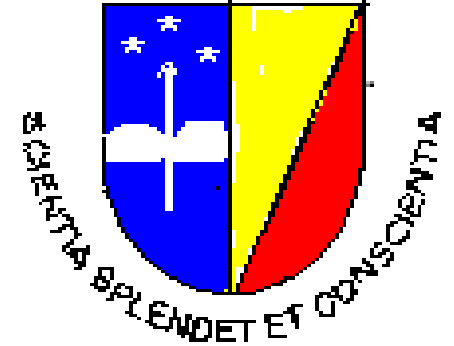




Prise en charge rythmologique d'un patient ayant fait une mort subite récupérée

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ESC

European Society
of Cardiology

European Heart Journal (2022) **43**, 3997–4126

<https://doi.org/10.1093/eurheartj/ehac262>

ESC GUIDELINES

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)

Authors/Task Force Members: Katja Zeppenfeld^{*†} (Chairperson) (Netherlands),

Plan

- INTRODUCTION
- EPIDEMIOLOGIE
- CAS CLINIQUE
- CONDUITE A TENIR DEVANT UN PATIENT RÉSUSCITÉ D'UNE MSC
- CONCLUSION
- PERSPECTIVES
- RECOMMANDATIONS

1. INTRODUCTION

1.1 Définition:

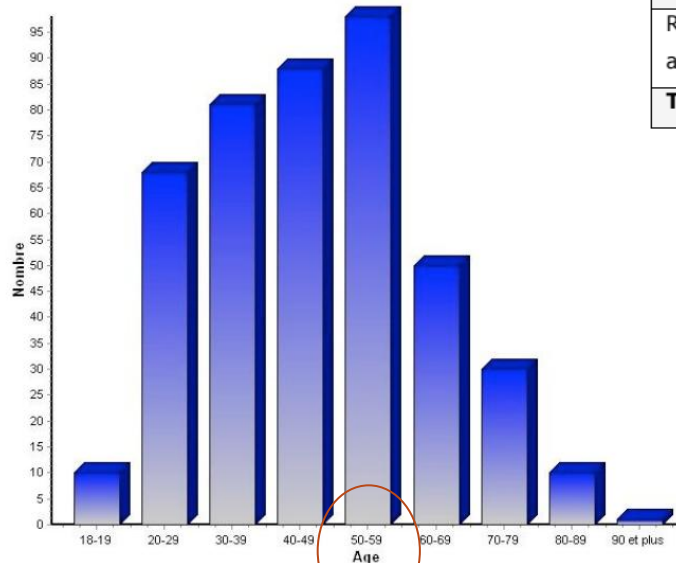
- Mort subite d'origine cardiaque (MSC) : mort naturelle subite présumée d'origine cardiaque qui survient : dans l'heure suivant l'apparition des symptômes dans les cas avec témoins, et dans les 24 heures suivant la dernière observation vivante dans les cas sans témoins. La MSC dans les cas autopsiés est définie comme la mort naturelle inattendue de cause inconnue ou cardiaque.

1.2. EPIDEMIOLOGIE

- Quelques chiffres:
 - Europe : 350.000 MS / an
 - France : 50.000 MS/ an
 - Moyenne d'âge : 67 ans

Tableau 1: Place de la mort subite dans les motifs d'autopsie

Motifs	2003	2004	2005	Total
Mort subite adulte	133	164	179	476
Accident voie publique	315	245	198	758
Noyade	76	54	70	200
Coups et blessures	52	50	36	138
Accident de travail	11	13	16	40
Suicide	7	12	10	29
Brûlure	5	10	12	27
Electrocution	8	6	9	23
Infanticide	3	7	9	19
Pendaison	3	3	6	12
Autres	67	75	72	214
Total	679	640	617	1936



Case series

La mort subite de l'adulte, particularités en Afrique, à propos de 476 cas

Mohamed Maniboliot Soumah^{1,*}, Drissa Kanikomo¹, Mor Ndiaye¹, Mamadou Lamine Sow¹

¹Service de Médecine Légale, B.P. 7080, Faculté de Médecine, Pharmacie et Odontostomatologie, Université Cheikh Anta Diop (UCAD), Dakar, Sénégal

Tableau 2: Répartition des causes cardiovasculaires hors atteinte cervicocéphalique

Affections cardiaques	2003	2004	2005	Total
Infarctus du myocarde	22	35	39	96
Myocardiopathie	11	15	16	42
Endocardite	12	9	20	41
Valvulopathie	3	1	2	6
Péricardite	1	2	3	6
Rupture anévrisme aortique	2	3	1	6
Total	51	65	81	197

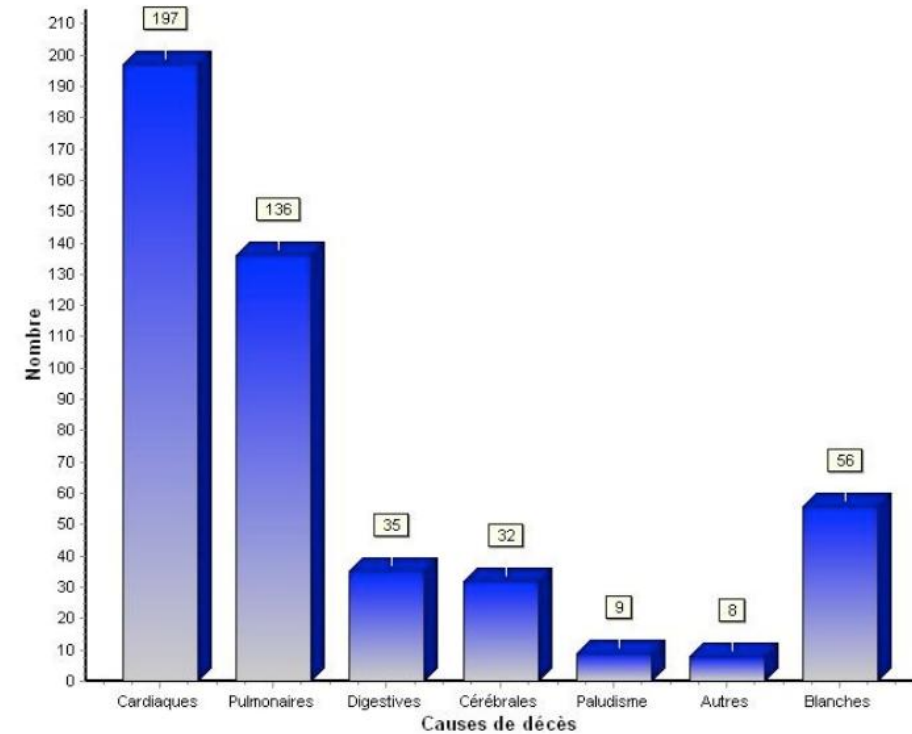


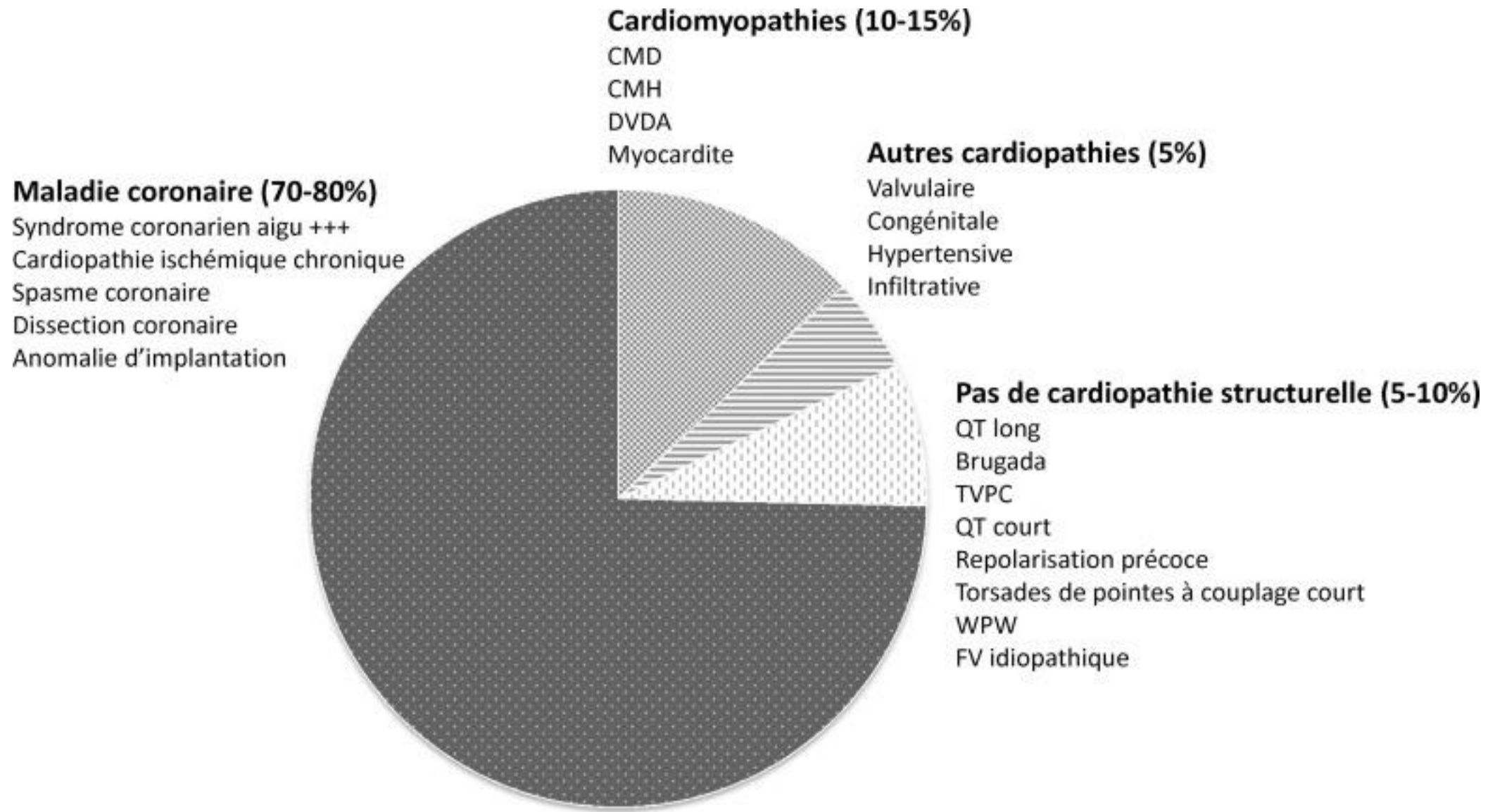
Figure 2: Répartition des morts subites selon la cause

