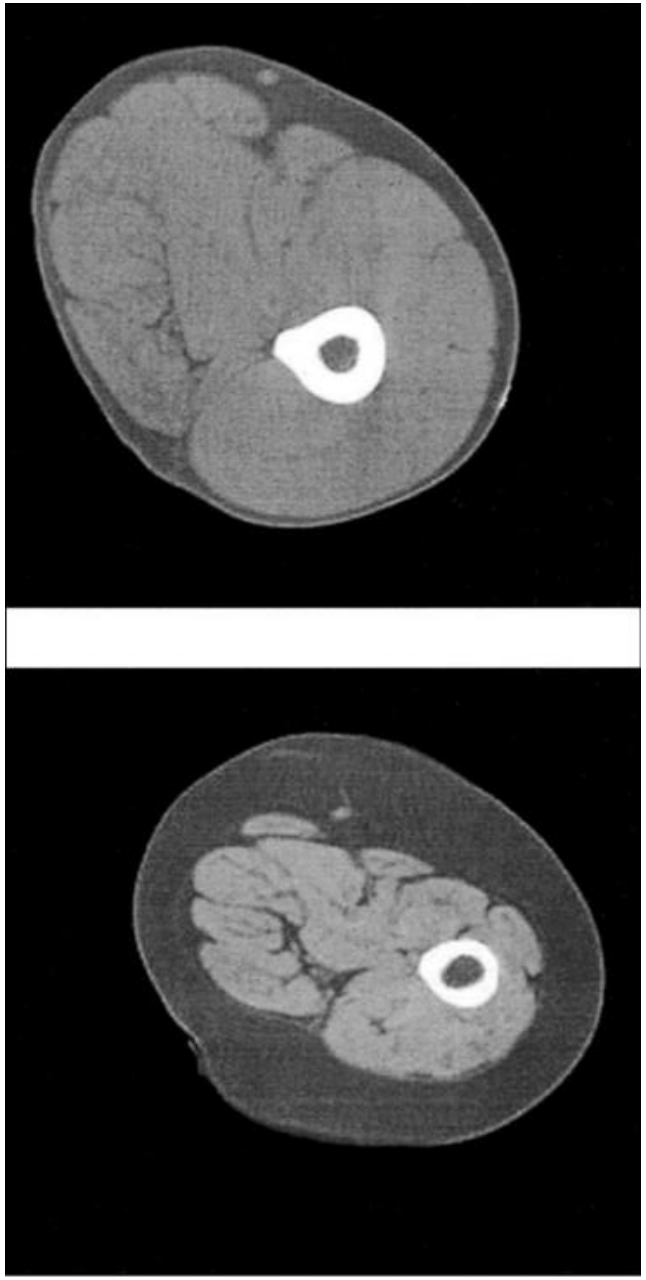


Figure 1. Cycle of frailty hypothesized as consistent with demonstrated pairwise associations and clinical signs and symptoms of frailty. Reproduced with permission from (14).

