- Dr Eduardo Philippi
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Manejo das arritmias no paciente assintomático

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Palpitações

EUROPEAN SOCIETY OF CARDIOLOGY®
Europace (2011) **13**, 920–934
doi:10.1093/europace/eur130

EHRA POSITION PAPER

Management of patients with palpitations: a position paper from the European Heart Rhythm Association

Definition

Palpitations are a symptom defined as awareness of the heartbeat and are described by patients as a *disagreeable sensation of pulsation or movement in the chest and/or adjacent areas.*[7] Implicit in that

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Fadiga, dispnéia, desconforto no peito, tonturas ou síncope.

the remaining cases, presentation was categorized as: 1) typical (palpitations with or without other concomitant symptoms), 2) atypical (fatigue, shortness of breath, chest pain, lightheadedness, syncope, decreased exercise tolerance, etc., without palpitations), 3)

Author's Accepted Manuscript

Typical, Atypical, and Asymptomatic Presentations of New-Onset Atrial Fibrillation in the Community: Characteristics and Prognostic Implications

Konstantinos C. Siontis, Bernard J. Gersh, Jill M. Killian, Peter A. Noseworthy, Pamela McCabe, Susan A. Weston, Veronique L. Roger, Alanna M. Chamberlain

Typical, atypical, and asymptomatic presentations of new-onset atrial fibrillation in the community: characteristics and prognostic implications. Heart Rhythm 2016;13:1418–24

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and warfarin use. Asymptomatic AF was associated with an increased risk of cardiovascular (HR 3.12, 95% CI 1.50-6.45) and all-cause mortality (HR 2.96, 95% CI 1.89-4.64) compared to typical AF after adjustment for CHA_2DS_2-VASc score and age.

Author's Accepted Manuscript

Typical, Atypical, and Asymptomatic Presentations of New-Onset Atrial Fibrillation in the Community: Characteristics and Prognostic Implications

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www.elsevier.com/locate/buildenv

Typical, atypical, and asymptomatic presentations of new-onset atrial fibrillation in the community: characteristics and prognostic implications. Heart Rhythm 2016;13:1418–24

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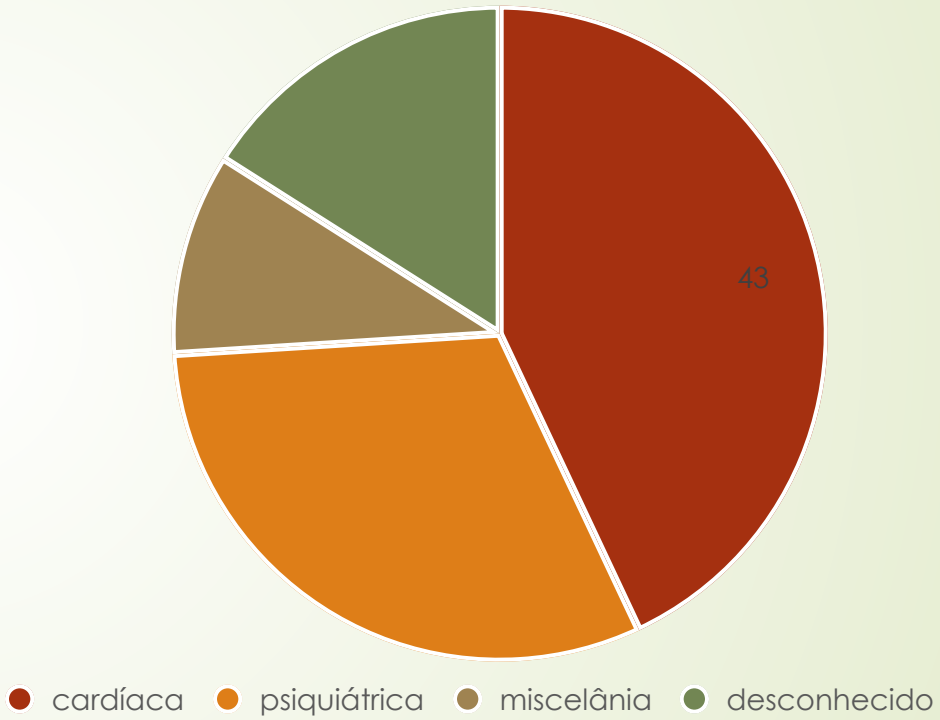
Arritmias cardíacas podem ser assintomáticas

Palpitação não significa arritmia

Evaluation and Outcomes of Patients With Palpitations

B.E. Weber, W.N. Kapoor. St. Mary's Hospital, Rochester, NY. Am J Med 1996;100: 138–48.

the patients. *Results*: An etiology of palpitations was determined in 84% of the patients. The etiology of palpitations was cardiac in 43%, psychiatric in 31%, miscellaneous in 10%, and unknown in 16%. Forty percent of the etiologies



Weber BE, Kapoor WN. Evaluation and outcomes of patients with palpitations.Am J Med 1996;100:138–48.

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Conflitantes

Origem?

Disordem cardiovascular?

Isoladas ou sustentadas?

Drogas?

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Journal of Cardiovascular Nursing
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Symptom Clusters in Adults With Chronic Atrial Fibrillation

Megan Streur, RN, MN; Sarah J. Ratcliffe, PhD; Jocasta Ball, PhD;
Simon Stewart, PhD, RN; Barbara Riegel, PhD, RN

Vagal cluster (nausea and diaphoresis)
Tired cluster(fatigue/lethargy, weakness, syncope/dizziness, and dyspnea/breathlessness)
Heart cluster (chest pain/discomfort and palpitations/fluttering).

Symptom clusters in adults with chronic atrial fibrillation. J Cardiovasc Nurs 2017;32:296–303.

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TABLE 4 Comparison of Heart Cluster Groups

Characteristic	None of the Symptoms (n = 118)	Some of the Symptoms (n = 129)	All of the Symptoms (n = 88)	*P*
Gender				**.002**
Male	76 (64.4)	63 (48.8)	35 (39.8)	
Female	42 (35.6)	66 (51.2)	53 (60.2)	
Age, y	73.7 ± 10.7	71 ± 11.6	69.6 ± 11.1	**.029**
European/white ethnicity	115 (97.5)	124 (96.1)	84 (95.5)	.759
AF subtype				**.042**
Recurrent paroxysmal	5 (4.2)	1 (0.8)	3 (3.4)	
Persistent	95 (80.5)	118 (91.5)	80 (90.9)	
Permanent	18 (15.3)	10 (7.8)	5 (5.7)	
Body mass index, kg/m^2	29.9 ± 7.6	29.9 ± 6.5	28.8 ± 5.4	.710
Charlson Comorbidity Index	5.2 ± 2.4	4.8 ± 2.6	4.5 ± 2.6	.108
Hypertension	87 (73.7)	95 (73.6)	58 (65.9)	.381
Coronary artery disease	49 (41.5)	37 (28.7)	26 (29.6)	.068
Valve disease	6 (5.1)	6 (4.7)	0 (0)	.079
Cardiac surgery	26 (22)	23 (17.8)	19 (21.6)	.672
β-Blocker	66 (55.9)	57 (44.2)	42 (47.7)	.173
Calcium channel blocker	31 (26.3)	26 (20.2)	17 (19.3)	.392
Digoxin	37 (31.4)	49 (38)	31 (35.2)	.550
Antiarrhythmic	22 (18.6)	44 (34.1)	35 (39.8)	**.002**

Data are mean ± SD or n (%) of patients.
Statistically significant differences ($P < .05$) are shown in bold.
Abbreviation: AF, atrial fibrillation.

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Europace (2011) **13**, 920–934
doi:10.1093/europace/eur130

EHRA POSITION PAPER

Management of patients with palpitations: a position paper from the European Heart Rhythm Association

- Management of patients with palpitations: a position paper from the European Heart Rhythm Association. Europace 2011;13:920–34

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Table 2 Types of palpitations and their clinical presentations

Type of palpitation	Subjective description	Heartbeat	Onset and termination	Trigger situations	Possible associated symptoms
Extrasystolic	'Skipping/missing a beat', 'sinking of the heart'	Irregular, interspersed with periods of normal heartbeat	Sudden	Rest	—
Tachycardiac	'Beating wings' in the chest	Regular or irregular, markedly accelerated	Sudden	Physical effort, cooling down	Syncope, dyspnoea, fatigue, chest pain
Anxiety-related	Anxiety, agitation	Regular, slightly accelerated	Gradual	Stress, Anxiety attacks	Tingling in the hands and face, lump in the throat, atypical chest pain, sighing dyspnoea
Pulsation	Heart pounding	Regular, normal frequency	Gradual	Physical effort	Asthenia

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Table 3 Clinical characteristics of tachycardiac palpitations

Type of arrhythmia	Heartbeat	Trigger situations	Associated symptoms	Vagal manoeuvres
AVRT, AVNRT	Sudden onset regular with periods of elevated heart rate	Physical effort, changes in posture	Polyuria, frog sign	Sudden interruption
Atrial fibrillation	Irregular with variable heart rate	Physical effort, cooling down, post meal, alcohol intake	Polyuria	Transitory reduction in heart rate
Atrial tachycardia and atrial Flutter	Regular (irregular if A-V conduction is variable) with elevated heart rate			Transitory reduction in heart rate
Ventricular tachycardias	Regular with elevated heart rate	Physical effort	Signs/symptoms of haemodynamic impairment	No effect

AVRT, atrio-ventricular reentrant tachycardia; AVNRT, atrio-ventricular node reentrant tachycardia; A-V, atrioventricular.

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Complicações

AVC

MS

Disfução cardíaca

Asymptomatic lone atrial fibrillation—how can we detect the arrhythmia? Curr Pharm Des 2015;21:659–66.

Atrial fibrillation burden and atrial fibrillation type: clinical significance and impact on the risk of stroke and decision making for longterm anticoagulation. Vasc Pharmacol 2016;83:26–35.

Screening for atrial fibrillation: a report of the AF-SCREEN International Collaboration. Circulation 2017;135:1851–67.

Screening for atrial fibrillation: a European Heart Rhythm Association (EHRA) consensus document endorsed by the Heart Rhythm Society (HRS), Asia Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulacion Cardiaca y Electrofisiologia (SOLAECE). Europace 2017;19: 1589–623.

2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. Europace 2015;17:1601–87.

Relationshipbetween atrial tachyarrhythmias and symptoms. Heart Rhythm 2005;2:125–31.

O Paciente assintomático como tratar?

Evidências?

The European Heart Rhythm Association (EHRA), in collaboration with the Heart Failure Association (HFA), the Heart Rhythm Society (HRS), the Asia Pacific (APHRS), the Cardiac Arrhythmia Society of Southern Africa (CASSA), and the Latin American Heart Rhythm Society(LAHRS),

Task Force to review the management of asymptomatic arrhythmias

- Whereas some patients with a very high burden of PVCs (>20%) are completely asymptomatic, other patients experience uncomfortable symptoms with a single PVC.

mias and via this mechanism possibly influence the perception of the individual's symptoms.

