

Samlet svar fra arbejdsgruppen vedr. "endorsement" af:

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

Nedenstående svar fra ad hoc arbejdsgruppen, bestående af:

Professor dr.med. Henning Bundgaard, Hjerteafdelingen, RH
Overlæge, dr.med. Steen Pehrsson, Hjerteafdelingen, RH
Reservelæge, Ph.D. Susanne G. Tischer, Hjerteafdelingen, RH
Overlæge, Ph.D. Lars Juel Andersen, Hjerteafdelingen, Roskilde-Køge hospital
Overlæge, Ph.D. Nis B. Høst, Hjerteafdelingen, Bispebjerg-Frederiksberg hospital
Overlæge, Ph.D. Hanne K. Rasmusen, Hjerteafdelingen, Bispebjerg-Frederiksberg hospital (tovholder)

Generelle kommentarer fra arbejdsgruppen: Vi finder overordnet de første samlede ESC guidelines om sport ved kardiovaskulær sygdom velkommen og vigtig i klinisk praksis. Langt de fleste guidelines er således anbefalet mens andre er tilsluttet med kommentarer/begrænsninger og kun få afvist. Begrænsningen ved denne guideline er, at evidensniveauet generelt er lavt. Vi har kommenteret/taget stilling til alle guidelines i dette dokument som anført nedenfor men har reservationer over for dels kardiologisk udredning af raske samt guidelines for hyppighed af opfølgning ved de forskellige sygdomme. I forbindelse med begge anbefaler vi at følge nationale guidelines.

4.2 Exercise recommendations in individuals with cardiovascular risk factors

General recommendations for exercise and sports in healthy Individuals (p. 17)

General recommendations for exercise and sports in healthy individuals

Recommendations	Class ^a	Level ^b	
At least 150 min/week of moderate-intensity, or 75 min/week of vigorous-intensity aerobic exercise, or an equivalent combination thereof is recommended in all healthy adults. ^{113–118}	I	A	Accept uden kommentarer
A gradual increase in aerobic exercise to 300 min/week of moderate-intensity, or 150 min/week of vigorous-intensity aerobic exercise, or an equivalent combination is recommended for additional benefits in healthy adults. ^{114,116}	I	A	Accept uden kommentarer
Regular assessment and counselling to promote adherence and, if necessary, to support an increase in exercise volume over time are recommended. ¹¹⁹	I	B	Arbejdstest til raske i kardiologisk regi kan ikke tilsluttes
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. ^{113,114}	I	B	Accept uden kommentarer

Recommendations for cardiovascular evaluation and regular exercise in healthy individuals aged >35 years

Recommendations	Class ^a	Level ^b
Among individuals with low to moderate CVD risk, the participation in all recreational sports should be considered without further CV evaluation.	IIa	C
Cardiac screening with family history, symptoms, physical examination, and 12-lead resting ECG should be considered for competitive athletes.	IIa	C
Clinical evaluation, including maximal exercise testing, should be considered for prognostic purposes in sedentary people and individuals with high or very high CV risk who intend to engage in intensive exercise programmes or competitive sports.	IIa	C
In selected individuals without known CAD who have very high CVD risk (e.g. SCORE>10%, strong family history, or familial hypercholesterolaemia) and want to engage in high- or very high-intensity exercise, risk assessment with a functional imaging test, coronary CCTA, or carotid or femoral artery ultrasound imaging may be considered.	IIb	B

© ESC 2020

Accept uden kommentarer

Afvises og henviser til tidligere DCS rapport om screening af atleter for skjult hjertesygdom fra 2010.

Kapacitet til arbejdstest begrænset og betydning i denne sammenhæng usikker, hvorfor ikke tilsluttes.

Generelt udredes asymptomatiske ikke, hvorfor det ikke tilsluttes.

4.2. Special considerations for individuals with obesity, hypertension, dyslipidaemia, or diabetes, p.21

Special considerations for individuals with obesity, hypertension, dyslipidaemia, or diabetes

Recommendations	Class ^a	Level ^b
In obese individuals (BMI ≥ 30 kg/m ² or a waist circumference > 80 cm for females or > 94 cm for males) resistance training ≥ 3 times per week, in addition to moderate or vigorous aerobic exercise (at least 30 min, 5–7 days per week) is recommended to reduce CVD risk. ¹²¹	I	A
In individuals with well-controlled hypertension, resistance training ≥ 3 times per week in addition to moderate or vigorous aerobic exercise (at least 30 min, 5–7 days per week) is recommended to reduce blood pressure and CVD risk. ¹³²	I	A
Among individuals with diabetes mellitus, resistance training ≥ 3 times per week in addition to moderate or vigorous aerobic exercise (at least 30 min, 5–7 days per week) is recommended to improve insulin sensitivity and achieve a better CVD risk profile. ^{176,178}	I	A
Among adults with well-controlled hypertension but high risk and/or target organ damage, high-intensity resistance exercise is not recommended.	III	C
In individuals with uncontrolled hypertension (SBP > 160 mmHg) high-intensity exercise is not recommended until blood pressure has been controlled.	III	C

Alle anbefalinger tilsluttes uden kommentarer og svarer til nuværende NBV anbefalinger.

4.3 Exercise and sports in ageing p.22

Recommendations for exercise in ageing individuals

Recommendations	Class ^a	Level ^b
Among adults aged 65 years or older who are fit and have no health conditions that limit their mobility, moderate-intensity aerobic exercise for at least 150 min/week is recommended. ^{212,214,215}	I	A
In older adults at risk of falls, strength training exercises to improve balance and coordination on at least 2 days a week are recommended. ^{201,212,214,215}	I	B
A full clinical assessment including a maximal exercise test should be considered in sedentary adults aged 65 years or older who wish to participate in high-intensity activity.	IIa	C
Continuation of high- and very high-intensity activity, including competitive sports, may be considered in asymptomatic elderly athletes (master athletes) at low or moderate CV risk.	IIb	C

Tilsluttes uden kommentarer

Tilsluttes uden kommentarer

Udredning inkl. arbejdstest anbefales ikke af raske og derfor kan vi ikke tilslutte os dette punkt.

