



Resuscitation Guidelines update

Dr. Luis García-Castrillo Riesgo
EuSEM Vice president



There are no COIs to disclose in this presentation.



CPR Mile Stones

1958 -William Kouwenhoven ,
cardiac massage.

1967 -International Symposium on
Emergency Resuscitation, Oslo,
Norway.

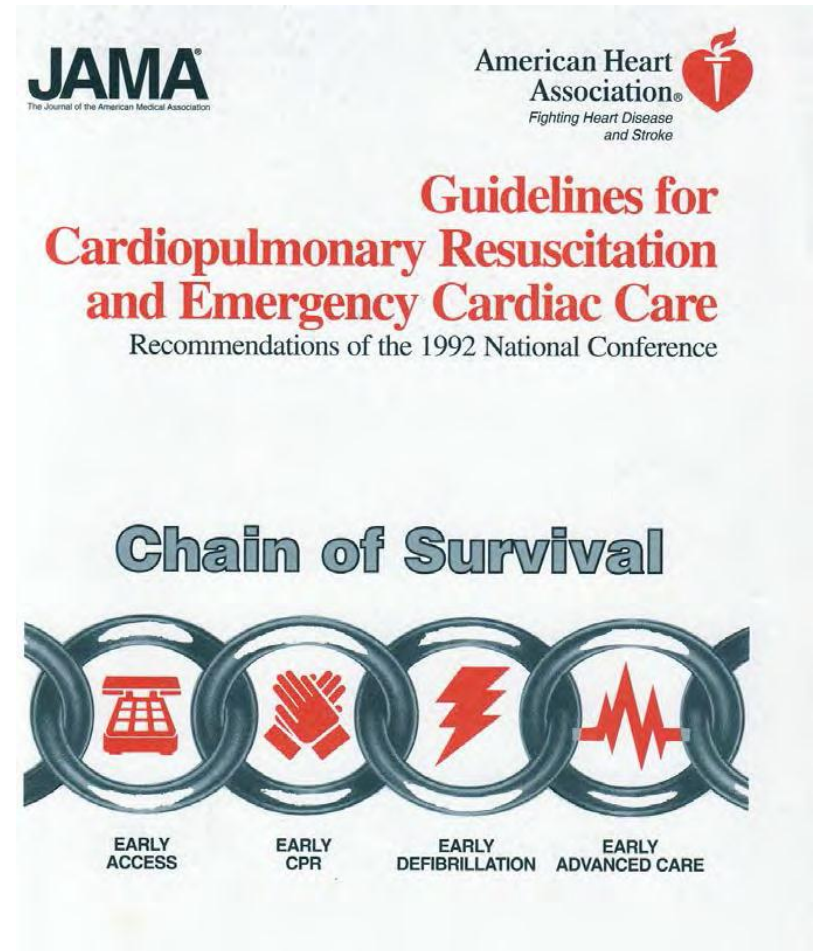
AHA Standards and guidelines CPR
and ECC –1974, 1980, 1986, 1992.



1992 CPR Guidelines

First International Meeting

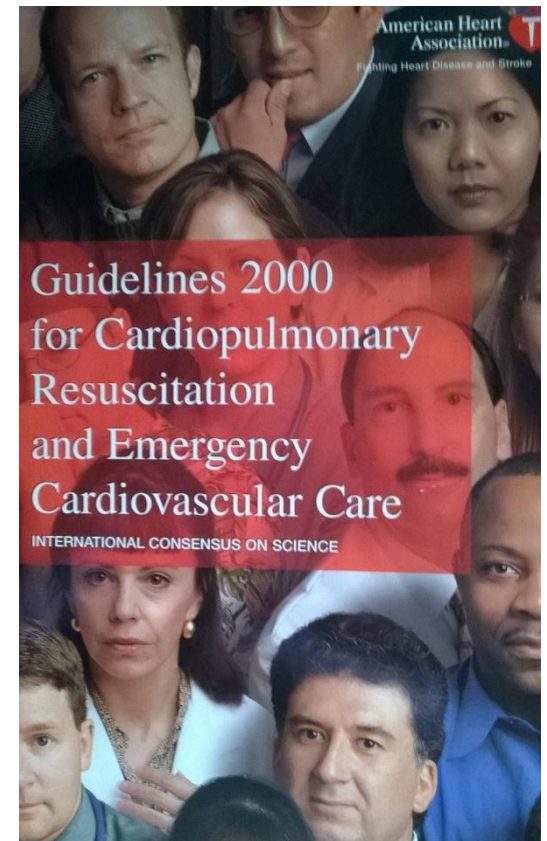
- Sodium Bicarbonate in CPR.
- Early Public Access Defibrillation .
- Chain of survival.
- ILCOR foundation.



