

Basic Life Support 2015 Compressioni e Ventilazioni

Andrea Scapigliati Roma

Dall'**Evidenza**



al Consenso



"Download"

alle Linee Guida



Cosa c'è sotto?

Resuscitation 95 (2015) e43-e69



Contents lists available at ScienceDirect

Resuscitation

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



Part 3: Adult basic life support and automated external defibrillation 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations^{\(\pi\)}



2015 Consensus On CPR – Adult BLS/AED

- 23 PICO Questions
 - 27 RCT / 181 Observational studies
 - Animal/manikin studies
 - 35-year period

• 32 Consensus on science

- Quality of Evidence
 - High
 - Medium
 - Low
 - Very Low
- Treatment Recommendations
 - Strong («We recommend»)
 - Weak («We suggest»)

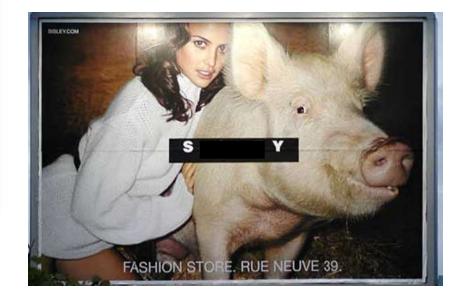
Modelli di ricerca in RCP

The "mock model"



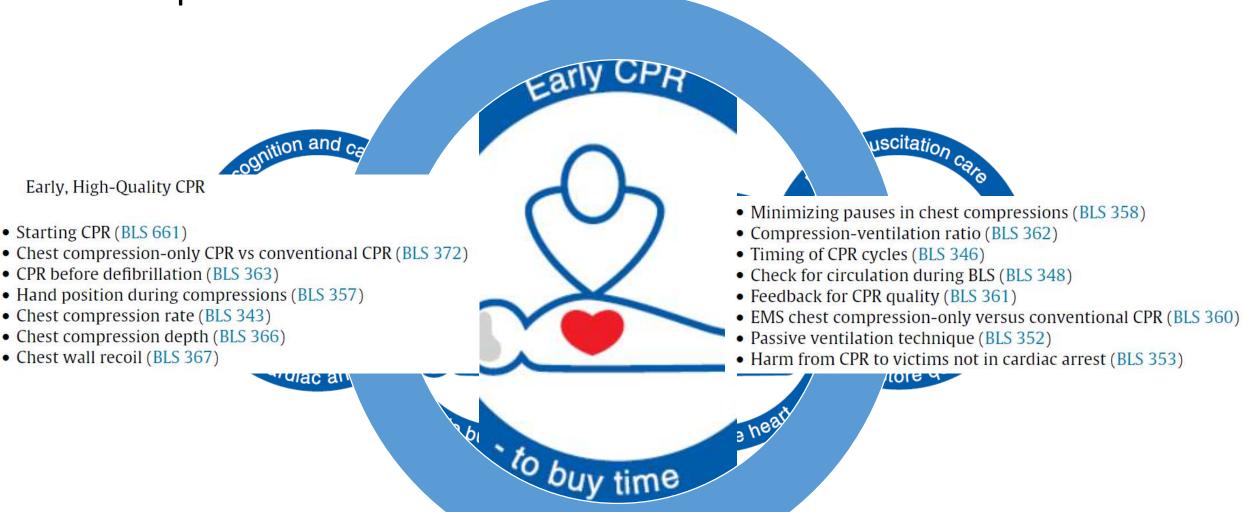


The "porck model"



Low/Very Low Quality

Compressioni e Ventilazioni: novità?



Starting CPR (BLS 661)

Treatment recommendation

We suggest commencing CPR with compressions rather than ventilations (weak recommendation, very-low-quality evidence).

- A-B-C versus C-A-B
- Nessuno studio umano
- C-A-B riduce
 - l'intervallo di inizio delle compressioni
 - Il tempo di completamento del primo ciclo 30/2
- AC adulto = AC cardiaco = priorità C



Chest compression-only CPR versus conventional CPR (BLS 372)

Treatment recommendations

We recommend that chest compressions should be performed for all patients in cardiac arrest (strong recommendation, very-low-quality evidence).

We suggest that those who are trained and willing to give rescue breaths do so for all adult patients in cardiac arrest (weak recommendation, very-low-quality evidence).

- RCP da astanti
 - Rallenta l'evoluzione di FV/TVsp in asistolia
 - Aumenta l'efficacia della defibrillazione
 - Migliora la funzione d'organo e la sopravvivenza (dal 3.9% al 16.1%, Sasson 2010)
- CC-Only CPR
 - Facile da insegnare e da comunicare (operatore CO 118)
- Standard CPR
 - AC asfittico e se intervallo pre EMS prolungato
- Evidenze: nessuna differenza significativa





M Chest-compression-only versus standard cardiopulmonary resuscitation: a meta-analysis

Michael Hüpfl, Harald F Seliq, Peter Nagele

Meta-analysis between January 1985 and August 2010

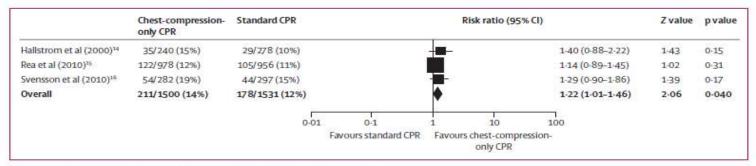


Figure 2: Primary analysis of survival to hospital discharge in randomised trials CPR=cardiopulmonary resuscitation.

