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**Sessão Especial II - Cardiologia Clínica**  
**Publicações de impacto no último ano**  
**- foco em métodos diagnósticos**



29º  
CONGRESSO  
DE CARDIOLOGIA  
DO ESTADO DA BAHIA

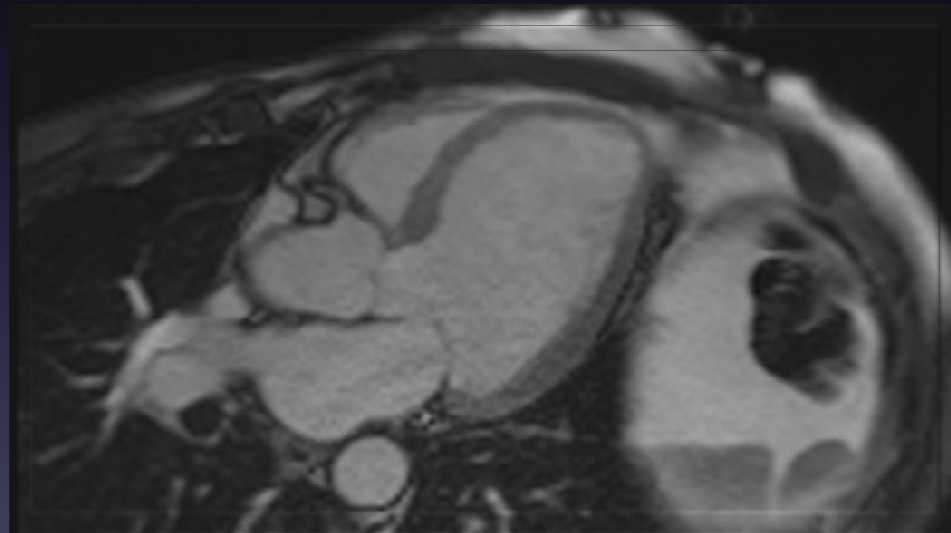
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Bahia Othon Palace

# Ressonância Magnética Cardíaca & Angiotomografia Cardíaca

**Jorge Andion Torreão**

*[jatorreao@hotmail.com](mailto:jatorreao@hotmail.com)*

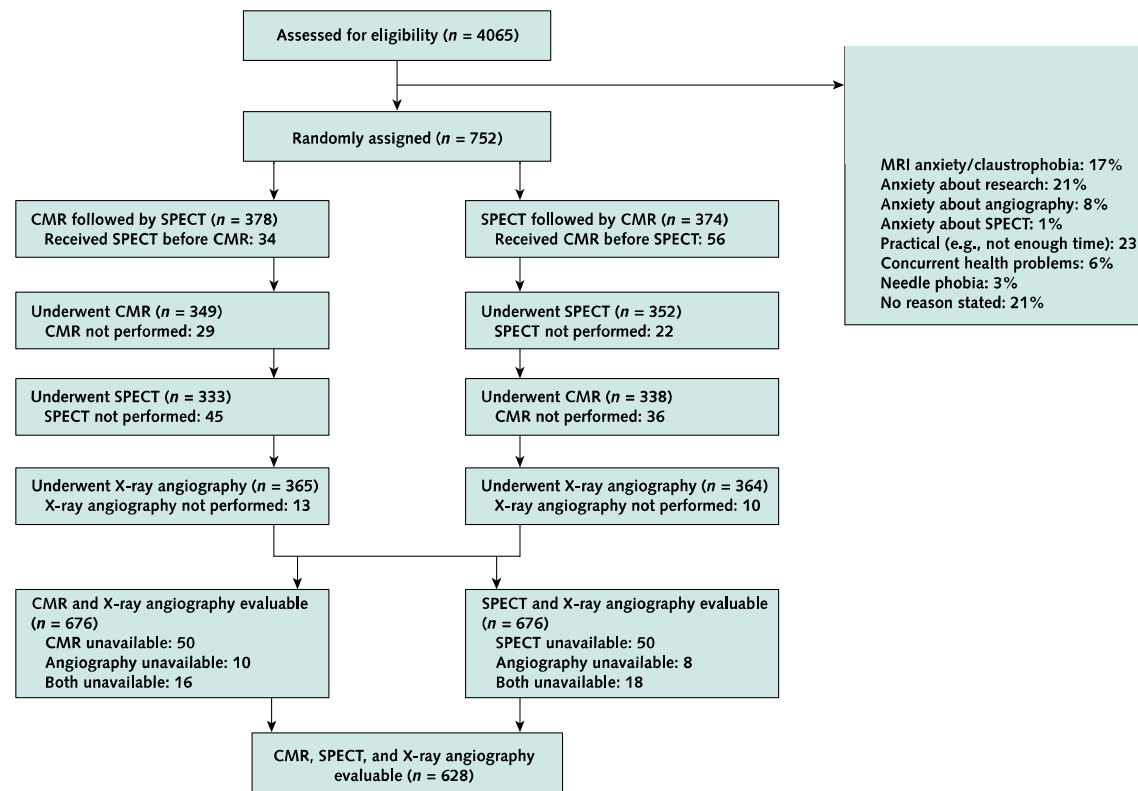
# RESSONÂNCIA MAGNÉTICA CARDÍACA



# Prognostic Value of Cardiovascular Magnetic Resonance and Single-Photon Emission Computed Tomography in Suspected Coronary Heart Disease: Long-Term Follow-up of a Prospective, Diagnostic Accuracy Cohort Study

John P. Greenwood, MB ChB, PhD; Bernhard A. Herzog, MD; Julia M. Brown, MSc; Colin C. Everett, MSc; Jane Nixon, PhD; Petra Bijsterveld, MA; Neil Maredia, MB ChB, MD; Manish Motwani, MB ChB, PhD; Catherine J. Dickinson, BM BCh, MA, PhD; Stephen G. Ball, MB BChir, PhD; and Sven Plein, MD, PhD

Figure 1. Study flow diagram.



CMR = cardiovascular magnetic resonance; MRI = magnetic resonance imaging; SPECT = single-photon emission computed tomography.

Média:  
60 anos

# Prognostic Value of Cardiovascular Magnetic Resonance and Single-Photon Emission Computed Tomography in Suspected Coronary Heart Disease: Long-Term Follow-up of a Prospective, Diagnostic Accuracy Cohort Study

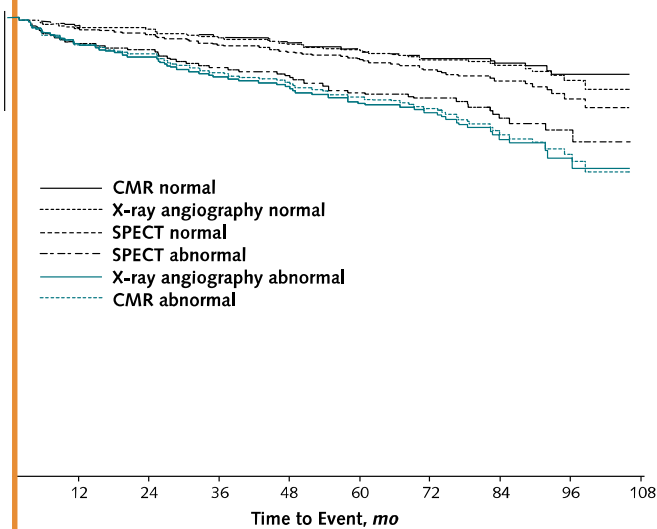
John P. Greenwood, MB ChB, PhD; Bernhard A. Herzog, MD; Julia M. Brown, MSc; Colin C. Everett, MSc; Jane Nixon, PhD; Petra Bijsterveld, MA; Neil Maredia, MB ChB, MD; Manish Motwani, MB ChB, PhD; Catherine J. Dickinson, BM BCh, MA, PhD; Stephen G. Ball, MB BChir, PhD; and Sven Plein, MD, PhD

