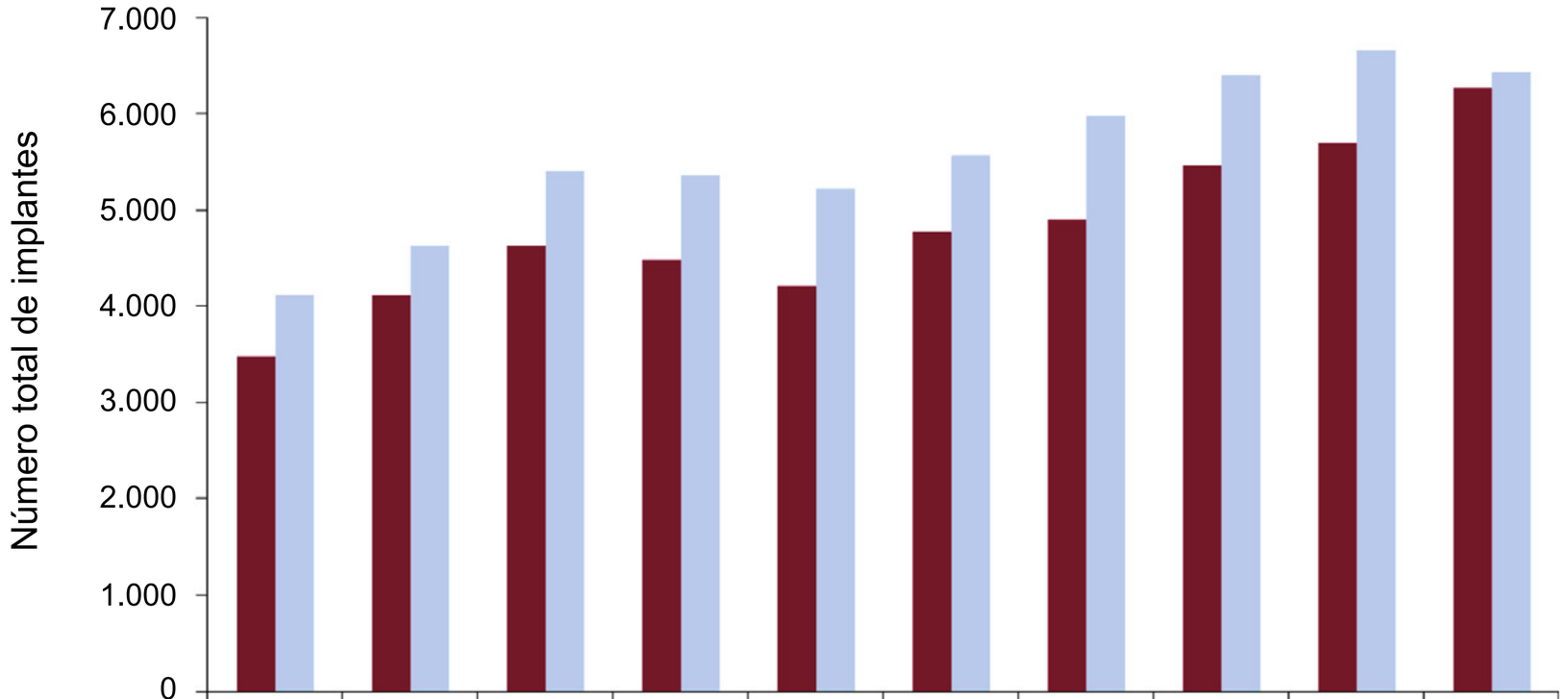
Diferencias de género en la utilización de la terapia de resincronización y desfibrilación:

¿cuestión de resultados o de oportunidades?

Concepción Alonso Martín
Hospital de Sant Pau. Barcelona

Registro Español de Desfibrilador Automático Implantable. XIV Informe Oficial de la Sección de Electrofisiología y Arritmias de la Sociedad Española de Cardiología (2017)



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Registro Español de DAI	3.486	4.108	4.627	4.481	4.216	4.772	4.911	5.465	5.703	6.271
Eucomed	4.114	4.633	5.405	5.365	5.215	5.573	5.980	6.406	6.662	6.429

Fernandez-Lozano et al. Rev Esp Cardiol 2018

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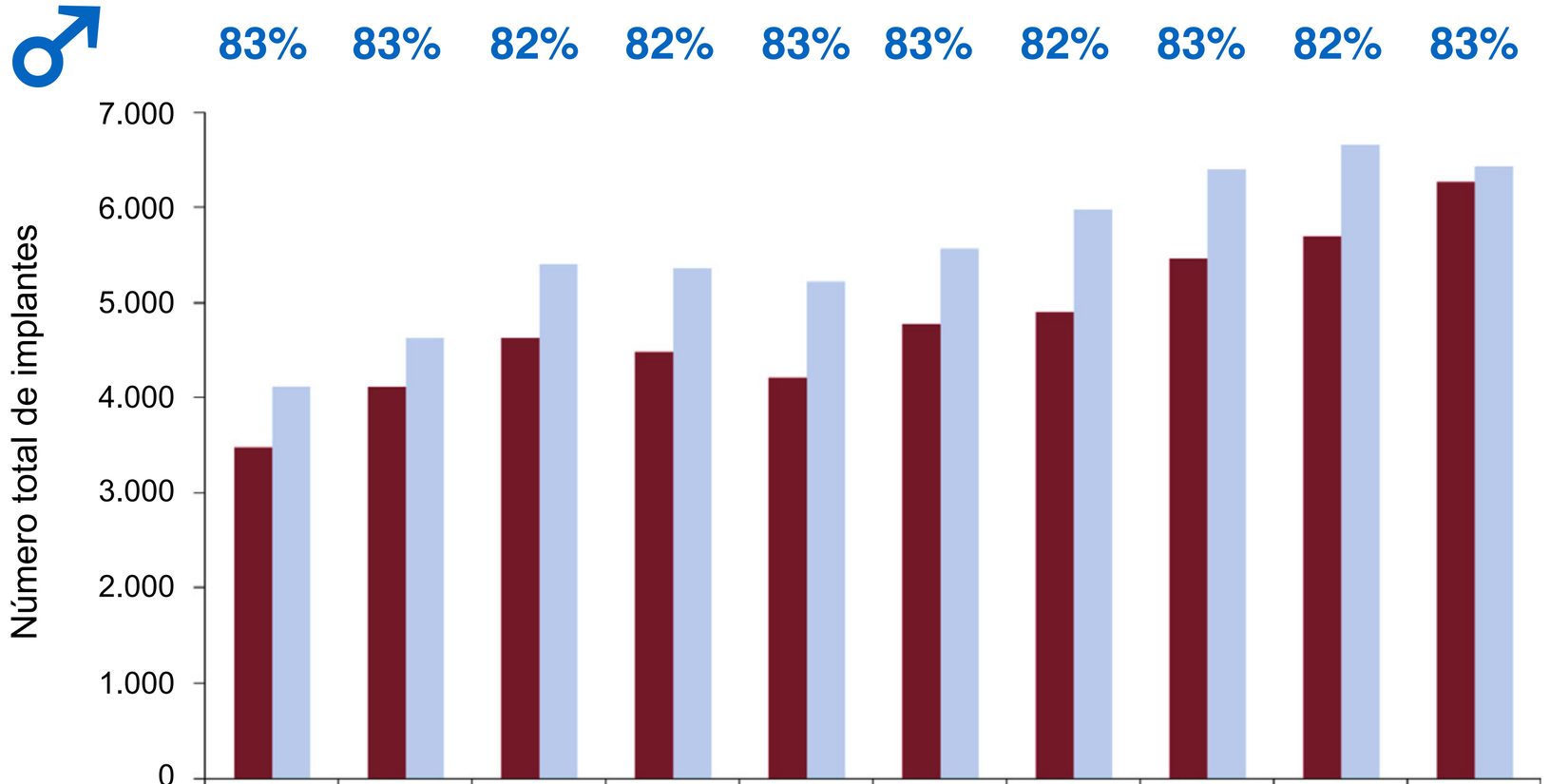

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Fernandez-Lozano et al. Rev Esp Cardiol 2018

chusema2013

Miscelánea

Titirolerías

32*...ES COSA DE HOMBRES*56

Europace (2014) **16**, 1175–1180
doi:10.1093/europace/euu015

CLINICAL RESEARCH
Sudden death and ICDs

Sex differences in implantable cardioverter-defibrillator implantation indications and outcomes: lessons from the Nationwide Israeli-ICD Registry

Guy Amit[1,2]*, Mahmoud Suleiman[3], Yuval Konstantino[1], David Luria[1,4], Mark Kazatsker[5], Israel Chetboun[6], Moti Haim[6], Natalie Gavrielov-Yusim[7], Ilan Goldenberg[7], and Michael Glikson[1,4] On behalf of the Israeli Working Group on Pacing and Electrophysiology

3544 implants
ICD and CRT-D

17% Women

Europace (2015) **17**, 69–77
doi:10.1093/europace/euu233

CLINICAL RESEARCH
Sudden death and ICDs

Current use of implantable electrical devices in Sweden: data from the Swedish pacemaker and implantable cardioverter-defibrillator registry

Fredrik Gadler[1,2], Cinzia Valzania[3]*, and Cecilia Linde[1,2]

[1]Department of Cardiology, Karolinska University Hospital, Stockholm, Sweden; [2]Department of Medicine, Karolinska Institutet, Stockholm, Sweden; and [3]Cardiovascular Department, S. Orsola Malpighi Hospital, University of Bologna, Bologna, Italy

Received 9 March 2014; accepted after revision 11 August 2014; online publish-ahead-of-print 21 October 2014

1900 implants
ICD and CRT-D

20% Women

Journal of Geriatric Cardiology (2018) 15: 310–314

Research Article · Open Access ·

The gender difference of utilization of cardiac implantable electronic device in China: data from Arrhythmia Interventional Therapy Data Registry

Ruo-Han CHEN[1], Ke-Ping CHEN[1], Wei HUA[1], Jing XU[2], Lin CHEN[3], Yang-Gang SU[4], Xi SU[5], Jian-Gang ZOU[6], Ji YAN[7], Jing-Feng WANG[8], Bao-Peng TANG[9], Mei-Xiang XIANG[10], Shu ZHANG[1]

1367 implants
ICD and CRT-D

30% Women

Europace (2014) **16**, 1175–1180
doi:10.1093/europace/euu015

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Sex

Gender

REAL ACADEMIA ESPAÑOLA

sexo

Del lat. *sexus*.

1. m. Condición orgánica, masculina o femenina, de los animales y las plantas.
2. m. Conjunto de seres pertenecientes a un mismo sexo. Sexo masculino, femenino.
3. m. Órganos sexuales.
4. m. Actividad sexual. Está obsesionado con el sexo.

género

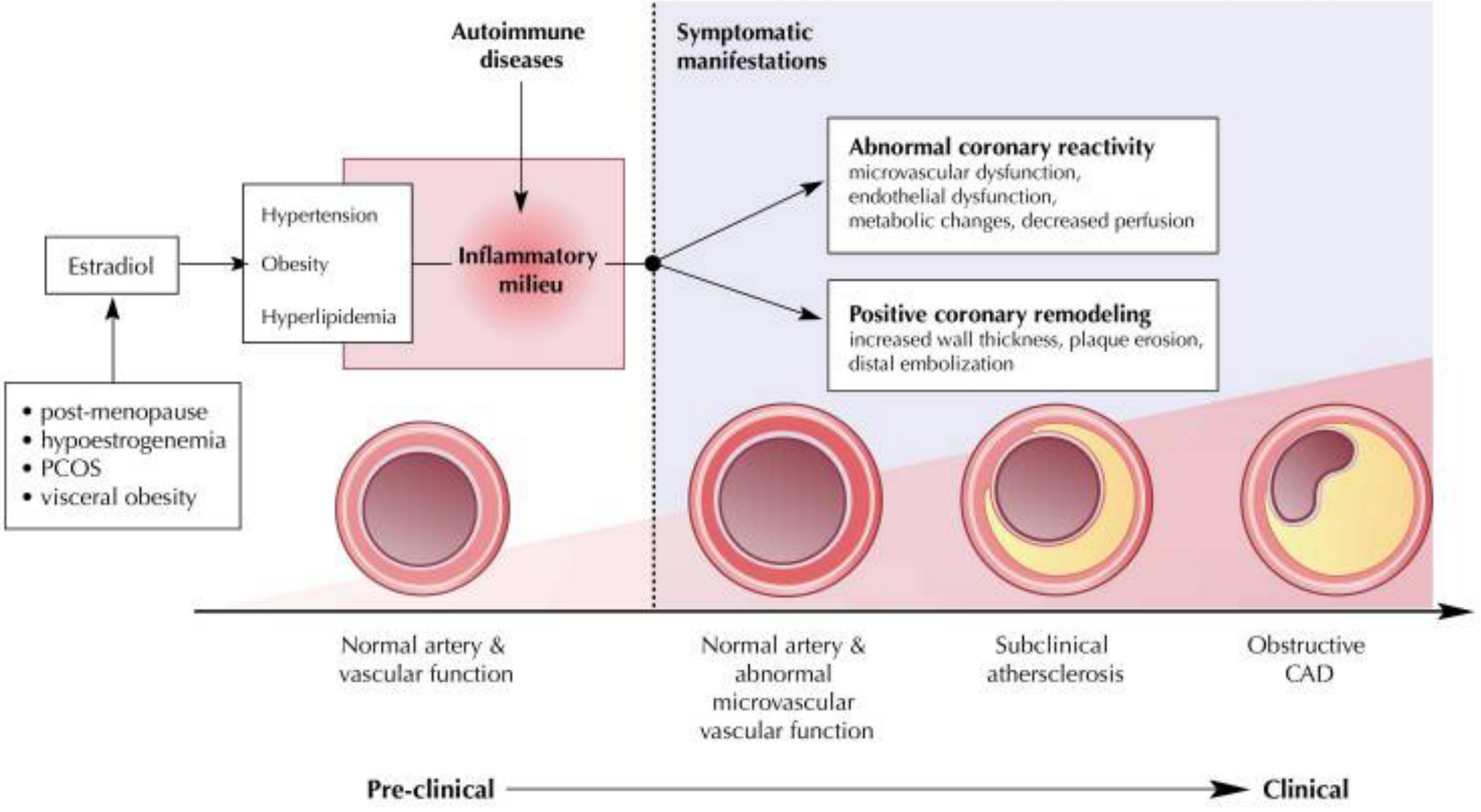
Del lat. *genus, -ĕris.*

1. m. Conjunto de seres que tienen uno o varios caracteres comunes.
2. m. Clase o tipo a que pertenecen personas o cosas. Ese género de bromas no me gusta.
3. m. Grupo al que pertenecen los seres humanos de cada sexo, entendido este desde un punto de vista sociocultural en lugar de exclusivamente biológico.