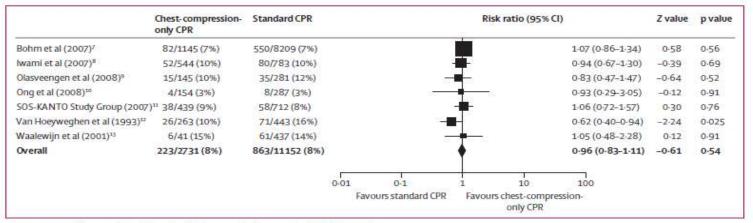


Figure 3: Secondary analysis of survival outcomes in observational cohort studies CPR=cardiopulmonary resuscitation.

Con la "Chest Compression-Only CPR" (●) le riserve di ossigeno arterioso si esauriscono in 2/4 min rispetto alla Standard CPR (○)

E. Dorph et al./Resuscitation 60 (2004) 309-318

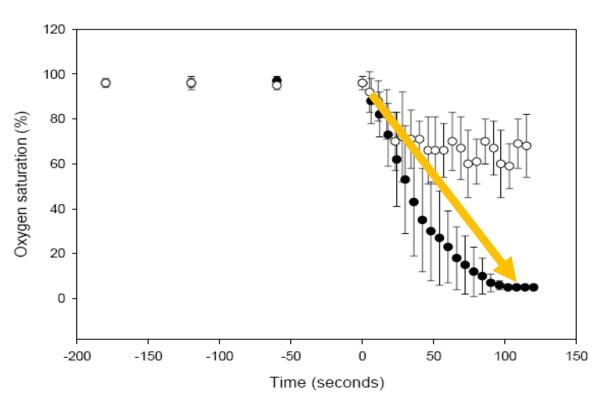
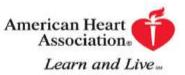


Fig. 1. Mean (±S.D.) arterial oxygen saturation (%) during the 3 min no-flow period and the initial 2 min of BLS for chest compressions only (●) and ratio 2:30 (○). End of no-flow period and start of BLS period is set to zero (0) seconds.

315





Bystander-Initiated Rescue Breathing for Out-of-Hospital Cardiac Arrests of Noncardiac Origin

Tetsuhisa Kitamura, Taku Iwami, Takashi Kawamura, Ken Nagao, Hideharu Tanaka and Atsushi Hiraide

Circulation 2010, 122:293-299; originally published online July 6, 2010

43246 OHCAs di origine non cardiaca

Table 3. Neurologically Intact 1-Month Survival After Bystander-Witnessed OHCAs of Noncardiac Origin by Type of Bystander CPR and EMS CPR

	No CPR	Compression-Only CPR	Conventional CPR 5236	
EMS CPR 0-15 min (n=31 659)	19 954	6469		
Neurologically intact 1-mo survival, n (%)	340 (1.7)	118 (1.8)	109 (2.1)	
Adjusted OR (95% CI)	Reference	1.18 (0.95-1.46)	1.39 (1.11-1.75)	
EMS CPR >15 min (n=10 712)	6294	2297	2121	
Neurologically intact 1-mo survival, n (%)	27 (0.4)	11 (0.5)	24 (1.1)	
Adjusted OR (95% CI)	Reference	1.20 (0.59-2.45)	3.11 (1.75-5.51)	

CPR before defibrillation (BLS 363)

Treatment recommendation

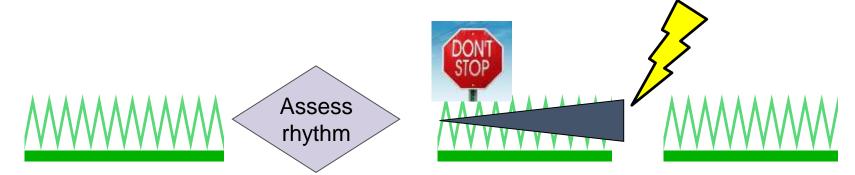
During an unmonitored cardiac arrest, we suggest a short period of CPR until the defibrillator is ready for analysis and, if indicated, defibrillation.

