World Water Safety

INTERNATIONAL LIFE SAVING FEDERATION

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MEDICAL POSITION STATEMENT - MPS 08

IN WATER RESUSCITATION

PLAIN LANGUAGE SUMMARY

Whenever possible, if a victim is found **unconscious** in the water, the rescuer should immediately establish whether spontaneous breathing is present and, if it is absent, initiate artificial ventilation. In general, only highly trained lifeguards have the skills to perform rescue breathing in deep water. It is recommended that 10 initial breaths are delivered and then the rescuer should make their way back to a dry area.

BACKGROUND

Whenever an apparently non-breathing victim (unconsciousness) is found in the water, the rescuer is confronted with a difficult choice. Should the rescuer attempt resuscitation procedures in the water and wait for a means of transport where the victim can be resuscitated while transported or should the rescuer bring the victim to shore immediate and there attempt resuscitation?

The hypoxia (oxygen starvation) caused by prolonged submersion results first in cessation of breathing [1,3,4,5,6,7]. If this hypoxia is not corrected quickly, respiratory arrest is followed by cardiac arrest at a variable, but short time interval determined by physical condition of the victim, exertion to prevent drowning to happen, water temperature, previous hypoxia, emotional state, and associated diseases [1,3,5,8,10,11].

When respiratory arrest is corrected prior to onset of cardiac arrest, the death rate is less (0% to 44%) than in those cases where full CPR (including chest compressions) is needed (33% to 93%) [1,3,5]. For these reasons, in cases of respiratory arrest without cardiac arrest while the victim is still in the water, the time involved in rescue will be enough, in the majority of cases, to result in cardiac arrest. This will lead to an increase in the likelihood of death as the resuscitation window possibility decreases with time. [1,3,5]. If hypoxia can be corrected in the water, before cardiac arrest takes place, the victim's chance of survival increases significantly.

Ventilation in deep water using a rescue board was demonstrated in Australia by Surf Life Saving New Zealand in 1975.[2] Deep water ventilation using a rescue board subsequently became part of lifeguard training in Australia in 1976 [1]. In 1978, during a World Lifesaving Association medical conference in California, it was agreed that artificial ventilation with the aid of a flotation device should be employed in any case in which there is a delay in removing the non-breathing victim from the water. No successful resuscitation in the water was reported until 1981, although several lifesaving organisations worldwide had been teaching the use of artificial ventilation in the water [2].

STATEMENT

Whenever possible, if a victim is found **unconscious** in the water, the rescuer should immediately establish whether spontaneous breathing is present and, if it is absent, initiate artificial ventilation.

Exceptions include threats to the safety of the rescuer and victim if immediate rescue is not initiated, in those cases where a dry place (land/boat/poolside) is near enough to get the victim out of the water immediately and cases of **known** submersion over 15 minutes [12,13]. Of importance is the fact that the time of unconsciousness in the water is seldom known. Initiating artificial ventilation while still in the water in cases of a unconscious victim may improve chances of good outcome (survival without

sequela) by more than 7 times (from 7.4% to 52.6%) [1,3]. The rescuer's ability and decision to perform this procedure will depend on factors such as water conditions at the location of the incident (surf, currents, etc.), the availability of a rescue flotation device (rescue buoy, rescue tube, rescue board, etc.), rescuer training, physical conditioning of the rescuer, the techniques used and distance to a dry place. Training in In Water Resuscitation techniques is highly recommended.

Specific recommendations, concerned only unconscious victims (non-breathing), for different water depths are as follows in cases where the submersion time is unknown or is **known** to be less than 15 minutes:

Shallow Water (if the rescuer can stand on the bottom)
Open the victim's airway by extending the victim's neck, evaluate the victim's breathing, and, if the victim is not breathing, begin a maximum of 10 mouth-to-mouth ventilations. If spontaneous breathing is restored at any time during the first ventilations, proceed towards shore, stopping to check from time to time that the victim is still breathing.

