Scientific Symposium 2015

Basic Life Support and Automated External Defibrillation

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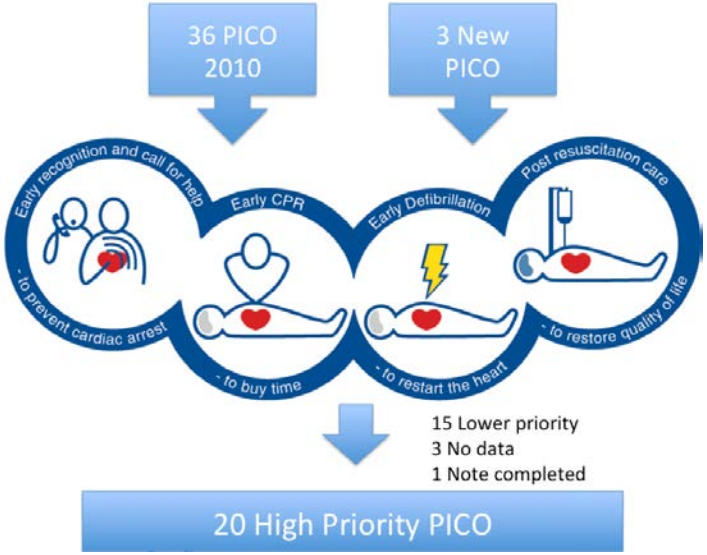
Senior Investigator NIHR

Conflict of interest

- Commercial – nil
- Academic
  - National Institute for Health Research funding to conduct clinical trials in cardiac arrest
  - BHF / RCUK support for OHCAO registry
  - Co-Chair ILCOR
  - BLS/AED roles (ILCOR, ERC, RCUK)
  - Editor Resuscitation

Outline

- Process summary
- BLS/AED Guidelines
- Key actions for implementation



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Part 3: Adult basic life support and automated external defibrillation 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations*

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ARTICLE INFO

Keywords:
Arrhythmia
Cardiac arrest
Cardiopulmonary resuscitation
Emergency department
Resuscitation

Introduction

This Part of the *2015 International Consensus on Cardiopulmonary Resuscitation* (CPR) and *Emergency Cardiovascular Care* (ECC) *Science With Treatment Recommendations* (CoSTR) presents the consensus on science and treatment recommendations for adult basic life support (BLS) and automated external defibrillation (AED). After the publication of the 2010 CoSTR, the Adult BLS Task Force developed review questions in PICO (population, intervention, comparator, outcome) format.[1] This resulted in the generation of 36 PICO questions for systematic reviews. The task force discussed the topics and then voted to prioritize the most important questions to be tackled in 2015. From the pool of 36 questions, 14 were rated low priority and were deferred from this round of evidence evaluation. Two new questions were submitted by task force members, and 1 was submitted via the public portal. Two of these (BLS 856, and BLS 891) were taken forward for evidence review. The third question (368: Foreign-Body Airway Obstruction) was deferred after a preliminary review of the evidence failed to identify compelling evidence that would alter the treatment recommendations made when the topic was last reviewed in 2005.[2]

Each task force performed a systematic review using detailed inclusion and exclusion criteria, based on the recommendations of the Institute of Medicine of the National Academies.[3] With the assistance of information specialists, a detailed search for relevant articles was performed in each of 3 online databases (PubMed, Embase, and the Cochrane Library).

Reviewers were unable to identify any relevant evidence for 3 questions (BLS 811, BLS 373, and BLS 348), and the evidence review was not completed in time for a further question (BLS 370). A revised PICO question was developed for the opioid question (BLS 891). The task force reviewed 23 PICO questions for the 2015 consensus on science and treatment recommendations, including BLS 811, BLS 373, and BLS 348. The PICO flow is summarized in Fig. 1

Using the methodological approach proposed by the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) Working Group,[4] the reviewers for each question created a reconciled risk-of-bias assessment for each of the included studies, using state-of-the-art tools: Cochrane for randomized controlled trials (RCTs),[5] Quality Assessment of Diagnostic Accuracy Studies (QUADAS)-2 for studies of diagnostic accuracy,[6] and GRADE for observational studies that inform both therapy and prognosis questions.[7] GRADE evidence profile tables[8] were then created to facilitate an evaluation of the evidence in support of each of the

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1 Co-chairs and equal first co-authors.
2 The members of the BLS Chapter Collaborators are listed in the Acknowledgments section.

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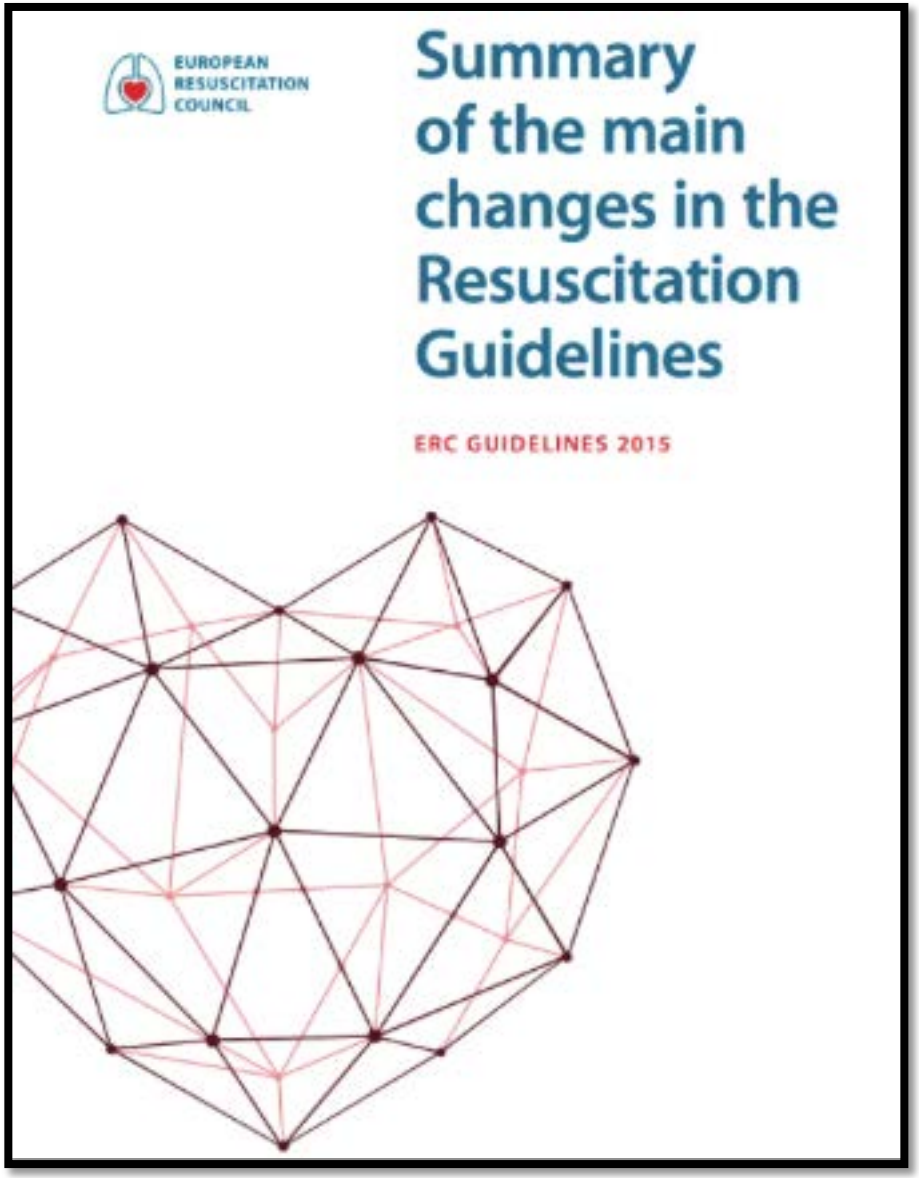
International Liaison Committee on Resuscitation

