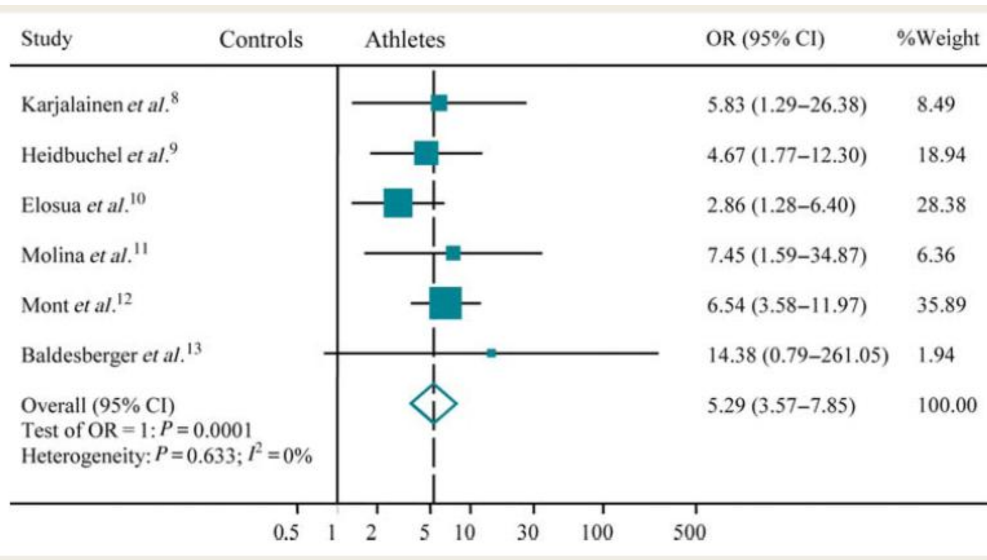
La FA du jeune sportif : où en est on ?

Alexandre Duparc (CHU Toulouse)

La FA chez le sportif



Type of athletes	Age (years) mean ± SD (athletes vs. controls)	Men (%)
Orienteers	48 ± 6 (46 ± 7 vs. 50 ± 5)	100
Mixed sports	55 ± 10 (53 ± 9 vs. 60 ± 10)	88
Mixed sports	43 ± 12 (NA)	69
Marathon runners	45 ± 10 (39 ± 9 vs. 50 ± 13)	100
Mixed sports	48 ± 10 (NA)	100
Cyclists	67 ± 7 (67 ± 7 vs. 67 ± 6)	100
Mixed sports	51 ± 9	93

Abdulla J, Nielsen JR. Is the risk of atrial fibrillation higher in athletes than in the general population? A systematic review and meta-analysis. Europace. 2009 Sep;11(9):1156-9.

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Athletics and Cardiac Function

Prevalence and Clinical Significance of Left Atrial Remodeling in Competitive Athletes

Antonio Pelliccia, MD,* Barry J. Maron, MD,† Fernando M. Di Paolo, MD,* Alessandro Biffi, MD,* Filippo M. Quattrini, MD,* Cataldo Pisicchio, MD,* Alessandra Roselli, MD,* Stefano Caselli, MD,* Franco Culasso, PHD‡

Rome, Italy; and Minneapolis, Minnesota

1777 athlètes, ≥ niveau régional

Table 1. Demographic and Clinical Features of the 14 Athletes With Supraventricular Tachyarrhythmias Identified Among 1,777 Highly Trained Athletes

Athlete	Gender	Age (yrs)	Sport	Palpitations at	Diagnostic Testing*	Arrhythmia	LA (mm)
1	M	23	Rowing	Exercise	EPS	AF	38
2	M	32	Soccer	Rest	ECG	AF	38
						AVRT	32
						AVNRT	37
5	M	36	Handball	Rest	EPS	AF	38
						AVNRT	40
7	M	18	Pentathlon	Rest	Holter	AF	32
						AVNRT	32
						AVNRT	36
						AVNRT	36
						AVRT	33
						AVNRT	36
13	M	17	Basketball	Exercise	EPS	AF	44
						AVNRT	46

Are Olympic athletes free from cardiovascular diseases? Systematic investigation in 2352 participants from Athens 2004 to Sochi 2014

Antonio Pelliccia, Paolo Emilio Adami, Filippo Quattrini, Maria Rosaria Squeo,

2352 athlètes olympiques italiens, 25 ans

1 FA paroxystique: femme, tennis

1 FA permanente: homme triathlon

Br J Sports Med 2017;51:238–243

JAMA Cardiology | Brief Report

Incidence of Atrial Fibrillation in Elite Athletes

Araceli Boraita, MD, PhD; Alejandro Santos-Lozano, PhD; María E. Heras, MD, PhD;

- 6813 athlètes espagnols niveau national, 1 centre, 1997-2017
- 27 ans
- 21 FA, 20 hommes / 1 femme
- 19 paroxystiques / 1 persistante / 1 persistante longue
- 20 symptomatiques (repos, post effort) 1 asymptomatique
- Diminution des performances

JAMA Cardiology Published online October 31, 2018

Lone AF?

