Elisoccorso sanitario tra prospettive e realta': Caso clinico

ISEO 17-18 OTTOBRE 2014

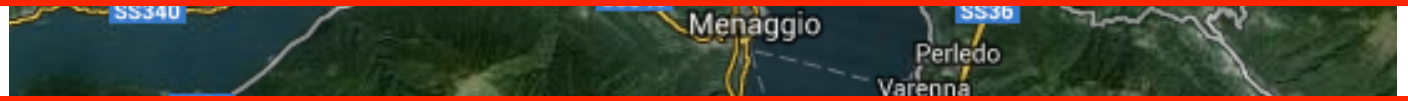
Alberto Piacentini

SOREU Laghi-AAT Como

Scenario “SOREU Laghi”

Como-Lecco-Varese (Legnano)	Popolazione	Km^2
TOTALE	**2.300.000**	**3.500**

Allarme 19:42

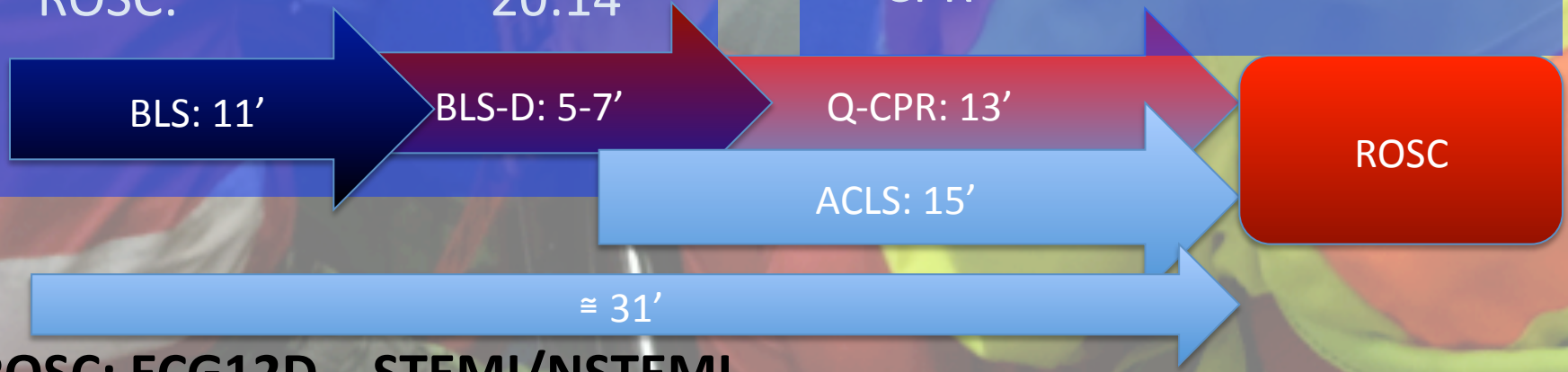


19:42: ACC BLS da bystander guidato da operatore di SOREU

Tempistiche-azioni

- Allarme 19:42
- CPR bystander: 19:43
- BLS-D: 19:54
- DAE: “NO SHOCK” x 2
- ACLS: 19:59
- q-CPR: 20:01
- ROSC: 20:14

- NO FLOW: (>8’ ?)
- LOW FLOW: 31’
- CPR: 21’
- q-CPR: 10’
- Ritmo presentazione: PEA
- Non segni circolo durante q-CPR



ROSC: ECG12D – STEMI/NSTEMI.

DestinazioneRia H Lecco (Elicomo)

ROSC:	**20:14**
Trasferimento BLSD:	**20:38-20:45**
Trasferimento Eli:	**20:52-21:02 10’**
TEMPI: (ROSC-H):	**48’**

1903: Schafer

RESUSCITATION

FROM

ELECTRIC SHOCK, TRAUMATIC SHOCK, DROWNING, ASPHYXIATION FROM ANY CAUSE

BY MEANS OF ARTIFICIAL RESPIRATION BY THE PRONE PRESSURE (SCHAEFER) METHOD

WITH ANATOMICAL DETAILS OF THE METHOD, AND COMPLETE DIRECTIONS FOR SELF-INSTRUCTION

BY

CHARLES A. LAUFFER, A.M., M.D.

