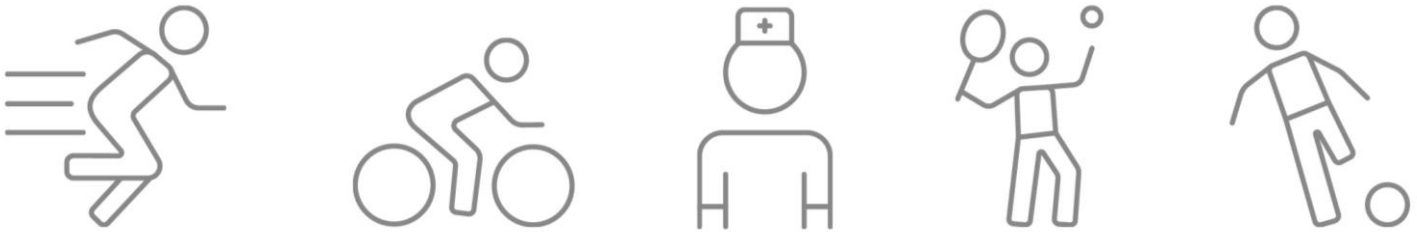
ČESKÁ SPOLEČNOST
TĚLOVÝCHOVNÉHO LÉKAŘSTVÍ

PREVENTIVNÍ VYŠETŘENÍ SPORTOVCE VE SVĚTLE AKTUÁLNÍ LEGISLATIVY A ODBORNÝCH DOPORUČENÍ

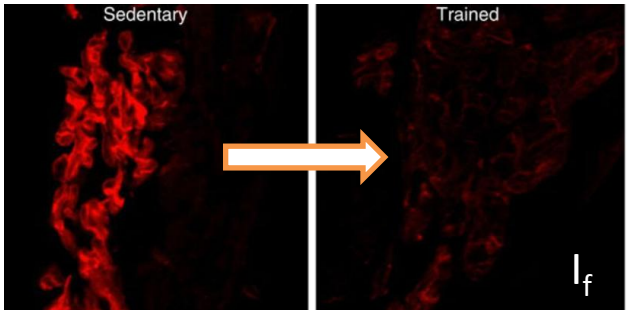
MUDr. Kryštof Slabý

Klinika rehabilitace a tělovýchovného lékařství
UK 2.LF a FN Motol

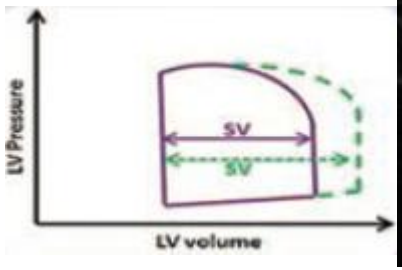


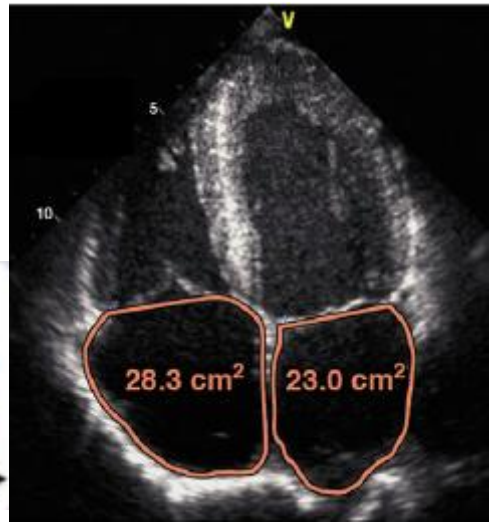
ADAPTACE NA VYTRVALOSTNÍ ZÁTĚŽ

- **Autonomní a elektrická**
  - » **Bradykardie, uniklé stahy**
  - » **Remodelace SA uzlu, sinus. arytmie**
  - » **Časná repolarizace, iRBBB, změny ST-T**



- **Strukturální**
  - » **Excentrická hypertrofie LK**
  - » **Dilatace LS**
  - » **Remodelace PK**