Pain tolerance can vary substantially amongst patients and the relationship between arrhythmias and symptoms also greatly varies between patients. For example, whereas some patients with a very high burden of PVCs (>20%) are completely asymptomatic, other patients experience uncomfortable symptoms with a single PVC. Patients with a low threshold for experiencing symptoms with arrhythmias are sometimes referred to as having 'cardiac awareness'.[16]

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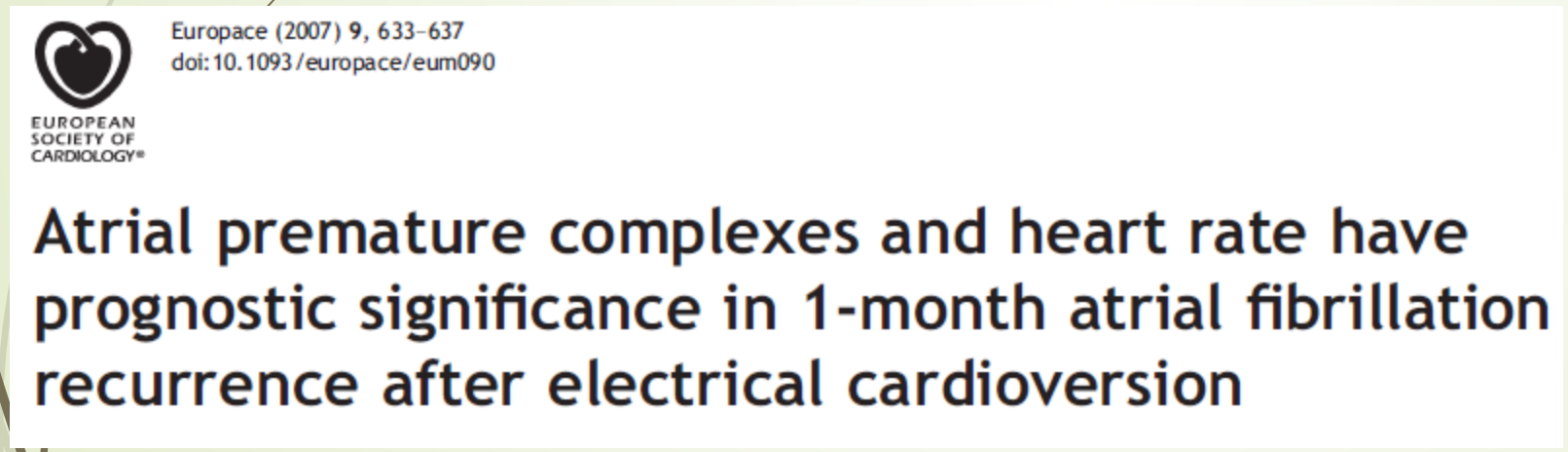
Table I Scientific rationale behind colored hearts recommendations

Definitions where related to a treatment or procedure	Consensus statement instruction	Symbol
Scientific evidence that a treatment or procedure is beneficial and effective. Requires at least one randomized trial or is supported by strong observational evidence and authors' consensus (as indicated by an asterisk)	'Should do this'	
General agreement and/or scientific evidence favour the usefulness/efficacy of a treatment or procedure. May be supported by randomized trials based on a small number of patients or which is not widely applicable	'May do this'	
Scientific evidence or general agreement not to use or recommend a treatment or procedure	'Do not do this'	

Premature atrial contractions and non-sustained atrial tachyarrhythmias

A maioria dos estudos focaram nos impactos e não nos sintomas



Atrial premature complexes and heart rate have prognostic significance in 1-month atrial fibrillation recurrence after electrical cardioversion. Europace 2007;9:633–7

Premature atrial contractions and non-sustained atrial tachyarrhythmias

Table 1 Baseline characteristics of patients

	Group I $n = 25$	Group II $n = 22$
Mean age ± SD (years)	63.3 ± 9	65 ± 11
Sex (male:female)	13:12	11:11
Fractional shortening ± SD	31.3 ± 6.5	30.7 ± 5.4
LA size ± SD (mm)	48.5 ± 6.3	50 ± 8.3
AF duration (weeks)	14.9 ± 13.8	15.2 ± 14
Underlying disease *n* (%)		
CHD	8 (32)	8 (36.4)
Valvular	8 (32)	8 (36.4)
Hypertention	8 (32)	7 (31.8)
Cardiomyopathy	1 (4)	1 (4.5)
Idiopathic	4 (16)	3 (13.6)
Beta-blockers *n* (%)	12 (48)	8 (36.3)
Antiarrhythmic medication *n* (%)		
Amiodarone	12 (48)	11 (50)
Propafenone	5 (20)	4 (18.2)
Both	3 (12)	4 (18.2)
Sotalol	4 (16)	2 (9.1)
None	1 (4)	1 (4.5)

All *P* values were non-significant.

Patients were analysed as receiving amiodarone vs. any other anti-arrhythmic treatment.

LA, left atrium; AF, atrial fibrillation; CHD, coronary heart disease.

atrial fibrillation recurrence a

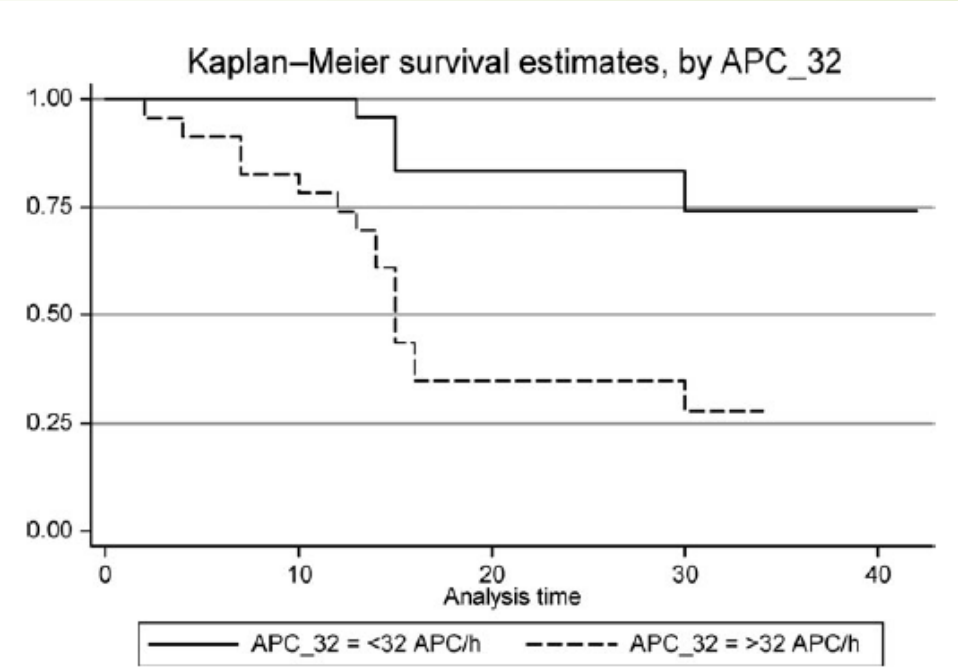


Figure 2 Kaplan–Meier curves for the two levels of APC/h for patients with >32 APC/h and those with <32 APC/h. Time 0 is the day of cardioversion.

Premature atrial contractions and non-sustained atrial tachyarrhythmias

A presença de ectopias atriais é preditor para desenvolvimento de taquicardia atrial e Fibrilação atrial.

Excessive Supraventricular Ectopic Activity and Increased Risk of Atrial Fibrillation and Stroke

Zeynep Binici, MD; Theodoros Intzilakis, MD; Olav Wendelboe Nielsen, MD, PhD, DMSc; Lars Køber, MD, DMSc; Ahmad Sajadieh, MD, DMSc

Excessive supraventricular ectopic activity and increased risk of atrial fibrillation and stroke. Circulation 2010;121:1904–11

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Premature atrial contractions and non-sustained atrial tachyarrhythmias

Table 1. Baseline Characteristics of the Whole Study Population and Subjects With and Without ESVEA

Baseline Variables	All (n=678)	ESVEA		P
		Yes (n=99)	No (n=579)	
Age, y	64.5±6.8	67.6±6.3	63.9±6.7	<0.0001
Female sex, n (%)	281 (41.4)	35 (35.4)	246 (42.5)	0.183
Current smoking, n (%)	314 (46.3)	47 (47.5)	267 (46.1)	0.801
Diabetes mellitus, n (%)	75 (11.1)	12 (12.1)	63 (10.9)	0.716
Glucose, mmol/L	5.82±1.7	5.82±1.1	5.81±1.8	0.024
Systolic blood pressure, mm Hg	156.4±24.2	162.3±25.8	155.3±23.8	0.009
Diastolic blood pressure, mm Hg	90.9±10.9	92.1±10.0	90.6±11.1	0.016
Total cholesterol, mmol/L	6.1±1.1	5.8±1.01	6.0±1.04	0.046
Log (NT-proBNP)	1.99±1.14	2.61±1.13	1.88±1.10	<0.0001
NT-proBNP, pmol/L	6.9 (3.6–13.8)	12.4 (5.5–25.7)	6.3 (3.3–12.3)	…
Alcohol, units/wk* (range)	13 (0–26)	12 (0–24)	13 (3–27)	0.27
Low level of physical activity, n (%)	174 (25.7)	27 (27.3)	147 (25.4)	0.69
Body mass index, kg/m^2	26.8±4.4	27.05±5.22	26.7±4.2	0.89
Aspirin use, n (%)	103 (15.2)	22 (22.2)	81 (14.0)	0.035
β-Blocker use, n (%)	34 (5.0)	4 (4.0)	30 (5.2)	0.631
Diuretic use, n (%)	121 (17.8)	25 (25.3)	96 (16.6)	0.037
ACE inhibitor use, n (%)	32 (4.7)	5 (5.1)	27 (4.7)	0.866

Values are presented as mean±SD and number (%) or median (Q1 to Q3). ACE indicates angiotensin-converting enzyme.

*Mean value.

Excessive su

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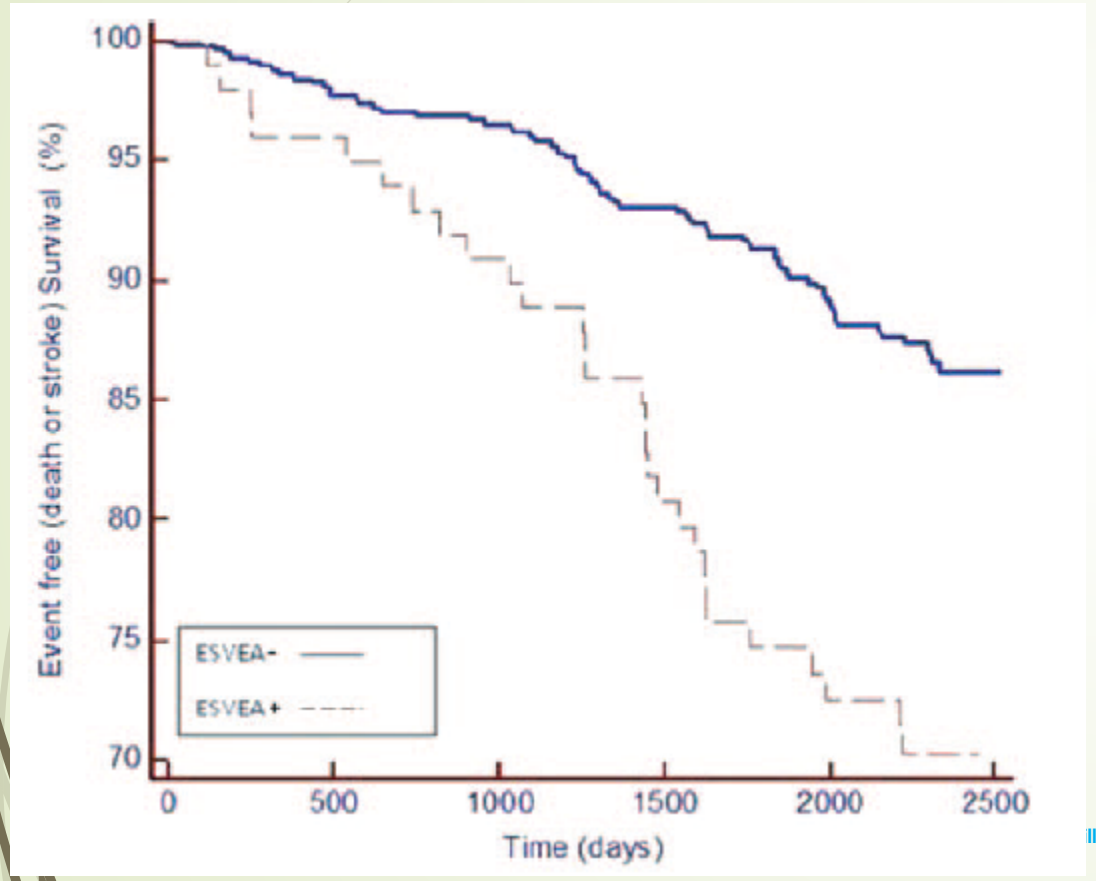
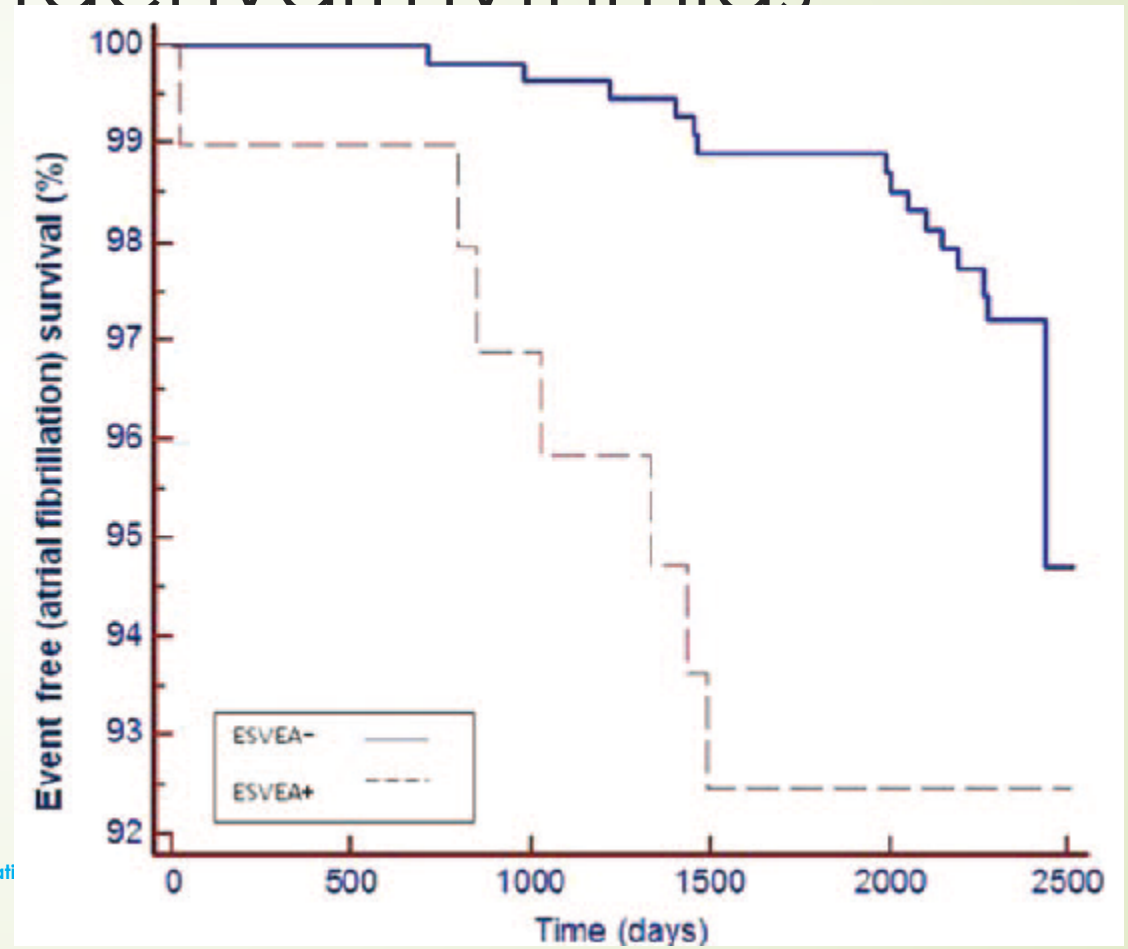
Premature atrial contractions and non-sustained atrial tachyarrhythmias





