



American Red Cross CPR for the Professional Rescuer Update

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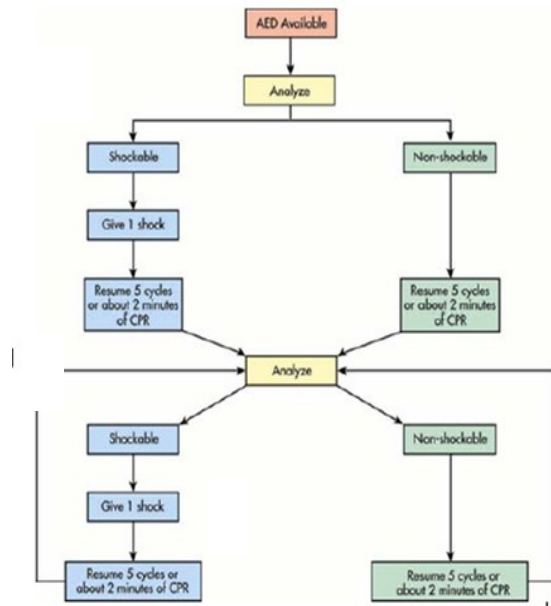


Photo by Sandy Sowerby



Objective

- To examine the 2005 International Consensus Conference on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations and the interpretation of these recommendations.





Levels of Training^{1,2}

- **Professional Rescuer (Level 1)**
 - Individuals with formal training who have a primary professional duty to respond to emergencies; lifeguards, police, athletic trainers, and firefighters.
- **Certified Lay Responder (Level 2)**
 - Individuals with some formal training who have a secondary, related duty-to-act, as designated by job or position responsibilities.
- **Lay Community Responder (Level 3)**
 - Individuals with either some or no formal training, and no duty-to-act (bystander who decides to act and help in an emergency situation)



Simplification of CPR Skill Sequences

- To make CPR instruction more effective and encourage retention, skills steps have been simplified.¹

Why change?

Believed CPR skill sequences involved too many steps, decision points, and distinct skills, which effected students' retention of the skill set. So by changing the skill set it is believed students should be able to demonstrate:

1. Proper acquisition of the skills through training,
2. Retention of learned skills after training.



Age Delineation¹⁻³

OLD

- Infant = < 1 year of age
- Child = 1-8 years of age
- Adult = > 8 years of age

NEW

- Infant = < 1 year of age
- Child = 1-12 years of age*
- Adult = > 12 years of age

Why change?

Age delineations were arbitrary in nature, however, the new established ages categories are based on epidemiological patterns of injuries and illnesses including care needed



Assessment

Call First or Care First

- *Call First*³
 - If a *lone responder* finds any of the following situations the responder should *activate EMS* immediately, get an AED (if available) and return to the victim to give care.
 - Suspected cardiac emergency
 - An unconscious adult (12 years or older)
 - An unconscious child or infant known to be at high risk for cardiac problems
 - Rescuers should use a pediatric dose-attenuating AED system, when available, for children 1 to 8 years of age²



Assessment

Call First or Care First

- *Care First³*
 - If a *lone responder* finds any of the following situations the responder should provide **2 minutes** of care (5 cycles), and then activate EMS for:
 - An unconscious infant or child (younger than 12 years old)
 - Any victim of a drowning or non-fatal submersion
 - Any victim who has suffered cardiac arrest associated with trauma
 - Any victim who has taken a drug overdose