**Table 4.** Predictors of MACEs, by Multivariable Analysis

Predictor	Hazard Ratio (95% CI)	P Value
<b>CMR</b>		
Abnormal result	2.3 (1.5–3.6)	<0.001
Age	1.0 (1.0–1.1)	<0.001
Male sex	1.1 (0.71–1.7)	>0.20
Diabetes mellitus	1.1 (0.65–2.0)	>0.20
Current smoker	1.2 (0.67–2.0)	>0.20
Total cholesterol	0.99 (0.83–1.2)	>0.20
Hypertension	1.0 (0.70–1.5)	>0.20
Family history	0.86 (0.57–1.3)	>0.20
<b>SPECT</b>		
Abnormal result	1.41 (0.94–2.1)	0.10
Age	1.1 (1.0–1.1)	<0.001
Male sex	1.2 (0.79–1.9)	>0.20
Diabetes mellitus	1.2 (0.71–2.1)	>0.20
Current smoker	1.2 (0.7–2.1)	>0.20
Total cholesterol	1.0 (0.84–1.2)	>0.20
Hypertension	1.1 (0.72–1.6)	>0.20
Family history	0.95 (0.63–1.4)	>0.20

CMR = cardiovascular magnetic resonance; MACE = major cardiovascular event; SPECT = single-photon emission computed tomography.

Events, by modality (CMR, SPECT, and X-ray angiography).



Time to Event, mo	0	12	24	36	48	60	72	84	96	108
CMR normal	342	338	327	322	316	255	169	50		
X-ray angiography normal	262	253	238	230	220	182	94	45		
SPECT normal	387	380	366	359	151	281	177	63		
SPECT abnormal	217	211	199	193	185	156	86	32		
X-ray angiography abnormal	370	367	356	351	344	281	184	64		
CMR abnormal	234	224	209	201	192	156	79	31		

major cardiovascular event; SPECT = single-photon emission computed tomography.

## **Prognostic Value of Cardiovascular Magnetic Resonance and Single-Photon Emission Computed Tomography in Suspected Coronary Heart Disease: Long-Term Follow-up of a Prospective, Diagnostic Accuracy Cohort Study**

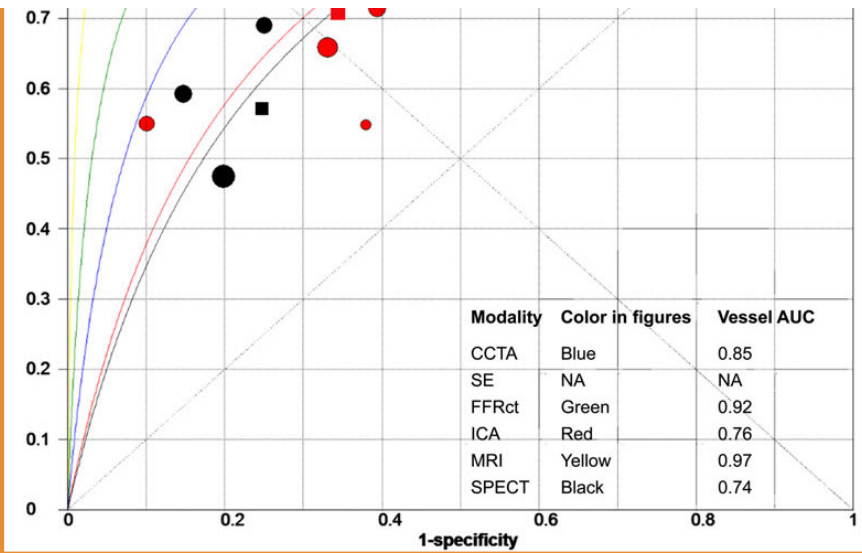
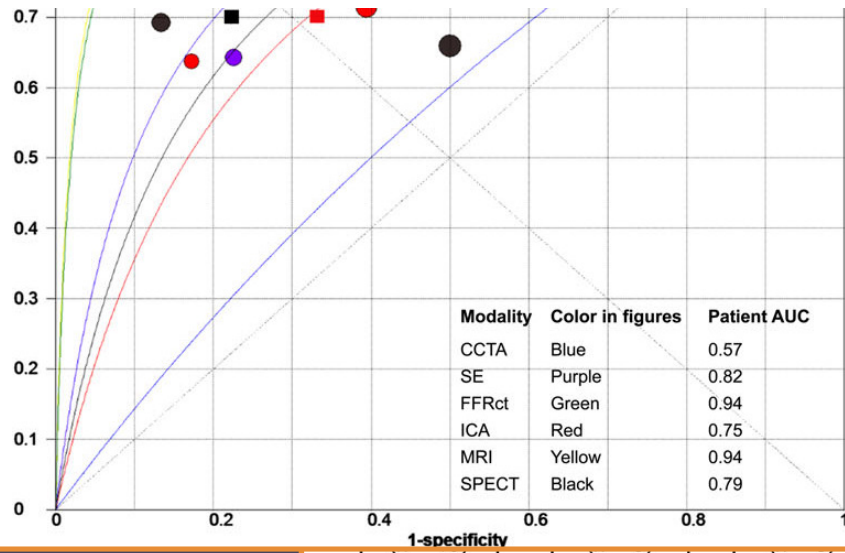
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**Em conclusão, no seguimento de 5 anos do CE-MARC foi demonstrado que, em comparação com o SPECT, a RMC foi um preditor de risco mais forte para MACE, independente dos fatores de risco cardiovasculares clínicos, do resultado da angiografia ou do tratamento inicial do paciente.**