- Cardiopathie

  Non retrouvée (Wutzler)

- Canalopathie

  Non retrouvée (Wutzler)

- TSV (Kent, RIN)

  12/21 FA sans cardiopathie < 35 ans (Wutzler)

- Extra cardiologique

  Hyperthyroidie 1/21 cas (Boraita)

Wutzler, Clin. Cardiol. 39, 4, 229–233 (2016): FA<35 ans athlètes ou non

Dopage et FA

Effets directs et indirects

- Stéroides anabolisants
- Hormone croissance
- Béta agonistes
- Amphétamines
- Cocaïne
- Hormones thyroïdienne
- Alcool, Boissons énergisantes (caféine)

Rôle du sport chez le jeune sportif

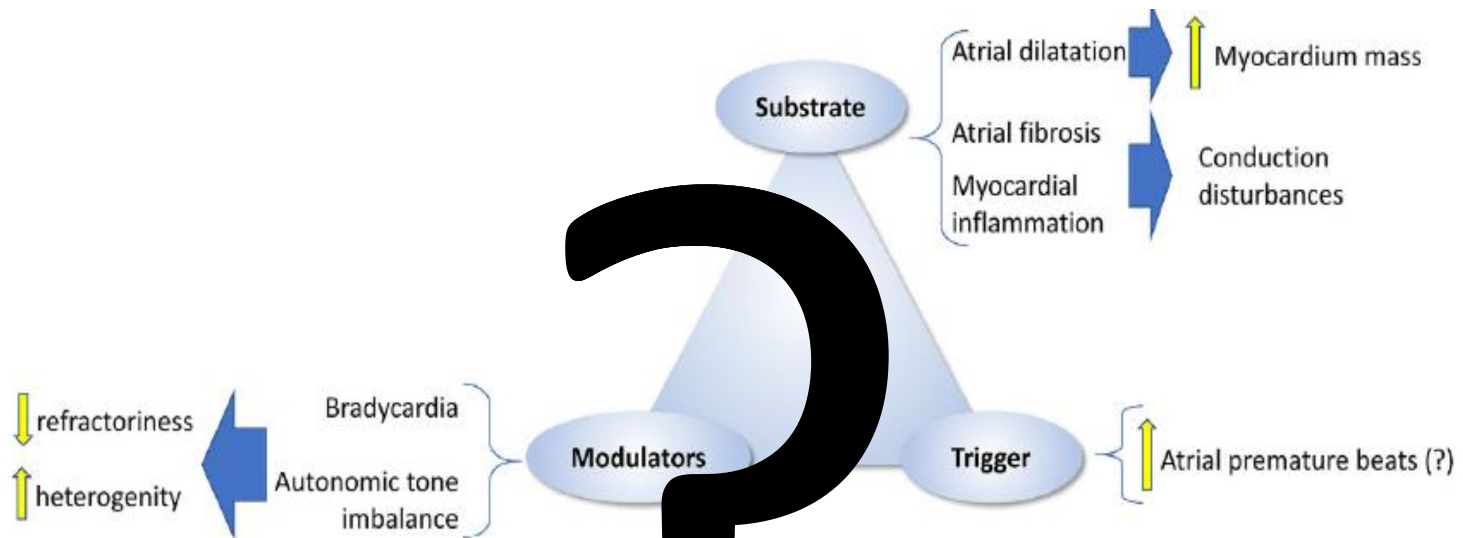


Fig. 1 Schematic representation of the potential mechanisms und[illegible] exercise-induced atrial fibrillation represented in a Coumel's triangle of arrhythmogenesis, and their functional consequences

?