1.2. EPIDEMIOLOGIE

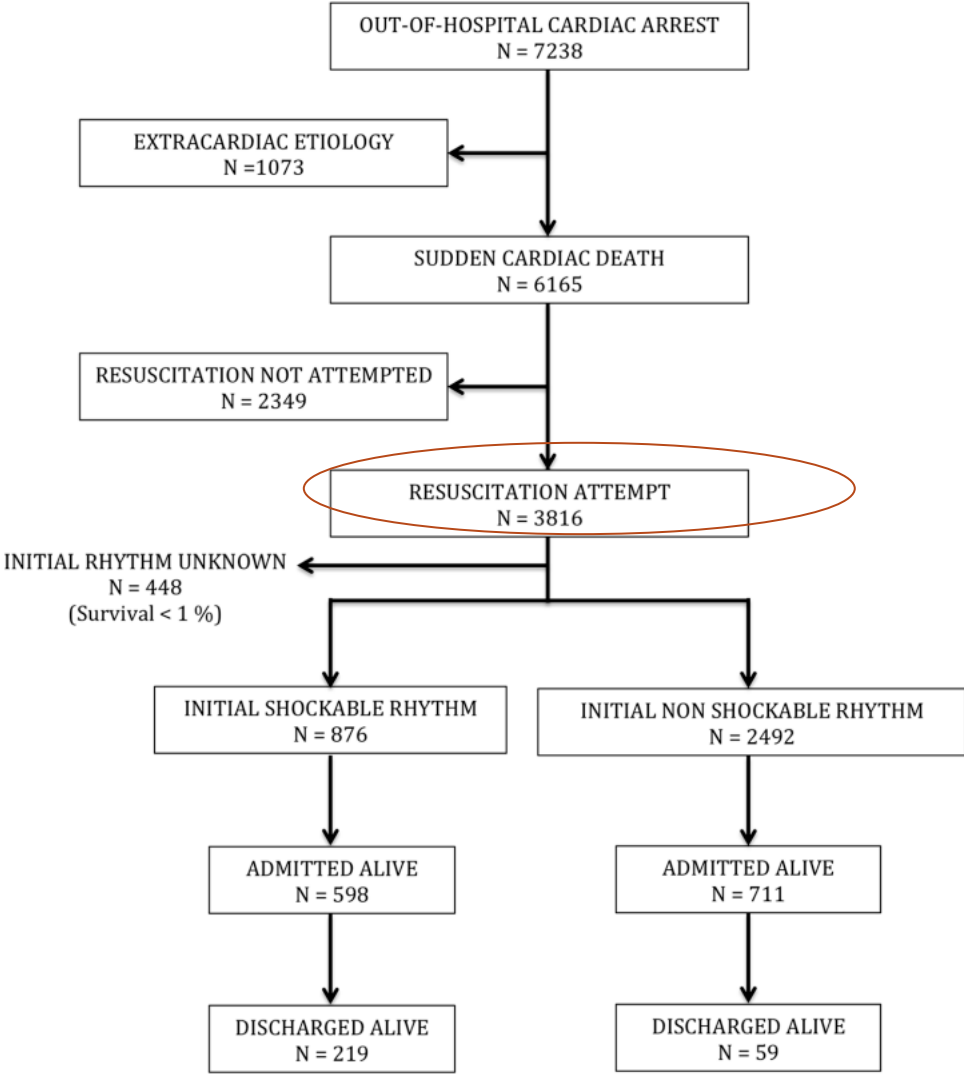
- MS :
 - 80 % d'origine cardiaque : CI, arythmies ventriculaires
 - 20% extracardiaque : AVC, EP,...

Maladie grave: 5% survie ; 95% de mortalité



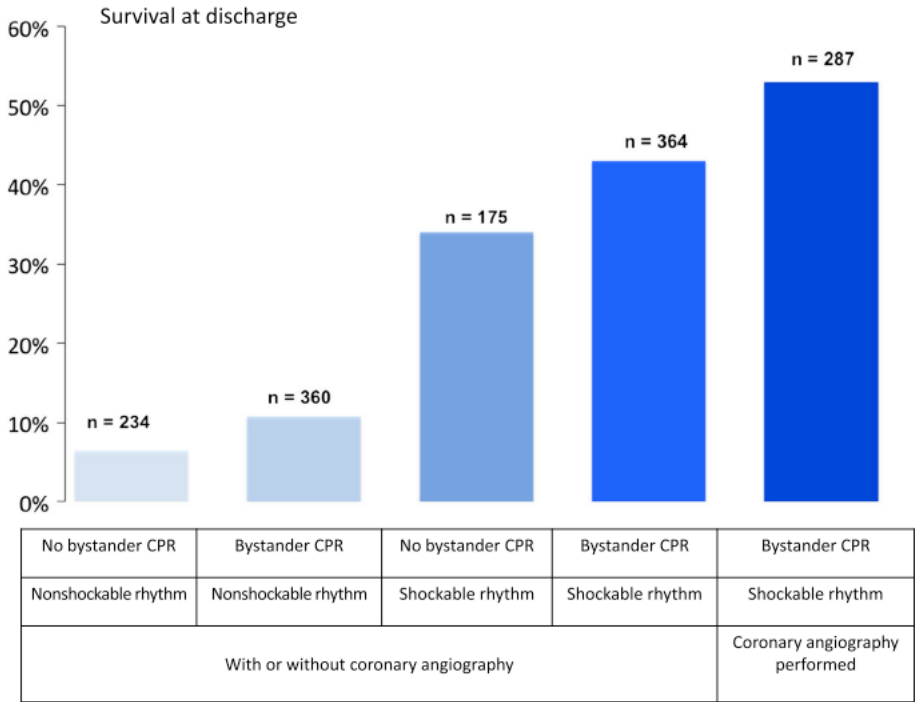


ents
period

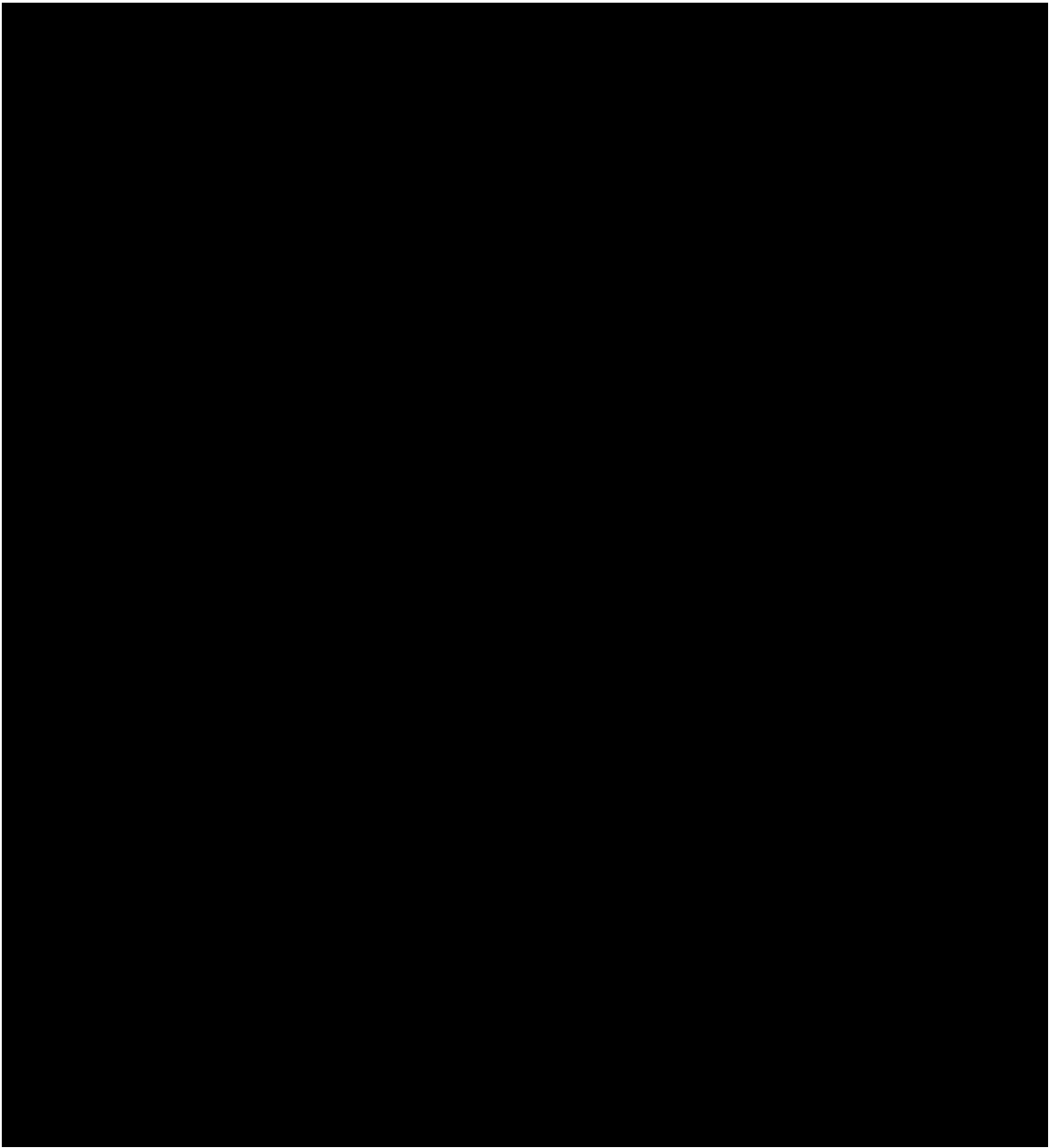


Characteristics and prognosis of sudden cardiac death in Greater Paris

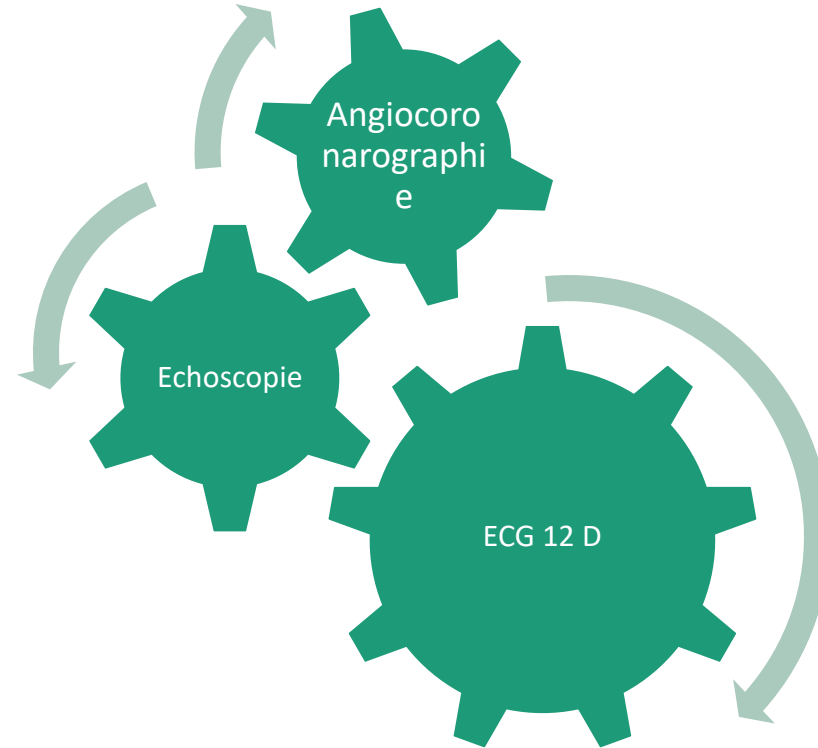
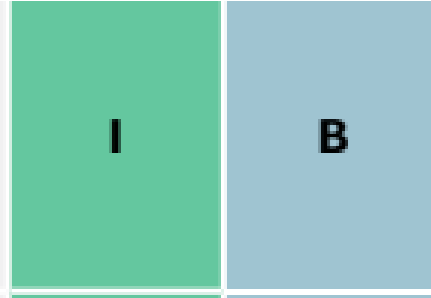
Population-based approach from the Paris Sudden Death Expertise Center (Paris—SDEC)

