

Doporučené postupy pro léčbu KT a prevenci NSS 2022 – co je nového?

Petr Peichl



2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

Developed by the task force for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death of the European Society of Cardiology (ESC)

Endorsed by the Association for European Paediatric and Congenital Cardiology (AEPC)

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Struktura doporučení

Classes of recommendations

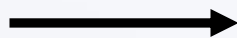
	Definition	Wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended or is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy.	Should be considered
Class IIb	Usefulness/efficacy is less well established by evidence/opinion.	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

Level of evidence A	Data derived from multiple randomized clinical trials or meta-analyses.
Level of evidence B	Data derived from a single randomized clinical trial or large non-randomized studies.
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries.

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Pohled do kuchyně tvorby doporučených postupů ...

- První schůzka 09/2020
- Limit textu na 10.000 slov, bez omezení u schémat
- Základem jsou doporučení (recommendations), text vzniká až v druhé době
- Vytvoření *Table of evidence* pro každé doporučení



- Od 09.2021 Review, review, review...

Agenda

- Diagnostika pacientů s KT – klinické scénáře
- Riziková stratifikace NSS u arytmiických syndromů
- Akutní léčba KES, širokokomplexové tachykardie a arytmiické bouře



Diagnostika pacientů s komorovými arytmiemi

Klinické scénáře



Diagnostika nesetrvané KT



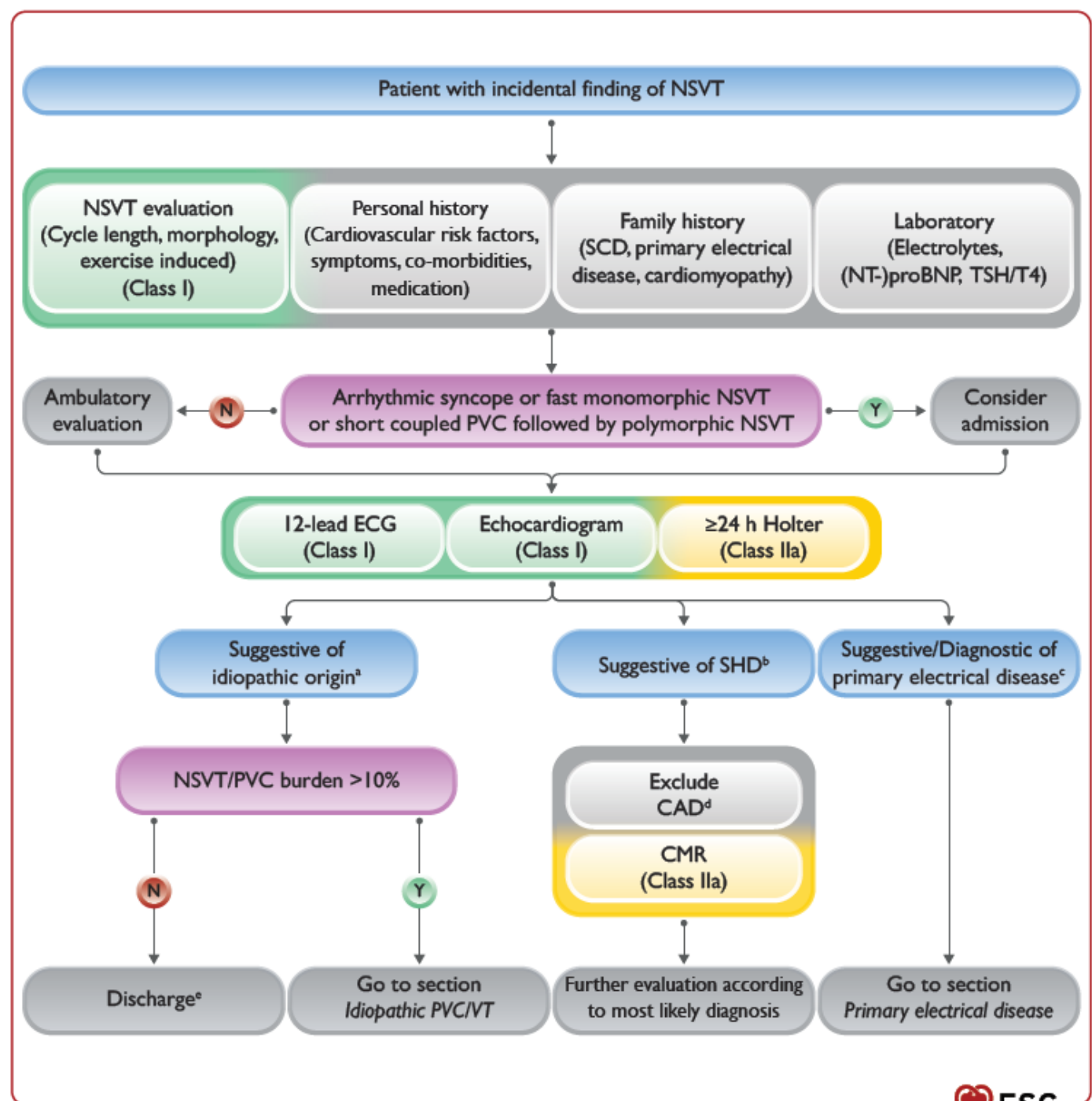
Diagnostika

Nesetrvalé KT

-EKG mono vs poly

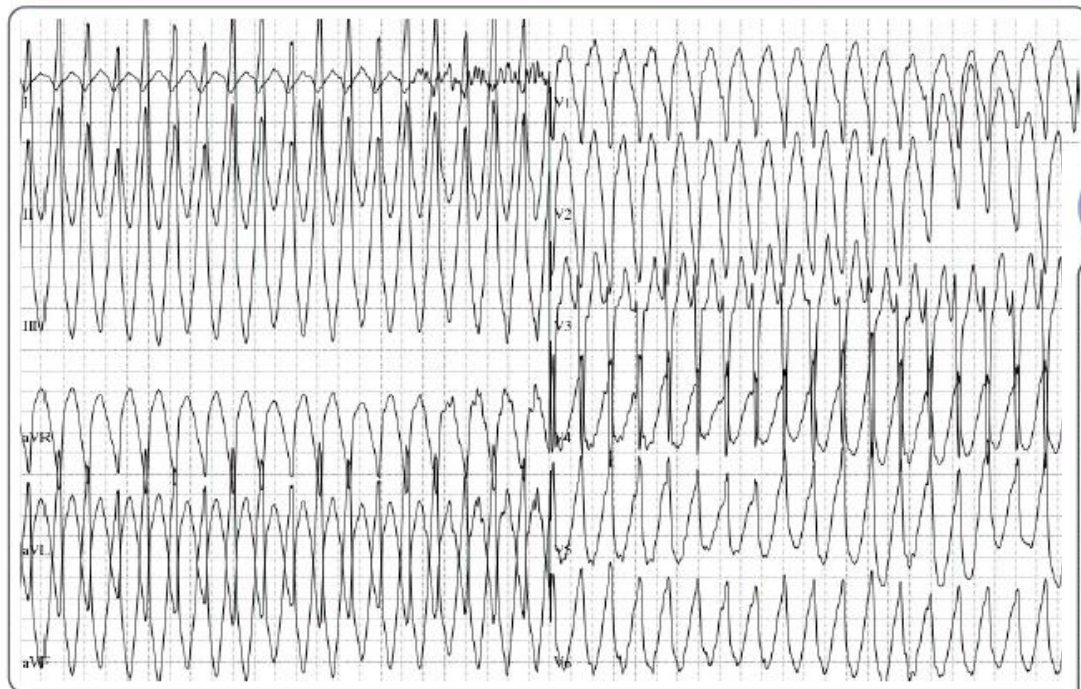
-Krátký vazebný interval <300ms
spouštěcí KES

-Při vyšetření pátrání po strukturálním onemocnění (SKG, MRI) a primárních elektrický syndromech

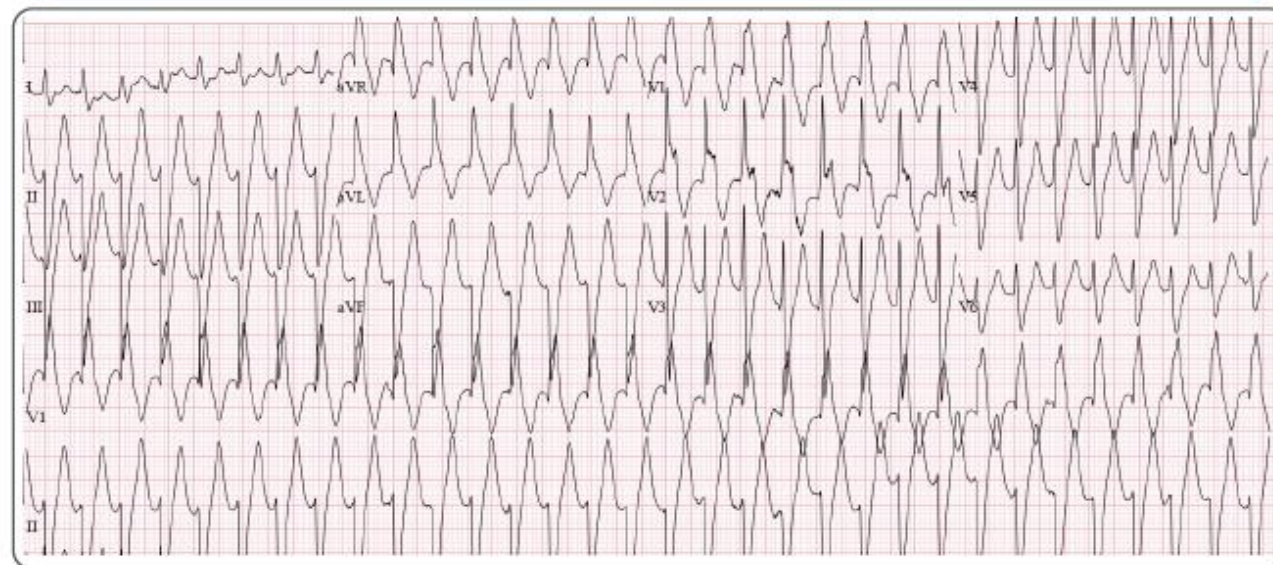


Diagnostika – setrvalé KT

RVOT VT (LBBB-like, inferior axis, V4 transition)



LV fascicular VT (RBBB-like, superior axis, QRS 130 ms)