Efecto de las hormonas sexuales

Lugar	Andrógenos	Estrógenos
Corazón		
Contractilidad	↑	↔
Masa ventrículo izquierdo	↑	↓
Fibrosis	↑	↓
Vasos	Vasoconstricción	Vasodilatación
Músculo esquelético	↑	↓
Riñón		
Glomeruloesclerosis	↑	↓
Renina	↑	↓

Crespo-Leiro al; Rev Esp Cardiol 2006;59:725



Progressive manifestations of ischemic heart disease

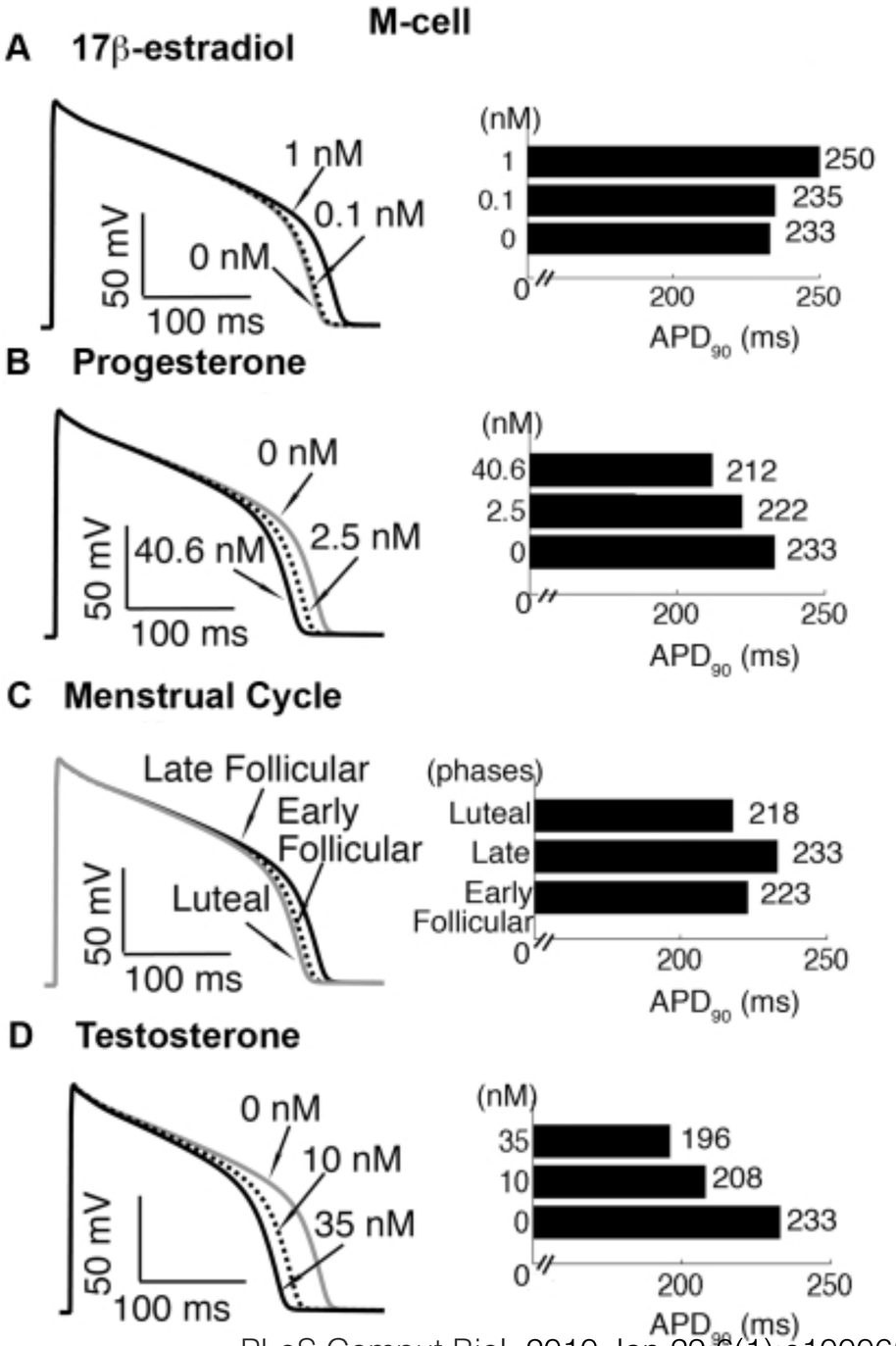
Acute effects of sex steroid hormones on susceptibility to cardiac arrhythmias: a simulation study.

Estradiol:

↑ Susceptibility to cardiac arrhythmias

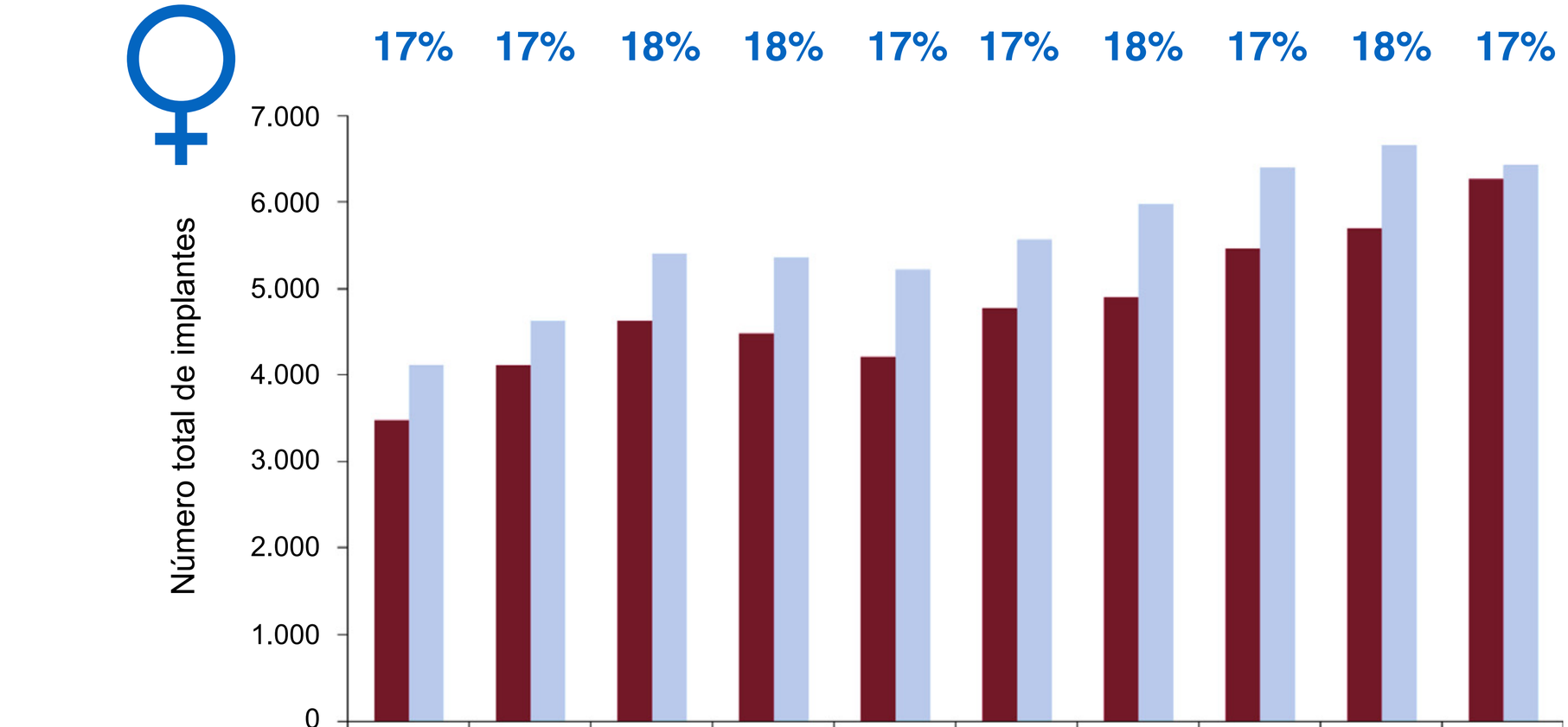
Testosterone
Progesterone

↓ Susceptibility to cardiac arrhythmias



PLoS Comput Biol. 2010 Jan 29;6(1):e1000658

Registro Español de Desfibrilador Automático Implantable. XIV Informe Oficial de la Sección de Electrofisiología y Arritmias de la Sociedad Española de Cardiología (2017)



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Fernandez-Lozano et al. Rev Esp Cardiol 2018

2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Secondary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for >1 year with good functional status.	I	A
Primary prevention An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA Class II–III), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than one year with good functional status, and they have:		
• IHD (unless they have had an MI in the prior 40 days – see below).	I	A
• DCM.	I	B

To reduce the risk of sudden death and all cause mortality

EHJ June 2016

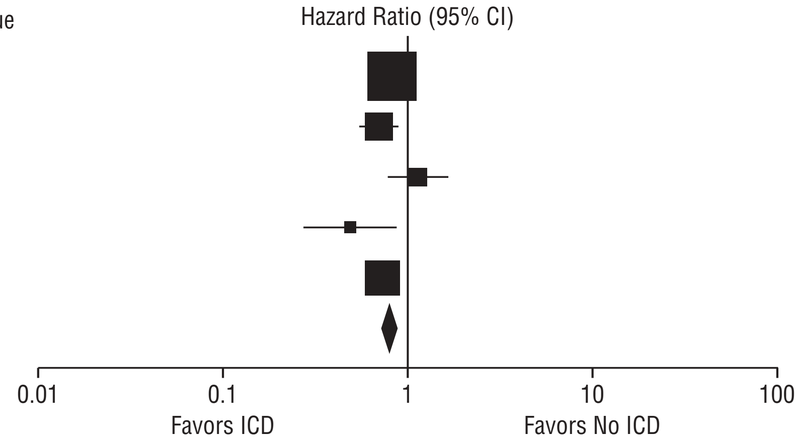
Los inicios

Effectiveness of Implantable Cardioverter-Defibrillators for the Primary Prevention of Sudden Cardiac Death in Women With Advanced Heart Failure

A Meta-analysis of Randomized Controlled Trials

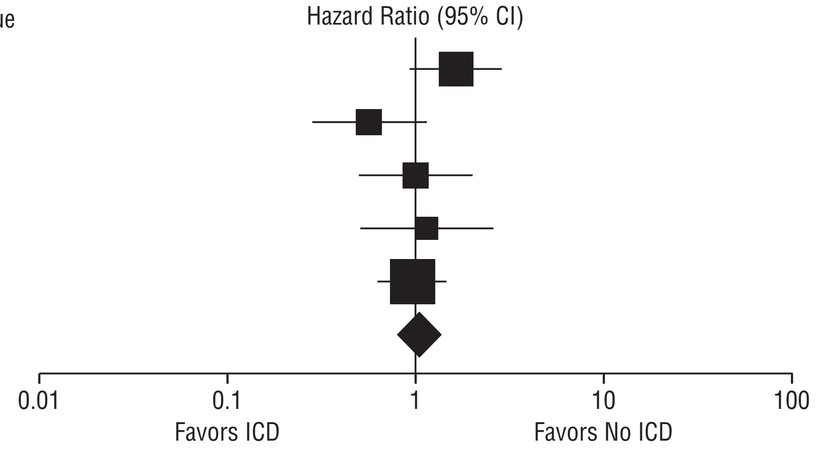
Mortality Men

Study Name	Hazard Ratio	(95% CI)	No. of Men	*P* Value
MUSTT	0.83	(0.71-0.97)	636	.02
MADIT II	0.66	(0.48-0.91)	1040	.008
DINAMIT	1.14	(0.77-1.69)	514	.51
DEFINITE	0.49	(0.27-0.89)	326	.02
SCD-HeFT	0.71	(0.57-0.88)	1294	.004
Combined	**0.78**	**(0.70-0.87)**	**3810**	**<.001**



Mortality Women

Study Name	Hazard Ratio	(95% CI)	No. of Women	*P* Value
MUSTT	1.64	(0.92-2.92)	68	.09
MADIT II	0.57	(0.28-1.18)	192	.12
DINAMIT	1.00	(0.49-2.04)	160	>.99
DEFINITE	1.14	(0.50-2.64)	132	.76
SCD-HeFT	0.90	(0.56-1.43)	382	.66
Combined	**1.01**	**(0.76-1.33)**	**934**	**.95**