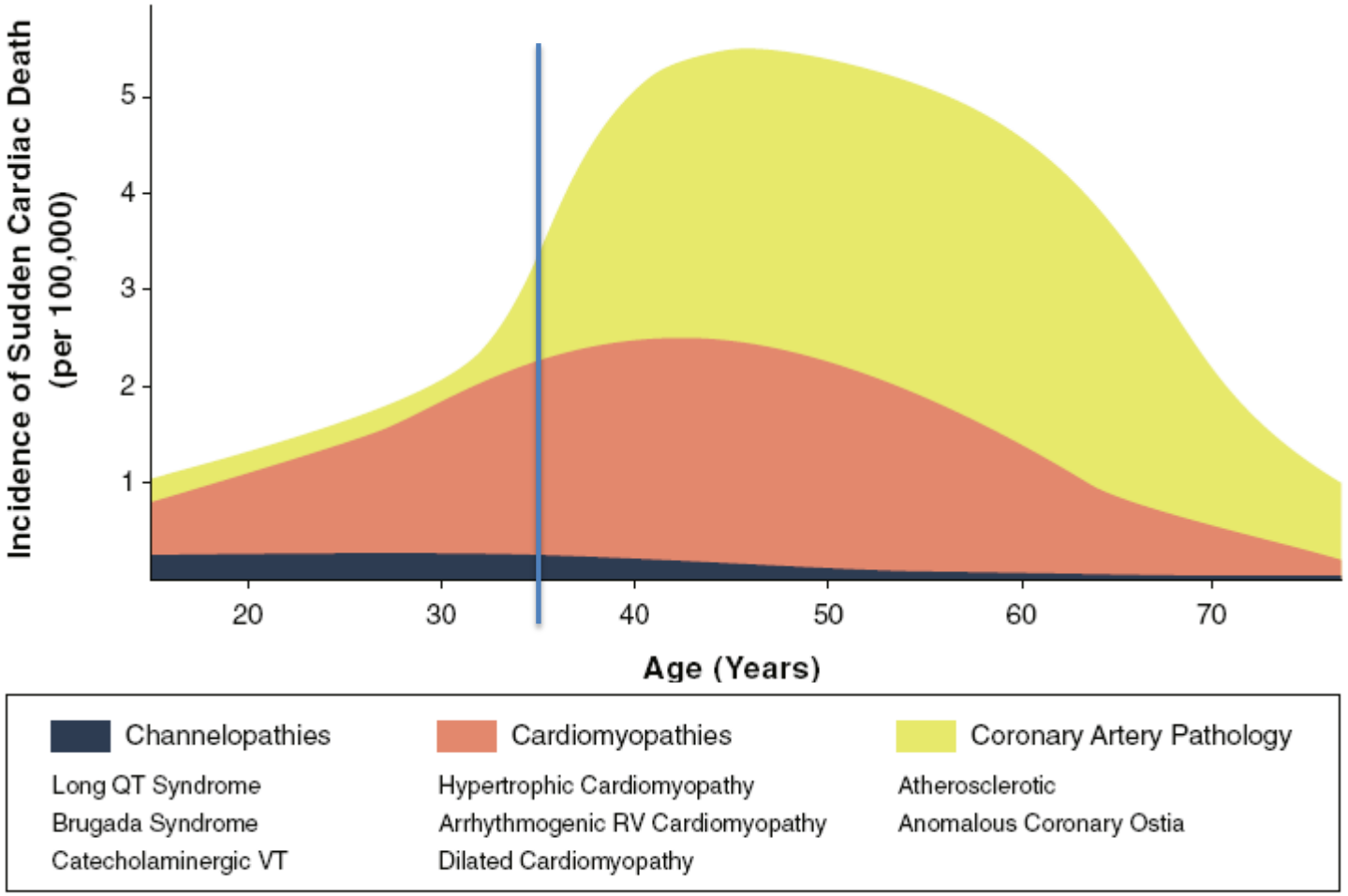




- **Fyziologická**
  - » **↑ extrakce O_2, ↑ max. srdeční výdej, ↓ % tělesného tuku**

Baldesberger S et al.: Eur Heart J 2008;29
La Gerche et al.: JACC Cardiovasc Imaging 2013

