



# CONGRESSO NAZIONALE IRC 2 22

TRAUMA: NUOVE EVIDENZE E PERCORSI

AUDITORIUM DELLA TECNICA • ROMA • 14-15 OTTOBRE



Italian  
Resuscitation  
Council

# La vita dopo un arresto cardiaco



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Non di solo ROSC:  
ai pazienti sopravvivere non basta.  
E nemmeno alle loro famiglie



# Che outcome conta di più?

Esiti oggettivi (valutazione medica – il cuoco) versus soggettivi (valutazione del paziente – il cliente).






## Esiti oggettivi in breve

- Attenzione: la maggior parte degli studi sull'outcome deriva da Paesi che tendono a sospendere i trattamenti con maggior facilità (circa in 2/3 dei pz che giungono in ICU).





In altri Paesi gli outcome potrebbero essere diversi (non migliori o peggiori in assoluto: diversi).

- «Late awakening is common in settings without withdrawal of life-sustaining therapy in out of hospital cardiac arrest survivors who undergo targeted temperature management».

Lee DH et al (South Korea). Critical Care Med 2022; 50: 235-244

- <<...the awakening time and late awakening were independently associated with poor neurologic outcomes>>

# I primi studi

## Trends in Survival after In-Hospital Cardiac Arrest

Saket Girotra, M.D., Brahmajee K. Nallamothu, M.D., M.P.H.,  
John A. Spertus, M.D., M.P.H., Yan Li, Ph.D., Harlan M. Krumholz, M.D.,  
and Paul S. Chan, M.D., for the American Heart Association  
Get with the Guidelines–Resuscitation Investigators

N Engl J Med 2012;367:1912-20.

- **84625** casi di arresto.
- Miglioramento della sopravvivenza alla dimissione ospedaliera
- E inoltre:

vival. Rates of clinically significant neurologic disability among survivors decreased over time, with a risk-adjusted rate of 32.9% in 2000 and 28.1% in 2009 (adjusted rate ratio per year, 0.98; 95% CI, 0.97 to 1.00; P=0.02 for trend).

# Ma intanto in Olanda...

Life after survival: Long-term daily functioning and quality of life after an out-of-hospital cardiac arrest<sup>☆</sup>

E.M. Wachelder<sup>a,b,\*</sup>, V.R.M.P. Moulaert<sup>b,c</sup>, C. van Heugten<sup>c,d</sup>,  
J.A. Verbunt<sup>b,e</sup>, S.C.A.M. Bekkers<sup>f</sup>, D.T. Wade<sup>a,b,g</sup>

Resuscitation 80 (2009) 517–522

- Studio retrospettivo su **63** pazienti
- Valutazione tramite una batteria di questionari “neuropsicologici”
- Timing: da 6 mesi a 6 anni post cardiac arrest

*Results:* On average 3 years post-cardiac arrest, 74% of the patients experienced a low participation level in society compared with the general population. Over 50% reported severe fatigue, 38% feelings of anxiety and/or depression and 24% a decreased quality of life. Caregivers reported stress related responses, feelings of anxiety and lower quality of life. Seventeen percent of the caregivers reported high caregiver strain,



## ...e anche in USA

### RECOVERY, LONG-TERM COGNITIVE OUTCOME AND QUALITY OF LIFE FOLLOWING OUT-OF-HOSPITAL CARDIAC ARREST


Chun Lim, MD, PhD<sup>1</sup>, Mieke Verfaellie, PhD<sup>2</sup>, David Schnyer, PhD<sup>3</sup>, Ginette Lafleche, PhD<sup>2</sup> and Michael P. Alexander, MD<sup>1,4</sup>

*From the <sup>1</sup>Cognitive Neurology Unit, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston*

- 25 pazienti
- Test neurocognitivi dopo 1 anno
- Risultati:

J Rehabil Med 2014; 46: 691-697

***Conclusions:* These survivors of OHCA had persistent long-term cognitive deficits. Quality of life at one year after OHCA was reduced compared to cardiac controls. Coma duration and memory impairment at three months were harbingers of long term reduced quality of life.**



# Perché queste discrepanze negli outcome?

- Nell'ultimo decennio c'è stata una maturazione culturale-scientifica:
  - Dagli outcome a breve termine (ROSC, poi dimissione), a quelli a lungo termine
  - Dagli outcome clinici e poco raffinati (CPC, ad es.), a quelli patient-centered e raffinati (qualità di vita, ad es.)