If breathing is not restored after 10 ventilations, the rescuer should tow the victim to a dry area without further ventilations to start CPR. This may be done without great difficulty and without lifesaving equipment. Attempt to prevent unnecessary neck movement if there is a suspicion of head or neck trauma.

Deep water (if the rescuer cannot stand on the bottom)
In general only highly trained lifeguards have the skills to perform rescue breathing in deep water.
Position the victim face up, extending the neck to open the airway. This can be accomplished by a single trained rescuer with the aid of appropriate lifesaving equipment (a rescue tube, rescue can, rescue board, bodyboard, etc.) or by two or more trained rescuers without lifesaving equipment. In either case, swim fins are highly recommended and will greatly facilitate these procedures.

If there is no spontaneous breathing, the rescuer should attempt to ventilate for a maximum of 10 ventilations, and then proceed to shore or dry land.

If ventilation is restored, proceed toward shore, intermittently stopping to check that the victim is still breathing.

If breathing is not restored after 10 ventilations, the rescuer should tow the victim to a dry area (land/boat/poolside) without further ventilations to start CPR. This may be done using lifesaving equipment. Management and care with neck movement is less important as the suspicion of head or neck trauma is very low at this deep water circumstance, unless a trauma is suspected.

When performed in deep water, this is a difficult procedure, requiring extreme fitness, swimming ability, a flotation device and prior training. Do not check victim's pulse or attempt compressions while in the water [21]. These are difficult and inefficient, and will slow the rescue process.

In case of a suspected back or neck injury the rescuer should check breathing before extending the victim's neck, then if there is no breathing, tilt the victim's neck backwards to check for breathing again. If there is no spontaneous breathing the rescuer should immediately start ventilations [1,21] consistent with the rescuer's training protocol. Suspicion of a back/neck injury should be greater in shallow water.

The rescuer should always keep the victim under observation during the rescue, even if the victim is breathing spontaneously, because during the first 5 to 10 minutes the victim could again cease breathing[1].

DISCUSSION

Usually the rescuer does not know all the circumstances related to the victim before the rescue is attempted, and the resuscitation window decreases with time. The proper training for different situations, with or without lifesaving equipment, will improve the rescuer's ability to make the right decision and select the right rescue equipment for the circumstances. By maintaining good physical conditioning and using the correct rescue techniques the rescuer can avoid unnecessary risks to both the rescuer and victim.

In considering the best course of action in treating a non-breathing (unconsciousness) victim in the water, lifeguards and other in-water rescuers have raised several questions:

What if the victim is actually breathing and the rescuer mistakenly gives ventilations?
It can be difficult to determine whether an unconscious victim is breathing spontaneously while the rescuer and victim are still in the water. Even so, if the rescuer ventilates a breathing victim, it is very unlikely to have a negative impact. On the other hand, ventilating a victim who is not breathing and still with circulation may restore the spontaneous ventilation or at least avoid cardiac arrest.

