External Life Support. ECMO ed arresto preospedaliero

Una nuova prospettiva terapeutica per l'arresto cardiaco

Mario Rugna

118 Firenze Soccorso ed Elisoccorso

NAPOLI 18_16_2016

x congresso nazionale
simeu
NAPOLI 18-20 NOVEMBRE 2016

Rete preospedaliera 118 Firenze

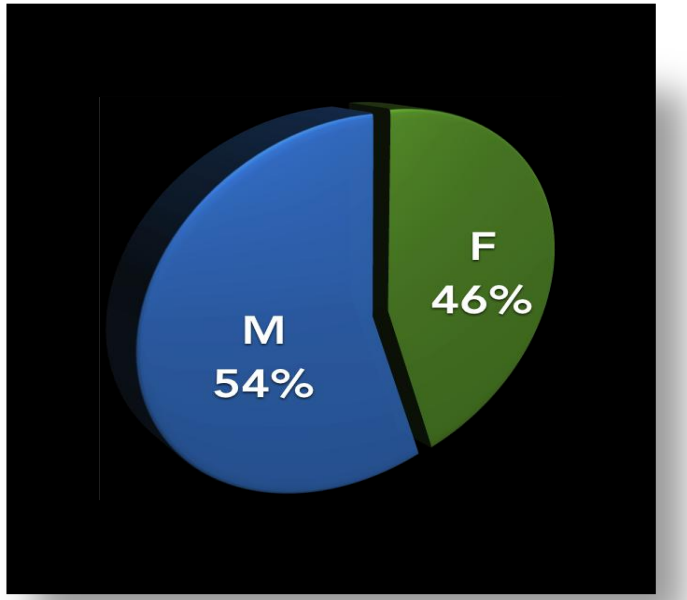
3500 telefonate entranti nelle 24 ore
300 interventi di soccorso al giorno

