VII Congresso
Novas Fronteiras
em Cardiologia

17 de Fevereiro 2017
Aula Magna da Faculdade
de Medicina da Universidade
de Lisboa

18 e 19 de Fevereiro 2017
Hotel Marriott Praia Del-Rey

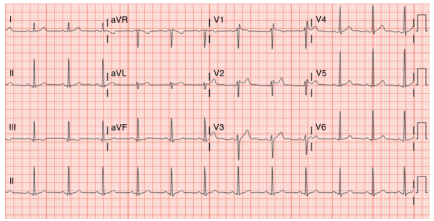
REGISTADOR DE EVENTOS IMPLANTÁVEL

em que doentes e que resultados?

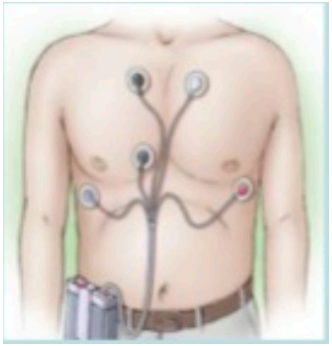
Andreia Magalhães

Serviço de Cardiologia, Hospital de Santa Maria

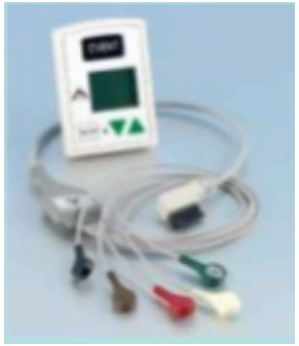
Sistemas de monitorização electrocardiográfica



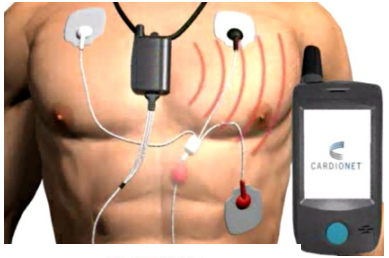
ECG

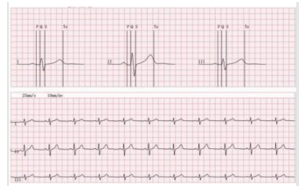


Holter



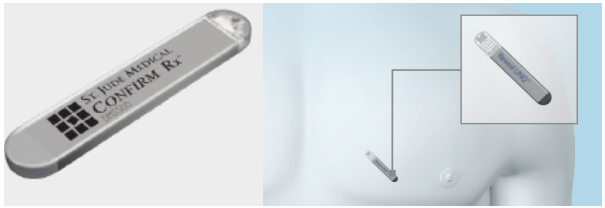
Registadores de eventos externos





Telemetria ambulatória

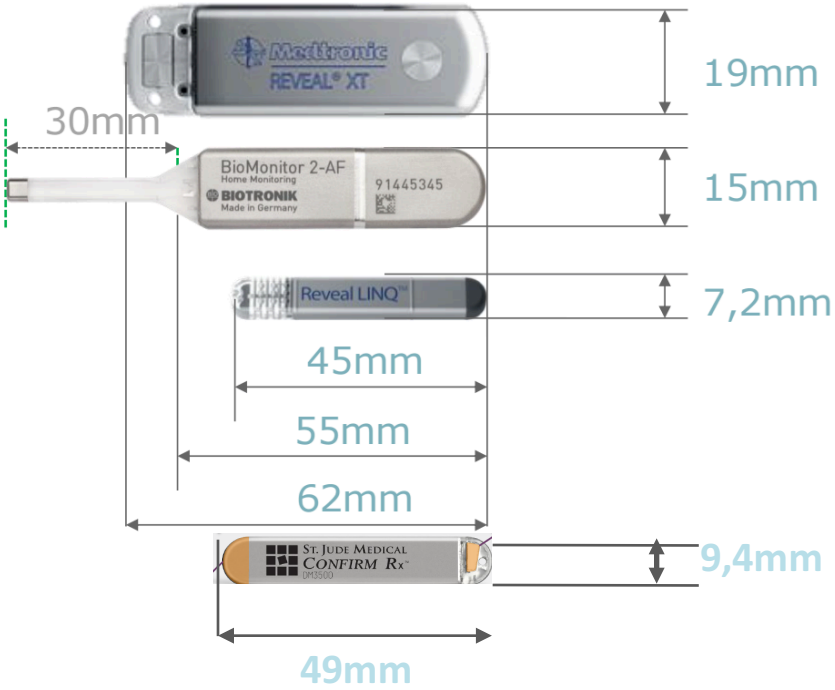
Registadores de eventos implantáveis

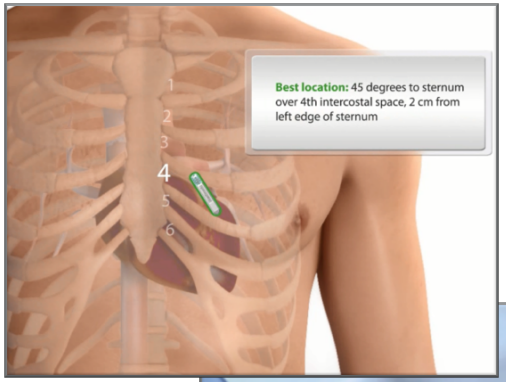


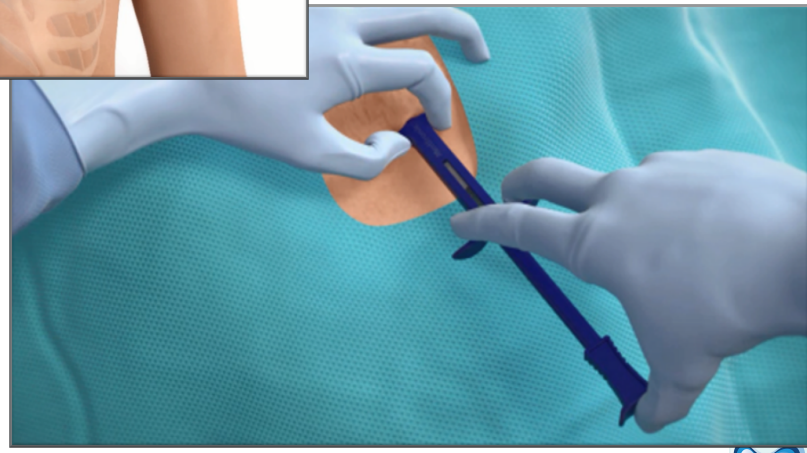
Registadores de eventos implantáveis

- Dispositivos subcutâneos
- Procedimento de implantação simples
- Permitem a detecção automática de arritmias
- Permitem a documentação de eventos ativados pelo doente
- Monitorização remota
- Bateria 2-4 anos

