



FIRST RESPONDER

December '04 Newsletter

IN THIS ISSUE:

- * CPR needs to change now !!!
- * Suggestions for teaching CPR classes the "new" way.

December Special



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CPR changes - should we wait 5 years or change now ?

The evidence is almost overwhelming. Studies and data now conclude that the hands off time and lack of chest compressions before a potentially life saving shock is directly responsible for the poor survival outcomes with defibrillation.

Resuscitation guidelines suggesting the method by which CPR should be performed obviously dictate how providers should teach CPR. The time taken to change guidelines after consensus has been reached varies from country to country and may take 5 to 7 years to be implemented in some cases. And then some changes are only introduced gradually piece by piece to appease certain provider bodies because of their inflexibility to change rapidly. So the upshot of it all is that change doesn't happen quickly despite strong evidence based data demonstrating the urgent need to do so.

The most dramatic change being suggested at this time relates to limiting interruptions of chest compression during CPR, prior to and in between defibrillatory shocks.

The following information is drawn from data and studies conducted in Tuscon, Arizona, USA and gives compelling evidence to change now!!!

The recent "International Guidelines for CPR 2000" states that "adult cardiac arrest victims are more likely to be saved if a higher number of chest compressions are delivered during CPR even if victims receive fewer ventilations" It has been shown that dramatic increases in survival are directly related to increased coronary artery perfusion pressure prior to defibrillation. Perfusion pressure can only be increased by continuous chest compressions with fewer interruptions for ventilations and adherence to Defibrillator voice prompts.

Hence the change to 15:2 CPR ratio across the board instead of 5:1. Simple mathematics demonstrates that more compressions are achieved with the 15:2 ratio. This is now proving to be inadequate, as studies continually show that the time taken to complete the 2 breaths in CPR is as long as 15 seconds instead of the suggested 4 seconds (almost every CPR instructor in the world can attest to that). In Europe especially, a 60:2 CPR ratio is being proposed and we hopefully will see that introduced into the European Resuscitation Guidelines in 2005.

The studies done in Tuscon show that continuous compressions (no ventilations) in CPR prior to defibrillation is directly attributable to significant increases in survival. It showed that lay rescuers are more likely to commence CPR if Expired Air Resuscitation (EAR) is not expected of them. The studies also showed that those taught only to do "compression only: CPR did better at remembering to shout for help, open the airway, check for breathing and call for an ambulance than those taught the "traditional" way. This study was repeated with first year medical students and achieved similar results. Most interestingly it showed that after 3 month and 6 monthly retraining, the average time to complete the 2 breaths in standard CPR was still 14 seconds.

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The study reviewed 30 cases of out of hospital cardiac arrest treated by Fire Department first responders. Average time to reach the patient's side from receipt of call was 6 minutes and 6 seconds and time from diagnosis to treatment (shock or chest compressions) was 28 seconds. Average time on scene where active resuscitation was performed was 15 minutes 20 seconds. The amazing finding here was that chest compressions were given for ONLY 38% of the time. So for more than half the time (62%) no compressions were performed because of the interruptions to chest compressions to repeatedly reassess the patient, give EAR, insert a central line, tracheal intubation, changing rescuers and pausing for AED prompts.

The consequences of chest compression interruptions are profound. These interruptions result in low coronary perfusion pressure (CPP) thereby resulting in lower survival. Data showed that CPP at the beginning of each 15 compression cycle is 50% less than at the end (that's if the 2 ventilations didn't take longer than the suggested 4 seconds). Chest compressions interruptions with standard CPR resulted in 40% less coronary artery blood flow than "compression only" CPR. It was found that when CPR was performed realistically with 15-16 second interruptions occurring for ventilation, the survival rate (neurologically normal) was only 13% whereas the "compression only" CPR resulted in an 80% survival.

