

Hervatting/opstarten van sportactiviteiten bij hartpatiënten

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UGent*



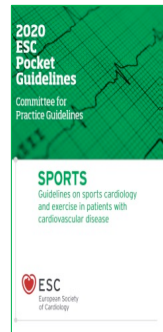
2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease



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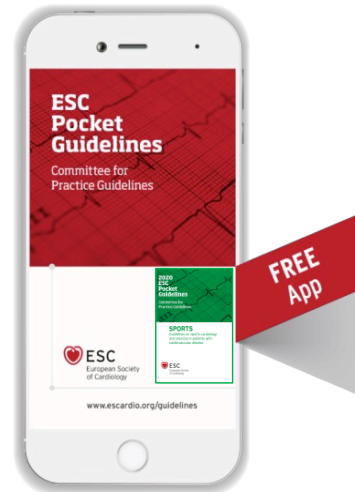


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Nationale richtlijnen voor lichaamsbeweging

- Vlaams Instituut Gezond Leven: Vlaamse gezondheidsaanbevelingen lichaamsbeweging en sedentair gedrag (lang stilzitten) (2017)
 - <https://www.gezondleven.be/files/beweging/Vlaamse-gezondheidsaanbevelingen-beweging.pdf>
 - Bewegingsdriehoek

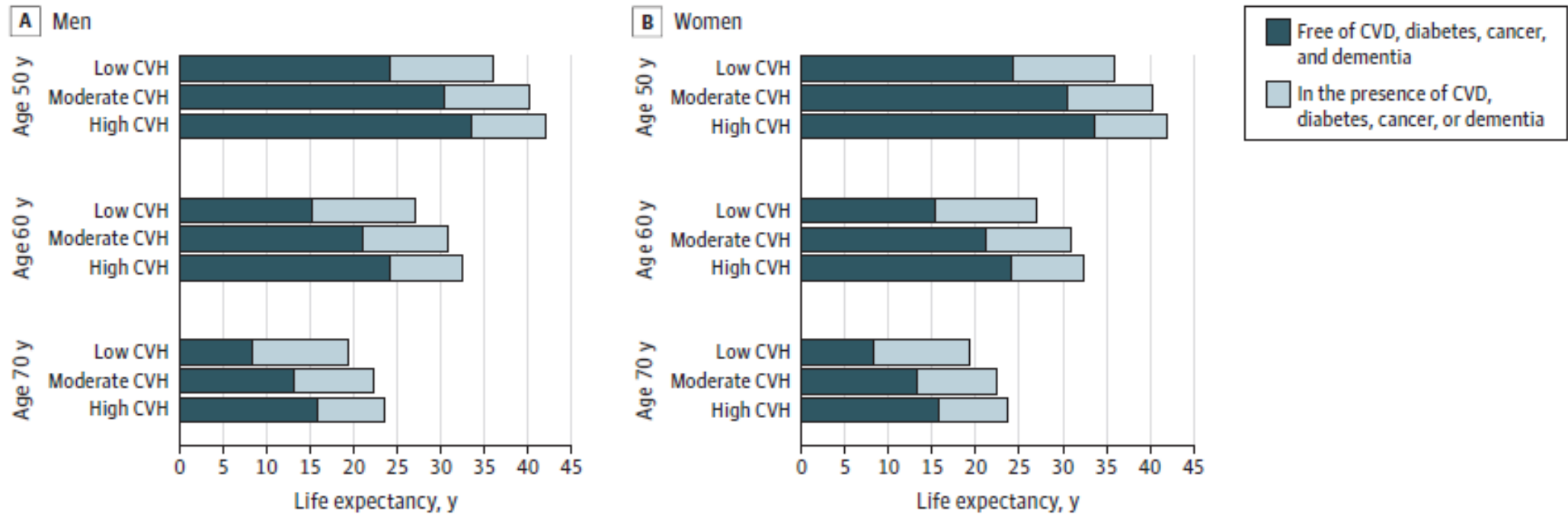


- Bewegen op verwijzing (2020)
 - <https://www.bewegenopverwijzing.be>
 - FYSS-short :
 - Ontwikkeld voor het EUPAP- project (Zweden, 2019) , uitgerold in verschillende Europese landen; ook voor Vlaanderen en Brussel verder uitgewerkt
 - Concrete aanbevelingen voor 32 verschillende ziektebeelden en diagnoses
 - In primaire preventie
 - In secundaire/tertiaire preventie na behandeling van de onderliggende aandoening en eventueel volgend op een specifiek revalidatie programma (bv na hartinfarct)



2023 American Heart Association's Life's Essential 8 score

Levensverwachting volgens niveau van cardiovasculaire gezondheidsindex (LE8 metrics)



CVD indicates cardiovascular disease; CVH, cardiovascular health.

135199 adults in UK Biobank Study – LE8 metrics – life expectancy total and free of CVD, diabetes, cancer or dementia

