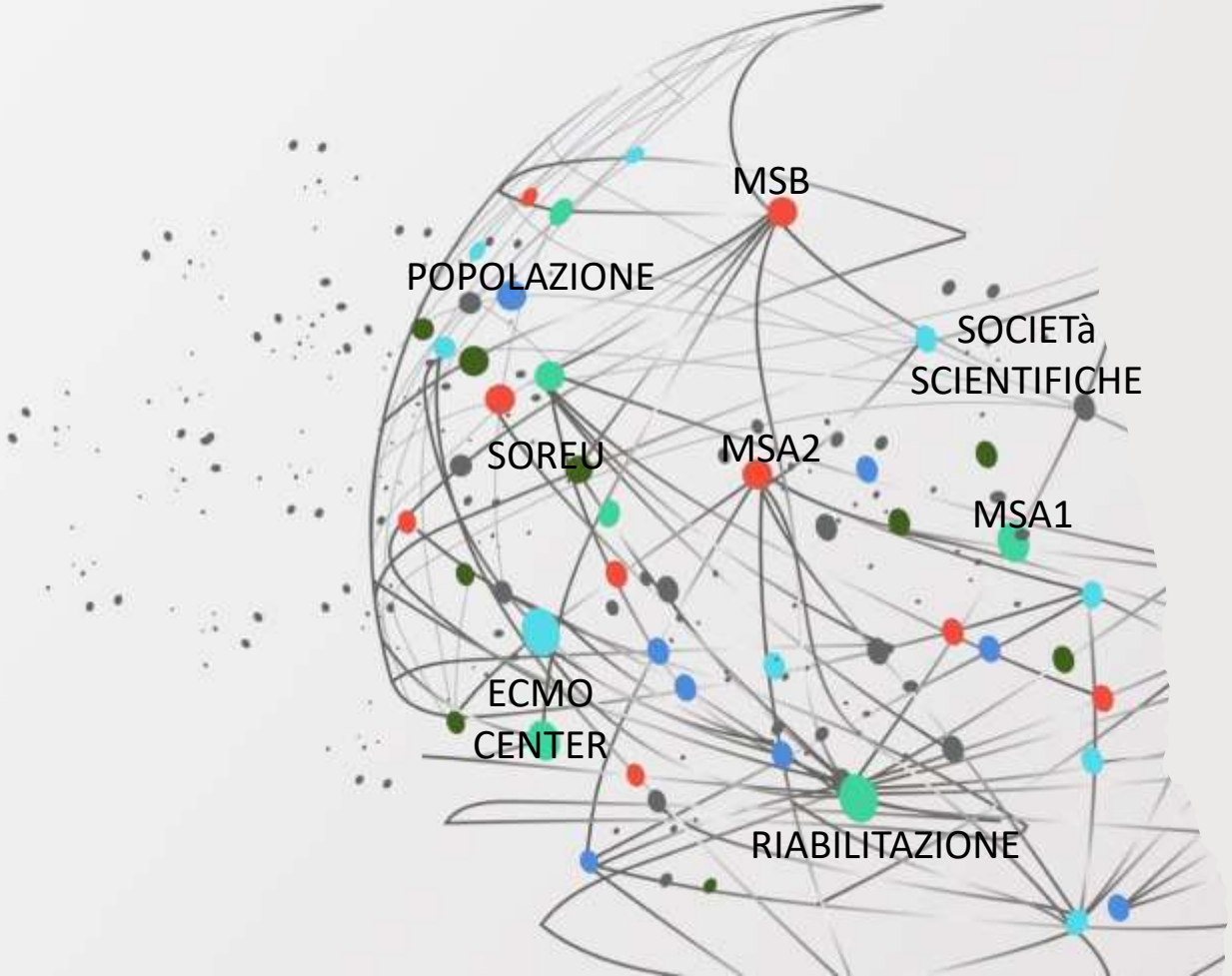
Rimini
IRC 2021
CONGRESSO NAZIONALE
16•17•18 DICEMBRE
NUOVE LINEE GUIDA 2021:
RIANIMAZIONE CARDIOPOLMONARE
POST-LOCKDOWN



ECLS: esperienze a confronto

un sistema per salvare vite

Rimini 18 Dicembre 2021

Dr.ssa Claudia Ruffini - Dr.ssa Gabriella Arlotta

L’arresto cardiaco è un causa di morte evitabile

La sopravvivenza a 30 giorni nei pazienti vittima di ACC pre-ospedaliero è pari al 10%

L’OHCA (Out-of-hospital Cardiac Arrest) rappresenta un problema rilevante:

In USA → circa 350000 casi/anno
In Europa → circa 275000 casi/anno

Tassi di sopravvivenza alla dimissione post-OHCA → 2-15%

Prognosi neurologica scadente nei sopravvissuti.

Yan *et al. Critical Care* (2020) 24:61
https://doi.org/10.1186/s13054-020-2773-2

Circulation
Volume 141, Issue 9, 3 March 2020; Pages e139-e596
https://doi.org/10.1161/CIR.0000000000000757

*Yan S. Gan. Y et al. « The global survival rate among adult out of hospital cardiac arrest patients who received cardiopulmonary resuscitation: a sistematic rewiev and meta-analisys» Crit.Care **2020**, 24,61*

Resuscitation 105 (2016) 188–195

Contents lists available at ScienceDirect

Resuscitation

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

Clinical paper

EuReCa ONE—27 Nations, ONE Europe, ONE Registry
A prospective one month analysis of out-of-hospital cardiac arrest outcomes in 27 countries in Europe☆

Jan-Thorsten Gräsner[a,b,*], Rolf Lefering[c], Rudolph W. K
Bernd W. Böttiger[f], Johan Herlitz[g], Jan Wnent[a,b], Ingvil
Fernando Rosell Ortiz[i], Holger Maurer[j], Michael Baubi
Irzal Hadžibegović[m], Marios Ioannides[n], Roman Škulec
Hervé Hubert[r], Nikolaos I. Nikolaou[s], Gerda Lóczi[t], Hil
Federico Semeraro[v], Peter J. Wright[w], Carlo Clarens[x], R
Vitor Gouveia Correia[aa], Diana Cimpoesu[ab], Violetta Ra
Andrej Markota[ae], Anneli Strömsöe[af], Roman Burkart[ag]
Leo L. Bossaert[ai], on behalf of EuReCa ONE Collaborator

RESUSCITATION 161 (2021) 80–97

Available online at www.sciencedirect.com

Resuscitation

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

European Resuscitation Council Guidelines 2021: Systems saving lives

Federico Semeraro[a,], Robert Greif[b], Bernd W Böttiger[c], Roman Burkart[d], Diana Cimpoesu[e], Marios Georgiou[f], Joyce Yeung[g], Freddy Lippert[h], Andrew S Lockey[i], Theresa M. Olasveengen[j], Giuseppe Ristagno[k], Joachim Schlieber[l], Sebastian Schnaubelt[m], Andrea Scapigliati[n], Koenraad G Monsieurs[o]*

SOREU METROPOLITANA

- Area 1981 Km^2
- Residenti: 4.038.864
- Flussi/giorno: 1.000.000

MSB (mezzo di soccorso di base): 102

MSA1 (auto infermieristica): 5

MSA2 (automedica) : 11

Sito www./areulombardia.it

Arresti Cardiaci in Regione Lombardia

	2020	2019	2018		2020	2019	2018
SRP	1923	1794	1756		606	646	643
SRM	5858	5423	5369		2853	2831	2980
SRL	2653	2354	2226		924	896	857
SRA	2938	2569	2468		1016	932	884

Quale risorsa ospedaliera?