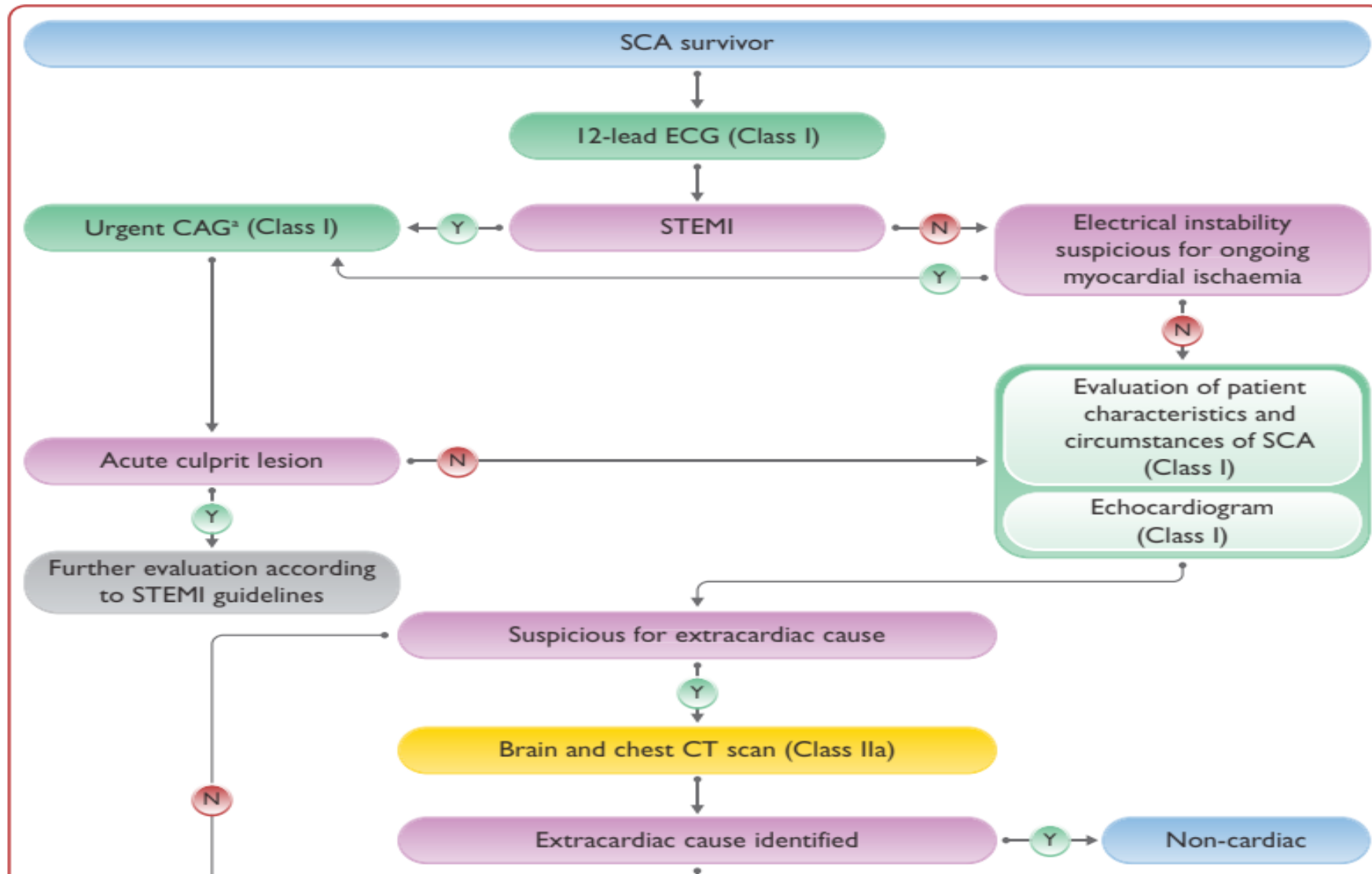


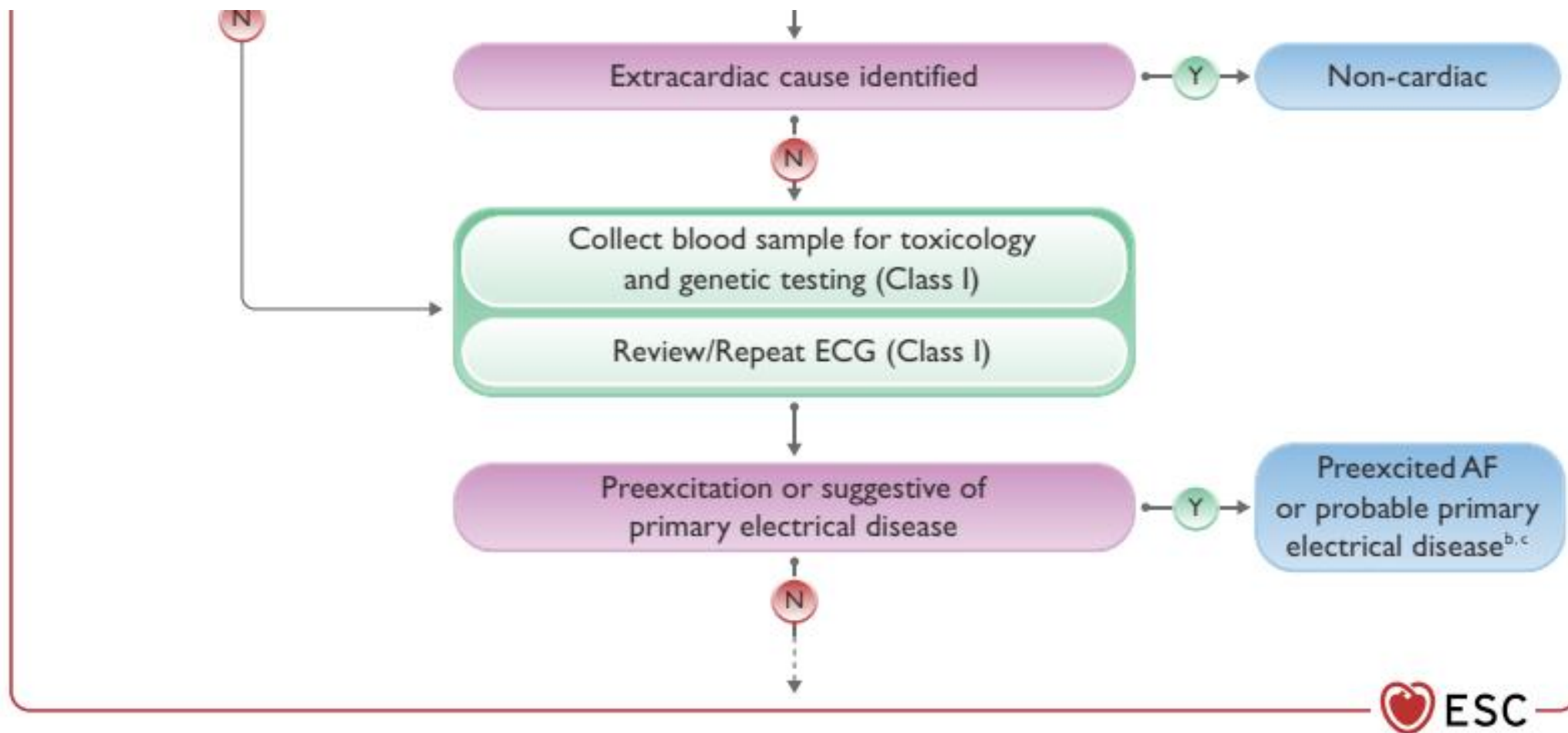


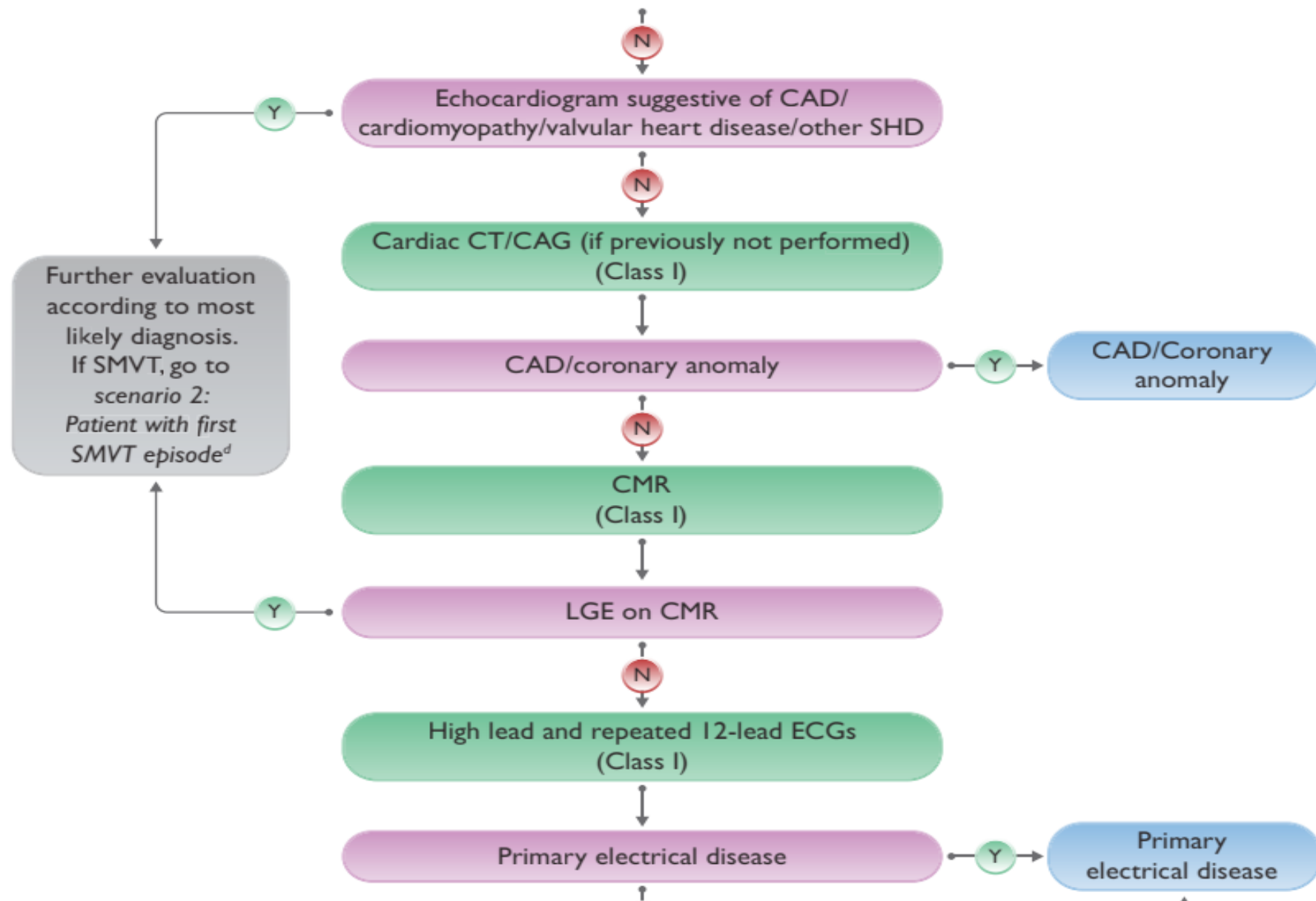


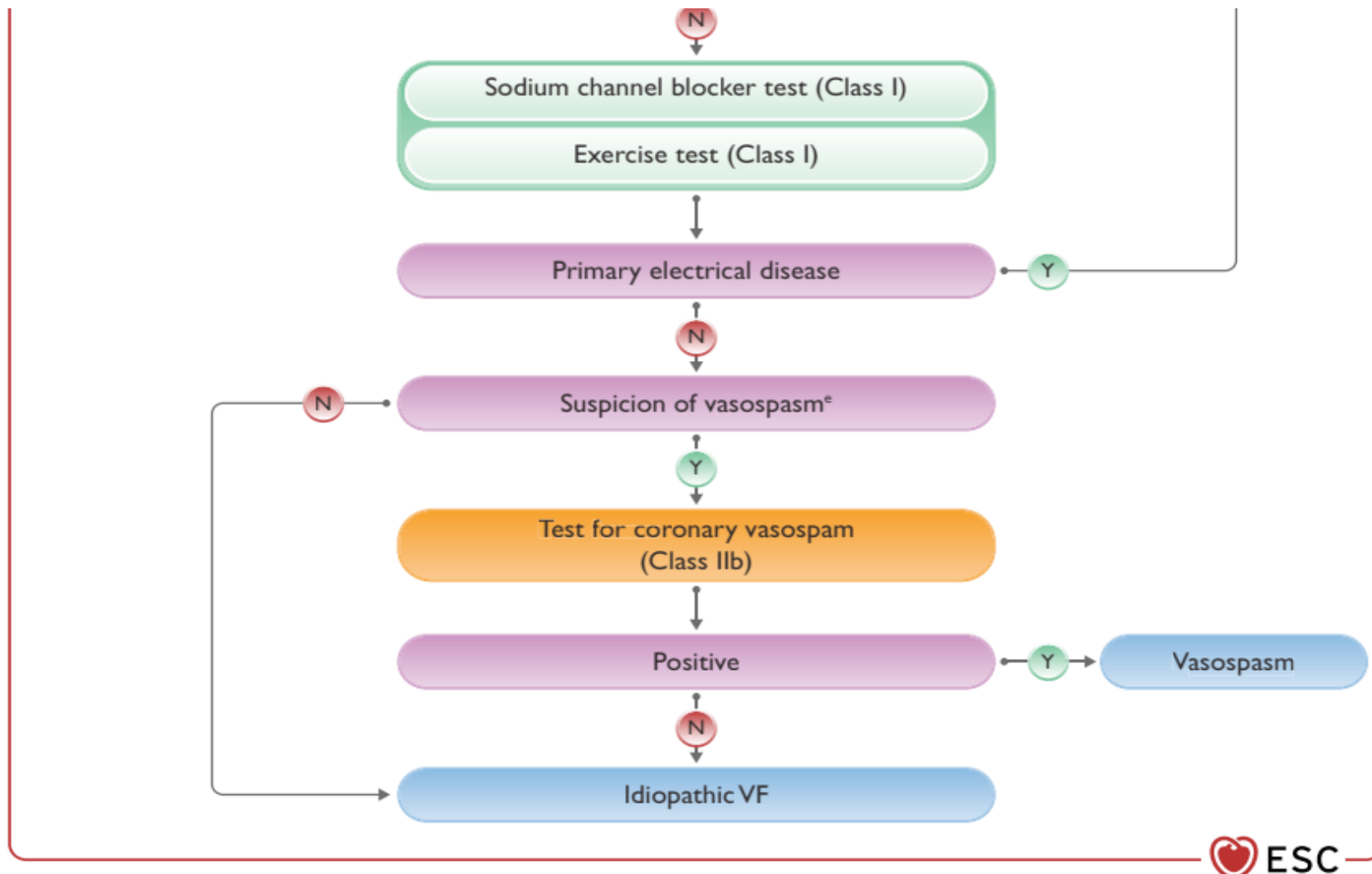
In cases of SD, it is recommended to collect a detailed description of circumstances of death, symptoms prior to death, the family history, and to review prior medical files.^{25,56}

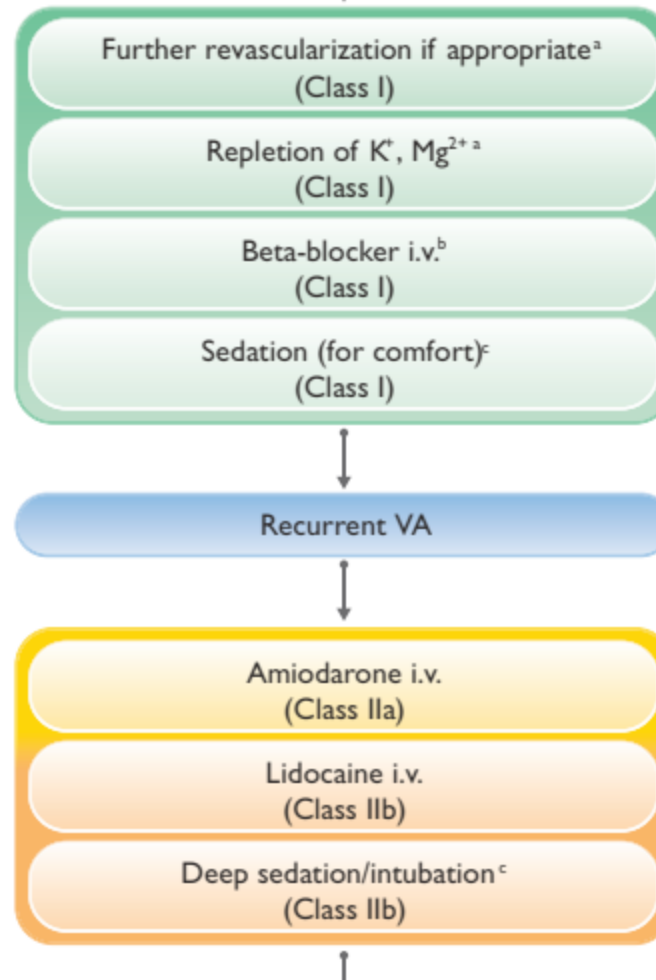






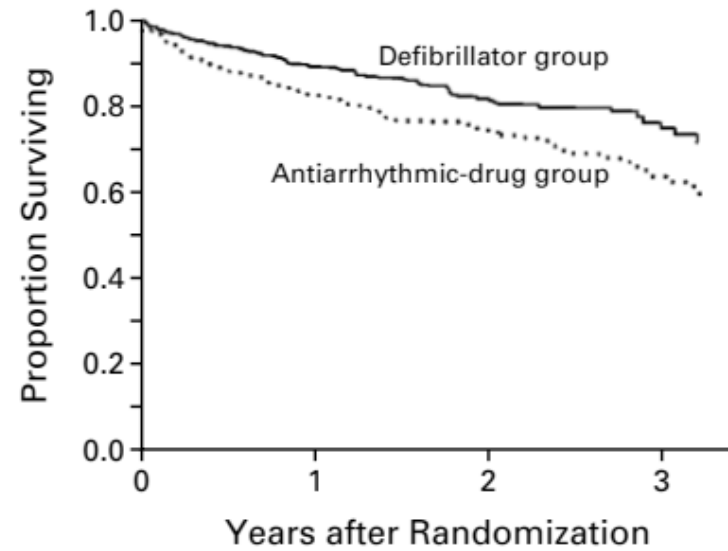






A COMPARISON OF ANTIARRHYTHMIC-DRUG THERAPY WITH IMPLANTABLE DEFIBRILLATORS IN PATIENTS RESUSCITATED FROM NEAR-FATAL VENTRICULAR ARRHYTHMIAS

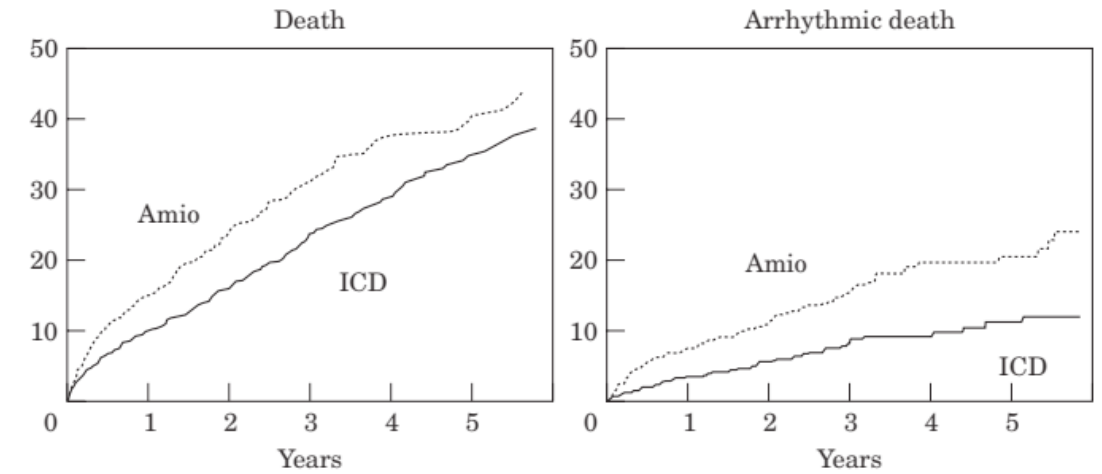
THE ANTIARRHYTHMICS VERSUS IMPLANTABLE DEFIBRILLATORS (AVID) INVESTIGATORS*



Patients at risk	1016	644	333	104
Percent surviving				
Defibrillator group		89.3	81.6	75.4
Antiarrhythmic-drug group		82.3	74.7	64.1

Meta-analysis of the implantable cardioverter defibrillator secondary prevention trials

S. J. Connolly, A. P. Hallstrom, R. Cappato, E. B. Schron, K.-H. Kuck, D. P. Zipes, H. L. Greene, S. Boczor, M. Domanski, D. Follmann, M. Gent, R. S. Roberts, on behalf of the investigators of the AVID, CASH and CIDS studies



Number at risk												
ICD:	934	715	467	273	159	104	934	715	467	273	159	104
Amio:	932	664	427	248	128	82	932	664	427	248	128	82

Figure 1 Cumulative risk of fatal events or the amiodarone (...) and ICD (—) treatment arms.



