



Journée des filières RESURCOR - RENAIR

29 novembre 2018

Actualités dans l'arrêt cardiaque

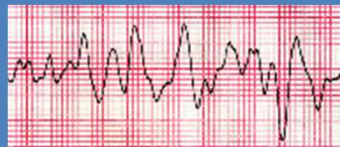


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Lésions d'ischémie/reperfusion

Lésions d'ischémie



AC
No Flow

Lésions d'ischémie Lésions de reperfusion

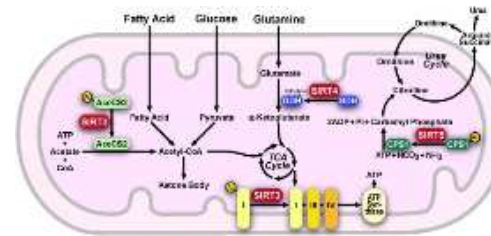
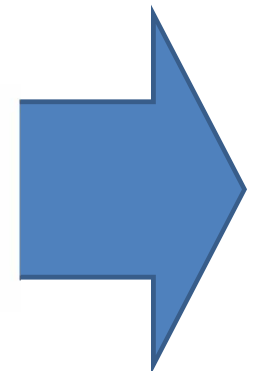


RCP de haute qualité
Low Flow

Lésions de reperfusion

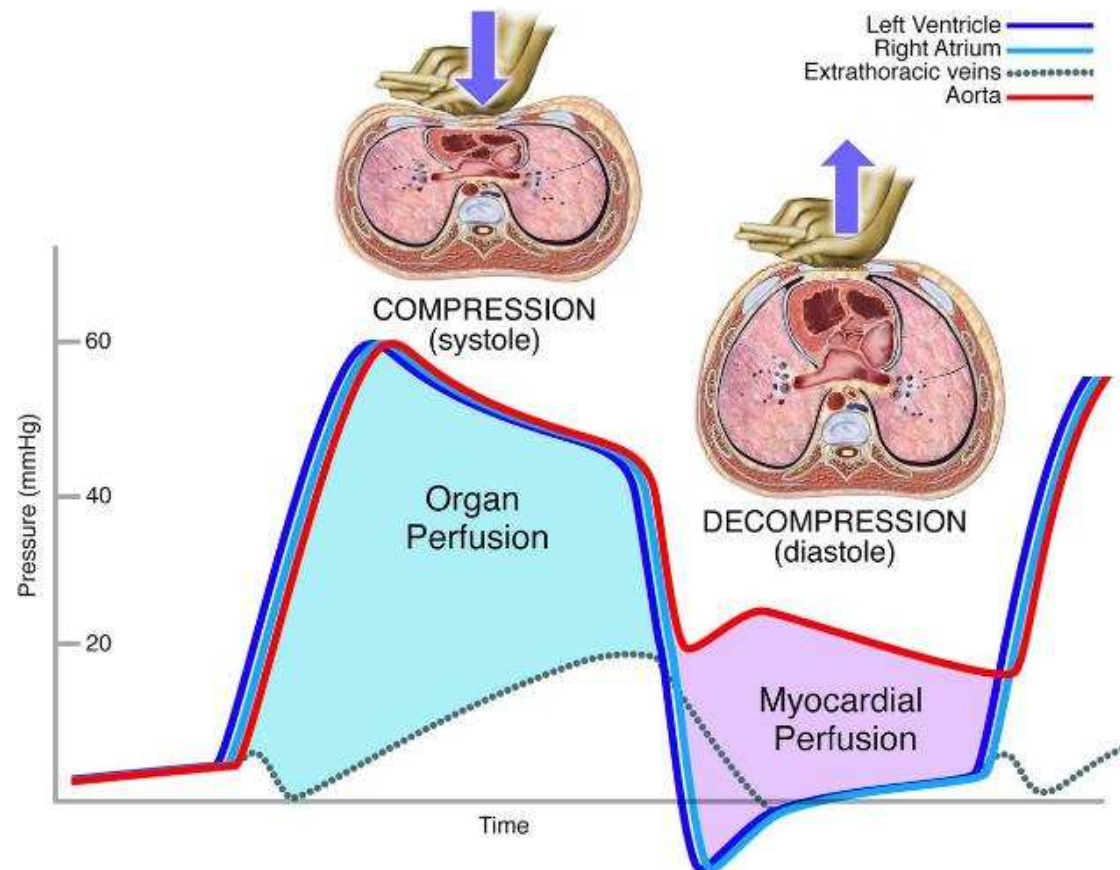


RACS



Pendant la RCP

Le plus important est de limiter les lésions de reperfusion avec une RCP de haute qualité



Harris AW, Kudenchuk PJ. *Heart* 2018;**0**:1–6. doi:10.1136/heartjnl-2017-

NNT et interventions dans l'arrêt cardiaque

Défibrillation précoce : **NNT = 5**

RCP par témoin : **NNT = 12**

Adrénaline : **NNT = 112**

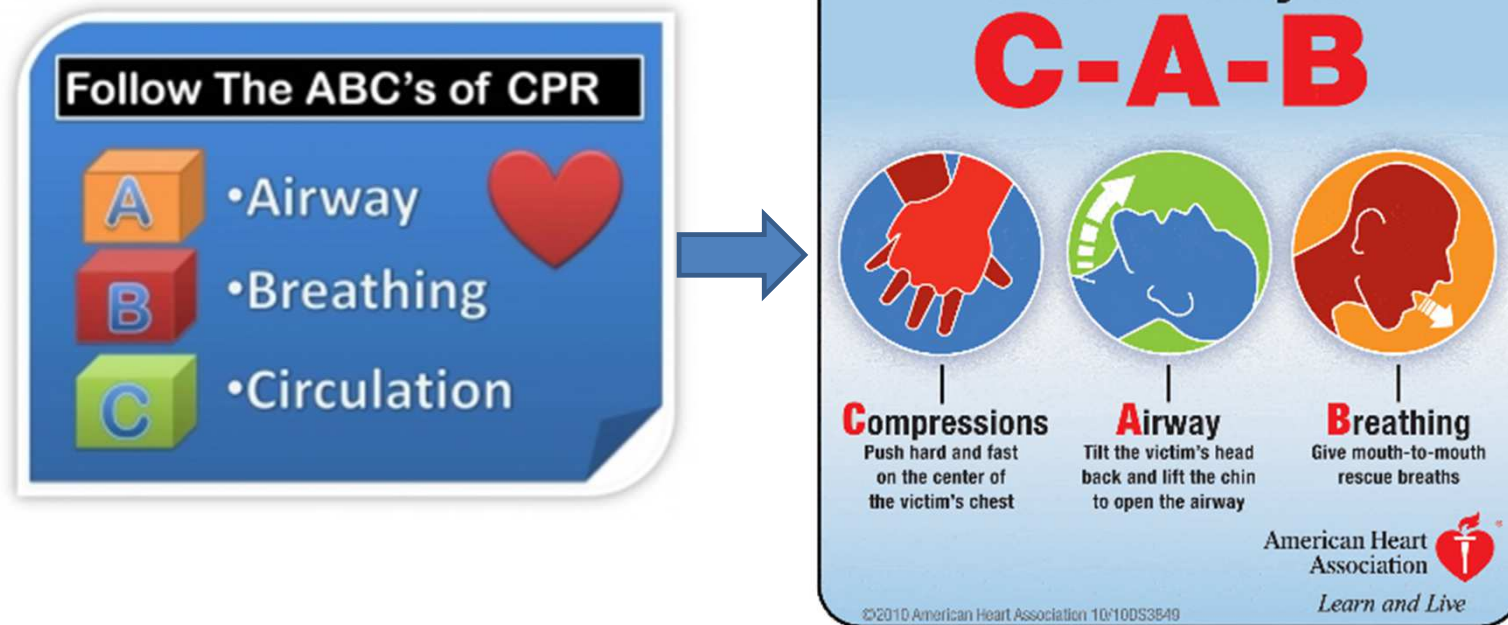
Intubation : **NNT = ?**

Contrôle des voies aériennes et ventilation

Faut-il encore intuber les patients ?



