One-Year Outcomes of Coronary Angiography after Cardiac Arrest without ST Segment Elevation. Results of the COACT trial.

On behalf of the **COACT investigators**

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Disclosure statement of financial interest

I, Jorrit Lemkes, DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

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Background

- Guidelines recommend immediate coronary angiography with PCI in patients who present with STEMI and cardiac arrest (class 1 LOE B).[1,2]
- In patients with cardiac arrest without ST-segment elevation, guidelines also recommend emergency angiography (weak recommendation, very-low-quality evidence).[3]
- This is based on observational data, as until recently no randomized trials had been performed.

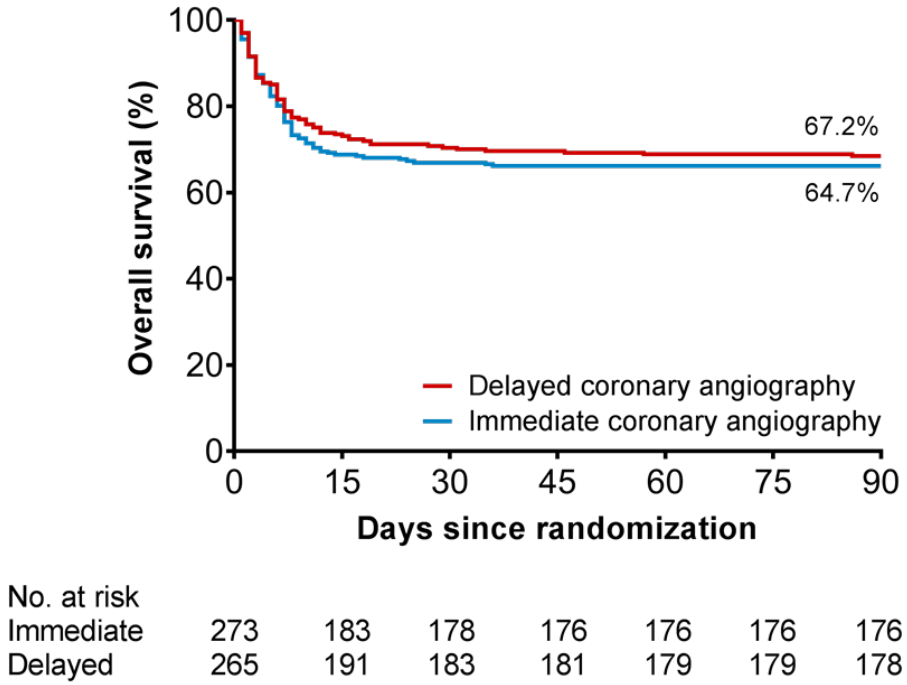
1. Ibanez B, et al. EHJ, 2018; 2. O'Gara PT, et al. J Am Coll Cardiol, 2013; 3. Welsford M, et al. Circulation, 2015

Background

- The COACT trial is the first randomized study to investigate the role of immediate coronary angiography in patients successfully resuscitated from out of hospital cardiac arrest in the absence of ST segment elevation.
- We hypothesized that immediate coronary angiography would improve survival.
- The primary endpoint was survival at 90 days
- Short term secondary endpoints included survival at 90 days with good cerebral performance or moderate disability, TIMI major bleeding, recurrence of ventricular tachycardia, occurrence of acute kidney injury and need for renal-replacement therapy, time to target temperature, duration of inotropic/catecholamine support, duration of mechanical ventilation, myocardial injury and markers of shock.