Tilsluttes uden kommentarer

5.1 Exercise programmes for leisure-time and competitive sport participation in chronic coronary syndrome

Recommendations for exercise in individuals at risk of atherosclerotic coronary artery disease and asymptomatic individuals in whom coronary artery disease is detected at screening, p.24

Recommendations for exercise in individuals at risk of atherosclerotic coronary artery disease and asymptomatic individuals in whom coronary artery disease is detected at screening

Recommendations	Class ^a	Level ^b
Among individuals with asymptomatic CCS, defined as CAD without inducible myocardial ischaemia on a functional imaging or conventional exercise stress test, ²³³ participation in all types of exercise, including competitive sports, should be considered based on individual assessment.	IIa	C

Tilsluttes med forhold for at ikke alle behøver funktionel test og slet ikke årligt med mindre den kliniske tilstand ændrer sig såsom uforklaret reduceret arbejdskapacitet.

Recommendations for exercise in individuals with long-standing chronic coronary syndrome, p. 25

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
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 (Table 11). ²³³	IIa	C
Leisure-time exercise, below the angina and ischaemic thresholds, may be considered in individuals at high risk of exercise-induced adverse events (Table 11), including those with persisting ischaemia. ²³³	IIb	C
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

Pkt 1.) Tilsluttes med forbehold: I kardiologisk regi risikostratificeres patienter berettiget til hjerterehabilitering inkl. arbejdstest, afsluttes efterfølgende når stabile til egen læge og her vil risikostratificering være uden arbejdstest. (Risikostratificering, herunder arbejdstest indgår som en del af hjerterehabilitering og kan tilsluttes)

Pkt.2) Tilsluttes med kommentar: Kardiologer følger disse patienter til stabile herefter afsluttes til videre kontrol ved egen læge.

Pkt.3) Tilsluttes uden kommentarer

Pkt.4) Tilsluttes uden kommentarer.

Pkt.5) Tilsluttes uden kommentarer.

Pkt. 6) Tilsluttes uden kommentarer.

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	Tilsluttes uden kommentarer
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	Tilsluttes uden kommentarer
All sports activities should be considered, at an individually adapted intensity level in low-risk individuals with CCS.	IIa	C	

Tilsluttes med kommentar: hvis konkurrence eller ekstrem idræt ønskes af patient anbefales dette først efter min. 3 mdr fra event.

Recommendations for exercise in young individuals/athletes with anomalous origins of coronary arteries, p.27

Recommendations for exercise in young individuals/athletes with anomalous origins of coronary arteries

Recommendations	Class ^a	Level ^b
When considering sports activities, evaluation with imaging tests to identify high-risk patterns and an exercise stress test to check for ischaemia should be considered in individuals with AOCA.	IIa	C
In asymptomatic individuals with an anomalous coronary artery that does not course between the large vessels, does not have a slit-like orifice with reduced lumen and/or intramural course, competition may be considered, after adequate counselling on the risks, provided there is absence of inducible ischaemia.	IIb	C
After surgical repair of an AOCA, participation in all sports may be considered, at the earliest 3 months after surgery, if they are asymptomatic and there is no evidence of inducible myocardial ischaemia or complex cardiac arrhythmias during maximal exercise stress test.	IIb	C
Participation in most competitive sports with a moderate and high cardiovascular demand among individuals with AOCA with an acutely angled take-off or an anomalous course between the large vessels is not recommended. ^c	III	C

Alle punkter tilsluttes uden kommentarer

Recommendations for exercise/sports in individuals with myocardial bridging, p. 28

Recommendations for exercise/sports in individuals with myocardial bridging

Recommendations	Class ^a	Level ^b
Participation in competitive and leisure-time sports should be considered in asymptomatic individuals with myocardial bridging and without inducible ischaemia or ventricular arrhythmia during maximal exercise testing.	IIa	C
Competitive sports are not recommended in individuals with myocardial bridging and persistent ischaemia or complex cardiac arrhythmias during maximal exercise stress testing.	III	C

Begge punkter tilsluttes uden kommentarer.

5.2 Exercise recommendations in individuals with chronic heart failure

Recommendations for exercise prescription in heart failure with reduced or mid-range ejection fraction, p. 30

Recommendations for exercise prescription in heart failure with reduced or mid-range ejection fraction

Recommendations	Class ^a	Level ^b
Regular discussion about exercise participation and provision of an individualized exercise prescription is recommended in all individuals with heart failure. ^{260,261,285}	I	A
Exercise-based cardiac rehabilitation is recommended in all stable individuals to improve exercise capacity, quality of life, and to reduce the frequency of hospital readmission. ^{260,261,285}	I	A
Beyond annual cardiac assessment, clinical reassessment should be considered when the intensity of exercise is increased.	IIa	C
Motivational and psychological support and individualized recommendations on how to progress the amount and intensity of sports activities should be considered.	IIa	C
Low- to moderate-intensity recreational sporting activities and participation in structured exercise programmes may be considered in stable individuals.	IIb	C
High-intensity interval training programmes may be considered in low-risk patients who want to return to high-intensity aerobic and mixed endurance sports.	IIb	C

Alle punkter kan tilsluttes uden kommentarer

Recommendations for participation in sports in heart failure

Recommendations	Class^a	Level^b
Before considering a sport activity, a preliminary optimization of heart failure risk factor control and therapy, including device implantation (if appropriate), is recommended.	I	C
Participation in sports activities should be considered in individuals with heart failure who are at low risk, based on a complete assessment and exclusion of all contraindications, in stable condition for at least 4 weeks, optimal treatment, and NYHA functional class I status.	IIa	C
Non-competitive (low- to moderate-intensity recreational) skill, power, mixed, or endurance sports may be considered in stable, asymptomatic, and optimally treated individuals with HFmrEF.	IIb	C
High-intensity recreational sports, adapted to the capabilities of the individual patient, may be considered in selected stable, asymptomatic, and optimally treated individuals with HFmrEF with an age-matched exercise capacity beyond average.	IIb	C
Non-competitive (low-intensity recreational skill-related sports) may be considered (when tolerated) in stable, optimally treated individuals with HFrEF.	IIb	C
High-intensity power and endurance sports are not recommended in patients with HFrEF irrespective of symptoms.	III	C

