

29<sup>ÈME</sup>  
CONGRÈS  
CNCH



## Atelier urgentistes - Urgences cardiologiques

# Les indications de Coronarographie en Urgence hors STEMI

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# DÉCLARATION DE LIENS D'INTÉRÊT POTENTIELS

**Intervenant :** Dr Karim MOUSSA, AVIGNON

Je n'ai pas de lien d'intérêt potentiel à déclarer

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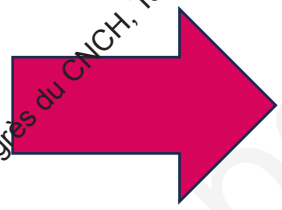


**France PCI registry  
2022  
Annual report**

**Registre de coronarographie  
et d'angioplastie coronaire**

47/ 200 centres participent au registre France PCI (dec 2022)

**DATABASE  
364 770 angio  
176 030 PCI  
85 680 ACS**

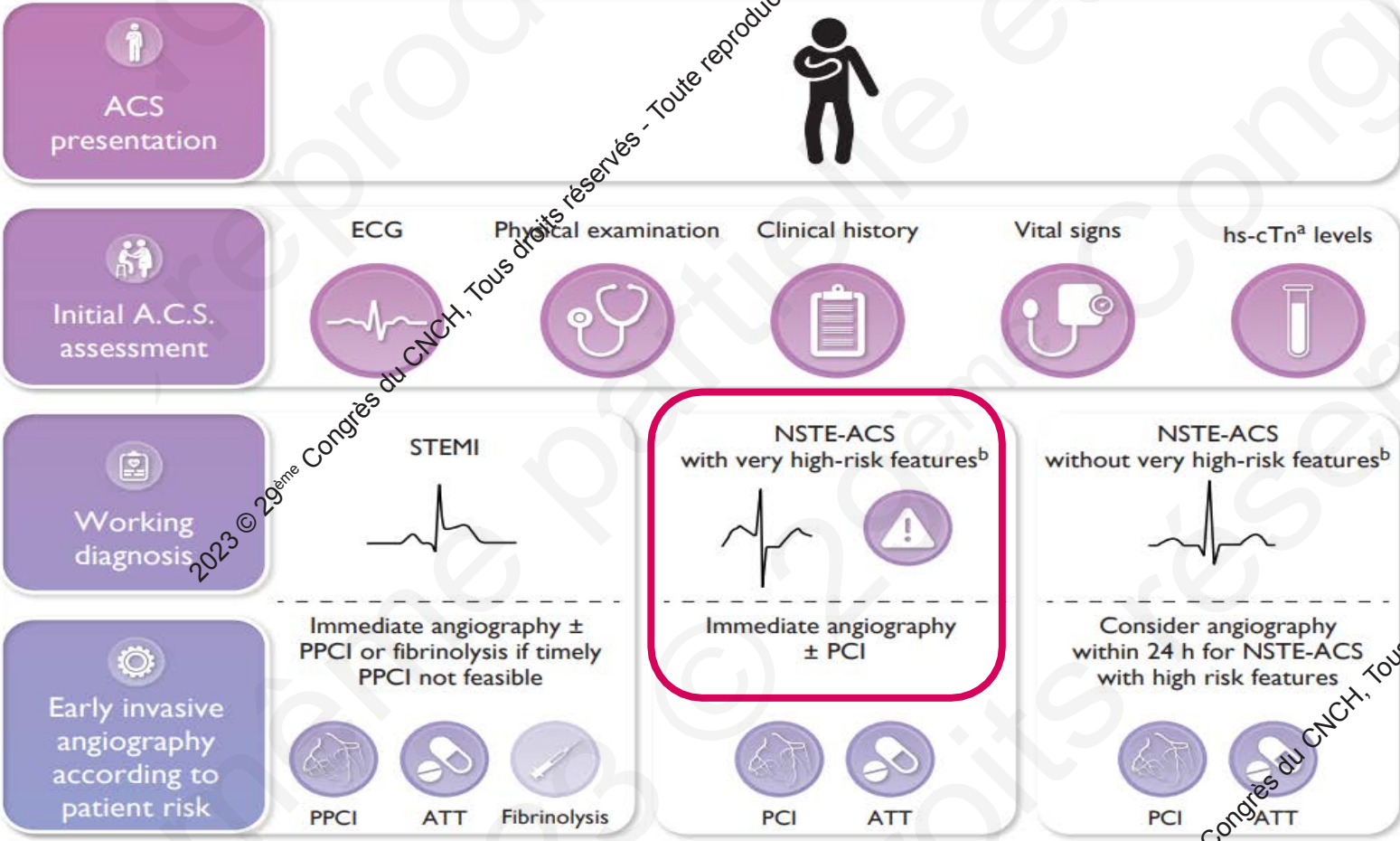


**SCA 23% des Coronarographies  
dont STEMI 9%      NSTEMI 14%**

