26-27-28 JANVIER 2022 HIGH TECH MARSEILLE

6 MINUTES POUR CONVAINCRE

Plus de réveil nocturne pour tous les arrêts cardiaques

Marion CHATOT

CHU de Besançon

CHRU Besançon centre hospitalier régional universitaire

Plus de réveil nocturne pour tous les arrêts cardiaques

- Pas de conflits d'intérêts en lien avec la présentation

26-27-28 JANVIER 2022 HIGH TECH MARSEILLE

Population concernée
Intérêt de la coronarographie

Pour	Contre
Prévention de l'ischémie myocardique	***Risques de complications :*** ***Insuffisance rénale, Ischémie-Reperfusion, Thrombose de stent, Saignements, Lésion cérébrale au produit de contraste…***
Prévention d'une détérioration de l'hémodynamique ou d'une insuffisance cardiaque	***Retard diagnostic en cas d'étiologie non coronaire***
Amélioration potentielle de la perfusion cérébrale (par amélioration de l'hémodynamique)	***Aggravation d'une autre cause d'ACR (hémorragie cérébrale)***
	Allongement du délai d'hypothemie thérapeutique

Spaulding CM, Joly LM, Rosenberg A, et al. Immediate coronary angiography in survivors of out-of-hospital cardiac arrest. N Engl J Med 1997; 336: 1629-1633

Dumas F, Cariou A, Manzo-Silberman S, et al. Immediate percutaneous coronary intervention is associated with better survival after out-of-hospital cardiac arrest: insights from the PROCAT (Parisian Region Out of hospital Cardiac

ACEH et STEMI

Etudes observationnelles, pas d'étude randomisée (éthique ?)

- 80 % d'occlusion coronaire aiguë
- Augmentation de la survie et du pronostic neurologique en cas de prise en charge invasive

2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC)

STEMI

BBG de novo
Instabilité hémodynamique
Arythmie persistante ou menaçante
Ischémie récurrente

Cardiac arrest

Recommendations	Class[a]	Level[b]
A primary PCI strategy is recommended in patients with resuscitated cardiac arrest and an ECG consistent with STEMI.[69–71,85]	I	B
It is indicated that healthcare systems implement strategies to facilitate transfer of all patients in whom a MI is suspected directly to the hospital offering 24/7 PCI-mediated reperfusion therapy via one specialized EMS.	I	C

Callaway CW, Donnino MW, Fink EL, et al. Part 8: Post- cardiac arrest care: 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015; 132(Suppl. 2): S465-S482.

ACEH et NSTEMI

Plusieurs études randomisées publiées ou en voie de publication :

COACT : NEJM 2019 - N = 552

TOMAHAWK : NEJM 2021 - N = 554

PEARL : Circulation 2020 - N = 99

ARREST : Resuscitation 2017 N = 40

DISCO : Resuscitation 2019 N = 79

ACCESS : en cours

COUPE : en cours

EMERGEncy : en cours

Patterson T, Perkins GD, Joseph J, Wilson K, Van Dyck L, Robertson S, Nguyen H, McConkey H, Whitbread M, Fothergill R, et al. A Randomised Trial of Expedited Transfer to a Cardiac Arrest Centre for Non-ST El- evation Ventricular Fibrillation Out-of-Hospital Cardiac Arrest: The AR- REST pilot randomised trial. Resuscitation. 2017;115:185–191. doi: 10.1016/j.resuscitation.2017.01.020

Elfwén L, Lagedal R, Nordberg P, James S, Oldgren J, Böhm F, Lundgren P, Rylander C, van der Linden J, Hollenberg J, et al. Direct or Subacute Coro- nary Angiography in Out-of-Hospital Cardiac Arrest (DISCO): an initial pilot study of a randomized clinical trial. Resuscitation. 2019;139:253– 261. doi: 10.1016/j.resuscitation.2019.04.027

ACEH et NSTEMI

ETUDE COACT 2019

N = 552
Rythme choquable
Exclusion : état de choc, IR sèvere

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 APRIL 11, 2019 VOL. 380 NO. 15

Coronary Angiography after Cardiac Arrest without ST-Segment Elevation

J.S. Lemkes, G.N. Janssens, N.W. van der Hoeven, L.S.D. Jewbali, E.A. Dubois, M. Meuwissen, T.A. Rijpstra,