So it has been found that the number of uninterrupted chest compressions delivered correlates directly with return of spontaneous circulation (ROSC) and that at least 80 compressions achieved each minute of resuscitation are required for successful interruptions.

The conclusion reached from the Tuscon experience was:

- * Reduction of interruptions in chest compressions is a critical issue
- * "Compression only" CPR is superior to "standard" CPR
- * No ventilations should be given for 1 person CPR. Rather, continuous compression should be performed to provide optimal circulation until more assistance arrives on the scene. Then standard CPR can continue at the 15:2 ratio. Recent evidence shows that some ventilation of the lungs occur with chest compressions provided that the airway is open and clear.
- * Starting CPR "blindly" immediately after a defibrillatory shock or a no shock advised prompt is a timely concept.

Editors Note:

From the perspective of First Response Australia (FRA) we feel that waiting another 5 years or more to have these life saving advancements to be introduced is unacceptable. We hope that Europe will lead the way next year with some of these exciting and promising developments.

In the meantime we need to have a different and more flexible approach to the way CPR is currently taught. FRA has adopted a new approach for some time, which is evident by referring to our last newsletter (refer CPR flowchart).

Its not surprising then, that challenges and accusations abound of non adherence to so called "standards". These unfortunately are levelled by the ignorant. Let me explain. First it must be said that there are no such things as "resuscitation standards". There are "guidelines" and most importantly it must be understood that guidelines only represent a suggested way to reach an outcome.

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They do not and should not represent an inflexible procedure such as the teaching of the traditional mnemonic "DRABC, requiring 'B' to follow 'A' and 'C' to follow 'B' with rigid steps in between. Sadly the "guidelines" have been interpreted as "standards" which has stifled discussion, innovation in delivery and the necessary and timely changes required to make the teaching and retention of CPR skills easier.

FRA believes many providers are losing site of the outcomes and getting bogged down with the process. So we've listed some of the ways (refer next article) in which our training organisation provides a simpler way for our class participants to learn CPR. I would suggest that if you are a dedicated trainer and can think outside the box, try using some of these techniques in your classes. The rewards are significant, because your students will leave the class, more willing to commence "effective" resuscitation in a real life situation. They will thank you for taking the fear away.

For First Responder teams having to combine numerous skills as they deploy equipment such as Oxygen Resuscitators, Defibrillators and Airway Management equipment there will be a demonstrable improvement in the ability to respond to a cardiac arrest utilising a much simpler approach to CPR.

Be brave - try it !!!!!

Making CPR understandable and easy !

I've listed below some tips you may be able to employ in the teaching of CPR. Firstly it would be a good idea to have in front of you, a copy of the flowchart reproduced from our last newsletter or refer to the flowcharts on page 4.

This flowchart is the corner stone of our resuscitation training. Before teaching resuscitation skills we discuss with our class that in an emergency situation, the assessment and management of scene safety in a completely different issue to assessing and management of the casualty. So the acronym of DRABC just does not exist for us. Safety and rescue are never to be confused with first aid.

So its :

ASSESS FOR SAFETY

1. Assessing for safety, hazard versus risk, mechanism of injury.
2. Ensuring scene safety.
3. Activating the EMS

Once the scene is safe the next point is:

ASSESS THE CASUALTY

1. Manage any Life threatening External Bleeding
2. Assess levels of consciousness (AVPU)
3. Assess airway, breathing and circulation (not necessarily in that order)

Tip - have your students come to appreciate that an unconscious casualty who responds to strong stimuli has circulation present (at least at that particular time) and that the assessment of the airway and breathing status becomes the priority. Then have them appreciate that casualties that are unresponsive to painful stimuli must immediately be suspected of being in cardiac arrest.

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RESPONSIVE CASUALTY

CHECK AIRWAY

CHECK BREATHING

INADEQUATE BREATHING
- commence EAR

ADEQUATE BREATHING
- posture laterally

CALL EMS

MONITOR

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We explain to the class the consequences of untreated collapsed unconscious casualties, emphasising the need for rapid assessment.