Une évolution dans la RCP



JAMA | Original Investigation

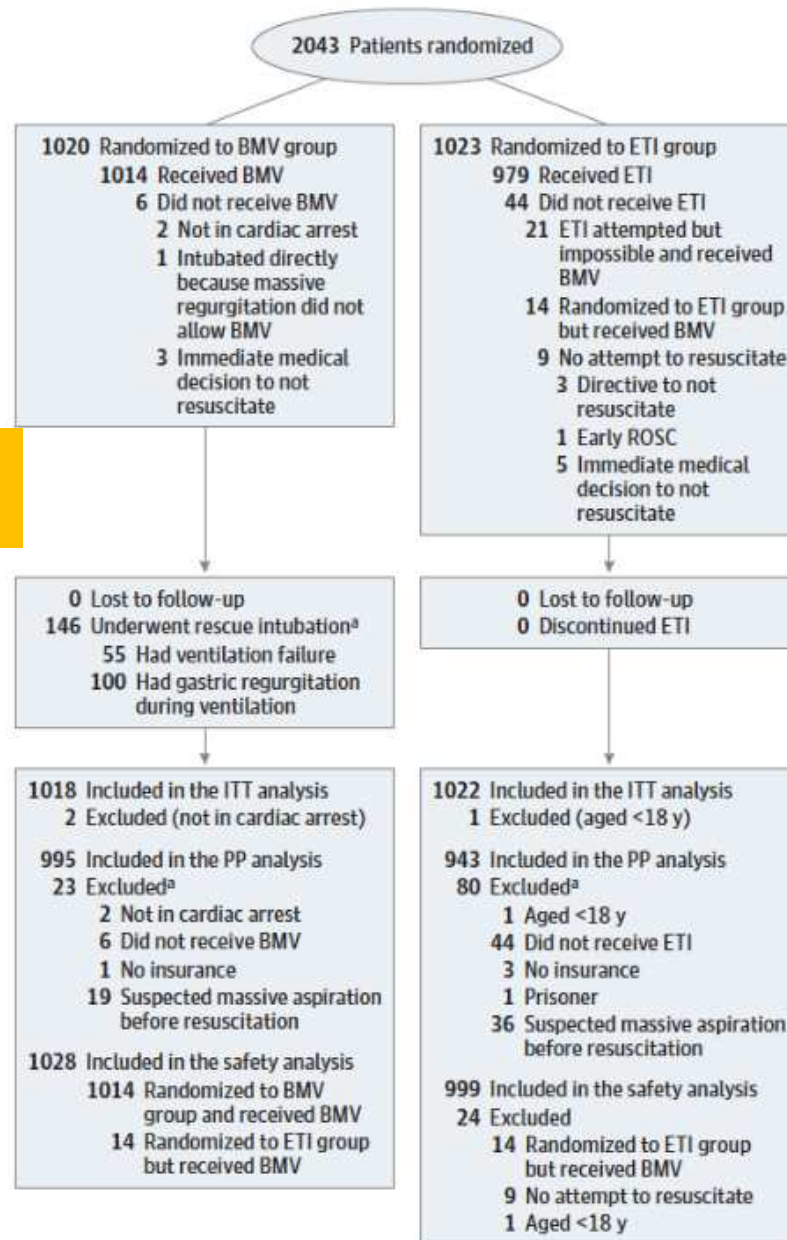
Effect of Bag-Mask Ventilation vs Endotracheal Intubation During Cardiopulmonary Resuscitation on Neurological Outcome After Out-of-Hospital Cardiorespiratory Arrest

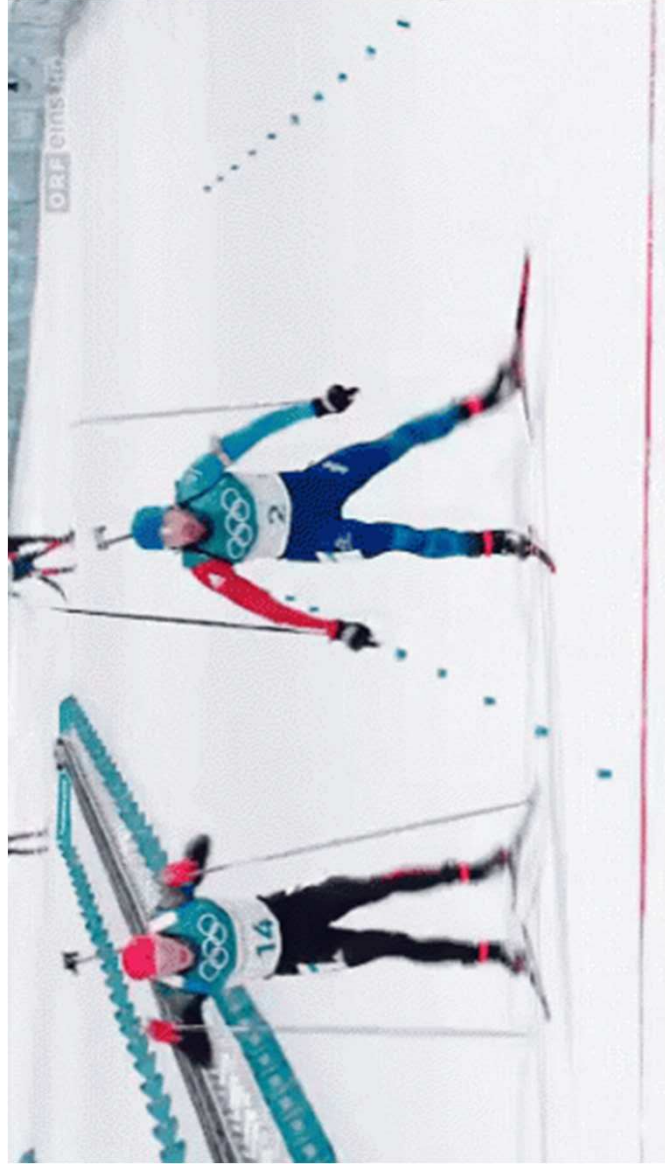
A Randomized Clinical Trial

Patricia Jabre, MD, PhD; Andrea Penaloza, MD, PhD; David Pinero, MD; Francois-Xavier Duchateau, MD; Stephen W. Borron, MD, MS; Francois Javaudin, MD; Olivier Richard, MD; Diane de Longueville, MD; Guillem Bouilleau, MD; Marie-Laure Devaud, MD; Matthieu Heidet, MD, MPH; Caroline Lejeune, MD; Sophie Fauroux, MD; Jean-Luc Greingor, MD; Alessandro Manara, MD; Jean-Christophe Hubert, MD; Bertrand Guihard, MD; Olivier Vermeylen, MD; Pascale Lievens, MD; Yannick Auffret, MD; Celine Maisondieu, MD; Stephanie Huet, MD; Benoît Claessens, MD; Frederic Lapostolle, MD, PhD; Nicolas Javaud, MD, PhD; Paul-Georges Reuter, MD, MS; Elinor Baker, MD; Eric Vicaut, MD, PhD; Frédéric Adnet, MD, PhD

JAMA. 2018;319(8):779-787. doi:10.1001/jama.2018.0156

Etude multicentrique,
randomisé, de non-infériorité



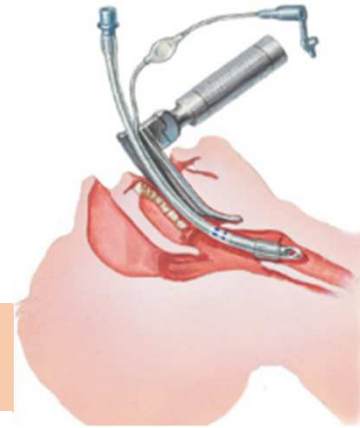




43/1022 (4,2%)



CPC 1-2 à 28j



44/1018 (4,3%)