Fried 2003

Spiermassa neemt af met de leeftijd

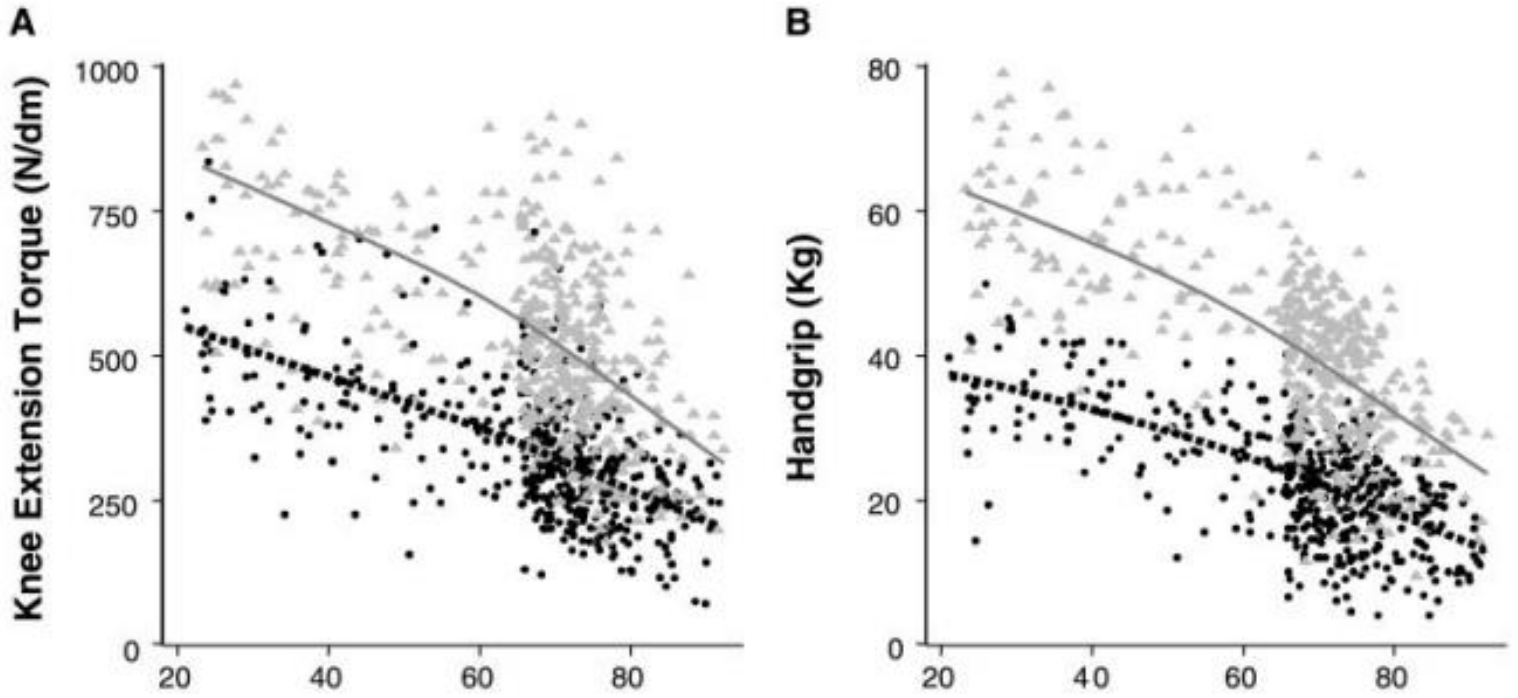




Roubenoff R. *J Gerontol 2003*

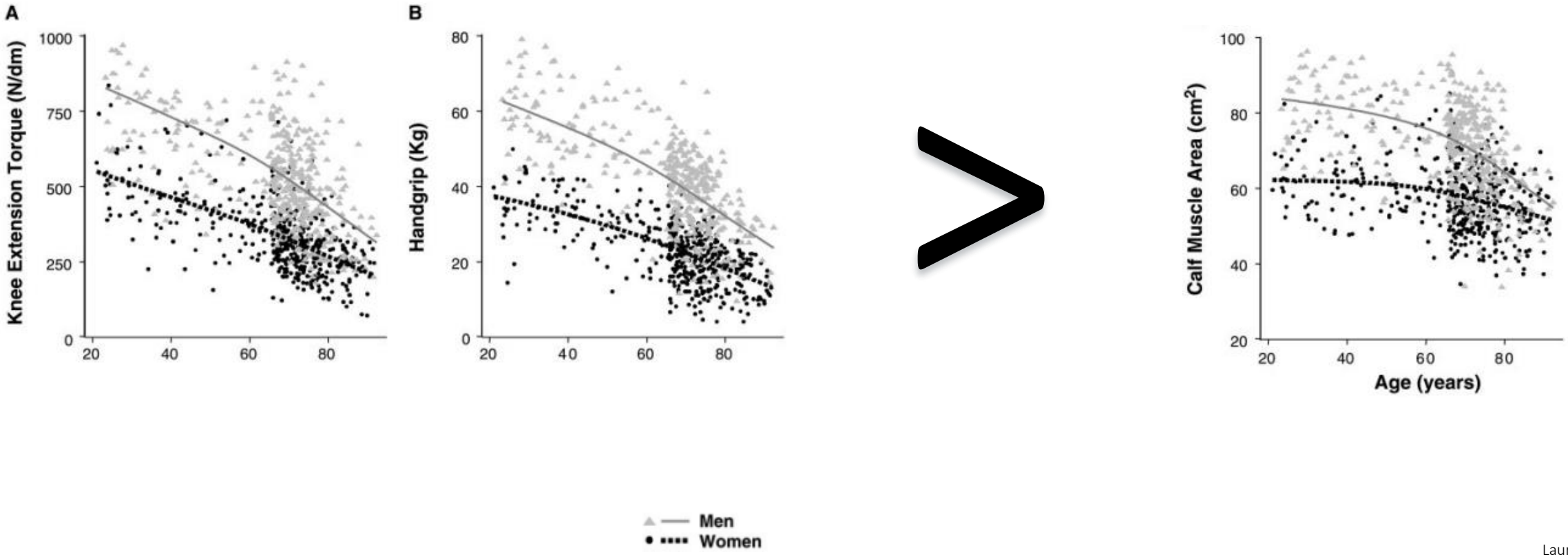
Lauretani 2003

Spierkracht neemt ook af met de leeftijd…



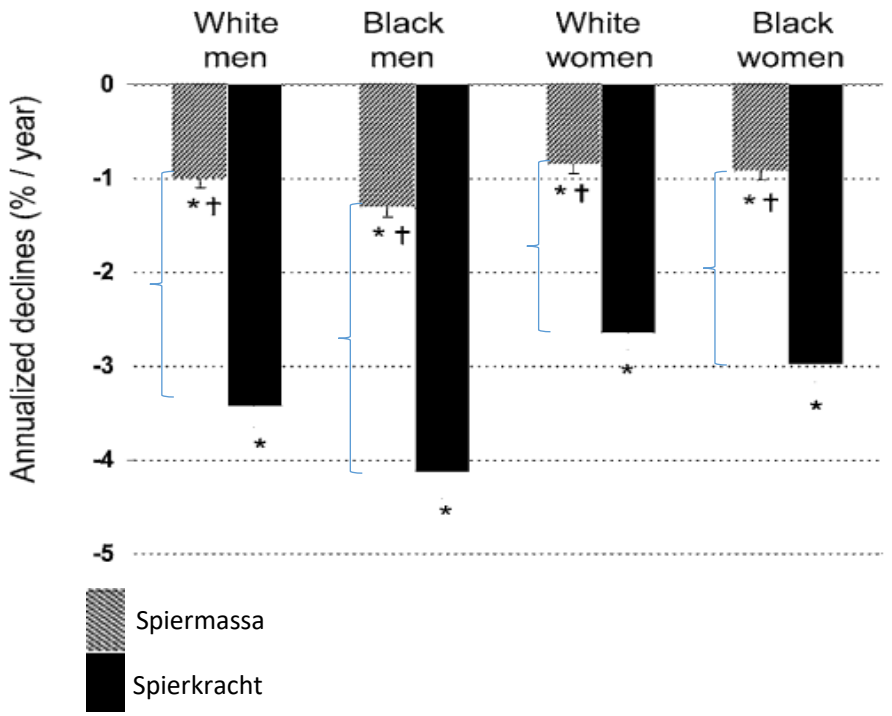
Lauretani 2003

Spierkracht neemt ook af met de leeftijd… maar in hogere mate dan spiermassa



Lauretani 2003

Afname van spierkracht is sneller dan het gelijktijdige verlies van spiermassa

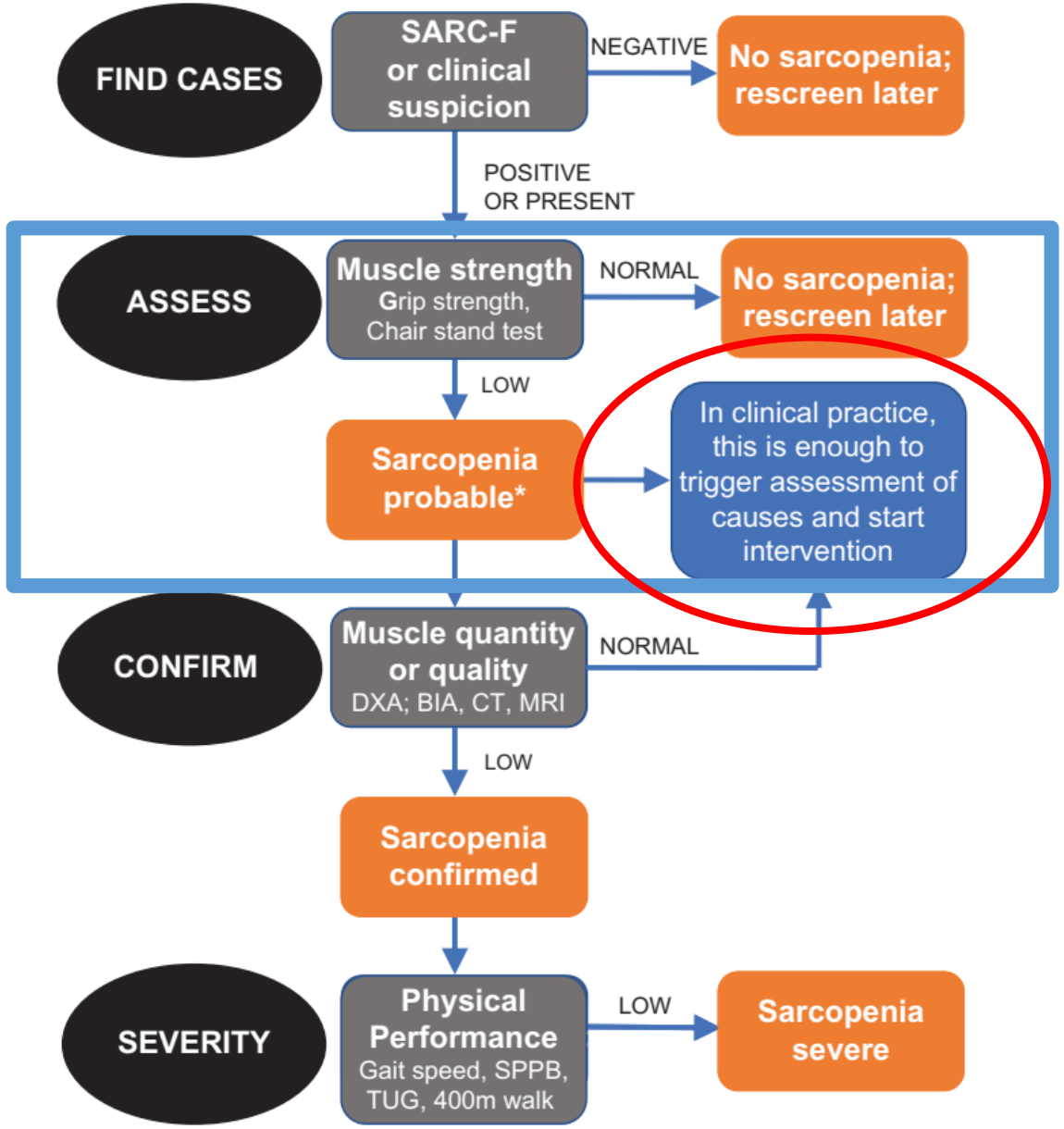


Delmonico 2009

GUIDELINES

Sarcopenia: revised European consensus on definition and diagnosis

Alfonso J. Cruz-Jentoft[1], Gülistan Bahat[2], Jürgen Bauer[3], Yves Boirie[4], Olivier Bruyère[5], Tommy Cederholm[6], Cyrus Cooper[7], Francesco Landi[8], Yves Rolland[9], Avan Aihie Sayer[10], Stéphane M. Schneider[11], Cornel C. Sieber[12], Eva Topinkova[13], Maurits Vandewoude[14], Marjolein Visser[15], Mauro Zamboni[16], Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2



Cruz-Jentoft 2018

INTERNATIONAL CLINICAL PRACTICE GUIDELINES FOR SARCOPENIA (ICFSR): SCREENING, DIAGNOSIS AND MANAGEMENT

E. DENT[1,2], J.E. MORLEY[3], A.J. CRUZ-JENTOFT[4], H. ARAI[5], S.B. KRITCHEVSKY[6], J. GURALNIK[7], J.M. BAUER[8], M. PAHOR[9], B.C. CLARK[10], M. CESARI[11,12], J. RUIZ[13], C.C. SIEBER[14], M. AUBERTIN-LEHEUDRE[15], D.L. WATERS[16], R. VISVANATHAN[17], F. LANDI[18], D.T. VILLAREAL[19] R. FIELDING[20], C.W. WON[21], O. THEOU[17,22], F.C. MARTIN[23], B. DONG[24], J. WOO[25], L. FLICKER[26], L. FERRUCCI[27], R.A. MERCHANT[28], L. CAO[29], T. CEDERHOLM[30], S.M.L. RIBEIRO[31], L. RODRÍGUEZ-MAÑAS[32], S.D. ANKER[33,34], J. LUNDY[35], L.M. GUTIÉRREZ ROBLEDO[36], I. BAUTMANS[37,38,39], I. APRAHAMIAN[40], J.M.G.A. SCHOLS[41], M. IZQUIERDO[42], B. VELLAS[43]

	Guideline	Strength of Evidence†	Certainty of Evidence††