Lemkes et al, NEJM 2019

Background



	Immmediate Angiography Group (N=273)	Delayed Angiography Group (N=265)	Effect size (95%CI)*
Survival with good cerebral performance or moderate disability - no./total no. (%)	171/272 (62.9%)	170/264 (64.4%)	OR, 0.94 (0.66-1.31)
TIMI-major bleeding - no. (%)	7 (2.6%)	13 (4.9%)	OR, 0.51 (0.20-1.30)
Recurrence of VT resulting in defibrillation or electrical cardioversion - no. (%)	21 (7.7%)	16 (6.0%)	OR, 1.30 (0.66-2.54)
Need for renal replacement therapy - no. (%)	8 (2.9%)	11 (4.2%)	OR, 0.70 (0.28-1.76)
Time to target temperature - hr Median (IQR) Geometric mean (95% CI)	 5.4 (2.9-8.6) 6.5 (5.9-7.1)	 4.7 (2.6-7.5) 5.5 (5.0-6.0)	 1.19 (1.04-1.36)
Duration of inotropic support - days Median (IQR) Geometric mean (95% CI)	 1.7 (1.1-2.7) 1.6 (1.4-1.8)	 1.9 (1.2-2.7) 1.7 (1.5-1.9)	 0.94 (0.79-1.12)
Duration of mechanical ventilation - days Median (IQR) Geometric mean (95% CI)	 2.3 (1.4-4.1) 2.3 (2.0-2.6)	 2.2 (1.5-4.1) 2.4 (2.1-2.7)	 0.96 (0.80-1.14)

Lemkes et al, NEJM 2019

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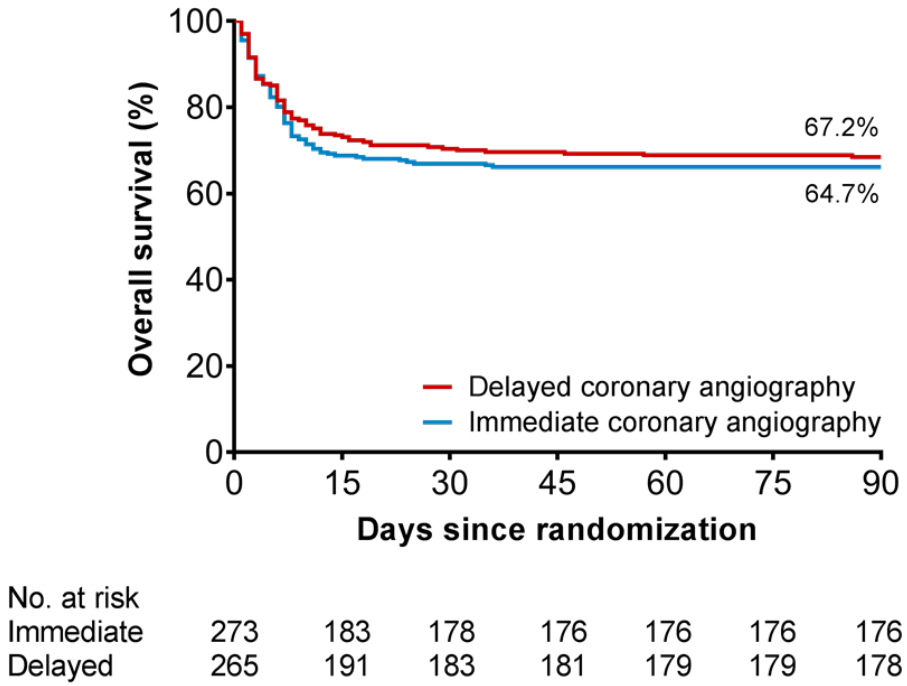