Extracorporeal Cardiopulmonary Resuscitation in Adults. Interim Guideline Consensus Statement From the Extracorporeal Life Support Organization

- Emodinamica interventistica
- Elettrofisiologia interventistica
- Cardiochirurgia

RegioneLombardia
LA GIUNTA

DELIBERAZIONE N° XI / 2562 Seduta del 02/12/2019

Oggetto

ULTERIORI DETERMINAZIONI IN MERITO ALL'APPLICAZIONE DELLA METODICA ECMO (EXTRA CORPOREAL MEMBRANE OXYGENATION): INDIVIDUAZIONE DEI CENTRI REGIONALI PER IL TRATTAMENTO DELLO SHOCK CARDIOGENO O ARRESTO CARDIACO REFRATTARIO E DELLA SINDROME DA INSUFFICIENZA RESPIRATORIA ACUTA GRAVE

«La sopravvivenza è migliore nei centri con almeno 30 impianti di ECMO all'anno «

Barbaro, R.P. et al."Association of hospital-level volume of ectracorporeal membrane oxygenation cases and mortality: analisys of the extracorporeal life support organization registry"Am. J. Respir. Crit. Care Med. 2015,191, 894-901

4 settembre 2021- Ore 14:38

Richiesta di soccorso per dolore toracico

Maschio

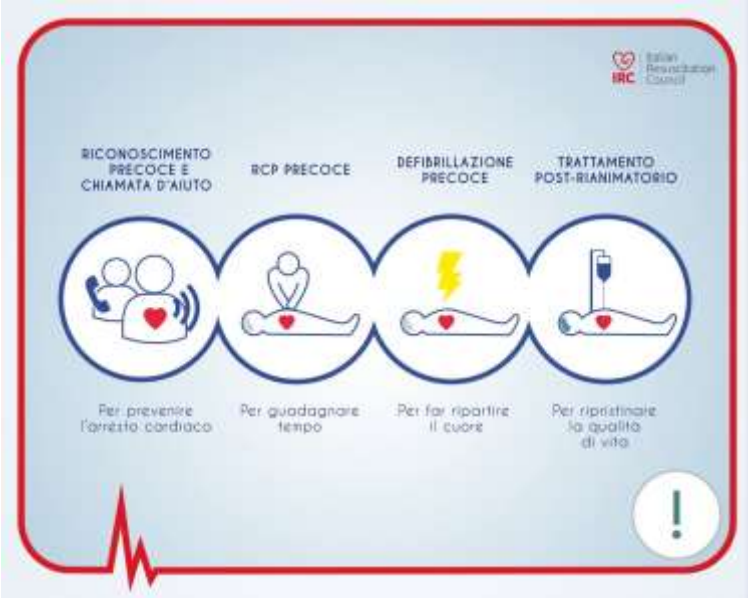
54 anni

Sudato

Eupnoico

Località: Settimo Milanese

Un sistema per salvare vite



Richiesta soccorso 14:38

MSB 14:55*

MSA1 14:56*

MSA2 15:08*

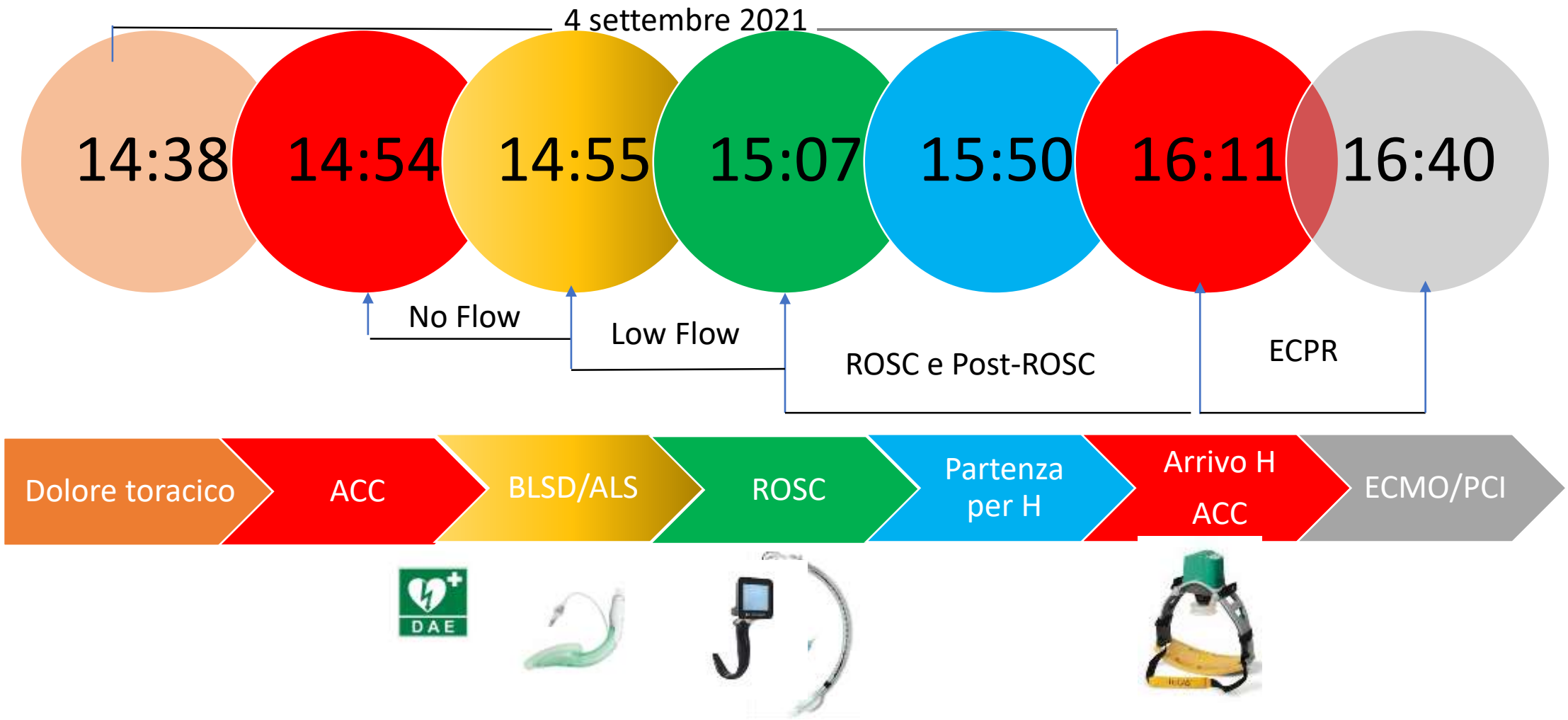
* Orario di arrivo sul luogo dell'evento

