

INTERVENTIES

JAAP DRONKERS



SPIER

MASSA

1



ALS
EIWITVOORRAAD





Blauwhoff-Buskermol, et al.

Loss of Muscle Mass During Chemotherapy Is Predictive for Poor Survival of Patients With Metastatic Colorectal Cancer

J Clin Oncol. 2016 Apr 20;34(12):1339-44.

SPIER KRACHT

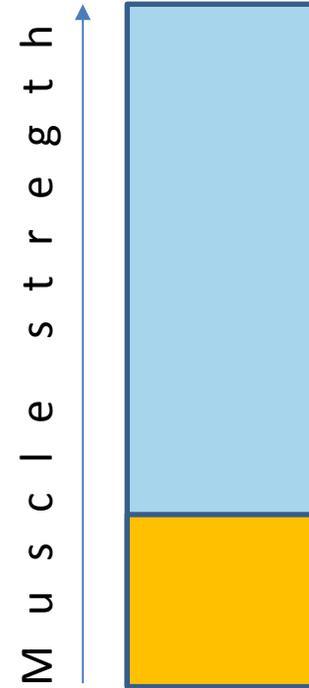
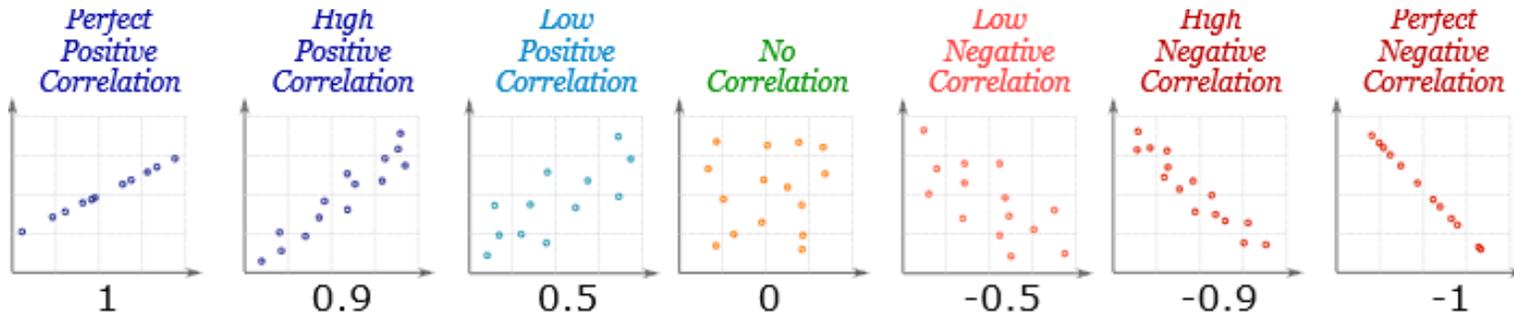
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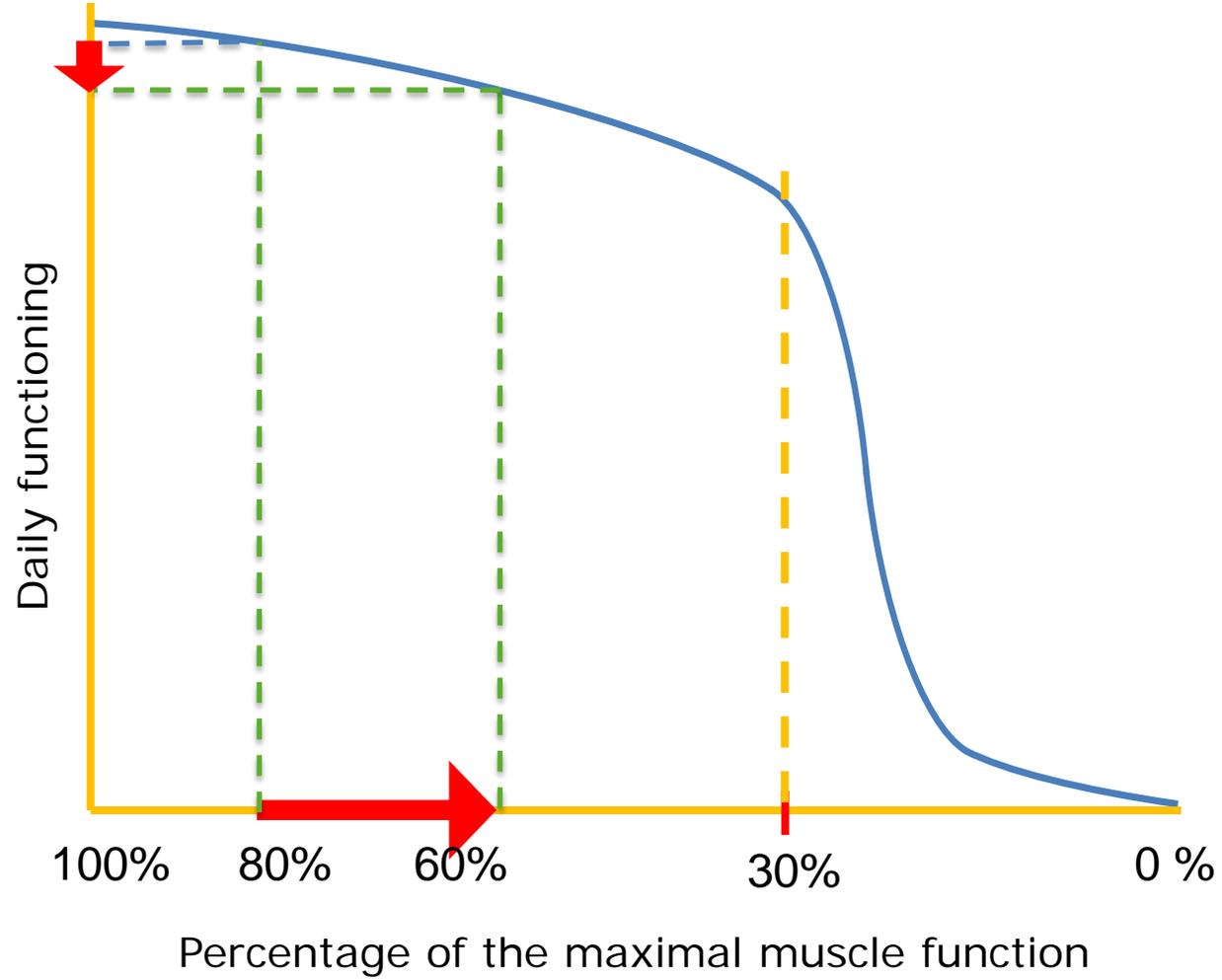


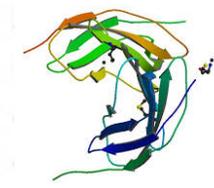
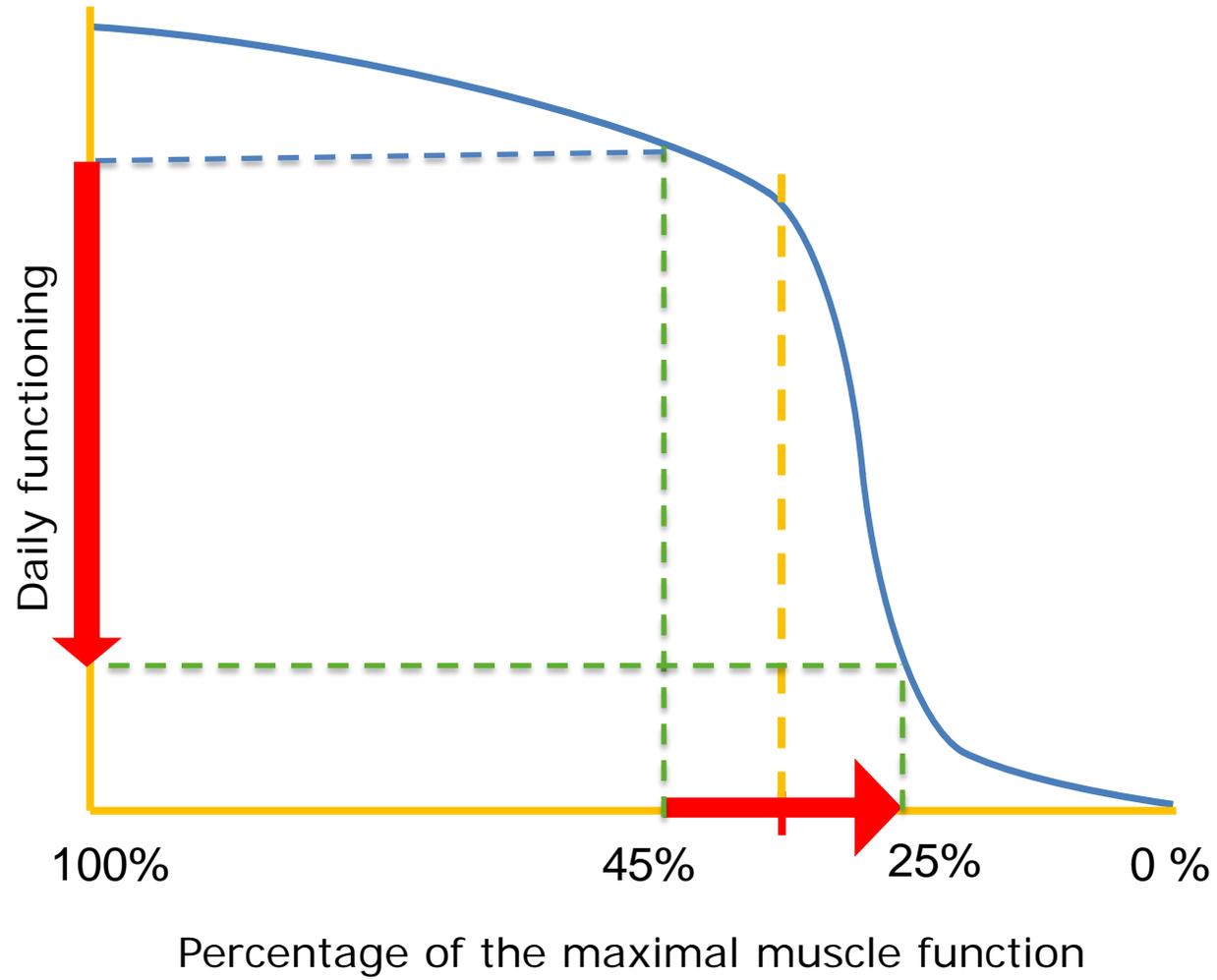
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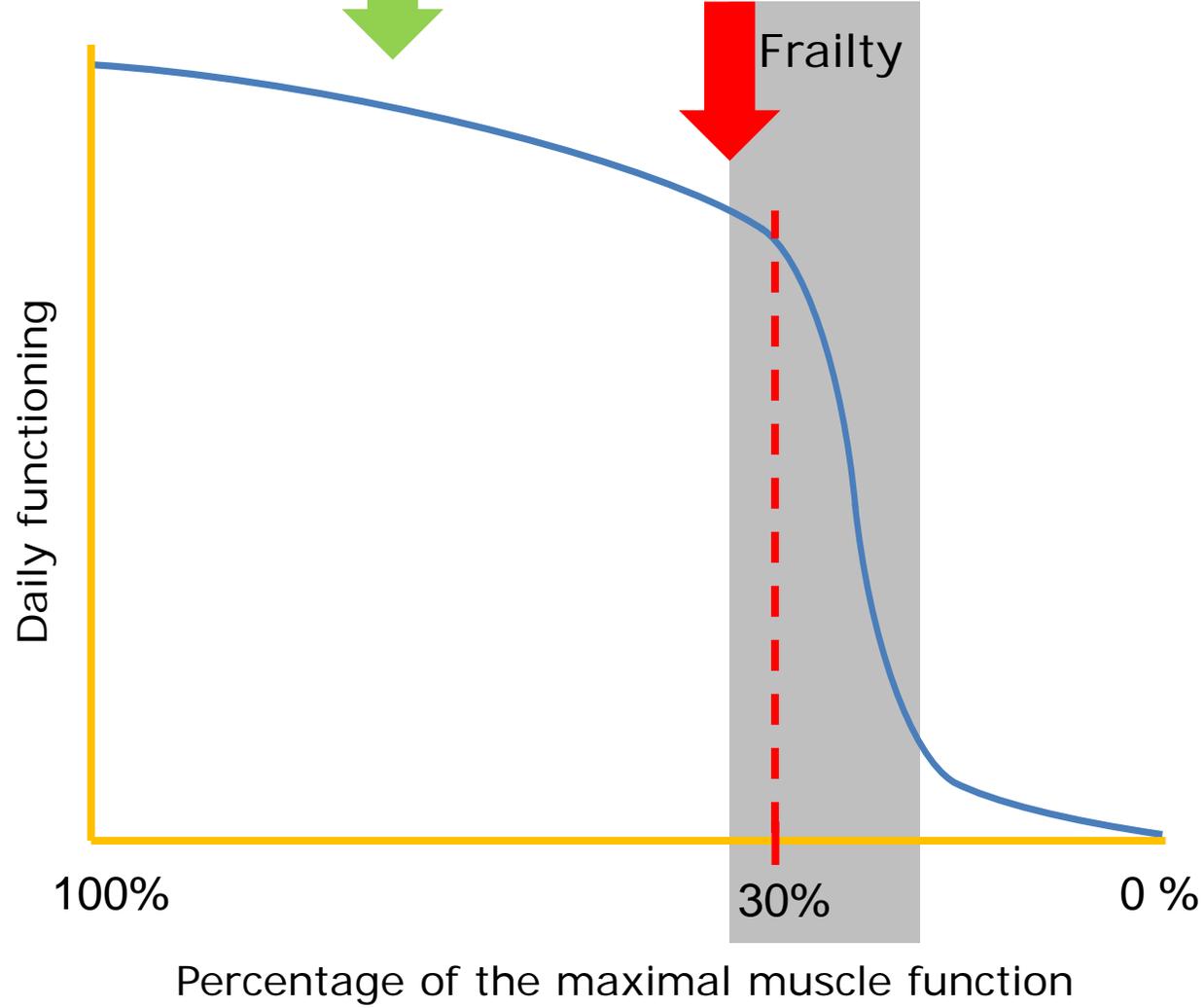
MASSA
KRACHT