2000 CPR Guidelines

The world's first international to produce International Resuscitation Guidelines.

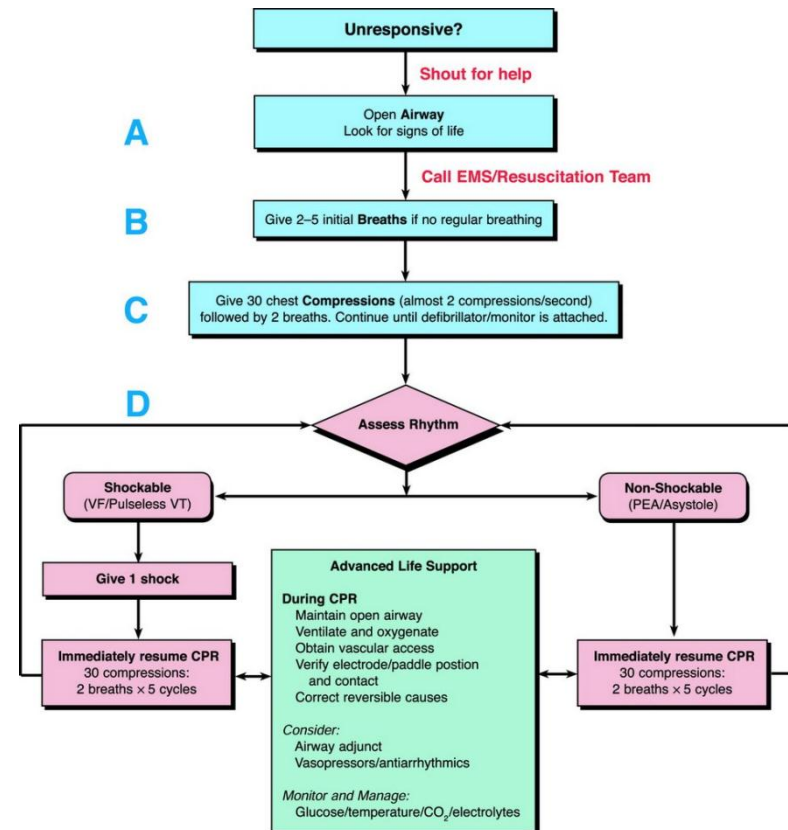
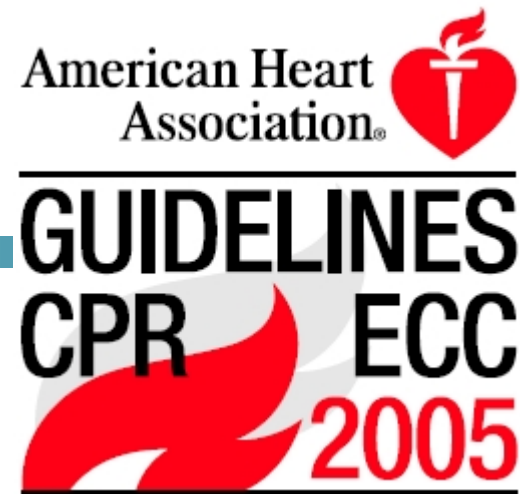
- Simplification of Adult BLS Ratio 100x' 15:2.
- Treatment of cardiac arrest with a "shockable" rhythm, deliver up to three "stacked" shocks without CPR between the shocks.
- Comparable Effectiveness: Bag-Mask Device May Be as Effective as Tracheal Tube.
- Death Pronouncement in the Field, the Futility of Transport of Patients Needing Continued CPR



2005 CPR Guidelines

International Consensus on Cardiopulmonary Resuscitation(CPR) and Emergency Cardiovascular Care(ECC) with Treatment Recommendations (CoSTR).

- The ratio of compressions-to-ventilations has been changed to 30:2.
- Rescuers now deliver 1 shock (360J monophasic) followed by CPR, not 3 shocks.
- Lay rescuers no longer check for circulation.
- Other algorithms have been simplified.