Ghanbari et al. Arch Int Med 2009;169:1500

Effectiveness of Implantable Cardioverter-Defibrillators for the Primary Prevention of Sudden Cardiac Death in Women With Advanced Heart Failure

A Meta-analysis of Randomized Controlled Trials

Mortality Men

Study Name	Hazard Ratio	(95% CI)	No. of Men	*P* Value
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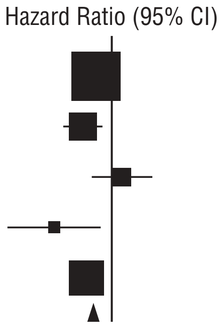

ICD therapy for PP of SCD in women *does not* reduce all-cause mortality

Mortality Women

MADIT II	0.57	(0.28-1.18)	192	.12
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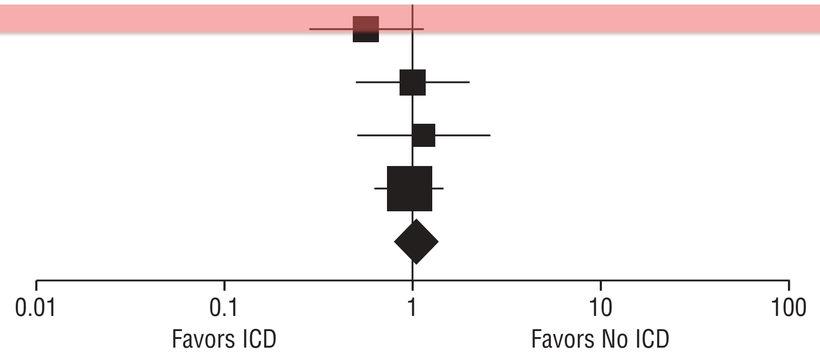
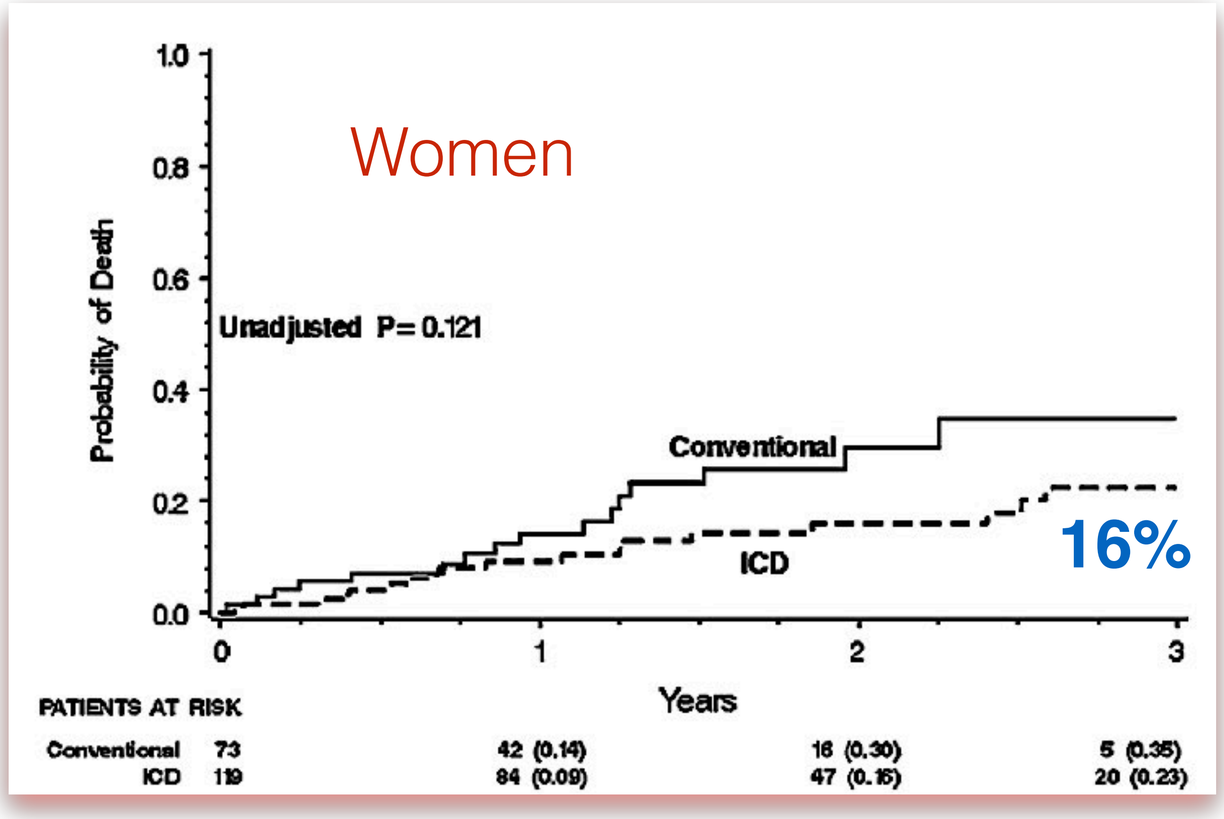


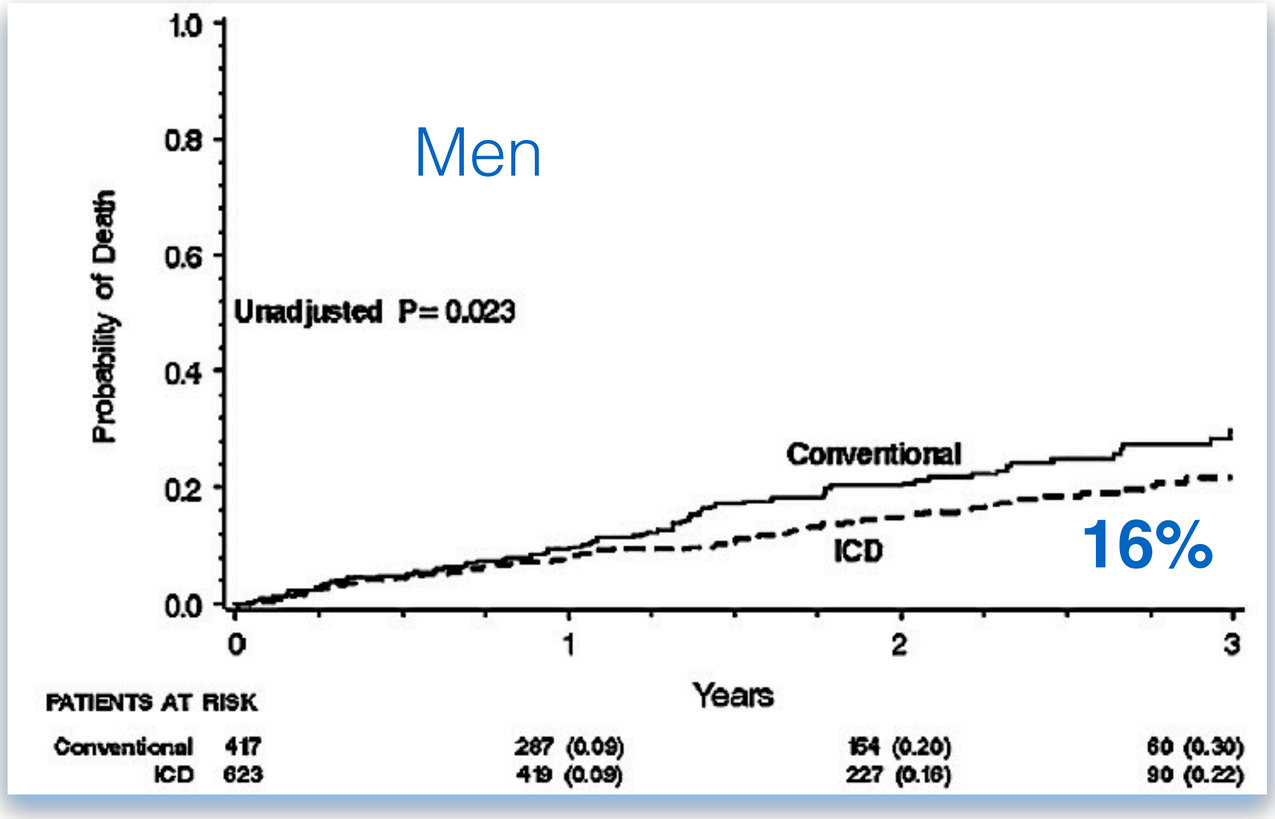
Ghanbari et al. Arch Int Med 2009;169:1500

Women are underrepresented in RT

ICD Trials	Subjects	% females	HR for mortality
AVID (sec prevent)	1885	**22**	M 14.4% mortality W 15,5% mortality (24.5% en pat without ICD)
MADIT I	196	**8**	54% RR global not by sex
MADIT II	1232	**16**	M 0.66 W 0.57 **ns**
SCD-HeFT	2521	**23**	M 0.73 W 0.96 **ns**
MUSTT	704	**10**	M 0.79 W 0.68 **ns**
DEFINITE	458	**29**	M 0.49 W 1.14 **ns**

MADIT II subgroup analysis





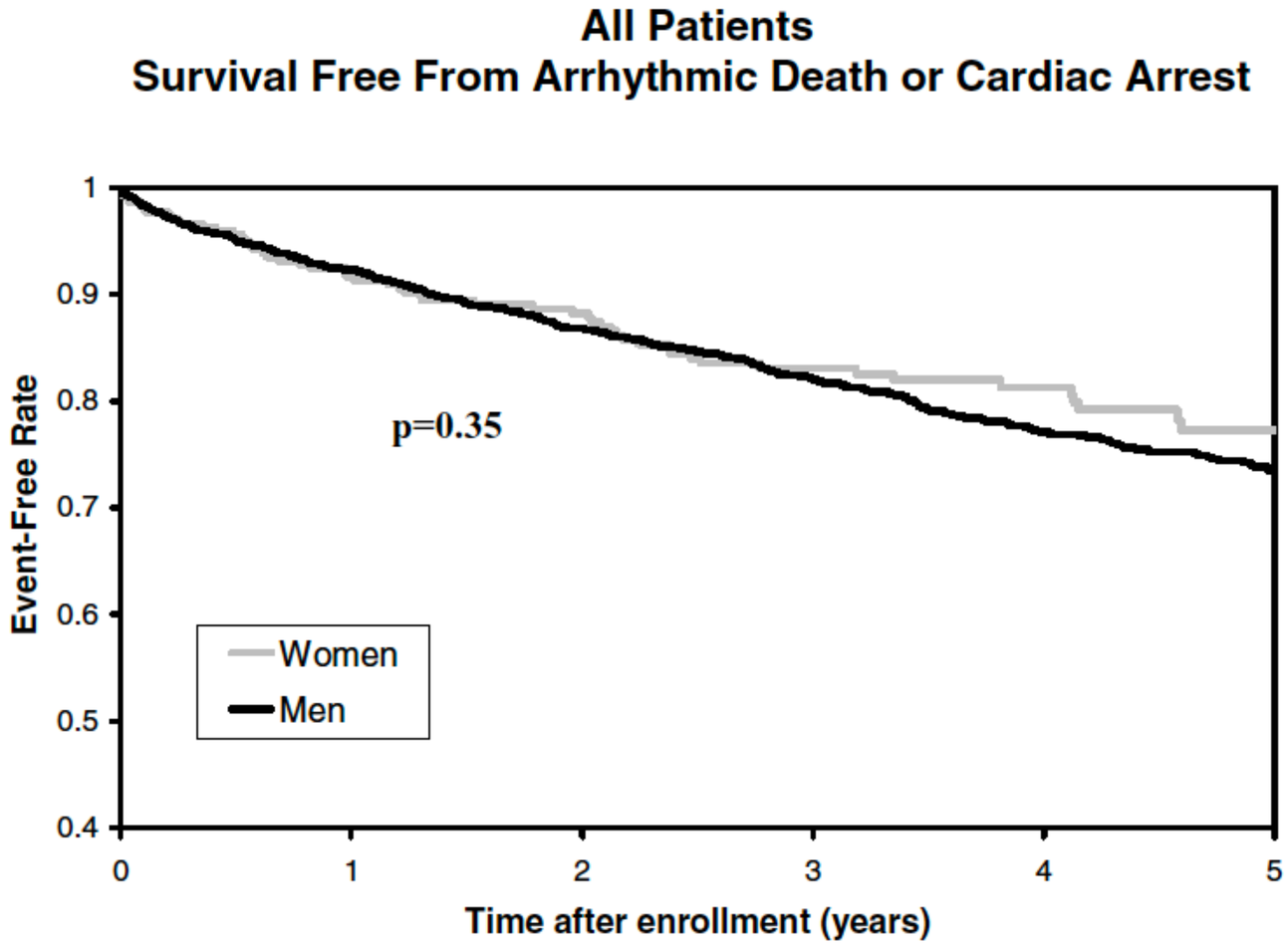
No differences in mortality rates

Influence of Gender on Arrhythmia Characteristics and Outcome in the Multicenter UnSustained Tachycardia Trial

