# L'arrêt cardiaque
# News in ICU ? And after…

Les MARES contre-attaque

Dr LE SAUX Audrey

Dr BOURENNE Jeremy

# La RDU aux JDU

- **10 lits de réanimation**
- **1 lits de déchocage**
- **600 admissions / an**
- **Dont 100 arrêts cardiaques**

AfterROSC

Cardiac Arrest network

**Consultation de suivi**

# Syndrome post arrêt cardiaque

## The second step in resuscitation—the treatment of the 'post-resuscitation disease'

V. A. NEGOVSKY *Resuscitation* (1972)

There is much evidence that the organism experiences a specific pathological condition after resuscitation. We are inclined to call this condition 'the post-resuscitation disease', and to examine it as an independent nosological form. Indeed, irreversible

**Metabolism**

**Heart and circulation**

**Respiration**

**Liver function**

**Kidney function**

**Central nervous system function**

# Syndrome post arrêt cardiaque

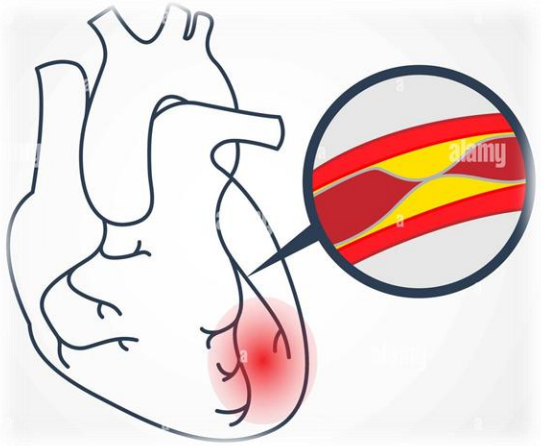
**Pathologie causale**

**Dysfonction myocardique**

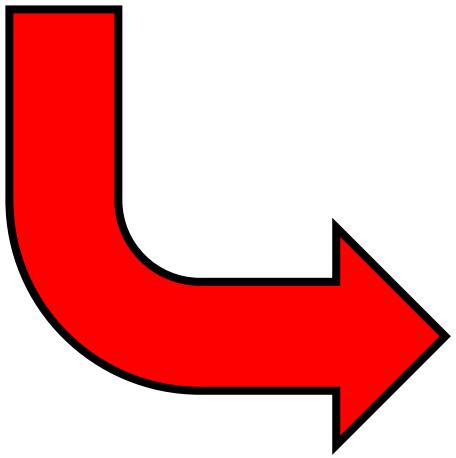
**Encéphalopathie post anoxique**

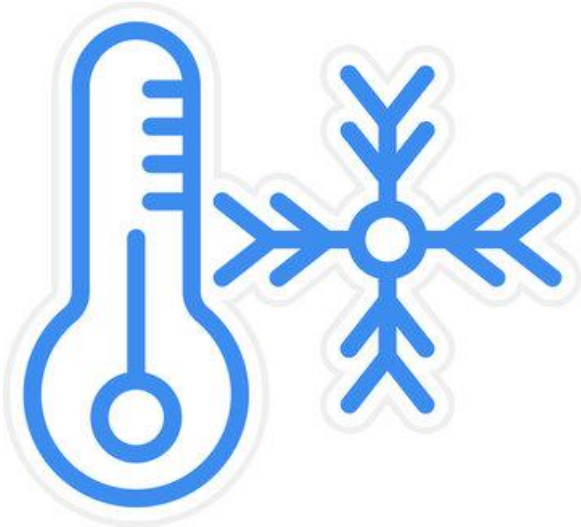
**Syndrome d'Ischémie – Reperfusion**
**Défaillance multi-viscérale**

# Encéphalopathie post anoxique



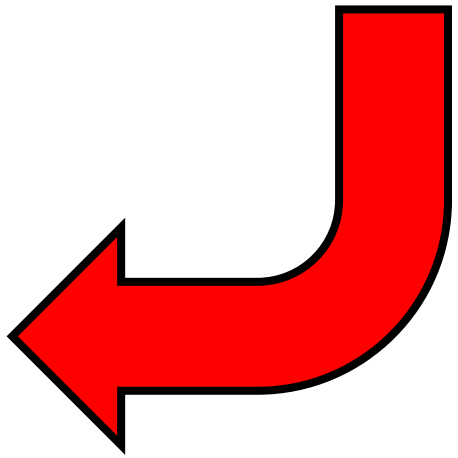
**Une coronarographie ?**





**Un contrôle ciblé ?**

**Des paramètres à optimiser ?**



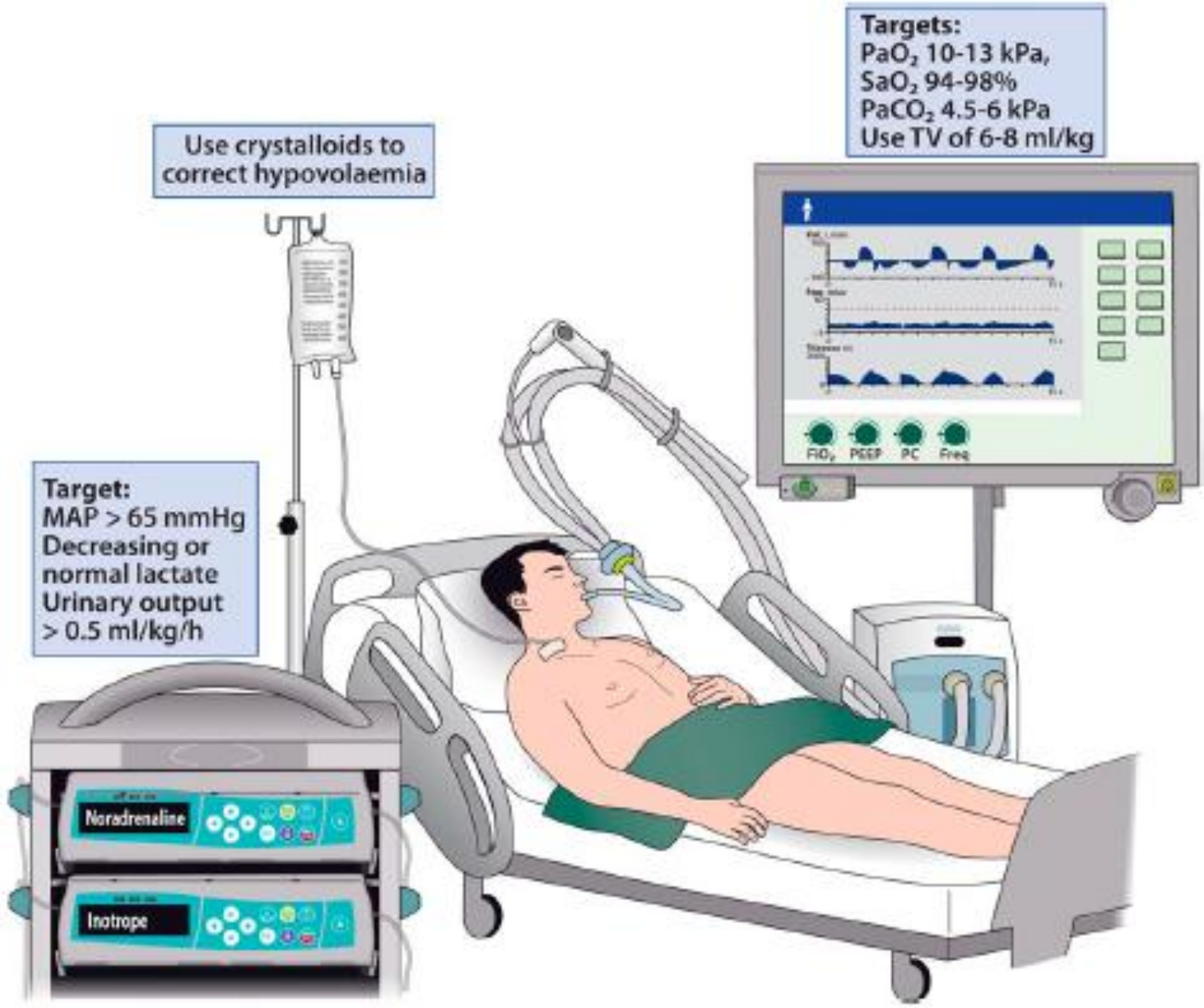
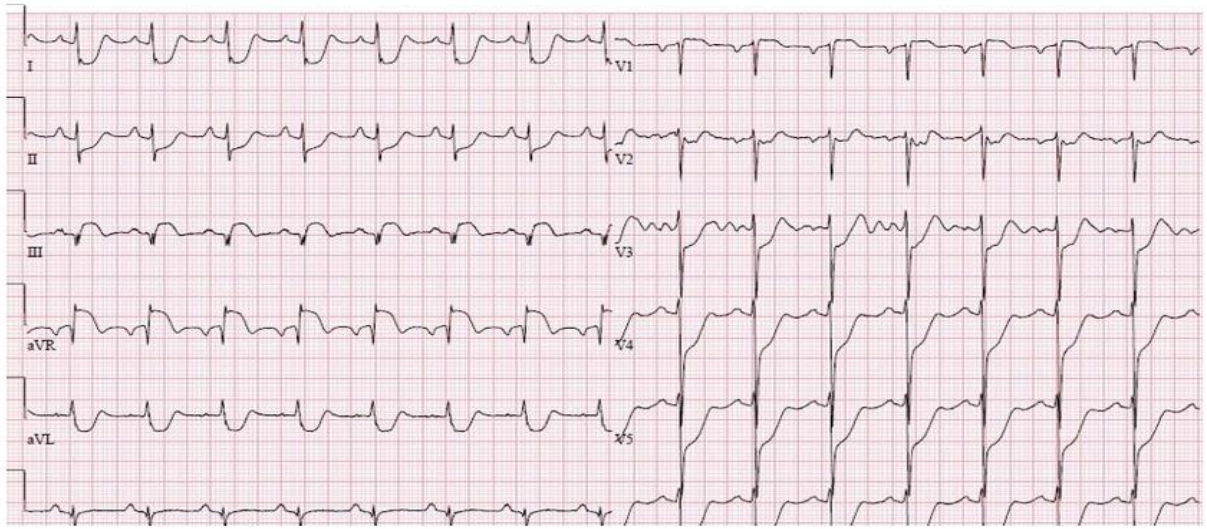
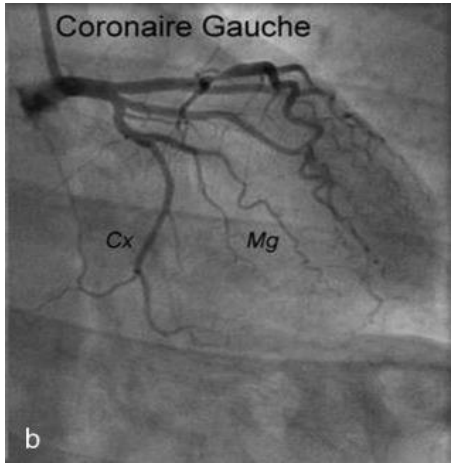