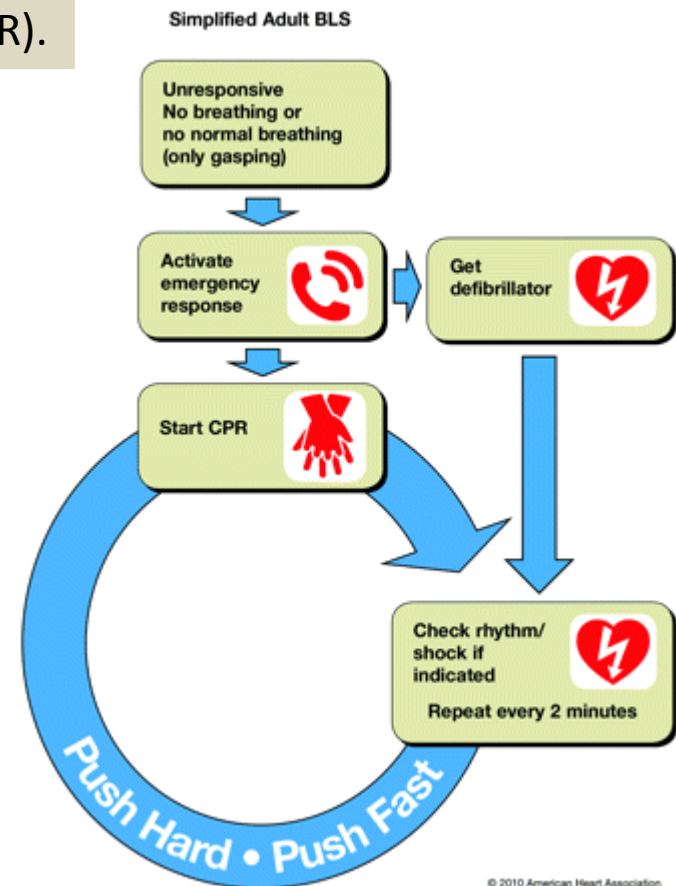
2010 CPR Guidelines

GUIDELINES
CPR ECC
2010

The official guidelines for CPR, first aid and advanced cardiovascular care are here!
Learn the latest from the leader in resuscitation science, education and training.

International Consensus on Cardiopulmonary Resuscitation(CPR) and Emergency Cardiovascular Care(ECC) with Treatment Recommendations (CoSTR).

- An adjustment to the CPR process from A – B – C (Airway – Breathing – Compressions) to C – A – B.
- An increased emphasis on High – Quality CPR.
- Revoking previous recommendations for performing cricoid pressure.



2015 Guidelines

- Goals
 - Reduce inventory of science with much more frequent “focused updates.”
 - Adopt an internationally recognized, transparent system for evaluating scientific evidence.
 - Encourage broad participation in the process.
 - Enhance quality of scientific reviews.
 - Speed development of revised guidelines.

ILCOR Taskforces for 2015

1. Advanced Life Support
2. Basic Life Support
3. Paediatric Life Support
4. Neonatal Life Support
5. Acute Coronary Syndromes
6. Education, Implementation & Teams
7. First Aid (new for 2015)
8. (Methodology Group)

2015 Guidelines: Methodology

ILCOR, Scientific Evidence Evaluation and Review System (SEERS)

