Université Claude Bernard Lyon 1

Les Jeudis de l'Urgence
Bataillon des Marins-Pompiers de Marseille

Marseille - 6 février 2014

Recommandations / RCP perspectives pour 2015?

Pr P-Y. Gueugniaud

SAMU de Lyon

Pôle « Urgences – Réanimation Médicale – Anesthésie-Réanimation - SAMU - »

GH Edouard Herriot

RéAC

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

RCP en 2015 ?

- Alerte
- RCP de base:

  MCE vs MCE + BàB ?
- Défibrillation
- RCP spécialisée:

  adrénaline / monitorage ?
- Suites de la RCP:

  hypothermie post-RACS ?

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

RCP en 2014

- Reconnaissance / Diagnostic de l' AC:

  = absence de « signes de vie »

  - Conscience - Réactivité = 0
  - Respiration absente ou anormale: « gasps » +++
  - [+/- pouls = 0]
- Conseil téléphonique = MCE seul
- Alerte PRIORITAIRE (15 – 112) / début RCP

  … sauf enfants

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

RCP en 2010

RCP Mécanique = Ventilation + MCE

Principe fondamental Reco. 2005/2010
=
Prépondérance MCE

➔ Continuité du MCE: ⇘⇘⇘ interruptions

↳ Réduction de la ventilation
↳ Prise de pouls différée

RCP en 2014

RCP de base
MCE seul ou MCE + BàB ?

RCP de base en 2007 ?
= MCE seul

Articles

Cardiopulmonary resuscitation by bystanders with chest compression only (SOS-KANTO): an observational study

SOS-KANTO study group

Lancet 2007; 369: 920–26
See Comment page 882
*Members listed at end of paper

Correspondence to:
Dr Ken Nagao, The SOS-KANTO Committee, Department of Emergency and Critical Care Medicine, Surugadai Nihon University Hospital, 1-8-13 Kanda Surugadai, Chiyoda-Ku, Tokyo, 101-8309, Japan
Kennagao@med.nihon-u.ac.jp

Summary

Background Mouth-to-mouth ventilation is a barrier to bystanders doing cardiopulmonary resuscitation (CPR), but few clinical studies have investigated the efficacy of bystander resuscitation by chest compressions without mouth-to-mouth ventilation (cardiac-only resuscitation).

Methods We did a prospective, multicentre, observational study of patients who had out-of-hospital cardiac arrest. On arrival at the scene, paramedics assessed the technique of bystander resuscitation. The primary endpoint was favourable neurological outcome 30 days after cardiac arrest.

Findings 4068 adult patients who had out-of-hospital cardiac arrest witnessed by bystanders were included; 439 (11%) received cardiac-only resuscitation from bystanders, 712 (18%) conventional CPR, and 2917 (72%) received no bystander CPR. Any resuscitation attempt was associated with a higher proportion having favourable neurological outcomes than no resuscitation (5·0% *vs* 2·2%, p<0·0001). Cardiac-only resuscitation resulted in a higher proportion of patients with favourable neurological outcomes than conventional CPR in patients with apnoea (6·2% *vs* 3·1%; p=0·0195), with shockable rhythm (19·4% *vs* 11·2%, p=0·041), and with resuscitation that started within 4 min of arrest (10·1% *vs* 5·1%, p=0·0221). However, there was no evidence for any benefit from the addition of mouth-to-mouth ventilation in any subgroup. The adjusted odds ratio for a favourable neurological outcome after cardiac-only resuscitation was 2·2 (95% CI 1·2–4·2) in patients who received any resuscitation from bystanders.

Interpretation Cardiac-only resuscitation by bystanders is the preferable approach to resuscitation for adult patients with witnessed out-of-hospital cardiac arrest, especially those with apnoea, shockable rhythm, or short periods of untreated arrest.

SOS Kanto

4 068 AC / 16 mois – 58 EMS

RCP / Témoins = 29 %

RCP ⊕ = 5,0% vs RCP - = 2,2% (p<0,001)

	MCE seul (11% AC)	MCE + BàB (18% AC)	p
Tous AC	6,1%	4,2%	0,14
FV	19,4%	11,2%	0,041
RCP < 4 min	10,1%	5,1%	0,022

RCP de base en 2010
= MCE seul

Chest Compression–Only CPR by Lay Rescuers and Survival From Out-of-Hospital Cardiac Arrest

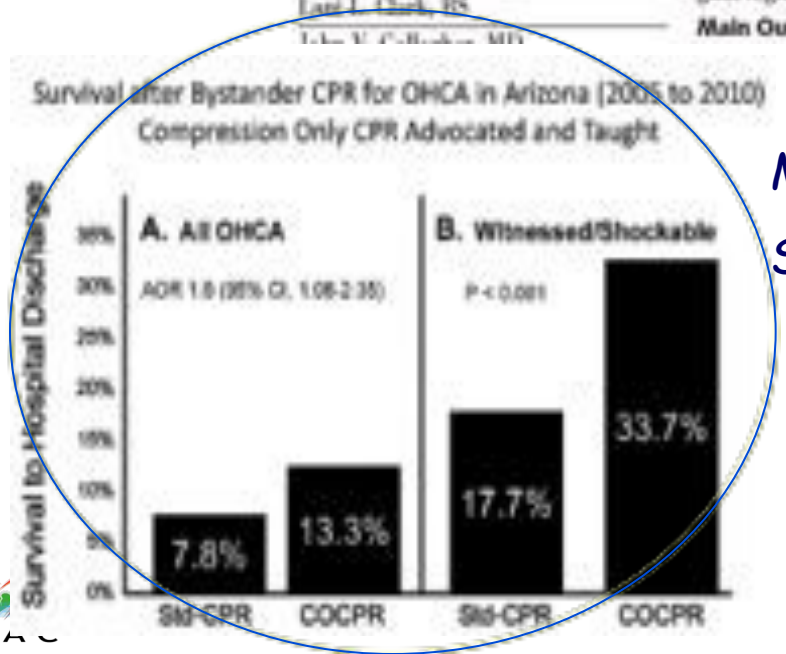
Bentley J. Bobrow, MD
Daniel W. Spaite, MD
Robert A. Berg, MD
Uwe Stolz, PhD, MPH
Arthur B. Sanders, MD
Karl B. Kern, MD
Tyler F. Vadeboncoeur, MD
Lori J. Clark, BS

Context Chest compression–only bystander cardiopulmonary resuscitation (CPR) may be as effective as conventional CPR with rescue breathing for out-of-hospital cardiac arrest.

Objective To investigate the survival of patients with out-of-hospital cardiac arrest using compression-only CPR (COCPR) compared with conventional CPR.

Design, Setting, and Patients A 5-year prospective observational cohort study of survival in patients at least 18 years old with out-of-hospital cardiac arrest between January 1, 2005, and December 31, 2009, in Arizona. The relationship between layperson bystander CPR and survival to hospital discharge was evaluated using multivariable logistic regression.

Main Outcome Measure Survival to hospital discharge.



MCE seul/2005 = 19,6% vs /2009 = 75,9%

Survie = 3,7 % (2005) ⇨ 9,8 % (2009)(p<0,001)

Conclusion Among patients with out-of-hospital cardiac arrest, layperson compression-only CPR was associated with increased survival compared with conventional CPR and no bystander CPR in this setting with public endorsement of chest compression–only CPR.

JAMA. 2010;304(13):1447-1454 www.jama.com

RCP de base en 2011
= MCE seul ou RCP conventionnelle ?

BMJ

RESEARCH

Outcomes of chest compression only CPR versus conventional CPR conducted by lay people in patients with out of hospital cardiopulmonary arrest witnessed by bystanders: nationwide population based observational study

