

ARRÊT CARDIAQUE EXTRAHOSPITALIER


LES CLÉS POUR UNE RÉANIMATION À JOUR

Matthieu HEIDET
SAMU 94 & SAU Mondor

A high-angle, top-down photograph of a man lying on his back on a paved street. He has blonde hair and is wearing a dark blazer over a light green button-down shirt and dark jeans. His eyes are closed, and his arms are outstretched. He is surrounded by several people standing around him, some looking down at him. The scene is brightly lit, casting long shadows. The text "QUELLES NOUVEAUTÉS EN 2026 ?" is overlaid in the center of the image.

QUELLES NOUVEAUTÉS EN 2026 ?



A man with dark hair, wearing a white t-shirt, is sitting at a white desk. He is looking upwards and to the right with a thoughtful expression, his hand resting on his chin. In front of him is a silver laptop. To the right of the laptop is a white mug. The background is a simple, light-colored room with a framed picture on the wall and a door.

CE QU'ON SAVAIT DÉJÀ

An overhead view of a man lying on a paved street with his eyes closed. He is wearing a dark blazer over a light green shirt and dark pants. Several people are gathered around him, some kneeling and some standing, appearing to be witnesses or bystanders. The scene is brightly lit, casting long shadows. The text 'MCE PAR TÉMOINS 58 %' is overlaid in the center of the image.

MCE PAR TÉMOINS 58 %

2 - 59 %



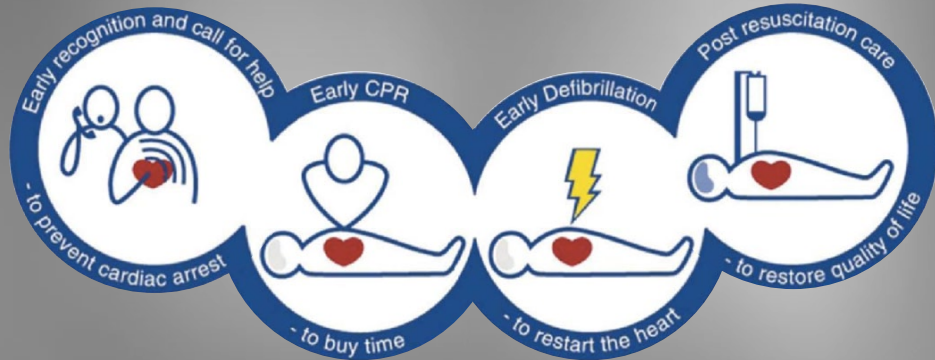
SURVIE
3 - 35 %

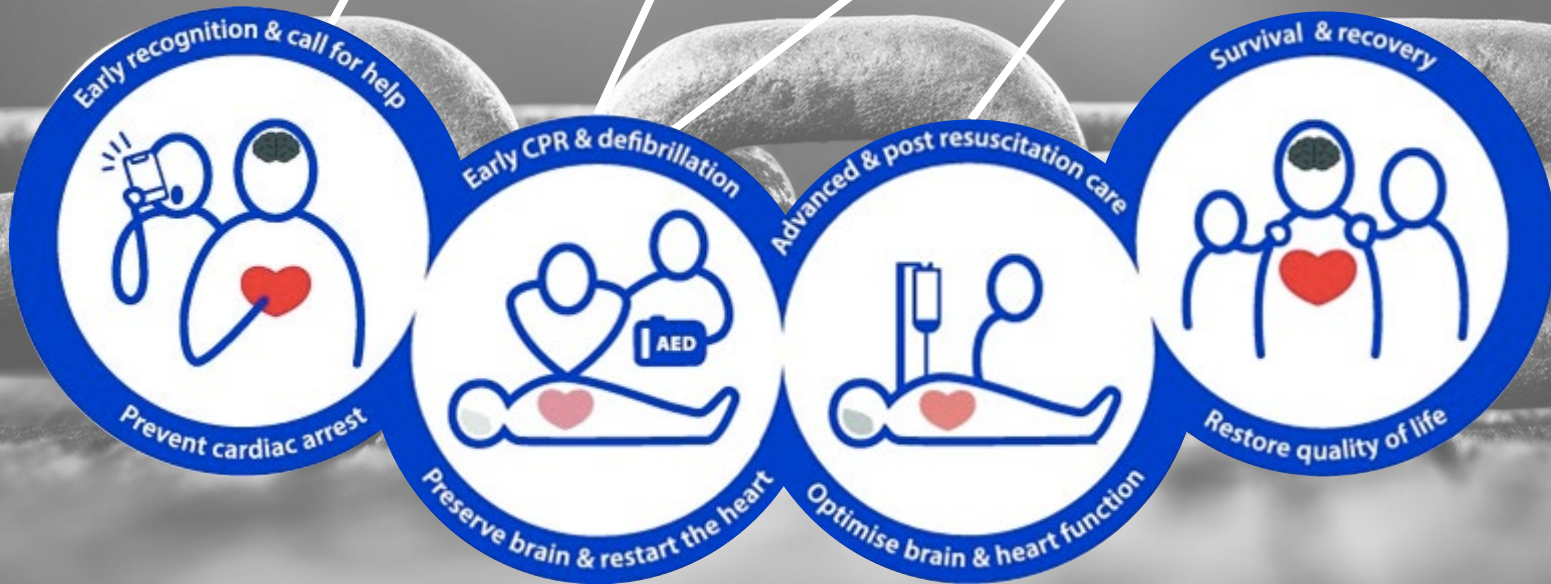




CE QUI A (UN PEU) **CHANGÉ**

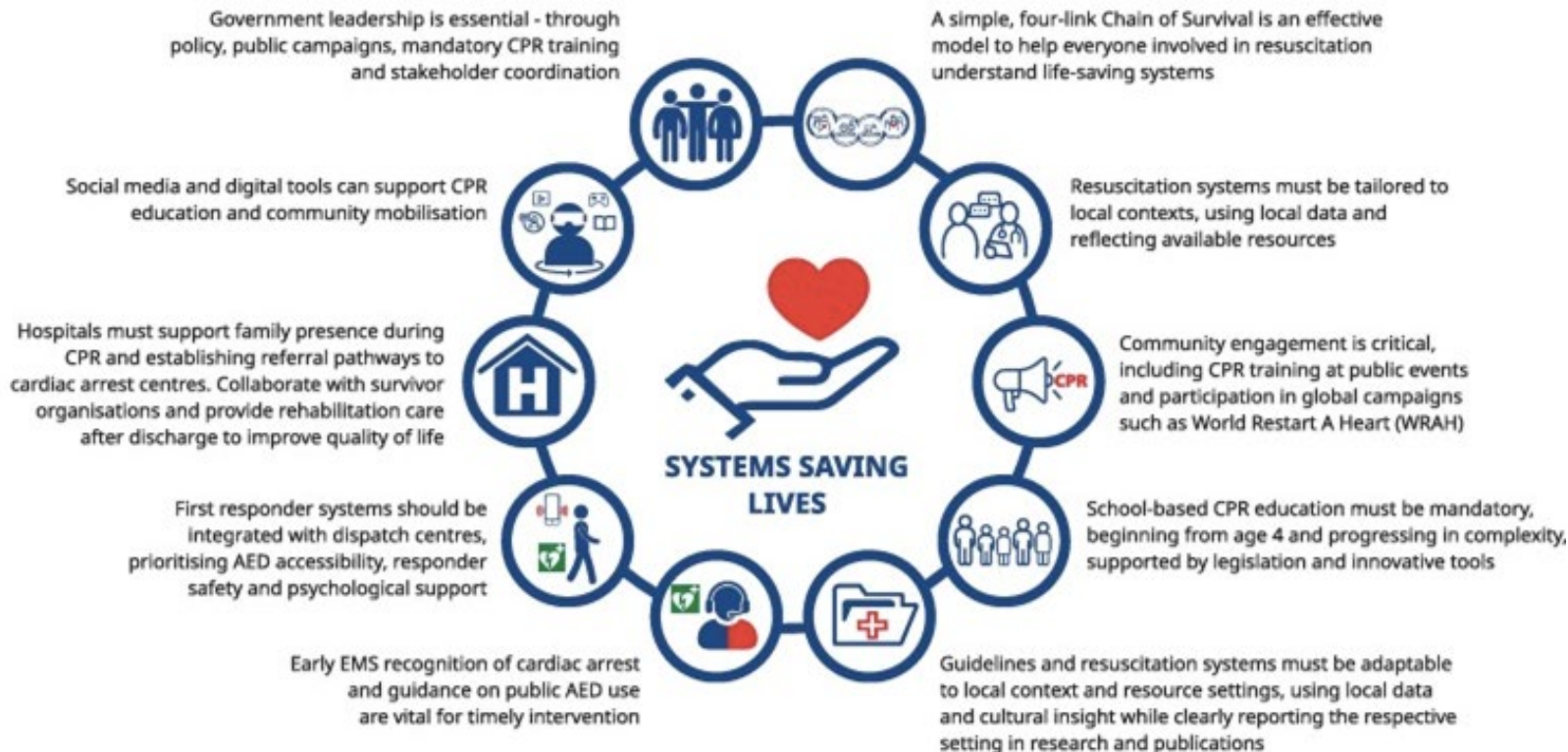






SYSTEMS SAVING LIVES

KEY MESSAGES



SYSTEMS SAVING LIVES

KEY MESSAGES

CHAÎNE DE SURVIE

Government
policy, public

an effective
resuscitation

Social media and digital tools can support CPR education and community mobilisation

Resuscitation systems must be tailored to local contexts, using local data and reflecting available resources

Hospitals must support family presence during CPR and establishing referral pathways to cardiac arrest centres. Collaborate with survivor organisations and provide rehabilitation care after discharge to improve quality of life

Community engagement is critical, including CPR training at public events and participation in global campaigns such as World Restart A Heart (WRAH)


First responder
integration
prioritising AED accessibility, responder safety and psychological support

Education must be mandatory, 4 and progressing in complexity, supported by legislation and innovative tools

Early EMS recognition of cardiac arrest and guidance on public AED use are vital for timely intervention

Guidelines and resuscitation systems must be adaptable to local context and resource settings, using local data and cultural insight while clearly reporting the respective setting in research and publications

FORMULE DE SURVIE



UN **CONTINUUM** BLS-ALS-POST-ARRÊT



APPELER DÈS L'INCONSCIENCE
ÉVALUER LA RESPIRATION APRÈS

RESPIRATION SUBNORMALE
CHEZ LES **SPORTIFS**



A black and white photograph showing a close-up of a person's hands resting on a patient's chest. The patient is wearing a checkered hospital gown. A semi-transparent dark horizontal band is overlaid across the center of the image, containing the text "PRIORITÉ ABSOLUE AU MCE" in white, uppercase letters. The background is softly blurred, suggesting a clinical setting.

