

**Recanalització de les oclusions coronàries cròniques:  
quan val la pena?  
Benefici Clinic**

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**Raula rodona: Recanalització de les oclusions coronàries cròniques: quan val la pena?**  
Societat Catalana de Cardiologia, dia 2 d'abril 2020,

# AGUAFIESTAS

Alguien que estropea o interrumpe una fiesta, diversión o un momento de alegría.



Beneficio clínico:

Escaso, en el mejor de los casos

# Objetivo en el tratamiento de CTO

```
graph TD; A[Objetivo en el tratamiento de CTO] --> B[Mejorar Síntomas]; A --> C[Mejorar Pronóstico]; B --> D[Siempre que exista isquemia en el territorio dependiente de la CTO]; C --> E[Siempre que exista isquemia/viabilidad en el territorio dep. de la CTO];
```

**Mejorar  
Síntomas**

Siempre que exista  
isquemia en el  
territorio dependiente  
de la CTO

**Mejorar  
Pronóstico**

Siempre que exista  
isquemia/viabilidad  
en el territorio dep.  
de la CTO

## Que dicen las Guías Europeas

Percutaneous revascularization of CTOs should be considered in patients with angina resistant to medical therapy or with a large area of documented ischaemia in the territory of the occluded vessel.

629.659–663

**Ila**

**B**

# ¿El tratamiento con éxito de una CTO mejora el pronóstico?

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## CLINICAL RESEARCH

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# Successful Recanalization of Chronic Total Occlusions Is Associated With Improved Long-Term Survival

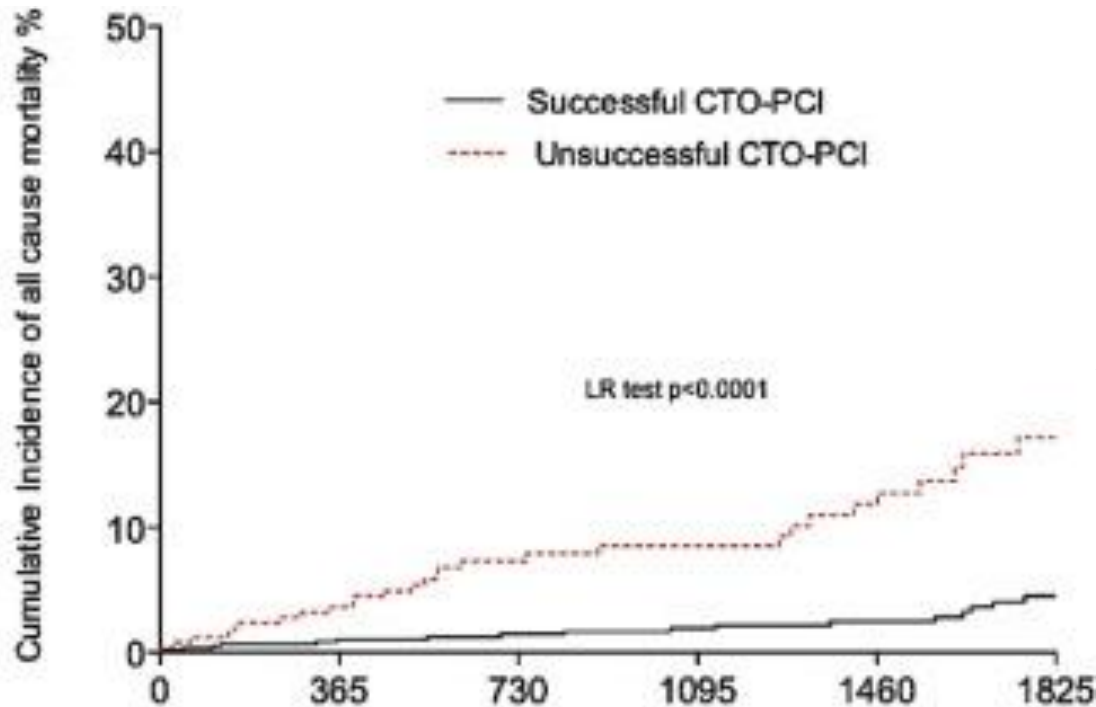
Daniel A. Jones, MD,\*†‡ Roshan Weerackody, MD,\* Krishnaraj Rathod, MD,\*  
Jonathan Behar, MD,\* Sean Gallagher, MD,\* Charles J. Knight, MD,\*‡ Akhil Kapur, MD,\*  
Ajay K. Jain, MD,\*‡ Martin T. Rothman, MD,\*‡ Craig A. Thompson, MD, MMSC,§  
Anthony Mathur, MD, PhD,\*†‡ Andrew Wragg, MD, PhD,\*†‡ Elliot J. Smith, MD\*‡

*London, United Kingdom; and New Haven, Connecticut*

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## ¿El tratamiento con éxito de una CTO mejora el pronóstico?

836 pacientes  
Barts and the London NHS Trust, London, United Kingdom



Mas Cirugía previa  
Mas PCI previa  
Peor FE  
Mas enfer. 3 vasos  
Mas Disección coronaria  
Mas perforación coronaria

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DOI: 10.1016/j.jcin.2011.03.021

 Interview

## CLINICAL RESEARCH

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# Long-Term Outcome of Percutaneous Coronary Intervention for Chronic Total Occlusions

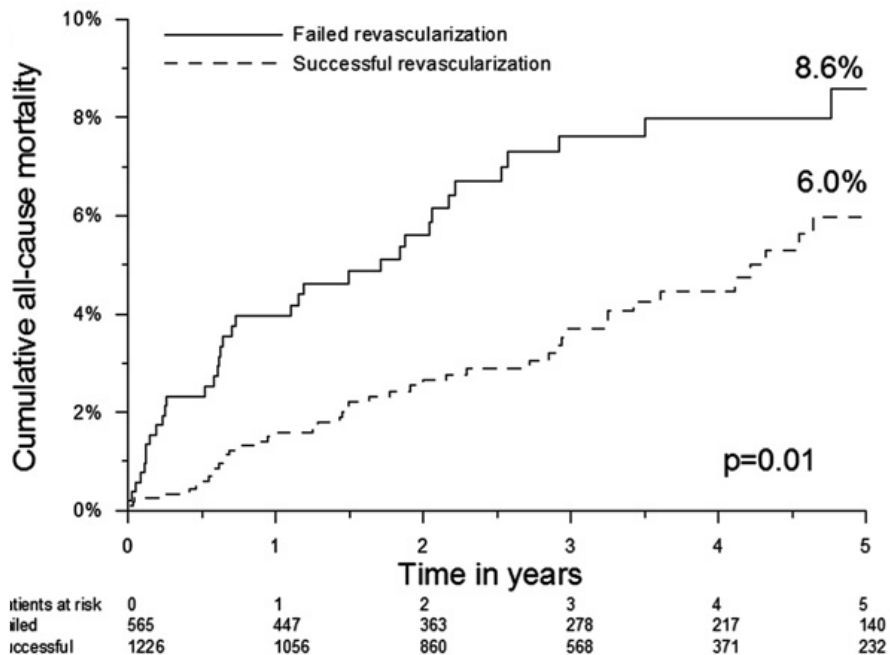
Roxana Mehran, MD,\* Bimmer E. Claessen, MD,†§ Cosmo Godino, MD,‡  
George D. Dangas, MD, PhD,\* Kotaro Obunai, MD,† Sunil Kanwal, MD,†  
Mauro Carlino, MD,‡ José P. S. Henriques, MD, PhD,§ Carlo Di Mario, MD,||  
Young-Hak Kim, MD,¶ Seung-Jung Park, MD,¶ Gregg W. Stone, MD,†  
Martin B. Leon, MD,† Jeffrey W. Moses, MD,† Antonio Colombo, MD,‡  
on behalf of the Multinational Chronic Total Occlusion Registry

*New York, New York; Milan, Italy; Amsterdam, the Netherlands; London, United Kingdom;  
and Seoul, South Korea*



# ¿El tratamiento con éxito de una CTO mejora el pronóstico?

1792 pacientes  
Multinational Chronic Total Occlusion Registry



Los dos grupos no son comparables

	Successful PCI (n = 1,226)	Failed PCI (n = 565)	p Value
Prior CABG	13.6%	20.9%	<0.01
Ejection fraction (%)	53.8 ± 10.0	52.6 ± 10.7	0.04
Multivessel disease	64.9%	75.3%	<0.01
CTO length (mm)	22.3 ± 15.6	26.3 ± 14.3	<0.01
Residual dissection	4.3%	9.4%	<0.01
Coronary perforation during procedure	1.7%	7.4%	<0.01

Predictores de mortalidad

	HR	95% CI	p Value
CKD	2.72	1.37–5.39	<0.01
Diabetes mellitus	2.02	1.25–3.26	<0.01
Age (per-yr increment)	1.09	1.06–1.11	<0.01
Procedural success of CTO	0.63	0.40–1.00	0.05

## ¿El tratamiento con éxito de una CTO mejora el pronóstico? ¿Solo en Diabéticos?

### Long-Term Clinical Outcomes of Percutaneous Coronary Intervention for Chronic Total Occlusions in Patients With Versus Without Diabetes Mellitus

Bimmer E. Claessen, MD<sup>a</sup>, George D. Dangas, MD, PhD<sup>a,c</sup>, Cosmo Godino, MD<sup>b</sup>, Seung-Whan Lee, MD<sup>d</sup>, Kotaro Obunai, MD<sup>a</sup>, Mauro Carlino, MD<sup>b</sup>, Jung-Won Suh, MD<sup>a</sup>, Martin B. Leon, MD<sup>a,c</sup>, Carlo Di Mario, MD<sup>f</sup>, Seung-Jung Park, MD<sup>d</sup>, Gregg W. Stone, MD<sup>a</sup>, Jeffrey W. Moses, MD<sup>a</sup>, Antonio Colombo, MD<sup>b</sup>, and Roxana Mehran, MD<sup>a,c,\*</sup>, on behalf of the Multinational Cto Registry