Diagnostika

Nově dg. setrvalá KT

- EKG charakteristiky iKT
- Pátrání po strukturálním srdečním onemocnění

– SKG u susp. ICHS

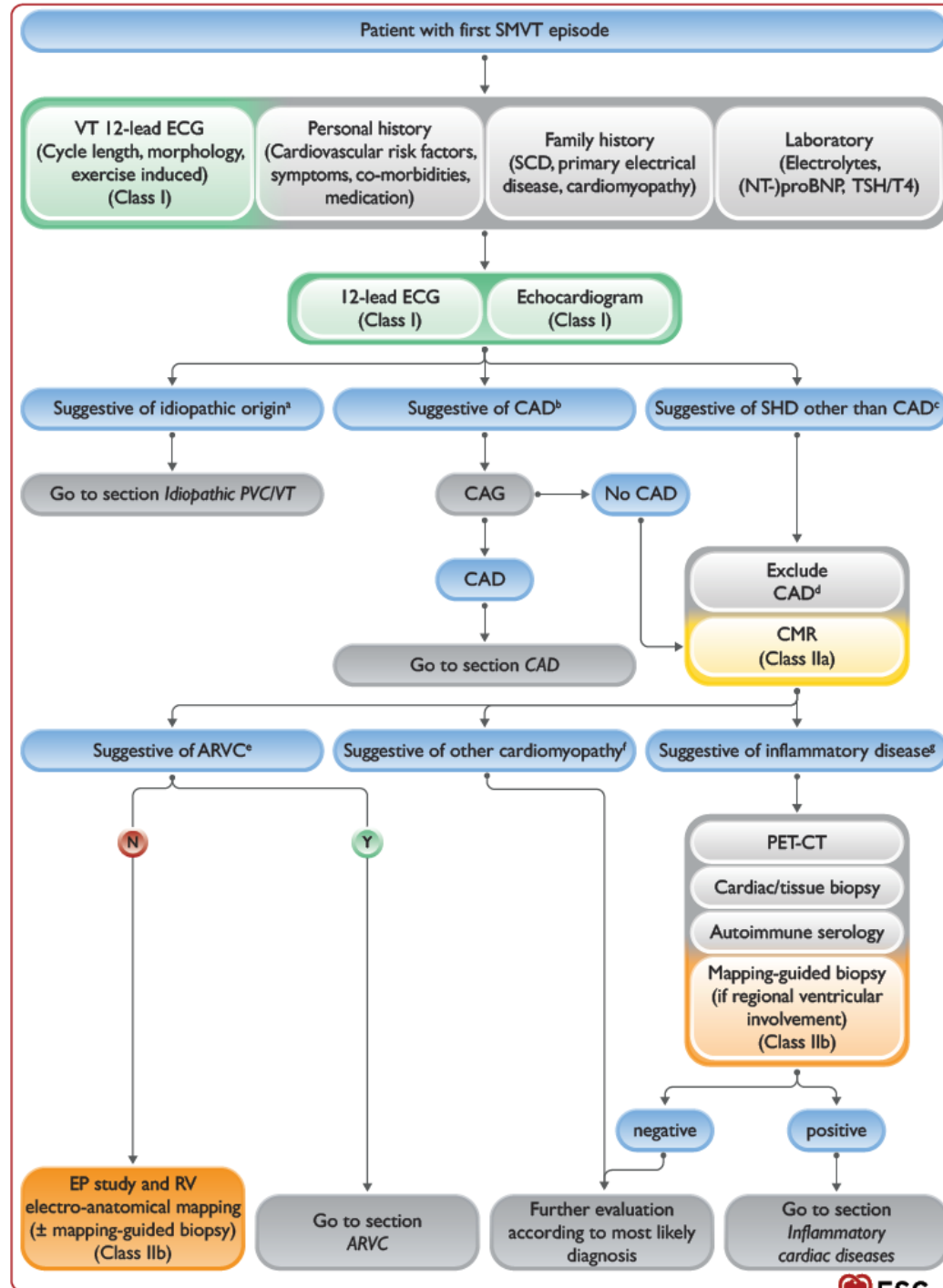
– MRI IIa u DKMP

– U susp. ARVC

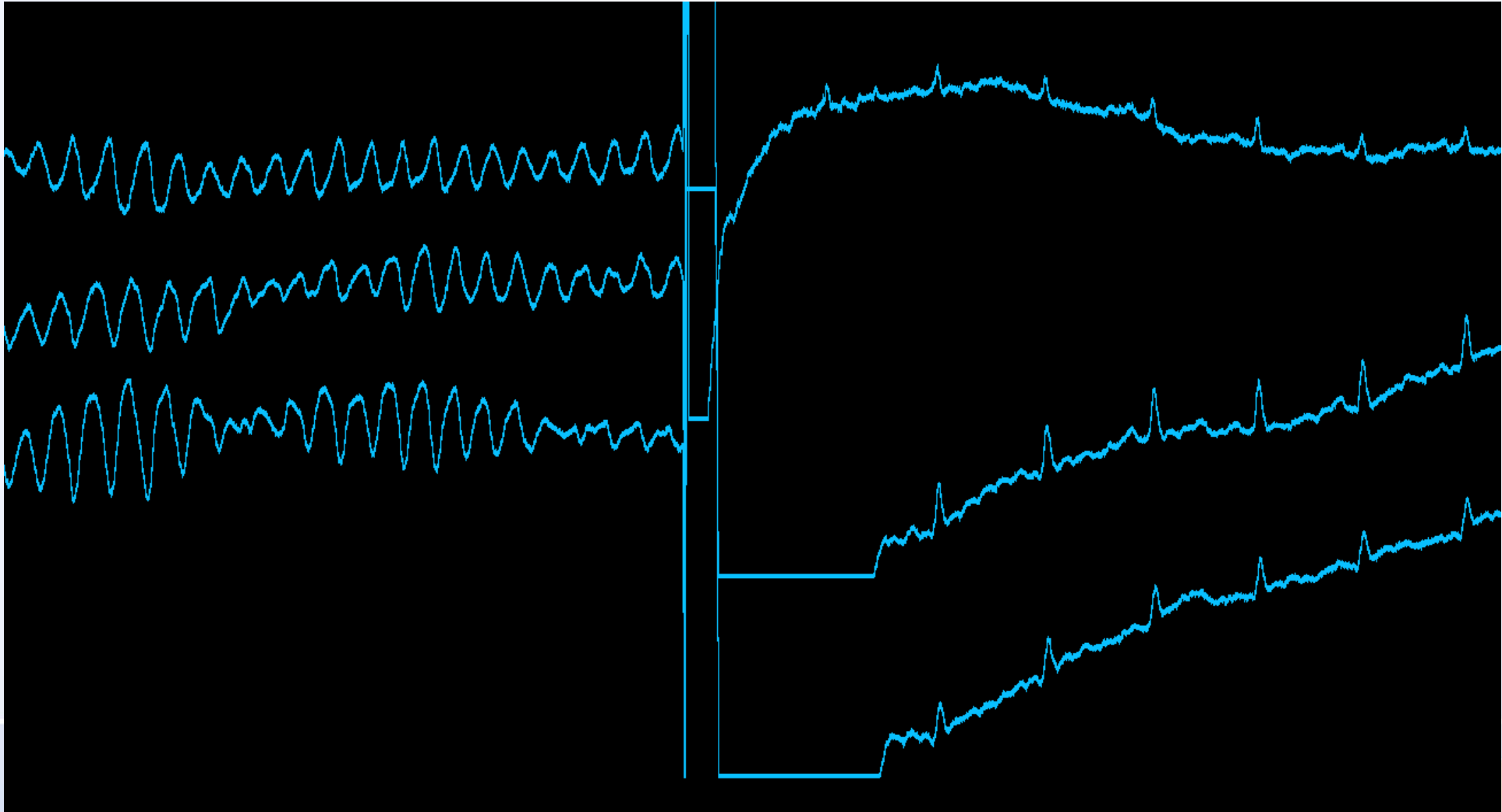
- EP mapování ± biopsie

– Infiltrativní/zánětlivé on.