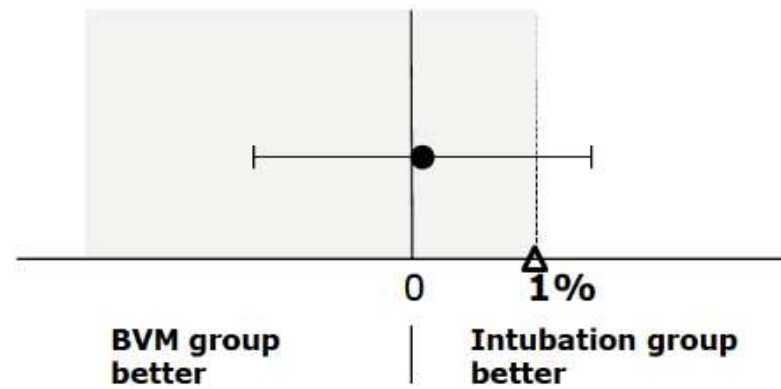


Table 2. Secondary Outcomes in Patients Included in the Study

Outcome	No. of Patients (%)		Proportion Difference, BMV(%) - ETI(%) (95% CI)		p Value ^a
	BMV Group	ETI Group			
Intention-to-Treat Population	n = 1018	n = 1022			
Survival at 28 d	55 (5.4)	54 (5.3)	0.1 (-1.8 to 2.1)		.90
CPCs ^b					
1, Good cerebral performance	35 (3.4)	37 (3.6)			
2, Moderate cerebral disability	9 (0.9)	6 (0.6)			
3, Severe cerebral disability	4 (0.4)	7 (0.7)			.68
4, Coma or vegetative state	7 (0.7)	4 (0.4)			
5, Death	963 (94.6)	968 (94.7)			
Survival to hospital admission	294 (28.9)	333 (32.6)	-3.7 (-7.7 to 0.3)		.07
Return of spontaneous circulation	348 (34.2)	397 (38.9)	-4.7 (-8.8 to -0.5)		.03
Per-Protocol Analysis	n = 995	n = 943			
Survival at 28 d	54 (5.4)	51 (5.4)	0.1 (-10 to 9.7)		.99
CPCs ^b					
1, Good cerebral performance	35 (3.5)	34 (3.5)			
2, Moderate cerebral disability	8 (0.8)	6 (0.6)			
3, Severe cerebral disability	4 (0.4)	7 (0.7)			.76
4, Coma or vegetative state	7 (0.7)	4 (0.4)			
5, Death	941 (94.6)	892 (94.6)			
Survival to hospital admission	289 (29.1)	312 (33.1)	-4.0 (-7.6 to 0.6)		.055
Return of spontaneous circulation	342 (34.4)	377 (30.0)	-5.6 (-9.9 to -1.3)		.01

Table 3. Airway Management Adverse Events Analysis

Safety Population	BMV Group	ETI Group	Absolute Difference, BMV(%) - ETI(%) (95% CI)	P Value ^a
BMV or ETI Difficulty				
BMV VAS, median (IQR), mm ^b	20 (5-55)	NA	NA	NA
Intubation Difficulty Scale score, median (IQR)	NA	1 (0-4)	NA	NA
Rate of airway management difficulty, No./total No. (%) ^c	186/1027 (18.1)	134/996 (13.4)	4.7 (1.5-7.9)	.004
BMV or ETI failure, No./total No. (%)	69/1028 (6.7)	21/996 (2.1)	4.6 (2.8-6.4)	<.001
BMV or ETI Complications, No. (%)				
	n = 1027	n = 999		
Regurgitation of gastric content	156 (15.2)	75 (7.5)	7.7 (4.9-10.4)	<.001
Mainstem intubation ^d	NA	20 (2.0)	NA	NA
Recognized esophageal intubation ^e	NA	102 (10.2)	NA	NA
Dental injury	NA	7 (0.7)	NA	NA
Extubation	NA	5 (0.5)	NA	NA

Early-Onset Pneumonia after Cardiac Arrest

Characteristics, Risk Factors and Influence on Prognosis

Sébastien Perbet^{1,2}, Nicolas Mongardon^{1,5}, Florence Dumas^{3,9}, Cédric Bruel^{2,8}, Virginie Lemiale¹, Bruno Mourvillier², Pierre Carli^{4,5}, Olivier Varenne^{5,6}, Jean-Paul Mira^{1,5,7}, Michel Wolff^{2,8}, and Alain Cariou^{1,5,9}

TABLE 2. OUTCOME ACCORDING TO DEVELOPMENT OR ABSENCE OF EARLY-ONSET PNEUMONIA

	Total (<i>n</i> = 641)	Pneumonia (<i>n</i> = 419)	No Pneumonia (<i>n</i> = 222)	<i>P</i> Value
LOS in ICU, d*	7.5	7.9 ± 7.2	6.7 ± 7.6	0.001
MV duration, d*	5.4	5.7 ± 5.9	4.7 ± 6.2	0.001
VAP, <i>n</i> (%)	91 (14)	64 (18)	27 (14)	0.25
Hospital survival, <i>n</i> (%)	253 (39)	172 (41)	81 (36)	0.26
CPC1/2, <i>n</i> (%)	238 (37)	161 (38)	77 (34)	0.35

JAMA | Original Investigation

Effect of a Strategy of Initial Laryngeal Tube Insertion vs Endotracheal Intubation on 72-Hour Survival in Adults With Out-of-Hospital Cardiac Arrest

A Randomized Clinical Trial

Henry E. Wang, MD, MS; Robert H. Schmicker, MS; Mohamud R. Daya, MD, MS; Shannon W. Stephens, EMT-P; Ahamed H. Idris, MD; Justin N. Carlson, MD, MS; M. Riccardo Colella, DO, MPH; Heather Herren, MPH, RN; Matthew Hansen, MD, MCR; Neal J. Richmond, MD; Juan Carlos J. Puyana, BA; Tom P. Aufderheide, MD, MS; Randal E. Gray, MEd, NREMT-P; Pamela C. Gray, NREMT-P; Mike Verkest, AAS, EMT-P; Pamela C. Owens; Ashley M. Brienza, BS; Kenneth J. Sternig, MS-EHS, BSN, NRP; Susanne J. May, PhD; George R. Sopko, MD, MPH; Myron L. Weisfeldt, MD; Graham Nichol, MD, MPH



Vs.



N=3 005 arrêt cardiaques (30 EMS)

N=1 506 groupe King

N=1 499 groupe intubation

27,9%

RACS*

24,34%

18,3%

Survie à 72h

15,4%

10,8%

Survie à 30 jours

8,1%

7,1%

Bon devenir neurologique

5,0%



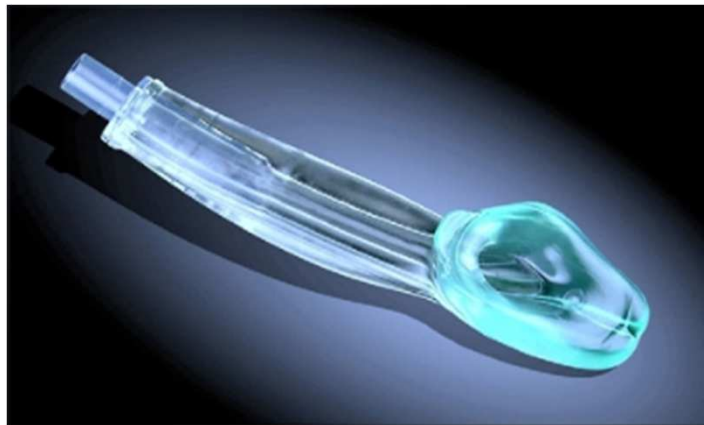
Tous les P<0,02

JAMA | Original Investigation

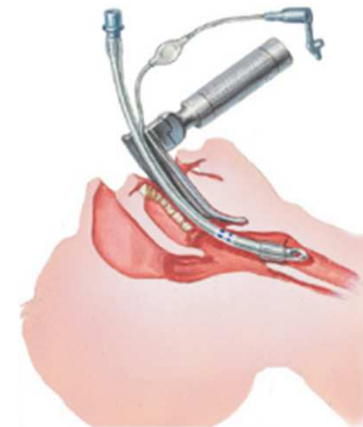
Effect of a Strategy of a Supraglottic Airway Device vs Tracheal Intubation During Out-of-Hospital Cardiac Arrest on Functional Outcome

The AIRWAYS-2 Randomized Clinical Trial

Jonathan R. Benger, MD; Kim Kirby, MRes; Sarah Black, DClinRes; Stephen J. Brett, MD; Madeleine Clout, BSc; Michelle J. Lazaroo, MSc; Jerry P. Nolan, MBChB; Barnaby C. Reeves, DPhil; Maria Robinson, MOst; Lauren J. Scott, MSc; Helena Smartt, PhD; Adrian South, BSc (Hons); Elizabeth A. Stokes, DPhil; Jodi Taylor, PhD; Matthew Thomas, MBChB; Sarah Voss, PhD; Sarah Wordsworth, PhD; Chris A. Rogers, PhD



Vs.