Table 1. Baseline Characteristics of the Patients.*

Characteristic	Immediate Angiography Group (N=273)	Delayed Angiography Group (N=265)
Age — yr	65.7±12.7	64.9±12.5
Male sex — no. (%)	223 (81.7)	202 (76.2)
Hypertension — no./total no. (%)	131/269 (48.7)	126/265 (47.5)
Previous myocardial infarction — no. (%)	73 (26.7)	76 (28.7)
Previous CABG — no./total no. (%)	43/272 (15.8)	24/265 (9.1)
Previous PCI — no./total no. (%)	46/272 (16.9)	60/264 (22.7)
Previous coronary artery disease — no. (%)	99 (36.3)	96 (36.2)
Previous cerebrovascular accident — no./total no. (%)	19/272 (7.0)	15/265 (5.7)
Diabetes mellitus — no./total no. (%)	55/272 (20.2)	44/265 (16.6)
Current smoker — no./total no. (%)	50/249 (20.1)	67/249 (26.9)
Hypercholesterolemia — no./total no. (%)	70/270 (25.9)	78/263 (29.7)
Peripheral artery disease — no./total no. (%)	16/272 (5.9)	23/265 (8.7)
Arrest witnessed — no. (%)	218 (79.9)	203 (76.6)
Median time from arrest to basic life support (IQR) — min	2 (1–5)	2 (1–5)
Median time from arrest to return of spontaneous circulation (IQR) — min	15 (9–21)	15 (8–20)
Signs of ischemia on ECG — no./total no. (%)†	168/262 (64.1)	172/248 (69.4)
Median GCS score at admission (IQR)‡	3 (3–3)	3 (3–3)

Table 2. Procedures, Treatments, and Characteristics of Coronary Artery Disease.*

Variable	Immediate Angiography Group (N=273)	Delayed Angiography Group (N=265)
Coronary angiography performed — no. (%)	265 (97.1)	172 (64.9)†
Median time from arrest to coronary angiography (IQR) — hr	2.3 (1.8–3.0)	121.9 (52.0–197.3)
Median time from randomization to coronary angiography (IQR) — hr	0.8 (0.5–1.2)	119.9 (47.2–203.7)
Severity of coronary artery disease — no./total no. (%)		
No clinically significant disease	94/265 (35.5)	59/172 (34.3)
One-vessel disease	72/265 (27.2)	49/172 (28.5)
Two-vessel disease	54/265 (20.4)	35/172 (20.3)
Three-vessel disease	45/265 (17.0)	29/172 (16.9)
Acute unstable lesion — no./total no. (%)‡	36/265 (13.6)	29/172 (16.9)
Acute thrombotic occlusion — no./total no. (%)	9/265 (3.4)	13/172 (7.6)§
Chronic total occlusion — no./total no. (%)	100/265 (37.7)	58/172 (33.7)
Revascularization treatment — no. (%)		
PCI	90 (33.0)	64 (24.2)
CABG	17 (6.2)	23 (8.7)
Pharmacologic or conservative treatment	168 (61.5)	179 (67.5)