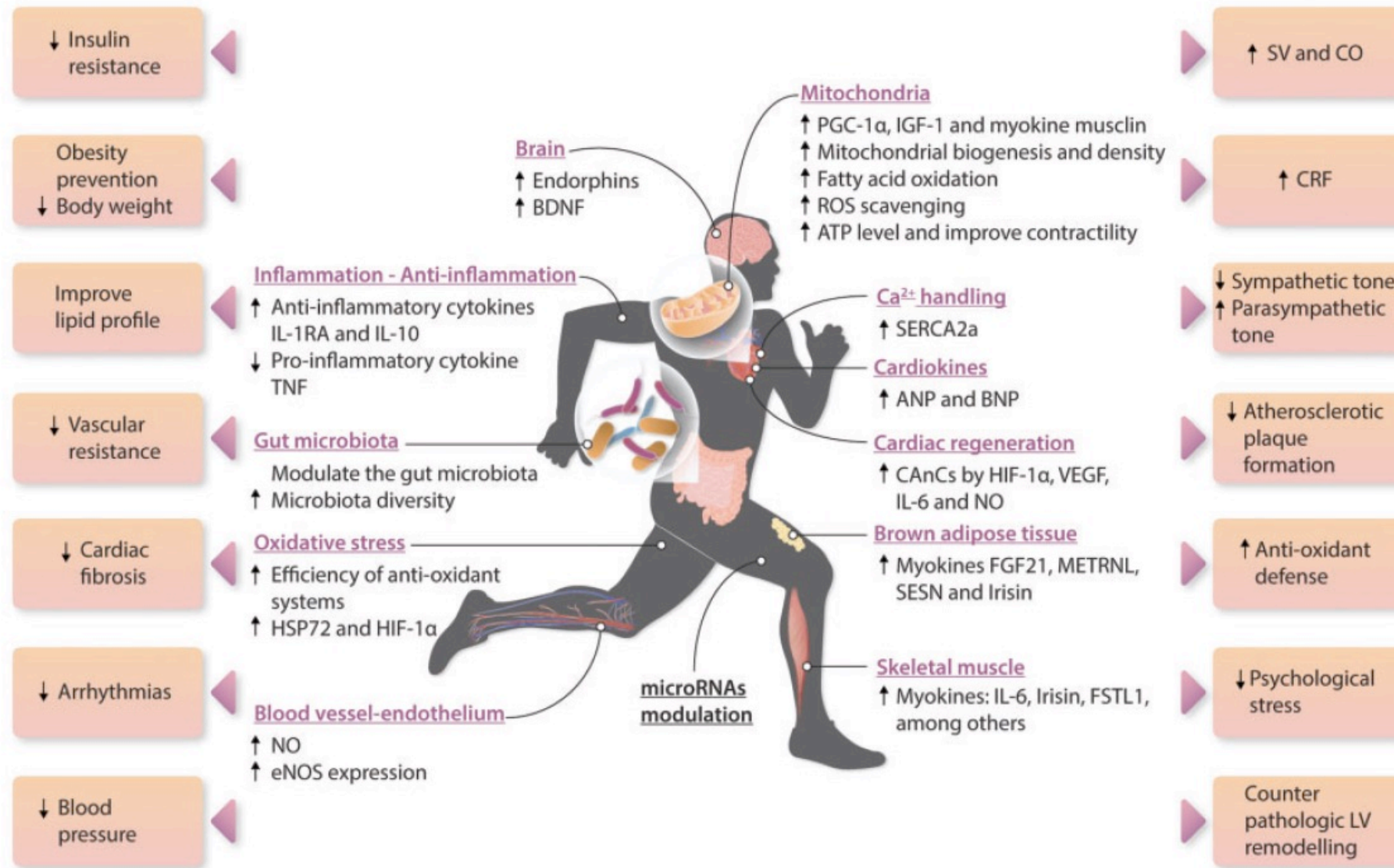


Figure 1 Endurance exercise-related pivotal mechanisms, physiological adaptations, and clinical improvements.



General recommendations for exercise and sports in healthy individuals

Recommendations	Class	Level
At least 150 minutes per week of moderate intensity, or 75 minutes per week of vigorous intensity aerobic exercise or an equivalent combination thereof is recommended in all healthy adults.	I	A
A gradual increase in aerobic exercise to 300 minutes per week of moderate intensity, or 150 minutes per week of vigorous intensity aerobic exercise, or an equivalent combination is recommended for additional benefits in healthy adults.	I	A
Regular assessment and counselling to promote adherence and, if necessary, to support an increase in exercise volume over time are recommended.	I	B
Multiple sessions of exercise spread throughout the week, i.e. on 4–5 days a week and preferably every day of the week, are recommended.	I	B

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Algemene richtlijnen - volwassenen



AEROBE LICHAAMSBEWEGING°			SPIERVERSTERKENDE ACTIVITEITEN			
intensiteit	duur	frequentie	aantal oefeningen*	herhalingen**	sets***	sessies
<u>Matig</u> ^{oo} 	minstens 150 min/ week	3-7 keer/ week	8-10	8-12	2-4	2-3 sessies/ week
OF						
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Original Investigation