ICDs implanted

Men
58%

Women
53%



Inclusion criteria: CAD, FE<40% and NSVT

Russo A et al. JCE 2004;15:993

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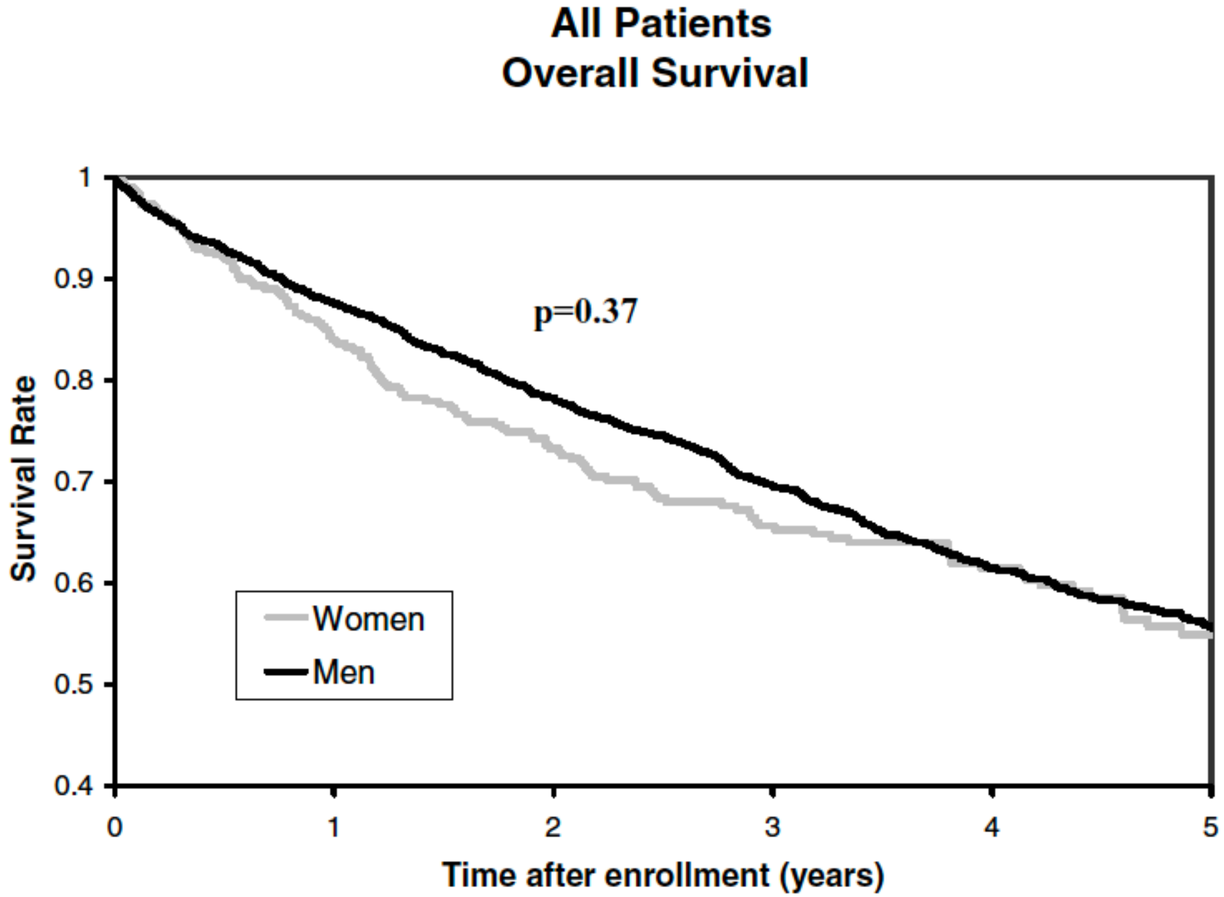

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Russo A et al. JCE 2004;15:993

Primary Prevention with Defibrillator Therapy in Women:
Results from the Sudden Cardiac Death in Heart Failure Trial

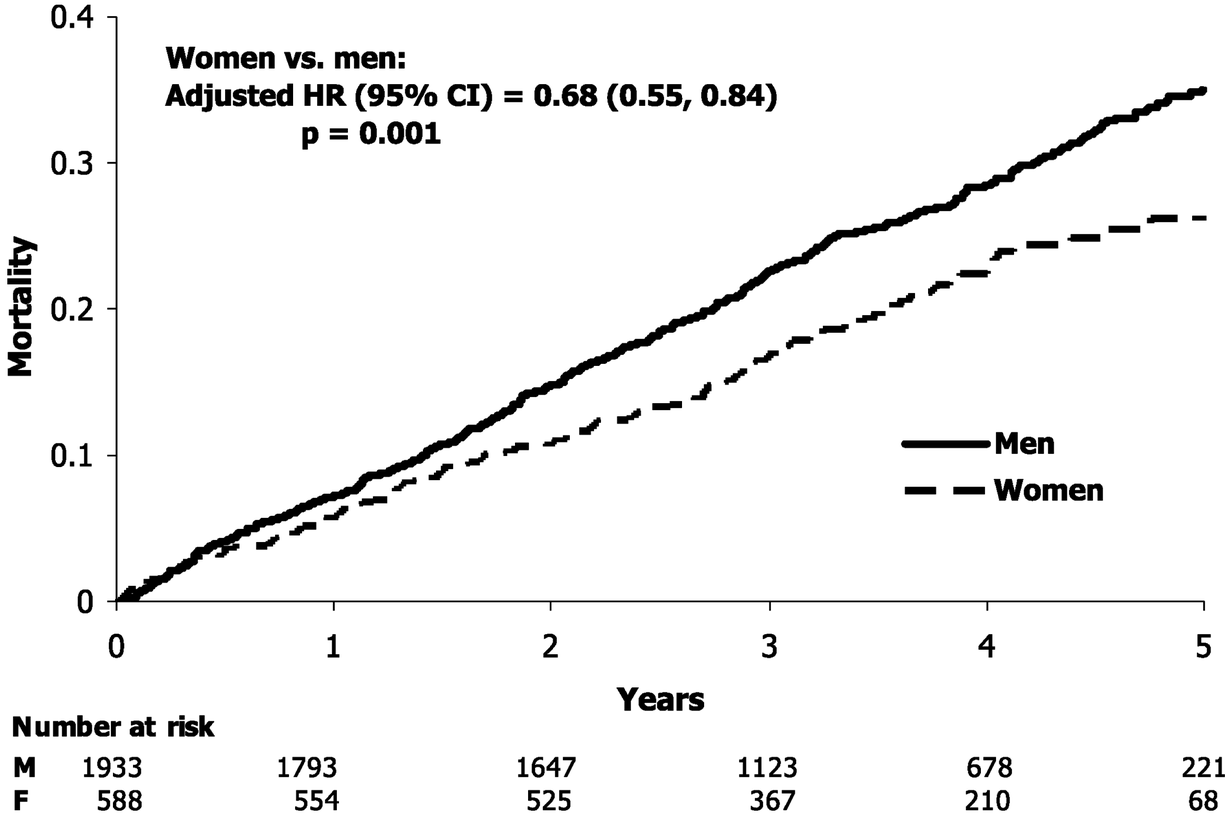


Figure 1. *Mortality by gender. Overall mortality was lower in women than in men (P = 0.001).*

23% Women

TABLE 3

Mortality Randomized Treatment Comparisons by Gender

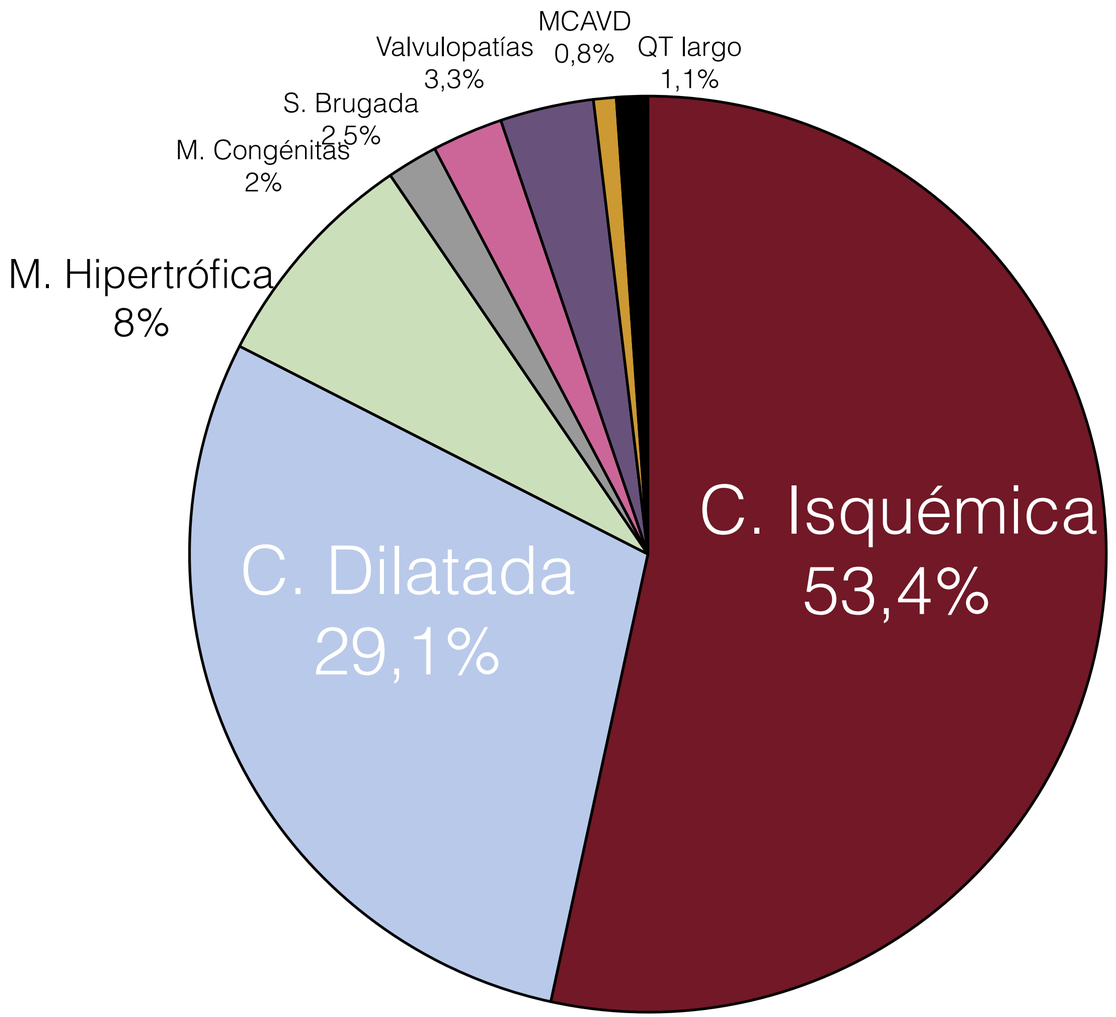
	Overall Mortality			Adjusted HR (95% CI)	
	ICD	Amioda-rone	Placebo	ICD vs. placebo	Amio vs. placebo
Women	18.9%	22.3%	21.4%	0.90 (0.56, 1.43)	1.11 (0.71, 1.73)
Men	22.8%	30.6%	31.0%	0.71 (0.57, 0.88)	1.02 (0.84, 1.25)

Russo A et al. JCE 2008;19:720-724

No benefit of ICD in women: Why?

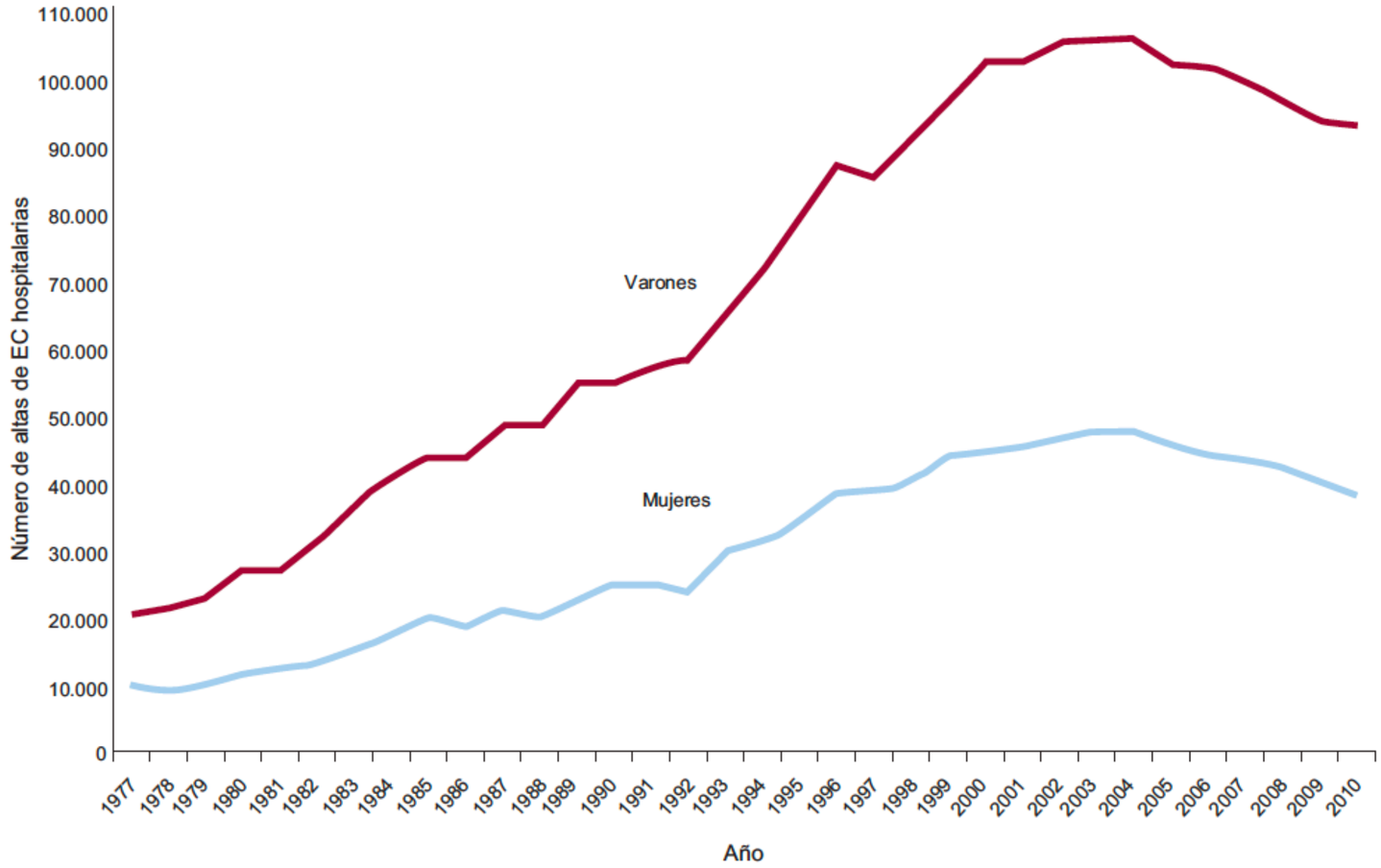
Ischemic vs non-ischemic

Registro Español de Desfibrilador Automático Implantable. XIV Informe Oficial de la Sección de Electrofisiología y Arritmias de la Sociedad Española de Cardiología (2017)