Il paziente

- ACC testimoniato
- Età :54 anni
- Ritmo di presentazione: defibrillabile
- Non comorbilità maggiori

- BMI :33,95
- Fumatore

La sequenza dei soccorsi



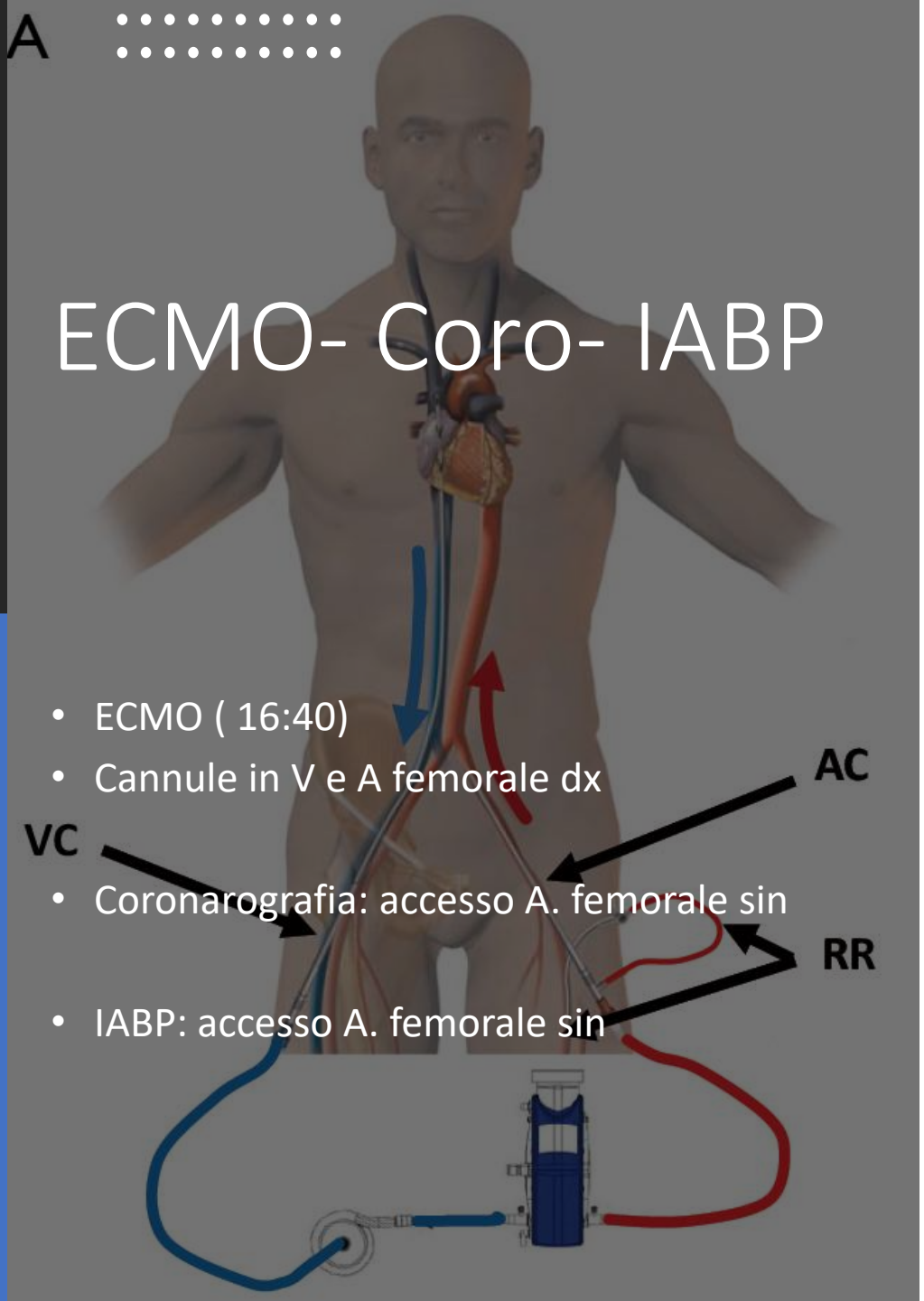
Il fattore tempo

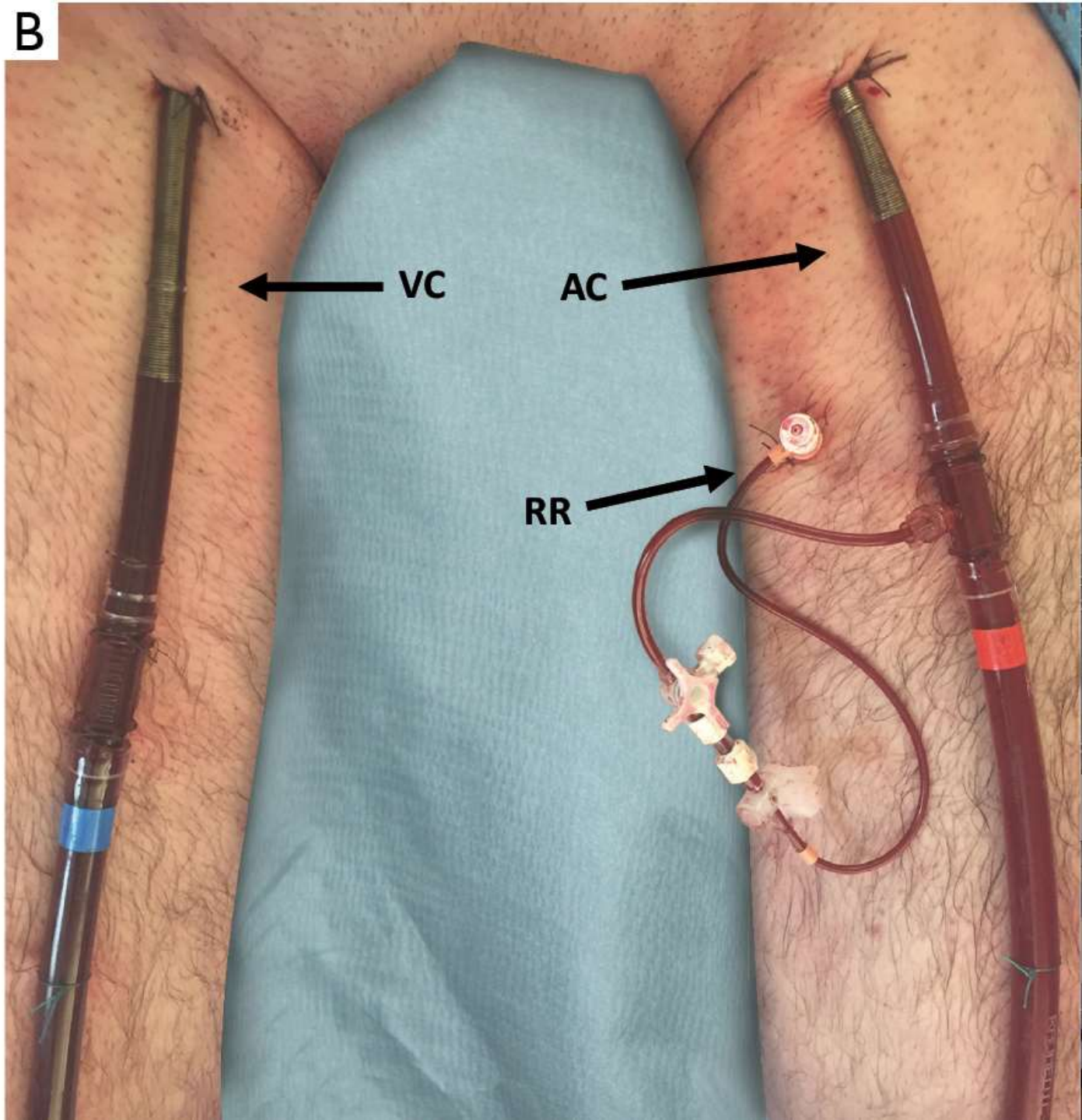
The time required to establish ECMO support is highly dependent upon the capabilities of the resuscitation team and patient factors. It may be achieved in as little as 10 minutes but may take longer.[9] We therefore advise early assessment for ECPR candidacy. It is reasonable to consider commencing cannulation after 10–20 minutes of failed resuscitation efforts. Beyond 20 minutes of refractory arrest, the probability of ROSC and survival with CCPR is <5%[17,18]; thus, the risks of V-A ECMO and ECPR at this point, with appropriately selected patients and providers, may be justified.