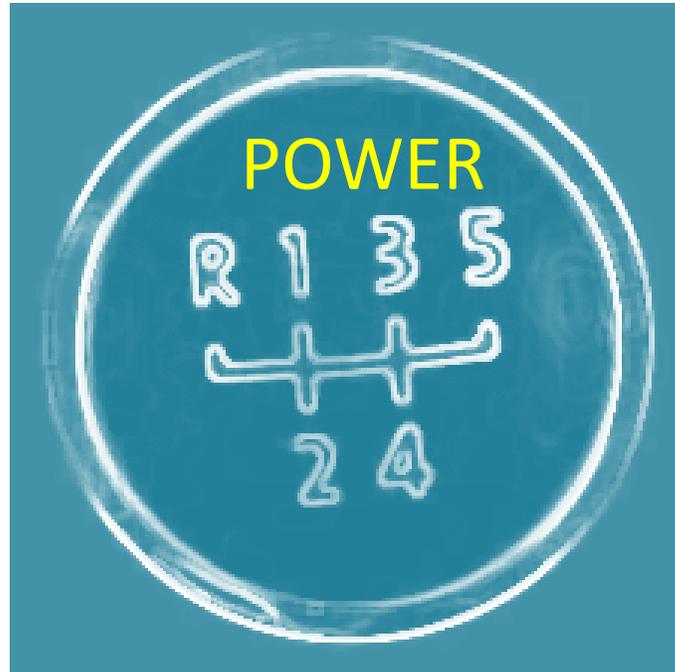




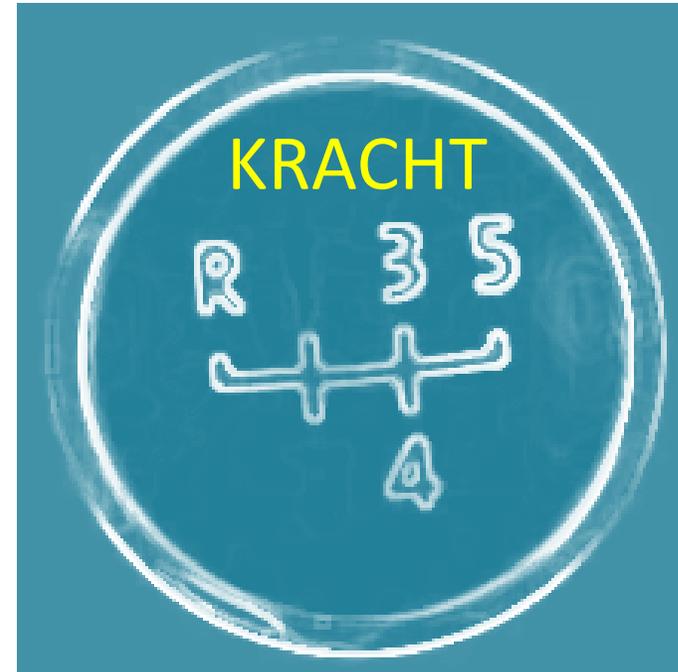
SCREENING

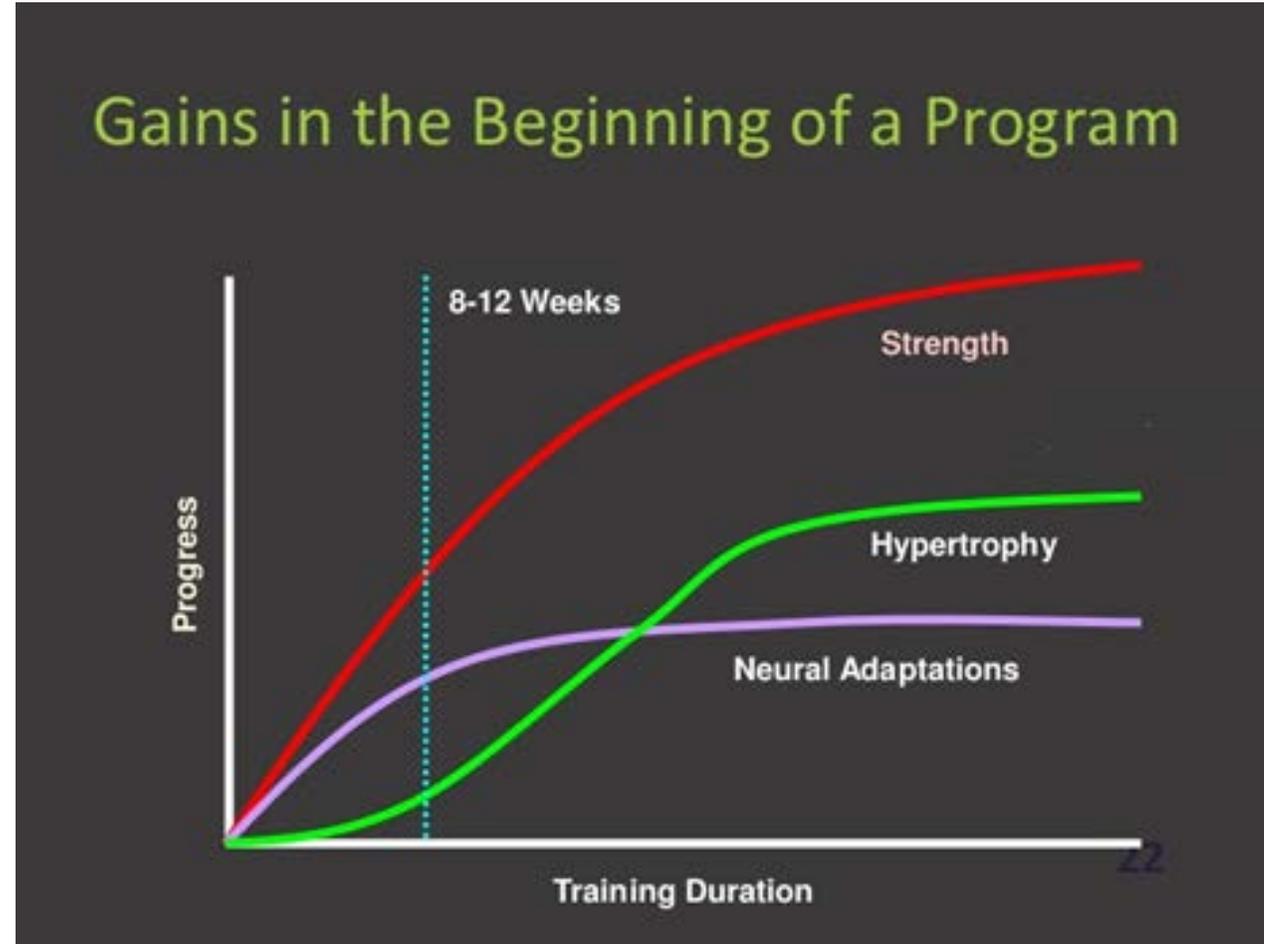
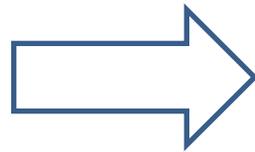
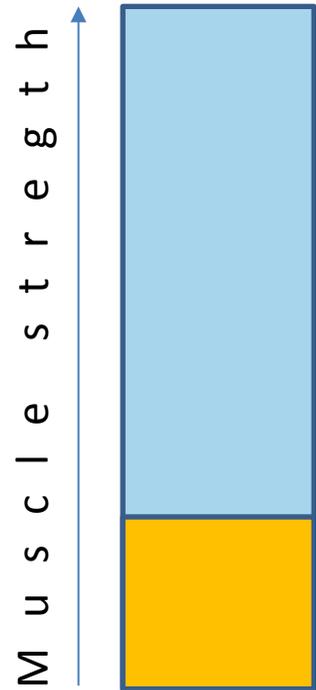






of





SPIER ACTIVITEIT

3

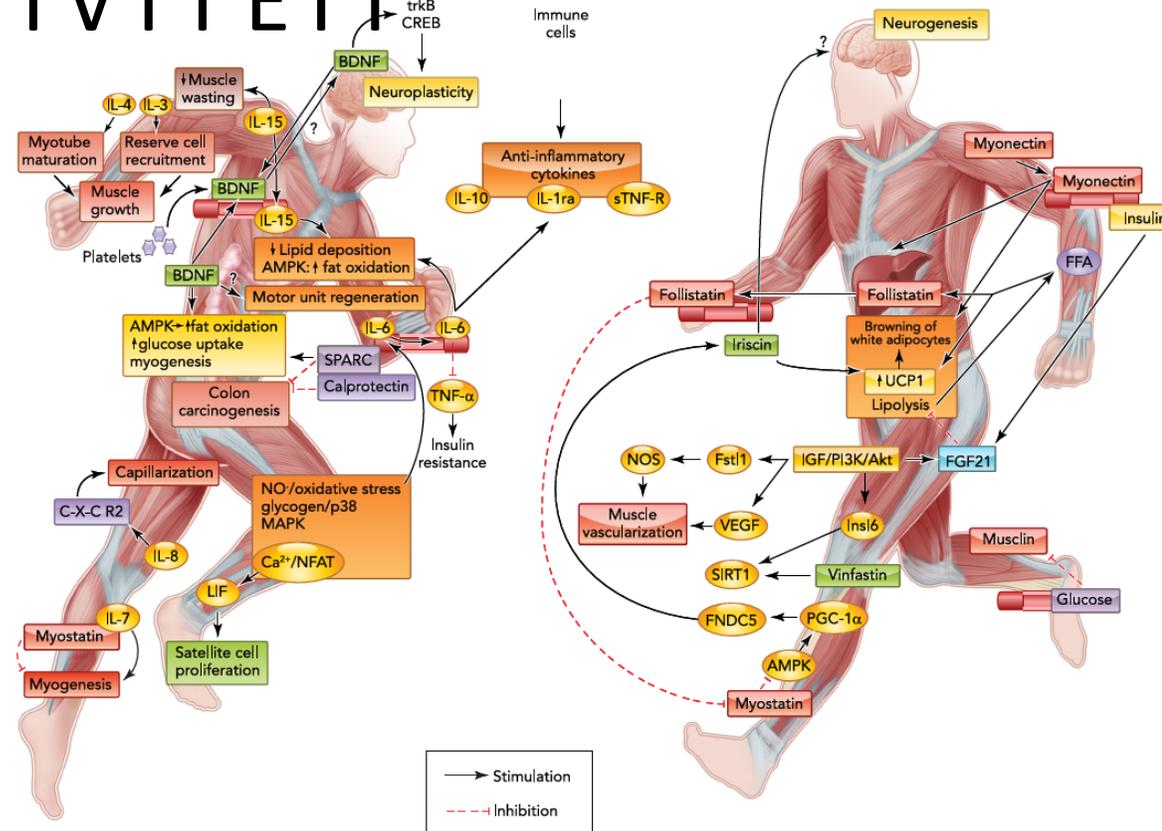
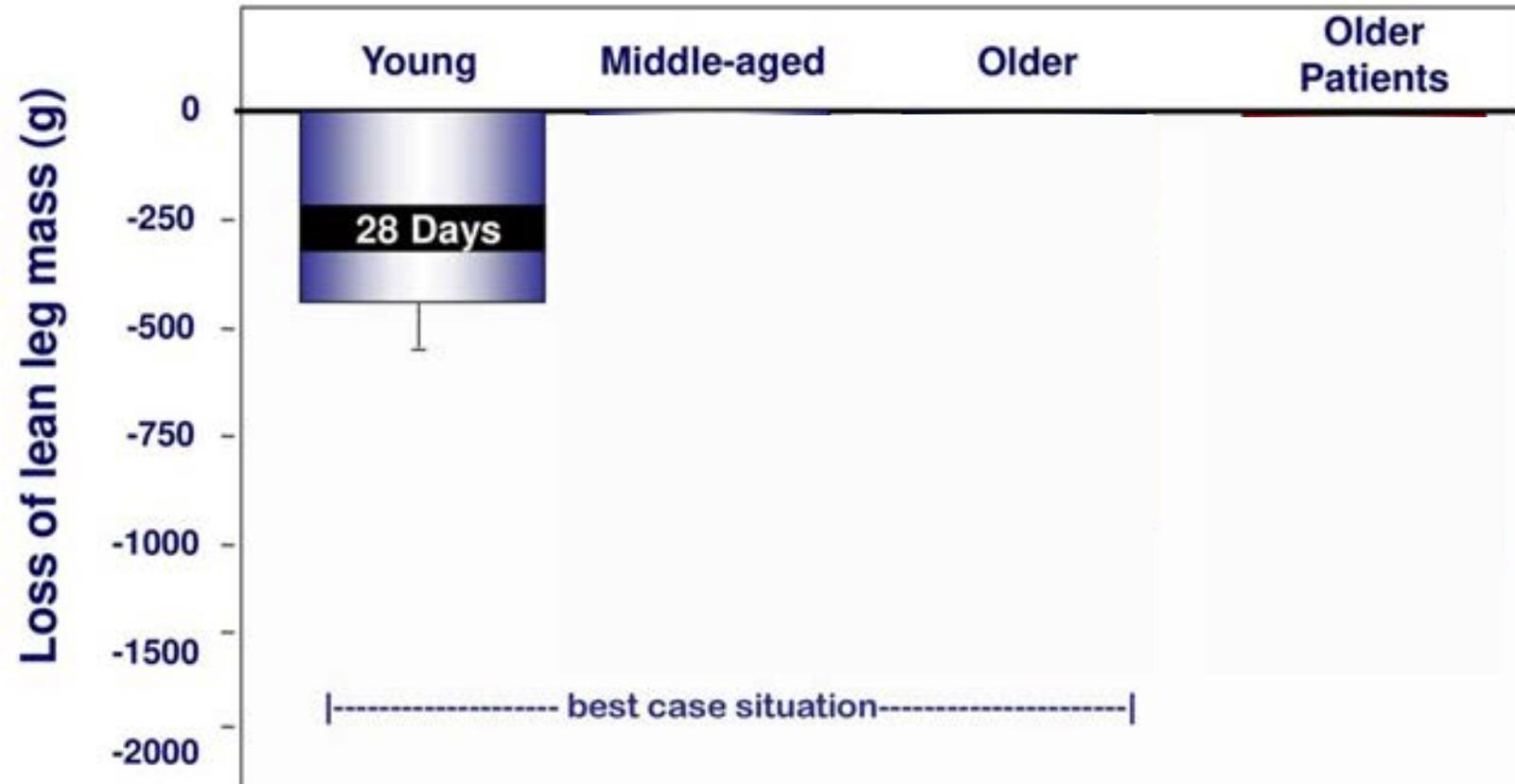


FIGURE 2. Summary of the main myokines, their putative effects, and the molecular signals/pathways involved

VOOR JE
GEZONDHEID

Inactivity and Muscle Loss

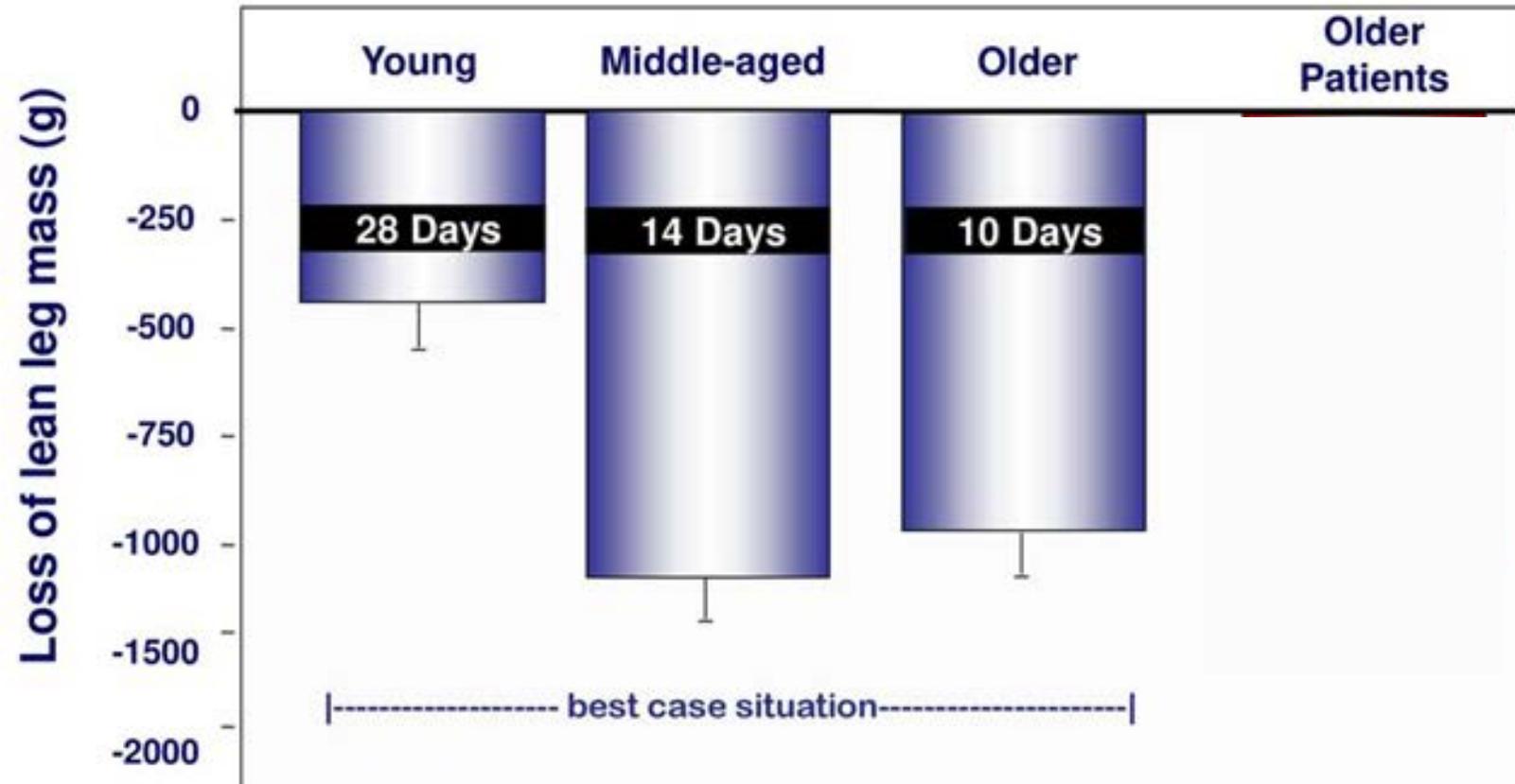
Bed Rest



Paddon-Jones et al. 2004
English et al. 2014
Kortebein et al. 2007
Paddon-Jones, Pilot Data

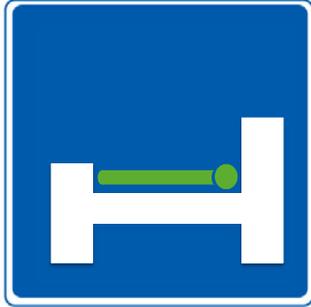
Inactivity and Muscle Loss

Bed Rest



Paddon-Jones et al. 2004
English et al. 2014
Kortebein et al. 2007
Paddon-Jones, Pilot Data