- PET CT ± biopsie



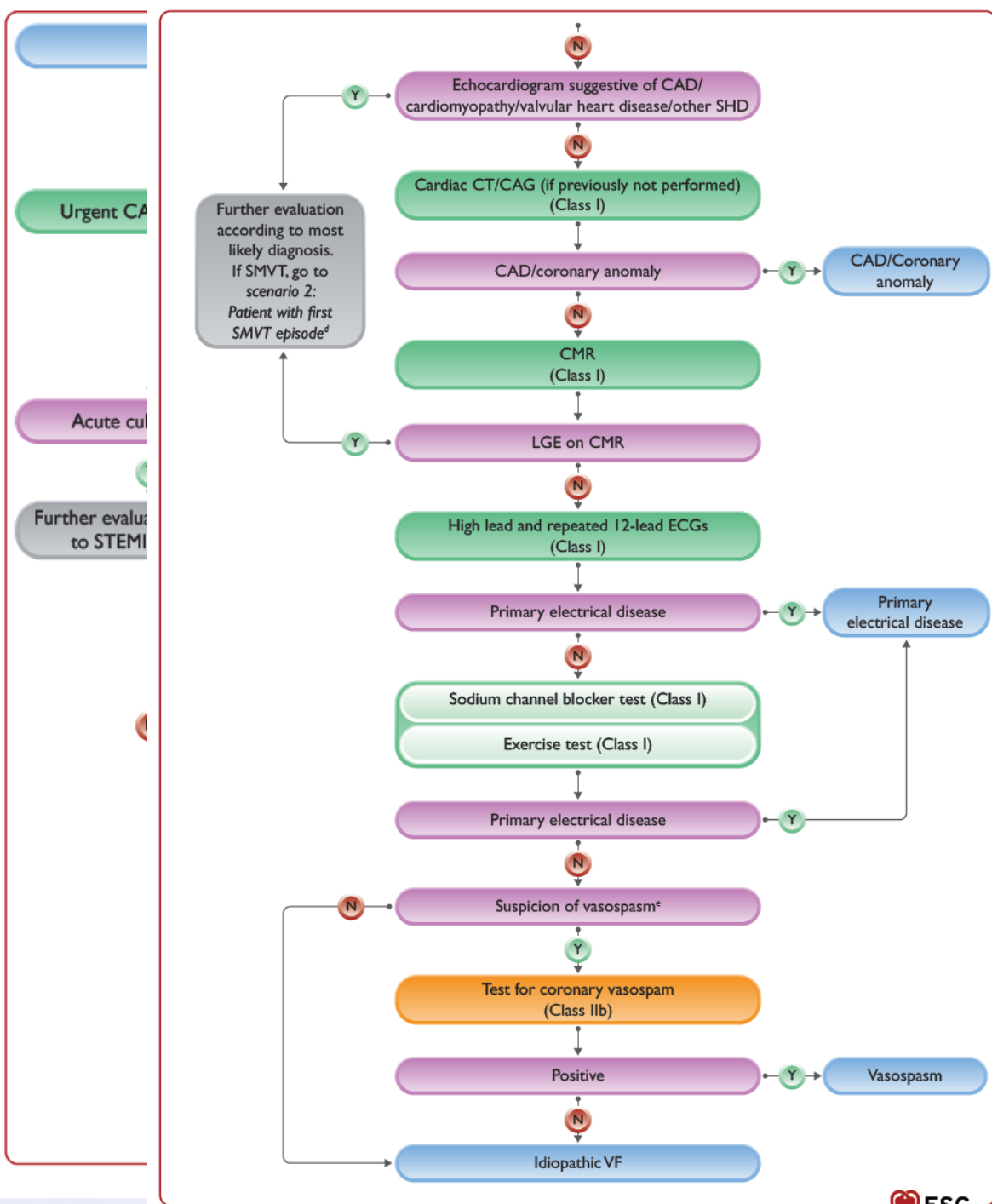
Diagnostika – stp. KPCR



Diagnostika

Stp. KPCR

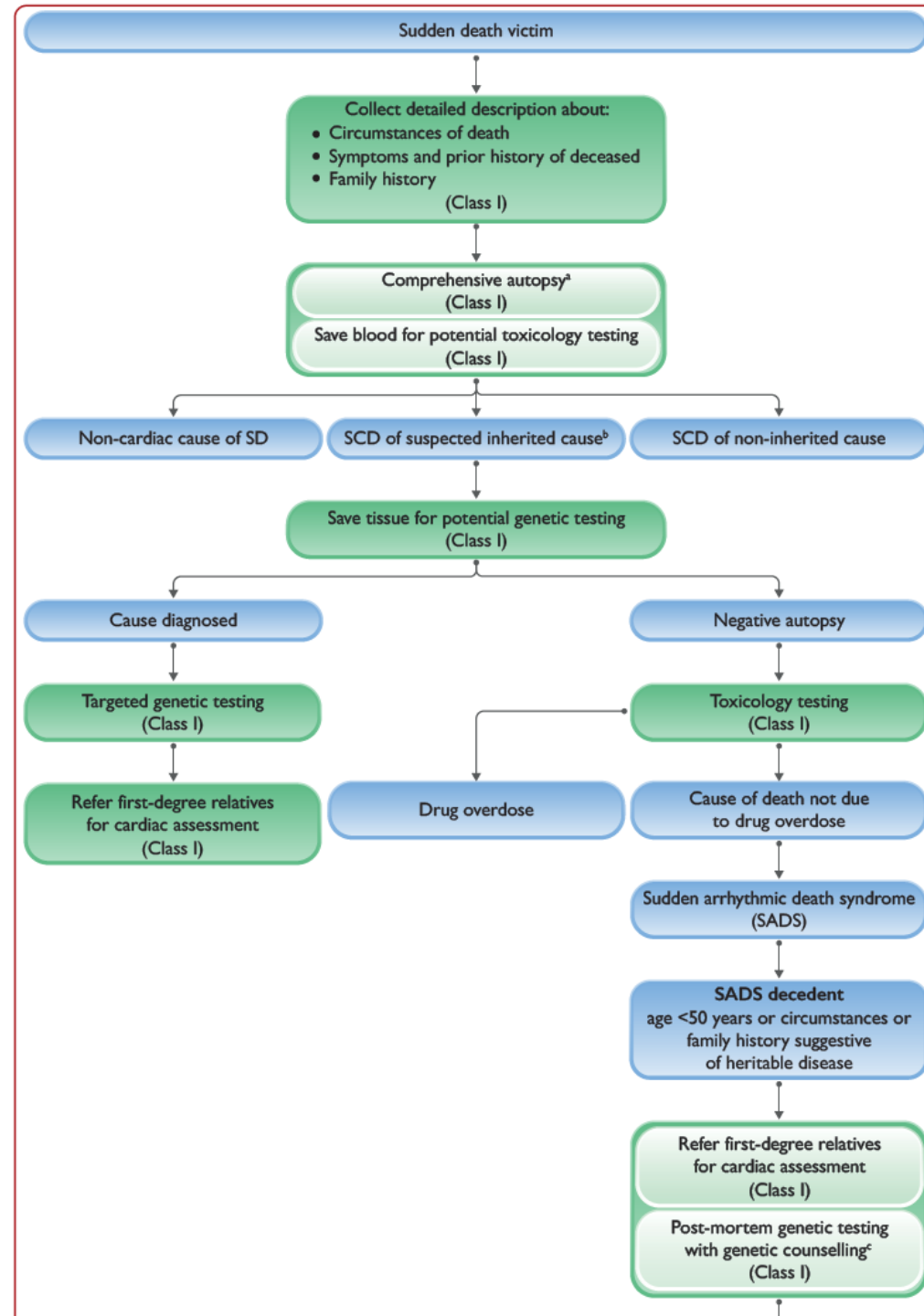
- SKG, CT mozku/hrudníku, toxikologie
- MRI (class I), genetické testování
- 12-svodové EKG s vysokými prekordiálními svody
- Provokační testy:
 - Zátěžové vyšetření class I
 - Aimalin class I
 - Ergotamin/acetylcholin class Ib
- Dg. Idiopatické FiK per exclusionem



Diagnostika

Oběť náhlé smrti

- Dok. okolností události
- U obětí <50let doporučena podrobná pitva.
 - Patol. spec. na KV onem ve 41% změni diagnózu
 - Toxikologie
 - V případě neg. nálezu SADS**
- Genetické vyšetření (zachování vzorku)
 - pozit u 1/3 SADS
- Vyšetření prvostupňových příbuzných v případě podezření na familiární on.**
 - Anamnéza, EKG včetně vysokých prekordiálních svodů, echo a zátěžové vyšetření
- Vyšetření u dospělých pouze jednorázové, u dětí do opakované do dosažení dospělosti



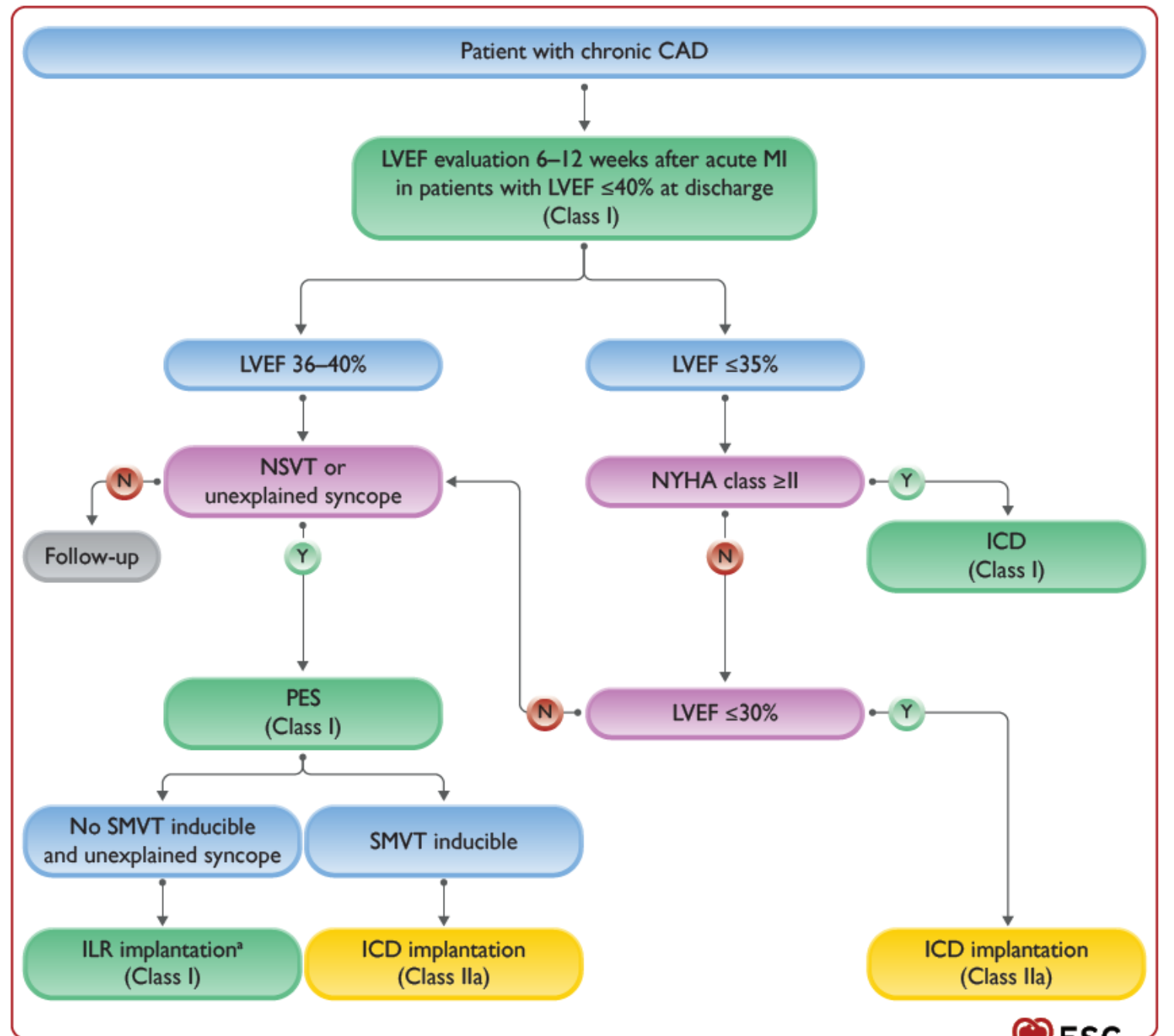
Riziková stratifikace NSS



Riziková stratifikace

Stabilní ICHS

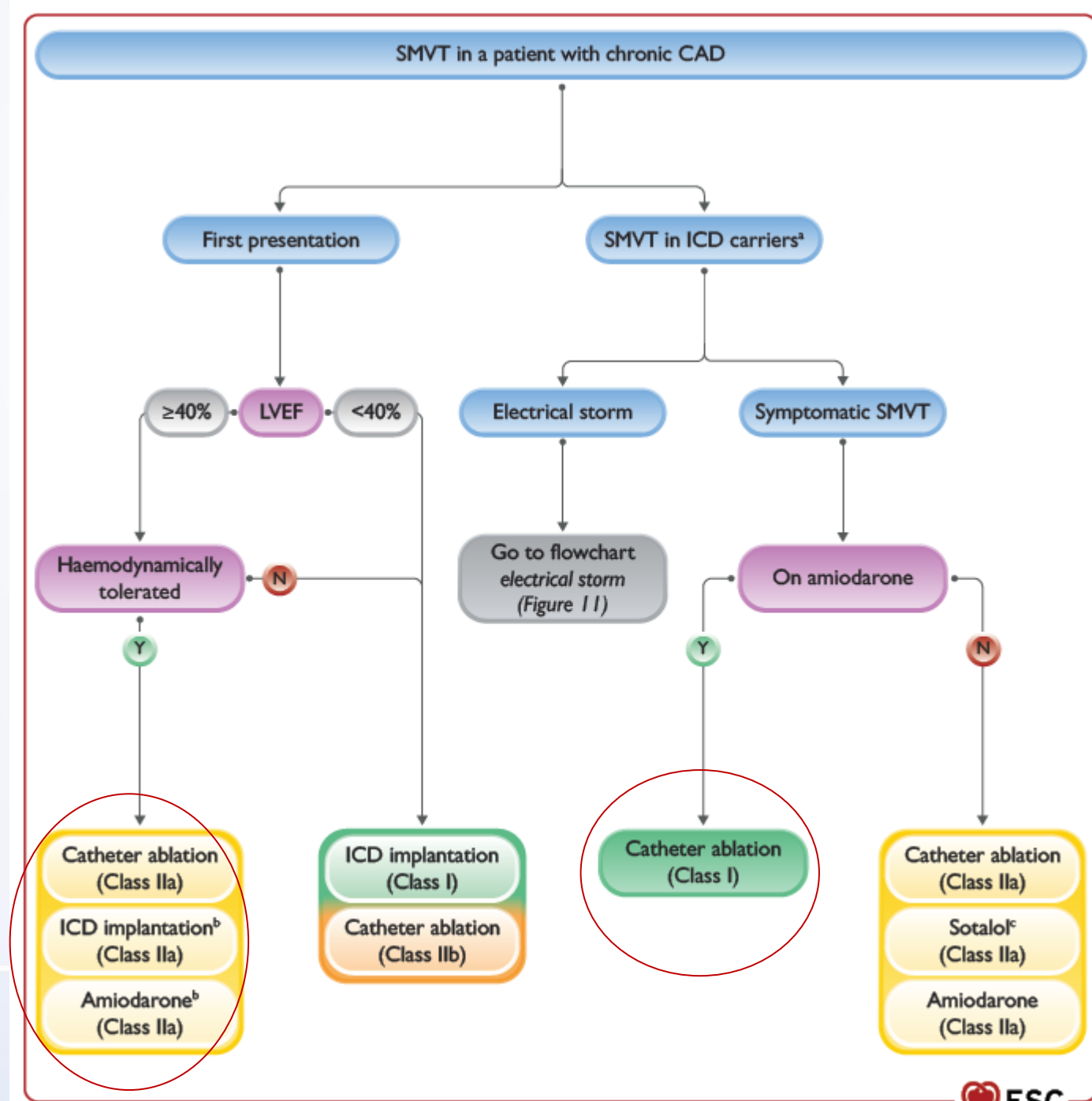
- Hodnocení EF v odstupu po IM
 - Okolo 5% po STEMI má EF<35% po 40 dnech od IM
- Nejasná role PSK u EF>40%
 - Studie PRESERVE – EF study