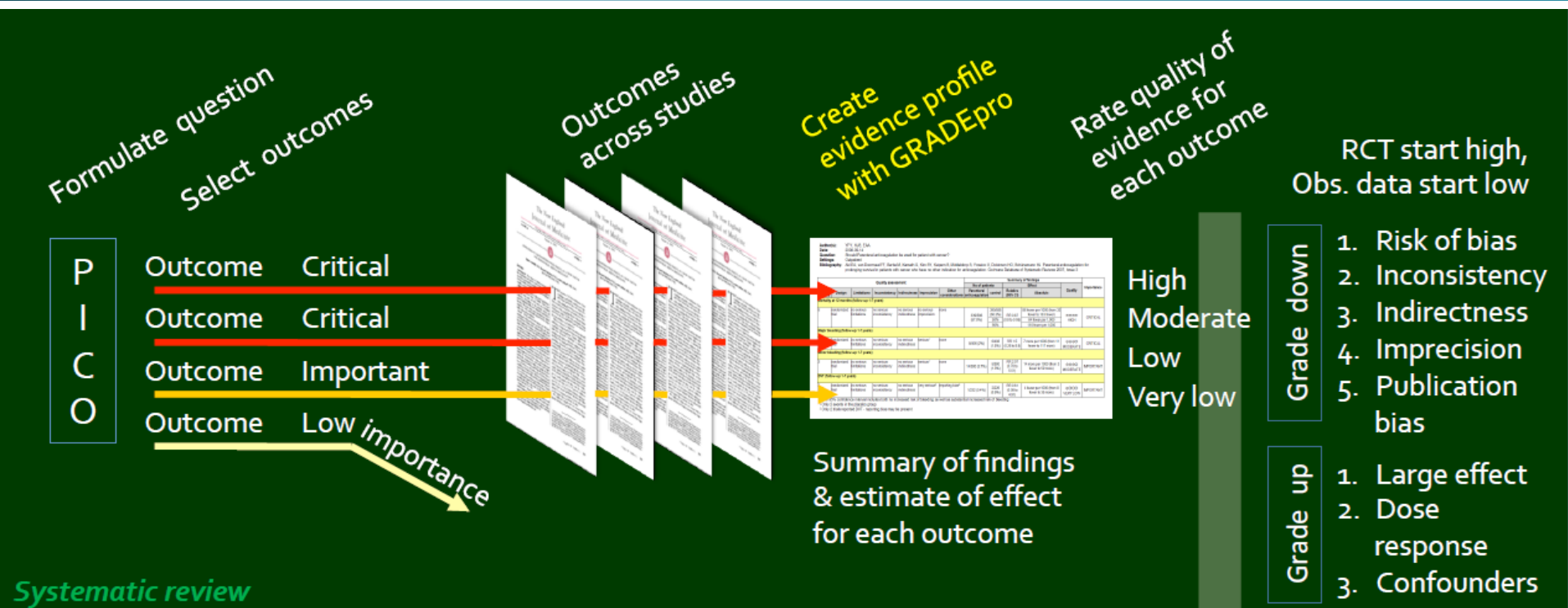


1. Questions PICO

- PICO stands for Patient/population, Intervention, Comparison and Outcome.
- 2015 169 (Picos)
- “ In community dwelling adults, how effective is hands-only CPR, versus hands plus breathing CPR, at preventing mortality?

2. Evaluation of the evidence: Grading of Recommendations Applicability, Development and Evaluation (GRADE)

2015 Guidelines: Methodology GRADE



Quality of evidence

- High
- Moderate
- Low
- Very low

Strength of recommendation

- “We recommend using...”
- “We suggest using...”
- “We recommend against using...”
- “We suggest against using...”

Guidelines Implementation

- Guidelines must take into account:
 - Science
 - Education issues
 - Cost effectiveness
 - Cultural differences

2015 CPR Guidelines

- New Guidelines Questions
 - High-Quality CPR. A “sweet spot” for the rate of chest compressions of 100 – 120 may be established.
 - Supporting research has shown a slower compression rate may restrict the heart muscles from perfusion, while a faster compression rate puts providers at risk of performing less effective compressions, and/or making mistakes during the CPR process.

Cardiac Arrest Compression rate

- The AHA Guidelines for CPR

	Compression to ventilation rate	Rate of compression	Initial breaths	Ventilation rate
1974	1 rescuers: 15:2 2 rescuers: 5:1	60/min	"4 staircase"	12
1980	Same as 1974	60/min	"4 staircase"	12
1986	Same as 1974	80-100/min	2 "full" breaths	12
1992	Same as 1974	80-100/min	2 "full" breaths	10-12
2000	1 & 2 rescuers: 15:2	100/min	2 breaths	10-12
2005	1 & 2 rescuers: 30:2	100/min	2 breaths	8-10 advanced airway
2010	1 & 2 rescuers: 30:2	At least 100	C-A-B	8-10 breaths/min

Cardiac Arrest Compression rate

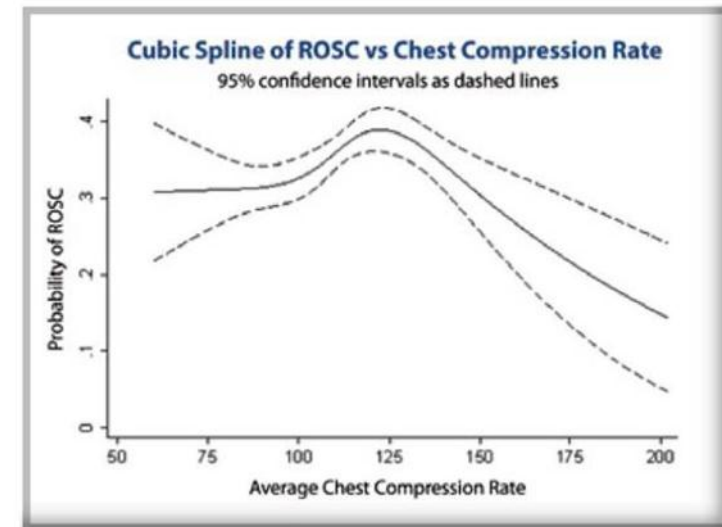
2010 Guidelines Chest compressions at least 100/min.

- About half of responders are giving chest compressions too fast, with about a third above 120 compressions per minute, and 20 percent above 140 per minute.
- Idris : Data from the Resuscitation Outcomes Consortium. Prehospital Resuscitation.
 - Pool of 13.469 patients. First 5 min CPR.

Chest compressions	Survival to hospital discharge	ROSC
>140	-4%	-5%
120-139	-2%	9%
100-119	Control	Control
80-99	-2%	
<80	-1%	

Increase in rate decrease in deepness.

ROSC



JEMS. 2012 Sep; 37(9): 4–9.
Crit Care Med. 2015

Compression rate 2015 Guidelines

Treatment Recommendation:

- We suggest a manual chest compression rate of 100 to 120 compressions per minute for adults in cardiac arrest in any setting (weak recommendation, very low quality of evidence).