Leisure Time Physical Activity and Mortality

A Detailed Pooled Analysis of the Dose-Response Relationship

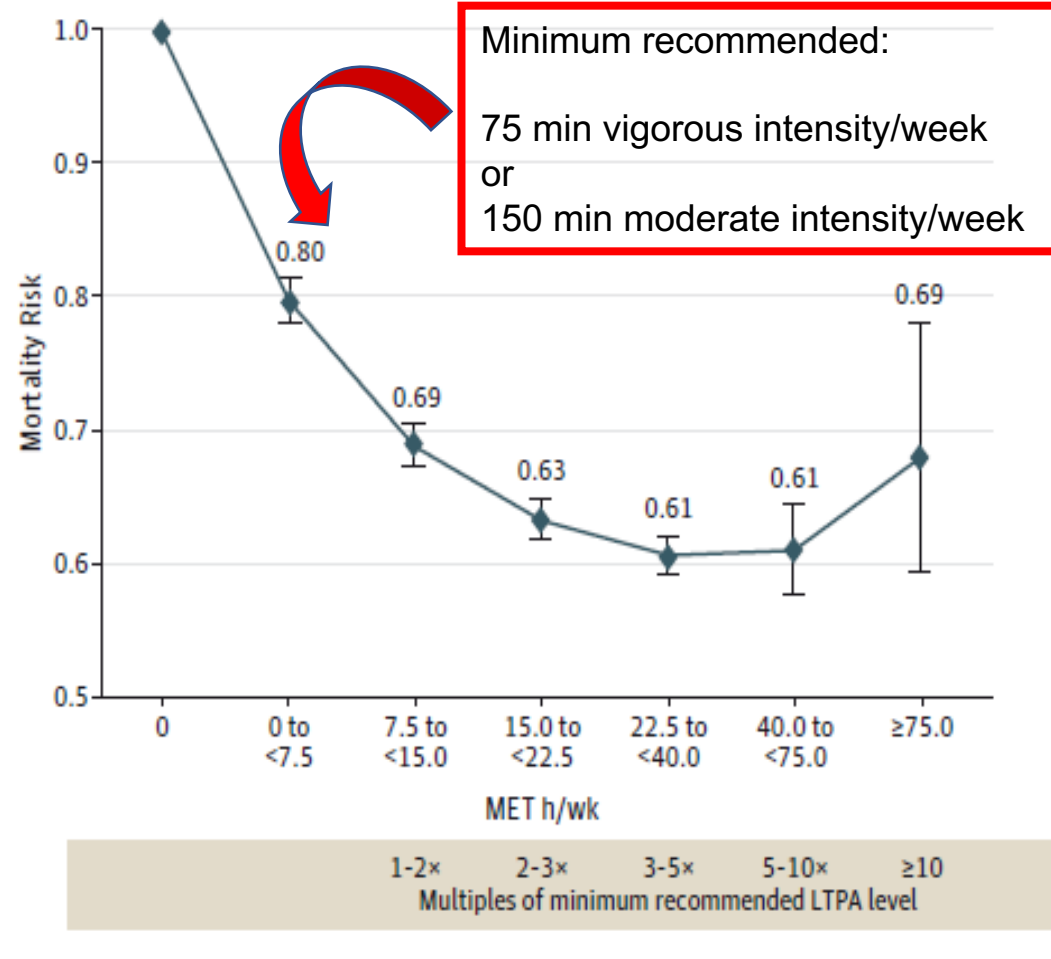
Hannah Arem, MHS, PhD; Steven C. Moore, PhD; Alpa Patel, PhD; Patricia Hartge, ScD;
Amy Berrington de Gonzalez, DPhil; Kala Viswanathan, MBBS, MPH; Peter T. Campbell, PhD;
Michal Freedman, JD, PhD; Elisabete Weiderpass, MD, MSc, PhD; Hans Olov Adami, MD, PhD;
Martha S. Linet, MD; I-Min Lee, MBBS, ScD; Charles E. Matthews, PhD

IMPORTANCE The 2008 Physical Activity Guidelines for Americans recommended a minimum of 75 vigorous-intensity or 150 moderate-intensity minutes per week (7.5 metabolic-equivalent hours per week) of aerobic activity for substantial health benefit and suggested additional benefits by doing more than double this amount. However, the upper limit of longevity benefit or possible harm with more physical activity is unclear.

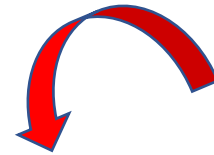
OBJECTIVE To quantify the dose-response association between leisure time physical activity and mortality and define the upper limit of benefit or harm associated with increased levels of physical activity.

DESIGN, SETTING, AND PARTICIPANTS We pooled data from 6 studies in the National Cancer Institute Cohort Consortium (baseline 1992-2003). Population-based prospective cohorts in the United States and Europe with self-reported physical activity were analyzed in 2014. A total of 661 137 men and women (median age, 62 years; range, 21-98 years) and 116 686 deaths were included. We used Cox proportional hazards regression with cohort stratification to generate multivariable-adjusted hazard ratios (HRs) and 95% CIs. Median follow-up time was 14.2 years.

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Physical activity and cause-specific mortality



Minimum recommended:
75 min vigorous intensity/week
or
150 min moderate intensity/week

Table 3. LTPA and Cause-Specific Mortality in 661137 Participants

Characteristic	LTPA Level, MET h/wk						
	0	0.1 to <7.5	7.5 to <15.0	15.0 to <22.5	22.5 to <40.0	40.0 to <75.0	≥75.0
Participants, No. (%)	52 848 (8.0)	172 203 (26.1)	170 563 (25.8)	118 169 (17.9)	124 446 (18.8)	18 831 (2.9)	4077 (0.6)
Cancer deaths, No. (%)	3143 (10.7)	8584 (29.3)	7375 (25.2)	4373 (14.9)	5187 (17.7)	557 (1.9)	75 (0.3)
HR (95% CI) ^a	1.00	0.87 (0.83-0.90)	0.79 (0.75-0.82)	0.75 (0.72-0.79)	0.74 (0.71-0.77)	0.72 (0.66-0.79)	0.69 (0.55-0.87)
CVD deaths, No. (%)	3238 (12.8)	7952 (31.4)	6316 (24.9)	3293 (13.0)	4044 (15.9)	457 (1.8)	69 (0.3)
HR (95% CI) ^a	1.00	0.80 (0.77-0.84)	0.67 (0.65-0.70)	0.59 (0.57-0.63)	0.58 (0.56-0.61)	0.61 (0.55-0.67)	0.71 (0.56-0.91)



Heart disease							
No	1.00	0.80 (0.78-0.82)	0.70 (0.68-0.72)	0.65 (0.63-0.66)	0.62 (0.60-0.64)	0.62 (0.58-0.66)	0.69 (0.60-0.80)
Yes	1.00	0.79 (0.75-0.83)	0.65 (0.62-0.68)	0.58 (0.55-0.61)	0.55 (0.52-0.58)	0.56 (0.48-0.65)	0.66 (0.45-0.98)

<.001

Table 2 Indices of exercise intensity for endurance sports from maximal exercise testing and training zones

Intensity	VO_{2max} (%)	HR_{max} (%)	HRR (%)	RPE Scale	Training Zone
Low intensity, light exercise ^a	<40	<55	<40	10–11	Aerobic
Moderate intensity exercise ^a	40–69	55–74	40–69	12–13	Aerobic
High intensity ^a	70–85	75–90	70–85	14–16	Aerobic + lactate
Very high intense exercise ^a	>85	>90	>85	17–19	Aerobic + lactate + anaerobic

^aAdapted from Vanhees L et al (Eur J Prev Cardiol 2012 Part I & II) using training zones related to aerobic and anaerobic thresholds. Low intensity exercise is below the aerobic threshold, moderate is above the aerobic threshold but not reaching the anaerobic zone; high intensity is close to the anaerobic zone and very intense exercise is above the anaerobic threshold. The duration of exercise will also largely influence this division in intensity.

