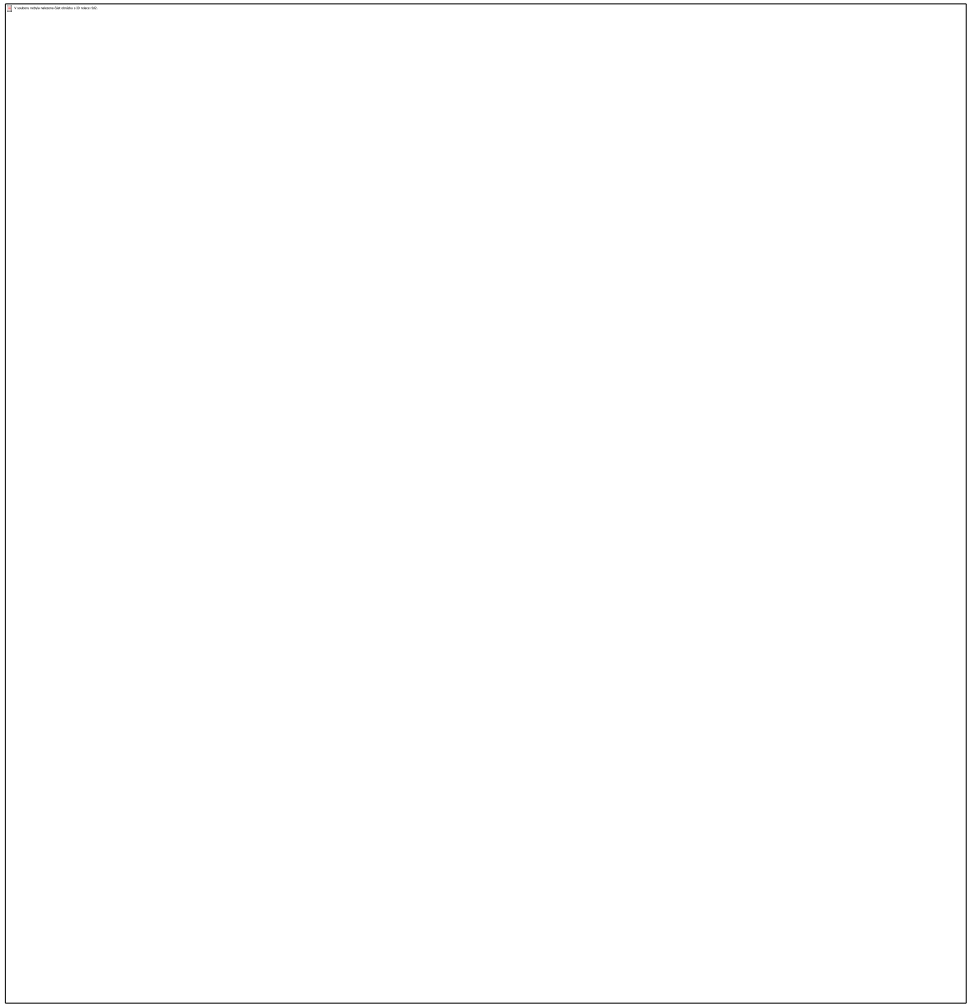
MASTERS ATHLETE A BRADYKARDIE - ROZHODOVACÍ ALGORITMY, ZPŮSOBILOST KE SPORTU

E. Sovová (Olomouc)

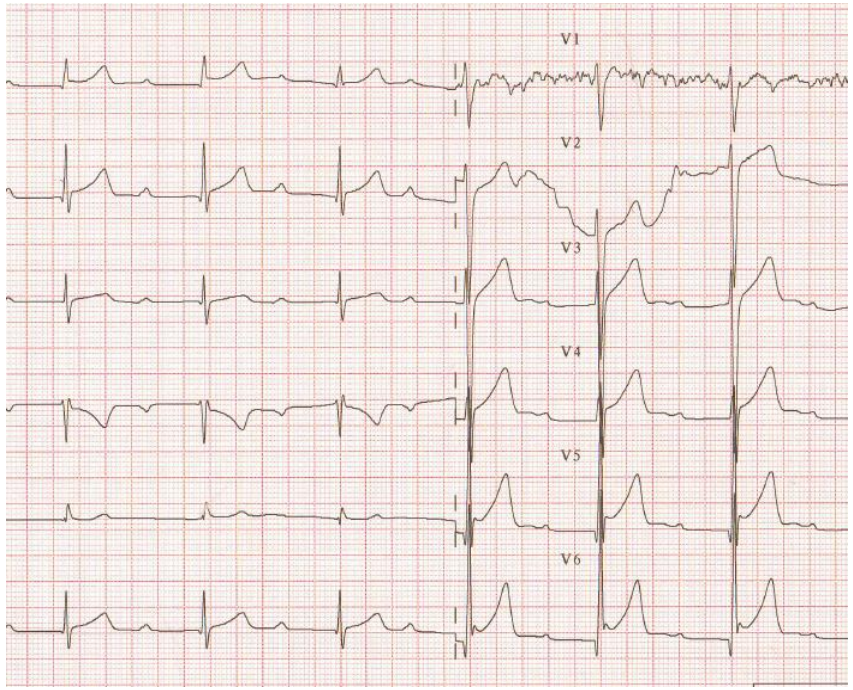
Obsah přednášky

- Definice, výskyt
- Patofyziologie
- Příznaky
- Vyšetření
- Algoritmy
- Léčba



Definice, výskyt

Definice bradykardie- klidová tepová frekvence pod 60/min.
U sportovců se někdy používá jako definice klidová tepová frekvence pod 50/min.
Prevalence u 50-85% sportovců (všechny disciplíny) a u více než 90% vytrvalostních sportovců.
Prevalence těžké bradykardie (klidová tepová frekvence pod 40/min je udávána u cca 4% sportovců, jsou popsány i případy s klidovou tepovou frekvencí pod 30/min.



Sharma S, Drezner JA, Baggish A, Papadakis M, Wilson MG, Prutkin JM, La Gerche A, Ackerman MJ, Borjesson M, Salerno JC, Asif IM, Owens DS, Chung EH, Emery MS, Froelicher VF, Heidbuchel H, Adamuz C, Asplund CA, Cohen G, Harmon KG, Marek JC, Molossi S, Niebauer J, Pelto HF, Perez MV, Riding NR, Saarel T, Schmied CM, Shipon DM, Stein R, Vetter VL, Pelliccia A, Corrado D. International recommendations for electrocardiographic interpretation in athletes. Eur Heart J. 2018 Apr 21;39(16):1466-1480. doi: 10.1093/eurheartj/ehw631. PMID: 28329355.