Fernandez-Lozano et al. Rev Esp Cardiol 2018

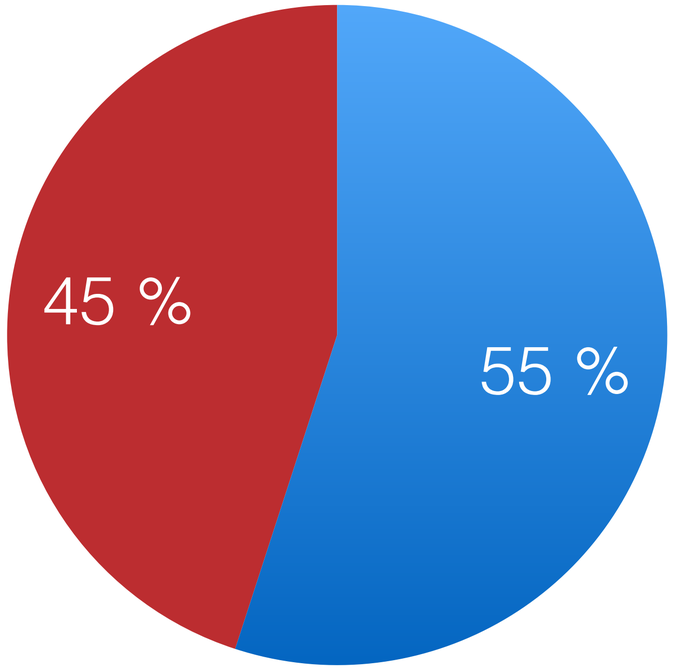
Enfermedad coronaria más prevalente en el varón



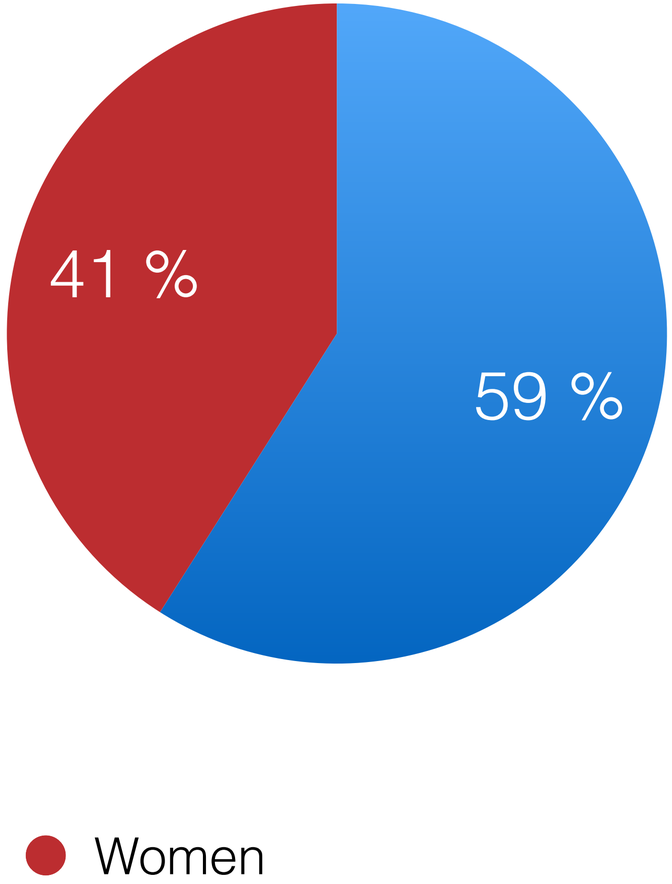
Número de altas de enfermedad coronaria entre 1977 y 2010