EUROPEAN  
SOCIETY OF  
CARDIOLOGY

# Dia me





European Heart Journal (2017) 38, 991–998  
doi:10.1093/eurheartj/ehw095

META-ANALYSIS  
Imaging

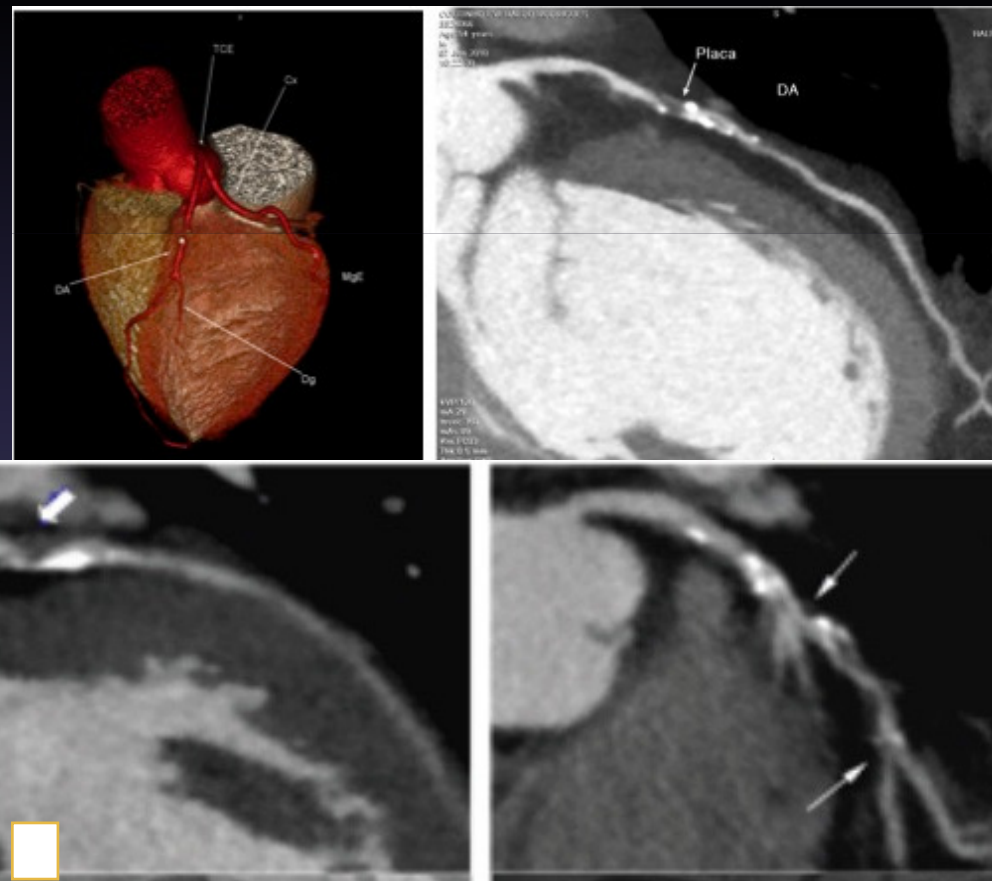
## Diagnostic performance of cardiac imaging methods to diagnose ischaemia-causing coronary artery disease when directly compared with fractional flow reserve as a reference standard: a meta-analysis

Ibrahim Danad<sup>1,2</sup>, Jackie Szymonifka<sup>1,2</sup>, Jos W.R. Twisk<sup>3</sup>, Bjarne L. Norgaard<sup>4</sup>, Christopher K. Zarins<sup>5,6</sup>, Paul Knaapen<sup>7</sup>, and James K. Min<sup>1,2\*</sup>

<sup>1</sup>Department of Radiology, Weill Cornell Medical College, New York, NY, USA; <sup>2</sup>Dalio Institute of Cardiovascular Imaging, New York-Presbyterian Hospital, New York, NY, USA; <sup>3</sup>Department of Epidemiology and Biostatistics, VU University Medical Center, VU University, Amsterdam, The Netherlands; <sup>4</sup>Department of Cardiology, Aarhus University Hospital Skejby, Aarhus, Denmark; <sup>5</sup>Department of Surgery, Stanford University Medical Center, Stanford, CA, USA; <sup>6</sup>HeartFlow, Inc., Redwood City, CA, USA; and <sup>7</sup>Department of Cardiology,

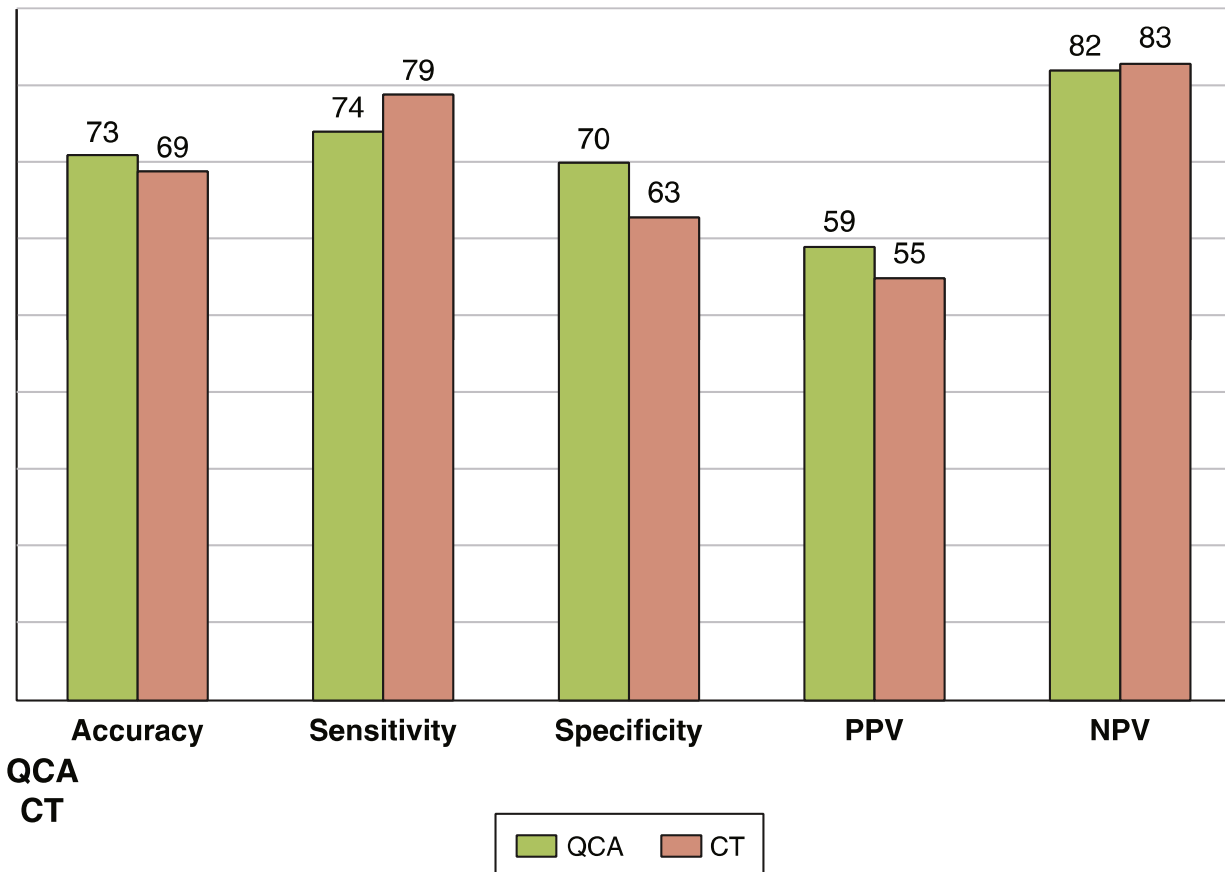
**CONCLUSÕES:** Nesta meta-análise, que comparou métodos de imagem cardíaca diretamente com a FFR, a RMC sob estresse teve o melhor desempenho para o diagnóstico de DAC com isquemia, seguidos da FFR-TC, ECO stress e CMPE, respectivamente.

