

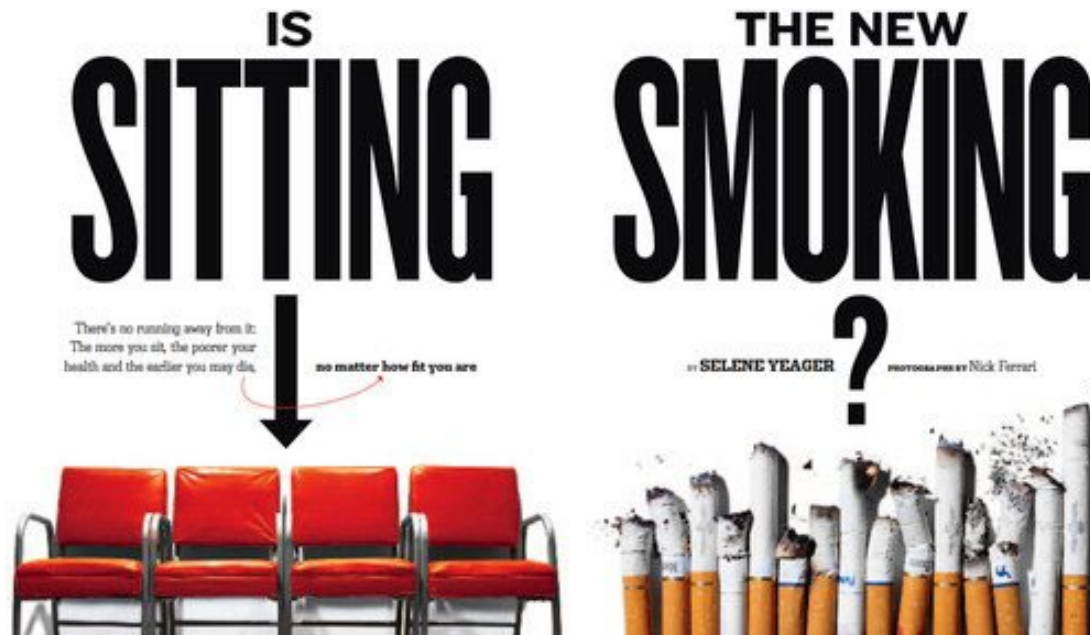


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# Trening som medisin

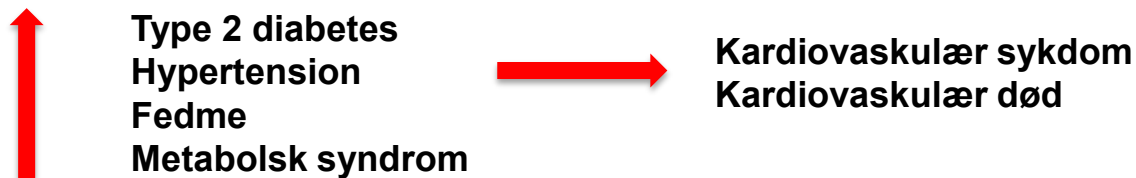
Inger-Lise Aamot Aksetøy



#### STILLESITTING:

- Våken tid i sittende, liggende eller annen fysisk hvilende stilling
- Energiforbruk < 1.5 MET

