

Osteoporosis and Soft Tissue (Muscle/Fat) Disorders Management and Medical Decision-Making Exercise

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Disclosures

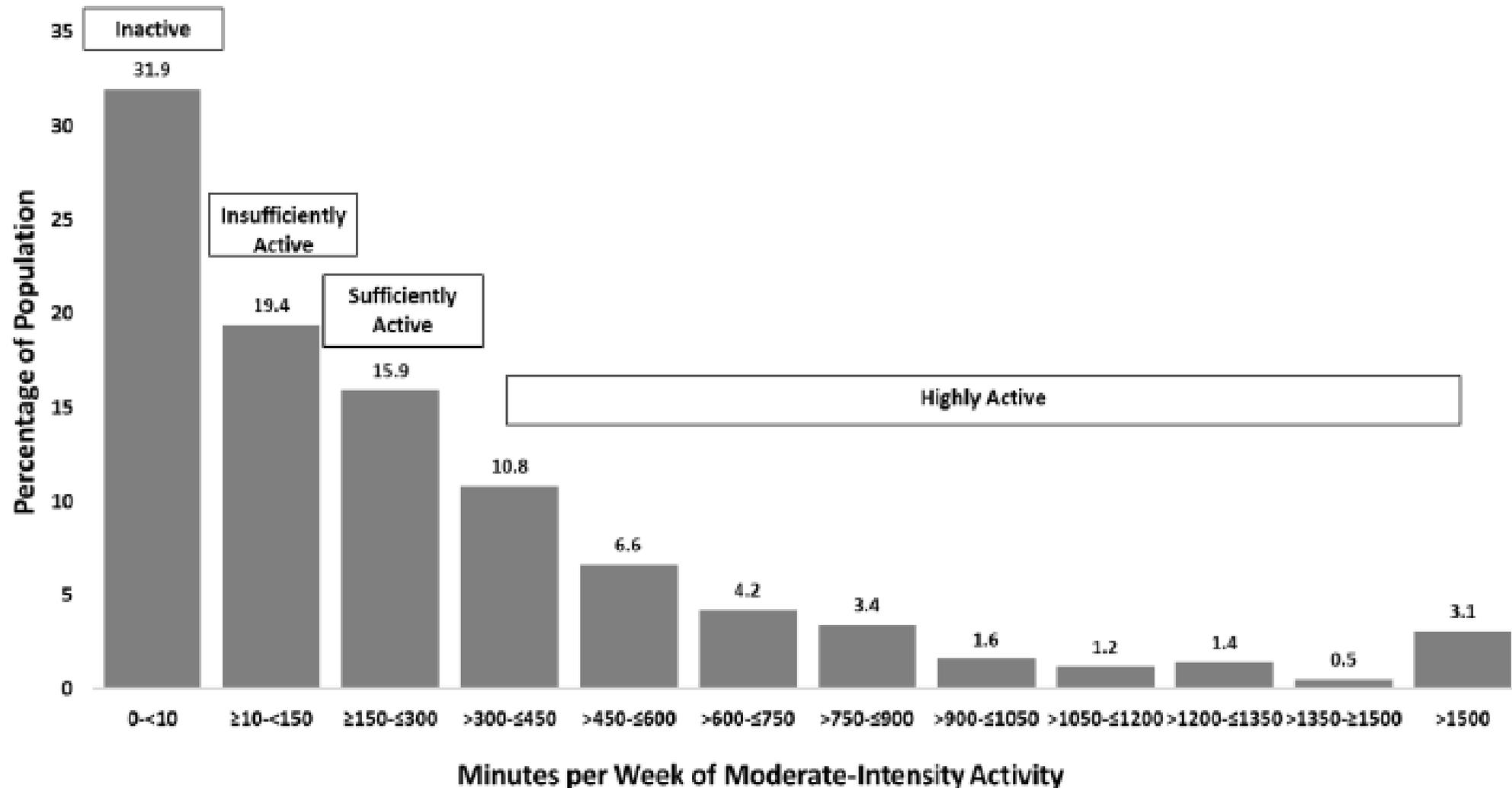
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- NIH (R33 AG056540, P30AG028740, U24AR071113, U01AG050499, U01AG061389, R01AG055529, P30 AG059297)
- Longeveron
- Biophytis