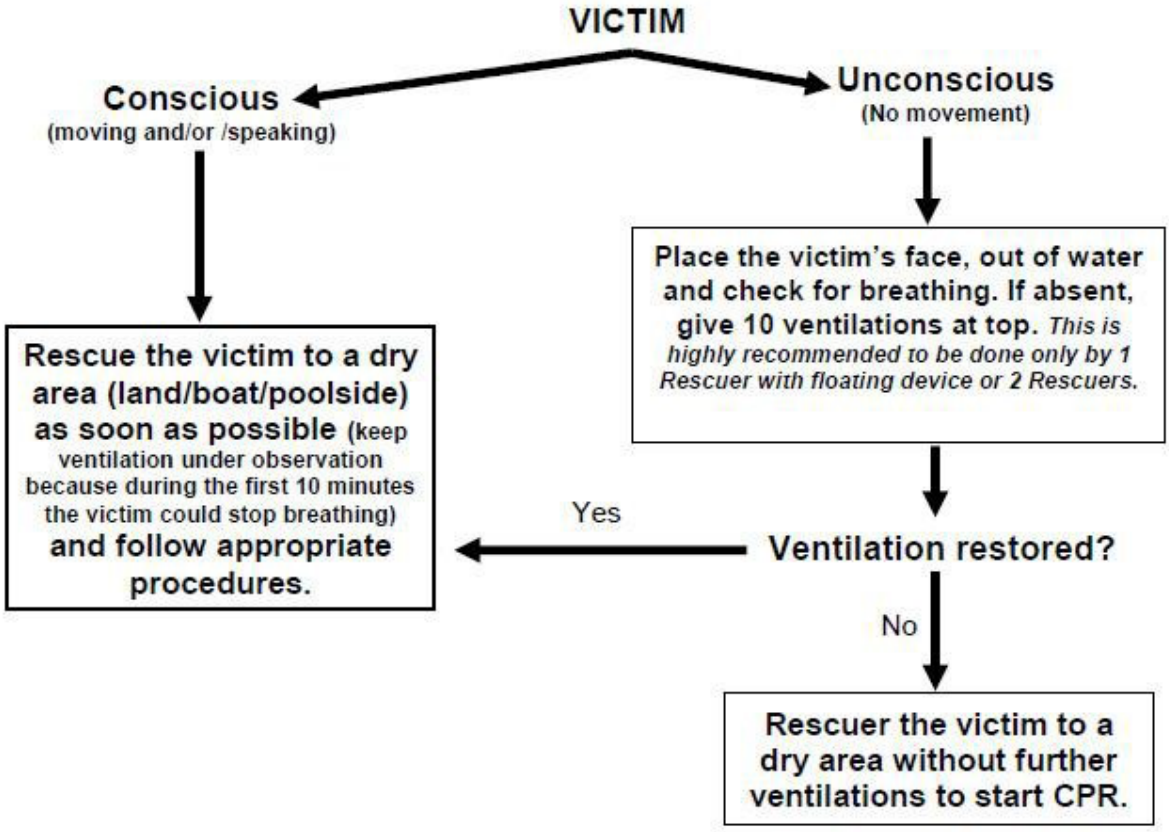
If the victim is in cardiac arrest, won't the time involved in giving ventilations in the water delay CPR, early supplemental oxygen, early rhythm and earlier advanced medical care and other critical interventions?
There will indeed be a delay, but the brief time involved in trying to immediately restart breathing seems to be the best approach. The higher death rate resulting from cardiac arrest (33% to 93%) versus respiratory arrest alone (0% to 44%) justifies the risk of attempting in-water resuscitation immediately. In the majority of these cases, breathing is usually restored by mouth-to-mouth ventilation in the first minute or in as few as 10 ventilations [1,8].

Does mouth-to-mouth place the rescuer at higher risk of contracting a communicable disease?
Studies suggest that the chance of contracting a communicable disease via mouth-to-mouth resuscitation attempts is extremely small [23]. On the other hand, the chance of saving a life in these cases is high. Rescuers should take this into account in deciding the best course of action. If the rescuer has a barrier device, it may be used, but these devices are usually very difficult to use in-water and attempts to use them may add further delays and endanger the rescuer.

What if the water conditions are such that the rescuer or victim is endangered (e.g. high surf, very cold water, etc.)?
If the rescuer is to successfully assist the victim, the rescuer must maintain a reasonable degree of safety. If the rescuer cannot safely provide ventilation at the location where the victim is found, then the rescuer should immediately move to a position of safety. This may be elsewhere in the water (such as further offshore), on-shore, into a rescue boat, etc.

IN-WATER RESUSCITATION (IWR) FLOW CHART DECISION

Only appropriate for highly trained lifeguards



IWR flow chart decision - Szpilman 2015 - Exceptions to attempt IWR include threats to the safety of the rescuer and victim if immediate rescue is not initiated, in those cases where a dry place (land/boat/poolside) is near enough to get the victim out of the water immediately and cases of **known** submersion over 15 minutes

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