The DISCHARGE Trial

An Irish Perspective

Professor Jonathan Dodd
St. Vincent's University hospital
and
University College Dublin

UCD DUBLIN
UCD School of Medicine
Scoil an Leighis UCD

ST. VINCENT'S UNIVERSITY HOSPITAL
Elm Park

European Commission

SEVENTH FRAMEWORK PROGRAMME

CHARITÉ
UNIVERSITÄTSMEDIZIN BERLIN

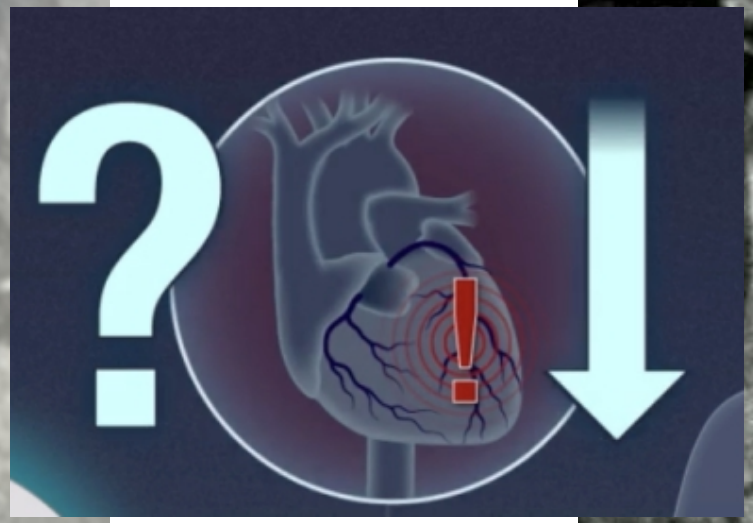
SCCT2023
Boston | July 27 - 30

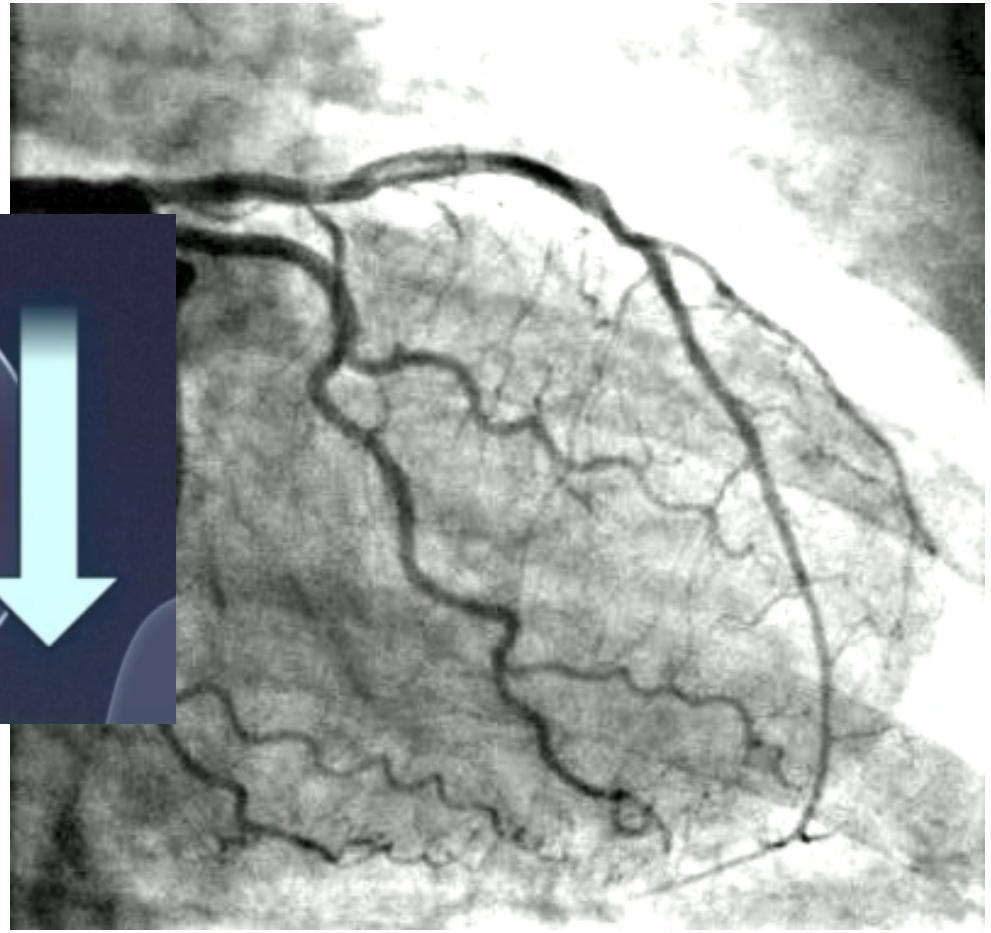
Overview of talk

- Synopsis of the DISCHARGE trial
- New analysis from the trial:
  - Additional functional testing
  - Revascularisation
  - Major procedure-related complications
- Trial implications and conclusions

Why the DISCHARGE Trial?