Premature atrial contractions and non-sustained atrial tachyarrhythmias

Annals of Internal Medicine | ORIGINAL RESEARCH

Atrial Ectopy as a Predictor of Incident Atrial Fibrillation

A Cohort Study

Table 1. **Baseline Characteristics of Participants With and Without Incident AF**

Characteristic	Entire Cohort (n = 1260)	Without AF (n = 917)	Incident AF (n = 343)	P Value*
Median age (IQR), *y*	71 (68–75)	70 (68–74)	71 (68–75)	0.002
Female, *n (%)*	691 (55)	519 (57)	172 (50)	0.041
White, *n (%)*	1200 (95)	873 (95)	327 (95)	0.92
Mean BMI (SD), kg/m^2	26.7 (4.1)	26.6 (4.1)	26.8 (4.2)	0.50
Hypertension, *n (%)*	686 (55)	476 (52)	210 (61)	0.003
Diabetes, *n (%)*	186 (15)	125 (14)	61 (18)	0.066
Heart failure, *n (%)*	31 (2)	16 (2)	15 (4)	0.007
Coronary disease, *n (%)*	245 (19)	161 (18)	84 (25)	0.006
Myocardial infarction, *n (%)*	132 (10)	84 (9)	48 (14)	0.013
Mean PR interval (SD), *ms*	171 (31)	170 (29)	174 (35)	0.036
Median PAC count (IQR), *beats/h*	2.5 (0.8–9.5)	1.8 (0.6–6.1)	5.3 (2.1–18.0)	<0.001

AF = atrial fibrillation; BMI = body mass index; IQR = interquartile range; PAC = premature atrial contraction.
* For the comparison of the indicated characteristic in participants with vs. those without incident AF.

–8.

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Premature atrial contractions and non-sustained atrial tachyarrhythmias

Table 2. **Association Between PAC Count and Outcome Events, by Quartile***

PAC Count	Unadjusted HR (95% CI)	*P* Value	Adjusted HR (95% CI)†	*P* Value
Incident AF				
Quartile 1	1.00 (reference)	–	1.00 (reference)	–
Quartile 2	2.13 (1.44–3.15)	<0.001	2.17 (1.46–3.22)	<0.001
Quartile 3	2.80 (1.93–4.08)	<0.001	2.79 (1.90–4.09)	<0.001
Quartile 4‡	5.01 (3.50–7.17)	<0.001	4.92 (3.39–7.16)	<0.001
Beats per hour§	1.18 (1.14–1.22)	<0.001	1.17 (1.13–1.22)	<0.001
Overall mortality				
Quartile 1	1.00 (reference)	–	1.00 (reference)	–
Quartile 2	1.13 (0.92–1.39)	0.25	0.96 (0.77–1.18)	0.68
Quartile 3	1.46 (1.19–1.78)	<0.001	1.14 (0.93–1.40)	0.21
Quartile 4‡	1.93 (1.59–2.34)	<0.001	1.35 (1.10–1.66)	0.005
Beats per hour§	1.10 (1.07–1.13)	<0.001	1.06 (1.03–1.09)	<0.001
Cardiovascular mortality‖				
Quartile 1	1.00 (reference)	–	1.00 (reference)	–
Quartile 2	1.01 (0.72–1.42)	0.94	0.88 (0.62–1.24)	0.47
Quartile 3	1.37 (0.99–1.90)	0.054	1.10 (0.79–1.54)	0.57
Quartile 4‡	2.15 (1.58–2.91)	<0.001	1.50 (1.08–2.08)	0.014
Beats per hour§	1.12 (1.08–1.17)	<0.001	1.08 (1.03–1.13)	0.001

AF = atrial fibrillation; HR = hazard ratio; PAC = premature atrial contraction.
* Quartile 1, 0–0.8 beats/h; quartile 2, 0.8–2.5 beats/h; quartile 3, 2.5–9.4 beats/h; and quartile 4, 9.5–965.4 beats/h.
† Adjusted for age; sex; race; body mass index; PR interval; and history of hypertension, diabetes, myocardial infarction, coronary artery disease, and heart failure.
‡ *P* value for trend <0.01 for unadjusted and adjusted comparisons.
§ Log-transformed with the resultant HR interpreted as the increased hazard for each doubling in ectopic beats per hour.
‖ Death secondary to coronary artery disease, heart failure, peripheral arterial disease, or cerebrovascular disease.

Atrial ectopy as a predictor of incident atrial fibrillation: a cohort study. Ann Intern Med 2013;159:721–8.

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Premature atrial contractions and non-sustained atrial tachyarrhythmias

Ectopias atriais e morte

Tratamento reduz morbidade ou mortalidade?

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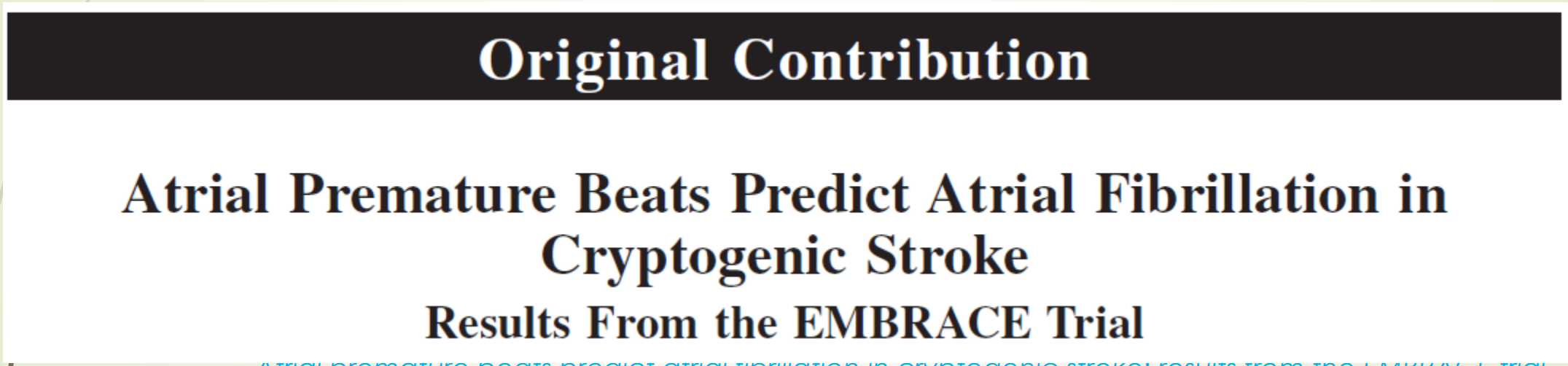
Premature atrial contractions and non-sustained atrial tachyarrhythmias

Qual o valor de corte?



Original Contribution

Atrial Premature Beats Predict Atrial Fibrillation in Cryptogenic Stroke

Results From the EMBRACE Trial

Atrial premature beats predict atrial fibrillation in cryptogenic stroke: results from the EMBRACE trial. Stroke 2015;46:936–41.

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Premature atrial contractions and non-sustained atrial tachyarrhythmias

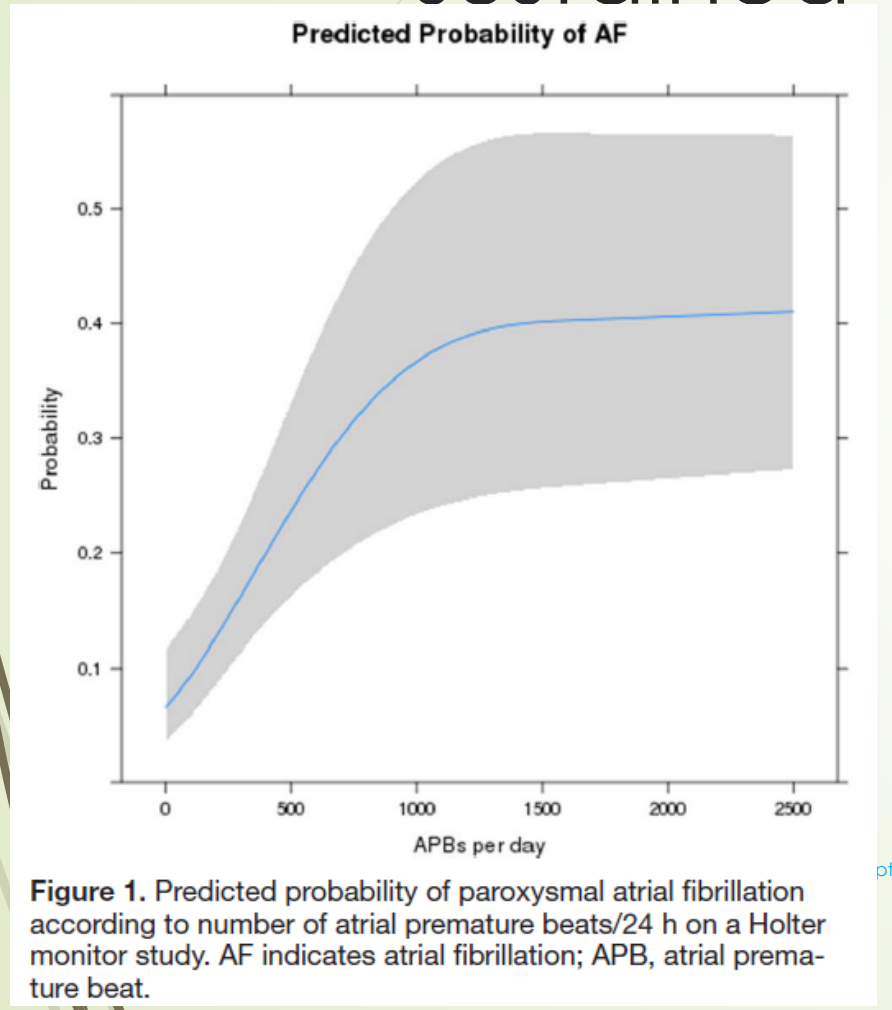

Figure 1. Predicted probability of paroxysmal atrial fibrillation according to number of atrial premature beats/24 h on a Holter monitor study. AF indicates atrial fibrillation; APB, atrial premature beat.