# ANGIOTOMOGRAFIA CARDÍACA





**FIGURE 1** Per-Patient Diagnostic Performance of Both Cardiac CT Scans and Invasive Angiography



252 pacientes

## CT Angiography for the Prediction of Hemodynamic Significance in Intermediate and Severe Lesions

Head-to-Head Comparison With Quantitative Coronary Angiography Using Fractional Flow Reserve as the Reference Standard

Matthew J. Budoff, MD,<sup>a</sup> Ryo Nakazato, MD,<sup>b</sup> G.B. John Mancini, MD,<sup>c</sup> Heidi Gransar, PhD,<sup>b</sup> Jonathon Leipsic, MD,<sup>c</sup> Daniel S. Berman, MD,<sup>b</sup> James K. Min, MD<sup>d</sup>

**Angio-TC e CATE apresentaram desempenho diagnóstico semelhante para a detecção e exclusão de isquemia, utilizando o padrão-ouro de referência (FFR).**

381 patients

# Prognostic Value of Combined CT Angiography and Myocardial Perfusion Imaging versus Invasive Coronary Angiography and Nuclear Stress Perfusion Imaging in the Prediction of Major Adverse Cardiovascular Events: The CORE320 Multicenter Study<sup>1</sup>

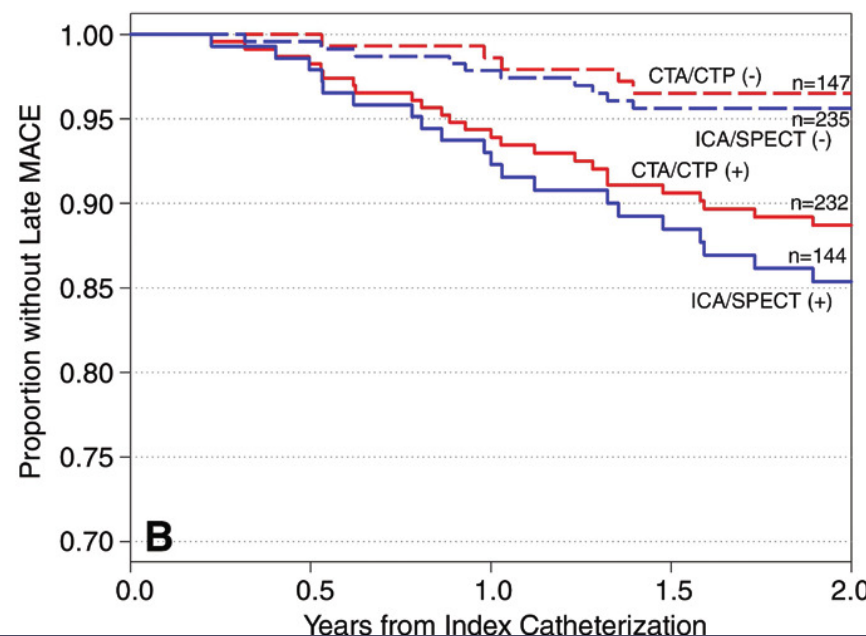
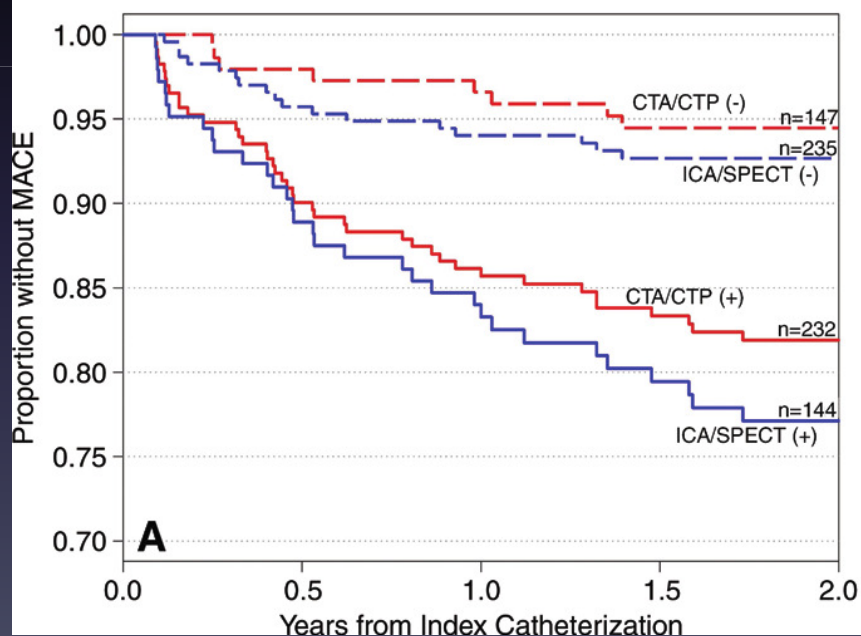
ORIGINAL RESEARCH ■ CARDIAC IMAGING

Marcus Y. Chen, MD  
 Carlos E. Rochitte, MD, PhD  
 Armin Arbab-Zadeh, MD, MPH, PhD  
 Marc Dewey, MD, PhD  
 Richard T. George, MD  
 Julie M. Miller, MD  
 Hiroyuki Niinuma, MD, PhD  
 Kunihiro Yoshioka, MD, PhD  
 Kakuya Kitagawa, MD  
 Hajime Sakuma, MD, PhD  
 Roger Laham, MD  
 Andrea L. Vavere, MS, MPH  
 Rodrigo J. Cerci, MD  
 Vishal C. Mehra, MD, PhD  
 Cesar Nomura, MD  
 For the CORE320 Investigators

381 pacientes

Angio-TC + TCP  
 X  
 CATE + CMPE

Figure 1

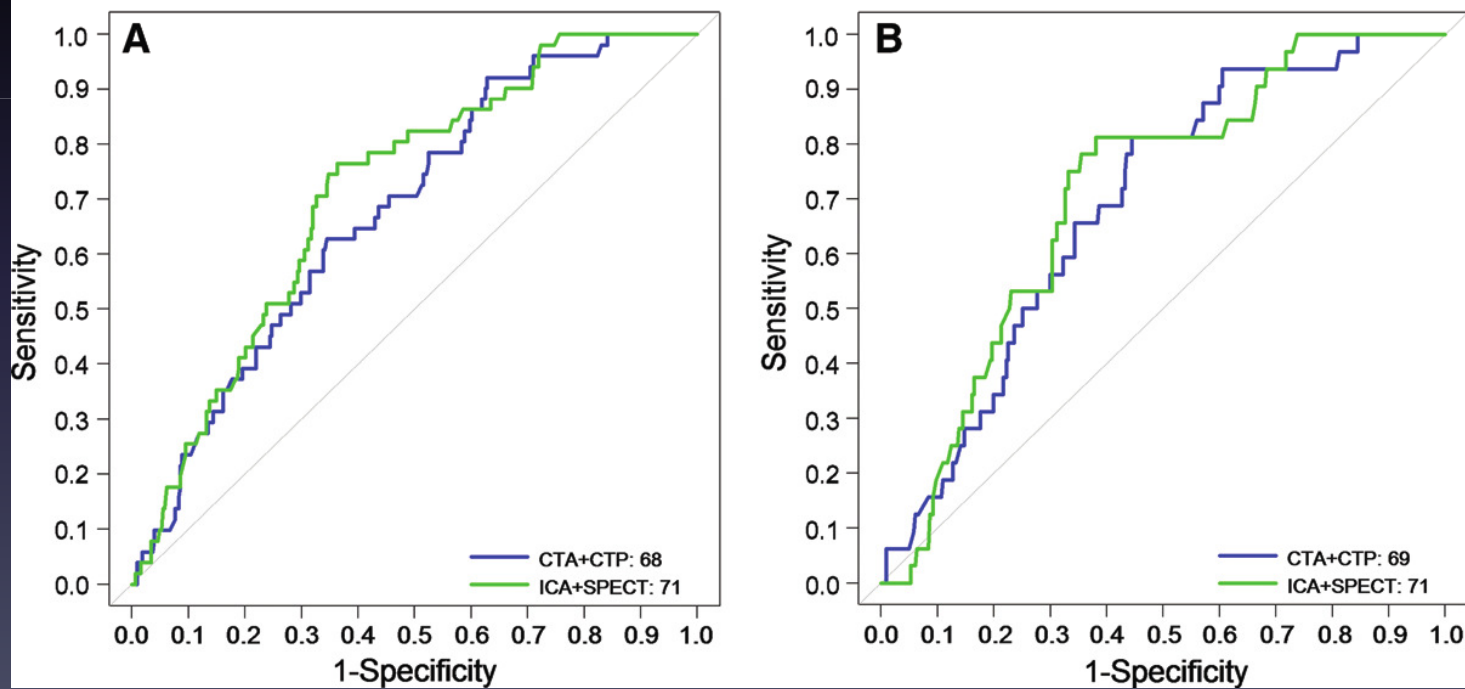


381 patients

# Prognostic Value of Combined CT Angiography and Myocardial Perfusion Imaging versus Invasive Coronary Angiography and Nuclear Stress Perfusion Imaging in the Prediction of Major Adverse Cardiovascular Events: The CORE320 Multicenter Study<sup>1</sup>