N=9 296 arrêt cardiaques

N=4 882 groupe IGel

N=4 407 groupe intubation

30,6%

RACS*

28,4%

13,6%

Survie à 72h

13,1%

8,0%

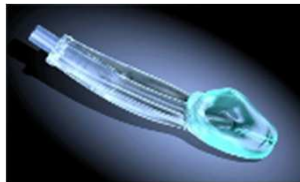
Survie à 30 jours

8,4%

6,4%

Bon devenir neurologique

6,8%



P=0,02

Conclusion - Airway

Aux USA : King LT > Intubation mais 51% de succès d'intubation

Aux UK : Igel = Intubation mais 69% de succès d'intubation

En France: Intubation non différente de Ventilation au masque mais moins de complications et 2,1% d'échec d'intubation

Adapter la technique au système de soins

CaB

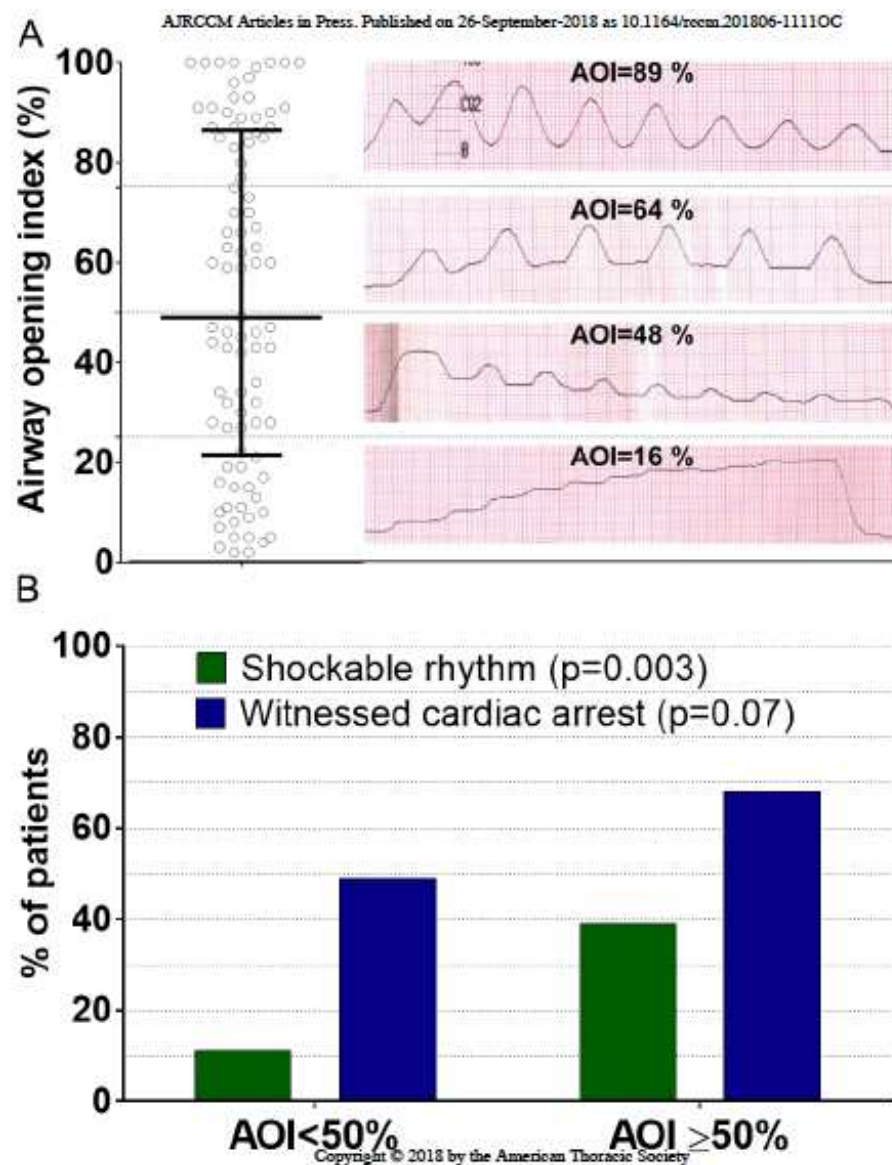


American Journal of Respiratory and Critical Care Medicine

Publishes the most innovative science and highest quality reviews, practice guidelines, and statements in the pulmonary, critical care, and sleep-related fields

Intrathoracic airway closure impacts CO₂ signal and delivered ventilation during cardiopulmonary resuscitation

Domenico L. Grieco^{1,2,3}, Laurent Brochard^{1,2}, Adrien Drouet⁴, Irene Telias^{1,2}, Stéphane Delisle⁵, Gilles Bronchti⁶, Cecile Ricard⁴, Marceau Rigollot⁷, Bilal Badat⁷, Paul Ouellet⁸, Emmanuel Charbonney^{5,6}, Jordi Mancebo⁹, Alain Mercat¹⁰, Dominique Savary⁴ and Jean-Christophe M. Richard^{4,11}, on behalf of the CAVIAR* Group



Thérapeutique Adrénaline ?

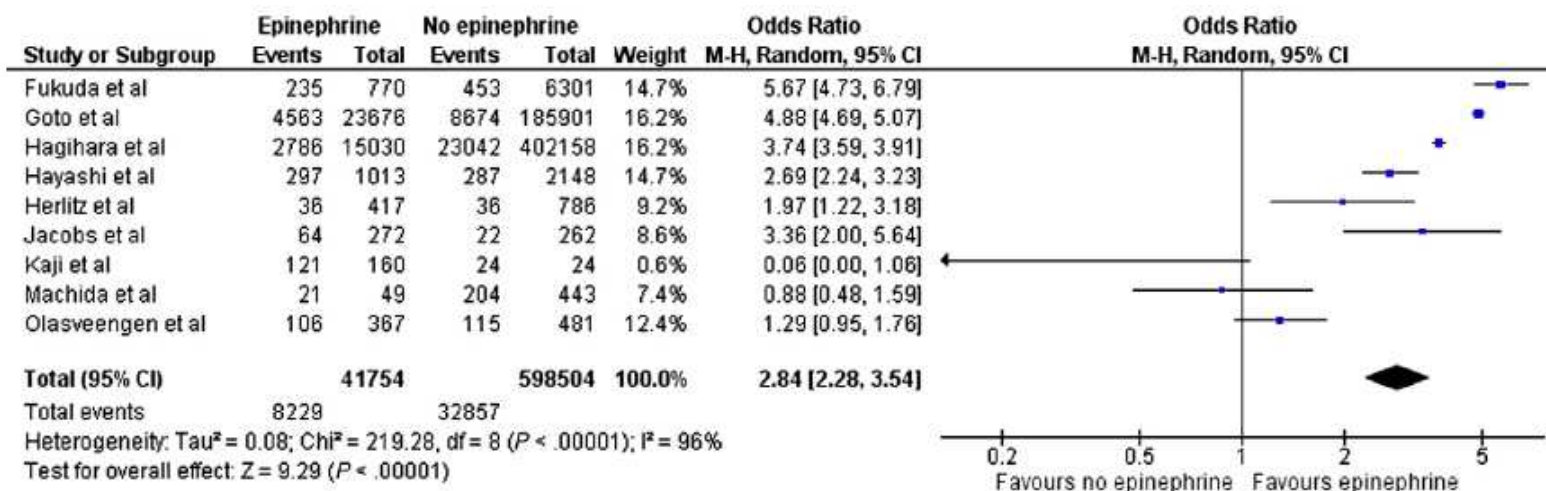
Increased return of spontaneous circulation at the expense of neurologic outcomes: Is prehospital epinephrine for out-of-hospital cardiac arrest really worth it? ☆