- RCP prima di defibrillare
- Evidenza: nessun benefico negli AC extra ospedalieri in VF/TVsp non monitorizzati

Assess

rhythm

- Enfasi sulla defibrillazione precoce
- RCP nell'attesa del defibrillatore (se non già connesso)

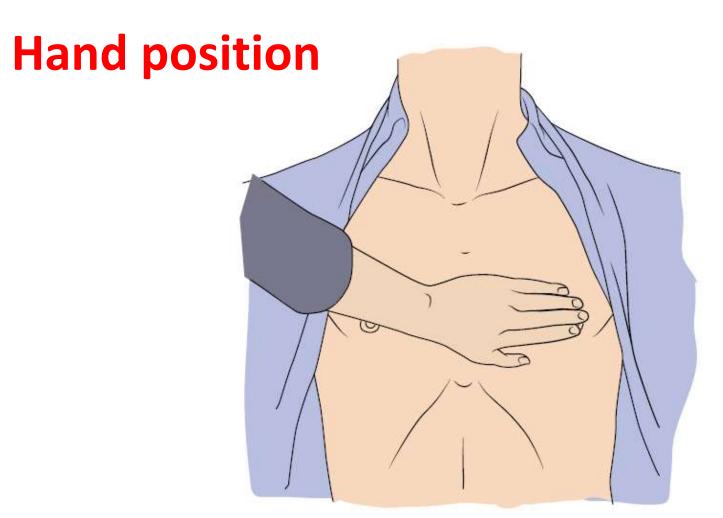


Hand position during compressions (BLS 357)

Treatment recommendation

We suggest performing chest compressions on the lower half of the sternum on adults in cardiac arrest (weak recommendation, very-low-quality evidence).

- Considerati solo parametri clinici o fisiologici (e non anatomici o
 - manichini)
 - Picco di pressione arteriosa invasiva
 - EtCO2
- Terzo inferiore dello sterno



"place the heel of your hand in the centre of the chest with the other hand on top"



The Journal of Emergency Medicine

Volume 44, Issue 3, March 2013, Pages 691-697

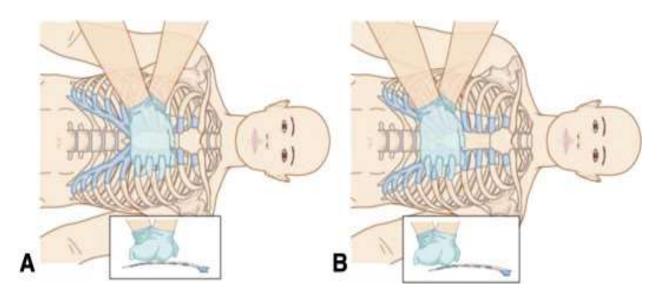


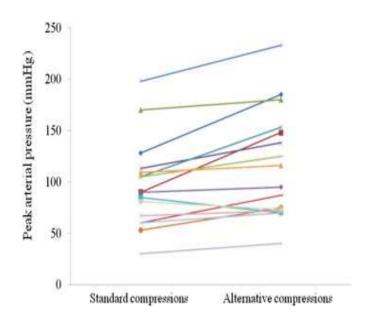
67939||

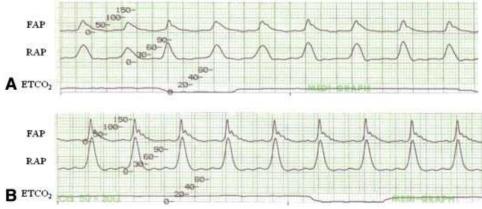
Brief Reports

Hemodynamic Effect of External Chest Compressions at the Lower End of the Sternum in Cardiac Arrest Patients

Kyoung Chul Cha, MD*, Ho Jung Kim, MD[†], Hyung Jin Shin, MD*, Hyun Kim, MD*, Kang Hyun Lee, MD*, Sung Oh Hwang, MD*, ♣









Resuscitation

Volume 84, Issue 9, September 2013, Pages 1203-1207



77394|| Clinical paper

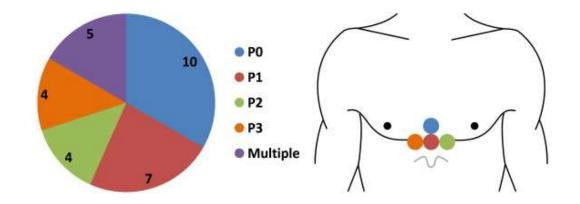
Clinical pilot study of different hand positions during manual chest compressions monitored with capnography *

Eric Qvigstad^a, & S. Jo Kramer-Johansen^b, Øystein Tømte^c, Tore Skålhegg^d, Øyvar Sørensen^d, Kjetil Sunde^c, Theresa M. Olasveengen^b

- La posizione ottimale può variare significativamente da soggetto a soggetto
- I team ALS potrebbero trovare la posizone migliore basandosi sulla EtCO2

EtCO₂ generated at four different hand positions.