1.Screening	1A. Older adults aged 65 years and older should be screened for sarcopenia annually, or after the occurrence of major health events	Conditional	++
	1B. Screening for sarcopenia can be performed using gait speed, or with the SARC-F questionnaire	Conditional	++
	1C. Individuals screened as positive for sarcopenia should be referred for further assessment to confirm the presence of the disease	Conditional	++
2. Diagnosis	2A. It is recommended that health practitioners use an objective measurement tool for the diagnosis of Sarcopenia, utilising any of the published consensus definitions	Conditional	+++
	2B. DXA should be used to determine low lean mass when diagnosing sarcopenia	Conditional	++
	2C. Walking speed or grip strength should be used to determine low levels of muscle strength and physical performance respectively when diagnosing sarcopenia	Strong	+++
3. Physical Activity	3A. In patients with sarcopenia, prescription of resistance-based training may be effective to improve lean mass, strength and physical function	Strong	+++
4. Protein	4A. We recommend clinicians consider protein supplementation/a protein-rich diet for older adults with sarcopenia	Conditional	++
	4B. Clinicians may also consider discussing with patients the importance of adequate calorie and protein intake	Conditional	+
	4C. Nutritional (protein) intervention should be combined with a physical activity intervention	Conditional	++
5. Vitamin D	5A. Insufficient evidence exists to determine whether a Vitamin D supplementation regime by itself is effective in older adults with sarcopenia	Insufficient evidence	+
6. Anabolic Hormones	6A. The current evidence is insufficient to recommend anabolic hormones for the management of sarcopenia	Insufficient evidence	+
7. Pharmacologic Interventions	7A. Pharmacological interventions are not recommended as first-line therapy for the management of sarcopenia	Insufficient evidence	+