ILCOR

EUROPEAN RESUSCITATION COUNCIL



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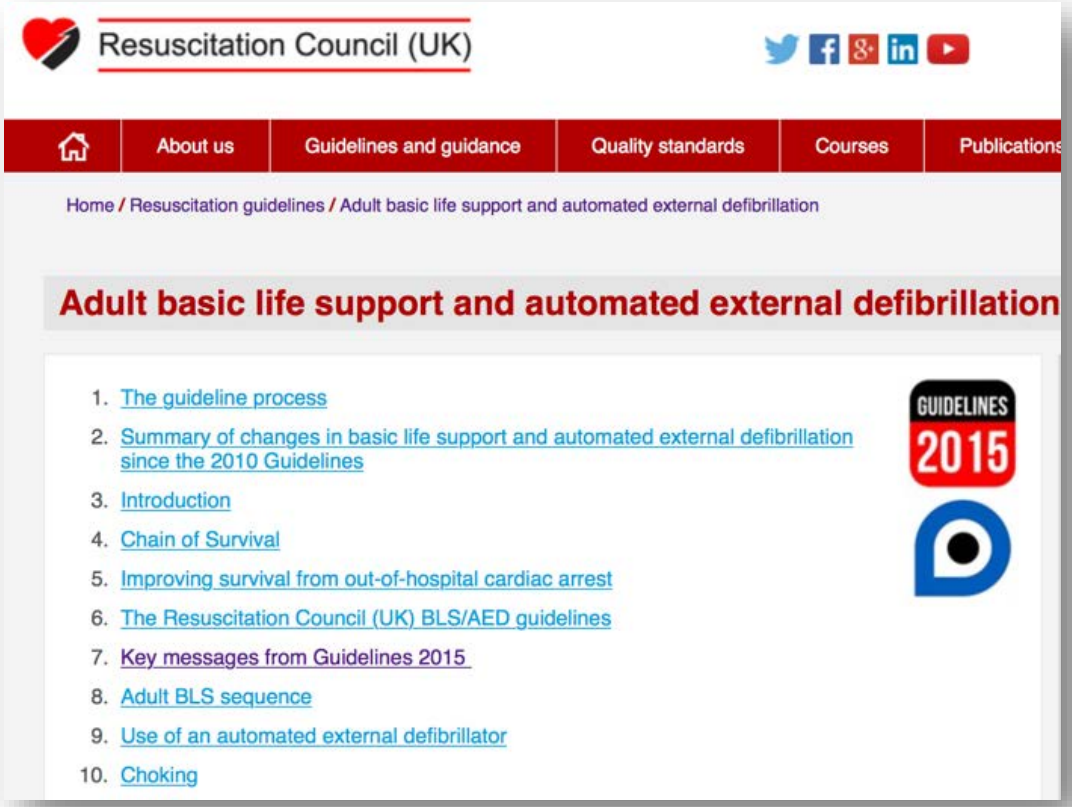
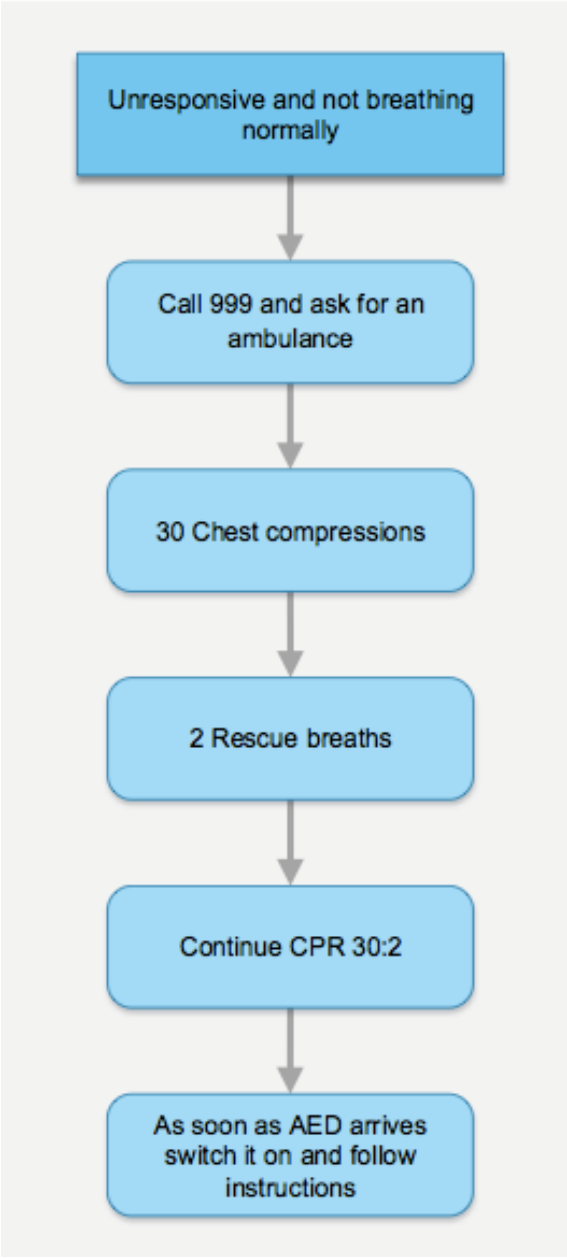
Resuscitation Council (UK)



Gavin Perkins, Mick Colquhoun, Charles Deakin, Anthony Handley, Chris Smith, Michael Smyth