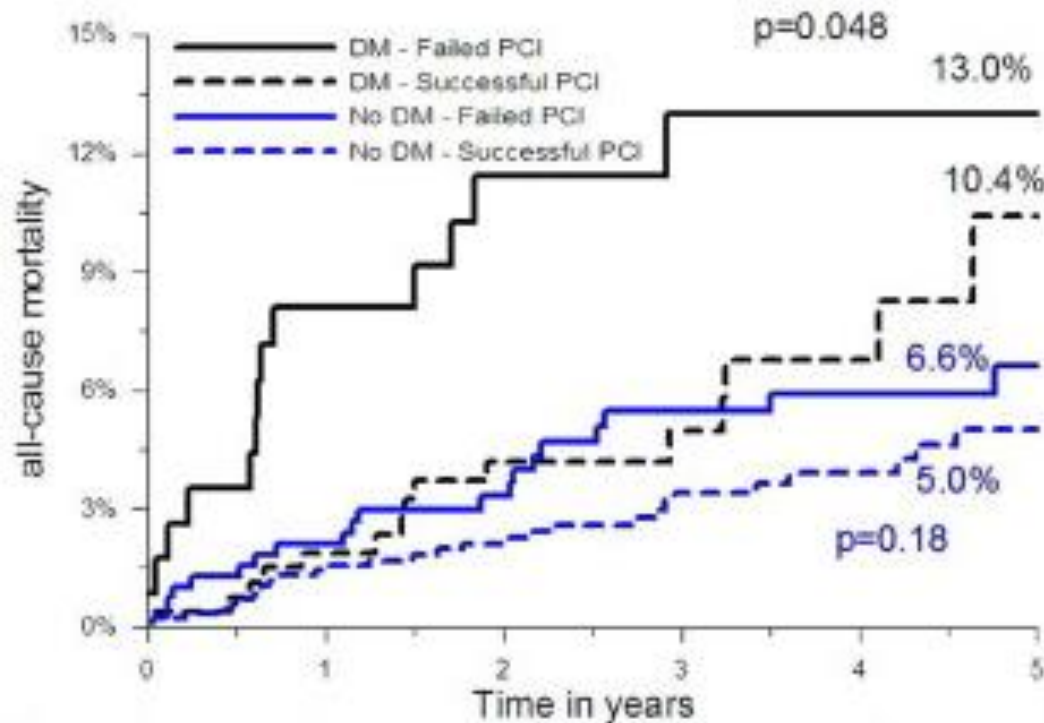
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There is a paucity of data on long-term outcomes after percutaneous coronary intervention (PCI) for chronic total occlusions (CTOs) in the high-risk group of patients with diabetes mellitus (DM). The aim of this study was to evaluate long-term clinical outcomes after PCI of CTOs in patients with and without DM. A total of 1,742 patients with known DM status underwent PCI of CTOs at 3 tertiary care centers in the United States, South Korea, and Italy from 1998 to 2007. Five-year clinical outcomes were evaluated in patients with successful versus failed CTO PCI and the use of drug-eluting stents (DES) versus bare-metal stents (BMS) stratified according to DM status. A total of 395 patients (23%) had DM (42% of whom had insulin-dependent DM). Procedural success was similar in patients with versus without DM (69.6% vs 67.9%,  $p = 0.53$ ). After successful CTO PCI, stents were implanted in 96.4% of patients with DM (BMS in 23.8%, DES in 76.2%) and in 94.0% of patients without DM (BMS in 38.6%, DES in 61.4%). Median follow-up was 3.0 years. In patients with DM, successful CTO PCI was associated with reduced long-term mortality (10.4% vs 13.0%,  $p < 0.05$ ) and a reduced need for coronary artery bypass grafting (2.4% vs 15.7%,  $p < 0.01$ ). The use of DES was associated with a reduction in target vessel revascularization in patients with DM (14.8% vs 54.1%,  $p < 0.01$ ) and in those without DM (17.6% vs 26.5%,  $p < 0.01$ ). Multivariate analysis identified insulin-dependent DM as an independent predictor of mortality in the DM cohort. In conclusion, successful CTO PCI in patients with DM was associated with a reduction in mortality and the need for coronary artery bypass grafting. Compared to non-insulin-dependent DM, patients with insulin-dependent DM had an increased risk for long-term mortality. The use of DES rather than BMS was associated with a reduction in target vessel revascularization in patients with and without DM. © 2011 Elsevier Inc. All rights reserved. (Am J Cardiol 2011;108:924–931)

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# ¿El tratamiento con éxito de una CTO mejora el pronóstico? ¿Solo en Diabéticos?

1792 pacientes  
Multinational Chronic Total Occlusion Registry



	Hazard Ratio	95% CI	p Value
<b>Patients with DM</b>			
Insulin-dependent DM	2.25	1.04–4.87	0.04
Age (per year)	1.10	1.06–1.15	<0.01
Successful PCI of CTO	0.44	0.21–0.93	0.03
<b>Patients without DM</b>			
Age (per year)	1.07	1.04–1.11	<0.01
Left ventricular ejection fraction (per 10%)	0.95	0.93–0.98	<0.01

# Tranquilos: un Meta-análisis nos lo arregla todo

Interventional Cardiology

## Effectiveness of recanalization of chronic total occlusions: A systematic review and meta-analysis

Dominique Joyal, MD, FACC,<sup>a</sup> Jonathan Afilalo, MD,<sup>a</sup> and Stéphane Rinfret, MD, SM<sup>b</sup> *Quebec, Canada*

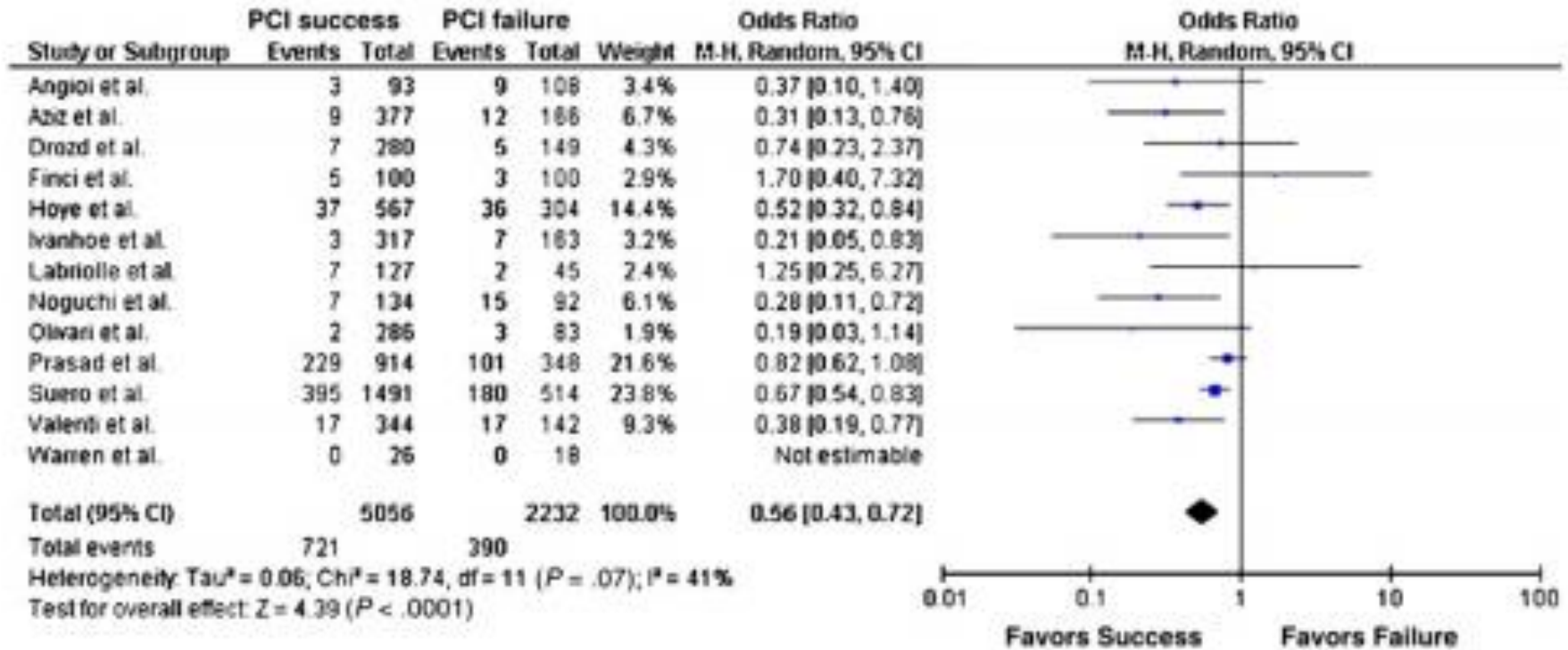
**Background** Chronic total occlusion (CTO) recanalizations remain extremely challenging procedures. With improvements in technology and techniques, success rates for recanalization of CTO continue to improve. However, the clinical benefits of this practice remain unclear. The aim of the study was to determine the effectiveness of CTO recanalization on clinical outcomes.

**Methods** We performed a systematic review and meta-analysis of published studies comparing CTO recanalization to medical management. Data were extracted in duplicate and analyzed by a random effects model.

**Results** We did not identify any randomized controlled trials or observational studies comparing CTO recanalization to a planned medical management. We did identify 13 observational studies comparing outcomes after successful vs failed CTO recanalization attempt. These studies encompassed 7,288 patients observed over a weighted average follow-up of 6 years. There were 721 (14.3%) deaths of 5,056 patients after successful CTO recanalization compared to 390 deaths (17.5%) of 2,232 patients after failed CTO recanalization [odds ratio [OR] 0.56, 95% CI 0.43-0.72]. Successful recanalization was associated with a significant reduction in subsequent coronary artery bypass graft surgery (CABG) (OR 0.22, 95% CI 0.17-0.27) but not in myocardial infarction (OR 0.74, 95% CI 0.44-1.25) or major adverse cardiac events (OR 0.81, 95% CI 0.55-1.21). In the 6 studies that reported angina status, successful recanalization was associated with a significant reduction in residual/recurrent angina (OR 0.45, 95% CI 0.30-0.67).

**Conclusions** In highly selected patients considered for CTO recanalization, successful attempts appear to be associated with an improvement in mortality and with a reduction for the need for CABG as compared to failed recanalization. However, given the observational nature of the reviewed evidence, randomized clinical trials are needed to confirm these findings. (Am Heart J 2010;160:179-87.)

## Tranquilos: un Meta-análisis nos lo arregla todo



Effect of successful versus failed CTO recanalization on all-cause mortality during available follow-up.