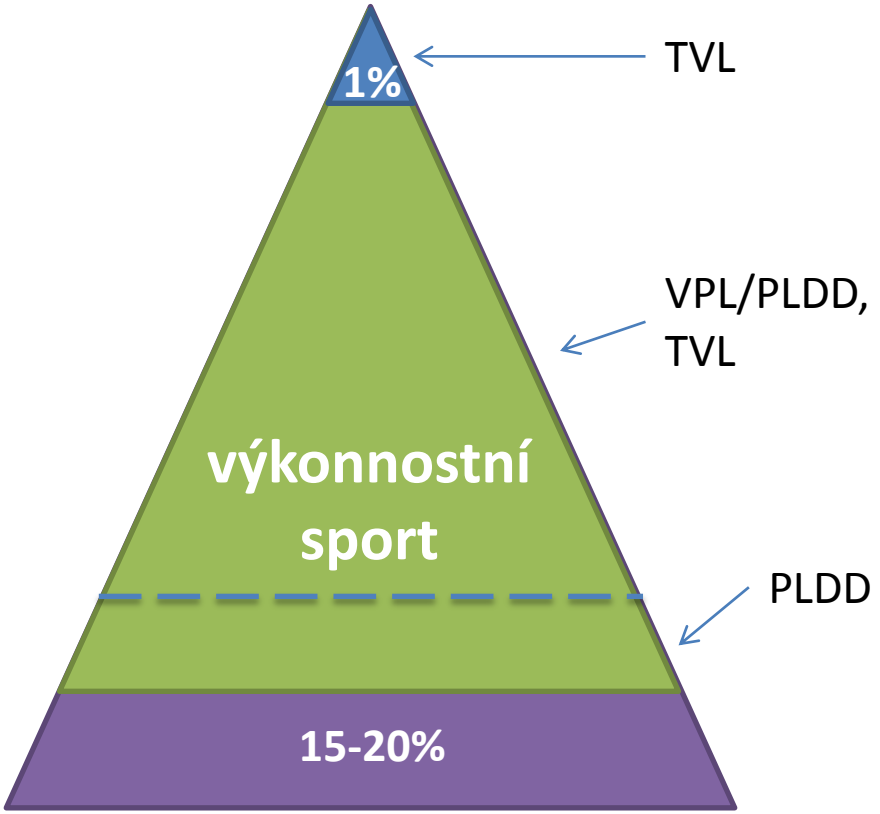
NÁHLÁ KV ÚMRTÍ PŘI SPORTU



La Gerche et al.: JACC Cardiovasc Imaging 2013

VÝKONNOSTNÍ KATEGORIE

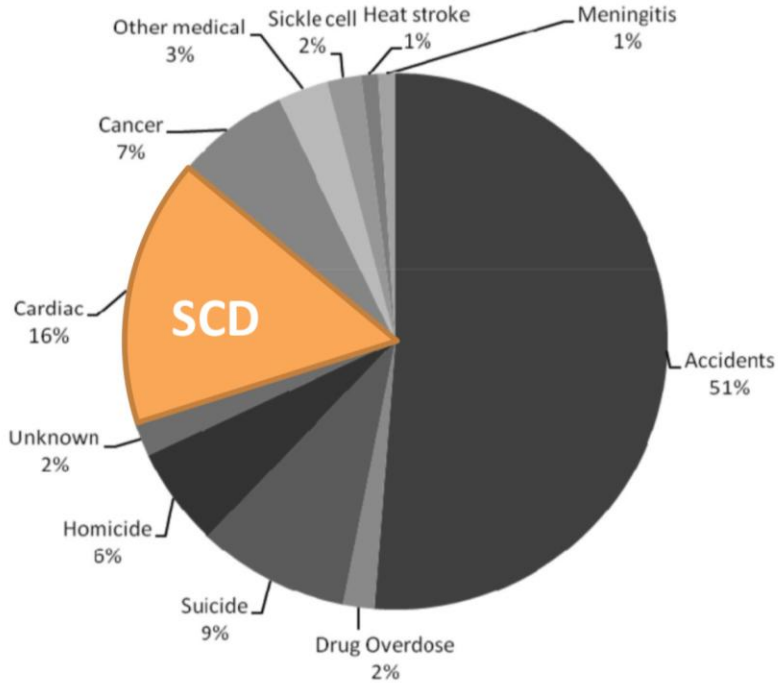
- Vrcholový sport
- Výkonnostní sport
- Příprava na výkonnostní sport
- „Rekreační“ sport



Fotbal 2015 (FAČR, ČUS)

RIZIKA POHYBOVÉ AKTIVITY

- **Nejčastější důvody ukončení sportovní kariery**
  - » **Chronické poškození pohybového aparátu**
  - » **Ztráta výkonnosti**
  - » **Ztráta motivace, zákaz činnosti**
  - » **Akutní úraz**
  - » **Závažné netraumatické**
- **Nejčastější příčiny náhlé smrti**
  - » **Traumatická**
  - » **Náhlá kardiovaskulární (SCD)**
  - » **Ostatní (nádorová, přehřátí, tonutí ad.)**