Medical Director, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

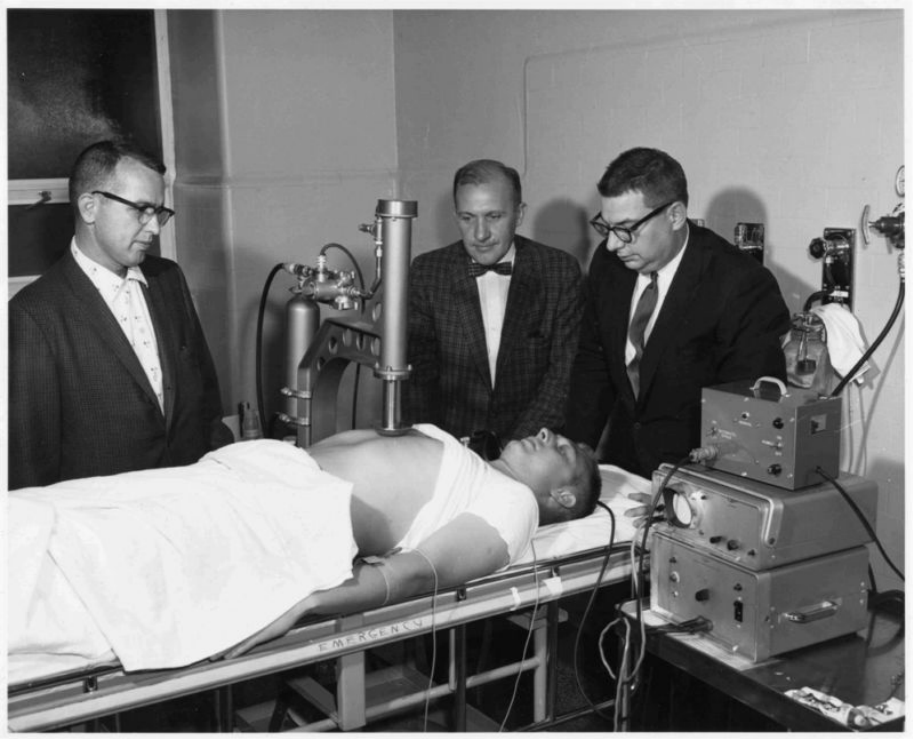
SECOND EDITION, ENLARGED

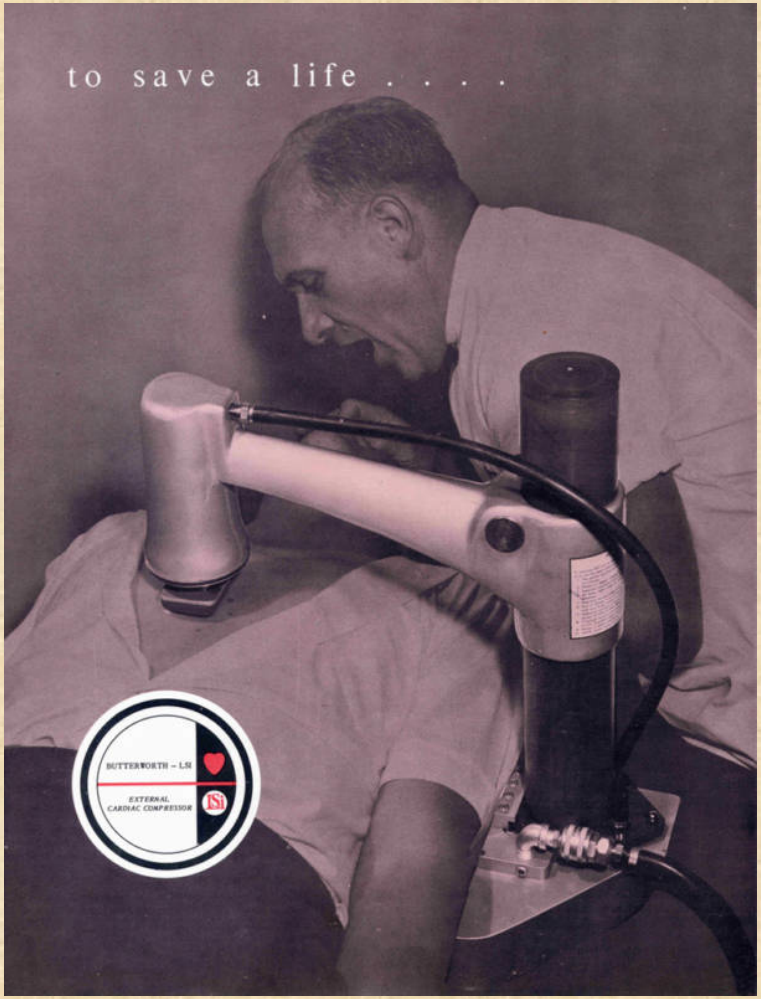
TOTAL ISSUE, FIVE THOUSAND

NEW YORK
JOHN WILEY & SONS, INC.
LONDON: CHAPMAN & HALL, LIMITED
1915

and that even if the patient is at first pulseless and apparently dead it should be continued for at least three hours if spontaneous breathing does not return before that time. Professor Henderson

1975: Michigan CPR Thumper mod. 1004





Device CPR meccanica

- MCE qualita':
  - Costanti
  - Omogenee
  - Senza interruzioni
- Libera operatori da CTE
- "3o soccorritore standby"
- Aumento sicurezza operatori durante trasferimento su mezzi in movimento

Giappone

Effects of the [redacted] used on patients with CPA during transportation in a "Doctor-Heli"

Juntendo University Shizuoka Hospital introduced the AutoPulse® system – one out of many devices available for automated mechanical chest compression – to its "Doctor-Helis" (1). Data showed that advanced CPR using AutoPulse® performed about 12 minutes might be effective to get the ROSC, if circumstances during a flight make it very difficult to perform manual CPR. Shizuoka Hospital – located in an underpopulated rural area called the Izu Peninsula of Shizuoka – is the only hospital in the area taking care of emergency patients. There is no other emergency or critical care center nearby and only few other hospitals take care of emergency patients in general. If the regional emergency medical service (EMS) in Shimoda-city, located at the tip of the Izu Peninsula, has to transport a patient showing a critical state (including CPA), it takes about 90 minutes from the scene to the hospital at Izunokuni-city by surface transport.