ETUDE COACT 2019

The NEW ENGLAND JOURNAL of MEDICINE

APRIL 11, 2019 VOL. 380 NO. 15

giography after Cardiac Arrest
ıt ST-Segment Elevation

der Hoeven, L.S.D. Jewbali, E.A. Dubois, M. Meuwissen, T.A. Rijpstra,

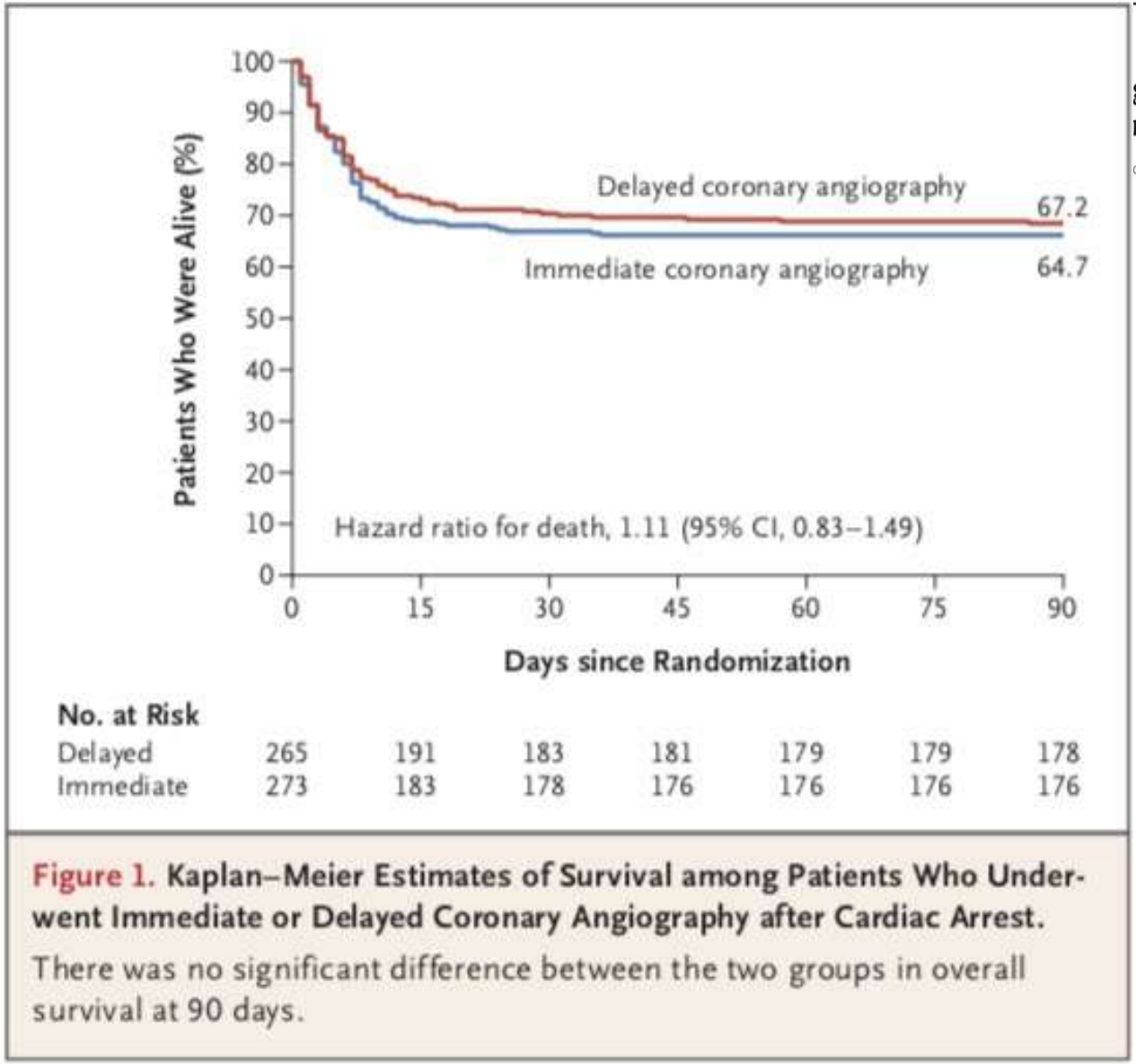

Figure 1. Kaplan–Meier Estimates of Survival among Patients Who Underwent Immediate or Delayed Coronary Angiography after Cardiac Arrest.

There was no significant difference between the two groups in overall survival at 90 days.