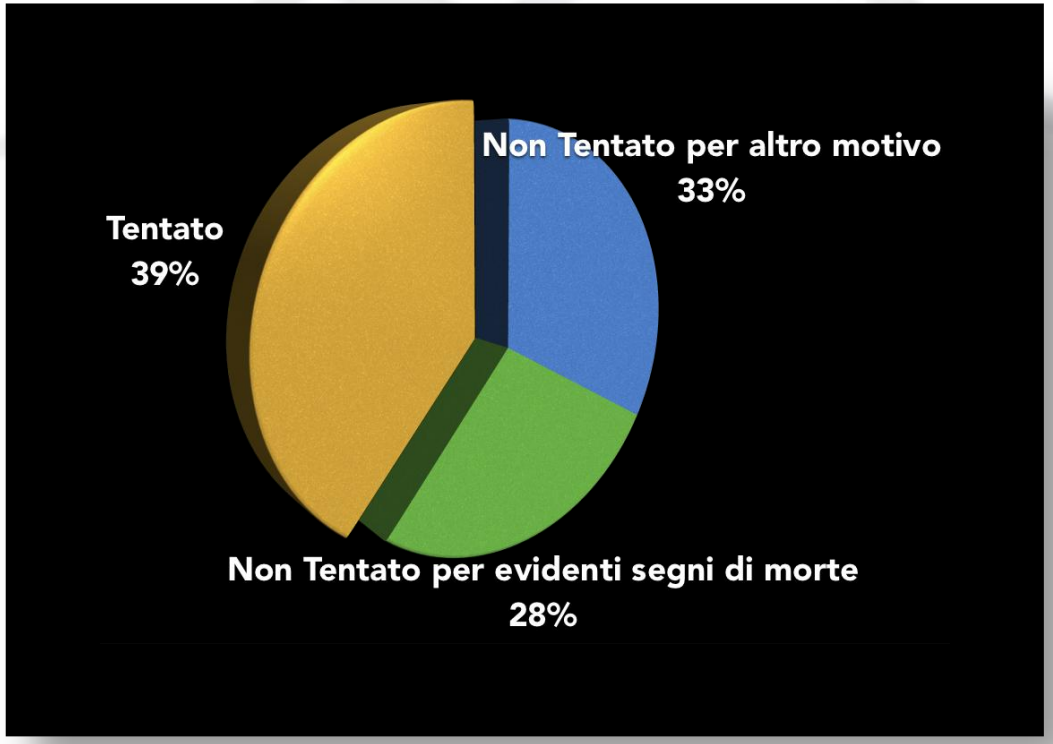
33 Comuni
2778.84 Kmq
775.887 residenti

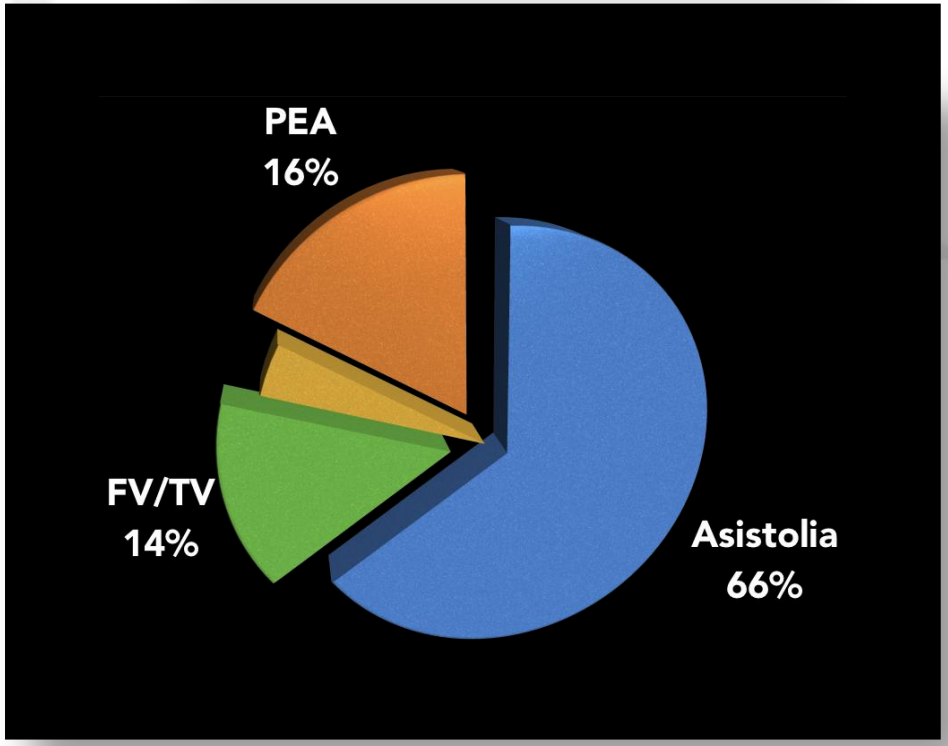
Epidemiologia ACR

Registro ACR 118 Firenze anno 2015

- 1721 ACR
- Età media 79 anni







Caso clinico

- Donna di 39 anni
- Chiama per difficoltà respiratoria
- ACR testimoniato da equipe BLS
- RCP di base seguita da ALS all'arrivo del mezzo medicalizzato
- ROSC dopo 10 min di manovre rianimatorie
- Rendez-vous con elicottero per centralizzazione

Caso clinico

All'arrivo dell'elicottero

- GCS 3 T
- Respiro assistito
- SaO2 100%, RS 90 bpm, PAS 90 mmHg
- ECG ST sotto in laterale no STE

Caso clinico

Mentre si predispone il trasferimento in elicottero

- ACR per PEA
- Ripresa manovre ALS
  - Ventilazione assistita
  - Massaggio cardiaco meccanico (m.c.m.)
- EtCO2 28 mmHg (con m.c.m. in atto)
- Evoluzione in asistolia

Outcome ACR da ritmi non defibrillabili

Nessun miglioramento sulla prognosi dell'arresto cardiaco da ritmo non defibrillabile negli ultimi 10 anni!

Resuscitation 85 (2014) 1633–1639

Contents lists available at ScienceDirect

Resuscitation

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

Clinical paper

Outcomes following out-of-hospital cardiac arrest with an initial cardiac rhythm of asystole or pulseless electrical activity in Victoria, Australia☆

E. Andrew[a,b,*], Z. Nehme[a,b], M. Lijovic[a,b], S. Bernard[a,b,c], K. Smith[a,b,d]

[a] Department of Research and Evaluation, Ambulance Victoria, Doncaster, Melbourne, VIC, Australia
[b] Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University, Prahran, Melbourne, VIC, Australia
[c] Intensive Care Unit, Alfred Hospital, Prahran, Melbourne, VIC, Australia
[d] Discipline of Emergency Medicine, School of Primary, Aboriginal and Rural Health Care, University of Western Australia, Crawley, Perth, WA, Australia

ARTICLE INFO

Article history:
Received 27 May 2014