Alle punkter tilsluttes uden kommentarer

Recommendations for exercise and participation in sport in individuals with heart failure with preserved ejection fraction, p. 31

Recommendations for exercise and participation in sport in individuals with heart failure with preserved ejection fraction

Recommendations	Class ^a	Level ^b
Moderate endurance and dynamic resistance exercise, together with lifestyle intervention and optimal treatment of cardiovascular risk factors (i.e. arterial hypertension and type 2 diabetes) are recommended. ^{287,289–292,299}	I	C
Competitive sports may be considered in selected stable patients without abnormalities on maximal exercise testing.	IIb	C

Tilsluttes med kommentar om at patienter med normaliseret LVEF ikke er medtaget i disse guidelines og forventeligt må vurderes individuelt ud fra udløsende årsag til LVEF-fald.

Recommendations for exercise and participation in sport in heart transplant recipients

Recommendations	Class ^a	Level ^b
Regular exercise through cardiac rehabilitation, combining moderate-intensity aerobic and resistance exercise, is recommended to revert pathophysiology to pre-transplantation time, reduce cardiovascular risk induced by post-transplantation medical treatment, and improve clinical outcome. ^{305–312}	I	B
Recreational (low-intensity recreational) sports participation should be considered and encouraged in stable, asymptomatic individuals after therapy optimization.	IIa	C
Eligibility for competitive sports involving low- and moderate-intensity exercise may be considered in selected, asymptomatic individuals with an uncomplicated follow-up. ^{304,309,310}	IIb	C

Tilsluttes uden kommentarer

5.3 Exercise recommendations in individuals with valvular heart disease

5.3.2 Aortic valve stenosis

Recommendations for exercise and participations in recreational/leisure-time sports in asymptomatic individuals with aortic stenosis, p. 33

Recommendations for exercise and participation in recreational/leisure-time sports in asymptomatic individuals with aortic stenosis

	Aortic stenosis ^c		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all recreational sports, if desired, is recommended.	I	C
Moderate	Participation in all recreational sports involving low to moderate intensity, if desired, should be considered in individuals with LVEF \geq 50%, good functional capacity, and normal exercise test.	IIa	C
Severe	Participation in all recreational sports/exercise involving low intensity, if desired, may be considered in individuals with LVEF \geq 50% and normal BP response during exercise.	IIb	C
	Participation in competitive or recreational sports/exercise of moderate and high intensity is not recommended.	III	C

Mild aortastenose: Anbefaling tilsluttes uden kommentarer

Moderat aortastenose: Tilsluttes med kommentar: undtagen arbejdstest

Svær aortastenose: Begge anbefalinger tilsluttes uden kommentarer

Recommendations for participation in **competitive sports** in asymptomatic individuals with aortic stenosis, p. 33

Recommendations for participation in competitive sports in asymptomatic individuals with aortic stenosis

	Aortic stenosis ^c		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all competitive sports, if desired, is recommended.	I	C
Moderate	Participation in all competitive sports involving low to moderate effort, if desired, may be considered in individuals with LVEF \geq 50%, good functional capacity, and normal BP response during exercise.	IIb	C
Severe	Participation in low-intensity skill sports may be considered in a select group of individuals with LVEF \geq 50%.	IIb	C
	Participation in sports or exercise of moderate or high intensity is not recommended.	III	C

Mild aortastenose: Anbefaling tilsluttes uden kommentarer

Moderat aortastenose: Tilsluttes med kommentar: Arbejdstest, ud fra en individuel vurdering

Svær aortastenose: Begge anbefalinger tilsluttes uden kommentarer

5.3.3 Aortic valve regurgitation

Recommendations for participation in **recreational/leisure time sports** in asymptomatic individuals with aortic regurgitation, p. 34

Recommendations for participation in recreational/leisure-time sports in asymptomatic individuals with aortic regurgitation

	Aortic regurgitation ^c		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all recreational sports, if desired, is recommended.	I	C
Moderate	Participation in all recreational sports, if desired, should be considered in asymptomatic individuals with a non-dilated LV with LVEF>50% and normal exercise stress test.	IIa	C
Severe	Participation in all recreational sports involving low and moderate intensity, if desired, may be considered with a mild or moderately dilated LV with LVEF>50% and normal exercise stress test.	IIb	C
	Participation in any moderate- or high-intensity recreational exercise is not recommended with LVEF≤50% and/or exercise-induced arrhythmias.	III	C

Mild aortainsufficiens: Anbefaling tilsluttes uden kommentarer

Moderat aortainsufficiens: Tilsluttes med kommentar: Arbejdstest, ud fra en individuel vurdering

Svær aortainsufficiens: Begge anbefalinger tilsluttes uden kommentarer

Recommendations for participation in **competitive sports** in asymptomatic individuals with aortic regurgitation, p.34

Recommendations for participation in competitive sports in asymptomatic individuals with aortic regurgitation

	Aortic regurgitation ^c		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all competitive sports, if desired, is recommended.	I	C
Moderate	Participation in all competitive sports, if desired, should be considered in individuals with LVEF>50% and normal exercise test.	IIa	C
Severe	Participation in most competitive sports involving low to moderate intensity may be considered in individuals with a mild or moderately dilated LV with LVEF>50% and normal exercise stress test.	IIb	C
	Participation in any moderate- or high-intensity competitive sports is not recommended in individuals with severe AR and/or LVEF≤50% and/or exercise-induced arrhythmias	III	C

Mild aortainsufficiens: Anbefaling tilsluttes uden kommentarer

Moderat aortainsufficiens: Tilsluttes med kommentar: Arbejdstest, ud fra en individuel vurdering (ekcentrisk LV påvirkning af sport vs. Klapsygdom). Ætiologi til aortainsufficiens og evt. aortapåvirkning vigtig i samlet vurdering.