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 For the CORE320 Investigators

Figure 3



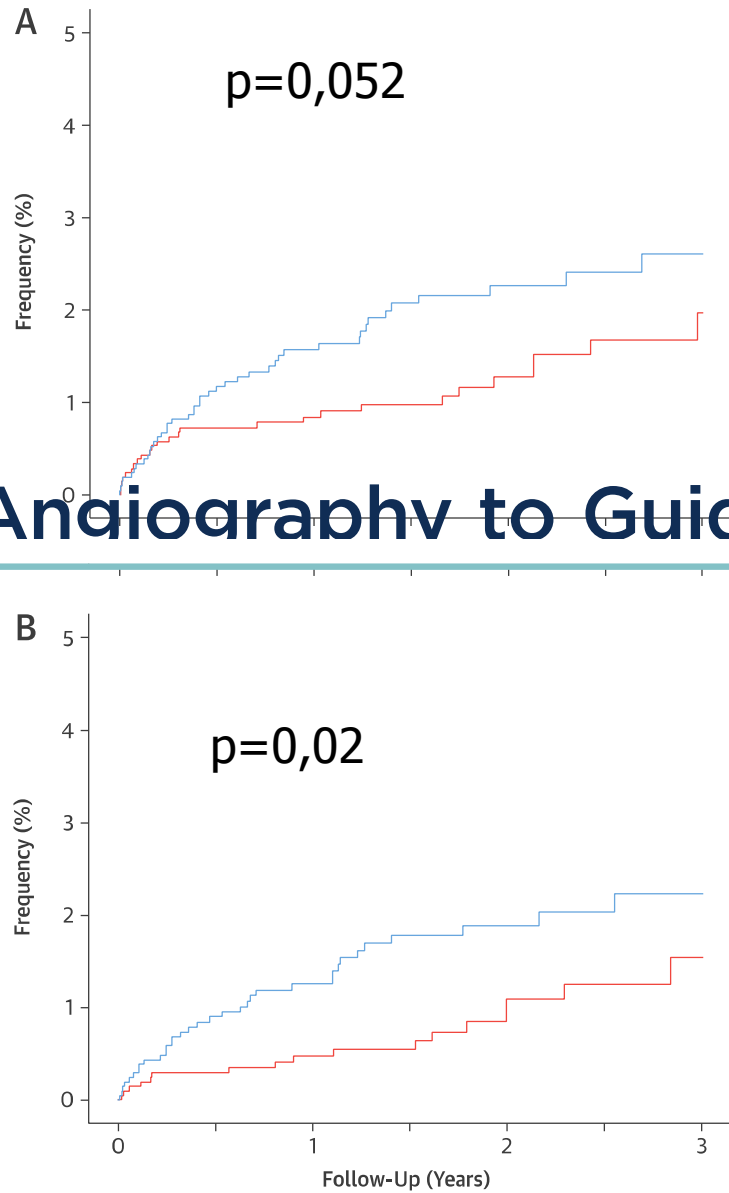
381 patients

**Prognostic Value of Combined CT Angiography and Myocardial Perfusion Imaging versus Invasive Coronary Angiography and Nuclear Stress Perfusion Imaging in the Prediction of Major Adverse Cardiovascular Events: The CORE320 Multicenter Study<sup>1</sup>**

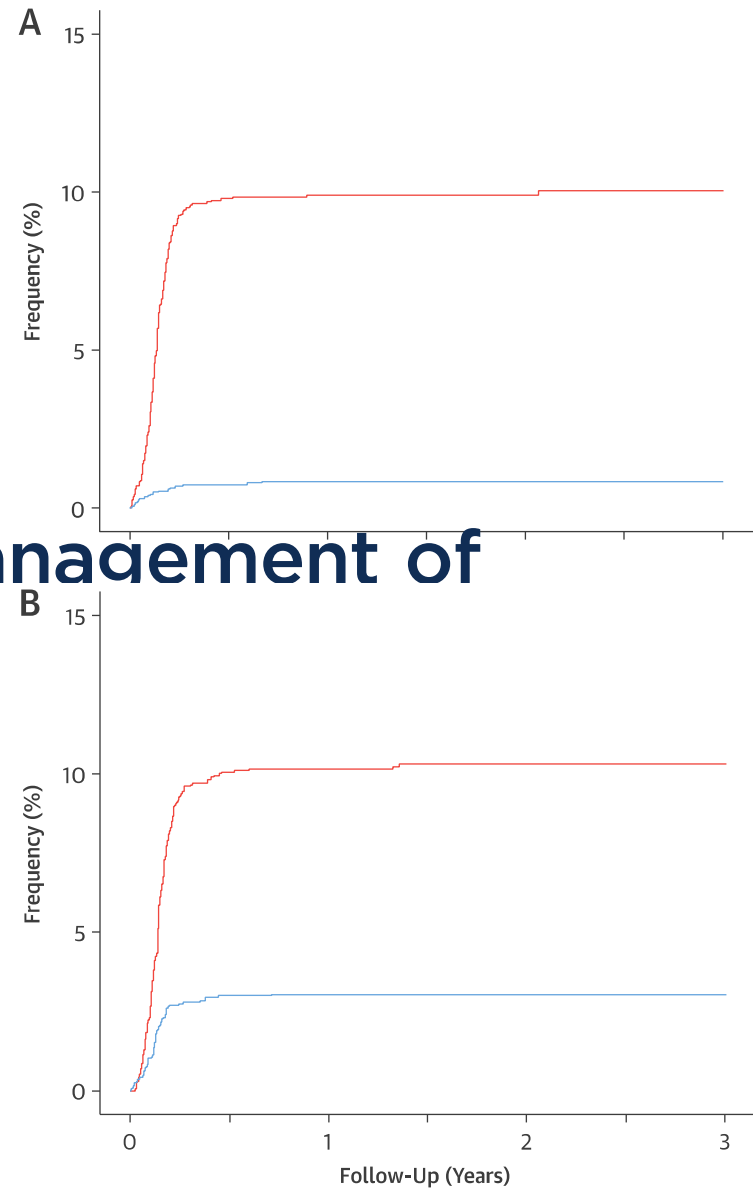
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Vishal C. Mehra, MD, PhD  
Cesar Nomura, MD  
For the CORE320 Investigators

**A angiografia (Angio-TC) combinada com perfusão de TC (TCP) permitem uma predição similar de sobrevida livre de eventos semelhantes àquela prevista pelo CATE e SPECT combinados.**

**FIGURE 3** Fatal and Nonfatal Myocardial Infarction With and Without the 50-Day Implementation Delay



**FIGURE 2** Timing of Initiation of New Preventive Therapies



# Angiography to Guide Management of

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PHD,<sup>g</sup>  
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**CENTRAL ILLUSTRATION** Clinical Effect of CCTA in Suspected Angina Pectoris: Coronary Heart Disease Death and Nonfatal Myocardial Infarction