PRIORITÉ ABSOLUE AU **MCE**

Electrical rhythm degeneration in adults with out-of-hospital cardiac arrest according to the no-flow and bystander low-flow time

Alexis Courmoyer^{a,b,c,d,e,f}, Jean-Marc Chauny^{a,b,c}, Jean Paquet^b, Brian Yoan Lamarche^{b,i,j,k,l,m}, Luc de Montignyⁿ, Eli Segal^{a,n,o}, Yiorgios Alexandros Cavayas^{a,p,q}, Martin Albert^{r,s,q}, Judy Morris^{a,b,c}, Justine Lessard^{a,b,c}, Martin Marquis^b, Sylvie Cossette^{a,i,m,n,o,p,q,r}, Véronique Castonguay^{a,b,c}, Raoul Daoust^{a,b,c}

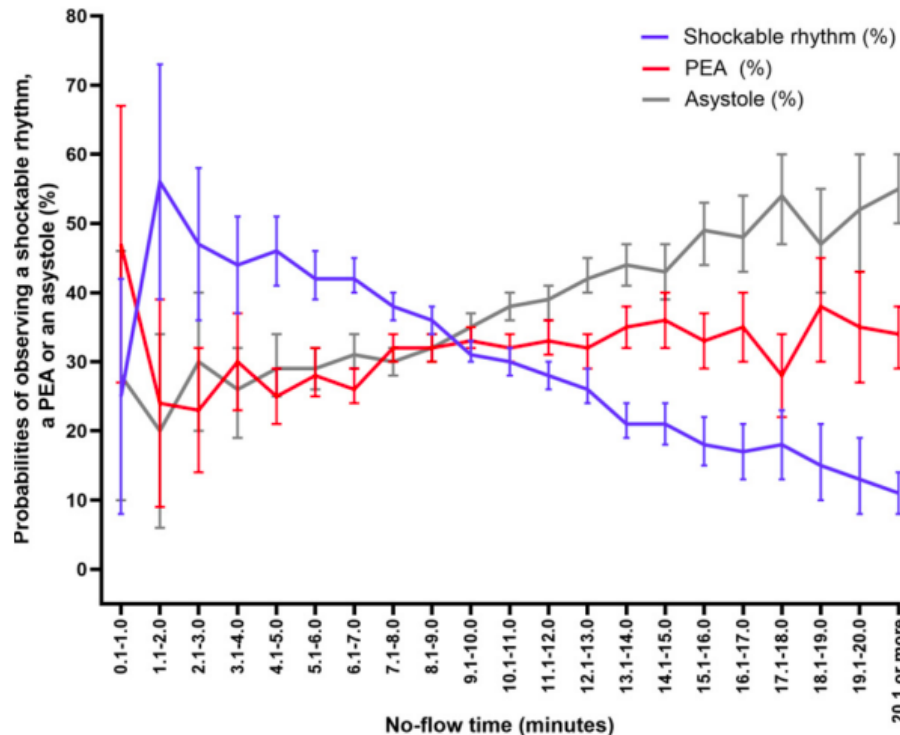
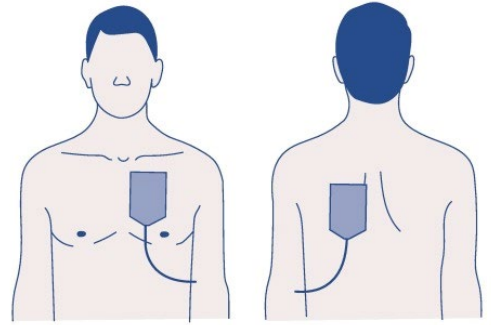
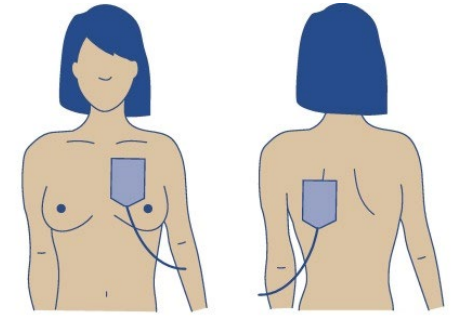
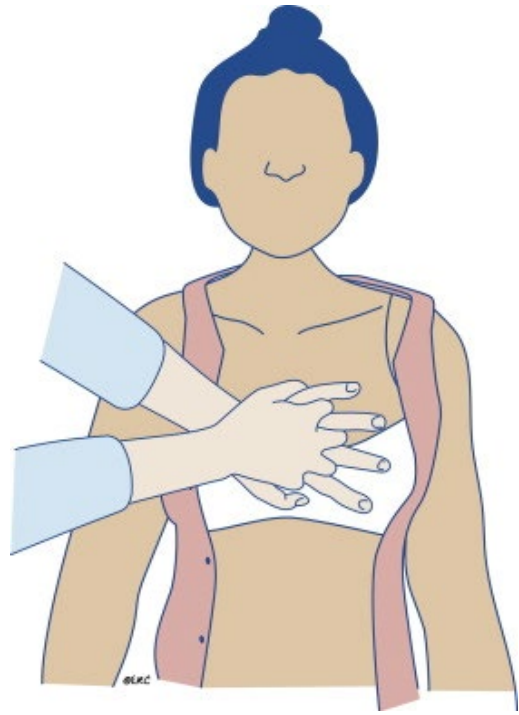
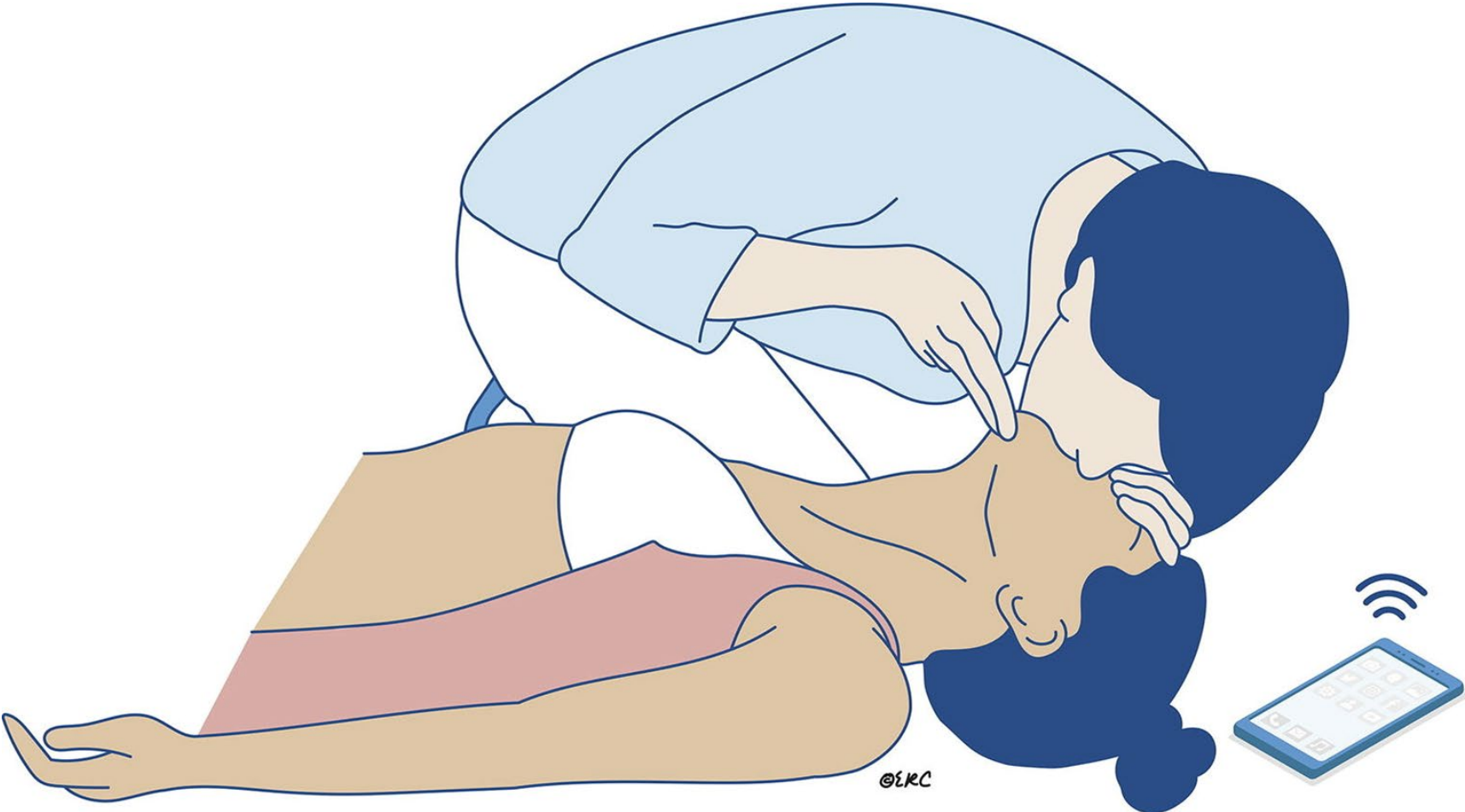


Fig. 2 - Proportions of shockable rhythm, PEA or asystole according to the no-flow time (n = 18,127). PEA: Pulseless electrical activity.

Public Perceptions on Why Women Receive Less Bystander Cardiopulmonary Resuscitation Than Men in Out-of-Hospital Cardiac Arrest

Scott M. Pearson, MD, MPH, ^{1,2} Sherry K. Strasser, MPH, ¹ Christopher Heneghan, PhD, MPH, ¹ Matthew Pappert, MD, ¹ Daniel D. Morlock, MD, MPH, ¹ Kathleen Heneghan, MD, MPH, ¹ Edward F. Horvath, MD, and ¹ Steven C. Douglas, MD, MPH | [DOI:10.1186/s12874-015-0100-0](#)







30:2 Y COMPRIS CHEZ LE PATIENT **OBÈSE**



ACCESSIBLES H24 7/7



The impact of time to defibrillation on return of spontaneous circulation in out-of-hospital cardiac arrest patients with recurrent shockable rhythms

[Emad Awad](#) ^{a,b}  · [Brent Klapthor](#)^a · [Michael H. Morgan](#)^a · [Scott T. Youngquist](#)^{a,c}



The impact of time to defibrillation on return of spontaneous circulation in out-of-hospital cardiac arrest patients with recurrent shockable rhythms

Emad Awad ^{a,b} · Brent Klaphor ^a · Michael H. Morgan ^a · Scott T. Youngquist ^{a,c}

Table 2 – Effect of VF/pVT duration on ROSC: GEE model.

Variable	Beta Coeff	OR	(95% CI)	P value
VF/ pVT duration	-0.20	0.81	0.72 – 0.93	<0.001
Age	-0.02	0.99	0.97 – 1.02	0.43
Male sex	-0.43	0.65	0.33 – 1.29	0.21
Response time > 7 min	-0.76	0.47	0.23 – 0.97	0.04
Location	0.68	1.98	1.08 – 3.62	0.03
Witness status	0.62	1.86	0.85 – 4.08	0.12
Bystander CPR	1.03	2.81	1.24 – 6.36	0.01
Anti-Arrhythmic	-0.28	0.76		
Epinephrine	-0.24	0.79		
Pause duration > 15 sec	-0.28	0.75		

*N = 142 (104 had VF as the initial rhythm, and 38 had pVT).