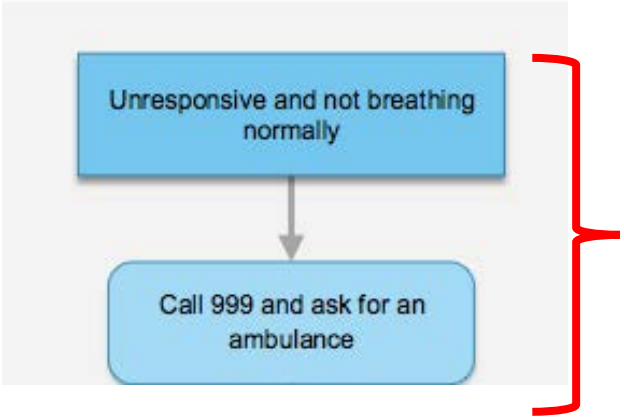
GUIDELINES 2015

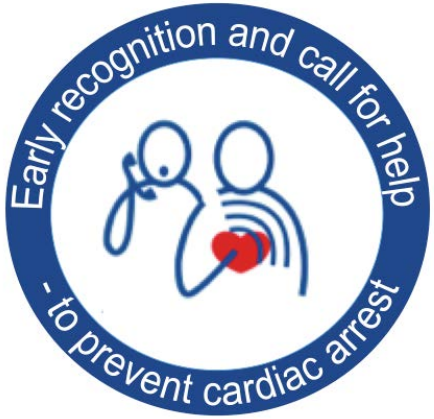
Review the evidence

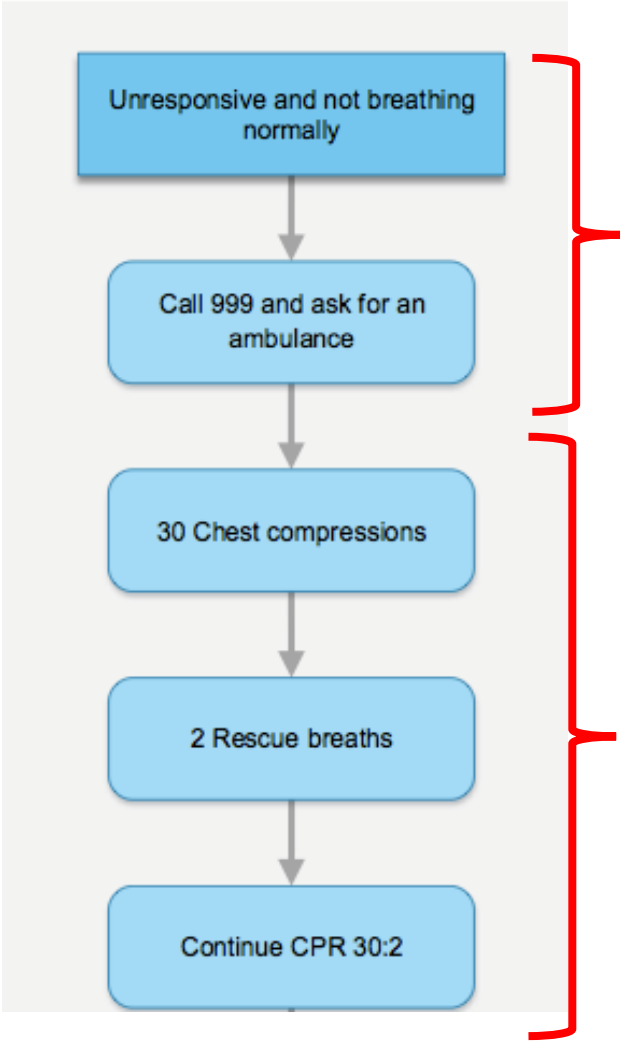
Revise the algorithm

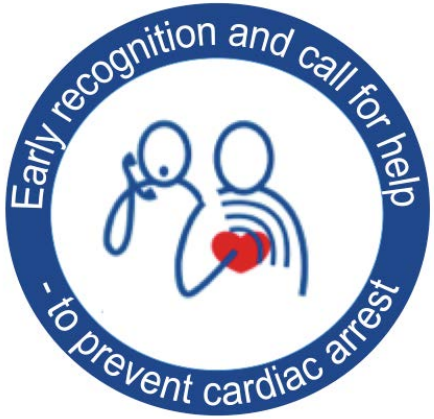
Simplify the sequence

Reduce time to use of AED

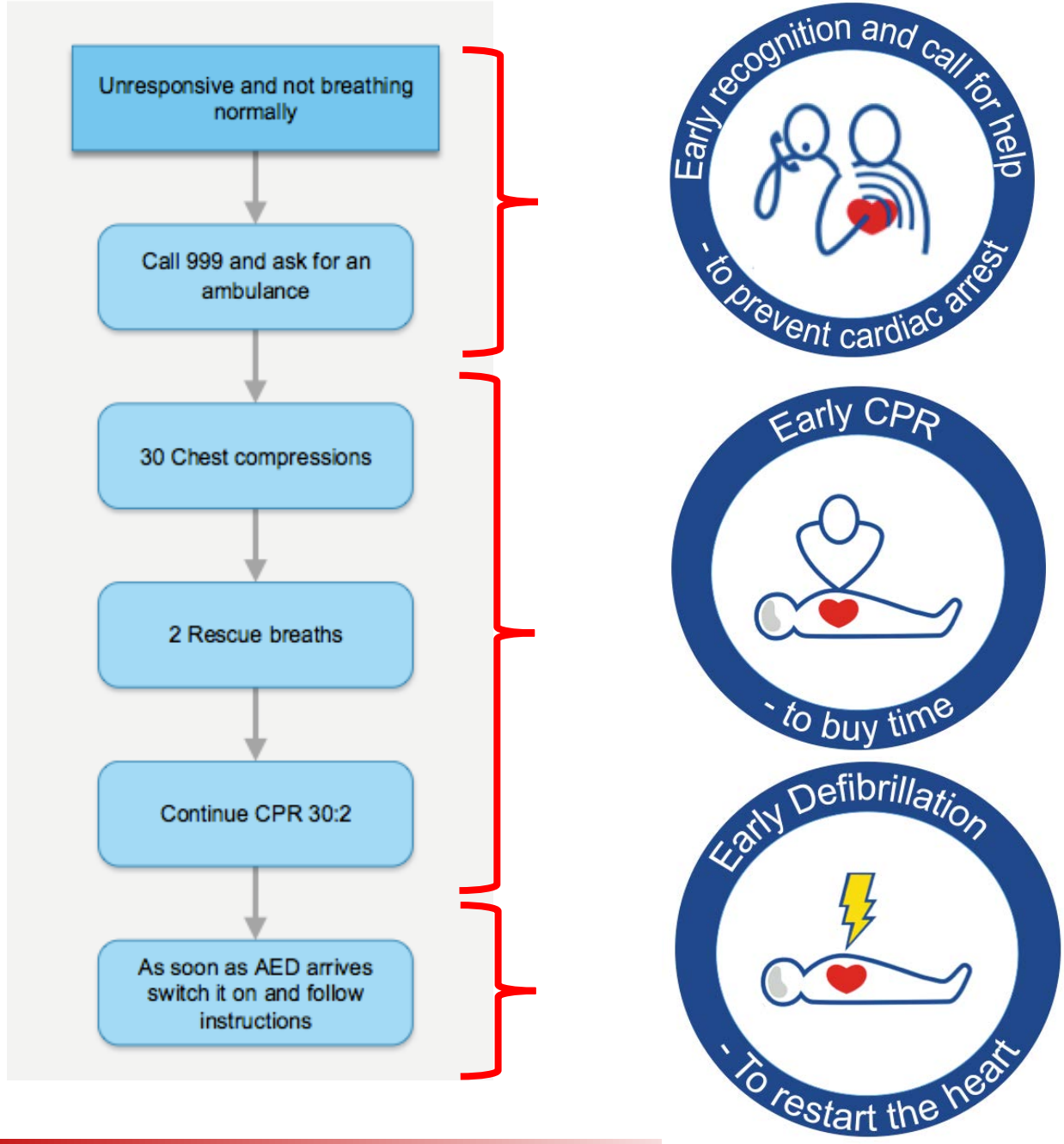

Unresponsive and not breathing normally
Call 999 and ask for an ambulance


Early recognition and call for help
- to prevent cardiac arrest


Unresponsive and not breathing normally
Call 999 and ask for an ambulance
30 Chest compressions
2 Rescue breaths
Continue CPR 30:2


Early recognition and call for help
- to prevent cardiac arrest


Early CPR
- to buy time


Unresponsive and not breathing normally
Call 999 and ask for an ambulance
30 Chest compressions
2 Rescue breaths
Continue CPR 30:2