Assessment

Checking the Victim³

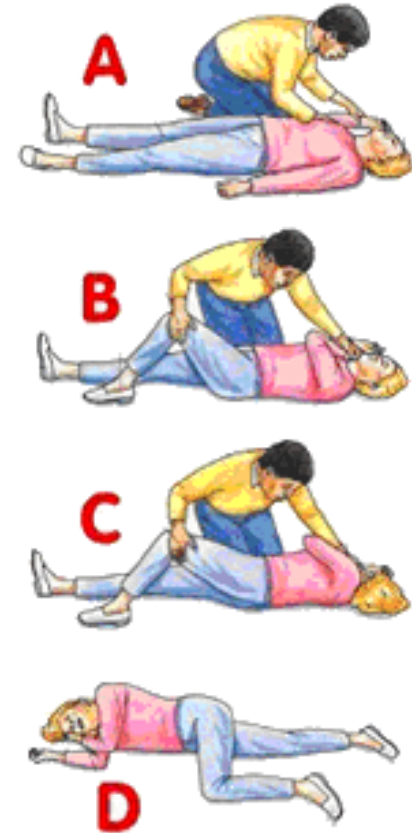
- When checking an A/C/I
 1. Check for consciousness.
 2. If unresponsive, have someone else call 9-1-1.
 3. If the victim is face-down, ***roll the victim onto his or her back***, while supporting the head.
 4. Look for any movement and check for breathing ***for no more than 10 seconds (signs of life)***.
 5. If the victim is not moving or breathing, position the resuscitation mask and give 2 rescue breaths (***≈ 1 s with visible chest rise***).²
 6. Remove the resuscitation mask and check the victim for a pulse ***for no more than 10 seconds***.
 7. Quickly scan the victim for severe bleeding.



Assessment

Recovery Position

- During initial assessment place the victim in a recovery position if:
 - You are alone and must *leave* the victim to summon advanced medical personnel or
 - Find that the victim is moving, breathing and has a pulse but is *unconscious*.





Assessment Recovery Position



- If a HNB injury is suspected and the responder *is unable to maintain* an open airway *or* has to leave to get help and/or AED use the Modified-**H**igh-**A**rm-**I**N-**E**ndangered-**S**pine (H.A.I.N.E.S.) position.⁴



Assessment

Recovery Position

- Blake et al.⁵ found the modified H.A.IN.E.S. position resulted in a more neutral position of the spine making it preferable to the lateral recovery position during cervical spine trauma.
- Gunn et al.⁶ found that the total degree of lateral flexion of the cervical spine in the HAINES modified recovery position was less than half of that measured during use of the lateral recovery position.



Conscious Choking Victim

OLD

- Adult and child received abdominal thrusts until the airway was cleared

NEW

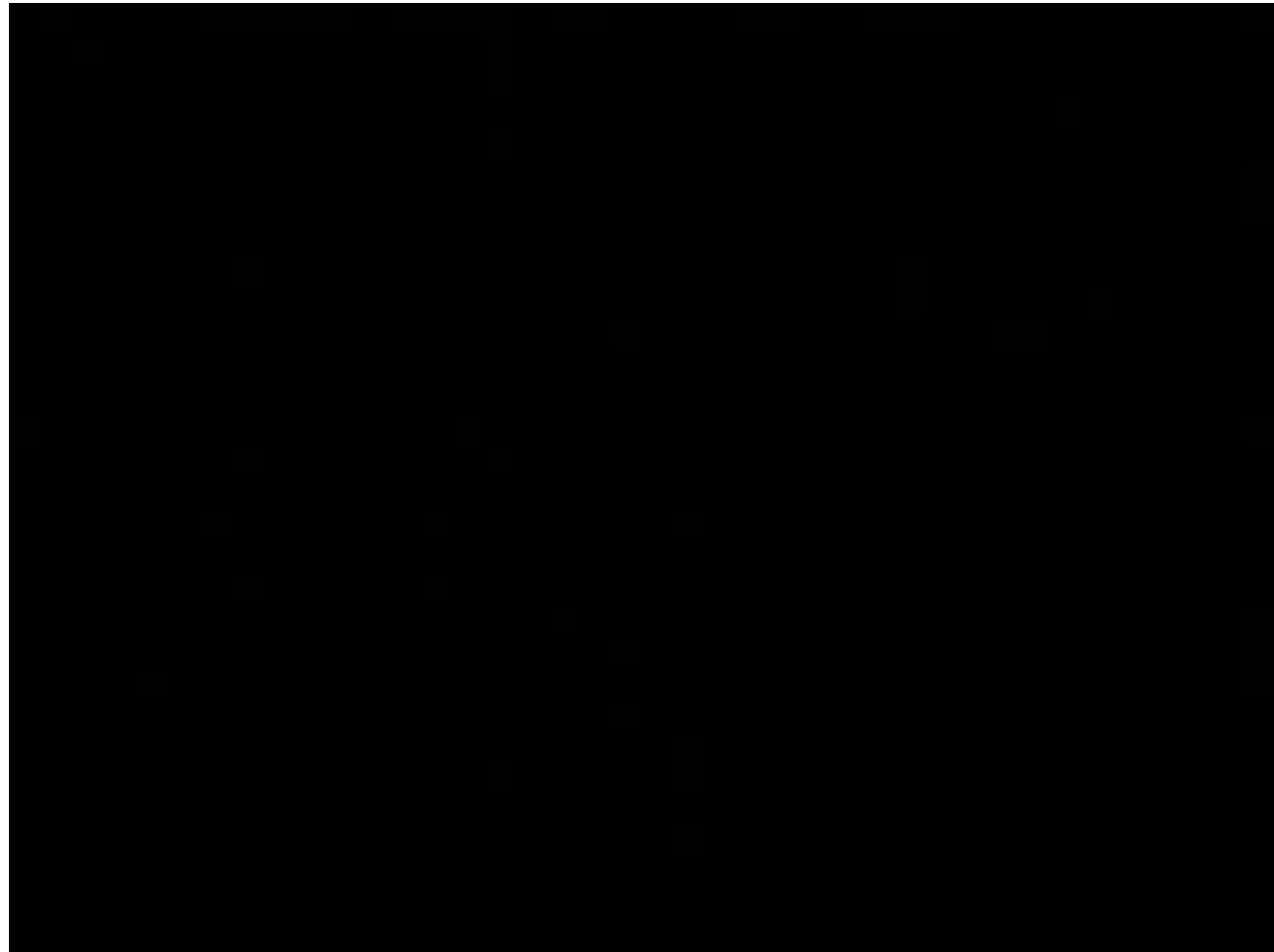
- Adult and child now receive a **combination of 5 back blows** with the heel of your hand followed by **5 abdominal thrusts**