Purpose

The "Doctor-Helicopter"-system has recently been introduced as part of EMS in the local area, complementing the inadequate numbers of ambulances and hospitals in Japan. The "flying doctor" was implemented in the area of the Izu Peninsula in order to take care of extremely critical patients with CPA. However, it is not easy to do effective manual chest compressions in the helicopter. The purpose of the study was to evaluate the effect of the automated load-distributing band (LDB) chest compression device, the so-called AutoPulse®, for continuous chest compression during transportation in a "Doctor-Helicopter".

Conclusion

Use of the LDB device [redacted] ring transportation from the landing point of the "Doctor-Helicopter" to the ER might result in a good outcome for introducing aggressive treatment in hospital.

0	ROSC group	Non-ROSC	group P-value
Age (year old)	55.1 ± 19.3	66.3 ± 18.9	0.062
Gender			
male	12	26	0.9214
female	3	8	
Cause			
endogenous	7	21	0.3249
exogenous	8	13	
witness	7	18	0.6855
unwitness	8	16	
bystander	8	16	0.6856
non-bystander	7	18	

	ROSC group (min)	Non-ROSC (min)	P-value
EMS dispatch ~ EMS personnel arrival	12.7±6.1	16.9±12.9	0.246
EMS personnel arrival ~ Medical staff arrival	19.1±10.0	20.3±11.0	0.7069
Stay at the scene	16.9±7.8	18.6±8.2	0.5047
M[redacted]ual-CPR	36.6±13.8	42.4±16.6	0.2472
[redacted]	11.9±6.7	18.1±5.2	0.0011