Cardiac Arrest Hypothermia

2010 Guidelines “In summary, we recommend that comatose adult patients with ROSC after out-of-hospital VF cardiac arrest should be cooled to 32°C to 34°C for 12 to 24 hours.” (Class I, LOE B).

- When
- How
- How long
- At what level..

Cardiac Arrest Hypothermia

- Mild Therapeutic Hypothermia to Improve the Neurologic Outcome after Cardiac Arrest
- Cardiac Arrest Trial, two branches (Shockable rhythms)
 - 32-34° (137)(24 h)
 - Normothermia (138)

The New England
Journal of Medicine

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TABLE 2. NEUROLOGIC OUTCOME AND MORTALITY AT SIX MONTHS.

OUTCOME	NORMOTHERMIA	HYPOTHERMIA	RISK RATIO (95% CI)*	P VALUE†
	no./total no. (%)			
Favorable neurologic outcome‡	54/137 (39)	75/136 (55)	1.40 (1.08–1.81)	0.009
Death	76/138 (55)	56/137 (41)	0.74 (0.58–0.95)	0.02

Cardiac Arrest Hypothermia

Niklas Nielsen

- Cardiac Arrest Trial two branches (GCS <8)
 - 33° (24 h)
 - 36°

Table 2. Outcomes.

Outcome	33°C Group	36°C Group	Hazard Ratio or Risk Ratio (95% CI)*	P Value
	<i>no./total no. (%)</i>			
Primary outcome: deaths at end of trial	235/473 (50)	225/466 (48)	1.06 (0.89–1.28)	0.51
Secondary outcomes				
Neurologic function at follow-up†				
CPC of 3–5	251/469 (54)	242/464 (52)	1.02 (0.88–1.16)	0.78
Modified Rankin scale score of 4–6	245/469 (52)	239/464 (52)	1.01 (0.89–1.14)	0.87
Deaths at 180 days	226/473 (48)	220/466 (47)	1.01 (0.87–1.15)	0.92

Cardiac Arrest Hypothermia

Francis Kim: “Effect of Prehospital Induction of Mild Hypothermia on Survival and Neurological Status Among Adults With Cardiac Arrest.”

- Cardiac Arrest Trial, Four branches, Out of Hospital cooling.

1. Ventricular Fibrillation.

1. Cold Fluids
2. Standard

2. Non Ventricular Fibrillation.

1. Cold Fluids
2. Standard

Table 2. Status at Time of Discharge

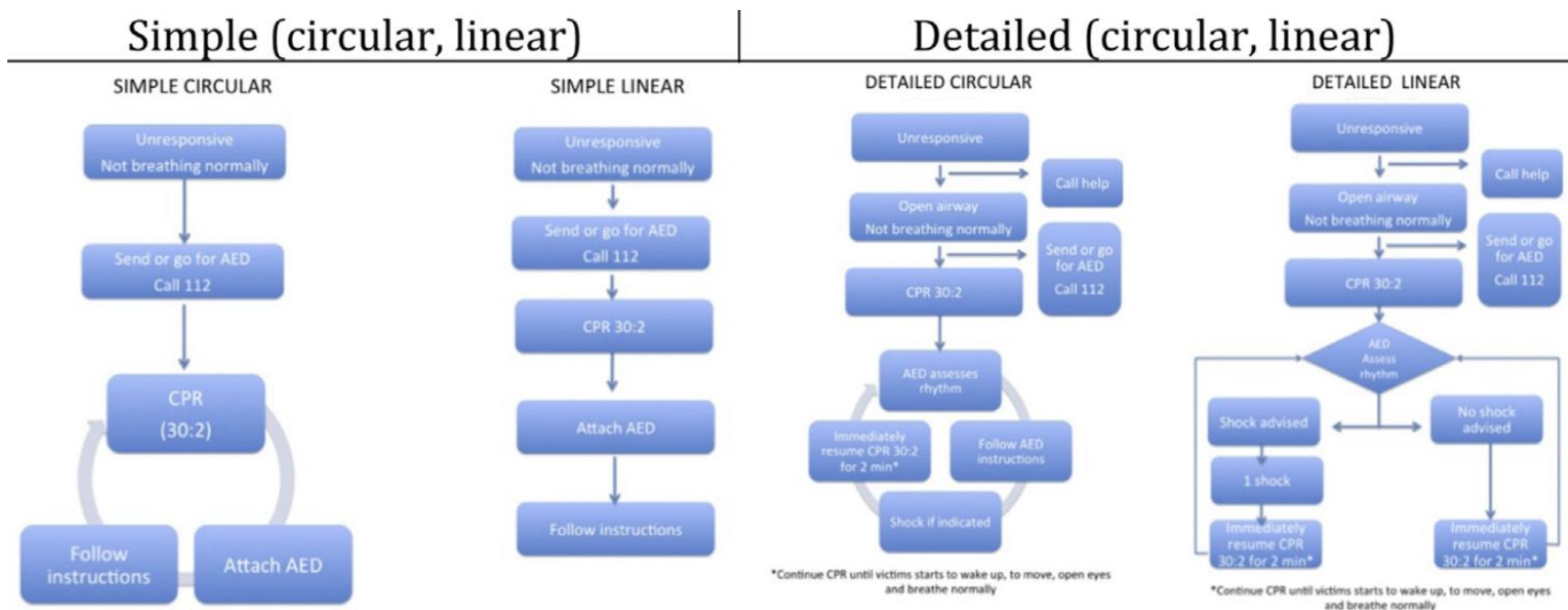
	With Ventricular Fibrillation (n = 583)			Without Ventricular Fibrillation (n = 776)		
	No. (%) [95% CI]		P Value	No. (%) [95% CI]		P Value
	Intervention (n = 292)	Control (n = 291)		Intervention (n = 396)	Control (n = 380)	
Vital status						
Dead	109 (37.3) [32.0-43.0]	104 (35.7) [30.5-41.4]	.69	320 (80.8) [76.6-84.4]	318 (83.7) [79.6-87.1]	.30
Alive	183 (62.7) [57.0-68.0]	187 (64.3) [58.6-69.5]		76 (19.2) [15.6-23.4]	62 (16.3) [12.9-20.4]	