Then we suggest that all collapsed casualties are simply divided into 2 groups: **RESPONSIVE and UNRESPONSIVE**. This of course relates to response from verbal and/or painful stimuli (AVPU).

We then concentrate on the **RESPONSIVE** casualty.

Next comes the **AIRWAY** (open and inspect). We suggest a simple head tilt and chin lift (no pistol grip - this is an Aussie icon that needs to be buried). The mouth then is opened to see if the airway needs clearing.

Tip - opening the mouth often can lead to the airway being occluded. So we teach the student to quickly lift the chin back up when the airway has been checked. This is one reason for not teaching mouth to mouth because many rescuers may accidentally occlude the airway during ventilations.

Tip - don't teach the rolling of every casualty onto their side. It is time wasting and usually only necessary in aquatic emergencies. Remember most casualties only have soiled airways after ventilations have been given (this has to tell you something doesn't it?). Rapid initial and full breaths, poor head tilts, depression of the mandible during ventilations - all common mistakes which are due to the persistence of adhering to old unproven techniques.

Then, **BREATHING** is assessed.

Tip - emphasis the "look" part of the "look, listen and feel". Explain to your class to ignore noisy breathing unless it is accompanied by chest movement. Agonal breathing is common in the witnessed cardiac arrest and may often be confused by the rescuer as a sign of breathing by the collapsed casualty.

Explain to your students that if the casualty's breathing is too shallow, too slow or not existent - immediately start EAR. No initial breaths, no pulse checks just do it. If, after a minute of EAR the casualty is no longer responsive to painful stimuli, colour has deteriorated and breathing is non existing, consider the casualty to be in cardiac arrest and start CPR.

Tip - the class must appreciate that responsiveness and breathing (albeit inadequate) represents presence of circulation and attempts at pulse checks will simply confuse the issue as they are unreliable.

If breathing is adequate (visible and clear rise and fall of the chest) then the casualty is postured laterally and monitored closely.

Tip - where possible always have the casualty rolled towards the rescuer, not away. This allows for great control of the unconscious flacid body and allows for better access to the airway. It also will allow support of the head and neck if required.

So, for the responsive casualty airway and breathing management is the priority!

Now we come the **UNRESPONSIVE** casualty.

Tip - re-emphasise that the unresponsive collapsed casualty should be immediately suspected of being in cardiac arrest. Because responsiveness may be subtle and missed by the rescuer no one factor should singularly be used to determine a lack of circulation (such as was the case with pulse checks). At this stage we used a simple formula: sudden collapse plus, unresponsiveness to pain plus no colour and no breathing equals cardiac arrest.

UNRESPONSIVE CASUALTY

If suddenly collapsed and unresponsive- suspect sudden cardiac arrest !!

CHECK AIRWAY

CHECK BREATHING

Sudden Collapse
+ Unresponsive
+ No Colour
+ No Breathing
= Cardiac arrest

CALL FOR DEFIBRILLATOR
CALL EMS

START CPR

Start cardiac compressions immediately (no ventilations)

Do not waste time looking for barrier device

Let someone else bring the barrier device to you if possible

Continue compressions for 2-3 minutes before reassessing

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Tip - in a basic class no reference or practice is made of pulse checks. In the suddenly collapsed unresponsive casualty students are taught to now look for signs or lack of signs that circulation exists.

Tip - explain to your students that when assessing the airway, observe not only the colour of the face but also the colour (or lack of) of the mucosa (inside the mouth) and the colour of the tongue). Again re-emphasise that when checking for breathing, sounds must be ignored if no chest movement accompanies them (agonal breathing). Hence you are teaching them to use the formula for assessing cardiac arrest.

Now we come the interesting part. If the rescuer is on their own the priority becomes calling for assistance then starting "compression only CPR". If a 2nd rescuer is available, they would activate the EMS whilst "compression only" CPR is done by the first rescuer. Then 2 person CPR could continue when the 2nd rescuer is available (preferably with a barrier device).