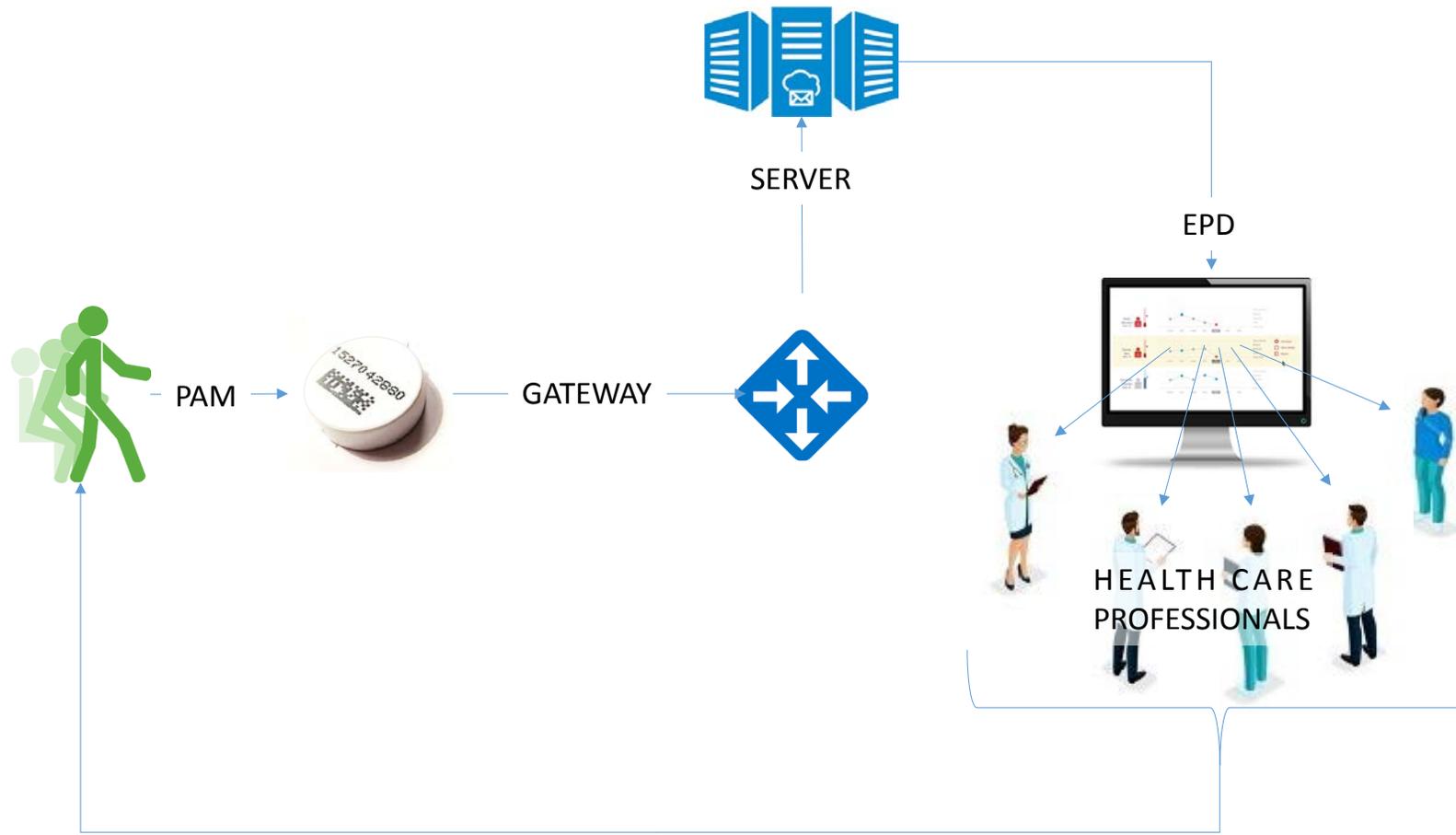
Inactiviteit

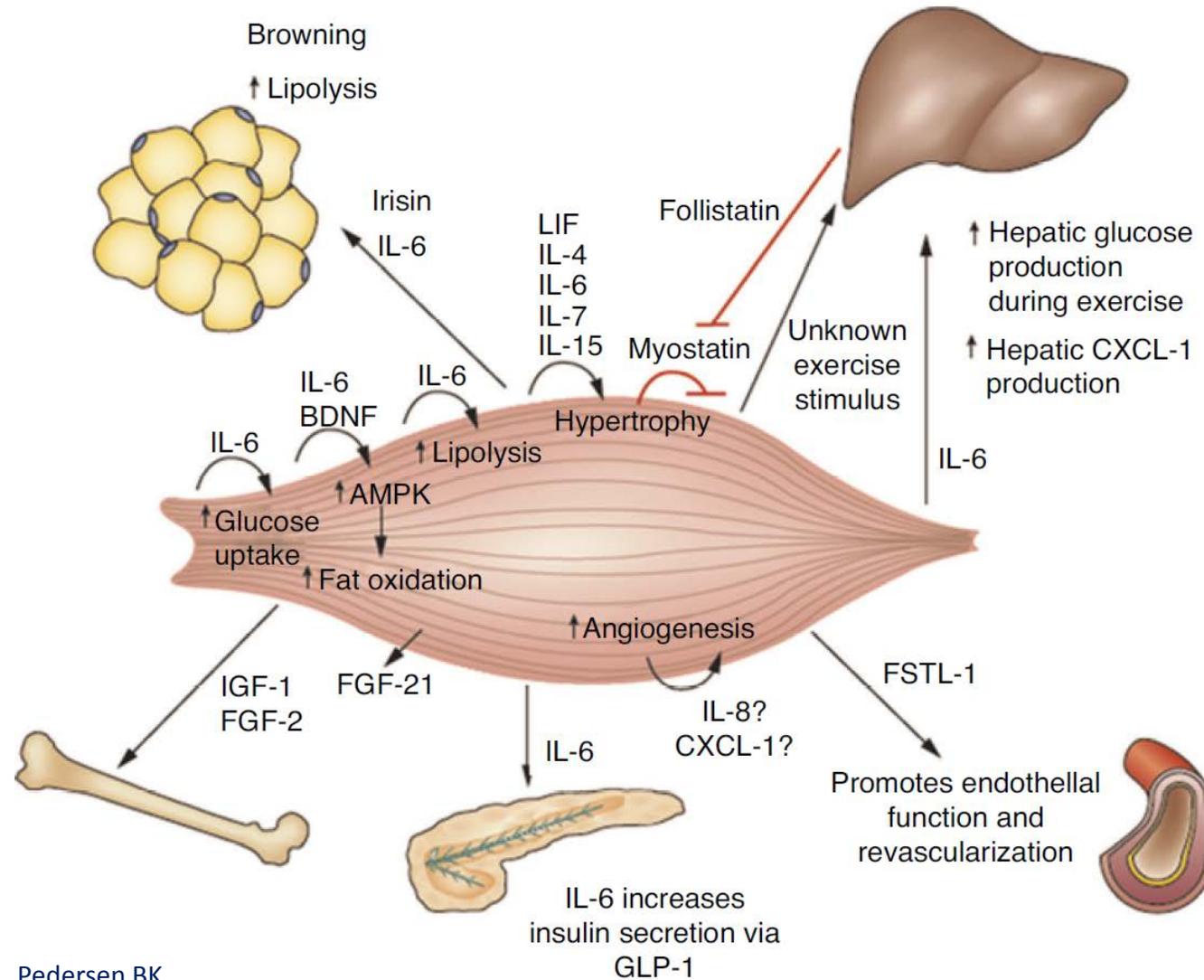
83 % of the measured
hospital stay was spent
lying in bed

Brown CJ, Redden DT, Flood KL, Allman RM.

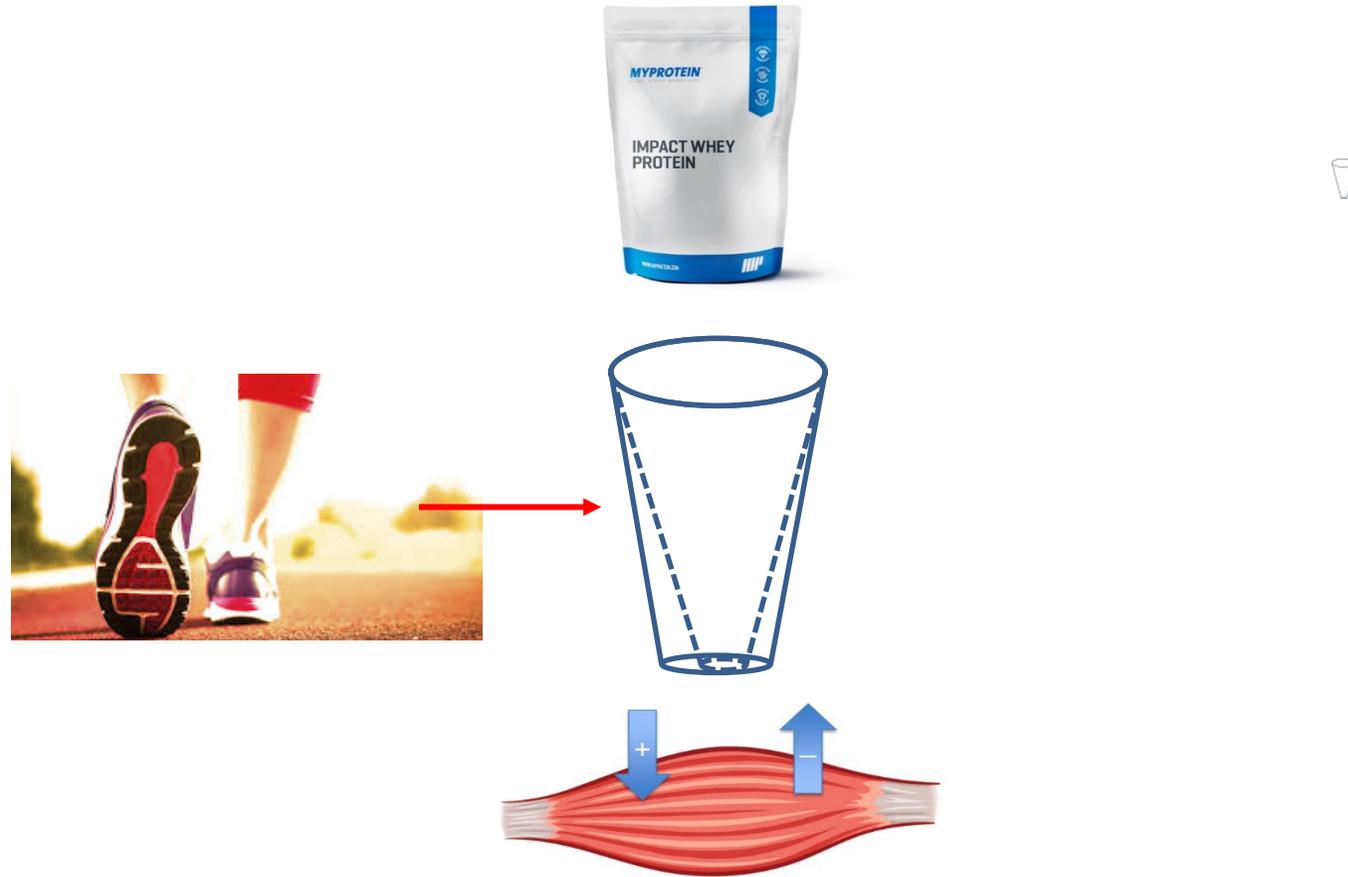
The underrecognized epidemic of low mobility during hospitalization of older adults.

J Am Geriatr Soc. 2009 Sep;57(9):1660-5.

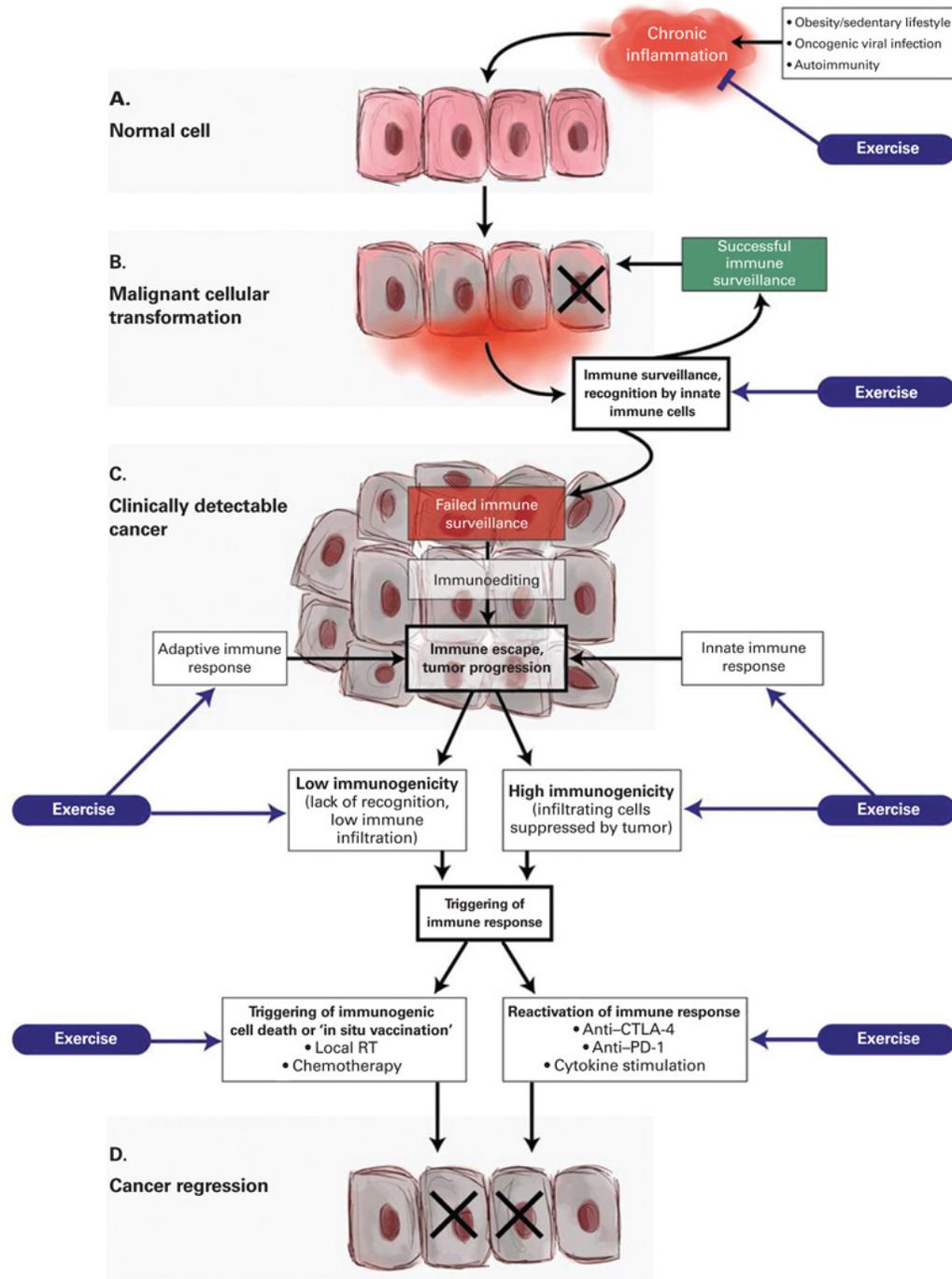


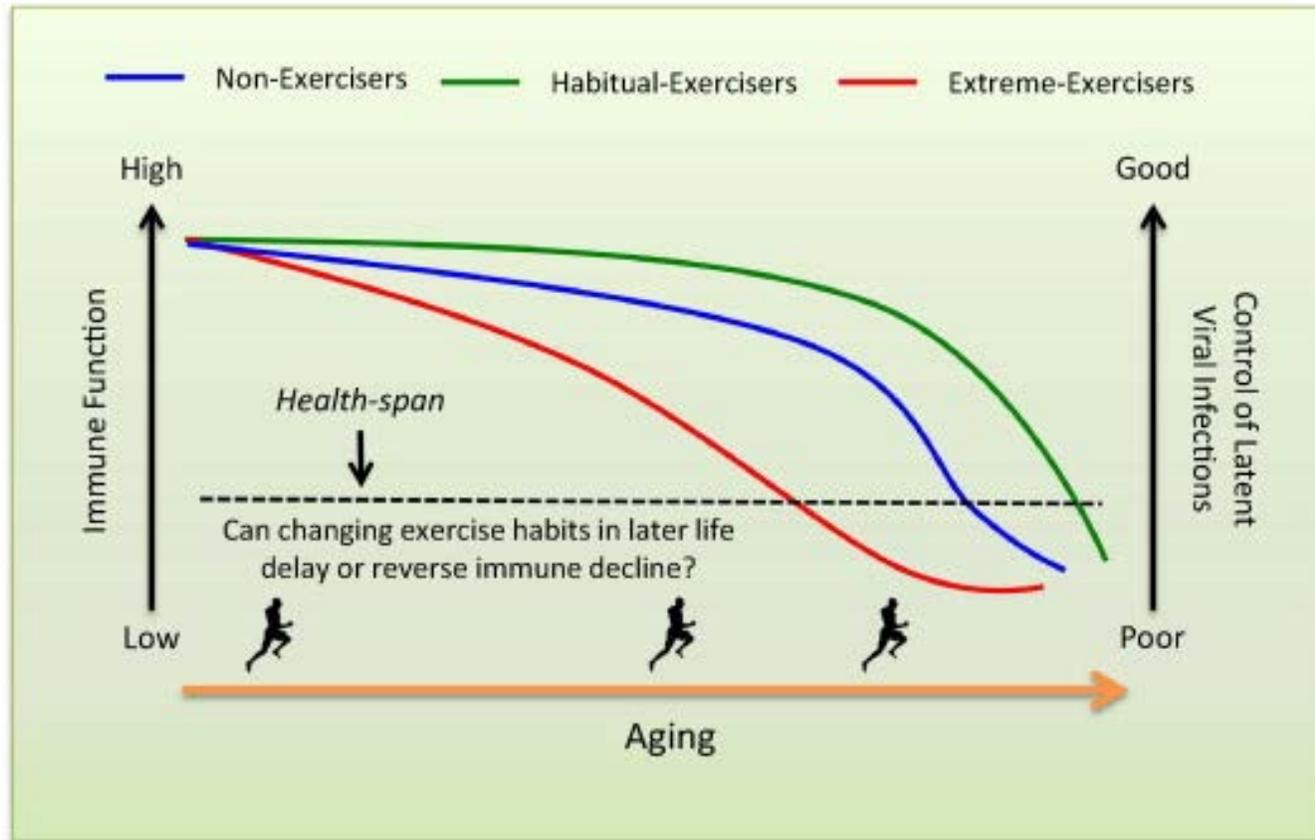


Pedersen BK.
Muscle as a secretory organ.
Compr Physiol. 2013 Jul;3(3):1337-62.



Burd NA, Gorissen SH, van Loon LJ.
Anabolic resistance of muscle protein synthesis with aging.
Exerc Sport Sci Rev. 2013 Jul;41(3):169-73.

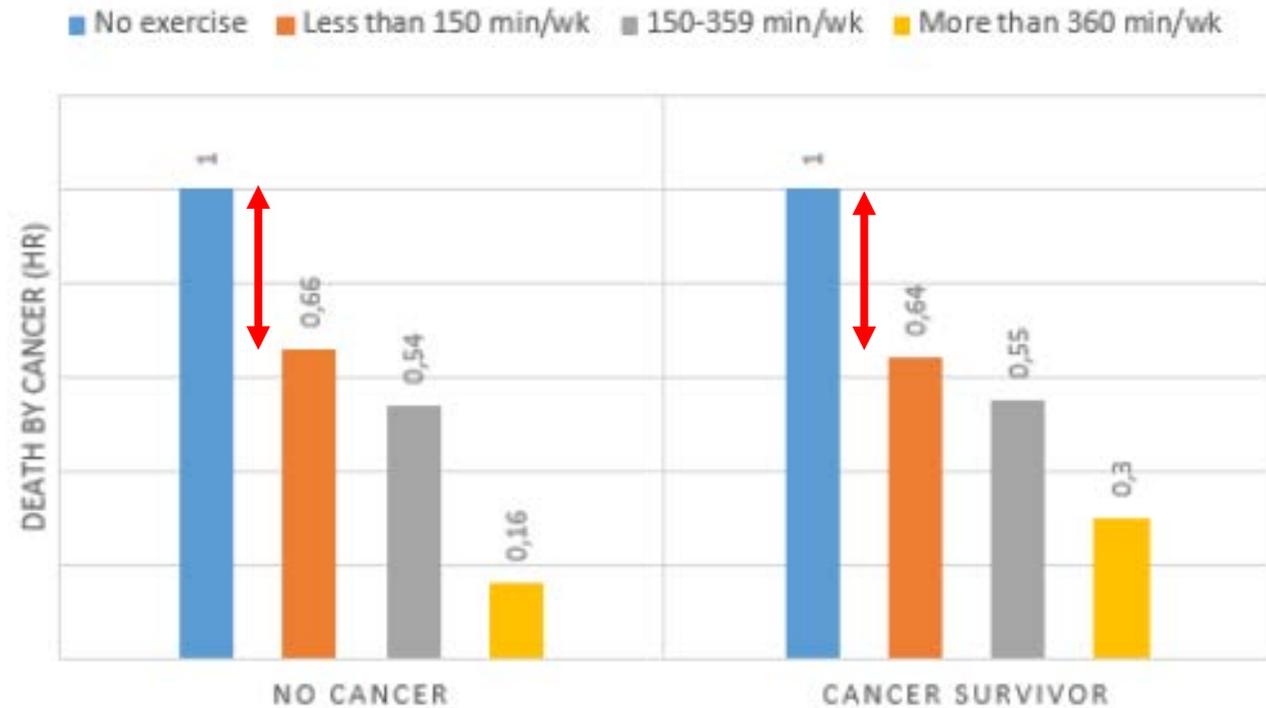




Simpson RJ, Bosch JA.

Special issue on exercise immunology: current perspectives on aging, health and extreme performance.

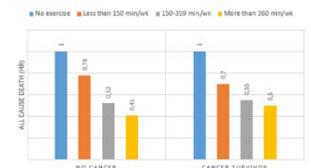
Brain Behav Immun. 2014 Jul;39:1-7.

