

Akut kranskärlsröntgen efter hjärtstopp?

Stockholm 24 september

Ludvig Elfwén, Hjärtläkare, Södersjukhuset

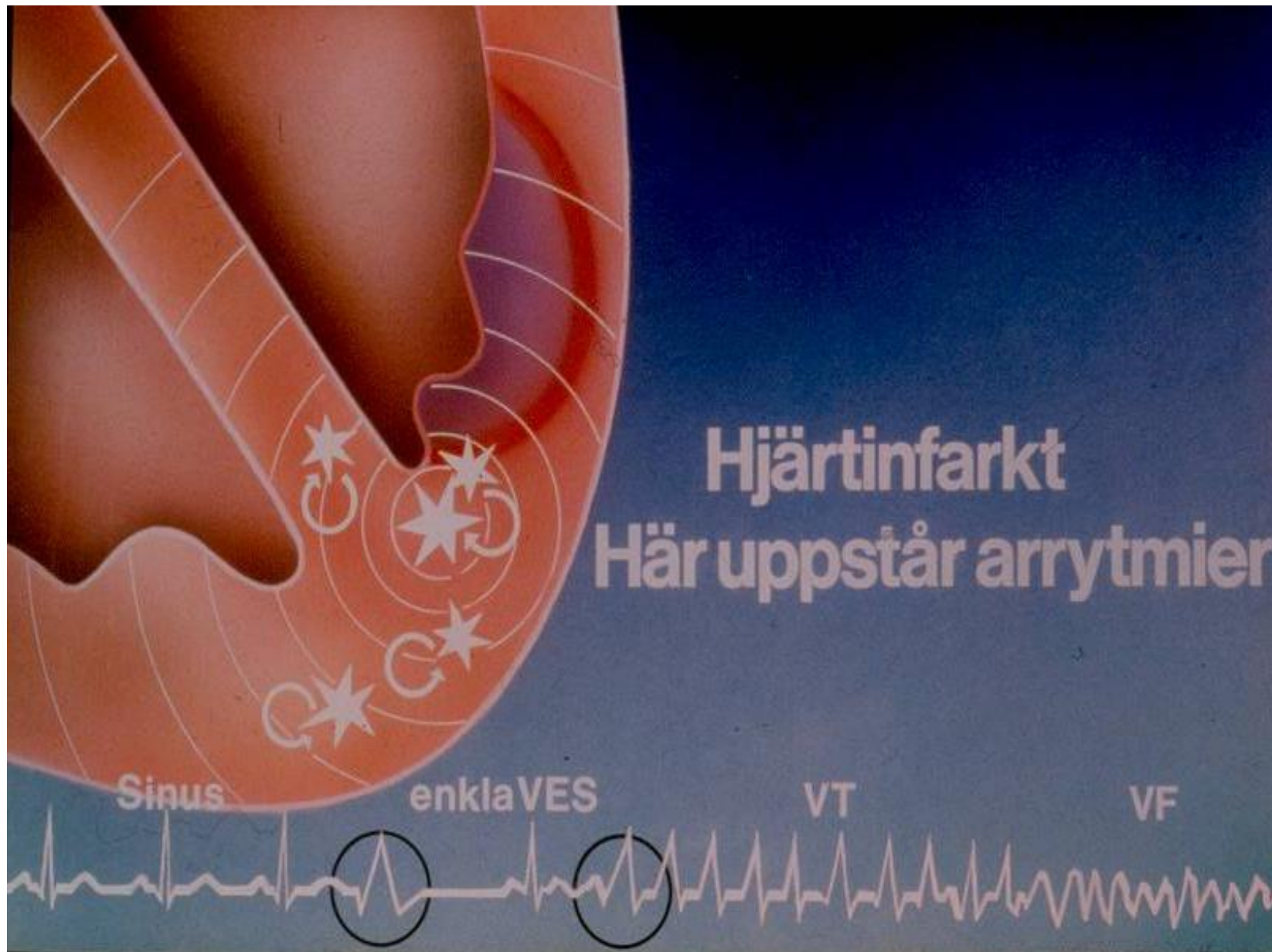


Kranskärlsröntgen



Revaskularisering





Varför ska man göra kranskärlsröntgen efter hjärtstopp?