1 minute =
-20% RACS

A Poor Association Between Out-of-Hospital Cardiac Arrest Location and Public Automated External Defibrillator Placement

Matthew J. Levy, DO, MS^{1,2,3} Kevin G. Seaman, MD² Michael G. Millin, MD, MPH¹
 Richard A. Bissell, PhD³ J. Lee Jenkins, MD, MS¹

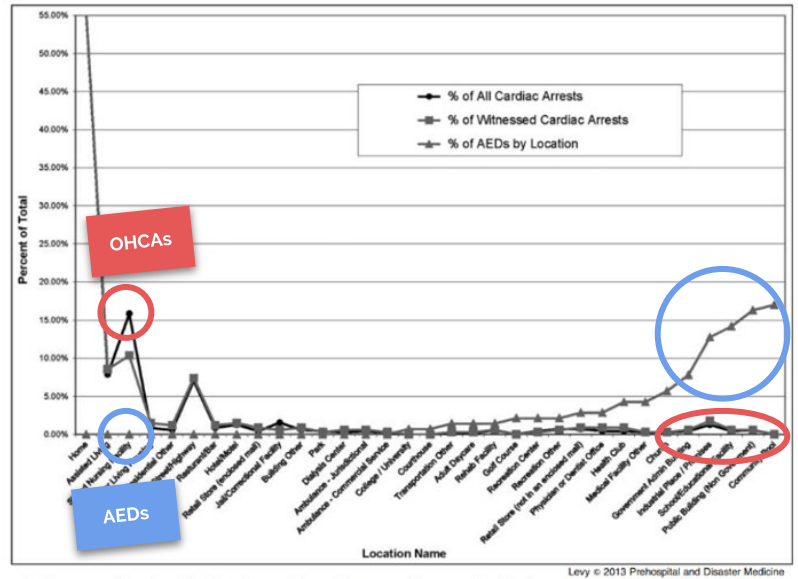
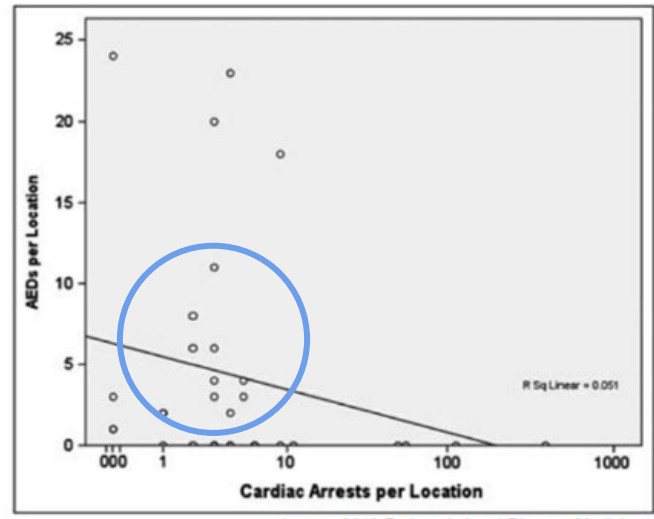


Figure 1. Histogram Showing Cardiac Arrest Event Frequency Compared with Arrest Location and PAD Location
 Abbreviation: AED = automated external defibrillator



Levy © 2013 Prehospital and Disaster Medicine
 Figure 2. Scatter Diagram of AEDs and Total Cardiac Arrests per Location

Eglises Administrations

Ecoles Piscines

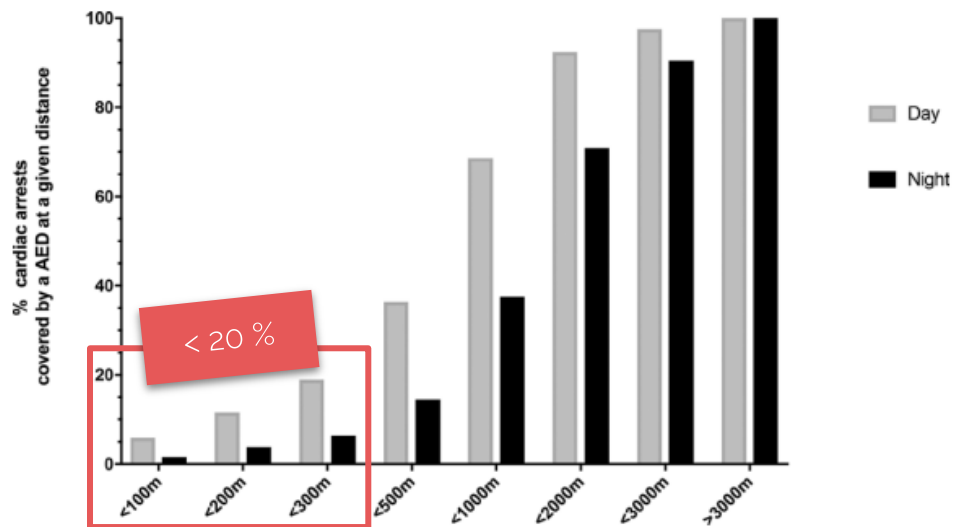


Figure 1 The percentage of cardiac arrests covered by an AED at any given distance, for both daytime (08:00–18:00) and out-of-hours (18:00–08:00) incidents. AEDs, automated external defibrillators.

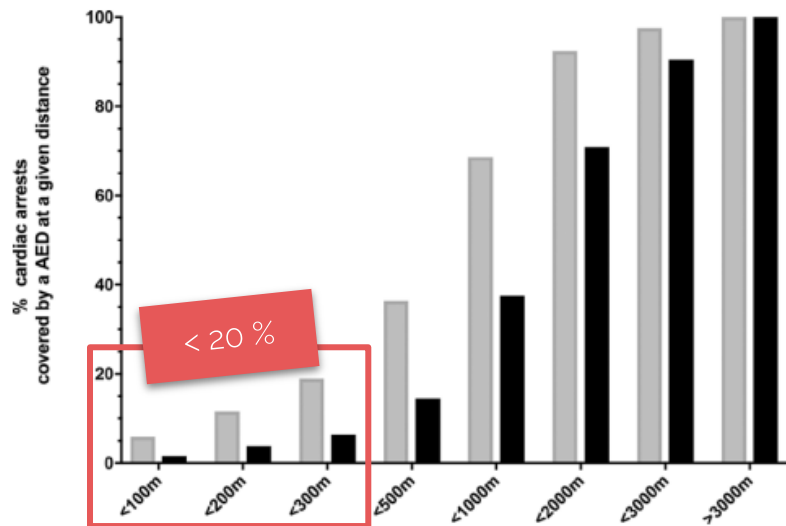


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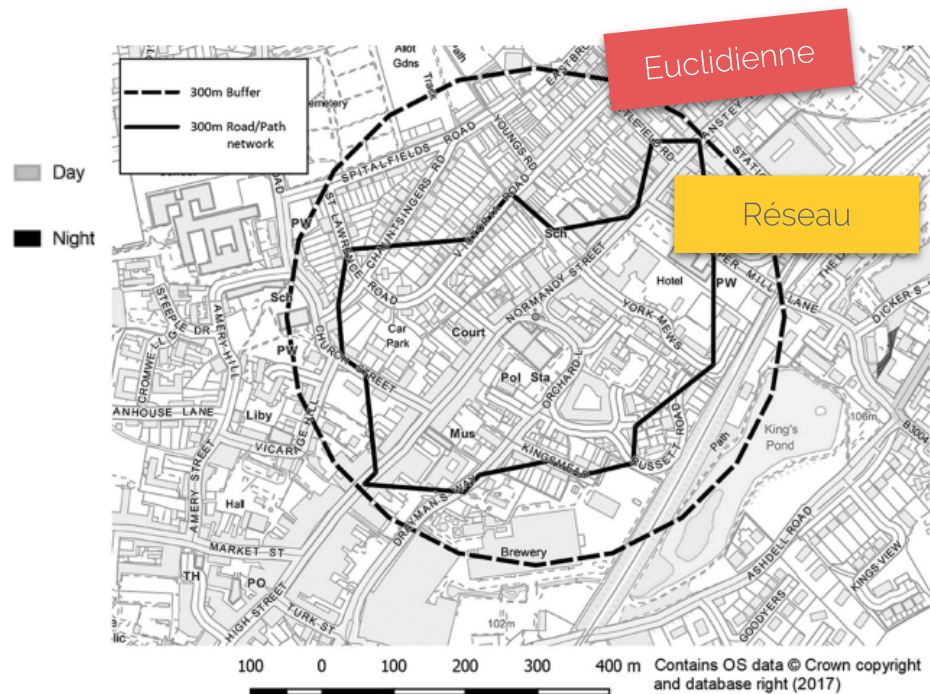
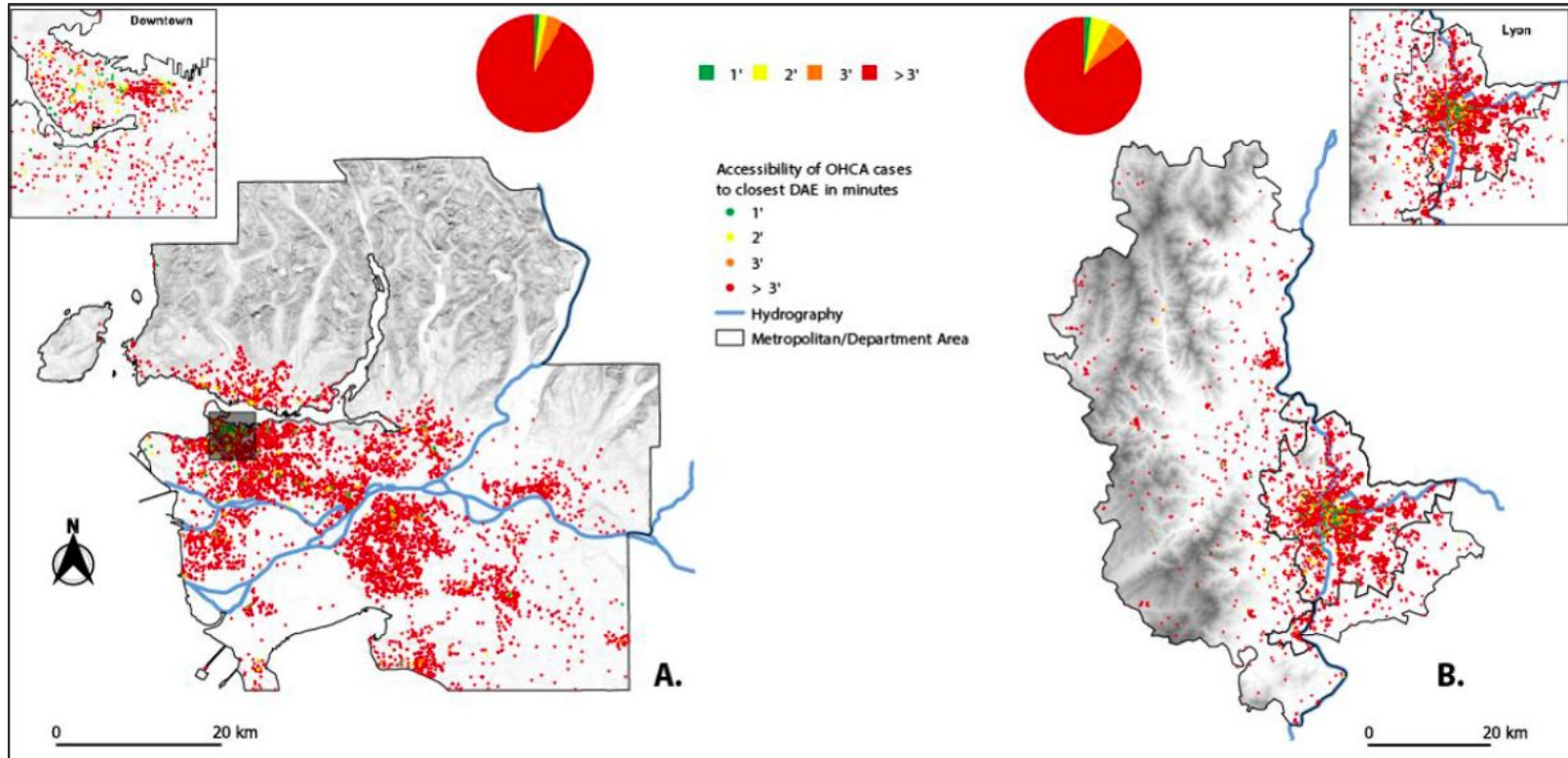