**Fig. 3 – Haemodynamic, oxygenation and ventilation targets.**

# Faut-il faire une coronarographie d'emblé




# IMMEDIATE CORONARY ANGIOGRAPHY IN SURVIVORS OF OUT-OF-HOSPITAL CARDIAC ARREST

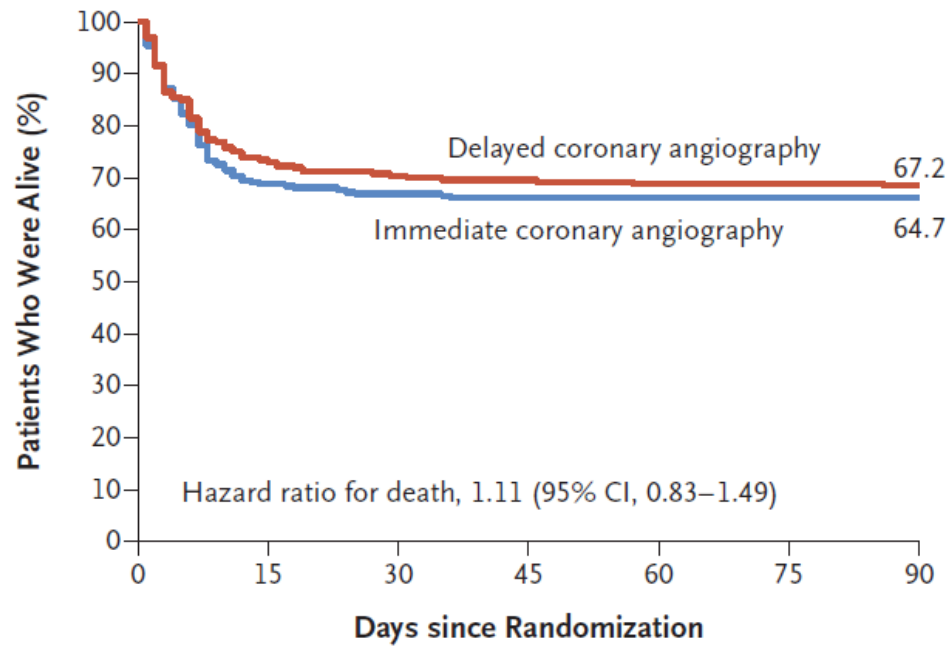
CHRISTIAN M. SPAULDING, M.D., LUC-MARIE JOLY, M.D., ALAIN ROSENBERG, M.D., MEHRAN MONCHI, M.D., SIMON N. WEBER, M.D., JEAN-FRANÇOIS A. DHAINAUT, M.D., PH.D., AND PIERRE CARLI, M.D.

| VARIABLE | VALUE |
|---|---|
| Normal coronary arteries — no. (%) | 17 (20) |
| Clinically insignificant coronary artery disease (≤50 percent stenosis) — no. (%) | 7 (8) |
| Clinically significant coronary artery disease — no. (%) | 60 (71) |
| Single-vessel disease | 22 |
| Two-vessel disease | 13 |
| Three-vessel disease | 24 |
| Isolated left main coronary artery disease | 1 |
| Left ventricular ejection fraction — % | 33.9±10.5 |
| Left ventricular end-diastolic pressure — mm Hg | 25.3±9.5 |

| VARIABLE | NO. OF PATIENTS | NO. WITH RECENT CORONARY-ARTERY OCCLUSION (%) |
|---|---|---|
| ST-segment elevation and chest pain | | |
| Present | 15 | 13 (87) |
| Absent | 69 | 27 (39) |
| ST-segment elevation or chest pain | | |
| Present | 49 | 31 (63) |
| Absent | 35 | 9 (26) |

# Coronary Angiography after Cardiac Arrest without ST-Segment Elevation

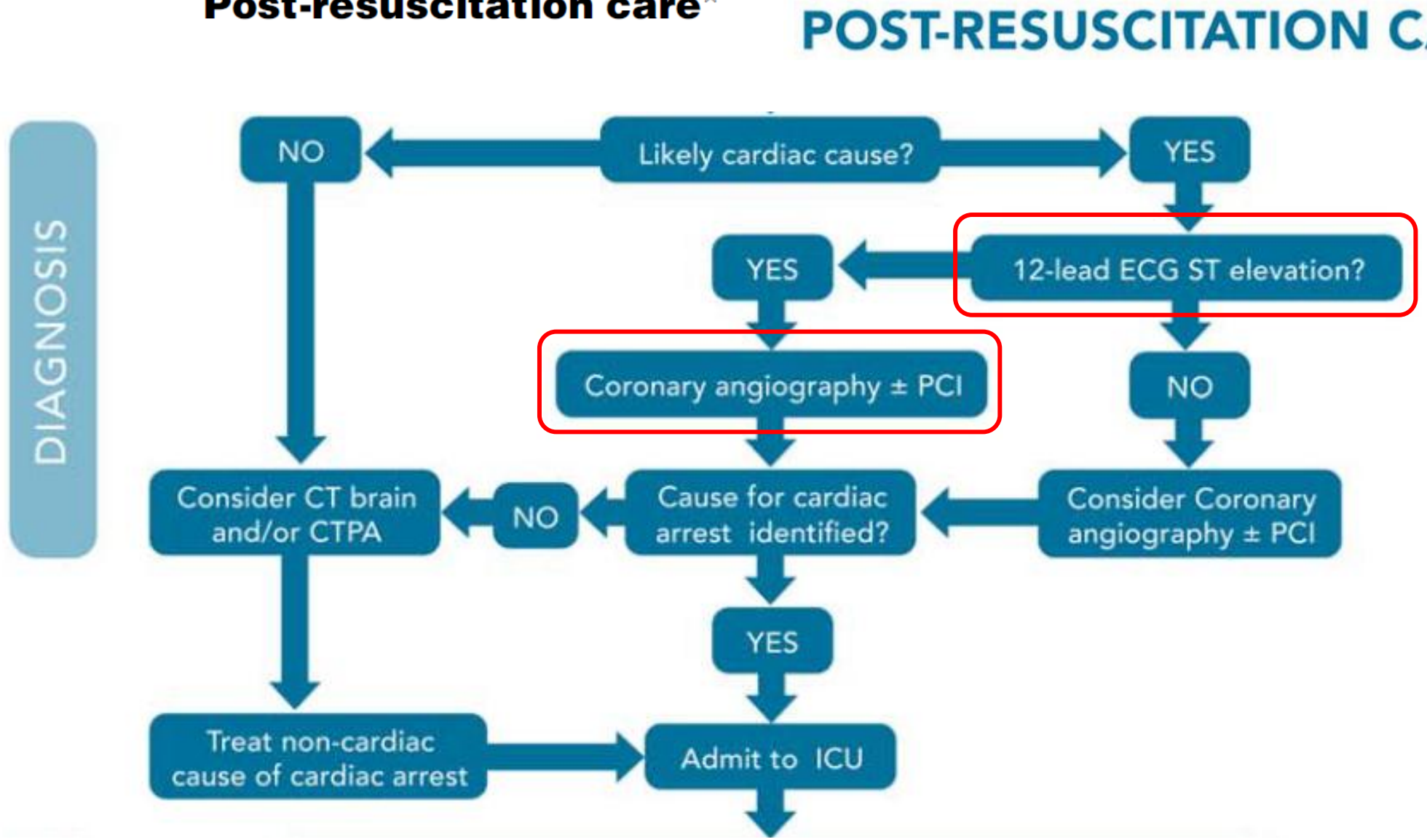
| Outcome | Immediate Angiography Group (N=273) | Delayed Angiography Group (N=265) | Effect Size (95% CI)† |
|---|---|---|---|
| **Primary end point** | | | |
| Survival at 90 days — no. of patients (%)‡ | 176 (64.5) | 178 (67.2) | OR, 0.89 (0.62 to 1.27) |
| **Secondary end points** | | | |
| Survival 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) |



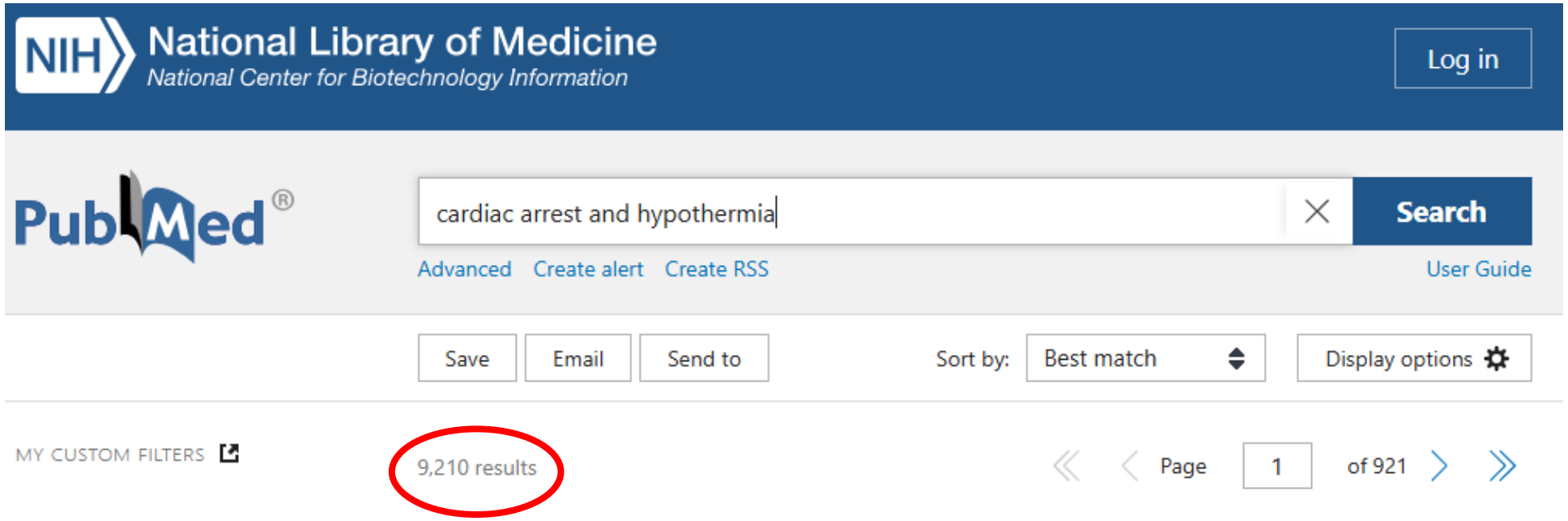

**No. at Risk**

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

# European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2021: Post-resuscitation care☆



# **Pubmed:** Arrêt cardiaque et Contrôle thermique




Plus de 9000 references.