- Minskad risk för nytt hjärtstopp med återkommande VT/VF?
- Förbättrad hjärtfunktion på kort och lång sikt?
- Förbättrad neurologisk funktion?
- Förbättrar kranskärlsröntgen överlevnaden?

Risker med kranskärlsröntgen efter hjärtstopp

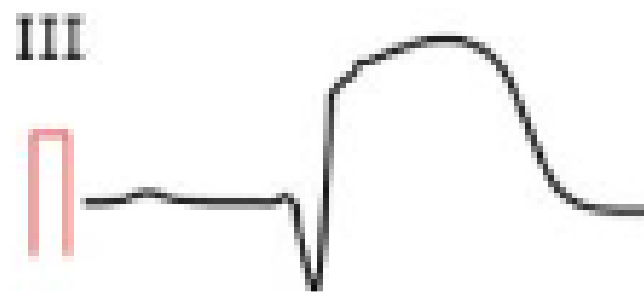
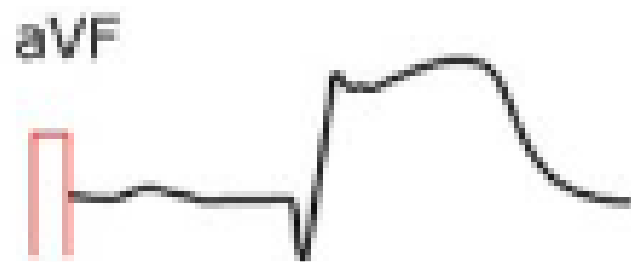
- Blödningskomplikationer
- Försenar tid till intensivvård
- Transport till sjukhus med tillgång till kranskärlsröntgen
- Andra komplikationer relaterade till kranskärlsröntgen

Vilka hjärtstoppspatienter ska man göra kranskärlsröntgen på?

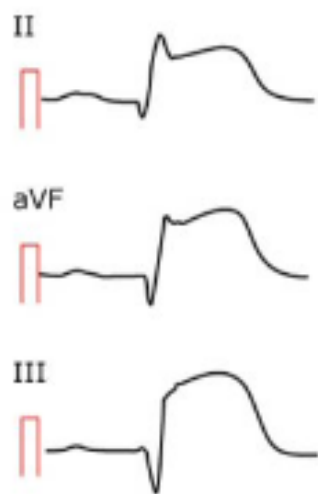
- ST-höjning på EKG?
- Ej ST-höjning på EKG?
- Under pågående HLR för att få igång hjärtat?
- När ska man göra kranskärlsröntgen, akut eller senare?
- Bara på VF? Asystoli/PEA?

2019-08-21, kl 13:45
59-årig man faller ihop i Ringens köpcentrum





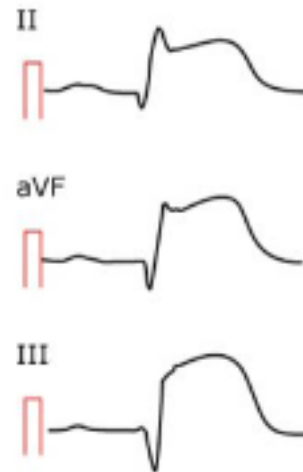
Source: "The ECG of Myocardial Infarction" by J. H. Green, 1960