# Meta-Análisis: datos no mostrados

Study and year	Age (y)		Male sex (%)		multivessel disease (%)		Diabetes (%)		LVEF (%)		NYHA class 3-4 (%)		Renal dysfunction (%)		Occlusion length (mm)		Calcified vessel (%)		Ischemic Burden	
	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure	Success	Failure
Finci <sup>43</sup> 1990	55±11	55±12	93	88	24	23	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Warren <sup>44</sup> 1990	54	55	53	47	48	52	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Ivanhoe <sup>45</sup> 1992	55±10	56±11	81	82	30	54 (0.0001)	10	15	55±10	56±11	3	3	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Angioi <sup>46</sup> 2000	55±10	56±11	52	88	37	45	10	11	59±14	59±14	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Noguchi <sup>47</sup> 2000	61±9	61±11	78	80	47	67 (0.01)	26	32	56±12	54±9	n/d	n/d	n/d	n/d	11,3±8.3	141±8.1 (<0.05)	37	56 (<0.01)	n/d	n/d
Suero <sup>48</sup> 2001	60±11	61±12	78	80	73	82 (0.001)	21	20	51±14	52±14	n/d	n/d	8.2	7.1	n/d	n/d	n/d	n/d	n/d	n/d
Olivari <sup>49</sup> 2003	58±10	59±11	86	85	45	60 (0.014)	17	20	56±10	56±10	9	7	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Hoye <sup>50</sup> 2005	60±11	61±10	74	72	54	67(0.03)	12	9.1	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Drozd <sup>51</sup> 2006	57±10	58±10	81	80	46	53	11	11	n/d	n/d	14.4	18 (NYHA≥2)	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Aziz <sup>52</sup> 2007	59	59	76	81	50	40 (0.006)	14	9	53	53	12.2	15.7	0.3	1.8	n/d	n/d	n/d	n/d	n/d	n/d
Prasad <sup>53</sup> 2007	63±11	64±11	76	75	70	74	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Valentj <sup>54</sup> 2008	67±11	70±11	81	83	85	87	24	21	42±13	41±14	n/d	n/d	n/d	n/d	25 (15-52.5)	28 (21-47.5)	n/d	n/d	n/d	n/d
de Labriolle <sup>55</sup> 2008	61±12	64±10	72	87	45	66 (0.002)	19	40.5 (0.005)	50±12	48±15	n/d	n/d	9.1	6.3	n/d	n/d	n/d	n/d	n/d	n/d

## Quantifying the Early Health Status Benefits of Successful Chronic Total Occlusion Recanalization

### Results From the FlowCardia's Approach to Chronic Total Occlusion Recanalization (FACTOR) Trial

J. Aaron Grantham, MD; Philip G. Jones, MS; Louis Cannon, MD; John A. Spertus, MD, MPH

**Background**—Data on the health status benefits of percutaneous coronary intervention for coronary chronic total occlusions (CTOs), a principal indication for the procedure, are lacking.

**Methods and Results**—In the FlowCardia Approach to CTO Recanalization (FACTOR) trial, patients (n=125) completed the Seattle Angina Questionnaire (SAQ) at baseline and 1 month after percutaneous coronary intervention. One-month health status outcomes were compared by multivariable analysis, adjusting for group differences between those whose CTO was successfully and unsuccessfully recanalized. These changes were also analyzed according to baseline symptoms. Procedural success was 55% (n=64) and independently associated with angina relief (difference between those with successful and unsuccessful percutaneous coronary intervention [ $\Delta$ ] in SAQ angina frequency=9.5 points; 95% confidence interval, 1.6 to 17.5;  $P=0.019$ ), improved physical function ( $\Delta$  in SAQ physical limitation=13.1 points; 95% confidence interval, 5.1 to 21.1;  $P=0.001$ ), and enhanced quality of life ( $\Delta$  in SAQ quality of life [QoL]=20.3 points; 95% confidence interval, 11.9 to 28.6;  $P<0.001$ ). The benefit of successful percutaneous coronary intervention was greatest in symptomatic patients as compared with asymptomatic patients although statistically significantly so only for QoL ( $\Delta$ SAQ angina frequency domain=10.3 versus 4.3 points,  $P=0.51$ ,  $\Delta$ physical limitation =15.9 versus 6.3 points,  $P=0.25$ ;  $\Delta$ QoL=27.3 versus 8.5 points,  $P=0.047$ ).

**Conclusions**—Successful CTO recanalization is associated with significant early improvements in patient symptoms, function, and QoL but only among symptomatic patients. Percutaneous treatment of a CTO offers the potential to provide significant health status benefits in symptomatic patients. (*Circ Cardiovasc Qual Outcomes*. 2010;3:284-290.)

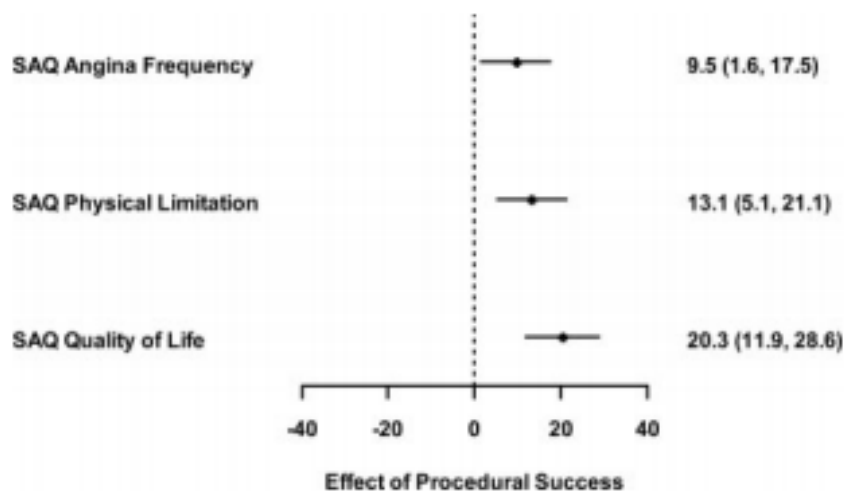
**Key Words:** coronary artery disease ■ health status ■ angina ■ quality of life ■ catheters

## ¿El tratamiento de la CTO mejora los síntomas?

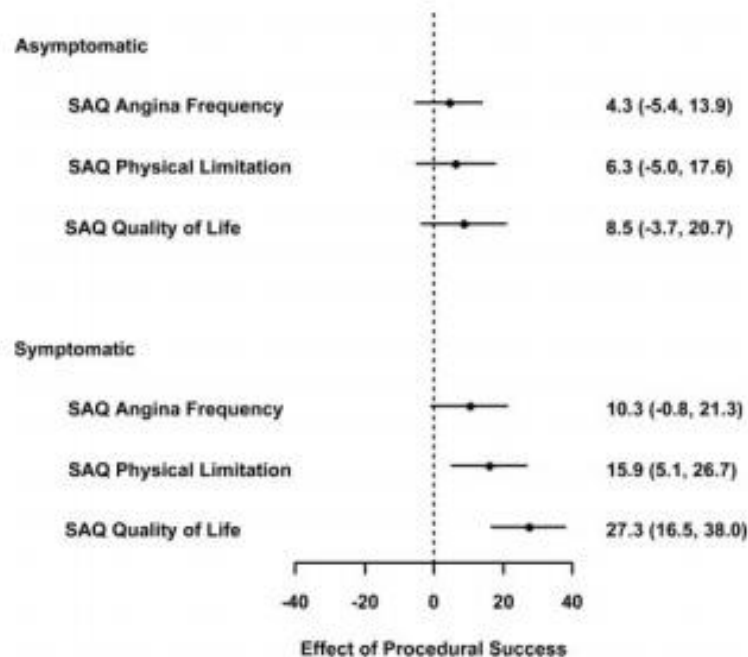
### FlowCardia Approach to CTO Recanalization (FACTOR) trial

125 pacientes  
Seattle Angina Questionnaire (SAQ)

Parece que sí



Pero solo si tienen síntomas





# NOTICE-PUBLIC BAR

OUR PUBLIC BAR IS PRESENTLY  
NOT OPEN BECAUSE IT IS  
CLOSED. MANAGER

Editorial

## Chronic total occlusion: no more meta-analysis, please – a randomized clinical trial is urgently needed

Alfredo Bardají, Gil Bonet

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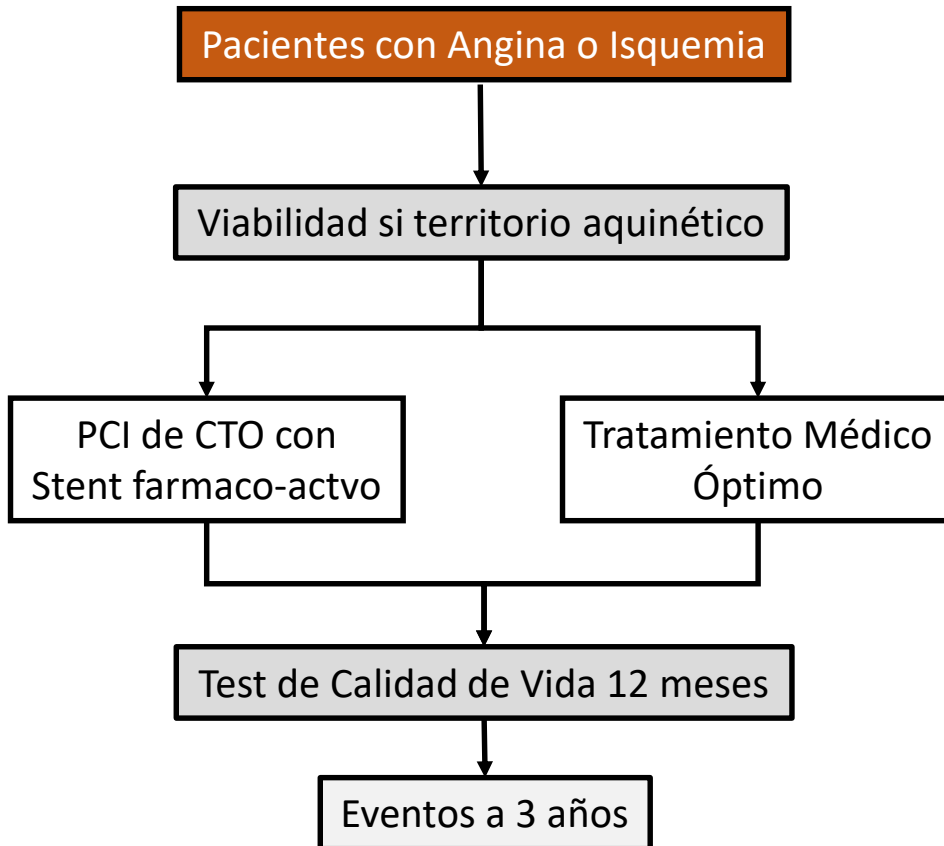
**ESC**European Society  
of CardiologyEuropean Heart Journal (2018) 39, 2484–2493  
doi:10.1093/eurheartj/ehy220**CLINICAL RESEARCH***Interventional cardiology*

# A randomized multicentre trial to compare revascularization with optimal medical therapy for the treatment of chronic total coronary occlusions