Rohit Seth Loomba, MD ^{a,*}, Karan Nijhawan, BS ^b, Saurabh Aggarwal, MD ^c, Rohit Romesh Arora, MD ^d

Journal of Critical Care 30 (2015) 1376–1381

RACS



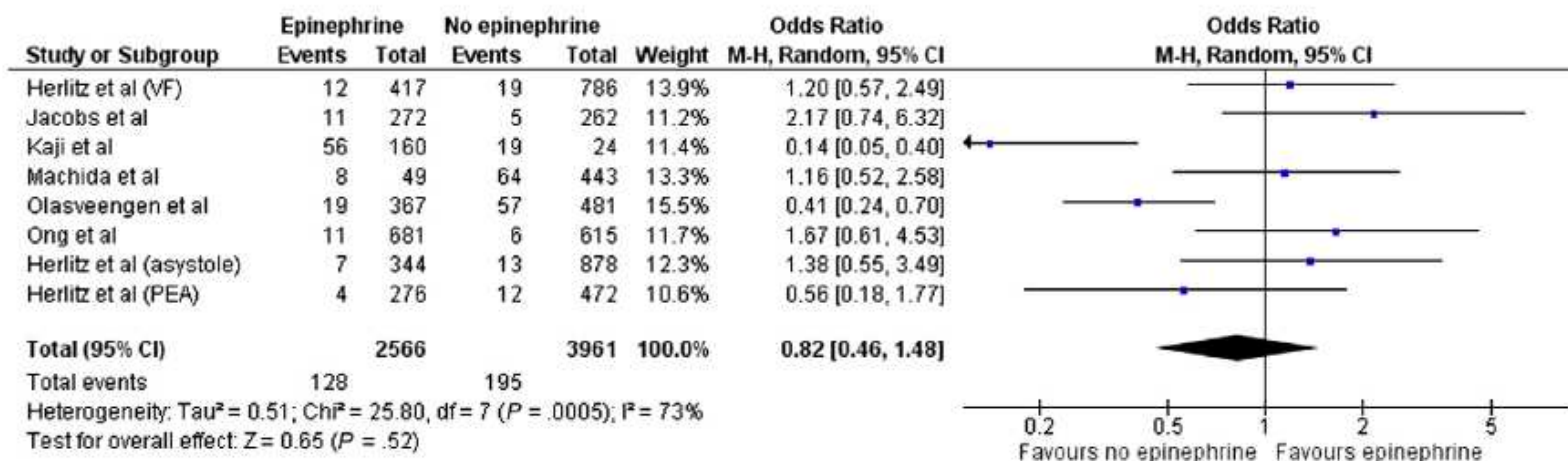
Increased return of spontaneous circulation at the expense of neurologic outcomes: Is prehospital epinephrine for out-of-hospital cardiac arrest really worth it? ☆



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Journal of Critical Care 30 (2015) 1376–1381

Survie à la sortie de l'hôpital



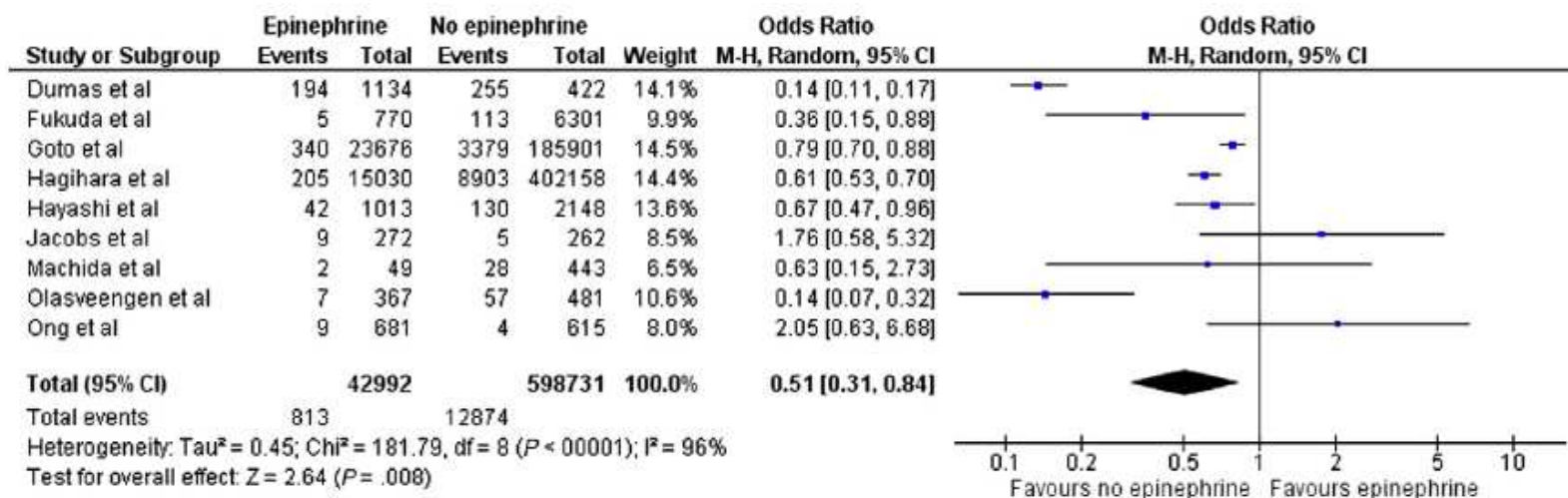
Increased return of spontaneous circulation at the expense of neurologic outcomes: Is prehospital epinephrine for out-of-hospital cardiac arrest really worth it? ☆



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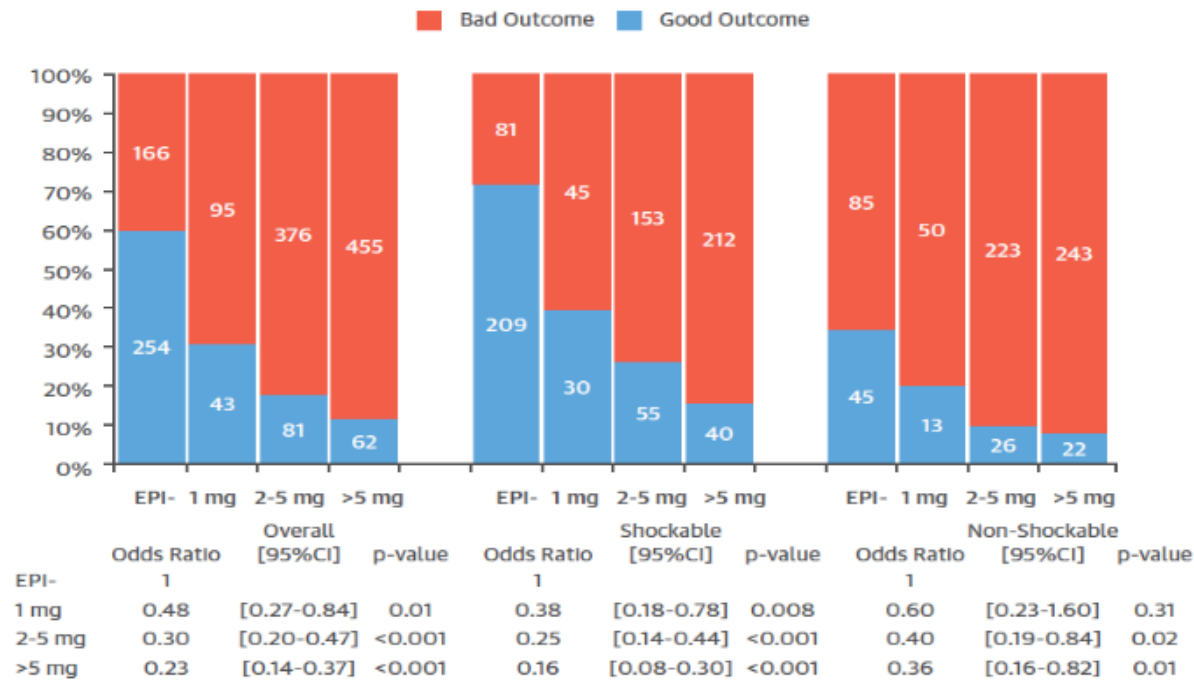
Journal of Critical Care 30 (2015) 1376–1381