	P0	P1	P2	P3	p-value
All $(n = 30)$	3.1 (0.7-8.7)	3.5 (0.5-10.7)	3.5 (0.5-10.3)	3.8 (0.4-8.8)	0.4
	23 (5-65)	26 (4-80)	26 (4-77)	29 (3-66)	

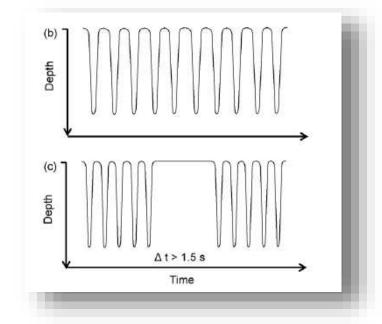


Chest compression rate (BLS 343)

Treatment recommendations

We recommend a manual chest compression rate of 100–120/min (strong recommendation, very-low-quality evidence).

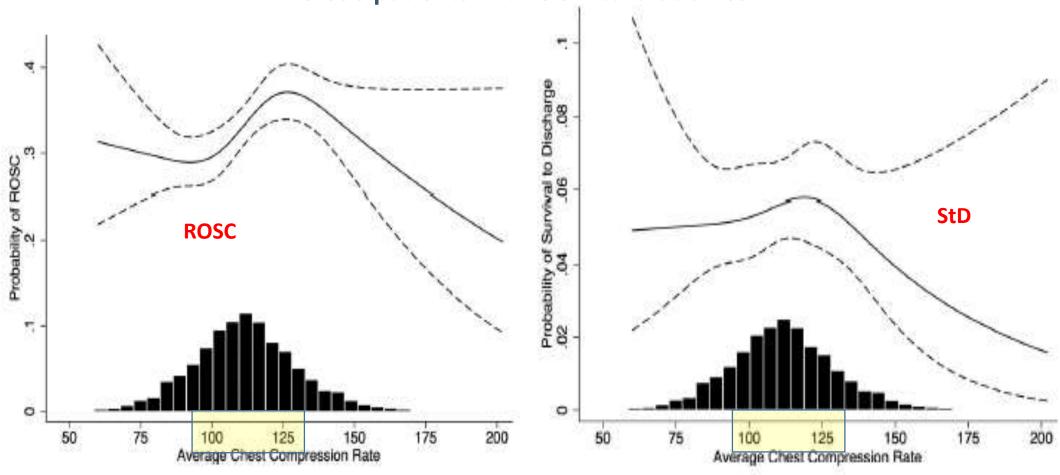
- Frequenze <100 e >120 riducono ROSC e sopravvivenza alla dimissione
- Con l'aumentare della frequenza si riduce la profondità



Relationship Between Chest Compression Rates and Outcomes From Cardiac Arrest

Ahamed H. Idris, MD; Danielle Guffey, BS; Tom P. Aufderheide, MD; Siobhan Brown, PhD;

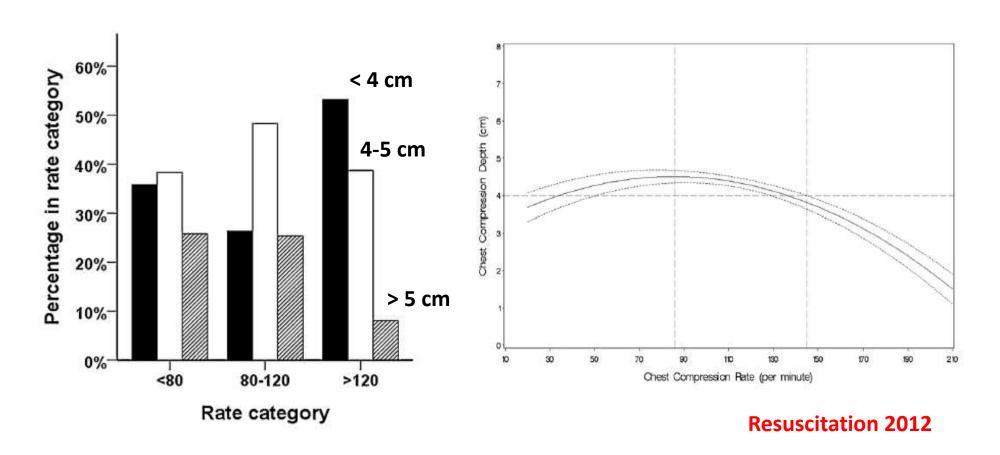
3.098 patients with OOH cardiac arrest



Excessive chest compression rate is associated with insufficient compression depth in prehospital cardiac arrest*

Koenraad G. Monsieurs ^{a,b,*}, Melissa De Regge ^c, Kristof Vansteelandt ^d, Jeroen De Smet ^e, Emmanuel Annaert ^e, Sabine Lemoyne ^e, Alain F. Kalmar ^f, Paul A. Calle ^b

133 consecutive patients



Chest compression depth (BLS 366)

Treatment recommendations

We recommend a chest compression depth of approximately 5 cm (2 in.) (strong recommendation, low-quality evidence) while avoiding excessive chest compression depths (greater than 6 cm [greater than 2.4 in.] in an average adult) (weak recommendation, low-quality evidence) during manual CPR.