Riziková stratifikace a léčba

Stabilní ICHS

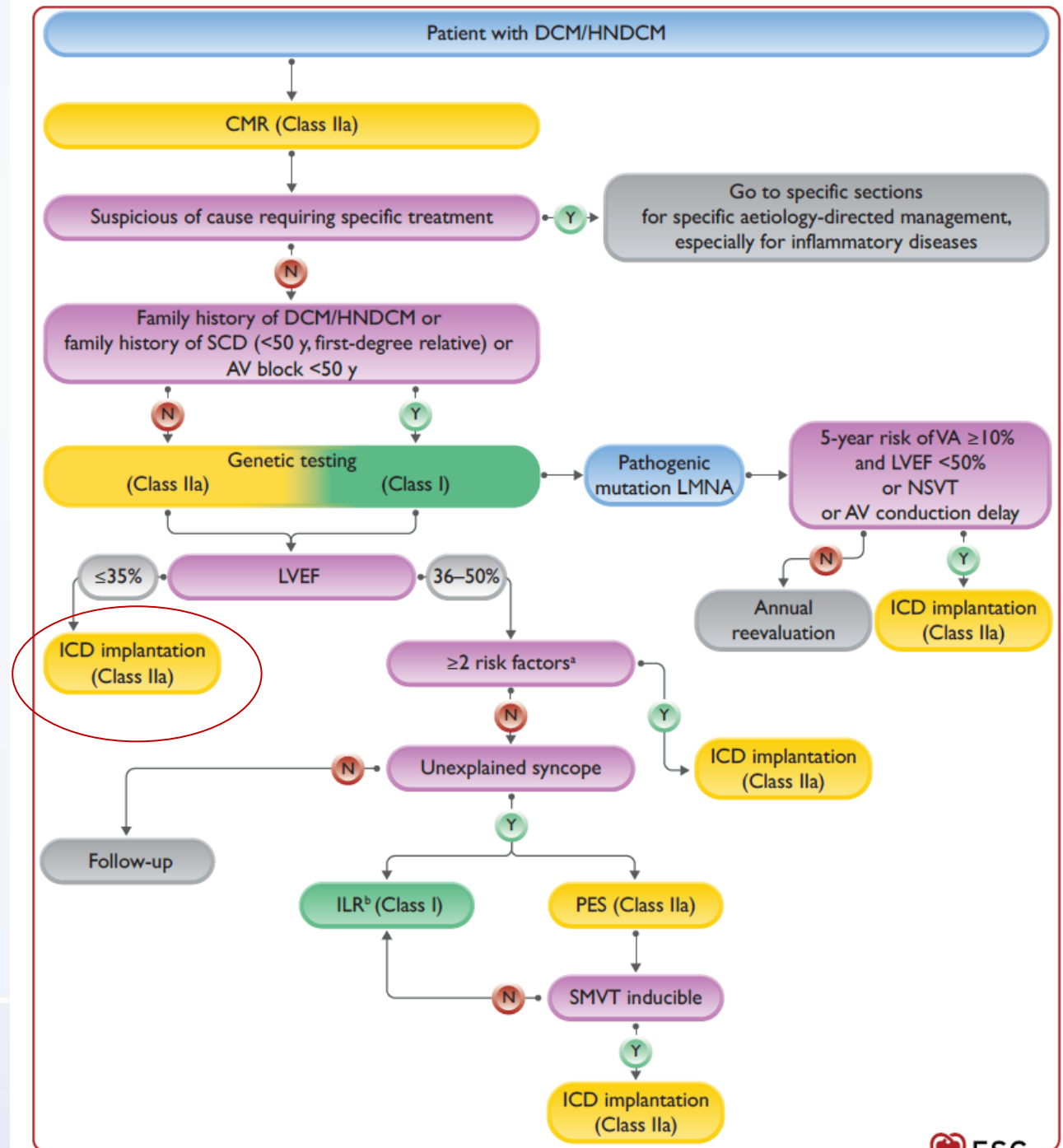
- Tolerovaná KT a EF>40%
 - Katetrizační ablace IIA
 - ICD IIA
 - Amiodarone IIA
- Recidivující KT u ICD
 - Již na amiodaronu
 - ablace IA
 - Bez amiodaronu
 - Ablace IIA
 - Amiodarone IIA



Riziková stratifikace a léčba

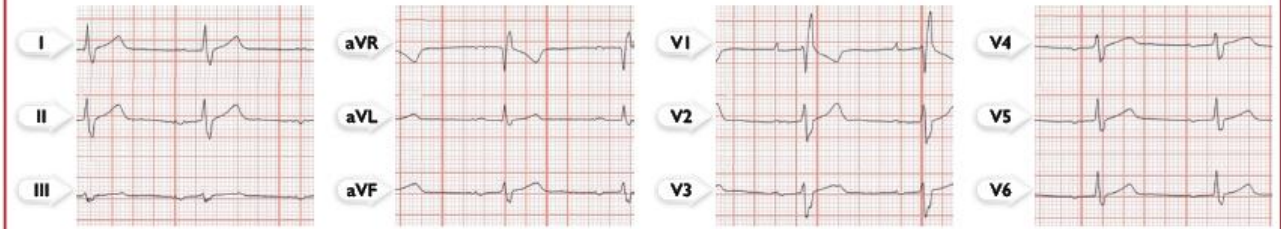
Neischemická kardiomyopatie

- **ICD u EF LK < 35% I → IIA**
- Vedle EF LK role MRI a genetického vyšetření
- Rizikové faktory u nemocných s EF > 35%:
 - Nevysvětlené synkopa
 - Patogenní mutace (LMNA, PLN, FLNC, RBM20)
 - LGE on MRI
 - Inducibilní mKT při PSK
- Indikace k ICD IIA při kombinaci rizikových faktorů

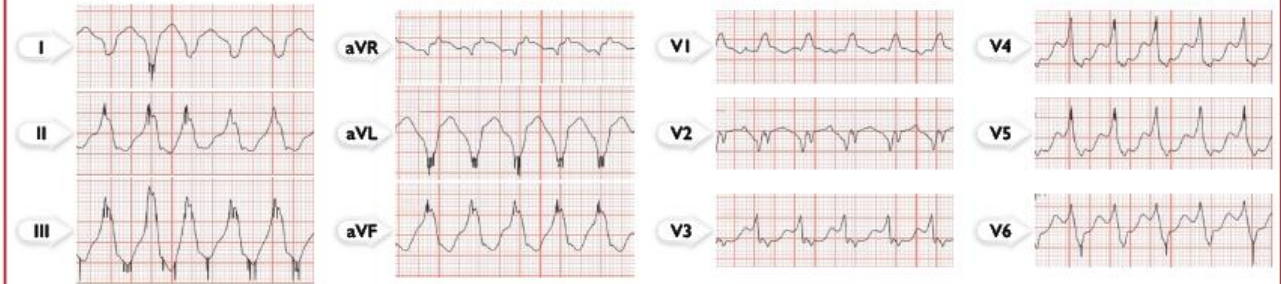


Laminopathie

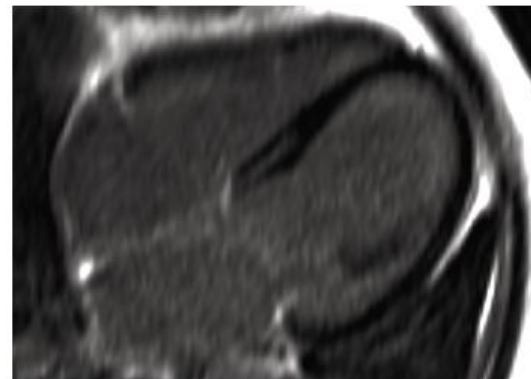
ECG sinus rhythm – Small amplitude P waves and first degree AV block



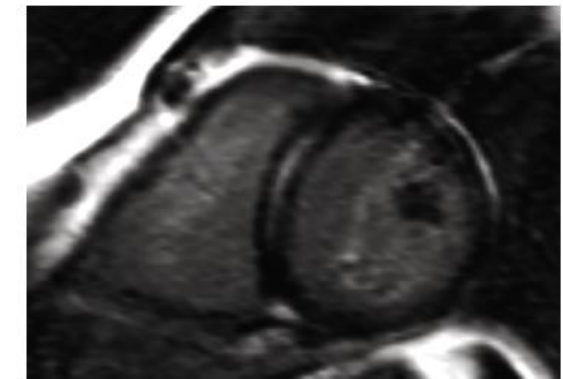
ECG VT – RBBB-like, inferior axis (LV summit origin)



CMR – Mid-wall septal LGE



4-chamber

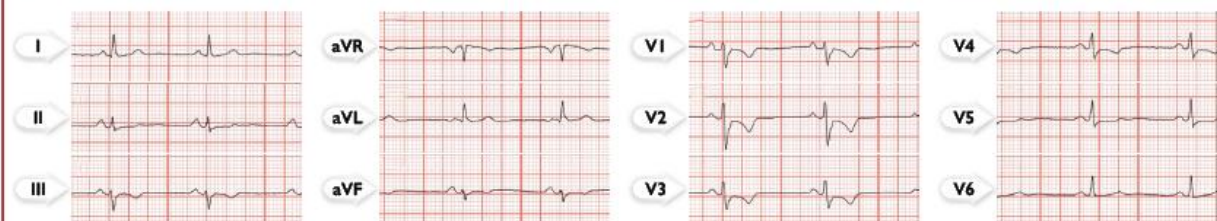


Short axis

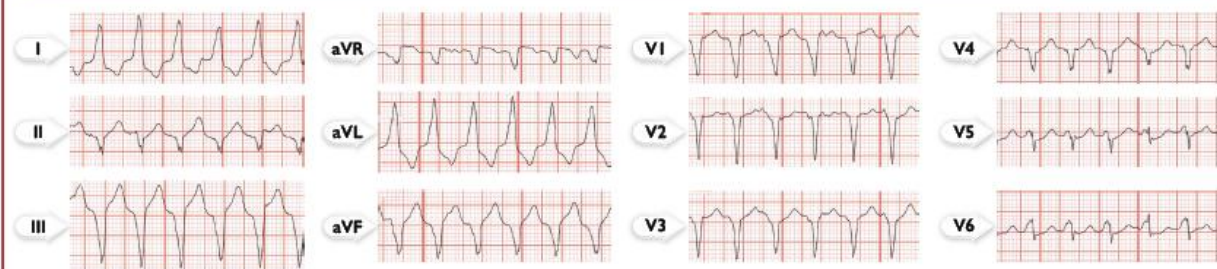
ARVC

- Sekundární prevence :
 - ICD i pro pacienty s tolerovanou KT class IIA
 - Ablace pro rec. KT class IIA
- Prim prevence KT a NSS:
 - Arytmická synkopa IIA
 - Těžká dysfunkce LK či PK IIA
 - Středně omezená funkce LK či PK + nsKT/inducibilní sKT při PSK IIA

ECG sinus rhythm – Negative T waves V1-V4, terminal QRS duration >55 ms



ECG VT – LBBB-like, superior axis (basal RV origin)