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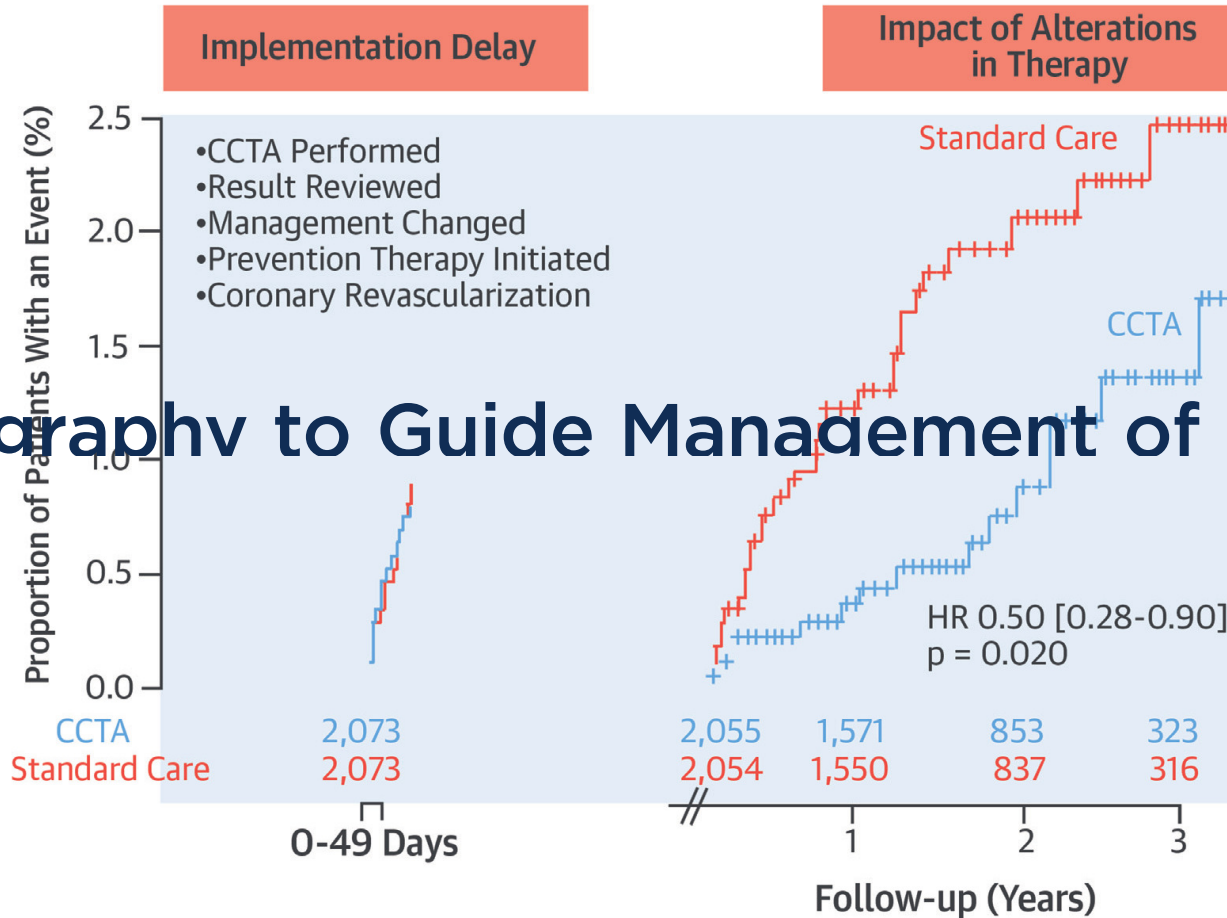
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Angiography to Guide Management of  
Pa

Michel  
Stepha  
Marcu  
Adam

CHD Death and Non-fatal MI, Post hoc 50-Day Landmark Analysis



Williams, M.C. et al. J Am Coll Cardiol. 2016;67(15):1759-68.

Post hoc landmark analysis at 50 days to account for the implementation and treatment delay consequent on the conduct, reporting, and communication of the coronary computed tomography angiography (CCTA) findings. HR = hazard ratio.

ORIGINAL INVESTIGATIONS

# Use of Coronary Computed Tomographic Angiography to Guide Management of Patients With Coronary Disease



Michelle C. Williams, MD,<sup>a</sup> Amanda Hunter, MD,<sup>a</sup> Anoop S.V. Shah, MD,<sup>a</sup> Valentina Assi, PhD,<sup>b</sup> Stephanie Lewis, PhD,<sup>b</sup> Joel Smith, PhD,<sup>c</sup> Colin Berry, MD,<sup>d</sup> Nicholas A. Boon, MD,<sup>a</sup> Elizabeth Clark,<sup>a</sup> Marcus Flather, MD,<sup>e</sup> John Forbes, PhD,<sup>f</sup> Scott McLean, PhD,<sup>g</sup> Giles Roditi, MD,<sup>d</sup> Edwin J.R. van Beek, MD,<sup>a</sup> Adam D. Timmis, MD,<sup>h</sup> David E. Newby, MD,<sup>a</sup> on behalf of the SCOT-HEART Investigators

**Em pacientes com suspeita de angina devido a doença coronariana, a CCTA leva a um uso mais apropriado da angiografia invasiva e a alterações em terapias preventivas que foram associadas com a redução para metade do infarto do miocárdio fatal e não fatal.**



**Table 2. Inclusion and Exclusion Criteria for Each Study**

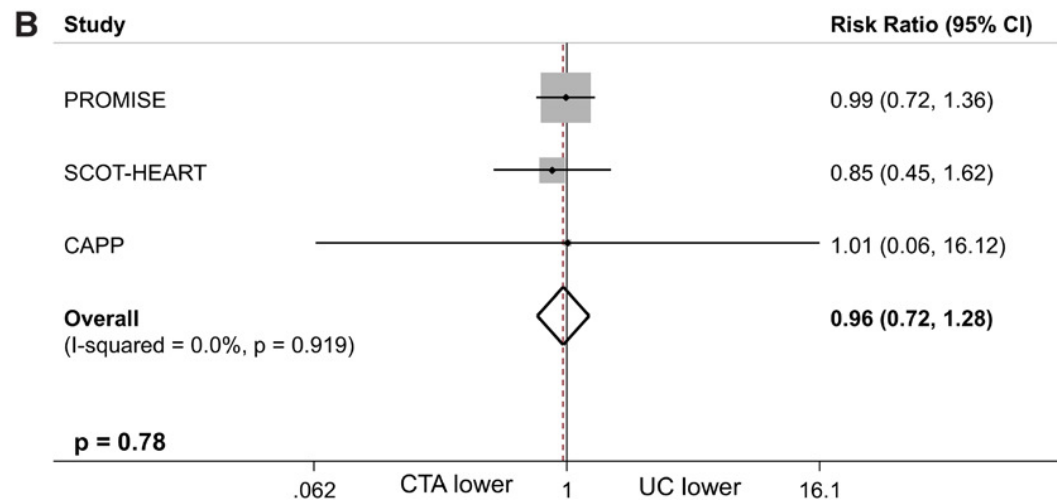
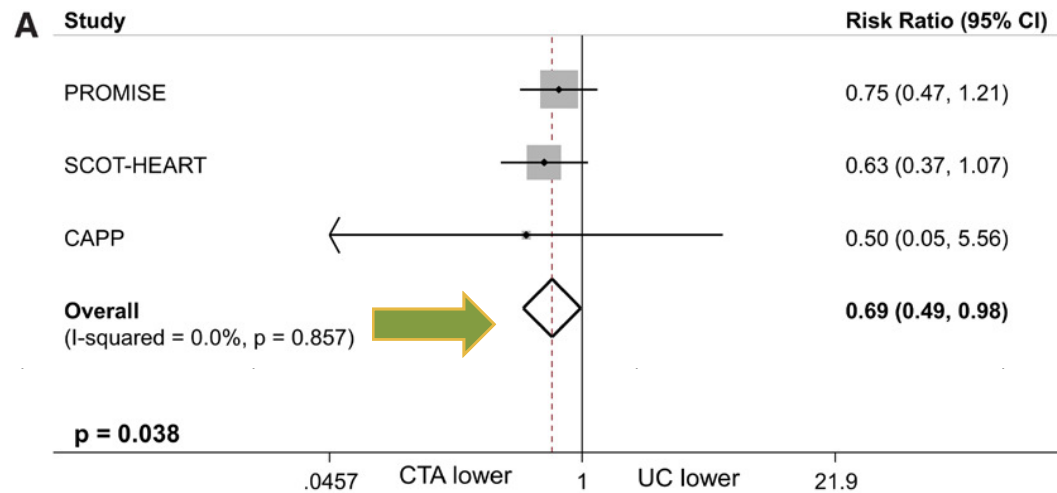
Study	Inclusion and Exclusion Criteria	Exclusion Criteria
PROMISE <sup>14</sup>	Symptomatic, nonurgent	Previous CAD, previous