Received in revised form 14 July 2014
Accepted 24 July 2014

Keywords:
Heart arrest
Cardiopulmonary resuscitation
Emergency medical services
Outcome studies

ABSTRACT

Background: While internationally reported survival from out-of-hospital cardiac arrest (OHCA) is improving, much of the increase is being observed in patients presenting to emergency medical services (EMS) in shockable rhythms. The purpose of this study was to assess survival and 12-month functional recovery in patients presenting to EMS in asystole or pulseless electrical activity (PEA).
Methods: The Victorian Ambulance Cardiac Arrest Registry was searched for adult OHCA patients presenting in non-shockable rhythms in Victoria, Australia between 1st July 2003 and 30th June 2013. We excluded patients defibrillated prior to EMS arrival and arrests witnessed by EMS. Twelve-month quality-of-life interviews were conducted on survivors who arrested between 1st January 2010 and 31st December 2012. The main outcome measures were survival to hospital discharge and 12-month functional recovery measured by the Extended Glasgow Outcome Scale (GOSE).
Results: A total of 38,378 non-shockable OHCA attended by EMS were included, of which 88.0% were asystole and 11.6% were PEA. Of the patients receiving resuscitation, survival to hospital discharge was 1.1% for asystole and 5.9% for PEA ($p < 0.001$), with no significant improvement observed over the 10 year study period. In survivors with 12-month follow-up data, the combined rate of death, vegetative state or lower severe disability was 66.7% (95% CI 41.0–80.0%) for asystole and 44.7% (95% CI 30.2–59.9%) for PEA.
Conclusion: Survival outcomes following OHCA with initial rhythms of asystole or PEA did not improve over the 10-year study period. Our findings indicate high rates of death within 12 months, and unfavourable functional recovery for survivors.