**Gerald S. Werner<sup>1\*</sup>, Victoria Martin-Yuste<sup>2</sup>, David Hildick-Smith<sup>3</sup>, Nicolas Boudou<sup>4</sup>, Georgios Sianos<sup>5</sup>, Valery Gelev<sup>6</sup>, Jose Ramon Rumoroso<sup>7</sup>, Andrejs Erglis<sup>8</sup>, Evald Høj Christiansen<sup>9</sup>, Javier Escaned<sup>10</sup>, Carlo di Mario<sup>11</sup>, Thomas Hovasse<sup>12</sup>, Luis Teruel<sup>13</sup>, Alexander Bufe<sup>14</sup>, Bernward Lauer<sup>15</sup>, Kris Bogaerts<sup>16</sup>, Javier Goicolea<sup>17</sup>, James C. Spratt<sup>18</sup>, Anthony H. Gershlick<sup>19</sup>, Alfredo R. Galassi<sup>20</sup>, and Yves Louvard<sup>12</sup>; for the EUROCTO trial investigators<sup>†</sup>**

# Objetivo: mejorar los síntomas

## EUROCTO Clinical Trial



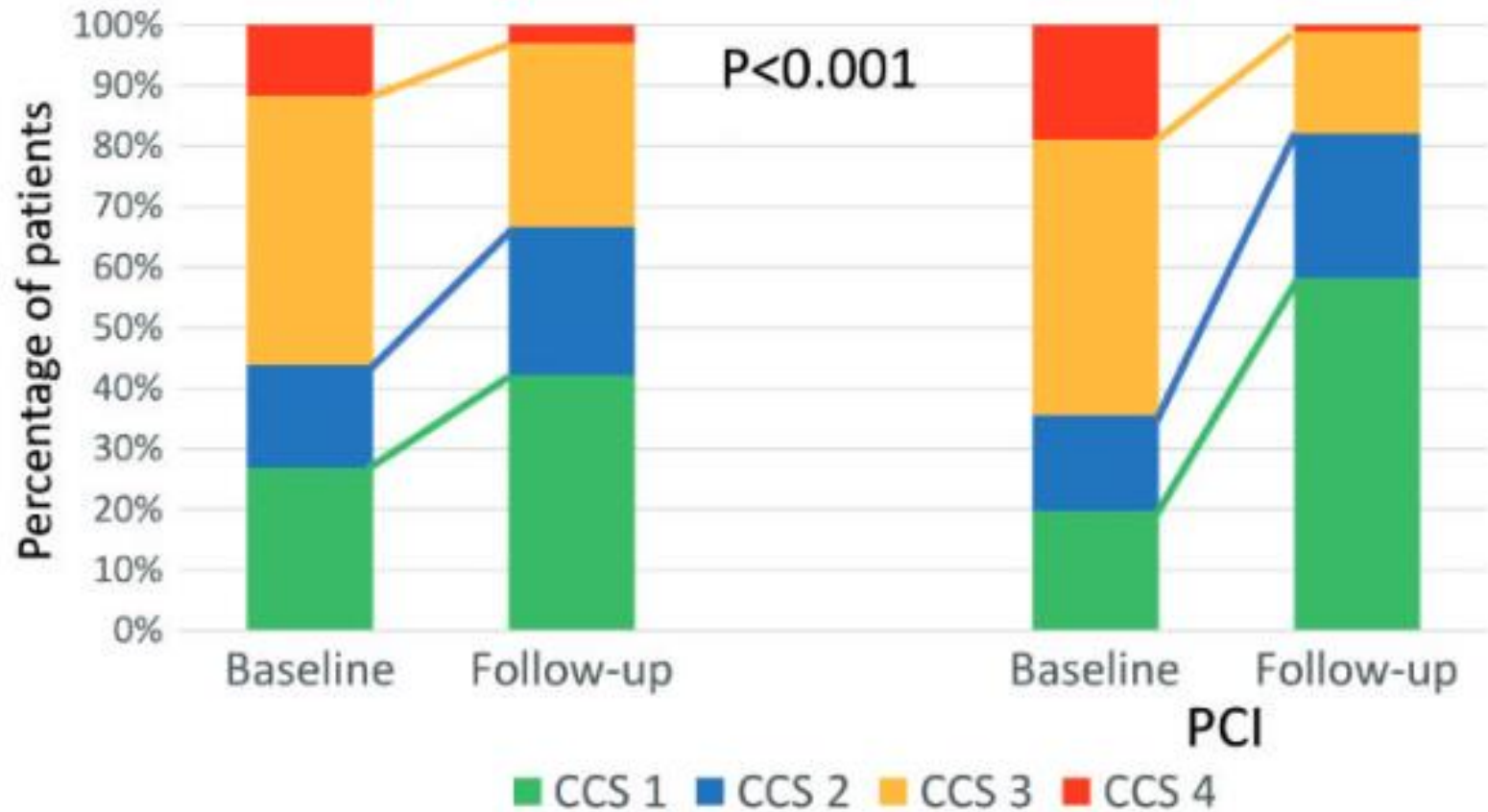
396 pacientes  
en 28 centros europeos  
(objetivo:1200 pacientes  
luego rebajado a 600)

Objetivo Primario  
Calidad de vida a 12 meses  
Eventos Mayores a 3 años

Marzo 2012  
Mayo 2015

# Objetivo: mejorar los síntomas

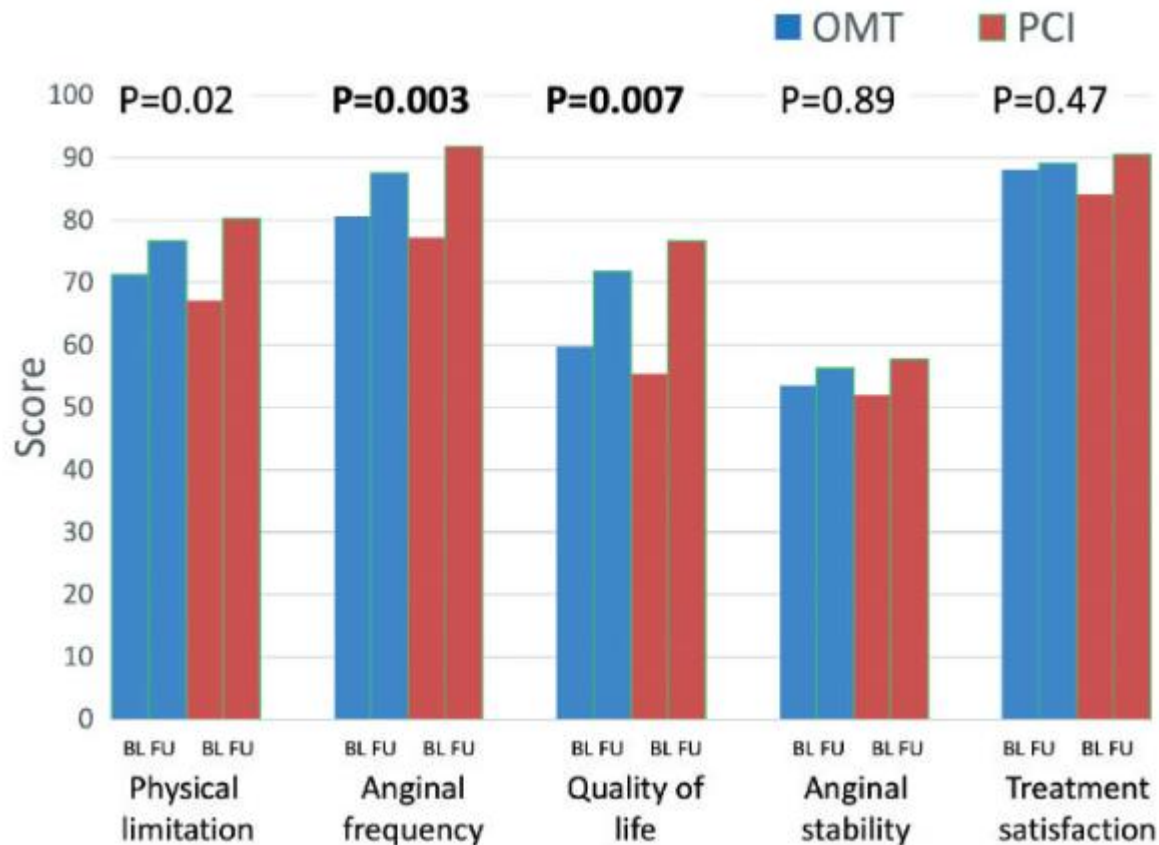
## EUROCTO Clinical Trial



# Objetivo: mejorar los síntomas

## EUROCTO Clinical Trial

Sub-escalas del cuestionario de Seattle para Angina



**Y por fin empiezan a llegar los Ensayos Clínicos.**

**Casi mejor que no hubiesen llegado**

# Objetivo: mejorar los síntomas

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## Letters

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### RESEARCH CORRESPONDENCE

### The IMPACTOR-CTO Trial



Despite concordant outcome data from a thousand registries comparing successful versus unsuccessful CTO PCI (1), recent randomized trials did not support the impact on survival of CTO PCI compared with OMT (2). In contrast, more certainty exists about its importance in improving QoL (2).

The IMPACTOR-CTO (Impact on Inducible Myocardial Ischemia of Percutaneous Coronary

OMT. In the PCI group, failed CTO PCI was observed in 8 patients, for an overall angiographic success rate of 83%. In the OMT group, 14 patients were excluded for noncompliance with OMT. Thus, 39 and 33 patients were included in the PCI and OMT arms, respectively. The mean age of the study population was  $56.6 \pm 8.1$  years, and 83.3% were men. No difference was observed in baseline clinical and angiographic characteristics between the PCI and OMT groups.