Europace

doi:10.1093/europace/euv027

CLINICAL RESEARCH

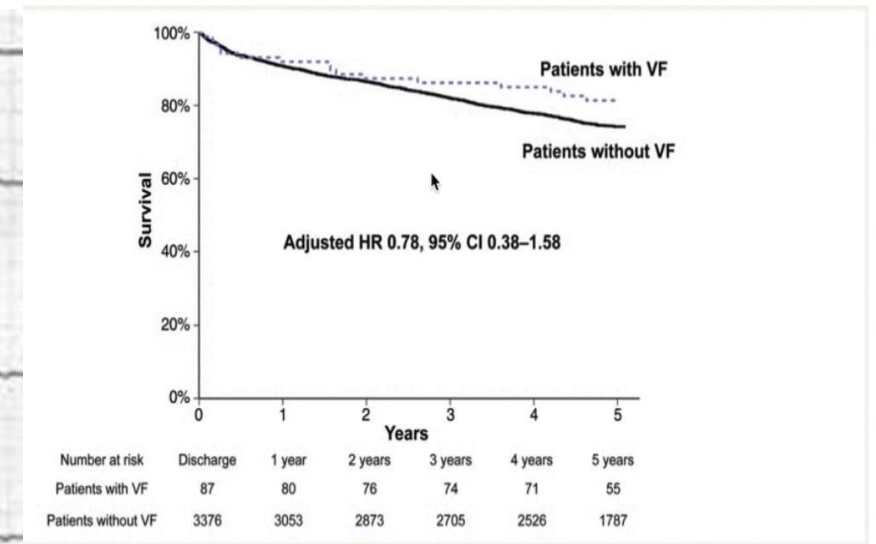
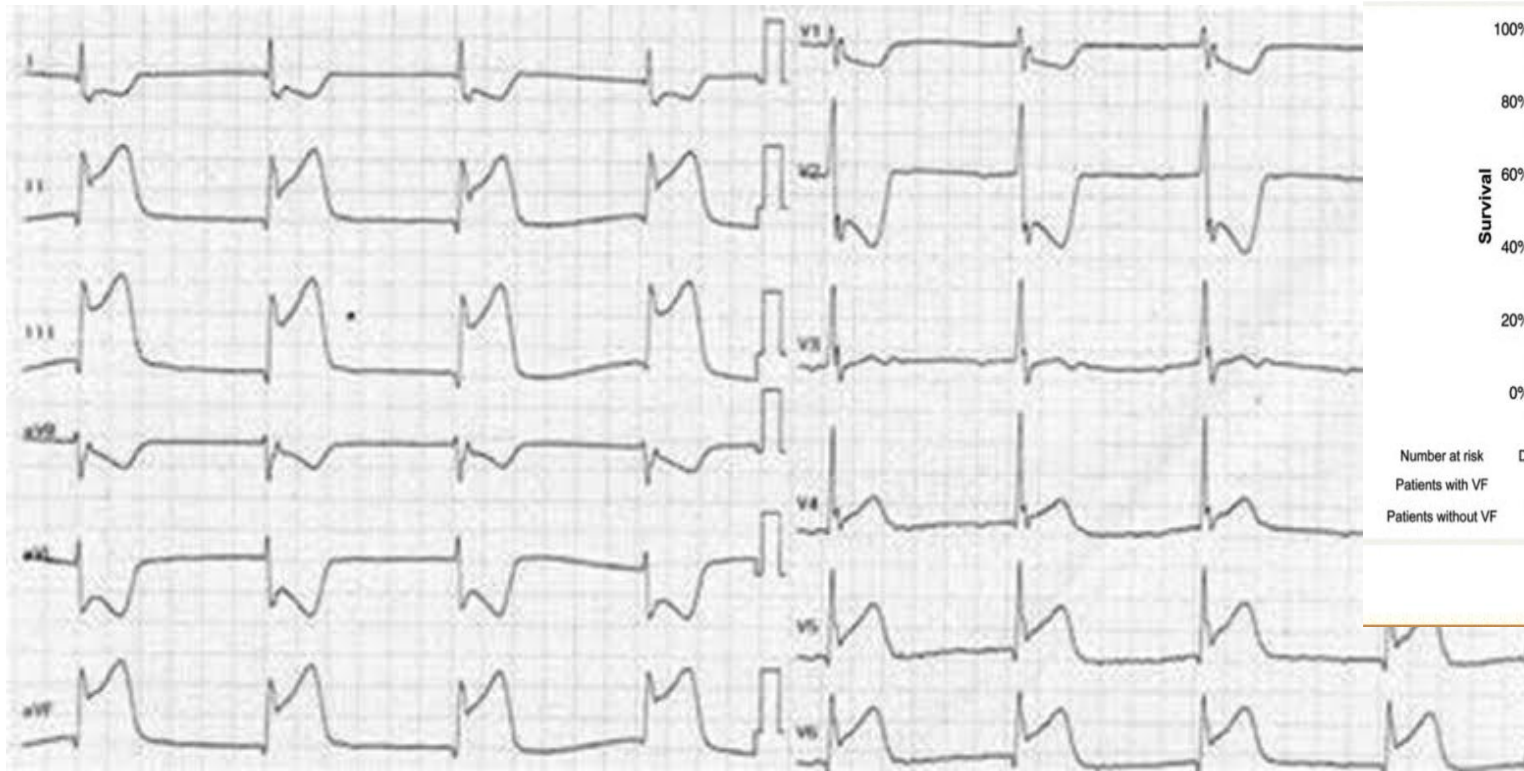
Outcome of contemporary acute coronary syndrome complicated by ventricular tachyarrhythmias

CAT devant une MCS Récupérée

- 7 Situations cliniques sont possibles :
 - 1) Cardiopathie ischémique
 - 2) Canalopathies
 - 3) SWPW
 - 4) Myocardite
 - 5) Spasme coronaire
 - 6) Tachycardie des chambres de chasses
 - 7) Pas de cause retrouvée

- Cardiopathie ischémique

M 67 ans ACR récupéré :



Prevention and treatment of VAs in the acute phase of STEMI

Beta-blocker i.v. prior to PCI, if not contraindicated^{a,b}
(Class IIa)

Urgent CAG and revascularization^a
(Class I)

VA

Further revascularization if appropriate^a
(Class I)

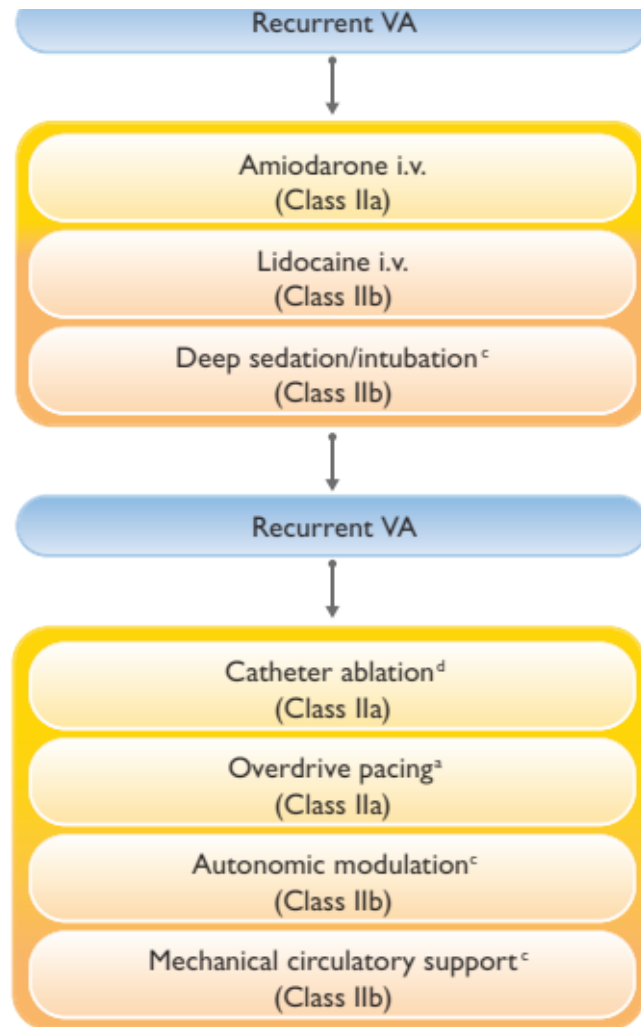
Repletion of K^+ , Mg^{2+} ^a
(Class I)

Beta-blocker i.v.^b
(Class I)

Sedation (for comfort)^c
(Class I)

Recurrent VA

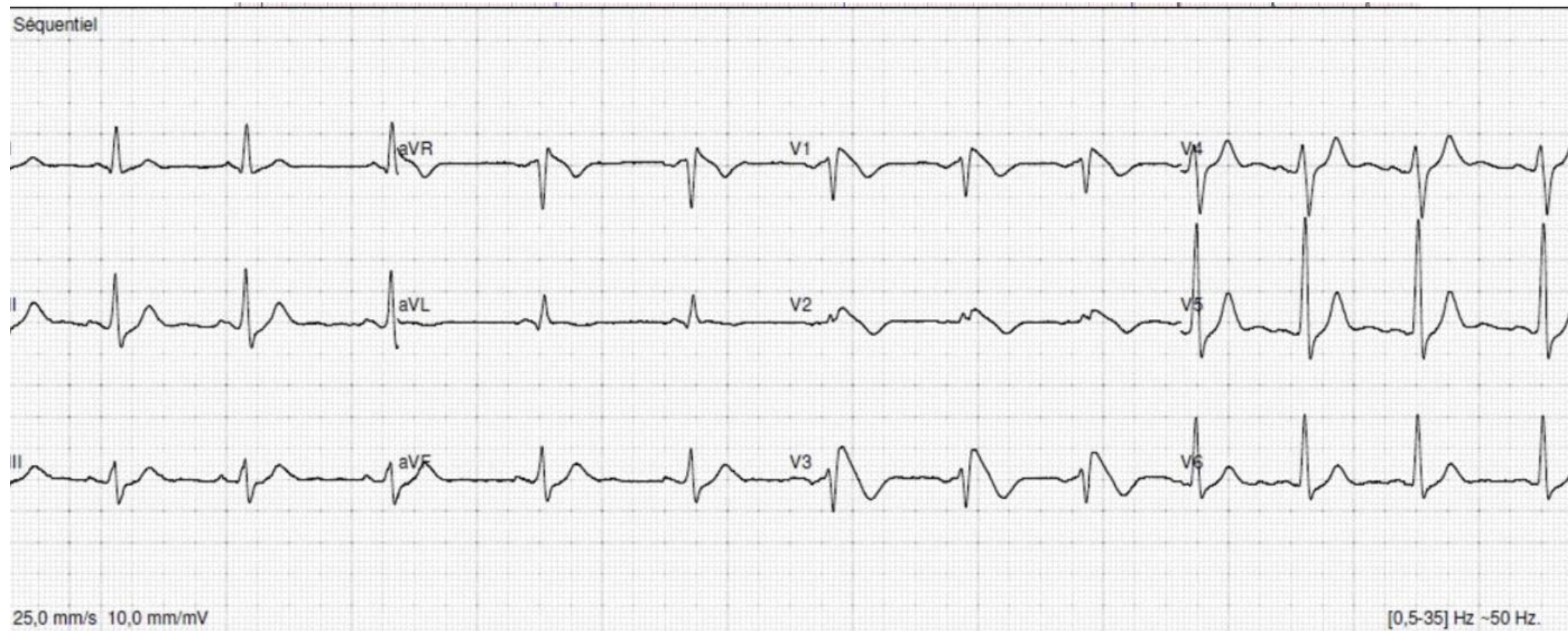




Recommendation Table 22 — Recommendations for treatment of ventricular arrhythmias in acute coronary syndrome and vasospasm

Recommendations	Class ^a	Level ^b
Treatment of VAs in ACS		
Intravenous beta-blocker treatment is indicated for patients with recurrent PVT/VF during STEMI unless contraindicated. ^{551,552}	I	B
Intravenous amiodarone treatment should be considered for patients with recurrent PVT/VF during the acute phase of ACS. ^{552,554,555}	IIa	C
Intravenous lidocaine may be considered for the treatment of recurrent PVT/VF not responding to beta-blockers or amiodarone, or if amiodarone is contraindicated during the acute phase of ACS. ⁵⁵⁴	IIb	C
Prophylactic treatment with AADs (other than beta-blockers) is not recommended in ACS. ³²²	III	B
Secondary prevention of SCD and treatment of VAs		
ICD implantation is recommended in patients without ongoing ischaemia with documented VF or haemodynamically not-tolerated VT occurring later than 48 h after MI. ^{349–351}	I	A
In patients with CAD and recurrent, symptomatic SMVT, or ICD shocks for SMVT despite chronic amiodarone therapy, catheter ablation is recommended in preference to escalating AAD therapy. ⁴⁷¹	I	B

- Canalopathies:
- Patiente 49 ans, Fumeur ATCD MSC dans la famille non explorée, Echo: FE 65%





General recommendations

The following is recommended in all patients with BrS:

- (a) Avoidance of drugs that may induce ST-segment elevation in right precordial leads (<http://www.brugadadrugs.org>).
- (b) Avoidance of cocaine, cannabis, and excessive alcohol intake.
- (c) Treatment of fever with antipyretic drugs.