**PCI STEMI 16% NSTEMI 20%    Angor instable 8%**

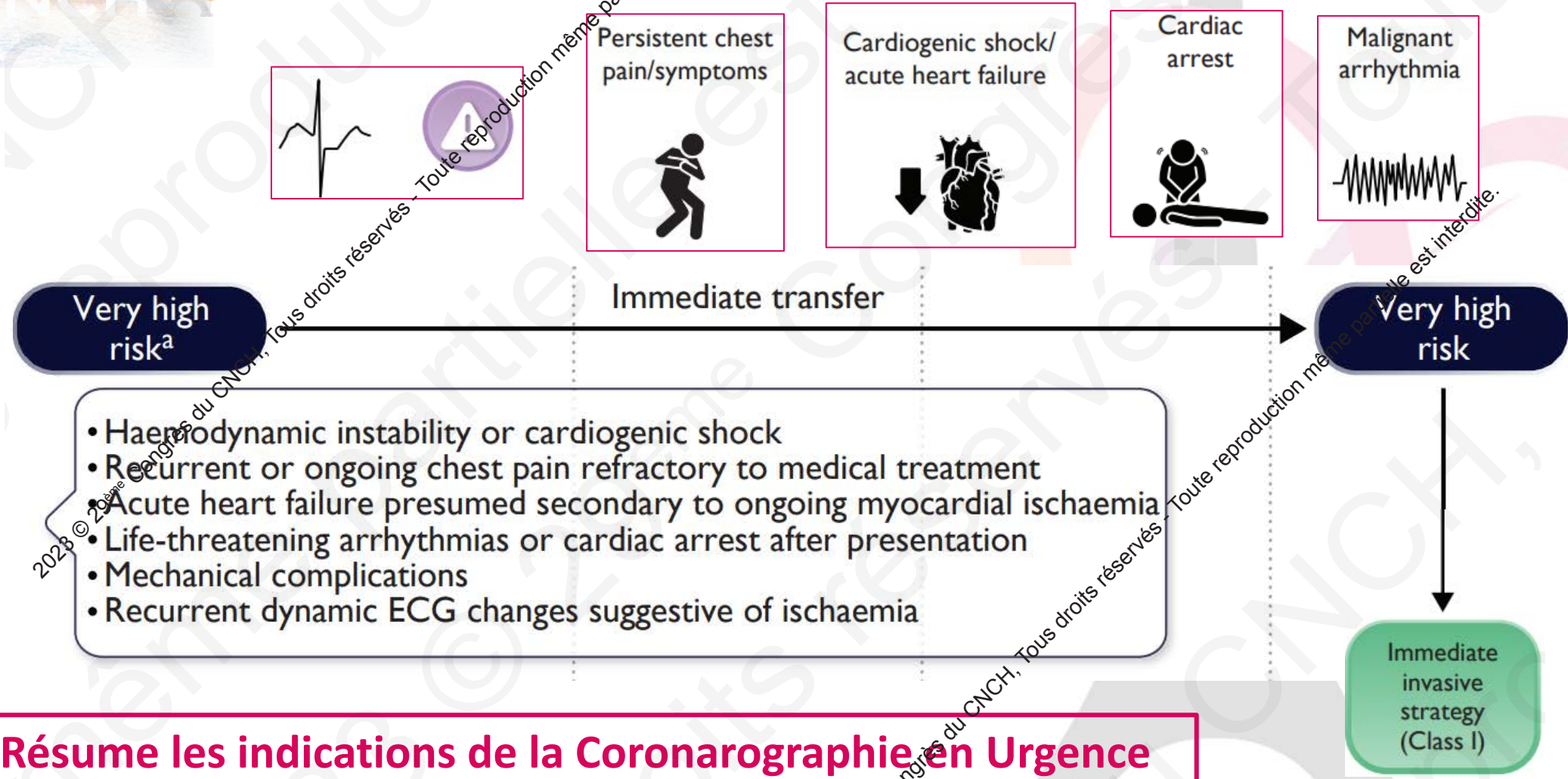


# Coro en Urgence STEMI-Like: le SCA à Très Haut Risque



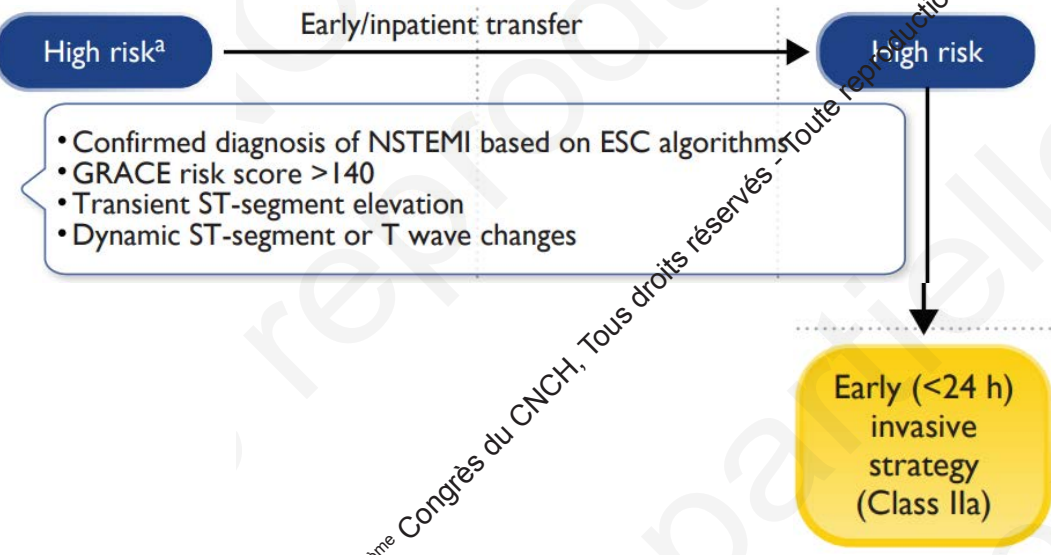
- Dès que Possible
- Idéalement <120 min

# Le NSTEMI à très Haut Risque



**Résume les indications de la Coronarographie en Urgence**

# Timing of Angiography and Outcomes in High-Risk Patients With Non-ST-Segment-Elevation Myocardial Infarction Managed Invasively



**The Sooner the Better !**

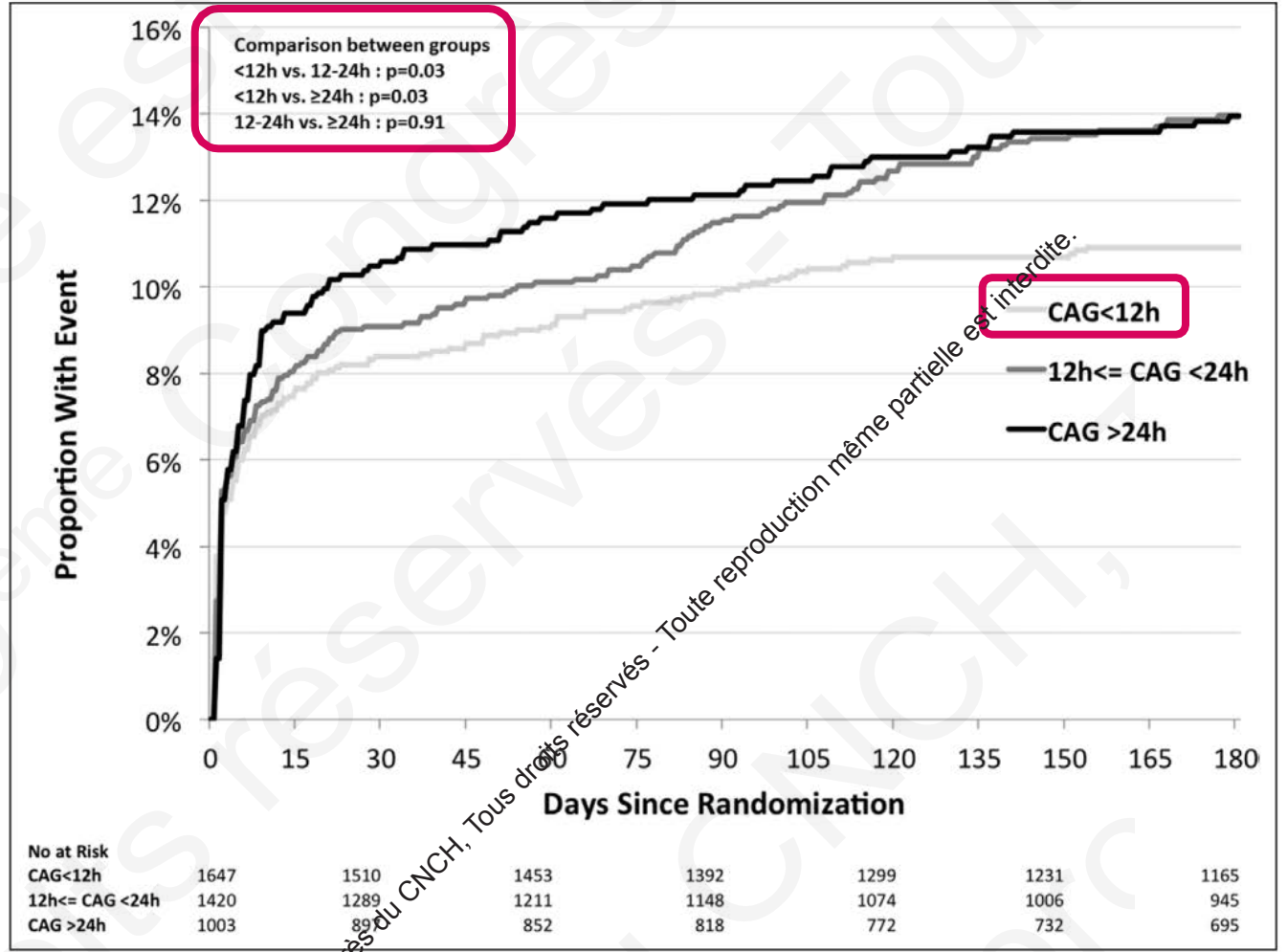


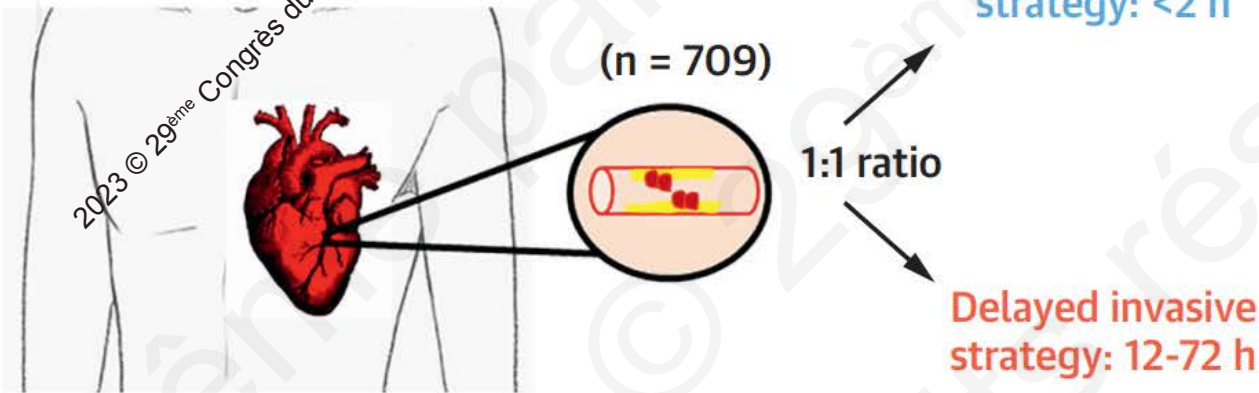
Figure 2. Kaplan-Meier curves depicting the incidence of the unadjusted primary efficacy end point up to 180 days. CAG indicates coronary angiography.