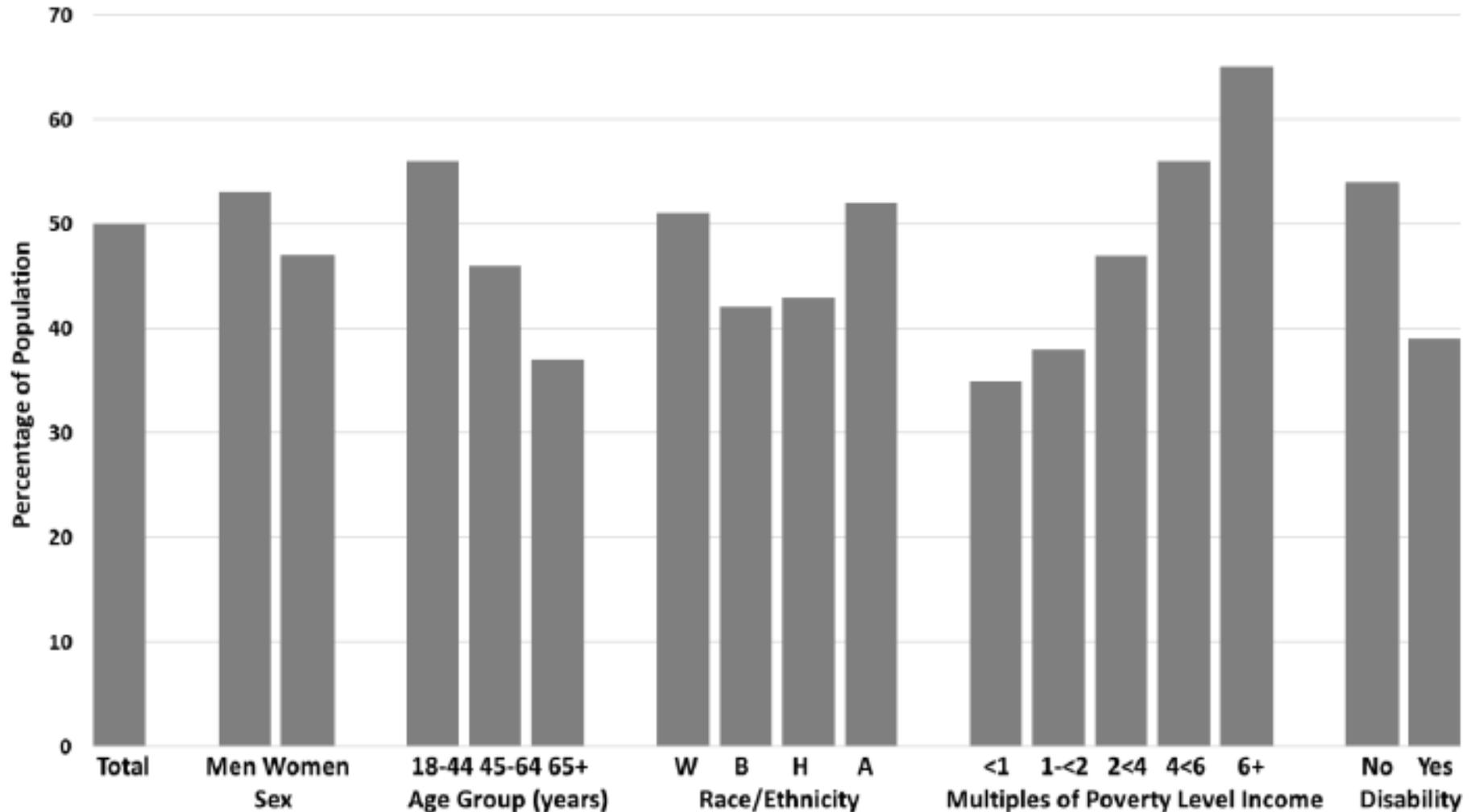
Other financial relationships: None

Conflicts of interest: None

Distribution of Self-Reported Volume of Moderate-to-Vigorous Physical Activity, U.S. Adults, 2015

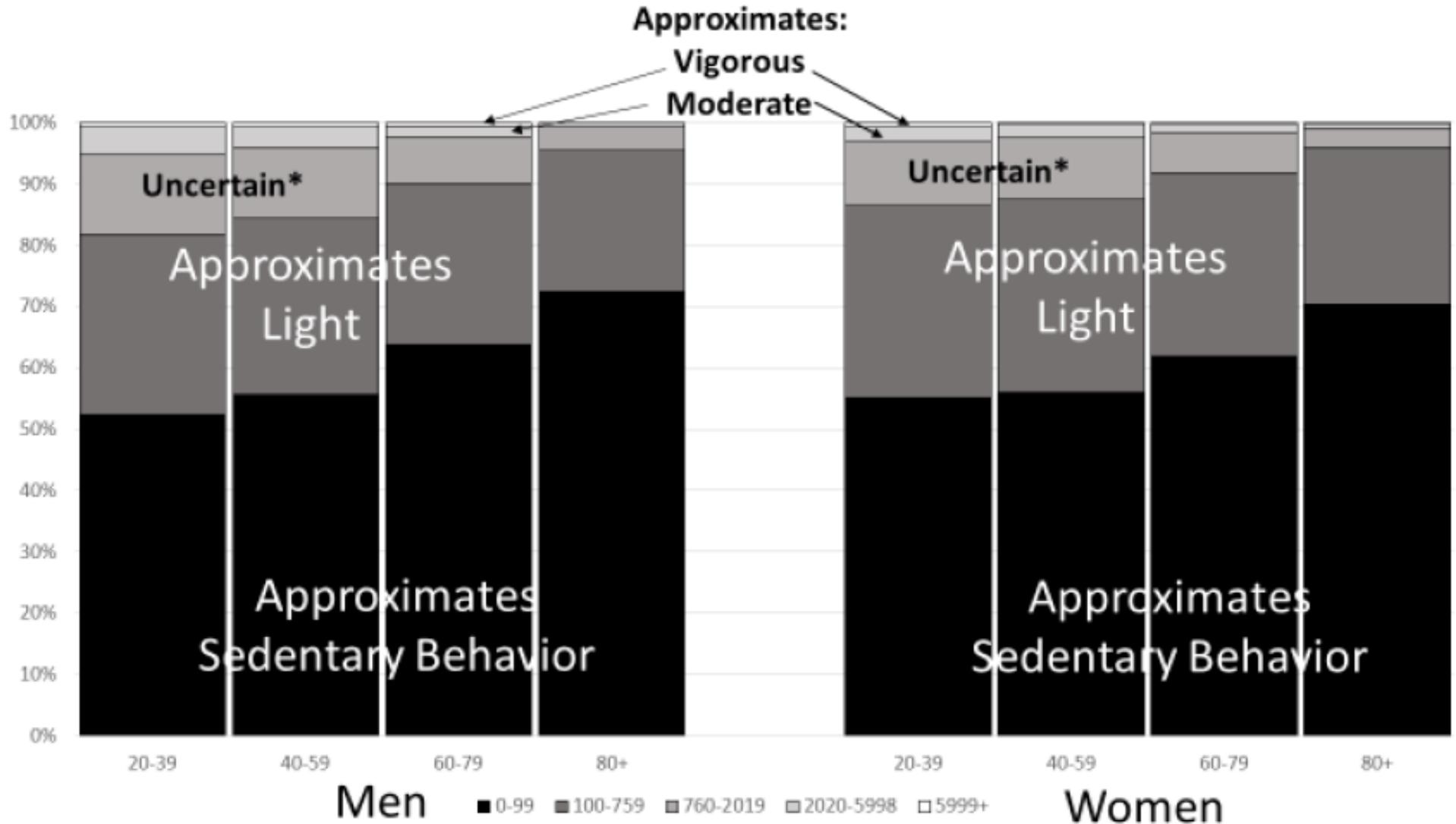


Percentage Adults within or above Target Range for Moderate-to-Vigorous Physical Activity, by Population Subgroup, 2015