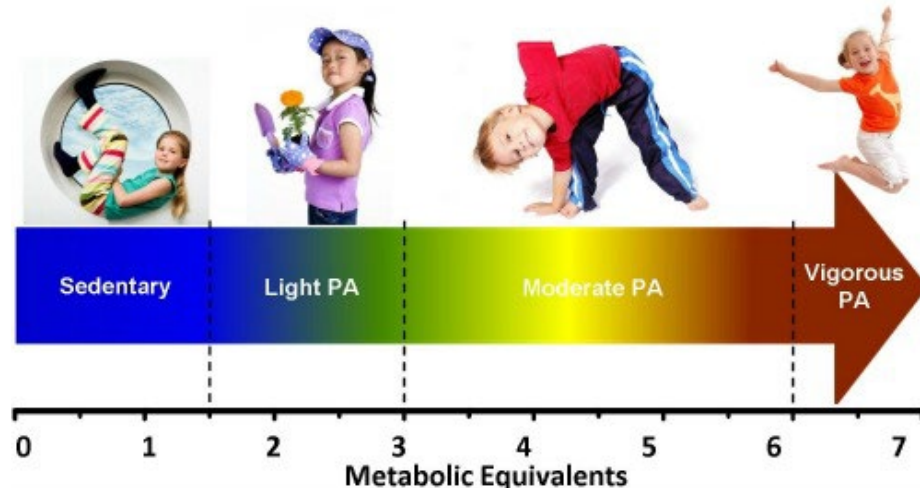
# Fysisk inaktivitet



## Potensielle mekanismer

- Redusert insulinsensitivitet
- Postprandial dysmetabolisme
- Inflammasjon og aterosklerose
- Fravær av gunstige treningseffekter

Thyfault et al. Med Sci Sports Exerc, 2015  
Booth et al. Scand J Med Sci Sports, 2010  
Young et al. Circulation, 2016



1 MET = 3,5 ml/kg/min  $VO_2$  = hvilemetabolisme  
FITT principle: frekvens, intensitet, tid, type aktivitet

# Trening versus fysisk aktivitet

## Fysisk aktivitet

«enhver kroppslig bevegelse forårsaket av skjelettmuskulatur som resulterer i energiforbruk over hvilenivå»

## Trening

«fysisk aktivitet som er planlagt, strukturert og repeterende med mål om å forbedre eller vedlikeholde fysisk form»

# WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR



For additional health benefits:

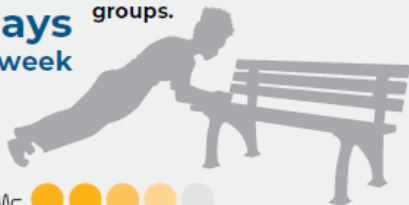
On at least



**2**

**days**  
a week

muscle-strengthening  
activities at moderate  
or greater intensity that  
involve all major muscle  
groups.



At least

**150**  
to **300**  
minutes

moderate-intensity  
aerobic physical  
activity



or

at least

**75**  
to **150**  
minutes

vigorous-intensity  
aerobic physical  
activity



or an equivalent combination throughout the week




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<https://iris.who.int/bitstream/handle/10665/336656/9789240015128-eng.pdf?sequence=1>





Utholdenhets-  
trening

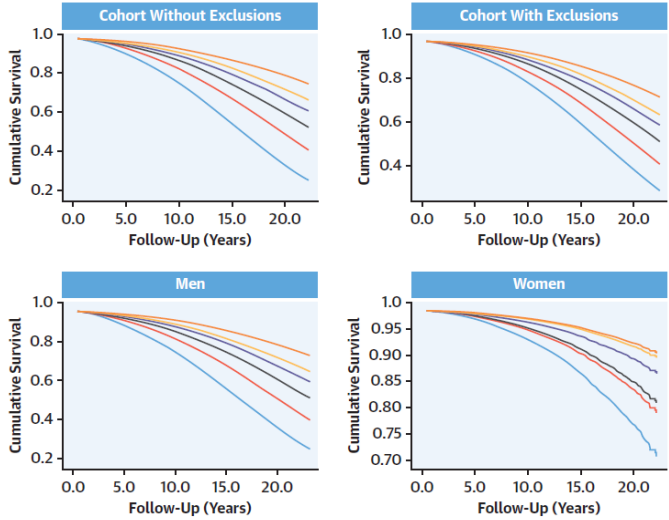
Styrketrening

Balanse- og  
Bevegelighets-  
trening





**FIGURE 3** Survival Curves According to Cardiorespiratory Fitness Categories



Blue, least fit; red, low fit; gray, moderately fit; purple, fit; yellow, highly fit; orange, extremely fit.