I

C

Risk stratification, prevention of SCD and treatment of VA

ICD implantation is recommended in patients with BrS who:

- (a) Are survivors of an aborted CA and/or
- (b) Have documented spontaneous sustained VT.^{980,990–992}

I

C

ICD implantation should be considered in patients with type 1 Brugada pattern and an arrhythmic syncope.^{990,992,996}

IIa

C

Implantation of a loop recorder should be considered in BrS patients with an unexplained syncope.^{997,999}

IIa

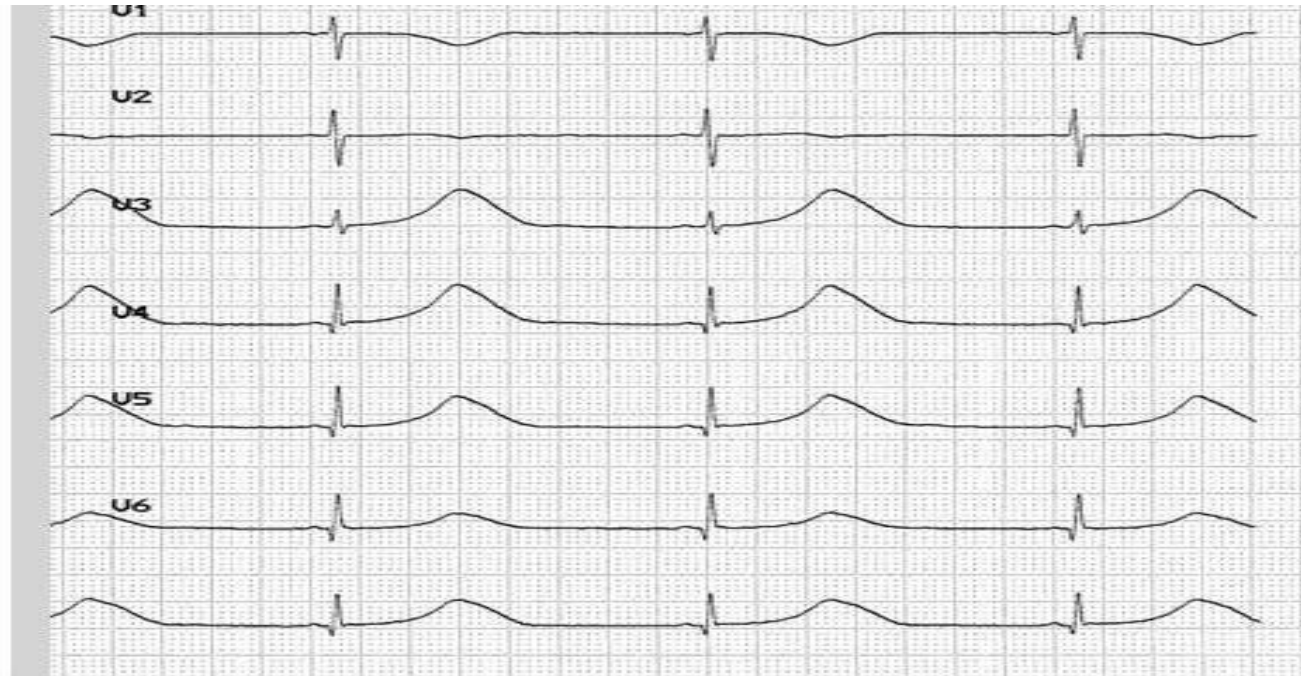
C

Quinidine should be considered in patients with BrS who qualify for an ICD but have a contraindication, decline, or have recurrent ICD shocks.^{922,1006,1007}

IIa

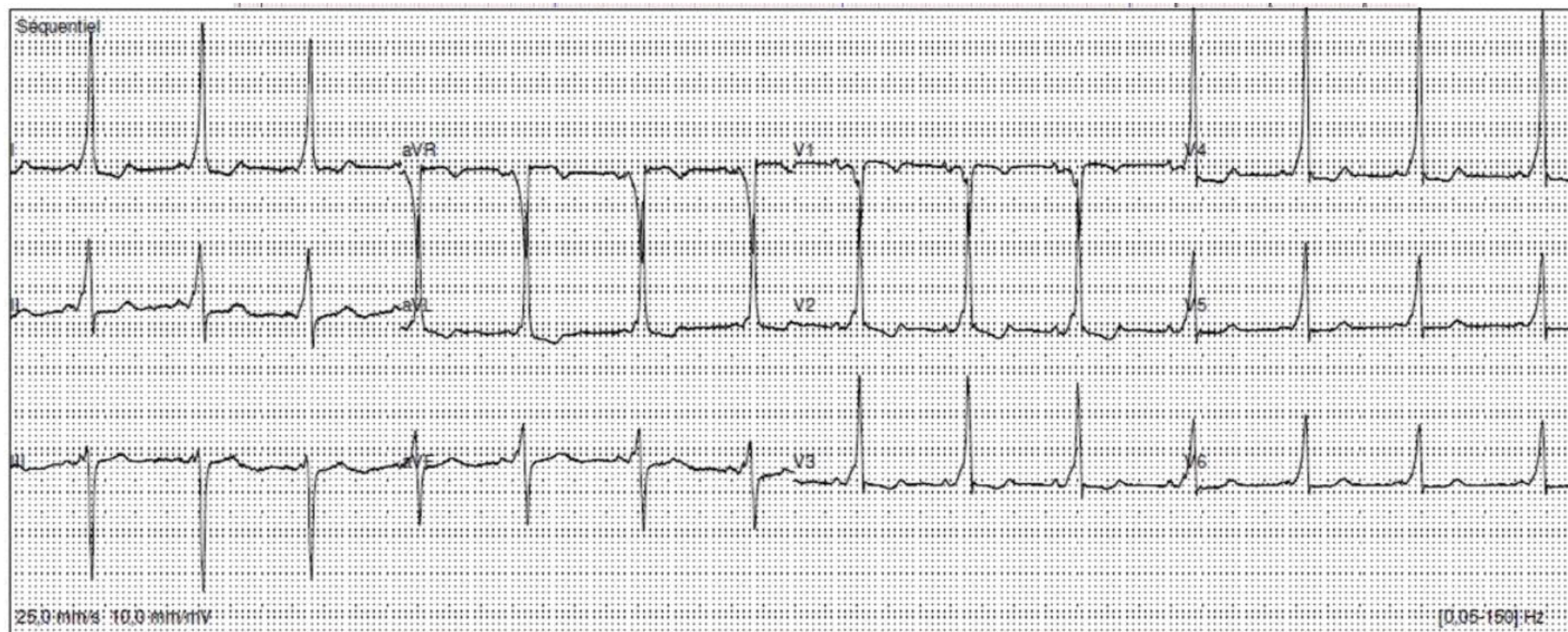
C

- Patiente de 28 ans, récupérée d'une MSC lors d'une course de divertissement, kaliémie à l'arrivée aux urgences à 4,1 mmol, pas de traitement à domicile.



Long QT syndrome	
In patients with clinically diagnosed LQTS, genetic testing, and genetic counselling are recommended.	I
Beta-blockers, ideally non-selective beta-blockers (nadolol or propranolol), are recommended in LQTS patients with documented QT interval prolongation, to reduce risk of arrhythmic events.	I
Mexiletine is indicated in LQT3 patients with a prolonged QT interval.	I
In LQTS, it should be considered to calculate the arrhythmic risk before initiation of therapy based on the genotype and the duration of QTc interval.	IIa
ICD implantation may be considered in asymptomatic LQTS patients with high-risk profile (according to the 1-2-3 LQTS Risk calculator) in addition to genotype-specific medical therapies (mexiletine in LQT3 patients).	IIb
Routine diagnostic testing with epinephrine challenge is not recommended in LQTS.	III

Sequentiel



- Patient de 19 ans MSCR à l'école pendant la récréation



Therapeutic interventions

Beta-blockers, ideally non-selective (nadolol or propranolol) are recommended in all patients with a clinical diagnosis of CPVT. [1045,1048,1059](#)

I

C

ICD implantation combined with beta-blockers and flecainide is recommended in CPVT patients after aborted CA. [1045,1047,1060](#)

I

C

- Spasme coronaire:

Patient ayant présenté une MSCR lors d'une soirée, notion de consommation de toxiques:



In SCA survivors with coronary artery spasm, implantation of an ICD should be considered.

Idiopathic VF

It is recommended that idiopathic VF is diagnosed in a SCA survivor, preferably with documentation of VF, after exclusion of an underlying structural, channelopathic, metabolic, or toxicological aetiology.

I

Isoproterenol infusion, verapamil, or quinidine for acute treatment of an electrical storm or recurrent ICD discharges should be considered in idiopathic VF.

IIa

Quinidine should be considered for chronic therapy to suppress an electrical storm or recurrent ICD discharges in idiopathic VF.

IIa

Clinical testing (history, ECG, and high precordial lead ECG, exercise test, echocardiogram) of first-degree family members of idiopathic VF patients may be considered.