CMR – Dilated RV with basal aneurysm



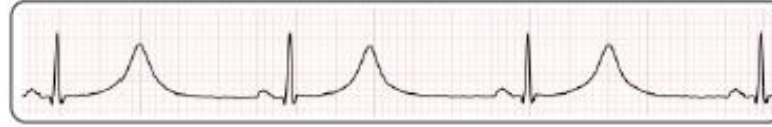
4-chamber

3-chamber

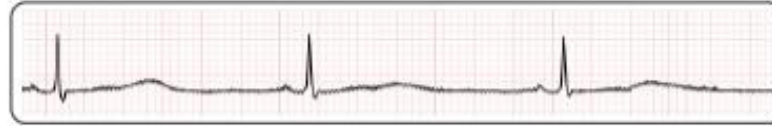
Short axis

A

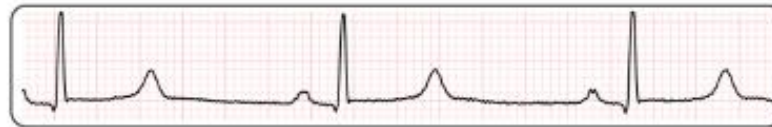
LQT1



LQT2



LQT3



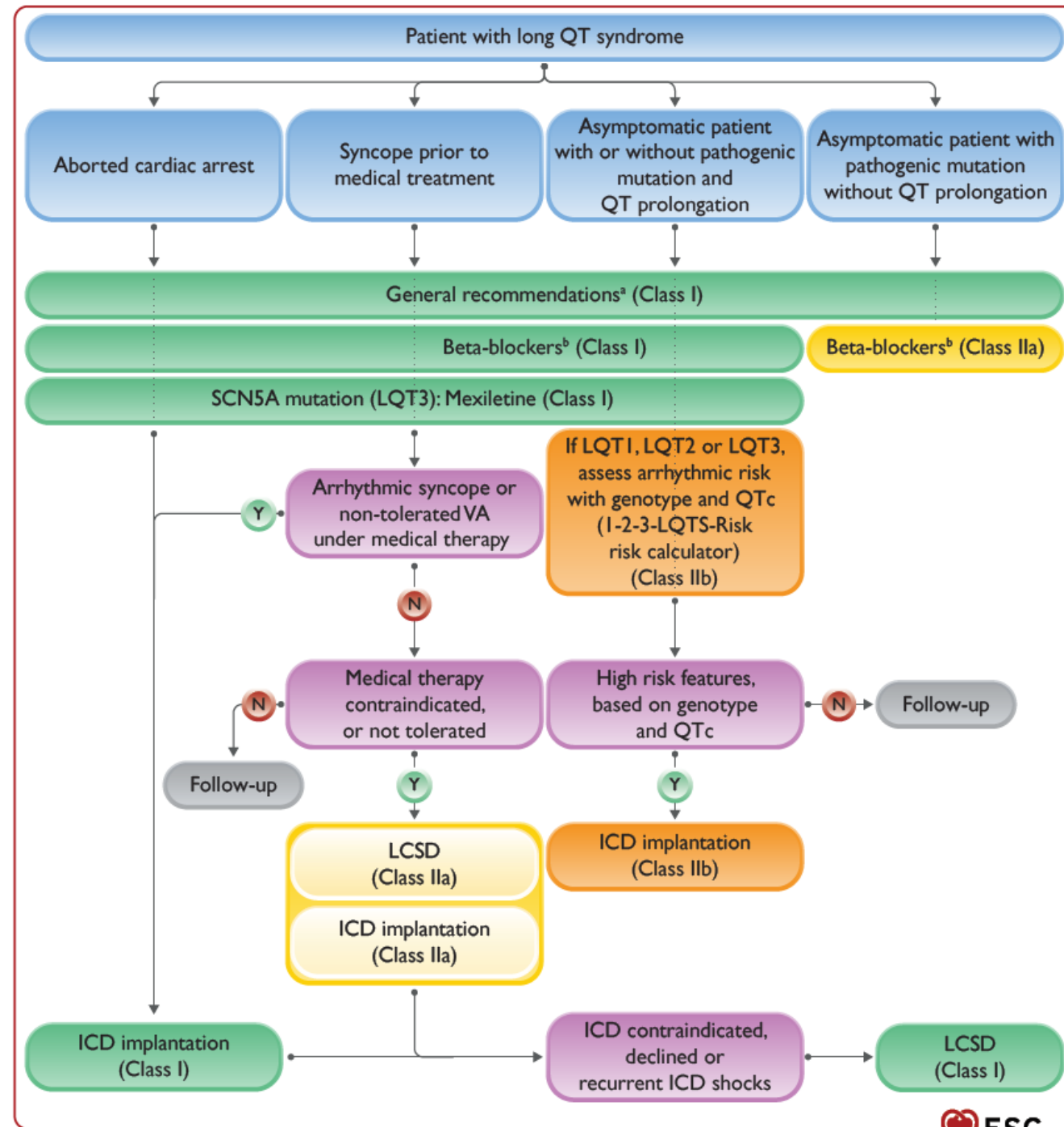
B



Riziková stratifikace a léčba

Long QT

- Role genetického testování
- Léčba neselektivními BB!
- Mexiletin u LQT3
- **1-2-3 LQT Risk kalkulátor**
 - >5%/5let – implantace ICD
- Role sympatektomie
 - IIA u nemožnosti BB či KI ICD
 - Class I v případě opak. intervencí ICD



Kalkulátory rizika závažných KT

SCD HCM risk calculator_V2

https://doc2do.com/hcm/webHCM.html

HCM Risk-SCD

Age Years Age at evaluation

Maximum LV wall thickness mm Transthoracic echocardiography

Left atrial size mm Left atrial diameter by echocardiography in the parasternal plane at time of diagnosis

HCM Risk-Kids model for sudden cardiac death in childhood Hypertrophic Cardiomyopathy

Age (years)*

The model is only validated for patients aged 1-16 years of age

Independent validation and clinical implications of the risk prediction model for long QT syndrome (1-2-3-LQTS-Risk)

Andrea Mazzanti^{1,2,3}, Alessandro Trancuccio^{1,2,3}, Deni Kukavica^{1,2,3}, Eleonora Pagan⁴, Meng Wang⁵, Muhammad Mohsin¹, Derick Peterson⁵, Vincenzo Bagnardi⁴, Wojciech Zareba¹

$P_{LAE \text{ at } 5 \text{ years}} = 100 \times (1 - 0.9849143482^{\text{exp}(\text{Prognostic Index})})$

ARVC Risk Calculator

Please read our [disclaimer](#) for appropriate use and interpretation. This calculator was designed to estimate risk predictions in ARVC patients for two outcomes:

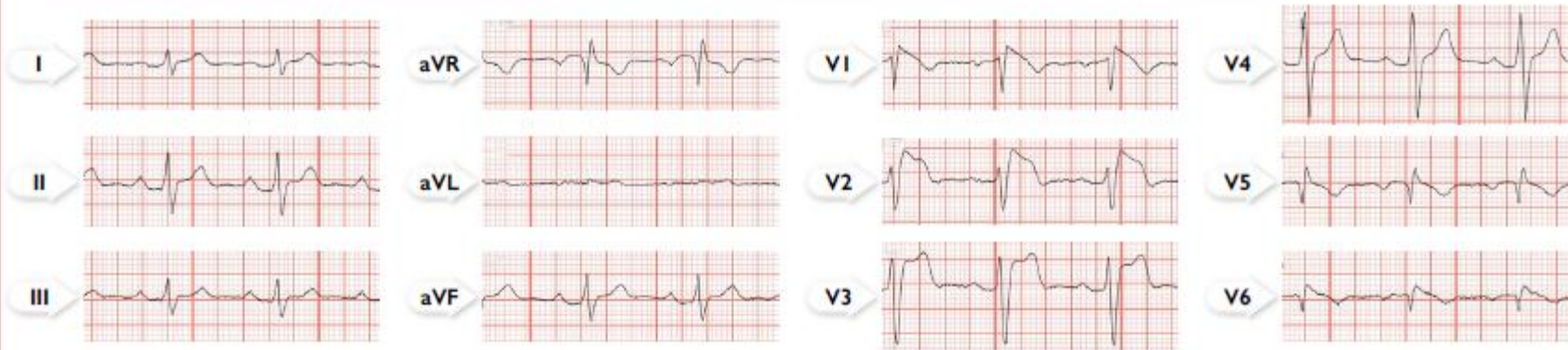
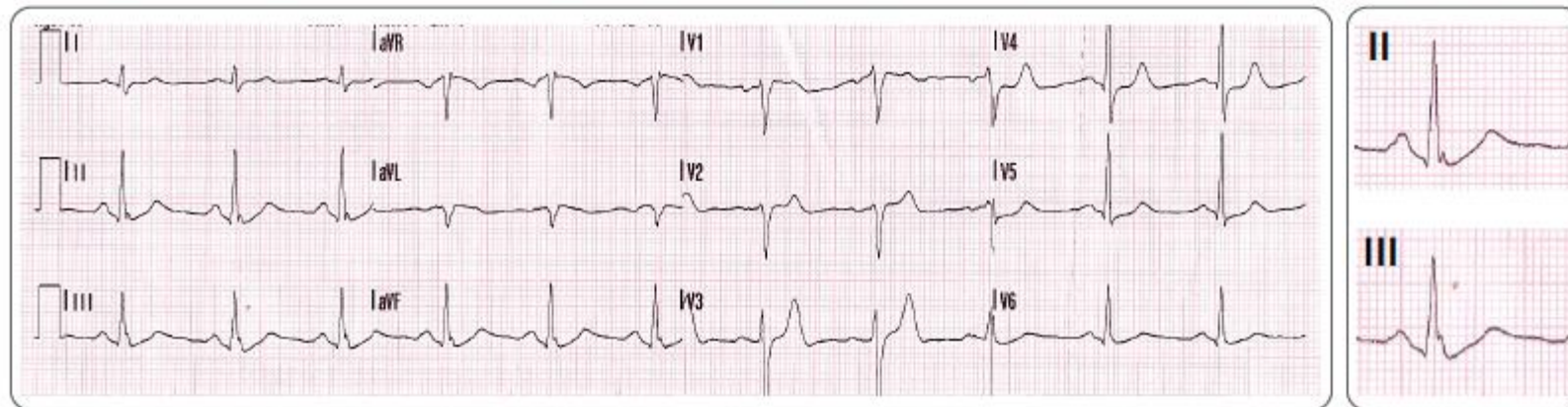
- 1) **Fast VT (>250bpm)/VF/SCA** in all patients with *definite* ARVC diagnosis
- 2) **First sustained ventricular arrhythmia (VA)** which only applies to patients with *definite* ARVC diagnosis **without prior sustained events** (ignore result otherwise).

LMNA-risk VTA calculator

https://lmna-risk-vta.fr

LMNA-risk VTA calculator

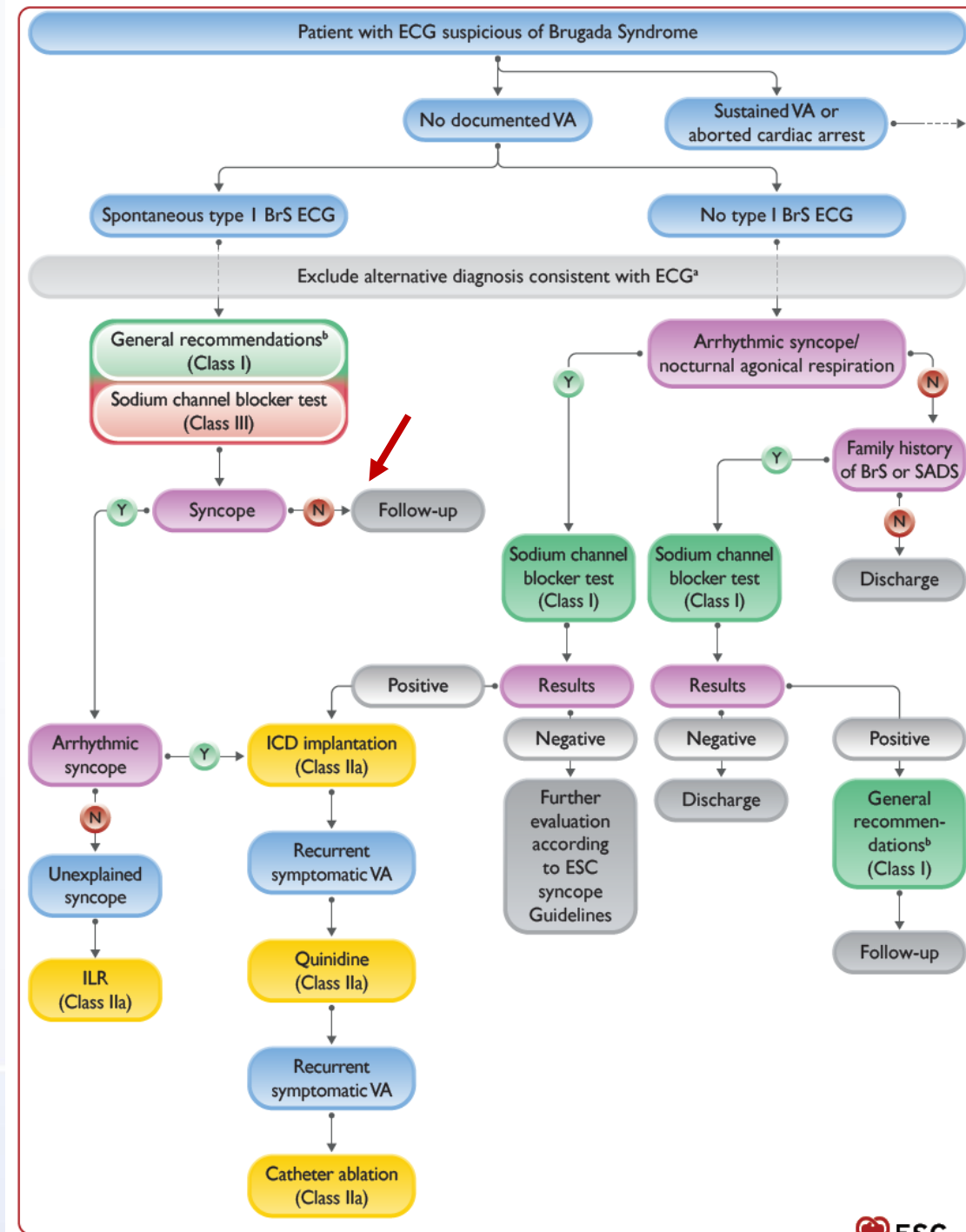
Risk Prediction Score for Life-Threatening Ventricular Tachyarrhythmias in Laminopathies