Svær aortainsufficiens: Begge anbefalinger tilsluttes uden kommentarer

5.3.5 Primary mitral regurgitation

Recommendations for participation in **recreational/leisure-time sports** in asymptomatic individuals with mitral regurgitation, p. 35

Recommendations for participation in recreational/leisure-time sports in asymptomatic individuals with mitral regurgitation

	Mitral regurgitation ^{c,d}		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all sports, if desired, is recommended.	I	C
Moderate	Participation in all recreational sports, if desired, should be considered in individuals fulfilling the following: <ul style="list-style-type: none"> ● LVEDD<60 mm³²⁷ or <35.3 mm/m² in men and <40 mm/m² in women ● LVEF≥60% ● Resting sPAP<50 mmHg ● Normal exercise test 	IIa	C
Severe	Participation in all recreational sports involving low and moderate intensity, if desired, may be considered in individuals fulfilling the following: <ul style="list-style-type: none"> ● LVEDD<60 mm³²⁷ or <35.3 mm/m² in men and <40 mm/m² in women ● LVEF≥60% ● Resting sPAP<50 mmHg ● Normal exercise test 	IIb	C

Alle anbefalinger tilsluttes uden kommentarer

Recommendations for participation in competitive sports in asymptomatic individuals with mitral regurgitation, p. 35

Recommendations for participation in competitive sports in asymptomatic individuals with mitral regurgitation

	Mitral regurgitation ^{c,d}		
	Recommendation	Class ^a	Level ^b
Mild	Participation in all competitive sports, if desired, is recommended.	I	C
Moderate	Participation in all competitive sports, if desired, should be considered in individuals fulfilling the following: <ul style="list-style-type: none"> ● LVEDD<60 mm³²⁷ or <35.3 mm/m² in men and <40 mm/m² in women ● LVEF≥60% ● Resting sPAP<50 mmHg ● Normal exercise test 	IIa	C
Severe	Participation in competitive sports involving low exercise intensity, if desired, may be considered in individuals fulfilling the following: <ul style="list-style-type: none"> ● LVEDD<60 mm³²⁷ or <35.3 mm/m² in men and <40 mm/m² in women ● LVEF≥60% ● Resting sPAP<50 mmHg ● Normal exercise test 	IIb	C
	Participation in competitive sports is not recommended in individuals with a LVEF<60%	III	C

Alle anbefalinger kan tilsluttes uden kommentarer

5.3.5.1 Mitral valve prolapse, side 36

Der er ikke angivet anbefalinger med anbefalingsgrad eller evidensniveau, hvorfor alene tilsluttes som overvejelser ved udredning i tvivlstilfælde. Langt de fleste med mitralprolaps er asymptomatiske og er et tilfældigt fund.

5.3.6 Mitral stenosis

Recommendations for participation in [recreational/leisure-time sports](#) in individuals with mitral stenosis, p. 37

Recommendations for participation in recreational/leisure-time sports in individuals with mitral stenosis

	Mitral stenosis ^{c,d}		
	Recommendation	Class ^a	Level ^b
Mild (MVA 1.5 – 2.0 cm ²)	Participation in all recreational sports, if desired, is recommended in individuals with a resting sPAP < 40 mmHg and normal exercise test.	I	C
Moderate (MVA 1.0 – 1.5 cm ²)	Participation in all recreational sports involving low and moderate intensity, if desired, may be considered in individuals with resting sPAP < 40 mmHg and a normal exercise test.	IIb	C
Severe (MVA < 1 cm ²)	Participation in leisure sports of moderate or high intensity is not recommended.	III	C

Alle anbefalinger kan tilsluttes uden kommentarer

Recommendations for participation in [competitive sports](#) in individuals with mitral stenosis, p.37

Recommendations for participation in competitive sports in asymptomatic individuals with mitral stenosis

	Mitral stenosis ^{c,d}		
	Recommendation	Class ^a	Level ^b
Mild (MVA 1.5 – 2.0 cm ²)	Participation in all competitive sports, if desired, is recommended in individuals with a resting sPAP < 40 mmHg and a normal exercise test.	I	C
Moderate (MVA 1.0 – 1.5 cm ²)	Participation in all competitive sports involving low intensity may be considered in individuals with a resting sPAP < 40 mmHg and normal exercise test.	IIb	C
Severe (MVA < 1.0 cm ²)	Participation in competitive sports is not recommended.	III	C

Alle anbefalinger kan tilsluttes uden kommentarer

5.4 Exercise recommendations in individuals with aortopathy

Table 14 Classification of risk to perform sports in patients with aortic pathology, p. 38

Table 14 Classification of risk to perform sports in patients with aortic pathology

	Low risk	Low-intermediate risk	Intermediate risk	High risk
Diagnosis	<ul style="list-style-type: none"> Aorta <40 mm in BAV or tricuspid valve Turner syndrome without aortic dilatation 	<ul style="list-style-type: none"> MFS or other HTAD syndrome without aortic dilatation Aorta 40–45 mm in BAV or tricuspid valve After successful thoracic aorta surgery for BAV or other low risk situation 	<ul style="list-style-type: none"> Moderate aortic dilatation (40–45 mm in MFS or other HTAD; 45–50 mm in BAV or tricuspid valve, Turner syndrome ASI 20–25 mm/m², tetralogy of Fallot <50 mm) After successful thoracic aorta surgery for MFS or HTAD 	<ul style="list-style-type: none"> Severe aortic dilatation (>45 mm in MFS or other HTAD, >50 mm in BAV or tricuspid valve, Turner syndrome ASI >25 mm/m², tetralogy of Fallot >50 mm) After surgery with sequelae
Advice	<ul style="list-style-type: none"> All sports permitted with preference for endurance over power sports 	<ul style="list-style-type: none"> Avoid high and very high intensity exercise, contact, and power-sports. Preference for endurance over power sports 	<ul style="list-style-type: none"> Only skill sports or mixed or endurance sports at low intensity 	<ul style="list-style-type: none"> Sports are (temporarily) contra-indicated
Follow-up	Every 2–3 years	Every 1–2 years	Every 6 months to 1 year	Re-evaluation after treatment

ASI = aortic size index; BAV = bicuspid aortic valve; HTAD = hereditary thoracic aortic disease; MFS = Marfan syndrome.