As soon as AED arrives switch it on and follow instructions
Early recognition and call for help
- to prevent cardiac arrest
Early CPR
- to buy time
Early Defibrillation
- To restart the heart

Unresponsive and not breathing normally

- Ensure safety
- Assess response
- Open airway
- Check breathing
  - Recognise agonal breathing
  - Be suspicious of cardiac arrest in any patient presenting with seizures

Ryan Radford
https://www.youtube.com/watch?v=CBMxH4xtE8w

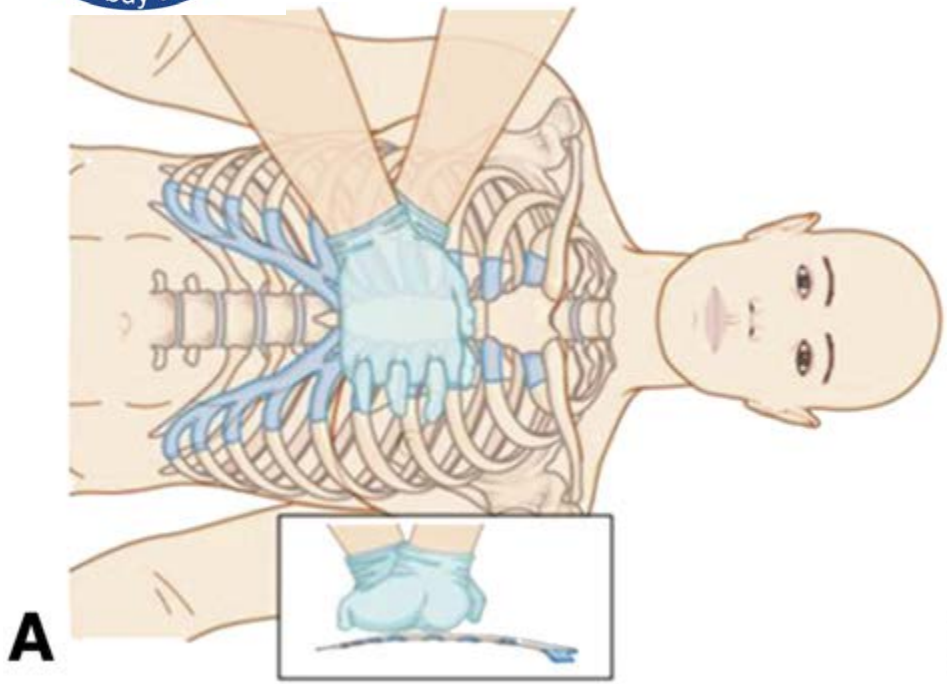
Call 999 and ask for an ambulance

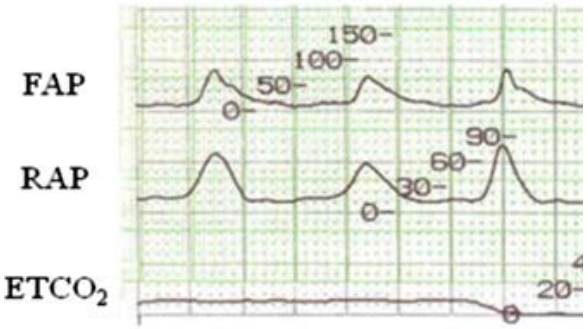
Call 999 and ask for an ambulance

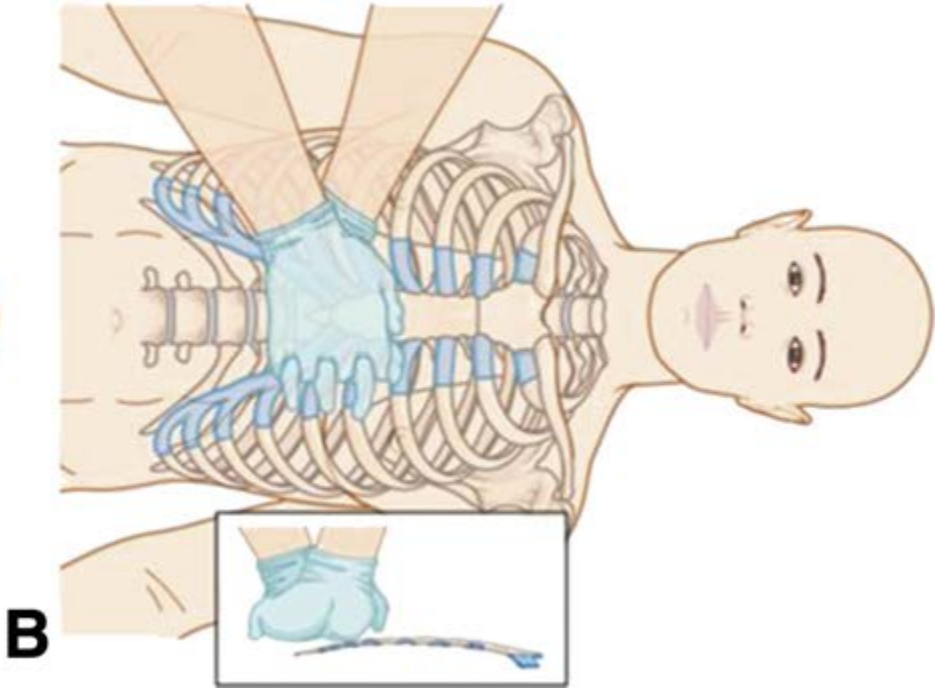
- 80% arrests occur at home – mostly single bystander
- 2 out of every 3 999 calls made from mobiles
- Ambulance dispatch processes prioritise reports of unconscious and not breathing normally