A**Brugada type I pattern ECG****B****Early repolarization pattern ECG**

Riziková stratifikace a léčba

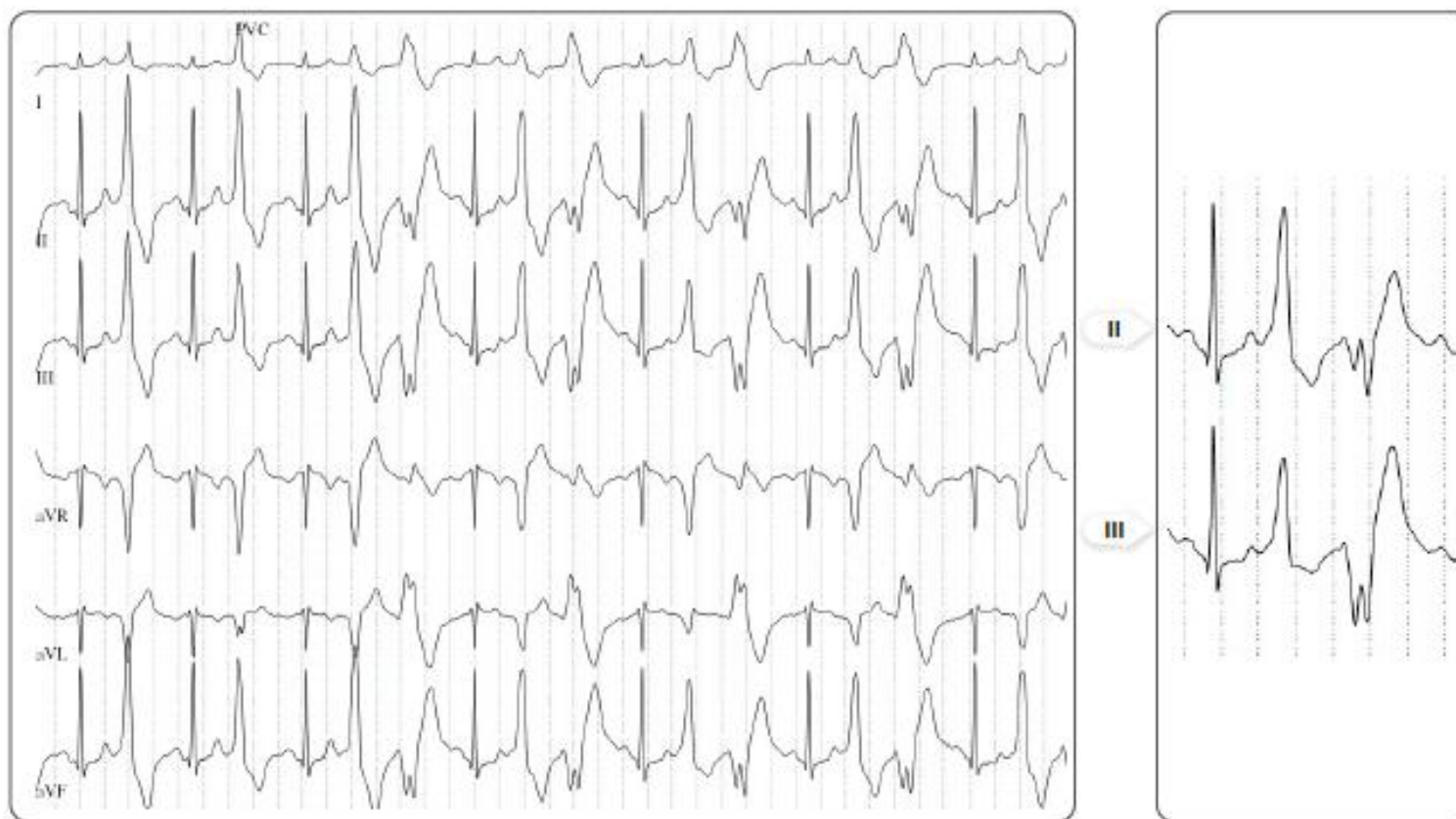
Brugada syndrom

- Riziková stratifikace u asymptomatických nemocných je kontraverzní
- Nejvyšší riziko u spontánní Brugada typ I a arytmické synkopy – ICD IIA
- Lékově indukovaný Brugada obraz je málo specifický a na dg nestačí!
- ILR u nevysvětlené synkopy IIA
- PSK v rizikové stratifikaci IIB
- Ablace v případě recidiv KT u ICD - IIA
- Quinidin IIA (cilostazol), isoproterenol