Guash, Neth Heart J (2018)

JAMA Cardiology | Brief Report

Incidence of Atrial Fibrillation in Elite Athletes

Araceli Boraita, MD, PhD; Alejandro Santos-Lozano, PhD; María E. Heras, MD, PhD;

Variable	Logistic Regression, OR (95% CI)		Association Cutoff Value	Receiver Operator Curves for Cutoff Values		
	Univariate	Multivariate, Stepwise Forward		AUC (95% CI)	Sensitivity, Specificity, %	*P* Value
Sex (male)	11.02 (1.48-82.23)[a]	NS				
Age	1.18 (1.14-1.22)[b]	1.07 (1.00-1.14)[c]	27 y	0.87 (0.76-0.97)	85, 81	<.001
Years of competition	1.15 (1.11-1.19)[b]	1.14 (1.07-1.22)[b]	14 y	0.86 (0.76-0.96)	80, 86	<.001
Endurance sport	2.58 (1.10-6.11)[c]	NS				
RA.Sid	1.20 (1.13-1.29)[b]	NS	55 mm	0.77 (0.65-0.89)	75, 72	<.001
LA.Sid	1.16 (1.09-1.25)[b]	NS	54 mm	0.70 (0.56-0.84)	71, 70	.001
LA.APd	1.32 (1.22-1.43)[b]	1.21 (1.10-1.32)[b]	41 mm	0.83 (0.71-0.95)	70, 92	<.001
Left atrial sphericity index[d]	1.10 (1.06-1.14)[b]	NS	79%	0.72 (0.59-0.85)	50, 89	.001

Abbreviations: AF, atrial fibrillation; AUC, area under the curve; LA.APd, left atrial anteroposterior diameter; LA.SId, left atrial superoinferior diameter; NS, nonsignificant in the model; OR, odds ratio; RA.Sid, right superoinferior diameter.

[a] $P = .02$

[b] $P < .001$.

[c] $P = .03$.

[d] LA.APd/LA.SId × 100.

Evolution

- Paroxystique → persistante: 20% à 10 ans chez le non athlète (1) et chez l'athlète (2)
- Rôle de l'entrainement
  - Sport d'endurance: RR multiplié par 5 (3)
  - Rôle du niveau de charge (4) et de la durée cumulée(5)
- Rôle du désentrainement
  - Expérimental: oui (6)
  - Chez l'humain:???

(1) Scardi, Am Heart J (1999)
(2) Hoogsteen, Europace (2004)
(3) Abdulla, Europace (2009)
(4) Andersen, European Heart Journal (2013)
(5) O'Keefe, Mayo Clin Proc. (2012)
(6) Bénito, Circulation (2011)

Diagnostic

- Liée à l’exercice ou non
- ECG, Holter (pendant l’effort ou non), test effort
- CardioFM, montre connectée…

- Exploration EP (confirmation du diagnostic, exclusion autres TSV)

Stratégie anticoagulant

- En général CHADSVAS 0 (1 pour les femme)
- Problématique des patients avec CHADSVAS=1
  - Risque embolique
  - Risque hémorragique (sport de contact)
  - Choix du patient

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

Stratégie antiarythmique personnalisée +++

- Aucune stratégie n’a montré de bénéfice en terme de morbimortalité (AFFIRM…CABANA…)
- Facteurs favorisants et associés:
  - dopage, hygiène de vie, TSV
- Critères:
  - Choix du patient (bénéfices vs risques et contraintes)
  - Fréquence des accès
  - Intensité des symptômes
  - Survenue pendant le sport ou en phase vagale
  - Niveau de compétition

European Heart Journal (2016) 37, 2893–2962
doi:10.1093/eurheartj/ehw210

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)

Recommendation	Class	Level
The ventricular rate while exercising with AF should be evaluated in every athlete (by symptoms and/ or by monitoring), and titrated rate control should be instituted.	IIa	C
After ingestion of pill-in-the-pocket flecainide or propafenone, patients should refrain from sports as long as AF persists and until two half-lives of the antiarrhythmic drug have elapsed.	IIa	C
AF ablation should be considered to prevent recurrent AF in athletes.	IIa	B

Flecaine, propafénone > BB ICa

Flecaine: 12h, Propafénone 2-32h…

Discuter ablation préventive de l’ICT en cas de classe IA

Désentrainement: ?