Why change?

Abdominal thrusts, chest thrusts and back blows are considered equally effective. No one technique is believed to be better than another and in fact more than one technique may be required.⁴



Conscious Choking Victim





Unconscious Choking Victim

OLD

- Adult and child received 5 abdominal followed by checking the mouth
- Infant received 5 back blows and 5 abdominal thrusts followed by checking the mouth

NEW

- Adult, child and infant *all* receive **5 chest thrusts** after repositioning the head fails to deliver a breath

Why change?

While case reports have demonstrated success in relieving FBAO with abdominal thrusts, higher airway pressures can be generated by using the chest thrust rather than abdominal thrusts.⁷⁻⁹



Unconscious Choking Victim





Rescue Breaths and Rescue Breathing

- *Adult* = 1 breath about every 5 seconds
- *Child and Infant* = 1 breath about every 3 seconds
- Normal breath is now *given over 1 second and until the chest rises*
- *After 2 minutes*, recheck for breathing and a pulse for *no more than 10 seconds*



CPR

Hand Position

- **OLD**
 - When treating adults we traced the ribs to the xiphoid process
 - When treating children we placed one hand on the chest
- **NEW**
 - Place the hands in the *“middle of the chest”* with the heel of the rescuer’s dominant hand in the center of the chest of an adult victim^{4,10}
 - One or two hands can be used to perform chest compression when treating a child based on the size of the child



CPR

Hand Position

Why change?

Recommend to simplify instruction on hand placement with less details by giving students the simple instruction to ***“place your hands in the center of the chest”*** to begin compressions as quickly as possible¹



CPR

Compression Rate and Ventilations

OLD

- Single rescuer
 - Adults 15:2
 - Child and infant 5:1

NEW

- Single rescuer
 - Adult, Child, Infant now are all 30:2 with compression rate of $\approx 100/\text{min}$



CPR

Compression Rate and Ventilations

Why change?

- One universal compression-ventilation ratio of 30:2 limits the time between compressions and breaths and increases the number of compressions given³ and reduces the likelihood of hyperventilation, minimizes interruptions in chest compressions for ventilation, and simplifies instruction for teaching and skills retention.¹⁰
- During the first minutes of V-tach during sudden cardiac arrest, rescue breaths are probably not as important as chest compressions because the oxygen level in the blood remains high for the first several minutes after cardiac arrest.¹⁰



CPR

Compression Rate and Ventilations

OLD

- Two-person
 - Adult 15:2
 - Child and infant 5:1

NEW

- Two-person
 - Adult 30:2
 - Child and infant 15:2

Why change?