Dégano et al; Rev Esp Cardiol 2013;62:472

Ischemic heart disease

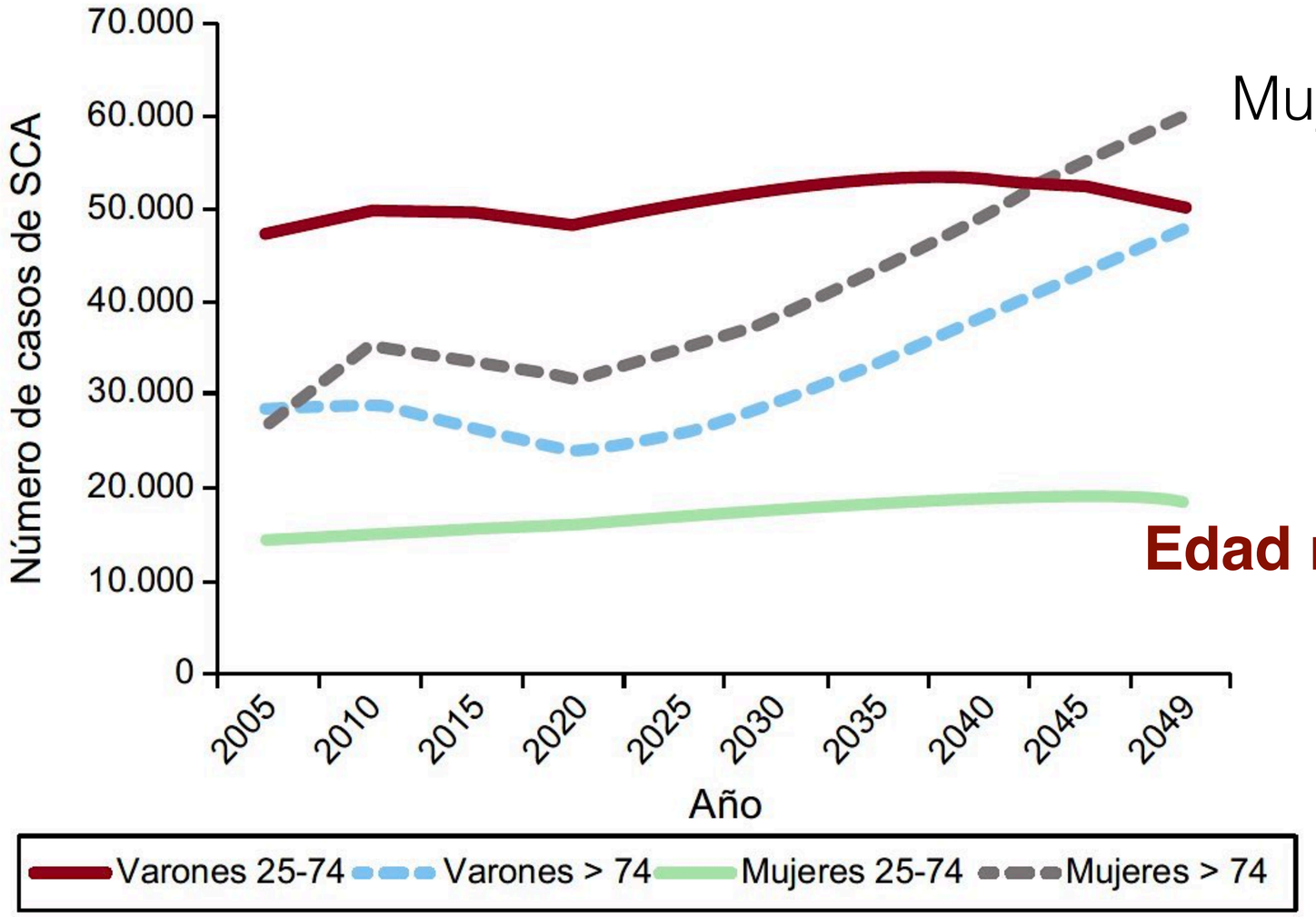


Myocardial infarction and fatal CAD



Cardiology in Review 2006;14: 292–298

Importancia de la edad y comorbilidades



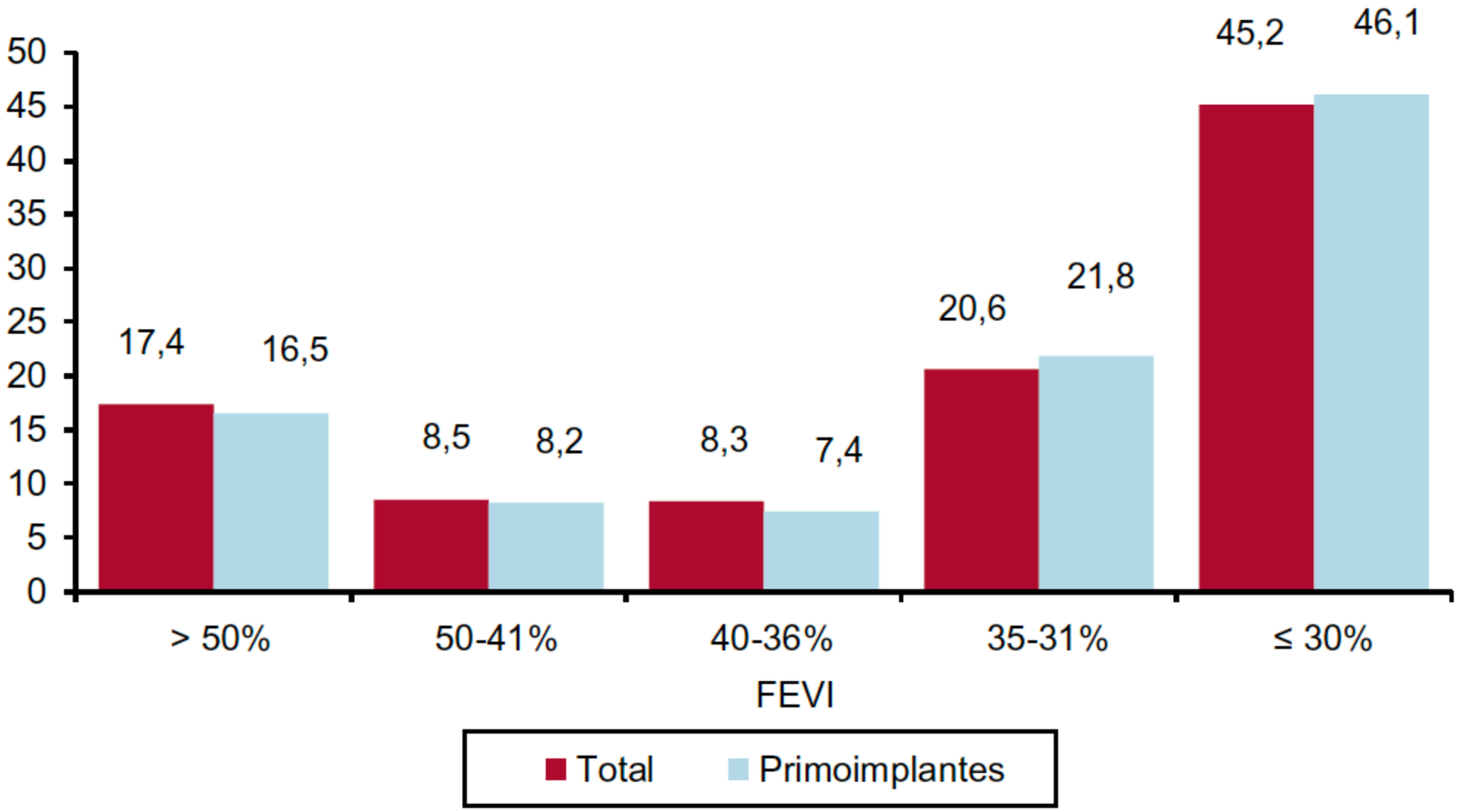
Mujeres >74

Edad registro español
61± 13

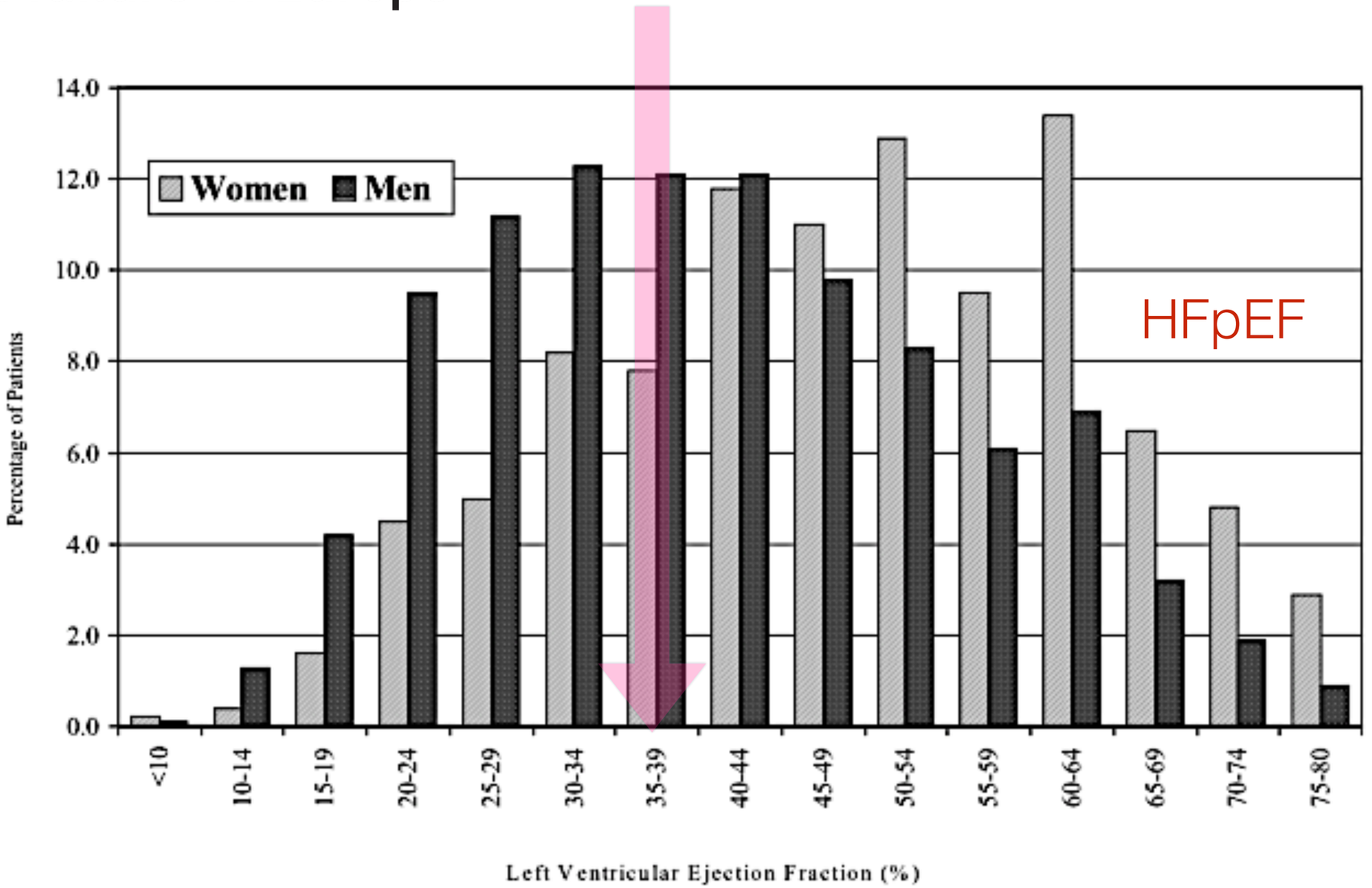
Dégano et al; Rev Esp Cardiol 2013;62:472

EF < 35%

Implantes según la FE



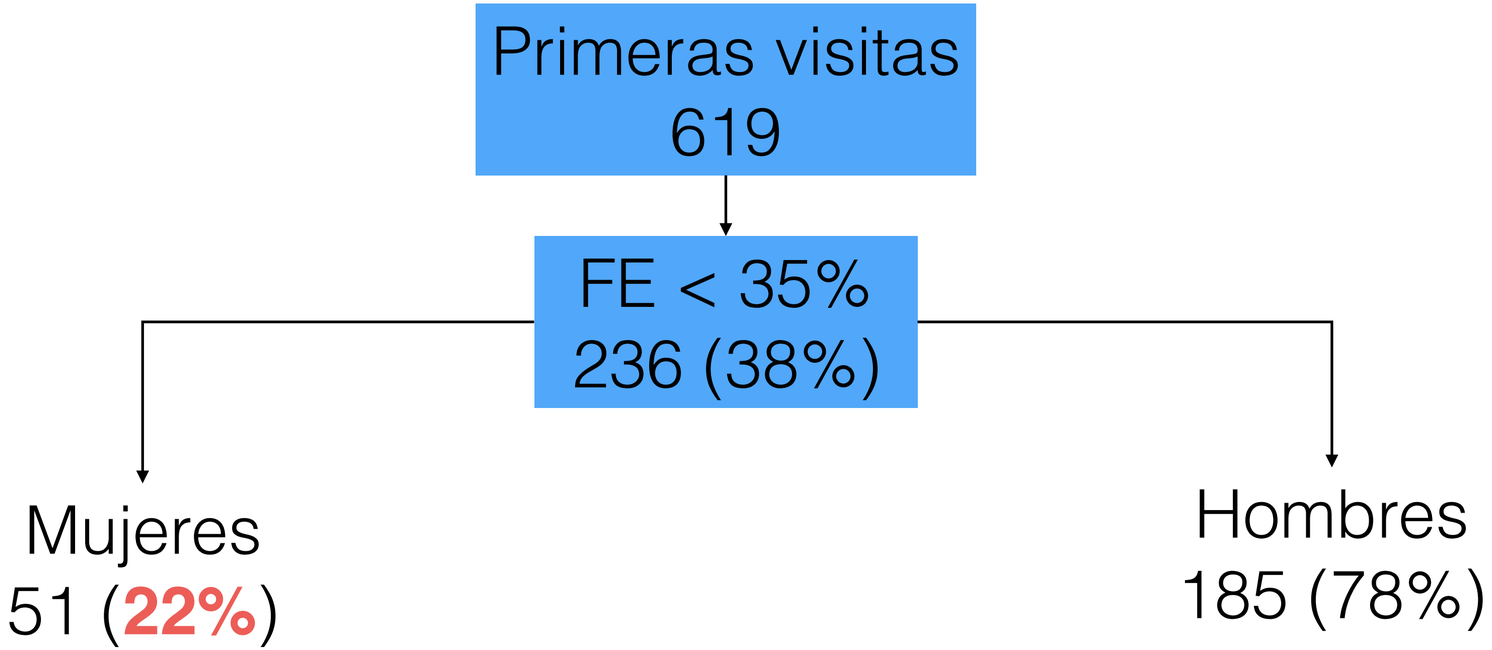
The EuroHeart Failure survey programme—a survey on the quality of care among patients with heart failure in Europe



European Heart Journal (2003) 24, 442–463

UIC H. Sant Pau

Visitas en UIC entre 2010-2015



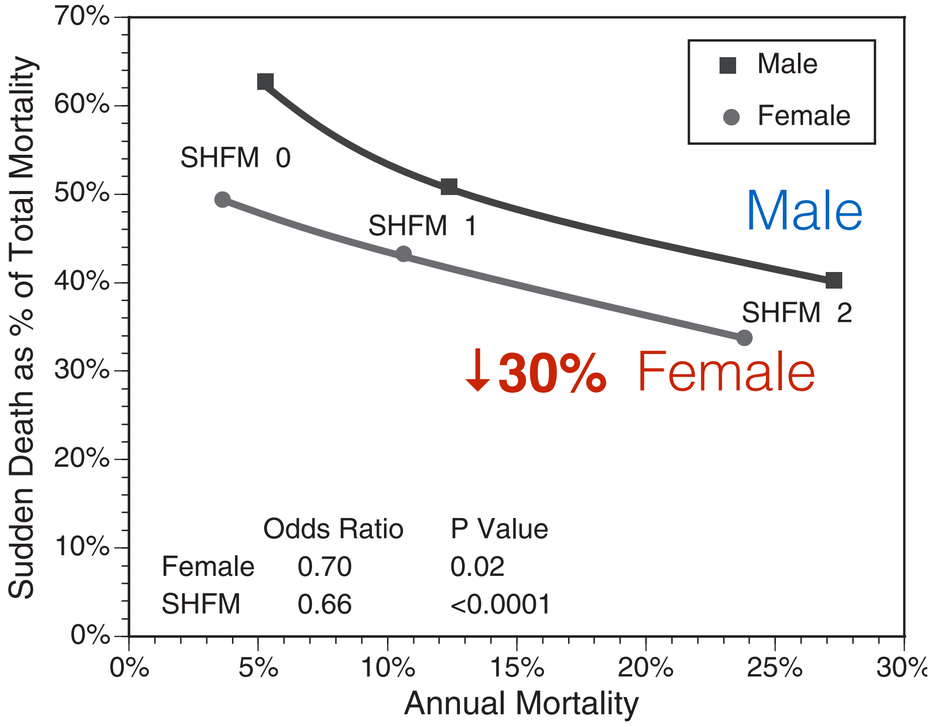
Cortesía Dra. E. Roig

De qué se mueren los pacientes?

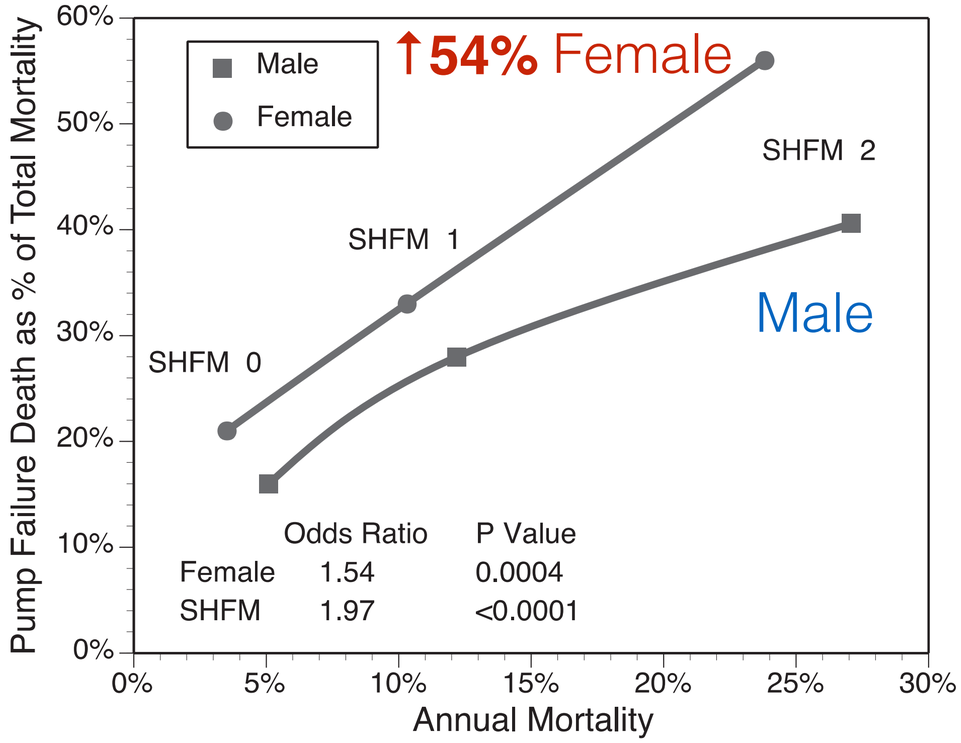
Important Differences in Mode of Death Between Men and Women With Heart Failure Who Would Qualify for a Primary Prevention Implantable Cardioverter-Defibrillator

N 8337;
20% Women

Sudden Death



Heart Failure Death

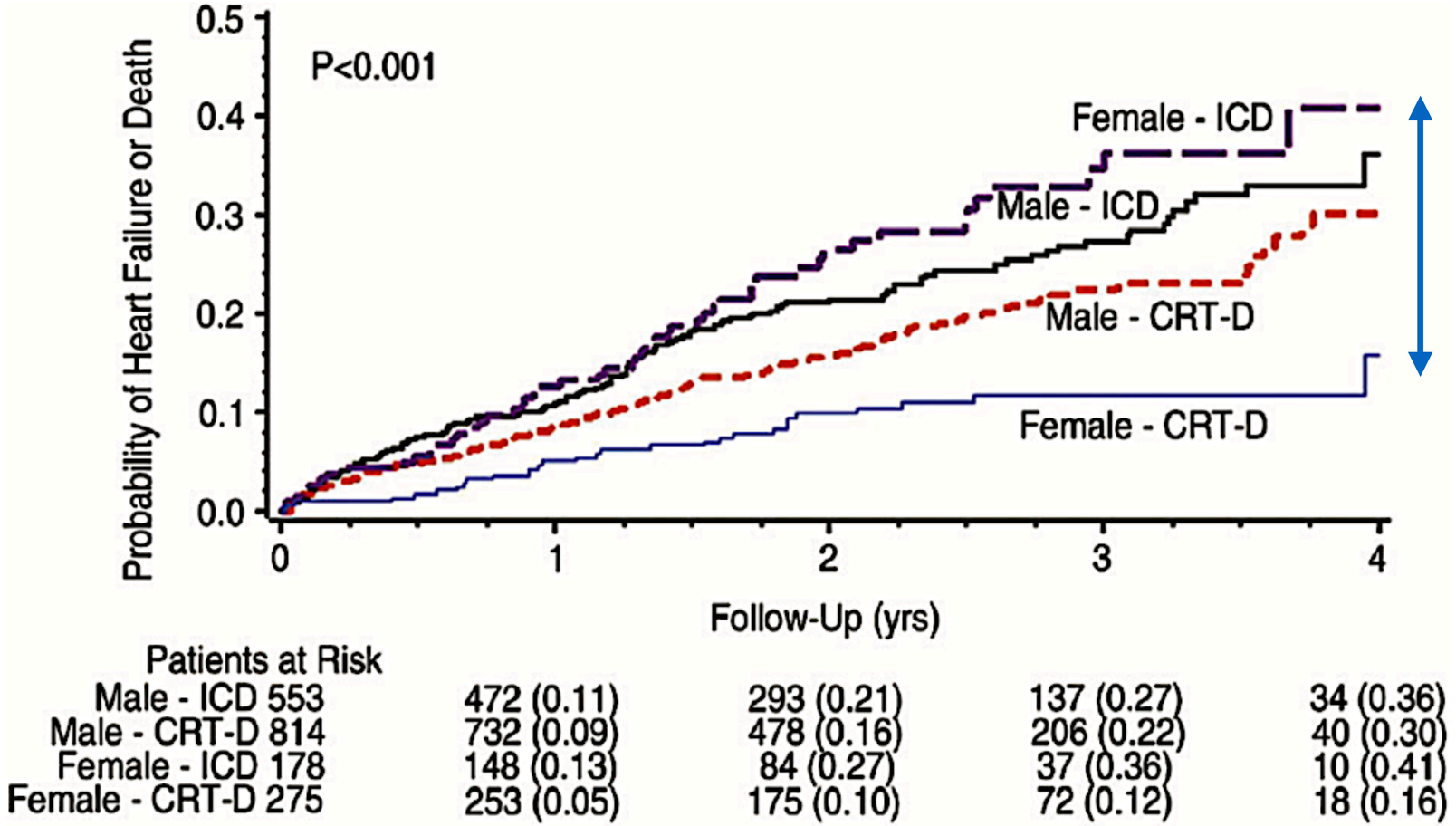


NYHA II-III; FE < 35%.
Ischemic cardiomyopathy: 43% Women, 59% Men

Rho et al. Circulation 2012;126:2402-2407

Cardiac Resynchronization Therapy Is More Effective in Women Than in Men

The MADIT-CRT (Multicenter Automatic Defibrillator Implantation Trial With Cardiac Resynchronization Therapy) Trial