Nevím o spolehlivě uváděné statistice, která by přímo kvantifikovala výskyt bradykardií (např. definovaných jako klidová srdeční frekvence pod určitou hranicí) **u sportovců kategorie „masters“** (tj. starších závodních sportovců) jako celku.

Z dostupné literatury však lze uvést tyto orientační údaje:

- U vysoce trénovaných vytrvalostních sportovců bývá bradykardie běžná — např. že klidová srdeční frekvence výrazně snížená je uváděna až u ~50–85 % atletů. ResearchGate +3
- U jednoho výzkumu sportovců (triatlonistů) bylo bradykardie prokázáno u 68,2 % účastníků. PMC
- Podle přehledové práce „Athlete’s ECG Made Easy“ se uvádí, že klidová sinusová bradykardie „až do 80 %“ u vysoce trénovaných vytrvalostních atletů je běžná. MDPI
- U kohorty „masters endurance athletes“ bylo zjištěno, že tzv. „bradykardie burden“ (podíl času, kdy je srdeční frekvence < 50 bpm) byla výrazně vyšší než u netrénovaných kontrol, avšak absolutní procento sportovců s diagnostikovanou bradykardií nebylo v článku uvedeno jako jednoduché procento. PMC

Pokud bych měl nabídnout **orientační odhad**, mohl by znít: u masters vytrvalostních sportovců by se výskyt klidové bradykardie mohl pohybovat v řádu **50 % až** **ná i ~80 %**, pokud definujeme bradykardii např. jako klidovou srdeční frekvenci pod ~50-60 bpm a jde o vytrvalostní typ sportu.

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CLINICAL FEATURE
REVIEW

Asymptomatic bradycardia amongst endurance athletes

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ABSTRACT

It is established that an intensive training results in a lower average resting heart rate. Management of bradycardia in an athlete can be difficult given the underlying mechanisms are not clearly understood. The authors reviewed the different mechanisms described in the literature, including recent advances in physiology regarding remodeling of ion channels, which may partially explain bradycardia in athletes. Sinus bradycardia amongst athletes, especially endurance focused athletes, is common but difficult to apprehend. The underlying mechanisms are observably of multifactorial origin and likely incompletely elucidated by the current body of knowledge.

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KEYWORDS
Athlete's heart; bradycardia; physiology; ion channel; endurance athletes; autonomic balance

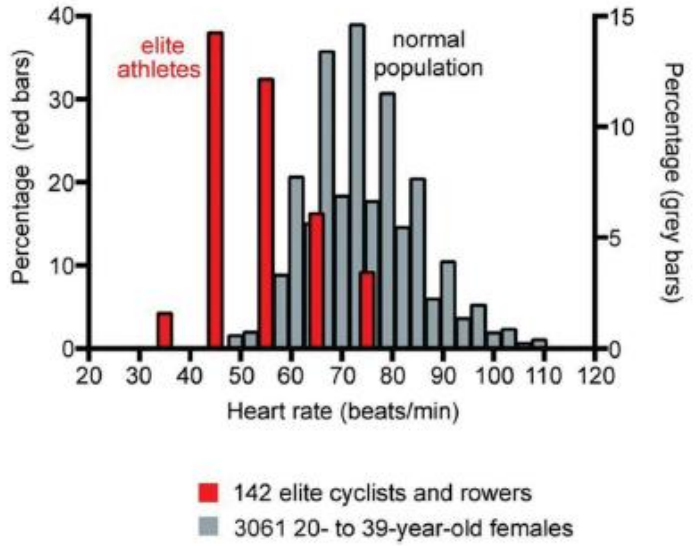

Figure 1. Resting heart rates in elite athlete versus the normal population. Reproduced from D'Souza et al. [3], with permission. © 2015 The Authors. The Journal of Physiology published by John Wiley & Sons Ltd on behalf of The Physiological Society.

Reviews in Cardiovascular Medicine

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Systematic Review

ECG Screening in Athletes: A Systematic Review of Sport, Age, and Gender Variations

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ported in males. Regarding age, adolescents who were regular in sports showed a lower prevalence of abnormal ECG findings compared to adult athletes. However, when the abnormalities were detected, they often manifested as increased QRS voltage or TWI. Additionally, adolescents engaged in high-intensity training beyond typical levels for their age group, showed cardiac changes such as right atrial enlargement, which were also indicated by an increase in P-wave duration (Table 2).

[20]	Cohort Study	Norway	81	35–74	63	Endurance sports	High	High negative predictive value of PCVE. Detected CVD in 20% of master athletes, primarily in the symptom group.	5 months	Small sample size, limited number of female participants, self-reported questionnaires.
[21]	Observational study	Spain	356 (308 athletes, 48 controls)	36.4 years (athletes), 49.3 years (controls)	Not specified	Various sports including competitive athletes	Competitive training	Left atrial enlargement is common in adult competitive athletes but not accompanied by a significant modification in electrocardiographic parameters No relevant differences in P-wave duration, prevalence of interatrial block, or morphology-voltage-P-wave duration score	Not specified	The study is limited to the analyzed population and may not be generalizable to all athletes; potential bias due to sample selection and specific population traits.
[22]	Observational Study	France	2457	35+	Not specified	Leisure time sportsmen and sportswomen	Mixed	Positive exercise ECG correlated with higher CVD risk factors, supporting the use of exercise ECG in screening.	3 years	No specific funding for the study, limited to asymptomatic participants.

RESEARCH ARTICLE | Originally Published 5 August 2024 |

Check for updates

Long-Term Incidence of Bradycardia and Pacemaker Implantations Among Cross-Country Skiers: A Cohort Study

Niclas Svedberg, MD, Johan Sundström, MD, PhD, Stefan James, MD, PhD, Ulf Hållmarker, MD, PhD, Kristina Hambraeus, MD, PhD, and Kasper Andersen, MD, PhD | AUTHOR INFO & AFFILIATIONS

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Srovnání lyžařů, kteří se zůčastnili Vasova běhu 1989-2011 (209 108 osob) s nelyžaři ze Švédského registru (532 290 osob)
Průměrný věk 37/41 let

Výskyt bradykardie u 0,21% lyžařů a 0,24% nelyžařů
Implantace PM u 0,23% lyžařů a 0,27% nelyžařů.