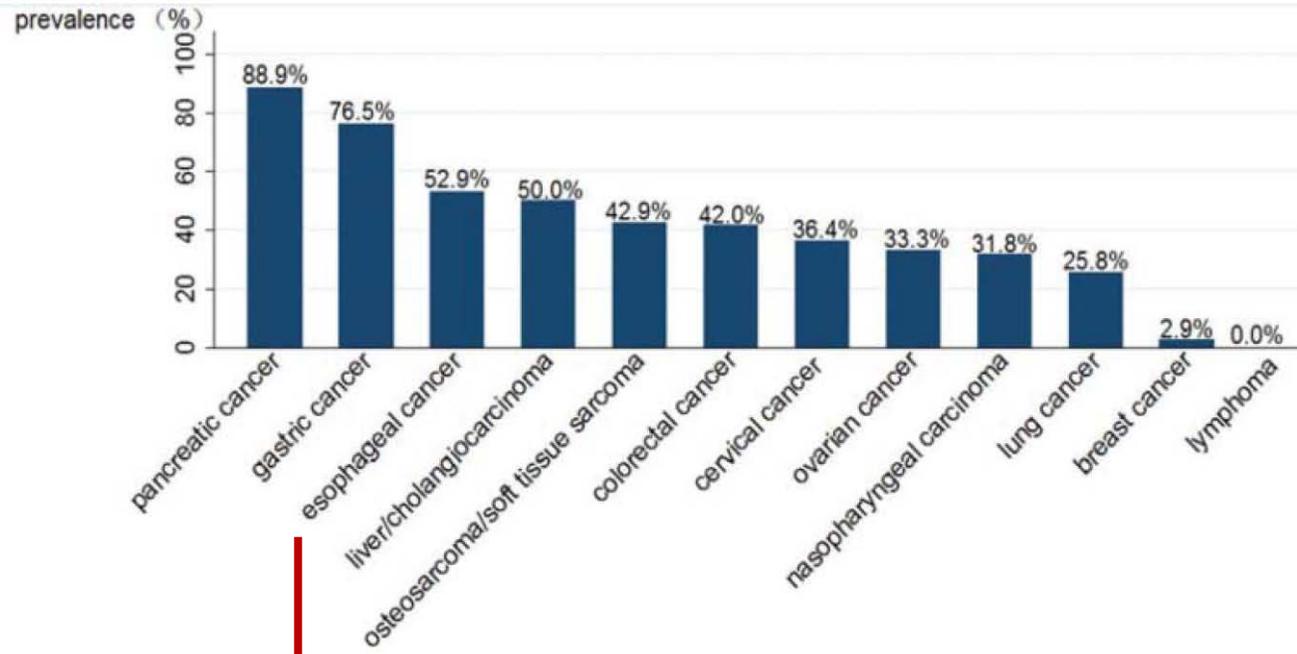


Front Public Health. 2017 Feb 14;5:19.

Physical Activity and Survival among Long-term Cancer Survivor and Non-Cancer Cohorts.

Gunnell AS, Joyce S, Tomlin S, Taaffe DR, Cormie P, Newton RU, Joseph D, Spry N, Einarsdóttir K, Galvão DA.





PRIOR



SPIERMASSA



SPIERKRACHT



SPIERACTIVITEIT



COMORBIDITEIT



PIJN



MOTIVATIE

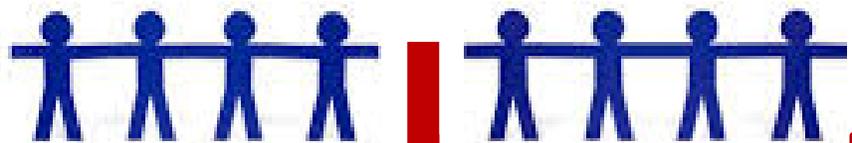


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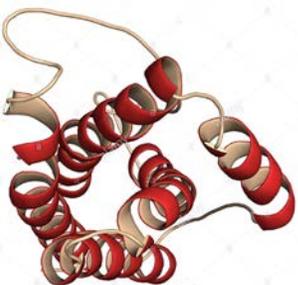






bedankt
voor
jullie
aandacht

DRONKERSJ@ZGV.NL





Aerobic Training



Increased cardiovascular fitness
Higher IL-10 and IL-1ra levels
Decreased TNF- α levels
Increased oxidation of lipids in skeletal muscle and liver



Strength Training



Limited influence on IL-10 and IL-1ra levels
Decreased TNF- α levels
Increased oxidation of carbohydrate in skeletal muscle
Increased muscle anabolism
Decreased muscle catabolism

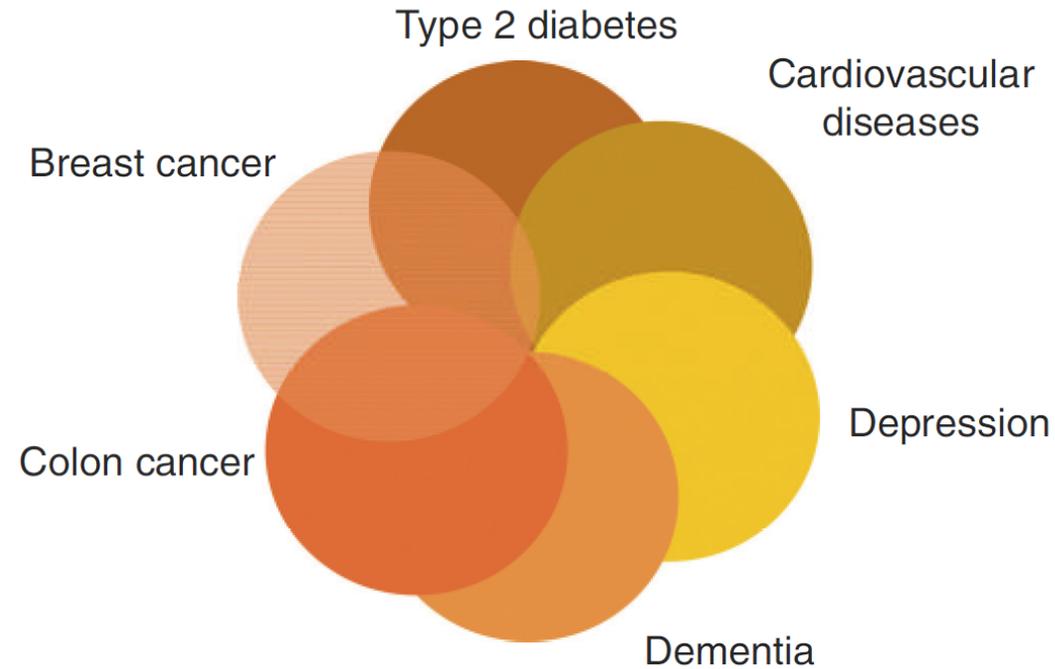


Lira FS, Neto JC, Seelaender M.

Exercise training as treatment in cancer cachexia.

Appl Physiol Nutr Metab. 2014 Jun;39(6):679-86. doi: 10.1139/apnm-2013-0554. Epub 2014 Mar 24. Review

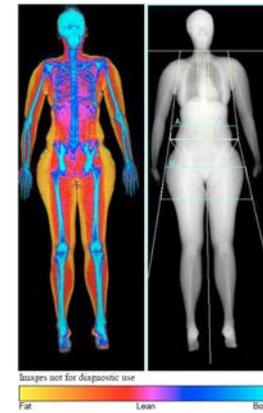
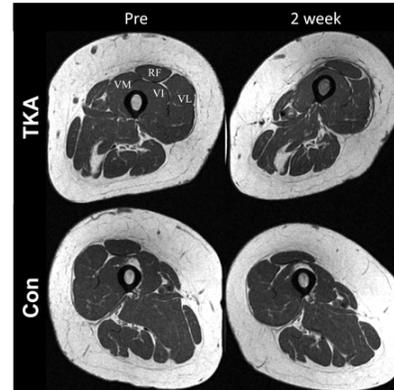
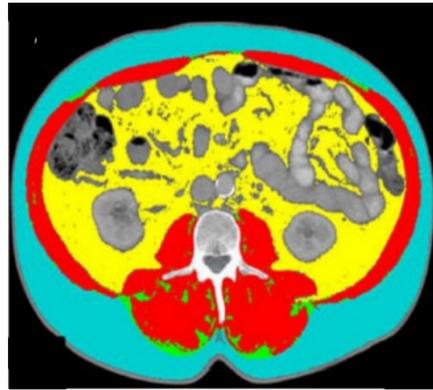
Diseasome of physical inactivity



Pedersen BK.

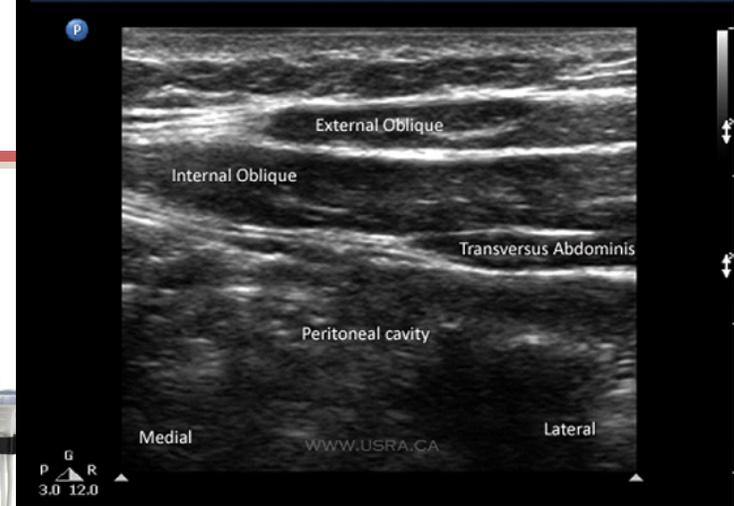
Muscle as a secretory organ.

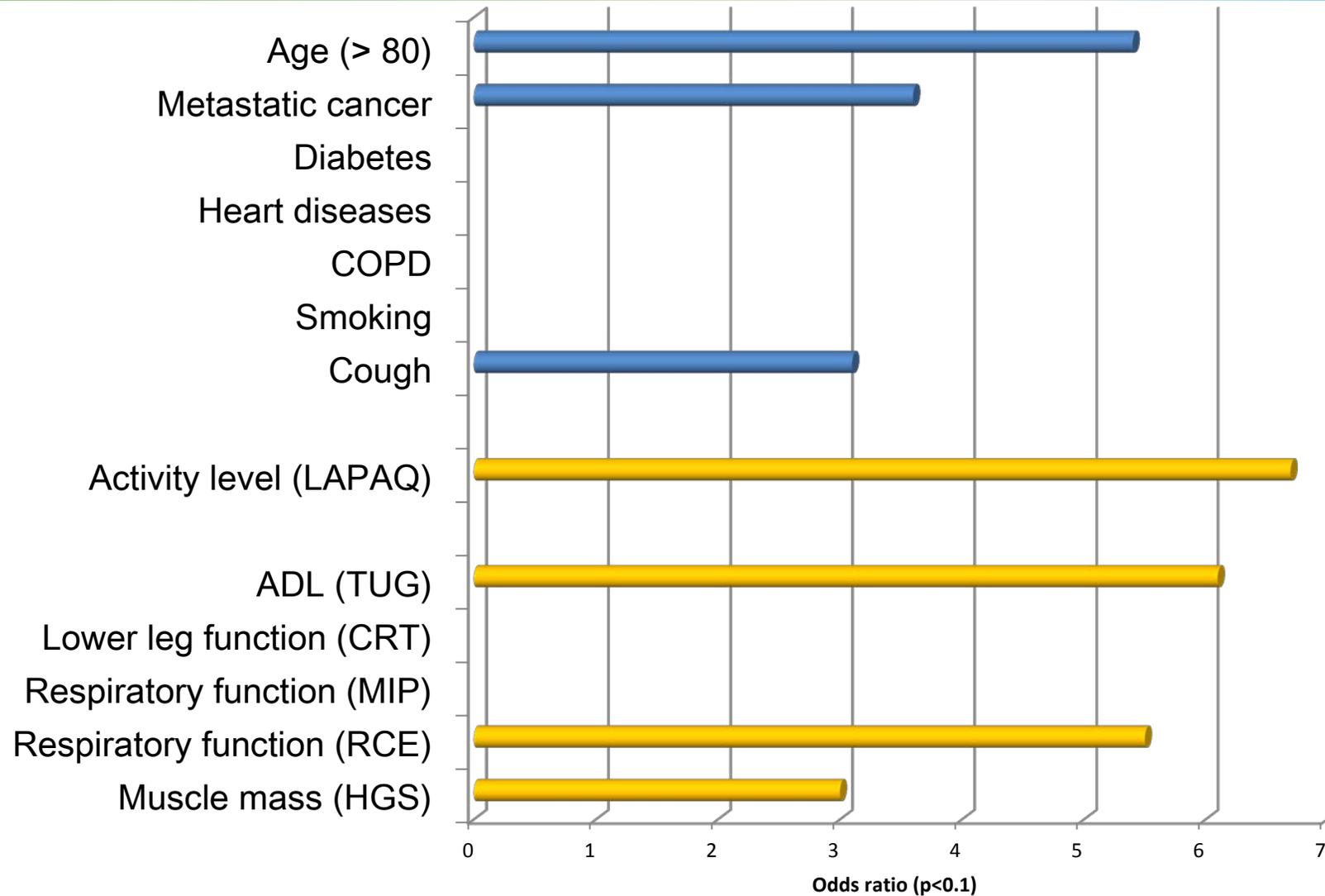
Compr Physiol. 2013 Jul;3(3):1337-62.





Venue 50 with the Portable Docking Cart

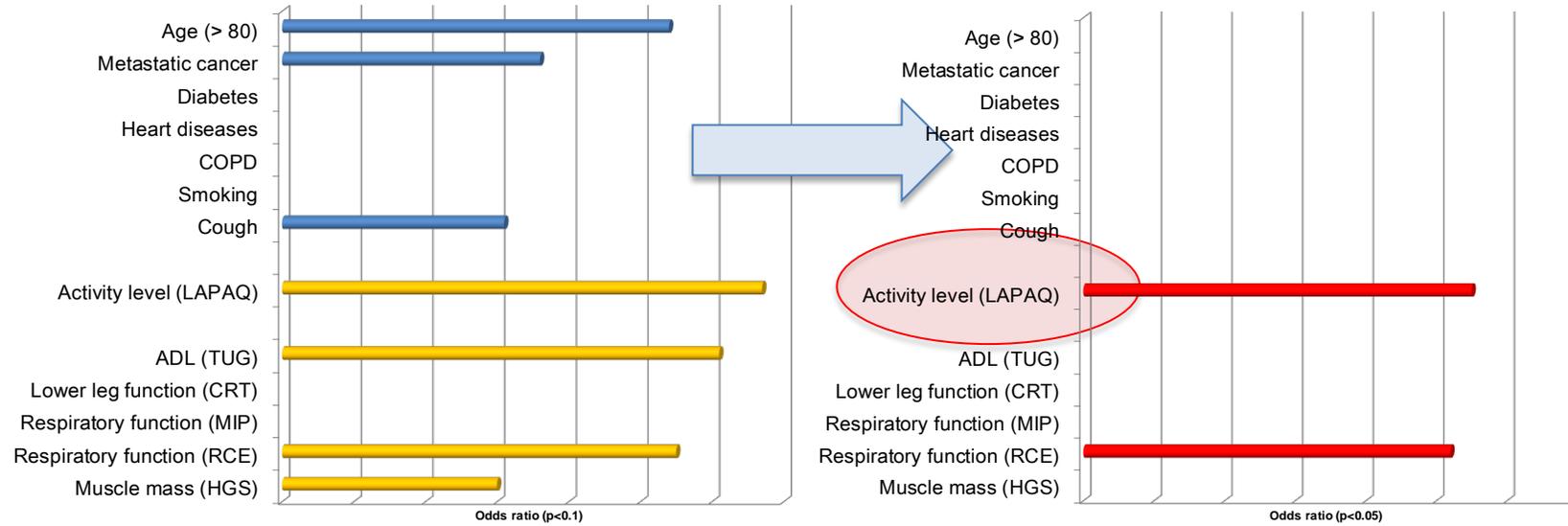




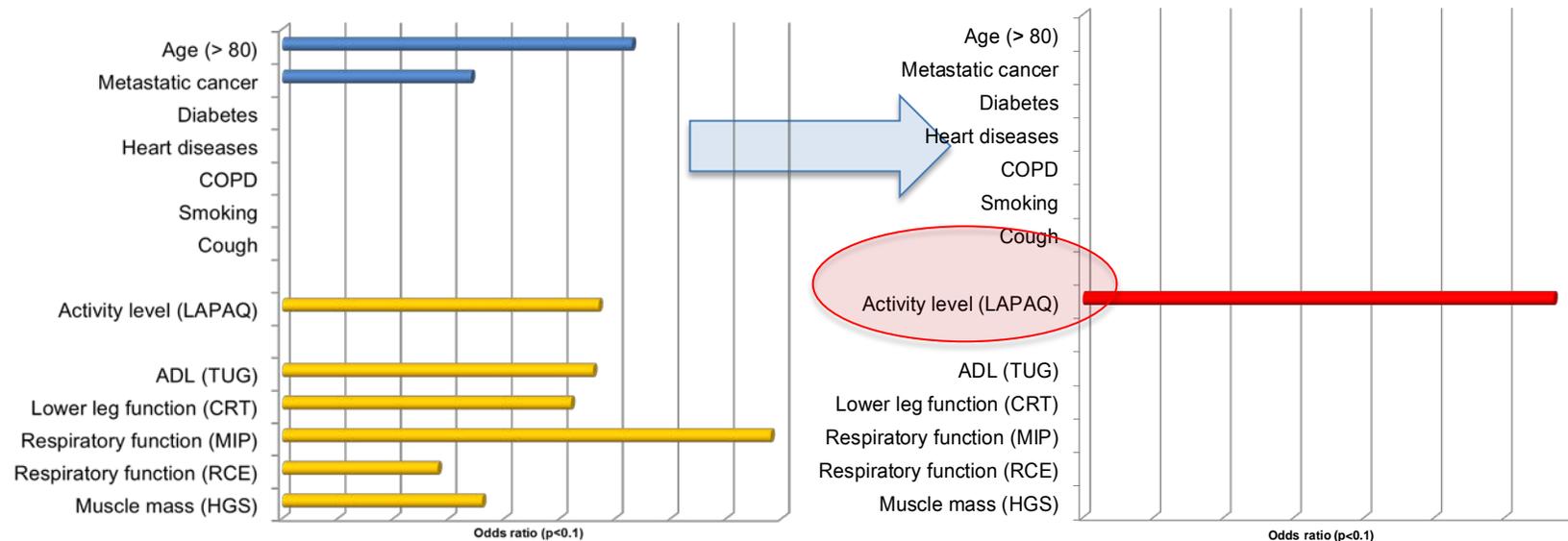
Dronkers JJ, Chorus AM, van Meeteren NL, Hopman-Rock M.

The association of pre-operative physical fitness and physical activity with outcome after scheduled major abdominal surgery. *Anaesthesia.* 2013;68(1):67-73.

