THE BRITISH SUB-AQUA CLUB

BSAC Basic Life Support Guidelines 2006

General Points

The following guidance has been prepared by the Safety and Rescue Skills Advisor and endorsed by the National Diving Committee to update our guidance and procedures in light of current advice and guidance available from all relevant sources. Key changes are highlighted in boxes within the text below for ease of reference.

Background to changes

The techniques for life support and resuscitation taught by the BSAC currently are based on an international collaboration between experts in resuscitation medicine from the world's major resuscitation organisations and are therefore consistent not only with other agencies providing training to lay rescuers, but also with the techniques used by doctors, nurses and others working in medical services around the world. These techniques are all based on the best evidence as to what is most effective.

As knowledge advances a regular review of this evidence is needed and such a review took place in 2005 leading to the publication of the *2005 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations* (CoSTR, Ref 1). This formed the scientific basis for the European Resuscitation Council (ERC) Guidelines for Resuscitation (2005) (Ref 2) and the Resuscitation Council (UK) Guidelines 2005 (Ref 3).

The BSAC has considered the revised guidelines and this document represents the BSAC recommended technique for basic life support. The training materials for the Diver Training Programme and Skill Development Courses will be revised to incorporate these changes. It will take time for courses and training materials to be updated and for changes in practice to be disseminated. During this period there will be some variation in practice between individuals. There is no evidence that the "old" techniques based on guidance published in 2000, were dangerous or ineffective, however this new approach is recommended and is based on the best available evidence as to what is most effective. Changes in practice such as this emphasise the importance of always keeping these rescue skills current and in practice by regular up-to-date training.

Changes to BSAC Guidance and Training

Terminology

The revision of the Resuscitation Guidance for the BSAC is an opportunity to bring nomenclature in line with that used by other rescue agencies and resuscitation training agencies.

The term "Resuscitation" refers to a wide variety of techniques to promote recovery in casualties who have suffered cardiac and/or respiratory arrest. These techniques encompass some which are appropriate for lay rescuers with minimal and often no equipment, through rescuers with progressively more training and facilities, to those methods only available in hospitals.

The technique first introduced in the Diver Training Programme at ST2 and referred to as "**Resuscitation**" should be referred to as "**Basic Life Support**".

The rationale for this is:

- This is consistent with other training agencies which use this term for this technique which requires no equipment
- The term “Basic Life Support” emphasises the purpose of the technique (i.e. to maintain the viability of the casualty)
- It reduces the expectation that this technique *alone* will promote full recovery
- It therefore emphasises the need to obtain help urgently
- It will potentially reduce the likelihood of self-recrimination in the rescuer in the event of an unsuccessful rescue attempt
- It is consistent with the principle of progressive training with the introduction of pocket mask, oxygen enrichment and airway adjuncts later in training in the rescue SDCs

The technique generally referred to as “Artificial Ventilation” (“AV”) throughout the DTP and SDCs should be renamed “**Rescue Breathing**”.

- This again promotes consistency across agencies
- It also emphasises a distinction between other types of artificial ventilation taught currently in the Rescue First Aid SDC

Thus “Basic Life Support” encompasses rescue breathing and cardiac compressions only.

Guideline change

The main aim of the guidance change has been to **reduce the possibility that cardiac compressions are interrupted** during basic life support. It has been recognised that such interruptions are common and are associated with reduced chances of survival for the casualty.

The major changes are

1) Cardiac arrest is diagnosed if a casualty is unresponsive and not breathing normally.
2) Rescuers should **place their hands in the centre of the chest**, rather than spend more time positioning their hands using other methods.
3) Each rescue breath is given over **1 sec** rather than 2 sec.
4) Use a ratio of compressions to Rescue Breaths of **30:2** for all casualties.
5) Once the casualty is **on land**, on diagnosing cardiac arrest,
   - summon help, *leaving the casualty if necessary*
   - give 30 compressions immediately
   - follow this by 2 rescue breaths (Unless there are **OBVIOUS** signs of circulation)
   - give 30 compressions followed by 2 rescue breaths
   - continue compressions and ventilation at 30:2 ratio.

Basic Life Support Sequence

In diving situations it is very unlikely that a lone rescuer will initiate these actions on land or in a boat. The most likely scenario is that Life support attempts will have been initiated in the water by a lone rescuer, and once the casualty is out of the water other members of the diving group will be available for help. Once the casualty is on land or in a boat the following sequence should be followed.

1 Make sure you, the casualty and any other divers or bystanders are safe.

2 Check the casualty for a response

- gently shake his shoulders and ask loudly: ‘‘Are you all right?’’