Table 1. Baseline Characteristics

Characteristics	Skiers (n=209 108)	Nonskiers (n=532 290)
Men	126 741 (60.6)	357 572 (67.2)
Women	82 367 (39.4)	174 718 (32.8)
Age at inclusion, y	37.4±11.5	41.7±12.7
Age at pacemaker implantation, y	63.5±13.4	65.1±11.4
Education level		
Primary school <9 y	5938 (2.8)	48 224 (9.1)
Primary school 9 y	8543 (4.1)	59 365 (11.2)
Secondary school <2 y	36 351 (17.4)	160 216 (30.1)
Secondary school 2–3 y	34 190 (16.4)	97 499 (18.3)
Higher education >2 y	41 702 (19.9)	69 888 (13.1)
Higher education >3 y	77 990 (37.3)	91 097 (17.1)
PhD	4394 (2.1)	6001 (1.1)
Yearly mean income (standardized 2004), SEK	307 529	234 206
Concomitant diseases at baseline		
Atrial fibrillation	425 (0.2)	3762 (0.7)
Ischemic heart disease	477 (0.2)	9631 (1.9)
Diabetes	914 (0.4)	9336 (1.8)
Heart failure	65 (0.03)	2284 (0.4)
Cancer	6074 (2.9)	21 950 (4.1)
Chronic respiratory disease	10 535 (5.0)	30 577 (5.7)
Concomitant beta-blockers or calcium channel blockers at baseline	972 (0.5)	12 446 (2.3)

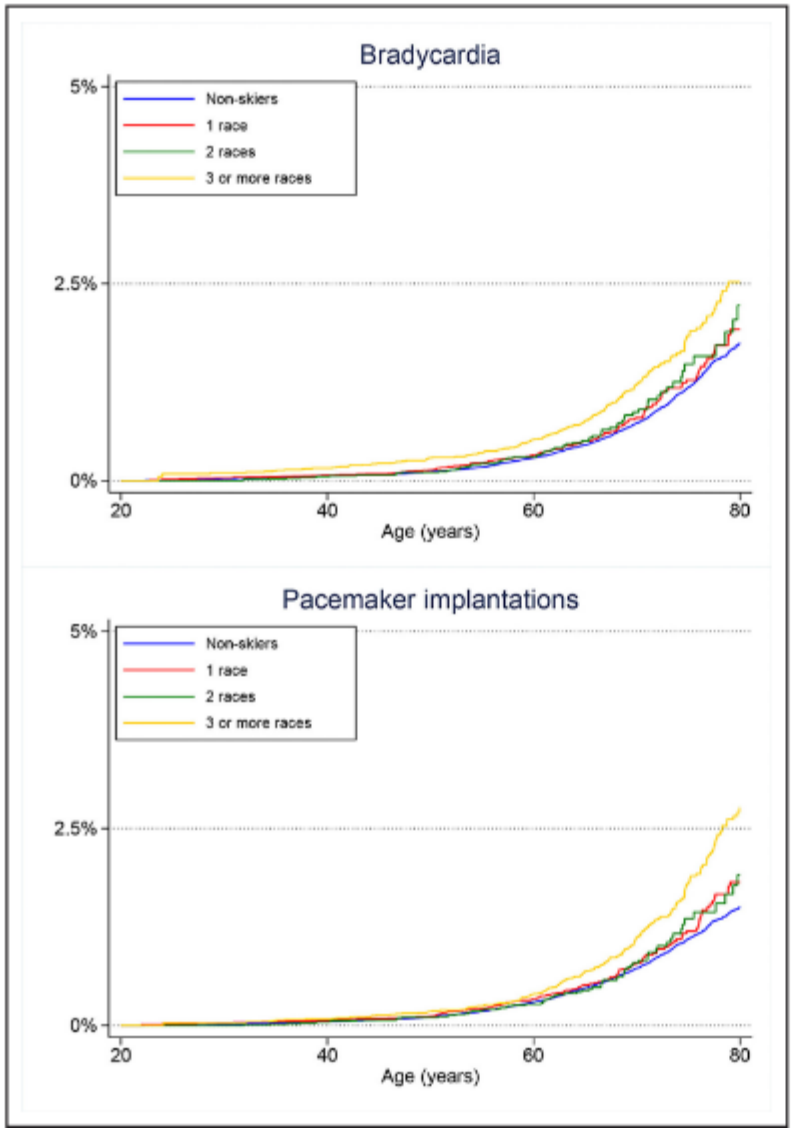

Figure 1. Kaplan-Meier failure estimates of bradycardia and pacemaker implantations by number of completed races in Vasaloppet (1989–2011).
Adjusted for diabetes, atrial fibrillation, ischemic heart disease, and heart failure.