Fig.1 Spatial distribution of OHCA represented by walking access time



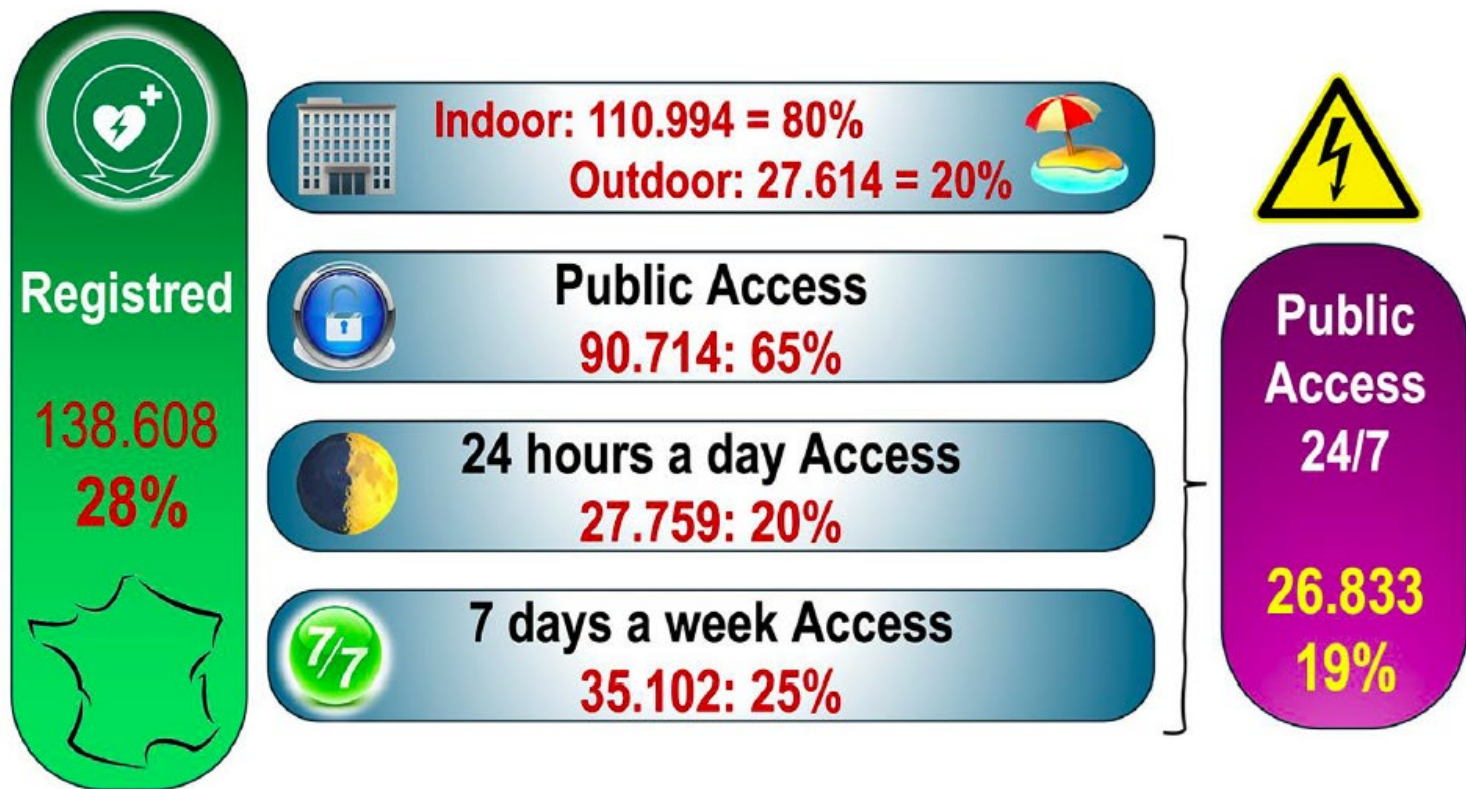


Fig. 1 – Accessibility of the 138.608 AED recorder in the French registry.



Drone delivery of automated external defibrillators compared with ambulance arrival in real-life suspected out-of-hospital cardiac arrests: a prospective observational study in Sweden

Sofia Schierbeck, Anette Nord, Leif Svensson, Mattias Ringh, Per Nordberg, Jacob Hollenberg, Peter Lundgren, Fredrik Folke, Martin Jonsson, Sune Forsberg, Andreas Claesson

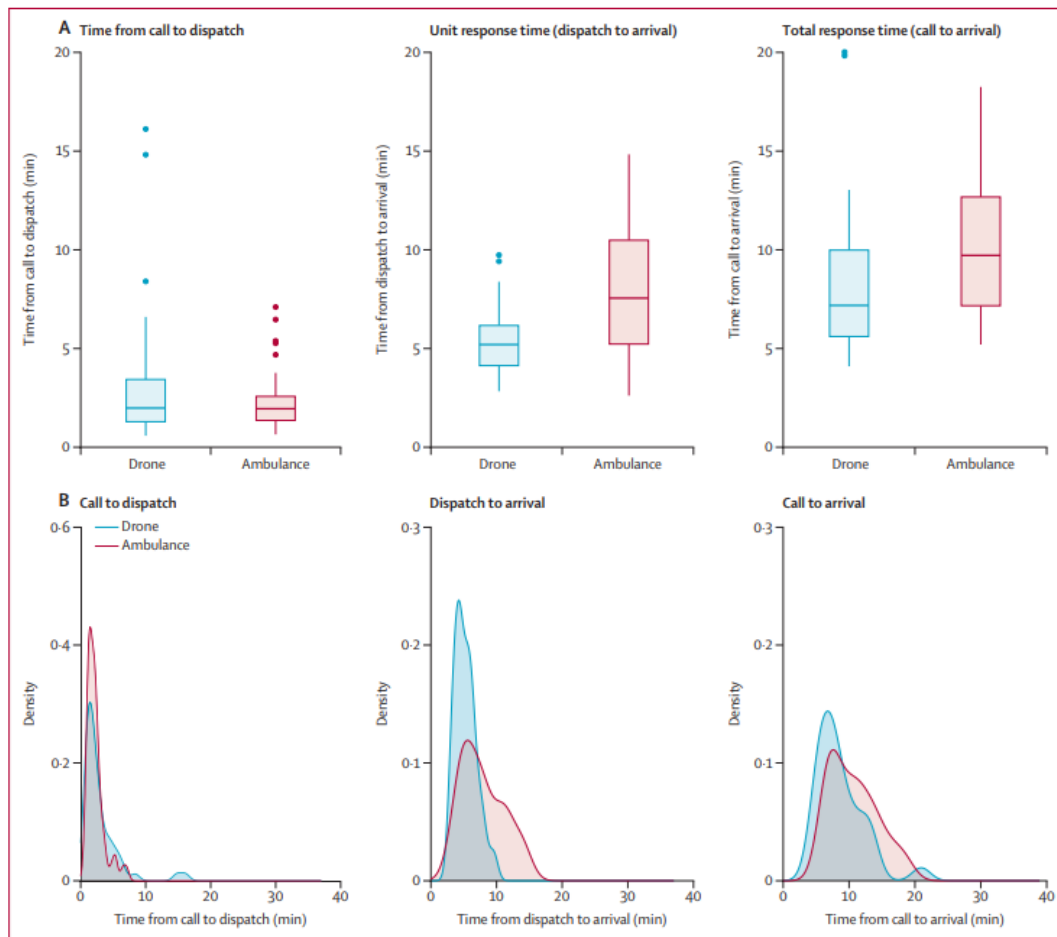


Figure 2: Response times for AED-drones and ambulances

(A) Boxplots of response times for AED-drones and ambulances. From the left, call to dispatch, dispatch to arrival, and call to arrival. (B) Density plots of response times for AED-drones and ambulances. From the left, call to dispatch, dispatch to arrival, and call to arrival. AED=automated external defibrillator.

	Ambulance-treated out-of-hospital cardiac arrests (n=68)	Ambulance-treated out-of-hospital cardiac arrests (when drone did not deliver an AED; n=44)	Ambulance-treated out-of-hospital cardiac arrests (in cases with a drone-delivered AED; n=24)	Ambulance-treated out-of-hospital cardiac arrests (when drone arrived first; n=18)
Age, years	74 (64–82)	71 (60–81)	77 (69–82)	77 (69–82)
Females	19 (28%)	8 (18%)	11 (46%)	7 (39%)
Males	49 (72%)	36 (82%)	13 (54%)	11 (61%)
Residential location	59 (87%)	39 (89%)	20 (83%)	15 (83%)
Witnessed	37 (54%)	23 (52%)	14 (58%)	9 (50%)
CPR before ambulance arrival	50 (74%)	30 (68%)	20 (83%)	15 (83%)
AEDs attached before ambulance arrival*				
On-site AEDs	4/58 (7%)	4/43 (9%)	0/15	0/11
First responders' and lay responders' AEDs	5/58 (9%)	4/43 (9%)	1/15 (7%)	1/11 (9%)
Drone AEDs	2/58 (3%)†	0/43	2/15 (13%)†	2/11 (18%)†
Shockable first rhythm	9 (13%)	5 (11%)	4 (17%)	2 (11%)
Defibrillated before ambulance arrival*				
On-site AEDs	1/58 (2%)	1/43 (2%)	0/15	0/11
First responders' and lay responders' AEDs	3/58 (5%)	3/43 (7%)	0/15	0/11
Drone AEDs	1/58 (2%)‡	0/43	1/15 (7%)‡	1/11 (9%)‡
Return of spontaneous circulation at hospital arrival	20/58 (34%)	14/43 (33%)	6/15 (40%)	4/11 (36%)
Survival past 30 days	6/58 (10%)	4/43 (9%)	2/15 (13%)	1/11 (9%)

Data are median (IQR), n (%), or n/N (%). Data collected from ambulance charts and The Swedish Registry of Cardiopulmonary Resuscitation. Ambulance-treated out-of-hospital cardiac arrest means true cardiac arrest where ambulance personnel performed CPR. AED=automated external defibrillator. CPR=cardiopulmonary resuscitation.

*Data from The Swedish Registry of Cardiopulmonary Resuscitation. 15% of all out-of-hospital cardiac arrests identified in ambulance charts are missing in the registry.

†Four cases of drone-delivered AED attachment missing. ‡One case of defibrillation by drone-delivered AED missing.