Bon devenir neurologique



Thérapeutiques : Adrénaline

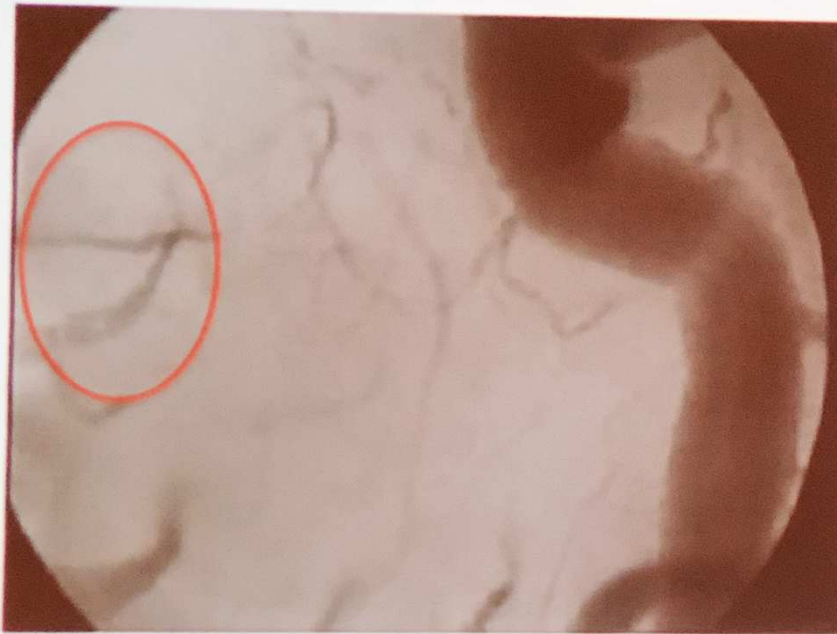
FIGURE 3 Association Between Outcome and Early Dose of EPI and According to the Initial Rhythm



Dumas F, (2014) Is epinephrine during cardiac arrest associated with worse outcomes in resuscitated patients? J Am Coll Cardiol 64: 2360-2367

Atteinte du flux microvasculaire

Adrénaline



Placébo



The NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

AUGUST 23, 2018

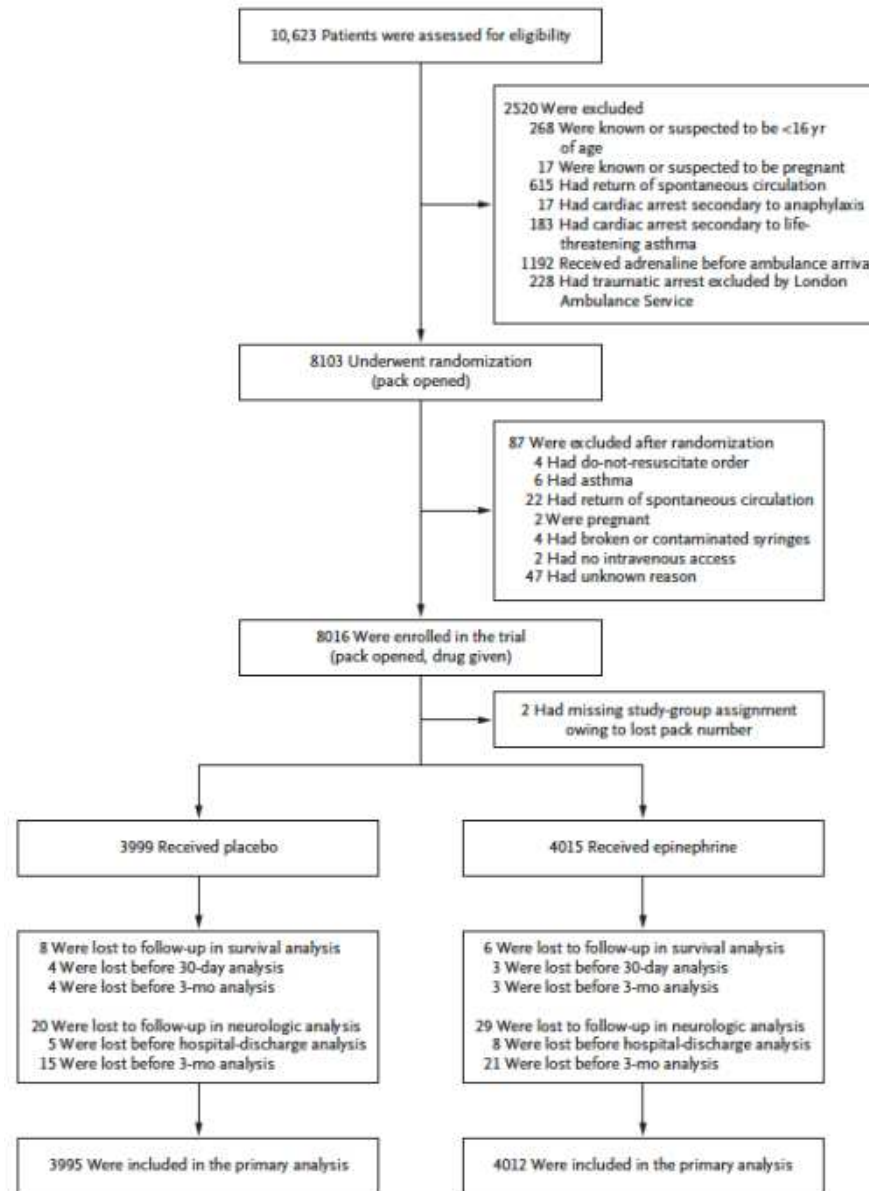
VOL. 379 NO. 8

A Randomized Trial of Epinephrine in Out-of-Hospital Cardiac Arrest

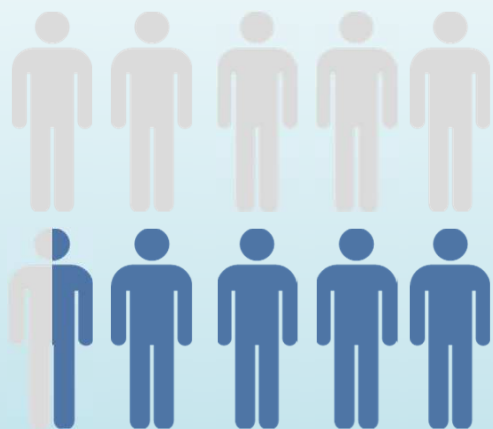
G.D. Perkins, C. Ji, C.D. Deakin, T. Quinn, J.P. Nolan, C. Scamperin, S. Regan, J. Long, A. Slowther, H. Pocock, J.J.M. Black, F. Moore, R.T. Fothergill, N. Rees, L. O'Shea, M. Docherty, I. Gunson, K. Han, K. Charlton, J. Finn, S. Petrou, N. Stallard, S. Gates, and R. Lall, for the PARAMEDIC2 Collaborators*