© 2014 Elsevier Ireland Ltd. All rights reserved.

Outcome ACR da ritmi non defibrillabili

Nessun miglioramento sulla prognosi dell'arresto cardiaco da ritmo non defibrillabile negli ultimi 10 anni!

Survival to hospital	
Asystole	**PEA**
n=1,203 (15.4%)	n=1,333 (33.6%)
Survival to discharge	
Asystole	**PEA**
n=83 (1.1%)	n=233 (5.9%)

Riflettiamo

Azioni in caso di ACR da ritmi defibrillabili

- ❌ Gestione delle vie aeree
- ✔ Massaggio cardiaco
- ✔ Defibrillazione
- ❌ Adrenalina
- ❌ Antiaritmici

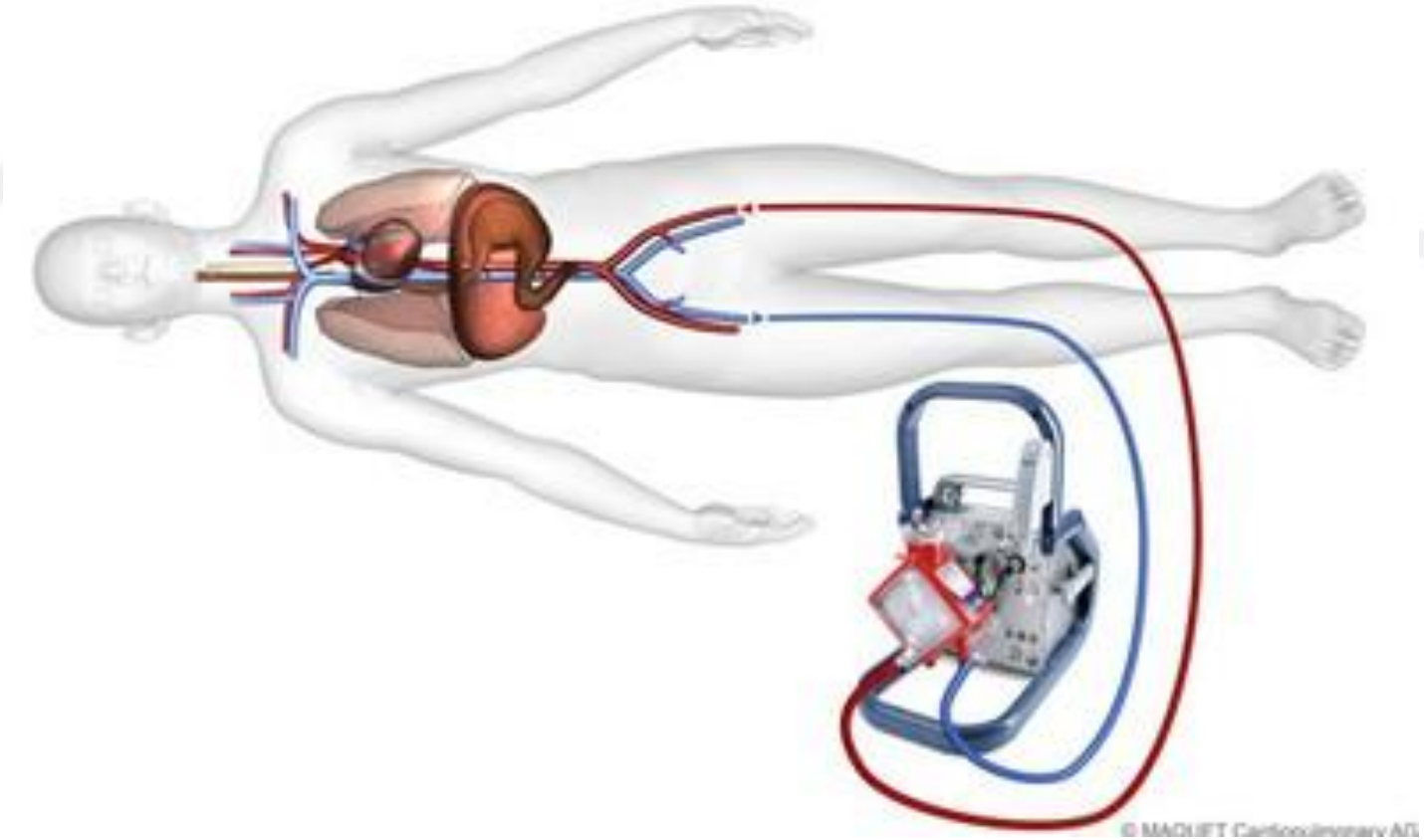
Riflettiamo

Azioni in caso di ACR da ritmi defibrillabili

- ✗ Gestione delle vie aeree
- ✓ Massaggio cardiaco
- ✗ Adrenalina

Nuove prospettive intraospedaliere

Centri ECMO e circolazione extracorporea



ECMO ed ACR

<u>Guadagnare tempo</u>

Individuare ed eventualmente trattare le cause potenzialmente reversibili

Nuove prospettive extraospedaliere

- Massaggio cardiaco meccanico
- Manovre ALS di alta qualità in itinere

Quali pazienti trasportare

Criteri di eligibilità

- Pazienti giovani, con buone possibilità di outcome neurologico
- Breve tempo di no flow
- Brevi tempi di trasporto verso il centro ECMO (tempo di low flow)

Quali pazienti trasportare

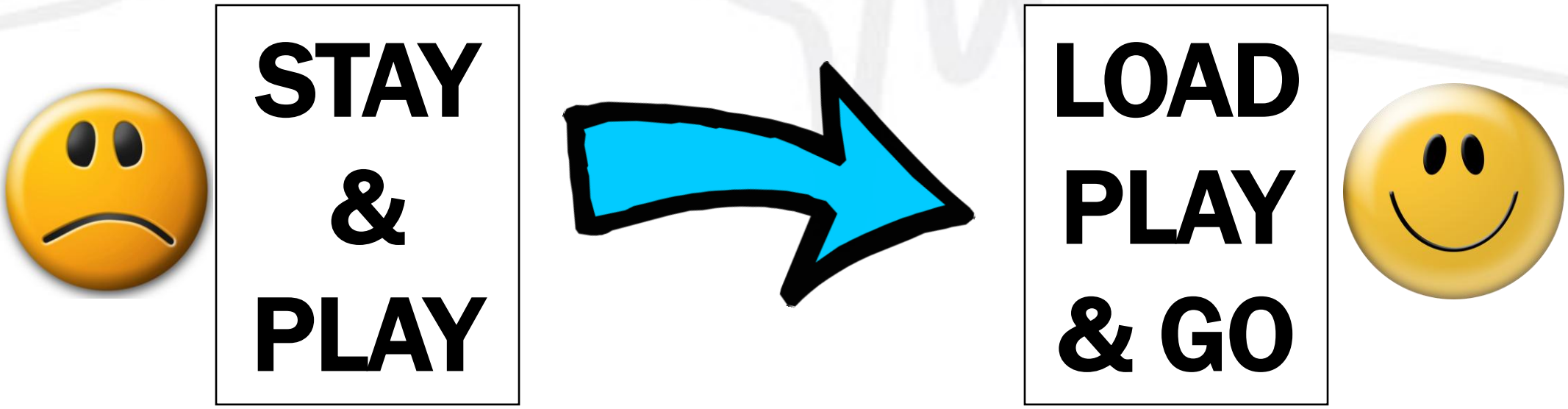
PROTOCOLLO ELS

ACR da causa non traumatica	**Si**	**No**
Età compresa tra 14 e 70 anni	**Si**	**No**
Tempo ACR/RCP a DEA Careggi <90 min.	**Si**	**No**

ACR Testimoniato e Tempo ACR a DEA Careggi <90 min			**ACR Non testimoniato e RCP to DEA Careggi <90 min.**		
Tempo da ACR a RCP<20 min.	**Si** ✓	**No** ✖	Esiste **almeno una** **delle due condizioni** • Primo ritmo (automatico o manuale) rilevato defibrillabile • E' presente una causa potenzialmente reversibile ☐ *Ipotermia* ☐ *Intossicazione da farmaci* ☐ *Altre cause reversibili*	**Si** ✓	**No** ✖