Registadores de eventos implantáveis







Registadores de eventos implantáveis

Indicações

Síncope

Palpitações não documentadas

Acidente vascular cerebral criptogénico

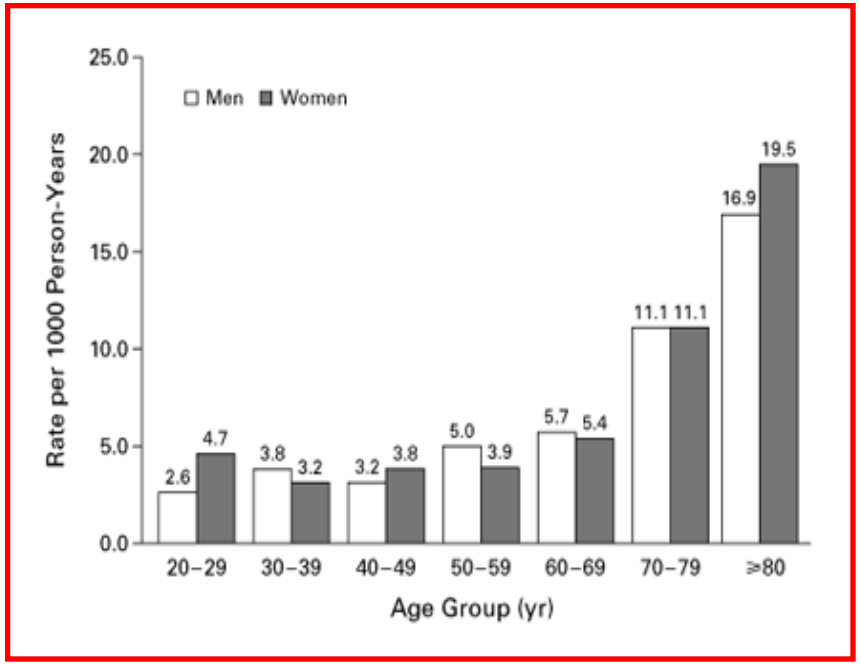
Outros

Pós-ablação de FA

Miocardiopatias/Canalopatias

Síncope

- Perda de consciência devido a hipoperfusão cerebral global transitória – súbita, curta duração e recuperação completa espontânea
- Causa frequente de consulta médica e de ida ao serviço de urgência
- Muitas vezes recorrente
- Afecta de forma significativa a qualidade de vida dos doentes

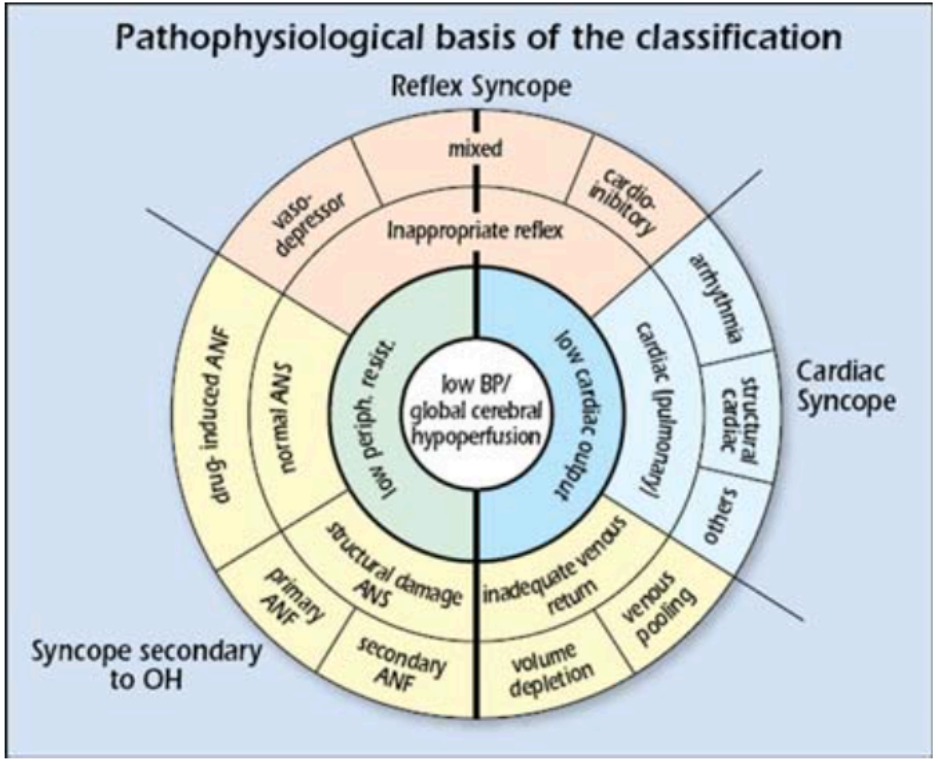


Soteriades et al. *NEJM* 2002; 347: 878

Síncope

Pode ter diferentes etiologias

Desafio Diagnóstico



Síncope

Test/Procedure	Yield based on mean time to diagnosis of 5.1 months[7]
History and Physical (including carotid sinus massage)	**49-85%** [1, 2]
ECG	2-11% [2]
Electrophysiology Study without SHD*	11% [3]
Electrophysiology Study with SHD	**49%** [3]
Tilt Table Test (without SHD)	11-87% [4, 5]
Ambulatory ECG Monitors:	
- Holter	2% [7]
- External Loop Recorder (2-3 weeks duration)	20% [7]
-**Insertable Loop Recorder** (up to 18 months duration)	**65-88%** [6, 7]
Neurological † (Head CT Scan, Carotid Doppler)	0-4% [4,5,8,9,10]

[1] Kapoor, et al *N Eng J Med,* 1983.
[2] Kapoor, *Am J Med*, 1991.
[3] Linzer, et al. *Ann Int. Med*, 1997.
[4] Kapoor, *Medicine*, 1990.
[5] Kapoor, *JAMA*, 1992
[6] Krahn, *Circulation*, 1995
[7] Krahn, *Cardiology Clinics*, 1997
[8] Eagle K,, et al. The Yale J Biol and Medicine. 1983.
[9] Day S, et al. Am J Med. 1982; 73: 15-23.
[10] Stetson P, et al. PACE. 1999; 22 (part II): 782

Síncope

Causa arrítmica

- Durante o exercício
- Posição sentada/deitada
- Palpitações
- Sem pródromos
- História familiar de MSC
- Alterações no ECG (perturbação da condução; QT prolongado; padrão de Brugada; pré-excitação)
- Doença estrutural grave
- Doença coronária

Neurally mediated syncope:

- Absence of heart disease
- Long history of recurrent syncope
- After sudden unexpected unpleasant sight, sound, smell or pain
- Prolonged standing or crowded, hot places
- Nausea, vomiting associated with syncope
- During a meal or post-prandial
- With head rotation or pressure on carotid sinus (as in tumours, shaving, tight collars)
- After exertion

Syncope due to OH

- After standing up
- Temporal relationship with start or changes of dosage of vasodepressive drugs leading to hypotension
- Prolonged standing especially in crowded, hot places
- Presence of autonomic neuropathy or Parkinsonism
- Standing after exertion

Cardiovascular syncope:

- Presence of definite structural heart disease
- Family history of unexplained sudden death or channelopathy
- During exertion, or supine
- Abnormal ECG
- Sudden onset palpitation immediately followed by syncope
- ECG findings suggesting arrhythmic syncope:
  - Bifascicular block (defined as either LBBB or RBBB combined with left anterior or left posterior fascicular block)
  - Other intraventricular conduction abnormalities (QRS duration ≥0.12 s)
  - Mobitz I second degree AV block
  - Asymptomatic inappropriate sinus bradycardia (<50 bpm), sinoatrial block or sinus pause ≥3 s in the absence of negatively chronotropic medications
  - Non-sustained VT
  - Pre-excited QRS complexes
  - Long or short QT intervals
  - Early repolarization
  - RBBB pattern with ST-elevation in leads V1–V3 (Brugada syndrome)
  - Negative T waves in right precordial leads, epsilon waves and ventricular late potentials suggestive of ARVC
  - Q waves suggesting myocardial infarction

Table 9 Important historical features

Questions about circumstances just prior to the attack

- Position (supine, sitting or standing)
- Activity (rest, change in posture, during or after exercise, during or immediately after urination, defaecation, cough, or swallowing)
- Predisposing factors (e.g. crowded or warm places, prolonged standing, post-prandial period) and of precipitating events (e.g. fear, intense pain, neck movements)