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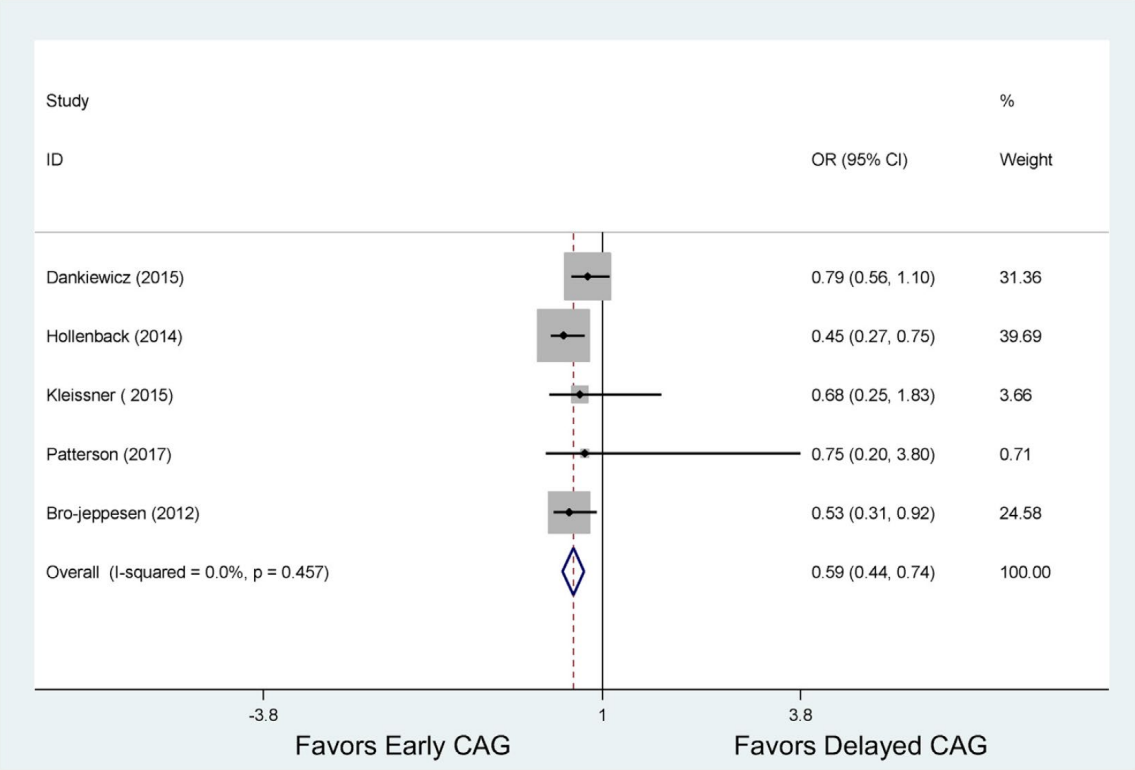
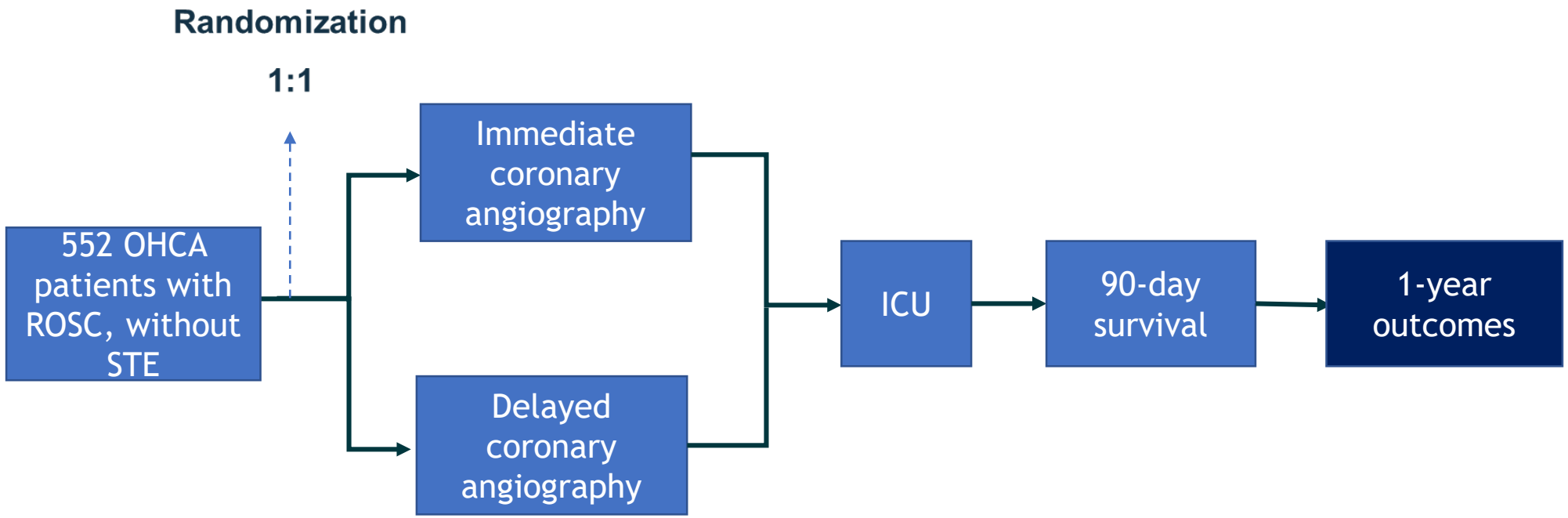
Observational studies favor early CAG on long term mortality