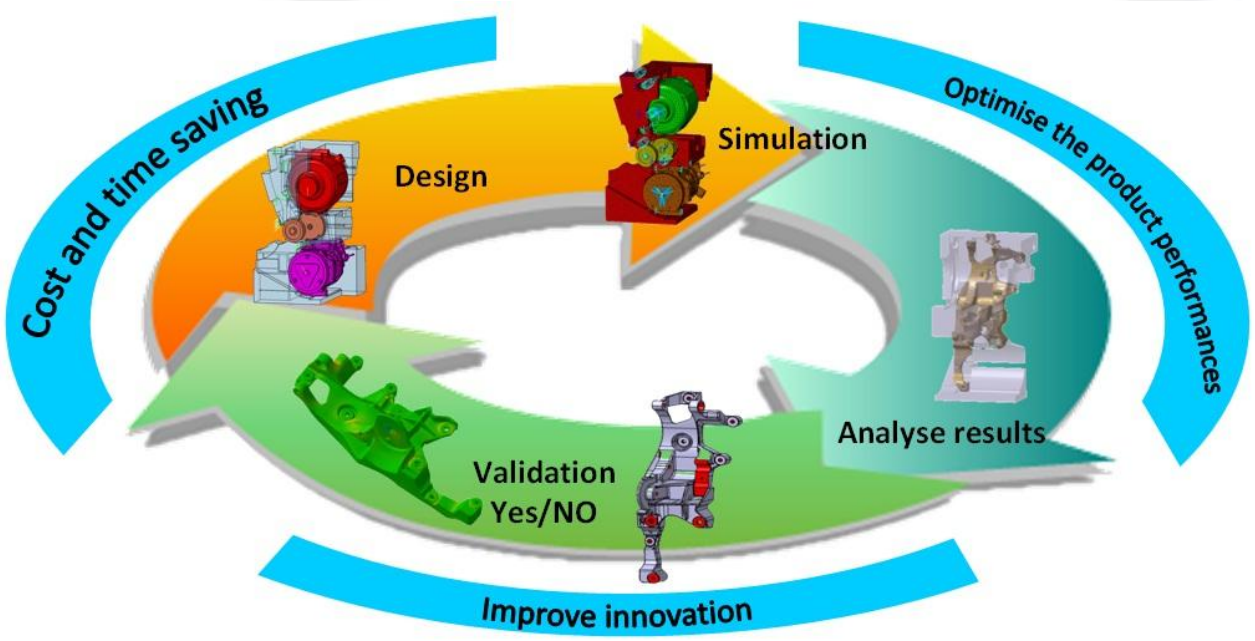
La sfida per il sistema 118

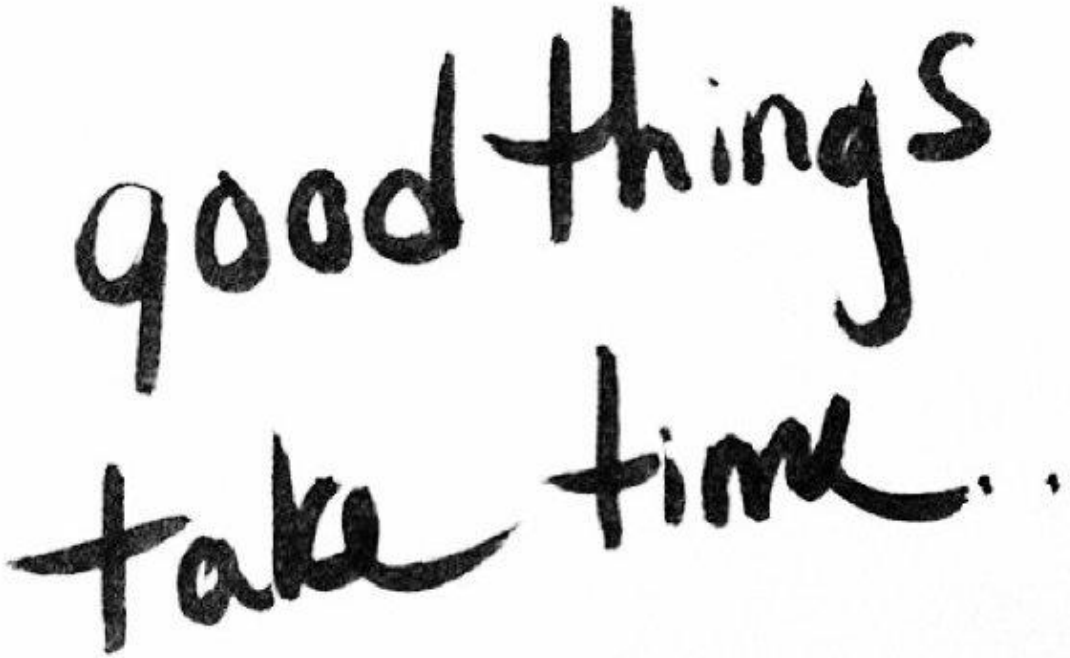
- Cambio di mentalità
- Cambio di strategia
- Innalzamento della qualità dei professionisti



La sfida per il sistema 118

- Cambio di mentalità
- Cambio di strategia
- Innalzamento della qualità dei professionisti





La sfida per i professionisti sanitari

LOAD
PLAY&
GO

6 minute timer

6:00

Time map ACR in caso di paziente elgibile per ELS

Arrivo sul posto

0 min

- Inizio ALS
- Inizio primo ciclo RCP
- Massaggio cardiaco manuale
- Ventilazione a maschera
- Derivazione del ritmo con piastre autoadesive(eventuale defibrillazione)
- Fine primo ciclo ALS
- Valutazione del ritmo (eventuale defibrillazione)
- Posizionamento del massaggiatore meccanico

2 min

- Inizio secondo ciclo ALS
- Inizio massaggio cardiaco meccanico
- Valuta l'elegibilità del paziente per il protocollo ECLS
- Ventilazione a maschera
- Fine secondo ciclo ALS
- Valutazione del ritmo (eventuale defibrillazione)