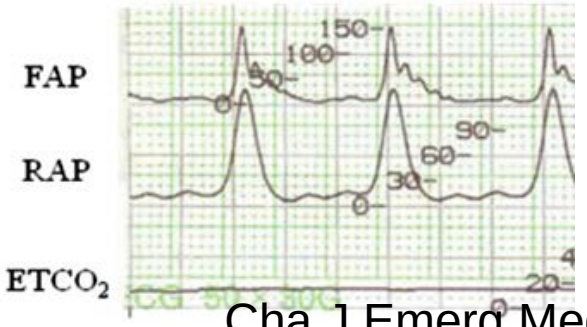
- Get a helper to call if possible
- Stay with victim
- Activate speaker phone
- Send for AED… don't leave the victim

30 chest compressions





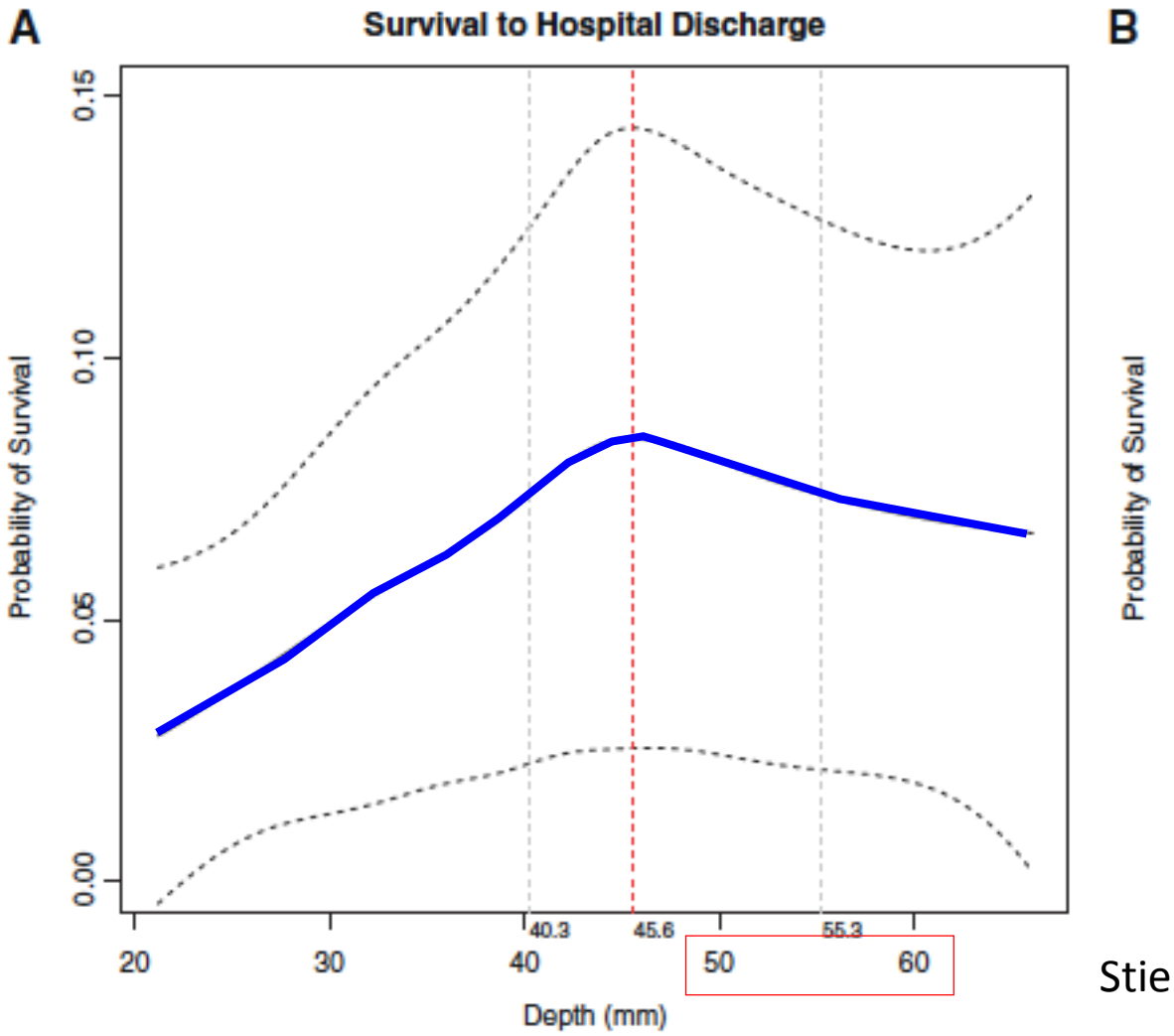




Cha J Emerg Med 2013

Compress 5-6cm

6779/9136 (74%) compressions too shallow



Stiell Circulation 2014

Compress 5-6cm

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Clinical paper

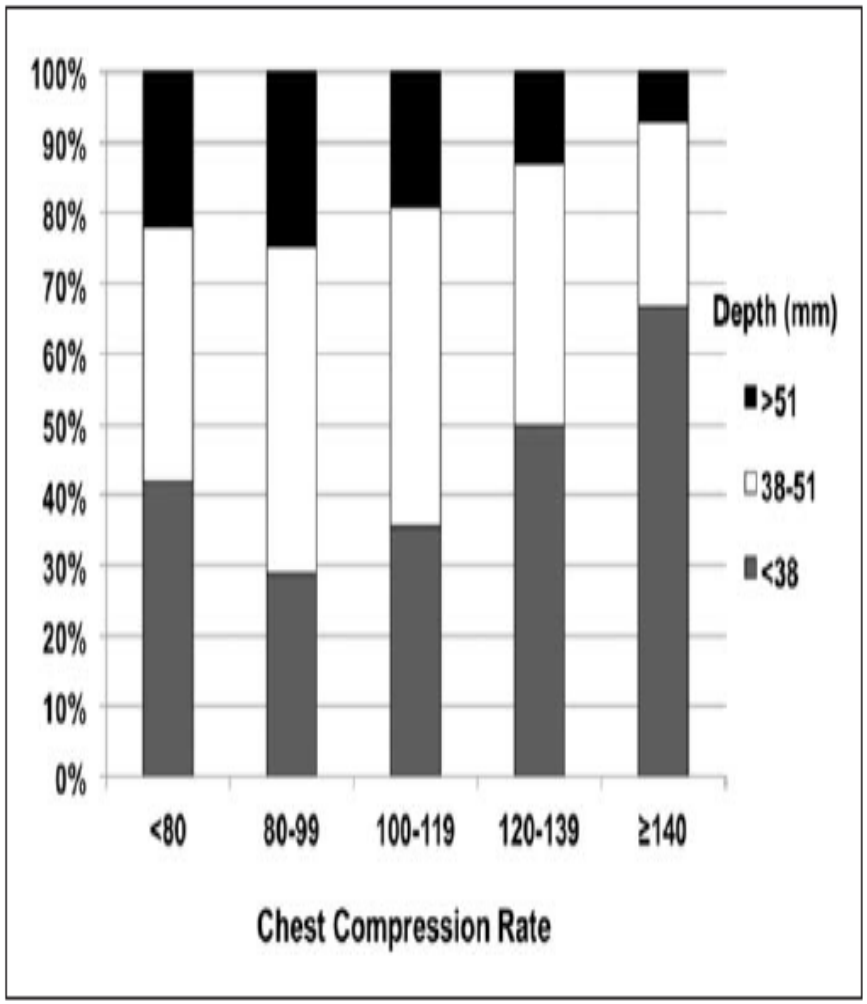
Deeper chest compression – More complications for cardiac arrest patients?☆