Hypothermia 2015 Guidelines

Treatment Recommendation:

- We recommend selecting and maintaining a constant, target temperature between 32°C and 36°C for those patients in whom temperature control is used (strong recommendation, moderate-quality evidence). Whether certain subpopulations of cardiac arrest patients may benefit from lower (32-34°C) or higher (36°C) temperatures remains unknown, and further research may help elucidate this.

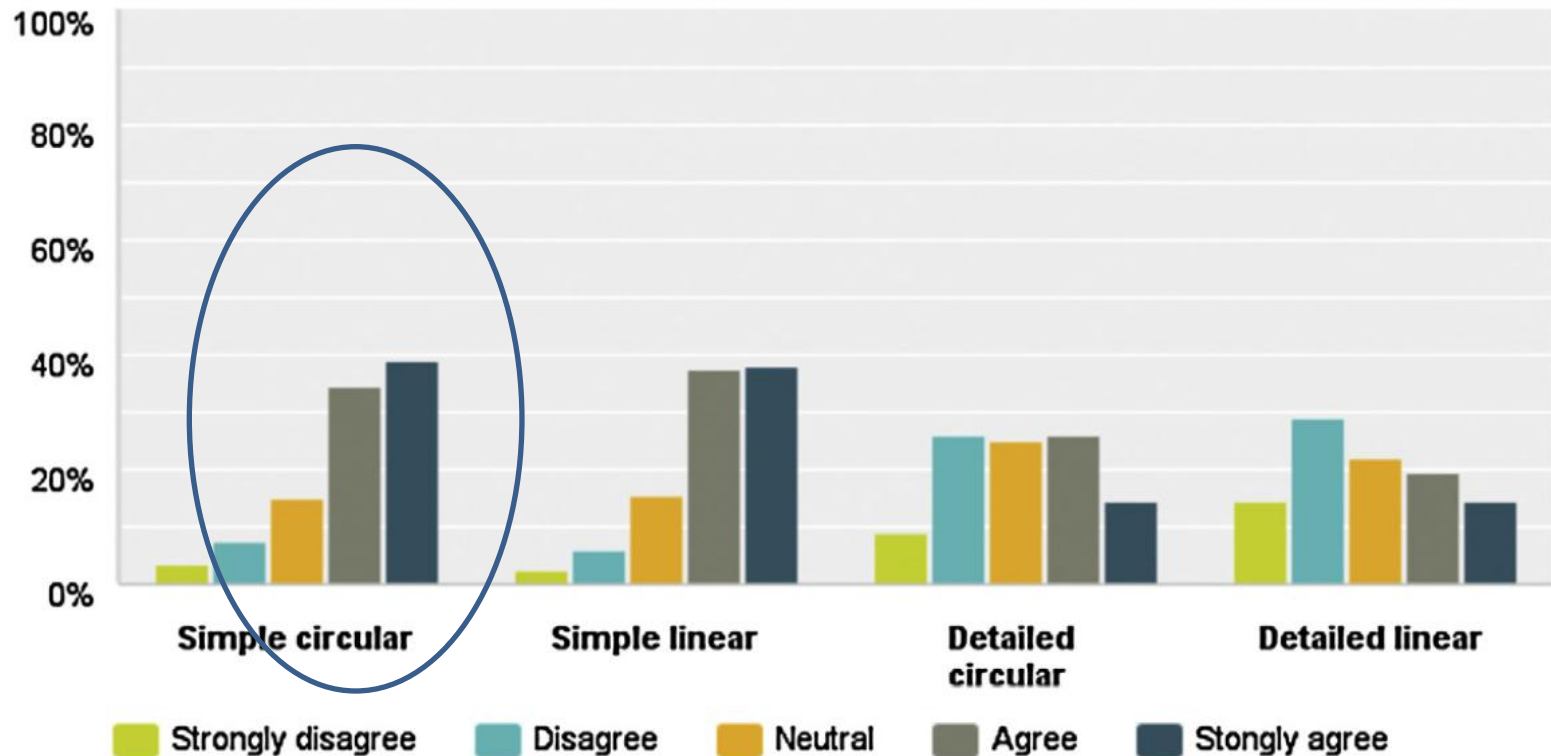
Algorithms structure



Resuscitation algorithms-Linear or Circular? Perkins GD, Handley AJ, Raffay V, Monsieurs KG, Castren M. Resuscitation 2015.