Questions about onset of the attack

- Nausea, vomiting, abdominal discomfort, feeling of cold, sweating, aura, pain in neck or shoulders, blurred vision, dizziness
- Palpitations

Questions about the attack (eyewitness)

- Way of falling (slumping or kneeling over), skin colour (pallor, cyanosis, flushing), duration of loss of consciousness, breathing pattern (snoring), movements (tonic, clonic, tonic–clonic, minimal myoclonus or automatism), duration of movements, onset of movement in relation to fall, tongue biting

Questions about the end of the attack

- Nausea, vomiting, sweating, feeling of cold, confusion, muscle aches, skin colour, injury, chest pain, palpitations, urinary or faecal incontinence

Questions about the background

- Family history of sudden death, congenital arrhythmogenic heart disease or fainting
- Previous cardiac disease
- Neurological history (Parkinsonism, epilepsy, narcolepsy)
- Metabolic disorders (diabetes, etc.)
- Medication (antihypertensive, antianginal, antidepressant agent, antiarrhythmic, diuretics, and QT-prolonging agents) or other drugs including alcohol
- In the case of recurrent syncope, information on recurrences such as the time from the first syncopal episode and on the number of spells

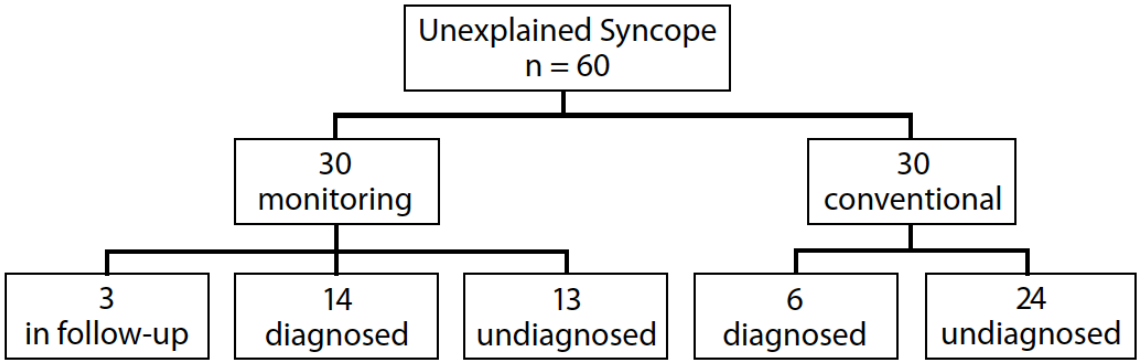
Síncope

RAST: Krahn, *Circulation*. 2001

Diagnostic yield with ICM vs. conventional testing in unexplained syncope

- Patients with unexplained syncope (n = 60)
- Randomized to Reveal® or conventional testing (Holter + tilt table + EP testing)

- In 1 year of monitoring, Reveal provided superior diagnostic yield (52% vs. 20%, p = 0.012)
- Bradycardia was the most frequent cause of syncope (90%)



Patient flow diagram shows higher diagnostic yield with Reveal monitoring

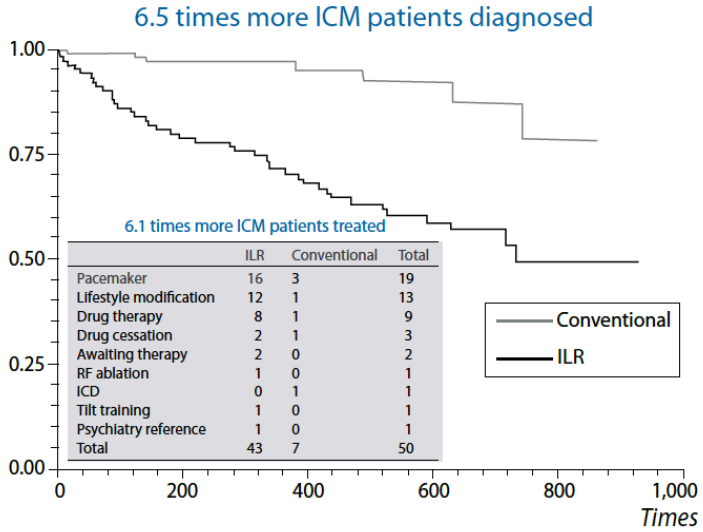
Krahn AD, et al. *Circulation*. 2001;104:46-51.

Síncope

EaSyAS: Farwell, *Eur Heart J.* 2006

Diagnostic yield with ICM vs. conventional testing in unexplained syncope

- Patients with unexplained syncope and without pacing indication resulting from carotid sinus massage and tilt testing
- Randomized to Reveal® Plus (n = 103) or conventional testing (n = 98)
- Over median follow-up 17 months, more ICM patients received an ECG diagnosis than by conventional testing (43% vs. 6%; HR 6.53 [95% CI 3.73-11.4]; p < 0.001)
- Time to ECG-directed therapy was 6.5 times faster in ICM patients (p < 0.001)



6.1 times more ICM patients treated

	ILR	Conventional	Total
Pacemaker	16	3	19
Lifestyle modification	12	1	13
Drug therapy	8	1	9
Drug cessation	2	1	3
Awaiting therapy	2	0	2
RF ablation	1	0	1
ICD	0	1	1
Tilt training	1	0	1
Psychiatry reference	1	0	1
Total	43	7	50

Farwell DJ, et al. *Eur Heart J.* 2006;27:351-356.

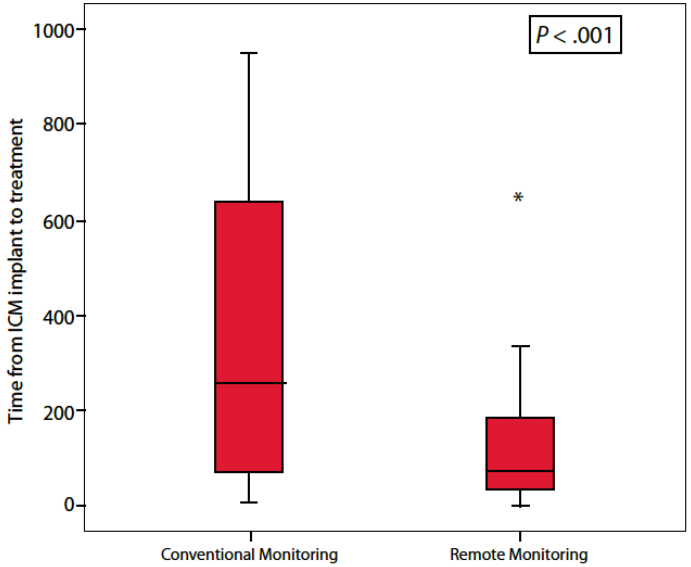
Síncope

Drak-Hernandez, *Rev Esp Cardiol*. 2013

Reduced time to diagnosis and treatment with remote monitoring in ICM patients

- Patients implanted with Reveal® DX/XT for unexplained syncope (n = 109)
- Retrospective assessment of patients followed with the CareLink® Network or conventional on-site follow-up
- Remote monitoring reduced time to diagnosis (56 days vs. 260 days, p < 0.001) and time to initiation of specific treatment (73 days vs. 260 days, p < 0.001)

Remote Monitoring reduced time to treatment by 187 days



Drak-Hernandez Y, et al. *Rev Esp Cardiol*. 2013;66:943-948.