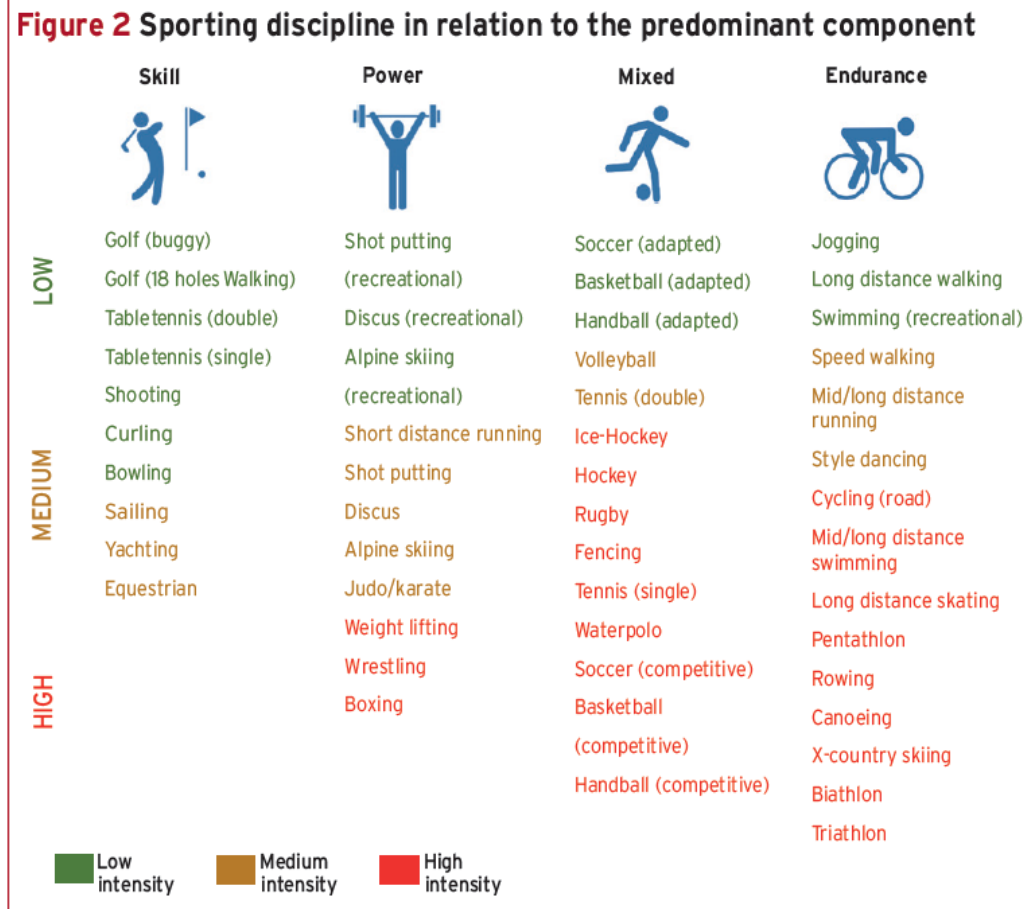


Figure 2 Sporting discipline in relation to the predominant component (skill, power, mixed and endurance)

The physical activity paradox in cardiovascular disease and all-cause mortality: the contemporary Copenhagen General Population Study with 104 046 adults

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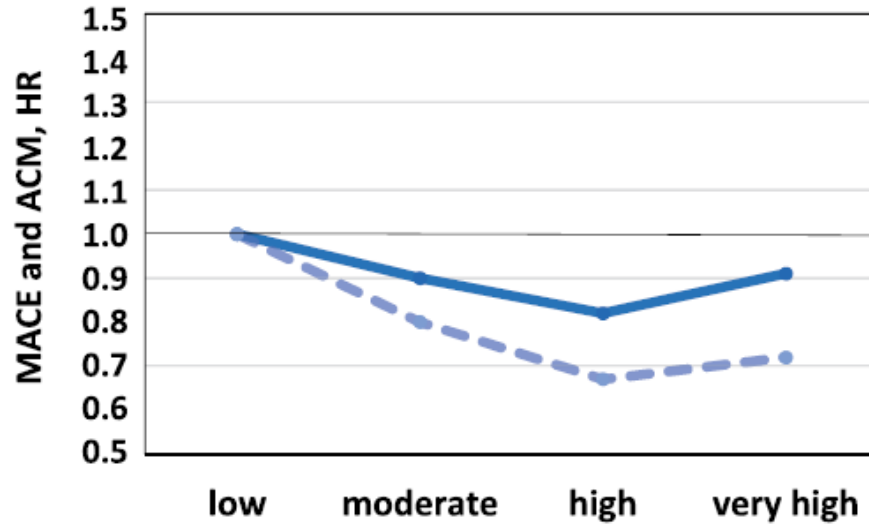
See page 1512 for the editorial comment on this article (doi: 10.1093/eurheartj/ehab105)

Aims Leisure time physical activity associates with reduced risk of cardiovascular disease and all-cause mortality, while these relationships for occupational physical activity are unclear. We tested the hypothesis that leisure time physical activity associates with reduced major adverse cardiovascular events (MACE) and all-cause mortality risk, while occupational physical activity associates with increased risks.