CCPR was 14%.[19] Until there are more robust data to the contrary, we recommend that the goal of ECPR is to establish adequate ECMO flow within 60 minutes of onset of cardiac arrest.

ECMO- Coro- IABP

- ECMO (16:40)
- Cannule in V e A femorale dx
- Coronarografia: accesso A. femorale sin
- IABP: accesso A. femorale sin

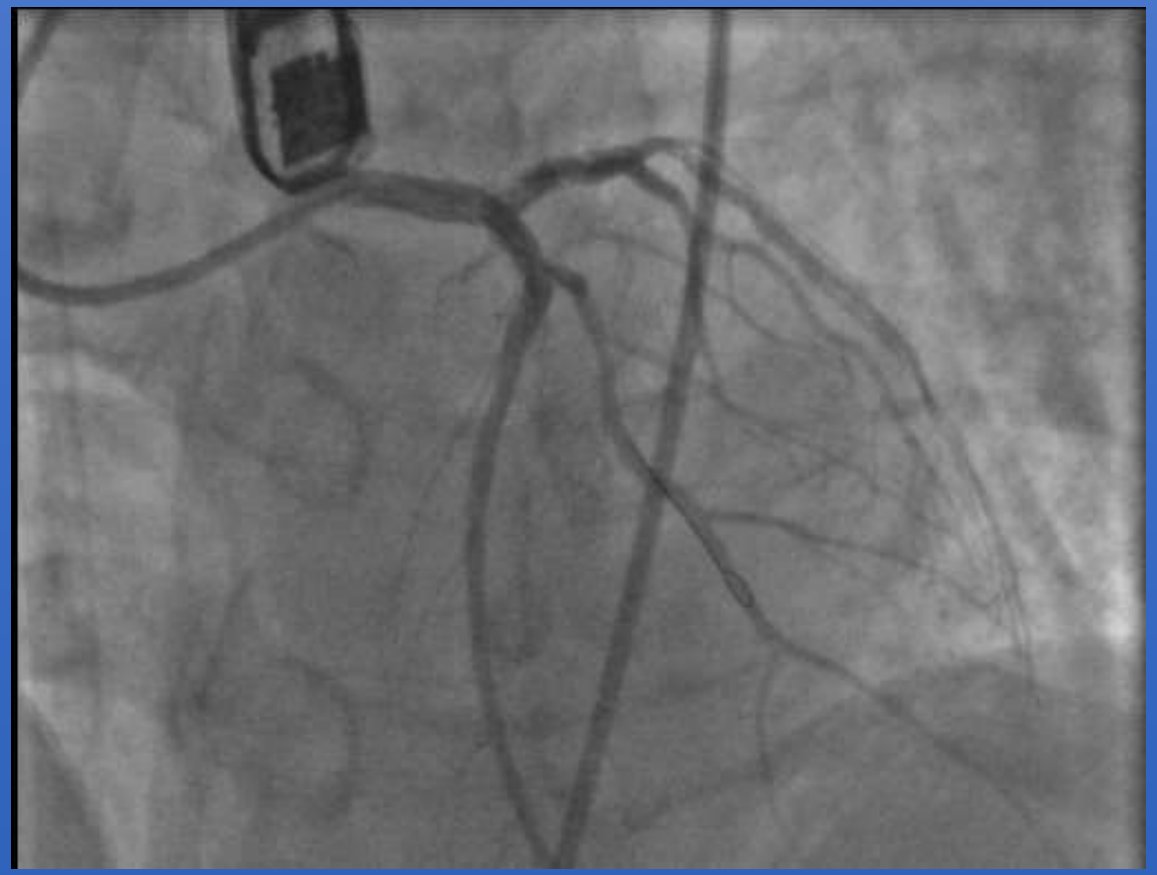




Pre PCI Post

IVA: stenosi prossimale TIMI 0
Cdx dominante: stenosi non significativa tratto distale

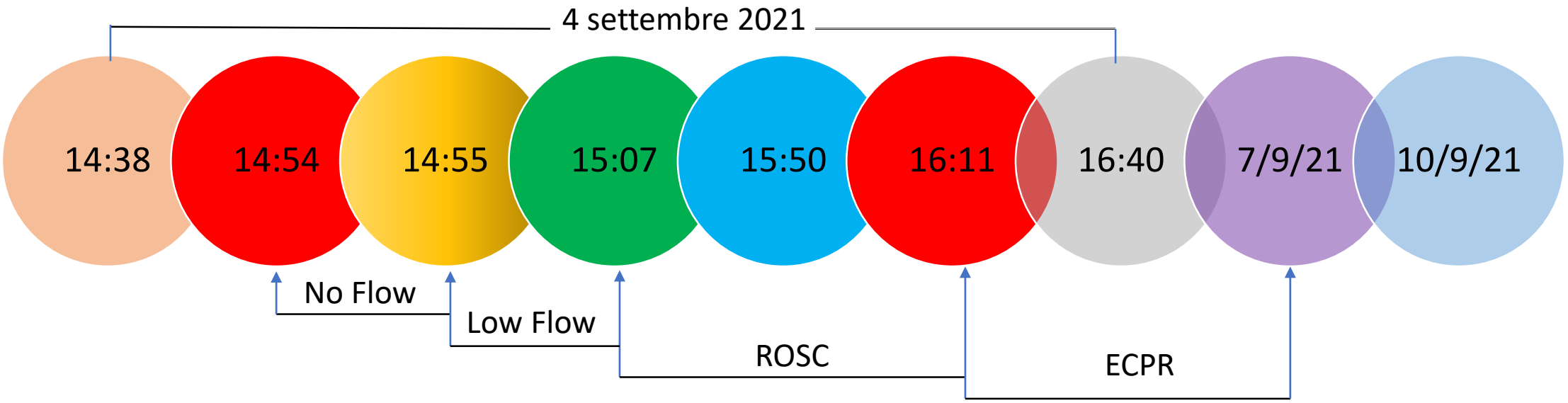
17:00 Trombectomia manuale
Impianto di DES su IVA a cavallo origine D1