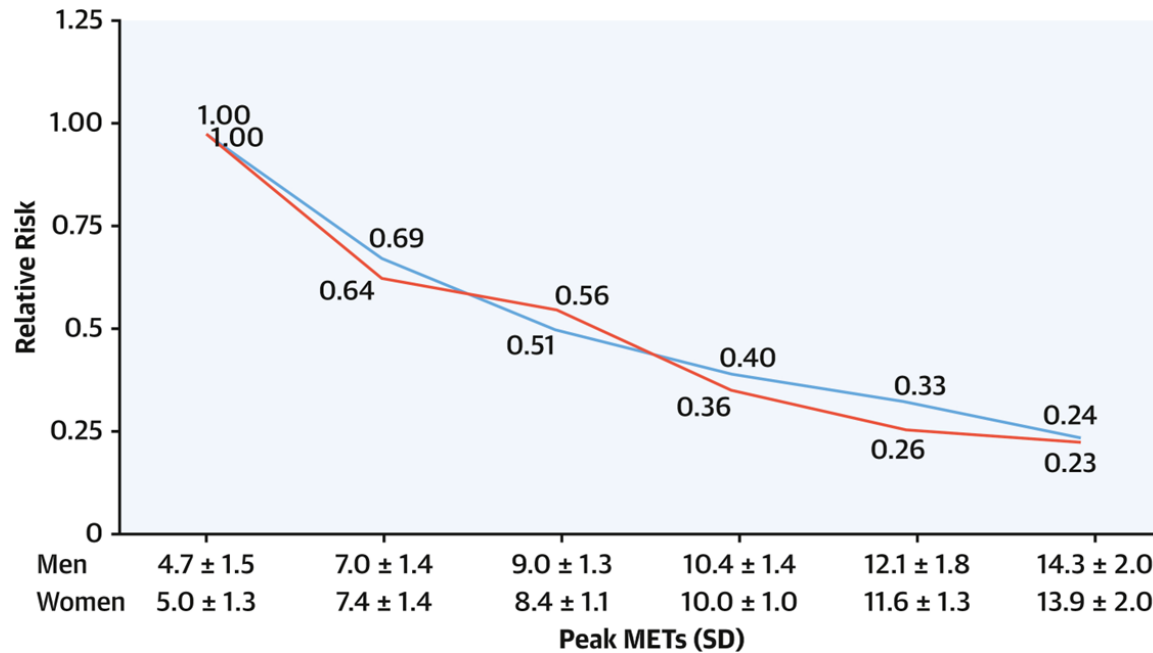
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY  
© 2022 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION  
PUBLISHED BY ELSEVIER

VOL. 80, NO. 6, 2022

# Cardiorespiratory Fitness and Mortality Risk Across the Spectra of Age, Race, and Sex



Peter Kokkinos, PhD,<sup>a,b,c</sup> Charles Faselis, MD,<sup>a,c</sup> Immanuel Babu Henry Samuel, PhD,<sup>d,e</sup> Andreas Pittaras, MD,<sup>a,c</sup> Michael Doumas, MD,<sup>a,f</sup> Rayelynn Murphy, MS,<sup>a</sup> Michael S. Heimall, BS,<sup>a</sup> Xuemei Sui, PhD,<sup>g</sup> Jiajia Zhang, PhD,<sup>h</sup> Jonathan Myers, PhD<sup>i,j</sup>



*Kokkinos et al. (2022). Journal of the American College of Cardiology*

# Styrketrening



- **STYRKE** er den maksimale kraften eller det dreiemomentet en muskel eller muskelgruppe kan skape ved en spesifikk eller forutbestemt hastighet
- **MAKSIMAL STYRKETRENING** er all trening som gjennomføres med den hensikt å øke evnen til maksimal kraftutvikling (...). Normalt er dette trening med så stor motstand at vi bare klarer 1-12 repetisjoner i en serie før utmattelse, 1-12 RM serier.



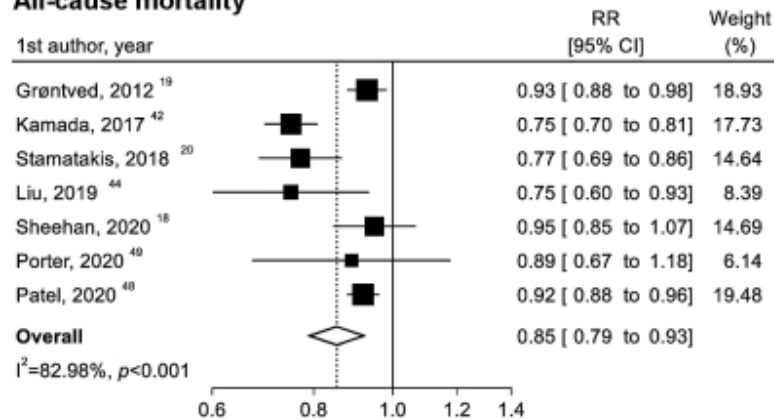
# Muscle-strengthening activities are associated with lower risk and mortality in major non-communicable diseases: a systematic review and meta-analysis of cohort studies