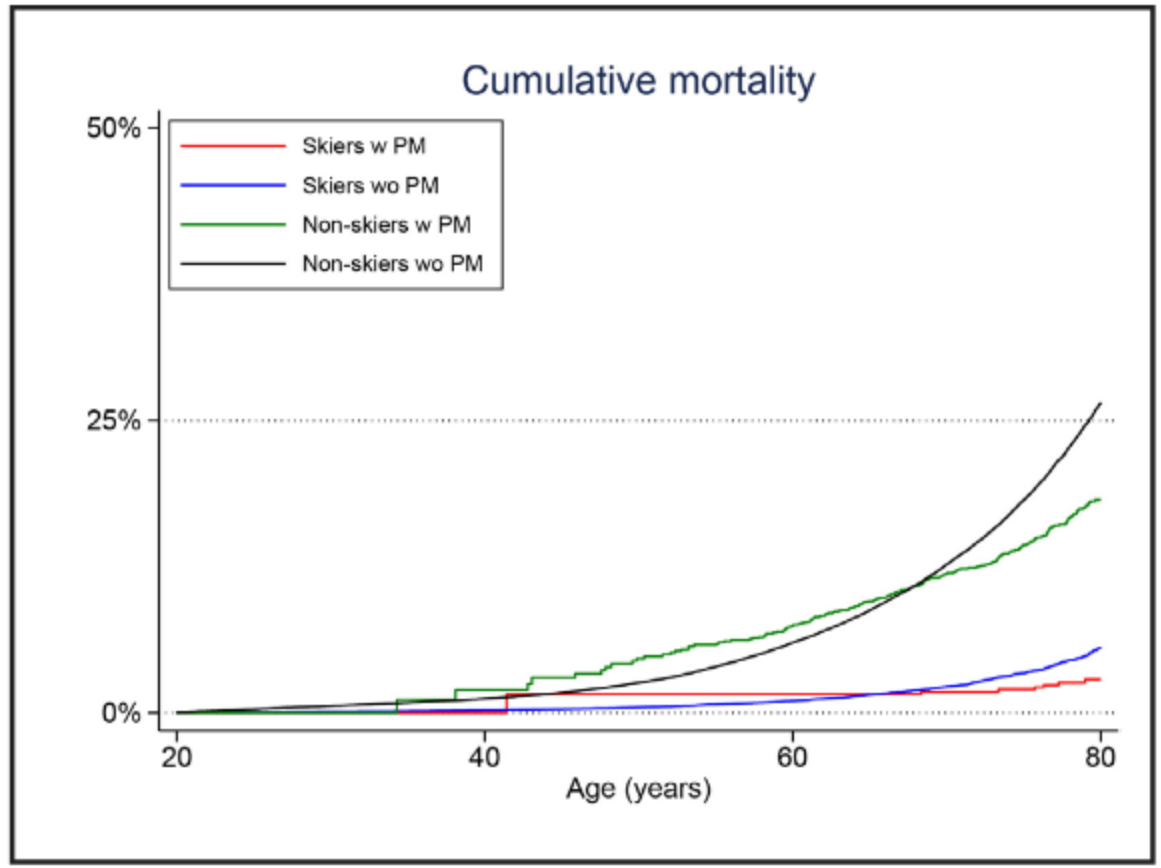

Figure 3. Cumulative incidence of mortality in skiers and nonskiers with or without a pacemaker.
Adjusted for diabetes, atrial fibrillation, ischemic heart disease, and heart failure. PM indicates pacemaker.

Patofyziologie bradykardie u sportovců

- Sinusový uzel- pacemakerové bb: spontánní depolarizace (kanály- L type voltage gated ca chanels, hyperpolarization- activated cyklic nukleotid-gated (HCN)- „Funny channels“)- závislé na autonomní inervaci
- Parasympatický nervový systém- nervus vagus (ACH na muskarinové receptory- down regulace funny channels)- snížení tepové frekvence
- Sympatický nervový systém- katecholaminy- zvýšení tepové frekvence
- Mechanismus- autonomní balance??
- Srdeční remodelace- remodelace sinusového uzlu? Ovlivnění funny channels?

Masters kategorie

Contents lists available at ScienceDirect
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journal homepage: www.elsevier.com/locate/tcm

Evaluating and managing bradycardia ☆

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Table 1
Conditions associated with bradycardia and conduction disorders.

Autonomic dysfunction
• Carotid sinus hypersensitivity
• Neurally-mediated syncope
• Situational syncope
Cardiomyopathy
• Ischemic
• Non-ischemic
• Infiltrative
Congenital heart disease
Degenerative
Infection
• Lyme disease
• Infectious endocarditis
• Chagas disease
Ischemia/ infarction – especially inferior MI
Medications/ drugs
• Antihypertensives – Beta-blockers, verapamil, diltiazem
• Antiarrhythmics – Amiodarone, dronedarone, Sotalol, digoxin
• Psychoactive – Phenothiazines, opioids, tricyclic antidepressants
Metabolic/ endocrine
• Acidosis
• Hypo- or hyperkalemia
• Hypothyroidism, hypoadrenal state
• Hypothermia
• Hypoxia
Rheumatologic
• Rheumatoid arthritis
• Scleroderma
• Lupus
Surgical/ traumatic
• Catheter ablation
• Surgical correction of congenital heart disease
• Valve surgery
• Septal myectomy/ alcohol septal ablation

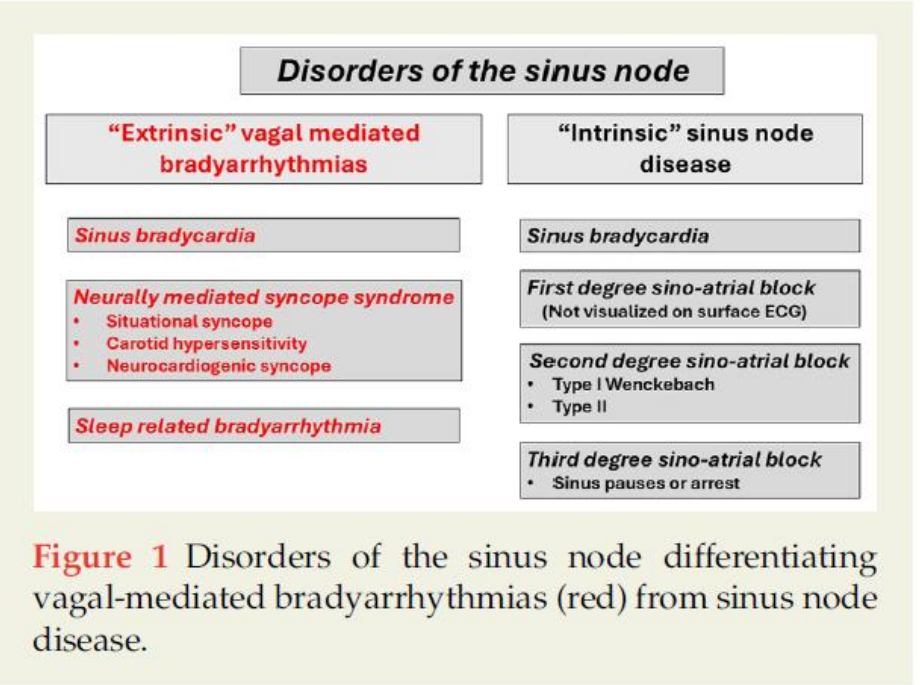

Figure 1 Disorders of the sinus node differentiating vagal-mediated bradyarrhythmias (red) from sinus node disease.