# Optimal Timing of Intervention in NSTEMI-ACS Without Pre-Treatment

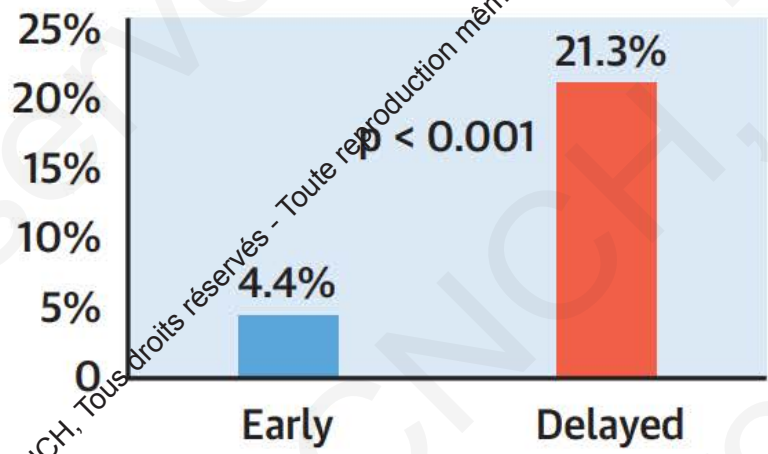
## The EARLY Randomized Trial

EARLY: Prospective Randomized Multicenter Controlled Open-Label Trial

Patients with high-or intermediate-risk NSTEMI-ACS  
without P2Y<sub>12</sub> ADP-receptor antagonist  
pretreatment



Primary Endpoint: CV Death and Recurrent Ischemic Events at 1 Month



**The Earlier the Better !**



# Insuffisance cardiaque Aiguë

- SCC et SCA 1<sup>ere</sup> Cause Insuffisance cardiaque, FEVG conservée ou altérée : 52% avant 75ans European Heart Journal (2001) 22, 228–236 Heart Fail Clin. 2014 Apr;10(2):353–65.
- La maladie coronaire est un facteur prédictif indépendant de mortalité dans l'IC aiguë ( HR 2,57 ) Heart. 2006 May; 92(5): 598–602.
- Ne pas réaliser de coronarographie rapidement peut retarder le diagnostic et la prise en charge adaptée
- OAP a souvent des Triggers Multiples et associés : ischémique, rythmique, hypertensif, valvulaire, septique, iatrogène ....
- Orienté par examen clinique, ATCD, ECG, ETT et Biomarqueurs



# Diagnostic workup of new onset acute heart failure

2021 ESC Guidelines



Patient history, signs and/or symptoms suspected of acute HF

- Electrocardiogram
- Pulse oximetry
- Echocardiography
- Initial laboratory investigations<sup>a</sup>
- Chest X-ray
- Lung ultrasound
- Other specific evaluations<sup>b</sup>

Natriuretic peptide testing

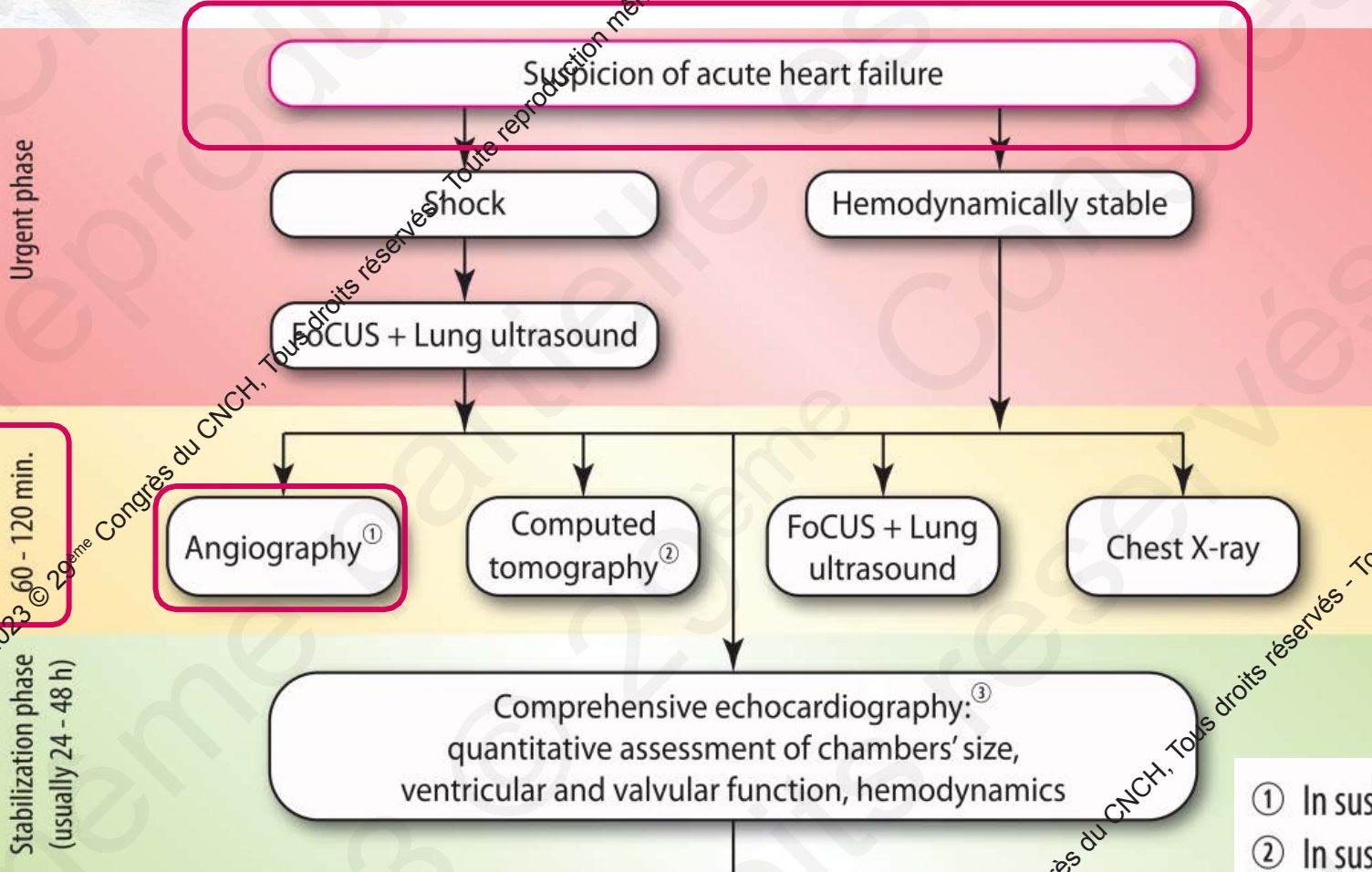
Acute heart failure confirmed

- Après Stabilisation du patient sur le plan hémodynamique (Choc ou Poussée HTA) et Respiratoire (CPAP-VNI)
- Vérifier Tolérance et faisabilité Décubitus dorsal