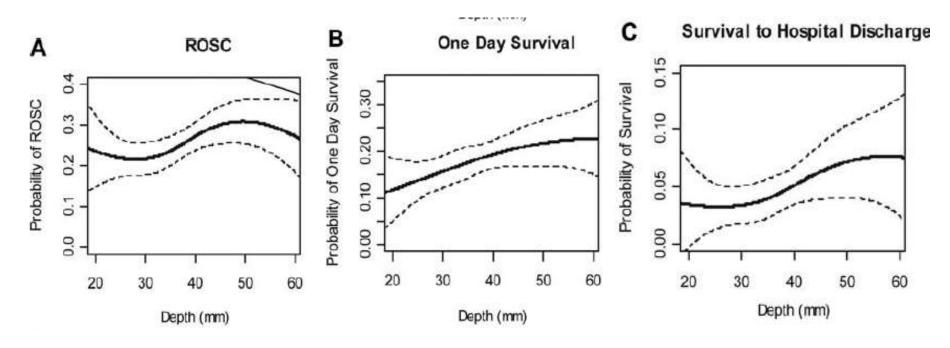
- Superficie rigida (tavola dorsale?)
- Massima sopravvivenza alla dimissione tra 4-5.5 cm con picco a 4.6 cm
- Aumento delle lesioni sopra i 6 cm



What is the role of chest compression depth during out-of-hospital cardiac arrest resuscitation?*

lan G. Stiell, MD; Siobhan P. Brown; James Christenson; Sheldon Cheskes; Graham Nichol; Judy Powell; Blair Bigham; Laurie J. Morrison; Jonathan Larsen; Erik Hess; Christian Vaillancourt; Daniel P. Davis; Clifton W. Callaway; the Resuscitation Outcomes Consortium (ROC) Investigators

Prospective cohort study conduced in seven U.S. and Canadian urban regions. 1029 out-of-hospital patients with recordings of CC depth.

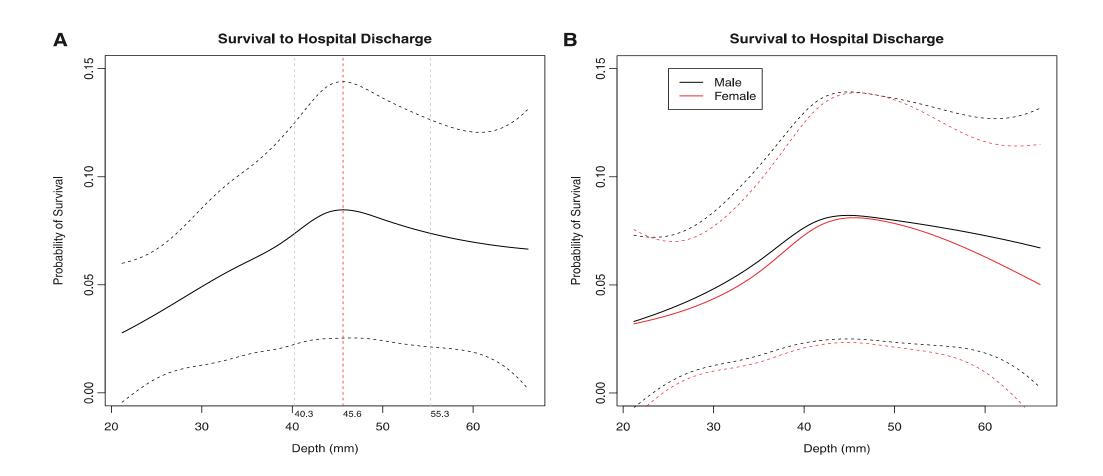






What is the Optimal Chest Compression Depth During Out-of-Hospital Cardiac Arrest Resuscitation of Adult Patients?

Ian G. Stiell, Siobhan P. Brown, Graham Nichol, Sheldon Cheskes, Christian Vaillancourt, Clifton W. Callaway, Laurie J. Morrison, James Christenson, Tom P. Aufderheide, Daniel P. Davis, Cliff Free, Dave Hostler, John A. Stouffer and Ahamed H. Idris and the Resuscitation Outcomes Consortium (ROC) Investigators





Resuscitation

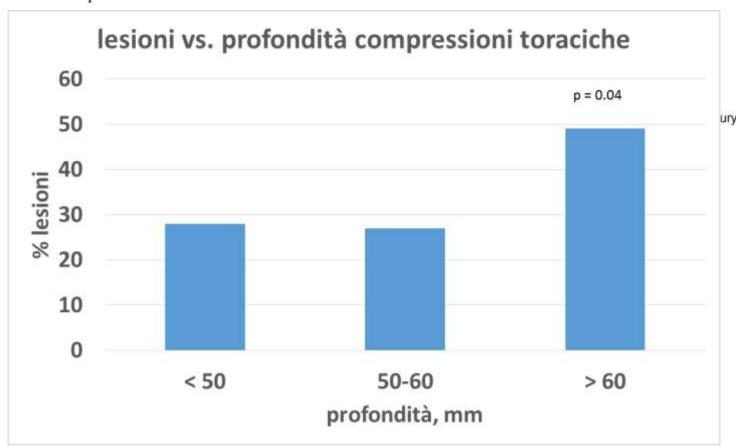
Volume 84, Issue 6, June 2013, Pages 760-765



79580||

Clinical paper

Deeper chest compression – More complications for cardiac arrest patients?