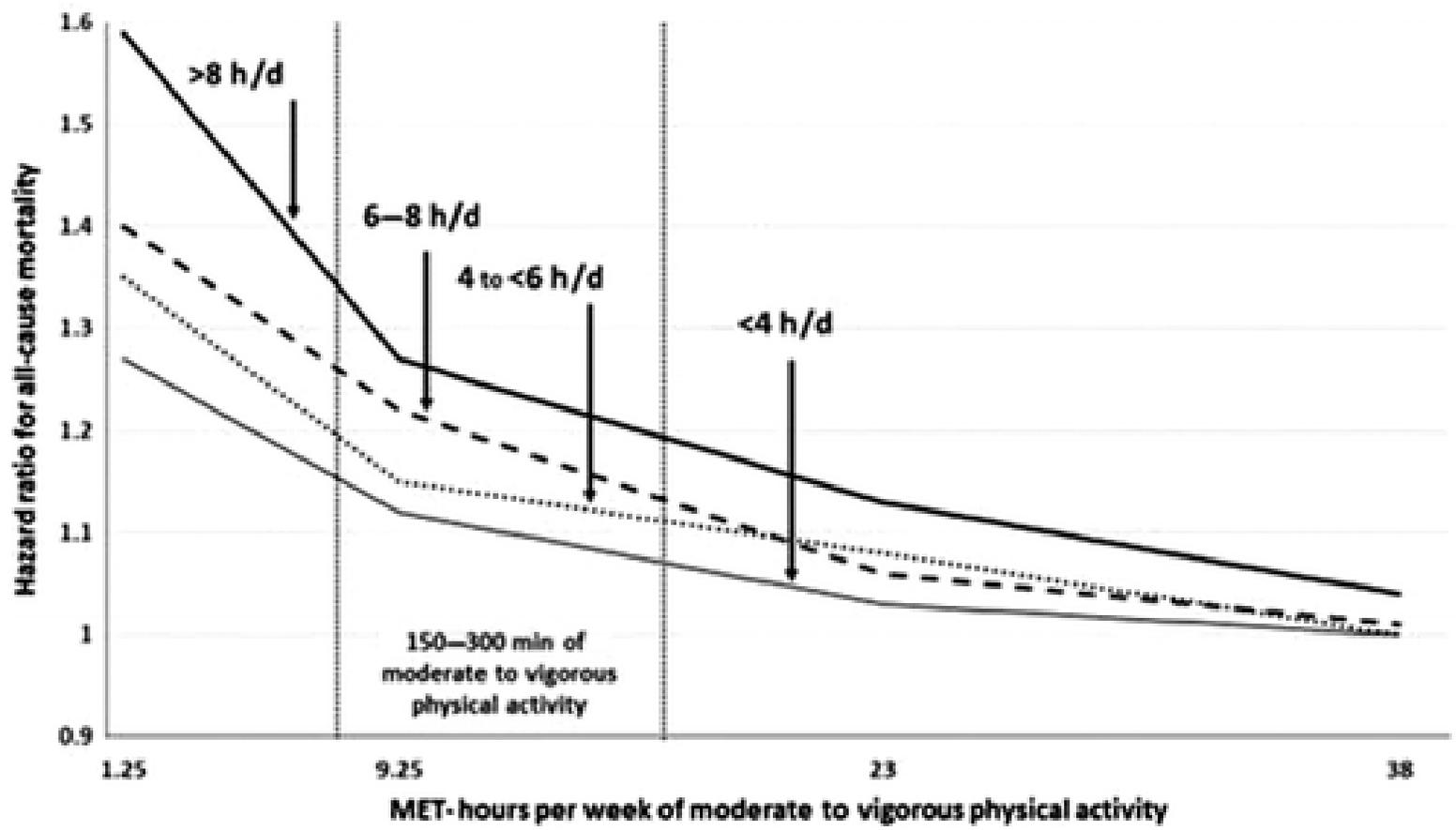


Legend: W=White, B=Black, H=Hispanic, A=Asian.

Proportion of Time-awake at Different Categories of Accelerometer Counts for U.S. Adults