Evidensniveauet for råd ved aortopati og deltagelse i sport er helt overvejende baseret på kasuistikker, hvorfor må vurderes individuelt herunder med fokus på progression af aorta diameter over tid jf. NBV.

Recommendations for exercise and participation in sports in individuals with aortic pathology, p. 39

Recommendations for exercise and participation in sports in individuals with aortic pathology

Recommendations	Class ^a	Level ^b
Prior to engaging in exercise, risk stratification, with careful assessment including advanced imaging of the aorta (CT/CMR) and exercise testing with blood pressure assessment is recommended.	I	C
Regular follow-up including risk assessment is recommended.	I	C
Dynamic exercise should be considered more suitable than static exercise.	IIa	C
Participation in competitive or leisure-time sports activities (except power sports) should be considered in low-risk individuals (Table 14).	IIa	C
Participation in individualized leisure exercise programmes may be considered in high-risk individuals (Table 14).	IIb	C
Competitive sports are not recommended in individuals who are at high risk (Table 14).	III	C

Ad pkt 1) Kan tilsluttes med forbehold for at alle skal have foretaget arbejdstest og følgende kommentarer: Generelt anbefales alle med aortopati udredt med CT/MR scanning af aorta thorakalis og blodtryks-monitorering, evt. døgn-BT. I tvivlstilfælde f. ex. ved hurtigere progression af aortadiameter end forventet kan supplerende arbejdstest foretages for at sikre passende blodtryksregulering også under belastning.

Øvrige punkter kan tilsluttes uden kommentarer men henvisning til tabel 14 kommentarer.

5.5 Exercise recommendations in individuals with cardiomyopathies, myocarditis and pericarditis

5.5.1 Hypertrophic cardiomyopathy

Recommendations for exercise and sports participation in individuals with hypertrophic cardiomyopathy, p. 41

Recommendations for exercise and sports participation in individuals with hypertrophic cardiomyopathy

Recommendations	Class^a	Level^b
Exercise recommendations		
Participation in high-intensity exercise/competitive sports, if desired (with the exception of those where occurrence of syncope may be associated with harm or death), may be considered for individuals who do not have any markers of increased risk ^c following expert assessment.	IIb	C
Participation in low- or moderate-intensity recreational exercise, if desired, may be considered for individuals who have any markers of increased risk ^c following expert assessment .	IIb	C
Participation in all competitive sports, if desired, may be considered for individuals who are gene positive for HCM but phenotype negative.	IIb	C
Participation in high-intensity exercise (including recreational and competitive sports) is not recommended for individuals who have ANY markers of increased risk ^c .	III	C
Follow-up and further considerations relating to risk		
Annual follow-up is recommended for individuals who exercise on a regular basis.	I	C
Six-monthly follow-up should be considered in adolescent individuals and young adults who are more vulnerable to exercise-related SCD.	IIa	C
Annual assessment should be considered for genotype-positive/phenotype-negative individuals for phenotypic features and risk stratification purposes.	IIa	C

Alle anbefalinger vedr. "exercise recommendations" kan tilsluttes uden kommentarer mens alle punkter under "follow-up and further considerations relating to risk" ikke anbefales men henviser til nationale retningslinjer.

5.5.2 Arrhythmogenic cardiomyopathy

Recommendations for exercise and sports participation in individuals with arrhythmogenic cardiomyopathy, p. 42

Recommendations for exercise and sports participation in individuals with arrhythmogenic cardiomyopathy

Recommendations	Class ^a	Level ^b
Exercise recommendations		
Participation in 150 min of low-intensity exercise per week should be considered for all individuals.	IIa	C
Participation in low- to moderate-intensity recreational exercise/sports, if desired, may be considered for individuals with no history of cardiac arrest/VA, unexplained syncope, minimal structural cardiac abnormalities, <500 PVCs/24 h and no evidence of exercise-induced complex VAs.	IIb	C
Participation in high-intensity recreational exercise/sports or any competitive sports is not recommended in individuals with ACM, including those who are gene positive but phenotype negative. ^{384,386}	III	B
Follow-up and further considerations relating to risk		
Annual follow-up is recommended for individuals who exercise on a regular basis.	I	C
Six-monthly follow-up should be considered in adolescent individuals and young adults who are more vulnerable to exercise-related SCD.	IIa	C
Annual assessment should be considered for genotype-positive/phenotype-negative individuals for phenotypic features and risk stratification purposes.	IIa	C
Six-monthly follow-up should also be considered in individuals with high arrhythmic risk genotypes such as DSP, TMEM43, and carriers of multiple pathogenic variants.	IIa	C

Pkt 1 og 2) Tilsluttes uden kommentarer

Pkt 3) "Exercise recommendations": Tilsluttes med forbehold: Patienter med fænotype der opfylder kriterier for diagnosen ARVC vides ud fra epidemiologiske studier at de både

udvikler sygdom tidligere og med progression til sværere forløb, hvorfor denne del af anbefaling kan tilsluttes. Mht. genotype positive men fænotype negative synes dette mere usikkert i forhold forskellige genotyper og i forhold til efterfølgende ekspression til fænotype hvorfor denne del af anbefaling ikke tilsluttes generelt men må individuelt vurderes. "Follow-up and further considerations relating to risk": Kan ikke tilsluttes, men henviser til nationale anbefalinger.