T Ogawa et al. BMJ 2011; 342: c7106

RCP de base en 2011
= RCP conventionnelle > MCE seul

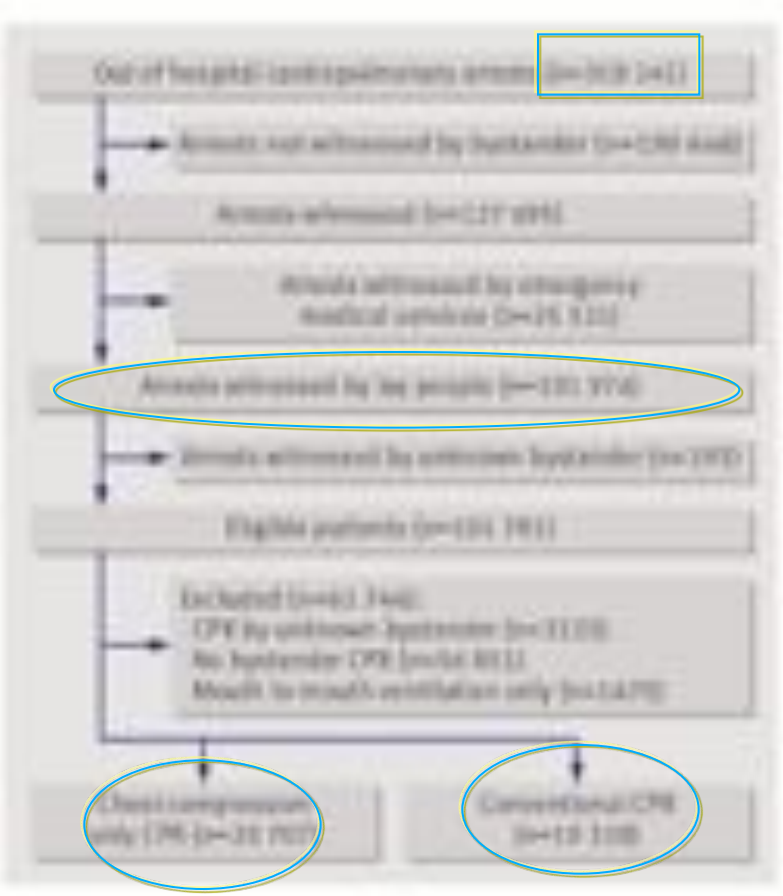


Fig 1| Study profile with selection of participants

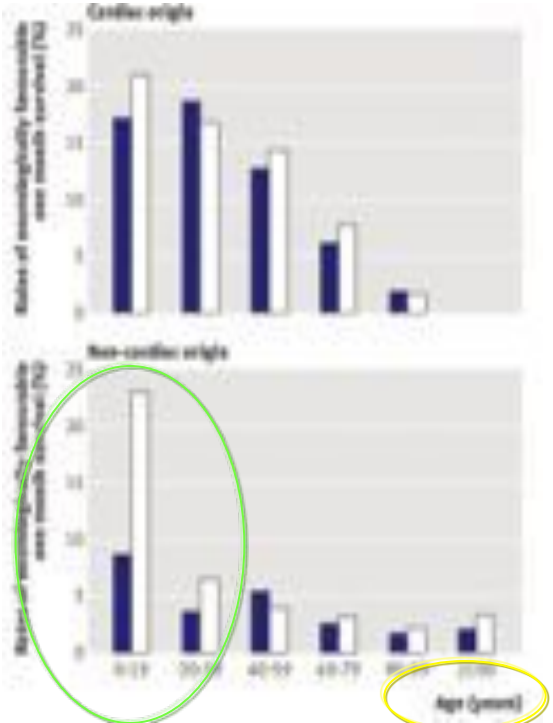
BMJ 2011; 342: c7106

RCP de base en 2011
= RCP conventionnelle > MCE seul

Table 2 | One month survival and neurologically favourable one month survival in cases of out of hospital cardiopulmonary arrest witnessed by bystander with chest compression only CPR and conventional CPR. Figures are percentages (numbers of participants)

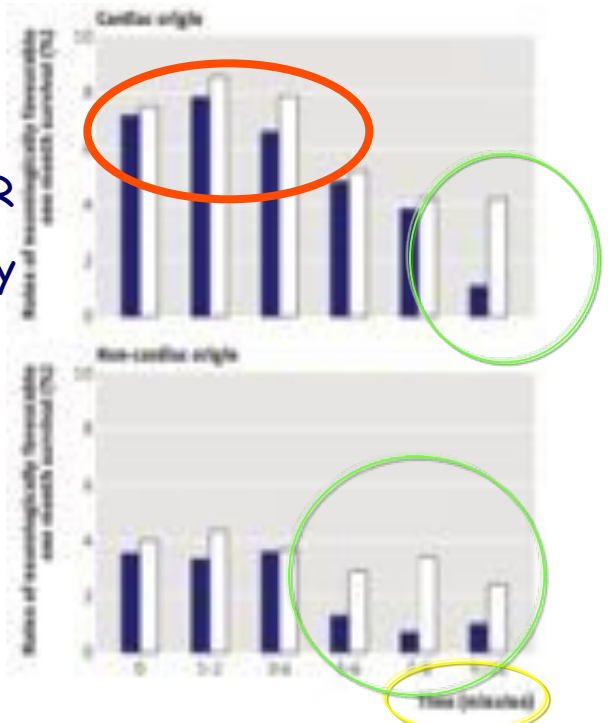
	Chest compression only CPR	Conventional CPR	Odds ratio (95% CI), P value	
			Unadjusted	Adjusted*
One month survival	8.7 (1799/20 707)	10.3 (1997/19 327)	1.21 (1.13 to 1.29), <0.001	1.17 (1.06 to 1.29), 0.002
Neurologically favourable one month survival	4.6 (943/20 662)	5.6 (1070/19 247)	1.23 (1.12 to 1.35), <0.001	1.17 (1.01 to 1.35), 0.037

*Adjusted for age, sex, assistance from dispatcher, initial identified cardiac rhythm, cause of cardiac arrest, relation of bystander to patient, use of public access automated external defibrillator, first shock from emergency medical staff, use of drug during CPR, and duration between bystander witnessing event to bystander starting CPR, to CPR by emergency medical staff, and to patient's arrival at hospital.



Conventionnal CPR

Compressions only



BMJ 2011; 342: c7106

RCP de base en 2012
= MCE seul > RCP conventionnelle

Chest Compression–Only Cardiopulmonary Resuscitation for Out-of-Hospital Cardiac Arrest With Public-Access Defibrillation

A Nationwide Cohort Study

Taku Iwami, MD, MPH, PhD; Tetsuhisa Kitamura, MD, MSc, DrPH; Takeshi Kawamura, MD, PhD; Hideo Mitamura, MD, PhD; Kei Nagao, MD, PhD; Motoharu Tanizawa, MD, PhD; Yoshihiko Soeda, MD, PhD; Hidekazu Tanaka, MD, PhD; Hiroshi Nonogi, MD, PhD; Naohiro Yonemoto, DrPH; Takeshi Kimura, MD, PhD; for the Japanese Circulation Society Resuscitation Science Study (JCS-ReSS) Group

Background—It remains unclear which is more effective to increase survival after out-of-hospital cardiac arrest in those with public-access defibrillation, bystander-initiated chest compression–only cardiopulmonary resuscitation (CPR) or conventional CPR with rescue breathing.

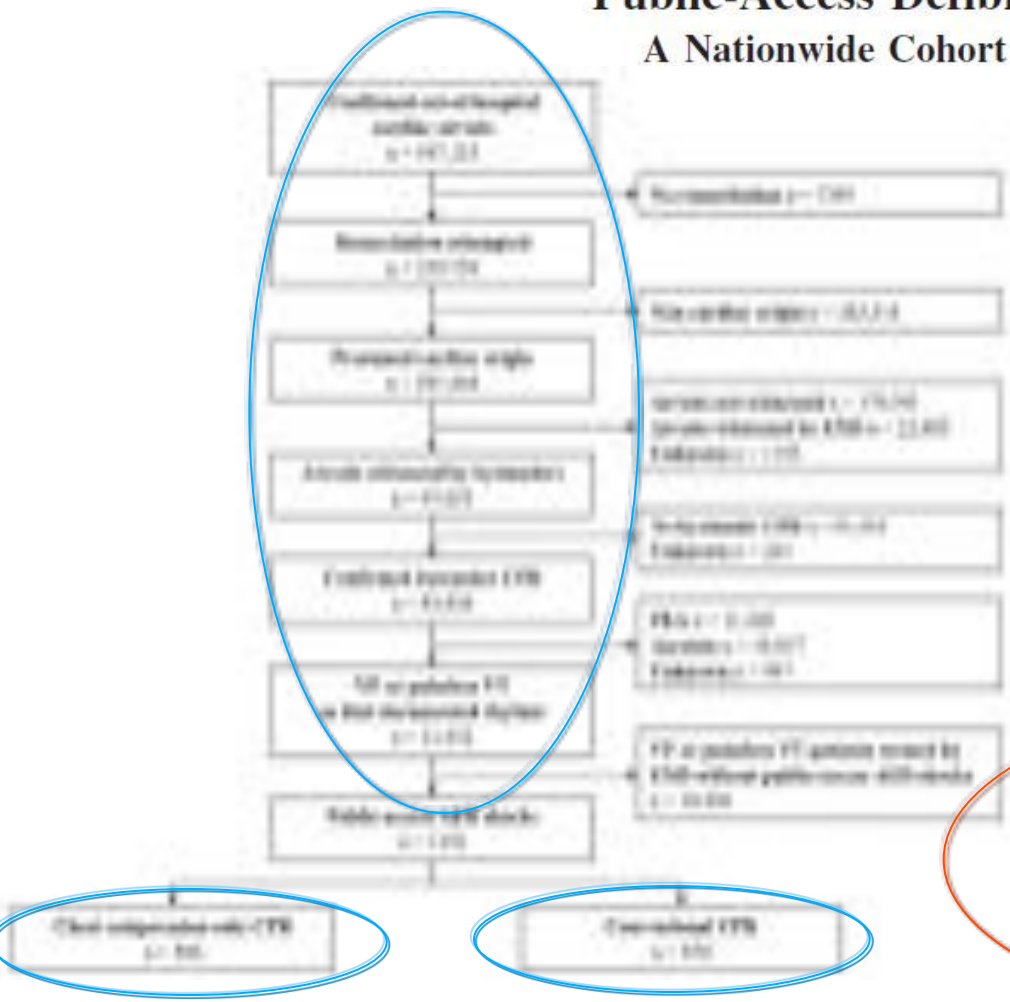
Methods and Results—A nationwide, prospective, population-based observational study covering the whole population of Japan and involving consecutive out-of-hospital cardiac arrest patients with resuscitation attempts has been conducted since 2005. We enrolled all out-of-hospital cardiac arrests of presumed cardiac origin that were witnessed and received shocks with public-access automated external defibrillators (AEDs) by bystanders from January 1, 2005, to December 31, 2009. The main outcome measure was neurologically favorable 1-month survival. We compared outcomes by type of bystander-initiated CPR (chest compression–only CPR and conventional CPR with compressions and rescue breathing). Multivariable logistic regression was used to assess the relationship between this type of CPR and a better neurological outcome. During the 5 years, 1519 bystander-witnessed out-of-hospital cardiac arrests of cardiac origin in individuals who received CPR and shocks with public-access AEDs by bystanders were registered. Among them, 508 (36.0%) received chest compression–only CPR and 870 (64.0%) received conventional CPR. The chest compression–only CPR group (40.7%, 206 of 506) had a significantly higher rate of 1-month survival with favorable neurological outcome than the conventional CPR group (32.9%, 286 of 870; adjusted odds ratio, 1.31; 95% confidence interval, 1.03–1.70).