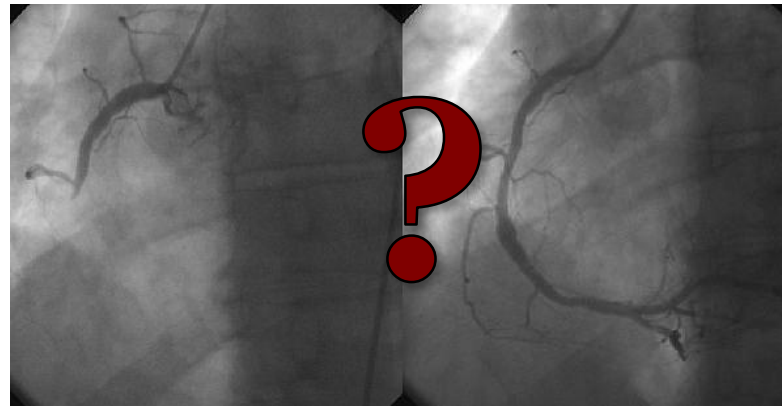
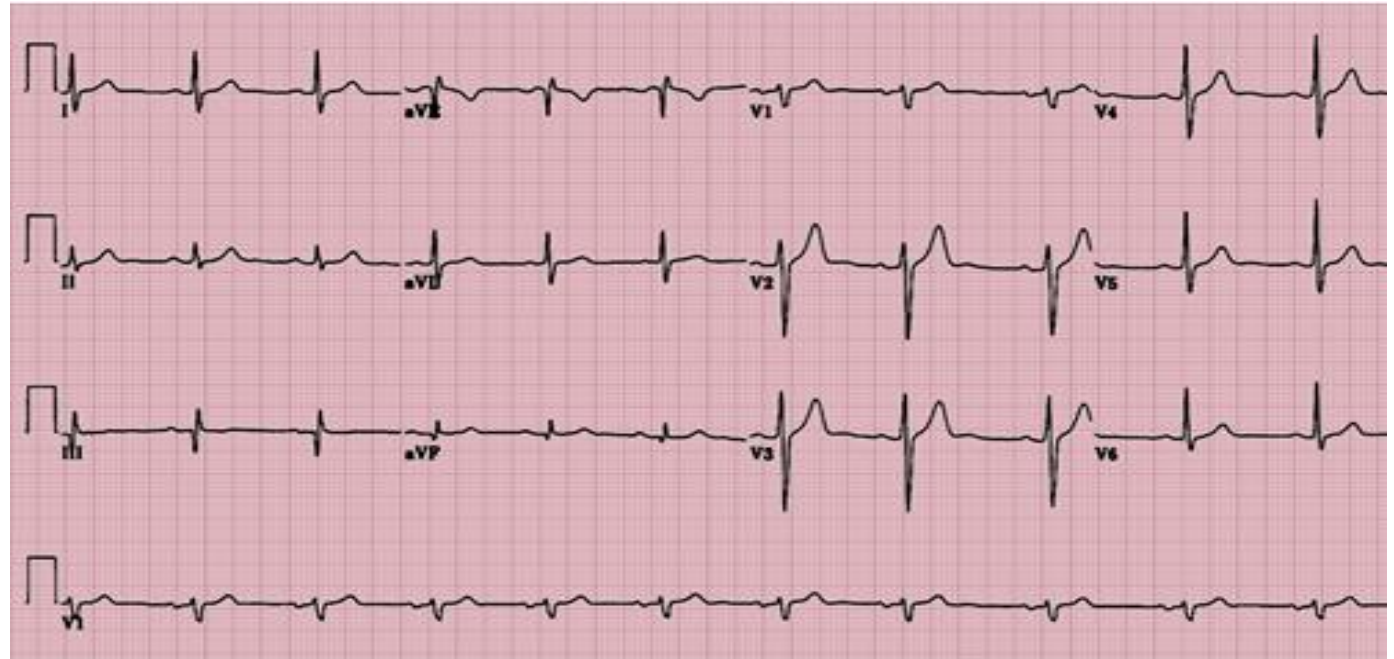
2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