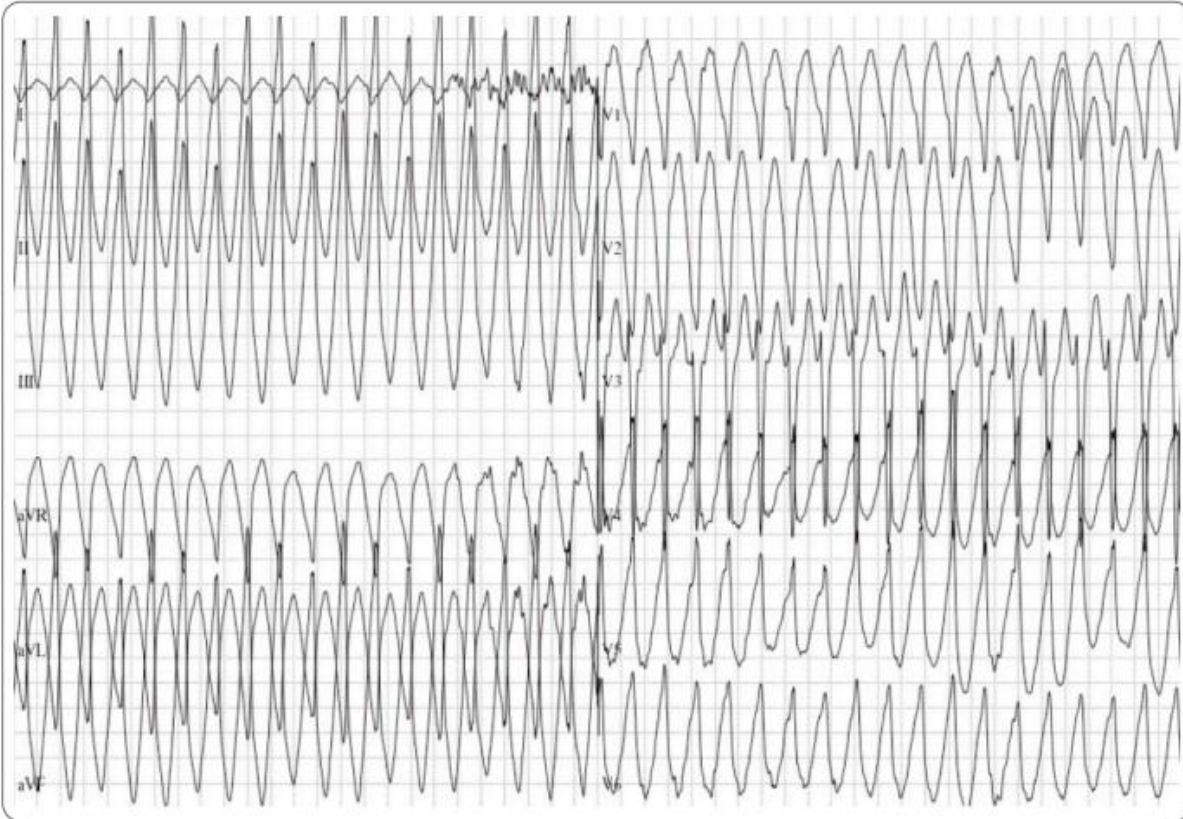
IIb

In idiopathic VF patients, genetic testing of genes related to channelopathy and cardiomyopathy may be considered.

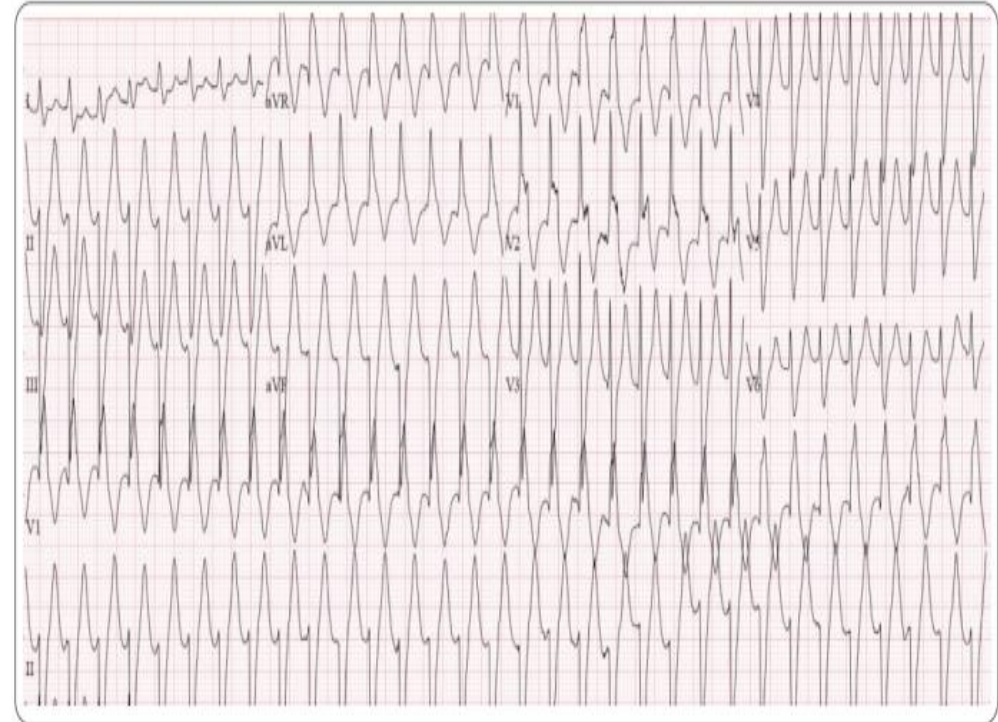
IIb

Tachycardie des chambres de chasse

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



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



Patient de 82 ans, porteur d'un DAI sorin ULYS DR en prévention primaire de cardiopathie ischémique avec FEVG 35%
→ emmené par les pompiers aux urgences pour arrêt cardiaque récupéré au super marché.

ULYS DF4 DR

21/Fév/2024

MONTAIGNE BERNARD

Urgence

Français

ECG II

Ajuster

Messages d'avertissements : 3

Etat et courbe de pile

Durée jusqu'à DRR

D.R.R.1 3 5 7 10 15 Ans

Tension 3.20 V 20/Fév/24

B.O.S. = 3.24 V

D.R.R. = 2.62 V

E.O.S. = 2.50 V

Temps de charge 3.5 s

Impéd. de choc 71 Ohm

Sondes

	Amplitudes P/R (mV)	Seuils (V)	Impédances (Ohm)
A	3.8 21/Fév/24	0.50 21/Fév/24	468 21/Fév/24
V	12.4 21/Fév/24	0.50 21/Fév/24	598 21/Fév/24

Continuité coil VD 473 Ohm 21/Fév/24

Paramètres

60 130 min-1

Mode SafeR (AAI<=>DDD)

Sensi V 0.4 mV

Zones

	TV lente OII	TV OII	TV rapide + FV OII
Détection	PARAD+ >> Fréq. + Stabilité		
ATP 1	Non	3 SALVE+SCAI	1 SALVE
ATP 2	Non	3 RAMPE	
Choc 1	Non	42 J	42 J
Choc 2	Non	42 J	42 J
Choc 42J	Non	4 x 42 J	4 x 42 J

Statistiques

P.A.Z

% Cycles P: 97% A: 1% R: 99% V: 1%

Nombre de replis 0

Temps en repli 00s

Depuis le 19/Fév/24

	Dernier ép. traité 21/Fév/24	ATP délétère	Nb. total de chocs (hors choc T)
Episodes	Nb	Traité(s)	Prog. ATP Nb Efficace(s)
TVR / FV	5	2	1 0 2 2
TV	1	1	1 1 0 0
TV lente	0	0	0 0 0 0
Autre	0	0	0 0 0 0
Total	6	2	2 2

ULYS DF4 DR

21/Fév/2024

MONTAIGNE BERNARD

Urgence

Français

ECG II

Ajuster

Suivi du 19/Fév/2024 au 21/Fév/2024

Résumé PMDAI Arythmies/Thérapies Conduc AV

Param. AIDA

Diagnostiques

Arythmies ventriculaires et thérapies

Cumul des arythmies ventriculaires

Thérapies appliquées par zone

Historique des arythmies et des thérapies

Arythmies auriculaires

Pas de dysfonctionnement détecté

Nombre d'épisodes stockés : 9

Type	Date	Traitement	Durée
TV Rapide	21/Fév/2024 09:37	1 x 42.0J	18s
Non sout.	21/Fév/2024 10:01		
FV	21/Fév/2024 09:45	1 x 42.0J	20s
FV	21/Fév/2024 09:42		12s
FV	21/Fév/2024 09:36		08s

Intervalles

FV ATP FV TVCL 42.0 J RL

min-1

440

340

240

140

40

09:37:53

09:37:58

09:38:03

09:38:08

FV (220) min-1

TV (180) min-1

TV lente (160) min-1

Interro.

Résumé

Assistent de tests

Diagnos. AIDA

Param.