Table 2: Patient characteristics of ambulance-treated out-of-hospital cardiac arrest cases, by drone delivery of AED

	Ambulance-treated out-of-hospital cardiac arrests (n=68)	Ambulance-treated out-of-hospital cardiac arrests (when drone did not deliver an AED; n=44)	Ambulance-treated out-of-hospital cardiac arrests (in cases with a drone-delivered AED; n=24)	Ambulance-treated out-of-hospital cardiac arrests (when drone arrived first; n=18)
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Drone AEDs	1/58 (2%)‡	0/43	0/15	1/11 (9%)‡
Return of spontaneous circulation at hospital arrival	20/58 (34%)	14/43 (33%)	10/15 (67%)	4/11 (36%)
Survival past 30 days	6/58 (10%)	4/43 (9%)	3/15 (20%)	1/11 (9%)



TAUX D'APPLICATION x 2.5

Data are median (IQR), n (%), or n/N (%). Data collected from ambulance charts and The Swedish Registry of Cardiopulmonary Resuscitation. Ambulance-treated out-of-hospital cardiac arrest means true cardiac arrest where ambulance personnel performed CPR. AED=automated external defibrillator. CPR=cardiopulmonary resuscitation. *Data from The Swedish Registry of Cardiopulmonary Resuscitation. 15% of all out-of-hospital cardiac arrests identified in ambulance charts are missing in the registry. †Four cases of drone-delivered AED attachment missing. ‡One case of defibrillation by drone-delivered AED missing.

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*Data from The Swedish Registry of Cardiopulmonary Resuscitation. 15% of all out-of-hospital cardiac arrests were not registered in the registry.

†Four cases of drone-delivered AED attachment missing. ‡One case of defibrillation by drone-delivered AED missing.

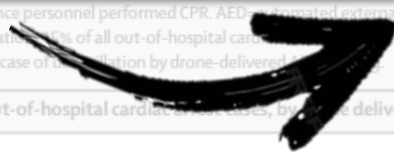
Table 2: Patient characteristics of ambulance-treated out-of-hospital cardiac arrest cases

**TAUX DE CEE
x 4.5**

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hospital cardiac arrest means true cardiac arrest where ambulance personnel performed CPR. AED=automated external defibrillator. CPR=cardiopulmonary resuscitation.
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 †Four cases of drone-delivered AED attachment missing. ‡One case of defibrillation by drone-delivered AED.

Table 2: Patient characteristics of ambulance-treated out-of-hospital cardiac arrests, by mode of delivery of AED



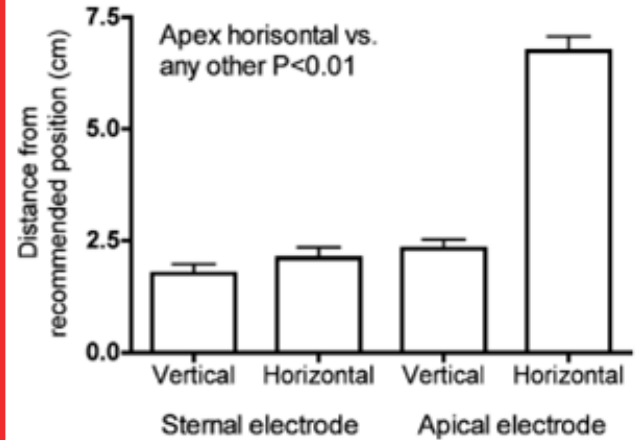
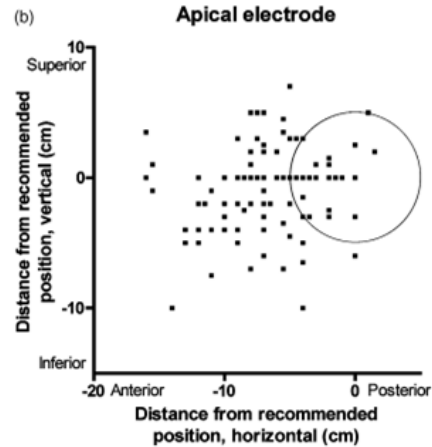
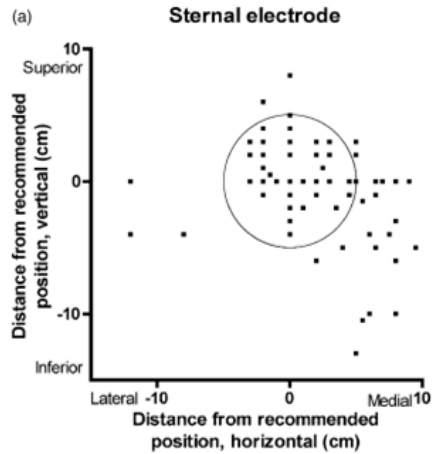
Layperson positioning of defibrillation electrodes guided
by pictorial instructions[☆]

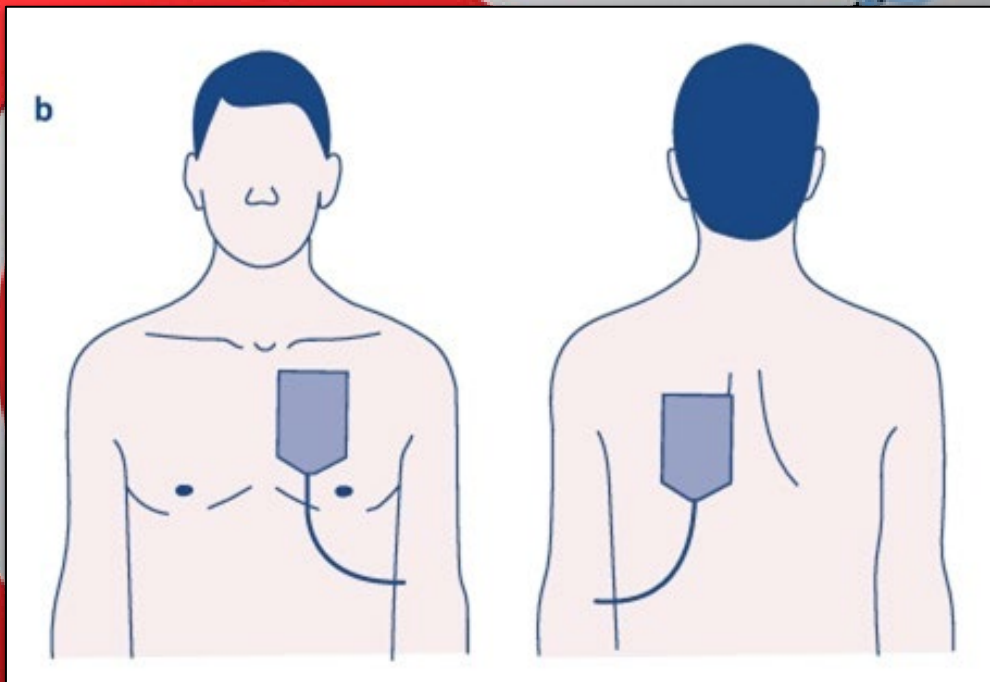
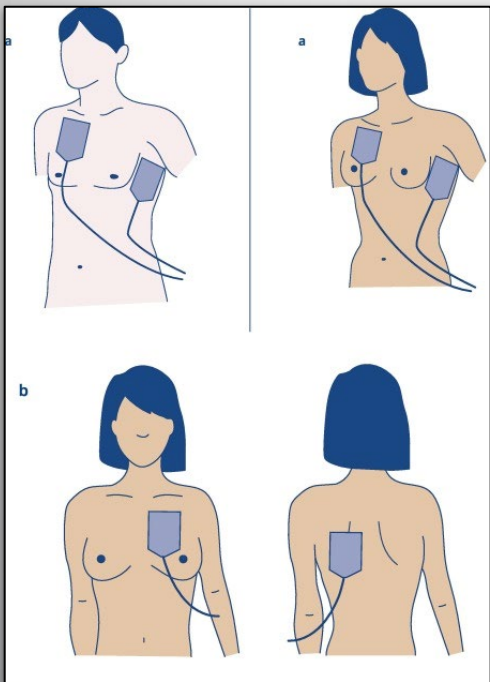
Jouni Nurmi*, Maaret Castrén



Layperson positioning of defibrillation electrodes guided by pictorial instructions[☆]

Jouni Nurmi*, Maaret Castrén







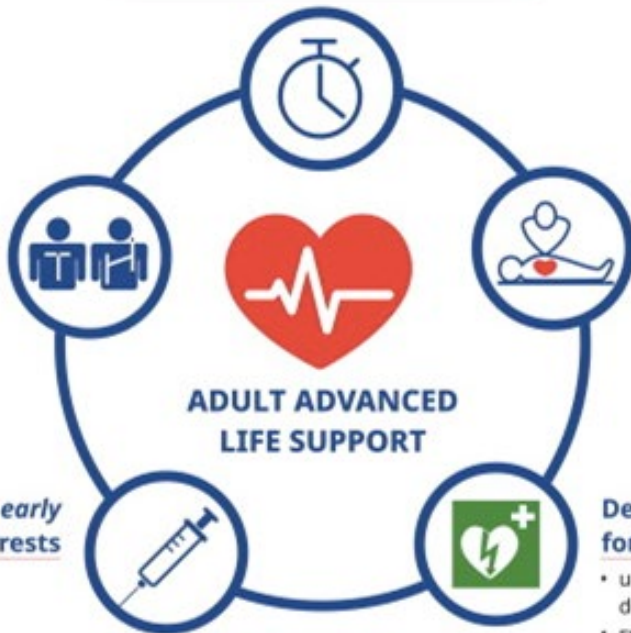




ADULT ADVANCED LIFE SUPPORT KEY MESSAGES

Start advanced life support *early*
- every second counts!

Identify and treat reversible
causes *without delay*



Ensure *effective* ventilation
and high-quality chest compressions

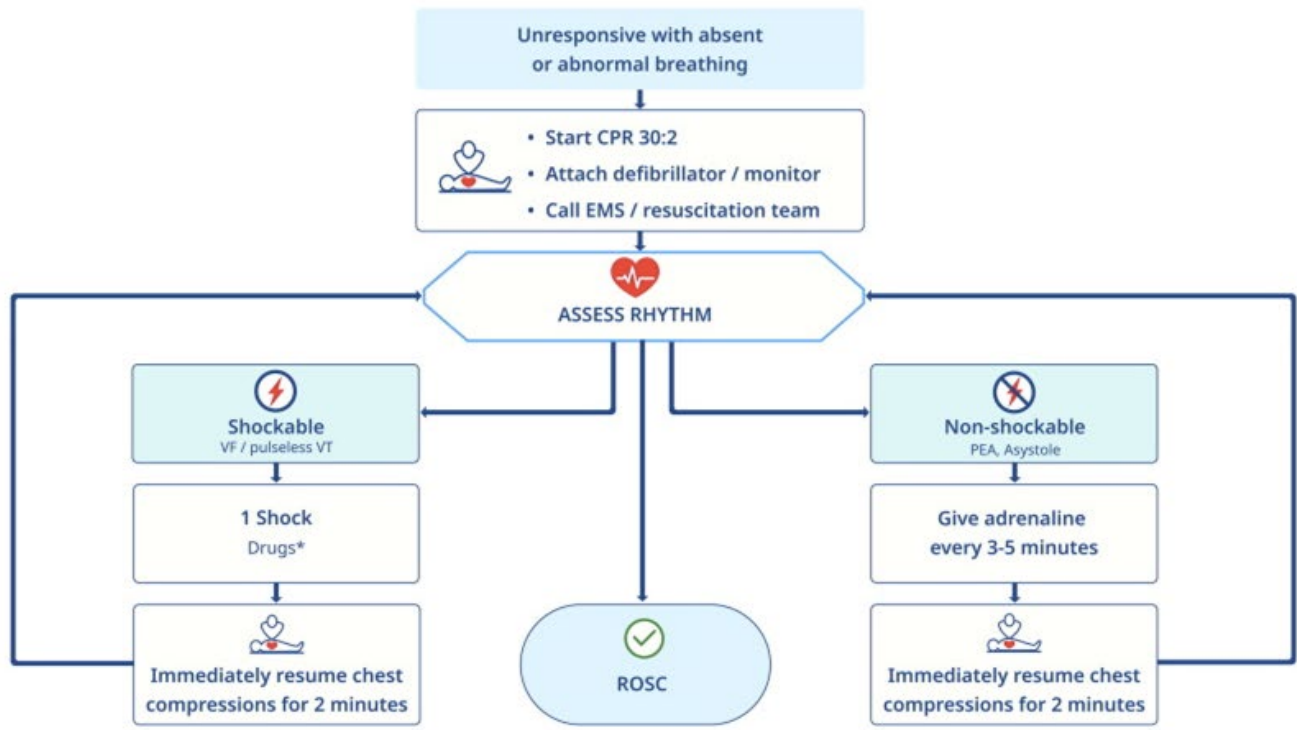
Give IV adrenaline *early*
for non-shockable cardiac arrests