ptogenic stroke: results from the EMBRACE trial. Stroke 2015;46:936–41

Table. Predicted Probability of Atrial Fibrillation for a Given Number of Atrial Premature Beats in Patients With Cryptogenic Stroke or Transient Ischemic Attack

No. of APBs/24 h on Baseline Holter Monitor	Probability of AF, %*	Lower CI, %	Upper CI, %
0	6.6	3.6	11.6
25	7.2	4.1	12.3
50	7.9	4.6	13.0
75	8.6	5.2	13.7
100	9.3	5.8	14.5
150	10.9	7.2	16.2
200	12.6	8.5	18.1
250	14.4	10.0	20.2
300	16.2	11.3	22.6
350	18.1	12.7	25.1
400	19.9	13.9	27.7
450	21.8	15.1	30.4
500	23.6	16.2	33.1
550	25.4	17.2	35.7
600	27.1	18.2	38.3
650	28.6	19.0	40.7
700	30.1	19.8	42.9
750	31.5	20.6	45.0
800	32.8	21.2	46.9
850	33.9	21.8	48.5
900	35.0	22.4	50.0
950	35.9	22.9	51.3
1000	36.7	23.3	52.5
1100	38.0	24.1	54.2
1200	38.9	24.6	55.4
1300	39.6	25.1	56.1
1400	39.9	25.4	56.5
1500	40.2	25.6	56.7
1600	40.3	25.8	56.7
1700	40.4	26.0	56.6
1800	40.5	26.2	56.6
1900	40.5	26.3	56.6
2000	40.6	26.5	56.5

AF indicates atrial fibrillation; APB, atrial premature beat; and CI, confidence interval.

Premature atrial contractions and non-sustained atrial tachyarrhythmias

Consensus statement	Symbol	References
Patients with a high PAC burden (>500/24 h) on Holter monitor should be considered at increased risk for developing of AF and be educated on the symptoms of AF. They should undergo further evaluation for possible AF including more detailed or prolonged rhythm monitoring		[19–21], Expert consensus
Comprehensive cardiovascular risk factor modification is recommended for patients with a high PAC burden including careful control of hypertension, weight loss, and screening for sleep apnoea. In addition, evaluation for structural heart disease should be considered in selected cases.		Expert consensus
When brief episodes of AF, which *per se* would not be an indication for oral anticoagulation (OAC), are observed, the burden of PACs (>500 PACs/24 h or any episode of runs of more than 20 PACs) could add to the decision process whether anticoagulation therapy should be initiated. This decision should always be made on an individual basis.		Expert consensus
Low to moderate PAC burden without documented AF is not an indication for oral anticoagulation		Expert consensus

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Asymptomatic ventricular pre-excitation

Prevalência estimada em 0.1–.3%

O risco de MS pacientes sintomáticos com WPW é estimado em 3–4%.

O risco de MS pacientes assintomáticos com WPW é estimado entre 0 and 0.6%

Asymptomatic ventricular pre-excitation

ACC/AHA/HRS Guideline

2015 ACC/AHA/HRS Guideline for the Management of Adult Patients With Supraventricular Tachycardia

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and

Recommendations for Ongoing Management of Orthodromic AVRT		
COR	LOE	Recommendations
I	B-NR	1. Catheter ablation of the accessory pathway is recommended in patients with AVRT and/or pre-excited AF.[103,254,276–282]
See Online Data Supplements 11 and 12.		Several large series support the use of catheter ablation of the accessory pathway as first-line therapy in patients who have had AF and/or AVRT. These series report a success rate of approximately 93% to 95% and a 3% risk of major complications when patients are followed up for 6 months to 8 years[102,103,254,276–282] (Table 8). AF in younger patients is usually associated with the accessory pathway and is unlikely to occur after ablation; in contrast, older patients may have recurrence of AF from causes unrelated to the accessory pathway.[283,284] Catheter ablation is also effective for treating PJRT (Table 3) by ablating the concealed accessory pathway with a success rate of approximately 90%.[283,284] Catheter ablation of an atriofascicular (Mahaim) pathway is successful in preventing reentrant tachycardia in approximately 70% to 100% of patients.[285,286]

Asymptomatic ventricular pre-excitation

Arrhythmia/Electrophysiology

Wolff-Parkinson-White Syndrome in the Era of Catheter Ablation

Insights From a Registry Study of 2169 Patients

Carlo Pappone, MD, PhD; Gabriele Vicedomini, MD; Francesco Manguso, MD, PhD; Massimo Saviano, MD; Mario Baldi, MD; Alessia Pappone, MD; Cristiano Ciaccio, MD; Luigi Giannelli, MD; Bogdan Ionescu, MD; Andrea Petretta, MD; Raffaele Vitale, MD; Amarild Cuko, MD; Zarko Calovic, MD, Angelica Fundaliotis, MD; Mario Moscatiello, MD; Luigi Tavazzi, MD; Vincenzo Santinelli, MD

Pappone C, Vicedomini G, Manguso F, Saviano M, Baldi M, Pappone A et al.Wolff-Parkinson-White syndrome in the era of catheter ablation: insights from a registry study of 2169 patients. Circulation 2014;130:811–9.

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Asymptomatic ventricular pre-excitation

Table 1. Characteristics of the Study Population

	Untreated (n=1001)	Treated (n=1168)	*P*
Age at enrollment, y	19 (10–37.5)	19 (12–35)	0.341
Male sex, n (%)	600 (59.9)	701 (60.0)	0.971
SHD, n (%)	55 (5.5)	76 (6.5)	0.324
AP-AERP, ms	280 (250–300)	280 (250–300)	0.945
Symptomatic, n (%)	451 (45.1)	962 (82.4)	<0.001
AVRT-AF, n (%)	47 (4.7)	73 (6.3)	0.114
Multiple APs, n (%)	59 (5.9)	80 (6.8)	0.365
MAs, n (%)	78 (7.8)	0 (0)	<0.001
VF, n (%)	15 (1.5)	0 (0)	<0.001
Follow-up, mo	96 (50–96)	96 (48–96)	0.525

Continuous variables are expressed as median (25th–75th percentile). AP indicates accessory pathway; AP-AERP, accessory pathway antegrade effective refractory period at baseline; AVRT-AF, inducible atrioventricular reentrant tachycardia triggering atrial fibrillation at electrophysiological testing; MA, potentially malignant arrhythmia; SHD, structural heart disease; and VF, ventricular fibrillation.

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from a registry study of 2169

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Asymptomatic ventricular pre-excitation

Durante exercícios e repouso

Resposta ventricular durante uma FA pre excitada

Ajmaline(1mg/kg por 3 min) e procainamide (10mg/kg por 5 mins)

Teste esofágico

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Asymptomatic ventricular pre-excitation

- Atletas e profissionais de risco

IIa	B-NR [SR]	**3. Catheter ablation of the accessory pathway is reasonable in asymptomatic patients if the presence of pre-excitation precludes specific employment (such as with pilots).**[103,254,276–282,302–304]
See Online Data Supplements 11–15.		Patients with asymptomatic pre-excitation whose job activities would place them or others at risk if a hemodynamically significant arrhythmia occurred (such as airline pilots) are potential candidates for catheter ablation. Catheter ablation is associated with a success rate of approximately 95% and a 3% risk of major complications when patients are followed up for 6 months to 8 years.[103,254,276–282,302,303] Other documents advise EP study in asymptomatic athletes who engage in moderate- or high-level competitive sports.[305]

Asymptomatic ventricular pre-excitation

Table 2 **High risk features of an antegrade accessory pathway**

- Young age
- Effective refractory period of the accessory pathway <240 ms (>250 b.p.m.)
- Inducibility of atrioventricular reentrant tachycardia at EPS
- Multiple accessory pathways

b.p.m., beats per minute; EPS, electrophysiology study; ms, milliseconds.

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Asymptomatic ventricular pre-excitation

Consensus statements	Symbol	References
Clinical follow-up without ablation may be reasonable in subjects with asymptomatic pre-excitation who are low risk either due to intermittent delta wave or an electrophysiology study not demonstrating high-risk features.		45
Electrophysiology study for risk stratification may be considered in individuals with asymptomatic pre-excitation. Catheter ablation may be considered in asymptomatic individuals with high-risk features, (antegrade ERP of the accessory pathway <240 ms, inducible AVRT triggering pre-excited AF and multiple accessory pathways).		46
Catheter ablation should be considered in individuals who participate in high intensity or professional sports and those with an occupational risk.		46
There should be a detailed discussion with the patient and their family regarding the individual's personal preference and willingness to accept risk, whether from an ablation or from an untreated asymptomatic WPW.		33

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Atrial fibrillation and flutter

FAxFlutter

Asymptomatic AF usually refers to AF that is incidentally discovered and recorded for >30 s

Europace (2016) **18**, 1609–1678
doi:10.1093/europace/euw295

ESC GUIDELINES

2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS

The Task Force for the management of atrial fibrillation of the European Society of Cardiology (ESC)

Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC

Endorsed by the European Stroke Organisation (ESO)

documented AF was the entry criterion in trials forming the evidence for these guidelines. By accepted convention, an episode lasting at least 30 s is diagnostic. Individuals with AF may be

ESC Guidelines for the manag

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Atrial fibrillation and flutter

Prevalence of asymptomatic AF is unknown. Reported rates vary from 10% to 40%

Asymptomatic AF could portend a less favourable prognosis than symptomatic AF

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Atrial fibrillation and flutter

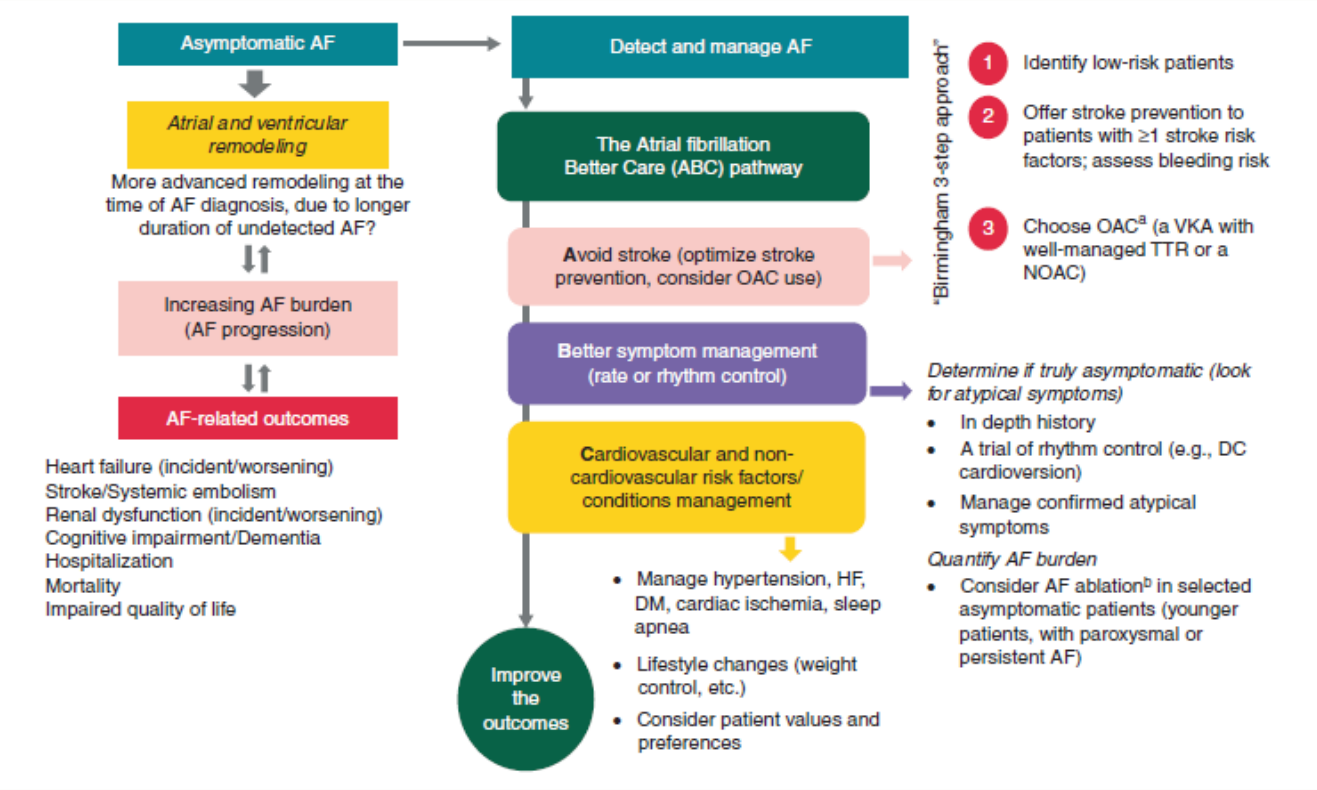
Table 4 Baseline characteristics and outcomes in asymptomatic AF patients: *post hoc* analyses of RCTs and observational studies