**Coronarographie :  
délai ??**



# Imaging in patients with suspected acute heart failure: timeline approach position statement



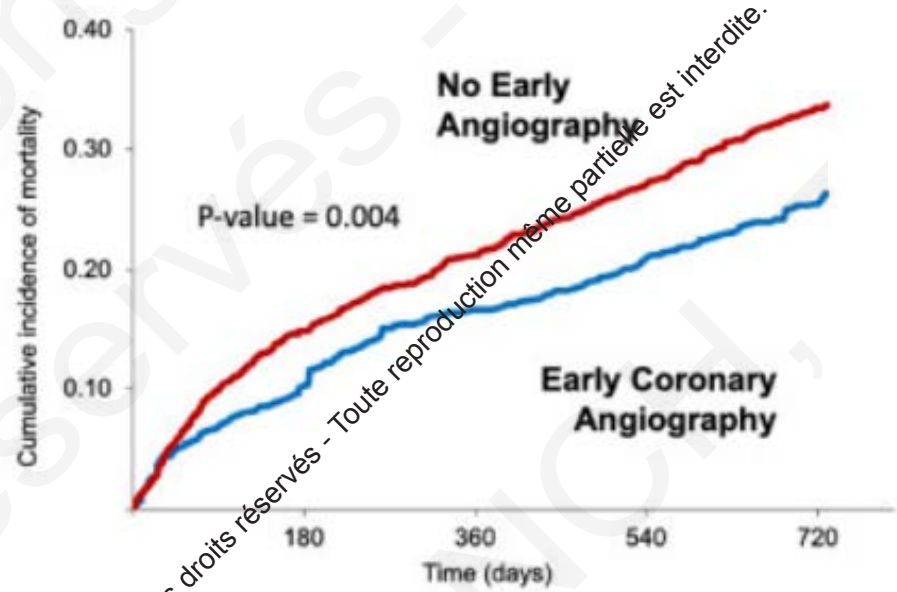
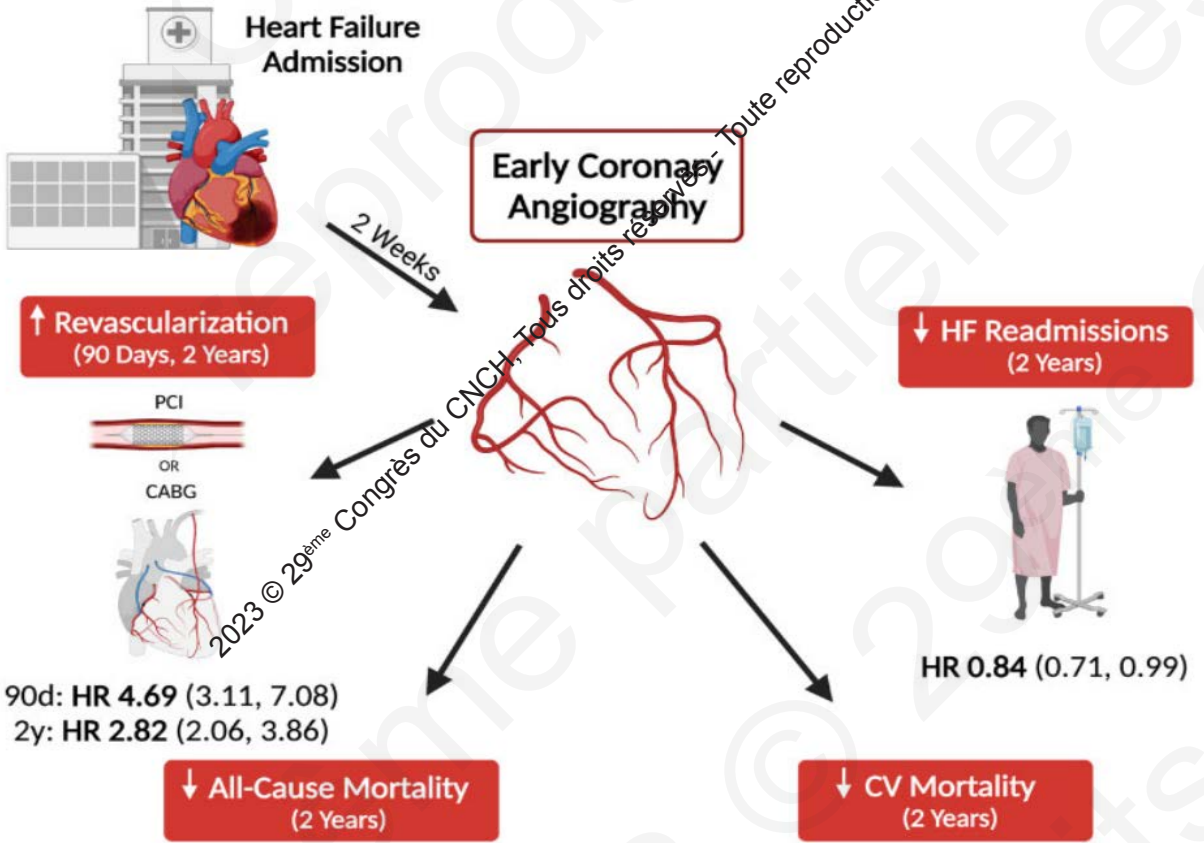
60 - 120 min.

Stabilization phase (usually 24 - 48 h)

- ① In suspicion of acute coronary syndrome.
- ② In suspicion of pulmonary embolism, aortic dissection,
- ③ Magnetic resonance imaging may be used as replacerr