5.5.3 Exercise recommendations in individuals with left ventricular non-compaction

Recommendations for exercise in individuals with left ventricular non-compaction cardiomyopathy

Recommendations for exercise in individuals with left ventricular non-compaction cardiomyopathy

Recommendation for diagnosis	Class ^a	Level ^b
A diagnosis of LVNC in athletic individuals should be considered if they fulfil imaging criteria, in association with cardiac symptoms, family history of LVNC or cardiomyopathy, LV systolic (EF<50%) or diastolic (E'<9 cm/s) dysfunction, a thin compacted epicardial layer (<5 mm in end-diastole on CMR, or <8 mm in systole on echocardiography), or abnormal 12-lead ECG. ^{404,405,410,411}	IIa	B
Exercise recommendations		
Participation in high-intensity exercise and all competitive sports, if desired, with the exception where syncope may cause serious harm or death, may be considered in asymptomatic individuals with LVNC and LVEF≥50% and absence of frequent and/or complex VAs.	IIb	C
Participation in recreational exercise programmes of low to moderate intensity, if desired, may be considered in individuals with LVEF 40–49% in the absence of syncope and frequent or complex VAs on ambulatory Holter monitoring or exercise testing.	IIb	C
Participation in high- or very high-intensity exercise including competitive sports, if desired, may be considered for individuals who are gene positive for LVNC but phenotype negative (with the exception of lamin A/C or filamin C carriers).	IIb	C
Participation in high-intensity exercise or competitive sports is not recommended in individuals with any of the following: symptoms, LVEF<40% and/or frequent and/or complex VAs on ambulatory Holter monitoring or exercise testing.	III	C
Follow-up and further considerations		
Annual assessment for risk stratification is recommended for individuals with LVNC and genotype-positive/phenotype-negative individuals who exercise on a regular basis.	I	C

Alle pkt kan tilsluttes uden kommentarer undtagen "follow-up and further considerations" som ikke anbefales men i stedet henvises til nationale retningslinjer.

5.5.4 Exercise recommendations in individuals with dilated cardiomyopathy

Recommendations for exercise for individuals with dilated cardiomyopathy, p. 44

Recommendations for exercise in individuals with dilated cardiomyopathy

Recommendations	Class ^a	Level ^b
Participation in low- to moderate-intensity recreational exercise should be considered in all individuals with DCM, regardless of the EF, in the absence of limiting symptoms, and exercise-induced VAs.	IIa	C
Participation in high- or very high-intensity exercise including competitive sports (with the exception of those where occurrence of syncope may be associated with harm or death) may be considered in asymptomatic individuals who fulfil all of the following: (i) mildly reduced LV systolic function (EF 45–50%); (ii) absence of frequent and/or complex VAs on ambulatory Holter monitoring or exercise testing; (iii) absence of LGE on CMR; (iv) ability to increase EF by 10–15% during exercise; and (v) no evidence of high-risk genotype (lamin A/C or filamin C).	IIb	C

Participation in all competitive sports may be considered in individuals with DCM who are genotype positive and phenotype negative, with the exception of carriers of high-risk mutations (lamin A/C or filamin C).	IIb	C
Participation in high- or very high-intensity exercise including competitive sports is not recommended for individuals with a DCM and any of the following: (i) symptoms or history of cardiac arrest or unexplained syncope; (ii) LVEF<45%; (iii) frequent and/or complex VAs on ambulatory Holter monitoring or exercise testing; (iv) extensive LGE (>20%) on CMR; or (v) high-risk genotype (lamin A/C or filamin C).	III	C
Follow-up recommendations		
Annual follow-up is recommended for individuals with DCM who exercise on a regular basis.	I	C
Six-monthly follow-up should be considered in individuals with high-risk mutations and adolescent individuals and young adults whose DCM phenotype may still be evolving and who are more vulnerable to exercise-related SCD.	IIa	C
Annual assessment should be considered for genotype-positive/phenotype-negative individuals for phenotypic features and risk stratification purposes.	IIa	C

Pkt. 1) "Recommendations": Tilsluttes med kommentarer: Diagnosen DCM blandt eliteatleter kan være udfordrende. Da eliteatleter som dyrker sport med høj intensitet og volumen indenfor udholdenhedsidrætsgrene kan som del af fysiologisk tilpasning remodelles med ekcentrisk hypertrofi og let nedsat LVEF i hvile, her henvises til udredning i NVB kapitel 36.

Pkt 2+3+4) "Recommendations": Kan tilsluttes med følgende forbehold: Vedr. lamin A/C eller filamin C sygdomsfremkaldende mutationsbærere, der er helt raske dvs. helt uden positive fund ved kardiologisk udredning, må anbefalingen individualiseres, men generelt er vurderingen, at det er mest hensigtsmæssigt at afvente de allerførste fænotypiske træk, før der anbefales restriktioner.

Pkt 1+2+3) "Follow-up recommendations": Kan ikke tilsluttes, men anbefaler nationale anbefalinger.

5.5.5 Exercise recommendations in individuals with myocarditis and pericarditis

Recommendations for exercise in individuals with myocarditis, p. 46

Recommendations for exercise in individuals with myocarditis

Recommendations	Class ^a	Level ^b
Comprehensive evaluation, using imaging studies, exercise stress test and Holter monitoring, is recommended following recovery from acute myocarditis to assess the risk of exercise-related SCD. ^{455,462,463}	I	B
Return to all forms of exercise including competitive sports should be considered after 3–6 months in asymptomatic individuals, with normal troponin and biomarkers of inflammation, normal LV systolic function on echocardiography and CMR, no evidence of ongoing inflammation or myocardial fibrosis on CMR, good functional capacity, and absence of frequent and/or complex VAs on ambulatory Holter monitoring or exercise testing. ^{430,434,453,459,460,464}	IIa	C
Among individuals with a probable or definitive diagnosis of recent myocarditis, participation in leisure-time or competitive sports while active inflammation is present is not recommended. ^{459,460}	III	C
Participation in moderate- to high-intensity exercise for a period of 3–6 months after acute myocarditis is not recommended. ^{459–461,467}	III	B
Participation in leisure exercise or competitive sports involving high intensity in individuals with residual myocardial scar and persistent LV dysfunction is not recommended.	III	C

Ad Pkt.1) Tilsluttes med forbehold: Omfattende udredning efter pause fra sport efter myokarditis anbefales kun til atleter med potentiel forøget risiko som eliteatleter.