# Induced hypothermia and fever control for prevention and treatment of neurological injuries

Kees H Polderman

THE LANCET

Vol 371 June 7, 2008

Prevention de l'apoptose

Reduction de la dysfonction mitochondriale

Reduction de la production excessive de radicaux libres

Diminution du métabolisme cérébral

Attenuation de la reperfusion

Reduction de la permeabilite des membranes cellulaires

Effets anticoagulants

Depression de la reponse immunitaire

Diminution HTIC

| | | Time frame after injury |
|---|---|---|
| Prevention of apoptosis* | Ischaemia can induce apoptosis and calpain-mediated proteolysis. Hypothermia can prevent or reduce this process | Hours to many days or even weeks |
| Reduced mitochondrial … improved energy hom… | … episode of … Hypothermia reduces metabolic demands and might improve mitochondrial function | Hours to days |
| Reduction of excessive free radical production† | Production of free radicals such as superoxide, peroxynitrite, hydrogen peroxide, and hydroxyl radicals is typical in ischaemia | Hours to days |
| | … but with distinctive and a range of features<br>Suppressed by hypothermia | Hours to days |
| Reduced permeability of the blood–brain barrier and the vascular wall; reduced oedema formation* | Blood–brain barrier disruptions induced by trauma or ischaemia are moderated by hypothermia. The same effect occurs w… | Hours to days |
| Reduced permeability of cellular membranes (including membranes of the … | Decreased leakage of cellular membranes, with associated improvements in cell function and cellular homoeostasis, including decrease of intracellular acidosis and mitigation of DNA injury | Hours to days |
| Imp… | …y neurotransmitters such as glutamate and prolonged …vates numerous enzyme systems (kinases) and induces a state of permanent hyperexcitability (exitotoxic cascade), which can be moderated by hypothermia | First minutes to 72 h |
| Reduction of metabolism* | Cellular oxygen and glucose requirements decrease by an average of 5–8% per degree Celsius dec… | Hours to days |
| Depression of the immune response and various potentially harmful proinflammatory reactions* | Sus… ischaemia can be blocked or mitigated by hypothermia | 5 days |
| … | … higher temperatures than the surrounding areas and …nces can increase dramatically during injury, with up to …s of the brain. Hyperthermia can increase the damage to injured brain cells; this is mitigated by hypothermia | Minutes to many days |
| Anticoagulant effects* | Microthrombus formation might add to brain injury after CPR. Anticoagulant effects of hypothermia might protect against thrombus formation. Thrombolytic therapy has been shown to improve outcome after … | Minutes to days |
| Suppression of epileptic activity and seizures* | Many patients … to injury. Hypothermia has been shown to mitigate epileptic activity | Hours to days |

On t… …ort from clinical observations (eg, reduction in inflammatory response and pro-inflammatory cytokine level… …and CPR; decrease in excitatory transmitters measured using microdialysis probes in human beings; decrease in local brain hyperthermia). CPR=cardiopulmonary resuscitation. *Some supporting clinical evidence. †Animal studies only.

***Table 1*: Possible mechanisms underlying protective effects of hypothermia**

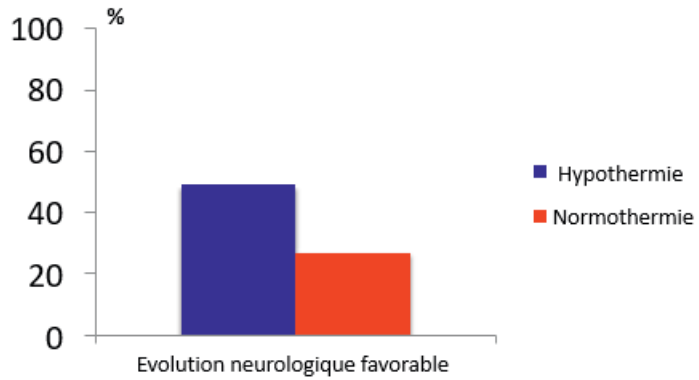
The New England
Journal of Medicine



VOLUME 346 FEBRUARY 21, 2002 NUMBER 8

# MILD THERAPEUTIC HYPOTHERMIA TO IMPROVE THE NEUROLOGIC OUTCOME AFTER CARDIAC ARREST

THE HYPOTHERMIA AFTER CARDIAC ARREST STUDY GROUP*




INDUCED HYPOTHERMIA AFTER OUT-OF-HOSPITAL CARDIAC ARREST

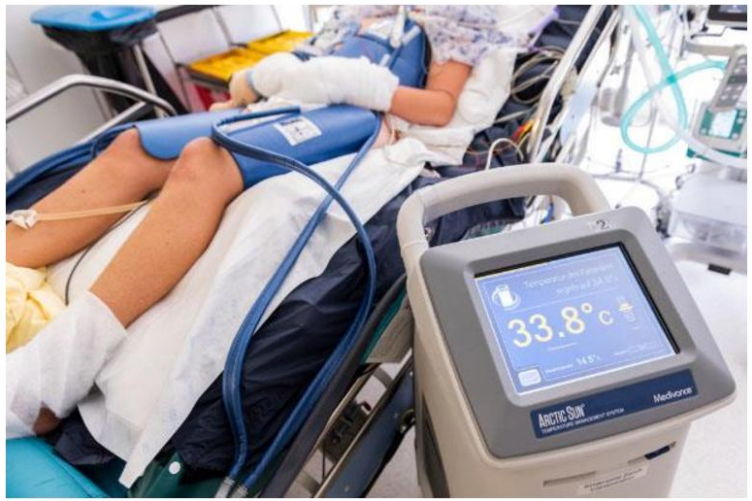
# TREATMENT OF COMATOSE SURVIVORS OF OUT-OF-HOSPITAL CARDIAC ARREST WITH INDUCED HYPOTHERMIA

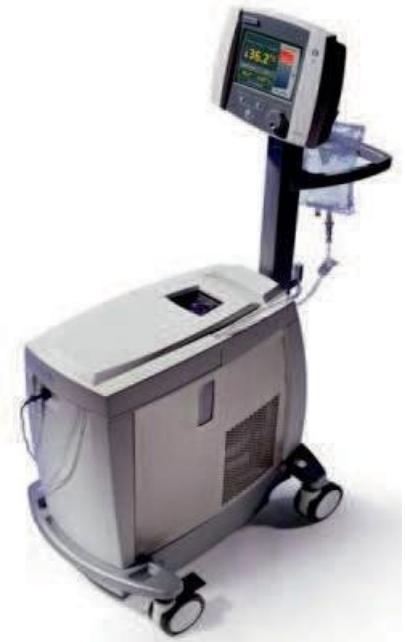
STEPHEN A. BERNARD, M.B., B.S., TIMOTHY W. GRAY, M.B., B.S., MICHAEL D. BUIST, M.B., B.S., BRUCE M. JONES, M.B., B.S., WILLIAM SILVESTER, M.B., B.S., GEOFF GUTTERIDGE, M.B., B.S., AND KAREN SMITH, B.SC.

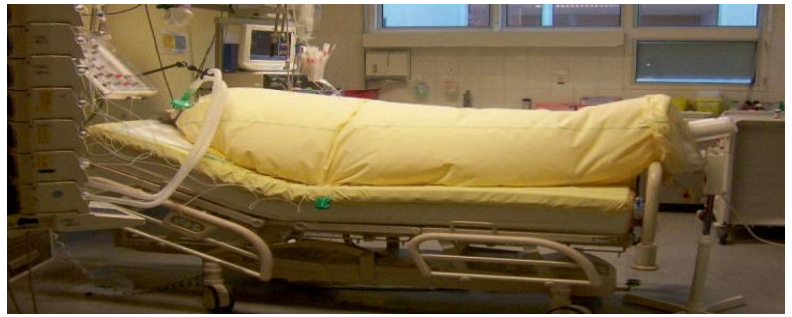
ORIGINAL ARTICLE

# Targeted Temperature Management at 33°C versus 36°C after Cardiac Arrest

Niklas Nielsen, M.D., Ph.D., Jørn Wetterslev, M.D., Ph.D., Tobias Cronberg, M.D., Ph.D., David Erlinge, M.D., Ph.D., Yvan Gasche, M.D., Christian Hassager, M.D., D.M.Sci., Janneke Horn, M.D., Ph.D., Jan Hovdenes, M.D., Ph.D., Jesper Kjaergaard, M.D., D.M.Sci., Michael Kuiper, M.D., Ph.D., Tommaso Pellis, M.D., Pascal Stammet, M.D., Michael Wanscher, M.D., Ph.D., Matt P. Wise, M.D., D.Phil., Anders Åneman, M.D., Ph.D., Nawaf Al-Subaie, M.D., Søren Boesgaard, M.D., D.M.Sci., John Bro-Jeppesen, M.D., Iole Brunetti, M.D., Jan Frederik Bugge, M.D., Ph.D., Christopher D. Hingston, M.D., Nicole P. Juffermans, M.D., Ph.D., Matty Koopmans, R.N., M.Sc., Lars Køber, M.D., D.M.Sci., Jørund Langørgen, M.D., Gisela Lilja, O.T., Jacob Eifer Møller, M.D., D.M.Sci., Malin Rundgren, M.D., Ph.D., Christian Rylander, M.D., Ph.D., Ondrej Smid, M.D., Christophe Werer, M.D., Per Winkel, M.D., D.M.Sci., and Hans Friberg, M.D., Ph.D., for the TTM Trial Investigators*