SCD in NCAA. Harmon KG et al.: Circulation 2011

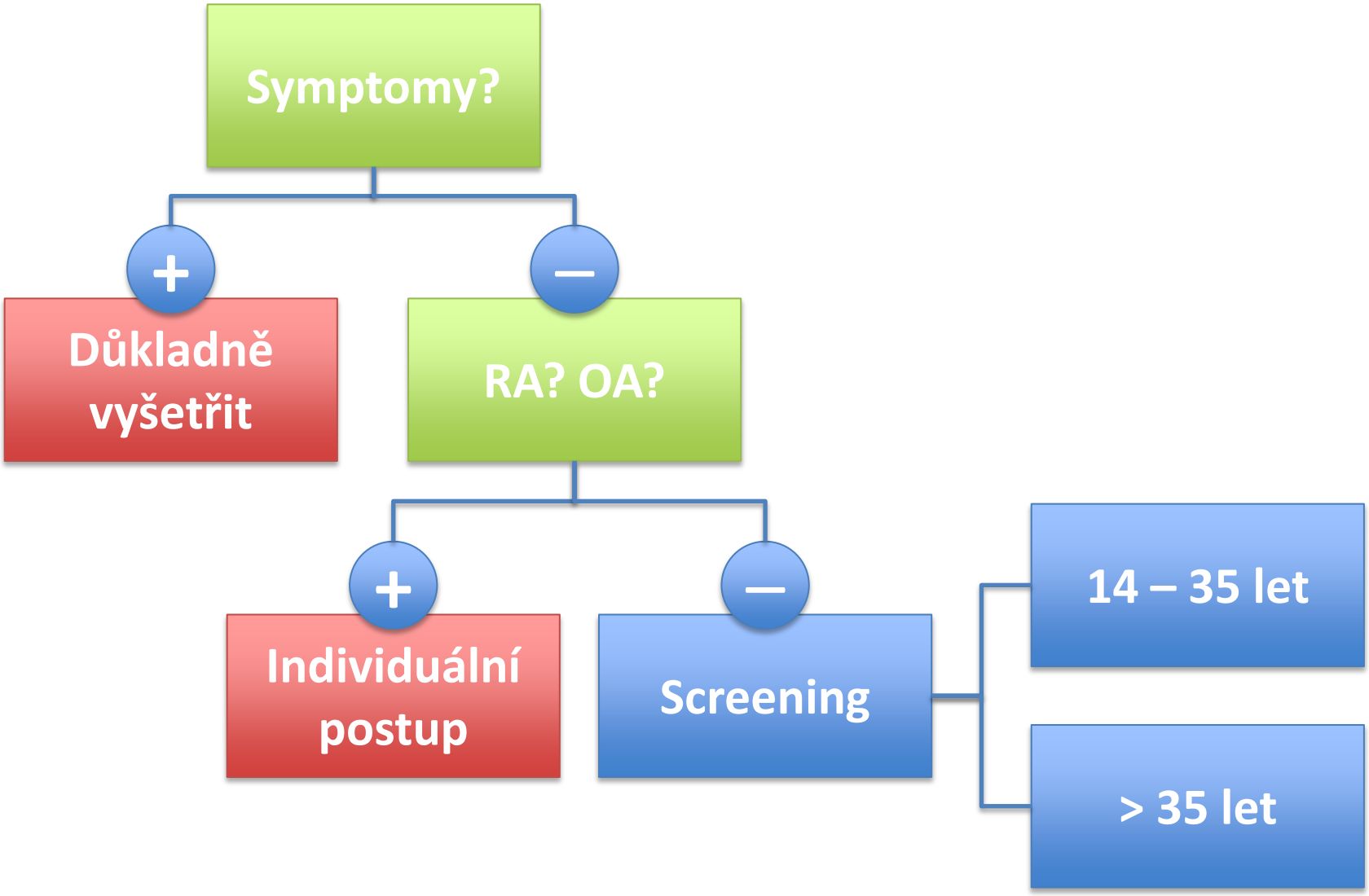
LEGISLATIVA

373/2011 Sb.
Zákon o specifických zdravotních službách

391/2013 Sb.
Vyhláška o zdravotní způsobilosti k tělesné výchově a sportu

Rovina	Forma		
Odborná	Vyšetření	Registrující praktik a/nebo tělovýchovný lékař + případně amb. specialista	
Organizační	Prohlídka	Vstupní	podrobná před výkon. sportem
		Periodická	pravidelná á 1 rok
		Mimořádná	po zranění, nemoci, delší pauze
Formální	Posudek	**Registrující praktik a/nebo tělovýchovný lékař**	

ZÁKLADNÍ ALGORITMUS



Europace (2017) **19**, 139–163
doi:10.1093/europace/euw243

EHRA POSITION PAPER

Pre-participation cardiovascular evaluation for athletic participants to prevent sudden death: Position paper from the EHRA and the EACPR, branches of the ESC. Endorsed by APHRS, HRS, and SOLAECE

Lluís Mont[1], Antonio Pelliccia[2], Sanjay Sharma[3], Alessandro Biffi[2], Mats Borjesson[4], Josep Brugada Terradellas[1], François Carré[5], Eduard Guasch[1], Hein Heidbuchel[6], André La Gerche[7], Rachel Lampert[8], William McKenna[9], Michail Papadakis[3], Silvia G. Priori[10], Mauricio Scanavacca[11], Paul Thompson[12], Christian Sticherling[13], Sami Viskin[14], Mathew Wilson[15], and Domenico Corrado[16]

Reviewers: Gregory Y.H. Lip, (Review Coordinator)[17], Bulent Gorenek[18], Carina Blomström Lundqvist[19], Bela Merkely[20], Gerhard Hindricks[21], Antonio Hernández-Madrid[22], Deirdre Lane[17], Guiseppe Boriani[23], Calambur Narasimhan[24], Manlio F. Marquez[25], David Haines[26], Judith Mackall[27], Pedro Manuel Marques-Vidal[28], Ugo Corra[29], Martin Halle[30], Monica Tiberi[31], Josef Niebauer[32], and Massimo Pieroli[33]

Mont L et al.: Europace. 2016

European Journal of
Cardiovascular
Prevention &
Rehabilitation

EUROPEAN SOCIETY OF CARDIOLOGY®

Review

European Journal of Cardiovascular Prevention & Rehabilitation
18(3) 446–458

DOI: 10.1177/HJR.0b013e32833b0969
ejcpr.sagepub.com
SAGE

Cardiovascular evaluation of middle-aged/ senior individuals engaged in leisure-time sport activities: position stand from the sections of exercise physiology and sports cardiology of the European Association of Cardiovascular Prevention and Rehabilitation

Mats Borjesson[1], Alex Urhausen[2], Evangelia Kouidi[3], Dorian Dugmore[4], Sanjay Sharma[5], Martin Halle[6], Hein Heidbüchel[7], Hans Halvor Björnstad[8], Stephan Gielen[9], Alessandro Mezzani[10], Domenico Corrado[11], Antonio Pelliccia[12] and Luc Vanhees[13]

Abstract

Regular aerobic exercise at moderate intensities and an increased physical fitness are associated with a reduced risk of fatal and nonfatal coronary events in middle-aged individuals. In contrast, moderate and vigorous physical exertion is associated with an increased risk for cardiac events, including sudden cardiac death in individuals harbouring cardiovascular disease. The risk-benefit ratio may differ in relation to the individual's age, fitness level, and presence of cardiovascular disease; sedentary individuals with underlying coronary artery disease are at greatest risk. The intention of the

Borjesson M et al.: Eur J Cardiovasc Prev Rehabil. 2011

SPECIAL COMMUNICATIONS

Roundtable Consensus Statement

Updating ACSM's Recommendations for Exercise Preparticipation Health Screening

DEBORAH RIEBE[1], BARRY A. FRANKLIN[2], PAUL D. THOMPSON[3], CAROL EWING GARBER[4], GEOFFREY P. WHITFIELD[5], MEIR MAGAL[6], and LINDA S. PESCATELLO[7]

[1]Department of Kinesiology, University of Rhode Island, Kingston, RI; [2]Department of Preventive Cardiology, Beaumont Health Center, Royal Oak, MI; [3]Department of Cardiology, Hartford Hospital, Hartford, CT; [4]Teachers College, Columbia University, New York, NY; [5]No affiliation; [6]Division of Mathematics and Sciences, North Carolina Wesleyan College, Rocky Mount, NC; and [7]Department of Kinesiology, University of Connecticut, Storrs, CT