CPC: davvero valutabile alla dimissione? Davvero completo? Davvero utile?



### ***Cerebral Performance Category (CPC)***

- 1 - Good cerebral performance: conscious, alert, able to work, might have mild neurologic or psychological deficit;
- 2 - Moderate cerebral disability: conscious, sufficient cerebral function for independent activities of daily life, able to work in sheltered environment;
- 3 - Severe cerebral disability: conscious, dependent on others for daily support because of impaired brain function, ranges from ambulatory state to severe dementia or paralysis;
- 4 - Coma or vegetative state: any degree of coma without the presence of all brain death criteria. Unawareness, even if appears awake (vegetative state) without interaction with environment; may have spontaneous eye opening and sleep/awake cycles, cerebral unresponsiveness;
- 5 - Brain death: apnea, areflexia, EEG silence, etc.



# LG ILCOR 2020

- ➡ <<(CPC, mRS, GOSE)... are **not** sufficiently sensitive to capture the problems that many of the survivors experience.>>



# Core Outcome SET for Cardiac Arrest – ILCOR 2018

- «Essential evidence of the impact of care from the survivors' perspective is currently missing from clinical trials>>.
- <<Health-related quality of life should be measured with at least 1 tool from HUI version 3, SF 35, EQ 5D 5L at 90 days and at periodic intervals up to 1 year>>



# Cosa sappiamo oggi sugli esiti cognitivi?

Cognitive function and health-related quality of life four years after cardiac arrest<sup>☆</sup>

Eirik Alnes Buanes<sup>a,b,\*</sup>, Arne Gramstad<sup>c,d</sup>, Karoline Kjellsdotter Søvig<sup>e</sup>, Karl Ove Hufthammer<sup>f</sup>, Hans Flaatten<sup>a,b</sup>, Thomas Husby<sup>a,b</sup>, Jørund Langørgen<sup>g</sup>, Jon-Kenneth Heltne<sup>a,b</sup>

<sup>a</sup> Department of Anaesthesia and Intensive Care, Haukeland University Hospital, Bergen, Norway

Resuscitation 89 (2015) 13–18

➡ 30 pazienti dimessi con CPC 1 o 2

The main finding in this study is that cognitive impairment persists in 29% (95% CI: 15–47%) of CA survivors with good neurological outcome at hospital discharge four years after arrest.<sup>10,22</sup> The pattern of impairment indicates dysfunction in medial temporal lobe structures, as seen, for instance, in early Alzheimer's dementia.<sup>23</sup>

# Long Term Cognitive Function After Cardiac Arrest: A Mini-Review

Guri Hagberg<sup>1,2\*</sup>, Håkon Ihle-Hansen<sup>1,3</sup>, Else Charlotte Sandset<sup>2</sup>, Dag Jacobsen<sup>4</sup>,  
Henning Wimmer<sup>4</sup> and Hege Ihle-Hansen<sup>1,2</sup>

Frontiers in Aging Neuroscience | May 2022 | Volume 14 |



Cognitive impairments after OHCA are common and affect up to 50%. CPC is crude and lacks sensitivity to detect most of these deficits. As diffuse cortical and deep gray matter lesions were the most common findings on neuroimaging, cognitive domains involved in executive functions, memory, and processing speed needs to be addressed. More long-term