Khan M, et al. Resuscitation, 2017

Trial design



Trial organization

Steering committee

Niels van Royen (chair), Jorrit Lemkes, Heleen Oudemans-van Straaten, Lucia Jewbali, Michiel Voskuil, Martijn Meuwissen.

Data safety monitoring board

Freek Verheugt (chair), Eric Boersma (statistician), Ruud Koster.

Trial statistician

Peter van de Ven.

Study coordinators

Gladys Janssens, Nina van der Hoeven, Eva Spoormans

Key in- and exclusion criteria

Inclusion criteria

- Age >18 years.
- Comatose patients (Glasgow coma score <8) with ROSC after OHCA.
- Ventricular tachycardia or ventricular fibrillation as initial arrest rhythm. Including patients treated with an AED.

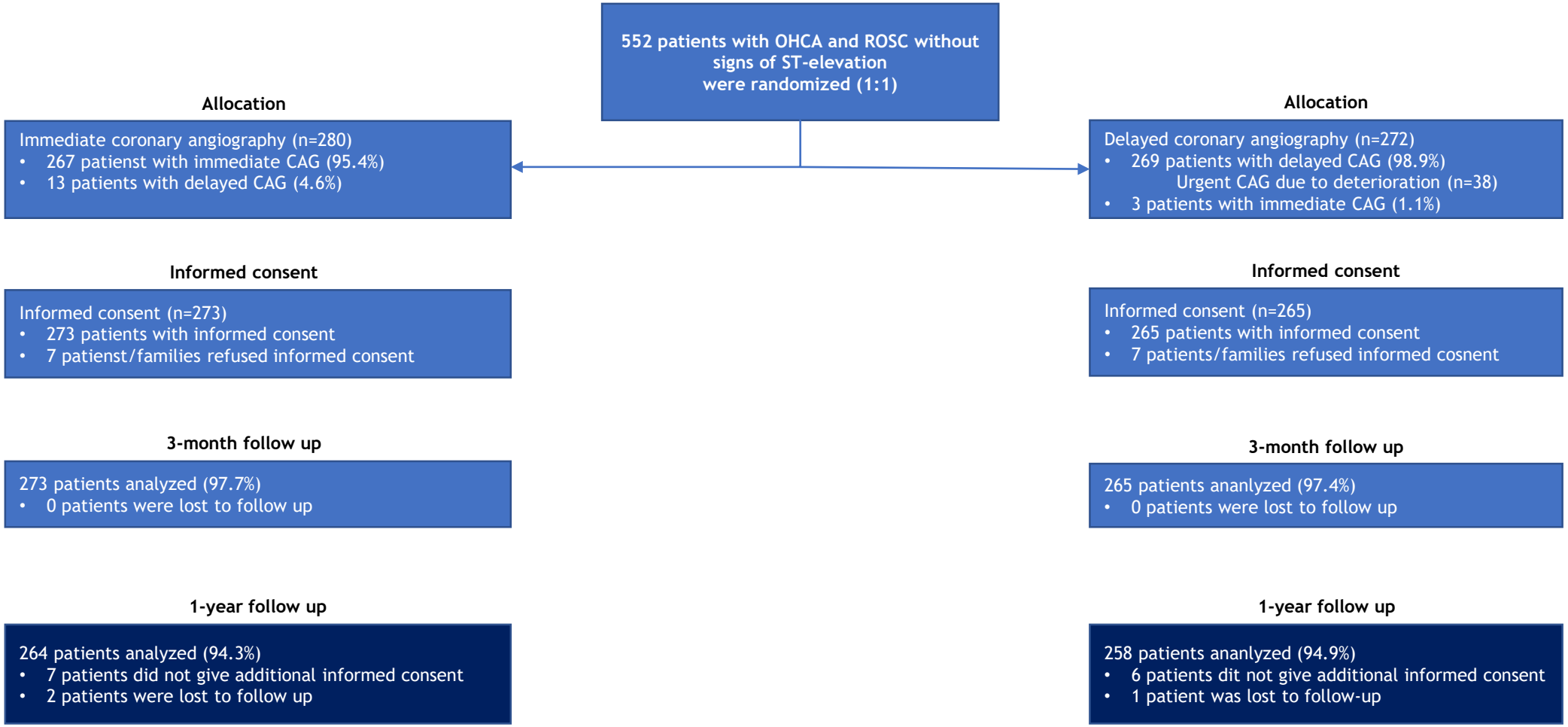
Exclusion criteria

- Signs of STEMI on the ECG at the emergency department.
- Hemodynamic instability unresponsive to medical therapy.
- Refractory ventricular arrhythmia.
- An obvious or suspected non-coronary cause of the arrest.
- Suspected or confirmed acute intracranial bleeding or acute stroke.

1-year outcomes of the COACT trial.

- Survival at 1 year.
- Myocardial infarction since index hospitalization.
- PCI since index hospitalization.
- CABG since index hospitalization.