Believed that because PR perform CPR often that they can learn and remember more complicated algorithms.³



CPR

Interrupting CPR

- “Professional rescuers should continue CPR, *without interruption* as long as possible, and attempt to limit any interruptions, except for specific interventions such as the insertion of an advanced airway by an arriving advanced medical care provider or the use of a defibrillator.”⁴



CPR

Compression Only CPR

- Responders unable, unwilling or untrained to give full CPR (compressions and ventilations), should give at a minimum continuous chest compressions, as this can be beneficial in circulating blood that contains some oxygen to the victim.⁴
- The outcome of chest compressions without ventilations is significantly better than the outcome of no CPR for adult cardiac arrest.¹¹⁻¹⁵



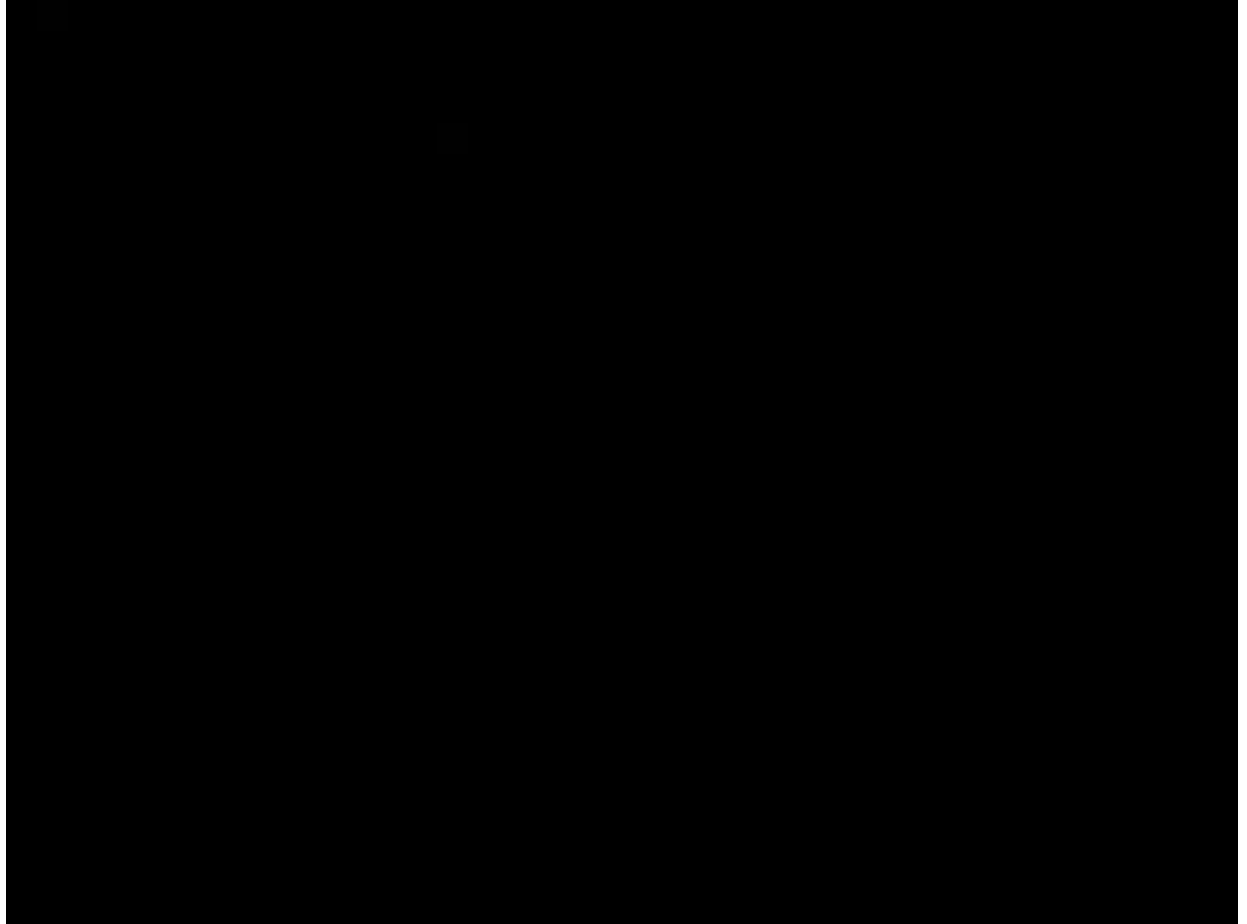
CPR

Two-Rescuer CPR Steps

- When performing two–rescuer CPR for all individuals, rescuers should change positions approximately every *2 minutes* and changing positions should take less than *5 seconds* to help prevent fatigue.^{4,10}



CPR





AED

How Many Shocks?

- **OLD**
 - Up to three shocks followed by 1 minute of CPR
- **NEW**
 - When shock is advised, only give **1** shock.
 - Do not recheck for signs of life after shock, instead provide **5 cycles**, or about **2 minutes** of CPR
 - If at any time you notice an obvious sign of life, stop CPR and reassess ABCs



AED

How Many Shocks?

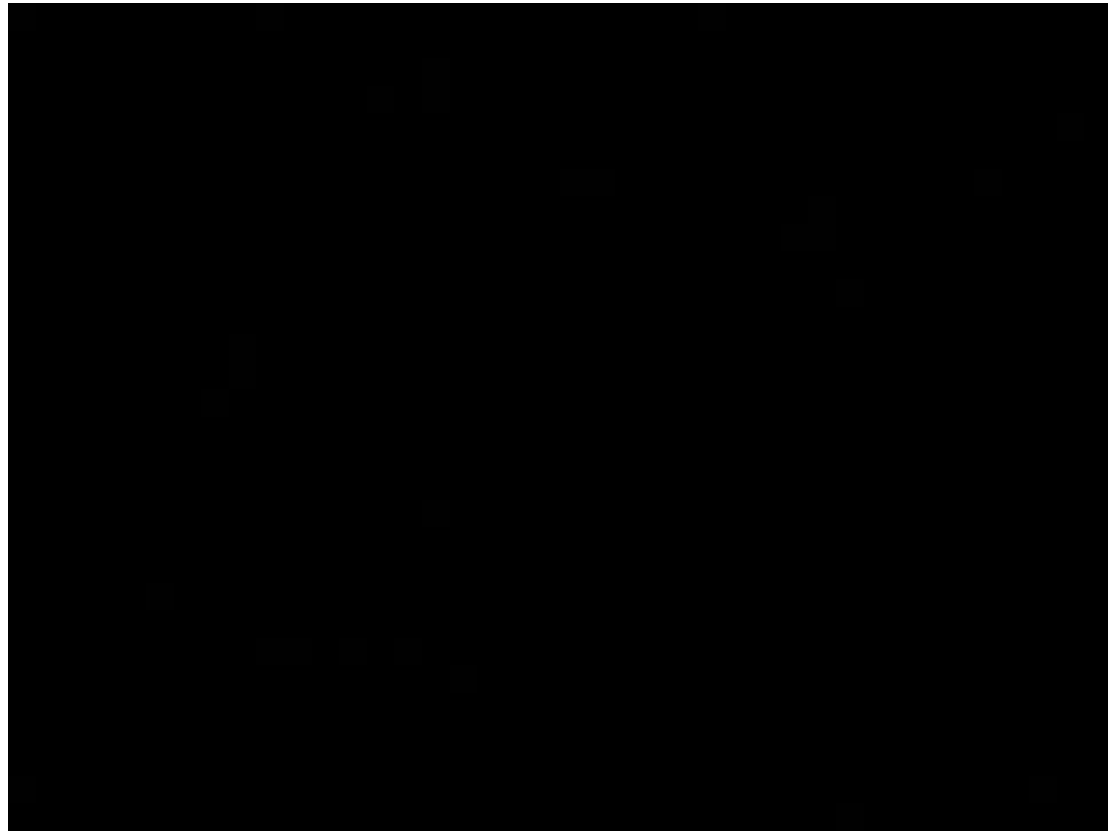
Why change?