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https://doi.org/10.1016/j.hlc.2025.04.001

REVIEW

The Clinical Spectrum of Bradyarrhythmias "To Pace or Not to Pace"

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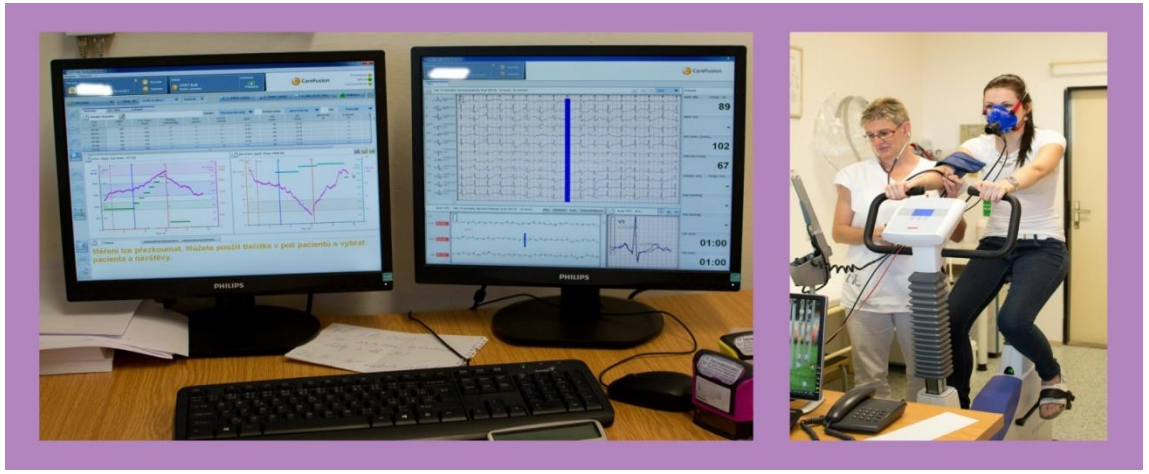
Příznaky

- Synkopa
- Presynkopa
- Mrákoty
- Únava
- Dušnost

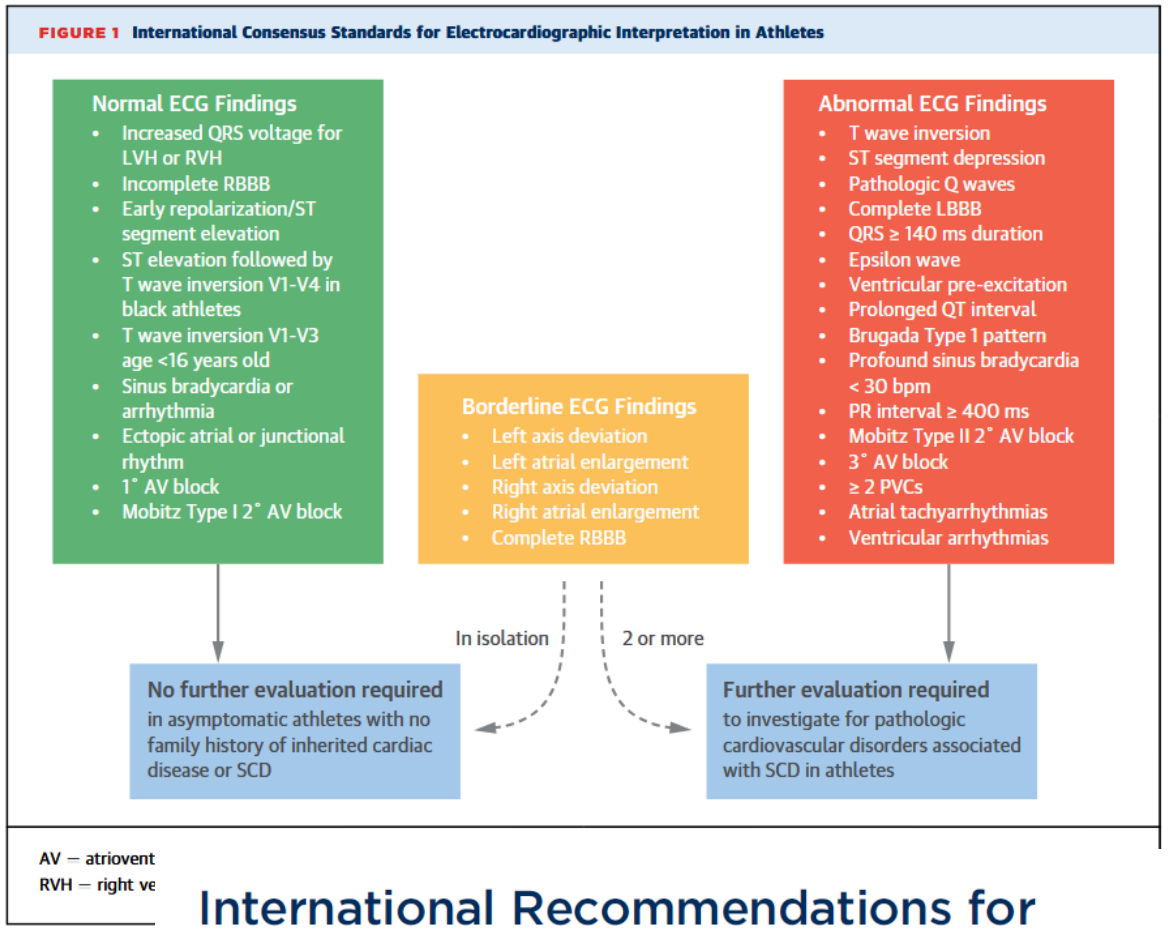
Vyšetření

- 24 hodinový (více hodinový) Holter
- Zátěžový test
- Echokardiografie
- Laboratoř (genetické testování??)
- Vyšetření spánkové apnoe
- CT angio, MRI
- Elektrofyziologie ?



12-35 let

Možné použití nad 35let??



Panhuyzen-Goedkoop NM, Wellens HJ, Verbeek AL, Jørstad HT, Smeets JR, Peters RJ. ECG criteria for the detection of high-risk cardiovascular conditions in master athletes. Eur J Prev Cardiol. 2020 Sep;27(14):1529-1538. doi: 10.1177/2047487319901060. Epub 2020 Jan 29. PMID: 31996014; PMCID: PMC7469710.

U asymptomatických osob!!!

International Recommendations for Electrocardiographic Interpretation in Athletes

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TABLE 1 Continued

Normal ECG findings in athletes

These training-related ECG alterations are physiologic adaptations to regular exercise, considered normal variants in athletes, and do not require further evaluation in asymptomatic athletes with no significant family history.