Dent et al. 2018

Gezond ouder worden

Kwetsbaarheid

Sarcopenie

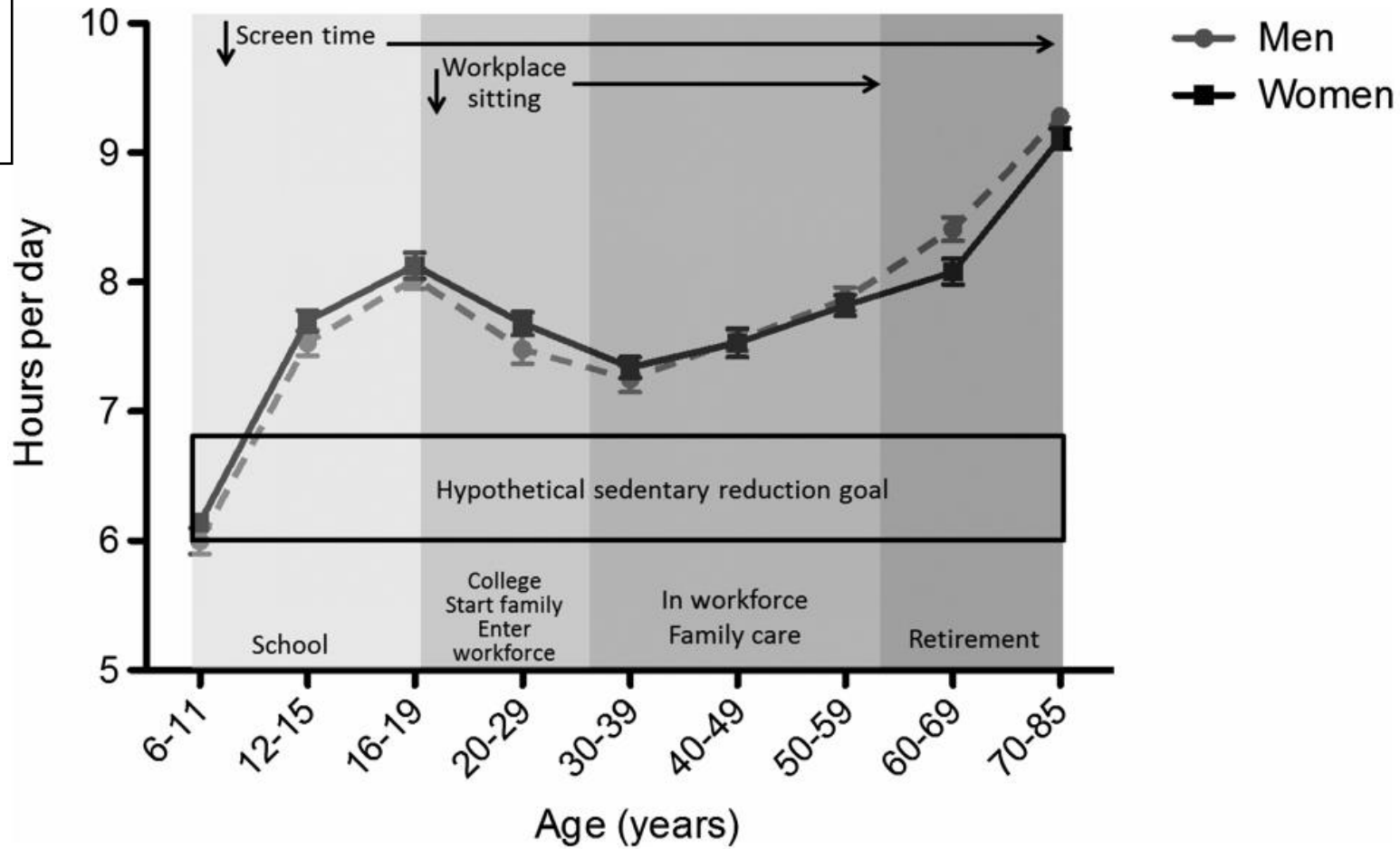
Fysieke activiteit – Oefenen

"Fysieke activiteit" moet niet worden verward met "oefenen"

SITTING

IS THE NEW SMOKING

De sedentaire tijd neemt consequent toe met toenemende leeftijd



Manini 2015

De sedentaire tijd neemt consequent toe met toenemende leeftijd

Objectively Measured Sedentary Behavior by Accelerometry (Hours per Waking Day)							
			Mean				
Location, Source, Period, Author	N	Age Mean/ Group (years)	Total	Male	Female	Younger[a]	Middle Tertiles
Canada[b], CHMS, 2007–09, Colley et al., 2011	901	67	10.0	9.9	10.0	9.5 (20–59)	–
Iceland[b], AGE II, 2009–10, Arnardottir et al., 2013	1,194	80	10.4	10.6	10.1	–	–
Iceland, AGE II, 2009–10, van der Berg et al., 2014	565	78	10.3	10.6	10.1	–	–
UK[b], Whitehall, 1997–2007, Hamer et al., 2012	394	66	10.7	–	–	–	–
UK, HSE, 2008, Stamatakis et al., 2011	646	73	–	–	–	–	8.5–9.5
USA, NHANES, 2003–04, Matthews et al., 2008	1,437	> 60[c]	8.8	9.2	8.6	7.5 (20–59)	–
USA, NHANES, 2003–06, Clark et al., 2011	2,303	71	9.2	–	–	7.9 (20–59)	–
USA, NHANES, 2003–06, Bankoski et al., 2011	1,367	71	9.5	–	–	–	–
USA, NHANES, 2003–06, Koster et al., 2012	1,906	63.8	9.0	–	–	–	–
USA[b], NHANES, 2003–06, Evenson et al., 2012	2,630	72	8.5	8.8	8.4	–	–
USA, NHANES, 2003–06, Gennuso et al., 2013	1,914	75	9.4	–	–	–	–
USA, WHS, 2011–13, Shiroma et al., 2013	7,247	71	–	–	9.7	9.4 (< 65 F)	–
Weighted mean	5,119	72			Mean of total population: 9.4 ± 0.1		

Harvey 2015

Lichamelijke inactiviteit vermindert de kracht en massa van de spieren

Study	Model of disuse	Duration of disuse (days)	Muscle loss (%/day)	Strength loss (%/day)	Changes in muscle protein synthesis	Changes in signaling
Kortebein et al. (2007)	Bed-rest	10	0.6	1.5	30% ↓	–
Kortebein et al. (2008)	Bed-rest	10	–	1.3	–	–
Suetta et al. (2009)	Immobilization	14	0.4	1.1	–	–
Ferrando et al. (2010)	Bed-rest	28	0.2	–	30% ↓	–
Hvid et al. (2010)	Immobilization	14	1.0 (type II fiber CSA)	1.8	–	–
Hvid et al. (2011)	Immobilization	14	–	1.6 (single fiber force)	–	–
Smith et al. (2012)	Immobilization	4	2.3	3.5	–	↑ MAFBx and MuRF1 gene expression (4 days)
		14	0.9 (fiber CSA)	1.1		
Drummond et al. (2012)	Bed-rest	7	0.6	–	40% ↓ (postprandial)	↑ mTOR protein content, ↓ mTOR phosphorylation in response to EAA
Deutz et al. (2013)	Bed-rest	10	0.5	0.9 (NS)	21% ↓	

Abbreviations: CSA, cross sectional area; MAFBx, muscle atrophy F-Box/atrogin-1; MuRF1, muscle-specific RING-finger protein 1; mTOR, mammalian target of rapamycin; NS, non-significant.