ETUDE COACT 2019

The NEW ENGLAND JOURNAL of MEDICINE

11, 2019 VOL. 380 NO. 15

after Cardiac Arrest
ment Elevation

D. Jewbali, E.A. Dubois, M. Meuwissen, T.A. Rijpstra,

Table 3. Clinical Outcomes.*

Outcome	Immediate Angiography Group (N=273)	Delayed Angiography Group (N=265)	Effect Size (95% CI)†
Secondary end points			
Survival with good cerebral performance or mild or moderate disability — no. of patients/total no. (%)	171/272 (62.9)	170/264 (64.4)	OR, 0.94 (0.66 to 1.31)
CPC score at 90 days — no./total no. (%)§			
1	157/272 (57.7)	159/264 (60.2)	Reference
2	14/272 (5.1)	11/264 (4.2)	OR, 1.29 (0.56 to 2.92)
3	4/272 (1.5)	5/264 (1.9)	OR, 0.81 (0.21 to 3.07)
4	0/272	2/264 (0.8)	NA
5	97/272 (35.7)	87/264 (33.0)	OR, 1.13 (0.78 to 1.63)
Survival until hospital discharge — no. of patients (%)	178 (65.2)	182 (68.7)	OR, 0.85 (0.60 to 1.22)
Neurologic status at ICU discharge			
GCS score			
Median (IQR)	15 (14 to 15)	15 (14 to 15)	
Geometric mean (95% CI)	13.7 (13.2 to 14.2)	13.5 (12.9 to 13.7)	1.02 (0.96 to 1.04)
CPC score — no./total no. (%)§			
1	74/258 (28.7)	86/249 (34.5)	Reference
2	59/258 (22.9)	56/249 (22.5)	OR, 1.22 (0.76 to 1.98)
3	36/258 (14.0)	30/249 (12.0)	OR, 1.39 (0.78 to 2.48)
4	4/258 (1.6)	9/249 (3.6)	OR, 0.52 (0.15 to 1.75)
5	85/258 (32.9)	68/249 (27.3)	OR, 1.45 (0.93 to 2.27)
TIMI major bleeding, any grade — no. (%)	7 (2.6)	13 (4.9)	OR, 0.51 (0.20 to 1.30)
Time to target temperature — hr			
Median (IQR)	5.4 (2.9 to 8.6)	4.7 (2.6 to 7.5)	
Geometric mean (95% CI)	6.5 (5.9 to 7.1)	5.5 (5.0 to 6.0)	1.19 (1.04 to 1.36)

ACEH et NSTEMI

ETUDE TOMAHAWK 2021

N = 554
Rythme choquable ou non

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Angiography after Out-of-Hospital Cardiac Arrest without ST-Segment Elevation

S. Desch, A. Freund, I. Akin, M. Behnes, M.R. Preusch, T.A. Zelniker, C. Skurk,

DZHK DEUTSCHES ZENTRUM FÜR HERZ-KREISLAUF-FORSCHUNG E.V.

TOMAHAWK

Baseline Characteristics

	Immediate angiography (n=265)	Delayed/selective angiography (n=265)
Age (years); median (IQR)	69 (59-78)	71 (60-79)
Female sex; n/total (%)	80/265 (30.2)	81/265 (30.6)
Known coronary artery disease; n/total (%)	79/229 (34.5)	93/229 (40.6)
Diabetes mellitus; n/total (%)	71/244 (29.1)	74/251 (29.5)
Arrest witnessed; n/total (%)	236/259 (91.1)	226/257 (87.9)
Shockable first monitored rhythm; n/total (%)	126/241 (52.3)	142/242 (58.7)
Bystander cardiopulmonary resuscitation; n/total (%)	142/247 (57.5)	152/252 (60.3)
Time from arrest to basic life support (min); median (IQR)	2 (0-8)	1 (0-5)
Time from arrest to return of spontaneous circulation (min); median (IQR)	15 (10-20)	15 (8-20)
Glasgow Coma Scale on admission; median (IQR)	3 (3-3)	3 (3-3)
Left ventricular ejection fraction on admission (%); median (IQR)	45 (38-56)	44 (30-50)

DZHK DEUTSCHES ZENTRUM FÜR HERZ-KREISLAUF-FORSCHUNG E.V.

TOMAHAWK

Characteristics and Treatment of CAD

	Immediate angiography (n=265)	Delayed/selective angiography (n=265)
Coronary angiography performed; n/total (%)	253/265 (95.5)	165/265 (62.2)
Time from arrest to coronary angiography (h); median (IQR)	2.9 (2.2-3.9)	46.9 (26.1-116.6)
Severity of coronary artery disease; n/total (%)		
No significant disease	99/252 (39.3)	46/165 (27.9)
1-vessel disease	37/252 (14.7)	21/165 (12.7)
2-vessel disease	32/252 (12.7)	26/165 (15.8)
3-vessel disease	84/252 (33.3)	72/165 (43.6)
Culprit lesion identified; n/total (%)	94/247 (38.1)	67/156 (43.0)
PCI performed; n/total (%)	93/250 (37.2)	70/162 (43.2)