Ablation chez l'athlète

Europace (2010) **12**, 30–36
doi:10.1093/europace/eup320

CLINICAL RESEARCH
Ablation for Atrial Fibrillation

Efficacy of circumferential pulmonary vein ablation of atrial fibrillation in endurance athletes

Naiara Calvo[†], Lluís Mont[*†], David Tamborero, Antonio Berruezo, Graziana Viola, Eduard Guasch, Mercè Nadal, David Andreu, Barbara Vidal, Marta Sitges, and Josep Brugada

Europace (2011) **13**, 1386–1393
doi:10.1093/europace/eur142

CLINICAL RESEARCH
Ablation for Atrial Fibrillation

Efficacy of radiofrequency catheter ablation in athletes with atrial fibrillation

Pieter Koopman, Dieter Nuyens, Christophe Garweg, Andre La Gerche, Stijn De Buck, Lieve Van Casteren, Becker Alzand, Rik Willems, and Hein Heidbuchel[*]

- Age 50 ans, endurance
- Taux de succès
  - Idem non athlète
  - 1 procédure: 45%
  - Plusieurs: 80%
- Complications: 3-4%

Catheter ablation of atrial fibrillation in very young adults: a 5-year follow-up study

Ardan M. Saguner[†], Tilman Maurer[†], Erik Wissner, Francesco Santoro,

Table 1 Baseline clinical characteristics of patients with long-term follow-up

Characteristic	All patients (*n* = 74)	PAF (*n* = 46)	Pers AF (*n* = 28)	No SHD (*n* = 66)	SHD (*n* = 8)
Age at index ablation	31 (27;33)	31 (27;33)	32 (28;33)	31 (27;33)	32 (29;32)
Male, n (%)	49 (66%)	27 (59%)	22 (79%)	47 (71%)	2 (25%)
BMI (kg/m^2)	26.6 ± 4.8	26.9 ± 4.7	26.3 ± 5.0	27.1 ± 4.6	22.5 ± 4.4
BMI >25kg/m^2	40 (54%)	24 (52%)	16 (57%)	37 (56%)	3 (38%)
BMI >30kg/m^2	19 (26%)	13 (28%)	6 (21%)	19 (29%)	0 (0%)
Arterial hypertension	17 (23%)	12 (26%)	5 (18%)	16 (24%)	1 (13%)
Diabetes mellitus	1 (1%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)
CHA_2DS_2-VASc score	1 (0;1)	1 (0;1)	0 (0;1)	0 (0;1)	2 (1;2)
EHRA Score	3 (3;4)	3 (3;4)	3 (3;4)	3 (3;4)	4 (2.5;4)
family history of AF ≤ 55years	14 (20%)	10 (22%)	4 (14%)	13 (20%)	1 (13%)
Competitive athlete	12 (18%)	7 (15%)	5 (18%)	12 (18%)	0 (0%)