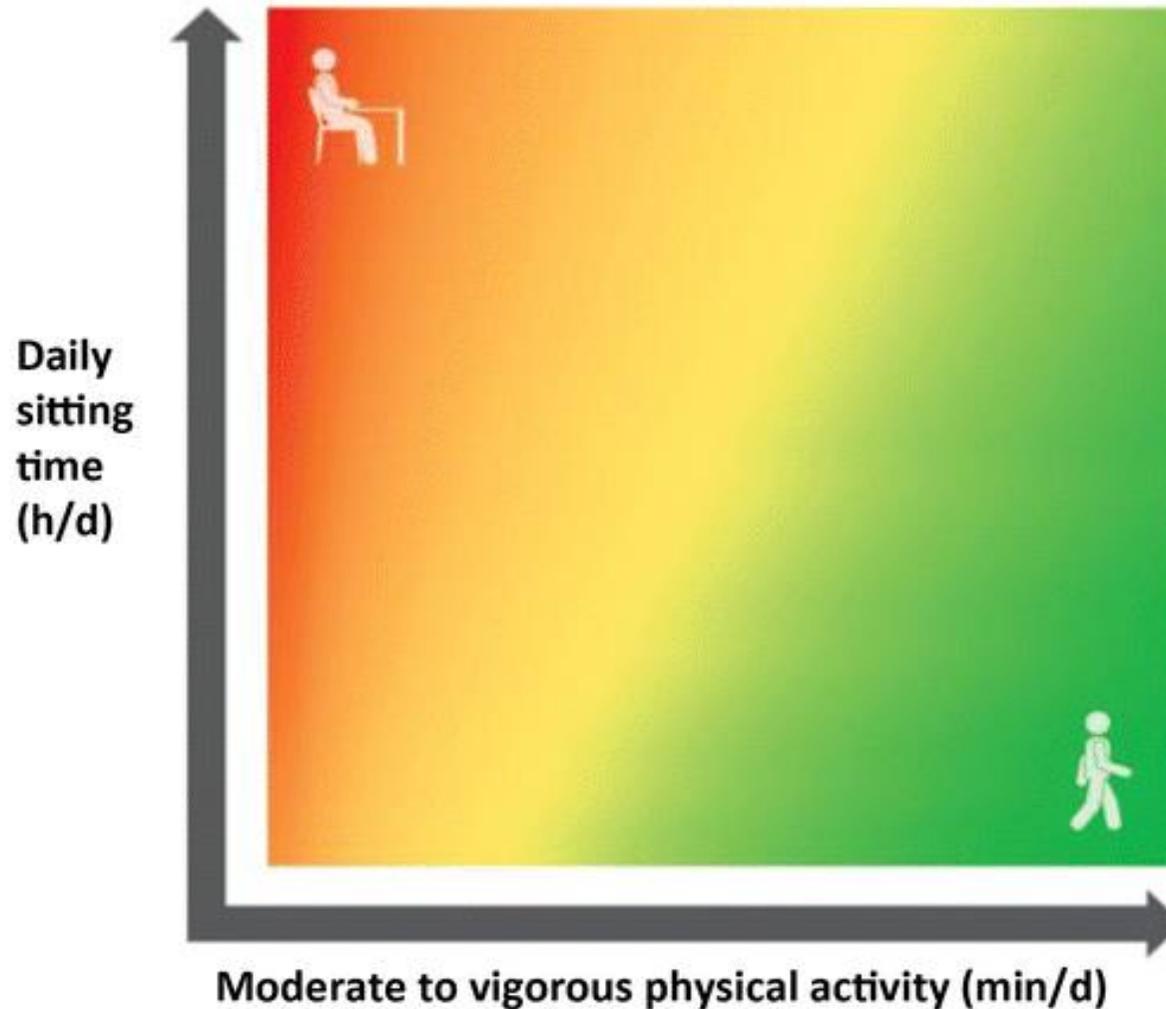


Relationship among moderate-to-vigorous physical activity, sitting time, and risk of all-cause mortality



2018 Physical Activity Guidelines Advisory Committee Scientific Report.
Powell et al. J. Phys. Act. Health 2018 Dec 17:1-11. doi: 10.1123/jpah.2018-0618

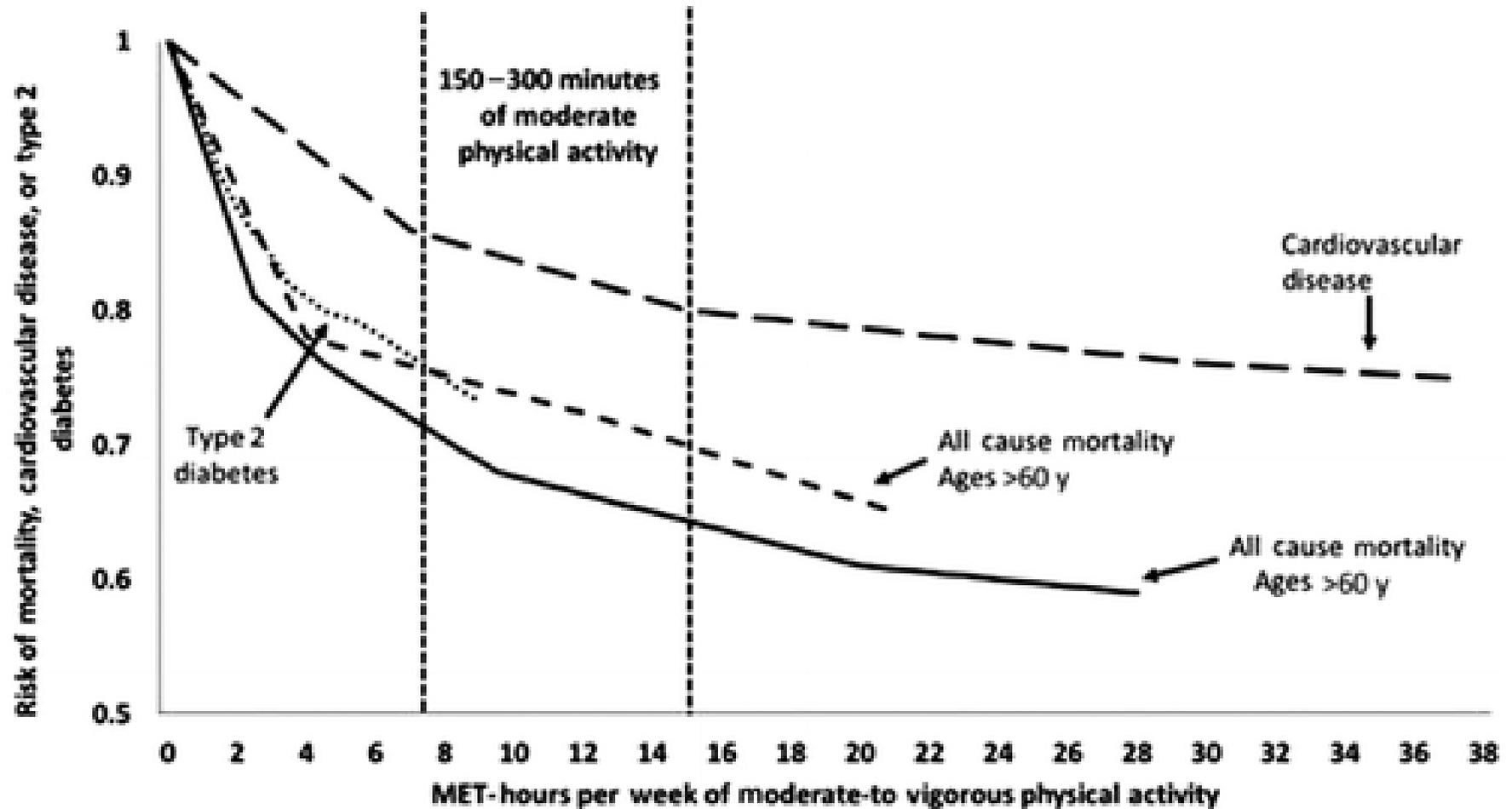
Relationship among moderate-to-vigorous physical activity, sitting time, and risk of all-cause mortality