Conclusions—Compression-only CPR is more effective than conventional CPR for patients in whom out-of-hospital cardiac arrest is witnessed and shocked with public-access defibrillation. Compression-only CPR is the most likely scenario in which lay rescuers can witness a sudden collapse and use public-access AEDs. (Circulation. 2011;124:2644-2650.)

RCP de base en 2012

Chest Compression–Only Cardiopulmonary Resuscitation for Out-of-Hospital Cardiac Arrest With Public-Access Defibrillation

A Nationwide Cohort Study



	Compression-Only CPR (n=506)	Conventional CPR (n=870)	*P*
Prehospital ROSC, n (%)	254 (50.2)	352 (40.5)	<0.001
1-mo survival, n (%)	235 (46.4)	347 (39.9)	0.018
Neurologically favorable 1-mo survival, n (%)	206 (40.7)	286 (32.9)	0.003

CPR indicates cardiopulmonary resuscitation; ROSC, return of spontaneous circulation.

RCP de base en 2013
MCE seul …

Chest Compression Alone Cardiopulmonary Resuscitation Is Associated With Better Long-Term Survival Compared with Standard Cardiopulmonary Resuscitation

Fleyrace Dumas, MD; PhD; Thomas D. Rea, MD; MPH; Carol Fahrenbruch MSPH;
Morten Breivegvist, MD; PhD; Jonas Finsås, MD; Leif Svensson, MD; PhD;
Mickey S. Eisenberg, MD; PhD; Katarina Bohm, RN; PhD

Background—Little is known about the long-term survival effects of layperson bystander cardiopulmonary resuscitation (CPR) in the community. We hypothesized that dispatcher instruction consisting of chest compression alone would be associated with better overall long-term prognosis in comparison with chest compression plus rescue breathing.

Methods and Results—The investigators used a retrospective cohort study that combined 2 randomized trials comparing the short-term survival effects of dispatcher CPR instructions consisting either of chest compression alone or chest compression plus rescue breathing. Long-term vital status was ascertained by using the respective National and State death records through July 31, 2011. We performed Kaplan-Meier survival and Cox regression to evaluate survival according to the type of CPR instruction. Of the 2906 subjects included in the current investigation, 1241 (50%) were randomly assigned to chest compression alone and 1211 (50%) were randomly assigned to chest compression plus rescue breathing. Baseline characteristics were similar between the 2 CPR groups. During the 10 512 person-years of follow-up, there were 2260 deaths and 236 long-term survivors. Randomization to chest compression alone in comparison with chest compression plus rescue breathing was associated with a lower risk of death after adjustment for potential confounders (adjusted hazard ratio 0.81, 95% confidence interval, 0.70–0.96; P=0.012).

Conclusions—The findings provide strong support for long-term mortality benefit of dispatcher CPR instruction strategy consisting of chest compression alone rather than chest compression plus rescue breathing among adult patients with cardiac arrest requiring dispatcher assistance. (Circulation. 2015;117:905-914.)

RCP de base en 2013
MCE seul …

Chest Compression Alone Cardiopulmonary Resuscitation Is Associated With Better Long-Term Survival Compared with Standard Cardiopulmonary Resuscitation

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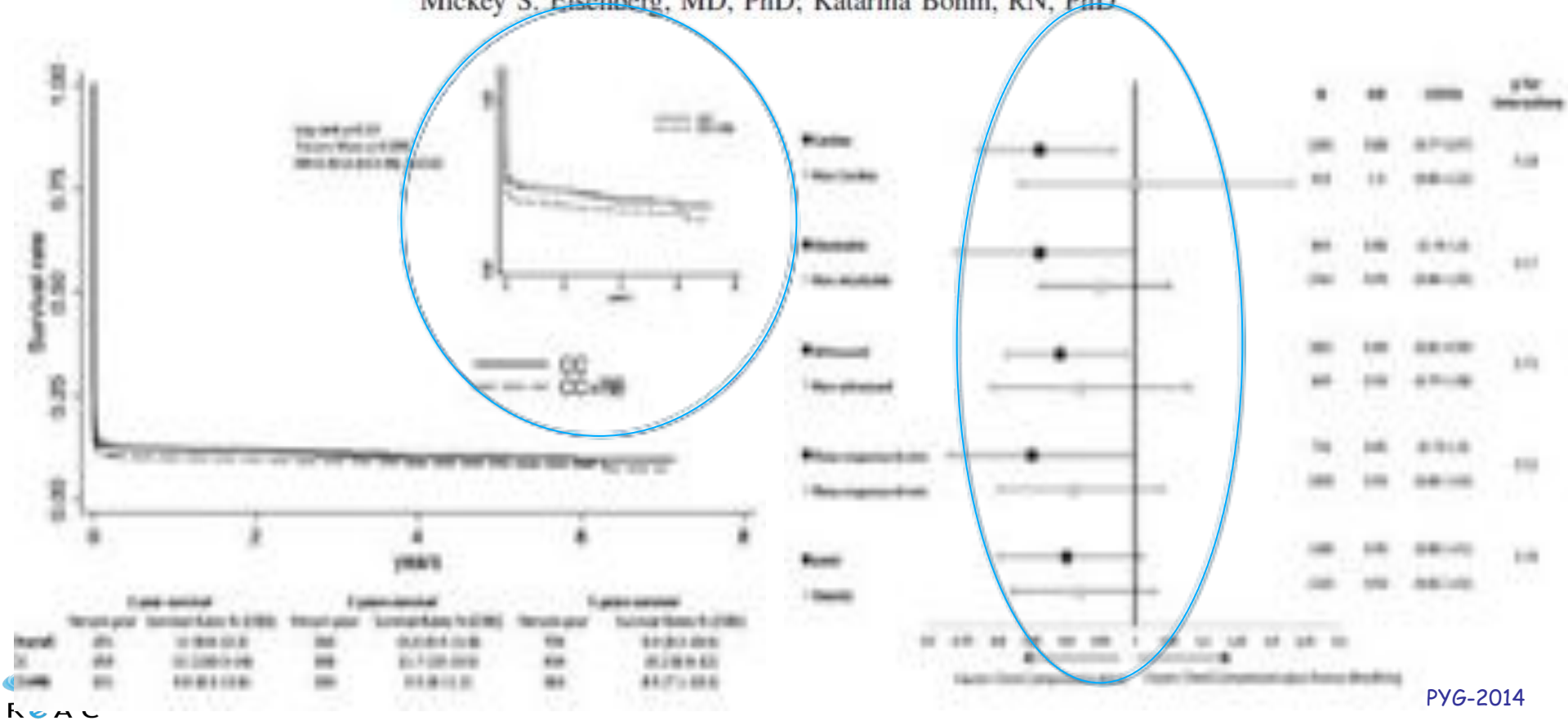

PYG-2014

French Registry data = 5 665 CA

« Conventional vs CC only CPR »

= 40,4 vs 59,6 %

ROSC / Admission / Discharge =

23,6 / 20,1 / 6,6 % if Chest Compressions alone

Vs 30,2* / 25,9* / 8,6 % if Rescue Breathing

*p < 0,01

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

The NEW ENGLAND JOURNAL of MEDICINE

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ORIGINAL ARTICLE

Nationwide Public-Access Defibrillation in Japan

Tetsuhisa Kitamura, M.D., Taku Iwami, M.D., Takashi Kawamura, M.D.,

- Etude prospective observationnelle / 3 ans

= analyse de l' impact de la diffusion des DAE

- 9 906 DAE en 2005 vs 88 265 DAE en 2007
- 312 319 AC ⇨ 12 631 FV ⇨ 462 DAE / témoins (3,7 %)
- Fréquence du choc = 1,2 % en 2005 vs 6,2 % en 2007
- Délai / choc = 3,7 min vs 2,2 min entre 2005 et 2007
- Survie FV (CPC 1 ou 2) = 14,4 % vs 31,6 % si choc / témoin
- 2,4 ⇨ 8,9 survivants/10 M habitants entre 2005 et 2007
- 1 ⇨ 4 DAE / Km^2 urbain

French Registry data = 5 665 CA

« First data on AED in France »

AED in OOHCA = 4,5 %

ROSC / Admission / Discharge =

30,1 / 28 / 12,4 % if AED (n=256)

Vs 17,4 / 14,3 / 3,7 % if no AED (n=5409)

p < 0,001

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

Nouvelles techniques/MCE

« Lucas »

« Autopulse »

⇨MCE prolongés: prélèvements « à cœur arrêté » ...