Recommendations	Class	Level
A primary PCI strategy is recommended in patients with resuscitated cardiac arrest and an ECG consistent with STEMI.	I	B
Targeted temperature management is indicated early after resuscitation of cardiac arrest patients who remain unresponsive.	I	B
It is indicated that healthcare systems implement strategies to facilitate transfer of all patients in whom a myocardial infarction is suspected directly to the hospital offering 24/7 PCI-mediated reperfusion therapy via one specialized EMS.	I	C
It is indicated that all medical and paramedical personnel caring for suspected myocardial infarction have access to defibrillation equipment and are trained in basic cardiac life support.	I	C
Urgent angiography (and PCI if indicated) should be considered in patients with resuscitated cardiac arrest without diagnostic ST-segment elevation but with a high suspicion of ongoing myocardial ischaemia.	IIa	C
Prehospital cooling using a rapid infusion of large volumes of cold i.v. fluid immediately after return of spontaneous circulation is not recommended.	III	B

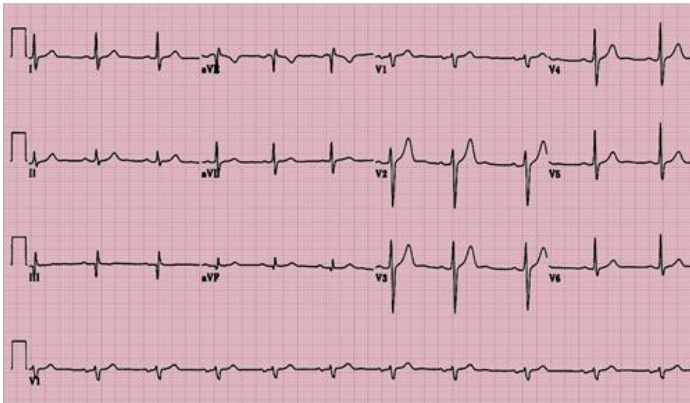
Ca 30% har ST-höjning efter hjärtstopp



Kranskärlsröntgen efter OHCA utan ST-höjning på EKG?



- 30% av hjärtstoppspatienter utan ST-höjning på första EKG har en akut kranskärlshändelse¹



¹Millin et al *Resuscitation* 2016: Patients without ST elevation after return of spontaneous circulation may benefit from emergent percutaneous intervention: A systematic review and meta-analysis

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

Recommendations	Class	Level
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Contents lists available at [ScienceDirect](#)

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Clinical Paper

Early cardiac catheterization is associated with improved survival in comatose survivors of cardiac arrest without STEMI[☆]



Ryan D. Hollenbeck^{a,*,1}, John A. McPherson^{a,1}, Michael R. Mooney^b, Barbara T. Unger^b, Nainesh C. Patel^c, Paul W. McMullan Jr.^d, Chiu-Hsieh Hsu^e, David B. Seder^f, Karl B. Kern^g

Tidig kranskärlsröntgen är associerat med förbättrad överlevnad



Karolinska
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Contents lists available at ScienceDirect

American Heart Journal



Clinical Investigations

Coronary angiography in out-of-hospital cardiac arrest without ST elevation on ECG—Short- and long-term survival

Ludvig Elfwén, MD^a, Rickard Lagedal, MD^b, Stefan James, MD, PhD^{c,*}, Martin Jonsson, MSc^d, Ulf Jensen, MD, PhD^a, Mattias Ringh, MD, PhD^d, Andreas Claesson, PhD^d, Jonas Oldgren, MD, PhD^c, Johan Herlitz, MD, PhD^e, Sten Rubertsson, MD, PhD^b, Per Nordberg, MD, PhD^d

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^c Uppsala Clinical Research Center and Department of Medical Sciences, Cardiology, Uppsala University, Sweden

^d Department of Medicine, Center for Resuscitation Science, Karolinska Institute, Solna, Sweden

^e Center for Pre-Hospital Research in Western Sweden and the School of Health Sciences, University of Borås and Sahlgrenska University Hospital

Tidig kranskärslsröntgen(<24h) kan vara associerat med förbättrad överlevnad



J. Dankiewicz
N. Nielsen
M. Annborn
T. Cronberg
D. Erlinge
Y. Gasche
C. Hassager
J. Kjaergaard
T. Pellis
H. Friberg

Survival in patients without acute ST elevation after cardiac arrest and association with early coronary angiography: a post hoc analysis from the TTM trial