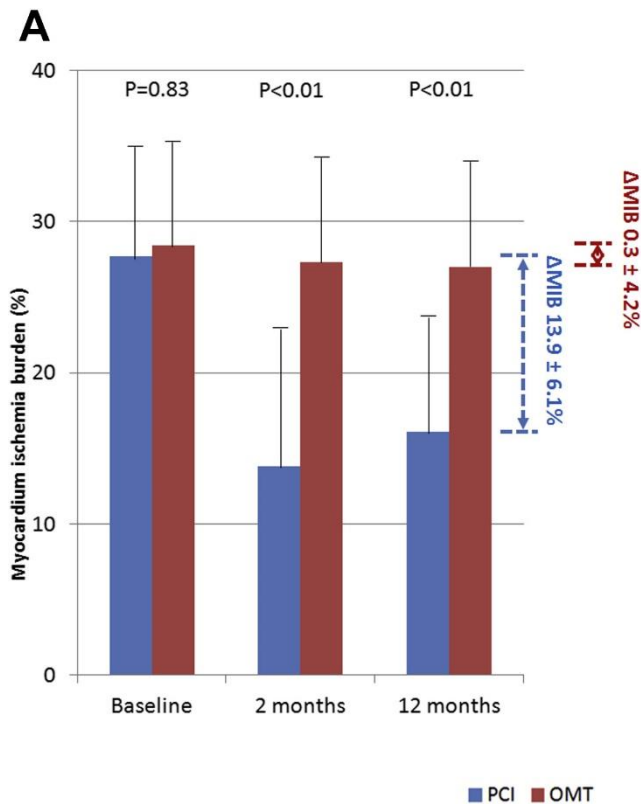
In the PCI group, MIB significantly decreased from  $27.7 \pm 8.5\%$  at baseline to  $16.1 \pm 8.6\%$  at 12 months ( $p < 0.01$ ), whereas no significant changes were observed in the OMT group (from  $28.4 \pm 8.6\%$  at baseline to  $27.0 \pm 8.0\%$ ;  $p = 0.83$ ). Hence,  $\Delta$ MIB was



# Objetivo: mejorar los síntomas

## IMPACTOR-CTO Trial

Solo 72 pacientes divididos en 2 grupos. Rusia



**B**

	Baseline			At 2 months			At 12 months		
	PCI group (n=39)	OMT group (n=33)	p	PCI group (n=39)	OMT group (n=33)	p	PCI group (n=39)	OMT group (n=33)	p
Physical Functioning, median (IQR)	40 (23; 45)	40 (30; 45)	0.42	45 (45; 75)*	41 (31; 45)	<0.01	45 (45; 70) *	40 (30; 45)	<0.01
Role Physical Functioning, median (IQR)	25 (0; 50)	25 (0; 75)	0.17	75 (50; 75) *	25 (25; 75)	<0.01	75 (50; 75) *	25 (25; 50)	<0.01
Bodily pain, median (IQR)	41 (22; 41)	41 (22; 51)	0.15	62 (41; 62) *	40 (40; 51)	<0.01	51 (41; 62) *	41 (32; 51)	<0.01
General Health, median (IQR)	25 (20; 45)	40 (25; 50)	0.07	50 (35; 57)	45 (20; 50)	0.02	50 (45; 55) *	40 (20; 50)	<0.01
Vitality, median (IQR)	30 (20; 38)	33 (25; 45)	0.22	45 (35; 50) *	35 (25; 45)	<0.01	45 (40; 50) *	33 (25; 40)	<0.01
Social Functioning, median (IQR)	50 (25; 54)	50 (25; 63)	0.43	75 (50; 75) *	50 (38; 75)	<0.01	63 (50; 75) *	50 (37; 63)	<0.01
Role-Emotional, median (IQR)	36 (33; 67)	38 (36; 69)	0.57	100 (67; 100) *	40 (34; 68)	<0.01	100 (66; 100) *	67 (33; 67)	<0.01
Mental Health, median (IQR)	40 (30; 46)	40 (32; 52)	0.22	52 (44; 62) *	40 (32; 52)	<0.01	52 (48; 60) *	40 (32; 48)	<0.01

# Objetivo: mejorar la función ventricular

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## A Randomized Trial to Assess Regional Left Ventricular Function After Stent Implantation in Chronic Total Occlusion The REVASC Trial



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# Objetivo: mejorar la función ventricular

REVASC Trial

205 pacientes  
Un solo centro Alemán

Pacientes con Angina o Isquemia

PCI de CTO con  
Stent fármaco-activo

Tratamiento Médico  
Óptimo

Función ventricular a 6 meses

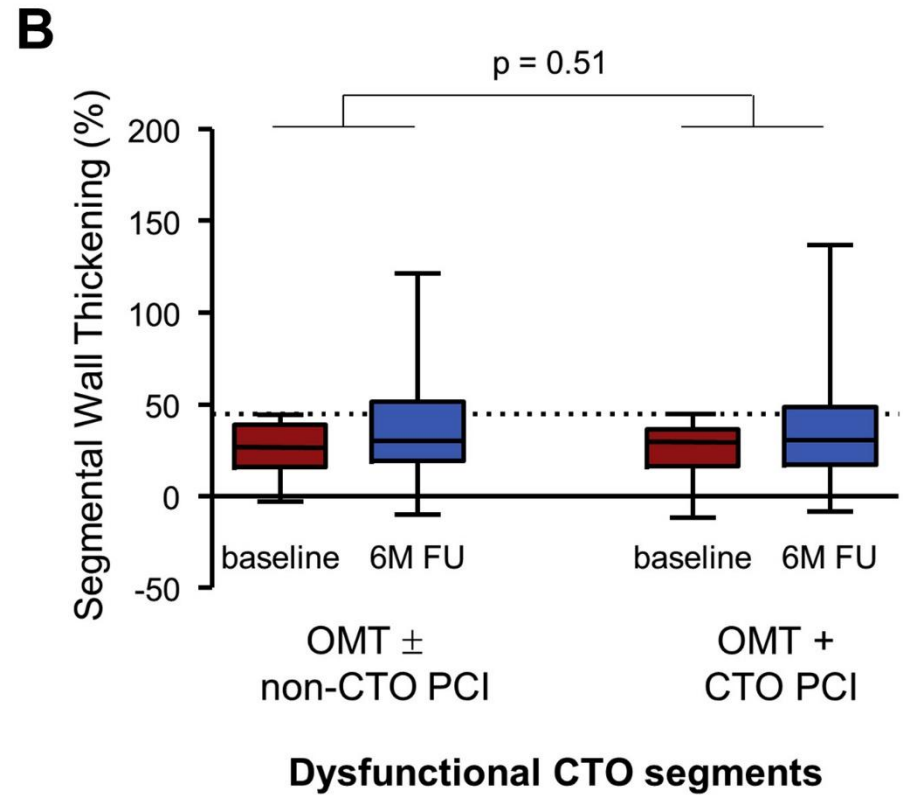
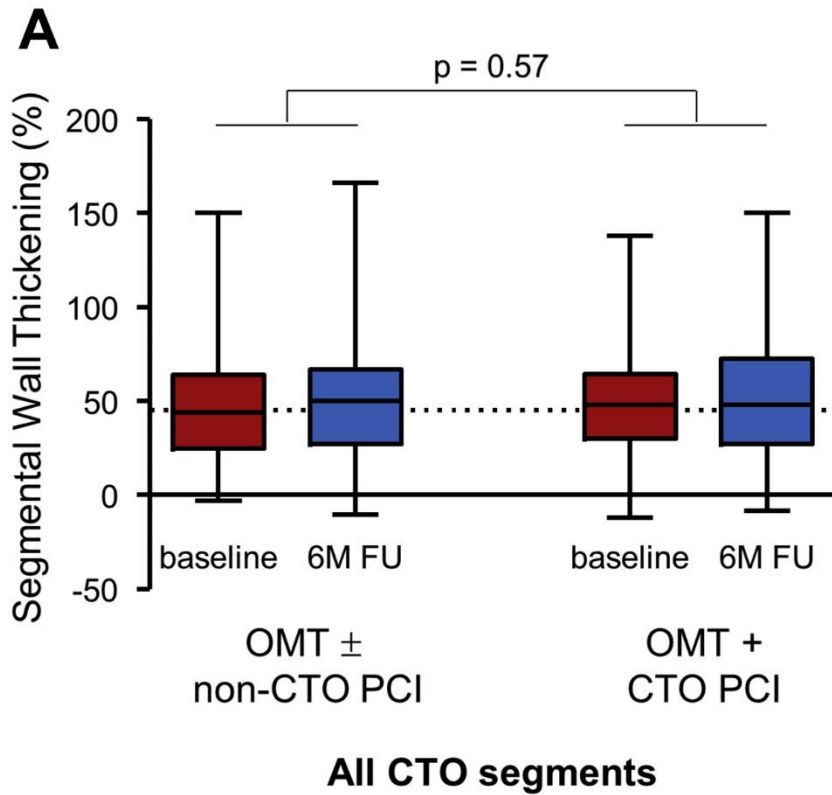
Objetivo Primario

Cambios en el engrosamiento  
regional segmentario  
por Resonancia

Agosto 2007  
Septiembre 2015

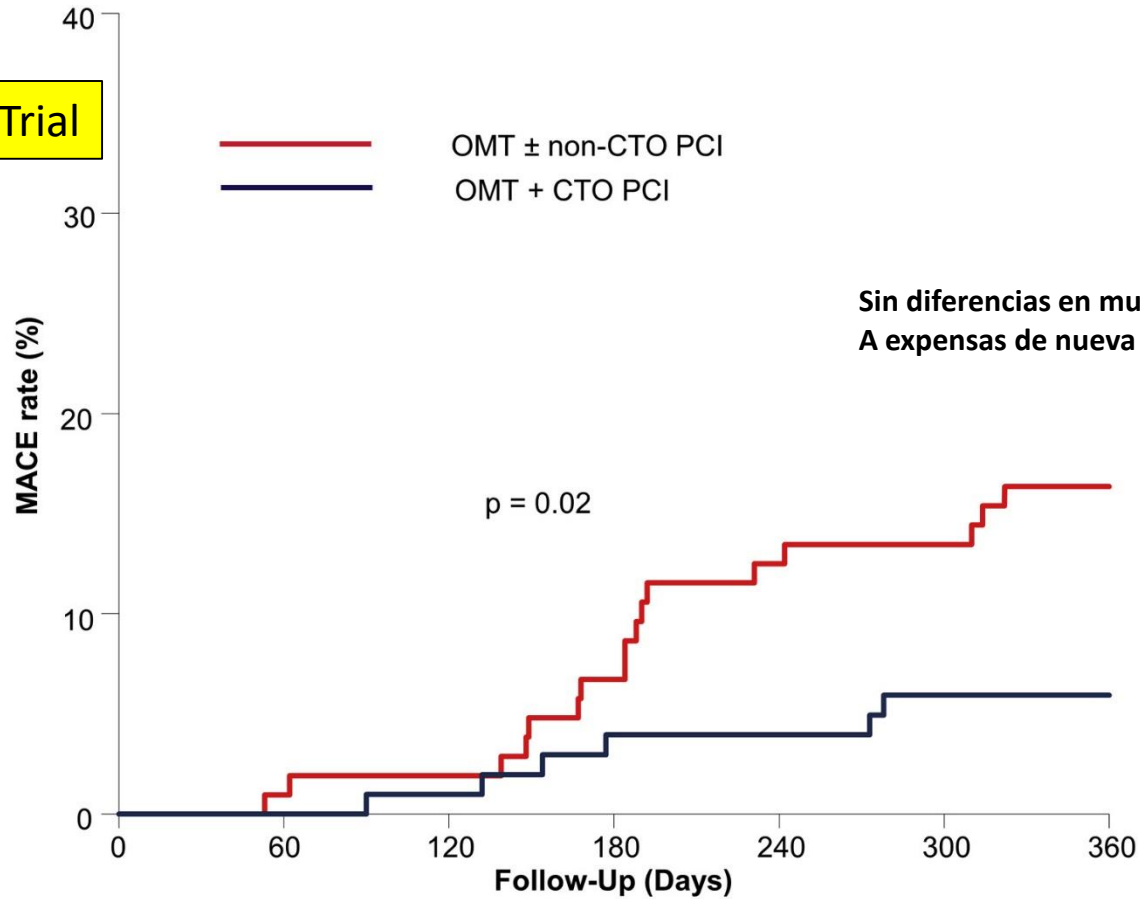
# Objetivo: mejorar la función ventricular