Haruki Momma <sup>1</sup>, Ryoko Kawakami <sup>2</sup>, Takanori Honda <sup>3</sup>,  
Susumu S Sawada <sup>2</sup>

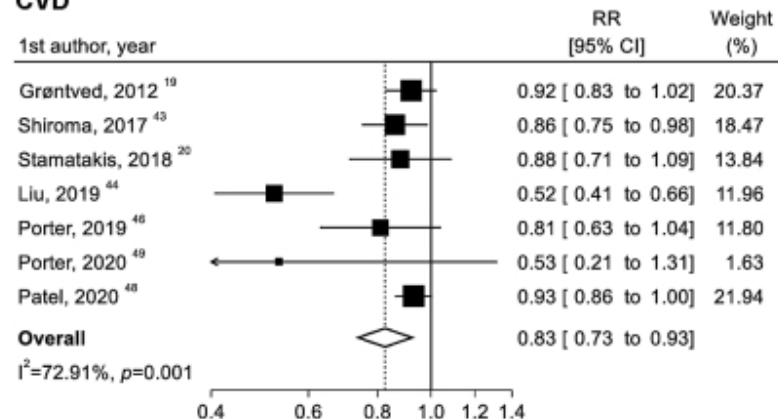
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Momma H, et al. *Br J Sports Med* 2022;**56**:755–763. doi:10.1136/bjsports-2021-105061