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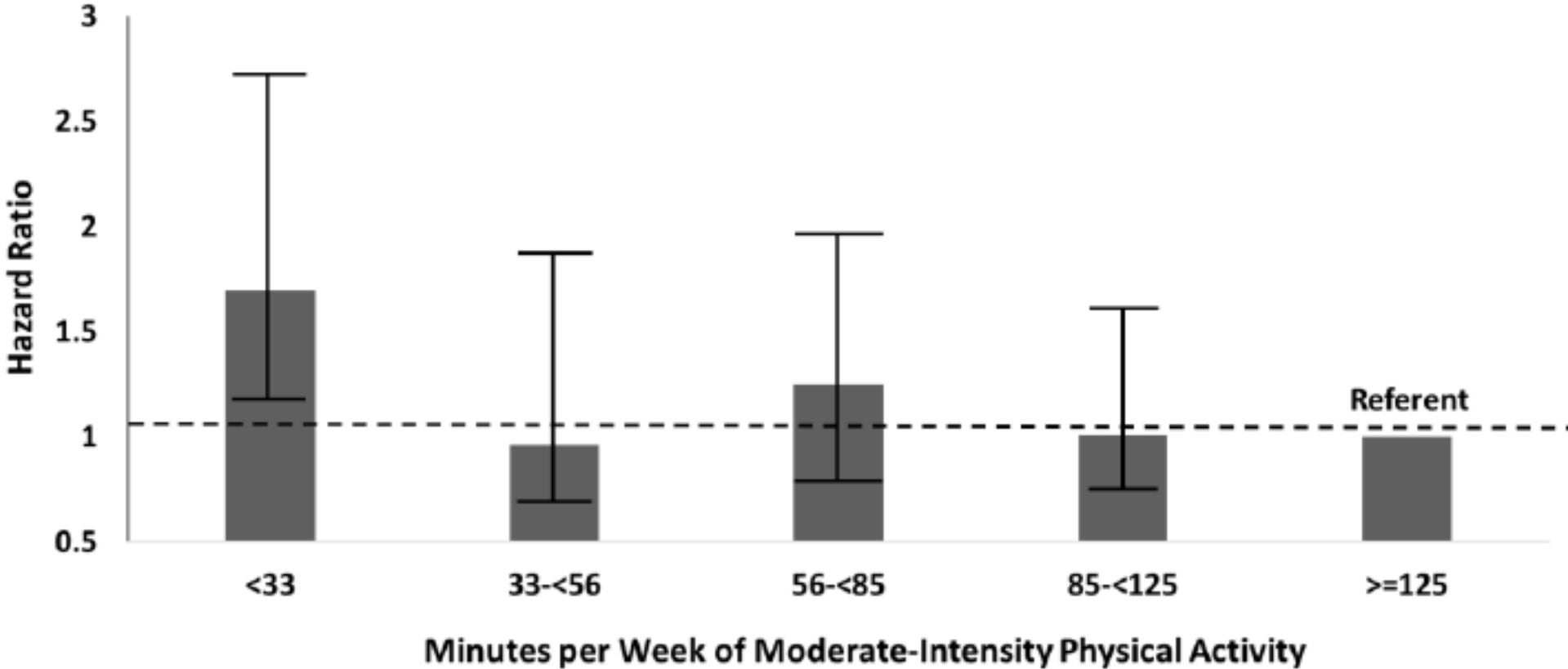
Moderate-to-vigorous aerobic physical activity, and risk of all-cause mortality, diabetes, and cardiovascular disease



2018 Physical Activity Guidelines Advisory Committee Scientific Report.

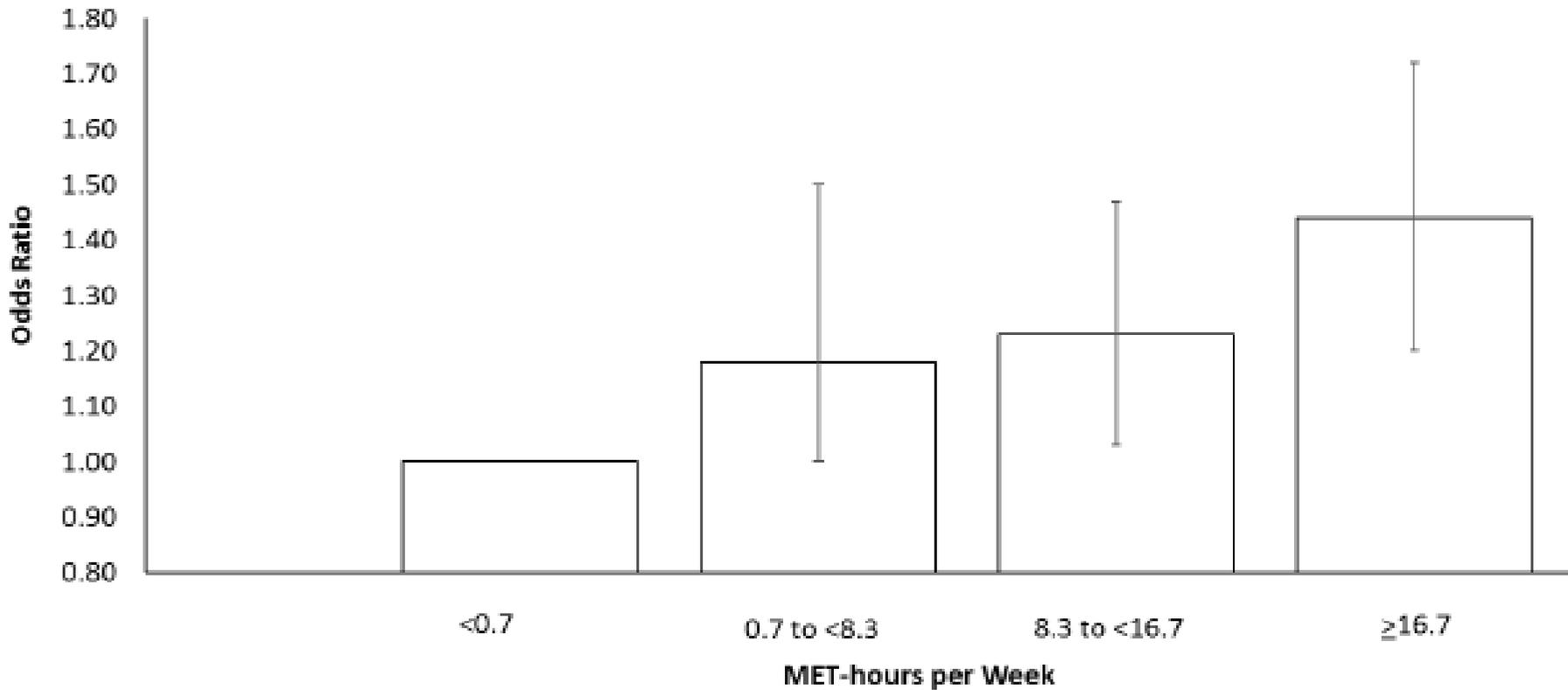
Powell et al. J. Phys. Act. Health 2018 Dec 17:1-11. doi: 10.1123/jpah.2018-0618

3.5 Year Risk of Fracture in Older Men by Quintile of Moderate-Intensity Physical Activity: The Osteoporotic Fractures in Men Study (N=2,731)