The Adrenaline Trial



Population d'étude



65%
Homme

Age Moyen
69 ans

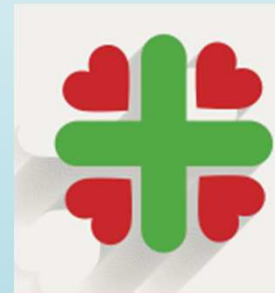


6 sur 10
RCP par témoin avant
l'arrivée des secours

Population d'étude



20%
FV/TV



Cause médicale
90%



Délai médian d'administration 21 min
Dose médiane 5 mg

Retour à une Circulation Spontanée



Adrénaline



36,3%

N=1457/3975



Placebo

11,7%

N=468/3960

Admission à l'Hôpital



Adrénaline



23,8%

N=947/3973



Placebo

8,0%

N=319/3982

Odds Ratio
3,6 (IC95% 3,1-4,1)

Bon devenir neurologique à la sortie

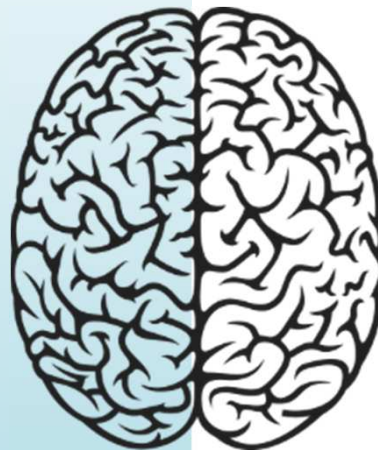


Adrénaline



2,2%

N=87/4007



Placebo

1,9%

N=74/3994

Odds Ratio
1,18 (IC95% 0,86-1,61)

Mauvais devenir neurologique

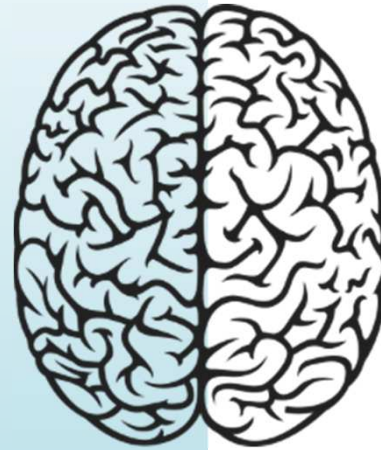


Adrénaline



31%

N=39/126



Placebo

17,8%

N=16/90

Plus de lésion neurologique
sévère (mrs 4/5) dans le
groupe adrénaline

Post Hoc comparison
0,51 (IC95% 0,27-0,96)

Devenir neurologique à la sortie

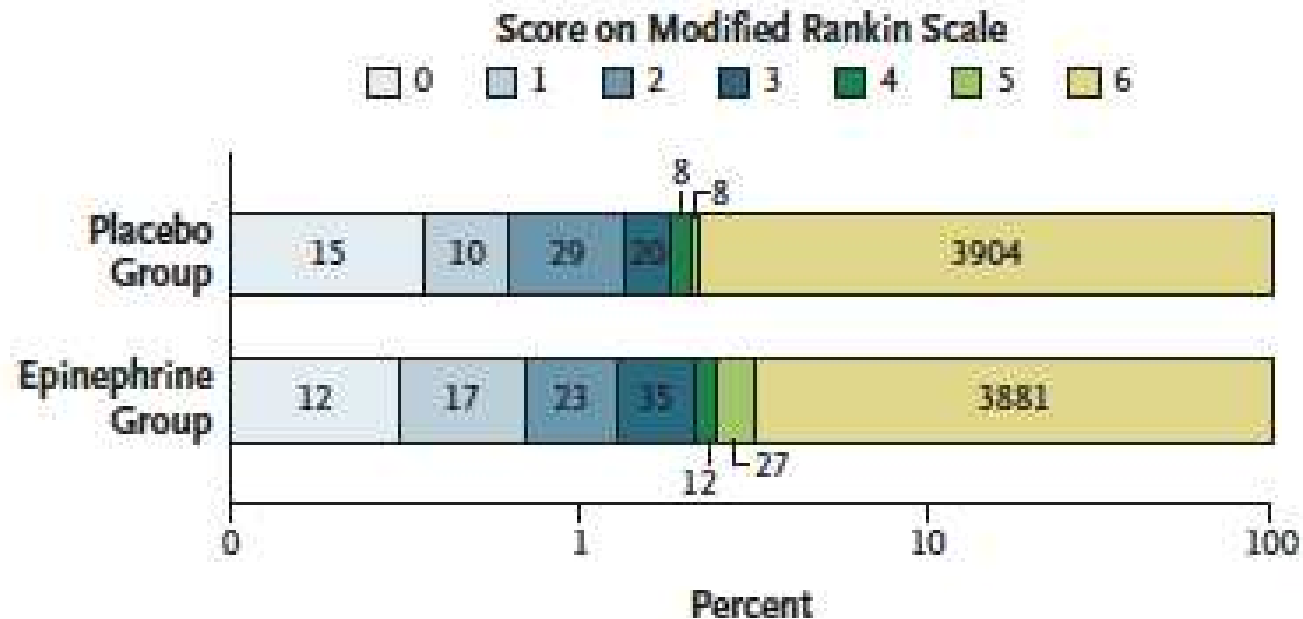


Figure 2. Survival with a Favorable Neurologic Outcome at Hospital Discharge.

Intra-osseuse versus intraveineuse et arrêt cardiaque

EMERGENCY MEDICAL SERVICES/ORIGINAL RESEARCH

Intraosseous Vascular Access Is Associated With Lower Survival and Neurologic Recovery Among Patients With Out-of-Hospital Cardiac Arrest

Takahisa Kawano, MD, PhD*; Brian Grunau, MD, MHSc; Frank X. Scheuermeyer, MD, MHSc; Koichiro Gibo, MD, MMSc; Christopher B. Fordyce, MD, MHS; Steve Lin, MD, MSc; Robert Stenstrom, MD, PhD; Robert Schlamp, MEd; Sandra Jenneson, MD; Jim Christenson, MD

13 155 patients dont 660 avec IO



Intraosseous versus Intravenous access in Patients with Out-of-Hospital Cardiac Arrest: Insights from the Resuscitation Outcomes Consortium Continuous Chest Compression Trial. Resuscitation. 2018 Oct 31.

19 731 patients dont 3,068 avec IO

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Amiodarone, Lidocaine, or Placebo in Out-of-Hospital Cardiac Arrest

P.J. Kudenchuk, S.P. Brown, M. Daya, T. Rea, G. Nichol, L.J. Morrison, B. Leroux, C. Vaillancourt, L. Wittwer, C.W. Callaway, J. Christenson, D. Egan, J.P. Ornato, M.L. Weisfeldt, I.G. Stiell, A.H. Idris, T.P. Aufderheide, J.V. Dunford, M.R. Colella, G.M. Vilke, A.M. Brienza, P. Desvigne-Nickens, P.C. Gray, R. Gray, N. Seals, R. Straight, and P. Dorian, for the Resuscitation Outcomes Consortium Investigators*

3 026 patients dont 651 avec IO

Retour à une Circulation Spontanée



IO



IV



ROC Primed

24%

OR 0,60 [0,49-0,74]

38%

ROC CCC

18%

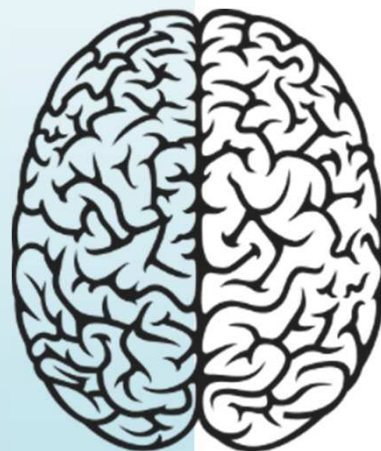
OR, 0.80, 95% CI 0.71 – 0.89, $p < 0.001$