ETUDE TOMAHAWK 2021

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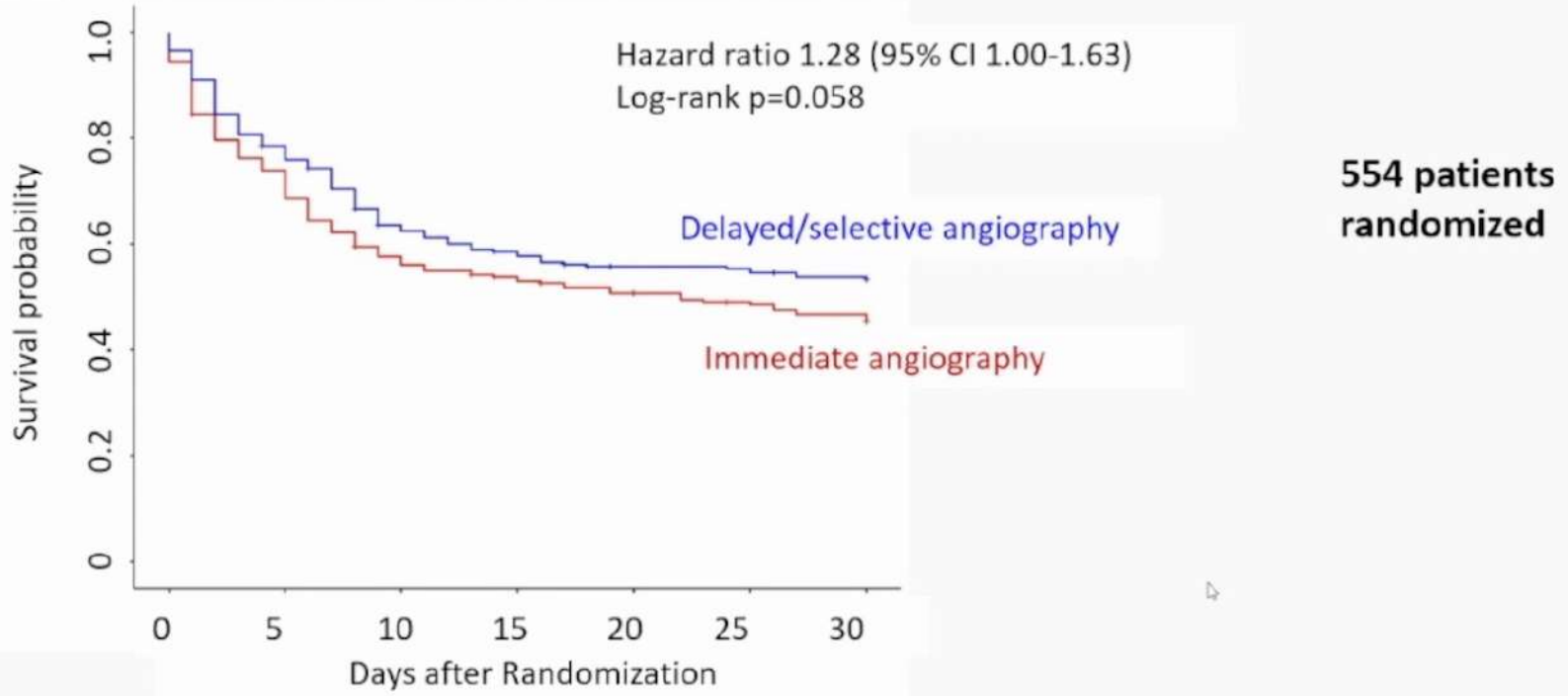
Results: Primary Endpoint mortality @30 d