Mortality



Discharge destination



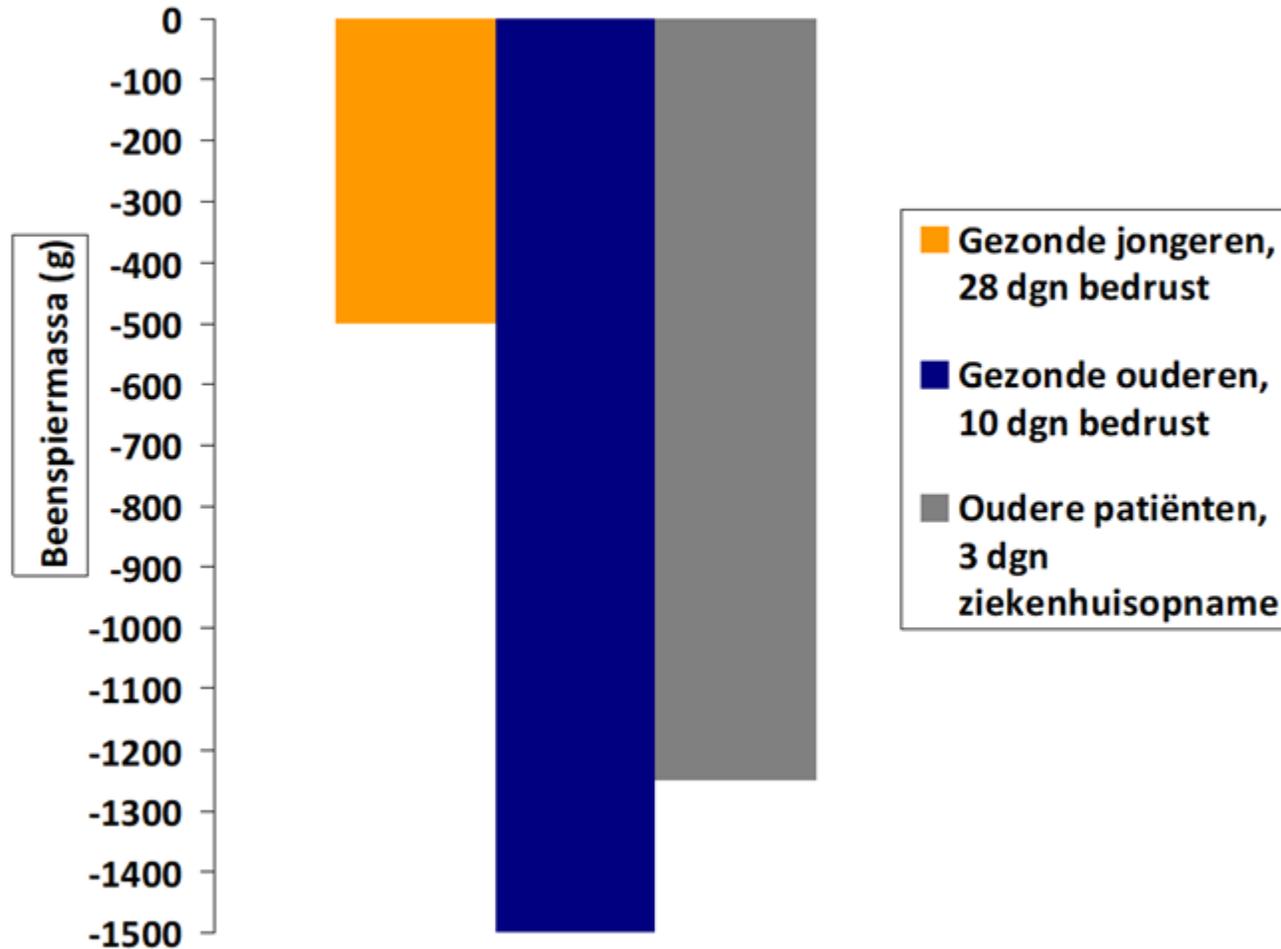
Inactivity and Muscle Loss

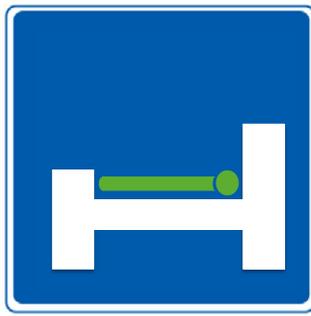
- Bed Rest -



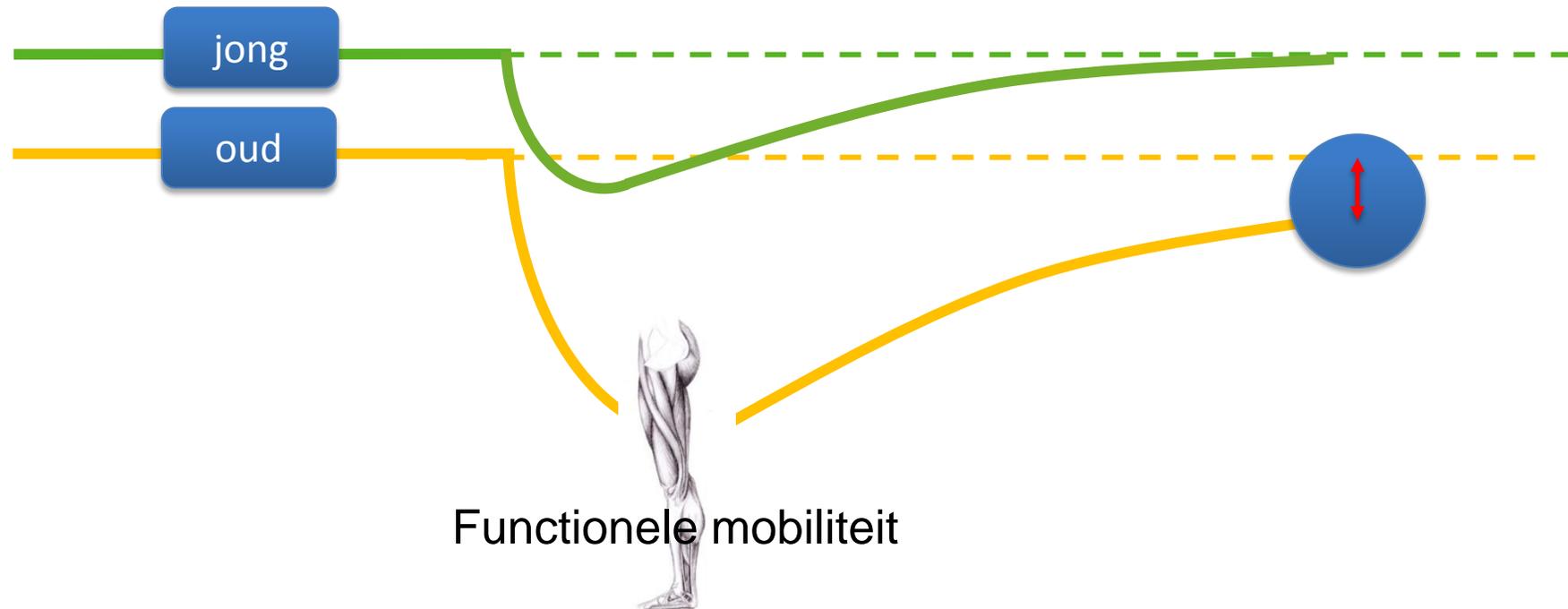
Paddon-Jones et al. 2004
English et al., 2014
Kortebein et al. 2007
Paddon-Jones, Pilot Data

Lichamelijke inactiviteit





Inactiviteit

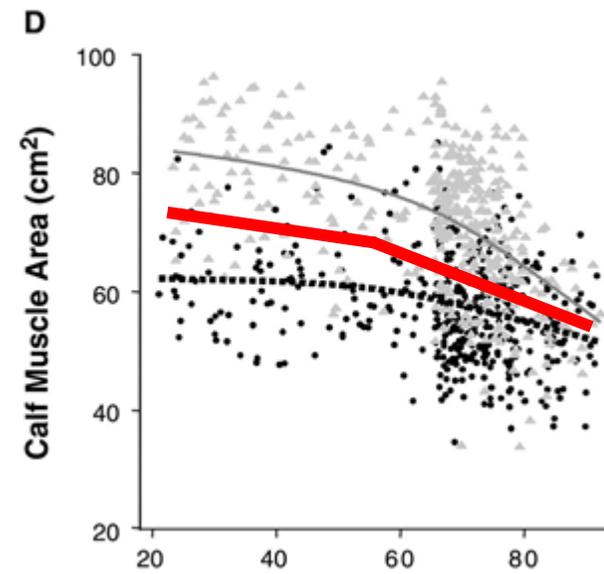


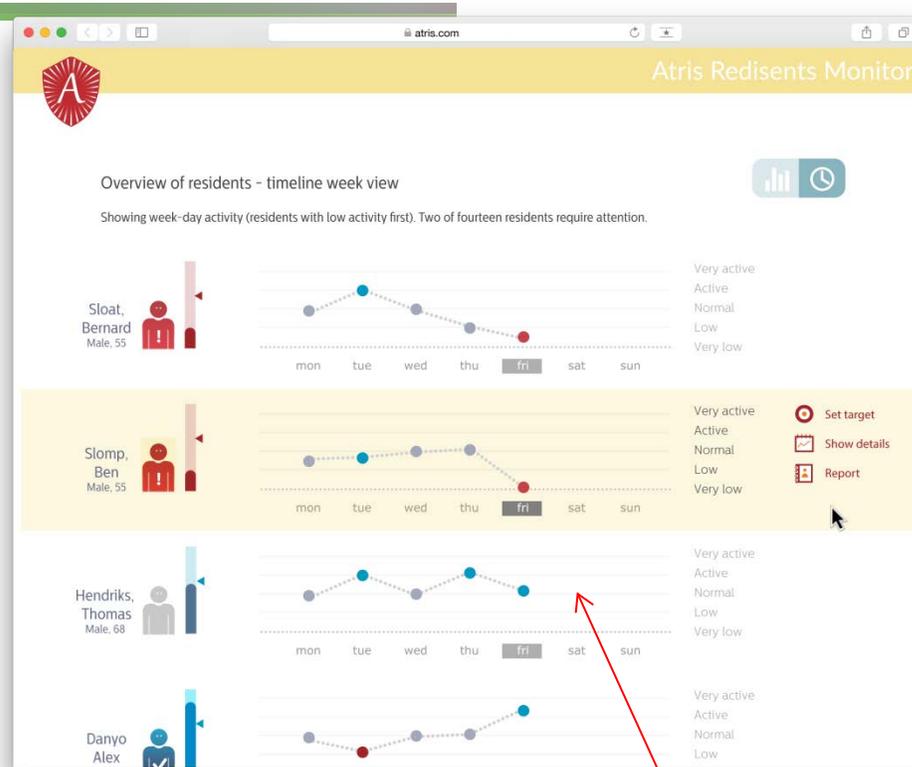
Kortebein P, et al.

Functional impact of 10 days of bed rest in healthy older adults.

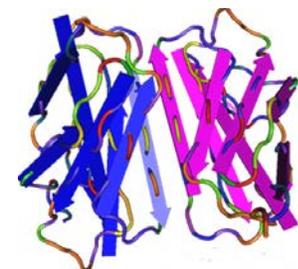
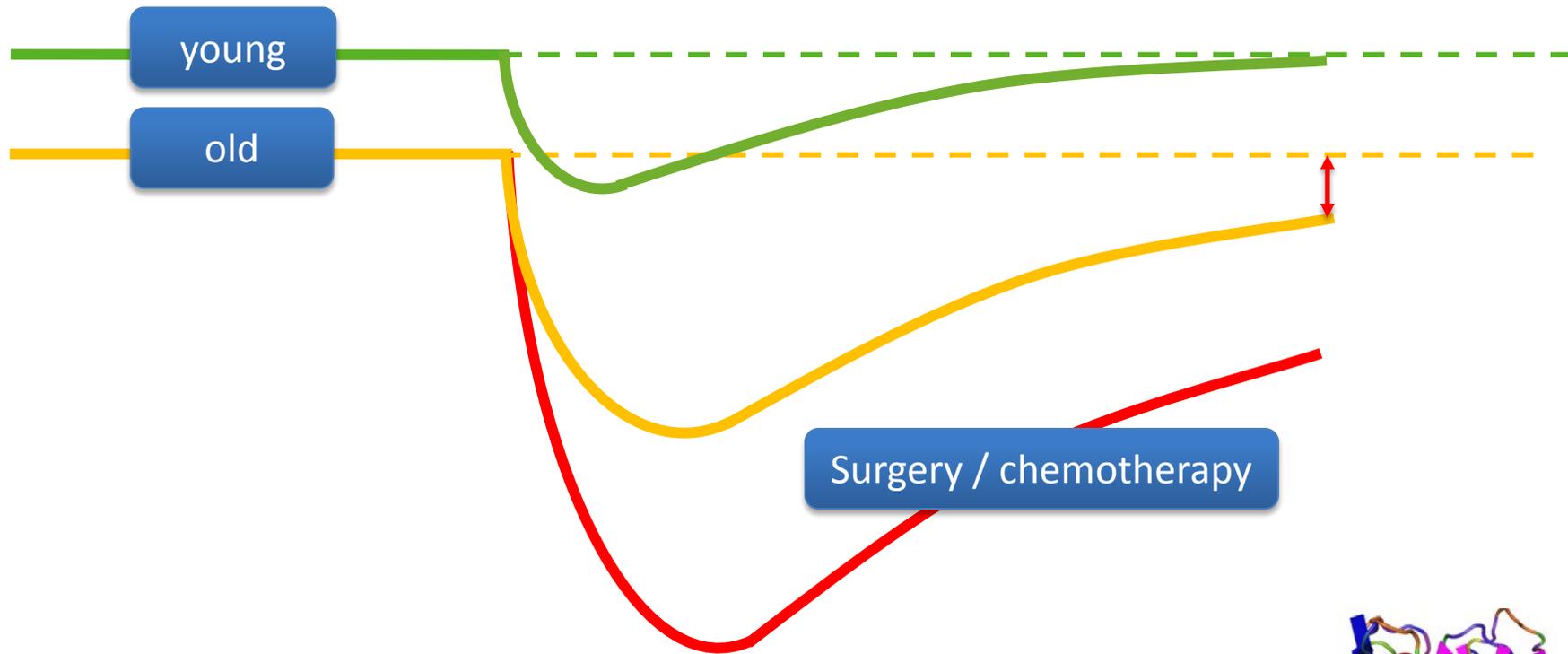
J Gerontol A Biol Sci Med Sci. 2008 Oct;63(10):1076-81.

MASSA

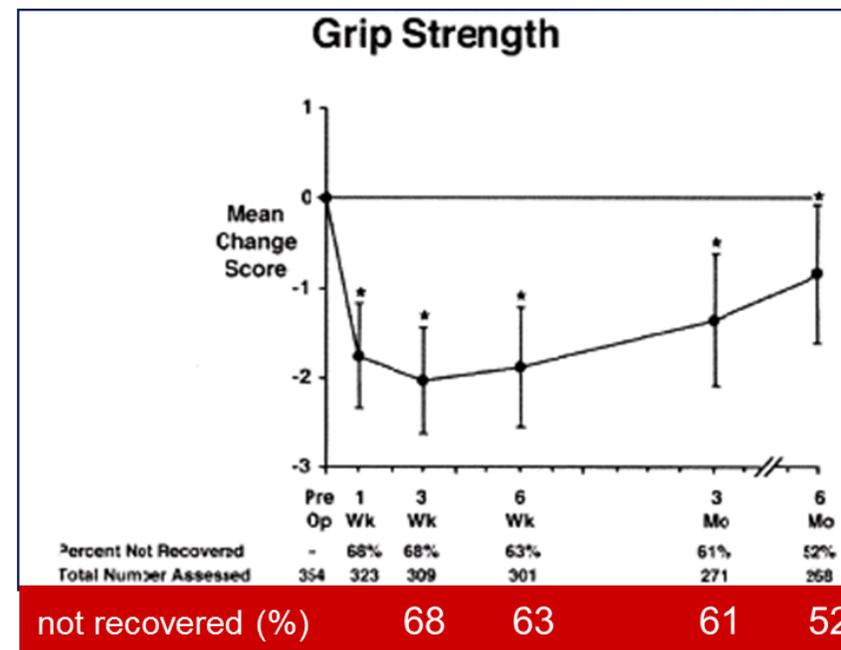
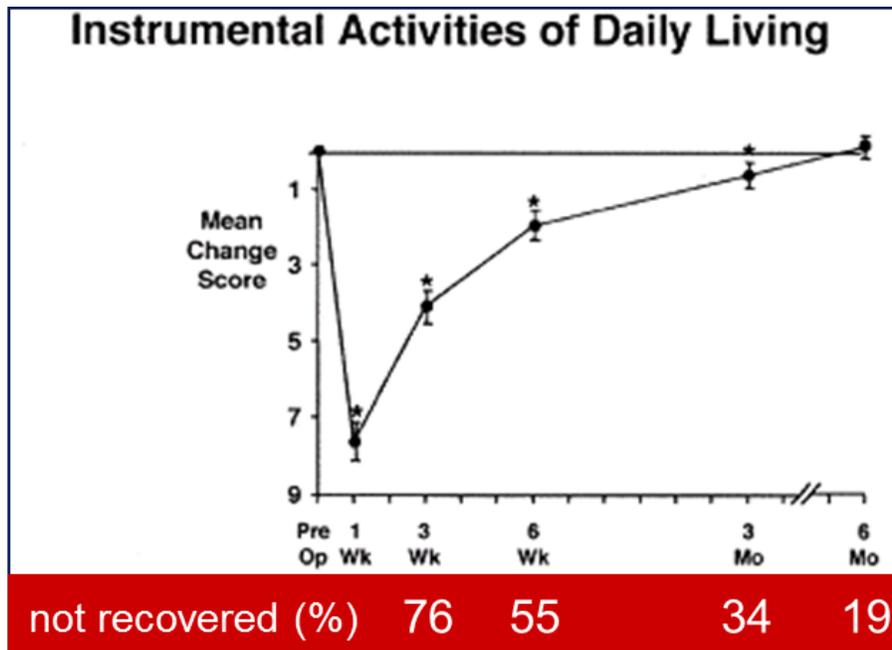




OPERATIESTRESS



Functional decline after surgery

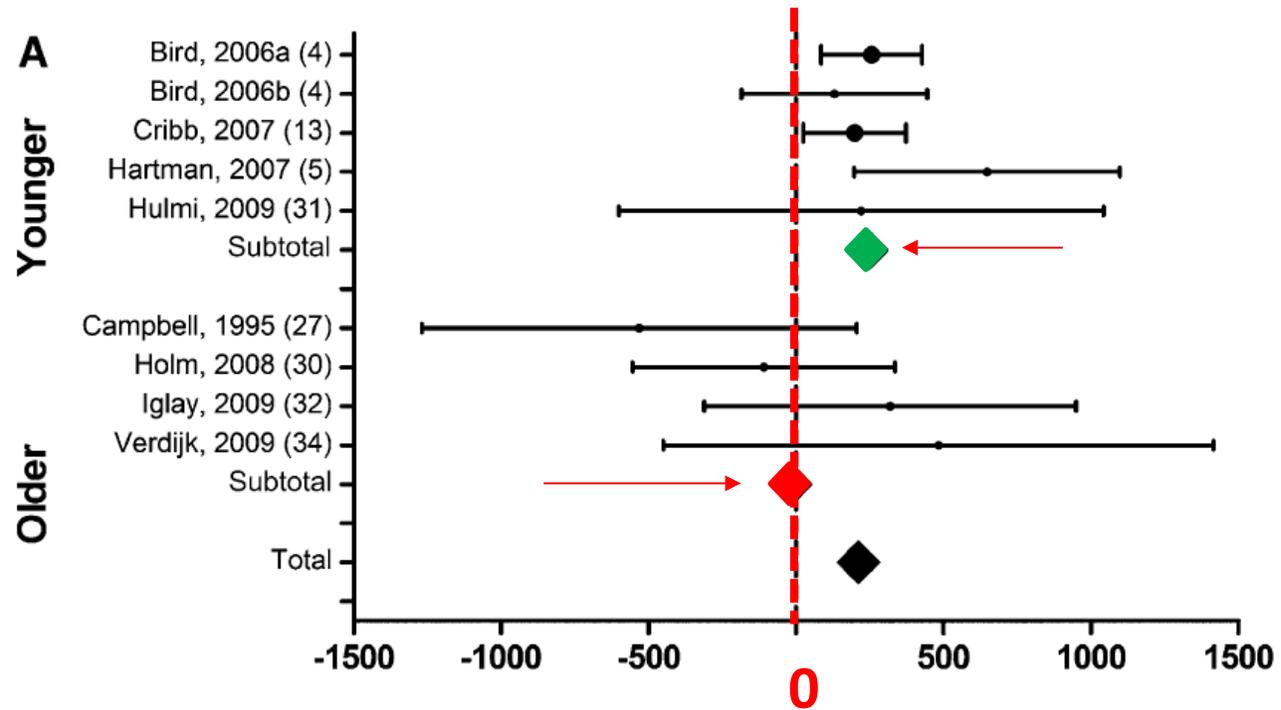


Lawrence VA, Hazuda HP, Cornell JE, Pederson T, Bradshaw PT, Mulrow CD, Page CP.