ABSTRACT

RIEBE, D., B. A. FRANKLIN, P. D. THOMPSON, C. E. GARBER, G. P. WHITFIELD, M. MAGAL, and L. S. PESCATELLO. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. *Med. Sci. Sports Exerc.*, Vol. 47, No. 8, pp. 2473–2479, 2015. The purpose of the American College of Sports Medicine's (ACSM) exercise preparticipation health screening process is to identify individuals who may be at elevated risk for exercise-related sudden cardiac death and/or acute myocardial infarction. Recent studies have suggested that using the current ACSM exercise preparticipation health screening guidelines can result in excessive physician referrals, possibly creating a barrier to exercise participation. In addition, there is considerable evidence that exercise is safe for most people and has many associated health and fitness benefits; exercise-related cardiovascular events are often preceded by warning signs/symptoms; and the cardiovascular risks associated with exercise lessen as individuals become more physically active/fit. Consequently, a scientific roundtable was convened by the ACSM in June 2014 to evaluate the current exercise preparticipation health screening recommendations. The roundtable proposed a new evidence-informed model for exercise preparticipation health screening on the basis of three factors: 1) the individual's current level of physical activity, 2) presence of signs or symptoms and/or known cardiovascular, metabolic, or renal disease, and 3) desired exercise intensity, as these variables have been identified as risk modulators of exercise-related cardiovascular events. Identifying cardiovascular disease risk factors remains an important objective of overall disease prevention and management, but risk factor profiling is no longer included in the exercise preparticipation health screening process. The new ACSM exercise preparticipation health screening recommendations reduce possible unnecessary barriers to adopting and maintaining a regular exercise program, a lifestyle of habitual physical activity, or both, and thereby emphasize the important public health

Riebe D et al.: Med Sci Sports Exerc. 2015

PREVENTIVNÍ VYŠETŘENÍ

- Mont L, Pelliccia A, Sharma S, Biffi A, Borjesson M, Terradellas JB, et al. **Pre-participation cardiovascular evaluation for athletic participants to prevent sudden death**: Position paper from the EHRA and the EACPR, branches of the ESC. Endorsed by APHRS, HRS, and SOLAECE. Europace. 2016;euw243. **doi: 10.1093/europace/euw243**

- Borjesson M, Urhausen A, Kouidi E, Dugmore D, Sharma S, Halle M, et al. **Cardiovascular evaluation of middle-aged/ senior individuals engaged in leisure-time sport activities**: position stand from the sections of exercise physiology and sports cardiology of the European Association of Cardiovascular Prevention and Rehabilitatio. Eur J Cardiovasc Prev Rehabil. 2011;18(3):446–58. **doi: 10.1097/HJR.0b013e32833bo969**

- Riebe D, Franklin BA, Thompson PD, Garber CE, Whitfield GP, Magal M, et al. **Updating ACSM's Recommendations for Exercise Preparticipation Health Screening**. Med Sci Sports Exerc. 2015;47(11):2473–9. **doi: 10.1249/MSS.0000000000000664**

European Heart Journal (2017) 00, 1–19
doi:10.1093/eurheartj/ehw631

CURRENT OPINION

International recommendations for electrocardiographic interpretation in athletes

Sanjay Sharma[1*†], Jonathan A. Drezner[2†], Aaron Baggish[3], Michael Papadakis[1], Mathew G. Wilson[4], Jordan M. Prutkin[5], Andre La Gerche[6], Michael J. Ackerman[7], Mats Borjesson[8], Jack C. Salerno[9], Irfan M. Asif[10], David S. Owens[5], Eugene H. Chung[11], Michael S. Emery[12], Victor F. Froelicher[13], Hein Heidbuchel[14,15], Carmen Adamuz[4], Chad A. Asplund[16], Gordon Cohen[17], Kimberly G. Harmon[2], Joseph C. Marek[18], Silvana Molossi[19], Josef Niebauer[20], Hank F. Pelto[2], Marco V. Perez[21], Nathan R. Riding[4], Tess Saarel[22], Christ[illegible], David M. Shipon[24], Ricardo Stein[25], Victoria L. Vetter[26], [illegible], Domenico Corrado[28]

[1]Cardiology Clinical Academic Group, St George's, University of London, UK; [2]Department of Family Medicine, University of Massachusettes General Hospital, MA, USA; [4]Department of Sports Medicine, ASPETAR, Qatar Orthopaedic and Sports [illegible] of Washington, Seattle, WA, USA; [6]Department of Cardiology, Baker IDI Heart and Diabetes Institute, Melbourne, Australia; [7]D[illegible] Medicine, and Molecular Pharmacology and Experimental Therapeutics, Mayo Clinic, MN, USA; [8]Department of Neuroscience a[illegible] Sahlgrenska Academy, Goteborg, Sweden; [9]Department of Pediatrics, University of Washington, Seattle, WA, USA; [10]Departme[illegible]

CURRENT OPINION

International Recommendatio[illegible] Electrocardiographic Interpre[illegible] in Athletes