# OAP ischémique : exploration précoce

## Early Invasive Coronary Angiography and Acute Ischaemic HF Outcomes



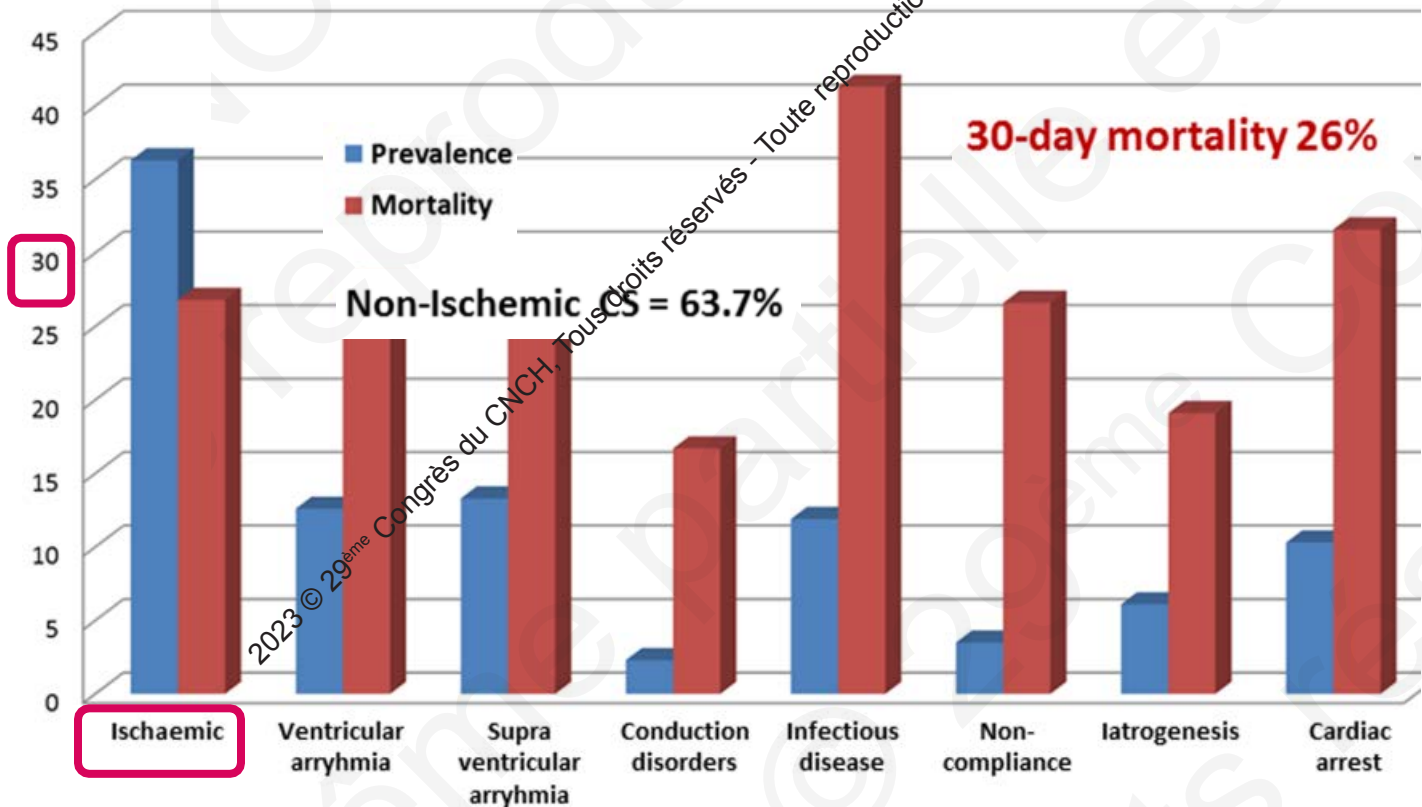


## Décompensation aiguë d'insuffisance cardiaque connue

- Situation la plus fréquente 50-70% des cas [Eur J Heart Fail 2017;19:12421254](#)
- ATCD de cardiopathie ischémique et non-ischémique
- Seulement <13% des patients bénéficient d'un contrôle coronarographique
- Tendance à explorer les SCA, les patients plus jeunes, fonction rénale préservée, avec moins de comorbidités
- 20% des patients ont découvert une sténose coronaire significative alors que la cardiopathie est décrite au préalable comme non ischémique
- Réduction des décès et des rehospitalisations si Coro est réalisée
- IC non ischémique ayant bénéficié d'une coro : meilleur pronostic que les ischémiques (avec ou sans angioplastie coronaire)

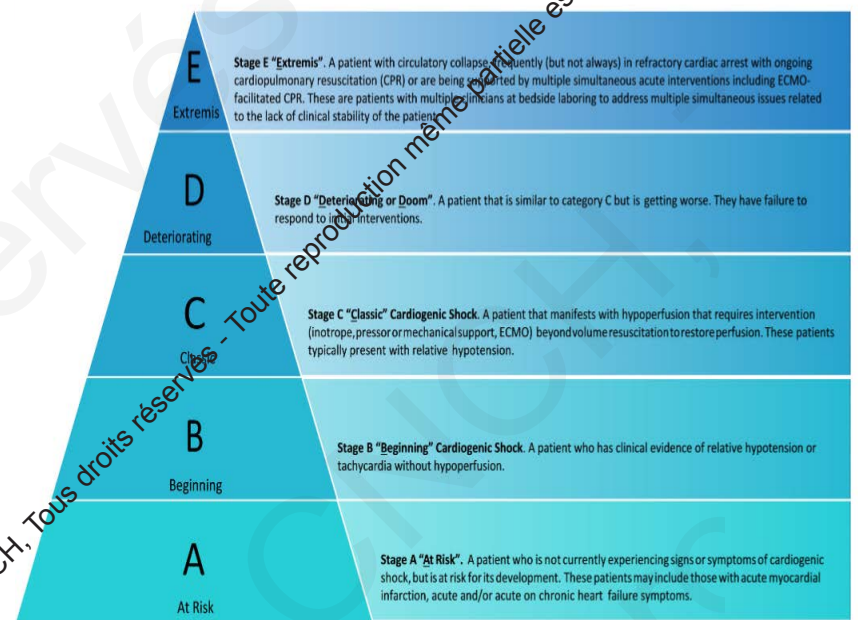


# Choc Cardiogénique



## FRENSHOCK definition of cardiogenic shock

1. Hemodynamic criteria
2. Left and/or right overload criteria
3. Organ malperfusion criteria



Cardiogenic shock in real life practice: the FRENHOCK registry



**Table 3** In-hospital management according to vital status at 30 days

	Overall population (n = 772)	30 day survivors (n = 571)	30 day non-survivors (n = 201)	P value
Invasive cardiology, n (%)				
coronary angiogram	399 (51.7)	318 (55.7)	81 (40.3)	<0.001
1-VD	80/399 (20.1)	65/399 (20.4)	15/399 (18.5)	0.46
2-VD	91/399 (22.8)	74/399 (23.3)	17/399 (21.0)	
3-VD	87/399 (21.8)	64/399 (20.1)	23/399 (28.4)	
Culprit lesion	256/399 (64.2)	196/399 (61.6)	60/399 (74.1)	0.08
Any PCI	217/399 (54.4)	171 (53.8)	46 (56.8)	0.63

**Meilleure Survie à 30 jours chez les chocs cardiogéniques explorés en Coronarographie**

**55,7%**



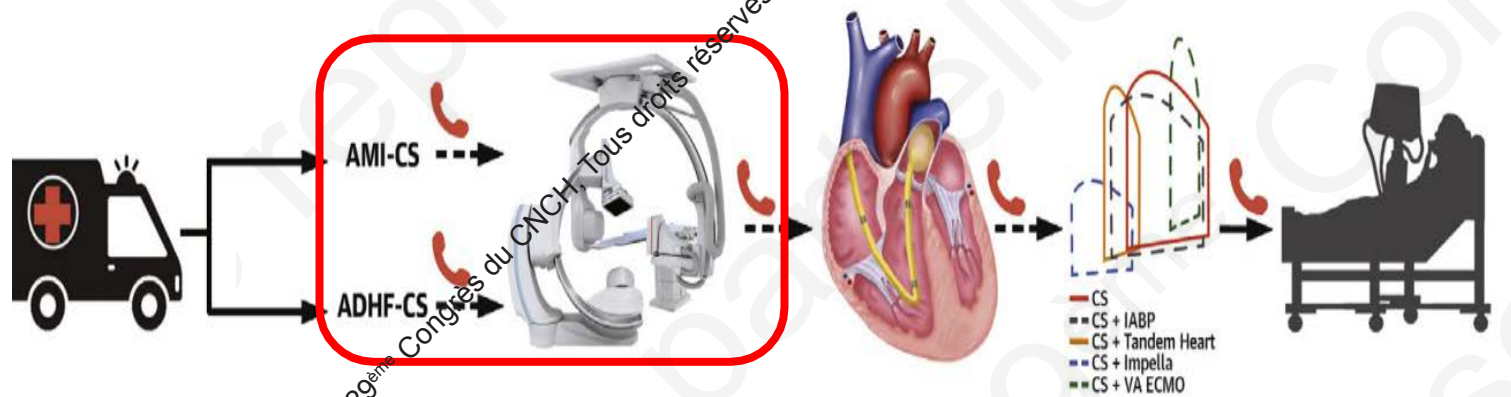
# Cardiogenic Shock

## CONTEMPORARY REVIEW



- CS complicates 5% to 10% of cases of acute MI and is the leading cause of death
- the 12-month mortality in CS has remained unchanged at 50% over the past 20 years
- On coronary angiography, CS with acute MI had 15% significant left main lesions and >50% triple-vessel disease.
- STEMI is associated with a 2-fold increased risk of CS compared with NSTEMI.
- NSTEMI-associated CS are less likely to undergo early cardiac catheterization, delaying PCI/CABG and increasing the risk of mortality compared with STEMI-associated CS.
- Echocardiography may be beneficial however it should not delay cardiac catheterization.
- The most important investigation in patients diagnosed with CS is coronary angiography.