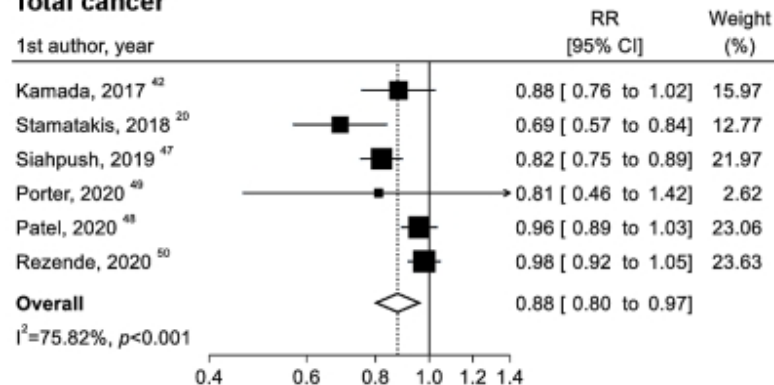
## All-cause mortality



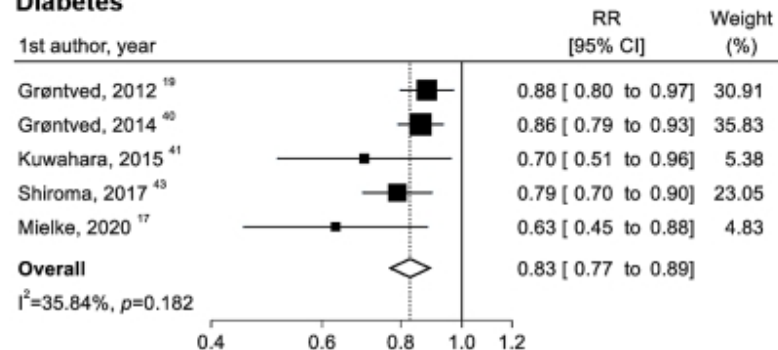
## CVD



## Total cancer



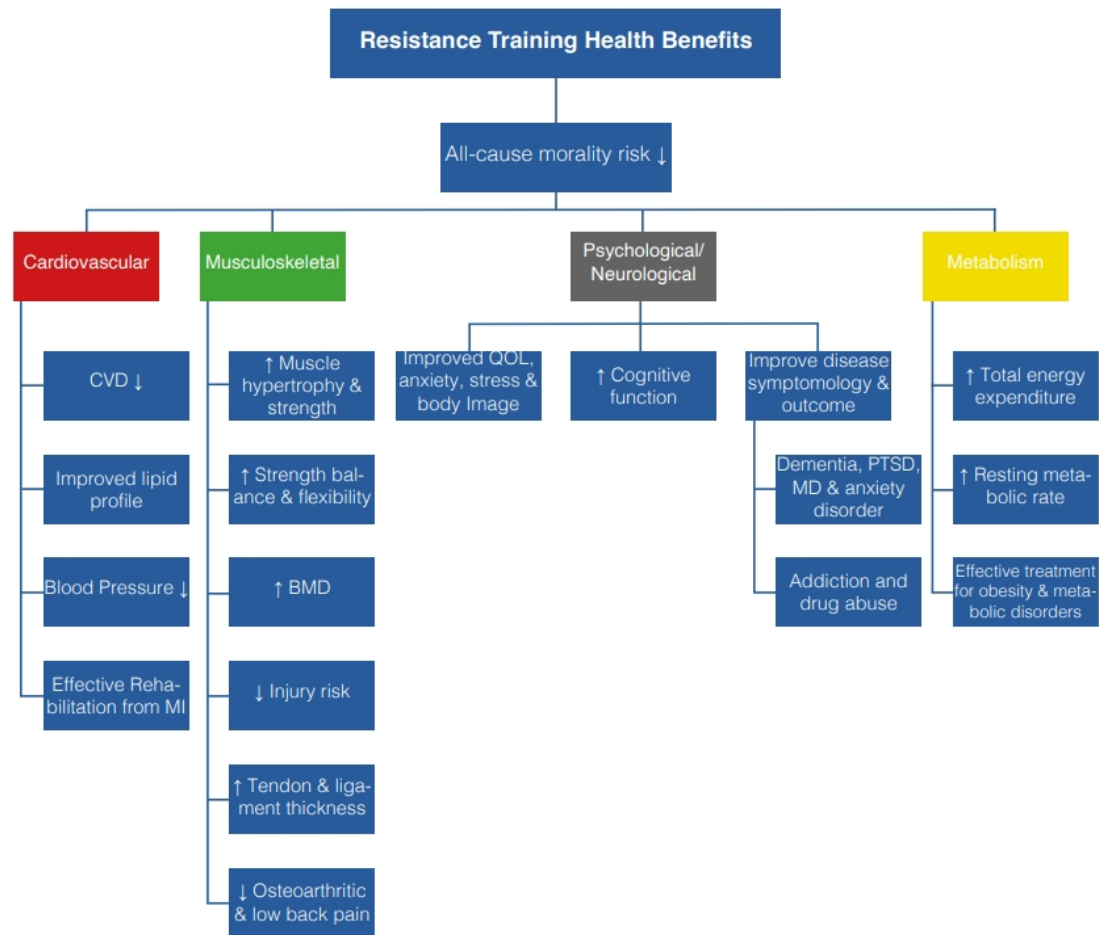
## Diabetes



**Figure 2** Two-group meta-analysis of the associations between no versus any muscle-strengthening activities and all-cause mortality, cardiovascular disease (CVD), total cancer and diabetes. RR, relative risk.

# Raising the Bar for Public Health: Resistance Training and Health Benefits

John R. Tyler<sup>1,2</sup> & Panayotis K. Thanos<sup>1,3</sup>



**Figure 1.**

Notes: Cardiovascular disease (CVD), Myocardial infarction (MI), Bone mineral density (BMD), Quality of life (QoI), Major depressive disorder (MDD)