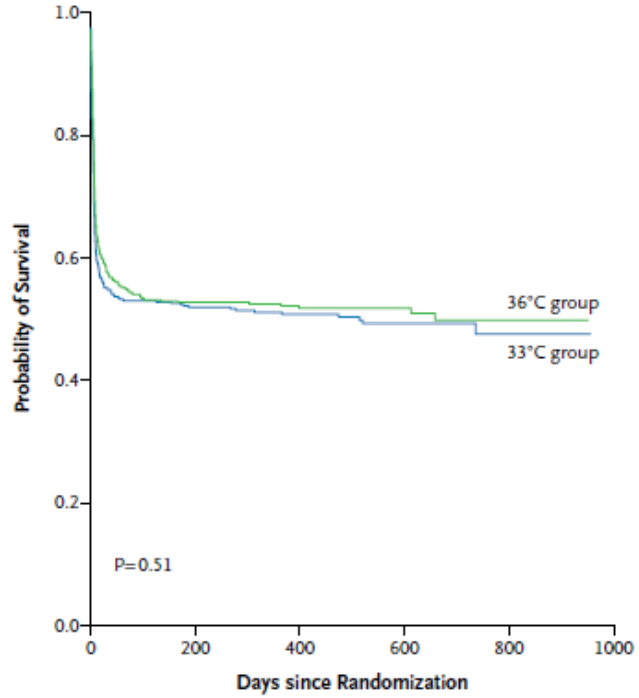



**Figure 2. Probability of Survival through the End of the Trial.**

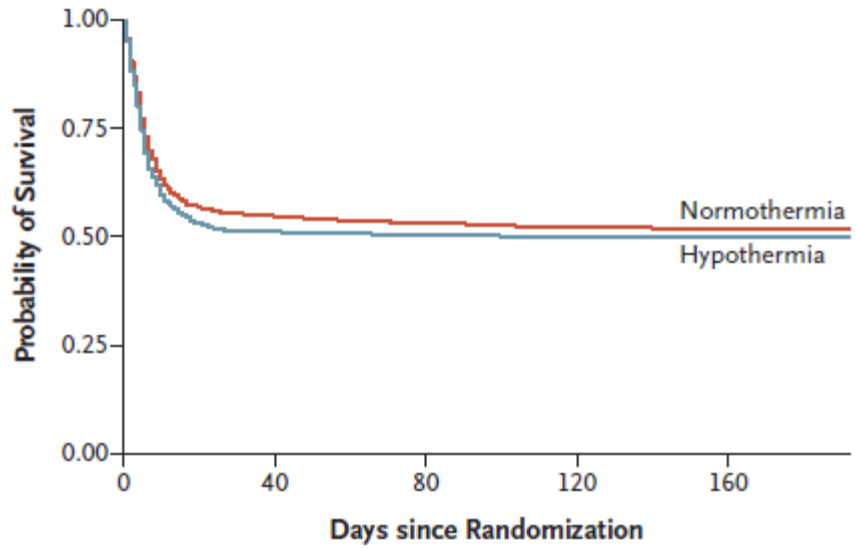
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

# Hypothermia versus Normothermia after Out-of-Hospital Cardiac Arrest

J. Dankiewicz, T. Cronberg, G. Lilja, J.C. Jakobsen, H. Levin, S. Ullén, C. Rylander, M.P. Wise, M. Oddo, A. Cariou, J. Bělohlávek, J. Hovdenes, M. Saxena, H. Kirkegaard, P.J. Young, P. Pelosi, C. Storm, F.S. Taccone, M. Joannidis, C. Callaway, G.M. Eastwood, M.P.G. Morgan, P. Nordberg, D. Erlinge, A.D. Nichol, M.S. Chew, J. Hollenberg, M. Thomas, J. Bewley, K. Sweet, A.M. Grejs, S. Christensen, M. Haenggi, A. Levis, A. Lundin, J. Düring, S. Schmidbauer, T.R. Keeble, G.V. Karamasis, C. Schrag, E. Faessler, O. Smid, M. Otáhal, M. Maggiorini, P.D. Wendel Garcia, P. Jaubert, J.M. Cole, M. Solar, O. Borgquist, C. Leithner, S. Abed-Maillard, L. Navarra, M. Annborn, J. Undén, I. Brunetti, A. Awad, P. McGuigan, R. Bjørkholt Olsen, T. Cassina, P. Vignon, H. Langeland, T. Lange, H. Friberg, and N. Nielsen, for the TTM2 Trial Investigators*

ABSTRACT




| No. at Risk | | | | | |
|---|---|---|---|---|---|
| Normothermia | 925 | 506 | 491 | 484 | 480 |
| Hypothermia | 925 | 474 | 468 | 462 | 461 |

**Figure 3. Probability of Survival until 180 Days after Randomization.**

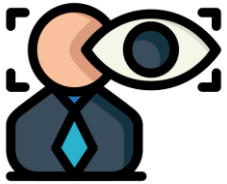
Shown are Kaplan–Meier estimates of the probability of survival until 180 days after randomization among patients assigned to undergo hypothermia or normothermia. Data are for the 1850 patients for whom survival status (including time of death) was available. Data were censored according to the last day of follow-up.

ICM RAPID PRACTICE GUIDELINE

# ERC-ESICM guidelines on temperature control after cardiac arrest in adults

**Table 2 ERC-ESICM Recommendations for temperature control after cardiac arrest in adults**

| | |
|---|---|
| GOOD PRACTICE | We **recommend** continuous monitoring of core temperature in patients who remain comatose after ROSC from cardiac arrest. |
| LOW | We **recommend** actively preventing fever (defined as a temperature > 37.7°C) in post-cardiac arrest patients who remain comatose. |
| GOOD PRACTICE | We **recommend** actively preventing fever for at least 72 hours in post-cardiac arrest patients who remain comatose. |
| GOOD PRACTICE | Temperature control can be achieved by exposing the patient, using anti-pyretic drugs, or if this is insufficient, by using a cooling device with a target temperature of 37.5°C. |
| GOOD PRACTICE | There is currently insufficient evidence to recommend for or against temperature control at 32-36°C in sub-populations of cardiac arrest patients or using early cooling, and future research may help elucidate this. We **recommend not** actively rewarming comatose patients with mild hypothermia after ROSC to achieve normothermia. |
| MODERATE | We **recommend not** using prehospital cooling with rapid infusion of large volumes of cold IV fluid immediately after ROSC. |



TEMOIN/ PAS TEMOIN, NF

INTRA/EXTRA HOSPITALIER

RYTHME CHOCABLE / NON CHOCABLE

CAUSE CARDIAQUE / NON CARDIAQUE

# Quid des sédations ?

Pas de refroidissement

=

pas de sédations ?

Rôle neuroprotecteur de la sédation

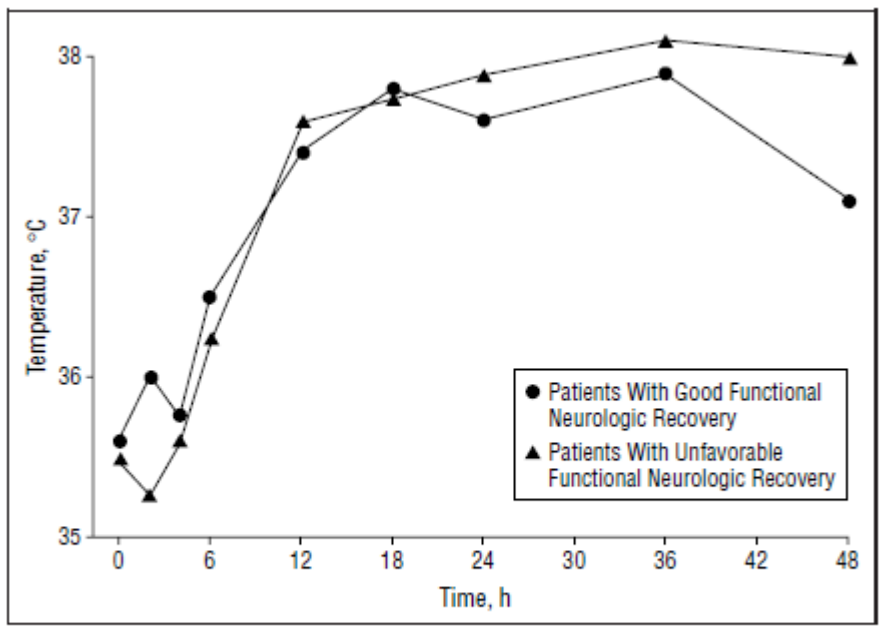
Evaluation neurologique rapide


Switch sédations si possible

ORIGINAL INVESTIGATION

# Hyperthermia After Cardiac Arrest Is Associated With an Unfavorable Neurologic Outcome

*Andrea Zeiner, MD; Michael Holzer, MD; Fritz Sterz, MD; Waltraud Schörkhuber, MD; Philip Eisenburger, MD; Christof Havel, MD; Andreas Kliegel, MD; Anton N. Laggner, MD*




Temperature curves within 48 hours after successful cardiopulmonary resuscitation. Data are expressed as the median.



ORIGINAL ARTICLE

# Hypothermia versus Normothermia after Out-of-Hospital Cardiac Arrest

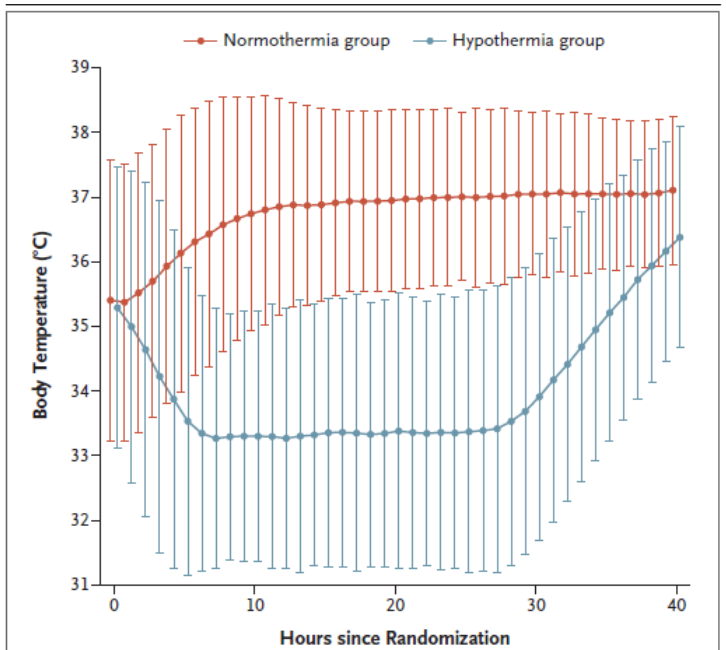



**Figure 1. Body Temperature during the Intervention Period.**
Shown are body-temperature curves in the hypothermia and normothermia groups for the patients in whom a bladder temperature was recorded. The median number of temperature recordings was 38 in both the hypothermia group and the normothermia group, out of 41 possible recordings. The temperature curves show the means, and the I bars indicate ±2 SD (95% of the observations are within the error bars). The median time from cardiac arrest to randomization in the trial was 135 minutes.