24%

Bon devenir neurologique à la sortie



IO



IV



ROC Primed

1,5%

OR 0,24 [0,13-0,46]

7,6%

ROC CCC

2,8%

OR, 0.87, 95% CI 0.67 – 1.12, p=0.29

4,2%

ROC Alps

20%

17%

Conclusion - Adrénaline

- Plus de RACS, survie à l'admission et survie à la sortie avec adrénaline
- Pas de différence sur le devenir neurologique
- Question de la dose, de l'intervalle et du mode d'administration

En post RACS - Circulation

Circulation

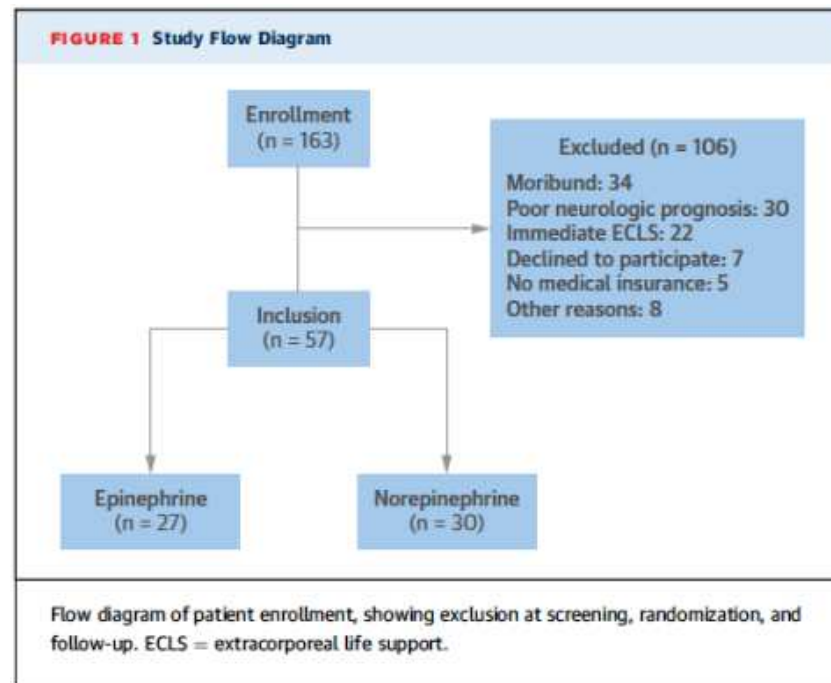
- 12-lead ECG
- Obtain reliable intravenous access
- Aim for SBP > 100 mmHg
- Fluid (crystalloid) – restore normovolaemia
- Intra-arterial blood pressure monitoring
- Consider vasopressor/ inotrope to maintain SBP

Epinephrine Versus Norepinephrine for Cardiogenic Shock After Acute Myocardial Infarction



Bruno Levy, MD, PhD,^a Raphael Clere-Jehl, MD,^b Annick Legras, MD,^c Tristan Morichau-Beauchant, MD,^d Marc Leone, MD, PhD,^e Ganster Frederique, MD,^f Jean-Pierre Quenot, MD, PhD,^g Antoine Kimmoun, MD, PhD,^a Alain Cariou, MD, PhD,^d Johan Lassus, MD, PhD,^h Veli-Pekka Harjola, MD, PhD,^h Ferhat Meziani, MD, PhD,^b Guillaume Louis, MD,ⁱ Patrick Rossignol, MD, PhD,^j Kevin Duarte, PhD,^j Nicolas Girerd, MD, PhD,^j Alexandre Mebazaa, MD, PhD,^k Philippe Vignon, MD, PhDⁱ

51% post AC



Adrénaline vs. Noradrénaline post RACS

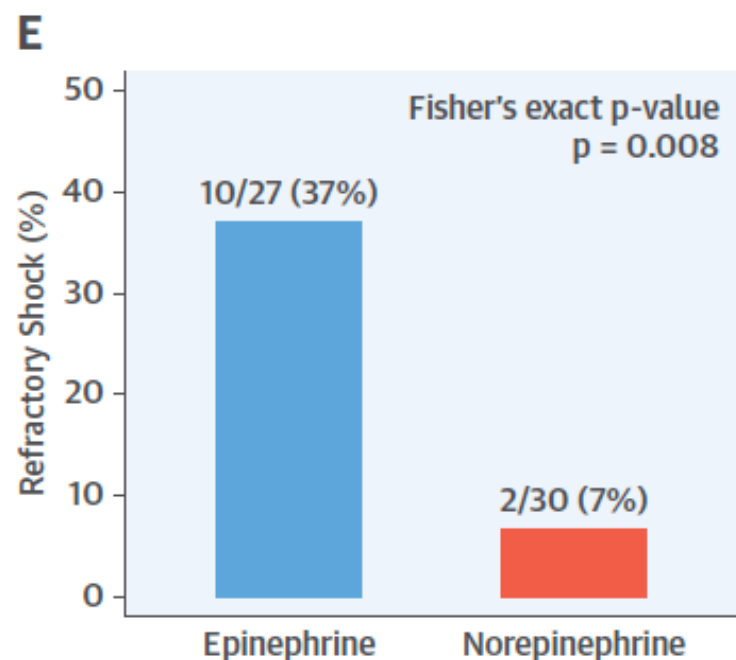


TABLE 2 Serious Adverse Events and Outcomes

	Epinephrine (n = 27)	Norepinephrine (n = 30)	p Value*	Odds Ratio (95% Confidence Interval)	p Value†
Refractory shock	10 (37)	2 (7)	0.008	8.24 (1.61–42.18)	0.011
Arrhythmia	11 (41)	10 (33)	0.59	1.37 (0.47–4.05)	0.56
ECLS	3 (11)	1 (3)	0.34	3.62 (0.35–37.14)	0.28
Death	14 (52)	11 (37)	0.29	1.86 (0.65–5.36)	0.25
Death within 7 days	8 (30)	3 (10)	0.093	3.79 (0.89–16.17)	0.072
Death within 28 days	13 (48)	8 (27)	0.11	2.55 (0.84–7.72)	0.097

Values are n (%) unless otherwise indicated. Odds ratios were expressed by using the norepinephrine group as reference. *p value from the Fisher exact test. †p value from the Wald test.
ECLS = extracorporeal life support.



Etude Dispatch

Multifaceted intervention for increasing performance of cardiopulmonary resuscitation by laypersons in out-of-hospital cardiac arrest.

A stepped wedge cluster randomized controlled trial

120 patients inclus au 28 novembre

1^{er} employeur du bassin grenoblois
avec plus de **9 500** professionnels

Plus de **2 100** lits et places

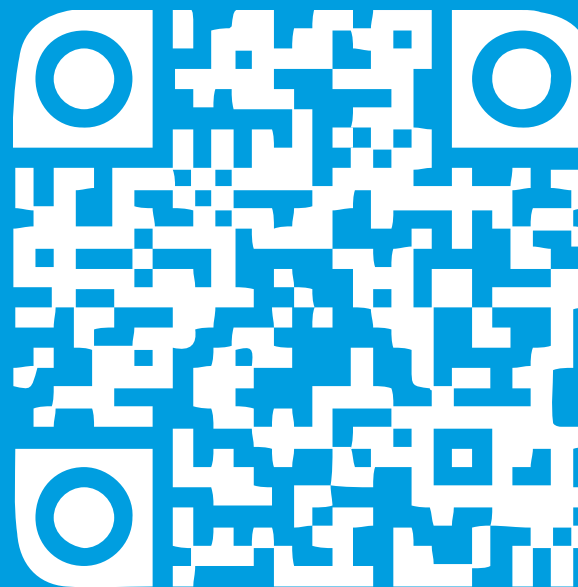
Le **1^{er}** *trauma center* de France

Plus de **2 400** patients accueillis par jour

9 instituts de formation d'excellence
avec **1200** élèves formés par an

1 300 études cliniques en cours

12^e Délégation à la Recherche Clinique
et à l'innovation (DRCI) en France



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