- Hospitalization due to heart failure since index hospitalization.
- ICD shock.
- Quality of life (RAND-36 questionnaire)

Trial flow diagram



Baseline characteristics

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Age - years	65.8±12.5	65.0±12.2
Male sex - no. (%)	215 (81.4%)	198 (76.7%)
Hypertension - no./total no. (%)	128/260 (49.2%)	124/258 (48.1%)
Previous myocardial infarction - no. (%)	70 (26.5%)	74 (28.7%)
Previous CABG - no./total no. (%)	41/263 (15.6%)	24/258 (9.3%)
Previous PCI - no./total no. (%)	44/263 (16.7%)	59/257 (23.0%)
Previous coronary artery disease - no. (%)	94 (35.6%)	94 (36.4%)
Previous cerebrovascular accident - no./total no. (%)	19/263 (7.2%)	15/258 (5.8%)
Diabetes mellitus - no./total no. (%)	54/263 (20.5%)	42/258 (16.3%)
Current smoker - no./total no. (%)	47/240 (19.6%)	64/242 (26.4%)
Hypercholesterolemia - no./total no. (%)	69/261 (26.4%)	76/256 (29.7%)
Peripheral artery disease - no./total no. (%)	16/263 (6.1%)	22/258 (8.5%)
Arrest witnessed - no. (%)	210 (79.5%)	198 (76.7%)
Median time from arrest to basic life support (IQR) - min	2 (1-5)	2 (1-5)
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Procedures, treatments and characteristics of coronary artery disease