# Comparison of two sedation regimens during targeted temperature management after cardiac arrest

Marine Paul [a,b,1] · Wulfran Bougouin [a,c,d,1] · Florence Dumas [a,c,d,e] · ... · Jean-Paul Mira [a,b] · Claudio Sandroni [h,2] · Alain Cariou [a,b,c,d,2] ... Show more


Fig 2b

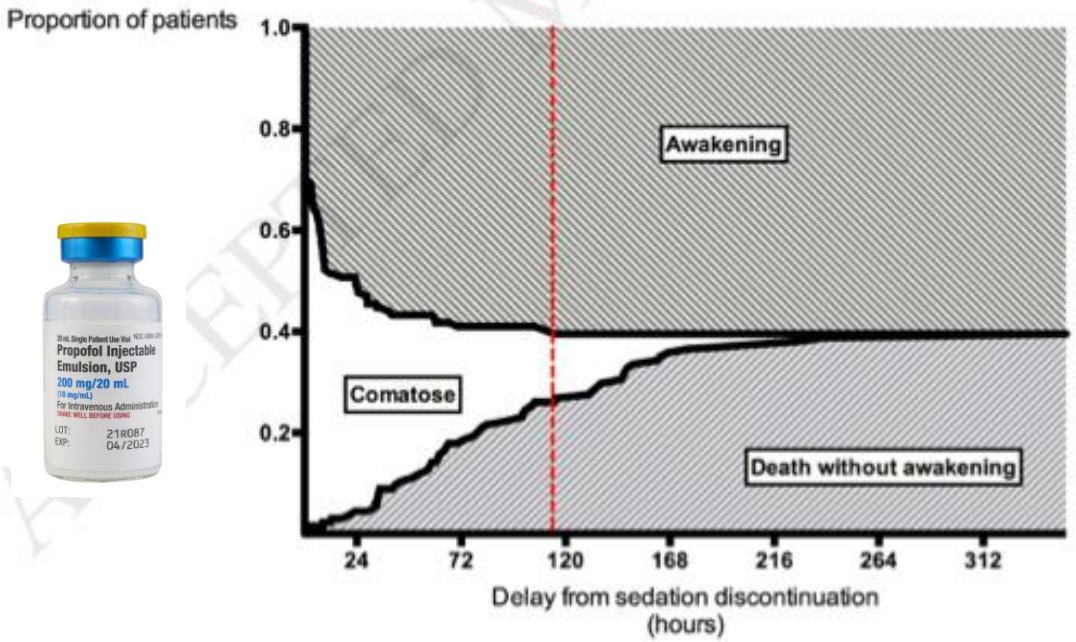
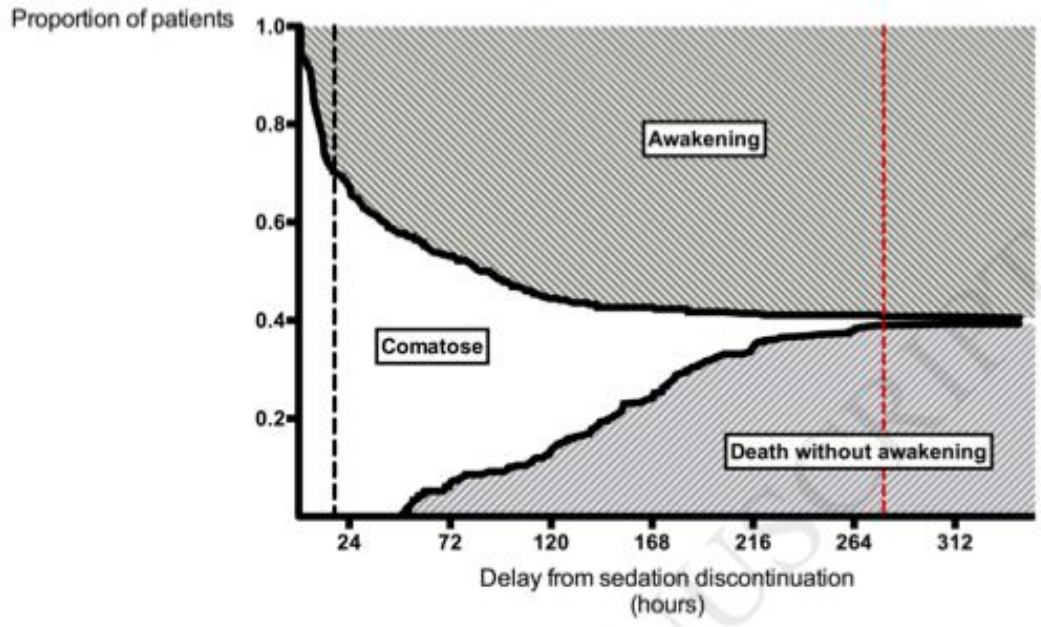






Fig 2a




chm
Centre Hospitalier Le Mans

Recherche clinique
metaphore

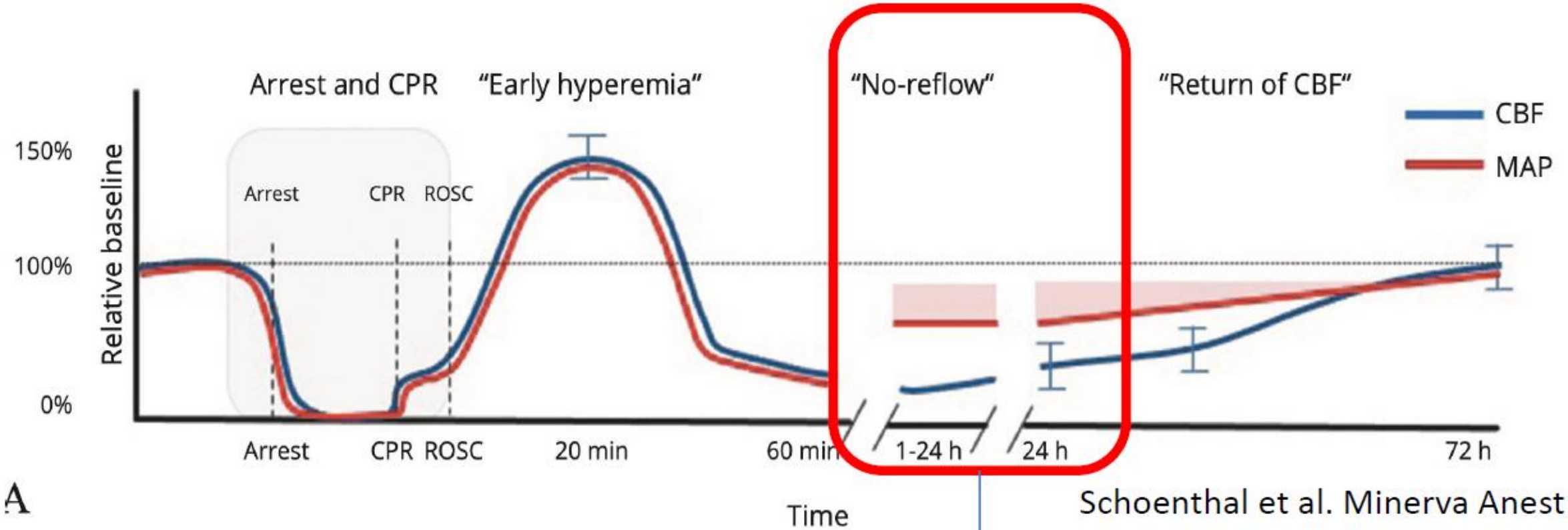
# Comparaison de deux niveaux de pression artérielle moyenne après arrêt cardiaque extra-hospitalier

## MEan arTeriAl Pressure after out-of-HOspital cardiac arREst

V1 19/09/2024

AfterROSC

CRICS
TRIGGERSEP




A

Schoenthal et al. Minerva Anest 2023

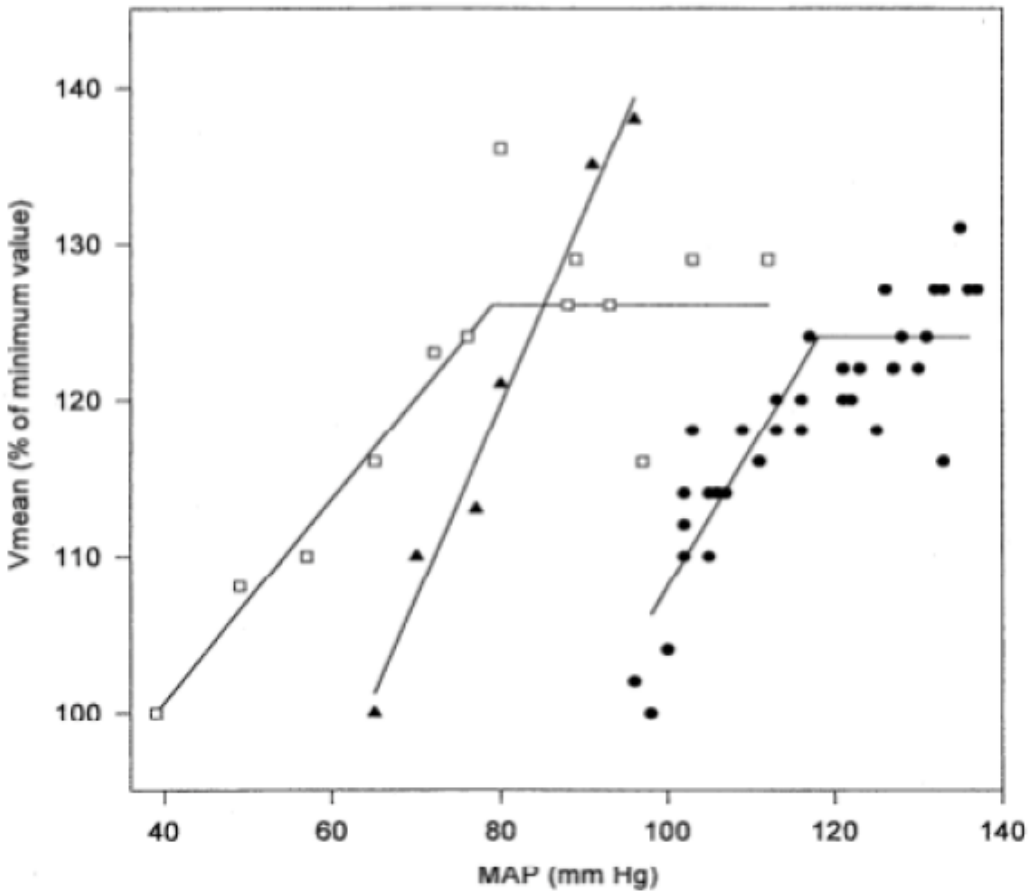
Vasoconstriction
↘ NO
Microthrombi
↑ EO2