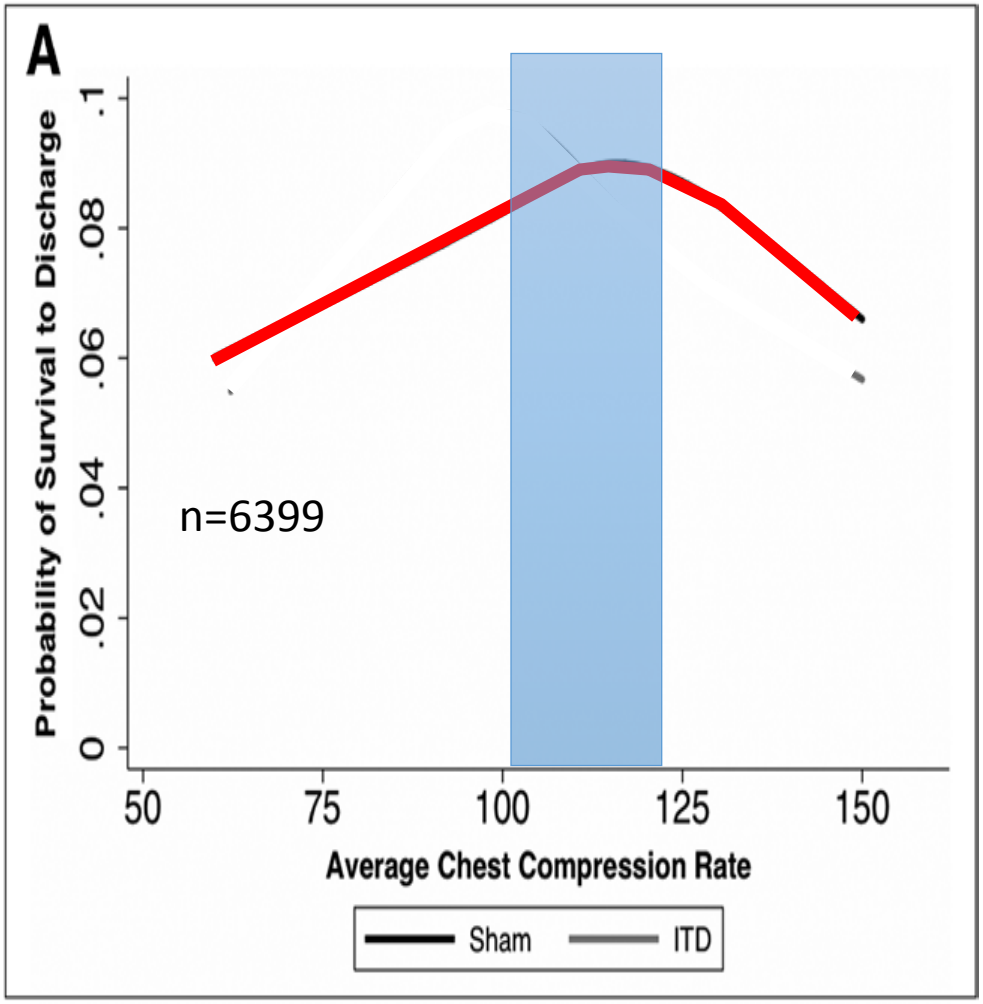
- Injuries in 110 males related to compression depth