# A Standardized and Comprehensive Approach to the Management of Cardiogenic Shock



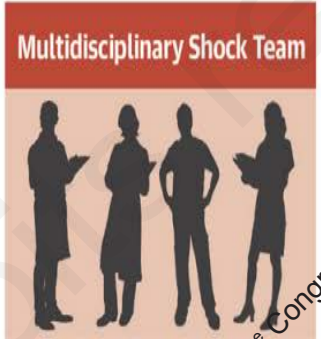
1. In cardiogenic shock, a coronary cause should routinely be sought .
2. Intensive care before coronary angiography of CS secondary to MI should be of the “scoop and run” type.
3. What is important is to transfer the patient alive to the coronary angiography unit without any delay as a result of an attempt at stabilization

**Clinical Criteria for CS**

- SBP <90 mm Hg for > 30 minutes or inotropes/vasopressors to maintain SBP >90 mm Hg
- Evidence of end-organ hypofusion
- Lactate >2 mmol/l

**Hemodynamic Criteria for CS**

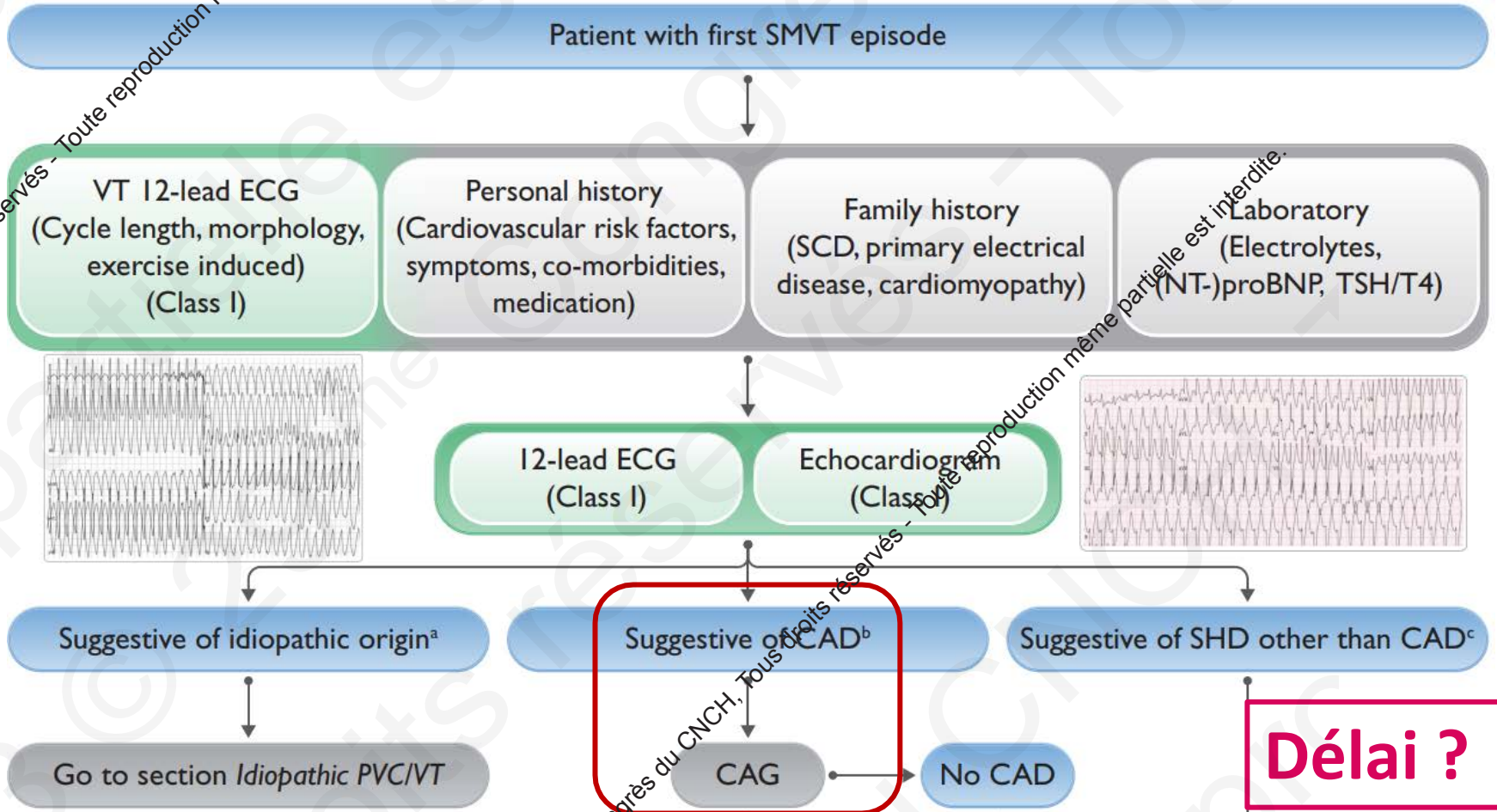
- CI <1.8 l/min/m<sup>2</sup> without vasopressors/inotropes (or <2.2 l/min/m<sup>2</sup> with vasopressors/inotropes)
- CPO <0.6 W
- PCWP & PAPI to identify CS phenotype





# Orage Rythmique : Trigger ischemique ?

3 TV/FV < 24h



Éliminer une cause aiguë réversible dont la coronaropathie

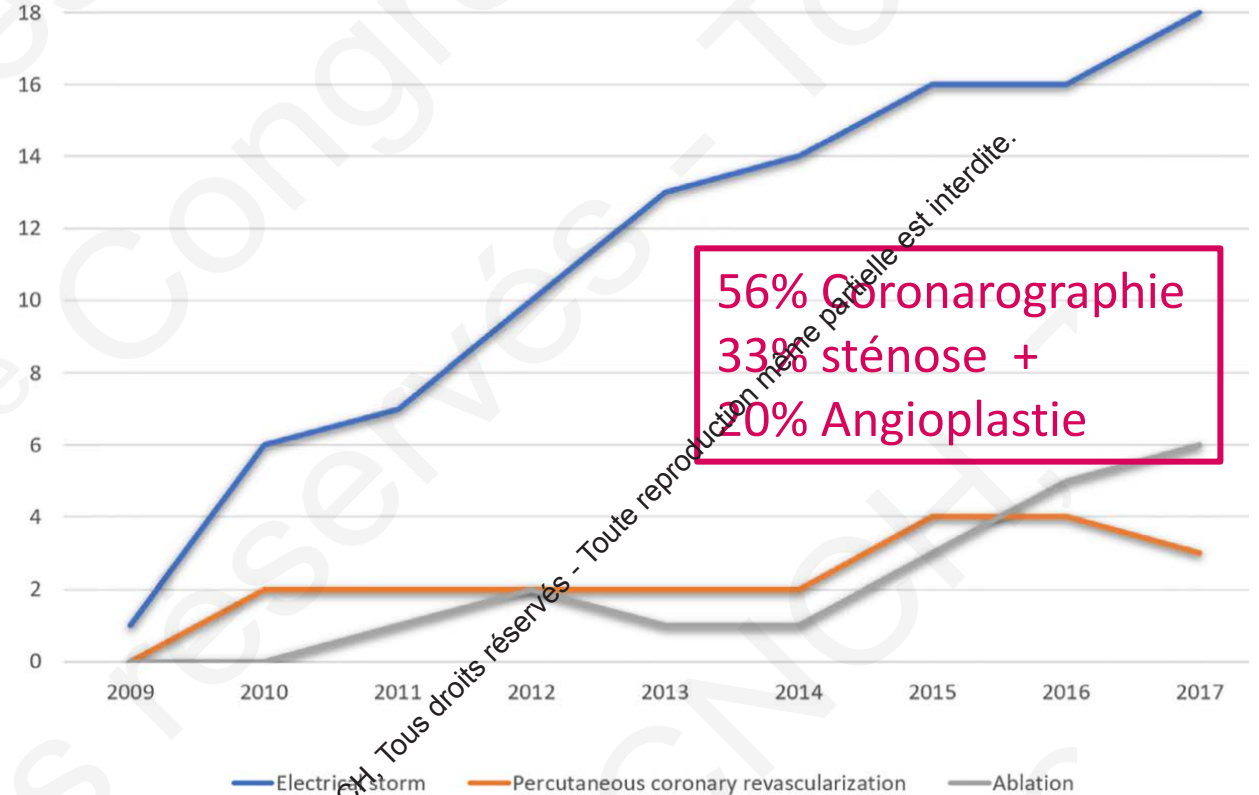
Délai ?