	Immediate Angiogrphy Group (N= 264)	Delayed Angiography Group (N= 258)
Coronary angiography performed - no. (%)	256 (97.0%)	167 (64.7%)
Median time from arrest to coronary angiography (IQR) - hr	2.1 (1.5-2.8)	121.4 (50.4-201.4)
Median time randomization to coronary angiography (IQR) - hr	0.9 (0.6-1.2)	119.9 (47.7-200.2)
Coronary artery disease severity - no./total no. (%)		
No significant disease	92/256 (35.9%)	57/167 (34.1%)
One-vessel disease	69/256 (27.0%)	48/167 (28.7%)
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Acute unstable lesion - no./total no. (%)	33/256 (12.9%)	27/167 (16.2%)
Acute thrombotic occlusion - no./total no. (%)	8/256 (3.1%)	13/167 (7.8%)
Chronic total occlusion - no./total no (%)	96/256 (37.5%)	58/167 (34.7%)
Revascularization treatment - no. (%)		
PCI	86 (32.6%)	63 (24.4%)
CABG	16 (6.1%)	21 (8.1%)
Medical or conservative treatment	164 (62.1)	174 (67.4)

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No significant disease	92/256 (35.9%)	57/167 (34.1%)
One-vessel disease	69/256 (27.0%)	48/167 (28.7%)
Two-vessel disease	53/256 (20.7%)	34/167 (20.4%)
Three-vessel disease	42/256 (16.4%)	28/167 (16.8%)
Acute unstable lesion - no./total no. (%)	33/256 (12.9%)	27/167 (16.2%)
Acute thrombotic occlusion - no./total no. (%)	8/256 (3.1%)	13/167 (7.8%)
Chronic total occlusion - no./total no (%)	96/256 (37.5%)	58/167 (34.7%)
Revascularization treatment - no. (%)		
PCI	86 (32.6%)	63 (24.4%)
CABG	16 (6.1%)	21 (8.1%)
Medical or conservative treatment	164 (62.1)	174 (67.4)

Intensive care support and medical treatment during index hospitalization.

	Immediate Angiography Group (N=264)	Delayed Angiography Group (N=258)
Median time to targeted temperature (IQR) - hr	5.5 (2.9-8.6)	4.7 (2.4-7.2)
Noradrenaline administration - no. (%)	231 (87.5%)	225 (87.2%)
Dobutamine administration - no. (%)	65 (24.6%)	76 (29.5)
Dopamine administration - no. (%)	11 (4.2%)	17 (6.6%)
Phosphodiesterase administration - no. (%)	20 (7.6%)	24 (9.3%)
Amiodarone - no./total no. (%)	73/263 (27.8%)	81/258 (31.4%)
Salicylates - no. (%)	201 (76.1%)	225 (87.2%)
P2Y12 inhibitor - no. (%)	152 (57.6%)	184 (71.3%)
Unfractionated heparin/LMWH - no. (%)	238 (90.2%)	229 (88.8%)
Bivalirudin - no. (%)	2 (0.8%)	2 (0.8%)
Glycoprotein IIb/IIIa inhibitor - no. (%)	17 (6.4%)	7 (2.7%)

Intensive care support and medical treatment during index hospitalization.

	Immediate Angiography Group (N=264)	Delayed Angiography Group (N=258)
Median time to targeted temperature (IQR) - hr	5.5 (2.9-8.6)	4.7 (2.4-7.2)
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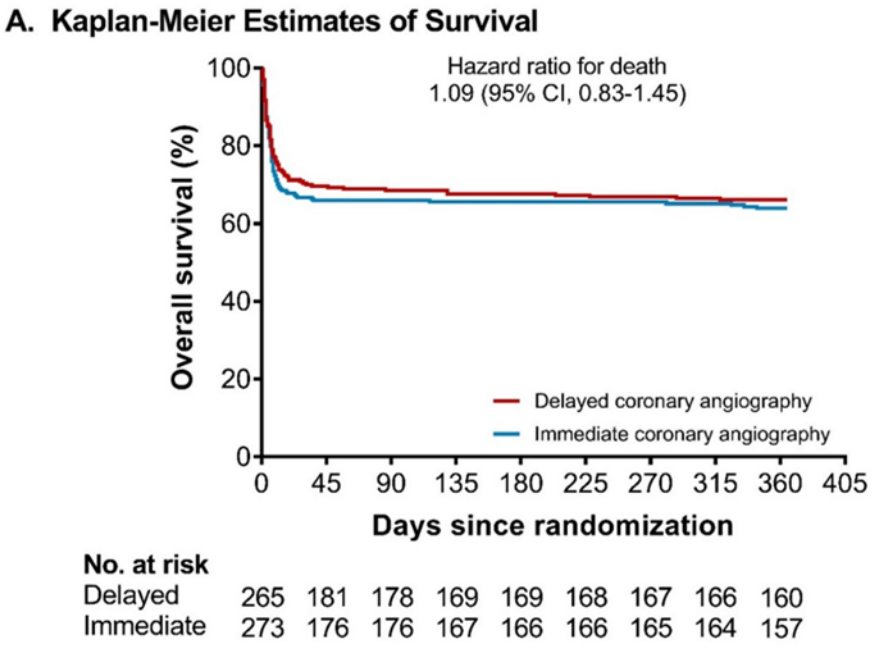
1-year outcomes of the COACT trial.