DISCHARGE Trial





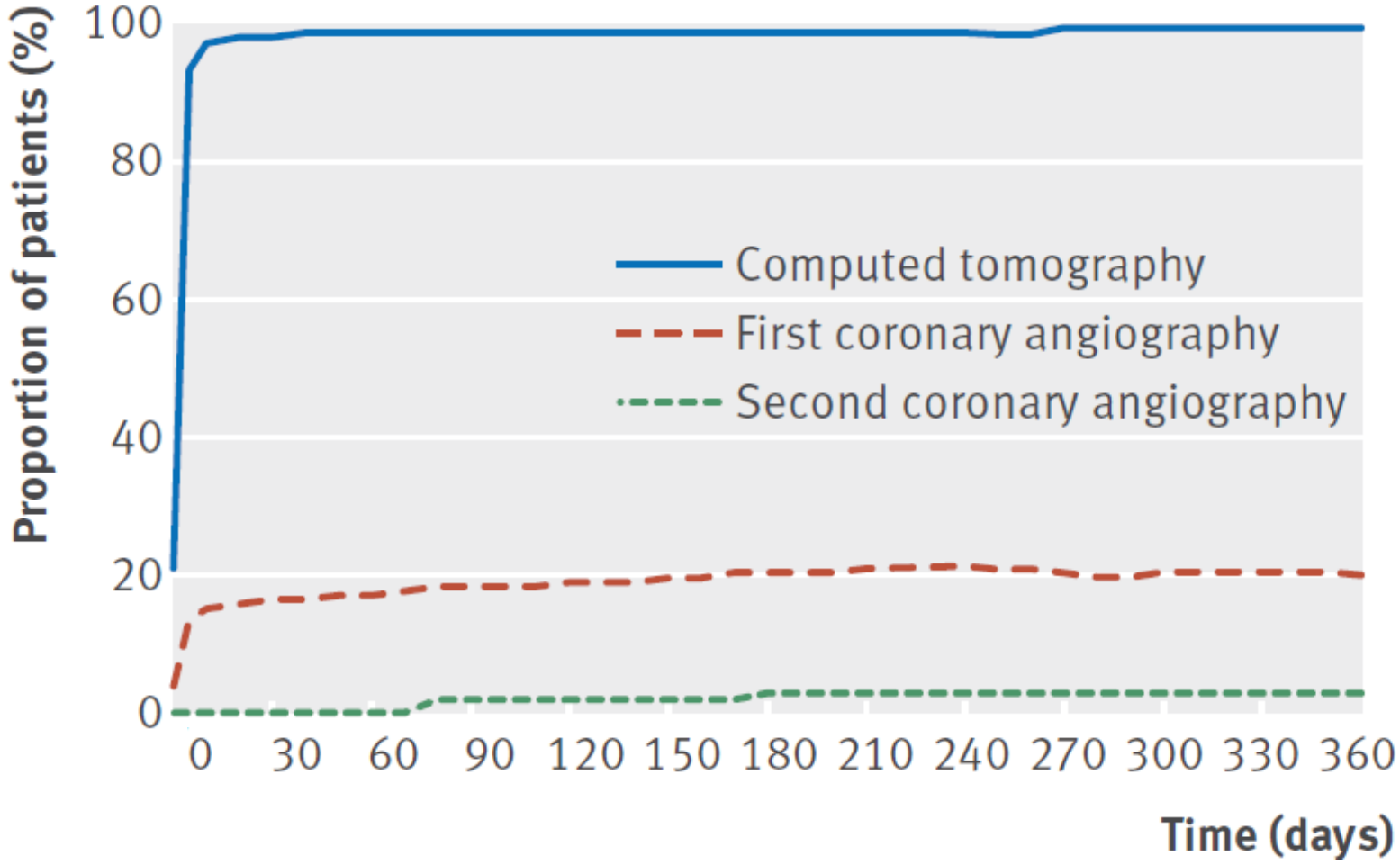
Cardiac CT

Invasive coronary angiography

The DISCHARGE Trial Group *NEJM* 2022

CAD-Man Trial

Only 20% of CT-Strategy Patients Need Coronary Angiography



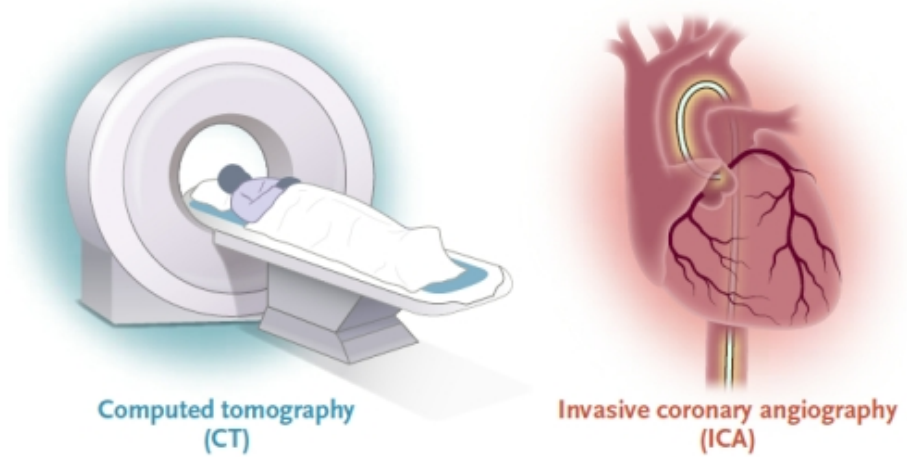
Dewey et al. *BMJ* 2016.

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 28, 2022 VOL. 386 NO. 17

CT or Invasive Coronary Angiography in Stable Chest Pain

The DISCHARGE Trial Group



The NEW ENGLAND JOURNAL of MEDICINE

The DISCHARGE Trial group

ORIGINAL ARTICLE

CT or Invasive Coronary Angiography in Stable Chest Pain