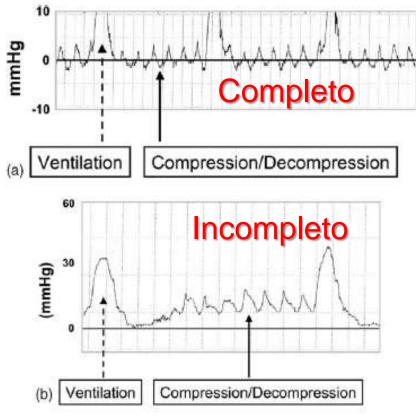
Chest wall recoil (BLS 367)

Treatment recommendation

We suggest that rescuers performing manual CPR avoid leaning on the chest between compressions to allow full chest wall recoil (weak recommendation, very-low-quality evidence).



- Riduzione della pressione di perfusione coronarica e della gittata cardiaca
- Probabilmente c'è una soglia minima tollearabile



T.P. Aufderheide et al. / Resuscitation 64 (2005) 353-362

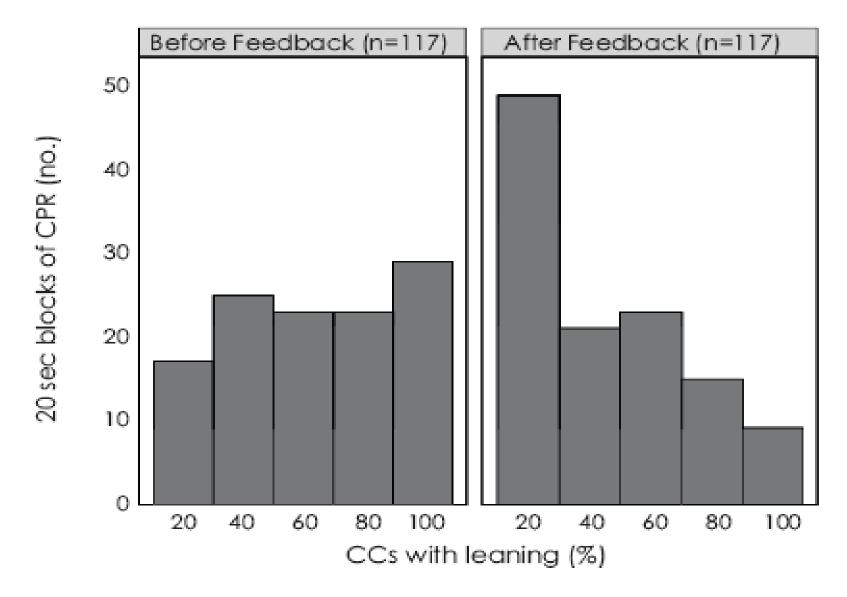


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Resuscitation



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



Minimizing pauses in chest compressions (BLS 358)

Treatment recommendations

We suggest that in adult patients receiving CPR with no advanced airway, the interruption of chest compressions for delivery of 2 breaths should be less than 10 s (weak recommendation, low-quality evidence).

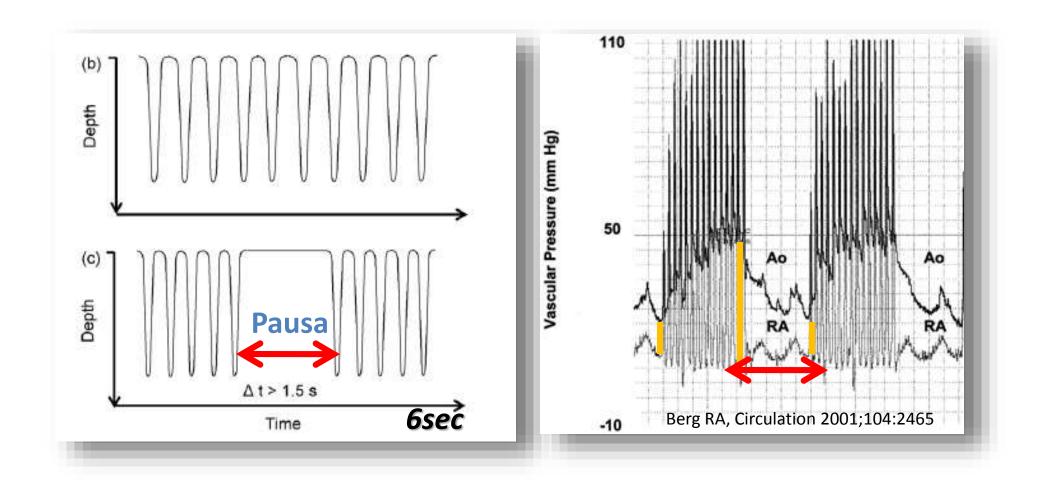
We recommend that total preshock and postshock pauses in chest compressions be as short as possible. For manual defibrillation, we suggest that preshock pauses be as short as possible and no more than 10 s (strong recommendation, low-quality evidence).