Source: Adapted from data found in Cauley et al., 2013.⁹

Odds of Maintaining a Healthy Weight by Level of Physical Activity



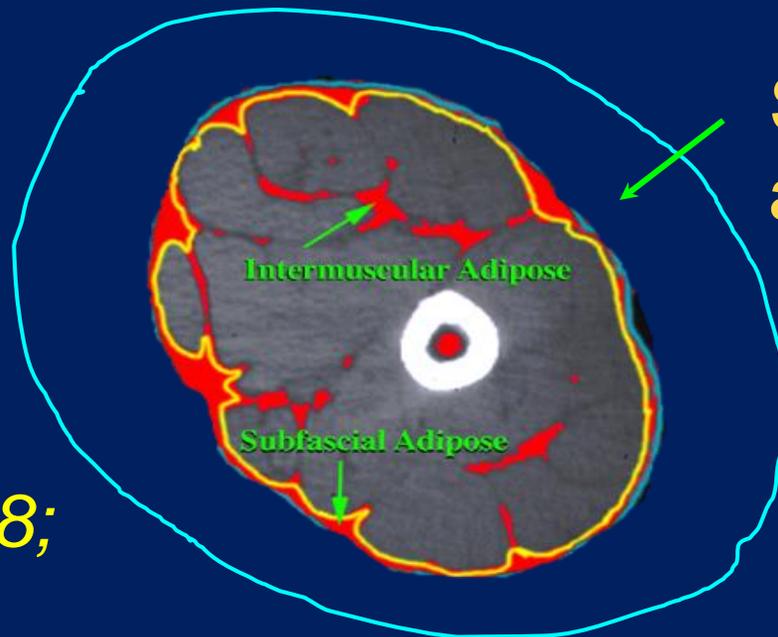
Source: Adapted from data found in Brown et al., 2016.²⁰

LIFE-Pilot Muscle study

Fat accumulation within skeletal muscle is associated with muscle weakness and the loss of function in older adults

The effects of physical activity on fat within muscle in older adults are not clear

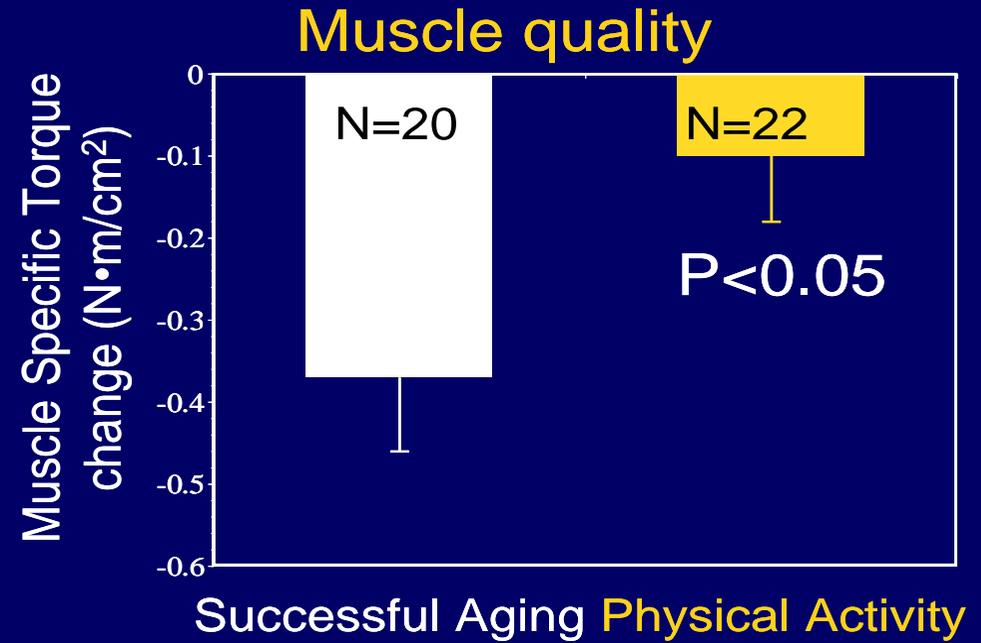
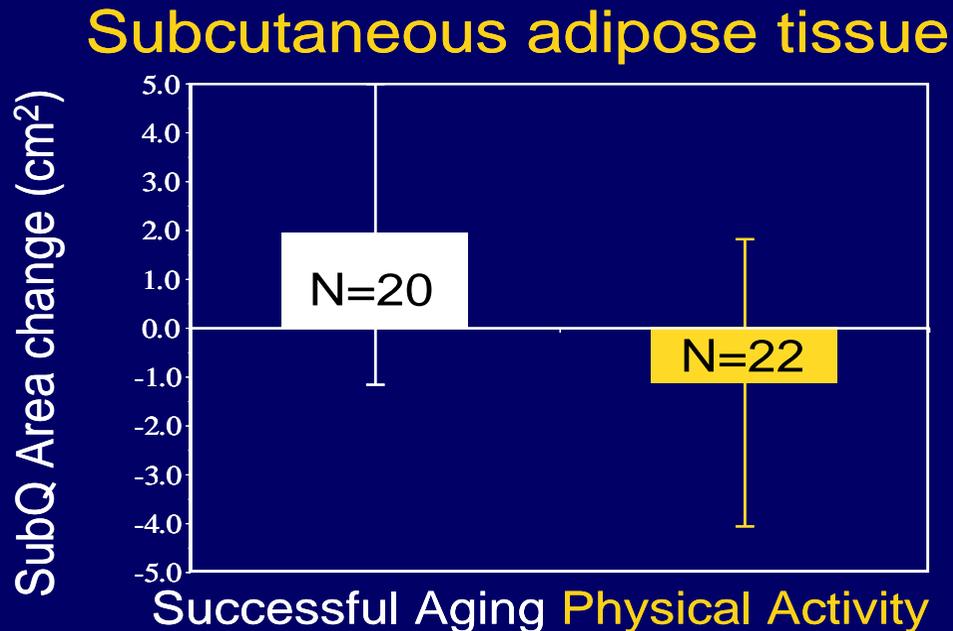
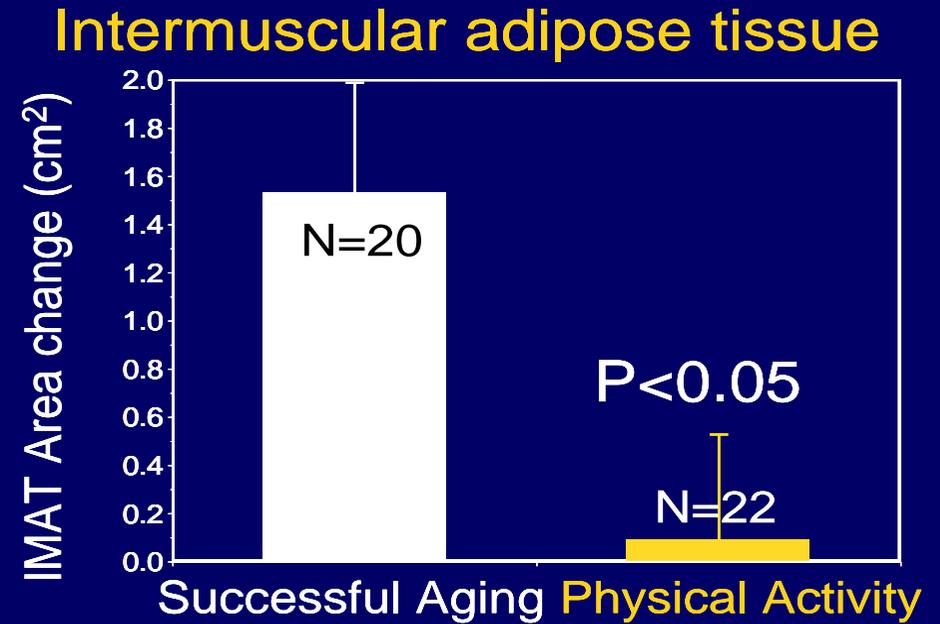
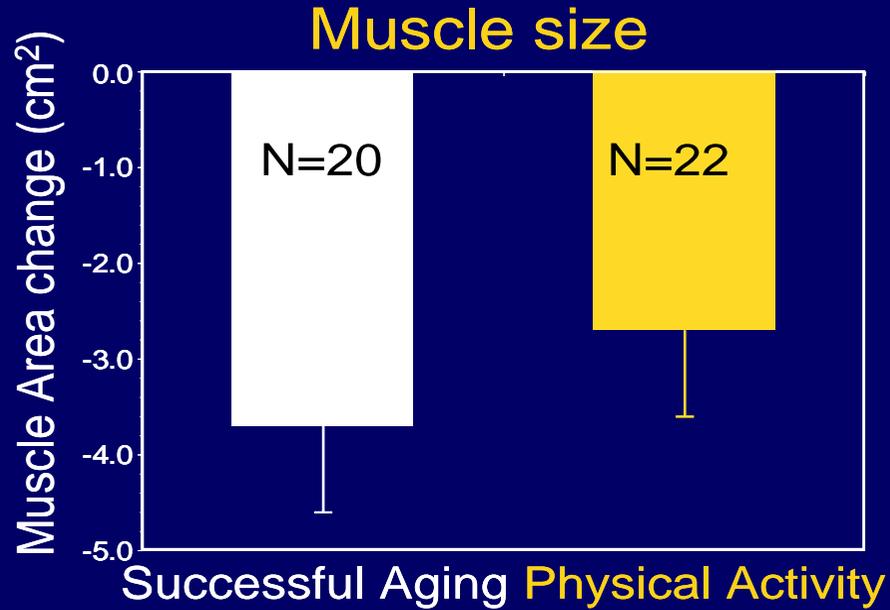
CT scan
of the thigh