REVASC Trial



# Objetivo: mejorar la función ventricular

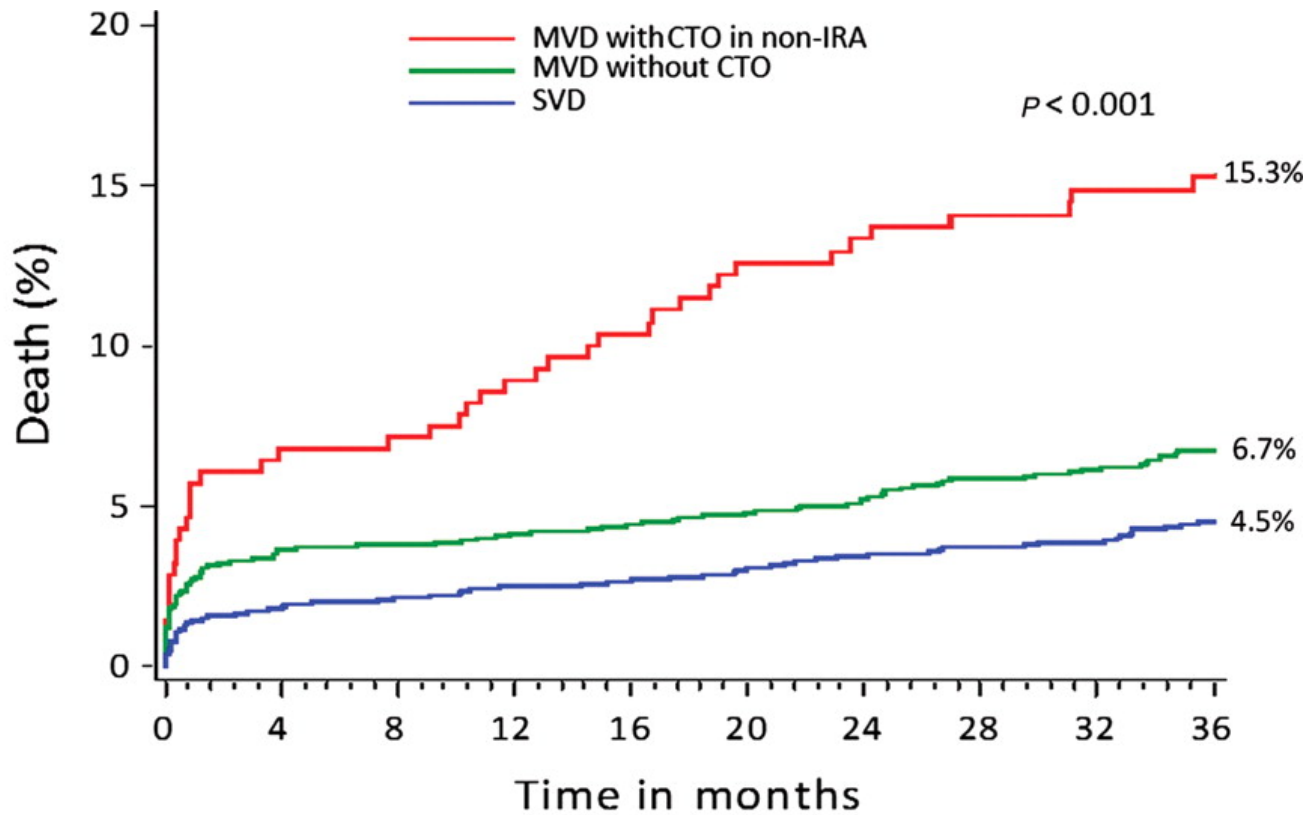
REVASC Trial



No. at risk

OMT ± non-CTO PCI	104	103	102	97	91	90	87
OMT + CTO PCI	101	101	100	97	97	95	95

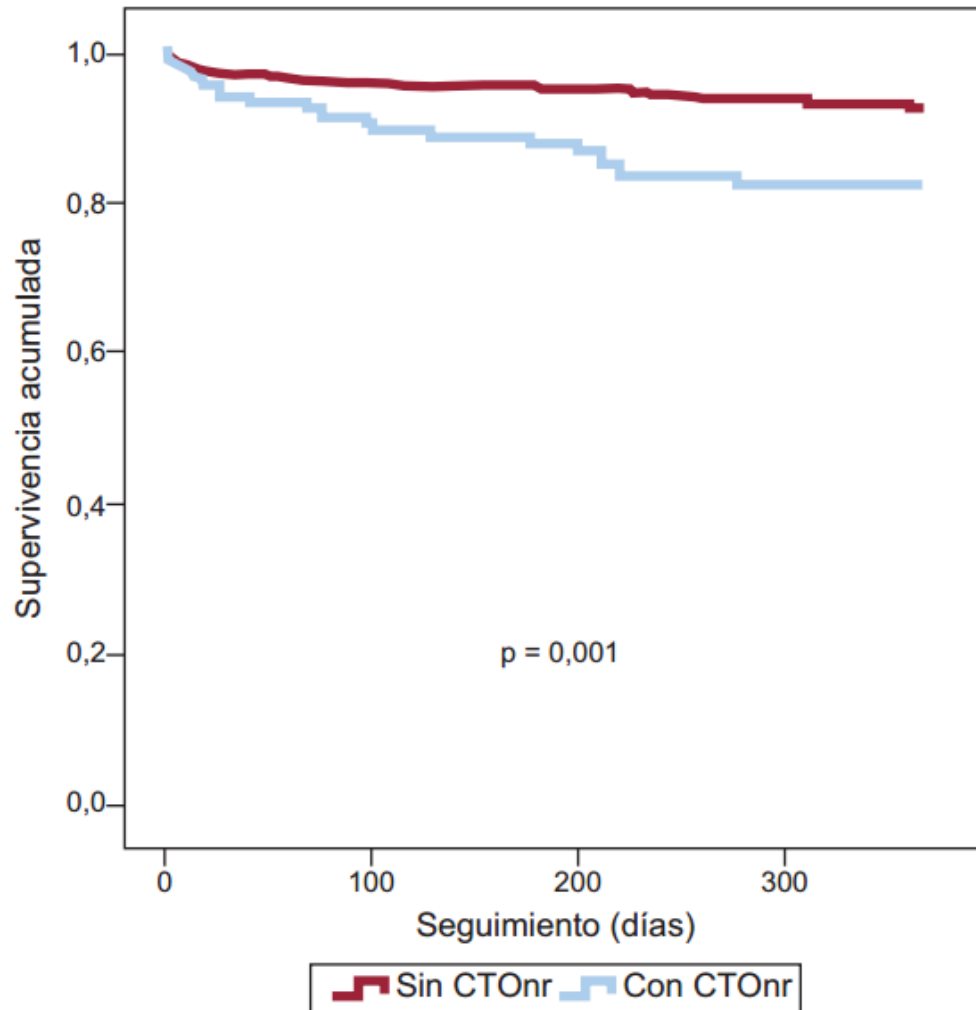
# IAMST tratado con AP y CTO en arteria no responsable



Horizons-AMI Trial

# IAMST tratado con AP y CTO en arteria no responsable

Hospital de  
Bellvitge



# IAMST tratado con AP y CTO en arteria no responsable

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## Percutaneous Intervention for Concurrent Chronic Total Occlusions in Patients With STEMI

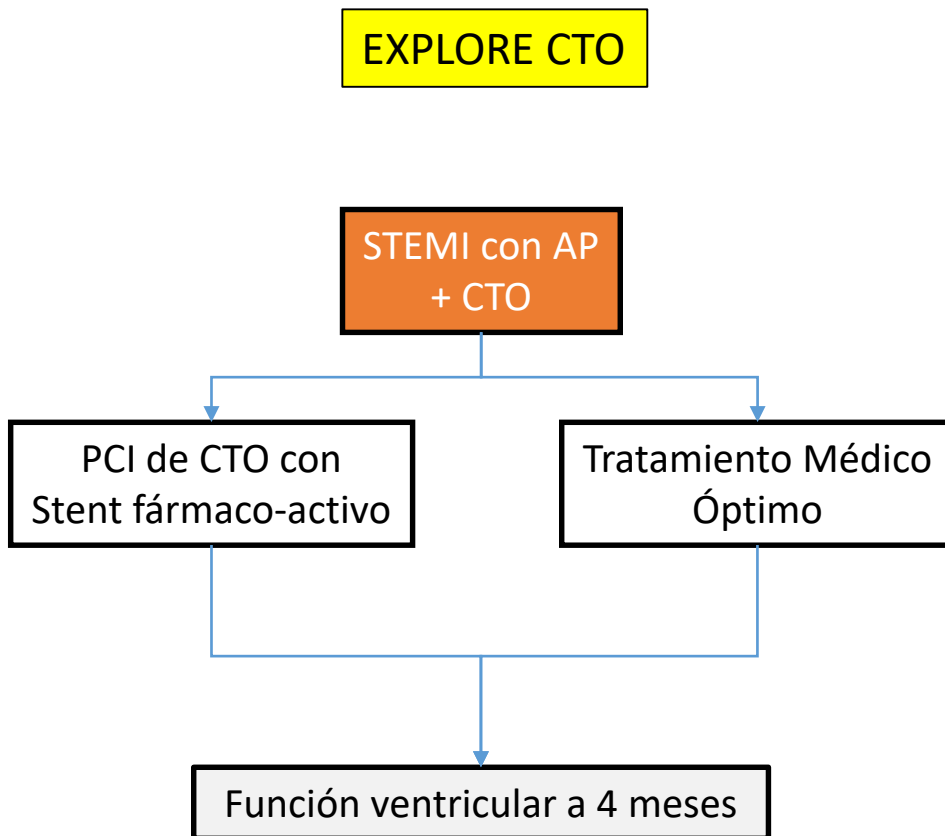


### The EXPLORE Trial

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for the EXPLORE Trial Investigators