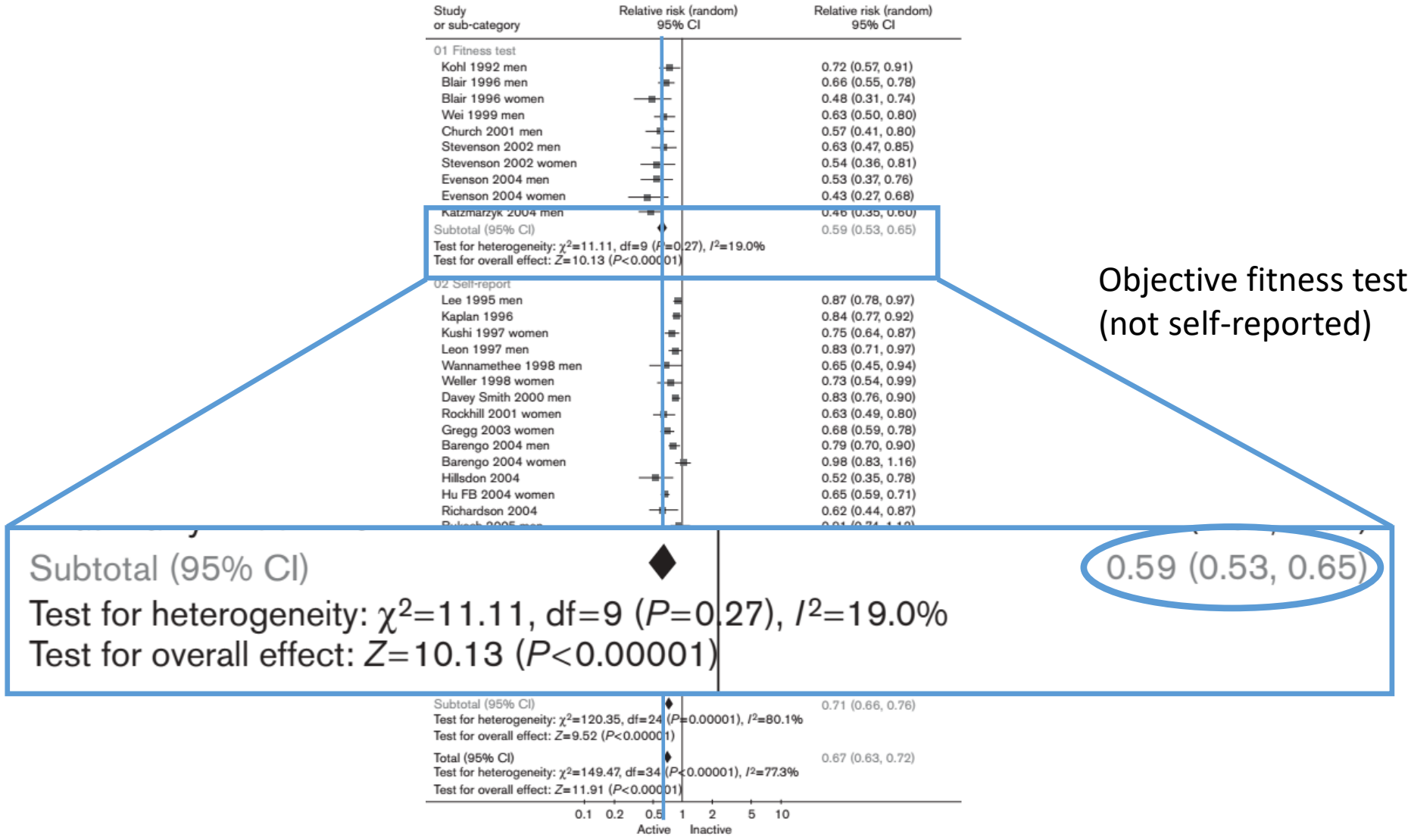
Wall (2013)

0,5% verlies van spiermassa per dag, wat betekent dat?