4 min

- Inizio terzo ciclo
- Massaggio meccanico
- Gestione delle vie aeree (Team leader)
- Ventilazione
- Accesso venoso
- Somministrazione di 1 mg di Adrenalina ev ogni 5 min
- Somministra liquidi freddi (max 1 L)
- Somministrazione di Amiodarone 300 mg ev (se indicato)
- Fine terzo ciclo
- Valutazione del ritmo (eventuale defibrillazione)

6 min

- Inizio quarto ciclo ALS
- Massaggio cardiaco meccanico
- Ventilazione
- Ricerca ed eventualmente correggi le cause reversibili
- Comunica alla CO l'eventuale elegibilità del paziente per il protocollo ECLS
- Trasporto del paziente verso l'ambulanza

In itinere verso il DEA

- Massaggio cardiaco meccanico
- Ventilazione
- Defibrillazione (se indicata)
  - Adrenalina 1 mg ev ogni 5 min
  - Amiodarone 150 ev (se indicato)
  - Altri farmaci (se indicati)
  - Somministra liquidi freddi

Arrivo in DEA Careggi

All'arrivo in DEA

<u>1 Step: Verifica dei criteri da parte dell'ECMO Team</u>

- Elegibili ECLS terapeutico
- Non elegibili per ECLS terapeutico, verifica dei criteri per donazione a cuore fermo (NHBD)

All'arrivo in DEA

2 Step: ECLS trapeutico

- Incannulamento dei vasi
- Inizio della circolazione extracorporea
- Interventi diagnostico/terapeutico di II livello

