

## Resuscitation Guidelines 2005 – The Instructor’s Guide

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This document is intended to make life easy for first aid instructors to learn the changes to the resuscitation guidelines, but equally as important, to understand the science behind them. This document can be copied and distributed freely, providing it is copied in its entirety.

The summary of scientific evidence is in black ink, and the resulting changes to the guidelines are in *blue italics*. I hope the notes are helpful.

### Adult, Child and Baby Resuscitation:

Every time there is a pause in chest compressions, the blood pressure falls. It takes several chest compressions to raise the blood pressure enough to perfuse oxygen through to the heart tissues. It is well documented that interruptions in chest compression are common and are associated with a reduced chance of survival.

- *The new guidelines place greater importance on uninterrupted chest compressions. The ratio of chest compressions to breaths is now **30 to 2**.*
- *The old guidelines gave ‘5 attempts’ to get the breaths in – this is not now the case. They now say ‘Do not attempt more than two breaths each time before returning to chest compressions’.*
  - *If the rescue breaths were not successful, the rescuer should restart the 30 compressions, but should try to correct the problem briefly before the next set of breaths (check in the mouth for obstructions, ensure the head is tipped back etc.).*

Because chest compressions are much less effective than a normal heart beat (about 30% of the blood flow; but just enough to critically keep the heart and brain oxygenated) there is less blood circulated, and therefore the oxygen demand of the body is less. This means that the patient can cope with less airflow in the lungs during CPR than they would require normally.

- *Further evidence to show that 30 to 2 is effective.*

Evidence shows that there is a relatively low incidence of there being a ‘foreign object’ in the mouth of the victim. The importance of minimising the delay to starting chest compressions is vital. Chest compressions are the best method of treatment of choking in the unconscious patient in any case.

- *The initial ‘check in the mouth’ has been removed, and the rescuer should only check in the mouth if they are failing to achieve effective breaths (just enough to see the chest rise). This should be done briefly **after** the next set of 30 compressions, before the next set of breaths.*

If a patient collapses with a cardiac cause (therefore no asphyxia before the arrest) there is likely to be enough oxygen in the blood stream for the patient to survive on for up to 5 minutes without rescue breaths if the blood is circulated. The vast majority of cardiac arrests (82%) are of a ‘cardiac’ cause.

- *A ratio of 30:2 is best, but the new guidelines advocate chest compression only CPR (uninterrupted chest compressions) if the rescuer is **unable** or **unwilling** to perform mouth-to-mouth, as ‘chest compressions only’ is better than no CPR at all.*
- *The guidelines now start CPR with chest compressions before breaths, as it can be assumed that there will be residual oxygen in the blood in the majority of collapses. (the ideal for children is to give 5 initial breaths however, as there is likely to be asphyxia in that instance).*

Guidelines 2000 identified that checking for 'signs of circulation' was prone to error. Studies have shown that checking for breathing is also prone to error. Approx. 40% of sudden cardiac arrest victims make agonal (occasional) gasps after cardiac arrest. This is commonly misinterpreted by lay-people as 'normal breathing', so CPR is incorrectly withheld from the cardiac arrest victim.

- *The new guidelines therefore indicate that 'occasional gasps' are a positive indication to start CPR. The new guidelines say to commence CPR if the patient "is unresponsive and **not breathing normally**" (rather than the previous "is the patient breathing?").*
- *The new guidelines go as far as to say "If you have any doubt whether breathing is normal, act as if it is **not** normal."*
- *The guidelines recommend that 'it should be emphasised during training that agonal gasps occur commonly in the first few minutes after sudden cardiac arrest'.*

Many rescuers are scared to commence mouth-to-mouth in 'real life' cardiac arrest situations. In the old guidelines they had to do this before chest compressions. In many cases this resulted in a significant delay to commencing chest compressions, and in some cases, no CPR being provided whatsoever!

- *In addition to the option of 'not doing the rescue breaths', for Adult CPR, the new guidelines now start the sequence with chest compressions **first**.*
- *The guidelines now emphasise further that the rescuer should take **no more** than 10 seconds to check for normal breathing.*

Hyperventilation during CPR (breathing too fast or too much) is not good for the patient, as it increases the chances of air being blown into the stomach (therefore regurgitation during CPR) and the increased pressure in the chest cavity squeezes on the veins in the chest, reducing return blood flow to the heart.

- *The amount of air recommended to achieve an effective rescue breath is 'just enough to see the chest rise'. To help prevent hyperventilation, the new guidelines recommend giving the breath over **one second** to make the chest rise'. Instructors are encouraged to ensure that students do not give 'rapid or forceful breaths'.*

There is a vast amount of evidence showing that the more complicated the CPR guidelines are, the less likely the rescuer will be able to perform them effectively. It is vital therefore to simplify the guidelines as much as possible.

- *Child guidelines have been brought in line with adult guidelines.*
- *There are fewer steps in the sequence:*
  - *There is no 'mouth check' before the head tilt, chin lift.*
  - *There is no 'signs of circulation check' – CPR commences as soon as it is established that the patient 'is 'unresponsive' and 'not breathing normally'.*
  - *Using fingers to locate the hands for chest compression has been replaced with 'place your hands in the centre of the chest' (this also takes less time).*
- *The guidelines in general have been simplified as much as possible.*

There is much evidence to show that 'rescuer fatigue' results in poor chest compressions in a comparatively short period of time, yet it is now clear that effective compressions are essential.