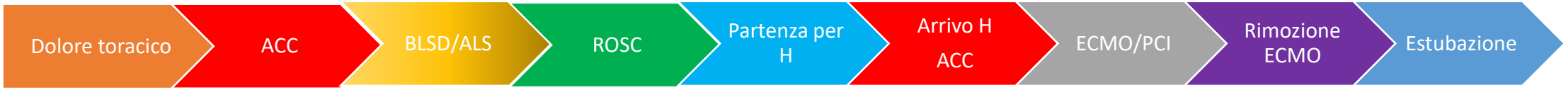


13/9/21: dimissione da terapia intensiva

- In data 04/09 STEMI anteriore complicato da ACC refrattario con necessità di ECMO VA + IABP + supporto inotropo
- massimale. Rivascolarizzazione con angioplastica primaria IVA (occlusione prossimale, TIMI 0, posizionato DES -
- TIMI 3).
- DECORSO IN UCICT
- - Iniziale gravissima disfunzione biventricolare con necessità di supporto meccanico (ECMO VA+ IABP) e
- farmacologico massimale (ADR 0,9mcg/kg/min). Successiva ripresa della funzione biventricolare con rimozione
- ECMO VA in 3^, rimozione IABP in 4^ giornata, progressivo scalo del supporto aminico fino a sospensione in data
- 12/09. Ultimo eco TT (12/9): Vsx non dilatato, FE 45-50%, acinesia apice inferosettale, ipocinesia delle restanti
- porzioni apicali. VDx di dimensioni e cinesi normali, TAPSE >20. Non valvulopatie di rilievo, non versamento.
- Esitano onde Q in sede anterosettale. Enzimi cardiaci in discesa.
- Transitorio screzio epato-renale (AST 153?40, ALT 200?64, Crea max , N max 102) attualmente in remissione.
- Diuresi stimolata da diurestico ic, passato a boli
- - Necessità di iniziali pressioni di ventilazione elevate in paziente obeso e con successiva insorgenza di polmonite
- basale destra da Haemophilus multisensibile, trattata con ceftriaxone per 5 gg con miglioramento clinico e
- laboratoristico. Estubazione in data 10/9, eseguiti cicli di NIV con beneficio, intrapresa FKT respiratoria
- - Inizialmente sedato per neuroprotezione, successivamente risveglio fino a completa ripresa neurologia ottimale.
- - Inizialmente antiaggregato con tirofiban, successivamente embricazione con DAPT (ASA e ticagrelor).