Síncope

PICTURE: Edvardsson, *Europace*. 2011

Role of the ICM in the syncope care pathway

- Patients (n = 570) with median of 4 unexplained syncope events were implanted with Reveal® Plus/DX/XT
- Prior to ICM, patients were evaluated on average by 3 different specialists, underwent median of 13 tests
- ICM guided diagnosis in 78% (170/218) of recurrent syncope events
  - 51% led to pacemaker implant
  - 18% led to no treatment

History of tests prior to ICM implant

Total recruitment	570 (100%)
Standard ECG	556 (98%)
Echocardiography	490 (86%)
Basic laboratory tests	488 (86%)
Ambulatory ECG monitoring	382 (67%)
In-hospital ECG monitoring	311 (55%)
Exercise testing	297 (52%)
Orthostatic blood pressure measurements	275 (48%)
Neurological or phychiatric evaluation	270 (47%)
MRI/CT scan	267 (47%)
EEG	222 (39%)
Carotid sinus massage	205 (36%)
Tilt test	201 (35%)
Electrophysiology testing	144 (25%)
Coronary angiography	133 (23%)
External loop recording	67 (12%)
ATP test	15 (3%)
Other tests	52 (9%)
No tests performed	1 (0%)

Síncope

EaSyAS: Farwell, *European Heart J.* 2004

Benefits with ICM vs conventional testing in unexplained syncope

Procedure	Reveal	Control	Difference in cost (£) (95% CI)
Computed tomography head	4	8	-5.30 (-13.86 to 1.29)
Magnetic resonance imaging	1	1	-0.05 (-3.06 to 2.91)
Electroencephalogram	0	2	-2.04 (-4.80 to 0.72)
Cartid doppler	3	5	-2.19 (-8.14 to 2.89)
Echo	12	15	-8.54 (-25.31 to 6.54)
24-hr Holter	4	11	-7.34 (-15.08 to -0.37)
ELR: 'R Test'	5	28	-29.84 (-43.49 to -18.04)
Electrophysiologic study	0	1	-6.12 (-17.90 to 5.65)
Investigations	£34.0	£95.4	£61.43 (-£92.92 to £35.16)
Hospitalisation	£379	£1090	-£747.30 (-£2728.48 to -£72.75)
Total costs	£406	£1210	£808.72 (-£2766.22 to -£123.42)

Farwell DJ, et al. *EHJ* 2004;25:1257-1263.

Davis, *Europace*. 2012

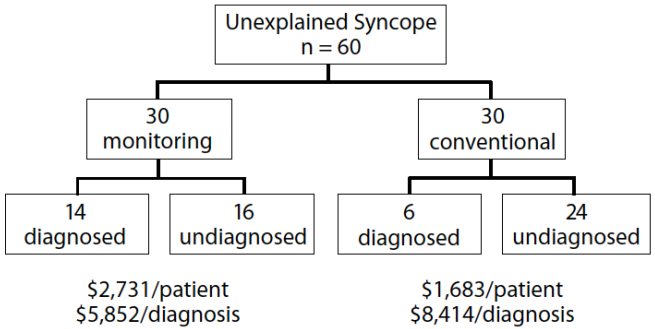
Table 4 Incremental cost-effectiveness results (deterministic)

Comparison	ILR vs. no testing		ILR vs. conventional testing
Population	Suspected arrhythmia	Unexplained	Unexplained
Diagnostic outcomes per 1,000 patients tested			
AV block	91	83	44
SSS	141	131	65
VT	30	30	11
Other arrhythmia	88	86	37
Arrhythmia excluded	154	250	197
Economic outcomes per patient tested			
Cost	£6,460	£6,380	£4,220
QALYs gained	0.394	0.366	0.181
Cost per QALY gained	£16 390	£17 450	£23 360

Davis S, et al. *Europace*. 2012;14:402-409.

RAST: Krahn, *J Am Coll Cardiol*. 2003

ICMs more cost-effective method to diagnose unexplained syncope



ICMs reduced cost/diagnosis by 30%

Vários estudos mostraram que a utilização do REI na avaliação de síncope é **custo-efectiva**

Episódios **pouco frequentes** que permanecem inexplicados ou numa fase precoce **se suspeita de causa arrítmica**

Síncope

NICE Clinical Syncope Guideline CG109

Transient loss of consciousness (TloC) management in adults and young people

For people with a **suspected cardiac arrhythmic cause of syncope,** offer an ambulatory ECG. Do not offer a tilt test as a first-line investigation.

- **TLoC at least several times a week**, offer Holter monitoring (up to 48 hours if necessary). If no further TLoC occurs during the monitoring period, offer an external event recorder that provides continuous recording with the facility for the patient to indicate when a symptomatic event has occurred.
- **TLoC every 1–2 weeks**, offer an external event recorder. If the person experiences further TLoC outside the period of external event recording, offer an ICM.
- **TLoC infrequently (> 2 weeks),** offer an ICM. A Holter monitor should not usually be offered unless there is evidence of a conduction abnormality on the 12-lead ECG.

Síncope

ESC Syncope Guidelines 2009

Class I ICM Guidelines

- Indicated in early phase of evaluation in patients with recurrent syncope of uncertain origin, absence of high-risk criteria and a high likelihood of recurrence within battery longevity of the device.
- Indicated in high-risk individuals in whom comprehensive evaluation did not demonstrate a cause of syncope or lead to a specific treatment.

Class IIa ICM Guidelines

- Consider to assess the contribution of brady-cardia before embarking on cardiac pacing in patients with suspected or certain reflex syncope presenting with frequent or traumatic syncopal episodes.

"If symptom-ECG correlation can be achieved in a substantial number of patients during the active life of the device, than analysis of the cost per symptom – ECG yield has shown that the implanted device maybe a more cost-effective strategy than using conventional investigation."

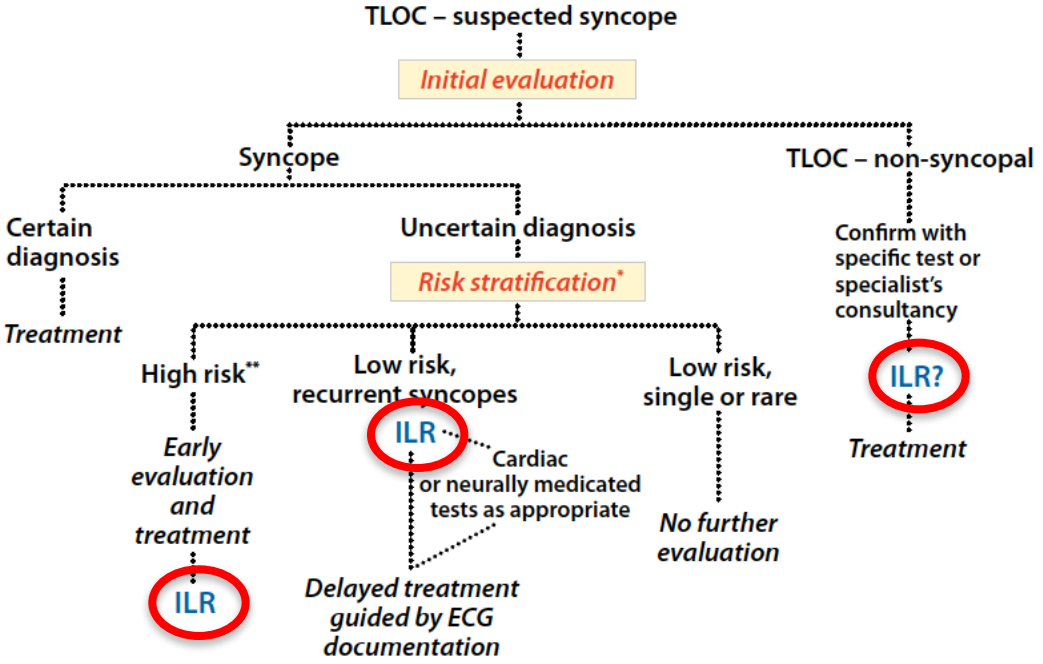
Eur Heart J. 2009;30(21):2631-2671.