# IAMST tratado con AP y CTO en arteria no responsable



304 pacientes en  
14 centros de Europa y Canadá

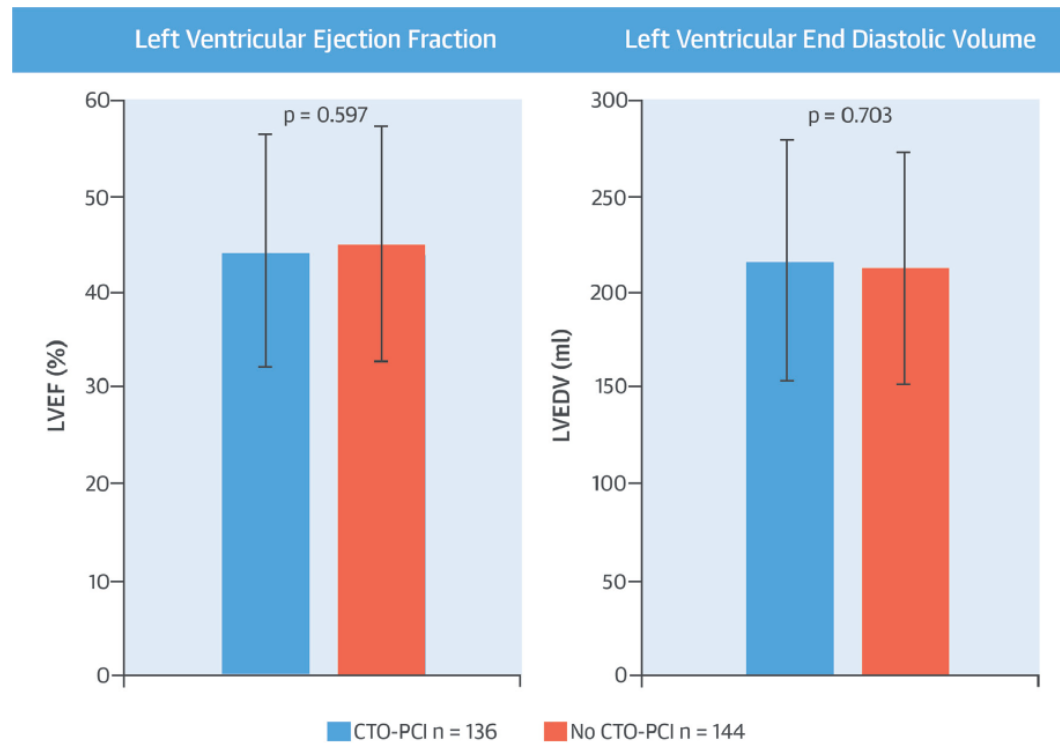
Objetivo Primario  
FE por Resonancia  
A 4 meses

Noviembre 2007  
Abril 2015

# IAMST tratado con AP y CTO en arteria no responsable

EXPLORE Trial

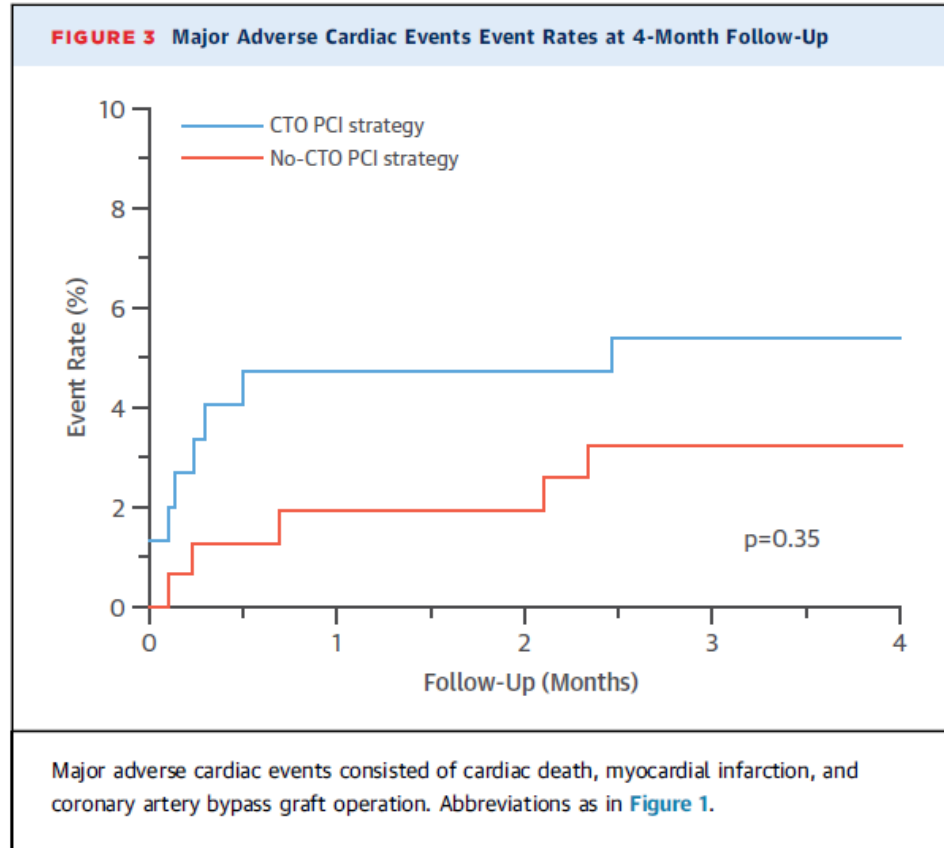
**CENTRAL ILLUSTRATION** Left Ventricular Function at 4-Month Follow-Up in STEMI Patients Undergoing CTO PCI Versus no CTO PCI



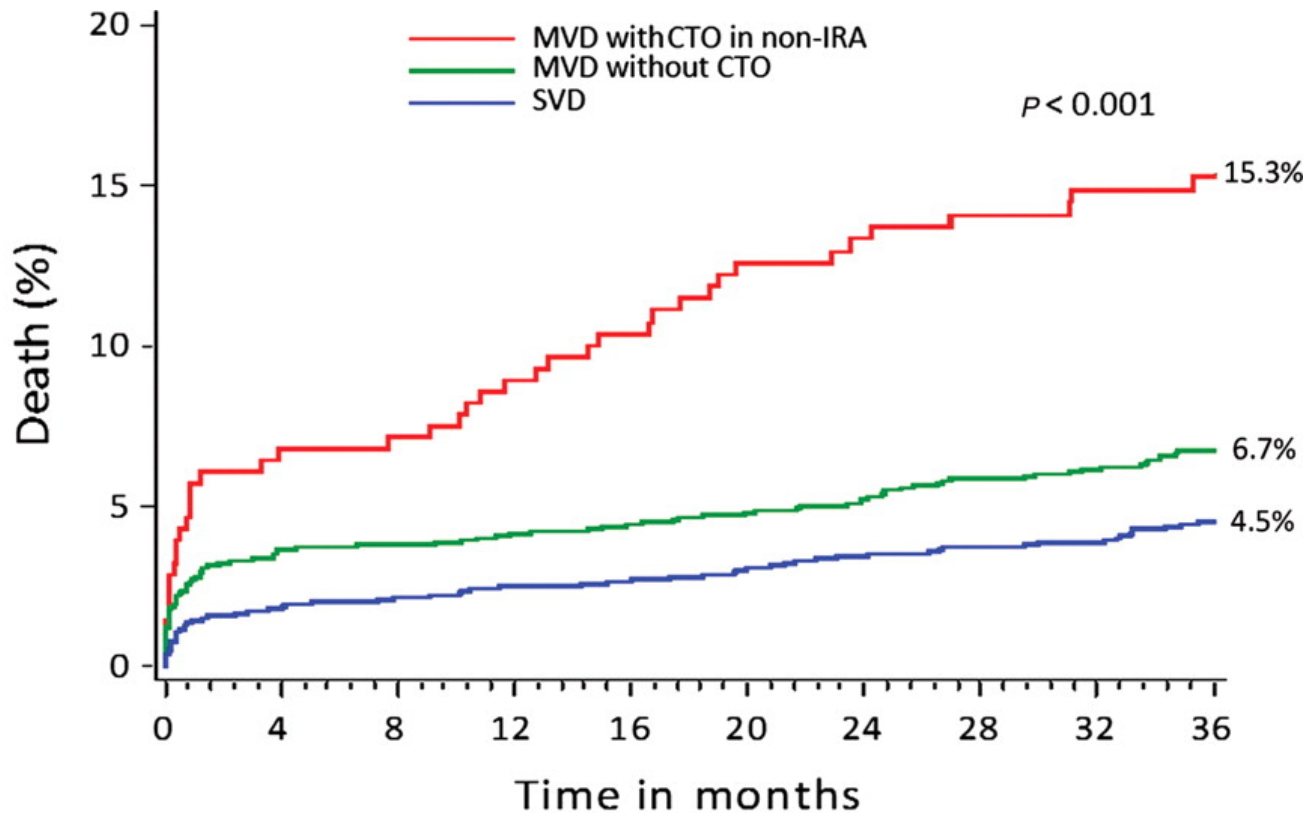
Henriques, J.P.S. et al. J Am Coll Cardiol. 2016;68(15):1622-32.

# IAMST tratado con AP y CTO en arteria no responsable

## EXPLORE Trial



# IAMST tratado con AP y CTO en arteria no responsable



Mas edad  
Mas HTA  
Mas Diabetes  
Mas IAM previo  
Mas ICP previa  
Mas By-Pass previo  
Mas IR  
Mas Killip II-IV  
Peor FE

Horizons-AMI Trial

# IAMST tratado con AP y CTO en arteria no responsable

**Tabla 3**

Análisis de la relación entre oclusión total crónica en arteria no responsable del infarto y mortalidad

	Análisis univariable		Análisis multivariable	
	HR (IC95%)	p	HR (IC95%)	p
CTOnr	2,79 (1,71-4,56)	0,001	1,76 (0,85-3,65)	0,166
Edad (años)	1,08 (1,06-1,10)	0,001	1,08 (1,04-1,12)	0,001
Diabetes mellitus	1,50 (0,96-2,35)	0,077		
Hipertensión	2,01 (1,27-3,18)	0,003		
Aclaramiento creatinina (ml/min)	0,97 (0,96-0,97)	0,001		
ACV previo	3,39 (1,97-5,84)	0,001	1,98 (0,97-4,04)	0,061
Vasculopatía periférica	2,31 (1,30-4,08)	0,004		
IAM previo	1,84 (1,06-3,21)	0,031		
ICP previo	1,74 (0,92-3,27)	0,086		
Glucemia al ingreso	1,10 (1,06-1,13)	0,001		
Infarto anterior	2,34 (1,45-3,79)	0,001		
Frecuencia cardiaca	1,04 (1,02-10,5)	0,001		
Número de vasos	1,88 (1,46-2,41)	0,001		
Clase Killip al ingreso	2,47 (2,06-2,95)	0,001	2,12 (1,58-2,85)	0,001
Tiempo de isquemia	1,001 (1,001-1,003)	0,079		
Stent directo	0,67 (0,42-1,06)	0,088		
FEVI	0,92 (0,90-0,94)	0,001	0,95 (0,92-0,98)	0,001

ACV: accidente cerebrovascular; CTOnr: oclusión total crónica en arteria no responsable del infarto; FEVI: fracción de eyección del ventrículo izquierdo; HR: *hazard ratio*; IAM: infarto agudo de miocardio; IC95%: intervalo de confianza del 95%; ICP: intervencionismo coronario percutáneo.