Monitorage RCP en 2014

$EtCO_2$ ⇨ rSO_2 / Spectrométrie infrarouge (NIRS)

INVOS™ 5100 C / COVIDIEN

Monitorage RCP en 2014

Resuscitation

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

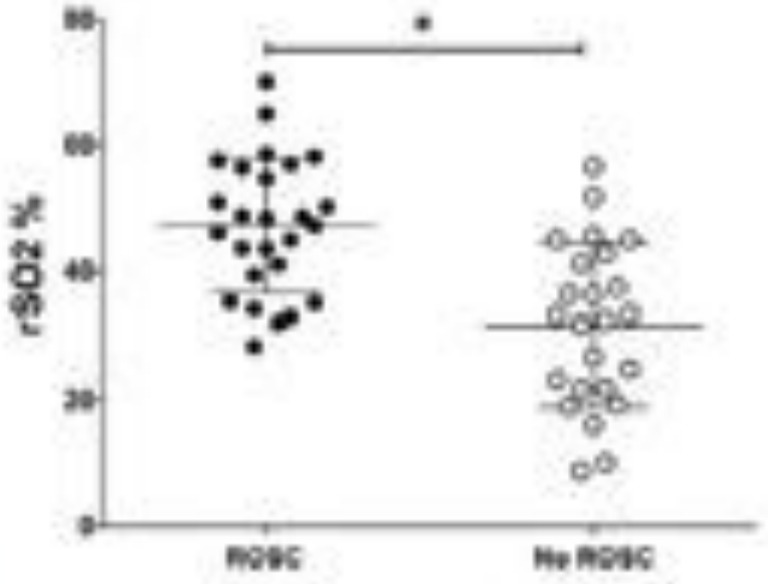
Clinical paper

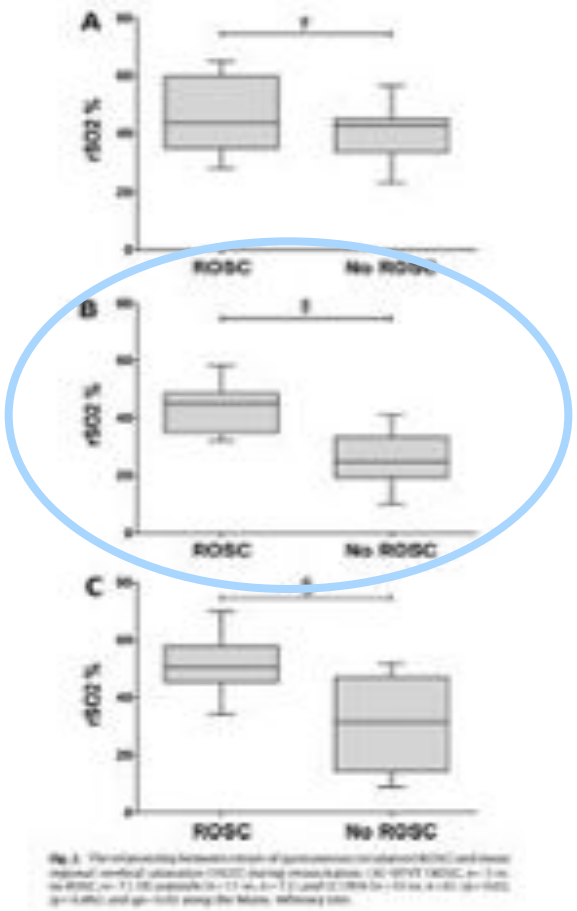
A pilot study examining the role of regional cerebral oxygen saturation monitoring as a marker of return of spontaneous circulation in shockable (VF/VT) and non-shockable (PEA/Asystole) causes of cardiac arrest*

Anna Ahn, Asad Nasir, Hanan Malik, Francis D'Orazi, Sam Parnia*

Background: Non-invasive monitoring of cerebral perfusion and oxygen delivery during cardiac arrest is not routinely utilized during cardiac arrest resuscitation. The objective of this study was to investigate the feasibility of using cerebral oximetry during cardiac arrest and to determine the relationship between regional cerebral oxygen saturation (rSO2) with return of spontaneous circulation (ROSC) in shockable

Monitorage RCP en 2014



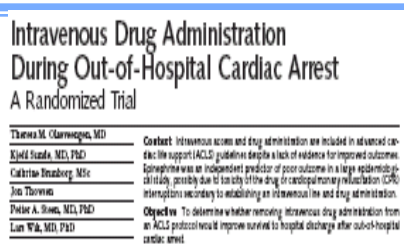


Methods: Cerebral oximetry was applied to 50 in-hospital and out-of-hospital cardiac arrest patients. *Results:* Overall, 52% (n = 26) achieved ROSC and 48% (n = 24) did not achieve ROSC. There was a significant difference in mean ± SD rSO2% in patients who achieved ROSC compared to those who did not (47.2 ± 10.7% vs. 31.7 ± 12.8%, $p < 0.0001$). This difference was observed during asystole (median rSO2 (IQR) ROSC versus no ROSC: 45.0% (35.1–48.8) vs. 24.9% (20.5–32.9), $p < 0.002$) and PEA (50.6% (46.7–57.5) vs. 31.6% (18.8–43.3), $p = 0.02$), but not in the VF/VT subgroup (43.7% (41.1–54.7) vs. 42.8% (34.9–45.0), $p = 0.83$). Furthermore, it was noted that no subjects with a mean rSO2 < 30% achieved ROSC.

Médicaments de l'AC

Drugs
or
Not drugs
in 2015 CPR ?

TM Olasveengen *et al*: Intravenous drug administration during out-of-hospital CA. JAMA 2009; 302: 2222-9



Intravenous Drug Administration During Out-of-Hospital Cardiac Arrest

A Randomized Trial

Etude prospective, monocentrique / 5 ans = 851 ACEH

ACLS + médicaments IV vs ACLS sans Médicaments IV

- ✓ Survie / sortie = 10.5 vs 9.2 % (p=0.61)
- ✓ Survie admission = 32 vs 21 % (p<0.001)
- ✓ Survie à 1 an = 10 vs 8 % (p=0.53)
- ✓ Survie CPC 1 = 9.8 vs 8.1 % (p=0.45)

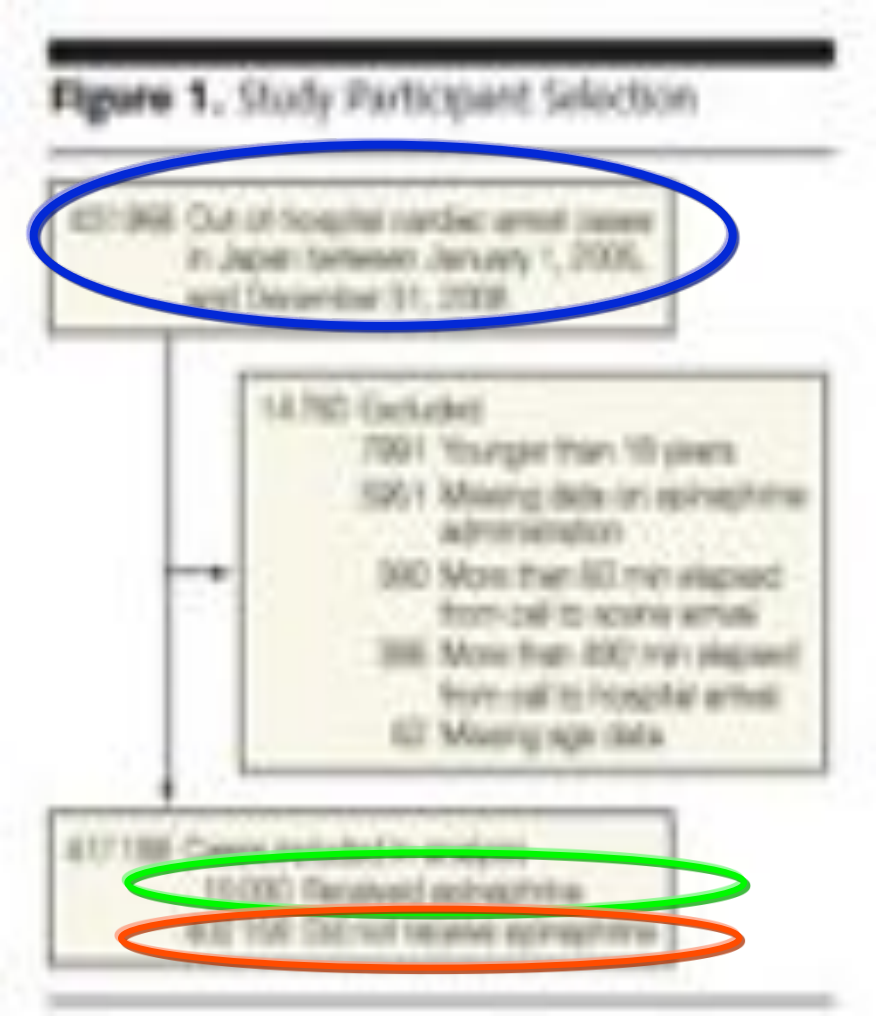
⇨ Pas d'amines ni anti-arythmiques ??

Prehospital Epinephrine Use and Survival Among Patients With Out-of-Hospital Cardiac Arrest

Akihito Hagihara, DMSc, MPH
Manabu Hasegawa, MD
Takeru Abe, MA
Takashi Nagata, MD

Context Epinephrine is widely used in cardiopulmonary resuscitation for out-of-hospital cardiac arrest (OHCA). However, the effectiveness of epinephrine use before hospital arrival has not been established.

Objective To evaluate the association between epinephrine use before hospital arrival and short- and long-term mortality in patients with cardiac arrest.