Normal ECG finding	Definition
Increased QRS voltage	Isolated QRS voltage criteria for left (SV1 + RV5 or RV6 >3.5 mV) or right ventricular hypertrophy (RV1 + SV5 or SV6 >1.1 mV)
Incomplete RBBB	rSR′ pattern in lead V_1 and a qRS pattern in lead V_6 with QRS duration <120 ms
Early repolarization	J-point elevation, ST-segment elevation, J waves, or terminal QRS slurring in the inferior and/or lateral leads
Black athlete repolarization variant	J-point elevation and convex ('domed') ST-segment elevation followed by T-wave inversion in leads V_1–V_4 in black athletes
Juvenile T-wave pattern	T-wave inversion V_1–V_3 in athletes age <16 yrs
Sinus bradycardia	≥30 beats/min
Sinus arrhythmia	Heart rate variation with respiration: rate increases during inspiration and decreases during expiration
Ectopic atrial rhythm	P waves are a different morphology compared with the sinus P-wave, such as negative P waves in the inferior leads ('low atrial rhythm')
Junctional escape rhythm	QRS rate is faster than the resting P-wave or sinus rate and typically <100 beats/min with narrow QRS complex unless the baseline QRS is conducted with aberrancy
1° AV block	PR interval 200–400 ms
Mobitz Type I (Wenckebach) 2° AV block	PR interval progressively lengthens until there is a non-conducted P-wave with no QRS complex; the first PR interval after the dropped beat is shorter than the last conducted PR interval

*The QT interval corrected for heart rate is ideally measured using Bazett's formula with heart rates between 60 and 90 beats/min; preferably performed manually in lead II or V_5 using the teach-the-tangent method[1] to avoid inclusion of a U-wave (please see text for more details). Consider repeating the ECG after mild aerobic activity for a heart rate <50 beats/min, or repeating the ECG after a longer resting period for a heart rate >100 beats/min, if the QTc value is borderline or abnormal.

AV = atrioventricular block; ECG = electrocardiogram; PVC = premature ventricular contraction; RBBB = right bundle branch block.

T wave inversion	≥1 mm in depth in two or more contiguous leads; excludes leads aVR, III, and V_1
• Anterior	• V_2-V_4 – excludes: black athletes with J-point elevation and convex ST-segment elevation followed by TWI in V_2-V_4; athletes age <16 with TWI in V_1-V_3; and biphasic T waves in only V_3
• Lateral	• I and AVL, V_5 and/or V_6 (only one lead of TWI required in V_5 or V_6)
• Inferolateral	• II and aVF, V_5-V_6, I and AVL
• Inferior	• II and aVF
ST-segment depression	≥0.5 mm in depth in two or more contiguous leads
Pathologic Q waves	Q/R ratio ≥0.25 or ≥40 ms in duration in two or more leads (excluding III and aVR)
Complete left bundle branch block	QRS ≥120 ms, predominantly negative QRS complex in lead V_1 (QS or rS), and upright notched or slurred R wave in leads I and V_6
Profound nonspecific intra-ventricular conduction delay	Any QRS duration ≥140 ms
Epsilon wave	Distinct low amplitude signal (small positive deflection or notch) between the end of the QRS complex and onset of the T-wave in leads V_1-V_3
Ventricular pre-excitation	PR interval <120 ms with a delta wave (slurred upstroke in the QRS complex) and wide QRS (≥120 ms)
Prolonged QT interval*	QTc ≥470 ms (male)
	QTc ≥480 ms (female)
	QTc ≥500 ms (marked QT prolongation)
Brugada Type 1 pattern	Coved pattern: initial ST-segment elevation ≥2 mm (high take-off) with downsloping ST-segment elevation followed by a negative symmetric T-wave in ≥ 1 leads in V_1-V_3
Profound sinus bradycardia	<30 beats/min or sinus pauses ≥3 s
Profound 1° AV block	≥400 ms
Mobitz Type II 2° AV block	Intermittently non-conducted P waves with a fixed PR interval
3° AV block	Complete heart block
Atrial tachyarrhythmias	Supraventricular tachycardia, atrial fibrillation, atrial flutter
PVC	≥2 PVCs per 10 s tracing
Ventricular arrhythmias	Couplets, triplets, and non-sustained ventricular tachycardia

Borderline ECG findings in athletes

These ECG findings in isolation likely do not represent pathologic cardiovascular disease in athletes, but the presence of two or more borderline findings may warrant additional investigation until further data become available.

ECG abnormality	Definition
Left axis deviation	−30° to −90°
Left atrial enlargement	Prolonged P wave duration of >120 ms in leads I or II with negative portion of the P-wave ≥1 mm in depth and ≥40 ms in duration in lead V_1
Right axis deviation	>120°
Right atrial enlargement	P-wave ≥2.5 mm in II, III, or aVF
Complete right bundle branch block	rSR′ pattern in lead V1 and a S wave wider than R wave in lead V_6 with QRS duration ≥120 ms

Pauzy nad 3 sekundy

Rozdělení

FYZIOLOGICKÉ

- Sinusová bradykardie nebo arytmie
- Ektopický síňový nebo junkční rytmus
- AV blokáda I stupně
- AV blokáda II stupně Mobitz I

PATOLOGICKÉ

- Sinusová bradykardie pod 30/min (pauzy nad 3 s)
- PR interval nad 400 ms
- AV blokáda II stupně, Mobitz II
- AV blokáda III stupně

Patologie	Příčina	Vyšetření	Další doporučení
Sinusová bradykardie frekvence <30/min¨, pauzy nad 3 s	Myokardiální nebo „elektrické“ onemocnění	EKG po střední pohybové aktivitě	Další vyšetření podle klinického podezření
AV I. Stupně, PR interval nad 400 ms	Myokardiální nebo „elektrické“ onemocnění	EKG po střední pohybové aktivitě	Další vyšetření podle klinického podezření
AV blokáda II. Stupně Mobitz II nebo AV blokáda III stupně	Myokardiální nebo „elektrické“ onemocnění	Echokardiografie EKG Holter Zátěžový test	Laboratorní skreening, MRI

HeartRhythm

The Official Journal of the Heart Rhythm Society, The Cardiac Electrophysiology Society, and The Pediatric & Congenital Electrophysiology Society

Heart Rhythm Society SM

Check for updates

HRS Consensus Statement

2024 HRS expert consensus statement on arrhythmias in the athlete: Evaluation, treatment, and return to play

Table 3 Definitions

Term	Definition
Athletes	Individuals who are engaged in habitual and vigorous training for the purposes of obtaining a high level of fitness. This includes competitive athletes, high-level recreational exercise enthusiasts, and occupational (tactical) athletes.
Age domains in athletes	Given the complexity of the interaction between age and different arrhythmic diseases, rather than use arbitrary age cut points, athletes are considered in different age domains based on stages of development. Young = prepubertal (< / ≈ 12 years old) and adolescent (≈ 13-17 years old) Young adult ≈ 18-24 years old Adult > / ≈ 25 years old Master > / ≈ 35 years old
Return to play/return to sport	These terms refer to returning to the desired level or intensity of recreational or competitive sport participation.