Resuscitation 84 (2013) 1045–1050

Contents lists available at SciVerse ScienceDirect

Resuscitation

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

Clinical paper

The analysis of efficacy for [redacted] system in flying helicopter☆

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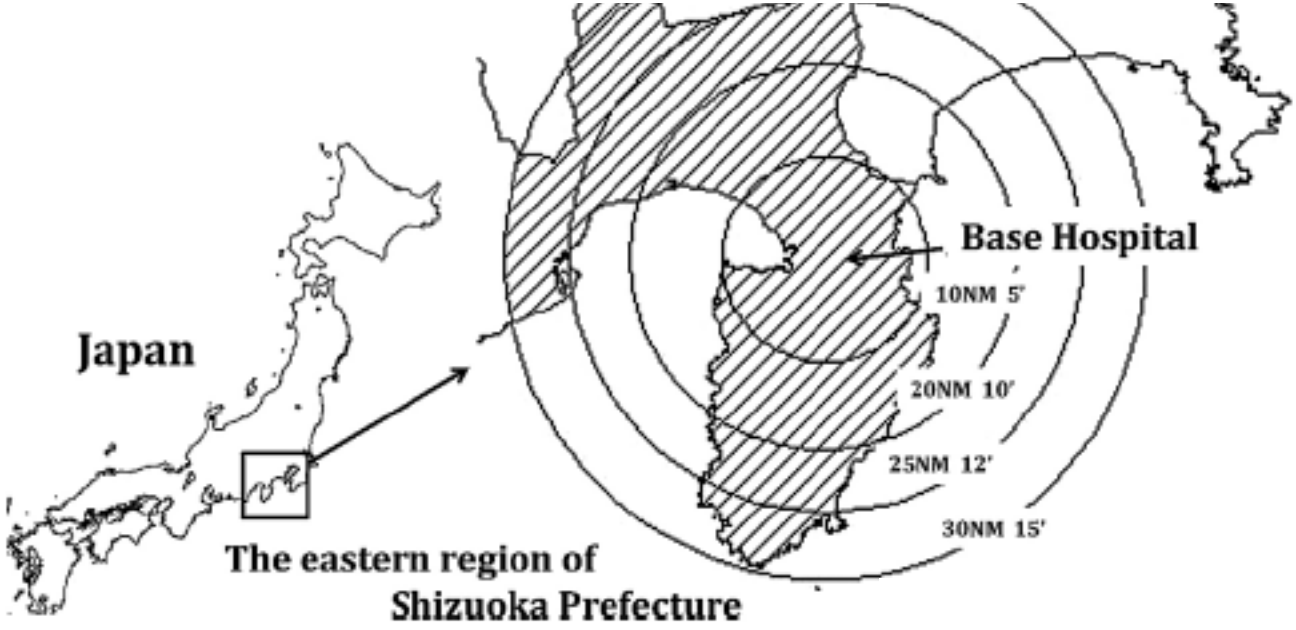
[b] Department of Internal Medicine, Juntendo University Shizuoka Hospital, Shizuoka, Japan
[c] Department of Emergency and Disaster Medicine, Juntendo University Urayasu Hospital, Urayasu, Japan



CODICE “PONTE”

Revascularización coronaria durante la resucitación cardiopulmonar. Código puente

A. Serrano Moraza[a,b,1], F. del Nogal Sáez[c] y F. Alfonso Manterola[d]

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[b] *Servicio de Urgencias Médicas Summa 112, Madrid*
[c] *Unidad de Cuidados Intensivos, Hospital Severo Ochoa, Leganés. Madrid, España*
[d] *Unidad de Hemodinámica, Hospital Severo Ochoa, Hospital Clínico Universitario, Madrid, España*

CPR meccanica (AAT Como)

INDICAZIONI

- Ogni qual volta si preveda il trasporto di un paziente sottoposto a manovre di RCP
- ACC refrattario eleggibile a: trombolisi, embolectomia meccanica percutanea, assistenza extracorporea ECLS/ECMO
- medico MSA, od il medico di SOREU lo ritengano necessario
- ACC in casi particolari:
  - intossicazione accidentale:
  - potassio cloruro
  - agenti ignoti
  - cianuri
- annegamento:
- Ipotermia:

CONTROINDICAZIONI

- ACC non testimoniato e non massaggiato (anche da laici by-standers) eccetto ipotermia primitiva.
- Segni di morte biologica
- Limiti costruttivi ed operativi dispositivi
- Evento traumatico maggiore
- ACC in pazienti con caratteristiche peculiari (es. fase finale di malattia grave terminale documentata, cardiomiopatie non candidabili a trapianto determinanti scompenso cardiaco refrattario con grado di compromissione dimostrabile.)

Case Report

Hindawi Publishing Corporation
Case Reports in Emergency Medicine
Volume 2012, Article ID 381798, 4 pages
doi:10.1155/2012/381798

Case Report

Successful Prolonged Mechanical CPR in a Severely Poisoned Hypothermic Patient: A Case Report

Alberto Piacentini,[1,2] Maurizio Volonte',[2,3] Marcello Rigamonti,[2,4] Elisa Guastella,[2,4] and Mario Landriscina[2,5]

(d) In our region HEMS can provide interfacility flights under instrument flight rules (IFR) 24 hours a day.