apathy and psychotic  
symptoms

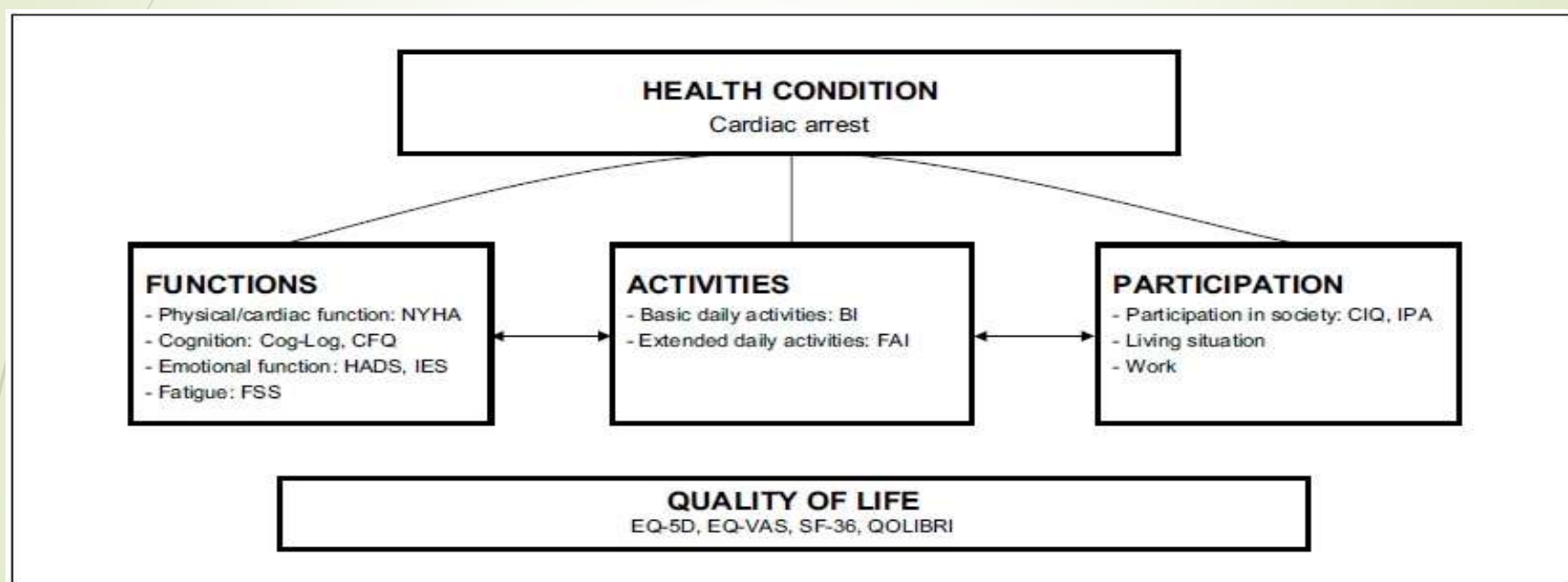
memory

speed

**FIGURE 1** | Areas susceptible for global anoxic-ischemic brain injury and related cognitive symptoms. Illustration adapted from servier medial art.

# Esiti soggettivi.

## La Qualità della vita è...



**Figure 1.** ICF model and measurement instruments used.

Abbreviations: BI, Barthel Index; CFQ, Cognitive Failures Questionnaire; CIQ, Community Integration Questionnaire; FAI, Frenchay Activities Index; FSS, Fatigue Severity Scale; HADS, Hospital Anxiety and Depression Scale; ICF, International Classification of Functioning, Disability and Health; IES, Impact of Event Scale; IPA, Impact on Participation and Autonomy; NYHA, New York Heart Association Classification.

Moulaert et al. Long-term outcome after survival of a cardiac arrest: a prospective longitudinal cohort study.

Neurorehabilitation and Neural Repair. 2017, vol 31(6) 530-539



# Strumenti di valutazione della health-related quality of life più comuni

## ➤ SF 36

Items	Scales	Summary Measures		
3a. Vigorous Activities	Physical Functioning (PF)	Physical Health		
3b. Moderate Activities				
3c. Lift, Carry Groceries				
3d. Climb Several Flights				
3e. Climb One Flight				
3f. Bend, Kneel				
3g. Walk Mile				
3h. Walk Several Blocks				
3i. Walk One Block				
3j. Bathe, Dress				
4a. Cut Down Time	Role-Physical (RP)	Physical Health		
4b. Accomplished Less				
4c. Limited in Kind				
4d. Had Difficulty				
7. Pain-Magnitude	Bodily Pain (BP)		Physical Health	
8. Pain-Interfere				
1. EVGFP Rating	General Health (GH)*			Physical Health
11a. Sick Easier				
11b. As Healthy				
11c. Healthy to Get Worse				
11d. Health Excellent				
9a. Pep/Life	Vitality (VT)*	Mental Health		
9e. Energy				
9g. Work Out				
9i. Tired				
5. Social-Extent	Social Functioning (SF)*		Mental Health	
10. Social Time				
5a. Cut Down Time	Role-Emotional (RE)			Mental Health
5b. Accomplished Less				
5c. Not Carreful				
9b. Nervous	Mental Health (MH)			
9c. Down in Dumps				
9d. Peaceful				
9f. Blue/Sad				
9h. Happy				