Tidig kranskärlsröntgen(<6h)är inte associerat med förbättrad överlevnad



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Institutet



ORIGINAL ARTICLE

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, H.A. Bosker, M.J. Blans, G.B. Bleeker, R. Baak,
G.J. Vlachojannis, B.J.W. Eikemans, P. van der Harst, I.C.C. van der Horst,
M. Voskuil, J.J. van der Heijden, A. Beishuizen, M. Stoel, C. Camaro,
H. van der Hoeven, J.P. Henriques, A.P.J. Vlaar, M.A. Vink, B. van den Bogaard,
T.A.C.M. Heestermans, W. de Ruijter, T.S.R. Delnoij, H.J.G.M. Crijns,
G.A.J. Jessurun, P.V. Oemrawsingh, M.T.M. Gosselink, K. Plomp, M. Magro,
P.W.G. Elbers, P.M. van de Ven, H.M. Oudemans-van Straaten, and N. van Royen

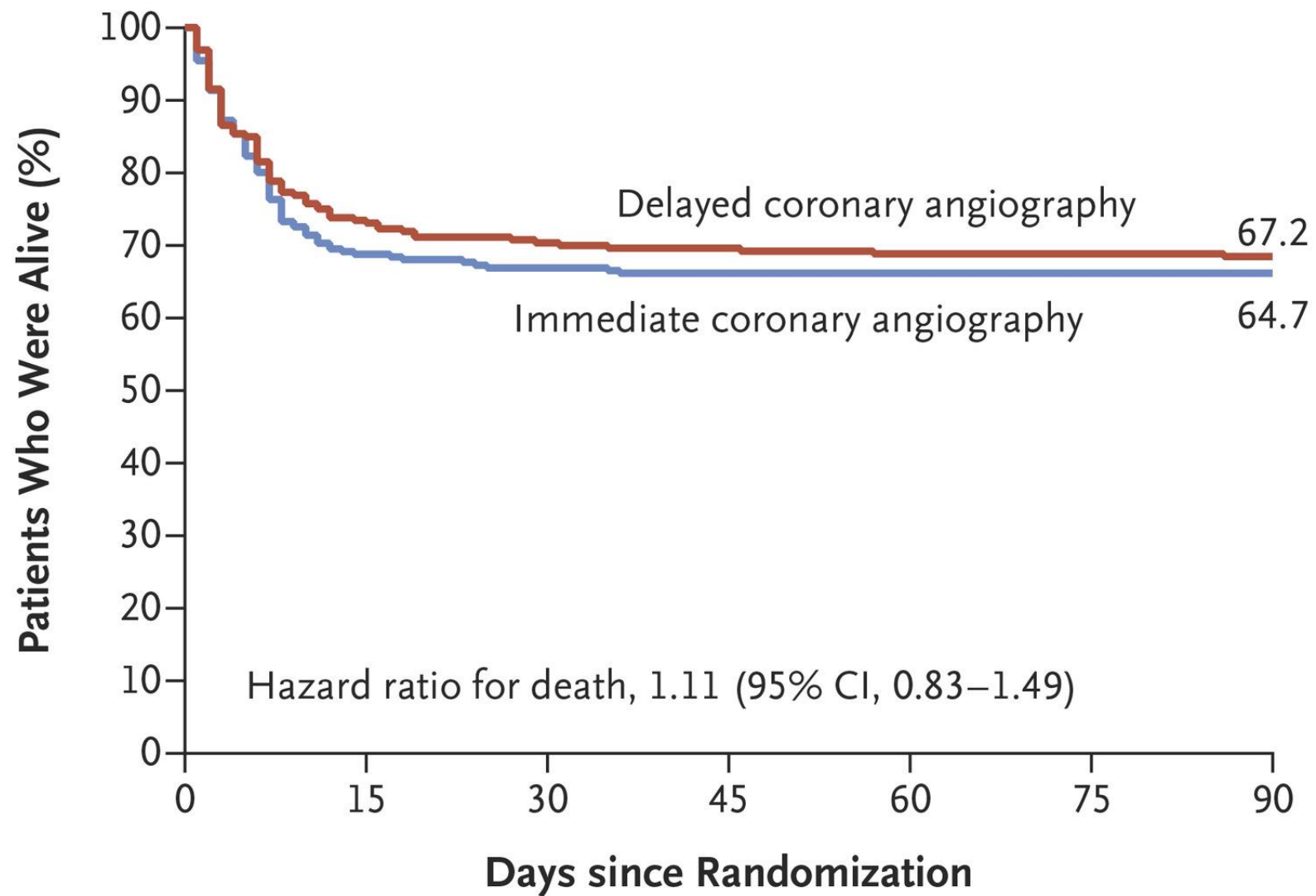
COACT Trial

Inklusion

Hjärtstopp utanför
sjukhus
Primärt VF/VT
Återfått bärande cirkulation
(ROSC)
Patientålder >18 år

Exklusion

- Patientålder <18 år
- Uppenbar icke-kardiell genes till hjärtstopp.
- Kända behandlingsbegränsningar
- Misstänkt eller bekräftad hjärnblödning
- Grav njurinsufficiens (GFR<30)
- Glasgow Coma Scale >8
- ST-höjning på EKG efter ROSC
- Kardiogen chock