## Characteristics and Outcomes in Patients With Electrical Storm

### Trigger orage Rythmique :

- 2/3 des cas inconnus !  
ATCD Cardiopathie Structurale (cardiopathie ischémique cicatricielle 68%)
- 1/3 : insuffisance cardiaque aiguë, SCA, trouble ionique, iatrogène, drogue, fièvre, post-op chir cardiaque



# Is Coronary Assessment in Ventricular Tachycardia Storm Still Necessary?\*

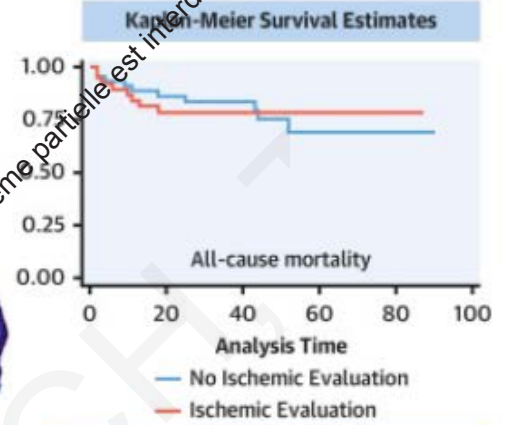
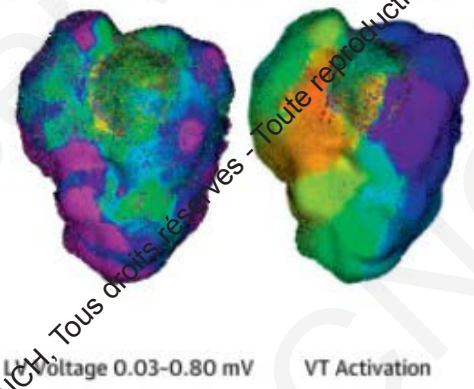
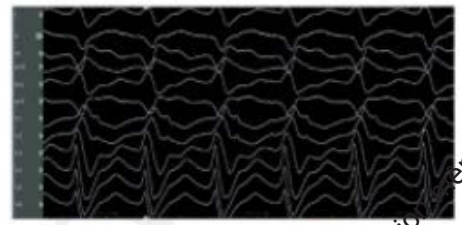
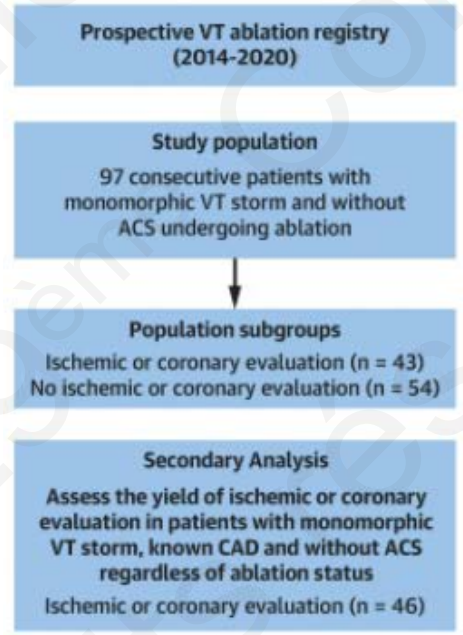
SCA plutôt FV ou TV polymorphe que TV monomorphe

Douleurs thoraciques et Trouble de la repolarisation post-Cardioversion trompeurs

Elévation des biomarqueurs (Troponines) peu spécifique dans ce contexte

Altération FEVG et Trouble de la cinétique 2aire à l'arythmie

## CENTRAL ILLUSTRATION: Ischemic or Coronary Evaluations in Patients With Monomorphic Ventricular Tachycardia Electrical Storm Undergoing Ventricular Tachycardia Ablation



- Low yield of ischemic or coronary evaluations; no acute lesions identified
- No association between ischemic evaluations and acute ablation outcomes and mortality upon follow-up
- Low yield of ischemic or coronary evaluations in secondary analysis

**Conclusions**

- The yield of ischemic or coronary evaluations in monomorphic VT storm was low
- Ischemic evaluations in monomorphic VT storm without ACS may not improve procedural outcomes or mortality post-ablation

# Is Coronary Assessment in Ventricular Tachycardia Storm Still Necessary?\*

## Expert consensus on acute management of ventricular arrhythmias

Recommendations on initial management and acute diagnostics. VT = ventricular tachycardia; VF = ventricular fibrillation; SCD = Sudden cardiac death.

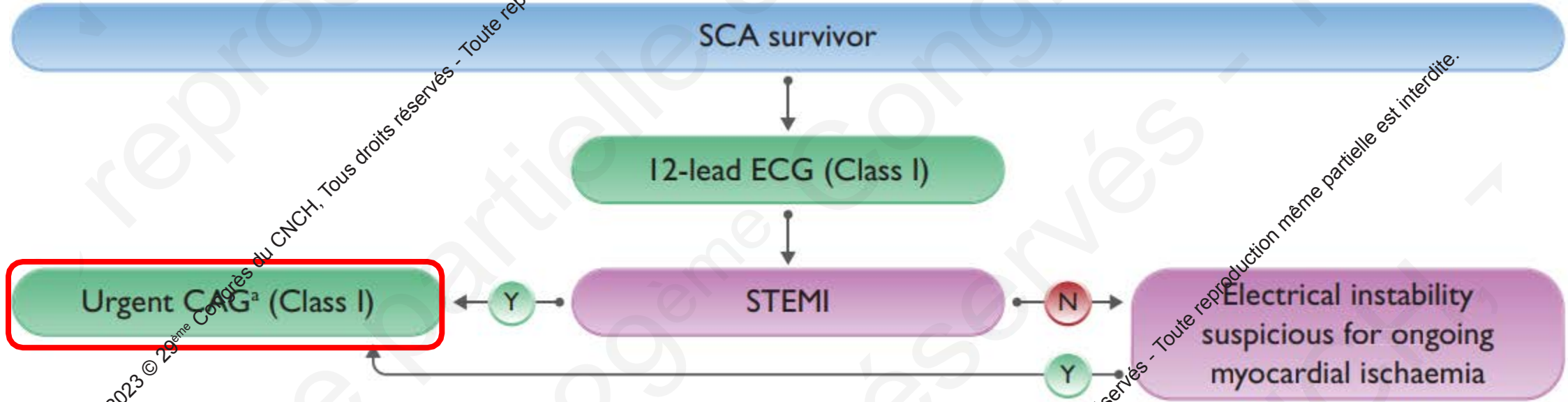
Recommendations – Initial Approach / Acute Diagnostics	Class	Level
12 lead ECG (tachycardia and resting ECG)	I	C
Antiarrhythmic Drug Therapy (Table 2)		
Electrical cardioversion if drug therapy fails or if patient is hemodynamically unstable.	I	A
Interrogation of the implantable intracardiac pacing / defibrillation device, if present, should be performed as soon as possible, to evaluate the arrhythmia and delivered therapies.	I	C
A transthoracic echocardiographic study should be conducted in every patient with VTs, after the arrhythmia has been treated accordingly.	I	B
In patients with refractory electrical storm despite adequate therapy, a transfer to an intensive care unit with hemodynamic and electrocardiographic monitoring (12 lead ECG monitoring if possible) and deep sedation up to general anaesthesia is indicated.	I	C
<b>An acute complete invasive cardiac evaluation should be considered in patients with polymorphic VT / VF or survivors of SCD, as well as in patients with unstable hemodynamics, cardiogenic shock, or persistent angina pectoris symptoms.</b>	I	C
An electrophysiology center from the Austrian VT Network should be contacted early in the treatment and the patient transferred if necessary.	I	C





# Arrêt Cardiaque ( Sudden cardiac arrest)

## 2022 ESC Guidelines



Algorithm for the evaluation of sudden cardiac arrest survivors.