JAMA. 2012;307(11):1161-1168

Prehospital Epinephrine Use and Survival Among Patients With Out-of-Hospital Cardiac Arrest

Akihito Hagihara, DMSc, MPH
Manabu Hasegawa, MD
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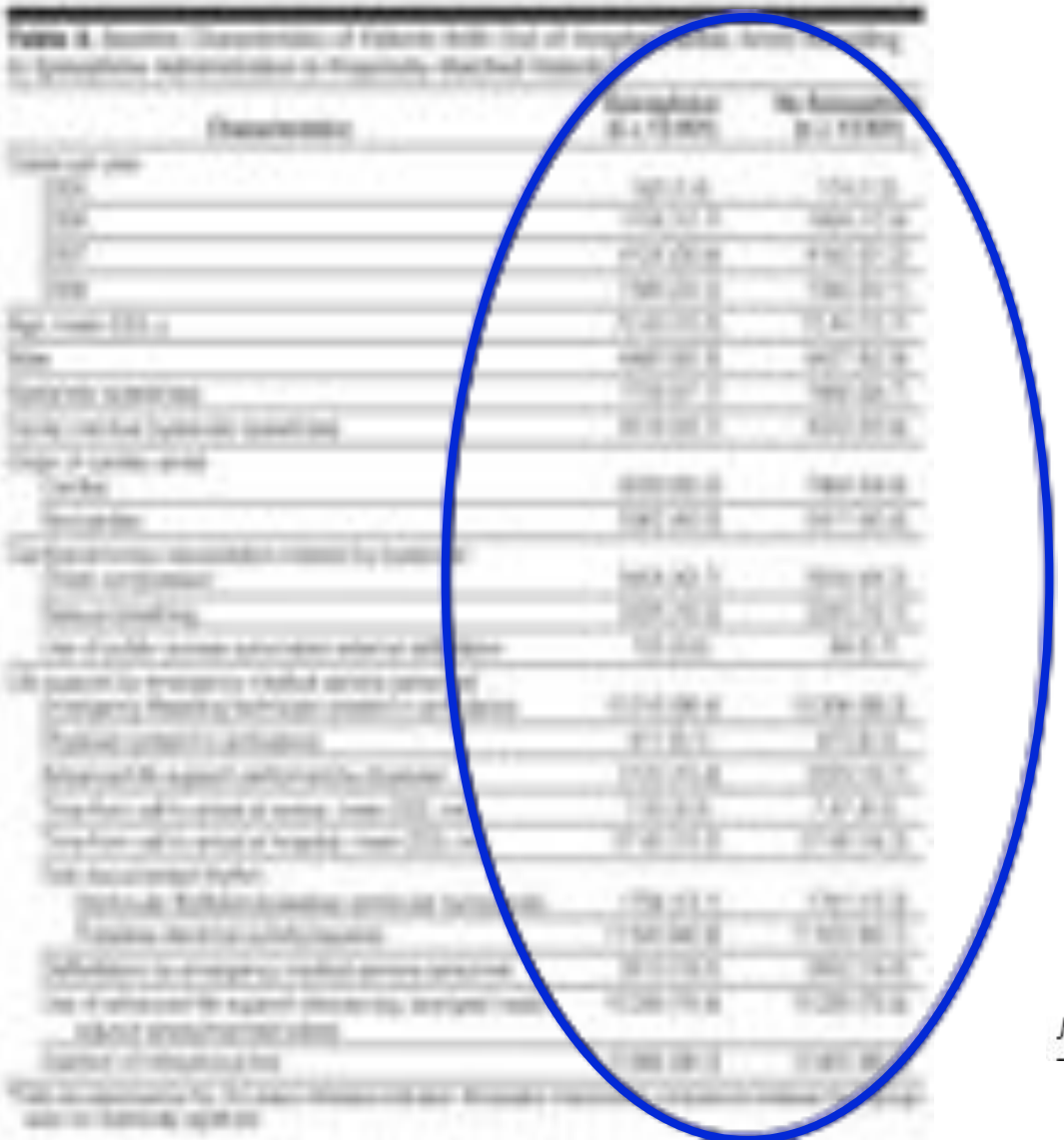

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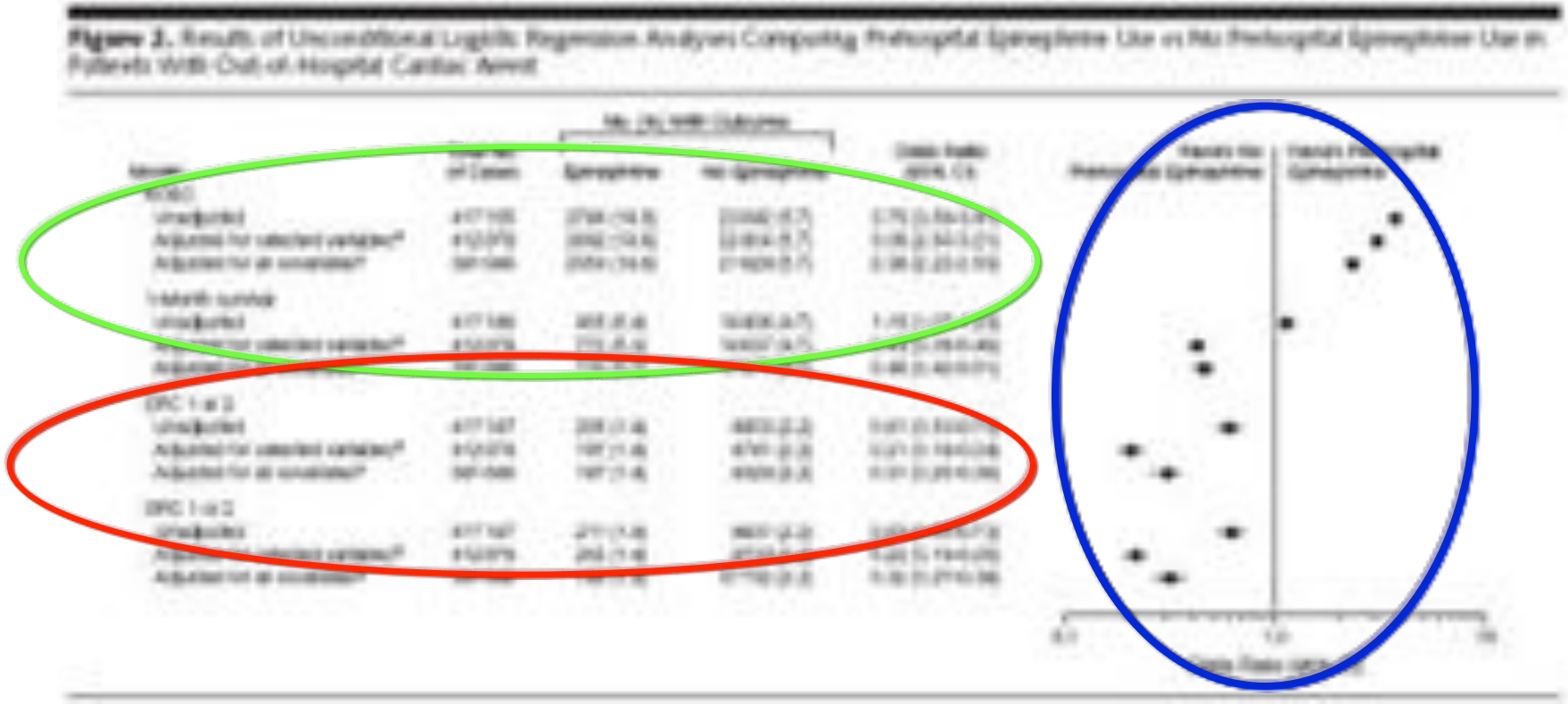


Conclusion Among patients with OHCA in Japan, use of prehospital epinephrine was significantly associated with increased chance of return of spontaneous circulation before hospital arrival but decreased chance of survival and good functional outcomes 1 month after the event.

JAMA. 2012;307(11):1161-1168

www.jama.com

JAMA. 2012;307(11):1161-1168

Médicaments de l' AC

Vasopressin, Steroids, and Epinephrine and Neurologically Favorable Survival After In-Hospital Cardiac Arrest
A Randomized Clinical Trial

Spyros D. Mentzelopoulos, MD, PhD; Sotirios Malachias, MD; Christos Chamos, MD; Demetrios Konstantopoulos, MD; Theodora Ntaidou, MD; Androula Papastylianou, MD, PhD; Iosifinia Kolliantzaki, MD; Maria Theodoridi, MD; Helen Ischaki, MD, PhD; Demosthenes Makris, MD, PhD; Epaminondas Zakynthinos, MD, PhD; Elias Zintzaras, MD, PhD; Sotirios Sourlas, MD; Stavros Aloizos, MD; Spyros G. Zakynthinos, MD, PhD

IMPORTANCE Among patients with cardiac arrest, preliminary data have shown improved return of spontaneous circulation and survival to hospital discharge with the vasopressin-steroids-epinephrine (VSE) combination.

Supplemental content at jama.com

JAMA. 2013;310(3):270-279. doi:10.1001/jama.2013.7832

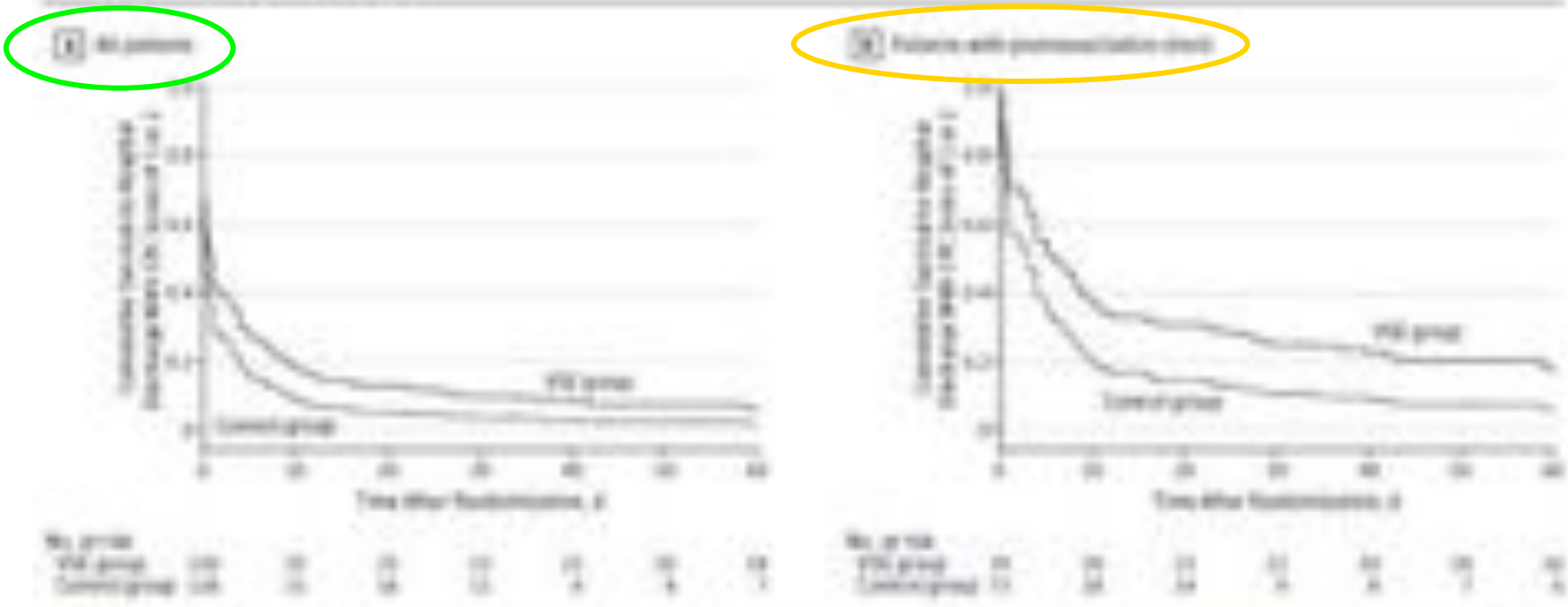
Vasopressin, Steroids, and Epinephrine and Neurologically Favorable Survival After In-Hospital Cardiac Arrest