Methods and results We studied 104 046 women and men aged 20–100 years in the Copenhagen General Population Study with baseline measurements in 2003–2014 and median 10-year follow-up. Both leisure and occupational physical activity were based on self-report with four response categories. We observed 7913 (7.6%) MACE and 9846 (9.5%) deaths from all causes. Compared to low leisure time physical activity, multivariable adjusted (for lifestyle, health, living conditions, and socioeconomic factors) hazard ratios for MACE were 0.86 (0.78–0.96) for moderate, 0.77 (0.69–0.86) for high, and 0.85 (0.73–0.98) for very high activity; corresponding values for higher occupational physical activity were 1.04 (0.95–1.14), 1.15 (1.04–1.26), and 1.25 (1.14–1.39), respectively. For all-cause mortality, corresponding hazard ratios for higher leisure time physical activity were 0.74 (0.68–0.81), 0.59 (0.54–0.64), and 0.60 (0.52–0.69), and for higher occupational physical activity 1.06 (0.96–1.16), 1.13 (1.01–1.27), and 1.27 (1.05–1.54), respectively. Similar results were found within strata on lifestyle, health, living conditions, and socioeconomic factors, and when excluding individuals dying within the first 5 years of follow-up. Levels of the two domains of physical activity did not interact on risk of MACE ($P=0.40$) or all-cause mortality ($P=0.31$).

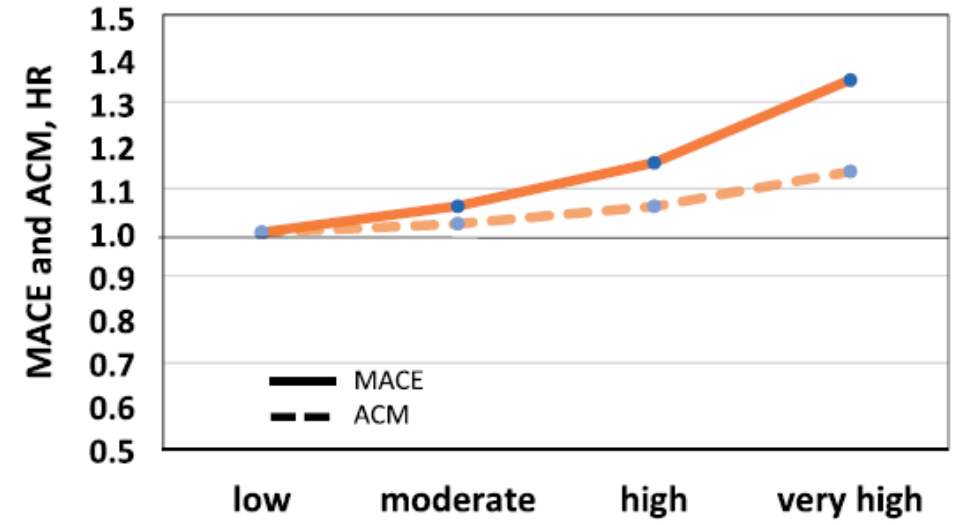
Conclusion Higher leisure time physical activity associates with reduced MACE and all-cause mortality risk, while higher occupational physical activity associates with increased risks, independent of each other.

Leisure Time



- ✓ Continuous endurance exercise
- ✓ Optimal metabolic intensity
- ✓ High dynamic components
- ✓ Sufficient recovery
- ✓ Positive social/psychological factors
- ✓ Improved autonomic control
- ✓ Positive nature experience



Occupational Time



- ⚡ Repetitive bouts of resistance exercise
- ⚡ High static, low endurance exercise
- ⚡ Prolonged elevated blood pressure
- ⚡ Insufficient recovery
- ⚡ Psychological stress
- ⚡ Impaired autonomic control
- ⚡ Environmental strain

Richtlijnen voor patiënten met stabiel coronair lijden



AEROBE LICHAAMSBEWEGING°			SPIERVERSTERKENDE ACTIVITEITEN			
intensiteit	duur	frequentie	aantal oefeningen*	herhalingen**	sets***	sessies
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Absolute contra-indicaties voor het voorschrijven of begeleiden van lichaamsbeweging met een matige of hoge intensiteit

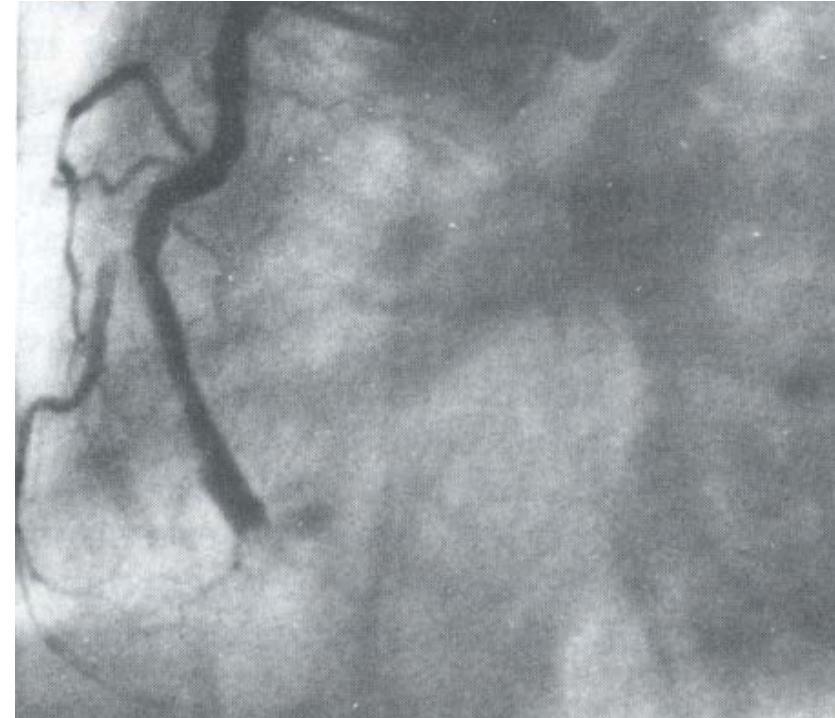


- Recente, belangrijke veranderingen in het ECG
- Onstabiele angina pectoris
- Ongecontroleerde hartritmestoornissen
- Ernstige aortaklepstenose
- Ongecontroleerd hartfalen
- Acute longembolie
- Acute myocarditis
- Vermoeden van/gekend aneurysma dissecans
- Acute systemische infectie