Subcutaneous
adipose

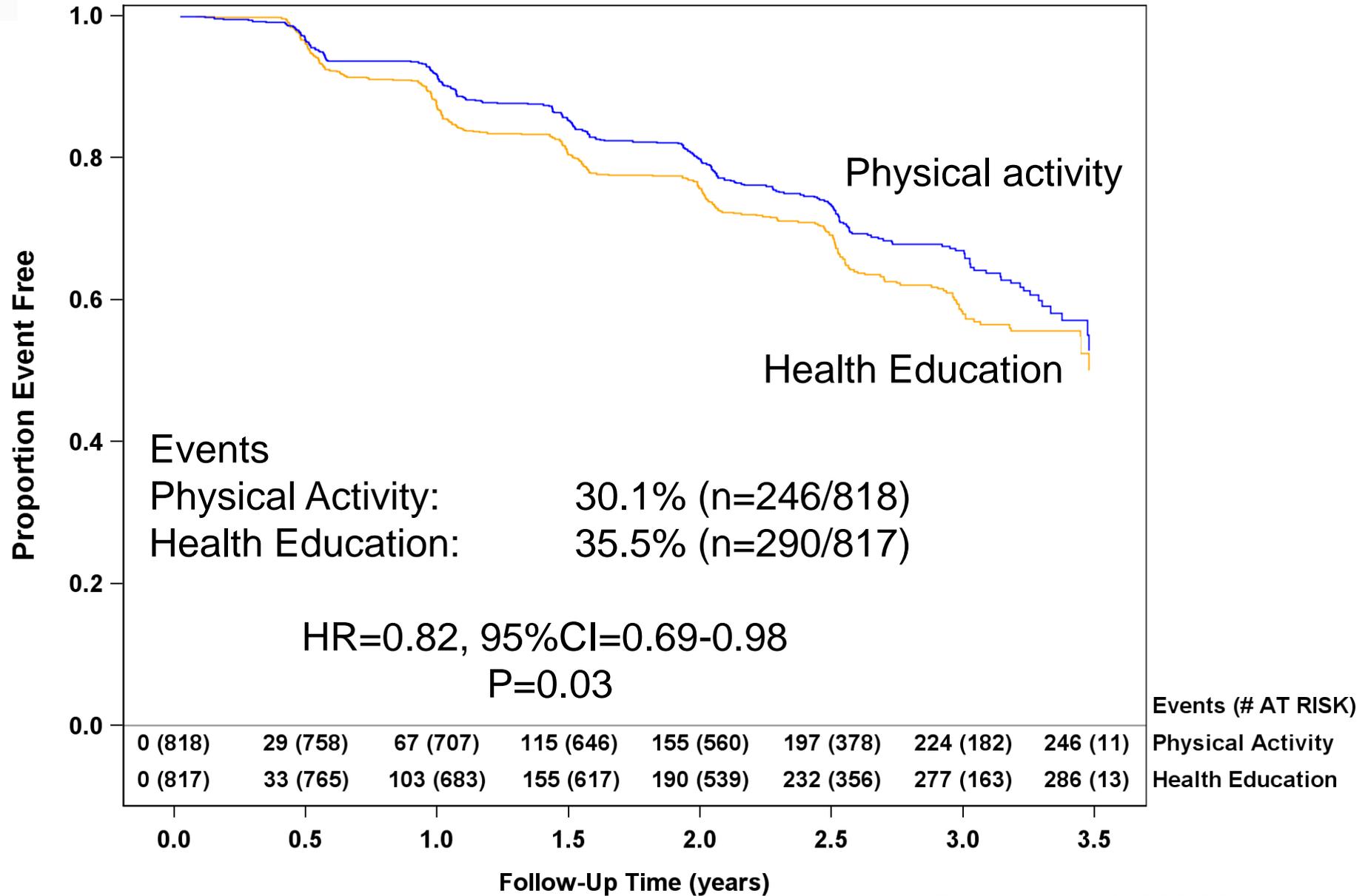
Goodpaster et al.
J Appl Physiol 2008;
105:1498