3a If he responds

- leave him in the position in which you found him provided there is no further danger
- try to find out what is wrong with him and get help if needed
- reassess him regularly

3b If he does not respond

- shout for help
- turn the casualty onto his back and then open the airway by placing your hand on his forehead and gently tilting his head back, keeping your thumb and index finger free to close his nose if rescue breathing is required
- with your fingertips under the point of the casualty's chin, lift the chin to open the airway

4 Keeping the airway open, look, listen and feel for normal breathing

- Look for chest movement.
- Listen at the casualty's mouth for breath sounds.
- Feel for air on your cheek.
- In the first few minutes after cardiac arrest, a casualty may be barely breathing, or taking infrequent, noisy gasps. Do not confuse this with normal breathing. Look, listen, and feel for no more than 10 seconds to determine whether the casualty is breathing normally. If you have any doubt whether breathing is normal, act as if it is not normal.

5a If he is breathing normally

- turn him into the recovery position
- send or go for help/call for an ambulance
- check for continued breathing

5b If he is not breathing normally

- send someone for help or, if you are on your own, leave the casualty and do this yourself; return and start chest compression as follows:
    - kneel by the side of the casualty
    - place the heel of one hand in the centre of the casualty's chest
    - place the heel of your other hand on top of the first hand
    - interlock the fingers of your hands and ensure that pressure is not applied over the casualty's ribs. Do not apply any pressure over the upper abdomen or the bottom end of the bony sternum (breastbone)
    - position yourself vertically above the casualty's chest and, with your arms straight, press down on the sternum 4—5 cm
    - after each compression, release all the pressure on the chest without losing contact between your hands and the sternum
    - repeat at a rate of about 100/min (a little less than 2 compressions per second)
    - compression and release should take equal amounts of time

6 Combine chest compression with rescue breaths.

- After 30 compressions open the airway again using head tilt and chin lift
- Pinch the soft part of the nose closed, using the index finger and thumb of your hand on the forehead.
- Allow the mouth to open, but maintain chin lift.
- Take a normal breath and place your lips around his the mouth, making sure that you have a good seal.
- Blow steadily into the mouth while watching for the chest to rise, taking about 1 second as in normal breathing; this is an effective rescue breath.
- Maintaining head tilt and chin lift, take your mouth away from the casualty and watch for the chest to fall as air passes out
- Take another normal breath and blow into the casualty's mouth once more, to achieve a total of two effective rescue breaths. Then return your hands without delay to the correct position on the sternum and give a further 30 chest compressions.

- Continue with chest compressions and rescue breaths in a ratio of 30:2.
- Stop to recheck the casualty only if he starts breathing normally; otherwise do not interrupt resuscitation.

If your initial rescue breath does not make the chest rise as in normal breathing, then before your next attempt:

- check the casualty's mouth and remove any obstruction
- recheck that there is adequate head tilt and chin lift
- do not attempt more than two breaths each time before returning to chest compressions

If there is more than one rescuer present, another should take over CPR every 1—2 min to prevent fatigue. Ensure the minimum of delay during the changeover of rescuers.

In-Water Life Support

- **The rescuers should be aware of their personal safety** and minimise danger to themselves and the casualty at all times.
- The casualty must be **removed from the water by the fastest and safest means possible**.
- The rescuer must make a firm hold on the casualty and maintain this throughout the rescue.
- The rescuer should make the casualty and themselves buoyant at the surface.
- Open the casualty's airway by applying gentle neck extension
- If there is no spontaneous breathing on opening the airway in this way give rescue breaths for approximately 1 minute (10 Rescue Breaths) (See **1 Minute Rescue Breath Sequence Note below**)
- If no spontaneous breathing returns, tow casualty while giving rescue breathing at 2 breaths/ 15 seconds

When in standing depth, or at boat prior to landing, continue rescue breathing for 1 further minute(10 Rescue Breaths), then dekit and land as quickly as possible **WITHOUT** further rescue breathing (See **1 Minute Rescue Breath Sequence Note below**)

- Begin basic life support according to the above algorithm i.e. 30 cardiac compressions initially, then two rescue breaths

1 Minute Rescue Breath Sequence
The rationale for this is that the general algorithm is aimed at the majority of cases of sudden cardiac arrest which are due to ventricular fibrillation, when oxygen stores in the body are not reduced. When asphyxia has occurred prior to arrest oxygen stores are likely to have been depleted. A specific case is made in the 2005 guideline for drowning because this is the only readily identifiable cause of asphyxia.
In diving situations where drowning is the likely cause, and early rescue breathing may be of benefit, this is most likely to have been initiated in the water.

References

1. International Liaison Committee on Resuscitation. *2005 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations.* Resuscitation 2005; 67: 157 – 341.
2. European Resuscitation Council. *European Resuscitation Council Guidelines for Resuscitation 2005.* Resuscitation 2005; 67(Suppl. 1): S1 – S190.
3. Resuscitation Council (UK). *Resuscitation Guidelines 2005.* ISBN 1-903812-10-0. (available at www.resus.org.uk)