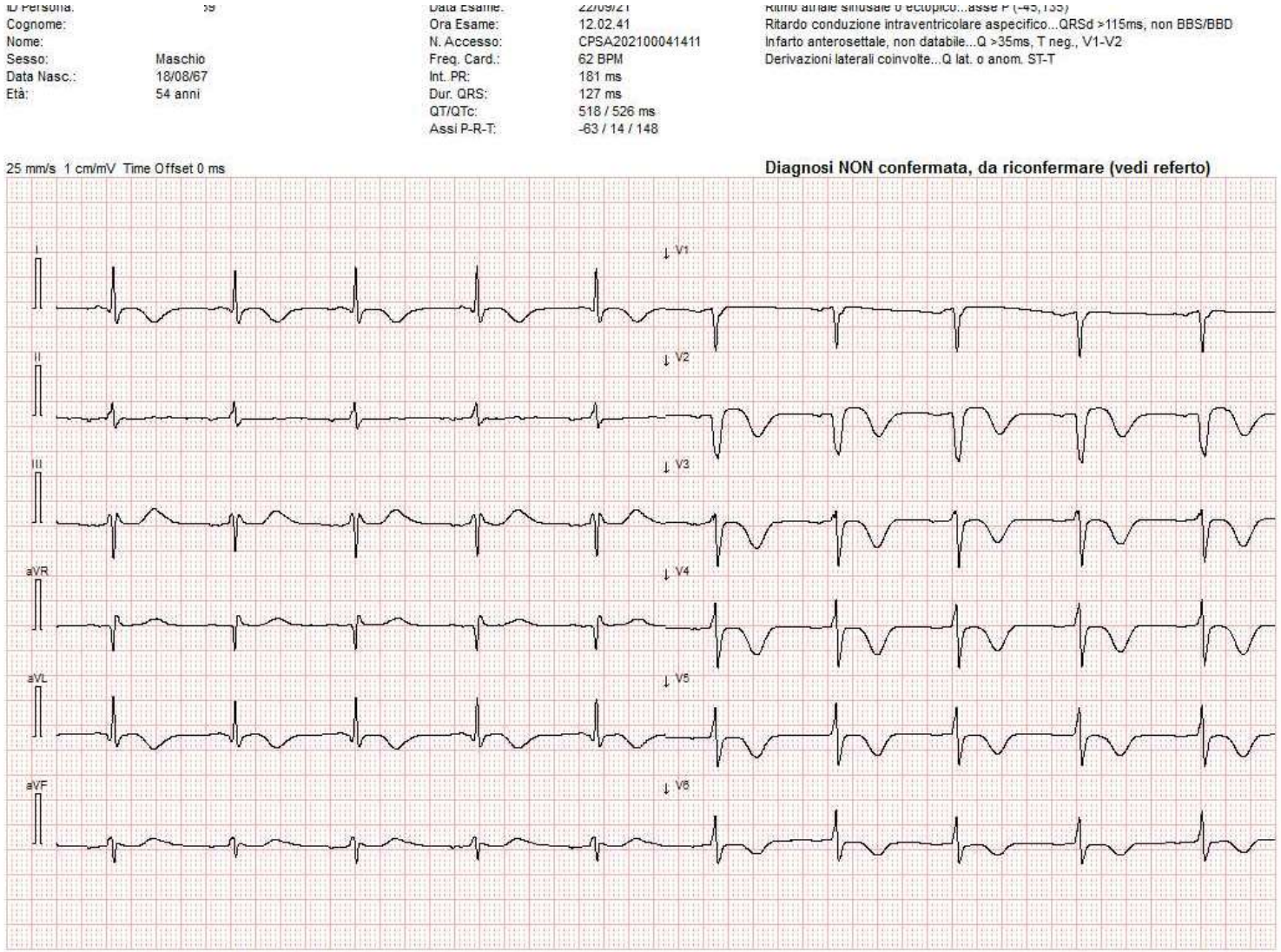
La sequenza dei soccorsi





CPC 1

22/9/2021: dimissione da ospedale



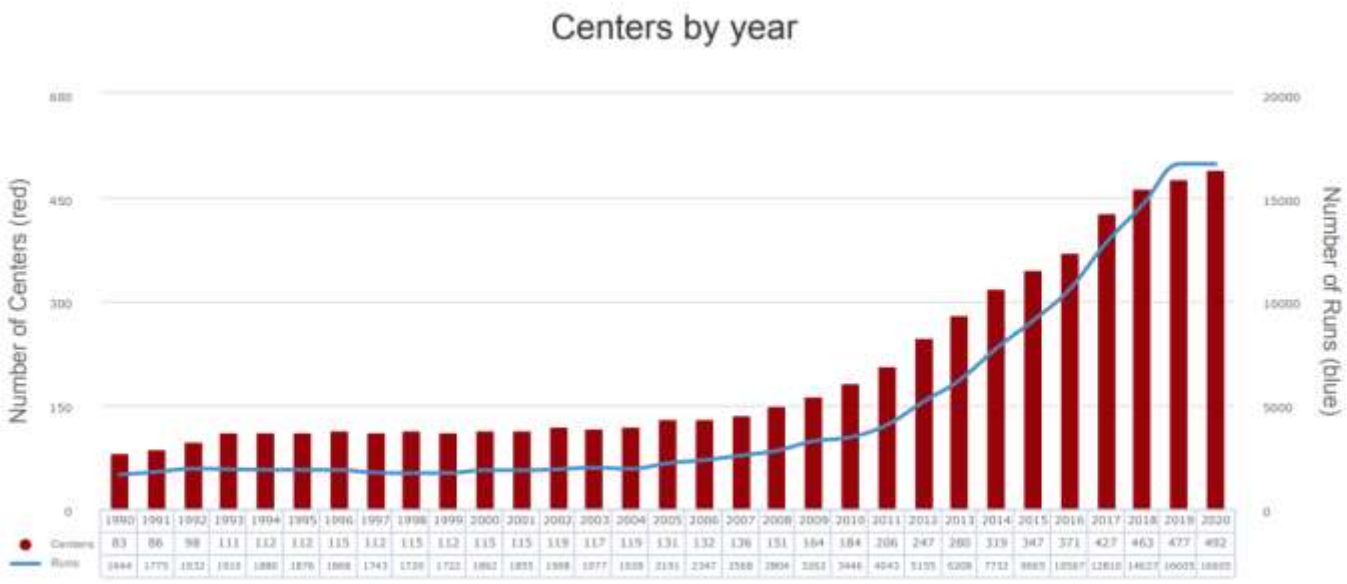
Centri Ecmo: sviluppo della rete

ASAIO Journal 2021 ELSO Guidelines

Extracorporeal Cardiopulmonary Resuscitation in Adults. Interim Guideline Consensus Statement From the Extracorporeal Life Support Organization

Alexander (Sacha) C. Richardson, MD, FCICM,* Joseph E. Tonna, MD, MS,† Vinodh Nanjayya, MD,* Paul Nixon, MD,* Darryl C. Abrams, MD,‡ Lakshmi Raman, MD,§ Stephen Bernard, MD,¶ Simon J. Finney, MD,‖ Brian Grunau, MD,# Scott T. Youngquist, MD, MS,† Stephen H. McKellar, MD, MS,† Zachary Shinar, MD,** Jason A. Bartos, MD, PhD,†† LanceB. Becker, MD,‡‡ Demetris Yannopoulos, MD,†† Jan Belohlávek, MD, PhD,§§ Lionel Lamhaut, MD,¶¶ and Vincent Pellegrino, MD*

Reviewers: Robert Neumar, MD,*** Shingo Ichiba, MD,††† Thomas Mueller, MD,‡‡‡ Alain Combes, MD, PhD§§§



Esperienze a confronto: ECPR intraospedaliera

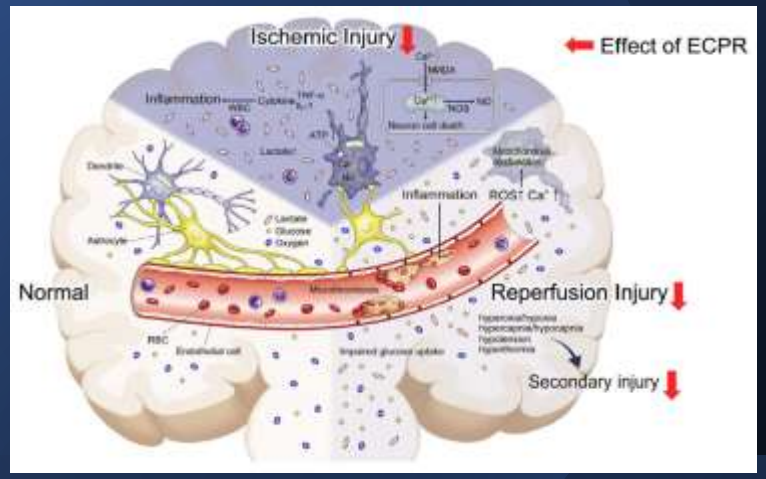
- Maschio
- 70 anni
- Cardiopatia ischemica
- Fe 30%- Obesità
- BY-pass Ao-Co ->Revisione sternale in V giornata (sterno instabile)
- ACC durante la notte fra la VII e VIII giornata->resternotomia in emergenza: non evidenza di cause reversibili
- ECMO VA a 55minuti dall'avvio C-CRP
- Emodinamica: embolia polmonare
- Sala operatoria: embolectomia polmonare
- Esito: GCS 3 – MOF- Sospensione ECMO a 72 ore

Selezione pazienti: standards consigliati

Table 1. Example of Inclusion Criteria for ECPR

Age < 70 years[14]
Witnessed arrest
Arrest to first CPR ("no-flow interval") < 5 minutes (*i.e.*, bystander CPR)
Initial cardiac rhythm of VF/pVT/PEA
Arrest to ECMO flow < 60 minutes "low flow interval"*
ETCO2 > 10 mm Hg (1.3 kPa) during CCPR before cannulation for ECMO
Intermittent ROSC or recurrent VF
"Signs of life" during conventional CPR may be a positive predictive factor for survival
The absence of previously known life limiting comorbidities (*e.g.* end stage heart failure/chronic obstructive pulmonary disease/end-stage renal failure/liver failure/terminal illness) and consistent with patient's goals of care
No known aortic valve incompetence (>mild aortic valve incompetence should be excluded)

*Unless other favorable prognostic features are present: *e.g.*, periods of intermittent ROSC/hypothermia prearrest/young age/signs of life during CPR. CPR, cardiopulmonary resuscitation; ECMO, extracorporeal membrane oxygenation; ECPR, extracorporeal cardiopulmonary resuscitation; ROSC, return of spontaneous circulation.



