Basic life support guidelines

Contents

General points

The following guidance has been prepared by the Safety and Rescue Skills Advisor and endorsed by the National Diving Committee to reflect our guidance and procedures in light of current advice and guidance available from all relevant sources.

Clarification of technique

The early initiation of Rescue Breaths (RB) is an essential treatment for a drowning casualty. Current guidance for the treatment of drowning recommends that this should be started in-water if the rescuer is trained to do so (1). BSAC teaches such a technique. This document will describe the technique for effective in-water Rescue Breaths (RB)

Diving casualties

A non-breathing diving casualty may have suffered many different types of injury to cause the absence of breathing, however because the casualty has suffered these while submerged or immersed in water, drowning must be considered a primary cause or major contributing factor to the casualty's condition and the casualty should be treated for drowning.

Principles of rescue

The casualty must be removed from the water by the fastest and safest means possible. The rescuers should be aware of their personal safety and minimise danger to them and the casualty at all times. Variations in technique may be necessary depending upon the physical build and the equipment of both the casualty and rescuer. Therefore, the principles of the technique will be emphasised rather than dogmatically require a standard method.

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BSAC Guidelines

In-water rescue
New recommendations about this were made in 2016 and BSAC now recommends the following in-water rescue sequence:

- Give one minute of rescue breaths (RB) (10 RBs)
- If no spontaneous breathing returns

then either

- Tow the victim to shore as quickly as possible without further RB

or

- Continue on the spot with approximately 10 RBs per minute until support from rescue boat or helicopter arrives to take over the resuscitation. This decision will depend on the local situation, such as sea conditions, distance to shore, and availability of rescue boat or rescue helicopter.
- In either case, when reaching shore, or having access to the boat or helicopter, the casualty should be promptly dekitted and landed as quickly as possible without further rescue breaths.

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 the casualty, any bystanders, and you 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 find 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, 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. This is often termed agonal breathing and must not be confused with normal breathing. Look, listen, and feel for no more than 10 seconds to determine if 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.
- Summon help from the ambulance service by mobile phone. If this is not possible, send a bystander. Leave the casualty only if no other way of obtaining help is possible.
- Continue to assess that breathing remains normal. If there is any doubt about the presence of normal breathing, start Chest Compressions and Rescue Breaths.

5b) If he is not breathing normally:

- Ask someone to call for emergency services and bring an AED if available. If you are on your own make the call yourself. Leave the casualty only when no other option exists for getting help.
- 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 (which is the lower half of the casualty's sternum (breastbone).
  - 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 sternum.
  - Position yourself vertically above the casualty's chest and, with your arms straight, press down on the sternum 5 - 6 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 100 - 120 min.
  - Compression and release should take an equal amount of time.

6a) Combine chest compressions with rescue breaths:

- After 30 compressions open the airway again using head tilt and chin lift.
- Pinch the soft part of the casualty's nose closed, using the index finger and thumb of your hand on his forehead.
- Allow his mouth to open, but maintain chin lift.
- Take a normal breath and place your lips around his mouth, making sure that you have a good seal.
- Blow steadily into his mouth whilst watching for his chest to rise; take about one second to make his chest rise 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 his chest to fall as air comes out.
- Take another normal breath and blow into the casualty's mouth once more to give a total of two effective rescue breaths. The two breaths should not take more than 5 s. 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 to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally; otherwise do not interrupt resuscitation.

- If the initial rescue breath of each sequence does not make the chest rise as in normal breathing, then, before your next attempt:
  - Check the casualty's mouth and remove any visible 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 every 1-2 min to prevent fatigue but ensure the minimum of delay during the changeover of rescuers.

6b) Compression-only CPR

- If you are not trained to give rescue breaths, give chest compressions only.
- If chest compressions only are given, these should be continuous at a rate of 100 -120 per minute.
- Stop to recheck the casualty only if he starts to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally; otherwise do not interrupt resuscitation.

7) Continue resuscitation until:

- Qualified help arrives and takes over.
- The casualty starts to show signs of regaining consciousness, such as coughing, opening his eyes, speaking, or moving purposefully AND starts to breathe normally, OR you become exhausted.

Note

BSAC recommends that this same sequence can be used in the event of a child being the casualty and is therefore appropriate for all BSAC members including young members of snorkelling branches from the age of 6 years.

Several studies have shown that unnecessary interruptions to chest compressions occur frequently during BLS and are associated with a poorer outcome from the resuscitation. The other major factor which appears to influence effectiveness of resuscitation is a delay in the use of an AED. BSAC guidelines emphasises the importance of minimising interruptions to chest compressions and early availability of an AED.