Defibrillate *early*
for shockable rhythms

- use correct antero-lateral defibrillator pad placement
- switch to antero-posterior pads if 3 shocks are ineffective

Give high-quality chest compressions & ventilation

Identify & treat reversible causes



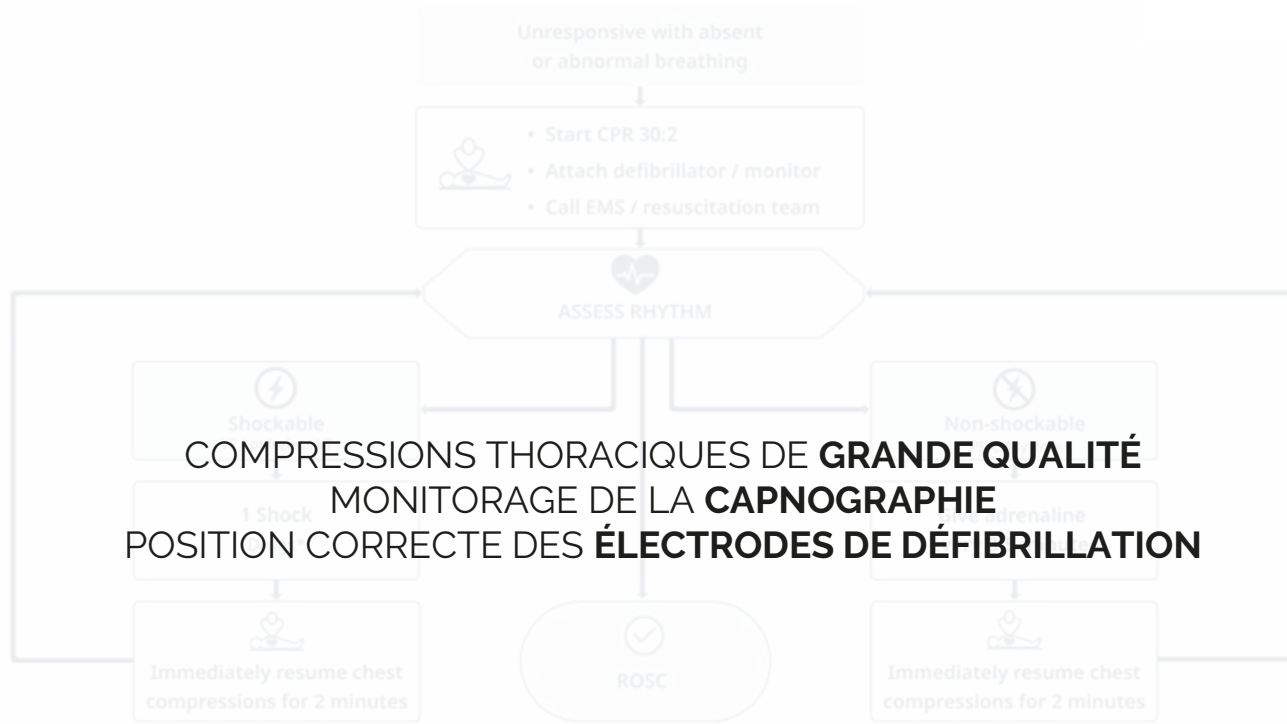
- Ensure optimal defibrillator pad placement
- Give oxygen
- Continuous compressions if tracheal tube or supraglottic airway
- Use waveform capnography
- Minimise interruptions to chest compressions
- Early IV access (IO if IV not possible)
- * Drugs
 - Give 1st adrenaline after 3 shocks, then every 3-5 minutes
 - Give amiodarone after 3 shocks

- Consider**
- Changing pads to antero-posterior after 3 shocks
 - Mechanical chest compressions to facilitate transfer / treatment
 - Ultrasound to identify reversible causes
 - Extracorporeal CPR and, or Coronary angiography/percutaneous coronary intervention

- Immediately after ROSC**
- Use ABCDE approach
 - Aim for SpO₂ of 94-98% and normal PaCO₂
 - Aim SBP > 100 mmHg
 - 12 Lead ECG
 - Identify and treat cause
 - Temperature control

- Hypoxia
- Hypovolaemia
- Hyper-hypokalaemia / metabolic
- Hypothermia, hyperthermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary / pulmonary)

Give high-quality chest compressions & ventilation



Identify & treat reversible causes

COMPRESSIONS THORACIQUES DE **GRANDE QUALITÉ**
MONITORAGE DE LA **CAPNOGRAPHIE**
POSITION CORRECTE DES **ÉLECTRODES DE DÉFIBRILLATION**

- Ensure optimal defibrillator pad placement
- Give oxygen
- Continuous compressions if tracheal tube or supraglottic airway
- Use waveform capnography
- Minimise interruptions to chest compressions
- Early IV access (IO if IV not possible)
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 - Give 1st adrenaline after 3 shocks, then every 3-5 minutes
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- Hypoxia
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- Hyper-hypokalaemia / metabolic
- Hypothermia, hyperthermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary / pulmonary)



A healthcare professional in light blue scrubs is shown from the chest down, holding two black handheld devices. The devices have a square face with a dark screen and a black handle. Coiled black cables are attached to the bottom of each device. A green rectangular callout box is overlaid on the left device, containing white text.

SI JE SAIS FAIRE
EN < 5 S

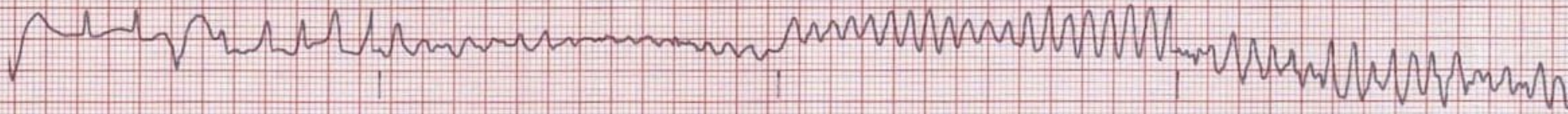


I

a/R

V1

V4



II

a/r

V2

V5



TOUTES LES FV : BYE-BYE LA PETITE MAILLE !

III

a/r

V3

V6



RHYTHM STRIP: JJ
25 mm/sec; 1 cm/mV



1 CEE ?

3 CEE ?

A healthcare professional, likely a nurse or doctor, is shown from the chest down, wearing a white lab coat over a light-colored shirt. A stethoscope is visible around their neck. They are holding two black, square-shaped devices with rounded corners and a textured surface. Each device has a black coiled cable extending from its bottom. The background is a plain, light-colored wall.

1 CEE - **REPRISE IMMÉDIATE**
DÉLAI CEE - RACS
25% DES RACS APRÈS > 2 MIN D'ASYSTOLIE



COMME VOUS VOULEZ (PUISSANCE MAX D'EMBLÉE)
SI ÉCHEC 1er CEE ET SI POSSIBLE : AUGMENTER LA PUISSANCE

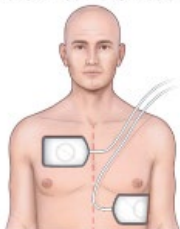
**TV / FV
RÉFRACTAIRE
(> 3 CEE)**

Defibrillation Strategies for Refractory Ventricular Fibrillation

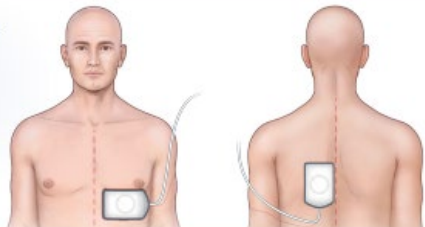
Sheldon Cheskes, M.D., P. Richard Verbeek, M.D., Ian R. Drennan, A.C.P., Ph.D., Shelley L. McLeod, Ph.D., Linda Turner, Ph.D., Ruxandra Pinto, Ph.D., Michael Feldman, M.D., Ph.D., Matthew Davis, M.D., Christian Vaillancourt, M.D., Laurie J. Morrison, M.D., Paul Dorian, M.D., and Damon C. Scales, M.D., Ph.D.

Pad Placement in the Three Defibrillation Strategies

Standard Defibrillation



Vector-Change Defibrillation



Double Sequential External Defibrillation

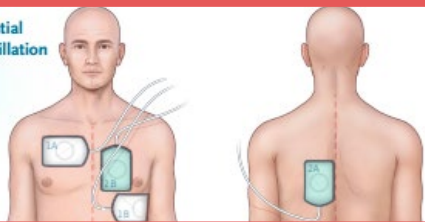


Table 3. Primary and Secondary Outcomes.

Outcome	Standard Defibrillation (N=136)	VC Defibrillation (N=144)	DSED (N=125)	Adjusted Relative Risk (95% CI)*	
				DSED vs. Standard	VC vs. Standard
<i>number of patients/total number (percent)</i>					
Survival to hospital discharge†	18/135 (13.3)	31/143 (21.7)	38/125 (30.4)	2.21 (1.33–3.67)	1.71 (1.01–2.88)
Termination of ventricular fibrillation	92/136 (67.6)	115/144 (79.9)	105/125 (84.0)	1.25 (1.09–1.44)	1.18 (1.03–1.36)
ROSC	36/136 (26.5)	51/144 (35.4)	58/125 (46.4)	1.72 (1.22–2.42)	1.39 (0.97–1.99)
Modified Rankin scale score ≤2‡	15/134 (11.2)	23/142 (16.2)	34/124 (27.4)	2.21 (1.26–3.88)	1.48 (0.81–2.71)

Survival to Hospital Discharge



ORIGINAL ARTICLE

Defibrillation Strategies for Refractory Ventricular Fibrillation

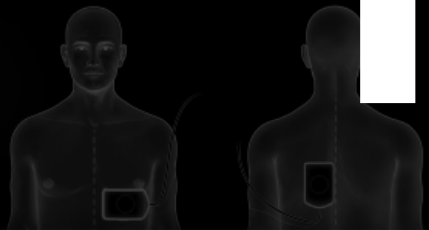
Sheldon Cheskes, M.D., P. Richard Verbeek, M.D., Ian R. Drennan, A.C.P., Ph.D.,
 Shelley L. McLeod, Ph.D., Linda Turner, Ph.D., Ruxandra Pinto, Ph.D.,
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Pad Placement in the Three Defibrillation Strategies

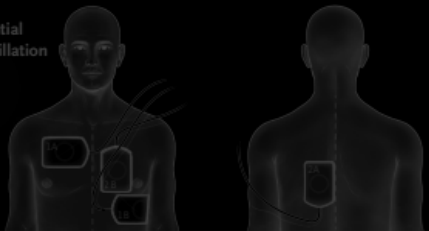
Standard
Defibrillation



Vector-Change
Defibrillation



Double Sequential
External Defibrillation



NON.