Tests EGM

Rapport

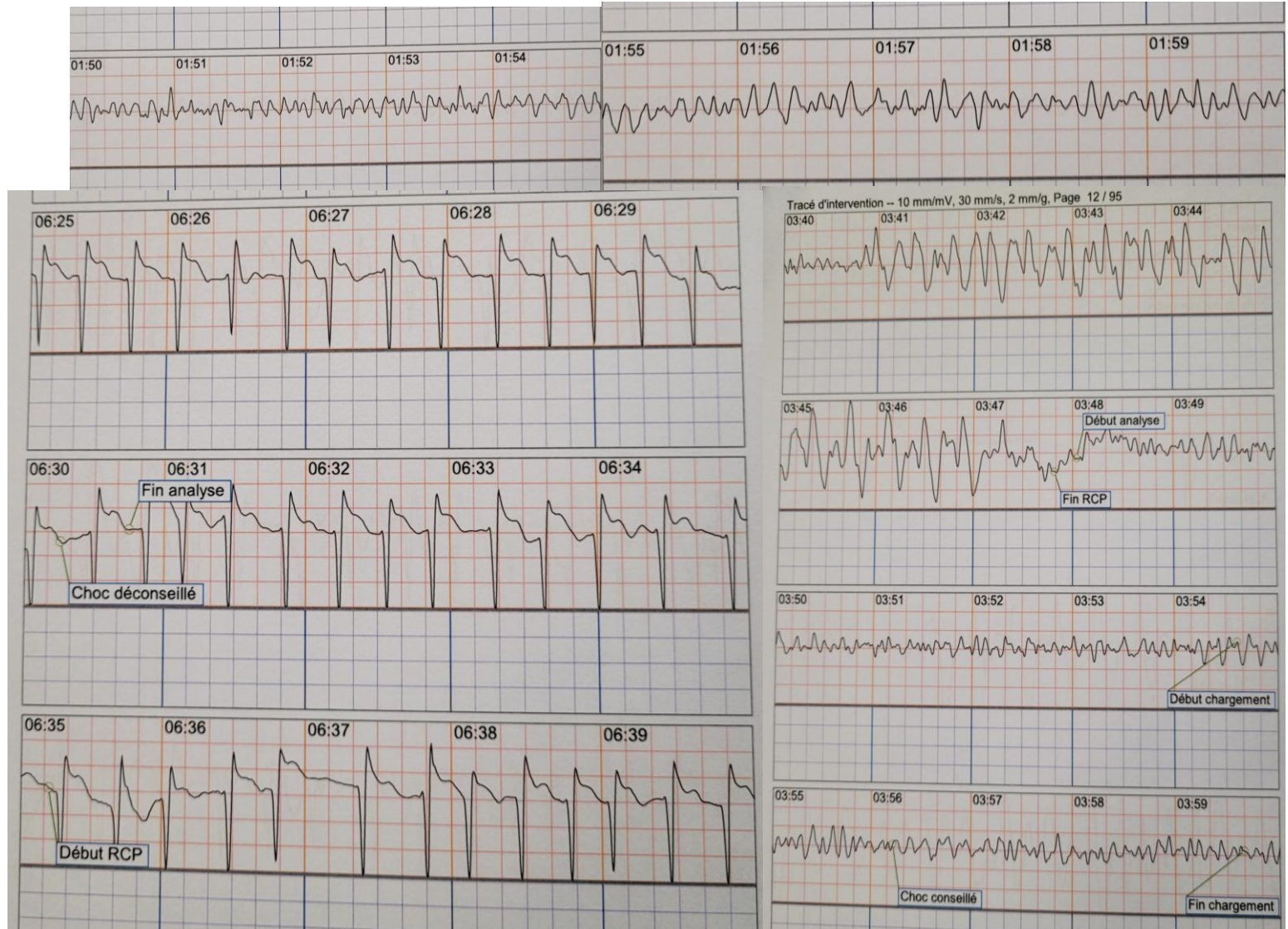
Patient

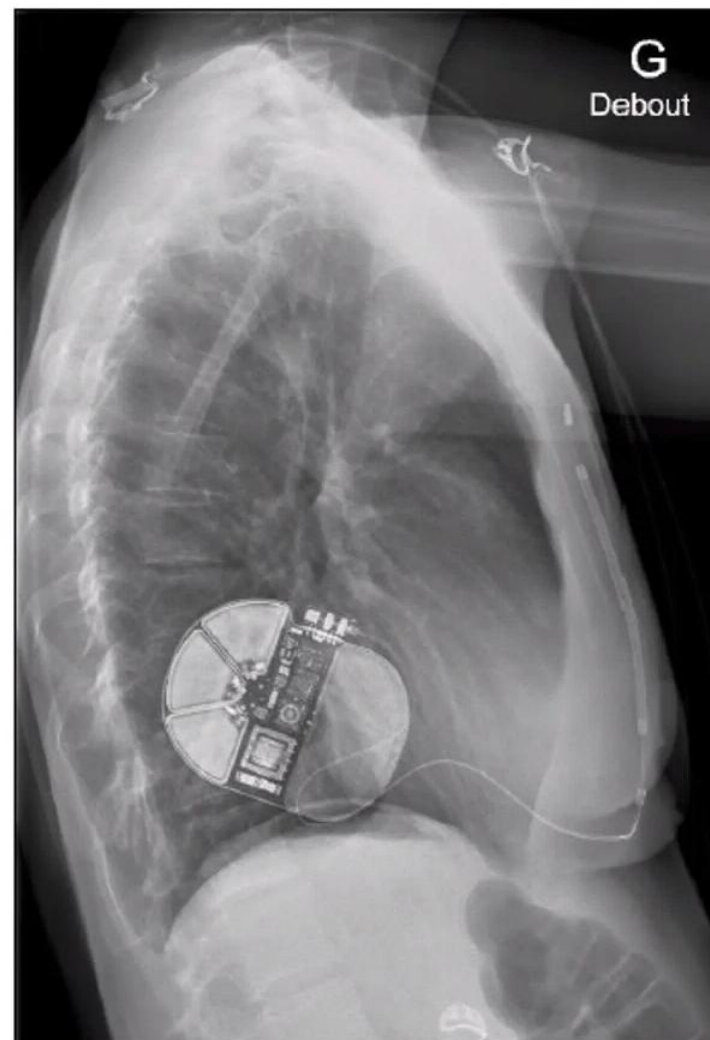
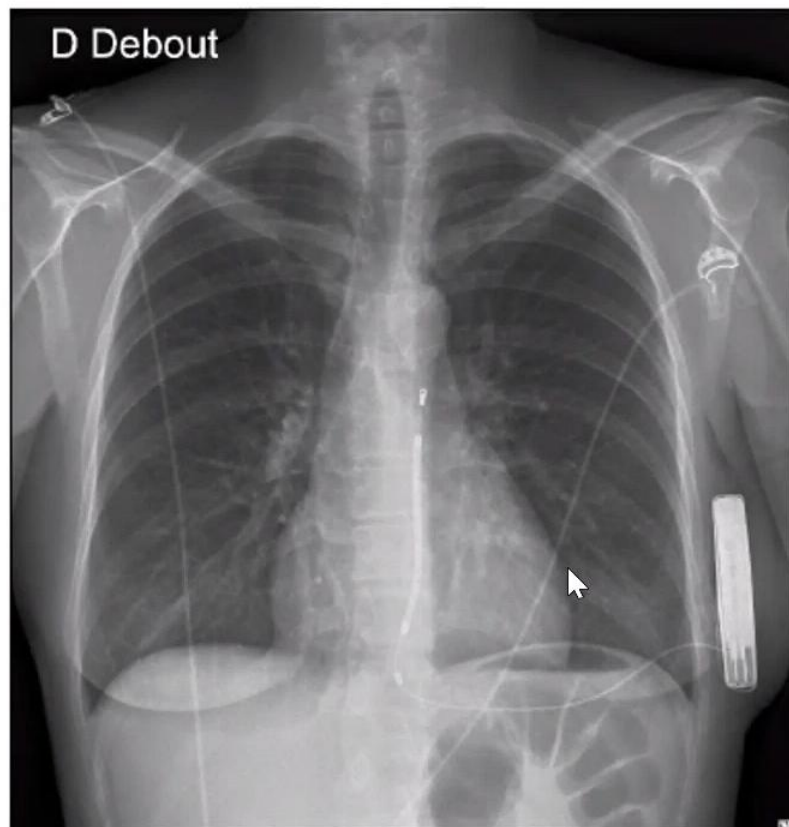
Prog.

Fin

FV IDIOPATHIQUE DU SUJET JEUNE

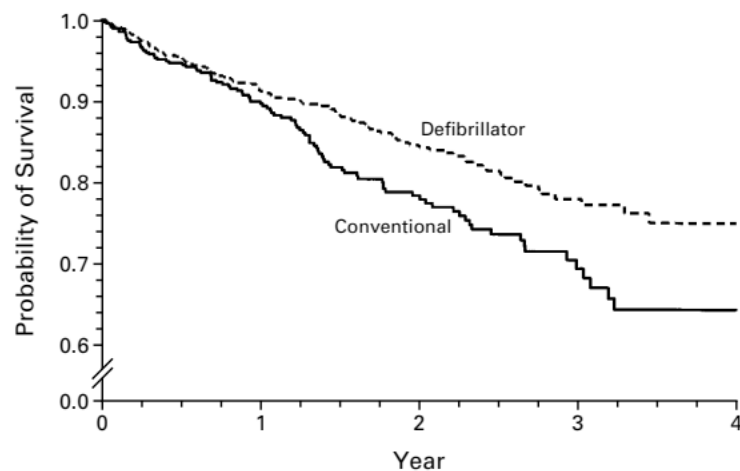
Patiente de 27 ans,
sans antécédent
morbide significatif,
pas de FRCV,
pas d'ATCD de mort
subite dans la
famille,
ACR dans un café en
présence de ses
proches.





PROPHYLACTIC IMPLANTATION OF A DEFIBRILLATOR IN PATIENTS WITH MYOCARDIAL INFARCTION AND REDUCED EJECTION FRACTION

ARTHUR J. MOSS, M.D., WOJCIECH ZAREBA, M.D., PH.D., W. JACKSON HALL, PH.D., HELMUT KLEIN, M.D.,
DAVID J. WILBER, M.D., DAVID S. CANNOM, M.D., JAMES P. DAUBERT, M.D., STEVEN L. HIGGINS, M.D.,
MARY W. BROWN, M.S., AND MARK L. ANDREWS, B.B.S.,
FOR THE MULTICENTER AUTOMATIC DEFIBRILLATOR IMPLANTATION TRIAL II INVESTIGATORS*

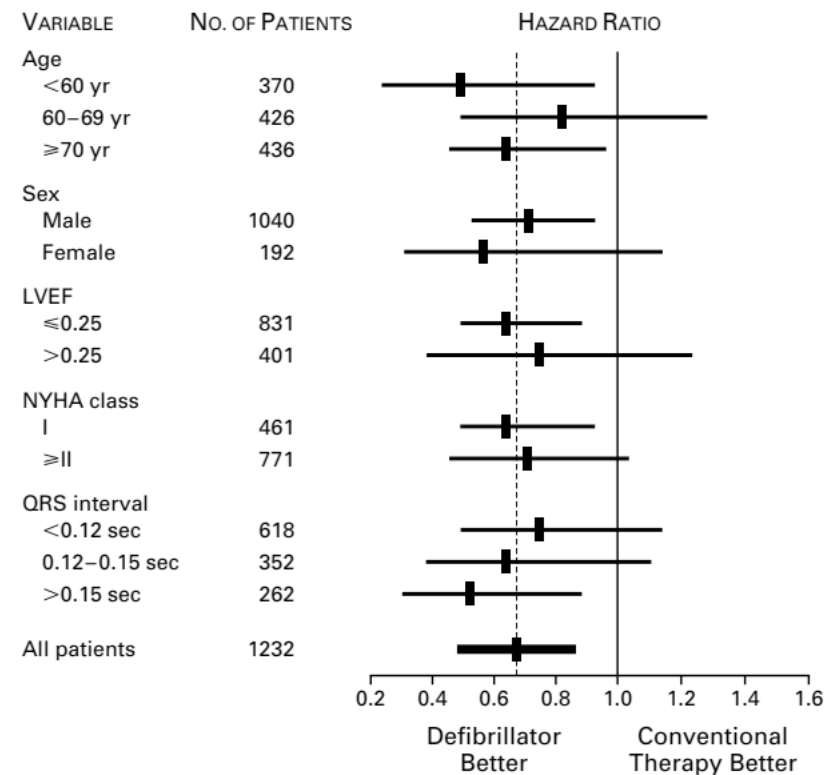


No. AT RISK

Defibrillator	742	503 (0.91)	274 (0.84)	110 (0.78)	9
Conventional	490	329 (0.90)	170 (0.78)	65 (0.69)	3

Figure 2. Kaplan-Meier Estimates of the Probability of Survival in the Group Assigned to Receive an Implantable Defibrillator and the Group Assigned to Receive Conventional Medical Therapy.

The difference in survival between the two groups was significant (nominal $P=0.007$, by the log-rank test).



Recommendation Table 2 — Recommendations for genetic testing

Recommendations	Class ^a	Level ^b
Genetic testing is recommended when a condition is diagnosed in a living or deceased individual with a likely genetic basis and a risk of VA and SCD. ^{56,183}	I	B
When a putative causative variant is first identified, evaluation for pathogenicity is recommended using an internationally accepted framework. ¹⁷⁶	I	C
When a Class IV or Class V variant has been identified in a living or deceased individual with a condition that carries a risk of VA and SCD, genetic testing of first-degree and symptomatic relatives and obligate carriers is recommended.	I	C
It is recommended that genetic testing and counselling on its potential consequences should be undertaken by an expert multidisciplinary team. ¹⁷⁹	I	C
It is recommended that Class III (variants of uncertain significance) and Class IV variants should be evaluated for segregation in families where possible, and the variant re-evaluated periodically.	I	C
It is not recommended to undertake genetic testing in index patients with insufficient evidence of a genetic disease.	III	C

Conclusion

- MSC doit être bien connu par le personnel soignant
- La prise en charge d'un patient ayant fait une mort subite doit être vulgarisée et débuté au lieux ou à été constaté cette mort subite, afin de diminuer la mortalité liée à cette maladie.
- Les moyens de préventions primaires et l'exploration des apparentés doit être envisagé pour éviter la recrudescence de ce phénomène dans certaines familles.

Recommendations

Recommendations	Class
Public basic life support and access to AEDs	
It is recommended that public-access defibrillation be available at sites where cardiac arrest is more likely to occur. ^a	I
Prompt CPR by bystanders is recommended at OHCA.	I
It is recommended to promote community training in basic life support to increase bystander CPR rate and AED use.	I
Mobile phone-based alerting of basic life support-trained bystander volunteers to assist nearby OHCA victims should be considered.	IIa

Merci pour votre attention