TOMAHAWK



554 patients randomized

ETUDE TOMAHAWK 2021

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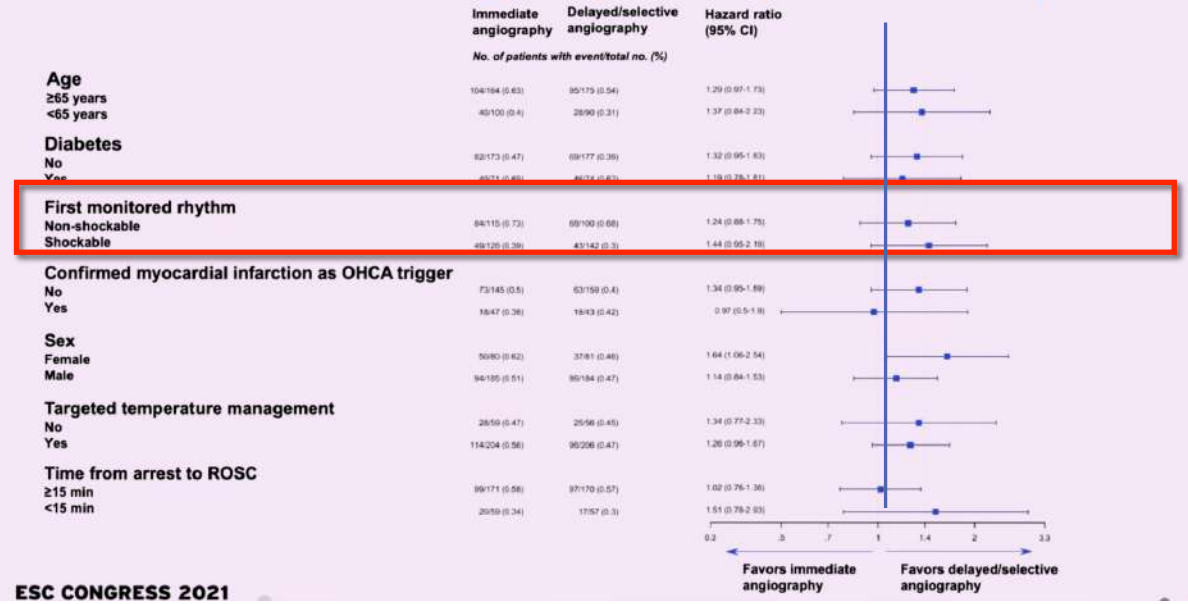
Secondary Endpoints at 30 days

	Immediate angiography (n=265)	Delayed/selective angiography (n=265)	Effect size
Myocardial infarction: n/total (%)	0/248 (0)	2/250 (0.8)	RR 0 (0-1.93)
Severe neurological deficit; n/total (%)	21/112 (18.8)	16/126 (12.7)	RR 1.48 (0.82-2.67)
All-cause mortality or severe neurological deficit: n/total (%)	164/255 (64.3)	138/248 (55.6)	RR 1.16 (1.002-1.34)
Peak release of myocardial enzymes			
Troponin T (µg/L); median (IQR)	0.39 (0.14-1.26)	0.34 (0.12-1.07)	HLE 0.04 (-0.03-0.11)
Troponin I (µg/L); median (IQR)	1.46 (0.42-5.69)	1.10 (0.40-5.75)	HLE 0.06 (-0.37-0.49)
Moderate and severe bleeding (BARC 2-5)*; n/total (%)	2/260 (4.6)	8/232 (3.4)	RR 1.34 (0.57-3.14)
Stroke*; n/total (%)	4/258 (1.6)	5/242 (2.1)	RR 1.13 (0.33-3.84)
Acute renal failure requiring renal replacement therapy*; n/total (%)	49/259 (18.9)	38/241 (15.8)	RR 1.14 (0.78-1.68)

*Assessed in safety (as treated) population
RR = Relative risk, HLE = Hodges-Lehmann estimator for location shift

DZHK DEUTSCHES ZENTRUM FÜR HERZ-KREISLAUF-FORSCHUNG E.V. — TOMAHAWK

Subgroup Analysis



ESC CONGRESS 2021

ESC European Society of Cardiology
European Heart Journal (2021) **42**, 1289–1367
doi:10.1093/eurheartj/ehaa575

2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation

Delayed as opposed to immediate angiography should be considered among haemodynamically stable patients without ST-segment elevation successfully resuscitated after out-of-hospital cardiac arrest.[358,364]	IIa	B

TAKE HOME MESSAGE

Arrêt cardiaque Extra Hospitalier
Pas de cause extra-cardiaque évidente
Rythme choquable ou Non

STEMI (ou équivalent)

NSTEMI

Instabilité hémodynamique
Ischémie récidivante
Troubles du rythme menaçant

Critères de mauvais pronostic
- NF ou LF prolongés
- Critères biologiques
- Age, comorbidités

CORONAROGRAPHIE D'EMBLEE
- PCI si besoin
- Hypothermie et admission en réanimation dans un second temps

CORONAROGRAPHIE RETARDEE
- Neuroprotection
- Admission en réanimation en premier temps

PAS DE CORONAROGRAPHIE
Neuroprotection
Admission en réanimation en premier temps