Na 1 dag: 150g

Na 10 dagen: 1,5kg

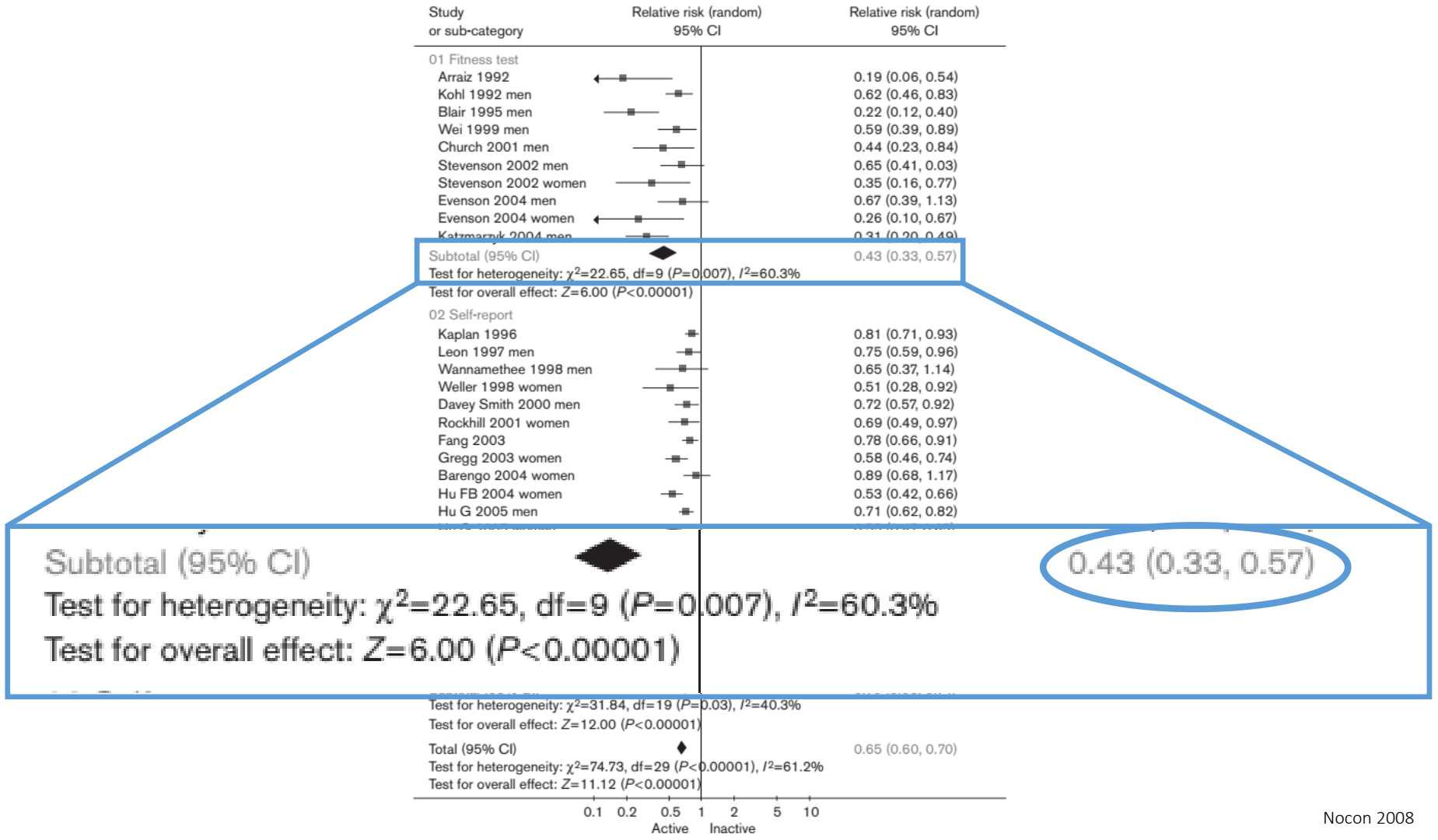
Fysieke activiteit vermindert het risico op sterfte door alle oorzaken met 41%



Objective fitness test (not self-reported)

Nocon 2008

Lichamelijke activiteit vermindert het risico op cardiovasculaire mortaliteit met 57%



Nocon 2008

World Health Organization

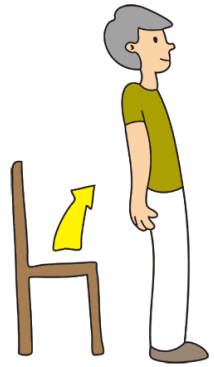
Australian Government

Department of Health and Ageing

AMERICAN COLLEGE OF SPORTS MEDICINE • FOUNDED 1954 •

AMERICAN COLLEGE of SPORTS MEDICINE

NHS



World Health Organization 2020 guidelines on physical activity and sedentary behaviour

Table 4 Summary of the WHO Guidelines on physcial activity and sedentary behaviour.

These public health guidelines are for all populations across the age groups from 5 years of age and above, irrespective of gender, cultural background or socioeconomic status and are relevant for people of all abilities. Those with chronic medical conditions and/or disability and pregnant and postpartum women should try to meet these recommendations where possible and as able.

	Physical activity	Sedentary behaviour
Children and adolescents ***(aged 5–17 years), including those living with disability***	In children and adolescents, physical activity confers benefits for the following health outcomes: physical fitness (cardiorespiratory and muscular fitness), cardiometabolic health (blood pressure, dyslipidaemia, glucose and insulin resistance), bone health, cognitive outcomes (academic performance, executive function) and mental health (reduced symptoms of depression) and reduced adiposity. It is recommended that: ► Children and adolescents should do at least an average of 60 min/day of moderate-to-vigorous intensity, mostly aerobic, physical activity, across the week; ► Vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone should be incorporated at least 3 days a week. *Strong recommendation*	In children and adolescents, higher amounts of sedentary behaviour are associated with detrimental effects on the following health outcomes: fitness and cardiometabolic health, adiposity, behavioural conduct/pro-social behaviour and sleep duration. It is recommended that: ► Children and adolescents should limit the amount of time spent being sedentary, particularly the amount of recreational screen time. *Strong recommendation*
Adults ***(aged 18–64 years) including those with chronic conditions and those living with disability***	adults, physical activity confers benefits for the following health outcomes: all-use mortality, cardiovascular disease mortality, incident hypertension, incident pe 2 diabetes, incident site-specific cancers,mental health (reduced symptoms of xiety and depression), cognitive health and sleep ; measures of adiposity may so improve. is recommended that: ► All adults should undertake regular physical activity; ► Adults should do at least 150–300 min of moderate-intensity aerobic physical activity, or at least 75–150 min of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate-intensity and vigorous-intensity activity throughout the week for substantial health benefits; ► Adults should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits. *Strong recommendation* ► Adults may increase moderate-intensity aerobic physical activity to >300 min, or do >150 min of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate-intensity and vigorous-intensity activity throughout the week for additional health benefits (when not contraindicated for those with chronic conditions). *Conditional recommendation*	In adults, higher amounts of sedentary behaviour are associated with detrimental effects on the following health outcomes: all-cause mortality, cardiovascular disease mortality and cancer mortality and incidence of cardiovascular disease, type 2 diabetes and cancer. It is recommended that: ► Adults should limit the amount of time spent being sedentary. Replacing sedentary time with physical activity of any intensity (including light intensity) provides health benefits; ► To help reduce the detrimental effects of high levels of sedentary behaviour on health, adults should aim to do more than the recommended levels of moderate-to-vigorous physical activity. *Strong recommendation*
Older adults ***(aged 65 years and older) including those with chronic conditions and those living with disability***	older adults, physical activity also helps prevent falls and falls-related injuries d declines in bone health and functional ability. is recommended that: s for adults, plus As part of their weekly physical activity, older adults should do varied multicomponent physical activity that emphasises functional balance and strength training at moderate or greater intensity on 3 or more days a week, to enhance functional capacity and to prevent falls. *Strong recommendation*	As for adults *Strong recommendation*

Bull 2020

De richtlijnen zijn van toepassing op álle mensen

Table 4 Summary of the WHO Guidelines on physcial activity and sedentary behaviour.