V-fib is the most common rhythm found in adults with witnessed, non-traumatic sudden cardiac arrest and victim survival rates are highest when immediate bystander CPR is provided and defibrillation occurs within 3 to 5 minutes.¹⁶⁻¹⁸

Believed that a 1-shock strategy may improve patient outcome by reducing interruption of chest compressions.⁴



AED





QUESTIONS



THANK YOU!



References

1. International Liaison Committee on Resuscitation. The 2005 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Resuscitation*, 2002;67, 157-314.
2. American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. (2005). Part 3: Overview of CPR. *Circulation*, 112, 12-18, Available at: http://circ.ahajournals.org/cgi/content/full/112/24_suppl/IV-12.
3. American Red Cross (2006). The American Red Cross 2005 Guidelines for Emergency Care and Education. Available at: www.redcross.org/static/file_cont5294_lang0_1934.pdf.
4. American Red Cross (2006). CPR/AED Professional Rescuer (r06) Instructor Update.
5. Blake WE, Stillman BC, Eizenberg N, Briggs C, McMeeken JM. The position of the spine in the recovery position-an experimental comparison between the lateral recovery position and the modified HAINES position. *Resuscitation*. 2002; 53: 289–297.
6. Gunn BD, Eizenberg N, Silberstein M, McMeeken JM, Tully EA, Stillman BC, Brown DJ, Gutteridge GA. How should an unconscious person with a suspected neck injury be positioned? *Prehosp Disaster Med*. 1995; 10: 239–244.
7. Langhelle A, Sunde K, Wik L, Steen PA. Airway pressure with chest compressions versus Heimlich manoeuvre in recently dead adults with



9. Ruben H, Macnaughton FI. The treatment of food-choking. *Practitioner*. 1978; 221: 725–729.
10. American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. (2005). Part 4:Adult Basic Life Support. *Circulation*, 112, V-19 – IV-34 Available at: http://circ.ahajournals.org/cgi/content/full/112/24_suppl/IV-12.
11. Berg RA, Kern KB, Sanders AB, Otto CW, Hilwig RW, Ewy GA. Bystander cardiopulmonary resuscitation:is ventilation necessary? *Circulation*. 1993; 88: 1907–1915.[]
12. Chandra NC, Gruben KG, Tsitlik JE, Brower R, Guerci AD, Halperin HH, Weisfeldt ML, Permutt S. Observations of ventilation during resuscitation in a canine model. *Circulation*. 1994; 90: 3070–3075.
13. Tang W, Weil MH, Sun S, Kette D, Gazmuri RJ, O’Connell F, Bisera J. Cardiopulmonary resuscitation by precordial compression but without mechanical ventilation. *Am J Respir Crit Care Med*. 1994; 150: 1709–1713.
14. Berg RA, Wilcoxson D, Hilwig RW, Kern KB, Sanders AB, Otto CW, Eklund DK, Ewy GA. The need for ventilatory support during bystander CPR. *Ann Emerg Med*. 1995; 26: 342–350.
15. Becker LB, Berg RA, Pepe PE, Idris AH, Aufderheide TP, Barnes TA, Stratton SJ, Chandra NC. A reappraisal of mouth-to-mouth ventilation during bystander-initiated cardiopulmonary resuscitation. A statement for healthcare professionals from the Ventilation Working Group of the Basic Life Support and Pediatric Life Support Task Force of the American Heart Association.



16. Valenzuela TD, Roe DJ, Cretin S, Spaite DW, Larsen MP. Estimating effectiveness of cardiac arrest interventions: a logistic regression survival model. *Circulation*. 1997; 96: 3308–3313.
17. Holmberg M, Holmberg S, Herlitz J. Factors modifying the effect of bystander cardiopulmonary resuscitation on survival in out-of-hospital cardiac arrest patients in Sweden. *Eur Heart J*. 2001; 22: 511–519.
18. Holmberg M, Holmberg S, Herlitz J, Gardelov B. Survival after cardiac arrest outside hospital in Sweden. Swedish Cardiac Arrest Registry. *Resuscitation*. 1998; 36: 29–36.