Tip - never teach 5:1 for the 2 operator ratio, as it will cause confusion and lack of skill retention. The 15 compressions should be considered as the minimum number

of compressions to do in one cycle and we suggest that more is better. If more than 4-5 seconds of interruption occurs for ventilations, more compressions must be done to make up for the drop in coronary perfusion pressure (CPP) that would have occurred. In other words, more "pumping" less "blowing".

Tip - if one rescuer CPR is to be taught then we suggest that a doubling of the compressions take place to make up for lost CPP. We would generally only suggest 1 rescuer CPR (using ventilations and compressions) take place if the rescuer is well practised and no assistance was available whilst waiting for the emergency services..

Tip - Do not mention "cycles per minute" !!! This is possibly the singular main reason for poor compression rates. Remember that compression rates have always been 100/minute as a minimum, but somewhere someone along the line it was suggested that "if a rate of 100 is used that would equate to approximately 60 compressions being achieved in a minute when ventilations were taken into account". That then become wrongfully interpreted as a rate of 60/minute. Trainers then penalised students if compression rates exceeded this, so we have a long history of purposely slowing people down with compression rates. Again, I would emphasise - do not mention cycles per minute but indeed emphasise compressions per minute.

Tip - forget checking for pulse after 1 minute then every 2. Have your student understand that it takes considerable time to raise CPP and interruptions to compressions simply decreases survival. CPR should not be interrupted for at least 2-3 minutes.

Tip - a good quote to use in class is "it's far better to give someone CPR who didn't need it, than to withhold CPR on someone who really did need it". This quote is usually used in response to questions like "what if someone's heart was already beating and you started compressions". You have to convince your class that CPR cannot "hurt" someone and indeed it is being recommended to continue CPR even after successful defibrillation.

Finally to make the whole thing even easier to teach and be retained, teach the one CPR ratio across the board. So for infants, children and adults its all the same - 15:2. Not many instructors know how the change of delivering CPR (ratio 5:1) to infants and children came about. So, if you're really a dedicated trainer of CPR, delve into the background as to how some of these techniques actually came about. You'll be shocked by the lack of evidence used to come up with some of the guidelines. The term "evidence based" is only just now being "used".

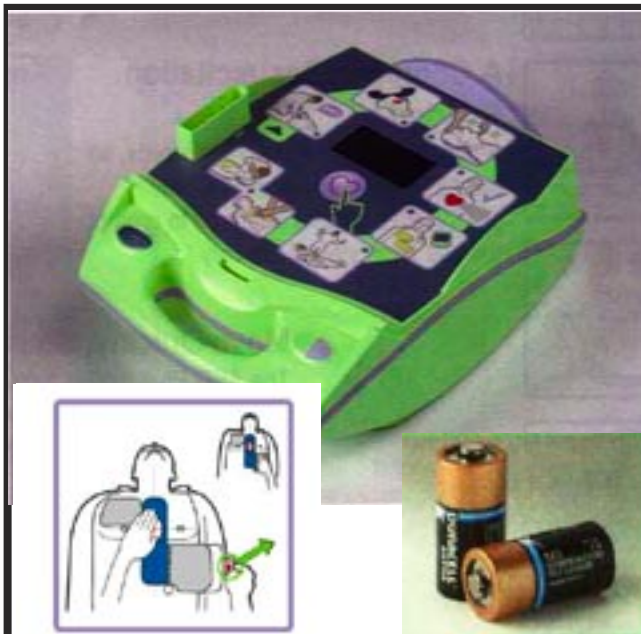
If you really understand what been suggested here, the suggestions really do fall well within established guidelines and recommendations.

SOMETIMES WE JUST CAN'T SEE THE WOOD FOR THE TREES.

*Edited by Charles Makray
Managing Director*

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