JAMA. 2013;310(3):270-279. doi:10.1001/jama.2013.7832

Figure 1. Study Flowchart

Vasopressin, Steroids, and Epinephrine and Neurologically Favorable Survival After In-Hospital Cardiac Arrest

JAMA. 2013;310(3):270-279. doi:10.1001/jama.2013.7832



Probability of survival with a Cerebral Performance Category (CPC) score of 1 or 2 to day 90 after randomization, which was identical to survival to hospital discharge with a CPC score of 1 or 2 in all 200 patients (A) and in the 169 patients with postresuscitation shock (B). The numbers of patients at risk were reduced according to the time points of occurrence of patient death or the earliest follow-up neurological evaluation that was consistent with a subsequent, poor neurological outcome (ie, CPC score of >2 that was ultimately confirmed at the final neurological evaluation at hospital discharge). VSE indicates vasopressin-steroids-epinephrine.

Vasopressin, Steroids, and Epinephrine and Neurologically Favorable Survival After In-Hospital Cardiac Arrest

JAMA. 2013;310(3):270-279. doi:10.1001/jama.2013.7832

RESULTS Follow-up was completed in all resuscitated patients. Patients in the VSE group vs patients in the control group had higher probability for ROSC of 20 minutes or longer (109/130 [83.9%] vs 91/138 [65.9%]; odds ratio [OR], 2.98; 95% CI, 1.39-6.40; $P = .005$) and survival to hospital discharge with CPC score of 1 or 2 (18/130 [13.9%] vs 7/138 [5.1%]; OR, 3.28; 95% CI, 1.17-9.20; $P = .02$). Patients in the VSE group with postresuscitation shock vs corresponding patients in the control group had higher probability for survival to hospital discharge with CPC scores of 1 or 2 (16/76 [21.1%] vs 6/73 [8.2%]; OR, 3.74; 95% CI, 1.20-11.62; $P = .02$), improved hemodynamics and central venous oxygen saturation, and less organ dysfunction. Adverse event rates were similar in the 2 groups.

CONCLUSION AND RELEVANCE Among patients with cardiac arrest requiring vasopressors, combined vasopressin-epinephrine and methylprednisolone during CPR and stress-dose hydrocortisone in postresuscitation shock, compared with epinephrine/saline placebo, resulted in improved survival to hospital discharge with favorable neurological status.

RCP en 2014

- Alerte
- RCP de base
- Défibrillation
- RCP spécialisée (et monitorage)
- Suites de la RCP

… dès la RACS …

Suites de la RCP

= Syndrome post-AC = « maladie AC »

- Maintien homéostasie
- VA ⇨ SpO2 > 92 % (< 98 %: lutte contre hyperoxémie)
- PA « optimale » / patient = stable
- Traiter les manifestations épileptiques: sédation ?
- Protéger coronaires et cerveau: pas de tt protecteur
- Traiter l' hyperthermie … et induire une « hypothermie »
- Lutter contre hyperglycémie > 10 mmoles/L

Suites de la RCP

= Hypothermie induite précoce / coma post-RCP

- Précoce pendant 12 - 24 h
- Modérée (32 - 34 °C)

* S.A. Bernard et al. Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia. N Engl J Med 2002 ; 346 : 557-63.

* M. Holzer et Hypothermia ACA Study Group : Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. N Engl J Med 2002 ; 346 : 549-56.

Quelque soit le type d' AC

Hypothermie post-RCP en 2012

JH Walters, JP Nolan: Resuscitation 2011; 82: 508-16 – Review/77 studies

YM Kim, HW Yim, CW Callaway: Resuscitation 2011; august 9 – TH ↓ IH mortality

F Dumas, A Cariou: Circulation 2011; 123: 877-86 – TH # IH non VF mortality

JB Lundbye, J Kluger: Resuscitation 2011; august 22 – TH ↑ IH outcome (29 vs 10 %)

E Lopez-de-Sa et al: Circulation 2012; 126:2826. Level H: 32°> 34° (61 vs 15 % CPC 1)

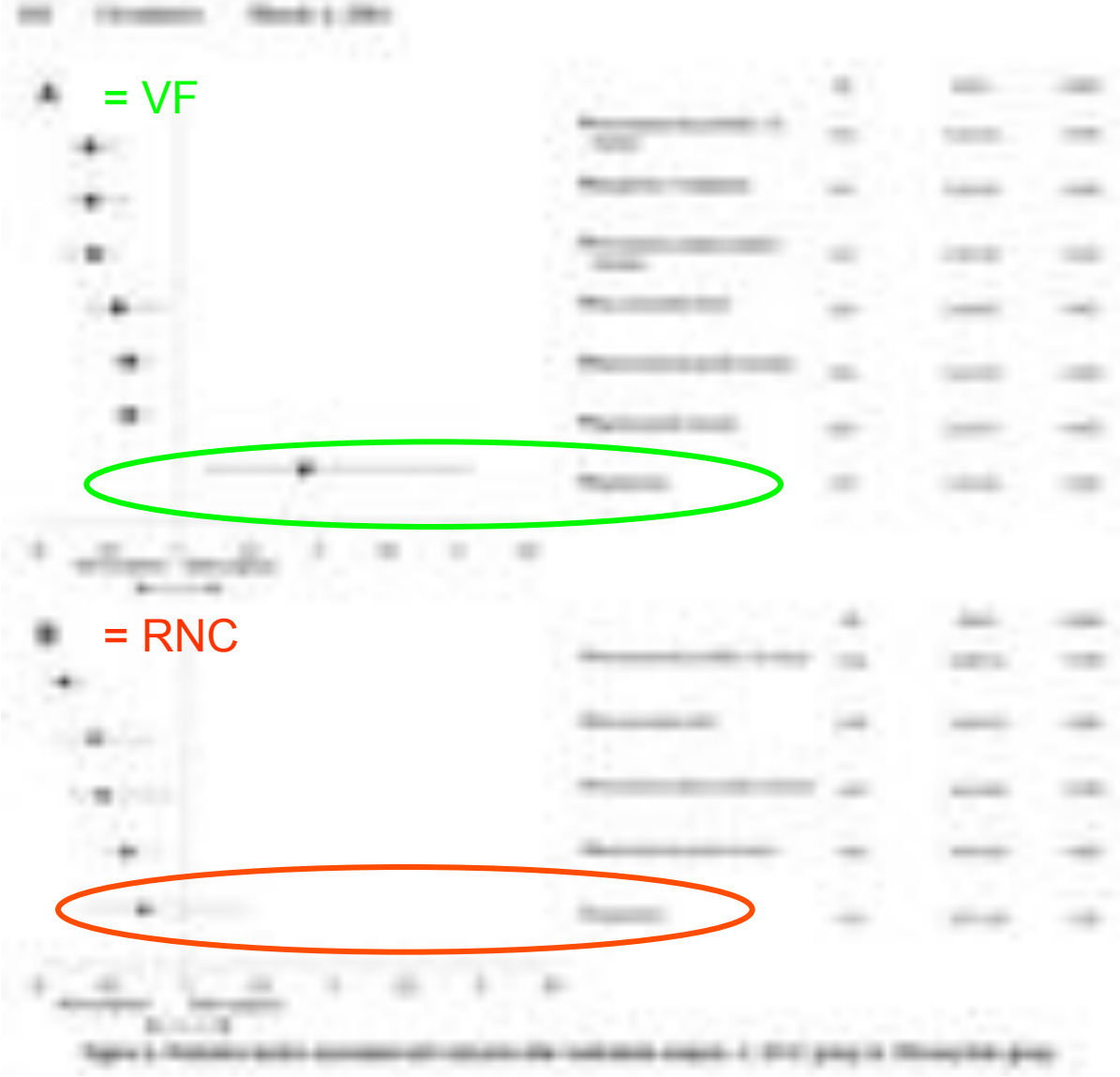
Is Hypothermia After Cardiac Arrest Effective in Both Shockable and Nonshockable Patients?