Table 3. Primary and Secondary Outcomes.

Outcome	Standard Defibrillation (N = 136)	VC Defibrillation (N = 144)	DSED (N = 125)	Adjusted Relative Risk (95% CI)*	
				DSED vs. Standard	VC vs. Standard
Survival to hospital discharge	18/135 (13.3)	31/143 (21.7)	38/125 (30.4)	2.21 (1.33–3.67)	1.71 (1.01–2.88)
Termination of ventricular fibrillation	92/135 (67.8)	115/144 (80.9)	105/125 (84.0)	1.25 (1.09–1.44)	1.18 (1.03–1.36)
Time to first shock	3.0 (1.1)	5.1 (1.4)	5.8 (1.4)	1.72 (1.22–2.42)	1.39 (0.97–1.99)
Modified Rankin scale score ≤2†‡	10/135 (7.4)	23/144 (16.0)	34/124 (27.4)	2.21 (1.26–3.88)	1.48 (0.81–2.71)

number of patients/total number (percent)





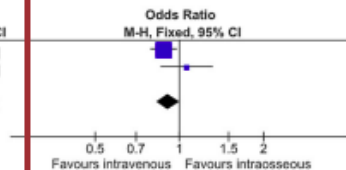
Intraosseous and intravenous vascular access during adult cardiac arrest: A systematic review and meta-analysis



Keith Couper^{1,2,3,4}, Lars W. Andersen^{5,6,7}, Ian R. Drennan^{8,9,10}, Brian E. Grunau^{11,12}, Peter J. Kudenchuk^{13,14}, Ranjit Lal¹⁵, Eric J. Lavonas^{16,17}, Gavin D. Perkins^{18,19}, Mikael Fink Vallentin^{20,21}, Asger Granfeldt²², On behalf of the International Liaison Committee on Resuscitation Advanced Life Support Task Force

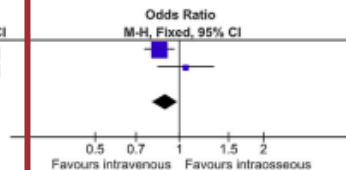
Panel A: Return of spontaneous circulation at any time

Study or Subgroup	Intraosseous		Intravenous		Weight	Odds Ratio M-H, Fixed, 95% CI
	Events	Total	Events	Total		
Couper 2024	1092	3031	1186	3035	81.9%	0.88 [0.79, 0.97]
Vallentin 2024	277	731	273	748	18.1%	1.06 [0.86, 1.31]
Total (95% CI)		3762		3783	100.0%	0.91 [0.83, 1.00]
Total events	1369		1459			
Heterogeneity: $\chi^2 = 2.50$, $df = 1$ ($P = 0.11$); $I^2 = 60\%$						
Test for overall effect: $Z = 1.95$ ($P = 0.05$)						



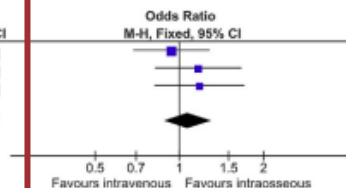
Panel B: Sustained return of spontaneous circulation

Study or Subgroup	Intraosseous		Intravenous		Weight	Odds Ratio M-H, Fixed, 95% CI
	Events	Total	Events	Total		
Couper 2024	654	3016	744	3023	80.2%	0.85 [0.75, 0.96]
Vallentin 2024	206	731	203	748	19.8%	1.05 [0.84, 1.32]
Total (95% CI)		3747		3771	100.0%	0.89 [0.80, 0.99]
Total events	860		947			
Heterogeneity: $\chi^2 = 2.72$, $df = 1$ ($P = 0.10$); $I^2 = 63\%$						
Test for overall effect: $Z = 2.18$ ($P = 0.03$)						



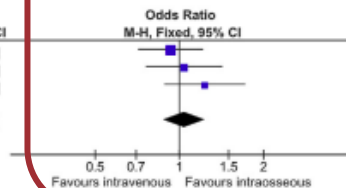
Panel C: Survival to discharge/ 30-days with favourable neurological outcome

Study or Subgroup	Intraosseous		Intravenous		Weight	Odds Ratio M-H, Fixed, 95% CI
	Events	Total	Events	Total		
Couper 2024	80	2994	85	2986	42.9%	0.94 [0.69, 1.28]
Ko 2024	63	741	73	991	29.6%	1.17 [0.82, 1.66]
Vallentin 2024	67	728	59	746	27.4%	1.18 [0.82, 1.70]
Total (95% CI)		4463		4723	100.0%	1.07 [0.88, 1.30]
Total events	210		217			
Heterogeneity: $\chi^2 = 1.22$, $df = 2$ ($P = 0.54$); $I^2 = 0\%$						
Test for overall effect: $Z = 0.70$ ($P = 0.49$)						



Panel D: Survival to hospital discharge

Study or Subgroup	Intraosseous		Intravenous		Weight	Odds Ratio M-H, Fixed, 95% CI
	Events	Total	Events	Total		
Couper 2024	112	3012	120	3012	44.8%	0.93 [0.72, 1.21]
Ko 2024	79	741	102	991	30.2%	1.04 [0.76, 1.42]
Vallentin 2024	87	730	74	748	25.0%	1.23 [0.89, 1.71]
Total (95% CI)		4483		4751	100.0%	1.04 [0.88, 1.23]
Total events	278		296			
Heterogeneity: $\chi^2 = 1.71$, $df = 2$ ($P = 0.42$); $I^2 = 0\%$						
Test for overall effect: $Z = 0.44$ ($P = 0.66$)						





BICARBONATES
CALCIUM
CORTICOÏDES



The image shows a close-up of a medical monitor screen. The screen displays several respiratory waveforms, including a large blue area plot at the top and a smaller waveform at the bottom. The background is slightly blurred, showing parts of the monitor's interface and a control panel with buttons on the left. A semi-transparent grey box is overlaid on the center of the screen, containing white text.

VOLUME CONTRÔLÉ OU RÉGULATION DE PRESSION

6-8 mL/kg

FiO₂ 100%

FR 10 / min

TEMPS INSPIRATOIRE 1 - 1.5 s

PEEP 0 - 5 cm H₂O

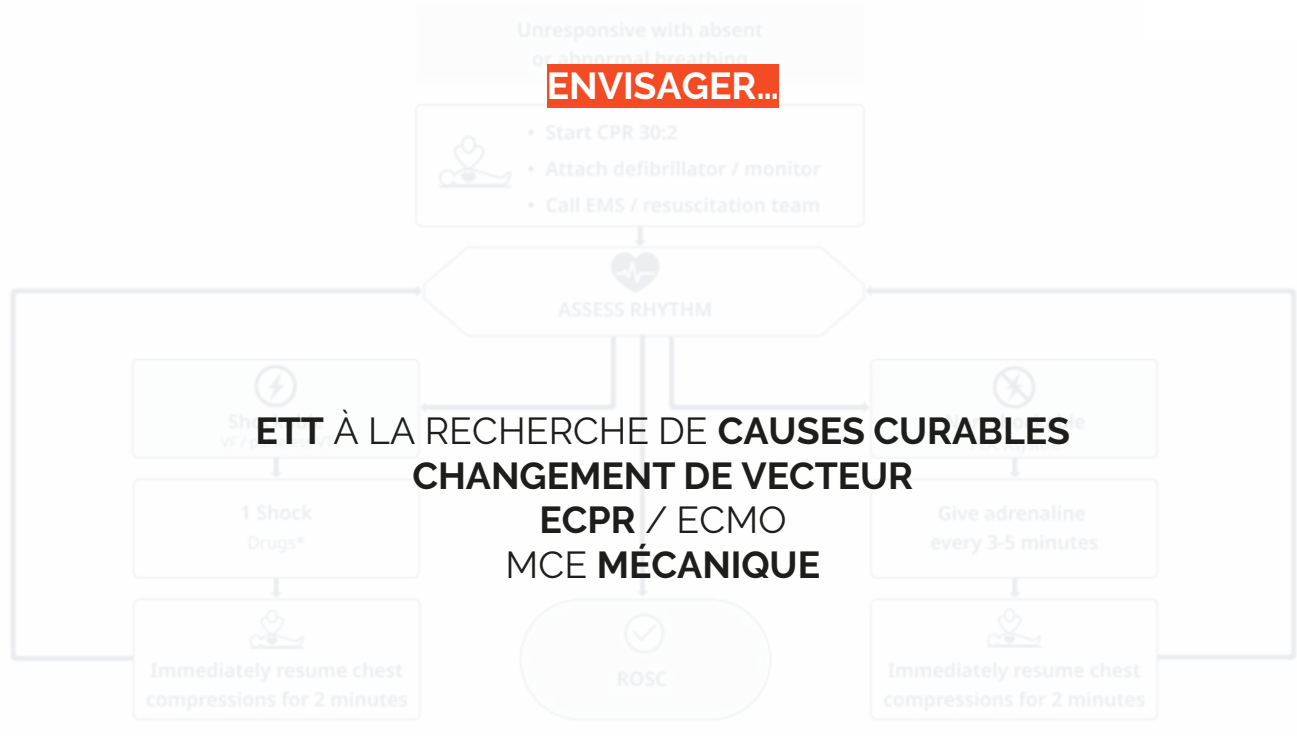
ALARME PIC DE PRESSION 60 - 70 cm H₂O

TRIGGER OFF

ENVISAGER...