Síncope

"Studies showed that early ILR implantation can be safely performed in the initial phase of the diagnostic evaluation, provided that patients at risk of life-threatening events are carefully excluded."

EHRA Position Paper, 2009

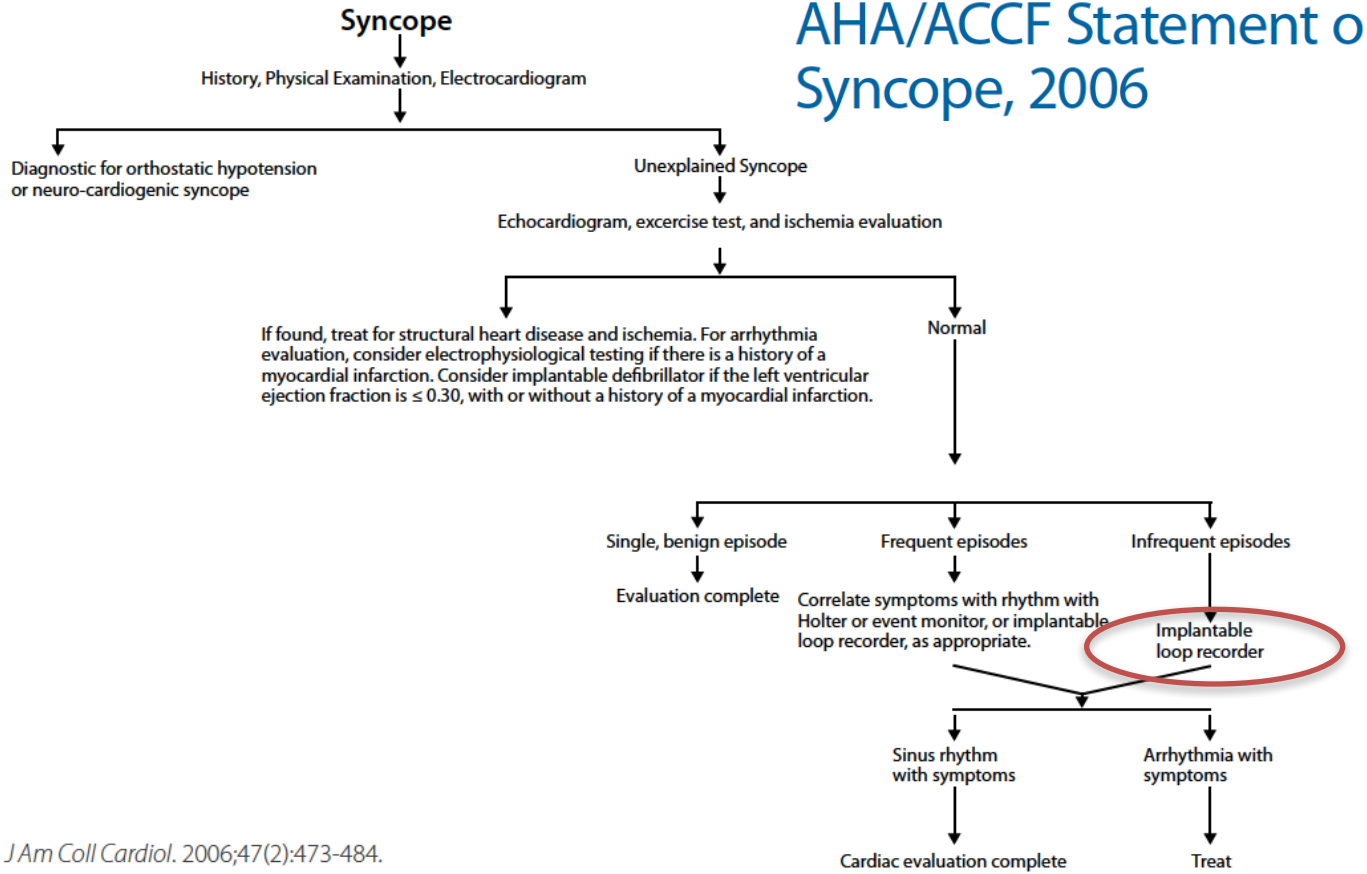
Indications for the Use of ICMs and External Loop Recorders



* May require laboratory investigations
** Risk of short-term serious events

Europace. 2009;11:671-687.

AHA/ACCF Statement on the Evaluation of Syncope, 2006



J Am Coll Cardiol. 2006;47(2):473-484.

Palpitações não documentadas

Palpitações representam um sintoma muito comum

Podem ter diversas etiologias

Table 7 Comparative advantages, drawbacks and indications for event recorders, ELR and ILR (modified from Giada *et al.*[63])

	Event recorders	ELR	ILR
Advantages	Low cost; easy to use	Retrospective and prospective ECG records; possibility to record asymptomatic arrhythmias automatically	Retrospective and prospective ECG records; quite good ECG records; monitoring capability up to 36 months; possibility to record asymptomatic arrhythmias automatically
Drawbacks	Short-lasting arrhythmias are not recorded; arrhythmic triggers are not revealed; poor ECG records	Monitoring cannot be carried out for more than 3–4 weeks; continual maintenance is required; devices are uncomfortable; quite poor ECG recordings	Invasiveness; risk of local complications at the implantation site; higher cost
Indications	Compliant patients; infrequent and fairly long-lasting palpitations unaccompanied by haemodynamic impairment that is likely to hinder use of the device.	Weekly short-lasting palpitations associated to haemodynamic impairment, in very compliant patients	Monthly palpitations associated with haemodynamic impairment; when all other investigations result inconclusive

EHRA Position Paper

Class IIA:

ILRs may be indicated in selected cases with severe infrequent symptoms when ELRs and other ECG monitoring systems fail to document the underlying cause (*Level of evidence B*)