Depth <50mm	**29%**
Depth 50-60mm	**33%**
Depth >60mm	**63%**

Hellevuo Resuscitation 2013

Compression rate 100-120 min^{-1}

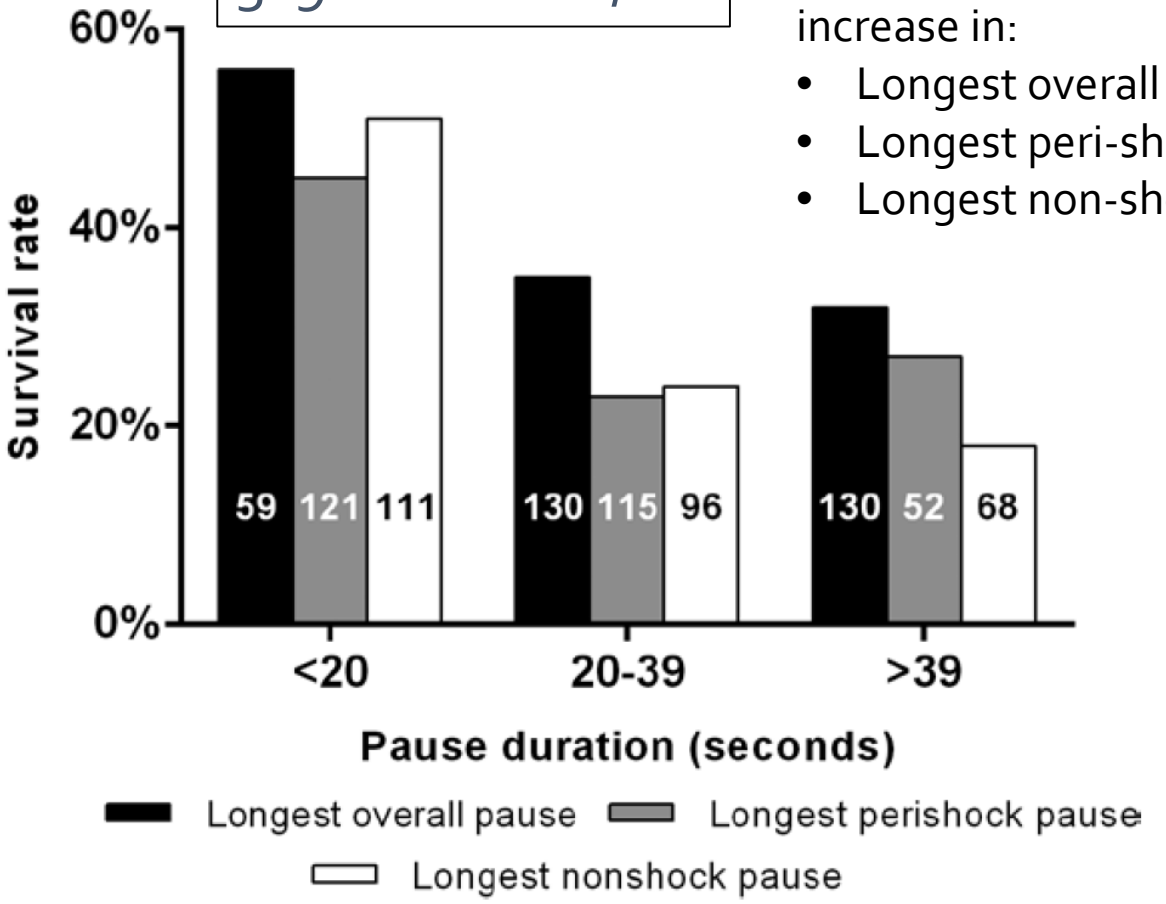




Idris CCM 2015

Avoid interruptions in compressions

319 OHCAs VF/VT



Lower odds ratio (OR) for survival per 5 second increase in:

- Longest overall pause OR 0.85 (0.77–0.93)
- Longest peri-shock OR 0.85 (0.77–0.93)
- Longest non-shock OR 0.83 (0.75–0.91)

Message:
Any pause is bad

Brouwer TF Circulation 2015

Avoid Leaning

After each compression, release all the pressure on the chest without losing contact between your hands and the sternum

Glatz Resuscitation 2013

Yannopoulos Resuscitation 2005

Zuercher Crit Care Med 2010

Ventilations

- If trained and able
  - 2 breaths within 10s
- Untrained or unable
  - Compression only

- Non-cardiac causes
- Children
- Delayed EMS response

Switch on AED and follow instructions

Time to Shock	Survival With Favorable Neurologic Outcome, n (%)
0–2	81 (71.1)
2–4	78 (63.4)
4–6	121 (52.4)
6–8	212 (42.3)
8–10	196 (37.7)
10–12	127 (27.7)
>12	155 (20.9)

Blom Circulation 2014

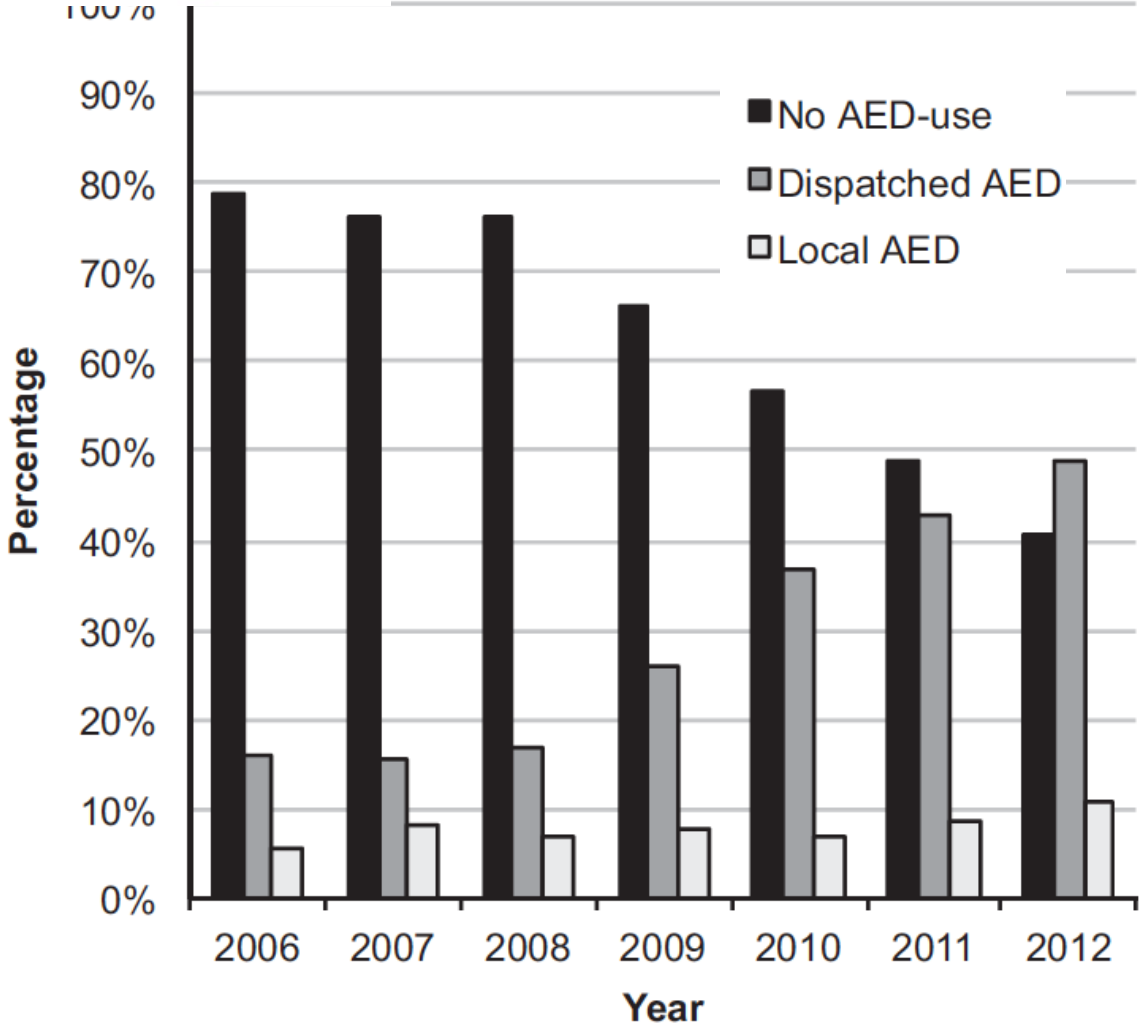
1035 cardiac arrests

44 AED on site

18 used (1.7%)

Deakin 2014

Switch on AED and follow instructions



Survival (shockable rhythms)