***Safar et al. Ann Emerg Med 1993***
***Takagi et al. Stroke 1977***
***Safar et al. Arch Neurol 1976***

## Autoregulation of Cerebral Blood Flow in Patients Resuscitated From Cardiac Arrest

Claus Sundgreen, MD; Fin Stolze Larsen, MD; Tina Maria Herzog, MD; Gitte Moos Knudsen, MD; Soren Boesgaard, MD; Jan Aldershvile, MD

18 patients (50% choquables)
6 sujets sains
↑ PAM 30 mmHg (norépinéphrine)
Vm (Doppler transcrânien)




Absence d'autorégulation : 8 patients sur 18

Seuil inférieur dévié à droite: 5 patients sur 18

**SEUIL INFÉRIEUR D'AUTORÉGULATION**

**76 mmHg**

SUJETS SAINS

**114 mmHg [80-120]**

PATIENTS



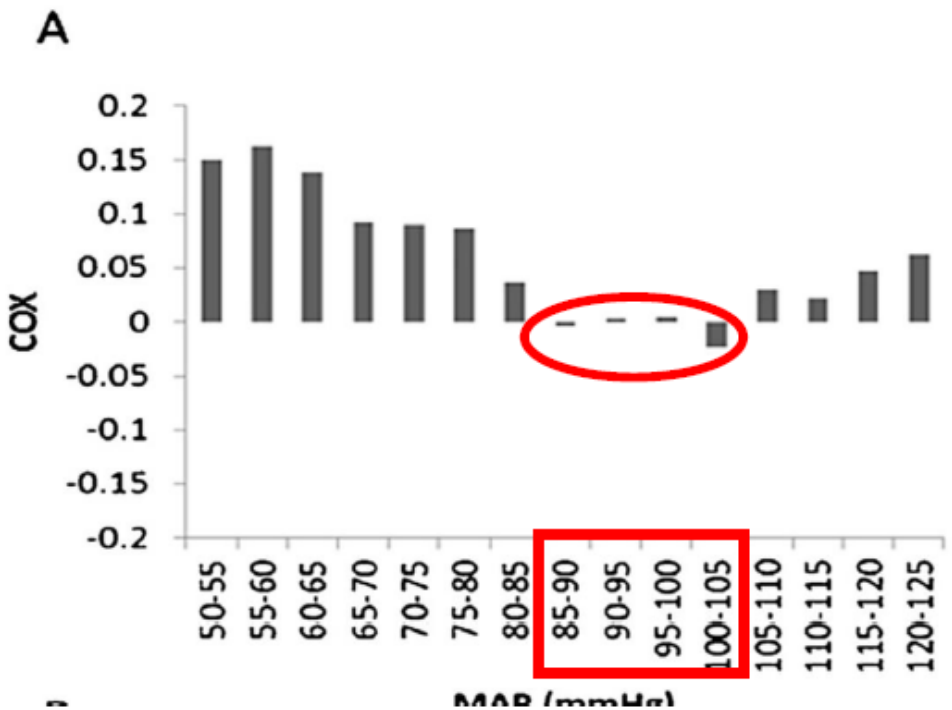
***Sundgreen et al. Stroke 2001***

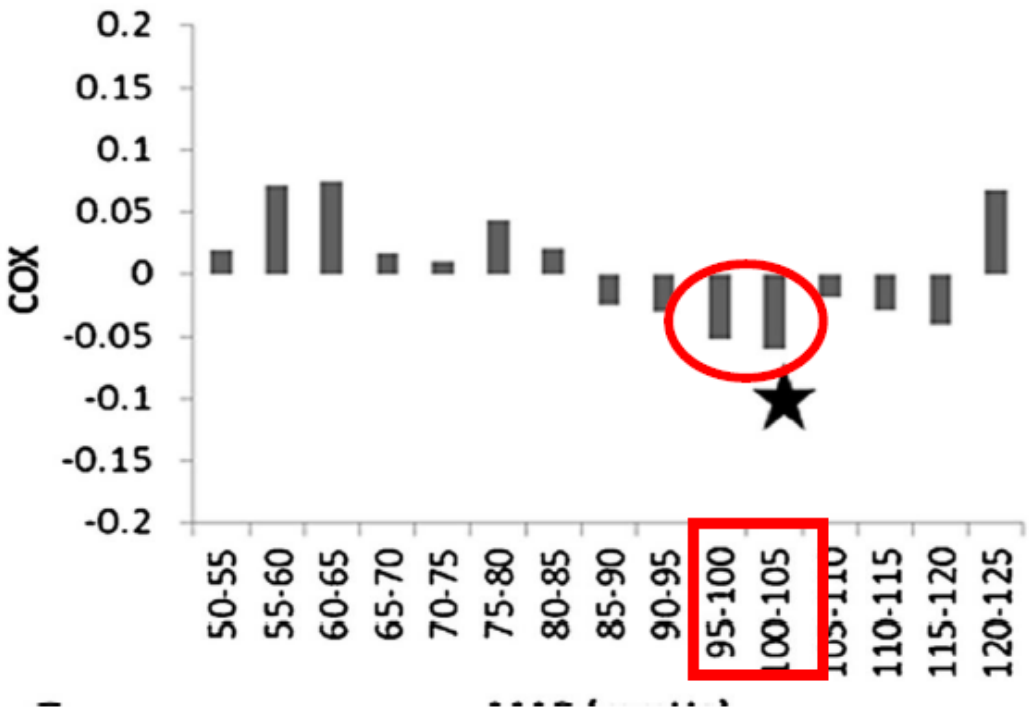
Clinical Paper

# An observational near-infrared spectroscopy study on cerebral autoregulation in post-cardiac arrest patients: Time to drop 'one-size-fits-all' hemodynamic targets?☆

K. Ameloot[a,*,1], C. Genbrugge[b,c,1], I. Meex[b,c], F. Jans[b,c], W. Boer[b], M. Vander Laenen[b], B. Ferdinande[a], W. Mullens[a,c], M. Dupont[a], J. Dens[a,c], C. DeDeyne[b,c]

[a] Department of Cardiology, Ziekenhuis Oost-Limburg, Genk, Belgium
[b] Department of Anesthesiology and Critical Care Medicine, Ziekenhuis Oost-Limburg, Genk, Belgium
[c] Faculty of Medicine and Life Sciences, University Hasselt, Diepenbeek, Belgium




**PAM optimale 85-100 mmHg?**

*Ameloot et al. Resuscitation 2015*

Clinical Paper

# An observational near-infrared spectroscopy study on cerebral autoregulation in post-cardiac arrest patients: Time to drop 'one-size-fits-all' hemodynamic targets?☆

K. Ameloot[a,*,1], C. Genbrugge[b,c,1], I. Meex[b,c], F. Jans[b,c], W. Boer[b], M. Vander Laenen[b], B. Ferdinande[a], W. Mullens[a,c], M. Dupont[a], J. Dens[a,c], C. DeDeyne[b,c]

[a] Department of Cardiology, Ziekenhuis Oost-Limburg, Genk, Belgium
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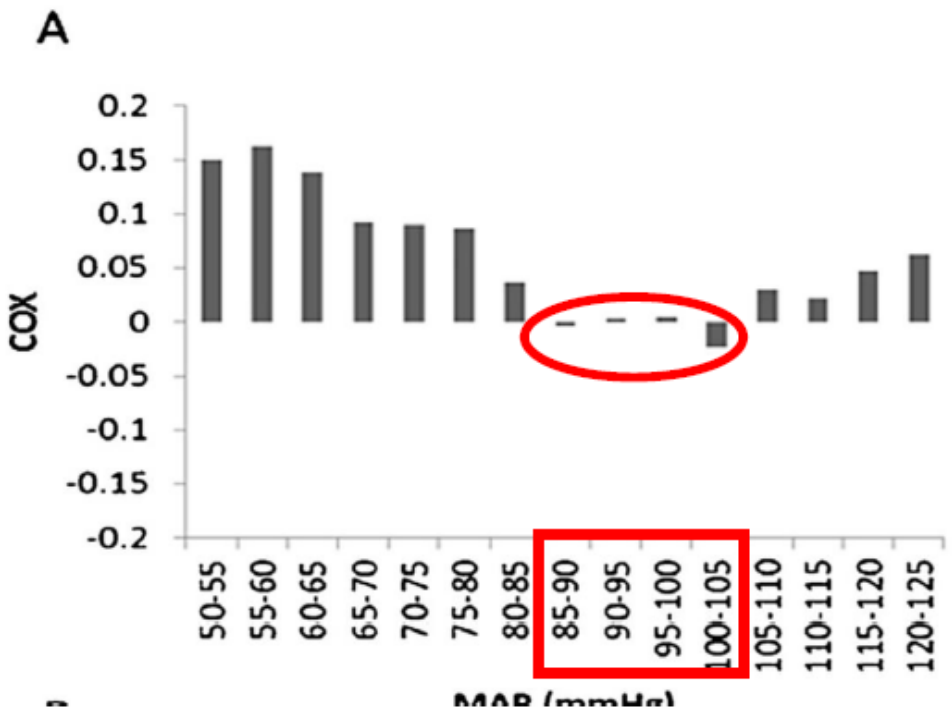