Brignole et al. Europace 2009

Palpitações não documentadas

- 50 doentes
- Palpitações ≤ 1 episódio/mês com duração > 1 minuto

24 doentes

Holter 24h
RE 4 semanas
EEF

26 doentes

RE implantável

RUP Study

Recurrent Unexplained Palpitations Study

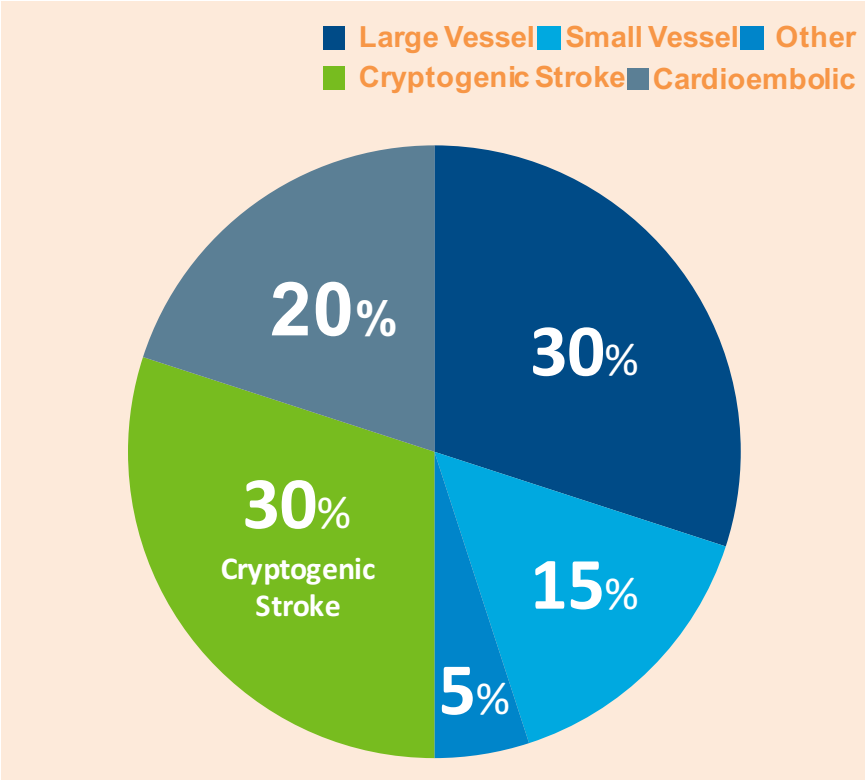
Diagnostic Outcome	Conventional Diagnostic Strategy (n = 24)	Implantable Loop Recorder (n = 26)
Diagnosis, n (%)	5 (21)	19 (73)*
Supraventricular tachycardia	4	6
Atrial fibrillation/atrial flutter	1	6
Sinus tachycardia	0	4
Sinus bradycardia	0	2
Paroxysmal AV block	0	1
No diagnosis, n (%)	**19 (79)**	**7 (27)**
No palpitation recurrence during monitoring	16	6
Patient error in activating the recorder	5	1
Recorder malfunctioning	1	0
Negative EPS	19	–

* $p < 0.001$

Acidente Vascular Cerebral Criptogénico

- Em cada ano, cerca de 15 milhões de pessoas têm um AVC; 5 milhões morrem e 5 milhões ficam com limitações permanentes
- A maioria dos AVCs são isquémicos (80%)
- Cerca de 30% dos casos não é possível identificar a causa do AVC mesmo após uma avaliação extensa

Ischemic Stroke

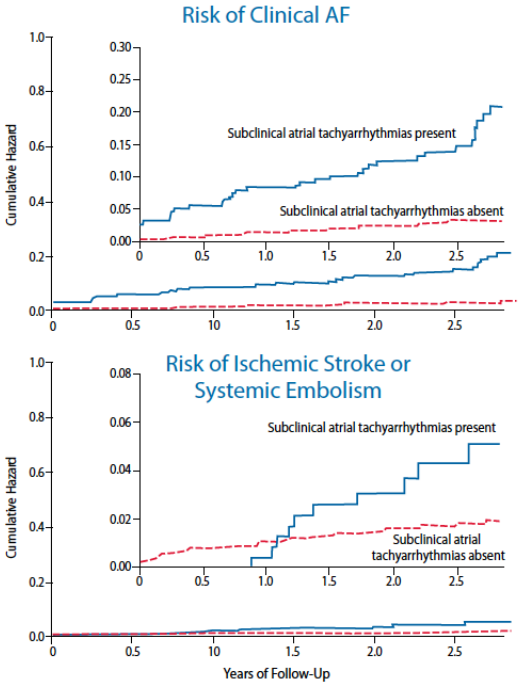


Acidente Vascular Cerebral Criptogénico

ASSERT: Healey, *NEJM*. 2012

- A Fibrilhação auricular é um forte preditor da ocorrência de AVC
- Os AVCs nestes doentes estão associados a maior probabilidade de prognóstico desfavorável

Estudos com monitorização através de pacemakers e CDIs mostram uma incidência de FA não conhecida de 30-60%



Estes doentes com FA subclínica têm risco aumentado de AVC

- N= 2580, CHADS2 score médio de 2.29
- 1 episódio de FA subclínica (>190 bpm, > 6 min) risco de AVC de 2.49 (95% IC 1.28-4.85)

Doentes com episódios >17,72 h, risco anual de AVC de 4.89 (95% IC 1.96 - 10.07)

Acidente Vascular Cerebral Criptogénico

ESC Guidelines FA, 2016

In stroke patients, additional ECG monitoring by long-term non-invasive ECG monitors or implanted loop recorders should be considered to document silent atrial fibrillation.	IIa	B	18, 128

Acidente Vascular Cerebral Criptogénico

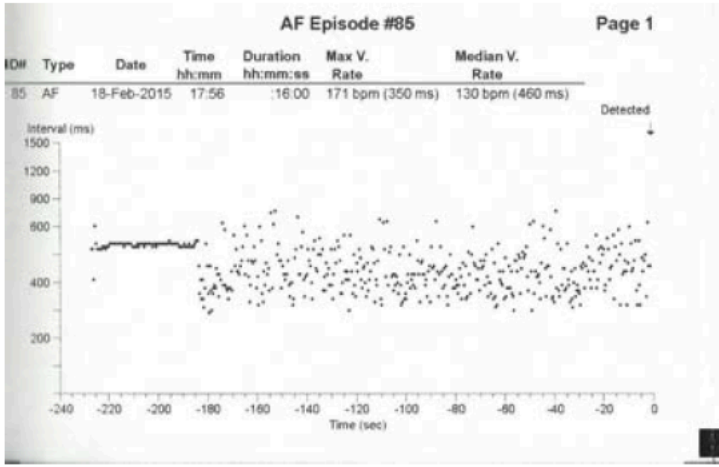
Cerca de 40% dos doentes não cumpre a monitorização durante os 30 dias

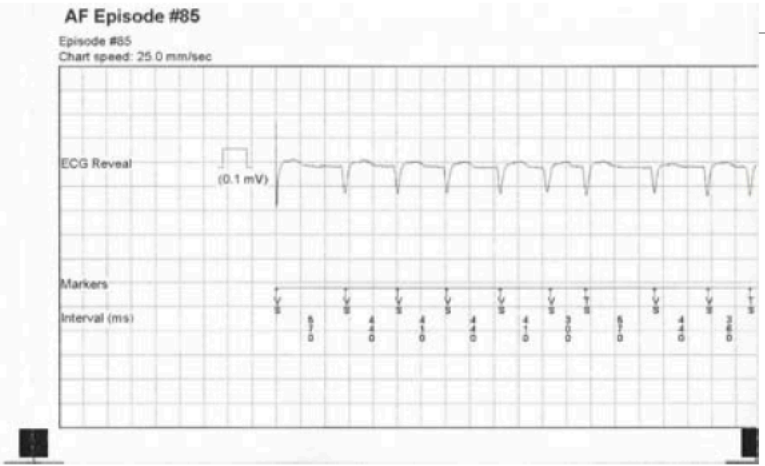
Study (Year)	N	AF Definition	Monitoring Duration	AF Yield
Tayal (2006)	56	Any duration	MCOT 21 Days	**Overall 23%** AF < 30 sec 18% AF > 30 sec 5%
Gaillard (2010)	98	32 seconds	TTM 30 days	**9%**
Bhatt (2011)	62	30 seconds	MCOT 28 days	**24%** AF > 5 min 9%
Flint (2012)	236	5 seconds	MCOT 30 days	**Overall 11%** AF < 30 sec 4% AF > 30 sec 7%
Kamel (2013)	20	30 seconds	MCOT 21 days	**0%**
Miller (2013)	156	30 seconds	MCOT 30 days	**Overall 17%** AF < 30 sec 12% AF > 30 sec 4%
Gladstone (2014)	572	30 seconds	Event Monitor 30 days vs 24 Holter	**16.1%** in event monitor vs. **3.2%** Holter

Source: Glotzer TV, et al. *Heart Rhythm*. 2015;12:234-241.