Functional independence after major abdominal surgery in the elderly.

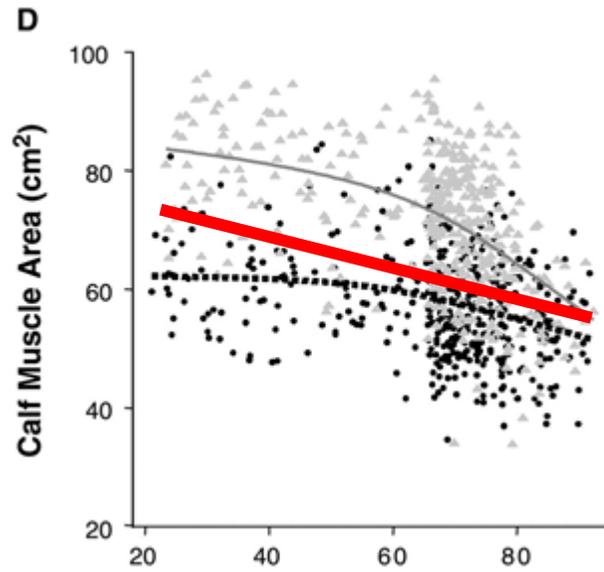
J Am Coll Surg. 2004 Nov;199(5):762-72

DIETARY PROTEIN AND EXERCISE TRAINING

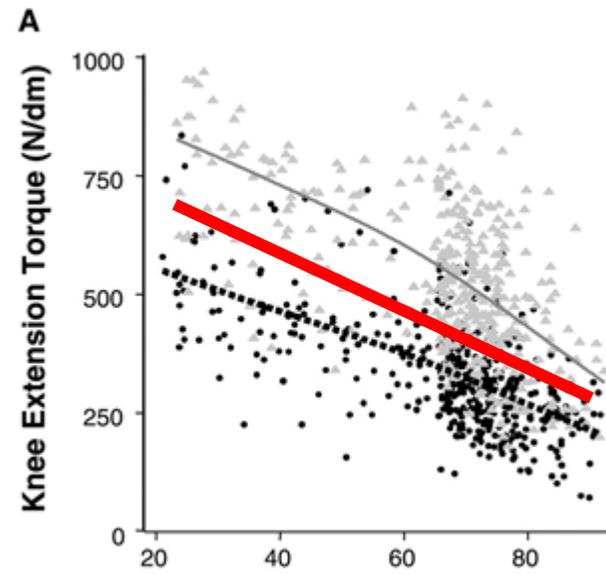


Cermak NM1, Res PT, de Groot LC, Saris WH, van Loon LJ. Protein supplementation augments the adaptive response of skeletal muscle to resistance-type exercise training: a meta-analysis. *Am J Clin Nutr.* 2012 Dec;96(6):1454-64.

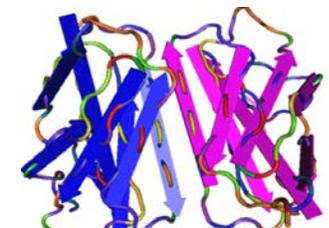
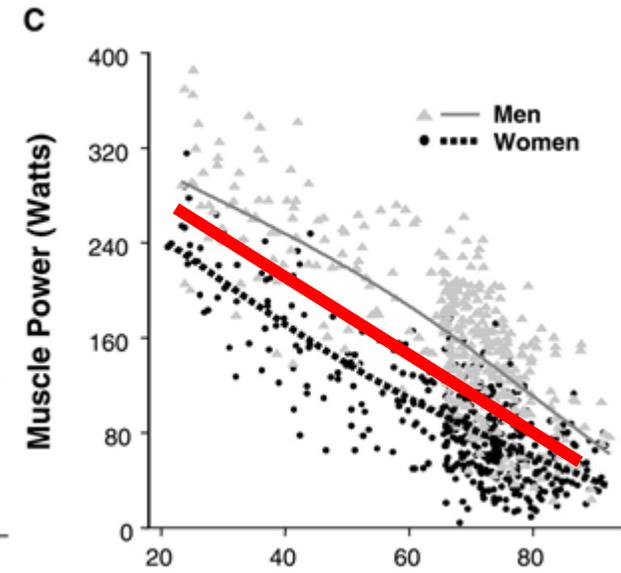
MASSA



KRACHT



POWER



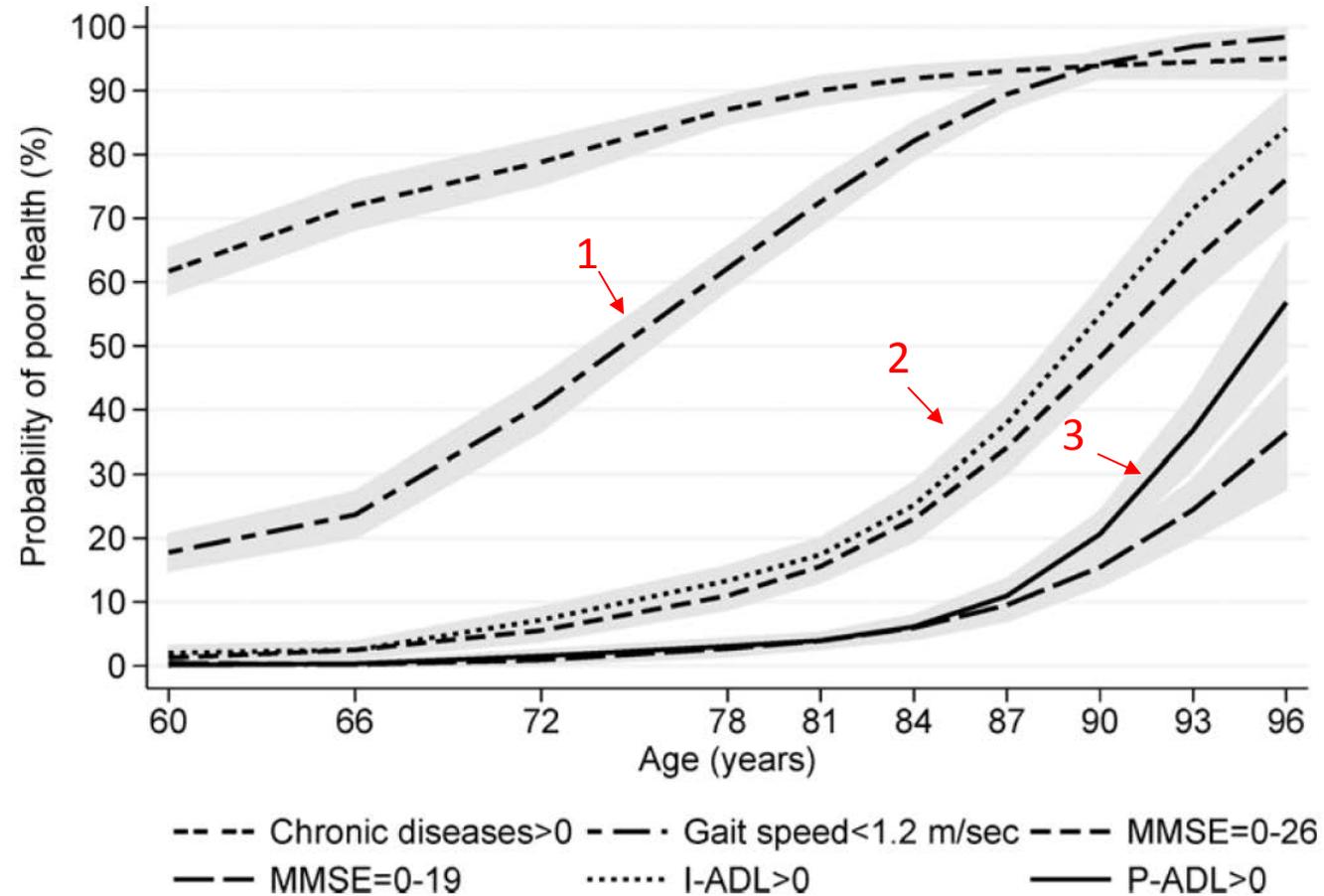
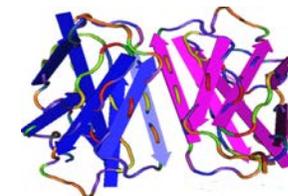


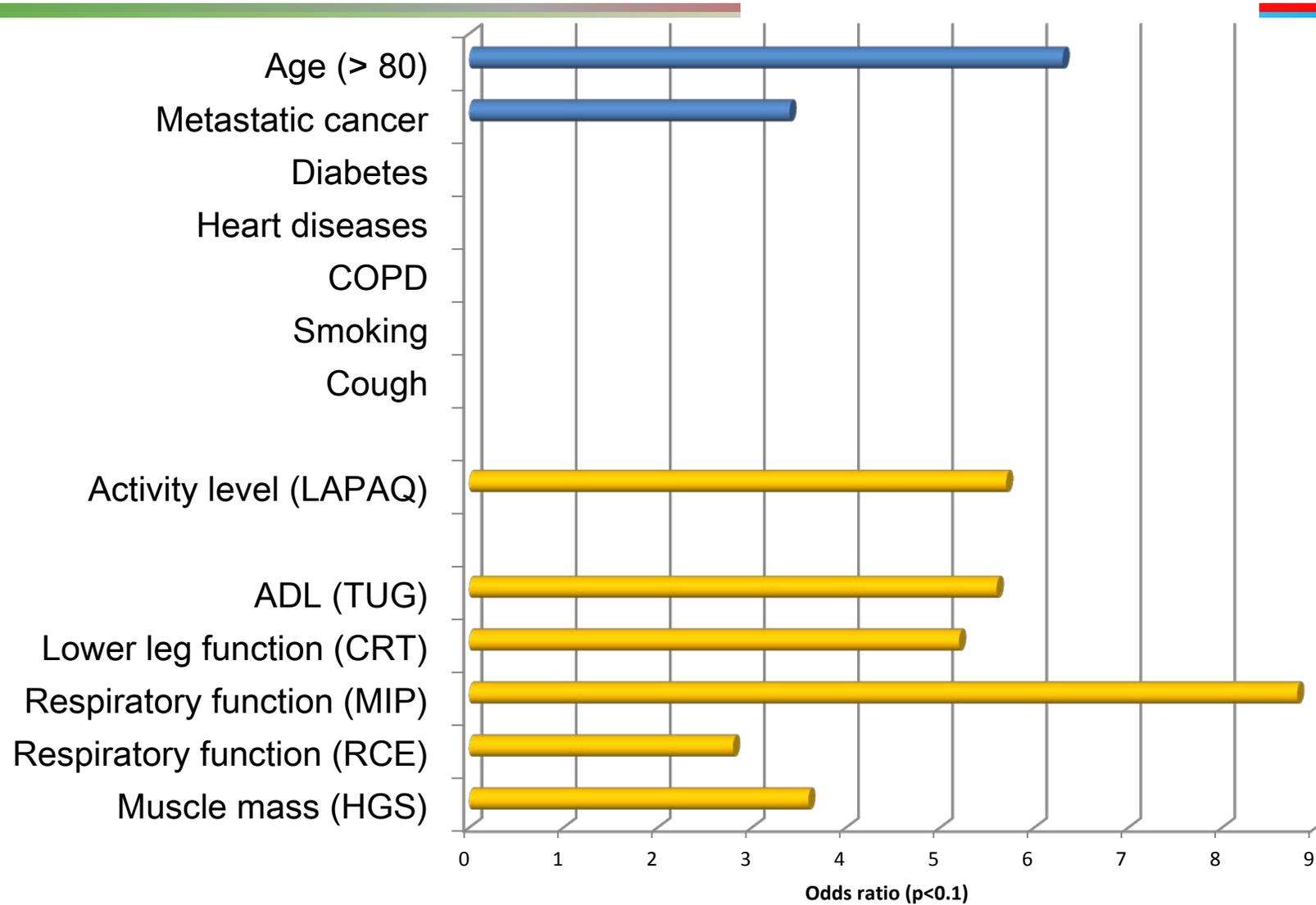
Fig 2. Sex-adjusted probability, per 100 persons, of poor health in one of the five health indicators as a function of age.

doi:10.1371/journal.pone.0120077.g002



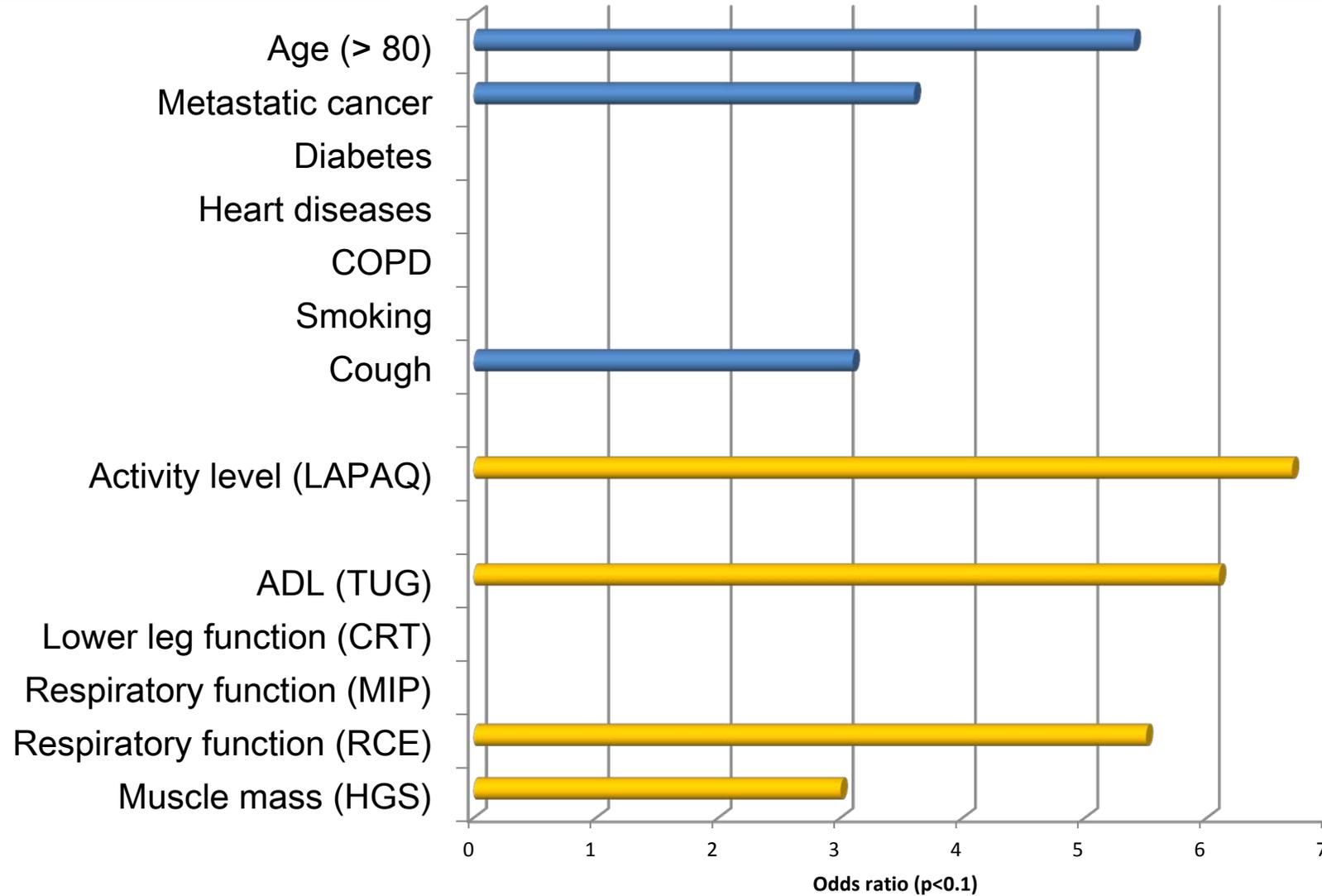
DISCHARGE DESTINATION

10 % nursing home n=169



Dronkers JJ, Chorus AM, van Meeteren NL, Hopman-Rock M.

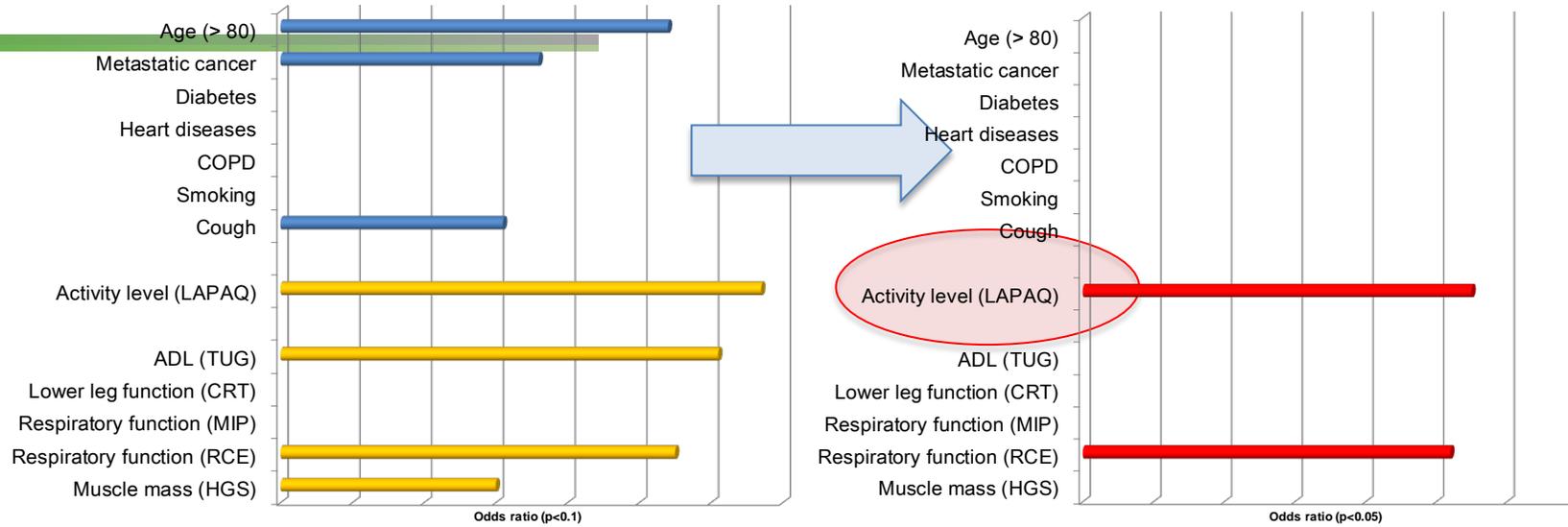
The association of pre-operative physical fitness and physical activity with outcome after scheduled major abdominal surgery. *Anaesthesia*. 2013;68(1):67-73.