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World Health Organization 2020 guidelines on physical activity and sedentary behaviour

Adults
(aged 18–64 years) including those with chronic conditions and those living with disability

Aërobe fysieke activiteit

Light physical activity	Moderate physical activity	Vigorous to high physical activity
An aerobic activity that does not cause a noticeable change in breathing rate, an intensity that can be sustained for at least 60 minutes	An aerobic activity that is able to be conducted whilst maintaining a conversation uninterrupted, an intensity that may last between 30 and 60 minutes	An intensity that may last up to about 30 minutes or for no longer than about 10 minutes, respectively

150-300 min = 2,5-5h /week

OR

75-150min = 1,5-2,5h /week

Bull 2020

World Health Organization 2020 guidelines on physical activity and sedentary behaviour

Adults
(aged 18–64 years) including those with chronic conditions and those living with disability

Spierversterkende activiteiten

Min. 2x/week

Bull 2020

World Health Organization 2020 guidelines on physical activity and sedentary behaviour

Adults
(aged 18–64 years) including those with chronic conditions and those living with disability

Voor extra gezondheidswinst

X 2

World Health Organization 2020 guidelines on physical activity and sedentary behaviour

Table 4 Summary of the WHO Guidelines on physcial activity and sedentary behaviour.

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Bull 2020

World Health Organization 2020 guidelines on physical activity and sedentary behaviour

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Gezond ouder worden

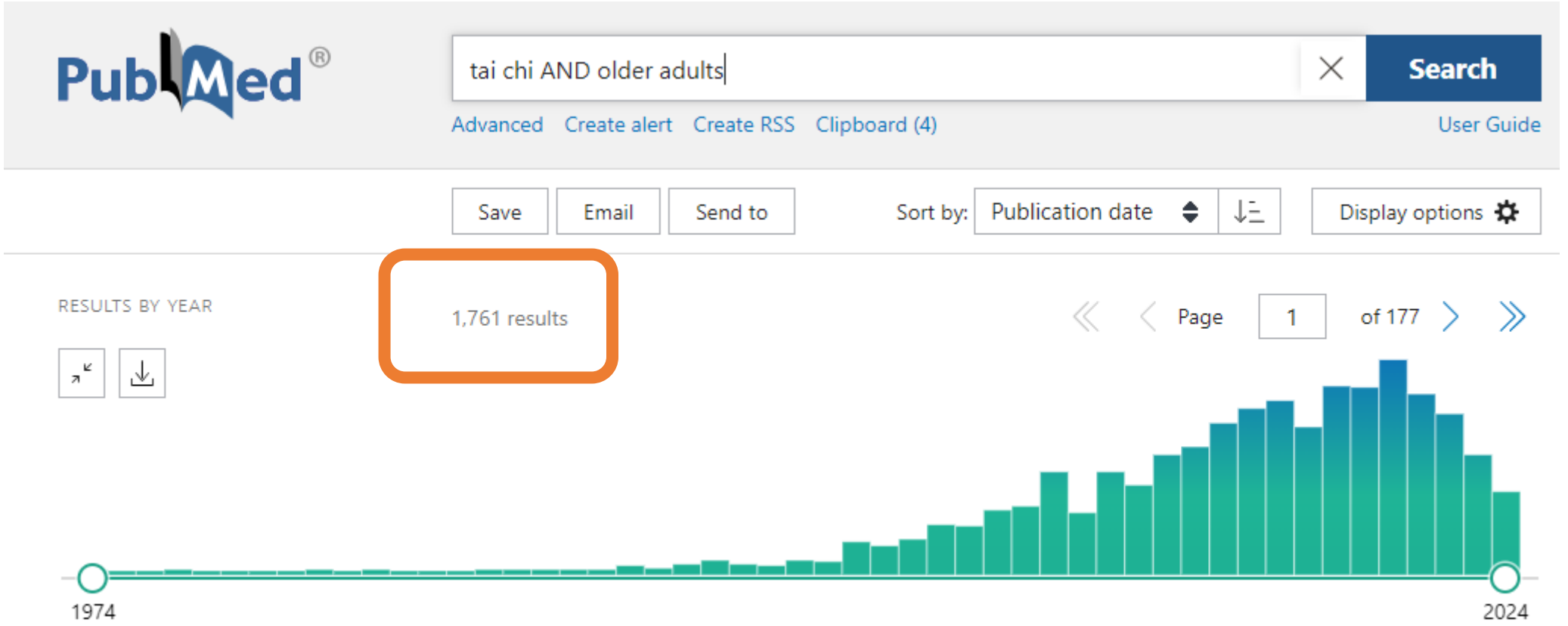
Kwetsbaarheid

Sarcopenie

Fysieke activiteit – ~~Oefenen~~

Tai Chi

Is Tai Chi nuttig als oefenvorm?