# Strumenti di valutazione della health-related quality of life più comuni

## ➔ EQ 5D 5L

Under each heading, please tick the ONE box that best describes your health TODAY

### MOBILITY

- I have no problems in walking about ☐
- I have slight problems in walking about ☐
- I have moderate problems in walking about ☐
- I have severe problems in walking about ☐
- I am unable to walk about ☐

### SELF-CARE

- I have no problems washing or dressing myself ☐
- I have slight problems washing or dressing myself ☐
- I have moderate problems washing or dressing myself ☐
- I have severe problems washing or dressing myself ☐
- I am unable to wash or dress myself ☐

### USUAL ACTIVITIES (e.g. work, study, housework, family or leisure activities)

- I have no problems doing my usual activities ☐
- I have slight problems doing my usual activities ☐
- I have moderate problems doing my usual activities ☐
- I have severe problems doing my usual activities ☐
- I am unable to do my usual activities ☐

### PAIN / DISCOMFORT

- I have no pain or discomfort ☐
- I have slight pain or discomfort ☐
- I have moderate pain or discomfort ☐
- I have severe pain or discomfort ☐
- I have extreme pain or discomfort ☐

### ANXIETY / DEPRESSION

- I am not anxious or depressed ☐
- I am slightly anxious or depressed ☐
- I am moderately anxious or depressed ☐
- I am severely anxious or depressed ☐
- I am extremely anxious or depressed ☐

- We would like to know how good or bad your health is TODAY.
- This scale is numbered from 0 to 100.
- 100 means the best health you can imagine.  
0 means the worst health you can imagine.
- Mark an X on the scale to indicate how your health is TODAY.
- Now, please write the number you marked on the scale in the box below.


YOUR HEALTH TODAY =

The best health  
you can imagine



The worst health  
you can imagine





## <<Long term disabilities of survivors of out of hospital cardiac arrest: the Hanox study>>

Pesquine a et al, Chest 2021; 159: 699-711

- «Among the patients who awoke in the 14 days after OHCA, 35% had moderate to severe disabilities or had died at month-18. ... their health related quality of life was impaired compared to a sex- and age-matched population. Low-flow time, SOFA score, coma > 3 days and ventilation > 3 days were associated with poor outcomes»


# Long-term survival and health-related quality of life after in-hospital cardiac arrest



Marc Schluep<sup>a,d,\*</sup>, Sanne Elisabeth Hoeks<sup>a</sup>, Michiel Blans<sup>c</sup>, Bas van den Bogaard<sup>d</sup>,

RESUSCITATION 167 (2021) 297–306


We conclude that in this study one-year survival after in-hospital cardiac arrest is 27.8% in this population and survival is associated with pre-admission functional status and morbidity. Outcomes such as cognitive function, daily functionality and work participation warrant more attention in future research. We think future guidelines should incorporate advanced directive planning, of which prognostication and CPR-directive counselling is a vital part.<sup>7,29</sup> Similar studies should be repeated in various populations in order to develop tailor-made prognostication tools.



<<Long term functional recovery and health related quality of life of **elderly** OHCA survivors>>.

Andrew E et al., Resuscitation 2018; 126:118-124

- ➡ «9.7% patients survived to hospital discharge (but only 2.2 of patients in an aged care facility); 8.6% survived at 12 months. 61% resided at home and 66% reported good functional outcome; increased age was associated with worse outcomes»



<<Cognitive and psychological outcomes following **pediatric** cardiac arrest.