Study/*post hoc* analysis (publication date) Study type	AFFIRM (2005)[53] RCT, *post hoc*	RACE (2014)[56] RCT, *post hoc*	Olmsted County (2011)[60] Retrospective	Belgrade AF (2013)[55] Single-centre, first-onset AF	UK-CPRD[a] (2014)[65] Administrative dataset	EORP-AF Pilot (2015)[58] International registry	ORBIT-AF (2016)[57] International registry	Olmsted County (2016)[2] Retrospective	Fushimi AF Registry (2017)[59] Community-based survey
Cohort size (*n*)	4060	522	4618	1100	30 260	3119	10 087	476	3749
Asymptomatic AF (%)	12	30	25	13.3	18.4[a]	39.7	38.2	33.8	52.6
Follow-up (mean) (years)	3.5	2.3 ± 0.6		9.9±6.1	≤3	1	Median 1.8	Median 6.0	3.0
Baseline characteristics of patients with asymptomatic AF									
Male predominance									
Older age									
Non-paroxysmal AF									
Slower heart rate									
More comorbidity									
Higher stroke risk									
Treatment differences									
Rate control									
Rhythm control									
OAC									
Outcomes (asymptomatic AF vs. comparator[b])									
AF progression				1.6 (1.1-2.2)					
Stroke		6% vs. 7%		2.1 (1.2–3.9)	19.4 vs. 8.4[a]	23.8% vs. 29.7%	1.13 (0.87–1.46)	2.6 (1.1–6.1)	1.28 (0.82–2.01)
Mortality	1.07 (0.79–1.46)	5% vs. 8%		0.8 (0.4–1.9)	40.1 vs. 20.9[a]	9.4% vs. 4.2%	1.00 (0.86–1.16)	4.0 (2.3–6.9)	1.71 (1.31–2.29)
MI					9.0 vs. 6.5[a]		1.05 (0.72–1.53)		
Heart failure		0% vs. 6%		0.7 (0.4–1.1)					0.96 (0.65–1.44)
Dementia									
Major bleeding		4% vs. 4%			7.7 vs. 4.0[a]		1.21 (1.02–1.45)		1.18 (0.74–1.90)

more common in asymptomatic AF;
no difference;
less common in asymptomatic AF;
greater risk of worse prognosis;
not reported.

[a]Patients incidentally diagnosed with AF were compared to matched non-AF controls; otherwise, the comparator was symptomatic AF.
[b]Outcomes presented as crude incidence rates per 1000 patient-years; otherwise, hazard ratios (95% confidence interval) or event rate, where reported.
AF, atrial fibrillation; AFFIRM, Atrial Fibrillation Follow-up Investigation of Rhythm Management; RACE, Rate Control vs. Electrical cardioversion for persistent atrial; RCT, Randomized Clinical Trial.

Atrial fibrillation and flutter



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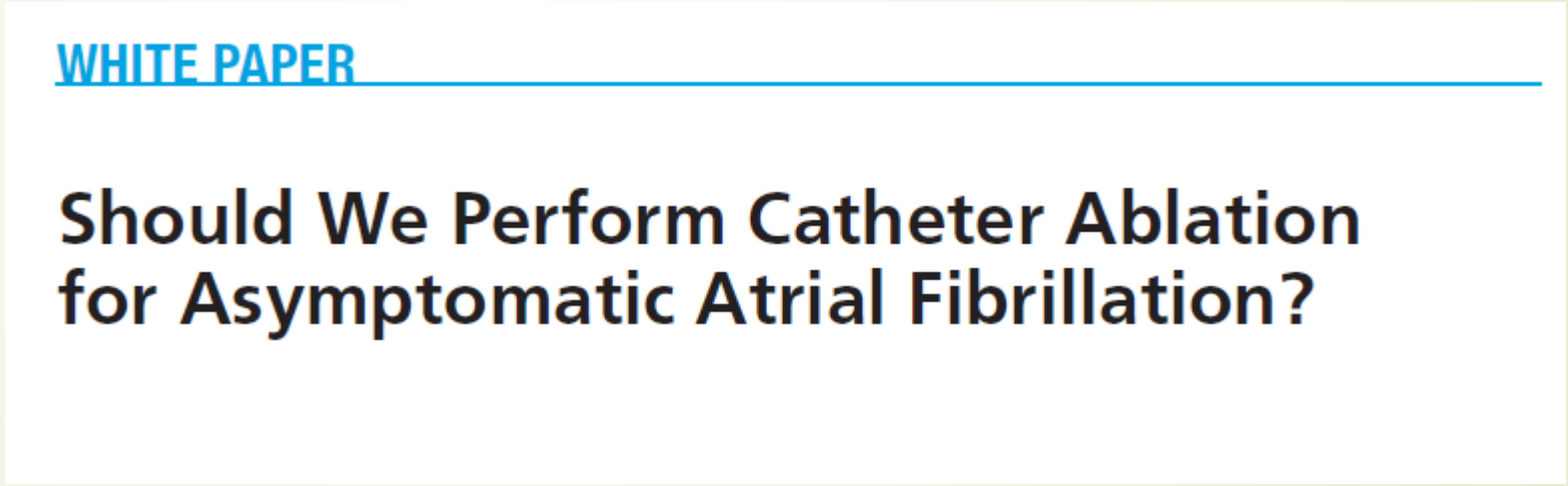
Atrial fibrillation and flutter

Incidental diagnosis of AF may trigger symptoms

Failed AF ablation may have a placebo effect in such patients

A failed procedure may turn truly asymptomatic patients into symptomatic due to post-procedural



Kalman JM, Sanders P, Rosso R, Calkins H. Should we perform catheter ablationfor asymptomatic atrial fibrillation? Circulation 2017;136:490–9.

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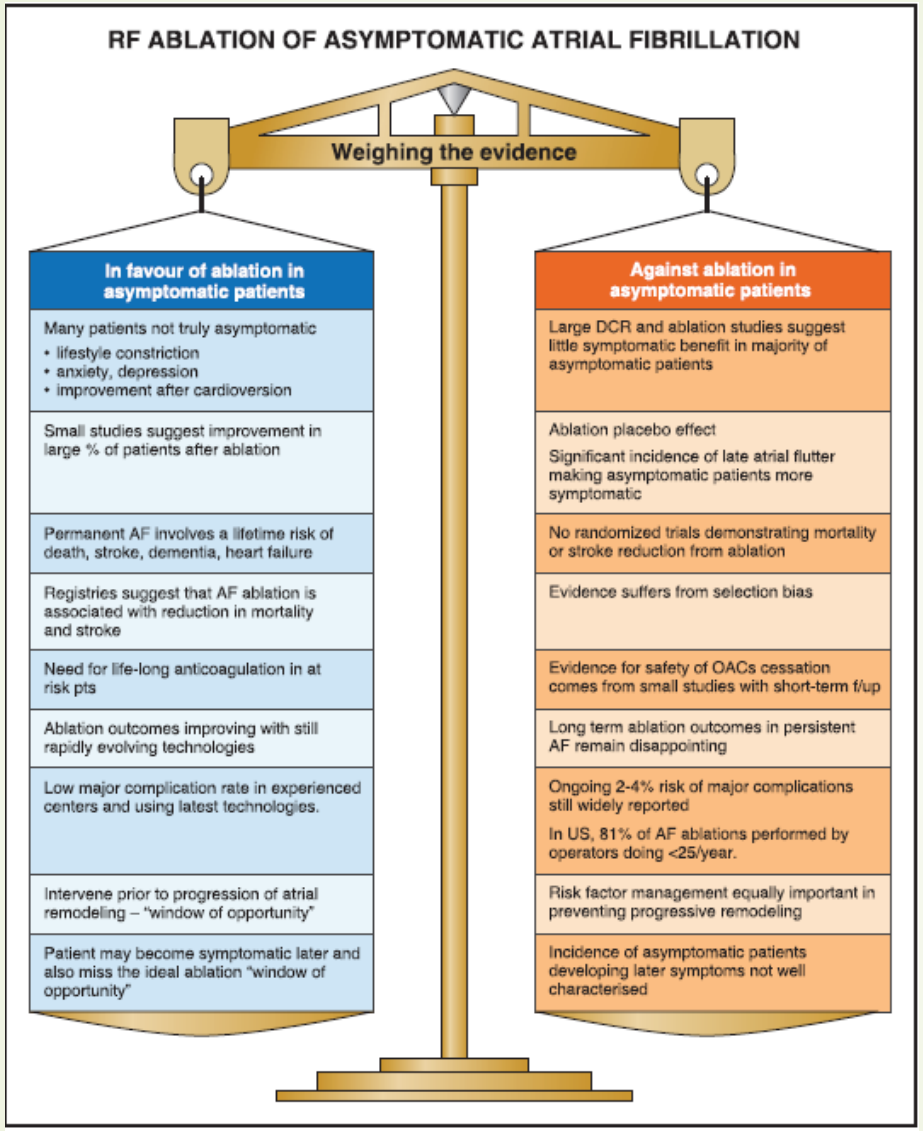


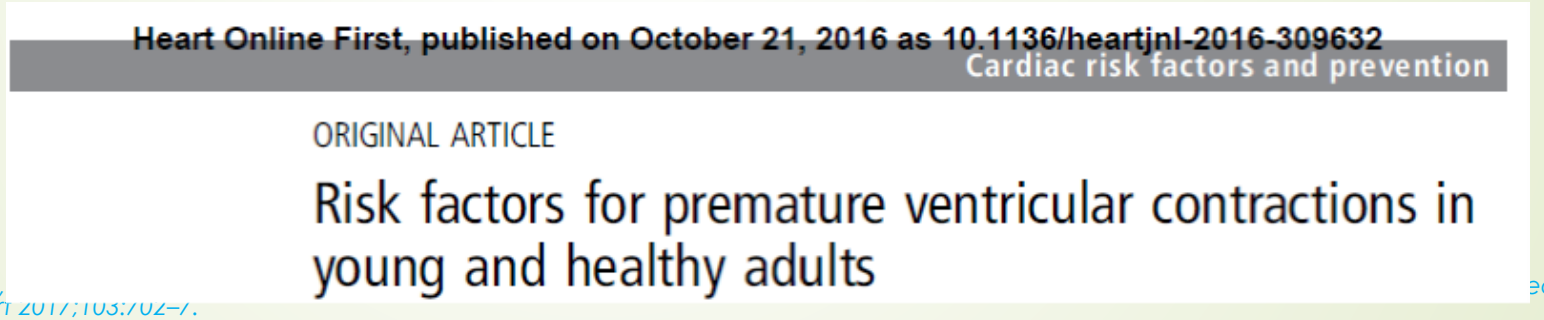
Figure. Radiofrequency ablation of asymptomatic atrial fibrillation (AF).
DCR indicates cardioversion; OAC, oral anticoagulant; and RF, radiofrequency.