We suggest during conventional CPR that chest compression fraction (i.e., total CPR time devoted to compressions) should be as high as possible and at least 60% (weak recommendation, low-quality evidence).

- Pause da ventilazioni
- Pause pre e post shock

- Le ventilazioni forzate (<5 sec) danno insufflazione gastrica
- Ventilazioni in 5-6 sec vs 10-12: nessuna differenza in outcome neurologico
- Pause PRE/post shock riducono ROSC e sopravvivenza alla dimissione
- Chest compressions fraction > 60%
- Uniformità del limite di pausa <10 sec

Interruzione = stop flusso

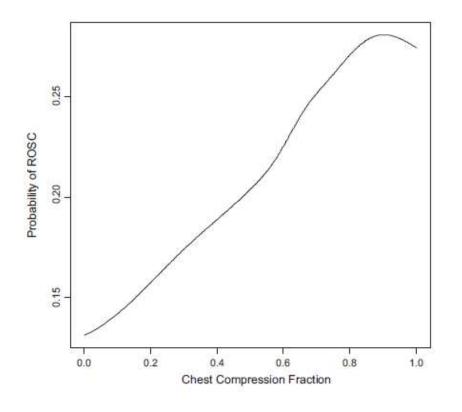


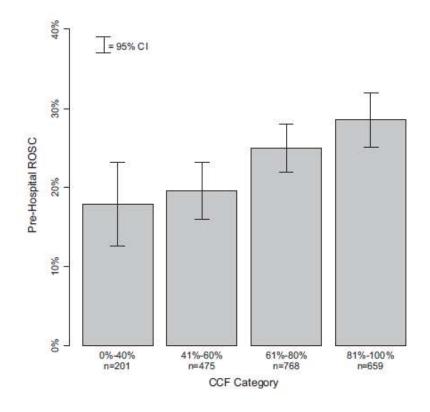
The impact of increased chest compression fraction on return of spontaneous circulation for out-of-hospital cardiac arrest patients not in ventricular fibrillation*

Resuscitation 2011

Christian Vaillancourt^{a,*}, Siobhan Everson-Stewart^b, Jim Christenson^c, Douglas Andrusiek^c, Judy Powell^b, Graham Nichol^b, Sheldon Cheskes^d, Tom P. Aufderheide^e, Robert Berg^f, Ian G. Stiell^a, the Resuscitation Outcomes Consortium Investigators

2.103 adult patients from 10 U.S. and Canadian centers



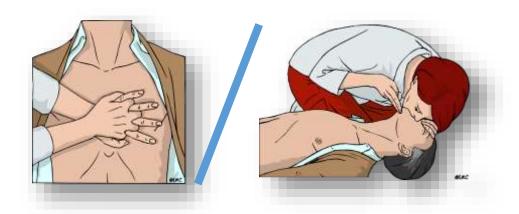


Compression-ventilation ratio (BLS 362)

Treatment recommendation

We suggest a compression-ventilation ratio of 30:2 compared with any other compression-ventilation ratio in patients in cardiac arrest (weak recommendation, low-quality evidence).

- Solo studi che confrontano 30/2 con 15 /2
- 30/2 migliora leggermente la prognosi (neurologica, StD, ROSC)
- 30/2 riduce il tempo hands-off e l'iperventilazione



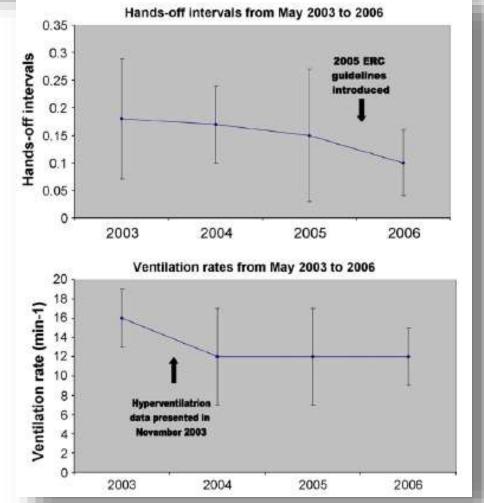
La **qualità della RCP** è migliorata con le **LG2005**. La **sopravvivenza** ha solo una **lieve** tendenza al miglioramento

Effect of implementation of new resuscitation guidelines on quality of cardiopulmonary resuscitation and survival*

T.M. Olasveengen et al. / Resuscitation 80 (2009) 407-411

Si riduce l'hands-off time

Si riduce l'*iperventilazione*



Resuscitation (2007) 75, 260-266

Timing of CPR cycles (BLS 346)

Treatment recommendation

We suggest pausing chest compressions every 2 min to assess the cardiac rhythm (weak recommendation, low-quality evidence).