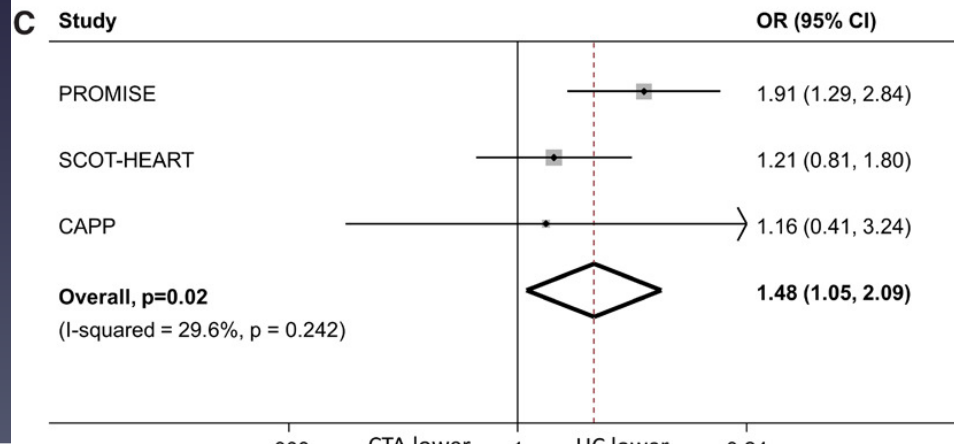
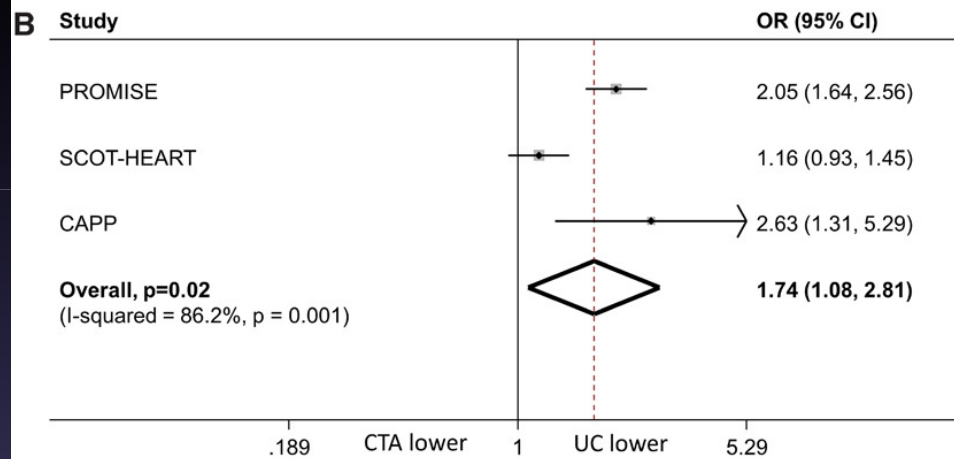
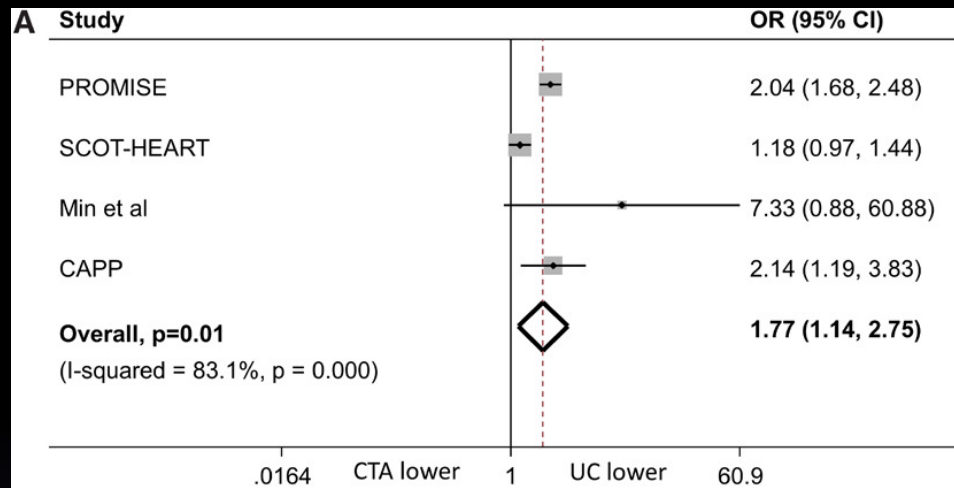
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Márcio Son

Computed  
Analysis  
Michael Cheezum,

Circulation: Ca

Greenville Avenue,





REVASCULARIZAÇÃO

ANGIOPLASITA

CIRURGIA

## Clinical Outcomes After Evaluation of Stable Chest Pain by Coronary Computed Tomographic Angiography Versus Usual Care: A Meta-Analysis

Márcio Sommer Bittencourt, Edward A. Hulten, Venkatesh L. Murthy, Michael Cheezum, Carlos E. Rochitte, Marcelo F. Di Carli and Ron Blankstein