Sanjay Sharma, MD,[a,*] Jonathan A. Drezner, MD,[b,*] Aaron Baggish, MD,[c] M[illegible] Mathew G. Wilson, PhD,[d] Jordan M. Prutkin, MD, MHS,[e] Andre La Gerche, M[illegible] Mats Borjesson, MD, PhD,[h] Jack C. Salerno, MD,[i] Irfan M. Asif, MD,[j] David [illegible] Eugene H. Chung, MD, MS,[k] Michael S. Emery, MD,[l] Victor F. Froelicher, MD,[m] Hein Heidbuchel, MD, PhD,[n,o] Carmen Adamuz, MD, PhD,[d] Chad A. Asplund, MD,[p] Gordon Cohen, MD,[q] Kimberly G. Harmon, MD,[b] Joseph C. Marek, MD,[r] Silvana Molossi, MD,[s] Josef Niebauer, MD, PhD,[t] Hank F. Pelto, MD,[b] Marco V. Perez, MD,[u] Nathan R. Riding, PhD,[d] Tess Saarel, MD,[v] Christian M. Schmied, MD,[w] David M. Shipon, MD,[x] Ricardo Stein, MD, ScD,[y] Victoria L. Vetter, MD, MPH,[z] Antonio Pelliccia, MD,[aa] Domenico Corrado, MD, PhD[bb]

Consensus statement

International criteria for electrocardiographic interpretation in athletes

Jonathan A Drezner,[1] Sanjay Sharma,[2] Aaron Baggish,[3] Michael Papadakis,[2] Mathew G Wilson,[4] Jordan M Prutkin,[5] Andre La Gerche,[6] Michael J Ackerman,[7,8,9,10,11] Mats Borjesson,[12,13] Jack C Salerno,[14] Irfan M Asif,[15] David S Owens,[5] Eugene H Chung,[16] Michael S Emery,[17] Victor F Froelicher,[18] Hein Heidbuchel,[19] Carmen Adamuz,[4] Chad A Asplund,[20] Gordon Cohen,[21,22] Kimberly G Harmon,[1] Joseph C Marek,[23] Silvana Molossi,[24,25] Josef Niebauer,[26] Hank F Pelto,[1] Marco V Perez,[27] Nathan R Riding,[4] Tess Saarel,[28,29] Christian M Schmied,[30] David M Shipon,[31] Ricardo Stein,[32] Victoria L Vetter,[33] Antonio Pelliccia,[34] Domenico Corrado[35,36,37]

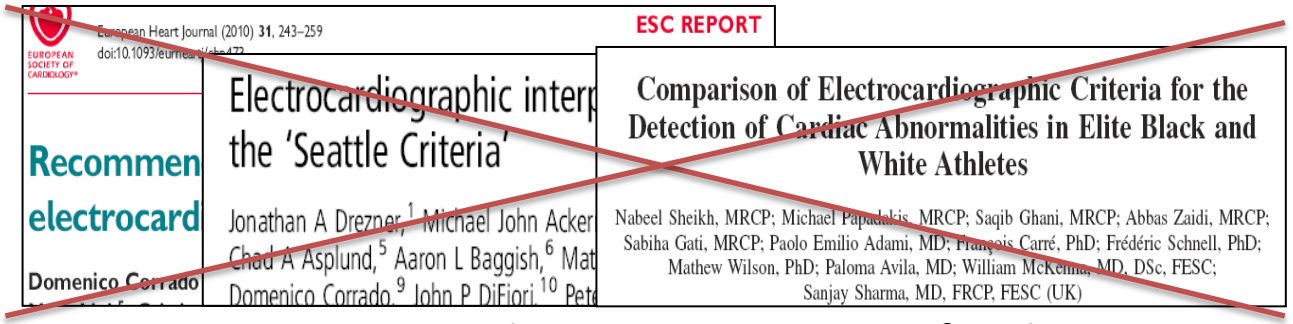
This statement has been endorsed by the following societies: American Medical Society for Sports Medicine (AMSSM), Austrian Society of Sports Medicine and Prevention, Brazilian Society of Cardiology – Department of Exercise and Rehabilitation (SBC – DERC), British Association for Sports and Exercise Medicine (BASEM), Canadian Academy of Sport and Exercise Medicine (CASEM), European College of Sports and Exercise Physicians (ECOSEP), European Society of Cardiology (ESC) Section of Sports Cardiology, Fédération Internationale de Football Association (FIFA), German Society of Sports Medicine and Prevention, International Olympic Committee (IOC), Norwegian Association of Sports Medicine and Physical Activity (NIMF), South African Sports Medicine Association (SASMA), Spanish Society of Cardiology (SEC) Sports Cardiology Group, Sports Doctors Australia, and the Swedish Society of Exercise and Sports Medicine (SFAIM). The American College of Cardiology (ACC) affirms the value of this document. ACC supports the general principles in the document

Sharma S et al.: Eur Heart J. 2017
Drezner JA et al.: Br J Sports Med. 2017

KRITERIA PRO HODNOCENÍ KLIDOVÉHO EKG

- Sharma S, Drezner JA, Baggish A, Papadakis M, Wilson MG, Prutkin JM, et al. **International recommendations for electrocardiographic interpretation in athletes**.
  Eur Heart J. 2017 **doi: 10.1093/eurheartj/ehw631**
  J Am Coll Cardiol. 2017;69(8):1057–75 **doi: 10.1016/j.jacc.2017.01.015**

- Drezner JA, Sharma S, Baggish A, Papadakis M, Wilson MG, Prutkin JM, et al. **International criteria for electrocardiographic interpretation in athletes**.
  Br J Sports Med. 2017;bjsports-2016-097331
  doi: 10.1136/bjsports-2016-097331



ESC 2010 Seattle 2013 Refined 2014

DOPORUČENÍ PRO ...