No. at Risk

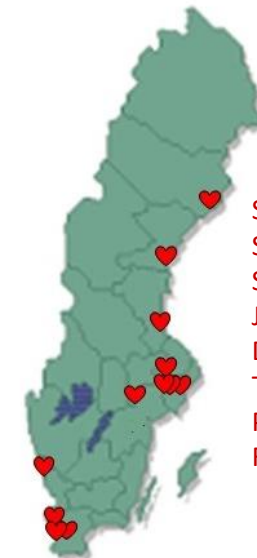
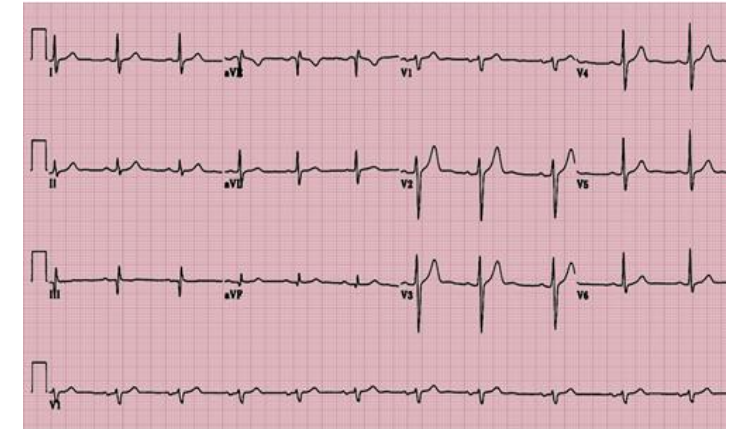
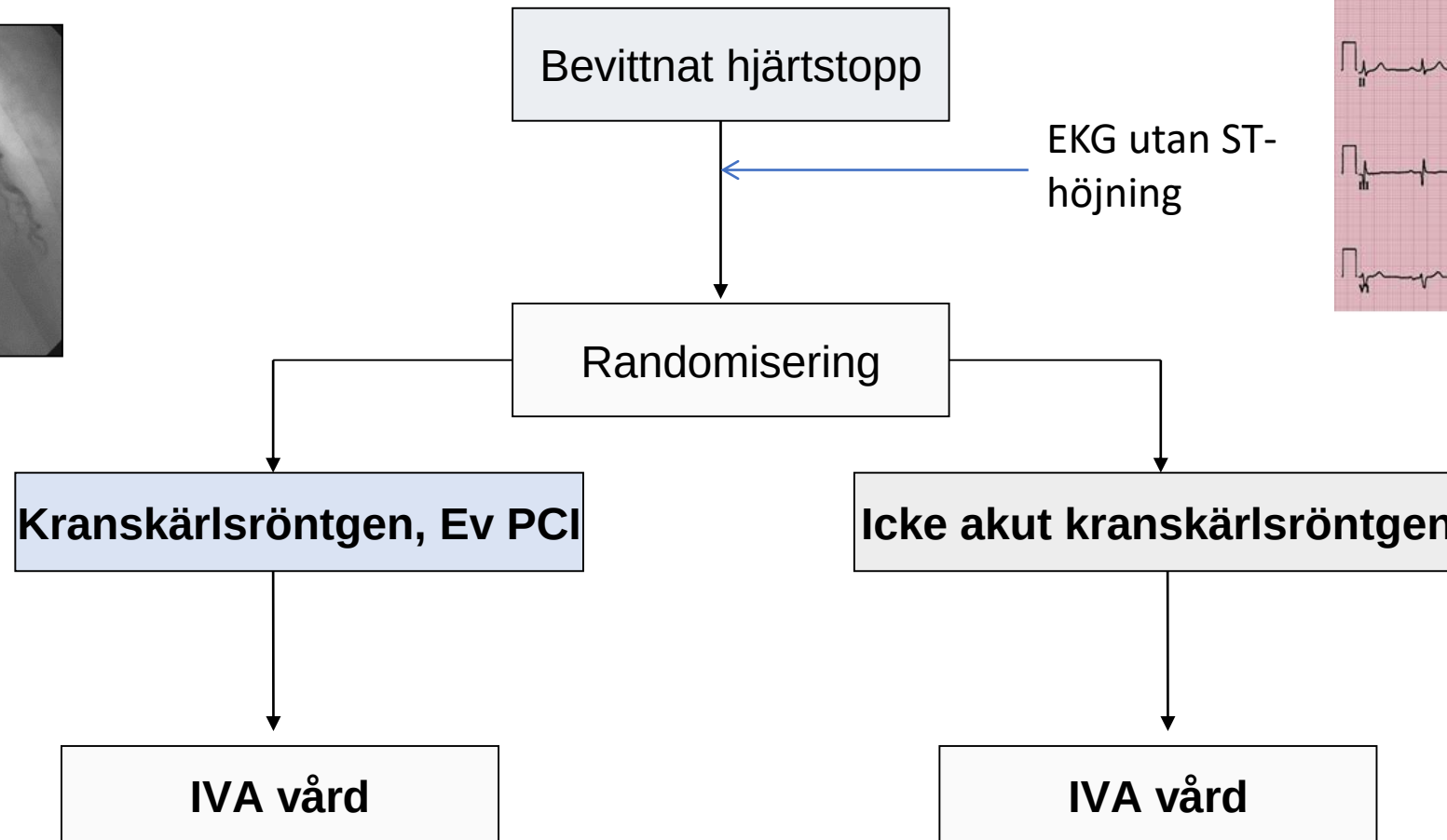
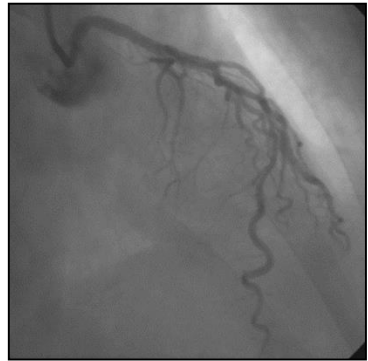
Delayed	265	191	183	181	179	179	178
Immediate	273	183	178	176	176	176	176

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

Variable	Immediate Angiography Group (N = 273)	Delayed Angiography Group (N = 265)
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)§