Give high-quality chest compressions & ventilation

Identify & treat reversible causes



ET À LA RECHERCHE DE CAUSES CURABLES*
CHANGEMENT DE VECTEUR
ECPR / ECMO
MCE MÉCANIQUE

- Ensure optimal defibrillator pad placement
- Give oxygen
- Continuous compressions if tracheal tube or supraglottic airway
- Use waveform capnography
- Minimise interruptions to chest compressions
- Early IV access (IO if IV not possible)
- * Drugs
 - Give 1st adrenaline after 3 shocks, then every 3-5 minutes
 - Give amiodarone after 3 shocks

- Consider**
- Changing pads to antero-posterior after 3 shocks
 - Mechanical chest compressions to facilitate transfer / treatment
 - Ultrasound to identify reversible causes
 - Extracorporeal CPR and, or Coronary angiography/percutaneous coronary intervention

- Immediately after ROSC
- Use ABCDE approach
 - Aim for SpO₂ of 94-98% and normal PaCO₂
 - Aim SBP > 100 mmHg
 - 12 Lead ECG
 - Identify and treat cause
 - Temperature control

- Hypoxia
- Hypovolaemia
- Hyper-hypokalaemia / metabolic
- Hypothermia, hyperthermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary / pulmonary)



Prehospital Extracorporeal Cardiopulmonary
Resuscitation for Out-of-Hospital Cardiac Arrest:
A Systematic Review and Meta-Analysis

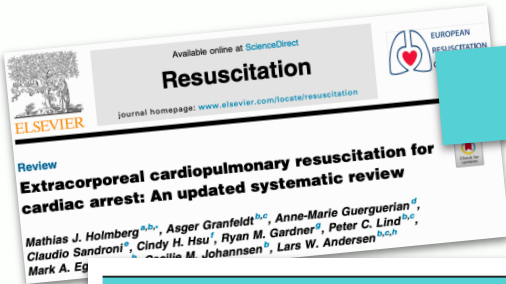
Natalie Kruit, MBBS (Hons), FANZCA^{*1,3,5,7},
Nivedita Rattan, BMed, MD¹, David Tian, MD, PhD^{5,8},
Stefan Dieleman, MD, PhD, FANZCA^{3,9},
Aidan Burrell, MBBS, FCICM, PhD^{4,10},
Mark Dennis, MBBS, FRACP, PhD^{11,12}

Table 4

Low-Flow Times, Survival, and Neurologic Outcomes for All Studies
Included in the Meta-Analysis

Study	Low-Flow Time	Survival, n/N (%)	Neurologic Outcomes, n/N (%)
Petermichl et al. (2021) ¹⁴	CPC 1-2: 40 min (IQR 30-47) CPC 3-4: 56 min (IQR 27-64) Non-survivors: 49 min (IQR 38- 64)	21/63 (33)	CPC 1-2: n = 17/63 (27) CPC 3-4: n = 4/63 (6)
Hilker et al. (2013) ¹⁵	61 min (SD ± 14.3)	2/6 (33)	CPC 3-4: n = 1/6 (16)
Bougouin et al. (2020) ¹³	90 min (IQR 70- 110)	19/123 (15) [*]	Not reported
Pozzi et al. (2022) ¹⁶	71.1 min (SD ± 15.4)	7/30 (23.3)	CPC 1-2: n = 7/30 (23.3)

**OBJECTIF LOW-FLOW
< 60 MIN**



ECMO

Table 4 - Certainty of evidence for randomized trials in adults with out-of-hospital cardiac arrest.

Outcomes	Studies	Risk of Bias	Inconsistency	Indirectness	Imprecision	Other ^a	Overall
Survival to hospital discharge or 30 days	3 studies ¹¹⁻¹³	Not serious	Serious ^b	Not serious	Serious ^c	None	Low
Survival to 3 months or 6 months	3 studies ¹¹⁻¹³	Not serious	Serious ^b	Not serious	Serious ^c	None	Low
Favorable neurological outcome at hospital discharge or 30 days	3 studies ¹¹⁻¹³	Not serious	Serious ^b	Not serious	Serious ^c	None	Low
Favorable neurological outcome at 3 months or 6 months	3 studies ¹¹⁻¹³	Not serious	Serious ^b	Not serious	Serious ^c	None	Low

^a Includes assessment of publication bias and magnitude of the effect
^b Some inconsistencies in effect sizes
^c Although no pooled estimate was calculated, the small sample sizes led to wide confidence intervals



Unresponsive with absent or abnormal breathing

MONITORER



- Start CPR 30:2
- Attach defibrillator / monitor
- Call EMS / resuscitation team

ASSESS RHYTHM



Shockable
VF / pulseless VT



1 Drugs*

Immediately resume chest compressions for 2 minutes

CHUTE BRUTALE DE L'ETCO₂ = AC

PAS < 50 mmHg = MCE

SI KTA & BOLUS ADRÉNALINE = 50 - 100 µg IV

PAD ≥ 30 mmHg & EtCO₂ ≥ 25 mmHg

ROSC



Non-shockable
PEA, Asystole



every 3 minutes

Immediately resume chest compressions for 2 minutes

Identify & treat reversible causes

Give high-quality chest compressions & ventilation

- Ensure optimal defibrillator pad placement
- Give oxygen
- Continuous compressions if tracheal tube or supraglottic airway
- Use waveform capnography
- Minimise interruptions to chest compressions
- Early IV access (IO if IV not possible)

* Drugs

- Give 1st adrenaline after 3 shocks, then every 3-5 minutes
- Give amiodarone after 3 shocks

Consider

- Changing pads to antero-posterior after 3 shocks
- Mechanical chest compressions to facilitate transfer / treatment
- Ultrasound to identify reversible causes
- Extracorporeal CPR and, or Coronary angiography/percutaneous coronary intervention



Immediately after ROSC

- Use ABCDE approach
- Aim for SpO₂ of 94-98% and normal PaCO₂
- Aim SBP > 100 mmHg
- 12 Lead ECG
- Identify and treat cause
- Temperature control

- Hypoxia
- Hypovolaemia
- Hyper-hypokalaemia / metabolic
- Hypothermia, hyperthermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary / pulmonary)

POST RESUSCITATION CARE

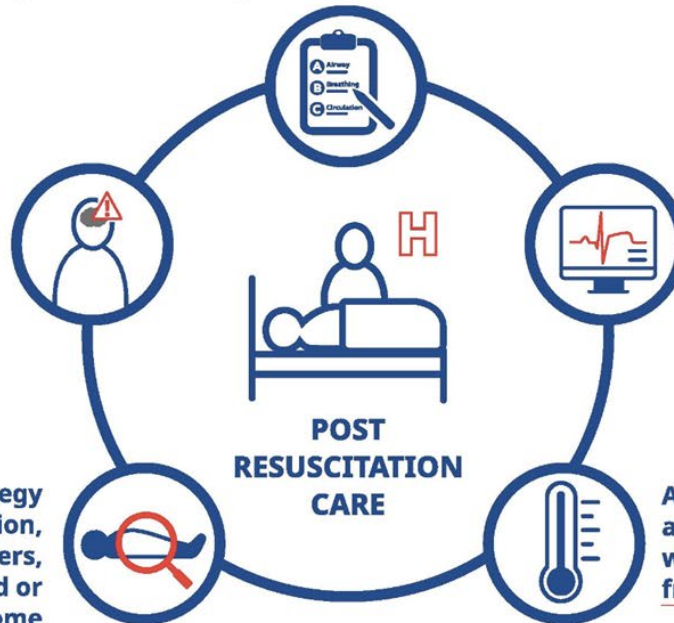
KEY MESSAGES

After ROSC use ABCDE approach

- Insert an advanced airway (tracheal intubation when skills available)
- As soon as SpO₂ can be measured reliably or arterial blood gas values are obtained, titrate the inspired oxygen to achieve an arterial oxygen saturation of 94-98%, and ventilate lungs to achieve normocapnia
- Aim for a systolic blood pressure > 100 mmHg or a mean arterial pressure > 60-65 mmHg

Perform functional assessments of physical and non-physical impairments before discharge to identify rehabilitation needs and refer to early rehabilitation if indicated

Use a multimodal strategy including clinical examination, electrophysiology, biomarkers, and imaging to predict good or poor neurological outcome



Prioritise immediate coronary angiography for patients with clear ST-elevation on the ECG or other high suspicion of coronary occlusion (e.g. haemodynamic and/or electrical instability)

Actively prevent fever by targeting a temperature ≤ 37.5 °C for patients who remain comatose after ROSC from cardiac arrest

POST-RACS

ADULTE



Rôle : **Equipe d'urgence**

RACCOURCIS :

A B C D E

STYLE :

NORMO-TOUT

POUVOIR UNIQUE



Maître circulatoire

Contrôle de la pression artérielle et de l'hématose

OBJECTIF : NEUROPROTECTION



Normoxie : SpO₂ 94-98%

FiO₂ à 100% en post-RACS immédiat, puis titration



Normocapnie : EtCO₂ entre 30-40mmHg



Gardien de la PAM > 60-65mmHg

Hors trauma crânien & médullaire



Conditionnement

T°C < 37.5°C	Glycémie 6-8mmol/L	Tête Relevée 30°
-----------------	-----------------------	------------------------

EQUIPEMENT



Ventilation
Protectrice

- Vt 6-8ml/kg (poids théorique)
- PEEP ≥ 5 cmH₂O
- FR = 15 (12-20) /min



Chimie
réfléchie

- Amine : noradrénaline (1mg/h puis titration) +/- dobutamine
- Sédation + analgésie (½ vie courte)



INTERPRÉTATION ECG IMMÉDIATE IMPOSSIBLE
Déverrouillé à partir de 10min post-RACS

QUÊTE PRINCIPALE :

👤 Activité cardiaque récupérée
Vaincre "ACSOS"

QUÊTE SECONDAIRE :

- Identifier la cause + échographie (5H & 5T)
- Coro directe si STEMI
- Du réa + TDM crâne & thorax à minima

BONUS : Occlusion des yeux + registre AC
Monitoring artériel invasif + Gd5



SÉDATION - ANALGÉSIE - CURARISATION



P qp/kp kvk vkqp "1"kp vgt t wr vkqp "T E R



G. Debaty¹, N. Baladi²,
G. Bois³, V. Canon⁴, T. Chouihed⁵,
A. Maluga⁶, C. Derkenne⁷,
F. Dumas^{8,9,10}, C. Genbrugge^{11,12},
C. Gil-Jardiné¹³, M. Heidet¹⁴,
H. Hubert⁴, P. Jabre^{15,8,9}, D. Jaeger⁵,
F. Javaudin^{16,17}, D. Jost^{18,8},
L. Lamhaut^{15,8,9}, E. Perret¹⁹,
L. Quirin²⁰, A. Renard^{21,22},
P.-G. Reuter²³, D. Savary^{24,25},
E. Wiel^{4,26}, A. Chauvin²⁷

Recommandations de pratiques professionnelles portant sur la gestion d'un appel pour suspicion d'arrêt cardiaque dans un centre d'appel d'urgence

R5.1 - Les experts proposent qu'en cas d'AC préhospitalier chez l'adulte, le régulateur peut décider de ne pas faire initier de RCP s'il a, dès l'appel, des éléments en faveur :

1. de présence d'une lésion mortelle évidente ou de mort irréversible (rigidité cadavérique, lividité cadavérique, putréfaction, décapitation, ...) avec l'adhésion de l'appelant à cette décision ;
2. ou des directives anticipées formalisées et/ou une décision médicale claire et certaine de ne pas réanimer avec l'adhésion de l'appelant à cette décision (exemple : directives anticipées du patient notées dans l'espace numérique de santé « *Mon espace santé* ») ;
3. ou devant l'association de plusieurs facteurs pronostiques défavorables et avec l'adhésion de l'appelant à cette décision ;
4. ou d'un danger immédiat pour l'intégrité physique du/des témoin(s) (réel ou perçu) ;
5. ou d'un refus par le(s) témoin(s) de suivre les gestes de RCP guidés par téléphone ;
6. ou d'une incapacité (physique ou psychologique/émotionnelle) du témoin à entreprendre les gestes de réanimation.

AVIS D'EXPERTS

Lésion mortelle

Facteurs pronostiques défavorables

Refus témoins

Incapacité physique de RCP

+ **ACCORD APPELANT !!**



MERCI

pour votre attention