Análisis univariable de asociación de cada uno de los potenciales confusores con la mortalidad. El análisis multivariable incluye todos los potenciales confusores (variables con asociación estadística  $p < 0,2$  con la exposición [oclusión total crónica en arteria no responsable del infarto; [tabla 1](#)] y el efecto [mortalidad; análisis univariable en esta misma tabla], incluyendo fracción de eyección del ventrículo izquierdo y clase Killip al ingreso).

## Objetivo: mejorar el pronóstico

Circulation

ORIGINAL RESEARCH ARTICLE



# Randomized Trial Evaluating Percutaneous Coronary Intervention for the Treatment of Chronic Total Occlusion

## The DECISION-CTO Trial

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Editorial, see p 1684

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**BACKGROUND:** Procedural results for percutaneous coronary intervention (PCI) in coronary vessels with chronic total occlusion (CTO) have improved in recent years, and PCI strategies have moved toward more complete revascularization with more liberal use of CTO-PCI. However, evidence evaluating CTO-PCI is limited to observational studies and small clinical trials.

---

Seung-Whan Lee\*  
Pil Hyung Lee, MD\*  
et al

# Objetivo: mejorar el pronóstico

DECISION-CTO

Pacientes con Angina o Isquemia

PCI de CTO con  
Stent fármaco-activo

Tratamiento Médico  
Óptimo

Eventos a 3 años

834 pacientes en Corea y  
países asiáticos

Objetivo Primario

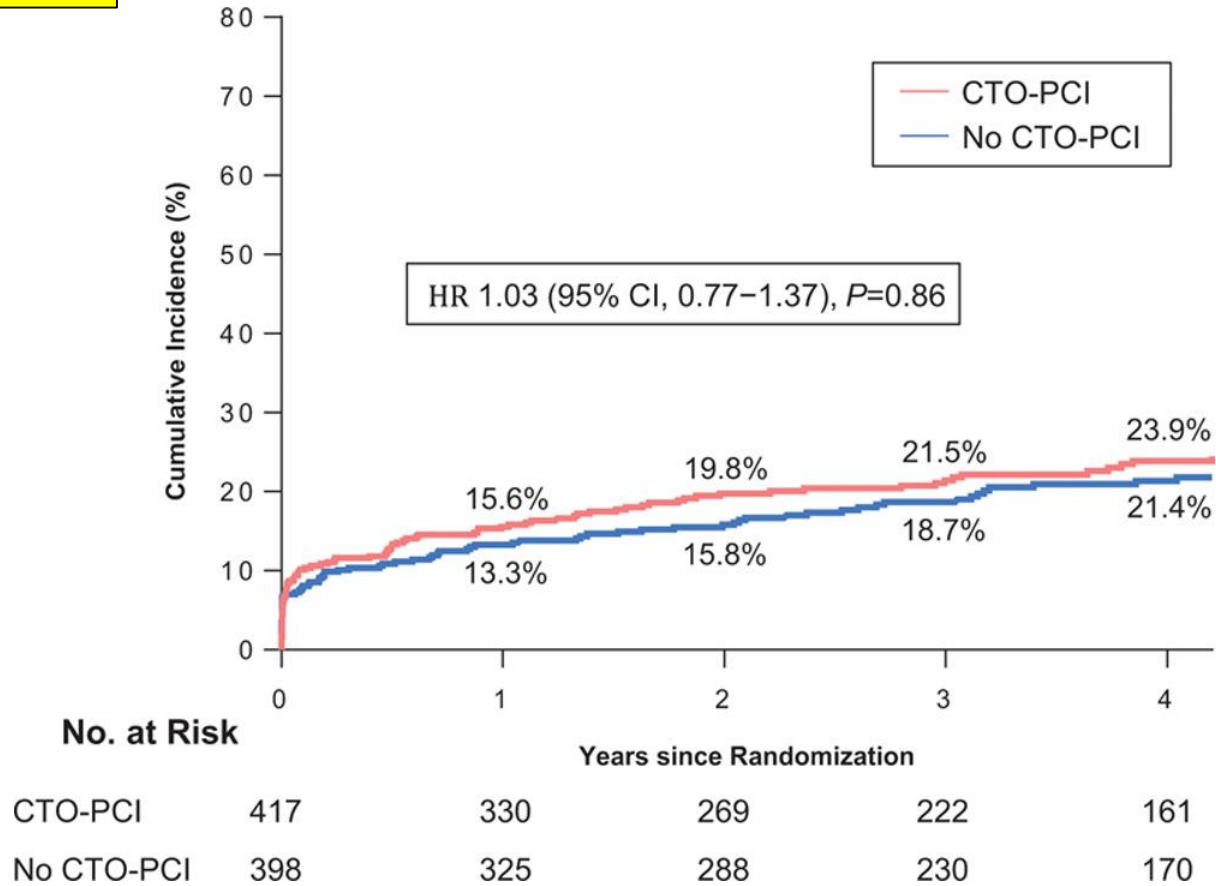
Evento combinado de  
muerte cardíaca, IM, AVC  
o revascularización a 3 a.

Marzo 2010

Septiembre 2016

# Objetivo: mejorar el pronóstico

## DECISION-CTO

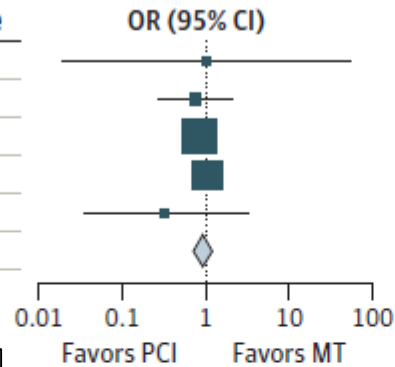




# Tratar la isquemia no mejora el pronóstico

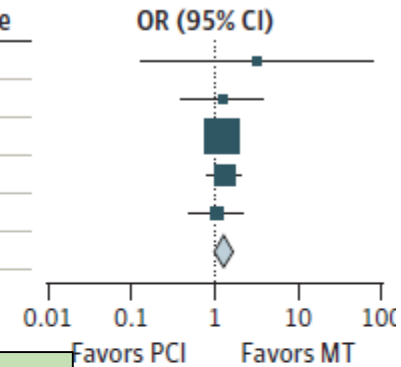
## Muerte

Source	OR (95% CI)	P Value
Hambrecht <sup>15</sup>	1.02 (0.02-52.43)	.99
MASS II <sup>13</sup>	0.76 (0.27-2.16)	.60
COURAGE <sup>17</sup>	0.84 (0.61-1.18)	.32
BARI 2D <sup>14</sup>	1.06 (0.71-1.58)	.78
FAME 2 <sup>16</sup>	0.33 (0.03-3.16)	.33
Overall	0.90 (0.71-1.16)	.42



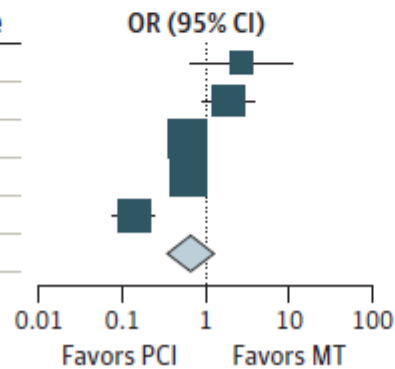
## Infarto no fatal

Source	OR (95% CI)	P Value
Hambrecht <sup>15</sup>	3.12 (0.12-78.45)	.49
MASS II <sup>13</sup>	1.24 (0.40-3.88)	.71
COURAGE <sup>17</sup>	1.24 (0.94-1.65)	.13
BARI 2D <sup>14</sup>	1.29 (0.82-2.04)	.27
FAME 2 <sup>16</sup>	1.06 (0.51-2.22)	.88
Overall	1.24 (0.99-1.55)	.06



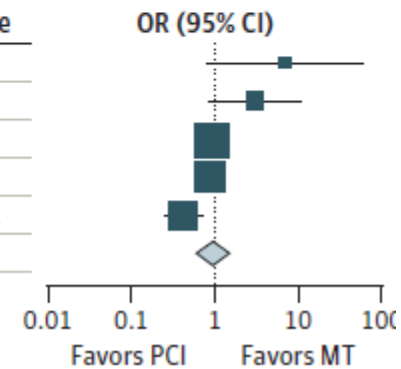
## Revasc, no planificada

Source	OR (95% CI)	P Value
Hambrecht <sup>15</sup>	2.60 (0.63-10.71)	.18
MASS II <sup>13</sup>	1.84 (0.91-3.73)	.09
COURAGE <sup>17</sup>	0.60 (0.48-0.74)	<.001
BARI 2D <sup>14</sup>	0.61 (0.46-0.80)	<.001
FAME 2 <sup>16</sup>	0.13 (0.07-0.24)	<.001
Overall	0.64 (0.35-1.17)	.14



## Angina en el seguimiento

Source	OR (95% CI)	P Value
Hambrecht <sup>15</sup>	6.82 (0.79-58.85)	.08
MASS II <sup>13</sup>	3.06 (0.83-11.29)	.09
COURAGE <sup>17</sup>	0.91 (0.74-1.10)	.33
BARI 2D <sup>14</sup>	0.87 (0.59-1.28)	.47
FAME 2 <sup>16</sup>	0.42 (0.25-0.72)	<.001
Overall	0.90 (0.57-1.44)	.67



# ¿Conclusiones?

## Box 1 Summary of our comments and suggestions

- ▶ Medical treatment should be the initial management of the patient with stable chest pain. Strong recommendation, high quality data (class IA).
- ▶ Percutaneous opening of a chronic total coronary occlusion is not recommended. High quality data (class IIIA).
- ▶ The composition of the guideline committee must be representative of the profession at large.
- ▶ The number of recommendations per guideline should be limited (eg, between 20 and 30), and be based on sound (high quality) clinical evidence.
- ▶ As a rule, recommendations based on opinion are not very useful and should be avoided. This pertains to most class II recommendations.
- ▶ The scope of the guidelines must not be too wide.
- ▶ New versions of guidelines must build on and expand on previous versions, and relevant changes in recommendations must be addressed specifically.

# Conclusiones

<p>Percutaneous revascularization of CTOs should be considered in patients with angina resistant to medical therapy <del>or with a large area of documented ischaemia in the territory of the occluded vessel.</del> <sup>629,659-663</sup></p>	<del>IIa</del>	<del>B</del>
---	----------------	--------------

<p>La revascularización de CTO se debería considerar en pacientes con angina severa a pesar de TMO</p>	II b	C
<p>O en el Contexto de un Ensayo Clínico</p>	I	C