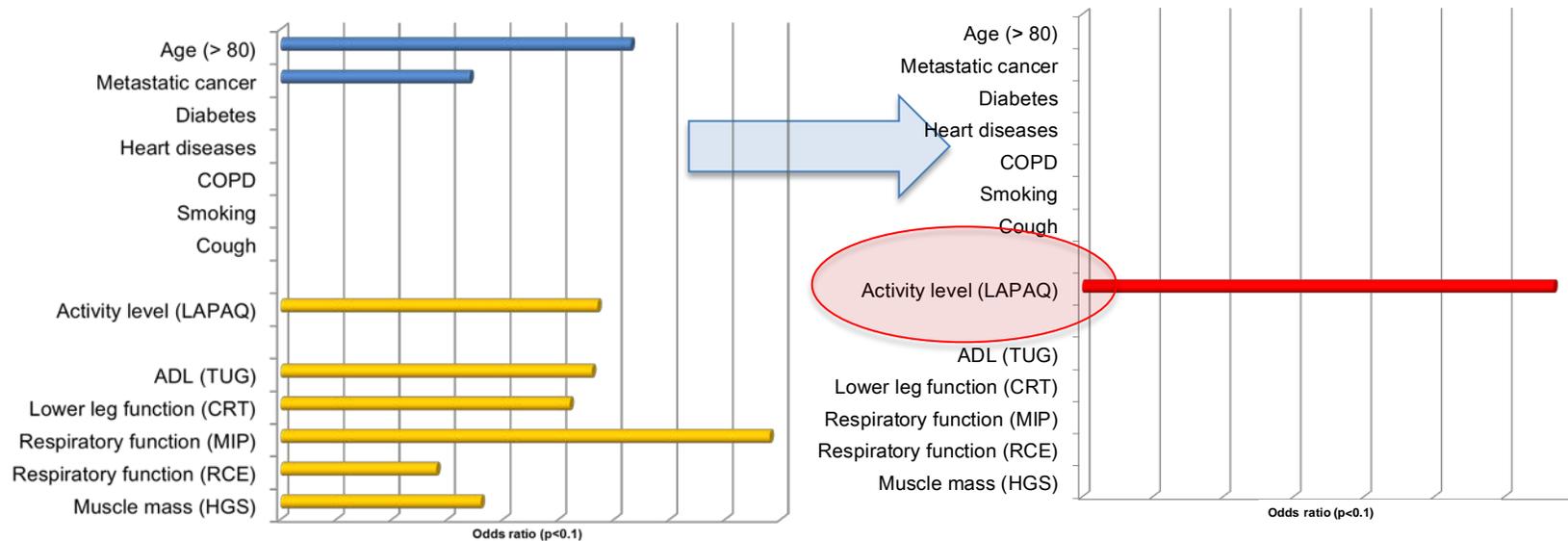
Dronkers JJ, Chorus AM, van Meeteren NL, Hopman-Rock M.

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Mortality



Discharge destination



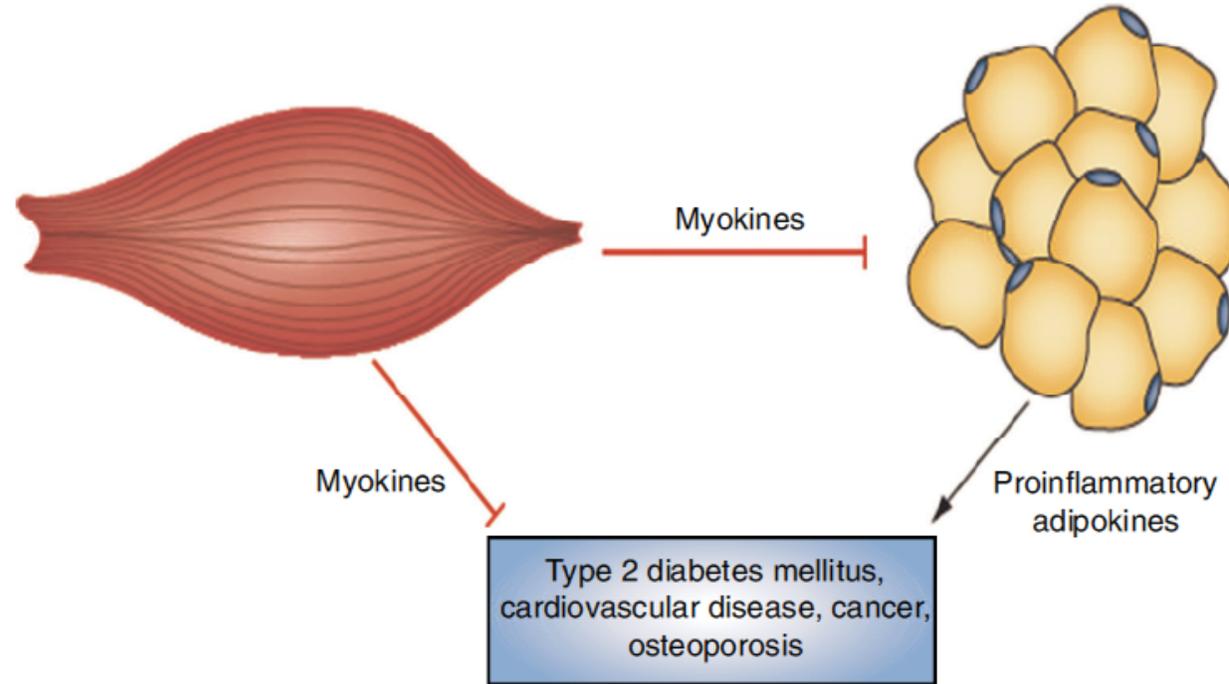
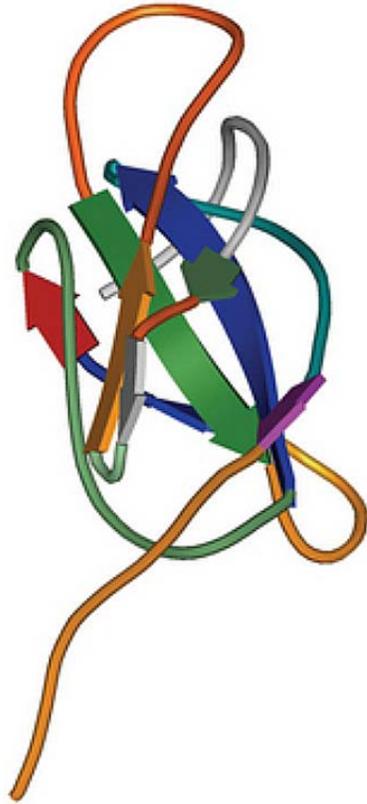


Figure 2 The interplay between adipokines and myokines represents a Yin-Yang balance. Especially under conditions of obesity, adipose tissue secretes adipokines that contribute to establish a chronic inflammatory environment, promoting pathological processes such as atherosclerosis and insulin resistance. Skeletal muscles are capable of producing myokines that confer some of the health benefits of exercise. Such myokines might counteract the harmful effects of proinflammatory adipokines. Adapted, with permission, from (172).

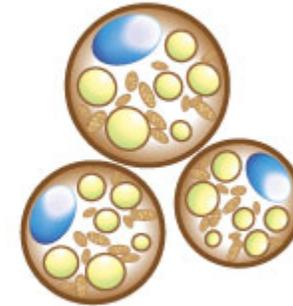
IRISINE



Witte vetcellen



Bruine vetcellen





Dankzij irisin beschermt beweging tegen kanker



Het beste niet-medische middel tegen kanker is beweging, maar hoe beweging precies tegen kanker beschermt weten we niet. Moleculaire biologen van de University of New Mexico publiceerden in de International Journal of Cancer een fundamenteel onderzoek dat daarin verandering brengt.

Kanker en beweging

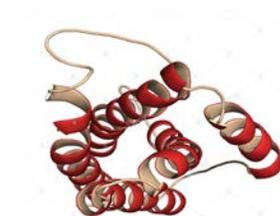
Wereldwijd zoeken miljoenen mensen naar een niet-medische manier waarop ze kanker kunnen voorkomen of, als ze al zijn behandeld voor kanker, de terugkeer van de ziekte kunnen voorkomen. Honderdduizenden kankeroverlevers hebben zich er bij neergelegd dat ze een ongeneeslijke vorm van kanker onder de leden hebben, en zoeken naar niet-medische manieren waarop ze de ontwikkeling van de ziekte kunnen afremmen.

Volgens studies zijn er inderdaad niet-medische anti-kankerstrategieën die hout snijden, en de meest effectieve is lichaamsbeweging. Het maakt eigenlijk niet uit wat je favoriete vorm van lichaamsbeweging is, als je het maar veel en vaak doet. Hoe meer, hoe beter. Een overzicht van onze stukjes over de kankerremmende kwaliteiten van lichaamsbeweging vind je [hier](#).

Conclusie

"Exercise has been shown to result in reduced cancer risk and improved prognosis of cancer patients", schrijven de onderzoekers. "Our data provides possible insights into potential mechanisms underlying these observations. Moreover, our data supports the hypothesis that irisin may play an important role in future cancer therapeutics, warranting the need for further investigation."

Bron:
Int J Cancer. 2015 Feb 15;136(4):E197-202.



Hippocrates (400 v Chr)
"Walking is man's best medicine"



BMJ 2013;347:f5577 doi: 10.1136/bmj.f5577 (Published 1 October 2013) Page 1 of 14

RESEARCH

Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study

 OPEN ACCESS

Huseyin Naci *researcher*¹ *fellow*², John P A Ioannidis *director*³



Exercise is medicine



Activiteitsniveau en PPC

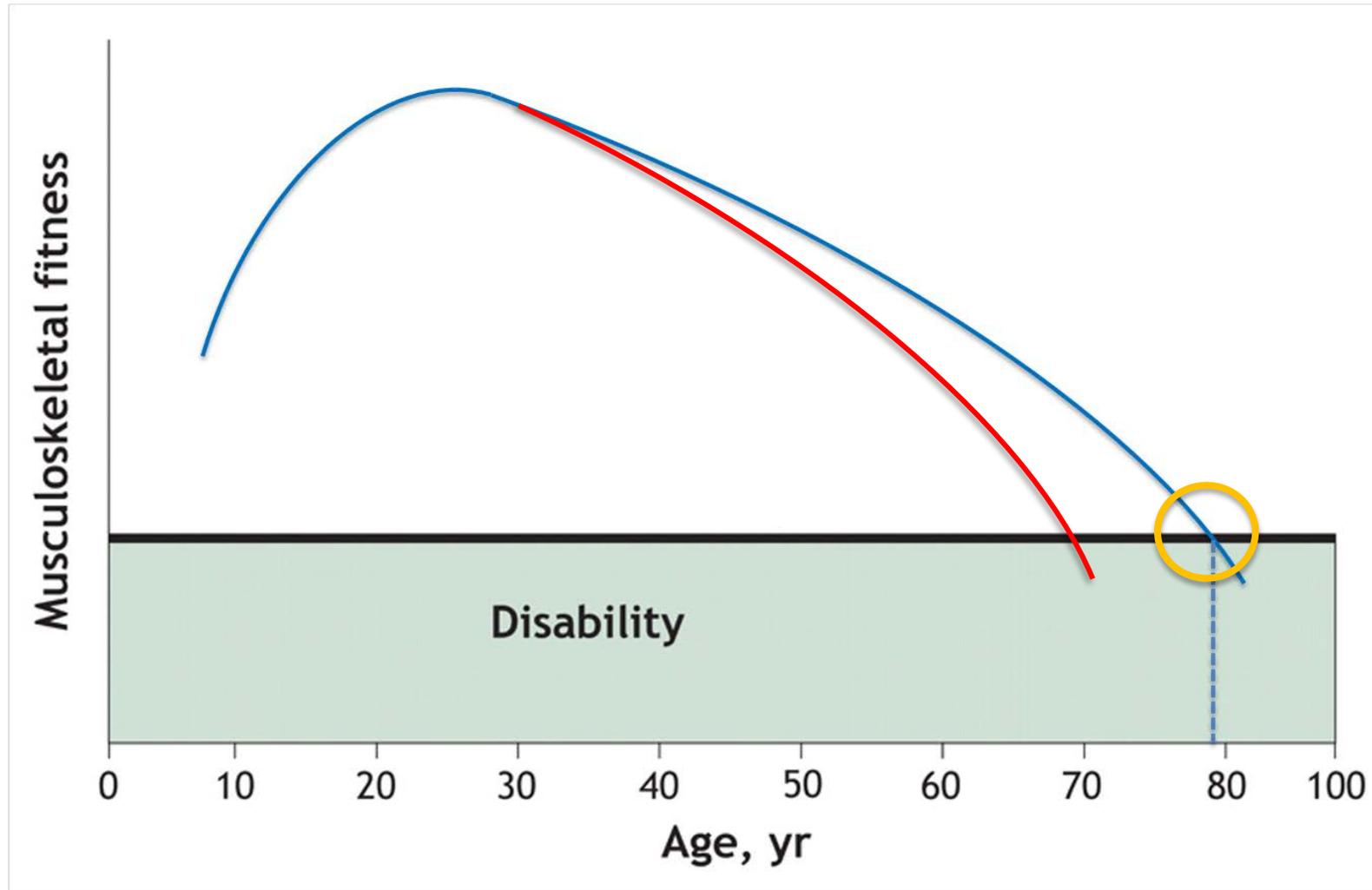
Table 6 PPC related to physical activity (measured by pedometer) in both the intervention and control group

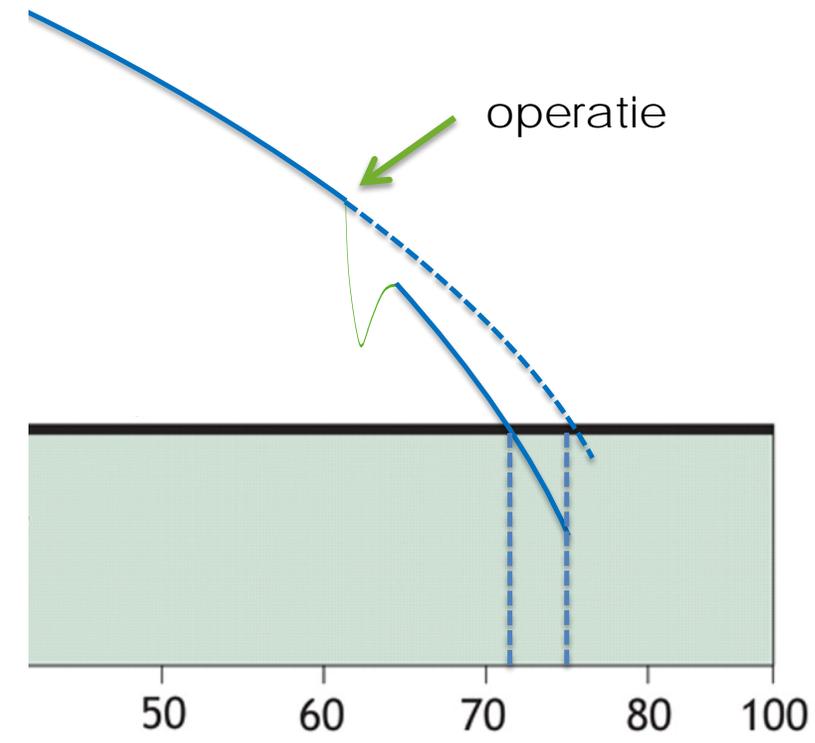
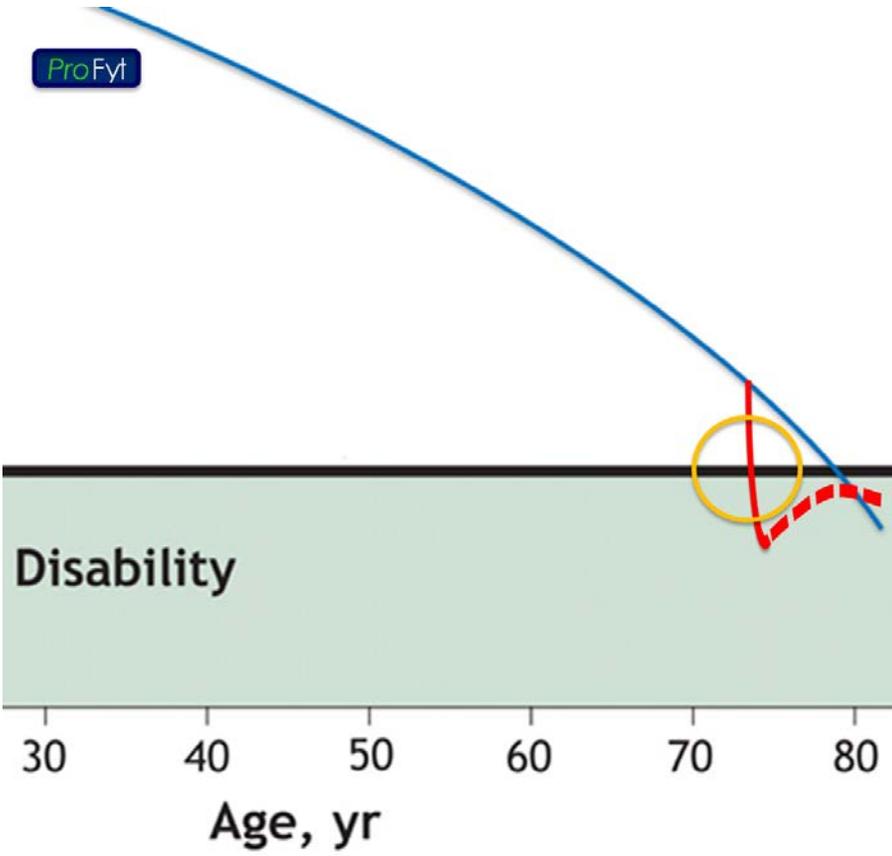
		PPC	
		no	yes
Activity	< 3000 steps per day	6	7
	> 3000 steps per day	25	3