Women RR 69%

Men RR 28%

Arshad et al.JACC 2011;57:813-20

Women are underrepresented in RT

CRT Trials	Subjects	% females	HR for events
COMPANION	1520	**33**	M 0.63 W 0.58 ns
CARE-HF	813	**27**	M 0.62 W 0.64
MADIT-CRT	1820	**25**	M 0.76 W **0.37**
RAFT	1798	**17**	M 0,82 **W 0,52**
MIRACLE	453	**32**	W longer time to HF or death

Después de los estudios randomizados…la vida real…

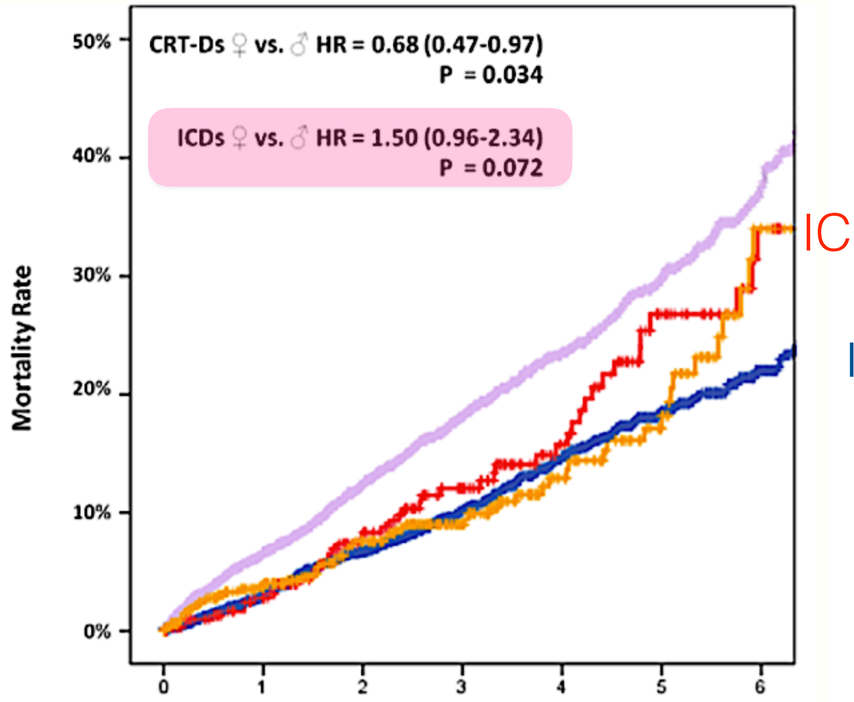
Primary Prevention Implantable Cardioverter Defibrillator (ICD) Therapy in Women—Data From a Multicenter French Registry

Rui Providência, MD, PhD; Eloi Marijon, MD, PhD; Pier D. Lambiase, PhD; Abdeslam Bouzeman, MD; Pascal Defaye, MD; Didier Klug, MD, PhD; Denis Amet, MD; Marie-Cécile Perier, MPH; Daniel Gras, MD; Vincent Algalarrondo, MD, PhD; Jean-Claude Deharo, MD, PhD; Christophe Leclercq, MD, PhD; Laurent Fauchier, MD, PhD; Dominique Babuty, MD, PhD; Pierre Bordachar, MD, PhD; Nicolas Sadoul, MD, PhD; Olivier Piot, MD; Serge Boveda, MD on behalf of the DAI-PP Investigators*

N: 5539

Women 837 **(15,1%)**

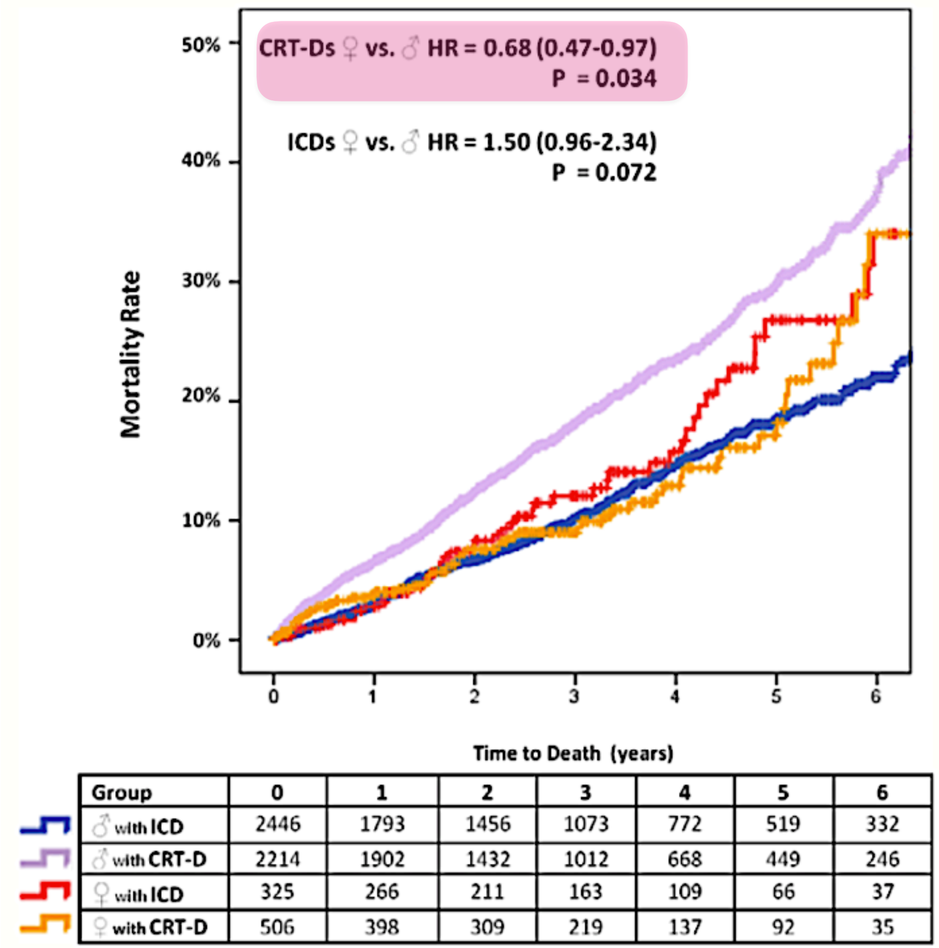
Similar mortality



ICD Women

ICD Men

Group	0	1	2	3	4	5	6
♂ with ICD	2446	1793	1456	1073	772	519	332
♂ with CRT-D	2214	1902	1432	1012	668	449	246
♀ with ICD	325	266	211	163	109	66	37
♀ with CRT-D	506	398	309	219	137	92	35



CRT-D Men

CRT-D Women

Group	0	1	2	3	4	5	6
♂ with ICD	2446	1793	1456	1073	772	519	332
♂ with CRT-D	2214	1902	1432	1012	668	449	246
♀ with ICD	325	266	211	163	109	66	37
♀ with CRT-D	506	398	309	219	137	92	35

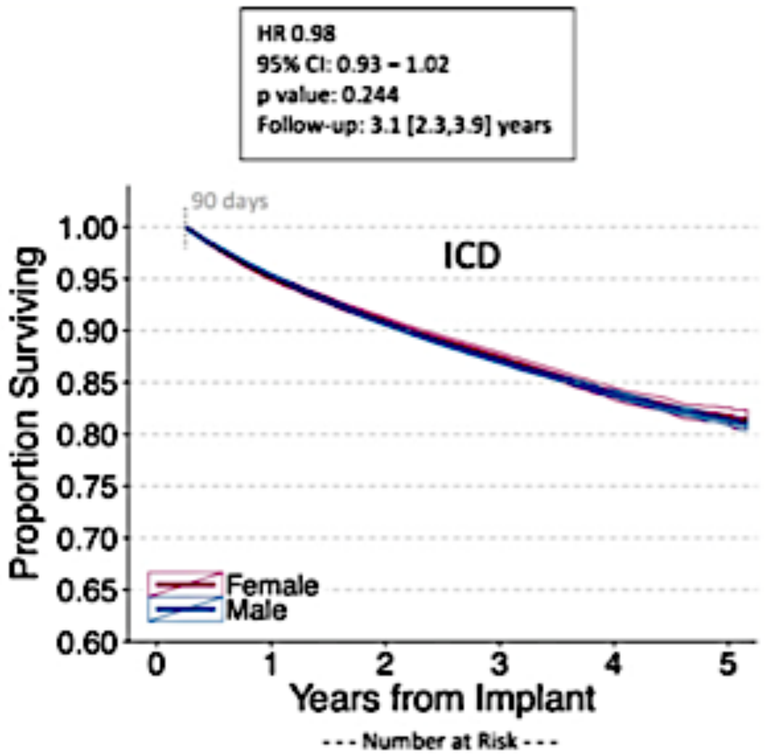
Providencia et al; JAHA 2016

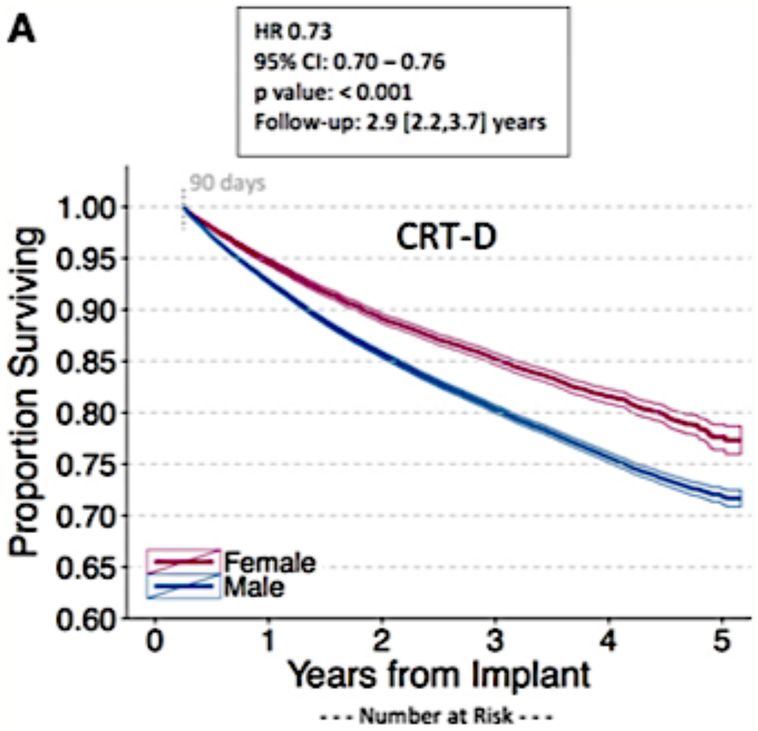
Survival in Women Versus Men Following Implantation of Pacemakers, Defibrillators, and Cardiac Resynchronization Therapy Devices in a Large, Nationwide Cohort