LIFE-Pilot Muscle study





Major Mobility Disability



LIFE n=1635 - GEE MODELS PREDICTING FRAILTY OVER 24 MONTHS ACCORDING TO RANDOMIZATION GROUP

	Unadjusted odds ratio (95% CI)	P Value	Adjusted odds ratio* (95% CI)	P Value
Fried frailty index				
Physical activity (n=818)	0.83 [0.69-0.99]	0.040	0.81 [0.68-0.98]	0.028
Health education (n=817)				
<i>(Reference)</i>				
SOF frailty index				
Physical activity (n=818)	0.81 [0.67-0.98]	0.034	0.86 [0.71-1.04]	0.125
Health education (n=817)				
<i>(Reference)</i>				

* Baseline value of the outcome, gender and field center (both used to stratify randomization), age, intervention, clinic visit, and intervention-by-visit interaction included in the models.

Adapted from Trombetti et al. Ann. Intern. Med. 2018

<https://www.motrpac.org>



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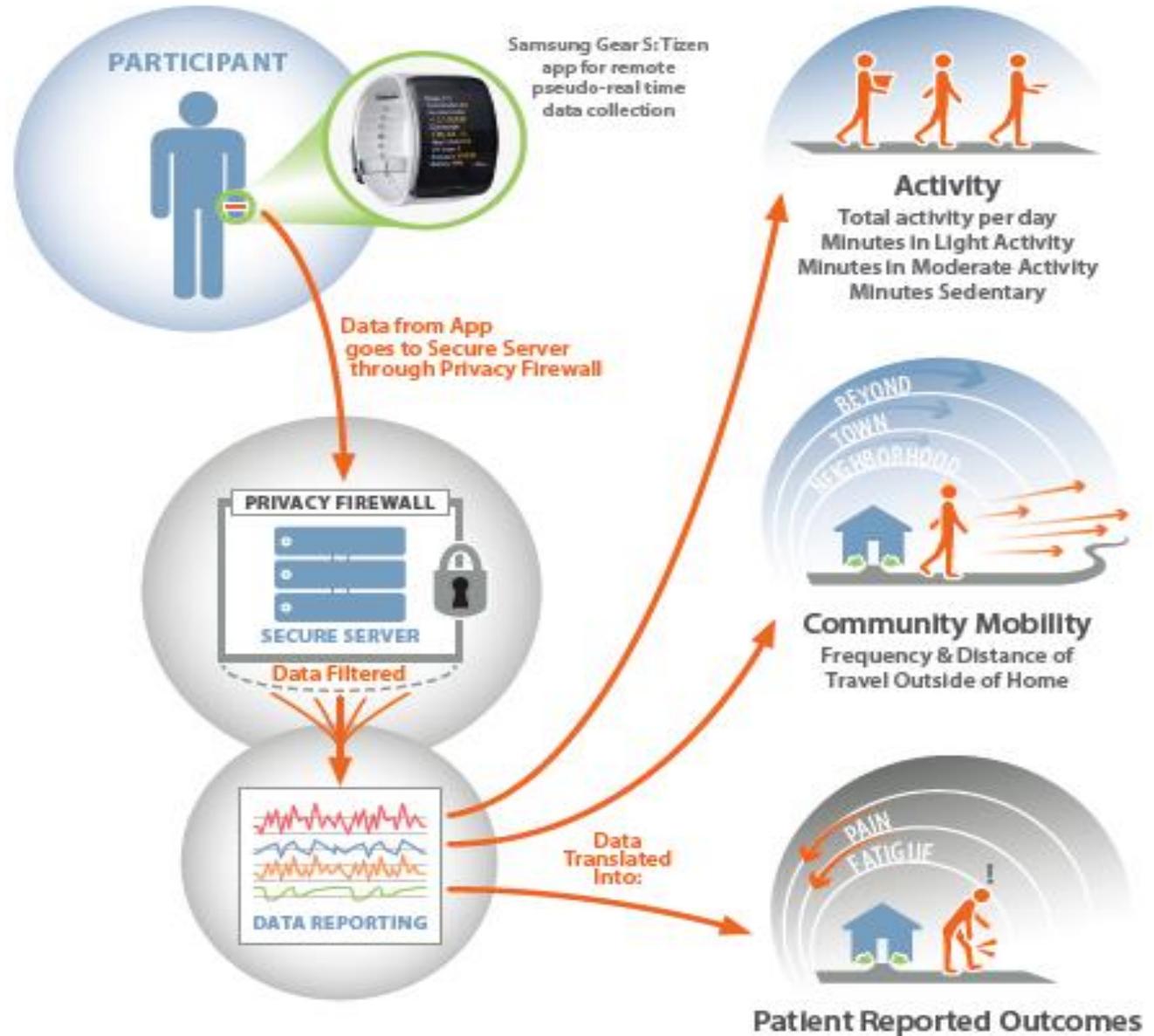


- Clinical Sites
- Consortium Coordination
- Chemical Analysis Sites
- Preclinical Animal Study Sites (PASS)
- Show all sites

[tpac.org/ancillarystudyguidelines.cfm](https://www.motrpac.org/ancillarystudyguidelines.cfm)

Data Science and wearable technologies

- Develop interactive mobile device monitoring
- Warehouse and integrate multi-modal data
- Use machine learning and data mining



Knowledge gaps and research opportunities

- Physical activity implementation studies in the community
- Identifying molecular transducers of physical activity in older persons
- Impact of averting sedentariness
- Effects of physical activity on frailty and sarcopenia
- Implementation of wearable technologies