Katecholaminergní polymorfni KT

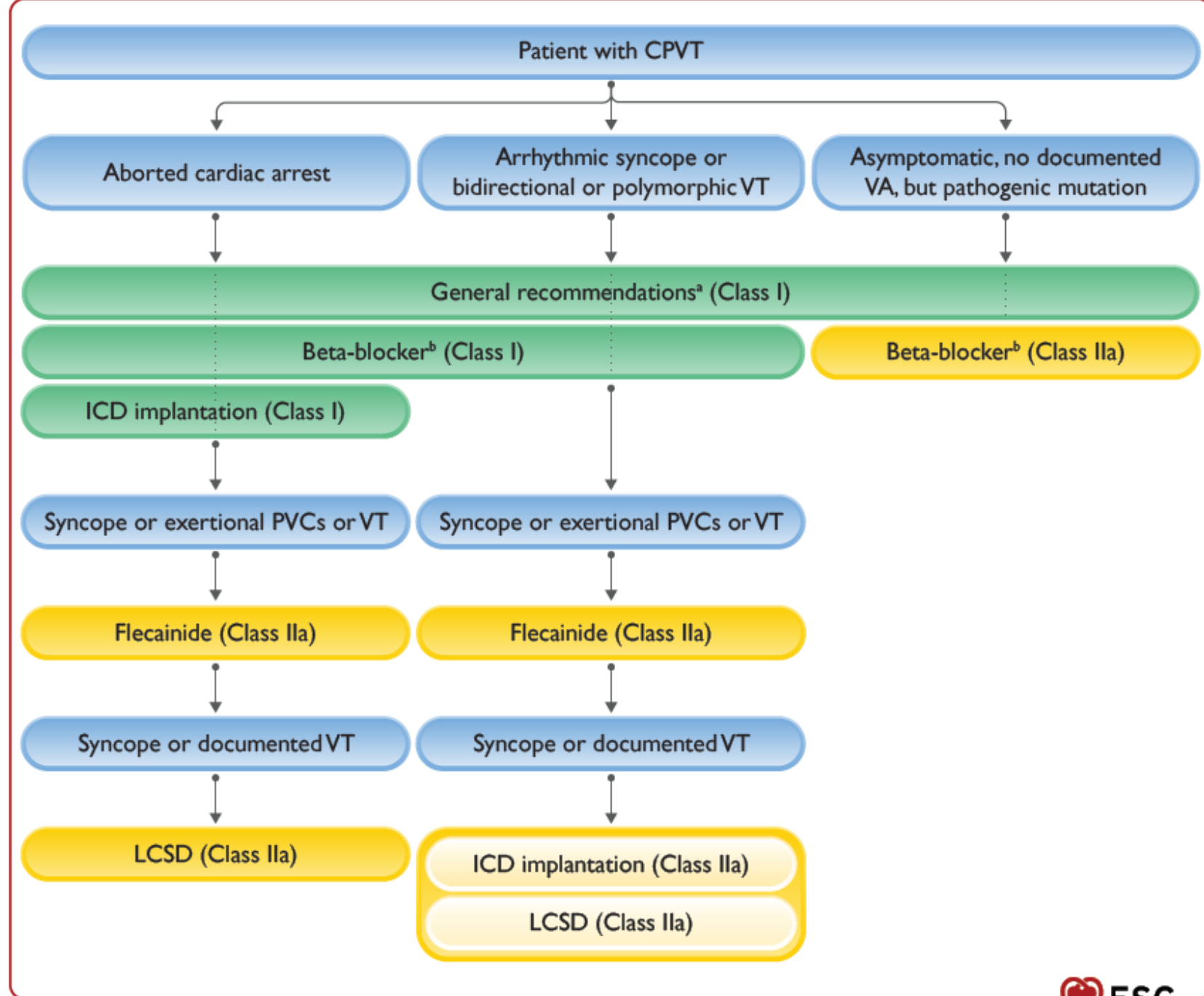
Bidirectional PVCs during exercise



Riziková stratifikace a léčba

CPVT

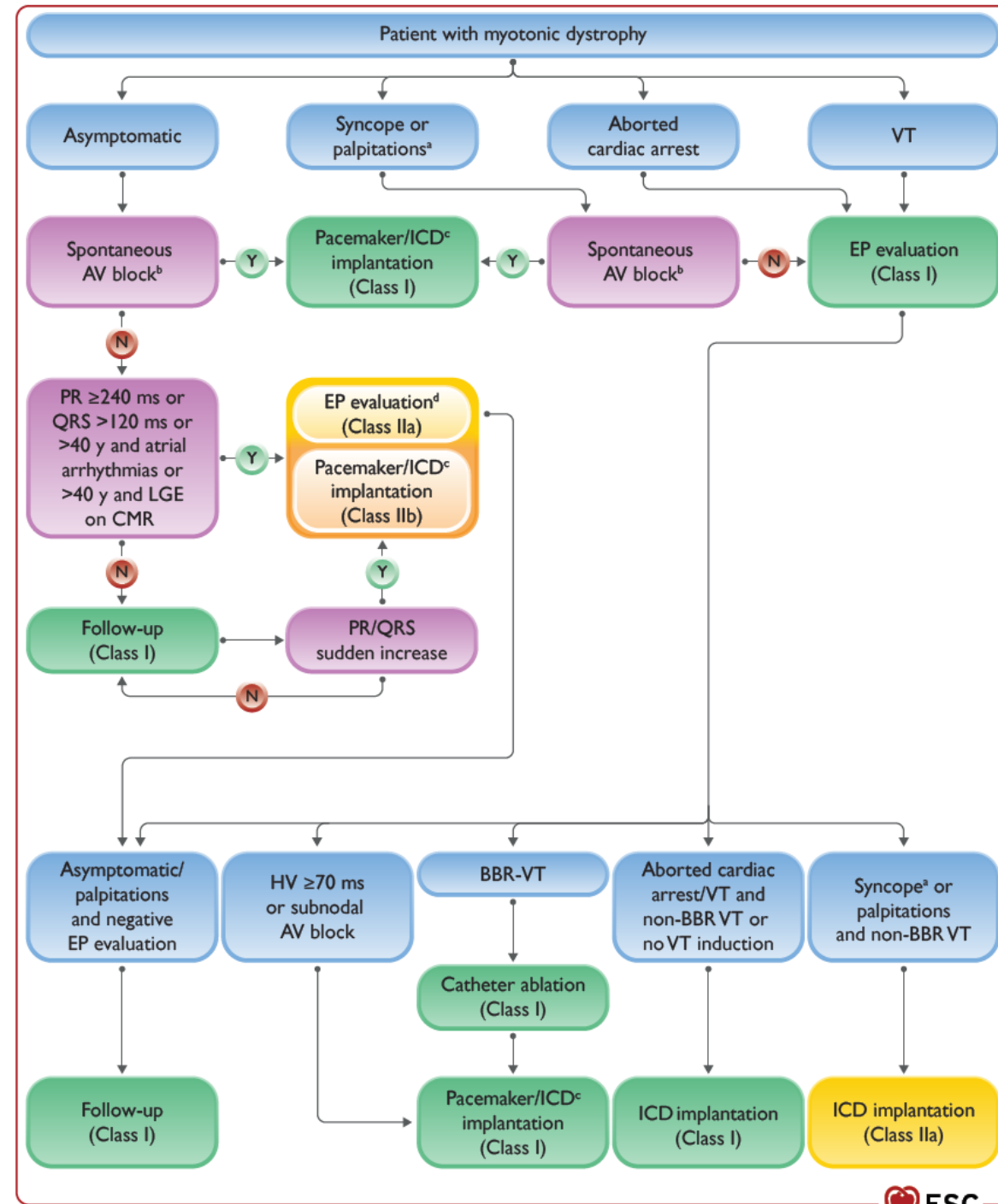
- BB
- Flekainid
- ICD
- Sympatektomie



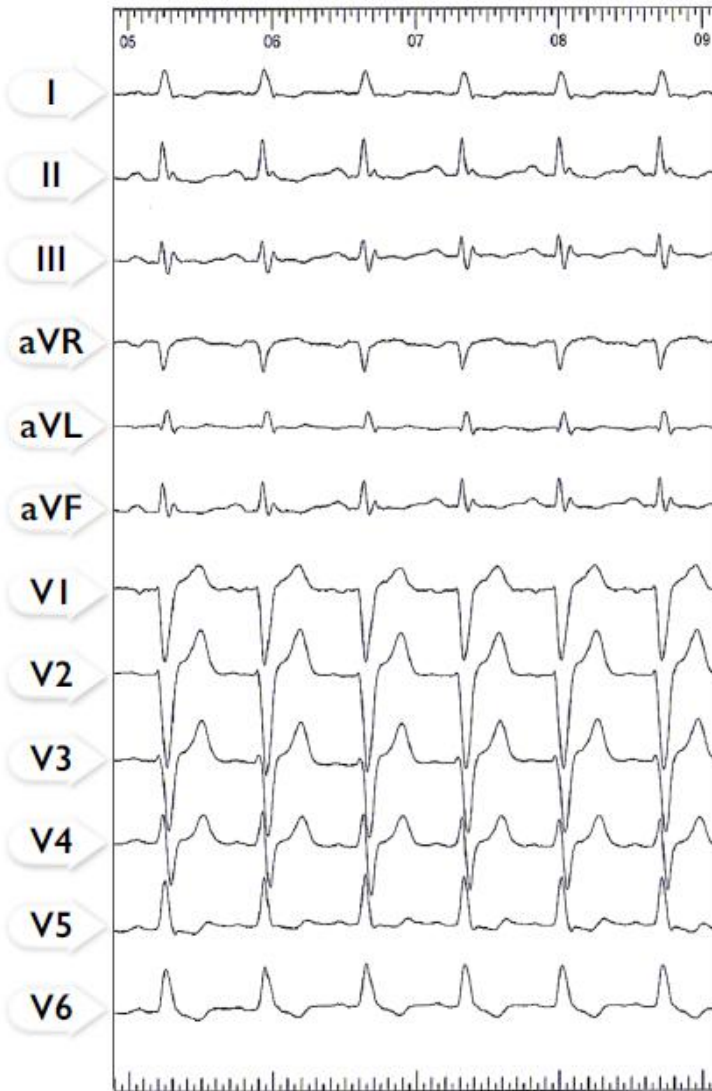
Riziková stratifikace a léčba

Myotonické dystrofie

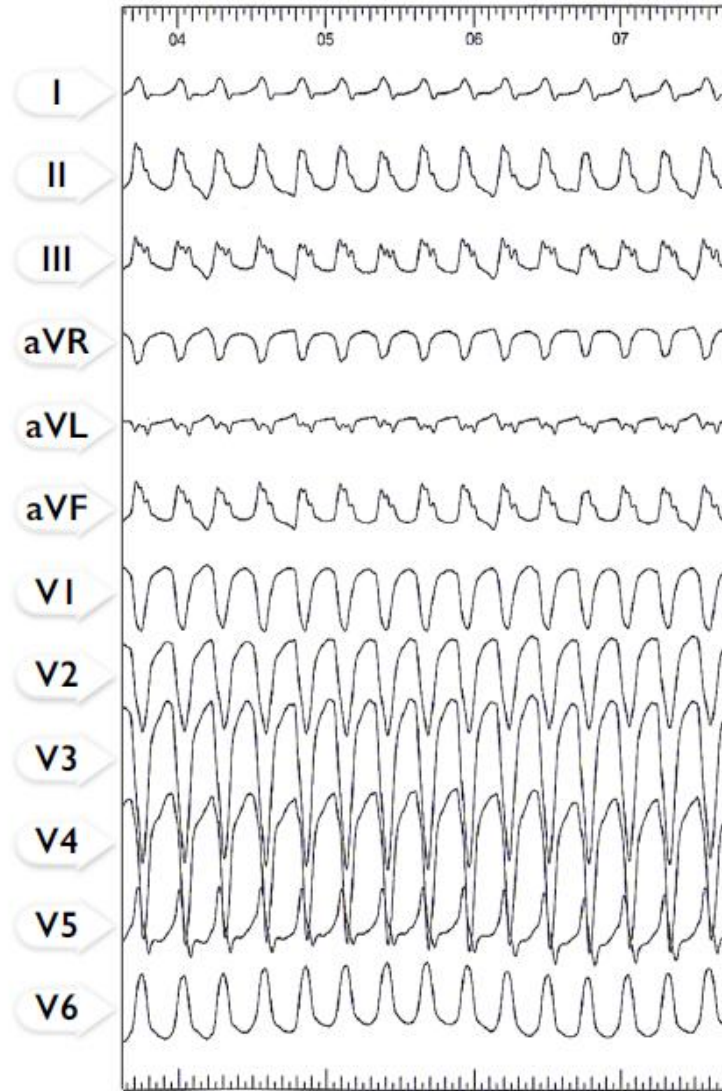
- Hodnocení PQ, šíře QRS, síňových arytmíí a LGE
- Role EFV u rizikových pacientů IIA
 - AVB I., široký QRS, FiS, LGE na MRI
- PM vs ICD dle nálezu
 - HV>70ms vs BBRT
- Dispenzarizace s kontrolami á 1 rok



ECG during sinus rhythm



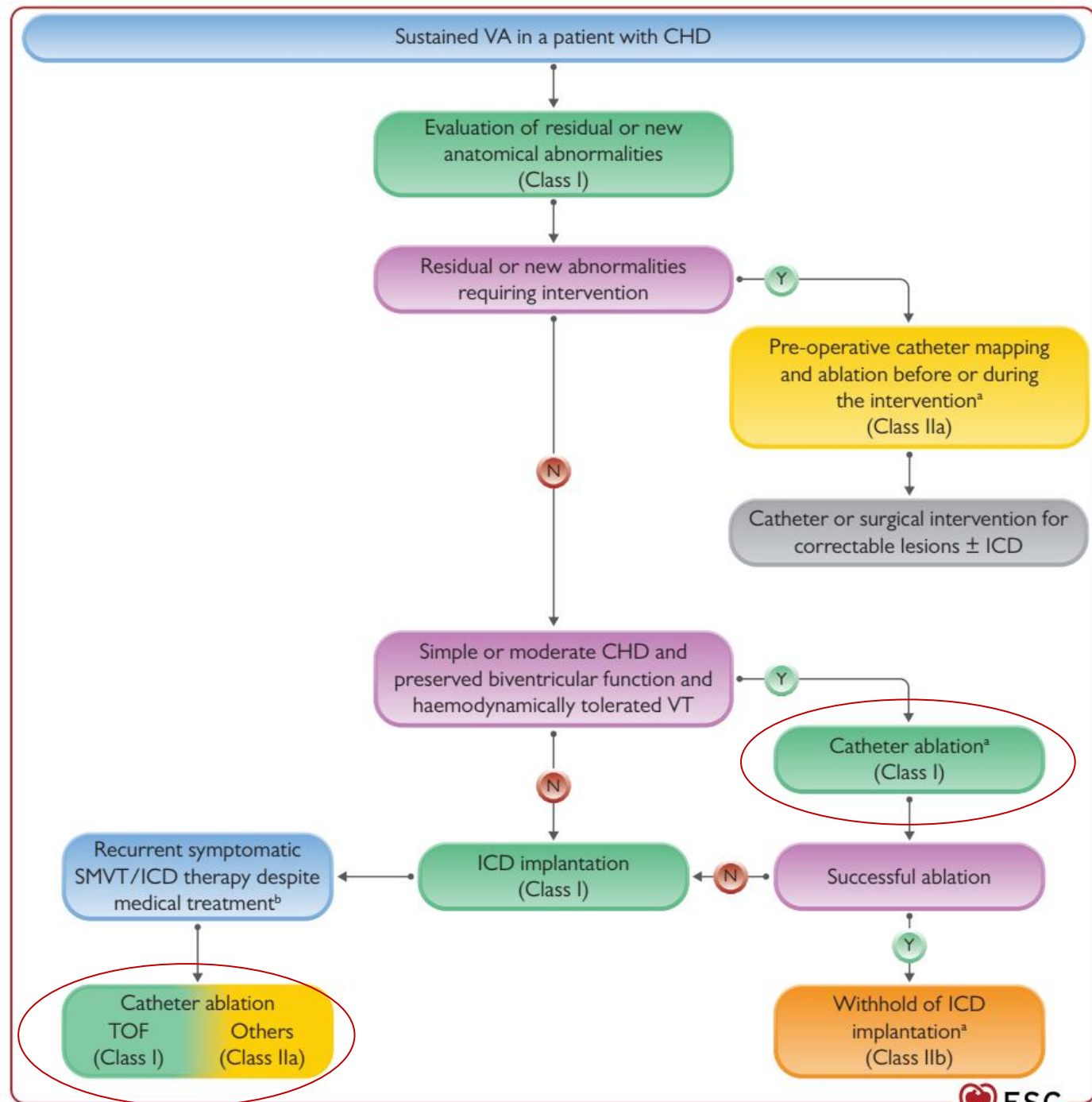
ECG during BBR-VT



Vrozené srdeční vady

Setrvalé KT

- Diagnostika/korekce reziduální vady
- **V případě tolerované KT a zachovalé funkce je ablace IA léčba bez zajištění ICD (IIB)**
- U asymptomatických pacientů s TOF evaluace pomocí PSK IIA→IIB