DISCO

Direct or Subacute Coronary angiography for
Out-of-hospital cardiac arrest



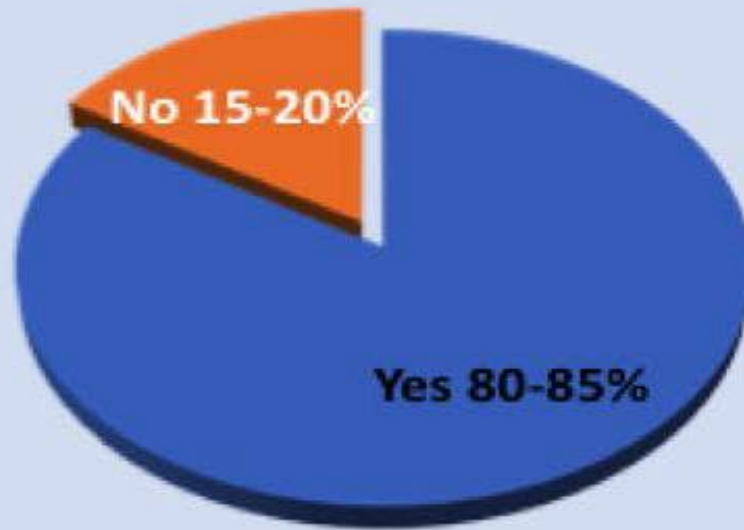
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Sten Rubertsson, Uppsala, PI
Stefan James, Uppsala
Jonas Oldgren, Uppsala
David Erlinge, Lund
Tobias Cronberg, Lund
Peter Lundgren, Göteborg
Felix Böhm, KS Solna

Akut kranskärlsröntgen under pågående HLR?

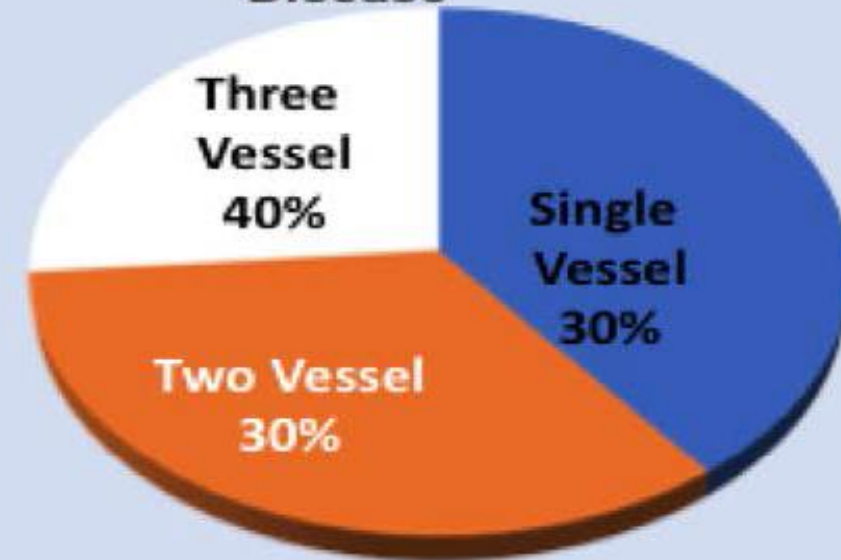


Coronary Artery Disease Burden for refractory VF OHCA

Significant Coronary Disease ($\geq 70\%$)

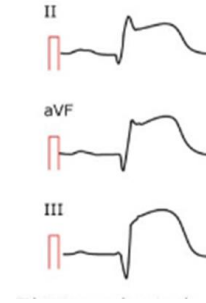


Extent of Coronary Artery Disease



Sammanfattning

- Akut kranskärlsröntgen på *ST-höjningar* efter hjärtstopp?
- JA
- Akut kranskärlsröntgen på *icke ST-höjning* efter hjärtstopp
- NJA
- Akut kranskärlsröntgen under *pågående HLR*?
- I utvalda fall



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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)

* Percentages may not total 100 because of rounding.

[†] These 172 patients represent 95% of those patients who survived until hospital discharge. A total of 38 of the 172 patients received urgent intervention because of cardiac deterioration.

[‡] Unstable lesions were defined as coronary lesions with at least 70% stenosis and the presence of characteristics of plaque disruption, including irregularity, dissection, haziness, or thrombus, as assessed by results of coronary angiography.

[§] Six of the 13 patients in the delayed angiography group who had an acute thrombotic occlusion received urgent intervention because of cardiac deterioration.