The DISCHARGE Trial Group

https://www.nejm.org/doi/full/10.1056/NEJMoa2200963

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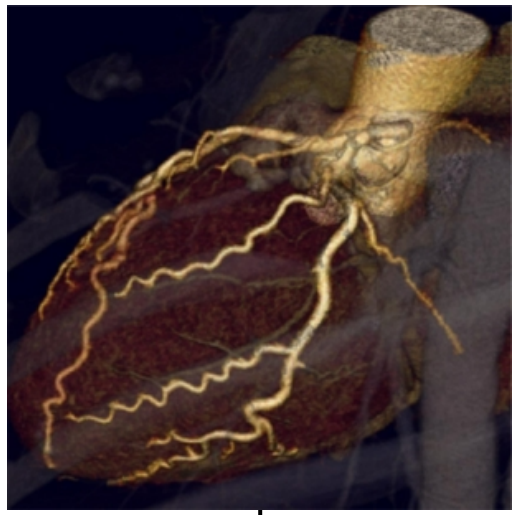
DISCHARGE Trial

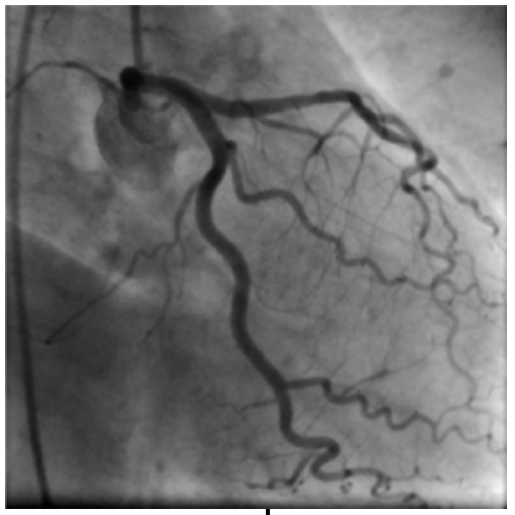
n=3561

Referred for ICA because of stable chest pain

CT (1808)



ICA (1753)



Patient-Relevant Outcomes

MACE (MI, stroke and cardiovascular death)

Major procedure-related complications

3.5 years of follow-up

Napp ,…, Dewey. *Eur Radiol 2017*

www.dischargetrial.eu

DISCHARGE Trial

Multiple observational pilot quality studies:

1. Pre-test probability
2. Patient reported outcomes
3. CT and ICA image acquisition

European Radiology
https://doi.org/10.1007/s00330-020-07175-z

COMPUTED TOMOGRAPHY

Clinical pre-test probability for obstructive coronary artery disease: insights from the European DISCHARGE pilot study

Sarah Feger[1] · Paolo Ibes[1] · Adriane E. Napp[1] · Alexander Lembcke[1] · Michael Laule[1] · Henryk Dreger[1] ·

Rieckmann et al. Health and Quality of Life Outcomes (2020) 18:140
https://doi.org/10.1186/s12955-020-01312-4

Health and Quality of Life Outcomes

RESEARCH Open Access

Health-related qualify of life, angina type and coronary artery disease in patients with stable chest pain

European Radiology (2020) 30:1997–2009
https://doi.org/10.1007/s00330-019-06522-z

CARDIAC

Pilot study of the multicentre DISCHARGE Trial: image quality and protocol adherence results of computed tomography and invasive coronary angiography

www.dischargetrial.eu

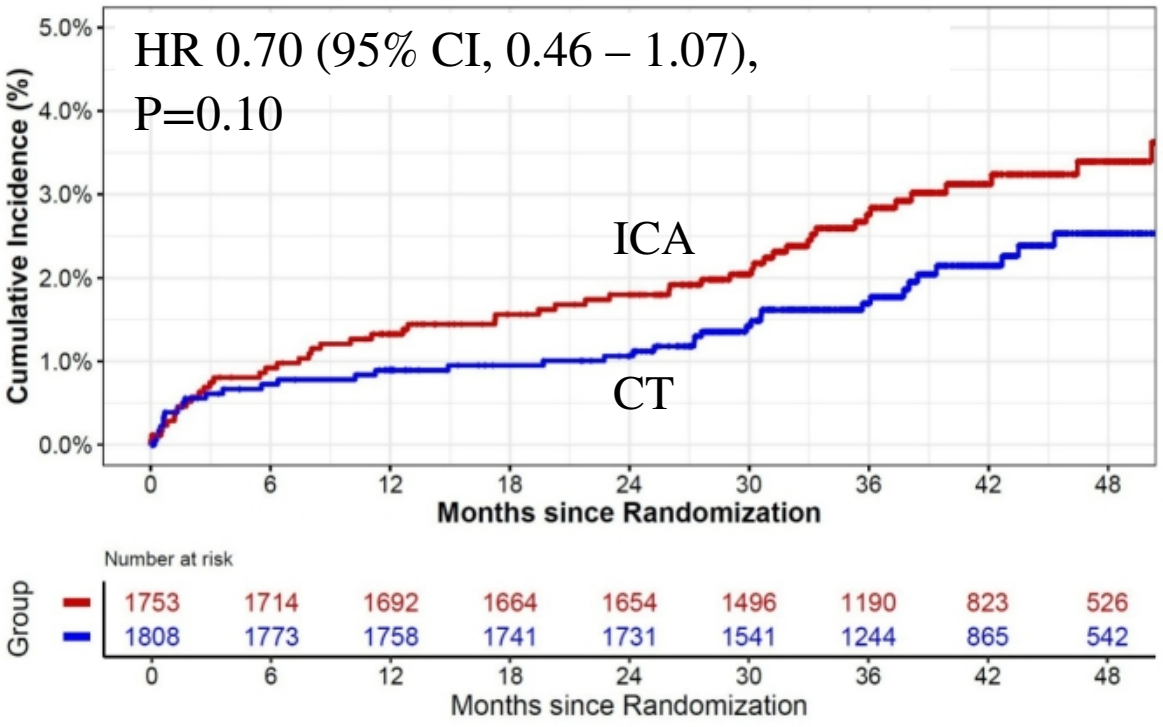
Main Trial Results

Baseline and Follow-up

- Mean patient age was 60.1 years and 56.2% were women
- Women: 2002 (CT: 1019 v ICA: 983); men : 1559 (CT: 789 v ICA: 770)
- 79% were outpatients
- Adherence to assignment was 98.6% in the CT and 97.3% in the ICA group
- Median follow- up obtained for 98.9% of patients