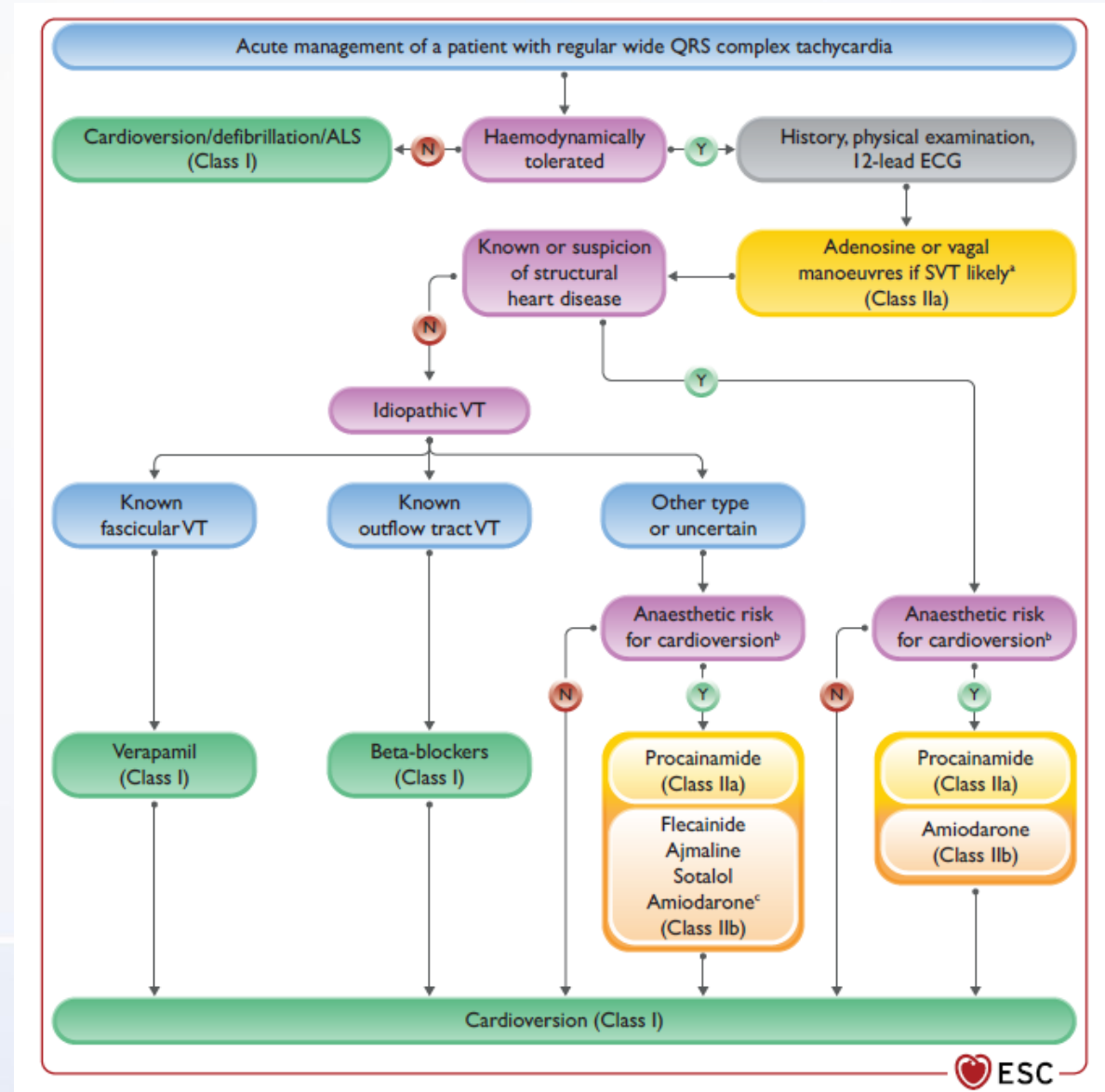


Léčba KT

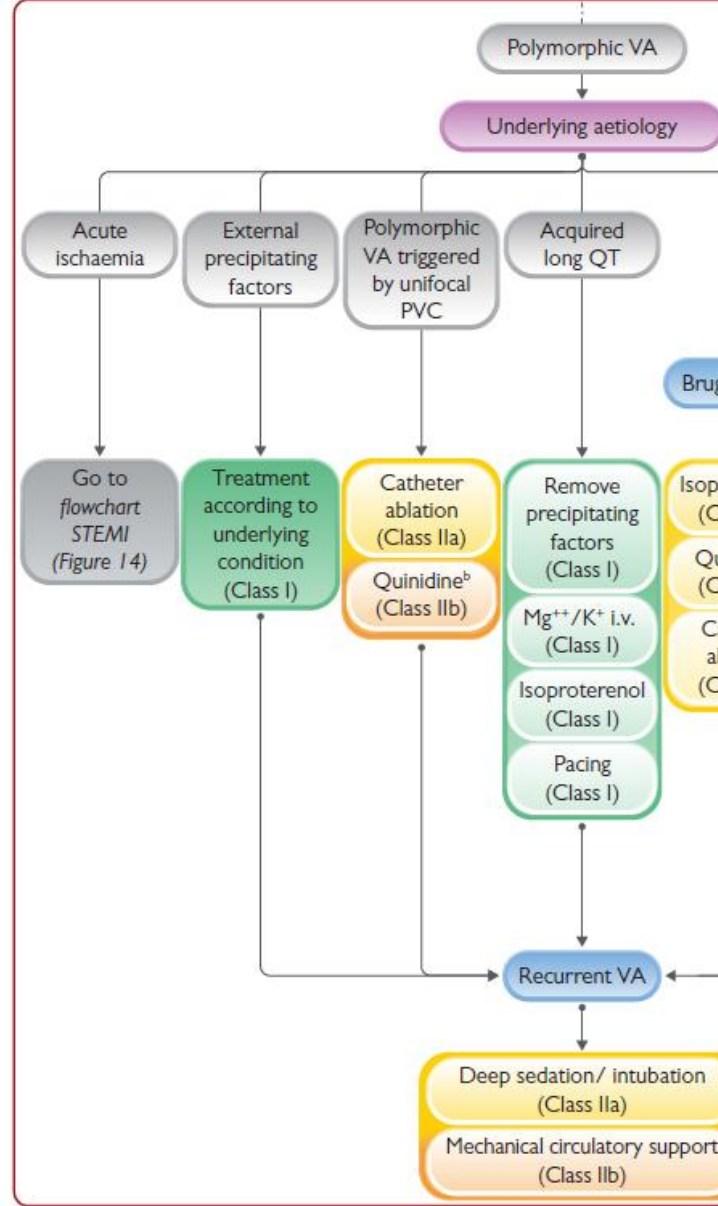
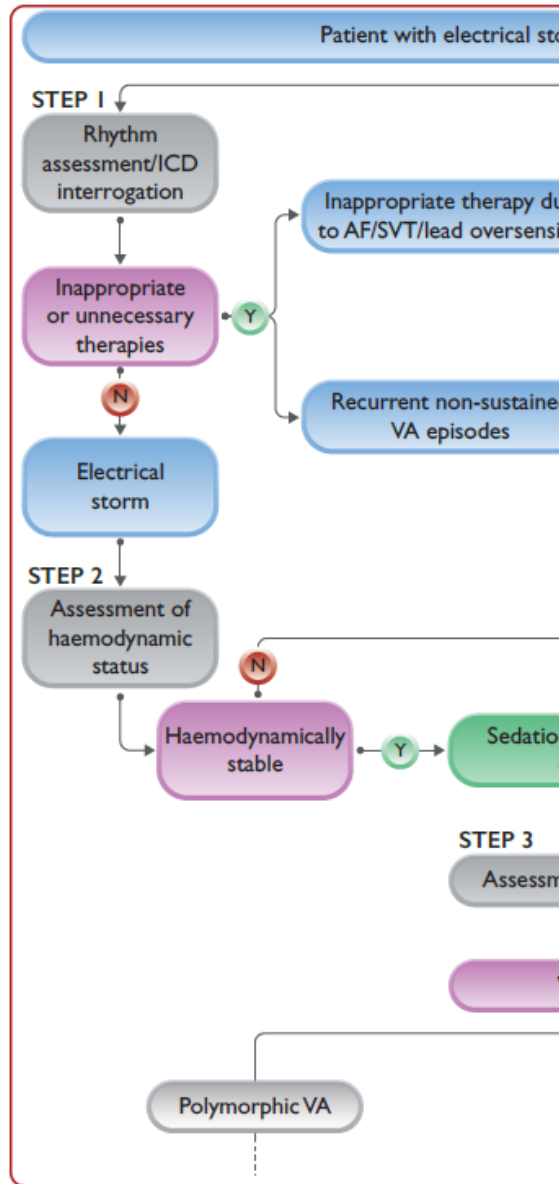


Akutní léčba širokokomplexové tachy

- Natočení 12-svodového EKG!
- Rozlišení aberované SVT (adenosin)
- **Preference el. kardioverze k terminaci rytmu**
- Amiodaron class IIB pro tolerovanou KT u strukturálního srdečního onemocnění či v nejasných případech
- AA IC pro iKT jako class IIB
- Verapamil KI pro WQRS tachykardií



Léčba arytmičné bouře



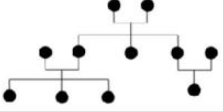



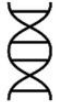
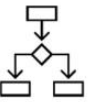





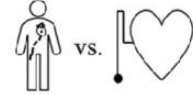
Léčba – programace ICD

- Minimalizace PK stimulace
- Programace ICD
zabraňuje výbojům a vliv
na prognózu
- Remote monitoring redukcí
neadekvátních terapií
– class I B





In single- or dual-chamber ICD patients without bradycardia pacing indications, it is recommended to minimize ventricular pacing. ^{378–380}	I	A
Programming of prolonged detection settings is indicated (duration criteria of at least 6–12 s or 30 intervals). ^{373,382,383}	I	A
It is recommended to program the slowest tachycardia therapy zone limit ≥ 188 b.p.m. in primary prevention ICD patients. ^{382,383}	I	A
In patients with SHD, programming of at least one ATP therapy is recommended in all tachyarrhythmias zones. ^{375,384,391}	I	A
It is recommended to program algorithms for SVT vs. VT discrimination for tachycardias with rates up to 230 b.p.m. ^{383–385}	I	B
It is recommended to activate lead failure alerts. ^{397–399}	I	B
Remote monitoring is recommended to reduce the incidence of inappropriate shocks. ³⁹⁵	I	B
Programming of burst ATP as first attempt is recommended over ramp ATP. ³⁹²	I	B
For S-ICDs, a dual detection zone configuration is recommended with activation of discrimination algorithm in the lower conditional shock zone. ^{388–390}	I	B
For routine ICD programming, activation of more than one tachycardia detection zone should be considered. ^{383,386}	IIa	B



New aspects and developments of recommendations of the recent ESC guideline compared to AHA/ACC/HRS guidelines and CCS/CHRS position statement

Diagnostic evaluation	Drug therapy	Risk stratification and device therapy	Catheter ablation
 Recommendations on evaluation of relatives of SCD victims	 Updated heart failure therapy	 SCD risk calculators for HCM, DCM, LQTS	 First-line therapy in idiopathic RVOT and fascicular PVC/VT
 Increased relevance of genetic testing	 New algorithms for antiarrhythmic drug therapy	 Recommendations for optimization of ICD programming	 Preferred therapy in CAD patients with chronic amiodarone therapy and recurrent VA
 Focus on cardiac MRI	 Non-selective beta-blockers in primary electrical diseases	 Downgrade of LVEF as risk marker (especially in DCM)	 Alternative to ICD implantation in selected patients with ICM

Additional novel aspects

 Focus on public basic life support and AED	 Recommendations for diagnostic evaluation according to different clinical scenarios	 New section on management of electrical storm	 Comprehensive supplementary data
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Děkuji za pozornost

Centrum komplexní léčby komorových arytmií

Email: komorovky@ikem.cz