Patologie	Příčina	Vyšetření	Další doporučení
Sinusová bradykardie frekvence <30/min	Myokardiální nebo „elektrické“ onemocnění	EKG po střední pohybové aktivitě	EKG Holter Zátěžový test Zobrazovací metody
AV blokáda I. Stupně, PR interval nad 400 ms	Myokardiální nebo „elektrické“ onemocnění	EKG po střední pohybové aktivitě	EKG Holter Zátěžový test Zobrazovací metody
AV blokáda II. Stupně Mobitz II nebo AV blokáda III stupně	Myokardiální nebo „elektrické“ onemocnění	Rodiná anamnéza!!! Echokardiografie, MRI EKG Holter Zátěžový test	
LAH, RBBB			
SSS			
LBBB, bifascikulární blok	Myokardiální nebo „elektrické“ onemocnění	Echokardiografie EKG Holter Zátěžový test	

Onemocnění: KMP, infiltrativní nemoci (sarkoidóza, amyloidoza), kanálopatie, kongenitální AV III (genetické onemocnění)

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Clinical Considerations for Competitive Sports Participation for Athletes With Cardiovascular Abnormalities:

A Scientific Statement From the American Heart Association and American College of Cardiology

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on behalf of the American Heart Association Leadership

competitive athletes. Similar to past articles, competitive athletes include both pediatric and adultaged individuals, but in contrast to past articles, we diverge from the previous arbitrary generality that this scientific statement is only intended for athletes between 12 and 25 years of age.[6,14] Some children begin competitive sports participation before 12 years of age, and professional athletes are often older than 25 years. The clinical considerations in this scientific statement apply to prepubertal athletes (<12 years of age), adolescent ıletes (middle and high school; between 12 and 17 years of age), young adult athletes ɔllege and professional; between 18 and 25 years of age), adult athletes (professional or ıer elite-level athletes between 25 and 35 years of age), and masters athletes (Section X; defined as ≥35 years of age). Sports cardiology bridges pediatric and adult cardiology, and continued engagement of pediatric cardiologists is critical as the field continues to grow.

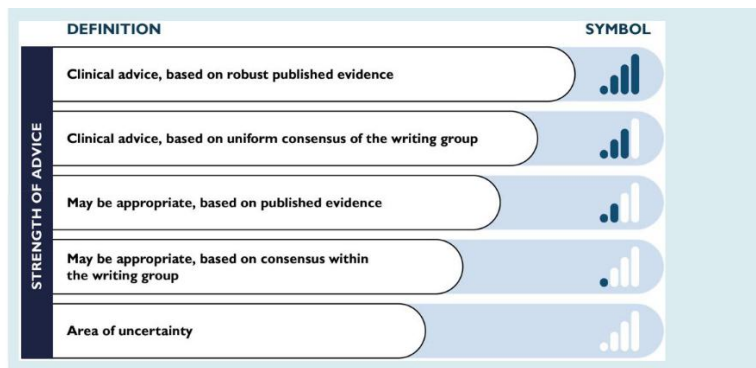
Bradycardia and Pacemakers

Sinus bradycardia, first-degree atrioventricular block, and Mobitz I (Wenckebach) block are normal in competitive athletes. Athletes with marked conduction abnormalities require further clinical evaluation. There are no data on competitive athletes after pacemaker

Abnormal electrocardiogram findings in athletes

A consensus statement of the European Association of Preventive Cardiology of the European Society of Cardiology

Gherardo Finocchiaro [1], Alessandro Zorzi [2], Mark Abela [3], Aaron Baggish[4], Silvia Castelletti [5], Elena Cavarretta [6], Guido Claessen[7], Domenico Corrado [2], Maria Sanz de la Garza[8], Sabiha Gati[9], Viviana Maestrini [10], Aneil Malhotra[11], Josef Niebauer[12], David Niederseer [13], Michael Papadakis[1], Antonio Pelliccia [10], Sanjay Sharma [1,*], and Flavio D'Ascenzi[14]



Patologie	Příčina	Vyšetření	Další doporučení
Sinusová bradykardie frekvence <30/min		EKG po střední pohybové aktivitě nebo hyperventilaci	Laboratoř Zátěžový test EKG holter (trénink) Echokardiografie Genetické testování (RA)
AV blokáda I. Stupně, PR interval nad 400 ms		EKG po střední pohybové aktivitě nebo hyperventilaci	Rodiná anamnéza Laboratoř Zátěžový test EKG holter (trénink) Echokardiografie Anti Ro/SSA (plus matka) Genetické testování
AV blokáda II stupně, Mobitz I v denních hodinách	Může být způsobena strukturálním, infiltrativním,infekčním, genetickým nebo autoimunitním onemocněním	EKG po střední pohybové aktivitě nebo hyperventilaci	Laboratoř Zátěžový test EKG holter (trénink) Echokardiografie Anti Ro/SSA (plus matka) Serologie, Genetické testování
AV blokáda II. Stupně Mobitz II nebo AV blokáda III stupně		Echokardiografie EKG Holter Zátěžový test	Laboratorní skreening, MRI

Patologie	Příčina	Vyšetření	Další doporučení
AV blokáda I stupně nebo II stupně plus blokáda Tawarových ramének	Genetické, infiltrativní, zánětlivé	Podrobné vyšetření	
Sinusová bradykardie <30/min, AV blokáda plus blokáda Tawarových ramének nebo podezření na SSS		Elektrofyziologie	
Krátký PR interval		Elektrofyziologie	

Detrénink (2 měsíce)- u bradykardie pod 30/min, PR nad 400 a denního výskytu AV blokády II stupně Mobitz I.