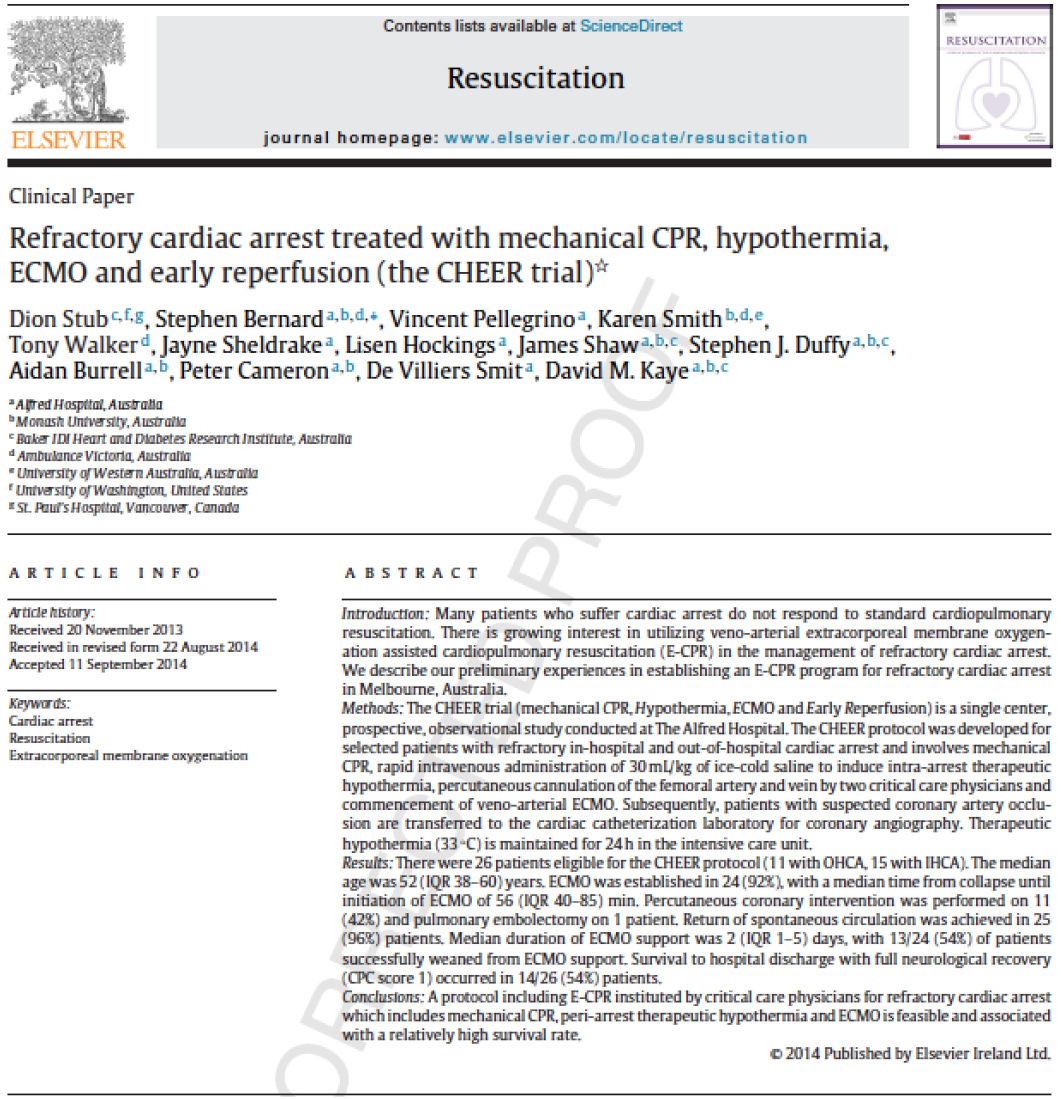
All'arrivo in DEA

<u>3 Step: Outcome clinico</u>

- Responder, ROSC, valutazione outcome neurologico
- Non responder, no ROSC, verifica dei criteri per donazione a cuore fermo (NHBD)

Cosa succede nel mondo

- Overall, ROSC was achieved in 25/26 (92%) of patients
- Survival to hospital discharge occurred in 14/26 (54%)
- All survivors were discharged directly home with full neurological recovery (CPC = 1).



Contents lists available at ScienceDirect

Resuscitation

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

Clinical Paper

Refractory cardiac arrest treated with mechanical CPR, hypothermia, ECMO and early reperfusion (the CHEER trial)☆

Dion Stub[c,f,g], Stephen Bernard[a,b,d,*], Vincent Pellegrino[a], Karen Smith[b,d,e], Tony Walker[d], Jayne Sheldrake[a], Lisen Hockings[a], James Shaw[a,b,c], Stephen J. Duffy[a,b,c], Aidan Burrell[a,b], Peter Cameron[a,b], De Villiers Smit[a], David M. Kaye[a,b,c]

[a] Alfred Hospital, Australia
[b] Monash University, Australia
[c] Baker IDI Heart and Diabetes Research Institute, Australia
[d] Ambulance Victoria, Australia
[e] University of Western Australia, Australia
[f] University of Washington, United States
[g] St. Paul's Hospital, Vancouver, Canada

ARTICLE INFO

Article history:
Received 20 November 2013
Received in revised form 22 August 2014
Accepted 11 September 2014

Keywords:
Cardiac arrest
Resuscitation
Extracorporeal membrane oxygenation

ABSTRACT

Introduction: Many patients who suffer cardiac arrest do not respond to standard cardiopulmonary resuscitation. There is growing interest in utilizing veno-arterial extracorporeal membrane oxygenation assisted cardiopulmonary resuscitation (E-CPR) in the management of refractory cardiac arrest. We describe our preliminary experiences in establishing an E-CPR program for refractory cardiac arrest in Melbourne, Australia.

Methods: The CHEER trial (mechanical CPR, Hypothermia, ECMO and Early Reperfusion) is a single center, prospective, observational study conducted at The Alfred Hospital. The CHEER protocol was developed for selected patients with refractory in-hospital and out-of-hospital cardiac arrest and involves mechanical CPR, rapid intravenous administration of 30 mL/kg of ice-cold saline to induce intra-arrest therapeutic hypothermia, percutaneous cannulation of the femoral artery and vein by two critical care physicians and commencement of veno-arterial ECMO. Subsequently, patients with suspected coronary artery occlusion are transferred to the cardiac catheterization laboratory for coronary angiography. Therapeutic hypothermia (33 °C) is maintained for 24 h in the intensive care unit.

Results: There were 26 patients eligible for the CHEER protocol (11 with OHCA, 15 with IHCA). The median age was 52 (IQR 38–60) years. ECMO was established in 24 (92%), with a median time from collapse until initiation of ECMO of 56 (IQR 40–85) min. Percutaneous coronary intervention was performed on 11 (42%) and pulmonary embolectomy on 1 patient. Return of spontaneous circulation was achieved in 25 (96%) patients. Median duration of ECMO support was 2 (IQR 1–5) days, with 13/24 (54%) of patients successfully weaned from ECMO support. Survival to hospital discharge with full neurological recovery (CPC score 1) occurred in 14/26 (54%) patients.

Conclusions: A protocol including E-CPR instituted by critical care physicians for refractory cardiac arrest which includes mechanical CPR, peri-arrest therapeutic hypothermia and ECMO is feasible and associated with a relatively high survival rate.

© 2014 Published by Elsevier Ireland Ltd.