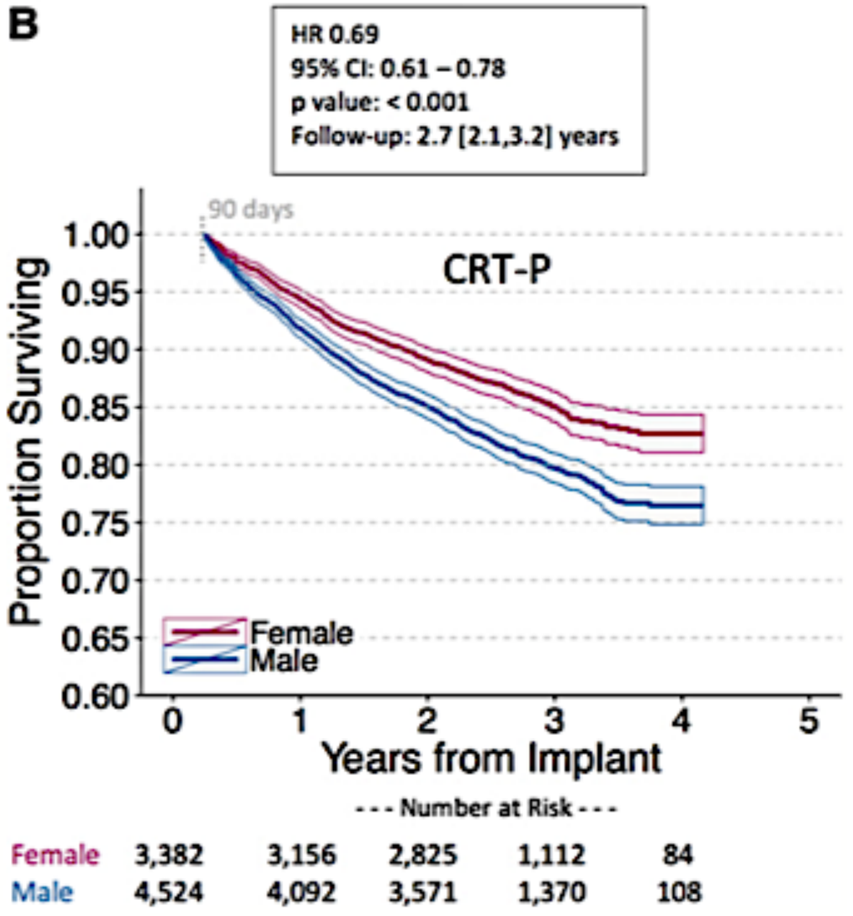
Niraj Varma, MA, DM, FRCP; Suneet Mittal, MD, FHRS; Julie B. Prillinger, PhD; Jeff Snell, AB; Nirav Dalal, MS; Jonathan P. Piccini, MD, MHSc, FHRS

N: 269.471

Postimplant survival by Sex

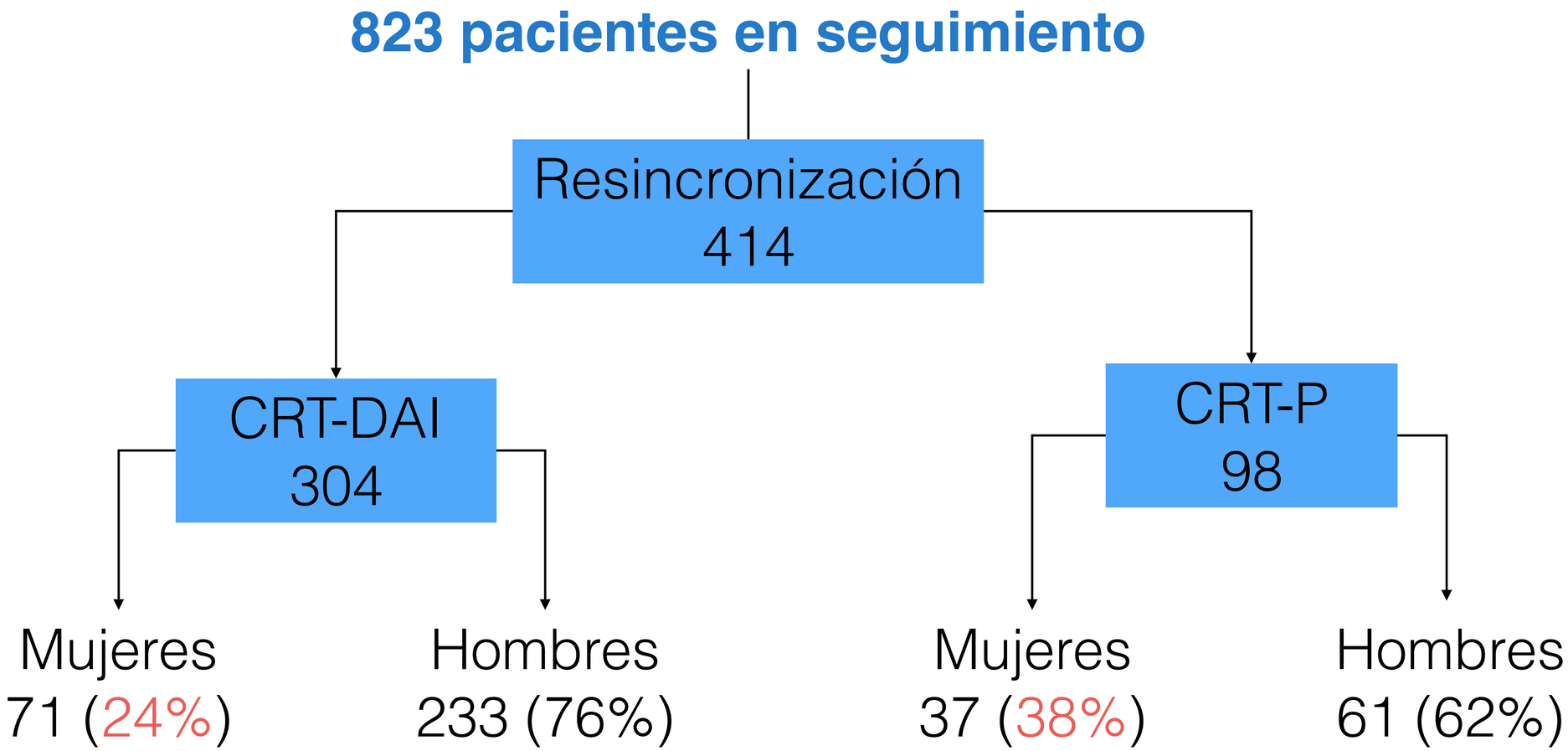






JAHA 2017 (36);6:e005031

Experiencia H. Sant Pau



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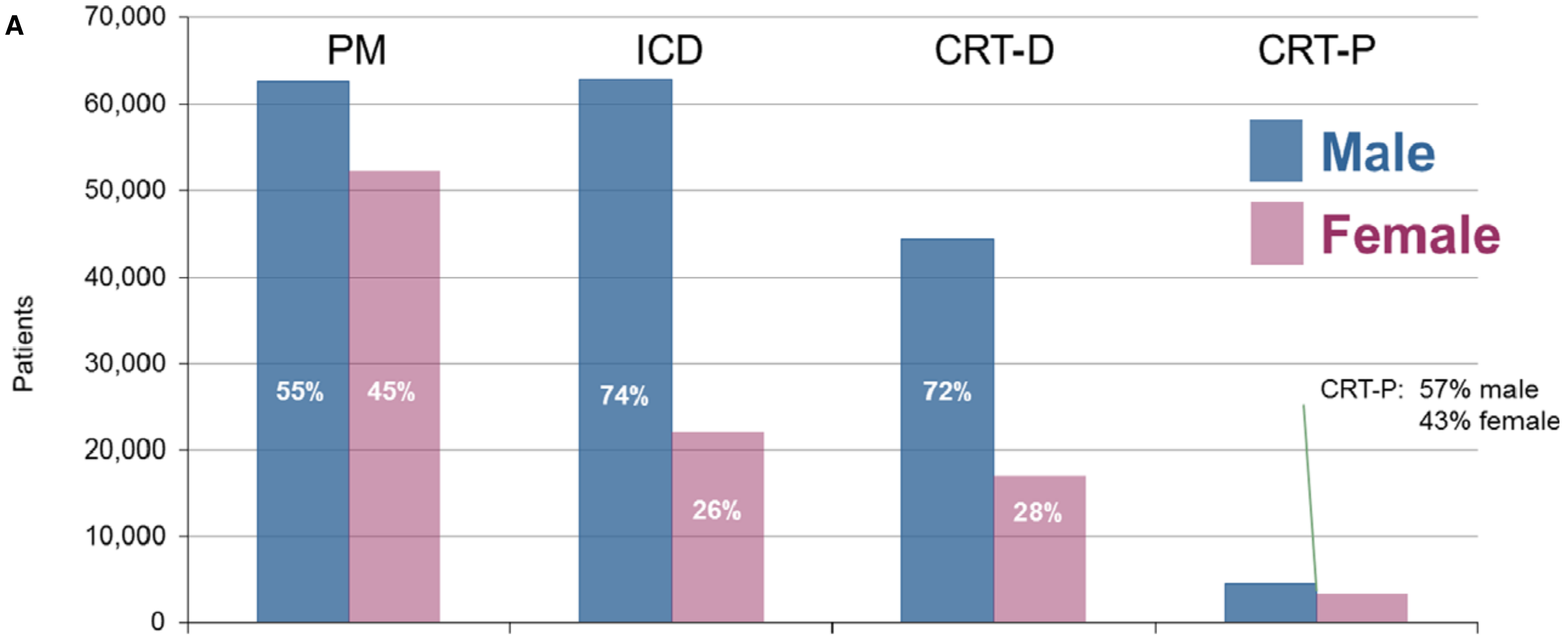
Distribution of patients with cardiac implantable devices



	Male	Female	Male	Female	Male	Female	Male	Female
Follow-up, yrs	2.7	2.7	3.1	3.1	2.9	3.0	2.5	2.6
Age	75.3	76.7	64.9	63.0	70.2	69.6	75.9	76.5

JAHA 2017 (36);6:e005031

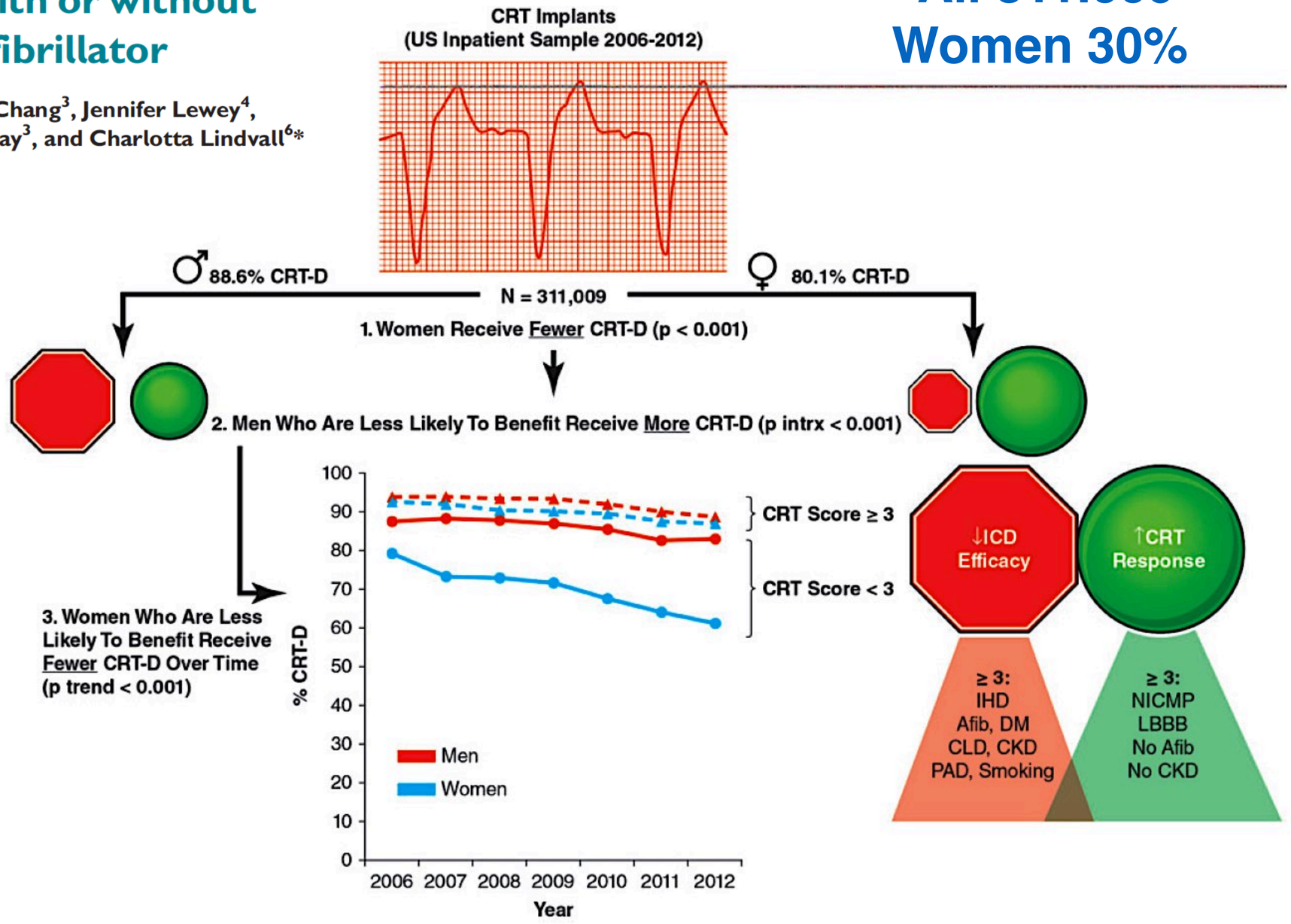
The power of women

Y el futuro…

Increasing sex differences in the use of cardiac resynchronization therapy with or without implantable cardioverter-defibrillator

Neal A. Chatterjee[1], Rasmus Borgquist[2], Yuchiao Chang[3], Jennifer Lewey[4], Vicki A. Jackson[5], Jagmeet P. Singh[1], Joshua P. Metlay[3], and Charlotta Lindvall[6]*

All 311.009
Women 30%



European Heart Journal (2017) 38, 1485–1494

Sex-specific precision medicine: targeting CRT-D and other cardiovascular interventions to those most likely to benefit

Viviany R. Taqueti[1] and C. Noel Bairey Merz[2]*

Conclusiones

¿Cuestión de resultados?

Los resultados avalan el uso del DAI y la CRT en mujeres

¿Cuestión de oportunidades?

Para los médicos