Doporučené postupy vycházejí ze soudobých poznatků lékařské vědy a považují se za postupy lege artis. Jde však o doporučení, nikoli předpisy, proto je nutný individuální přístup ke každému nemocnému. Ošetřující lékař může použít jiný postup, musí však v dokumentaci řádně zdůvodnit, proč se od doporučeného postupu odchýlil.

Pohybová a sportovní aktivita u dětí a mladistvých s kardiovaskulárním onemocněním

Doporučený postup České kardiologické společnosti a České společnosti tělovýchovného lékařství vypracovaný Pracovní skupinou pediatrické kardiologie

Autorský kolektiv: Václav Chaloupecký[1], Oleg Reich[1], Jan Janoušek[1], Helena Bartáková[1], Jiří Radvanský[2], Kryštof Slabý[2], Zuzana Urbanová[3], Jan Škovránek[1]

[1] Dětské kardiocentrum a Centrum výzkumu chorob srdce a cév, FN v Motole, Praha; [2] Klinika rehabilitace a tělovýchovného lékařství 2. LF UK a FN v Motole, Praha; [3] Klinika dětského a dorostového lékařství 1. LF UK a VFN, Praha

Adresa: Prof. MUDr. Václav Chaloupecký, CSc., Dětské kardiocentrum, FN v Motole, V Úvalu 84, 150 06 Praha 5, e-mail: v.chaloupecky@fnmotol.cz

Chaloupecký V et al.: Cor Vasa. 2011

European Heart Journal (2005) 26, 1422–1445
doi:10.1093/eurheartj/ehi325

ESC Report

Recommendations for competitive sports participation in athletes with cardiovascular disease

A consensus document from the Study Group of Sports Cardiology of the Working Group of Cardiac Rehabilitation and Exercise Physiology and the Working Group of Myocardial and Pericardial Diseases of the European Society of Cardiology

Antonio Pelliccia[1*], Robert Fagard[2], Hans Halvor Bjørnstad[3], Aris Anastassakis[4], Eloisa Arbustini[5], Deodato Assanelli[6], Alessandro Biffi[1], Mats Borjesson[7], François Carrè[8], Domenico Corrado[9], Pietro Delise[10], Uwe Dorwarth[11], Asle Hirth[3], Hein Heidbuchel[12], Ellen Hoffmann[11], Klaus P. Mellwig[13], Nicole Panhuyzen-Goedkoop[14], Angela Pisani[5], Erik E. Solberg[15], Frank van-Buuren[13], and Luc Vanhees[2]

Experts who contributed to and revised parts of these recommendations:
Carina Blomstrom-Lundqvist[16], Asterios Deligiannis[17], Dorian Dugmore[18], Michael Glikson[19], Per Ivar Hoff[3], Andreas Hoffmann[20], Erik Hoffmann[21], Dieter Horstkotte[14], Jan Erik Nordrehaug[3], Jan Oudhof[22], William J. McKenna[23], Maria Penco[24], Silvia Priori[25], Tony Reybrouck[2], Jeff Senden[26], Antonio Spataro[1], and Gaetano Thiene[9]

[1] *National Institute of Sports Medicine, Italian National Olympic Committee, Via dei Campi Sportivi 46, 00197 Rome, Italy;* [2] *Cardiovascular Rehabilitation Unit, KU Leuven, Leuven, Belgium;* [3] *Department of Heart Disease, Haukeland University Hospital, Bergen, Norway;* [4] *Division of Inherited Cardiovascular Diseases, University of Athens, Athens, Greece;* [5] *Department of Pathological Anatomy, University of Pavia, Pavia, Italy;* [6] *Department of Cardiology, University of Brescia, Brescia, Italy;* [7] *Department of Medicine, Sahlgrens University Hospital/Östra, Gothenburg, Sweden;* [8] *Unité Biologie et*

Pelliccia A et al.: Eur Heart J. 2005

AHA/ACC Scientific Statement

Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities: Preamble, Principles, and General Considerations

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

Barry J. Maron, MD, FACC, Co-Chair; Douglas P. Zipes, MD, FAHA, MACC, Co-Chair; Richard J. Kovacs, MD, FAHA, FACC, Co-Chair; on behalf of the American Heart Association Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, Council on Cardiovascular Disease in the Young, Council on Cardiovascular and Stroke Nursing, Council on Functional Genomics and Translational Biology, and the American College of Cardiology

This document addresses medical issues related to trained athletes with cardiovascular abnormalities. The objective is to present, in a readily useable format, consensus recommendations and guidelines principally addressing criteria for eligibility and disqualification from organized competitive sports for the purpose of ensuring the health and safety of young athletes. Recognizing certain medical risks imposed on athletes with cardiovascular disease, it is our aspiration that the recommendations that constitute this document will serve as a useful guide to the practicing community for clinical decision making. The ultimate goal is prevention of sudden death in the young, although it is also important not to unfairly or unnecessarily remove people from a healthy athletic lifestyle or competitive sports (that may be physiologically and psy-

Historical Context

There have been 3 prior documents, all sponsored by the American College of Cardiology (ACC),[1–3] that addressed eligibility and disqualification criteria for competitive athletes with cardiovascular diseases: Bethesda Conferences 16 (1985), 26 (1994), and 36 (2005), published and used over a 30-year period. Each of the 3 initiatives (and the present American Heart Association (AHA)/ACC scientific statement) were driven by the tenet that young trained athletes with underlying cardiovascular abnormalities are likely at some increase in risk for sudden cardiac death (usually on the athletic field) compared to nonathletes or competitive athletes without cardiovascular disease.[4–8]

All 3 Bethesda Conferences and the present derived AHA/

(Taskforce 1–15)

Maron BJ et al.: Circulation. 2015

SPORTOVCI S KV ONEMOCNĚNÍM

- Chaloupecký V, Reich O, Janoušek J, Bartáková H, Radvanský J, Slabý K, et al. **Pohybová a sportovní aktivita u dětí a mladistvých s kardiovaskulárním onemocněním**. Doporučený postup České kardiologické společnosti a České společnosti tělovýchovného lékařství.
  Cor Vasa. 2011;53(Suppl 1):86–103.