In-water Rescue Breaths (RB)

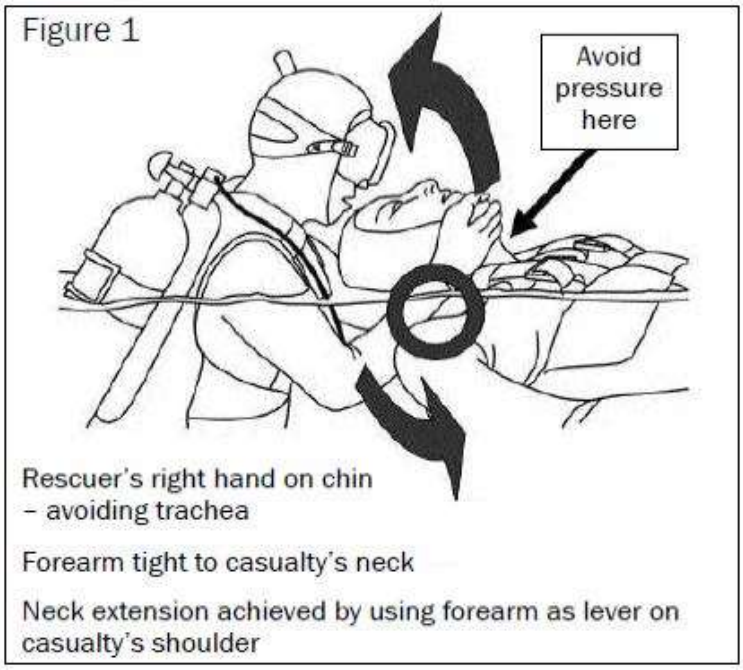
- The rescuers should be aware of their personal safety and minimise danger to themselves and the casualty at all times.
- The casualty must be removed from the water by the fastest and safest means possible.

1) The rescuer must make a firm hold on the casualty and maintain this throughout the rescue.
- Suitable hold includes on the top of the casualty's cylinder, or BC strap
- Ideally this hold will allow the rescuer to "roll" the casualty towards them in the event of Rescue Breaths (RB) being needed

2) The rescuer should make the casualty and themselves buoyant at the surface.
- Ensure adequate inflation of buoyancy device to float casualty safely with airway clear of the water in the event of spontaneous breathing returning
- Avoid over inflation preventing adequate neck extension
- Consider the dropping of weight belts/pouches to ensure both maintain position on the surface

3) Open the casualty's airway by applying gentle neck extension
- The hand not being used to hold the casualty should be applied to the casualty's chin

- Avoid applying pressure over the centre of the neck (trachea)



- The forearm should be close into the side of the casualties' neck (Figure 1) so that the neck can be extended by using the forearm as a "lever"
- The casualty's head should be tilted backwards as if they started out looking straight ahead and then directly overhead, i.e. the head should not tilt from side to side
- The purpose of neck extension is to prevent the tongue falling back in the throat. In training, a test of the adequacy of the neck extension is that a student simulating the role of "casualty" will have difficulty swallowing if the neck is extended
- During training divers simulating the role of a casualty should be briefed to relax and rescuers briefed not to forcefully gain the neck extension to avoid the risk of injury.

4) If there is no spontaneous breathing on opening the airway in this way give Rescue Breaths (RB) for approximately 1 minute (10 Rescue Breaths)

Background to changes and ongoing recommendations

BSAC recommendations for Basic Life Support (BLS) and use of Automated External Defibrillators (AEDs) are based on Guidelines published by the major international resuscitation organisations. Every five years experts in resuscitation from these organisations conduct a review of published literature. This review and a resulting consensus statement (Consensus on Science with Treatment Recommendations, CoSTR; Part 1) forms the scientific basis of the European Resuscitation Council (Section 2 and 4) and the Resuscitation Council (UK) Guidelines which are therefore consistent with the recommendations of resuscitation organisations world-wide.

Updated guidelines were published by the Resuscitation Council (UK) in October 2015. These current guidelines contain some recommendations and changes in practice based on new evidence since the previous guidelines in 2010, which formed the basis of the BSAC Basic Life Support Guidelines 2011. They represent a widely accepted view of how resuscitation should be achieved safely and effectively. This does not imply that previous practice is either unsafe or ineffective. BSAC has considered the revised guidelines and this document represents the BSAC recommended techniques for basic life support which 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.

The training materials for the Diver Training Programme and Skill Development Courses have been revised to incorporate these changes.

References

Basic Life Support Sequence References

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