Original Investigation | Emergency Medicine

Development and Validation of a Clinical Score to Predict Neurological Outcomes in Patients With Out-of-Hospital Cardiac Arrest Treated With Extracorporeal Cardiopulmonary Resuscitation

Yohei Okada, MD; Takeyuki Kiguchi, MD, PhD; Taro Irisawa, MD, PhD; Tomoki Yamada, MD, PhD; Kazuhisa Yoshiya, MD, PhD; Changhwi Park, MD; Tetsuro Nishimura, MD, PhD; Takuya Ishibe, MD, PhD; Yoshiki Yagi, MD, PhD; Masafumi Kishimoto, MD, PhD; Toshiya Inoue, MD; Yasuyuki Hayashi, MD, PhD; Taku Sogabe, MD, PhD; Takaya Morooka, MD, PhD; Haruko Sakamoto, MD; Keitaro Suzuki, MD; Fumiko Nakamura, MD; Tasuku Matsuyama, MD, PhD; Norihiro Nishioka, MD; Daisuke Kobayashi, MD, PhD; Satoshi Matsui, MD; Atsushi Hirayama, MD, MPH; Satoshi Yoshimura, MD; Shunsuke Kimata, MD, MPH; Takeshi Shimazu, MD, PhD; Shigeru Ohtsuru, MD, PhD; Tetsuhisa Kitamura, MD, MSc, DPH; Taku Iwami, MD, MPH, PhD

Table 3. TiPS65 Scoring System

Variable	Score
Time from call to hospital arrival ≤25 min	1
pH ≥7.0	1
Shockable on hospital arrival	1
<65 y	1
Sum	4

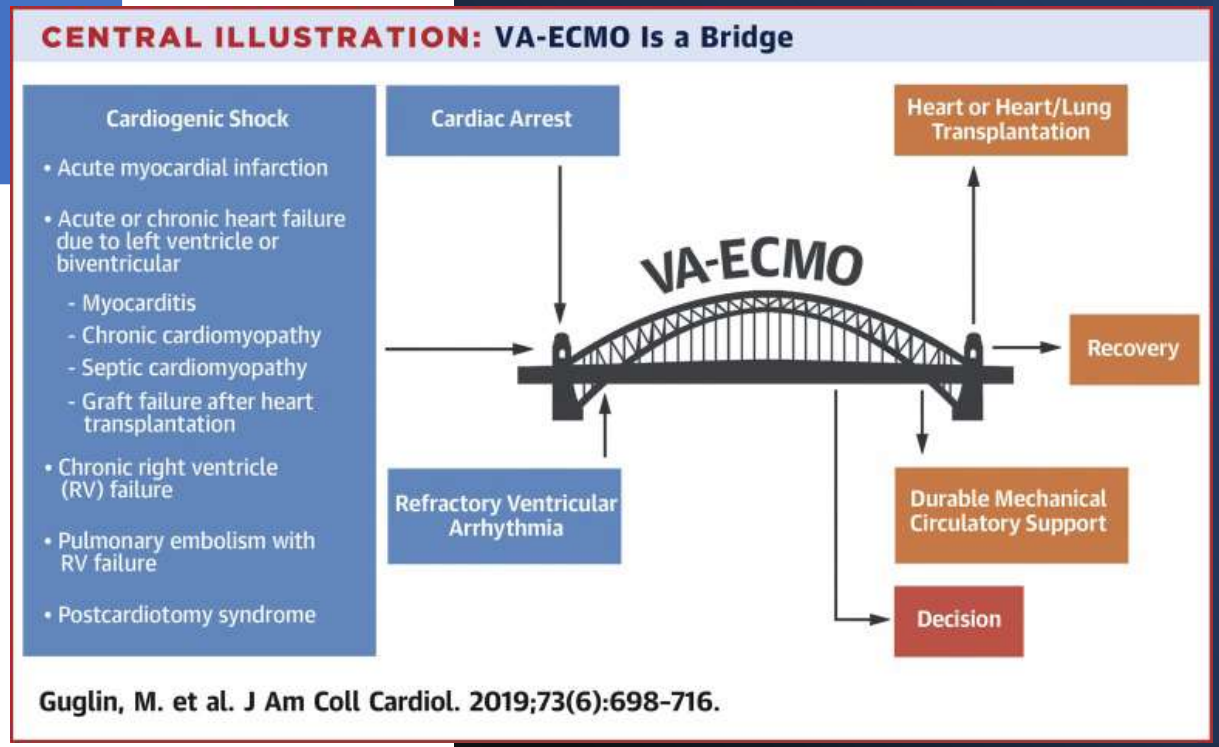
Abbreviation: TiPS65, time to hospital arrival, pH in initial blood gas assessment, shockable rhythm on hospital arrival, and age <65 years.

Patients were divided into 4 groups based on TiPS 65 score and probability of good neurological outcome (Cerebral Performance Category 1 or 2):

Very low: score 0
Low: score 1
Middle: score 2
High: score 3–4.

ECMO VA e ACC

- L’ECMO VA è un supporto emodinamico che non cura la causa dell’ACC
- La causa sottostante deve essere trattata prontamente

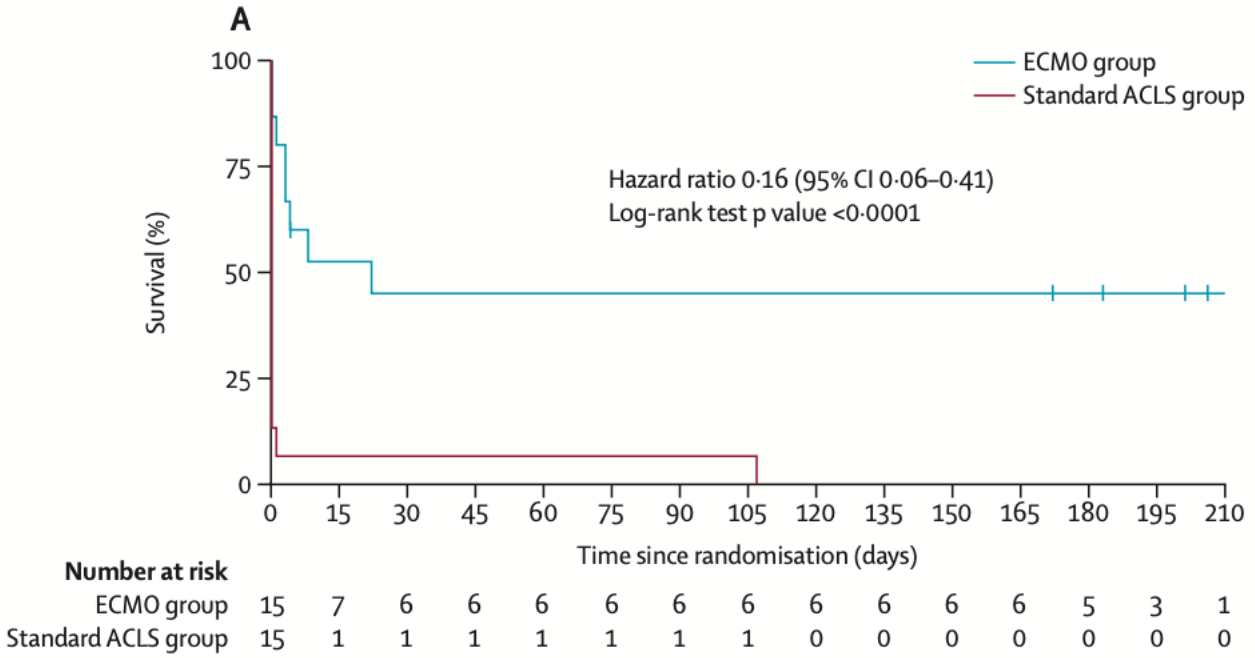


Lancet 2020; 396: 1807–16
Published Online
November 13, 2020
https://doi.org/10.1016/
S0140-6736(20)32338-2