*Circ Cardiovasc Imaging.* 2016;9:

doi: 10.1161/CIRCIMAGING.115.004419

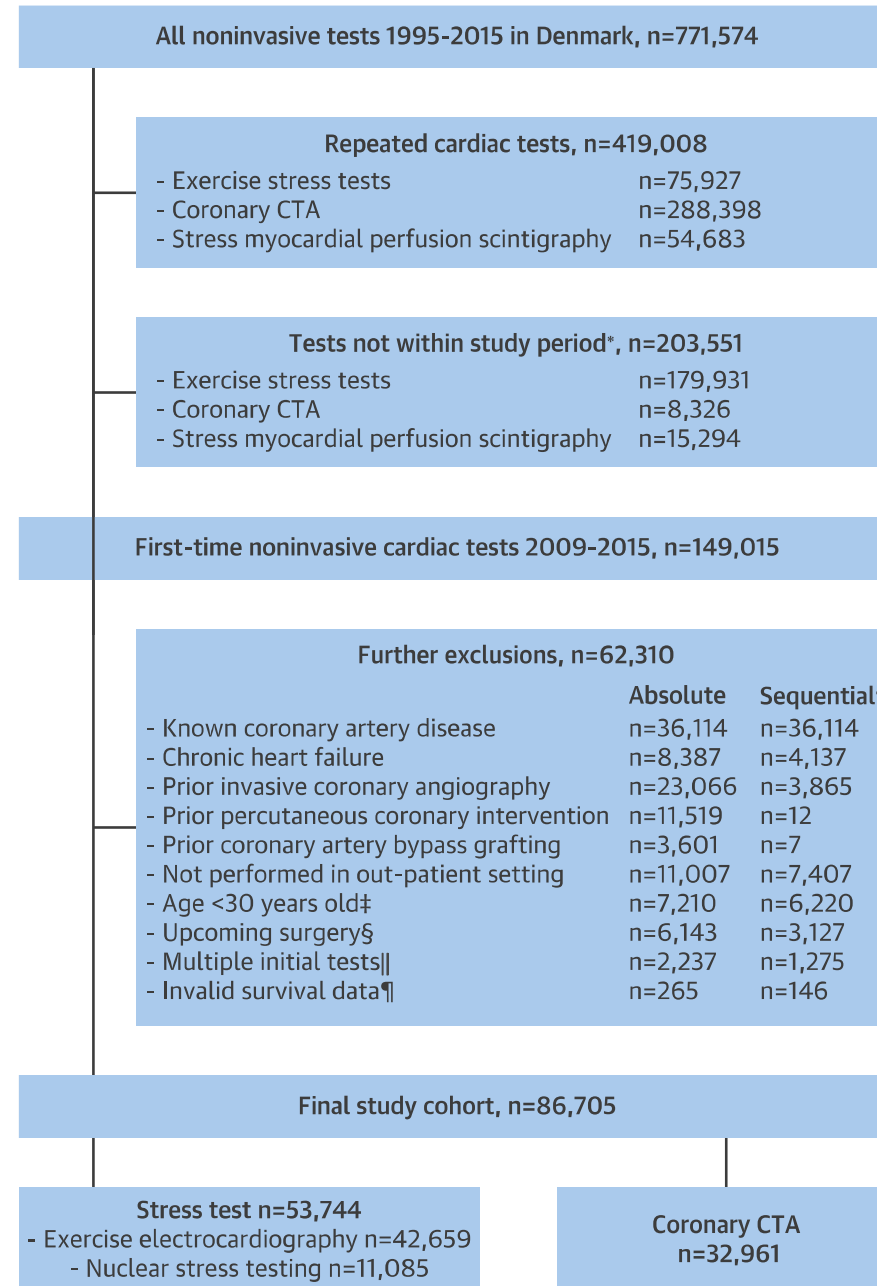
*Circulation: Cardiovascular Imaging* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

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Print ISSN: 1941-9651. Online ISSN: 1942-0080

**CONCLUSÕES:** O uso da Angio-TC em uma investigação doença arterial coronária em comparação com os cuidados habituais, (teste funcionais) em uma investigação doença arterial coronária resultou em uma redução significativa de infarto do miocárdio, uma maior incidência de revascularização coronária, e nenhum efeito em todas as causas de mortalidade.

**FIGURE 1** Flowchart



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**ORIGINAL**

**Functional  
Tomography  
Stability**

Mads E. Jørgensen  
Jawdat Abumeharik  
Gunnar H. Gøtzsche

9, NO. 14, 2017  
\$5-1097/\$36.00  
doi:10.1177/096914291701046

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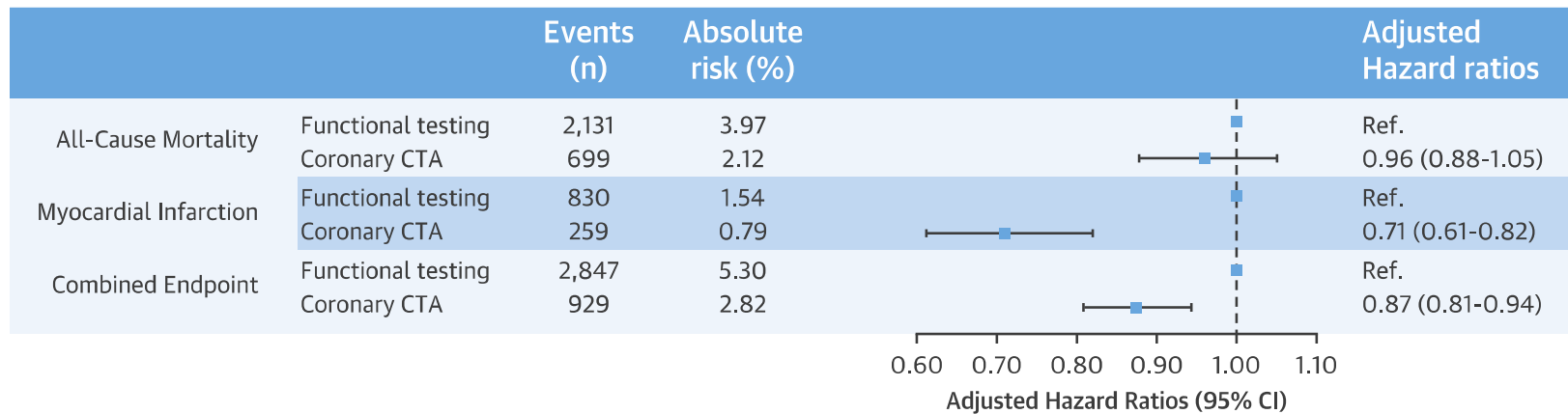
ORIGINAL INVESTIGATIONS

## Functional Testing or Coronary Computed Tomography Angiography in Patients With Stable Coronary Artery Disease



Mads E. Jørgensen, MB,<sup>a,b</sup> Charlotte Andersson, MD, PhD,<sup>b,c</sup> Bjarne L. Nørgaard, MD, PhD,<sup>d</sup> Jawdat Abdulla, MD, PhD,<sup>e</sup> Jacqueline B. Shreibati, MD,<sup>a</sup> Christian Torp-Pedersen, DMSc,<sup>e</sup> Gunnar H. Gislason, MD, PhD,<sup>b,d</sup> Richard E. Shaw, MA, PhD,<sup>a</sup> Mark A. Hlatky, MD<sup>a</sup>

### CENTRAL ILLUSTRATION Long-Term Risks of All-Cause Mortality and MI



Jørgensen, M.E. et al. *J Am Coll Cardiol.* 2017;69(14):1761-70.

Median follow-up was 3.6 years (interquartile range: 2.0 to 5.3 years; range: 0.0 to 7.0 years). All analyses were adjusted for sex, age, calendar year, prior echocardiography, medications, and comorbidities listed in [Table 1](#). Myocardial infarctions (MIs) included fatal and nonfatal events. The combined endpoint included all-cause mortality and myocardial infarction. Patients who had an MI and later died were censored at the time of the MI event. CI = confidence interval; CTA = computed tomography angiography.

ORIGINAL INVESTIGATIONS

## Functional Testing or Coronary Computed Tomography Angiography in Patients With Stable Coronary Artery Disease



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**Em pacientes estáveis submetidos à avaliação inicial de suspeita de doença arterial coronariana, a CTA coronária foi associada a maior uso de estatinas, aspirina e procedimentos invasivos, e custos mais elevados do que os testes funcionais. O CTA coronariano foi associado a um menor risco de IM, mas um risco semelhante de mortalidade por todas as causas.**

**OBRIGADO!**