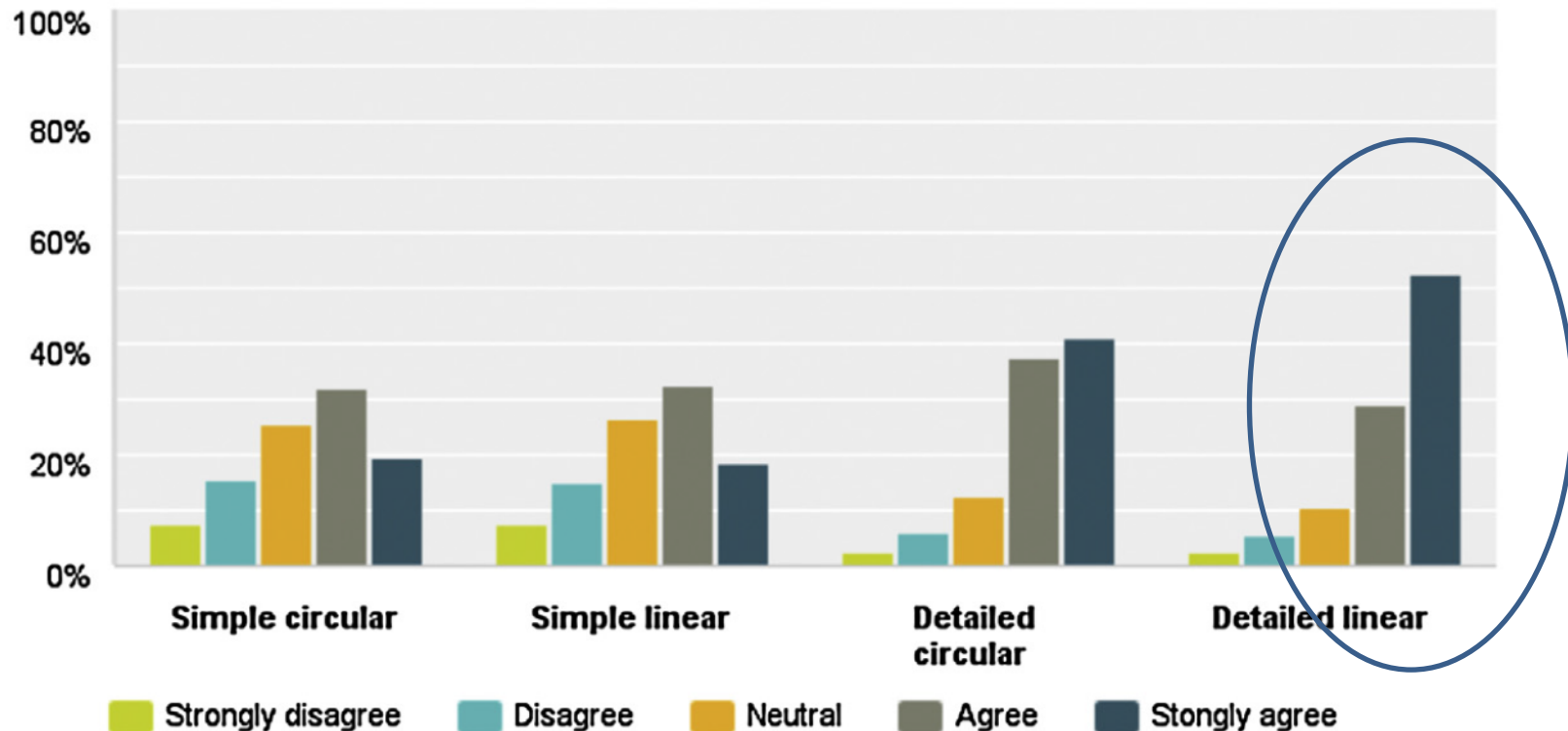
Algorithms structure

The algorithm is suitable for lay persons



Algorithms structure

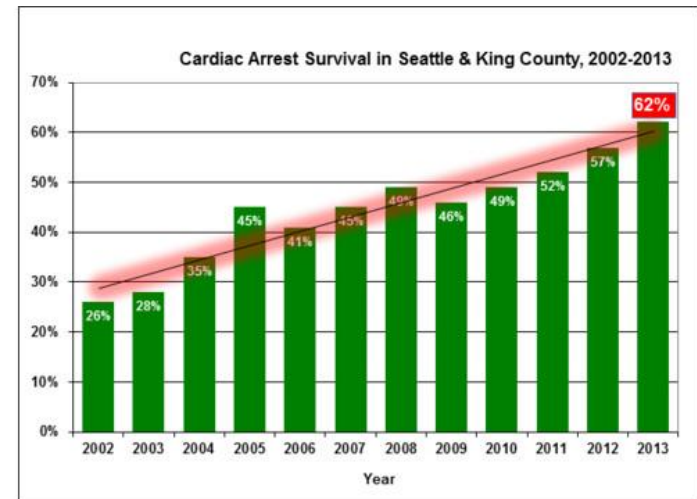
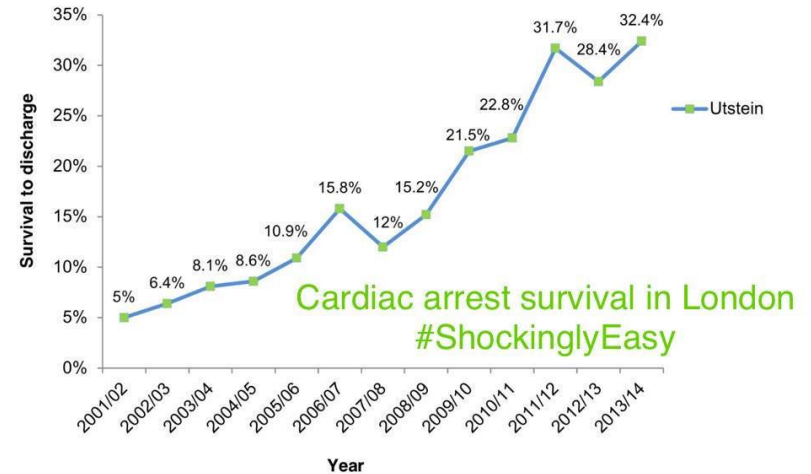
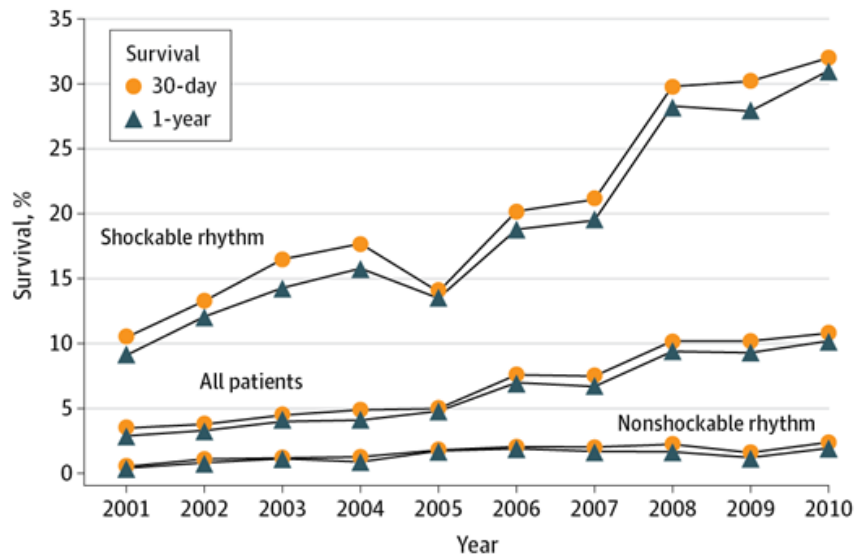
The algorithm is suitable for healthcare professionals



CPR Outcomes

Have the latest CPR guidelines improved cardiac arrest outcomes

Denmark



JAMA. 2013;310(13):1377-1384.

2015 Guidelines

To be Publish Oct 2015.... iiiii

Circulation and Resuscitation on October 15, 2015.

Thanks for your attention