Huebshmann N et al, Front Ped 2022; 10:780251>>

«Many children experience cognitive impairment including deficits in memory, attention, language and executive functioning. .. The burden of pediatric cardiac arrest on the child's family and caregivers can be substantial>>

# Qualità di vita



- Circa il 70% dei sopravvissuti la descrive come buona
- Se il pz soffre di ansia o depressione post arresto (presenti in circa un quarto dei sopravvissuti), la qualità di vita è percepita come peggiore
- Anche la funzionalità cognitiva percepita (non quella oggettiva) correla con la qualità di vita



# Qualità di vita



- La partecipazione sociale è mediamente peggiorata; risente della funzione cognitiva, della presenza di depressione, fatica, e riduzione della mobilità
- Il ritorno al lavoro precedente è possibile solo nel 50-70% dei casi

## Post ACC: un caso specifico di post ICU



# Post intensive care syndrome (PICS)

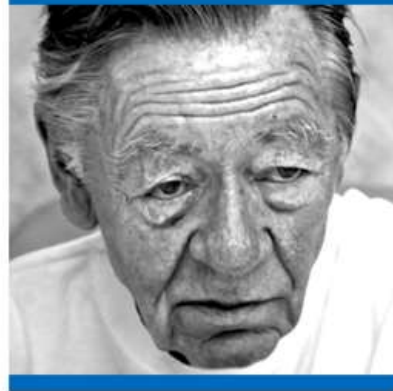
## Post-Intensive Care Syndrome (PICS)

*New or worsening impairments in...*

### Physical



### Cognitive



### Mental Health



- **Esito finale: ridotta qualità di vita per il paziente, i caregiver, la società**

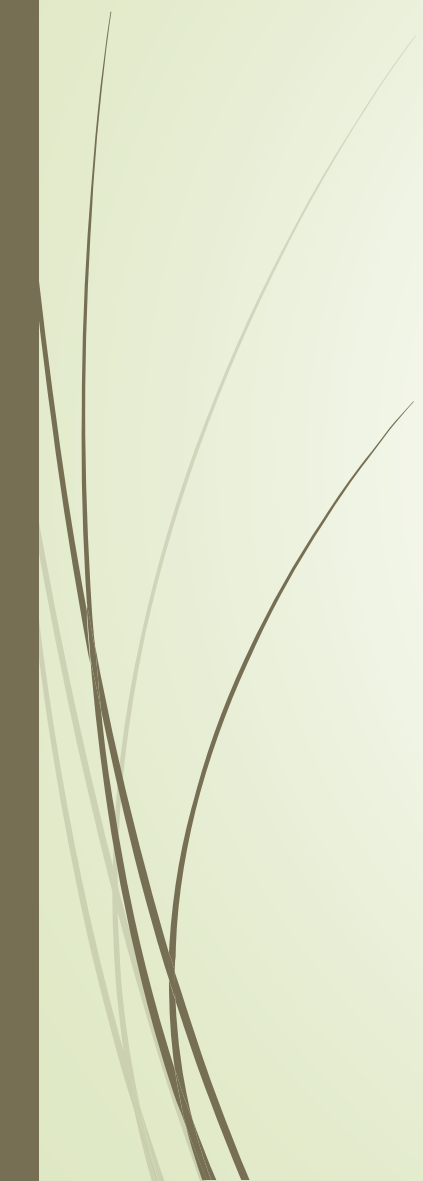


# Componenti «fisici»

- Coinvolgono il 60-80% dei pazienti
- ICU acquired weakness
- Ridotta funzionalità respiratoria
- Limitazioni nelle attività della vita quotidiana




# Componenti cognitive

- Coinvolgono il 50-70% dei pazienti
  - Deficit principali:
    - Funzioni esecutive
    - Memoria
    - Attenzione
- 





# Componenti emotivi - psichiatrici

- Coinvolgono il 10-40% dei pazienti
  - Ansia
  - Depressione
  - Stress post traumatico
  - Gli stessi disturbi sono spesso presenti anche nelle famiglie
- 



# Conclusioni

- Anche i migliori sopravvissuti ad arresto cardiaco possono avere sequele cognitive e un peggioramento della qualità di vita
- I caregiver sopportano un peso non indifferente
- Riabilitazione: dobbiamo cercare soluzioni semplici, economiche, accessibili; dobbiamo favorire la creazione di ampie collaborazioni, perché **outcome migliori sono possibili.**



# Italian Resuscitation Council

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