- N = 2823
- 29.1% to 41.4%
- P for trend = <0.001

- Explained mainly by AED use

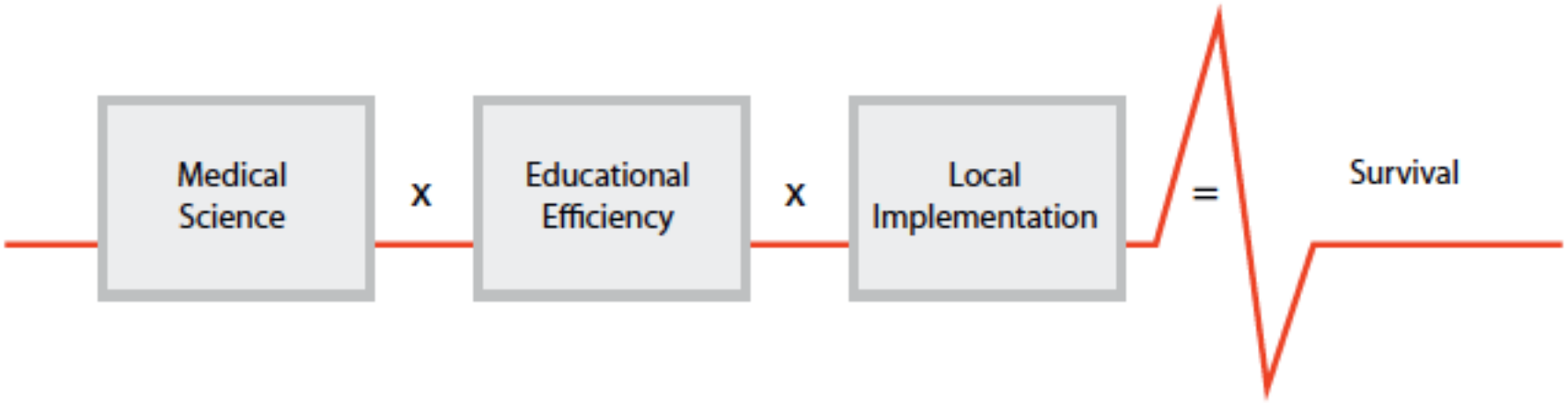
Blom Circulation 2014

Commentary and concepts

The formula for survival in resuscitation☆

Eldar Søreide[a,b,*,1], Laurie Morrison[c,d,1], Ken Hillman[e,f,1], Koen Monsieurs[g,h,1], Kjetil Sunde[i,1], David Zideman[j,k,1], Mickey Eisenberg[l,1], Fritz Sterz[m,1], Vinay M. Nadkarni[n,1], Jasmeet Soar[o,1], Jerry P. Nolan[p,1], Utstein Formula for Survival Collaborators

Resuscitation 2013



All school children are taught CPR and how to use an AED

Government blocks first aid Bill that could save thousands of lives

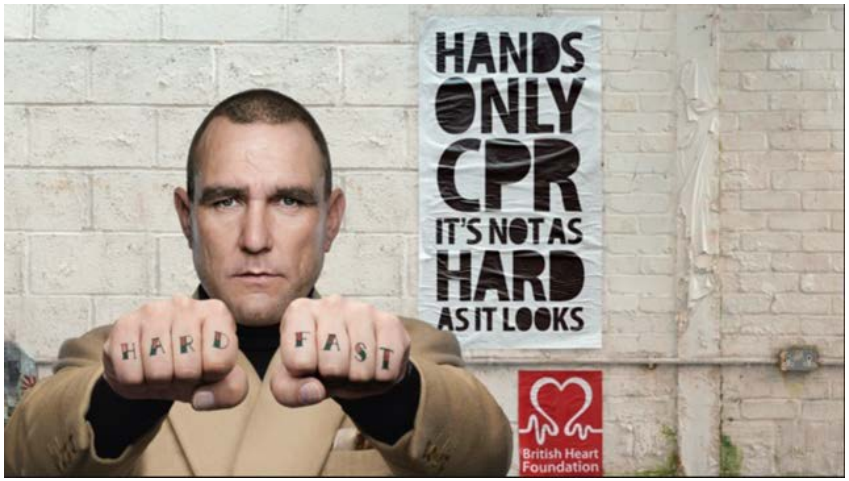
Tweet Recommend 808 G+1 2

20 November 2015

The British Red Cross and two more major UK charities have today declared their disappointment at the Government's failure to back a Private Members' Bill, despite mass public support. The Bill would have ensured all young people are given the opportunity to learn first aid in secondary schools.

Mrs Sheryll Murray (MP South East Cornwall) (Con): If somebody has a pulse that cannot be detected, or if somebody is breathing very shallowly, someone who comes along and starts to administer CPR could do damage to their health.

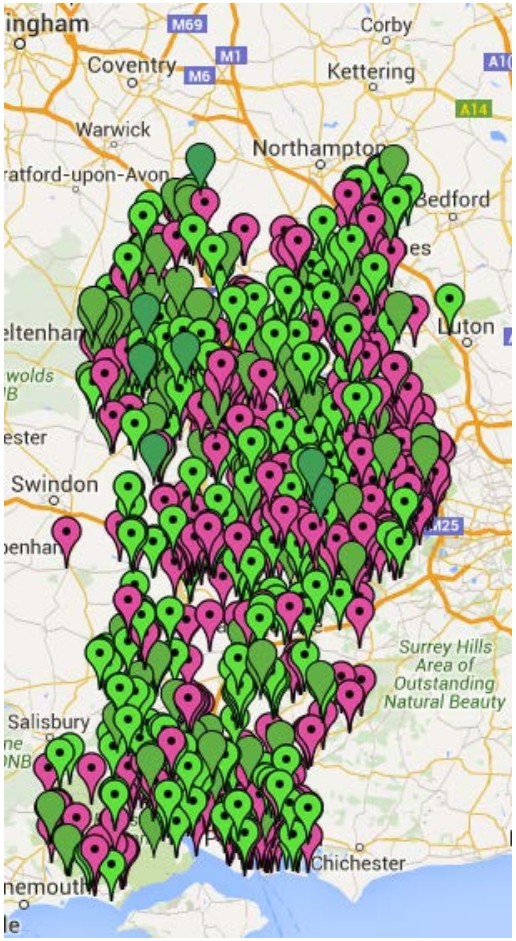
Everyone who is able to should learn CPR



The most people to take part in a CPR relay was achieved at an event organized by Patricia Conaghan and Christopher Cutts (both UK) at the University of Manchester in University Place, Manchester, on 16 October 2015

OFFICIALLY AMAZING

AEDs: Buy, Register, Deploy



OHCAO

ASSOCIATION OF AMBULANCE CHIEF EXECUTIVES

NASMeD
National Ambulance Service Medical Directors

WARWICK
CLINICAL TRIALS UNIT

Epidemiology and Outcome from Out of Hospital Cardiac Arrest in England during 2014

Samantha McDonnell
On behalf of the OHCAO Project Group.

British Heart Foundation

Resuscitation Council (UK)

NHS
National Institute for Health Research
THE UNIVERSITY OF WARWICK

Unresponsive and not breathing normally

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As soon as AED arrives switch it on and follow instructions