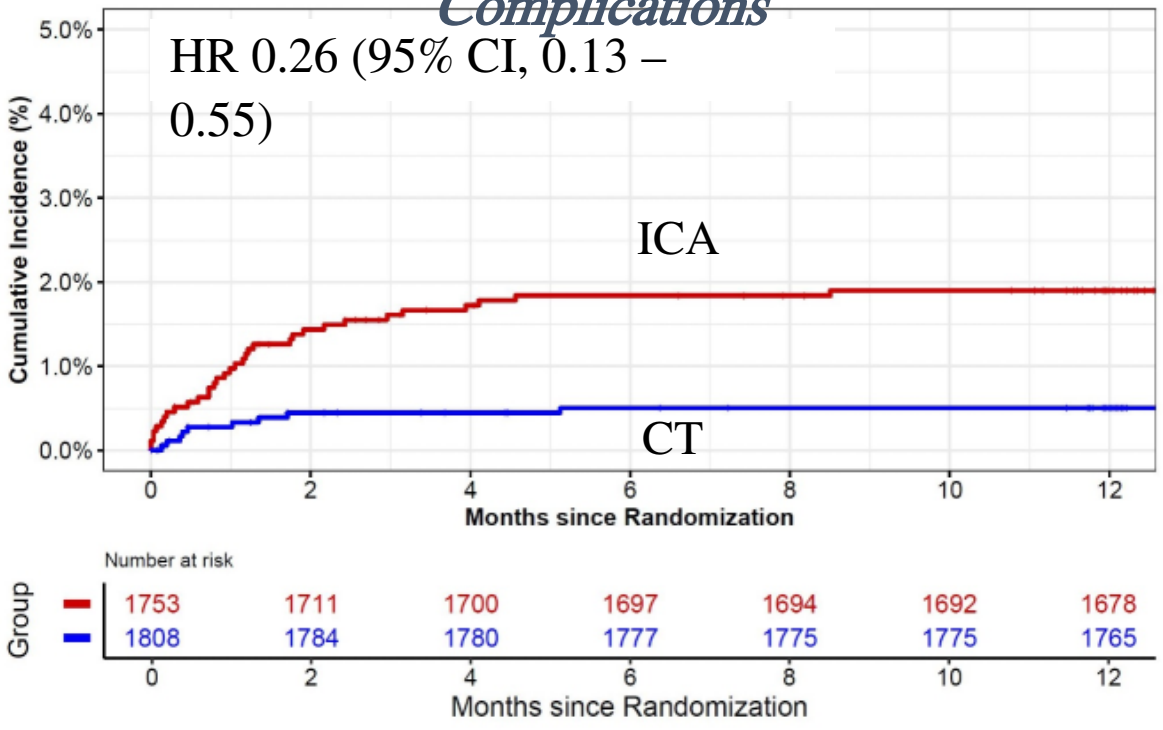
Trial main findings

Primary Outcome (MACE)*



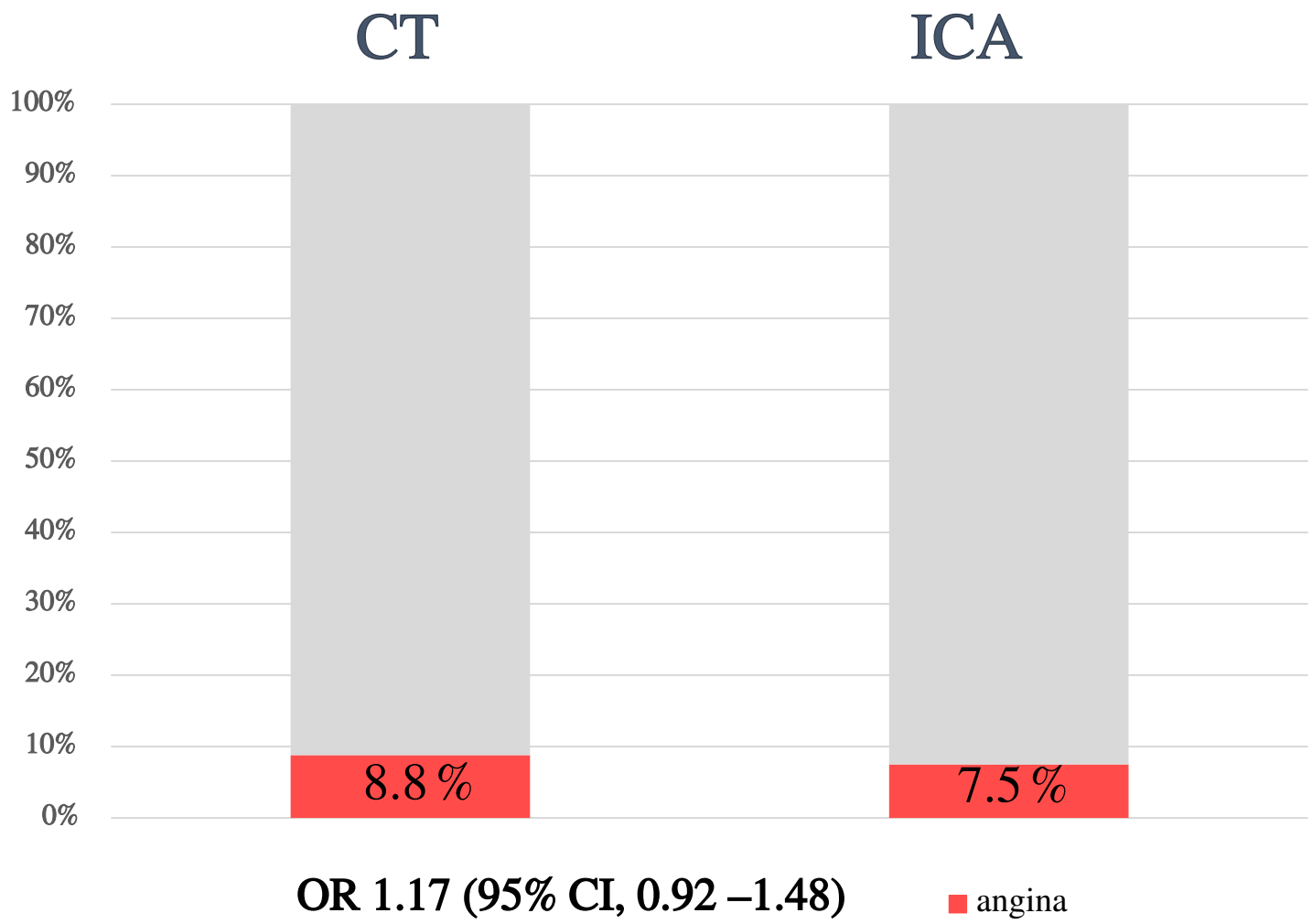
3.0%
vs.
2.1%

Major Procedure-related Complications



1.9%
vs.
0.5%

Angina in the Last 4 Weeks at 3.5 Years



DISCHARGE Trial

Additional Functional Testing
Revascularization
Major procedure-related complications

Additional functional tests in obstructive disease

	CT	ICA
Additional Functional test	**40.9% (190/465)****	24.8% (112/451)

** = P < 0.001

Additional functional tests in obstructive disease

Functional test	CT arm (n=465)	ICA arm (n=451)	P value
Invasive FFR	60 (13.9%)	77 (18.7%)	0.077
Stress PET	53 (11.4%)	9 (2.0%)	**<0.001**
Stress MRI	14 (3.0%)	2 (0.4%)	**0.003**
Stress SPECT	22 (4.7%)	9 (2.0%)	**0.022**
Exercise ECG	36 (7.7%)	17 (3.8%)	**0.01**
Stress Echo	44 (9.5%)	18 (4.0%)	**<0.001**
Total	190 (40.9%)	112 (24.8%)	**<0.001**