- *The new guidelines recommend changing rescuers (if possible) about every 2 minutes.*

When the last guidelines were published in 2000, there was a 'list of exceptions' for when the lone rescuer should do 1 minute CPR before leaving to call 999. This was for the potential 'non-cardiac' causes, such as drug overdose, electrocution, trauma, children, drowning etc. These instances are less common than 'cardiac cause' arrests, and less likely to happen when only one rescuer is present. These additional recommendations, therefore, added to the complexity of the guidelines whilst affecting only a minority of victims.

- *The new guidelines therefore do not advocate teaching the list of exceptions, and recommend that the normal CPR sequence should be followed in these circumstances. For adults, the only time '1 minute of CPR before going for help' should be taught is to specific target audiences. (e.g. on a first aid course for lifeguards, but not on a 'general' first aid course).*

## **Child / Baby Resuscitation**

There is evidence to show that children have not received resuscitation because the potential rescuer 'feared harm'. This was also fuelled by the knowledge that child CPR was 'different to adult CPR' and the rescuer may not have practiced the 'child' version.

- *The new guidelines have brought adult and child CPR in line and encourage instructors to stress that 'ADULT CPR' is better than 'NO CPR'. For ease of teaching and retention, therefore, laypeople should be taught that the adult sequence may also be used for children who are not responsive and not breathing.*
- *Because adult CPR can be used on a child, the new guidelines don't specify a maximum age for a child (it used to be 8 yrs). The guidelines say that for a child, **ideally**:*
  - *Compress the chest by approximately **one-third of its depth**. Use two fingers for an infant under 1 year; use **one or two hands** for a child over 1 year **as needed to achieve an adequate depth of compression**.*
  - *The depth for adult compressions incidentally remains at 4-5 cm.*

The fact remains that the likely cause of a cardiac arrest in children is asphyxia, rather than a 'cardiac cause', so the heart is likely to stop secondary to the fact that breathing stopped, and there is likely to be little residual oxygen in the blood at the time of arrest.

- *The new guidelines say that the adult sequence of CPR can be carried out on a child, but the following minor modifications to the adult sequence will, however, make it even more suitable for use in children:*
  - *Give **five initial rescue breaths** before starting chest compressions.*
  - *If you are on your own perform CPR for about 1 minute before going for help.*

*N.B. If you have read the new guidelines, you may have seen the definition of "puberty" mentioned as an upper age limit for a child. This is in the section for medical staff, not the section for the lay-person. The way I've interpreted the guidelines is that this does not have to be taught to the lay-person (first aider). The benefit is "less to learn" and less worry about child CPR differing from Adult CPR. Also, if a first aider performed the child guidelines on an 18 year old for example, 5 initial breaths is more likely to be appropriate for them in any case (non-cardiac cause and hypoxic). The only downside would be giving a chest compression depth of 1/3 of the chest rather than 4-5cm.*

## **AED's**

### **Background:**

The majority of patients who suffer cardiac arrest have Ventricular Fibrillation (VF) – chaotic electrical heart impulses that don't produce a circulation. The definitive treatment for VF is CPR and defibrillation.

Early bystander CPR can double or triple survival rates from VF.

Survival rates from out of hospital cardiac arrest in the UK are around 5%, but if the patient can be defibrillated within 3 to 5 minutes of collapse, survival rates can be as high as 49-75%. Each minute in delay to defibrillation can reduce the chances of survival by 7-10%. If effective bystander CPR is provided this decline can be reduced to 3-4% per minute.

In the UK, average ambulance response times are around 8 minutes from the time of call (connection to ambulance control) to ambulance arrival of ambulance (outside the premises). To be more realistic, add a couple of minutes for 'finding the patient', 'dialling 999' and the crew 'getting to the patient's side'.

### The latest evidence:

If the delay to defibrillation is more than 5 minutes, good CPR before defibrillation will significantly increase chances of survival, as the chances of a "blue heart" restarting are slim. If the heart is fully oxygenated just before defibrillation, its chances of restarting are significantly improved.

- *AED guidelines now advocate that if possible, CPR should commence immediately, whilst the AED is brought to the patient, and continued whilst the electrodes are attached, right up to the point that the AED needs to 'analyse the rhythm'.*

In most 'biphasic' defibrillators (virtually all AED's are the newer, biphasic type), the chances of converting VF in the first shock is as high as 90%. If the first shock does not convert the VF, this is most likely due to a lack of oxygen to the heart.

- *The new guidelines advocate 1 shock, followed immediately by 2 minutes CPR (without any checks for signs of circulation after the shock). This increases the oxygen supply to the heart in the hope that the 2nd shock, after 2 minutes of good CPR, will be more effective.*
- *The voice prompts on existing AED's should still be followed, but the device should be updated to follow the new guidelines as soon as it is reasonably practicable.*

In the majority of cases, it is very difficult, if not impossible, to palpate a pulse or detect 'signs of circulation' immediately after defibrillation, even when spontaneous circulation has been restored. Studies have also shown that carrying out chest compressions on a heart with spontaneous circulation will not cause it any harm.

- *This is the reason behind **immediately** starting CPR for 2 minutes after the first shock, and not attempting to check circulation. After 2 minutes of CPR, updated AED's will analyse the heart's rhythm again and advise the rescuer if a further shock is required (or to check for 'normal breathing').*

I hope that you have found this information useful. We are in the process of carefully updating our books (the **First Aid Manual**, **Emergency First Aid** and **Paediatric First Aid**) to reflect the new guidelines, which should be available early in the New Year. For your existing books, I hope to have amendment sheets available within one week. Please don't hesitate to contact me if you have any comments or questions.

Kindest Regards,  
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