Coronair lijden : ACS – PCI - CABG



Stenose : ischemie/angor



Occlusie : infarct of ACS (STEMI of non-STEMI)

Behandeling : medicatie – stenting (PCI) – overbrugging (CABG)

Exercise capacity in patients entering cardiac rehabilitation

2896 patients entering from 1996-2004



Peak V_{O2} (ml/kg/min)

Cardiac diagnosis	Women	Men
PCI, no MI	15.1 ± 4.1	21.2 ± 7.2
MI	14.7 ± 4.2	20.4 ± 6.6
Unstable angina	14.7 ± 3.8	18.3 ± 5.8
CABG	13.5 ± 3.4	17.8 ± 4.8



Meeste patienten hebben een globaal lager fysiek inspanningsvermogen dan wat als optimaal wordt beschouwd in kader van preventie

Beweging en coronair lijden – 2 fasen



- **Eerste 3-6 maanden na PCI, myocardinfarct of CABG**
 - Multidisciplinaire cardiale revalidatie
 - 2-3/week ambulante multidisciplinaire aanpak (kine, psycholoog, dietist, sociaal verpleegkundige,...)
 - Cardiaal revalidatie centrum situeert zich in het ziekenhuis
 - Duur van deze fase kan wisselen volgens ernst van de aandoening
 - Bv electieve PCI van 1 coronair bloedvat bij een bewaarde linker ventrikel functie : korte periode
 - Bv uitgebreid infarct met hartfalen en verminderde linker ventrikel functie : langere periode
 - Overgang naar chronische stabiele fase
 - Wordt bepaald door cardioloog/cardiaal revalidatie arts
- Chronisch stabiel coronair lijden (> 1 jaar na PCI, myocardinfarct of CABG)
 - Evaluatie van klinische stabiliteit door cardioloog/cardiaal revalidatie arts: belang van uitsluiten van residuele myocardischemie
 - Beweging/fysieke training volgens richtlijnen

Bewegen is een belangrijk onderdeel van de preventie en behandeling van coronair lijden



- Fysieke inactiviteit is verantwoordelijk voor 10% van overlijdens tgv ischemisch hartlijden
- Cardiale revalidatie bij patienten met coronair lijden
 - Verbetert de inspanningscapaciteit met 20-30%
 - Verbetert de levenskwaliteit met 20-30%
 - Vermindert het optreden van nieuwe infarcten en hospitalisaties met 20%
 - Vermindert cardiovasculaire sterfte met 26%
 - Vermindert totale sterfte met 20-27%

Recommendations for return to exercise after acute coronary syndrome



Recommendations	Class ^a	Level ^b
Exercise-based cardiac rehabilitation is recommended in all individuals with CAD to reduce cardiac mortality and rehospitalization. ²³⁴	I	A
During the initial period, motivational and psychological support, and individualized recommendations on how to progress the amount and intensity of sports activities, should be considered in patients with CAD.	IIa	B

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Recommendations for exercise in individuals with long-standing chronic coronary syndrome

Recommendations	Class ^a	Level ^b
Risk stratification for exercise-induced adverse events is recommended in individuals with established (long-standing) chronic coronary syndrome (CCS) prior to engaging in exercise. ²³³	I	C
Regular follow-up and risk stratification of patients with CCS is recommended. ²³³	I	B
It is recommended that individuals at high risk of an adverse event from CAD are managed according to the current Guidelines on CCS. ²³³	I	C

Table 11 High-risk features for exercise-induced adverse cardiac events in patients with atherosclerotic coronary artery disease²³³

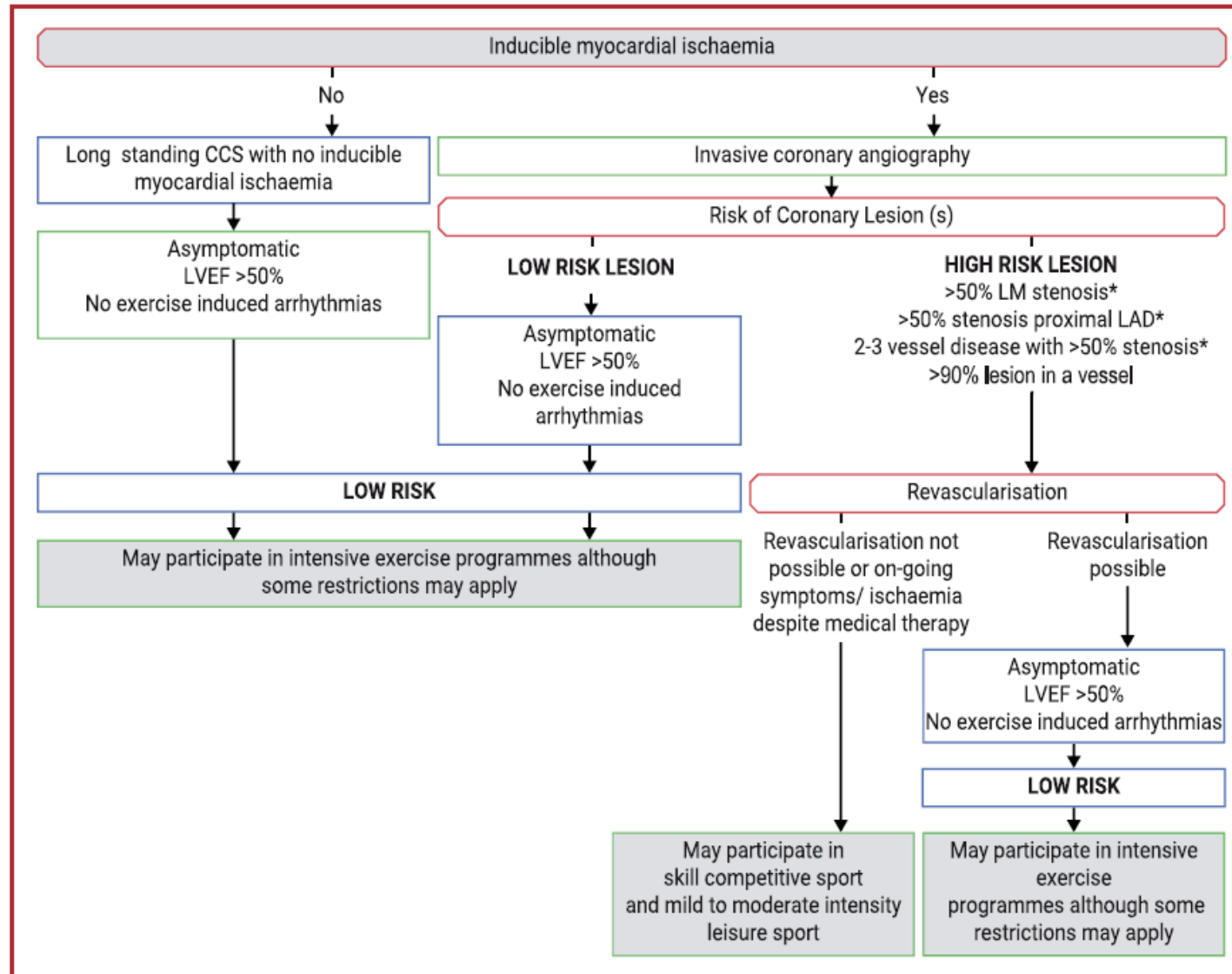
- Critical coronary stenosis, >70% in a major coronary artery or >50% in the left main stem on coronary angiography, and/or FFR <0.8 and/or iFR <0.9
- Basal left ventricular ejection fraction ≤50% and wall motion abnormalities
- Inducible myocardial ischaemia on maximal exercise testing
- NSVT, polymorphic or very frequent ventricular premature beats, at rest and during maximal stress
- Recent ACS ± PCI or surgical revascularization (<12 months)