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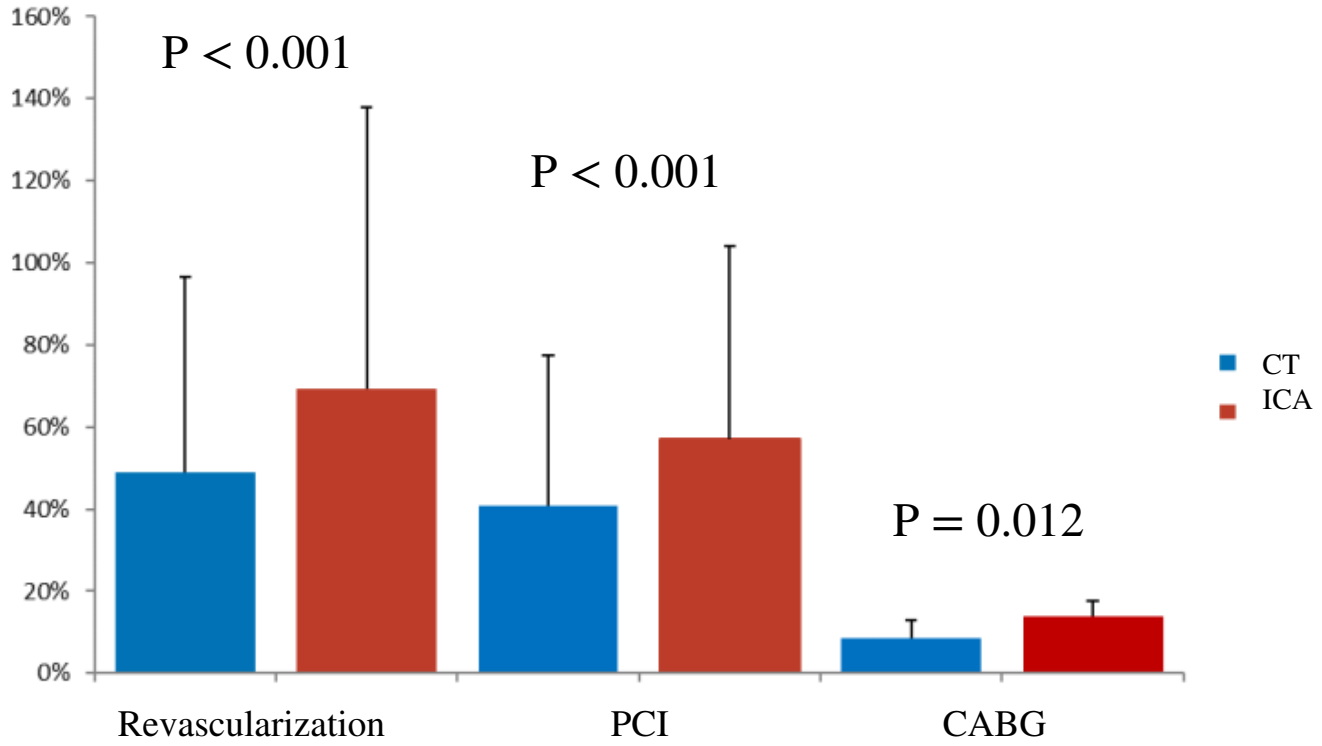
DISCHARGE and Revascularisation

Revascularisation and PCI vs CABG in obstructive disease



69.4%
vs.
48.6%

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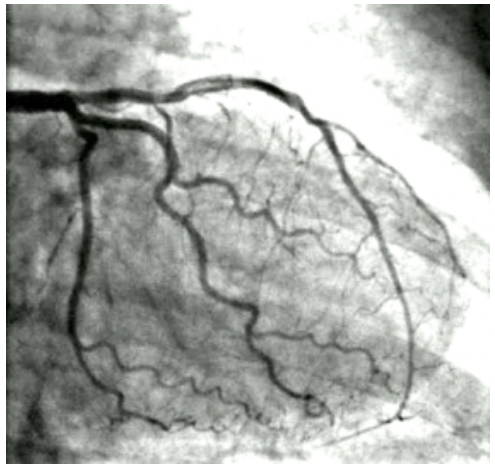
Major procedural complications in patients with Obstructive CAD

1.5%



4.9%

	CT arm (n=465)	ICA arm (n=451)	P value
With PCI			
Without PCI			

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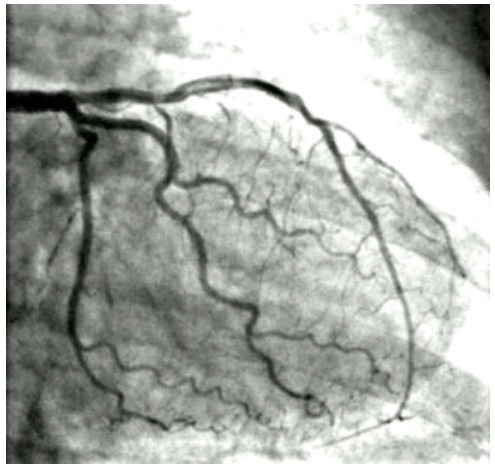
Major procedural complications in patients with Obstructive CAD

1.5%



4.9%

	CT arm (n=465)	ICA arm (n=451)	P value
With PCI	6 (1.3%)	15 (3.3%)	**0.04**
Without PCI	0 (0.0%)	4 (0.9%)	-