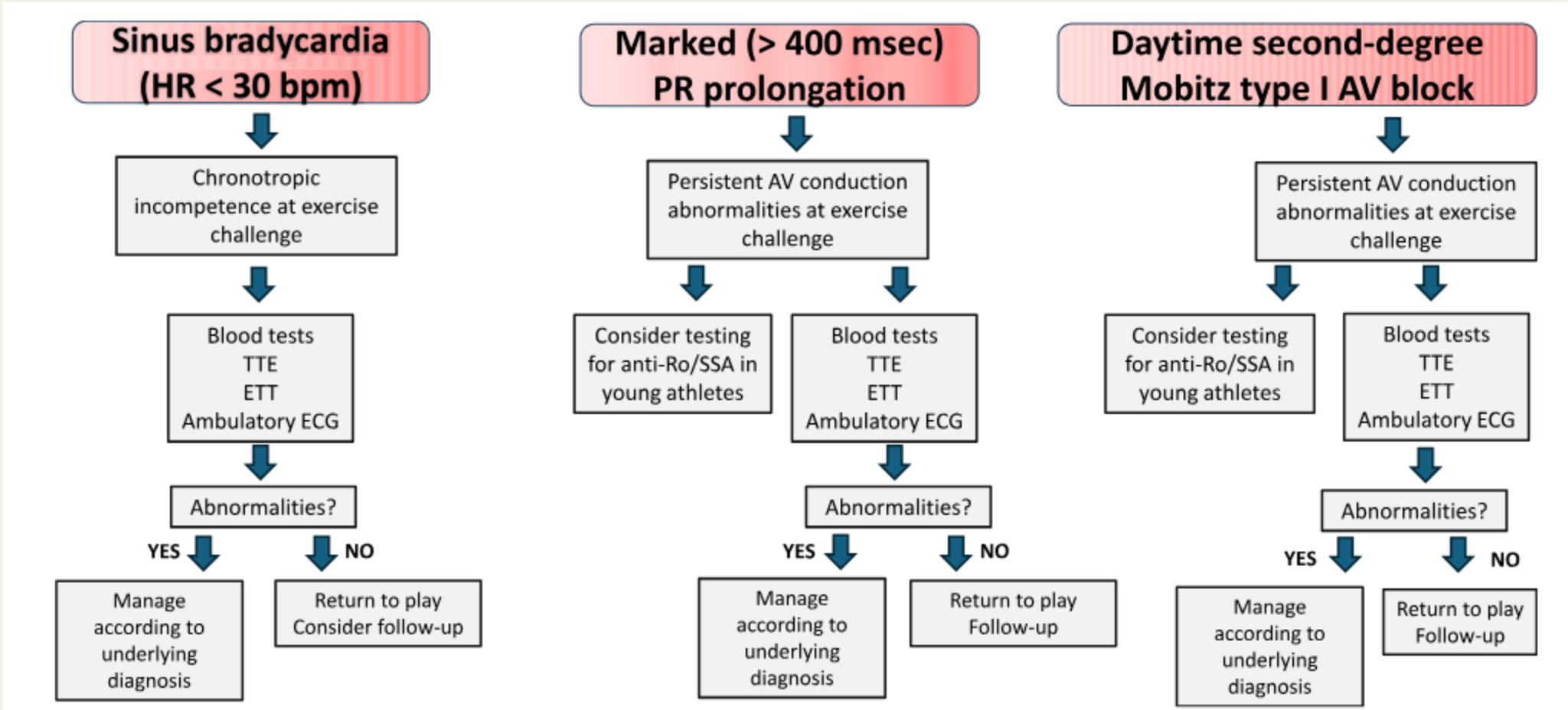


Figure 1 Management of athletes with bradyarrhythmias. It has to be noted that the recommendations on athletes with extreme bradycardia and marked PR prolongation apply to individuals in whom brisk exercise or hyperventilation does not rapidly resolve the anomaly. ETT, exercise tolerance test; HR, heart rate; TTE, transthoracic echocardiogram

Anti-Ro/SSA protilátky

- Autoprotilátky proti ribonukleoproteinovým antigenům (Ro60, Ro52)
- Typické pro Sjögrenův syndrom a systémový lupus erythematodes (SLE)
- Pomáhají v diagnostice autoimunitních onemocnění pojiva
- Klinický význam i mimo klasické revmatologické indikace
- Poruchy srdečního rytmu (AV blok, myokarditida) → možnost autoimunitní etiologie
- Kongenitální nebo získaný autoimmuní AV blok, který je způsoben maternálními anti-Ro/SSA-protilátkami (anti-Sjögren's-syndrome-related antigen A autoantibodies).

Léčba

- Základní onemocnění
- Implantace PM
- Kardioneuroablace

Journal of Interventional Cardiac Electrophysiology (2025) 68:281–292
https://doi.org/10.1007/s10840-024-01923-7

REVIEWS

Check for updates

Cardioneuroablation for the management of neurally mediated syncope, sinus bradycardia, and atrioventricular block

Jamario Skeete[1] · Jonathan S. Gordon[1] · Lincoln Kavinksy[1] · Henry D. Huang[1] · Tolga Aksu[2]

Způsobilost ke sportu

ESC European Society of Cardiology

European Heart Journal (2020) **00**, 1–80
doi:10.1093/eurheartj/ehaa605

ESC GUIDELINES

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

The Task Force on sports cardiology and exercise in patier cardiovascular disease of the European Society of Cardiolc

Doporučení pro... | Guidelines

Doporučené postupy ESC pro sportovní kardiologii a pohybovou aktivitu pacientů s kardiovaskulárním onemocněním, 2020.

Souhrn dokumentu připravený Českou kardiologickou společností

(2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease. Summary of the document prepared by the Czech Society of Cardiology)

Vladimír Tuka[a], Otakar Jiravský[b,c], Peter Kubuš[d], Eliška Sovová[e]

Na co nezapomenout v péči o MASTERS sportovce s bradykardií

- Nově myslet na AV blokádu II stupně Mobitz I (Wenkenbach) v denní době- jako potenciální patologii
- Při patologickém nálezu bradykardie pod 30/min, AV blokáda I stupně s PR nad 400 ms stačí udělat pár dřepů nebo hyperventilaci- pokud se zvýší tepová frekvence nebo zkrátí PR, nemusíme dále vyšetřovat (pokud není pozitivní RA nebo známá patologie)
- Myslet na genetické a autoimunitní příčiny (anti Ro/SSA, genetika)
- V posuzování způsobilosti je rozhodující základní onemocnění, které bradykardii způsobuje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