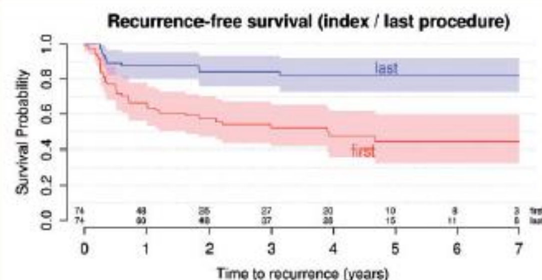
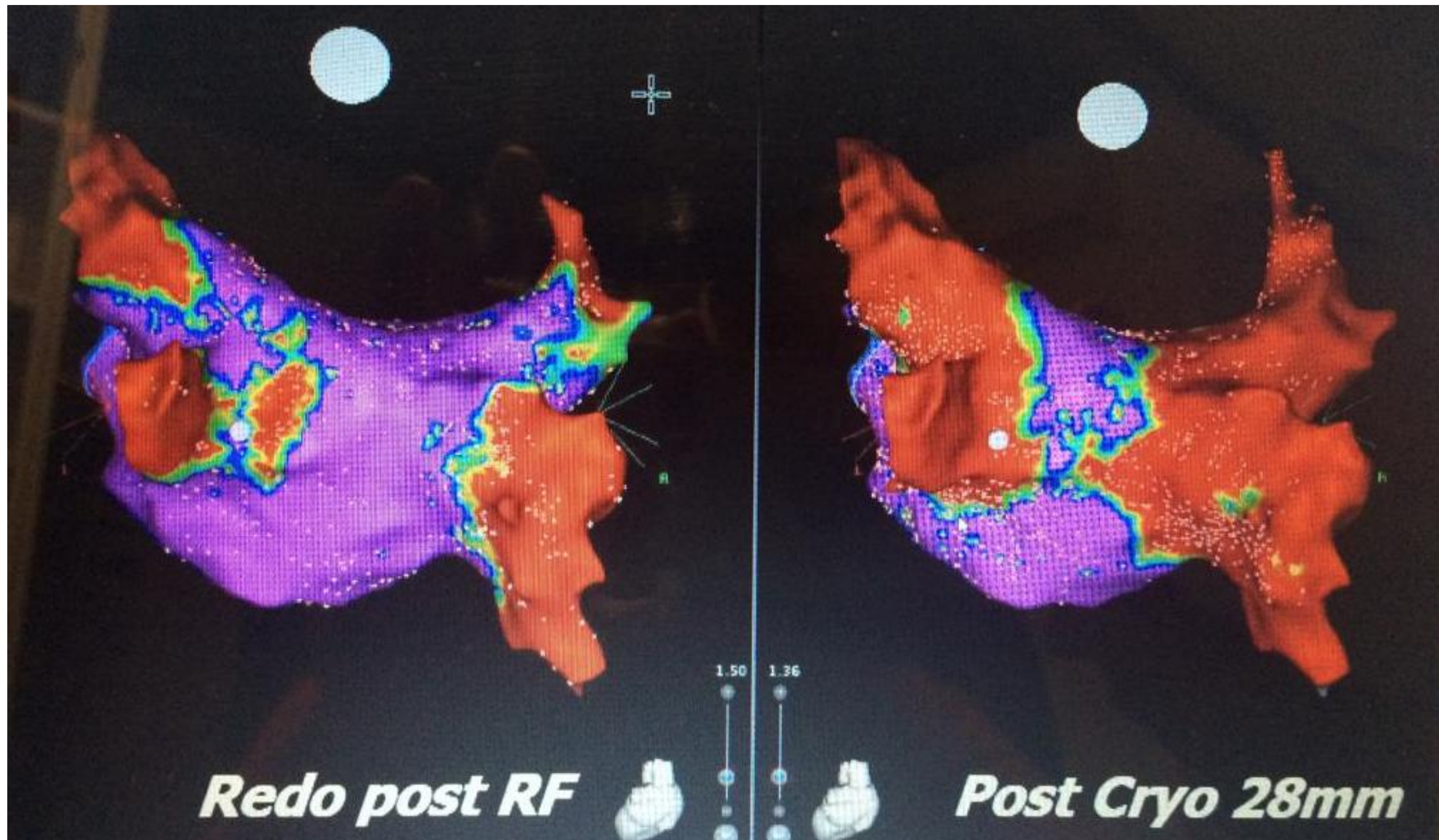


Figure 1 Arrhythmia-free survival estimates and 95% confidence intervals after catheter ablation of atrial fibrillation after the index procedure (red curve) and last procedure (blue curve). Both graphs are derived from patients on and off antiarrhythmic drugs. Numbers indicate remaining patients at risk at each time point. Proc, procedure.

After a median follow-up of 4.6 years and a mean of 1.5 ± 0.6 ablation procedures 84% [including 13% on previously ineffective antiarrhythmic drugs] of patients were in stable SR

Major complications occurred in 6/122 (4.9%) procedures (PV stenosis in 3, cardiac tamponade in 1, stroke in 1, and arterial-venous fistula in 1)

Ablation



Contre indication au sport?

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

ESC Report

Recommendations for competitive sports participation in athletes with cardiovascular disease

Evaluation	Criteria for eligibility	Recommendations	Follow-up
History, ECG, Echo, ET, 24 h Holter	a) After paroxysmal AF: if no cardiac disease, no WPW, and stable sinus rhythm >3 months	a) All sports	a) Yearly
	b) Permanent A F in the absence of cardiac disease, and WPW: assess heart rate and LV function response to exercise	b) Assessed on individual basis	b) Every 6 months

AHA/ACC Scientific Statement

Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities: Task Force 9: Arrhythmias and Conduction Defects

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

Douglas P. Zipes, MD, FAHA, MACC, Chair; Mark S. Link, MD, FACC;

2. **Athletes with low-risk AF that is well tolerated and self-terminating may participate in all competitive sports without therapy *(Class I; Level of Evidence C)*.**
3. **In athletes with AF, when antithrombotic therapy, other than aspirin, is indicated, it is reasonable to consider the bleeding risk in the context of the specific sport before clearance *(Class IIa; Level of Evidence C)*.**

Circulation December 1, 2015

Conclusion

- Rare mais invalidante
- Lien de causalité sport-FA moins évident
- Recherche étiologique/facteurs favorisants
- OAC rarement
- Traitement antiarythmique personnalisé:

  balance bénéfice risque à court et long terme
- Compétition autorisée
- Rôle des sport d'endurance dans l'évolutivité de la FA