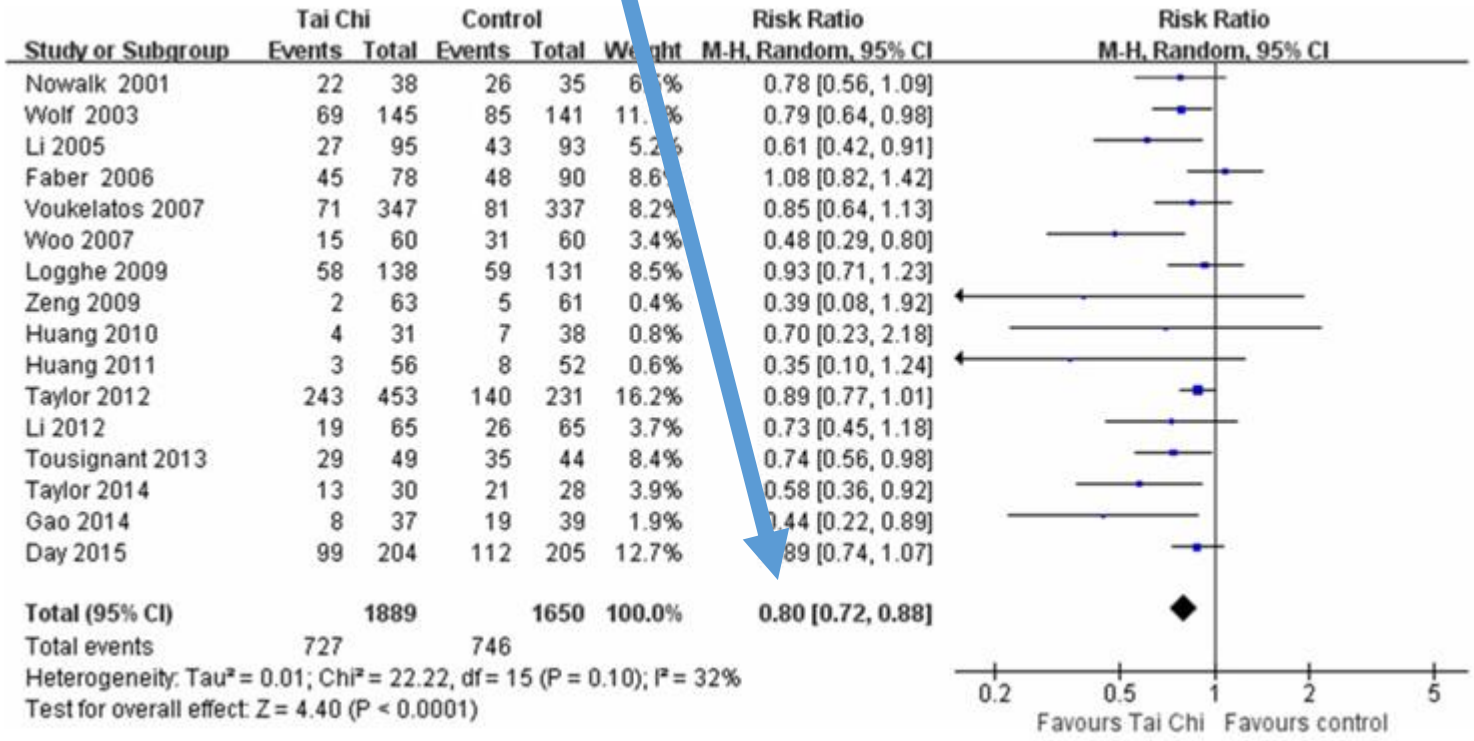
Open Access Research

BMJ Open

Systematic review and meta-analysis: Tai Chi for preventing falls in older adults

Zhi-Guan Huang,[1] Yun-Hui Feng,[2] Yu-He Li,[1] Chang-Sheng Lv[1]

Conclusions: Tai Chi is effective for preventing falls in older adults. The preventive effect is likely to incre with exercise frequency and Yang style Tai Chi see to be more effective than Sun style Tai Chi.



Study or Subgroup	Tai Chi Events	Tai Chi Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Nowalk 2001	22	38	26	35	6.[illegible]%	0.78 [0.56, 1.09]
Wolf 2003	69	145	85	141	11.[illegible]%	0.79 [0.64, 0.98]
Li 2005	27	95	43	93	5.2[illegible]	0.61 [0.42, 0.91]
Faber 2006	45	78	48	90	8.6[illegible]	1.08 [0.82, 1.42]
Voukelatos 2007	71	347	81	337	8.2%	0.85 [0.64, 1.13]
Woo 2007	15	60	31	60	3.4%	0.48 [0.29, 0.80]
Logghe 2009	58	138	59	131	8.5%	0.93 [0.71, 1.23]
Zeng 2009	2	63	5	61	0.4%	0.39 [0.08, 1.92]
Huang 2010	4	31	7	38	0.8%	0.70 [0.23, 2.18]
Huang 2011	3	56	8	52	0.6%	0.35 [0.10, 1.24]
Taylor 2012	243	453	140	231	16.2%	0.89 [0.77, 1.01]
Li 2012	19	65	26	65	3.7%	0.73 [0.45, 1.18]
Tousignant 2013	29	49	35	44	8.4%	0.74 [0.56, 0.98]
Taylor 2014	13	30	21	28	3.9%	0.58 [0.36, 0.92]
Gao 2014	8	37	19	39	1.9%	[illegible]44 [0.22, 0.89]
Day 2015	99	204	112	205	12.7%	[illegible]89 [0.74, 1.07]
Total (95% CI)		**1889**		**1650**	**100.0%**	**0.80 [0.72, 0.88]**
Total events	727		746			

Heterogeneity: Tau² = 0.01; Chi² = 22.22, df = 15 (P = 0.10); I² = 32%
Test for overall effect: Z = 4.40 (P < 0.0001)

Effectiveness of Tai Chi on quality of life, depressive symptoms and physical function among community-dwelling older adults with chronic disease: A systematic review and meta-analysis

Yu Ting Choo[a], Ying Jiang[a], Jingfang Hong[b,*], Wenru Wang[a,*]

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Conclusion: Tai Chi was found to have favourable effects on QoL and depressive symptoms of older adults with chronic disease which can act as a complement to disease management. However, future research can be improved to explore theoretical framework and include high-quality studies with larger sample sizes.

Review

The effect of Tai Chi in elderly individuals with sarcopenia and frailty: A systematic review and meta-analysis of randomized controlled trials

Chia-Yu Huang [a,b,1], Peter Karl Mayer [c,d,2], Mei-Yao Wu [d,e,f,3], Dung-Huan Liu [g,h,i,4], Pei-Ching Wu [d,g,5], Hung-Rong Yen [b,c,d,f,j,k,*,6]

Conclusions: Our results demonstrated that patients with frailty or sarcopenia who practiced Tai Chi exhibited improved physical performance in the 30-second chair stand test, the Timed up and go test, number of falls and fear of falling. However, there was no difference in muscle mass, grip strength, gait speed, or Short Physical Performance Battery score between the Tai Chi and control groups. Improvements in the sit-to-stand test, balance, diastolic blood pressure, Mini-Mental State Examination score, and depression and quality of life assessments were found when comparing the Tai Chi cohort to the nonexercise control cohort rather than the exercise control cohort. To explore the effectiveness of Tai Chi in sarcopenic and frail elderly individuals more comprehensively, a standardized Tai Chi training prescription and a detailed description of the study design are suggested for future studies.

Gezond ouder worden

Kwetsbaarheid

Sarcopenie

Fysieke activiteit

Tai Chi = Oefenen

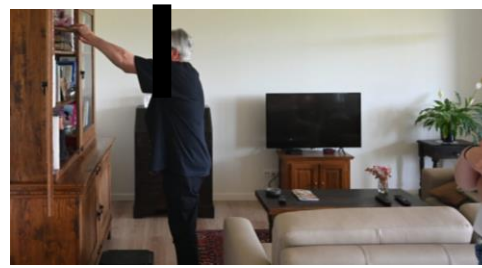
VUB RERE REHABILITATION RESEARCH GROUP
part of EUTOPIA European University

Doe mee aan onze Onderzoeken!

Jouw deelname kan het verschil maken!

Wij nodigen je uit om je aan te melden als **vrijwillige deelnemer voor onze onderzoeksprojecten**.

Samen kunnen we waardevolle inzichten verkrijgen en bijdragen aan de vooruitgang van de wetenschap.



De Krijgskunst van het Leven

Actief en Gezond Ouder Worden

Prof. David Beckwée