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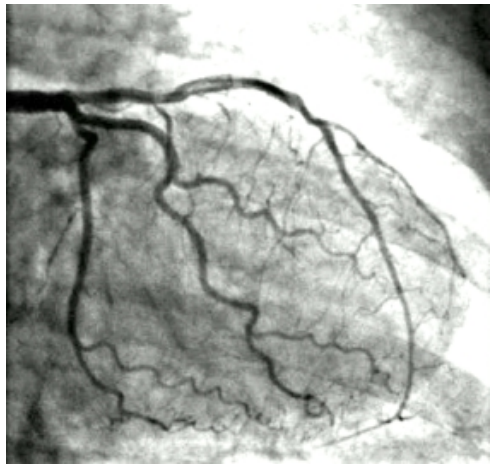
Major procedural complications in patients with Obstructive CAD

1.5%



4.9%

	CT arm (n=465)	ICA arm (n=451)	P value
With PCI	6 (1.3%)	15 (3.3%)	**0.04**
Without PCI	0 (0.0%)	4 (0.9%)	-
Nonfatal myocardial infarction			

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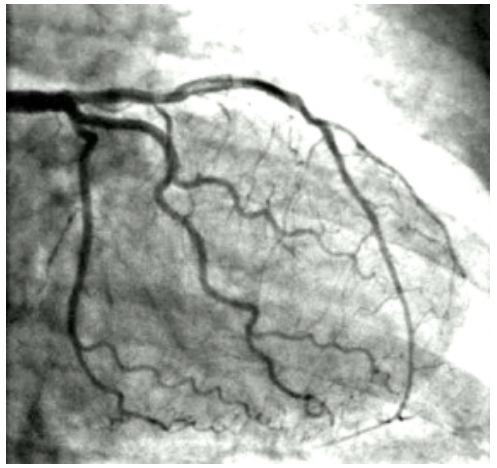
Major procedural complications in patients with Obstructive CAD

1.5%



4.9%

	CT arm (n=465)	ICA arm (n=451)	P value
With PCI	6 (1.3%)	15 (3.3%)	**0.04**
Without PCI	0 (0.0%)	4 (0.9%)	-
Nonfatal myocardial infarction	2 (0.4%)	10 (2.2%)	**0.017**

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Implications and Future Analyses

Implications and Future Analyses

- Two large previous trials* found that CT good/ better than functional testing
- DISCHARGE confirms safety of CT-first strategy, as good as ICA
- CT may be suitable in intermediate risk patients referred for ICA:
    - Clinical constellation suggesting high event risk
    - Abnormal or inconclusive functional test results
    - Persistent symptoms despite medical treatment
- Future analyses from DISCHARGE will focus on:
    - Quality of life, radiomics, patient acceptance, and cost

* PROMISE Trial *NEJM* 2015 and SCOT-HEART Trial *NEJM* 2018 Knuuti et al. *EHJ* 2020

nature reviews cardiology

https://doi.org/10.1038/s41569-023-00880-4

Consensus statement

Check for updates

Clinical quantitative coronary artery stenosis and coronary atherosclerosis imaging: a Consensus Statement from the Quantitative Cardiovascular Imaging Study Group

The QCI Study Group (Biavati et al.) *Nature Reviews Cardiology* 2023

nature reviews cardiology

https://doi.org/10.1038/s41569-023-00900-3

Roadmap

Check for updates

Roadmap on the use of artificial intelligence for imaging of vulnerable atherosclerotic plaque in coronary arteries

Bernhard Föllmer[1,21] ✉, Michelle C. Williams[2,21], Damini Dey[3], Armin Arbab-Zadeh[4], Pál Maurovich-Horvat[5], Rick H. J. A. Volleberg[6], Daniel Rueckert[7,8], Julia A. Schnabel[9,10,11], David E. Newby[2], Marc R. Dweck[2], Giulio Guagliumi[12], Volkmar Falk[13,14,15], Aldo J. Vázquez Mézquita[1], Federico Biavati[1], Ivana Išgum[16,17,18,22] & Marc Dewey[1,19,20,22] ✉

DISCHARGE trial Conclusions

In patients with stable chest pain, a CT-first strategy leads to:

- Similar MACE rates
- Higher rate of functional testing
    - Lower rate of revascularization
- Lower rate of major procedure-related complications
    - nonfatal myocardial infarction

Cardiac CT services should be increasingly offered

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Thanks to the DISCHARGE Trial Patients and Group

Thanks to our key funders:

ST. VINCENT'S UNIVERSITY HOSPITAL
Elm Park

jdodd@svhg.ie

UCD School of Medicine
Scoil an Leighis UCD

@UCDProfDodd

European Commission

DFG Deutsche Forschungsgemeinschaft

BIH Berlin Institute of Health @Charité

Reach out to Prof Dewey if interested in corelab research in Berlin:

dewey@charite.de

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