### Recommendations for evaluation of sudden cardiac arrest survivors

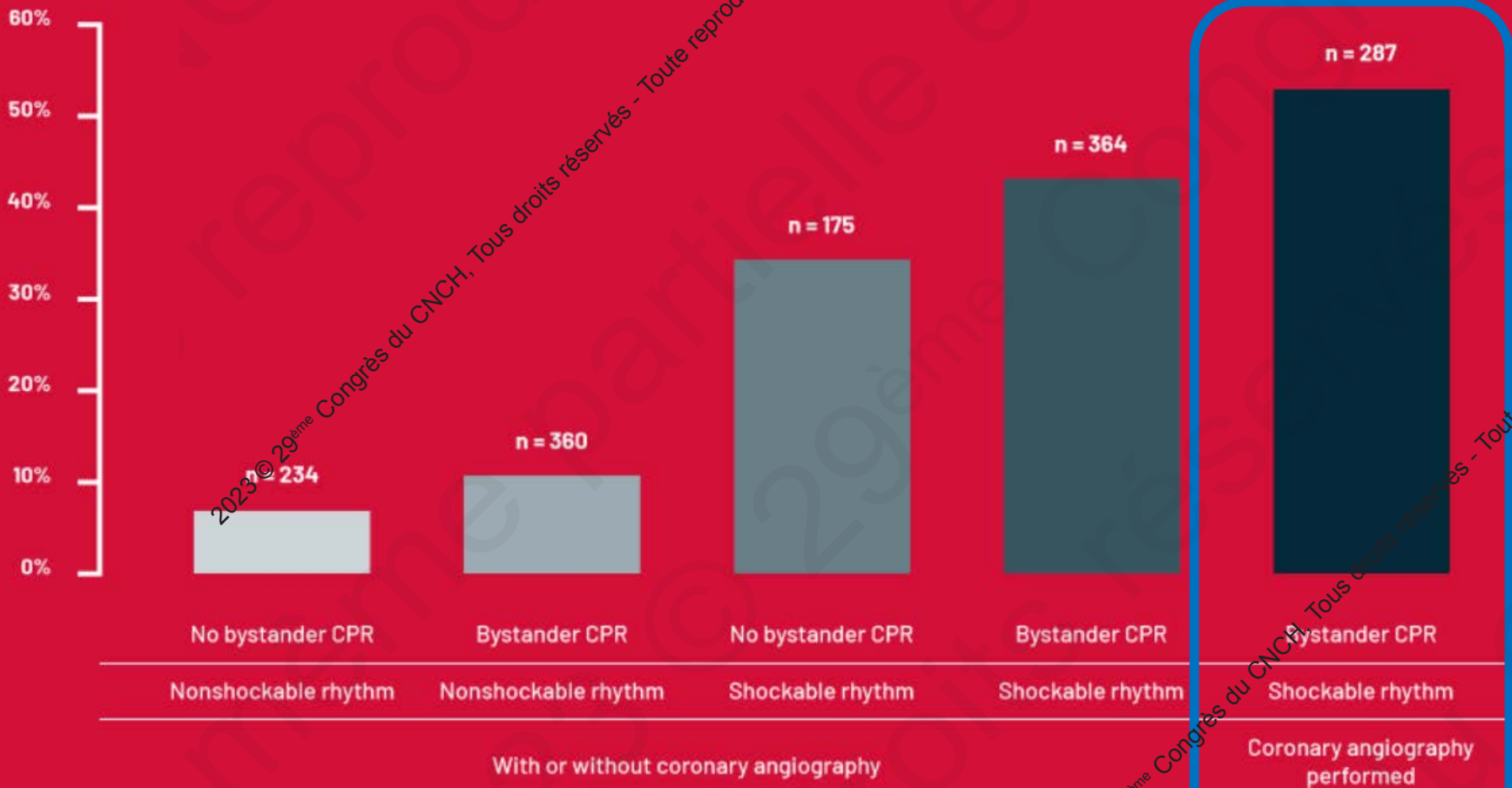
The investigation of a SCA survivor without obvious extra-cardiac cause is recommended to be overseen by a multidisciplinary team.

I	B
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# La Coronarographie améliore le pronostic des Morts Subites

## Survival at discharge



**Vraiment pour tous ?**



# Coronary Angiography in Patients With Out-of-Hospital Cardiac Arrest Without ST-Segment Elevation on Electrocardiograms: A Comprehensive Review

Reference, year, study title	Clinical trial identifier, location	No. of patients	Definition of early CAG	Definition of nonearly CAG	Primary end point	Key results on the primary end point	Favors early angiography
Lemkes et al, <sup>16</sup> 2019 COACT	NTR4973, Netherlands	552	<2 h after randomization	After neurologic recovery	Survival at 90 d	OR, 0.89; 95% CI, 0.62-1.27; P = .51	No
Desch et al, <sup>45</sup> 2021 TOMAHAWK	NCT02750462, Germany	530	As soon as possible after hospital admission	>24 h after cardiac arrest or not at all	Death due to any cause at 30 d	HR, 1.28; 95% CI, 1.00-1.63; P = .06	No
Kern et al, <sup>46</sup> 2020 PEARL	NCT02387398, USA, Slovenia, and Australia	99	<120 min of admission	>6 h from admission or not at all	Safety and efficacy of early CAG	55.1% vs 46.0%; P = .64	No
Hauw-Berlemount et al, <sup>47</sup> 2022 EMERGE	NCT02876458, France	279	Transferred directly to the catheterization laboratory	Admitted to the intensive care unit, and CAG planned 48-96 h after admission	180-d survival rate, with no or minimal neurologic sequelae; CPC score of 1 or 2	HR, 0.87; 95% CI, 0.65-1.15; P = .324	No



# Arrêt Cardiaque : Coronarographie urgente pour tous ?

**NON !**

1. STEMI alors Coronarographie rapide et angioplastie de Sauvetage
2. En l'absence de STEMI ou équivalent et en cas de stabilité rythmique et hémodynamique, pas de coronarographie Urgente ni systématique pour les ACR
3. Si absence réveil ( Coma) post ACR ressuscité, réévaluation neurologique en réanimation à 72h pour pronostic
4. Contrôle température avec éviction fièvre recommandée
5. SCA suspecté alors transfert vers CH disposant d'un plateau de Coronarographie





# Quand faire une Coronarographie en urgence ?

- Défaillance cardiaque aiguë : ischémique, hémodynamique ou rythmique
- Souvent Triggers multiples et associés
- Coronarographie précoce semble améliorer le pronostic même sans angioplastie
- Intérêt d'une discussion précoce multidisciplinaire: Urgentiste, SMUR, Régulation, Cardiologue et Réanimateur
- Après Stabilisation rapide du patient avant l'admission au CathLab



NSTEMI À TRÈS HAUT  
RISQUE ( LE STEMI-LIKE)



INSUFFISANCE  
CARDIAQUE AIGUE OAP



CHOC CARDIOGÉNIQUE  
APRÈS STABILISATION  
DU PATIENT



ORAGE RYTHMIQUE  
APRÈS RÉGULARISATION  
OU SÉDATION



ARRÊT CARDIAQUE OU  
MORT SUBITE ??

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**Merci de Votre Attention**



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