ACS = acute coronary syndrome; FFR = fractional flow reserve; iFR = instant flow reserve; NSVT = non-sustained ventricular tachycardia; PCI = percutaneous coronary intervention.



Recommendations for exercise in individuals with long-standing chronic coronary syndrome

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Regular follow-up and risk stratification of patients with CCS is recommended. ²³³	I	B
It is recommended that individuals at high risk of an adverse event from CAD are managed according to the current Guidelines on CCS. ²³³	I	C
Competitive or leisure sports activities (with some exceptions such as older athletes and sports with extreme CV demands) should be considered in individuals at low risk of exercise-induced adverse events (<i>Table 11</i>). ²³³	IIa	C



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Figure 5 Clinical evaluation and recommendations for sports participation in individuals with established coronary artery disease. CCS = chronic coronary syndrome; LAD = left anterior descending coronary artery; LM = left main coronary artery; LVEF = left ventricular ejection fraction. *With documented ischaemia or a haemodynamically relevant lesion defined by FFR <0.8 or iFR <0.9.

Recommendations for exercise in individuals with long-standing chronic coronary syndrome

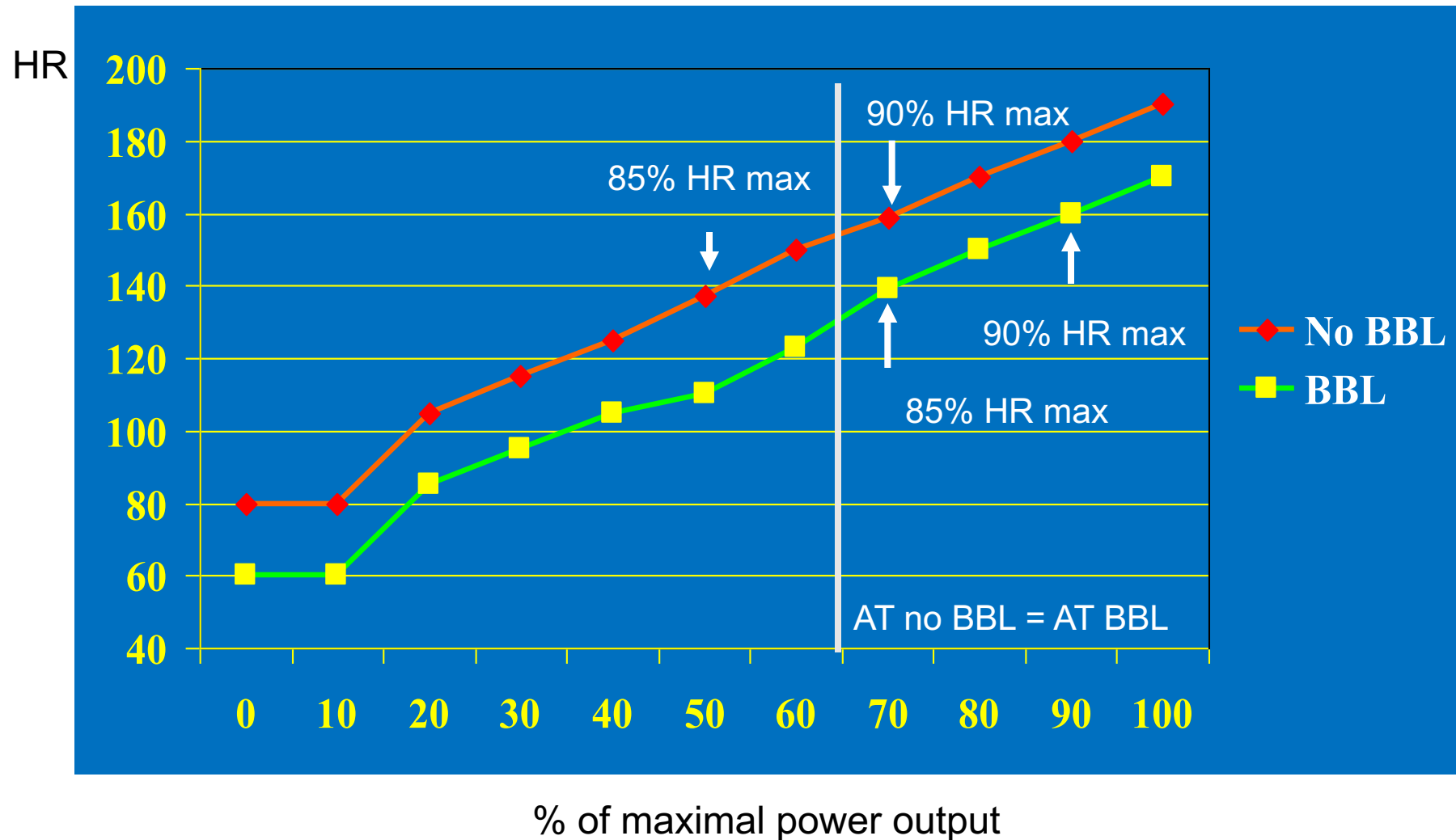
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Competitive sports are not recommended in individuals at high risk of exercise-induced adverse events or those with residual ischaemia, with the exception of individually recommended skill sports. ²³³	III	C