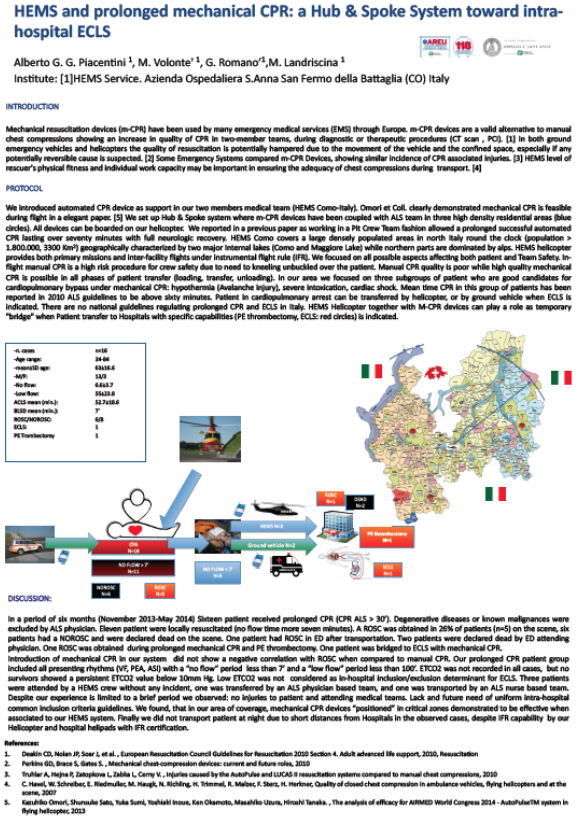
Academic Editors: P. Del Rio, E. Kagawa, and W. Mauritz

From the perspective of a "*Hub & Spoke*" system, our m-CPR devices are currently undergoing aviation certification and could play, together with helicopters, a pivotal role as temporary "bridging devices" during transfer of patients who are candidates for cardiopulmonary bypass (CPB) directly from the scene or from nearby local hospitals [7]. Studies are needed to better understand which subcategories of this class of patients would benefit from such a strategy.

Pubblicazioni

Weil Conference: 2012

Airmed: 2014



HEMS and prolonged mechanical CPR: a Hub & Spoke System toward intra-hospital ECLS

Alberto G. G. Piacentini [1], M. Volonte' [1], G. Romano'[1],M. Landriscina [1]
Institute: [1]HEMS Service. Azienda Ospedaliera S.Anna San Fermo della Battaglia (CO) Italy

INTRODUCTION

Mechanical resuscitation devices (m-CPR) have been used by many emergency medical services (EMS) through Europe. m-CPR devices are a valid alternative to manual chest compressions showing an increase in quality of CPR in two-member teams, during diagnostic or therapeutic procedures (CT scan , PCI). [1] In both ground emergency vehicles and helicopters the quality of resuscitation is potentially hampered due to the movement of the vehicle and the confined space, especially if any potentially reversible cause is suspected. [2] Some Emergency Systems compared m-CPR Devices, showing similar incidence of CPR associated injuries. [3] HEMS level of rescuer's physical fitness and individual work capacity may be important in ensuring the adequacy of chest compressions during transport. [4]