Insights From a Large Registry

Florence Dumas, MD; David Grimaldi, MD; Benjamin Zuber, MD; Jérôme Fichet, MD; Julien Charpentier, MD; Frédéric Pène, MD, PhD; Benoît Vivien, MD, PhD; Olivier Varenne, MD; Pierre Carli, MD, PhD; Xavier Jouven, MD, PhD; Jean-Philippe Empana, MD, PhD; Alain Cariou, MD, PhD

2000 – 2009

n = 1 145 AC



En pratique

- **Monitorage continu de la T°**
- **NaCl 4°C** (**30 ml/kg** max 2l) IV rapide sur VVP dédiée
- **Plaque d'hydrogel congelé** sur le tronc et les gros axes vasculaires (champ en interface pour éviter les gelures)
- **Sédation + Curarisation (Cistracrium)**

Contre-indications :

- **Arrêt cardiaque traumatique ou hémorragique (hémorragies digestives…)**
- **Patients dont la température initiale est inférieure à 34°C**

Hypothermie : pré hospitalier ?

Et dans la vraie vie en SMUR ?

« Survey of pre-hospital hypothermia use in France »

- Enquête téléphonique sur 105 SAMU / Mars 2010: 100 % de réponses
- 30 % = Hypothermie dont ½ sur protocole écrit
- 84 % pour tout RC
- 54 % / SS 0,9% à 4° (30 mL/ Kg en 30 min)
- 20 % sans surveillance de température

Y Yordanov Resuscitation 2012; 147.

Suites de la RCP

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

N Engl J Med 2013;369:2197-206.
DOI: 10.1056/NEJMoa1310519

Hypothermie post-RACS

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

In an international trial, we randomly assigned 950 unconscious adults after out-of-hospital cardiac arrest of presumed cardiac cause to targeted temperature management at either 33°C or 36°C. The primary outcome was all-cause mortality through the end of the trial. Secondary outcomes included a composite of poor neurologic function or death at 180 days, as evaluated with the Cerebral Performance Category (CPC) scale and the modified Rankin scale.

In total, 939 patients were included in the primary analysis. At the end of the trial, 50% of the patients in the 33°C group (236 of 473 patients) had died, as compared with 48% of the patients in the 36°C group (225 of 466 patients) (hazard ratio with a temperature of 33°C, 1.06; 95% confidence interval [CI], 0.89 to 1.26; P=0.51). At the 180-day follow-up, 54% of the patients in the 33°C group had died or had poor neurologic function according to the CPC, as compared with 52% of patients in the 36°C group (risk ratio, 1.02; 95% CI, 0.88 to 1.16; P=0.78). In the analysis using the modified Rankin scale, the comparable rate was 52% in both groups (risk ratio, 1.01; 95% CI, 0.89 to 1.14; P=0.87). The results of analyses adjusted for known prognostic factors were similar.

In unconscious survivors of out-of-hospital cardiac arrest of presumed cardiac cause, hypothermia at a targeted temperature of 33°C did not confer a benefit as compared with a targeted temperature of 36°C. (Funded by the Swedish Heart-Lung

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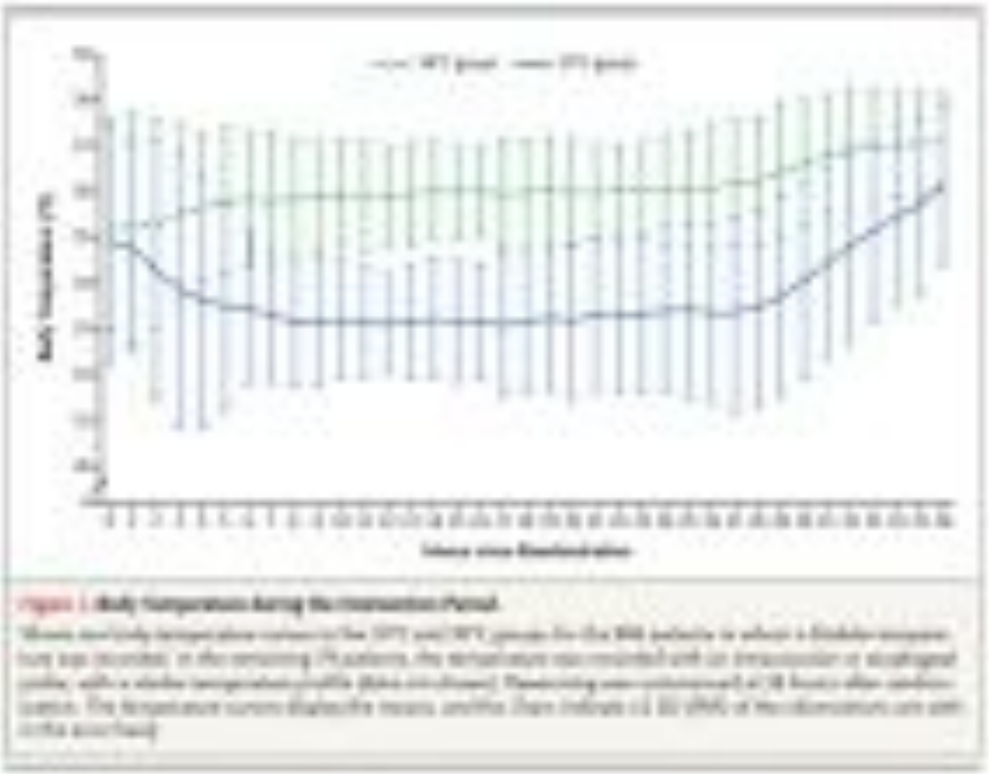
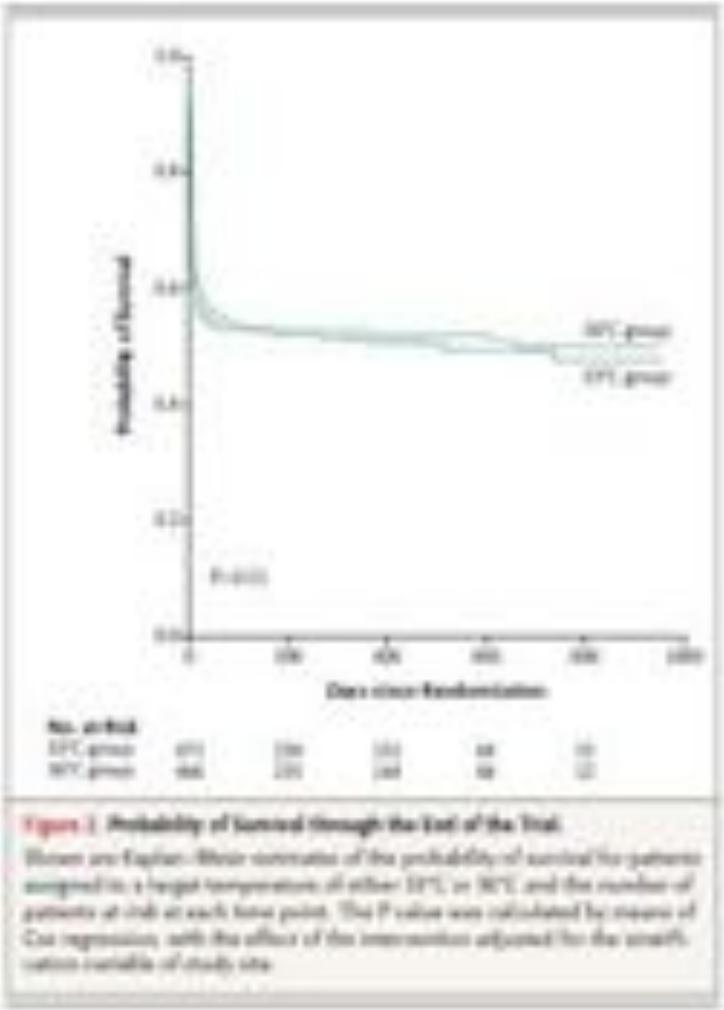
Hypothermie post-RACS