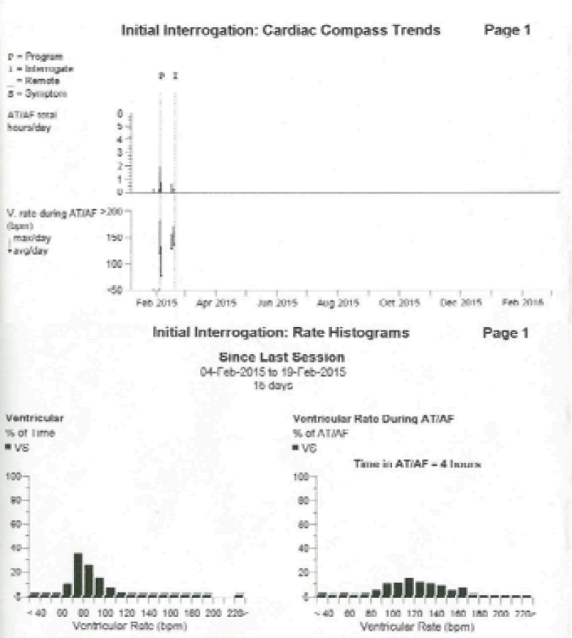
Acidente Vascular Cerebral Criptogénico

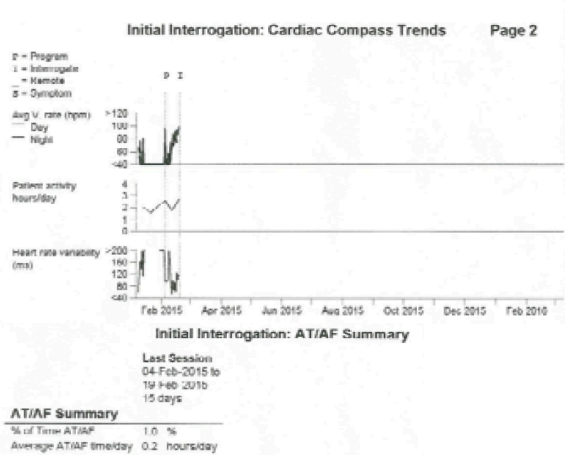
Homem, 68 anos, admitido por AVC
RM CE com múltiplos focos de difusão diminuída no território da ACM esquerda
ECG, ETE, doppler vasos pescoço e RE normais





Acidente Vascular Cerebral criptogénico





- Burden de FA
- Duração dos episódios
- A frequência ventricular durante a FA
- Variabilidade da FC
- Actividade do doente

Acidente Vascular Cerebral Criptogénico

Table 2 AF detected by insertable cardiac monitors in patients with cryptogenic stroke

Study (year)	No. of patients	AF definition	Monitoring duration	AF detection yield	Notes
Cotter et al[25] (2013)	51	2 minutes	Mean 229 (116) days	25.5%	Median time from ICM implant to first new AF episode: 48 days (range 0–154 days) Median duration of first new AF episode: 6 minutes (range 1– 4320 minutes)
Ritter et al[26] (2013)	60	2 minutes	1 year	16.7%	Mean time from ICM implant to first new AF episode: 64 days (1-556). 7-day Holter detected AF in only 1.7%
Etgen et al[27] (2013)	22	6 minutes	1 year	27.3%	Mean time from stroke to first new AF episode: 5 months
Rojo-Martinez et al[28] (2013)	101	2 minutes	281 ± 212 days	33.7%	
SURPRISE[29] (2014)	85	2 minutes	569 ± 310 days	16.1 %	Mean time from stroke to first new AF episode 109 ± 48 days
CRYSTAL AF[11] (2014)	221	>30 seconds*	Minimum 6 months	8.9% at 6 months 12.4% at 12 months 30.0% at 36 months	

Acidente Vascular Cerebral Criptogénico

CRYSTAL AF

- Randomized, controlled clinical trial with 441 patients
- Compared continuous, long-term monitoring with **Reveal™ ICM** vs. **conventional follow-up**
- Assessment at scheduled and unscheduled visits
- ECG monitoring performed at the discretion of the site investigator

End Point	
Primary	▪ Time to first detection of AF at 6 months of follow-up
Secondary	▪ Time to first detection of AF at 12 months ▪ Recurrent stroke or TIA ▪ Change in use of oral anticoagulant drugs

Sanna T, et al. *N Engl J Med.* 2014;370:2478-2486.

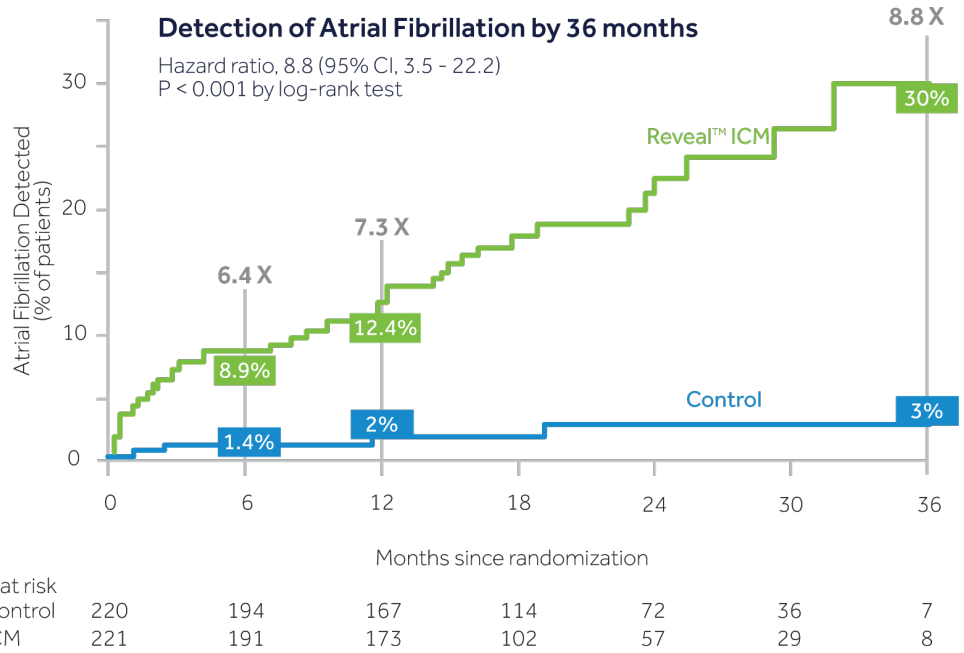
Acidente Vascular Cerebral Criptogénico

CRYSTAL AF

Detecção de FA superior nos doentes com REI

Aos 12 meses, foram necessários 121 ECGs,32 Holter 24h e 1 registador de eventos para detectar FA em 4 doentes na estratégia convencional

> 92% dos doentes com REI apresentaram episódios com > 6 minutos (limiar do ASSERT)



Acidente Vascular Cerebral Criptogénico

- A fisiopatologia do AVC criptogénico é mais do que detecção de FA – **mesmo após 3 anos de monitorização contínua menos de 1/3 apresentou FA**

- O número de doentes que necessita de receber REI para detectar FA no AVC criptogénico e prevenir recorrência é actualmente elevado
  - 10 doentes têm que implantar REI para detectar 1 doente com FA
  - Assumindo que o beneficio da anticoagulação é igual ao dos doentes com FA sintomática com AVC, serão necessários cerca de 100 dispositivos para prevenir um AVC

Será custo-efectivo?

- Factores de risco clínicos, ECG, ecocardiográficos?