PROTOCOL

We introduced automated CPR device as support in our two members medical team (HEMS Como-Italy). Omori et Coll. clearly demonstrated mechanical CPR is feasible during flight in a elegant paper. [5] We set up Hub & Spoke system where m-CPR devices have been coupled with ALS team in three high density residential areas (blue circles). All devices can be boarded on our helicopter. We reported in a previous paper as working in a Pit Crew Team fashion allowed a prolonged successful automated CPR lasting over seventy minutes with full neurologic recovery. HEMS Como covers a large densely populated areas in north Italy round the clock (population > 1.800.000, 3300 Km²) geographically characterized by two major internal lakes (Como and Maggiore Lake) while northern parts are dominated by alps. HEMS helicopter provides both primary missions and inter-facility flights under instrumental flight rule (IFR). We focused on all possible aspects affecting both patient and Team Safety. In-flight manual CPR is a high risk procedure for crew safety due to need to kneeling unbuckled over the patient. Manual CPR quality is poor while high quality mechanical CPR is possible in all phases of patient transfer (loading, transfer, unloading). In our area we focused on three subgroups of patient who are good candidates for cardiopulmonary bypass under mechanical CPR: hypothermia (Avalanche injury), severe intoxication, cardiac shock. Mean time CPR in this group of patients has been reported in 2010 ALS guidelines to be above sixty minutes. Patient in cardiopulmonary arrest can be transferred by helicopter, or by ground vehicle when ECLS is indicated. There are no national guidelines regulating prolonged CPR and ECLS in Italy. HEMS Helicopter together with M-CPR devices can play a role as temporary "bridge" when Patient transfer to Hospitals with specific capabilities (PE thrombectomy, ECLS: red circles) is indicated.

-n. cases	n=16
-Age range:	34-84
-mean±SD age:	61±16.6
-M/F:	13/3
-No flow:	6.6±3.7
-Low flow:	35±23.0
ACLS- mean (min.):	51.7±18.6
BLSD-mean (min.)	7'
ROSC/NOROSC:	6/8
ECLS:	1
PE Thrombectomy	1

DISCUSSION:

In a period of six months (November 2013-May 2014) Sixteen patient received prolonged CPR (CPR ALS > 30'). Degenerative diseases or known malignances were excluded by ALS physician. Eleven patient were locally resuscitated (no flow time more seven minutes). A ROSC was obtained in 26% of patients (n=5) on the scene, six patients had a NOROSC and were declared dead on the scene. One patient had ROSC in ED after transportation. Two patients were declared dead by ED attending physician. One ROSC was obtained during prolonged mechanical CPR and PE thrombectomy. One patient was bridged to ECLS with mechanical CPR.
Introduction of mechanical CPR in our system did not show a negative correlation with ROSC when compared to manual CPR. Our prolonged CPR patient group included all presenting rhythms (VF, PEA, ASI) with a "no flow" period less than 7' and a "low flow" period less than 100'. ETCO2 was not recorded in all cases, but no survivors showed a persistent ETCO2 value below 10mm Hg. Low ETCO2 was not considered as in-hospital inclusion/exclusion determinant for ECLS. Three patients were attended by a HEMS crew without any incident, one was transferred by an ALS physician based team, and one was transported by an ALS nurse based team. Despite our experience is limited to a brief period we observed: no injuries to patient and attending medical teams. Lack and future need of uniform intra-hospital common inclusion criteria guidelines. We found, that in our area of coverage, mechanical CPR devices "positioned" in critical zones demonstrated to be effective when associated to our HEMS system. Finally we did not transport patient at night due to short distances from Hospitals in the observed cases, despite IFR capability by our Helicopter and hospital helipads with IFR certification.

References:

1. Deakin CD, Nolan JP, Soar J, et al., European Resuscitation Council Guidelines for Resuscitation 2010 Section 4. Adult advanced life support, 2010, Resuscitation
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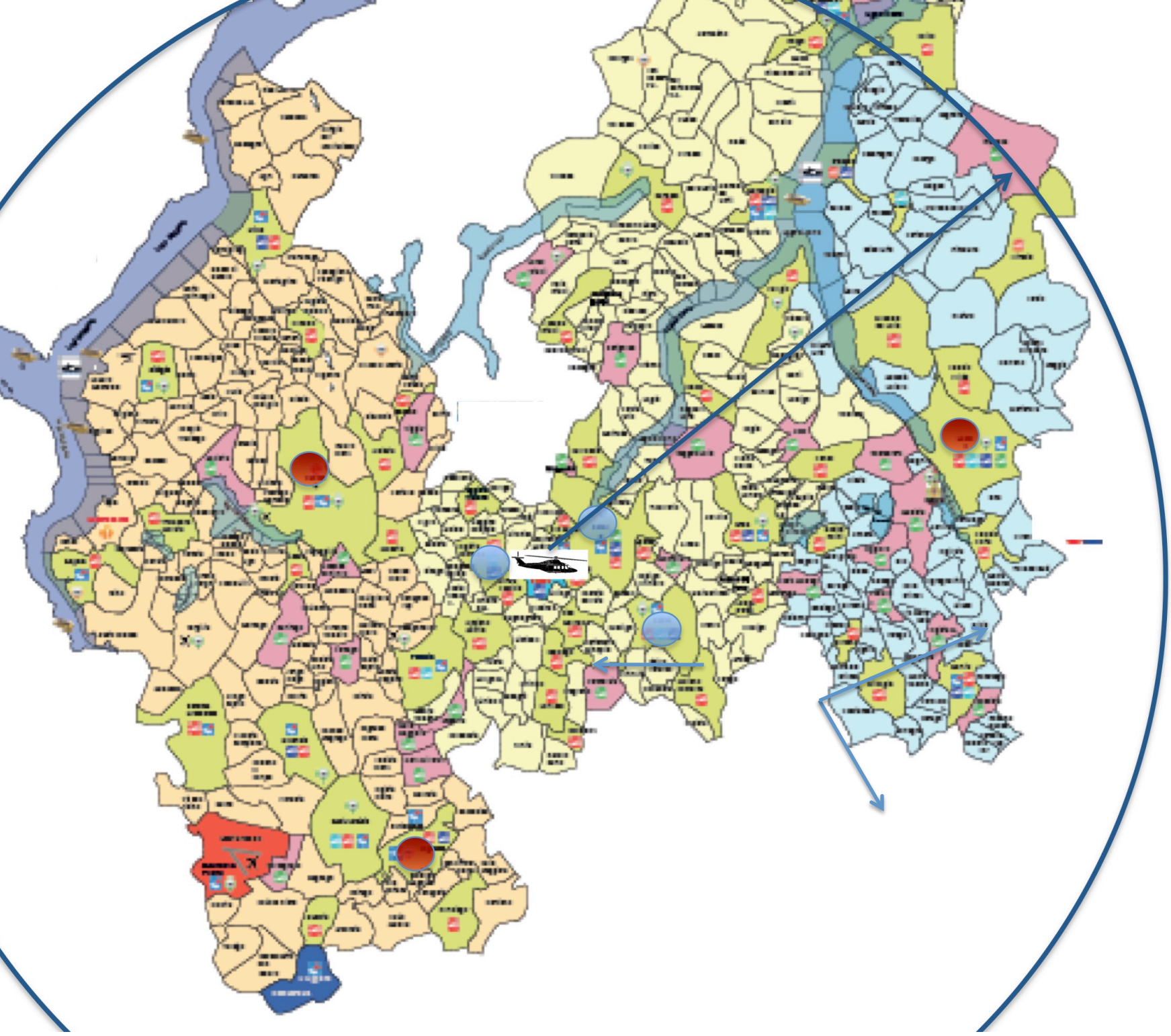
3. Truhlar A, Hejna P, Zatopkova L, Zabka L, Cerny V. , Injuries caused by the AutoPulse and LUCAS II resuscitation systems compared to manual chest compressions, 2010
4. C. Hawel, W. Schreiber, E. Riedmuller, M. Haugk, N. Richling, H. Trimmel, R. Mader, F. Stanz, H. Herkner, Quality of closed chest compression in ambulance vehicles, flying helicopters and at the scene, 2007
5. Katuhiko Omori, Shunsuke Sato, Yuka Sumi, Yoshiaki Inoue, Ken Okamoto, Masahiko Uzura, Hiroshi Tanaka. , The analysis of efficacy for AIRMED World Congress 2014 - AutoPulse™ system in flying helicopter, 2013