Ad øvrige punkter) Tilsluttes uden kommentarer

Recommendations for exercise for individuals with pericarditis, p. 46

Recommendations for exercise in individuals with pericarditis

Recommendations	Class ^a	Level ^b
Return to all forms of exercise including competitive sports is recommended after 30 days to 3 months for individuals who have recovered completely from acute pericarditis, depending on clinical severity. ^{459,460}	I	C
Participation in leisure-time or competitive sports is not recommended for individuals with a probable or definitive diagnosis of recent pericarditis while active inflammation is present, regardless of age, sex, or extent of LV systolic dysfunction. ^{459,460}	III	C
Participation in moderate- to high-intensity exercise, including competitive sports, is not recommended for individuals with constrictive pericarditis.	III	C

Alle punkter kan tilsluttes uden kommentarer

5.6 Exercise recommendations in individuals with arrhythmias and channelopathies

Afsnit 5.6.2, Atrieflimren

Recommendations for exercise for individuals with atrial fibrillation, p. 47

Recommendations for exercise in individuals with atrial fibrillation

Recommendations	Class ^a	Level ^b
Regular physical activity is recommended to prevent AF. ^{297,470–473}	I	A
Evaluation and management of structural heart disease, thyroid dysfunction, alcohol or drug abuse, or other primary causes of AF is recommended before engaging in sports. ⁴⁸⁵	I	A
Counselling about the effect of long-lasting intense sports participation on (recurrence of) AF is recommended in individuals with AF who exercise vigorously for prolonged periods, especially in middle-aged men. ^{471,475,481,490}	I	B
AF ablation is recommended in exercising individuals with recurrent symptomatic AF, and/or in those who do not want drug therapy, given its impact on athletic performance. ^{488,489}	I	B
The ventricular rate while exercising with AF should be considered in every exercising individual (by symptoms and/or by ECG monitoring), and titrated rate control should be instituted.	IIa	C
Participation in sports without antiarrhythmic therapy should be considered in individuals without structural heart disease, and in whom AF is well tolerated.	IIa	C
Cavo-tricuspid isthmus ablation should be considered in those with documented flutter who want to engage in intensive exercise, to prevent atrial flutter 1 : 1 atrioventricular conduction.	IIa	C
Prophylactic cavo-tricuspid isthmus ablation to prevent flutter should be considered in individuals with AF who want to engage in intensive exercise and in whom class I drug therapy is initiated.	IIa	C
The use of class I antiarrhythmic drugs as monotherapy, without proof of adequate rate control of AF/AFL during vigorous exercise, is not recommended. ^{482,483}	III	C
After ingestion of pill-in-the-pocket flecainide or propafenone, participation in intensive sports is not recommended until two half-lives of the antiarrhythmic drug have elapsed (i.e. up to 2 days). ⁴⁸⁴	III	C
Sports with direct bodily contact or prone to trauma are not recommended in exercising individuals with AF who are anticoagulated. ⁴⁸⁵	III	A

Pkt. 1-6) tilsluttes uden kommentarer

Pkt 7) Kan ikke tilsluttes, vi har følgende begrundelse: Det anbefales (IIa/C), at profylaktisk ablation for typisk atrieflagren bør overvejes i situationer, hvor man vil indlede Klasse I antiarytmika pga. atrieflimren; dette for at undgå atrieflagren med 1:1 konduktion. Endorsement-gruppen anså det for mere relevant at anbefale en egentlig atrieflimren ablation (lungevene-isolation). Det fremgår i øvrigt af den følgende anbefaling, at der er betænkeligheder ved at anvende Klasse I lægemidler (som monoterapi).

Pkt. 8-10) Tilsluttes uden kommentarer

Afsnit 5.6.3, PSVT og WPW

Recommendations for exercise and sports participation in individuals with paroxysmal supraventricular tachycardia and pre-excitation, p. 49

Recommendations for exercise and sports participation in individuals with paroxysmal supraventricular tachycardia and pre-excitation

Recommendations	Class^a	Level^b
In individuals with palpitations, a comprehensive assessment to exclude (latent) pre-excitation, structural heart disease, and VAs is recommended. ⁵⁰⁰	I	B
Participation in all sports activities is recommended in individuals PSVT without pre-excitation. ⁵⁰⁰	I	C
Ablation of the accessory pathway is recommended in competitive and recreational athletes with pre-excitation and documented arrhythmias. ⁵⁰⁰	I	C
In competitive/professional athletes with asymptomatic pre-excitation, an EP study is recommended to evaluate the risk for sudden death. ^{497,500}	I	B
In competitive athletes with PSVT but without pre-excitation, curative treatment by ablation should be considered.	IIa	C

Pkt 1-3) Tilsluttes uden kommentarer

Pkt. 4) tilsluttes med følgende forbehold: Det anbefales (I/B) at udføre invasiv elektrofysiologisk undersøgelse ved asymptomatisk præexcitation hos atleter mhp. at vurdere risiko for pludselig arytmisk død. I Danmark vil man generelt tilstræbe samtidig ablation, hvis det er muligt/forsvarligt (risiko for AV-blok ved His-nær ledningsbane).

Pkt. 5) Tilsluttes uden kommentarer.