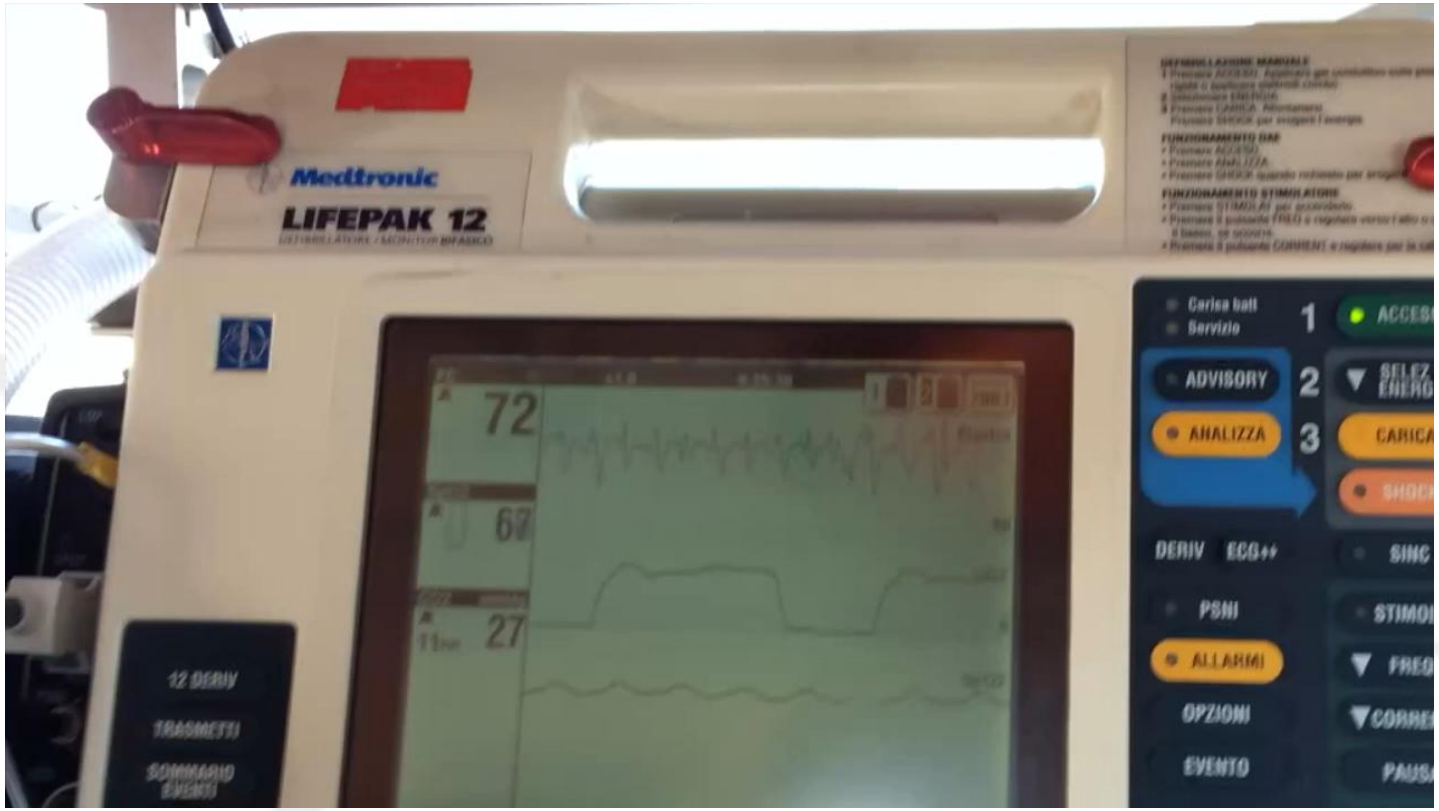
Ma se non ho il centro ECMO?

- Appoggio logistico in centro non ECMO e poi trasferimento in elisoccorso
- ECMO Team itinerante con ECMO portatile
- Adeguamento della rete preospedaliera
- Adeguamento delle strutture dei DEA

Ma se non ho il centro ECMO?

- ACR in paziente giovane, potenzialmente salvabile, con prospettiva di buon outcome neurologico
- Possibilità diagnostico/terapeutiche extraospedaliere
- ALS di alta qualità in itinere
- Possibilità diagnostico/terapeutiche

Caso clinico



Outcome

As I had promised, I send you some news about my daughter.

She is, since November the 2nd, in the hospital (a big hospital close to Paris) ultra specialized for rehabilitation post reanimation.

She is now free of all reanimation instruments.

Today, the medical staff would begin sessions of active physiotherapy (physical therapy). She moves the arms and the head, but, the shoulders, the chest, and the legs don't move for the moment. The doctors say that it will be long for her to regain a normal walk. Every day, she is sitting on an medical armchair for one or two hours.

She has at the moment a problem of swallowing (deglutition). It is very hard for her to eat and she don't eat enough. But, every day she can eat more than the day before! We have to be patient.

On the cerebral side, the progress are very good. She remembers of a lot of things, persons, photos ..... She reads, speaks, counts without too much difficulty. For the written expression, it is too early to have an opinion (the hands are not very skilful), but the doctors are very optimistic. But two problems: she has a low and weak voice (the speech therapist said that situation will improve slowly) and she is a little lost in the chronology of dates and events. The doctors say to us that it is necessary to give time to the time!

Thanks again

Nadine et Bernard

Grazie.

Mario Rugna

mrugna@yahoo.it

medest118.com

@medest118

Mario Rugna

Medest

Medest Articles & News

MEDEST

x congresso nazionale simeu

NAPOLI 18-20 NOVEMBRE 2016