- Pelliccia A, Fagard R, Bjørnstad HH, Anastassakis A, Arbustini E, Assanelli D, et al. **Recommendations for competitive sports participation in athletes with cardiovascular disease**: a consensus document from the Study Group of Sports Cardiology of the Working Group of Cardiac Rehabilitation and Exercise Physiology and the Working Group of Myocardial and Pericardial Diseases of the European Society of Cardiology. Eur Heart J. 2005;26(14):1422–45
  doi: 10.1093/eurheartj/ehi325

- Maron BJ, Zipes DP, Kovacs RJ, American Heart Association Electrocardiography and Arrhythmias Committee of Council on Clinical Cardiology, Council on Cardiovascular Disease in Young, Council on Cardiovascular and Stroke Nursing, Council on Functional Genomics and Translational Biology. **Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities**: Preamble, Principles, and General Considerations: A Scientific Statement From the American Heart Association and American College of Cardiology. Circulation. 2015;132(22):e256-349 (Taskforce 1–15)
  doi: 10.1161/CIR.0000000000000236

SCREENING 14 – 35 LET

1) ? symptomy, OA (strukturovaný dotazník?)

2) Základní vyšetření

- **rozšířené fyzikální vyšetření**
- **klidové EKG – specializovaná kriteria**

±3) Následná vyšetření

- **Indikace při podezření na patologii podle 1) a 2)**
- **ECHO, zátěžový test, EKG Holter; zobrazovací metody, elektrofyziologie,...**

Mont L et al.: Europace. 2016

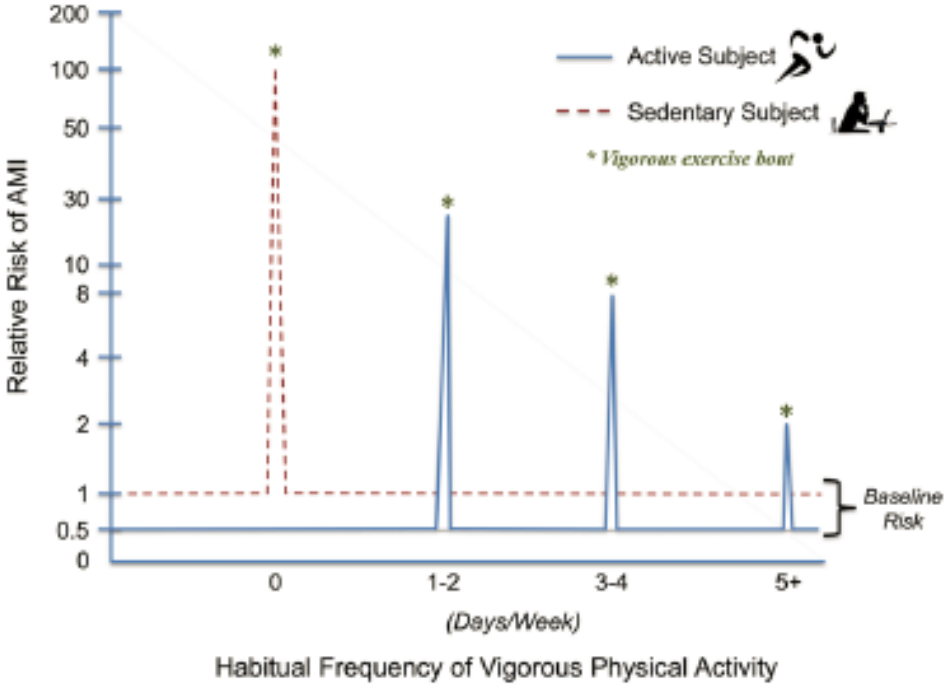
SCREENING > 35 LET

1) ? symptomy, OA

2) ? ↑ intensita PA, dlouhá pauza

±3) Základní vyšetření

- » **Fyzikální vyšetření**
- » **Rizikový profil – SCORE≥5%, TC>8,LDL>6, TK>180/110, DM s MAU, riziková RA, BMI>30**
- » **Klidové EKG**



±4) Následná vyšetření – zátěž, ECHO...

Borjesson M et al.: Eur J Cardiovasc Prev Reh. 2011
Riebe L et al.: Med Sci Sports Exerc. 2015

DĚKUJU ZA POZORNOST!

MUDr. Kryštof Slabý
Klinika rehabilitace a tělovýchovného lékařství
UK 2.LF a FN Motol
krystof.slaby@lfmotol.cuni.cz
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TĚLOVÝCHOVNÉ LÉKAŘSTVÍ 2017

Konference České společnosti tělovýchovného lékařství

19. – 21. 10. 2017
Hotel Imperial, Ostrava