Pós-ablação de FA

Estudo **DISCERN AF**, JAMA Intern Med. 2013

50 doentes

REI implantado 3 meses antes da ablação, seguidos ≥ 18 meses

- *Burden* de FA diminuiu 86% após a ablação
- A razão entre eventos assintomáticos e sintomáticos aumentou após a ablação (1,1 para 3,7, p=0,002)
- 12% das recorrências foram assintomáticas

Pós-ablação de FA

Pokushalov, *Circ Arrhythm Electrophysiol*. 2013

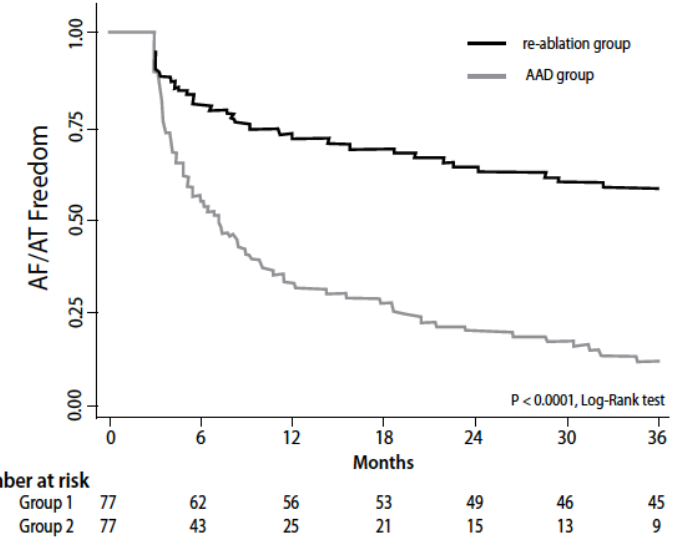
ICMs assess AF catheter ablation and AAD efficacy

Estudo prospectivo randomizado

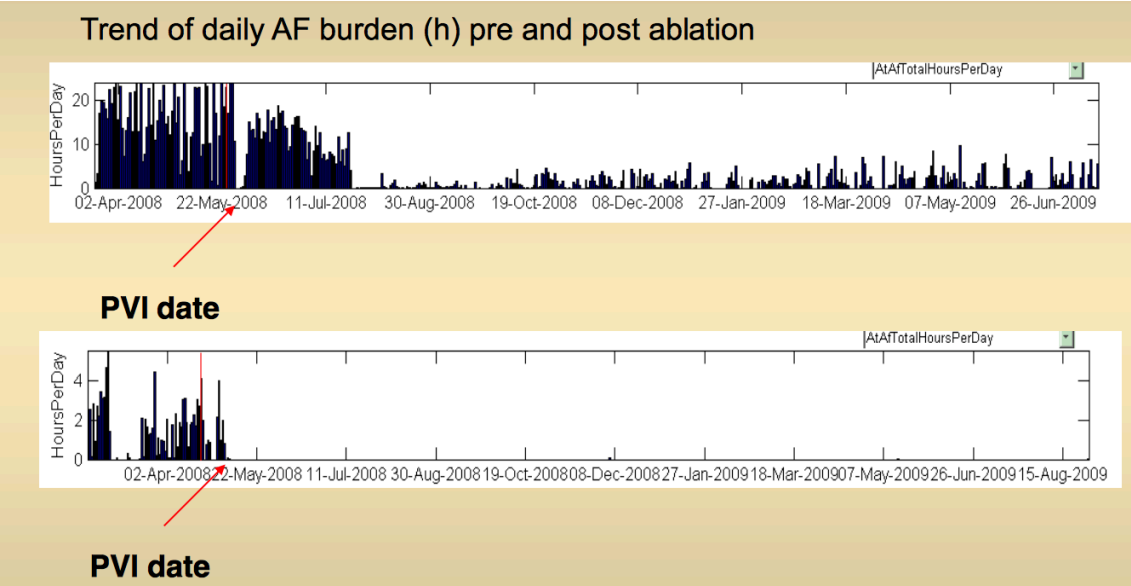
Comparar terapêutica antiarrítmica *versus* re-ablação em doentes com recorrência após 1ª ablação de FA

Todos os doentes implantaram REI

ICM identifies significantly more recurrent AF in AAD group vs. re-ablation group



Pós-ablação de FA



Os REI permitem detectar de forma mais rigorosa as recorrências de FA

Poderá ser relevante em ensaios clínicos, especialmente de novas estratégias terapêuticas

Do ponto de vista clínico, o seu papel para guiar a abordagem terapêutica não está estabelecido

Miocardiopatias
Canalopatias

Os registadores de eventos implantáveis **podem ser úteis na documentação da etiologia de síncope ou pré-síncope** em doentes com evidência genotípica ou fenotípica de miocardiopatias como miocardiopatia hipertrófica, miocardiopatia arritmogénica do VD ou canalopatias como síndrome de QT longo e Brugada

Especialmente relevantes na população pediátrica

No entanto não existe evidência científica para esta indicação

Os nossos dados

- Registadores de eventos implantados entre **2010 e 2016**
- **53** doentes
- Idade média 64 ± 18 anos
- 66% do sexo masculino

Investigação prévia	N (%)
ECG Holter 24h	53 (100%)
Registador de eventos de 7 dias	7 (13,2%)
Test TILT	17 (32,1%)
Estudo electrofisiológico	14 (26,4%)

Indicações para implantação

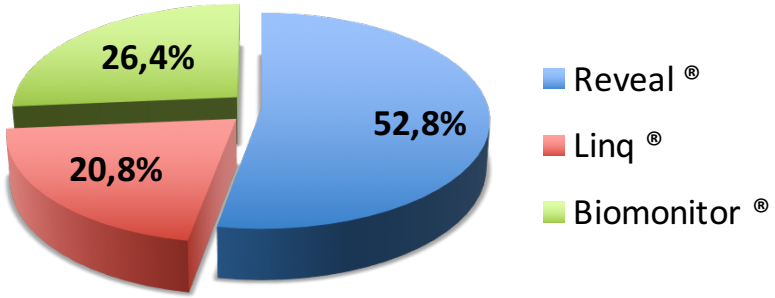
Síncope: 48 (90,6%)

Palpitações: 4 (7,5%)

Monitorização após ablação de FA: 1 (1,9%)

Os nossos dados

Tipo de dispositivo



Seguimento médio: 15,4 ± 15,9 meses

Complicações: 1 (1,9%) - infecção

Os nossos dados

Em **23 doentes (43,4%)** foi possível obter um diagnóstico

Tempo médio para o diagnóstico: 5,8 ± 11,5 meses

Indicação para implantação	N (%)	Diagnósticos	N (%)
Síncope	48 (90,6%)	Doença do nódulo sinusal	10 (20,8%)
		Perturbação da condução aurículo-ventricular	5 (10,4%)
		Fibrilhação auricular com resposta ventricular lenta	3 (6,3%)
		Causa não arrítmica	3 (6,3%)
Palpitações	4 (7,5%)	Fibrilhação auricular	1 (25%)
Monitorização após ablação de Fibrilhação auricular	1 (1,9%)	Sem recorrência de fibrilhação auricular em 4 anos	1 (100%)

Estes achados conduziram à implantação de **18 pacemakers** e à **introdução de anticoagulação em 5 doentes** por detecção de fibrilhação auricular previamente desconhecida

Conclusões

- A tecnologia dos **registadores de eventos implantáveis** tem evoluído:
  Miniaturização dos dispositivos; mais simples de implantar
  Algoritmos de detecção melhorados
  Monitorização remota que permite o rápido reconhecimento das arritmias

- Utilização estabelecida na avaliação de síncope
- Útil em doentes com palpitações não documentadas após avaliação complementar
- Pode ter um papel nas detecção de arritmias em situações em que o reconhecimento precoce pode levar a uma alteração do tratamento