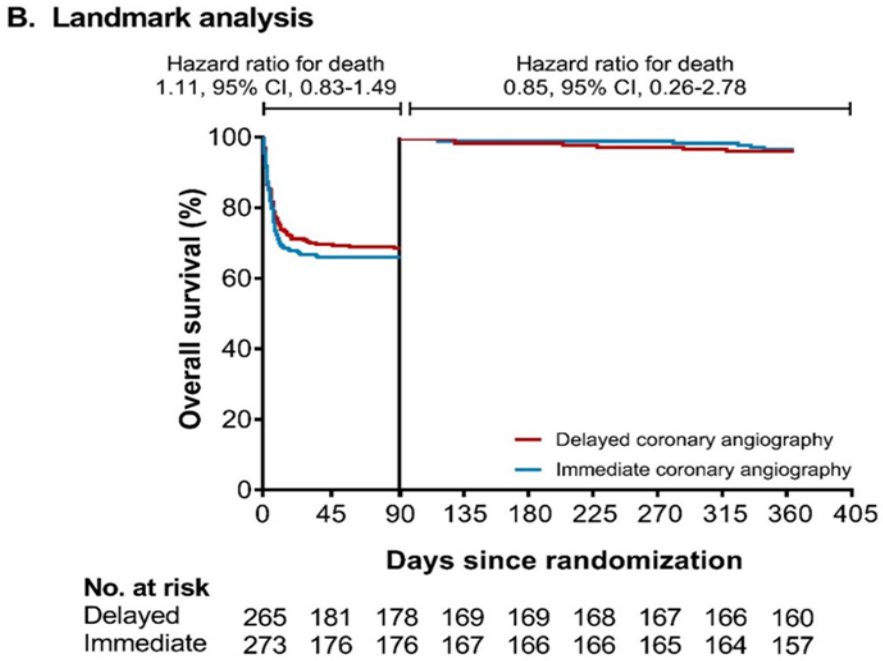
	Immediate Angiography Group (N=264)	Delayed Angiography Group (N=258)	OR(95% CI)
Survival, no. (%)	162 (61.4%)	165 (64.0%)	0.90 (0.63-1.28)

1-year outcomes of the COACT trial.

	Immediate Angiography Group (N=264)	Delayed Angiography Group (N=258)	OR(95% CI)
Survival, no. (%)	162 (61.4%)	165 (64.0%)	0.90 (0.63-1.28)

1-year outcomes of the COACT trial.





1-year outcomes of the COACT trial.