Specifieke aandachtspunten



- De meerderheid van patiënten met stabiel coronair lijden wordt behandeld met beta-blokkers (gebruik Borgschaal ipv Karvonen)
- Sporten en vermageren
- Indien blijvende ischemie ondanks maximale therapie en revascularisatie
 - Geen competitie sport
 - Laag tot matig intensiteit sporten mogelijk mits
 - Regelmatige klinische follow-up
 - Sport activiteiten onder de drempel van optreden van ischemie of ritmestoornissen bij inspanning (tot 10 slagen/minuut lager dan de drempel)

Mean heart rate response to exercise testing in healthy volunteers with placebo and bisoprolol

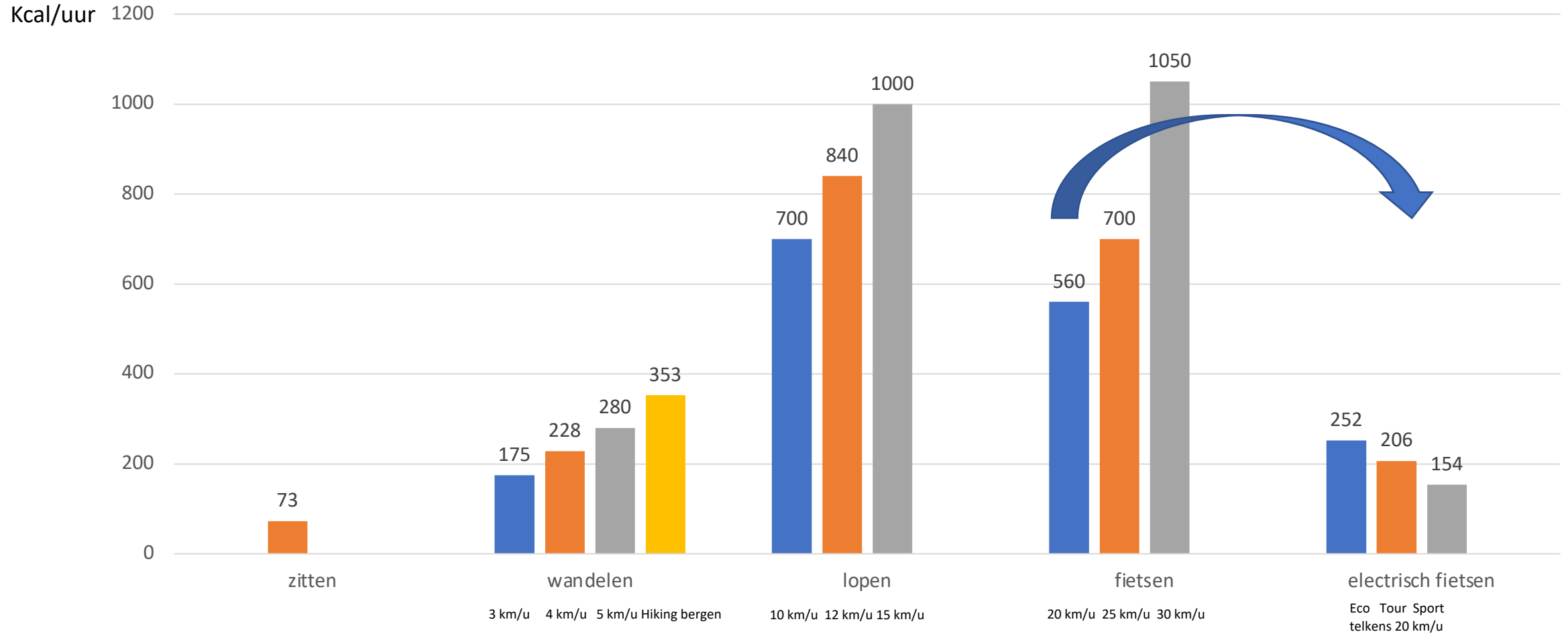


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Energieverbruik (Kcal/uur) per sport (persoon van 70 kg)



Sporten en vermageren bij coronaire patienten



- Aanpassing van de voedingsgewoonten is essentieel voor goede controle van risicofactoren (hypertensie, hyperlipidemie, obesitas, diabetes,...)
- Sporten op zich resulteert in weinig (geen ?) gewichtsreductie
 - Training (40-70% HRR) : verbranding van 0,5 gr vet/min
 - Bij ongewijzigde calorie inname : 150 min/week sporten = -1 kg na 3 maanden
- Bij patienten met obesitas en/of diabetes
 - Voorgeschiedenis van langdurige hoge inname van koolhydraten, met weinig vetverbranding
 - Bij aanvang best focus op langdurig wandelen, joggen,... ipv intensieve sporten

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