Atrial fibrillation and flutter

Consensus statements	Symbol	References
Patients with asymptomatic AF should be anticoagulated, according to their calculated risk of stroke, equal to patients with overt AF.	♥	47,66–68
Consideration should be given to screening high-risk individuals e.g. patients with a CHA_2DS_2-VASc score ≥ 2 for AF.	♥	Expert opinion
Lifestyle changes should be advised in patients with asymptomatic AF, as in patients with overt AF.	♥	47,66–68
Cardioversion of persistent AF in asymptomatic patients may be advised to differentiate between truly asymptomatic patients or those adapted to AF-related symptoms.	♥	77,137
Rate control drugs should be prescribed to patients with asymptomatic AF with fast AV conduction in order to attempt to decrease risk of tachycardia-induced cardiomyopathy.	♥	93,94
Ablation might be proposed to selected patients with asymptomatic AF, based on patient's preferences, after detailed informed consent.	♥	77, Expert opinion

Premature ventricular contractions

Isolated and sparse PVCs are a normal occurrence in most individuals. including healthy young individuals.


Heart Online First, published on October 21, 2016 as 10.1136/heartjnl-2016-309632

ORIGINAL ARTICLE

Risk factors for premature ventricular contractions in young and healthy adults

von Rotz M, ... ealthy adults.Heart 2017;103:702–7.

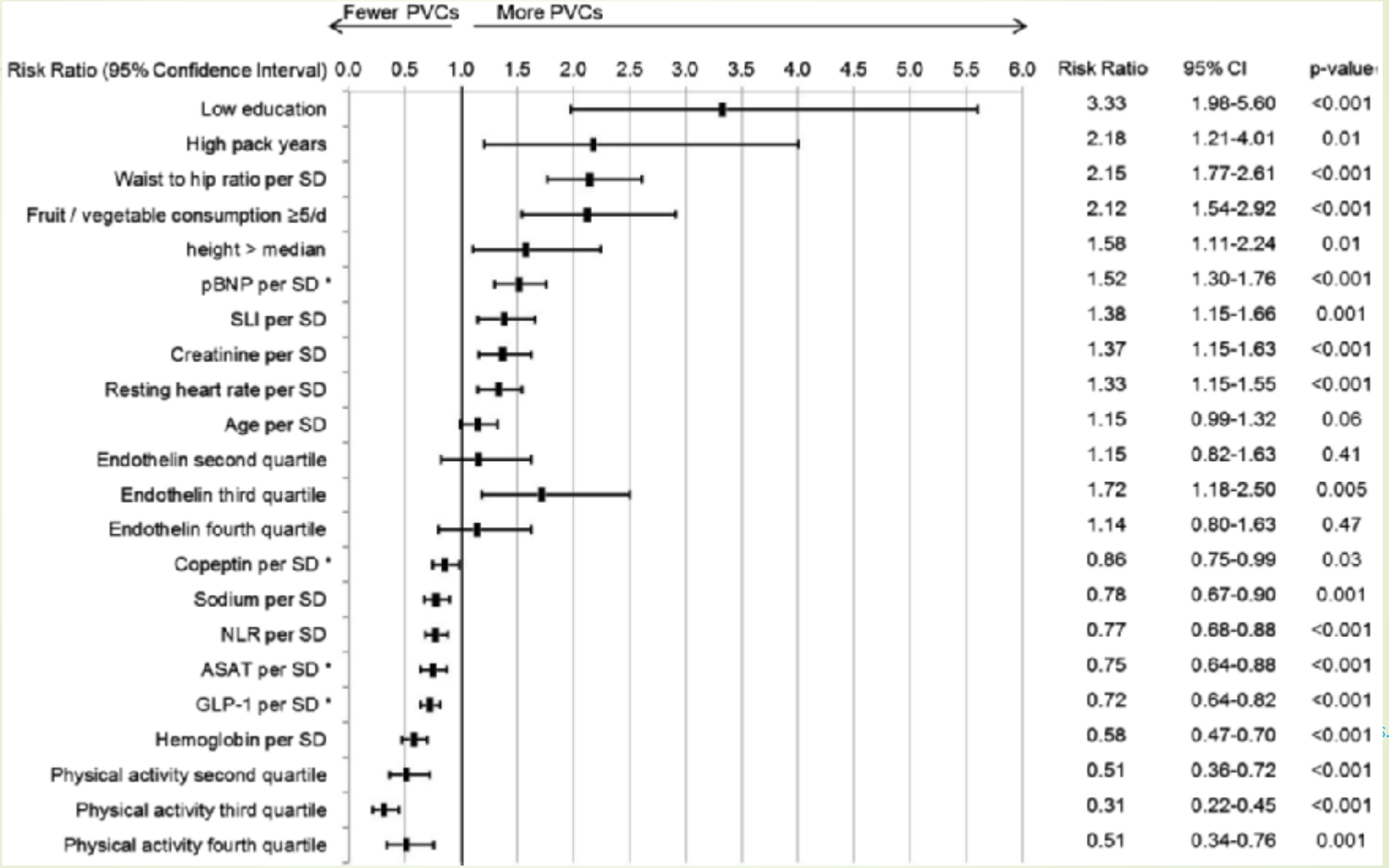
Premature ventricular contractions

Table 1 Baseline characteristics stratified by numbers of PVCs

Numbers of PVC	0 n=641 (31.3%)	1–2 n=589 (28.8%)	3–8 n=407 (19.8%)	8–32 n=207 (10.1%)	>32 n=204 (10.0%)	p Value*
Age, years	35.7 (30.8; 39.8)	36.6 (30.4; 40.2)	37.0 (31.4; 40.4)	37.6 (32.1; 40.5)	38.3 (32.8; 40.9)	0.0001
Male sex, %	297 (46.3)	301 (51.1)	182 (44.7)	76 (36.7)	97 (47.6)	0.009
BMI, kg/m^2	24.8 (3.7)	24.6 (3.8)	24.3 (3.8)	24.4 (3.9)	24.7 (3.8)	0.26
Height, cm	171.1 (9.2)	172.1 (9.2)	172.3 (9.2)	172.0 (9.2)	172.4 (8.9)	0.14
Waist:hip ratio	0.84 (0.08)	0.84 (0.07)	0.83 (0.08)	0.83 (0.07)	0.84 (0.08)	0.36
Phys. act. week, min	150 (60; 360)	175 (60; 360)	180 (60; 360)	180 (60; 360)	120 (25; 310)	0.34
Smoking						0.92
Current	145 (22.6)	129 (21.9)	79 (19.4)	42 (20.3)	42 (20.6)	0.76
Past	151 (23.6)	144 (24.5)	96 (23.6)	47 (22.7)	44 (21.6)	0.94
Never	345 (53.8)	316 (53.6)	232 (57.0)	118 (57.0)	118 (57.8)	0.65
Pack-years	5.8 (3.3; 15.0)	6.1 (4.0; 15.0)	5.8 (4.0; 14.3)	6.5 (3.3; 15.8)	6.5 (3.0; 17.3)	0.84
Low education, %	63 (9.8)	49 (8.3)	18 (4.4)	15 (7.3)	21 (10.3)	0.02
Regular fruit/vegetable consumption, %	124 (19.3)	107 (18.2)	88 (21.6)	40 (19.3)	47 (23.0)	0.51
Resting HR, bpm	62 (56; 68)	61 (56; 67)	62 (56; 68)	60 (54; 67)	61 (56; 67)	0.43
Systolic BP, mm Hg	119 (12)	120 (13)	121 (13)	121 (13)	121 (15)	0.16
Diastolic BP, mm Hg	78 (9)	79 (9)	79 (9)	78 (9)	79 (10)	0.24
SLI, mV	2.61 (0.76)	2.70 (0.77)	2.66 (0.79)	2.54 (0.64)	2.67 (0.79)	0.08
Haemoglobin, g/L	139 (14)	141 (13)	139 (13)	138 (13)	139 (12)	0.06
NLR	1.60 (1.24; 2.08)	1.65 (1.27; 2.16)	1.63 (1.30; 2.12)	1.58 (1.24; 2.14)	1.56 (1.23; 1.95)	0.49
Sodium, mmol/L	139 (2)	139 (2)	139 (2)	139 (2)	139 (2)	0.37
LDL-C, mmol/L	2.9 (2.4; 3.5)	2.9 (2.3; 3.4)	2.8 (2.3; 3.5)	2.9 (2.3; 3.5)	2.9 (2.4; 3.4)	0.79
HDL-C, mmol/L	1.5 (1.2; 1.8)	1.5 (1.2; 1.8)	1.6 (1.2; 1.8)	1.5 (1.2; 1.8)	1.5 (1.3; 1.8)	0.11
Creatinine, µmol/L	67 (57; 77)	69 (59; 78)	66 (57; 77)	65 (57; 74)	67 (58; 76)	0.04
ASAT, U/L	22 (19; 27)	22 (19; 27)	21 (18; 26)	21 (18; 26)	22 (18; 26)	0.26
NT-proBNP, pg/mL	33.0 (17.0; 59.0)	32.0 (16.0; 55.0)	35.0 (19.0; 61.0)	37.0 (21.0; 68.0)	38.5 (21.0; 69.0)	0.007
Copeptin, pmol/L	3.0 (2.0; 4.8)	3.2 (2.0; 4.7)	2.8 (1.9; 4.3)	2.9 (2.0; 4.6)	2.8 (1.9; 4.6)	0.23
GLP-1, pg/mL	32.4 (24.1; 42.7)	30.6 (23.2; 41.8)	31.0 (22.2; 43.6)	31.4 (23.4; 44.9)	29.9 (23.0; 39.6)	0.25

Vor … ricular contractions in young and healthy adults.Heart 2017;103:702–7.

Premature ventricular contractions



.Heart

Premature ventricular contractions

- PVCs requires a specialist approach to address the potential prognostic impact.

Table 5 Factors that may point to worse prognosis in patients with PVCs

- Underlying structural, ischemic or electrical disease
- More than 2000 PVC/24 h
- Complex PVCs (couplets, triplets, and non-sustained VT)
- Increasing number of morphologies
- Increasing number PVCs with exercise
- Non-outflow tract PVC (usually monomorphic or only slightly divergent morphologies)
- Short coupling interval of the PVCs ('R-on-T')
- PVCs with broader QRS complexes (more frequently related to cardiomyopathy)

These factors may suggest a poorer prognosis in individudals with PVCs and need a thorough investigation to rule out underlying structural, ischaemic, or electrical disease. The additional evaluations should be individually tailored, in analogy with the flowchart in *Figure 3*.
PVC, premature ventricular contractions; VT, ventricular tachycardia.

Premature ventricular contractions

Disfunção ventricular

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Premature ventricular contractions

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Ventricular Tachyarrhythmias in Athletes

Long-Term Clinical Significance of Frequent and Complex Ventricular Tachyarrhythmias in Trained Athletes

Table 1. Demographic and Clinical Data in 355 Competitive Athletes With Ventricular Tachyarrhythmias

	Group A (≥2,000 PVDs and ≥1 NSVT)	Group B* (≥100 to <2,000 PVDs)	Group C* (<100 PVDs)	p Value
No. athletes	71	153	131	
Age	24 ± 10	24 ± 10	25 ± 11	NS
Male:Female	51:20	120:33	102:29	NS
Palpitations†	8 (11%)	10 (6%)	0	0.0013‖
12-lead ECG abnormalities‡	15 (21%)	5 (3%)	2 (1.5%)	< 0.001¶
Echo abnormalities§	21 (30%)	8 (5%)	0	< 0.001¶

*NSVT was absent in these subgroups. †Defined as a frequent sensation of irregular heart beat (also during exercise), unassociated with dizziness. ‡Increased R and/or S wave ≥30 min, inverted T waves (≥2 leads), deep Q waves (≥2 mm), LBBB or RBBB, left axis deviation. §Mitral valve leaflet redundancy and prolapse (n = 11); dilated cardiomyopathy (end-diastolic dimension ≥60 mm) associated with systolic left ventricular dysfunction (ejection fraction ≤45% and/or segmental wall motion abnormalities) (n = 4); segmental wall motion abnormalities consistent with either ARVC and myocarditis (n = 11); and bicuspid aortic valve without aortic regurgitation (n = 3); ‖Group A versus Group C and Group B versus Group C ($p < 0.05$); ¶Group A versus Group B and Group A versus Group C ($p < 0.05$).