5.6.4 Premature ventricular contractions and non-sustained ventricular tachycardia

Recommendations for exercise in individuals with premature ventricular contractions or non-sustained ventricular tachycardia, p. 50

Recommendations for exercise in individuals with premature ventricular contractions or non-sustained ventricular tachycardia

Recommendations	Class ^a	Level ^b
In exercising individuals with ≥ 2 PVCs on a baseline ECG (or ≥ 1 PVC in the case of high-endurance athletes) thorough evaluation (including a detailed family history) to exclude underlying structural or arrhythmogenic conditions is recommended. ^{503,522}	I	C
Among individuals with frequent PVCs and non-sustained VT a thorough investigation with Holter monitoring, 12-lead ECG, exercise test, and suitable imaging is recommended. ⁵⁰³	I	C
It is recommended that all competitive and leisure-time sports activities are permitted, with periodic re-evaluation in individuals without familial or structural underlying disease. ⁵⁰³	I	C

Alle tre punkter kan tilsluttes uden kommentarer.

5.6.5 Long QT syndrome

Recommendations for exercise in long QT syndrome, p. 51

Recommendations for exercise in long QT syndrome

Recommendations	Class ^a	Level ^b
It is recommended that all exercising individuals with LQTS with prior symptoms or prolonged QTc be on therapy with beta-blockers at target dose. ⁵²⁹	I	B
It is recommended that exercising individuals with LQTS should avoid QT prolonging drugs (www.crediblemeds.org) and electrolyte imbalance such as hypokalaemia and hypomagnesaemia. ⁵²⁹	I	B
Shared decision making should be considered regarding sports participation in patients with genotype-positive/phenotype-negative LQTS (i.e. <470/480 ms in men/women). Type and setting of sports (individual vs. team), type of mutation, and extent of precautionary measures should be considered in this context.	IIa	C
Participation in high-intensity recreational and competitive sports, even when on beta-blockers, is not recommended in individuals with a QTc>500 ms or a genetically confirmed LQTS with a QTc≥470 ms in men or ≥480 ms in women.	III	B
Participation in competitive sports (with or without ICD) is not recommended in individuals with LQTS and prior cardiac arrest or arrhythmic syncope.	III	C

Alle fem anbefalinger kan tilsluttes uden kommentarer.

Afsnit 5.6.6, Brugada syndrom

Recommendations for exercise in Brugada syndrome, 51

Recommendations for exercise in Brugada syndrome

Recommendations	Class ^a	Level ^b
ICD implantation is recommended in patients with BrS with episodes of arrhythmic syncope and/or aborted SCD. ²⁴⁷	I	C
Following implantation of an ICD, resumption of leisure or competitive sports should be considered after shared decision making in individuals who have not experienced recurrent arrhythmias over 3 months after ICD implantation.	IIa	C
In asymptomatic individuals with BrS, asymptomatic mutation carriers and asymptomatic athletes with only an inducible ECG pattern, participation in sports activities that are not associated with an increase in core temperature >39°C (e.g. endurance events under extremely hot and/or humid conditions) may be considered.	IIb	C
Prescription of drugs that may aggravate BrS ^c , electrolyte abnormalities, and sports practice that increases core temperature >39°C are not recommended in individuals with overt BrS or phenotypically negative mutation carriers.	III	C

Alle fire anbefalinger tilsluttes med enkelt kommentar: Evidensniveau for implantation af ICD ved Brugada syndrom og samtidig arytmisk synkope/aborted sudden cardiac death anføres som "C". Det bør være A eller B.

5.6.7 Following device implantation

Recommendations for exercise in individuals with pacemakers and implantable cardioverter defibrillators, p.53

Recommendations for exercise in individuals with pacemakers and implantable cardioverter defibrillators

Recommendations	Class ^a	Level ^b
It is recommended that individuals with implanted devices with/without resynchronization and underlying disease follow the recommendations pertaining to the underlying disease. ^{384,425}	I	B
Participation in sports and exercise (except collision sports) should be considered in individuals with pacemaker therapy who do not have pathological substrates for fatal arrhythmias.	IIa	C
Prevention of direct impact to the implanted device by adapting the site of lead and/or device implantation, padding, or restricting direct impact sports should be considered.	IIa	C
Holter recordings and device interrogation during and after resuming sports should be considered to allow appropriate tailoring of rate-responsive pacing parameters, exclusion of myopotential or electromagnetic inhibition, and detection of VAs.	IIa	C
Shared decision making should be considered during decisions relating to continuation of intensive or competitive sports participation in individuals with an ICD, taking into account the effect of sports on the underlying substrate, the fact that intensive sports will trigger more appropriate and inappropriate shocks, the psychological impact of shocks on the athlete/patient, and the potential risk for third parties.	IIa	C
An ICD is not recommended as a substitute for disease-related recommendations when these mandate sports restrictions.	III	C

Alle seks anbefalinger kan tilsluttes uden kommentarer.

5.7 Exercise recommendations in individuals with adult congenital heart disease

Exercise recommendations for individuals with congenital heart disease, p. 56

Exercise recommendations for individuals with congenital heart disease

Recommendations	Class ^a	Level ^b
Participation in regular moderate exercise is recommended in all individuals with CHD. ^{588,591–594,619}	I	B
A discussion on exercise participation and provision of an individualized exercise prescription is recommended at every CHD patient encounter. ^{574,597,598,617}	I	B
Assessment for ventricular function, pulmonary artery pressure, aortic size, and arrhythmia risk is recommended in all athletes with CHD. ^{342,348,573,597}	I	C
Competitive sports participation should be considered for CHD athletes in NYHA class I or II who are free from potentially serious arrhythmias after individual tailored evaluation and shared decision making. ^{573,595,597,598}	IIa	C
Competitive sports are not recommended for individuals with CHD who are in NYHA class III–IV or with potentially serious arrhythmias. ^{605,608}	III	C

Alle fem anbefalinger kan tilsluttes uden kommentarer.