Device meccanici AAT Como: Situazione attuale

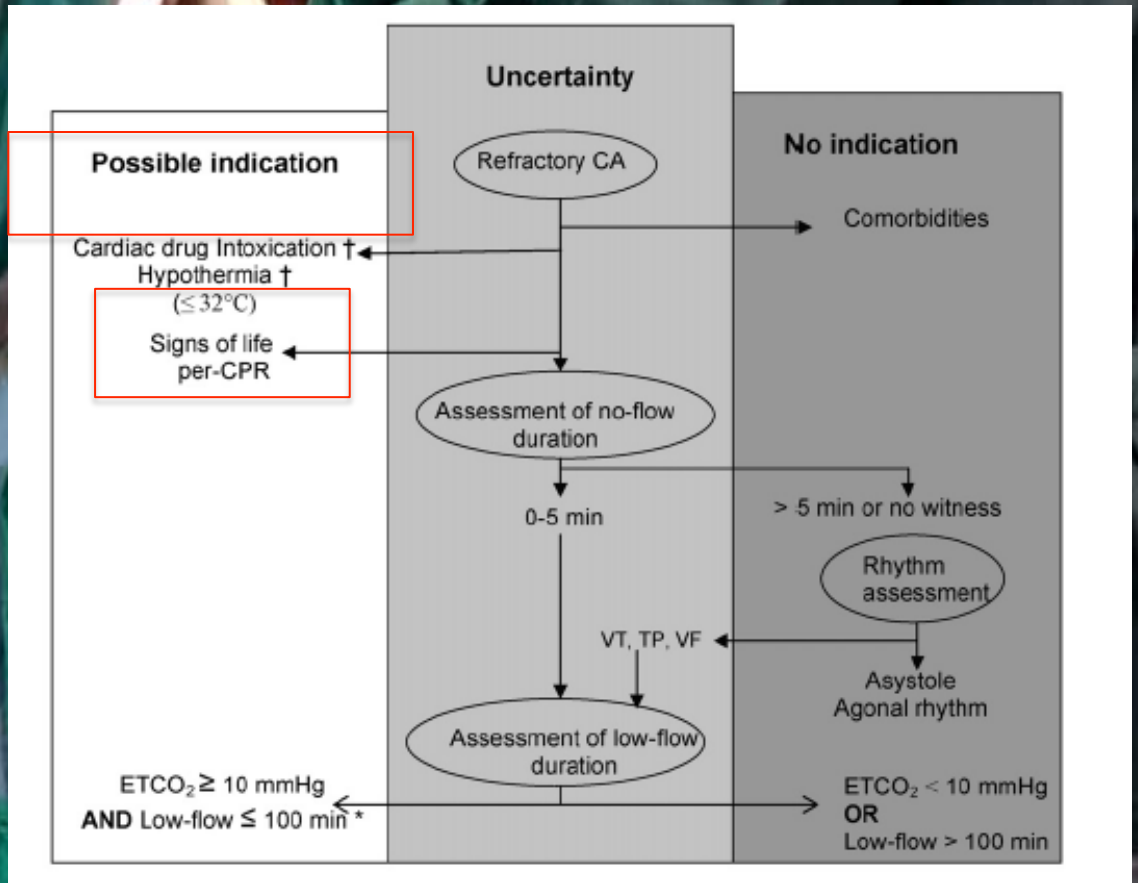
- 3 presidi CPR meccanica
- Donazione
- dislocati presso postazioni mezzi avanzati sul territorio:
  - MSA Como
  - MSA/MSI Olgiate
  - MSA/MSI Cantu’ (70% ACC)
- Certificazione aeronautica (estesa a tutti I modelli in commercio)



Annales Françaises d'Anesthésie et de Réanimation 28 (2009) 187–190

INFORMATION PROFESSIONNELLE

Guidelines for indications for the use of extracorporeal life support in refractory cardiac arrest☆



ROSC/NOROSC:	6/8
ECLS:	1
PE Trombectomy	1

CPA
N=16

NO FLOW > 7'
N=11

NOROSC
N=6

ROSC
N=5

NO FLOW < 7'
N=5

HEMS N=3

Ground vehicle N=2

ROSC
N=1

DEAD
N=2

OD
1

PE thrombectomy
N=1

ECLS
N=1

ROSC=
1

HEMS=1

OD
1

Conclusioni:

- Presidi “q-CPR” distribuzione strategica su territorio.
- auspicabile interazione mezzi terra-elicottero
- Disponibilita’ device a bordo elisoccorso
- Creazione rete “*spoke & hub*” q-CPR (bridge/ecls)
- Tempistiche: (low flow ≤ 100’)
- Centri ECMO: attualmente non criteri uniforme accettazione paziente da territorio
- Linee guida regionali: auspicabili
- Definizione “CPR prolungata”: non univoca

grazie per l'attenzione

"Non vi è niente di più difficile da maneggiare, di più periglioso da condurre; di più incerto nella possibilità di successo, che decidere di introdurre un nuovo ordine delle cose; poiché l'innovatore ha contro tutti coloro che sono soddisfatti del vecchio modo e debolmente a favore tutti quelli che potrebbero trovarsi meglio con il nuovo"

Machiavelli