ECG = electrocardiogram; Echo = two-dimensional echocardiography; NSVT = nonsustained ventricular tachycardia;

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L, Fernando F, Spataro A
tachyarrhythmias in trained athletes. J Am Coll Cardiol 2002;40:446–52.

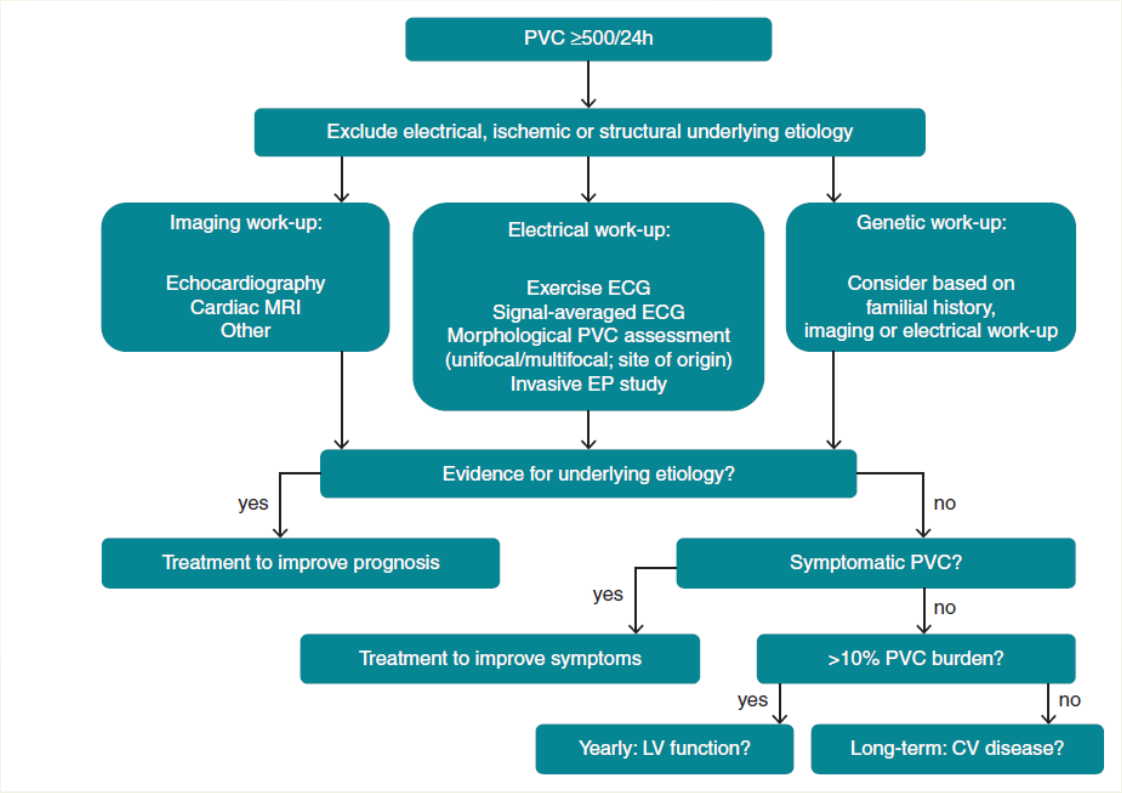
Premature ventricular contractions

Table 6 Summary of studies relating PVC burden with LV dysfunction

	No. of patients with PVCs	No. of patients (asymptomatic)	No. of patients with LV dysfunction (definition)	PVC burden (no LV dysfunction)	PVC burden (LV dysfunction)	PVC burden predictive for LV dysfunction	Lowest PVC burden with LV dysfunction
Baman *et al.*[164]	174	17	57 (LVEF < 50%)	13 ± 12%	33 ± 13%	24% (sensitivity 79%, specificity 78%)	10%
Hasdemir *et al*[165]	249	26	17 (LVEF < 50%)	8.1 ± 7.4	29 ± 9.2%	16% (sensitivity 100%, specificity 87%)	–
Munoz *et al*[166]	70	–	17 (LVEF < 50%)	16.7 ± 13.7	29.3 ± 14.6%	15/17 had PVC burden >10%	2/17 had PVC burden <10%
Ban *et al.*[167]	127	7	28 (LVEF < 50%)	22 ± 10%	31 ± 11%	26% (sensitivity 70%, specificity 78%)	–
Blaye-Felice *et al.*[168]	186	–	96 (LVEF < 50%)	17 ± 12%	26 ± 12%	–	10/96 had PVC burden <10%
Lie *et al*[169]	52	–	15 (GLS worse than -18%)	5%	22%	>8%	–
Park *et al*[170]	180	36	52 (LVEF <50%)	28 ± 11.6%	30.7 ± 10%	26% (sensitivity 63%, specificity 87%)	–

LV, left ventricular; LVEF, left ventricular ejection fraction; PVC, premature ventricular contraction.

Premature ventricular contractions



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Premature ventricular contractions

Consensus statements	Symbol	References
Asymptomatic patients with frequent PVCs (>500 per 24 h) should be referred to a specialist for further evaluation to rule out any underlying structural, ischaemic, or electrical heart disease.		151,152
Very frequent PVCs (burden > 20%) are a marker of all-cause and cardiovascular mortality and may justify intensified follow-up.		154
PVCs should be treated in patients with suspected PVC-mediated cardiomyopathy.		Expert consensus
Treatment of patients with asymptomatic PVCs should focus on the underlying heart disease in order to improve prognosis.		Expert consensus

Ventricular tachycardia

The prevalence of asymptomatic NSVT varies from 0.7% (healthy population) to 10% (in a geriatric population)

It is common in ischaemic heart disease (30–80% of patients)

Folarin VA, Fitzsimmons PJ, Kruyer WB. Holter monitor findings in asymptomatic male military aviators without structural heart disease. Aviat Space Environ Med 2001;72:836–8. 178. Zipes DP, Camm AJ, Borggrefe M, Buxton AE, Chaitman B, Fromer M et al.

ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: a report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death) developed in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. Europace 2006;8:746–837.

Ventricular tachycardia

Table 7 **Definitions of different sub-types of ventricular tachycardia**

Type of ventricular arrhythmia	Definition
Non-sustained VT	Three or more consecutive ventricular beats terminating spontaneously in less than 30 s with a cycle length of <600 ms (>100 b.p.m.)
• Non-sustained monomorphic VT	NSVT with a single QRS morphology
• Non-sustained polymorphic VT	NSVT with a changing QRS morphology and a cycle length between 600 and 180 ms
Monomorphic sustained VT	VT greater than 30 s in duration or terminated by external intervention with a stable QRS morphology
Bidirectional VT	VT with a beat to beat alternans in the frontal plane axis often associated with digitalis toxicity or channelopathies such as CPVT or Andersen-Tawil syndrome
Torsades de pointes	Polymorphic VT characterized by twisting of the peaks of the QRS complexes around the isoelectric line often associated with long QT. • Typical: initiation following a long/short/long coupling interval • Atypical: short coupled variant initiated by R on T PVCs
Accelerated idioventricular rhythm	Ventricular rhythm slower than 100 bpm

Ventricular tachycardia

Table 8 **Evaluation of patients with asymptomatic sustained or non-sustained VT**

First line evaluation	
History	Prior cardiovascular disease, hypertension, syncope or near-syncope, relation of VT to exercise.
Family history	SCD, inherited arrhythmia syndromes, coronary artery disease, cardiomyopathy
Medications	QT prolonging drugs, sodium channel blockers, drug interactions
Physical examination	Sign of structural heart disease or heart failure
Twelve-lead ECG	Q-waves, ischaemic changes, prolonged or fractionated QRS, QT prolongation or shortening, J point elevation and coved-type ST elevation V1–V3, early repolarization, epsilon waves, or T-wave inversion anteriorly, laterally or inferiorly
Prolonged rhythm monitoring (Holter-ECG)	Day/night/effort appearance. Frequency and duration of episodes
Echocardiography	Signs of structural heart disease
Laboratory	Serum electrolytes, renal function, thyroid function and BNP
Stress test	Suspicion of coronary artery disease, exercise-related symptoms, borderline QT interval. VT provocation by exertion
Second line evaluation	
Non-invasive evaluation of coronary artery	Low suspicion of coronary artery disease
Coronary arteriography	High suspicion of coronary artery disease
Cardiac MRI	Suspicion of structural heart disease such as ARVC, HCM, cardiac sarcoidosis, congenital abnormalities
Electrophysiological study	In case of NSVT, coronary artery disease and moderate LV dysfunction (EF<40%), syncope
Pharmacological testing	To unmask suspected Brugada syndrome
• Ajmaline test	
• Flecainide test	
Genetic testing	In case of inherited arrhythmic disorders or in the setting of familial screening when a mutation is identified in the family.

Ventricular tachycardia

Manuseio depende quase que exclusivamente da função cardíaca
Prognostico benigno naqueles sem doença estrutural

Kennedy, H. L., et al. Long-term follow-up of asymptomatic healthy subjects with frequent and complex ventricular ectopy. *N. Engl. J. Med.* 312: 193, 1985.

The authors followed 73 asymptomatic healthy subjects who were discovered to have frequent and complex ventricular ectopy for a 10-year period. Among those excluded from the study were patients with mitral valve prolapse, a very frequent finding in apparently healthy persons with complex ventricular ectopy. They conclude that long-term prognosis in asymptomatic healthy subjects with such ectopy is similar to that of the healthy United States population and suggests no increased risk of death.

Bernard Kaye

(Reprint requests to Dr. H. L. Kennedy, Div. of Cardiol., St. Louis Univ. Med. Ctr., 1325 S. Grand Blvd., St Louis, Mo. 63104)

Kennedy HL, Whitlock JA, Sprague MK, Kenne [illegible] nt and complex ventricular

CIÊNCIA & CORAÇÃO
Paixão pelo Conhecimento

Ventricular tachycardia

Canalopatias

Taquicardiomiopatia

Kane A, Defaye P, Jacon P, Mbaye A, Machecourt J. Malignant fascicular ventricular tachycardia degenerating into ventricular fibrillation in a patient with early repolarization syndrome. Ann Cardiol Angeiol 2012;61:292–5.

Fenelon G, Wijns W, Andries E, Brugada P. Tachycardiomyopathy: mechanisms and clinical implications. Pacing Clin Electrophysiol 1996;19:95–106

Ventricular tachycardia

ICD for the secondary prevention of sudden cardiac death and ventricular tachycardia

Recommendations	Class[a]	Level[b]	Ref.[c]
ICD implantation is recommended in patients with documented VF or haemodynamically not tolerated VT in the absence of reversible causes or within 48 h after myocardial infarction who are receiving chronic optimal medical therapy and have a reasonable expectation of survival with a good functional status >1 year.	I	A	151–154
ICD implantation should be considered in patients with recurrent sustained VT (not within 48 h after myocardial infarction) who are receiving chronic optimal medical therapy, have a normal LVEF and have a reasonable expectation of survival with good functional status for >1 year.	IIa	C	This panel of experts

Recommendations for Secondary Prevention of SCD in Patients With Ischemic Heart Disease

References that support the recommendations are summarized in Online Data Supplement 17 and 18.

COR	LOE	Recommendations
I	B-R B-NR	1. In patients with ischemic heart disease, who either survive SCA due to VT/VF or experience hemodynamically unstable VT (LOE: B-R) (1-4) or stable VT (LOE: B-NR) (5) not due to reversible causes, an ICD is recommended if meaningful survival greater than 1 year is expected.
Value Statement: Intermediate Value (LOE: B-R)		2. A transvenous ICD provides intermediate value in the secondary prevention of SCD particularly when the patient's risk of death due to a VA is deemed high and the risk of nonarrhythmic death (either cardiac or noncardiac) is deemed low based on the patient's burden of comorbidities and functional status (6).
I	B-NR	3. In patients with ischemic heart disease and unexplained syncope who have inducible sustained monomorphic VT on electrophysiological study, an ICD is recommended if meaningful survival of greater than 1 year is expected (7).

Recommendations for Secondary Prevention of SCD in Patients With NICM

References that support the recommendations are summarized in Online Data Supplement 25 and 26.