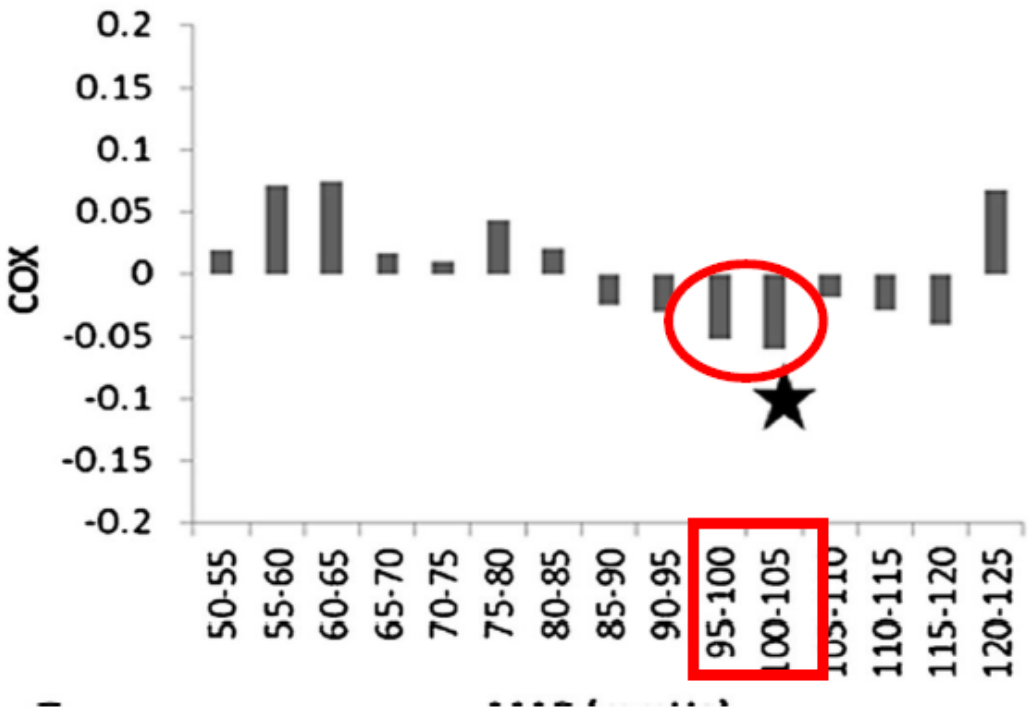


**PAM optimale 85-100 mmHg?**

*Ameloot et al. Resuscitation 2015*

ORIGINAL

# Targeting low-normal or high-normal mean arterial pressure after cardiac arrest and resuscitation: a randomised pilot trial

*Jakkula et al. Intensive Care Medicine 2018*

**PAM 65-75 vs 80-100 mmHg**

**Taux de NSE (µg/L) à 48h:**

- 21.2 [15.1-34.0] vs 22.0 [13.6-30.9] p=0.392

# Early goal-directed haemodynamic optimization of cerebral oxygenation in comatose survivors after cardiac arrest: the Neuroprotect post-cardiac arrest trial

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**% de voxels avec un score ADC < 650.$10^6$ $mm^2/s$:**

- 12% [9-16] vs 16% [13-21], p=0.09

*Ameloot et al. Eur Heart J 2020*

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ORIGINAL ARTICLE

# Blood-Pressure Targets in Comatose Survivors of Cardiac Arrest

## DESIGN

Etude randomisée
2 centres au Danemark
Mars 2017-Décembre 2021

## INTERVENTION

**PAM ≥ 63 mmHg vs PAM ≥ 77 mmHg**

*TTM 36°C*

*Remplissage vasculaire, noradrénaline, dopamine*

## RÉSULTATS

**799 patients:**

- Age 63 ans
- 45.9% hypertension artérielle

**Caractéristiques de l'arrêt cardiaque:**

- Extra-hospitalier
- Cause cardiaque présumée ou non connue
- 84.8% Rythme choquable
- 88% RCP par un témoin
- Durée No flow+ Low Flow 21 minutes
- 45.3% STEMI

***Kjaergaard et al. New England Journal of Medicine 2022***

ORIGINAL ARTICLE

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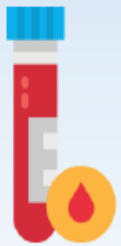
## RÉSULTATS


**Décès ou CPC 3 ou 4 à J90:**

- 127 (32%) vs 133 (34%), 1.08 [0.84-1.37], p=0.56



**NSE à 48h:**

- 18 µg/L [11-34] vs 18 µg/L [11-37]

**Score MoCA à J90:**

- 26 [24-29] vs 27 [24-29]

*Kjaergaard et al. New England Journal of Medicine 2022*

✓ Admission en réanimation après un arrêt cardiaque extra-hospitalier

✓ Reprise d'une activité cardiaque spontanée efficace persistante > 20 minutes

✓ Patient sous ventilation mécanique invasive pour coma défini par un score de Glasgow ≤ 8/15

✓ Consentement d'un membre de la famille ou d'un proche ou procédure d'inclusion en urgence

Critère de jugement principal = proportion de patients mRS 0-3 dans chaque bras



30 %

38 %

*Puissance 80%*
*Risque alpha 5% (2 analyses intermédiaires)*
*20% de chevauchement entre les 2 bras*

**1380** patients
(690 / bras)
Période d'inclusion : 3 ans
1.4 inclusion / mois / centre

2 analyses intermédiaires (n = 400 et 800)

✓ mortalité toute cause à J28

✓ complications globales J0 à J7

Recherche clinique
metaphore

## HYPOTHÈSE

Cibler une PAM haute (≥ 90 mmHg) pendant les 24 premières heures de prise en charge après un arrêt cardiaque extra-hospitalier améliore la survie et le devenir neuro-fonctionnel à J180.

**Comparer les effets d'une cible haute de PAM (≥ 90 mmHg) et d'une cible standard de PAM (≥ 65 mmHg) sur le devenir neurologique 6 mois après un arrêt cardiaque extra-hospitalier**

Proportion de patients avec évolution neurologique favorable (**score modifié de Rankin entre 0 et 3**) à J180

Recherche clinique
metaphore

# RANDOMISATION

*Algorithme de minimisation (HTA, rythme, centre)*

**Bras interventionnel**
**PAM ≥ 90 mmHg pendant 24h**

*Dose minimale de NORADRÉNALINE*
*↑ 0.05 µg/kg/min toutes les 10 min*
*↓ 0.05 µg/kg/min toutes les heures*

*Pas de valeur maximale de PAM*
***Anti-hypertenseurs non recommandés** pendant 24h sauf complications**

*Puis PAM ≥ 65 mmHg*

**Bras « standard of care »**
**PAM ≥ 65 mmHg pendant 24h**

*Dose minimale de NORADRÉNALINE*
*↑ 0.05 µg/kg/min toutes les 10 min*
*↓ 0.05 µg/kg/min toutes les heures*

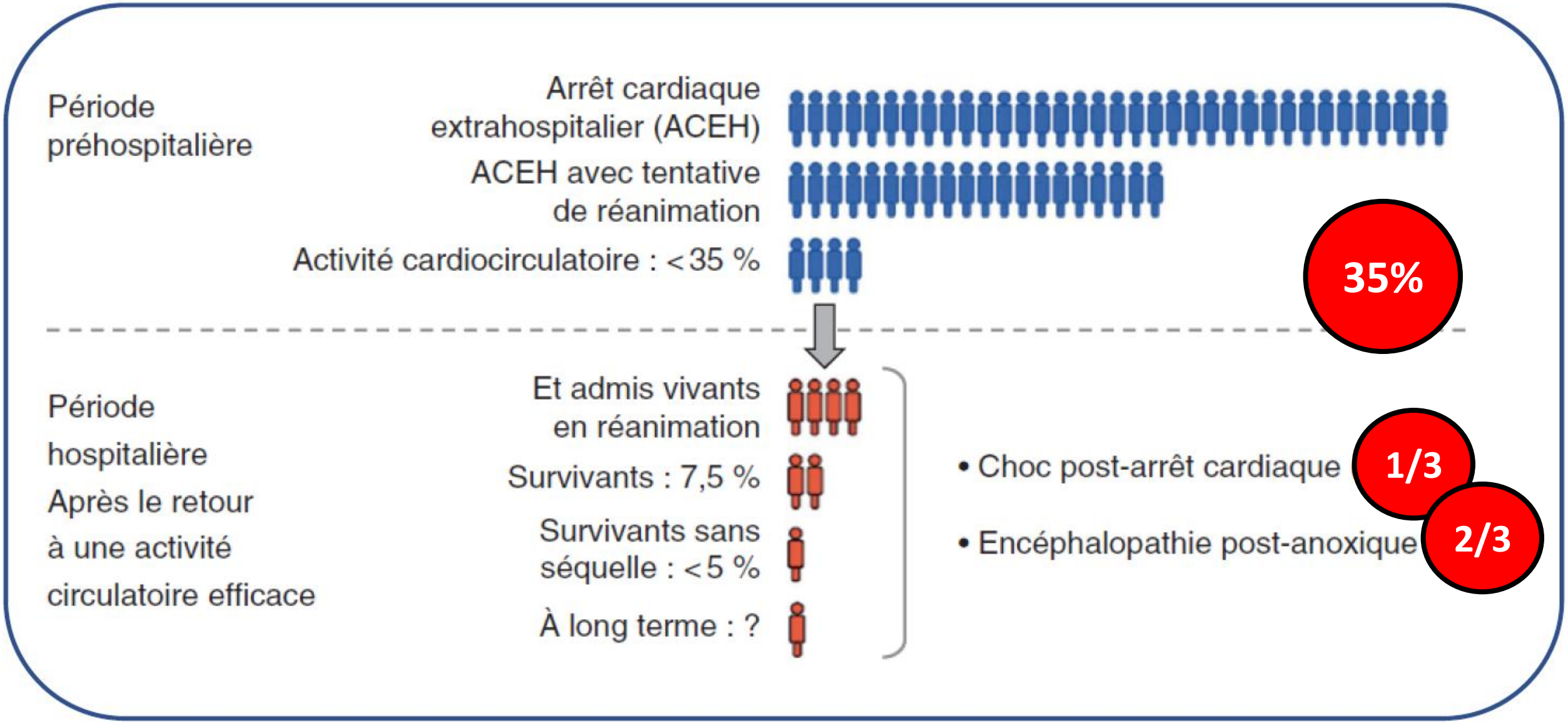
*Pas de valeur maximale de PAM*
***Anti-hypertenseurs non recommandés** pendant 24h sauf complications**

*Puis PAM ≥ 65 mmHg*

***En cas de complications, modification de la cible et anti-hypertenseurs au libre choix du clinicien*

**La stratégie doit être appliquée dès la randomisation et tout doit être mis en œuvre pour atteindre la cible dans les 30 minutes qui suivent la randomisation!**