# Psykisk helse

Research

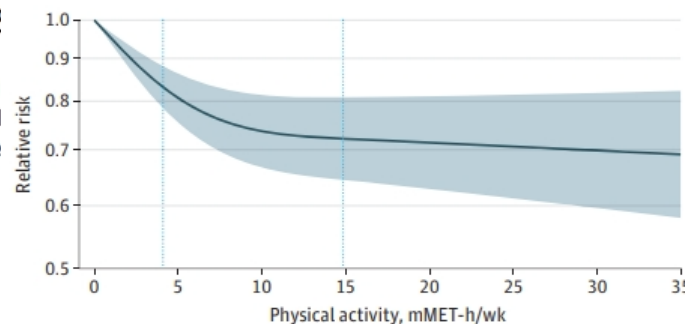
JAMA F

Assoc

A Sys

Matthew  
Rajna Gol  
Alexandre

Figure 1. Association Between Physical Activity and Incidence of Depression



Dark line represents the meta-analytical dose-response curve (constrained to be linear beyond upper knot at 75% of person-years). Shaded area displays 95% CI. Vertical dotted lines indicate knots at the 37.5th and 75th percentiles of person-years.  $I^2 = 73.7\%$ ;  $P < .001$ . Interactive dose-response curves and exposure distributions are available online.<sup>44</sup>

## Key Points

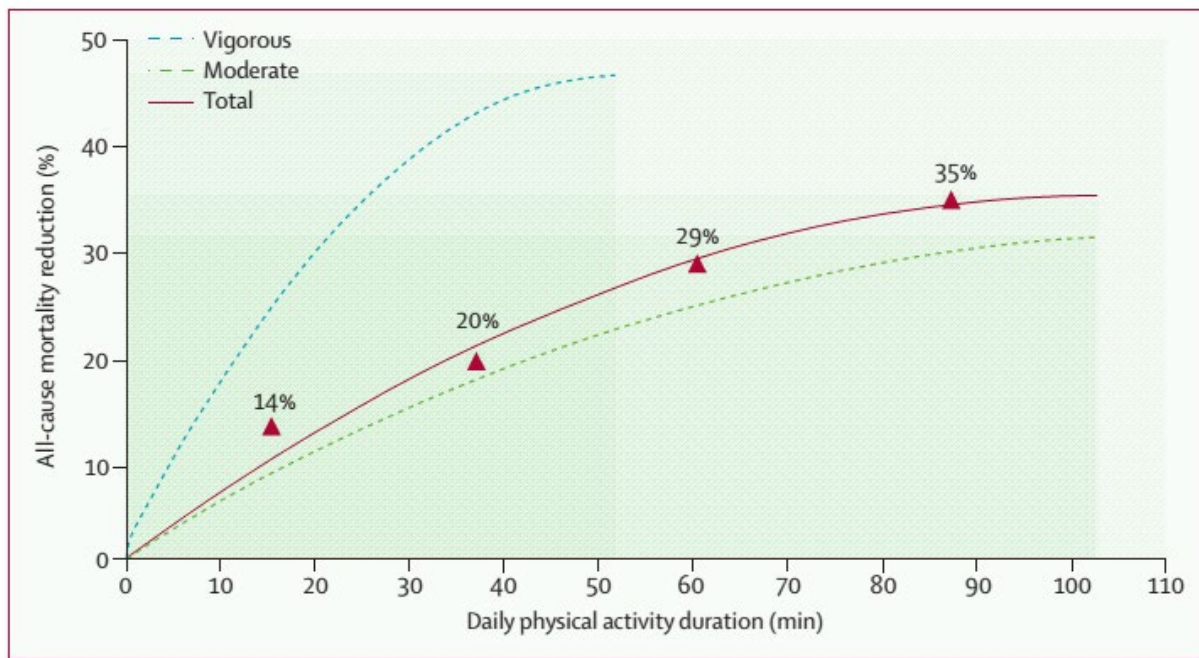
**Question** What is the dose-response association between physical activity and incident depression in adults?

**Findings** This systematic review and meta-analysis of 15 prospective studies including more than 2 million person-years showed an inverse curvilinear association between physical activity and incident depression, with greater differences in risk at lower exposure levels. Adults meeting physical activity recommendations (equivalent to 2.5 h/wk of brisk walking) had lower risk of depression, compared with adults reporting no physical activity.

**Meaning** In this study, relatively small doses of physical activity were associated with substantially lower risks of depression.







**Figure 2: Daily physical activity duration and all-cause mortality reduction**

**Wen et al. Lancet  
2011**