COR	LOE	Recommendations
I	B-R B-NR	1. In patients with NICM who either survive SCA due to VT/VF or experience hemodynamically unstable VT (LOE: B-R) (1-4) or stable VT (LOE: B-NR) (5) not due to reversible causes, an ICD is recommended if meaningful survival greater than 1 year is expected.
IIa	B-NR	2. In patients with NICM who experience syncope presumed to be due to VA and who do not meet indications for a primary prevention ICD, an ICD or an electrophysiological study for risk stratification for SCD can be beneficial if meaningful survival greater than 1 year is expected (6-11).
IIb	B-R	3. In patients with NICM who survive a cardiac arrest, have sustained VT, or have symptomatic VA who are ineligible for an ICD (due to a limited life-expectancy and/or functional status or lack of access to an ICD), amiodarone may be considered for prevention of SCD (12, 13).

Ventricular tachycardia

Consensus statements	Symbol	References
Patients with asymptomatic NSVT should be referred for careful evaluation to detect any underlying structural, ischaemic, or electrical heart disease.		Expert consensus
After ruling out acute coronary artery stenosis, an ICD is indicated for sustained VT without a reversible cause in those with LVEF < 35%.		Expert consensus
NSVT in an asymptomatic patient with a LVEF ≥ 40% does not usually require specific antiarrhythmic therapy, but optimization of the treatment of the underlying heart disease.		202

Tachycardia-induced cardiomyopathy (TICMP)

Both supraventricular and ventricular arrhythmias can lead to TICMP

Table 1 | Types of arrhythmias that can lead to tachycardia-mediated cardiomyopathy

Supraventricular tachycardia
• Atrial fibrillation
• Atrial flutter
• Atrial tachycardia
• Permanent junctional reciprocating tachycardia
• AV nodal re-entrant tachycardia
• AV re-entrant tachycardia
• Inappropriate sinus tachycardia (rare)
Ventricular tachycardia
• Any type of ventricular tachycardia
Premature contractions
• High burden of premature ventricular contractions
Pacing
• High-rate atrial pacing
• Persistent rapid ventricular pacing
• Permanent pacing with right ventricular stimulation

Tachycardia-induced cardiomyopathy (TICMP)

A incidência depende do tipo de arritmia

Table 1 Patients with TCM before and after RF

Patient	Age, years	Sex	Responsible arrhythmia	RFA success	Initial LVEDD (mm)	F/U LVEDD (mm)	Initial NT-proBNP (pg/ml)	F/U NT-proBNP (pg/ml)	Initial EF (%)	F/U EF (%)
1	32	M	AT	Yes	57	53	3,478	73	30	60
2	14	F	AT	Yes	64	60	9,580	1,432	28	67
3	36	F	AT	Yes	68	54	2,754	88	38	51
4	79	M	AF	Yes	45	40	2,033	357	46	70
5	48	M	AF	Yes	55	51	1,267	90	47	64
6	43	M	AFL	Yes	65	45	1,353	63	43	70
7	35	M	AFL	Yes	65	55	8,277	505	33	68
8	40	F	AFL	Yes	58	49	769	52	42	66
9	42	M	PJRT	Yes	43	44	3,834	365	29	58
10	22	M	PJRT	Yes	69	64	2,537	192	36	51
11	18	M	AVRT	Yes	50	44	2,403	73	35	68
12	22	M	PVCs	Yes	57	50	1,853	213	41	56
13	55	M	PVCs	Yes	68	55	7,965	663	38	46
14	27	F	PVCs	Yes	62	53	834	166	27	54
15	51	M	PVCs	Yes	63	55	118	80	43	56
16	9	M	PVCs	Yes	52	44	5,956	99	46	69
17	36	F	PVCs	No	70	67	14,563	3,630	22	36

Age, at presentation to investigator

RFA radiofrequency ablation; *F/U* follow-up; *EF* ejection fraction; *LVEDD* left ventricular end-diastolic; *NT-proBNP* NT-pro-B-type natriuretic peptide, and cause indicates responsible arrhythmia; *AF* atrial fibrillation; *AFL* atrial flutter; *AT* atrial tachycardia; *AVRT* atrial ventricular reentrant tachycardia; *PJRT* permanent junctional reciprocating tachycardia; *PVCs* premature ventricular contractions or nonsustained ventricular

Donghua Z, Jian

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Tachycardia-induced cardiomyopathy (TICMP)

- Overlap of the mechanisms leading to TICMP

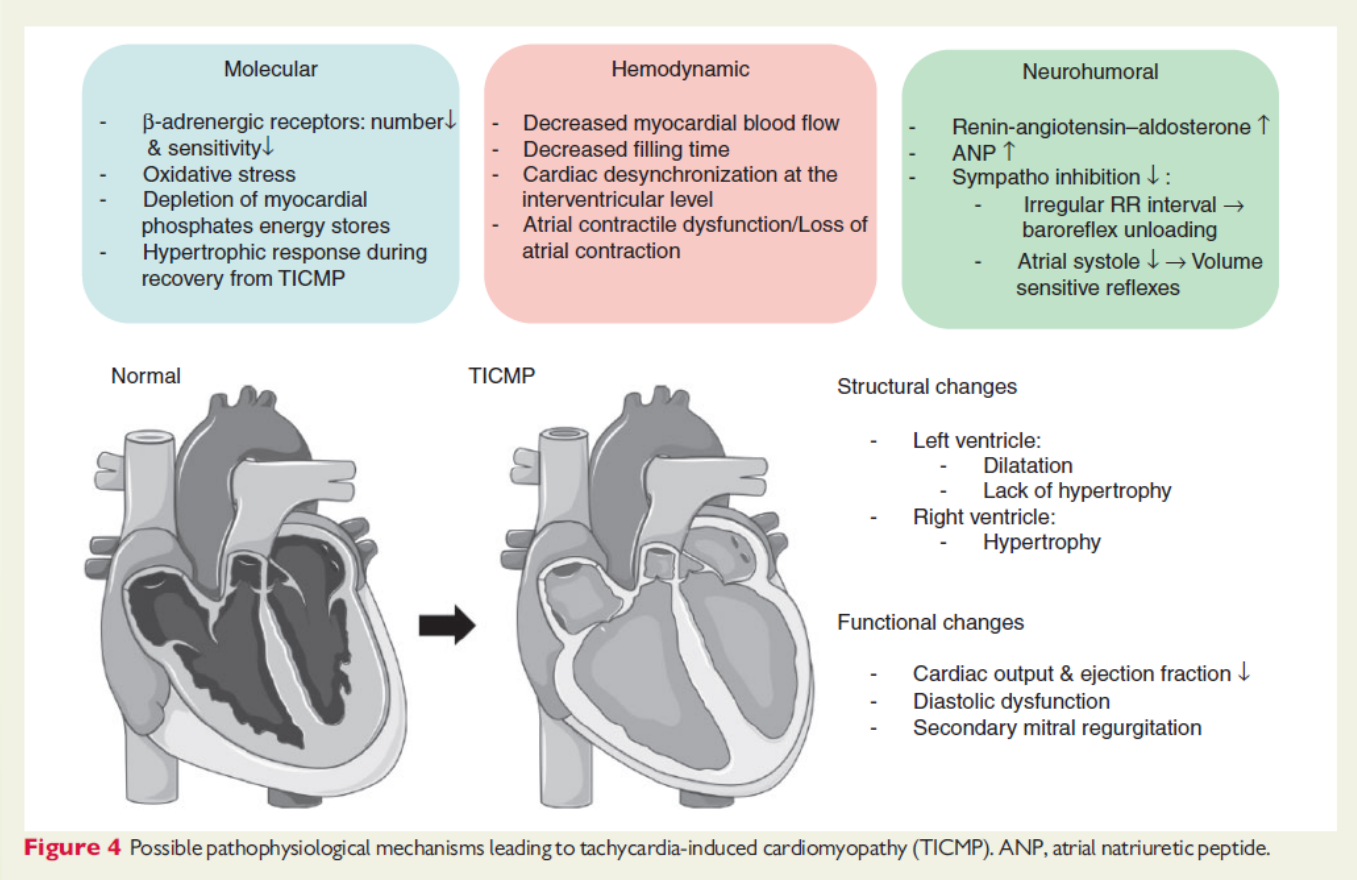

Figure 4 Possible pathophysiological mechanisms leading to tachycardia-induced cardiomyopathy (TICMP). ANP, atrial natriuretic peptide.

Tachycardia-induced cardiomyopathy (TICMP)

Não há critérios diagnósticos.
Diagnóstico?

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Gupta S, Figueredo VM. Tachycardia mediated cardiomyopathy: pathophysiology,mechanisms, clinical features and management. Int J Cardiol 2014;172:40–6.

Tachycardia-induced cardiomyopathy (TICMP)

ECG

Echocardiogram

Holter

Evaluation of coronary arteries

MRI

Tachycardia-induced cardiomyopathy (TICMP)

Table 12 Elements for the diagnosis of TICMP

(1)	No other cause of cardiomyopathy (myocardial infarction, valve disease, hypertension, alcohol or drug use, stress etc.)
(2)	Absence of left ventricular hypertrophy
(3)	No major increase in LV dimensions (LV end-diastolic dimension <6.5 cm)
(4)	Recovery of LV function after control of tachycardia (by rate control, cardioversion, or radiofrequency ablation) within a time frame of 1–6 months.
(5)	Rapid decline in LVEF following recurrence of tachycardia in a patient with recovered LV function after previous control of tachycardia.

LV, left ventricular; LVEF, left ventricular ejection fraction; TICMP, tachycardia-induced cardiomyopathy.

Tachycardia-induced cardiomyopathy (TICMP)

- TCIM usually resolves with treatment of the arrhythmia.

Ling LH, Kalman JM, Ellims AH, Iles LM, Medi C, Sherratt C et al. Diffuse ventricular fibrosis is a late outcome of tachycardia-mediated cardiomyopathy after successful ablation. Circ Arrhythm Electrophysiol 2013;6:697–704.

Tachycardia-induced cardiomyopathy (TICMP)

Consensus statements	Symbol	References
Other causes of cardiomyopathy (myocardial infarction, valve disease, hypertension, alcohol or drug use, stress, etc.) should be eliminated before considering a diagnosis of tachycardia-induced cardiomyopathy (TICMP).		191,232
Management of TICMP should involve drug treatment for heart failure, rate control in the case of atrial fibrillation (AF) when rhythm control is not feasible and rhythm control for the specific arrhythmia (including AF) causing TICMP.		191,230–232
Ablation may be preferred for rhythm control of persistent or repetitive atrial or ventricular arrhythmia, even when asymptomatic, in suspected TICMP cases.		231,232

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Arrhythmia	Acute Success	Recurrence Rate	Major Complications	References
Common SVTs				
AVNRT	96%–97%[102,103]	5%[103]	• Overall 3%[102] • PPM 0.7%[102] • Death 0%[102]	102,103
AVRT/accessory pathway	93%[102,103]	8%[103]	• Overall 2.8%[102] • PPM 0.3%[102] • Death 0.1%[102] • Tamponade 0.4%[102]	102,103
CTI-dependent atrial flutter	97%[102]	10.6% atrial flutter,[121] 33% atrial fibrillation[121]	• Overall 0.5%[102] • PPM 0.2%[102] • Pericardial effusion 0.3%[102]	102,103,121
Less common SVTs				
Focal AT	80%–100%	4%–27%	<1%–2%	122–129
JT	82%–85%	0–18%	0–18% CHB (overall complications N/A)	130–132
Non–CTI-dependent atrial flutter	73%–100%	7%–53%	0–7%	122,133–140

Table 18 Complications related to catheter ablation of atrial fibrillation

Complication severity	Complication type	Rate [727, 748, 750, 754-759]
Life-threatening complications	Periprocedural death	<0.2%
	Oesophageal injury (perforation/fistula)[a]	<0.5%
	Periprocedural stroke (including TIA/air embolism)	<1%
	Cardiac tamponade	1–2%
Severe complications	Pulmonary vein stenosis	<1%
	Persistent phrenic nerve palsy	1–2%
	Vascular complications	2–4%
	Other severe complications	≈1%
Other moderate or minor complications		1–2%
Unknown significance	Asymptomatic cerebral embolism (silent stroke)[b]	5–20%
	Radiation exposure	

- Obrigado