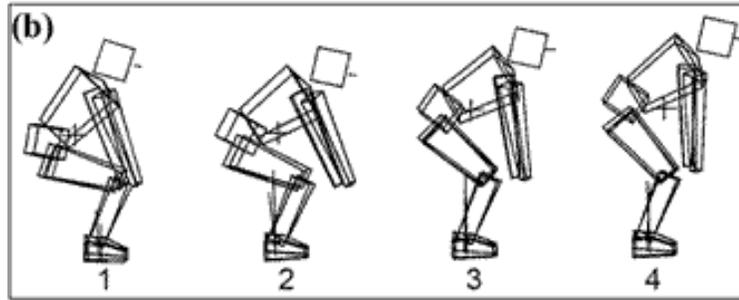
P=0,005



P R E O P E R A T I E F



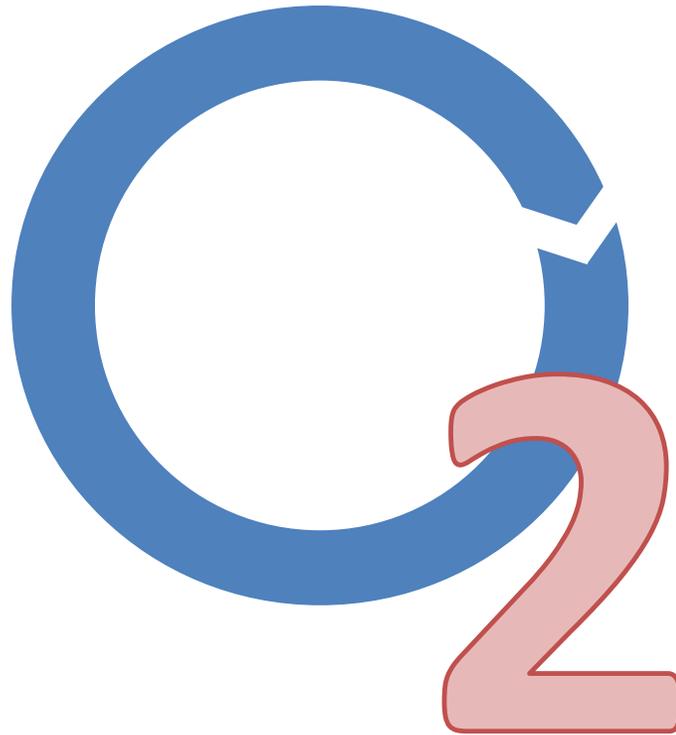






SRT

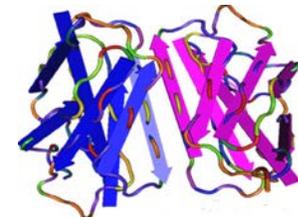
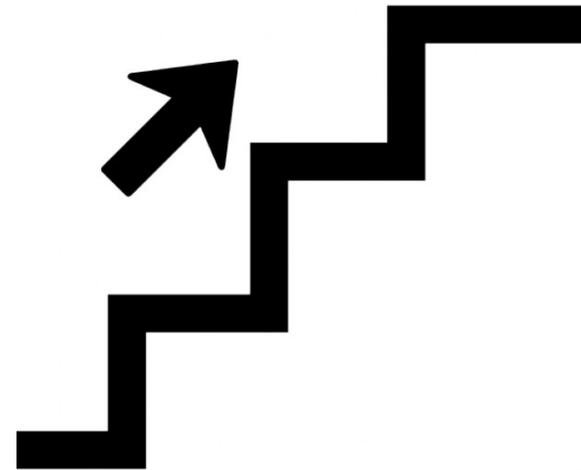
6MWT



18 ml/kg/min

1 MET is 3,5 ml/kg/min

5.5 MET





Beweegrichtlijnen

Aan: de minister van Volksgezondheid
Nr. 2017/08, Den Haag 22 augustus 2017

Gezondheidsraad

Figuur 1 **Beweegrichtlijnen 2017**

Bewegen is goed, meer bewegen is beter

Volwassenen en ouderen



Matig of zwaar intensieve inspanning
minimaal 150 minuten per week,
verspreid over diverse dagen



Spier- en botversterkende
activiteiten (voor ouderen
inclusief balansoefeningen):
minimaal 2x per week



En: voorkom veel stilzitten

Hoeveel procent
voldoet aan de
richtlijn?

vanaf 18 jaar



Kinderen



Matig of zwaar intensieve inspanning
minimaal 1 uur per dag



Spier- en botversterkende
activiteiten
minimaal 3x per week

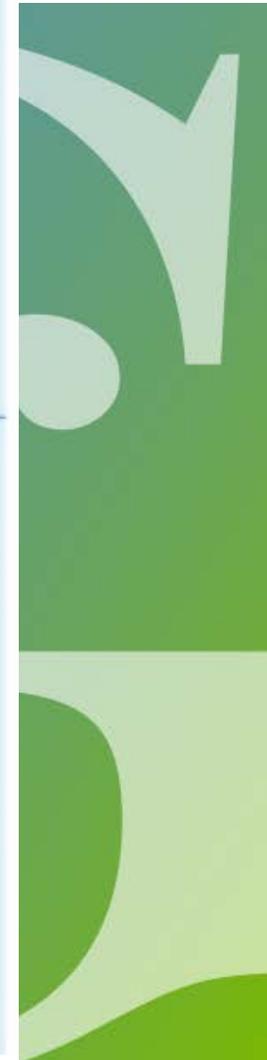
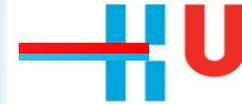


En: voorkom veel stilzitten

4 t/m 11 jaar



12 t/m 17 jaar



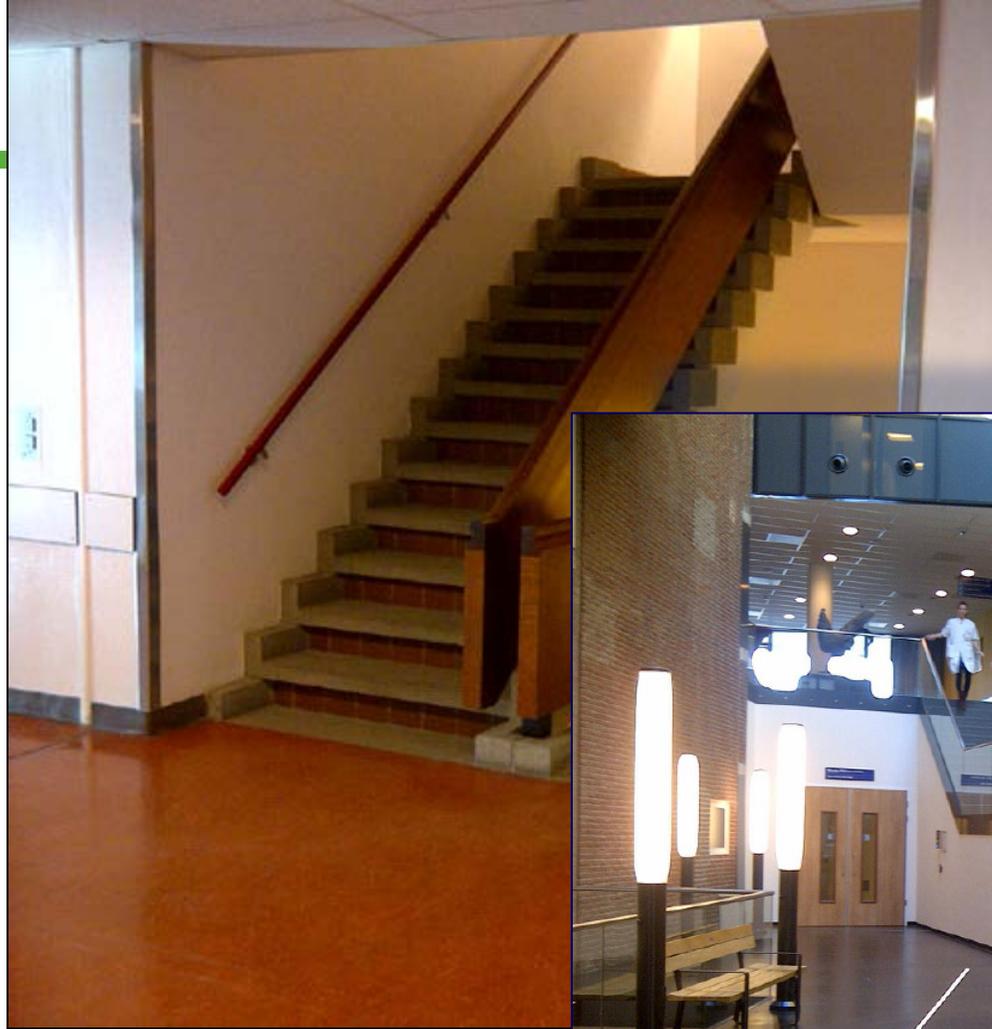


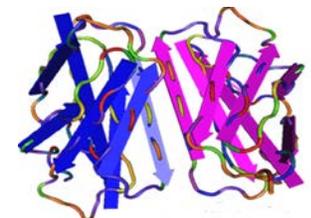
Spier trainen

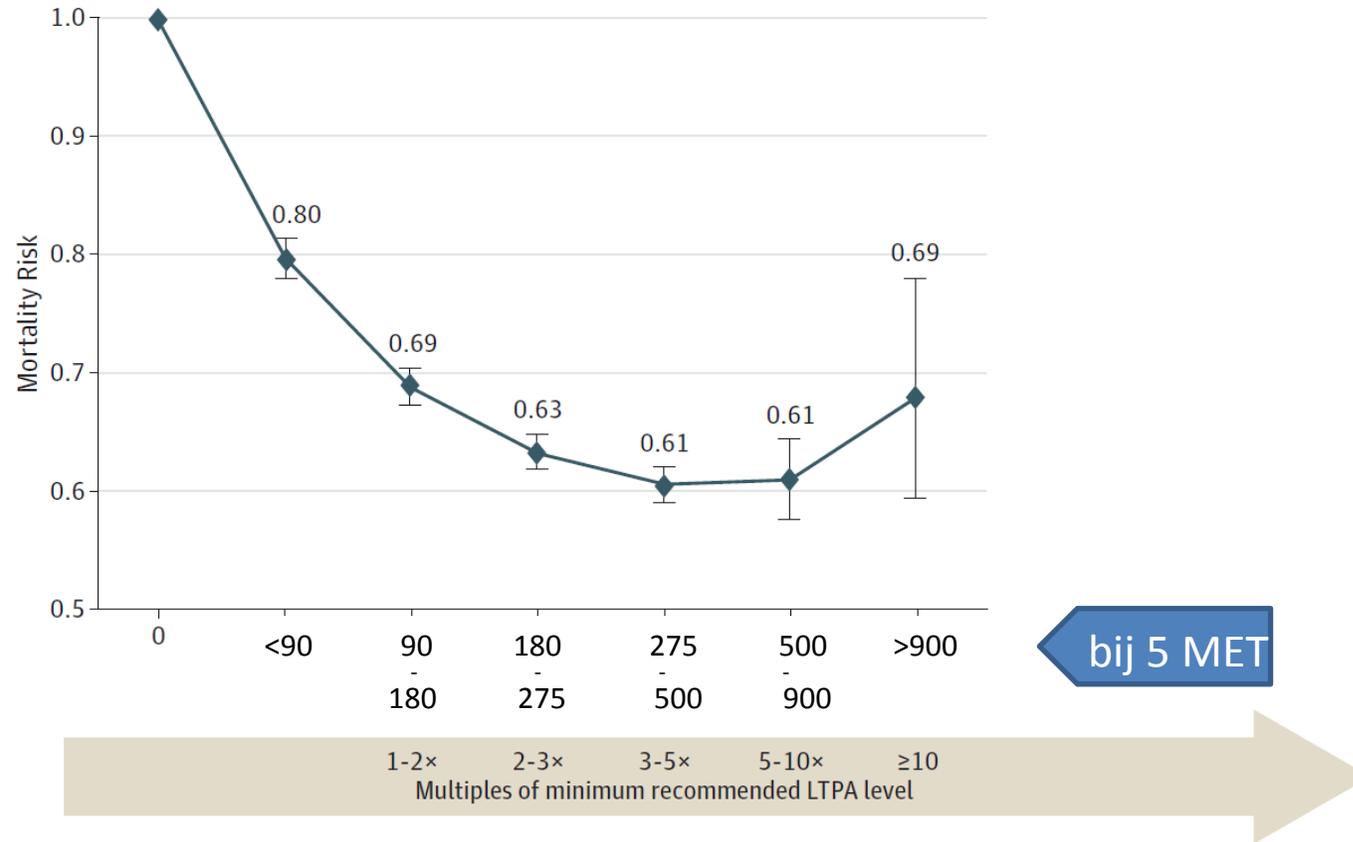










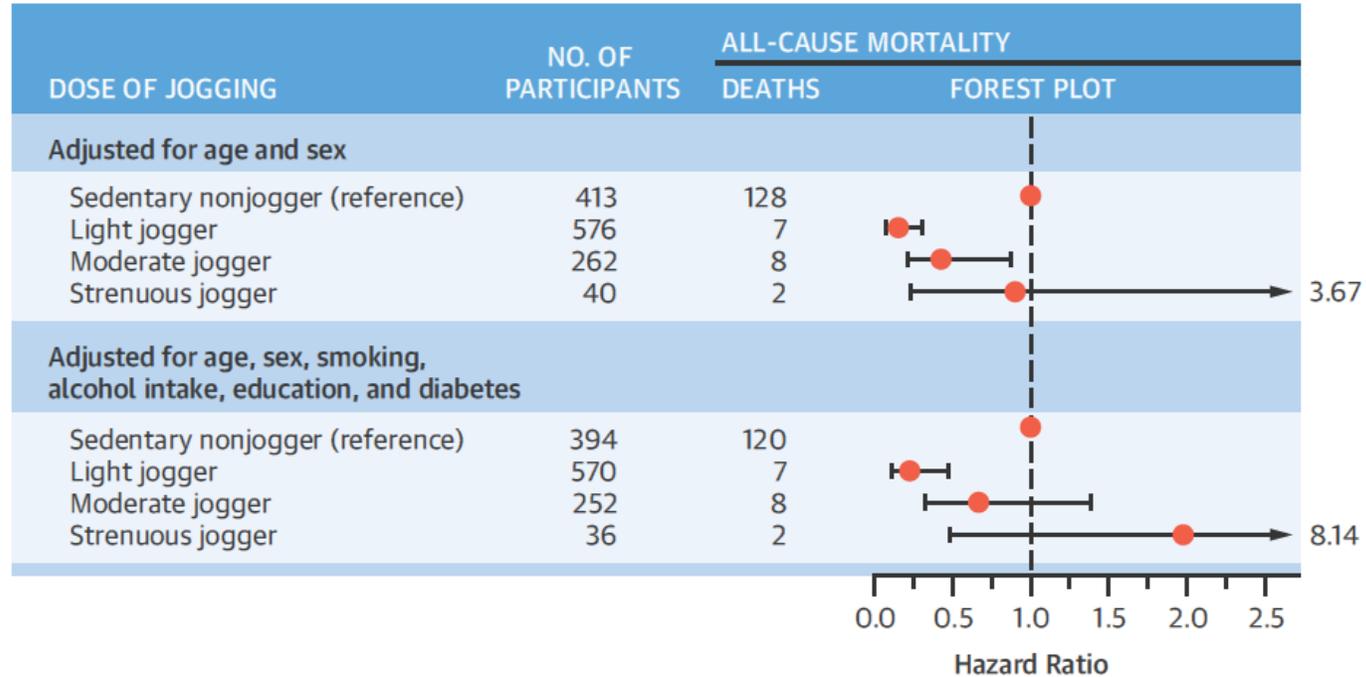


JAMA Intern Med. 2015 Jun;175(6):959-67. doi: 10.1001/jamainternmed.2015.0533.

Leisure time physical activity and mortality: a detailed pooled analysis of the dose-response relationship.

Arem H, Moore SC, Patel A, Hartge P, Berrington de Gonzalez A, Visvanathan K, Campbell PT, Freedman M, Weiderpass E, Adami HO, Linet MS, Lee IM6, Matthews CE.

CENTRAL ILLUSTRATION Dose of Jogging and Long-Term Mortality



Schnohr, P. et al. *J Am Coll Cardiol.* 2015; 65(5):411-9.

Forest plot indicating all-cause mortality in light, moderate, and strenuous joggers compared with sedentary nonjoggers.

Peter Schnohr, James H. O’Keefe, Jacob L. Marott, Peter Lange, Gorm B. Jensen

Dose of Jogging and Long-Term Mortality

J Am Coll Cardiol. 2015 Jan 16;65(5)

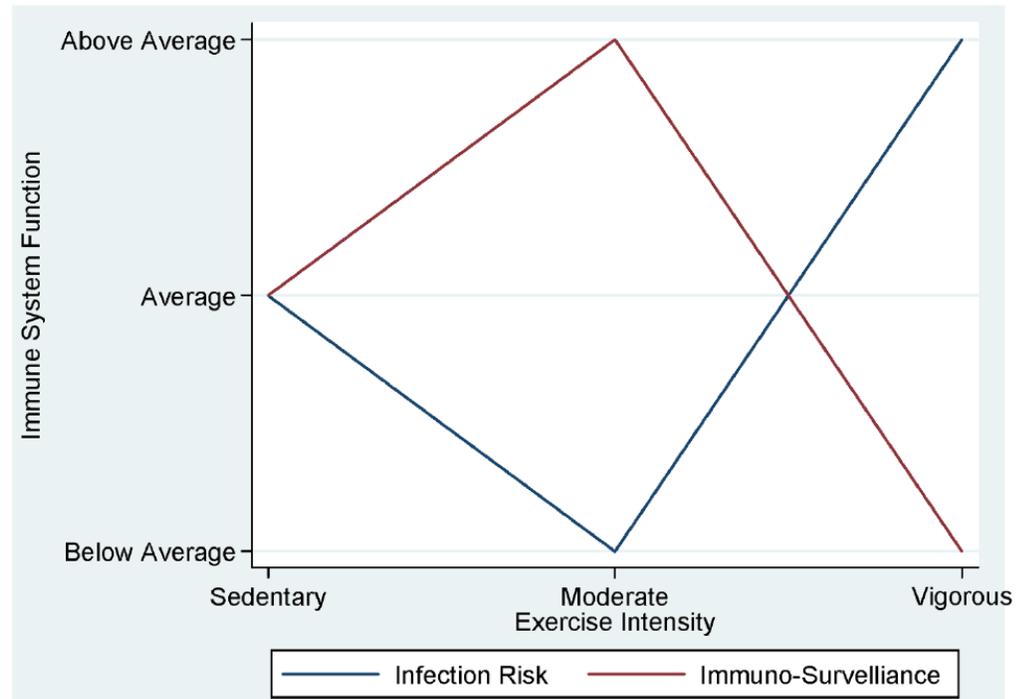


Figure 10. Exercise intensity and optimal states of infection risk and immuno-surveillance. Reproduced with permission from (115).