# Survie après arrêt cardiaque

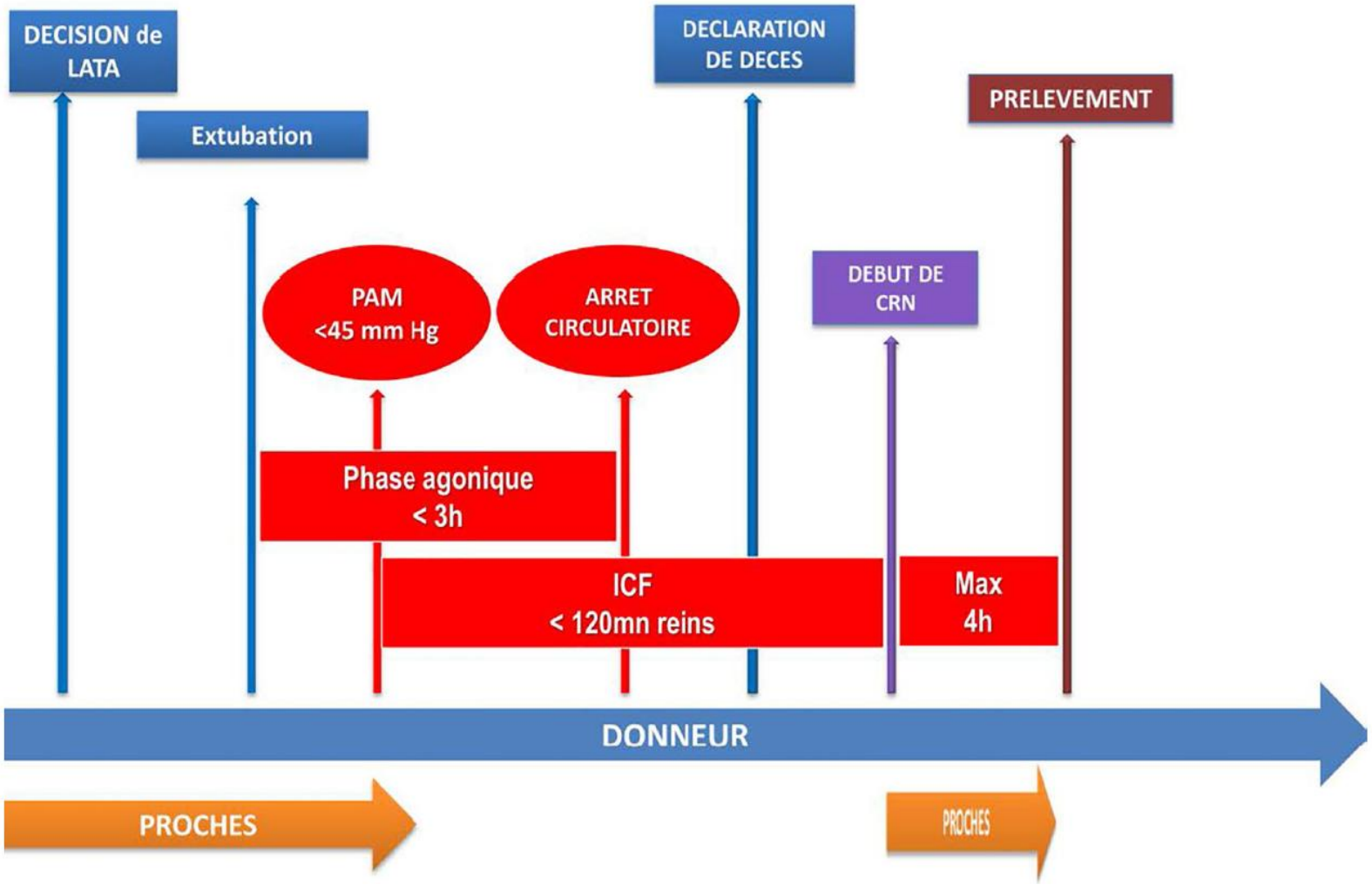


# Survie après arrêt cardiaque

**Classification internationale dite de Maastricht 1995, révisée en 2013**

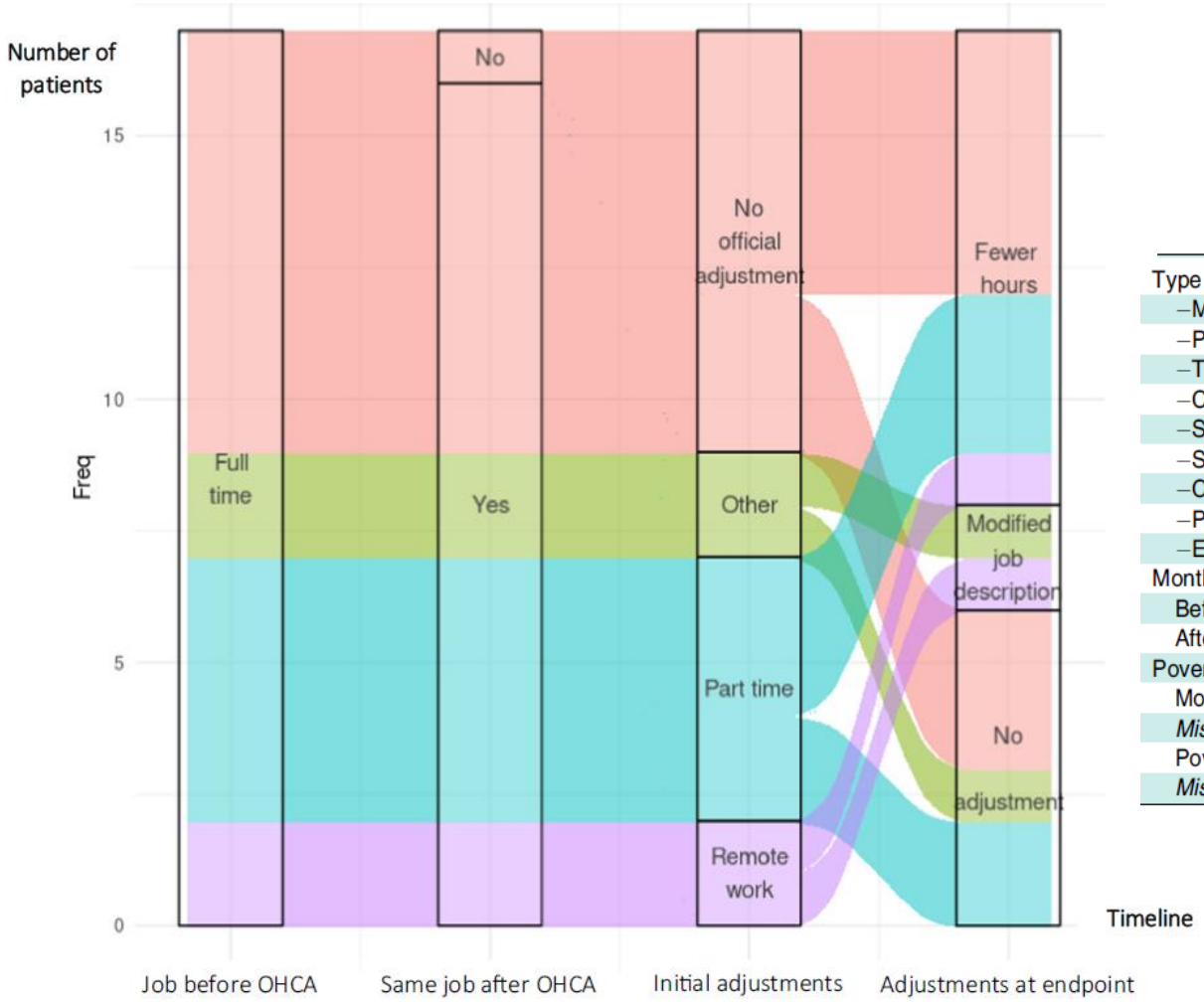
| | |
|---|---|
| Catégorie I | Les personnes qui font un arrêt circulatoire en dehors de tout contexte de prise en charge médicalisée, déclarées décédées à la prise en charge |
| Catégorie II | Les personnes qui font un arrêt circulatoire avec mise en œuvre d'un massage cardiaque et d'une ventilation mécanique efficaces, mais sans récupération d'une activité circulatoire |
| Catégorie III | Les personnes pour lesquelles une décision de limitation ou d'arrêt programmé des thérapeutiques est prise en raison du pronostic des pathologies ayant amené la prise en charge en réanimation |
| Catégorie IV | Les personnes décédées en mort encéphalique qui font un arrêt circulatoire irréversible au cours de la prise en charge en réanimation |

**Questionnement Ethique ?**



# Return to work after out of hospital cardiac arrest, insights from a prospective multicentric French cohort

*Nolwen Flajoliet[a,*], Jeremy Bourenne[b,h], Nathalie Marin[a], Jonathan Chelly[c,h], Jean Baptiste Lascarrou[d,h], Cédric Daubin[e,h], Wulfran Bougouin[f,h], Alain Cariou[a,h], Guillaume Geri[g,h]*




| | No return to work at endpoint *n* = 14 | Return to work at endpoint *n* = 17 | *p*-value |
|---|---|---|---|
| Type of job – ISCO 08. N | | | |
| –Managers | 1 | 5 | |
| –Professionals | 0 | 7 | |
| –Technicians and Associate Professionals | 3 | 0 | *0.005* |
| –Clerical Support Workers | 2 | 0 | |
| –Services and Salesworkers | 2 | 1 | |
| –Skilled Agricultural. Forestry and Fishery Workers | 0 | 1 | |
| –Craft and Related Trades Workers | 2 | 1 | |
| –Plant and Machine Operators and Assemblors | 3 | 1 | |
| –Elementary Occupation | 1 | 1 | |
| Monthly income. median (Q1Q3) | | | |
| Before OHCA. *median (Q1Q3)* | 1800 (1500–2500) | 3500 (1950–6000) | *0.024* |
| After OHCA. *median (Q1Q3)* | 900 (800–1200) | 3400 (2200–6000) | *<0.001* |
| Poverty rate and modified poverty rate. median (Q1Q3) | | | |
| Modified poverty rate. *median (Q1Q3)* | 20.00 (14.57–27.95) | 15.20 (12.50–19.65) | *0.001* |
| *Missing data* | *6* | *5* | |
| Poverty rate. *median (Q1Q3)* | 17.70 (11.97–20.27) | 10.80 (9.20–12.45) | *<0.001* |
| *Missing data* | 8 | 6 | |

# Conclusion

Après la RACS , c’est le début des problèmes