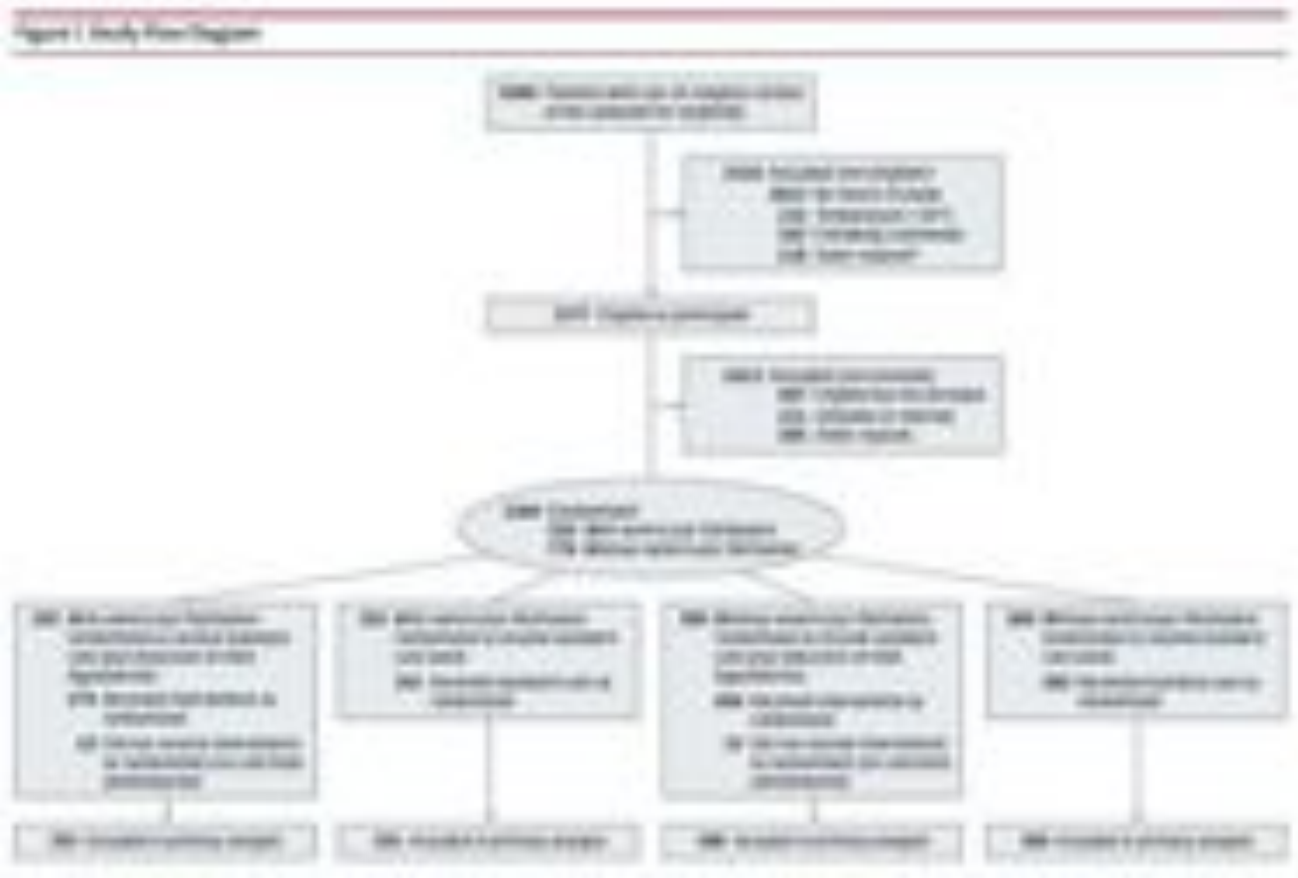


PYG-2014

Hypothermie : pré hospitalier ?

Effect of Prehospital Induction of Mild Hypothermia on Survival and Neurological Status Among Adults With Cardiac Arrest
A Randomized Clinical Trial

Francis Kim, MD; Graham Nichol, MD, MPH; Charles Maynard, PhD; Al Hallstrom, PhD; Peter J. Kudenchuk, MD; Thomas Rea, MD, MPH; Michael K. Copass, MD; David Carlbom, MD; Steven Deem, MD; W. T. Longstreth Jr, MD; Michele Olsufka, RN; Leonard A. Cobb, MD



Hypothermie : pré hospitalier ?

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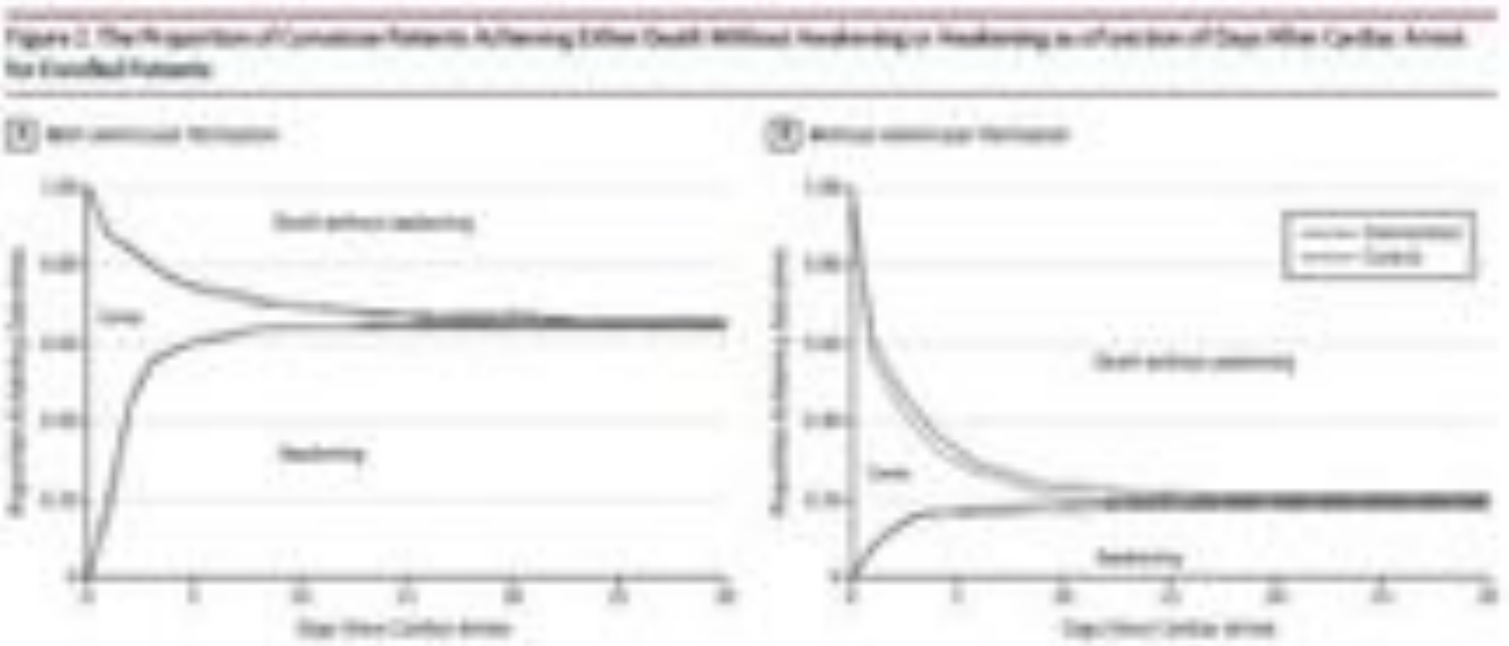
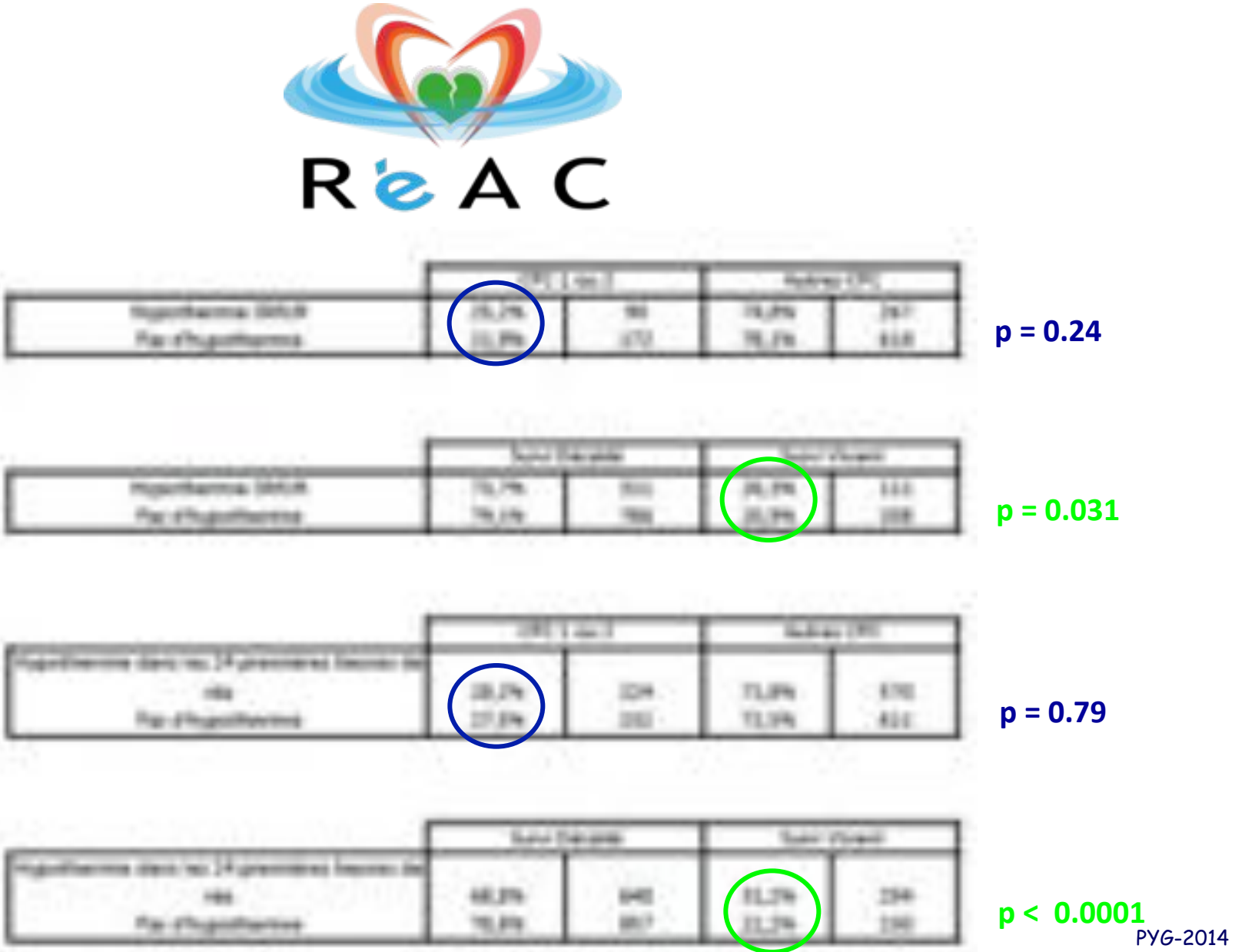


Hypothermie post-RACS



p = 0.24

p = 0.031

p = 0.79

p < 0.0001

En pratique, dès le SMUR

1- Oxygénation – Ventilation

VA – FiO_2 → SpO_2 94-98 %

FR = 10 – VC = 6-8 ml/kg → Normocapnie

2- Optimisation de l'hémodynamique selon étiologie

PAM entre 65 et 90 mmHg

3- Orientation du patient et traitement étiologique

4- Contrôle ciblé de la température si pas CI

Monitorage continu → 34-36°C

5- Contrôle glycémie ≤ 10 mmoles/l