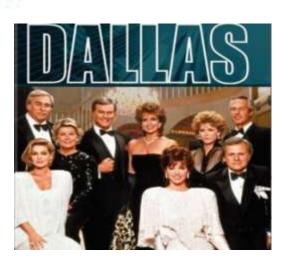
Nessuno studio: evidenza indiretta sulla fatica del soccorritore (2 min)

Check for circulation during BLS (BLS 348)

Treatment recommendation

Outside of the ALS environment where invasive monitoring is available, there is insufficient data around the value of a pulse check while performing CPR. We therefore do not make a treatment recommendation regarding the value of a pulse check.

Nessuno studio e nessuna evidenza: nessuna raccomandazione (evitare pause a meno di sospetto dio ROSC)



Feedback for CPR quality (BLS 361)

Treatment recommendation

We suggest the use of real-time audiovisual feedback and prompt devices during CPR in clinical practice as part of a comprehensive system for care for cardiac arrest (weak recommendation, very-low-quality evidence).

We suggest against the use of real-time audiovisual feedback and prompt devices in isolation (i.e., not part of a comprehensive system of care) (weak recommendation, very-low-quality evidence).

Coming soon

EMS chest compression-only versus conventional CPR (BLS 360)

Treatment recommendation

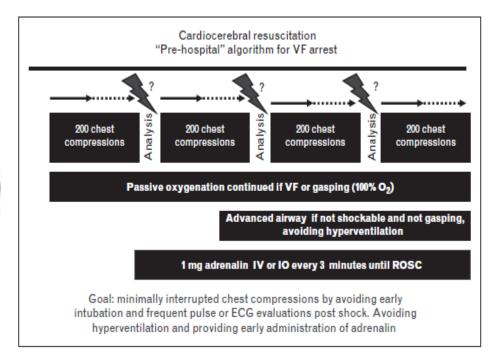
We suggest that where EMS systems² have adopted bundles of care involving minimally interrupted cardiac resuscitation,³ the bundle of care is a reasonable alternative to conventional CPR for witnessed shockable out of hospital cardiac arrest (weak recommendation, very-low-quality evidence).

Passive ventilation technique (BLS 352)

Treatment recommendation

We suggest against the routine use of passive ventilation techniques during conventional CPR (weak recommendation, very-low-quality evidence).

We suggest that where EMS systems have adopted bundles of care involving continuous chest compressions, the use of passive ventilation techniques may be considered as part of that bundle for patients in OHCA (weak recommendation, very-low-quality evidence).



Harm from CPR to victims not in cardiac arrest (BLS 353)

Treatment recommendation

We recommend that laypersons initiate CPR for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest (strong recommendation, very-low-quality evidence).

Pazienti non in AC ma sottoposti a RCP:

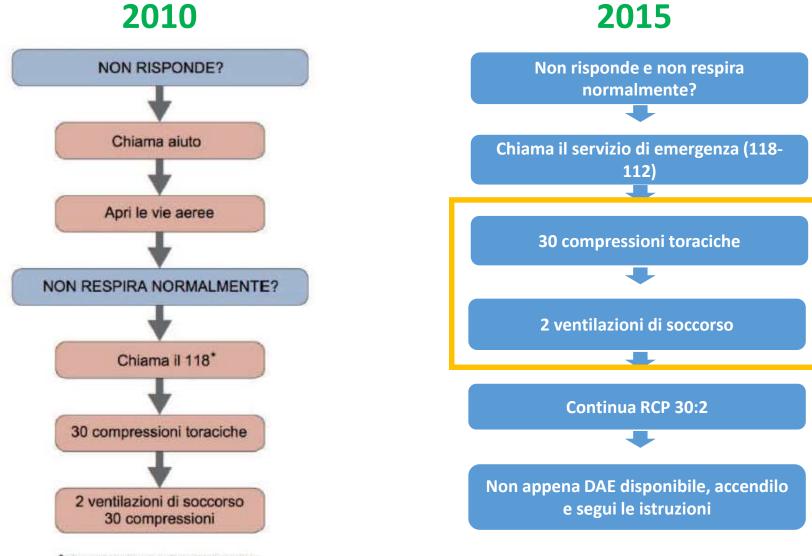
- Fratture costali o clavicolari 1.7%
- Dolore
- Nessuna lesione viscerale importante Nel dubbio massaggiare.



Riassumendo

- Profondità: circa 5 cm ma non più di 6 cm
- Frequenza: 100-120/minuto
- Riespansione completa del torace dopo ogni compressione
- Rapporto compressioni/ventilazioni 30:2
- Ventilazioni 1 ventilazione = 1 secondo (< 10 sec per 2 ventilazioni)
- Interruzioni minime nelle compressioni (pausa pre/post-shock < 10 sec)

Algoritmo BLS



^{*} o il numero nazionale per l'emergenza sanitaria

Grazie