Advanced reperfusion strategies for patients with out-of-hospital cardiac arrest and refractory ventricular fibrillation (ARREST): a phase 2, single centre, open-label, randomised controlled trial

Demetris Yannopoulos, Jason Bartos, Ganesh Raveendran, Emily Walser, John Connett, Thomas A Murray, Gary Collins, Lin Zhang, Rajat Kalra, Marinos Kosmopoulos, Ranjit John, Andrew Shaffer, R J Frascone, Keith Wesley, Marc Conterato, Michelle Biros, Jakub Tolar, Tom P Aufderheide

Primo trial randomizzato monocentrico che mette a confronto E-CPR e C-CPR nei pazienti con OHCA.
Primary outcome: sopravvivenza intraospedaliera
Secondary outcomes: sopravvivenza, sicurezza e disabilità al momento della dimissione, a 3 mesi e a 6 mesi



RCT MULTICENTRICO
Previsione di arruolamento: 110 pz
Termine arruolamento: Luglio 2021

Endpoints

- Primary: 30-day survival rate with favorable neurological status (CPC 1 or 2)
- Secondary: neurological status 6 months after resuscitation, quality of life in combination with survival

Early initiation of extracorporeal life support in refractory out-of-hospital cardiac arrest: Design and rationale of the INCEPTION trial

Martine E. Bol, MSc,[a,b,1] Martje M. Suverein, MD,[a,c,1] Roberto Lorusso, MD, PhD,[d] Thijs S. R. Delnoij, MD,[a,e] George J. Brandon Bravo Bruinsma, MD, PhD,[f] Luuk Otterspoor, MD, PhD,[g] Marijn Kuijpers, MD,[h] Ka Yan Lam, MD,[i] Alexander P. J. Vlaar, MD, PhD,[j] Carlos V. Elzo Kraemer, MD, PhD,[k] Joris J. van der Heijden, MD,[l] Erik Scholten, MD,[m] Antoine H. G. Driessen, MD,[n] José M. Montero Cabezas, MD,[o] Saskia Z. H. Rittersma, MD, PhD,[p] Bram G. Heijnen, MD,[m] Fabio S. Taccone, MD, PhD,[q] Brigitte Essers, PhD,[r] Tammo Delhaas, MD, PhD,[c,s] Patrick W. Weerwind, CCP, PhD,[c,d] Paul M. H. J. Roekaerts, MD, PhD,[a,c] Jos G. Maessen, MD, PhD,[c,d] and Marcel C. G. van de Poll, MD, PhD[a,b,t] *Maastricht, Zwolle, Eindhoven, Amsterdam, Leiden, Utrecht, Nieuwegein, The Netherlands; and Brussels, Belgium*

Inclusion criteria	Exclusion criteria (if known before randomization)
1. ≥18 - ≤70 years	1. ROSC with sustained hemodynamic recovery within 15 minutes
2. Witnessed OHCA	2. Terminal heart failure (NYHA III or IV)
3. Initial rhythm of VF/VT or AED-shock administered	3. Severe pulmonary disease (COPD GIII of GIV)
4. Bystander BLS	4. Oncological disease
5. No ROSC within 15 minutes	5. Pregnancy
	6. Bilateral femoral vessel bypass surgery
	7. Pre-arrest CPC score of 3 or 4
	8. Multiple trauma (Injury Severity Score> 15)
	9. Advance health care directive
	10. Expected initiation of cannulation >60 min after arrest

The ancient question:
stay and play or scoop and run ?

Dal 2011 è stato implementato a. Parigi un sistema di MoICU (Mobile Intensive Care Unit).

Clinical paper

A Pre-Hospital Extracorporeal Cardio Pulmonary Resuscitation (ECPR) strategy for treatment of refractory out hospital cardiac arrest: An observational study and propensity analysis

Resuscitation 117 (2017) 109–117

PERIOD 1 (114 pazienti)
Dopo 30 min di C-CPR ospedalizzazione e in-hospital E-CPR
(se distanza da ospedale < 20 min)
- Pre-hospital ECPR

PERIOD 2 (42 pazienti)
Strategia di Pre-Hospital E-CPR più «aggressiva», criteri di inclusione più definiti e E-CPR team dedicato per pz OHCA < 70 anni
Dopo 20 min di C-CPR max (ridotti i tempi per garantire inizio dei flussi)
ECMO entro 60 min da ACC

E-CPR nel pre-ospedaliero riduce i tempi di Low-Flow e aumenta il tasso di ROSC, ma NON è un fattore indipendente associato ad aumento della sopravvivenza.

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Reviewers: Robert Neumar, MD,*** Shingo Ichiba, MD,††† Thomas Mueller, MD,‡‡‡ Alain Combes, MD, PhD§§§

Additional Complexities for Out of Hospital Cardiac arrest

Providing ECPR for those with OHCA poses additional logistical obstacles. Integrated prehospital protocols are required to identify appropriate patients early, provide prearrival notification to hospital teams, and facilitate timely transport to hospital with continued high-quality resuscitative efforts. Prehospital teams should identify methods to mitigate the risk to CCPR quality during extrication and transport, and should participate in ECPR simulation exercises.

Regardless of specific details of the protocol, only a very small proportion of patients with OHCA will ultimately be considered eligible for ECPR.[40] Thus, prehospital resuscitation for the remaining patients with OHCA should ideally not be altered, which poses the risk of worsening CCPR quality in the majority of arrests, which could decrease overall survival. Thus, clear collaboration of hospital and prehospital systems is required to identify ECPR-candidates in the prehospital setting to achieve early transport to hospital.

Per i contributi inclusi in questa presentazione si ringrazia:

- Dr.ssa Sara Baraldi
- Dr. Niccolò Grieco
- Dr. Riccardo Stucchi

Il sistema per salvare vite del 4/9/2021 (in ordine di apparizione):

- SOREU
- Soccorritori MSB
- MSA1 : IP Bruno P.
  OTec. Oscar M.
- MSA2 : Dr Claudia R.
  IP Natascia R.
  A-Socc. Tommaso P.
- ECMO team : Dr Jacopo O. ed equipe

Grazie per la Vs attenzione

e

Buone feste

Italian Resuscitation Council