	Immediate Angiography group (N = 264)	Delayed Angiography group (N = 258)	Effect size (95% CI)
Survival, no. (%)	162 (61.4%)	165 (64.0%)	0.90 (0.63-1.28)
Myocardial infarction since index hospitalization - no./total no. (%)	2/264 (0.8%)	1/258 (0.4%)	1.96 (0.18-21.8)
Any revascularization since index hospitalization - no./total no. (%)	10/264 (3.8%)	10/258 (3.9%)	0.98 (0.40-2.39)
Any PCI since index hospitalization - no./total no. (%)	8/264 (3.0%)	8/258 (3.1%)	0.98 (0.36-2.64)
Any CABG since index hospitalization - no./total no. (%)	2/264 (0.8%)	2/258 (0.8%)	0.98 (0.14-6.99)
Hospitalization due to heart failure since index hospitalization - no./total no. (%)	2/264 (0.8%)	1/258 (0.4%)	1.96 (0.18-21.8
ICD shock - no. (%) /total no.	23/113 (20.4%)	17/105 (16.2%)	1.32 (0.66-2.64)

1-year outcomes of the COACT trial.

	Immediate Angiography group (N = 264)	Delayed Angiography group (N = 258)	Effect size (95% CI)
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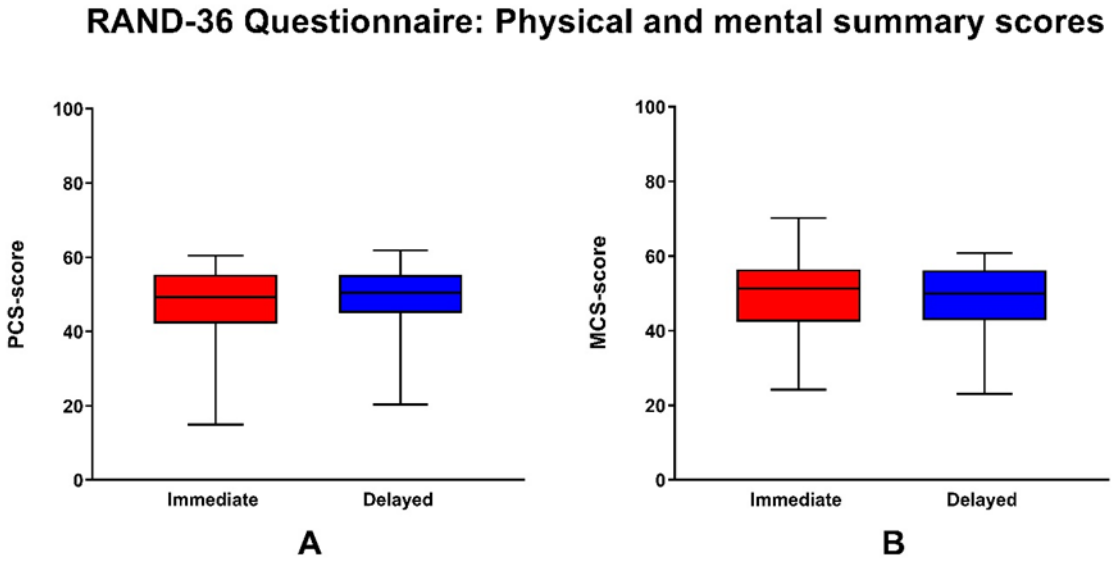
ICD shock - no. (%) /total no.	23/113 (20.4%)	17/105 (16.2%)	1.32 (0.66-2.64)

1-year outcomes of the COACT trial.

	Immediate Angiography group (N = 119)	Delayed Angiography group (N = 116)
RAND-36® PCS - Median (IQR)	49.2 (42.2-55.3)	50.4 (44.9-55.2)
RAND-36® MCS - Median (IQR)	51.3 (42.4-56.4)	50.0 (42.8-56.2)

PCS, Physical component summary score; MCS, Mental component summary score



RAND-36®, Health insurance study questionnaire. A: PCS, Physical component summary score B: MCS, Mental component summary score.

Conclusion

- In patients with ROSC after OHCA without signs of STEMI, immediate coronary angiography was not found to improve survival at 1 year compared to delayed coronary angiography.
- There was no significant difference in the rates of myocardial infarction, revascularization, hospitalization due to heart failure or ICD shocks between the two treatment groups at 1 year.

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