World Water Safety

INTERNATIONAL LIFE SAVING FEDERATION

Gemeenteplein 26 – 3010 Leuven – Belgium
Tel: (32.16) 89.60.60 – E-mail: ils.hq@telenet.be - Web: www.ilsf.org

MEDICAL POSITION STATEMENT - MPS 20

ABILITY TO PERFORM CPR POST RESCUE

NOTE: This statement is intended for those lifeguards, acting in a professional or volunteer capacity, who are trained in the techniques of water rescue and resuscitation and who assume a duty to safeguard members of the public at aquatic sites. They may be called lifeguards, lifesavers or both. This statement is not directed at members of the public trained in water safety and rescue techniques, but without a duty to respond, who may also be known, in some areas of the world, as lifesavers.

BACKGROUND

Drowning involves principles and interventions that are rarely or not found in any other medical situations. These interventions may affect the performance of CPR, if CPR is required to be performed on the drowned victim post rescue. [Szpilman 2014]. The whole drowning process, from immersion to cardiac arrest, usually occurs within seconds to a few minutes [Szpilman 2012]. Therefore, an early and effective rescue of the drowned victim may interrupt the drowning process, avoiding the majority of initial and subsequent water aspiration, respiratory distress, and the need to perform CPR.

However, effecting a rescue requires effort. The amount of effort depends on the type of rescue, the equipment chosen to perform the rescue and the time taken to perform the rescue. When choosing the most appropriate rescue technique, the lifeguard will consider the number of victims requiring rescue, the distance to the victim(s), the prevailing weather and water (surf) conditions as well as the resources available such as type of equipment available and other lifeguards that may be able to assist. An efficient rescue requires less effort. The less effort a lifeguard expends in effecting the rescue, the better the lifeguard will be able to perform CPR (if required) and attend to other duties post rescue.

To achieve this goal, several types of equipment are available that improve floatation and reduce time to rescue. These include rescue-tube/rescue buoy (it is recommended that fins be used by the lifeguard when using a rescue tube/rescue buoy for providing propulsion, rescue-board, and motor propelled equipment such as a RWC (jet ski) or inflatable rescue boat. [USLA 2011, Barcala 2013, 2014 & 2015, Abelairas 2013, Michniewicz 2008, Travers 2010].

Under controlled and simulated conditions [Barcala 2015] in surf conditions of less than 0.5m and within 100m from shore in a rested lifeguard, using 4 different rescue techniques in a calm water scenario, the use of rescue equipment demonstrated better results on diminishing total rescue time and requiring less effort by the rescuer. Other researchers reported similar results using a rescue tube and torpedo buoy [Claesson 2011, Prieto 2010]. Although all equipment was able to show better results on both total time and reducing the effort expended by the rescuer, the use of fins only saved 6%, while the rescue board was able to save 33% on the time to rescue as well as resulting in the rescuer expending less energy. Other factors like weather conditions, physical fitness, previous practice with the equipment and training may influence the results and need to be further evaluated.

Fatigue is a significant limiting factor for CPR quality if the lifeguard needs to provide it after a rescue [Barcala 2013, Claesson 2011]. Some studies emphasized the need for good physical condition and training under the possibility of fatigue [Barcala 2013 and 2014, Abelairas 2013]. Blood lactate levels were very high [Barcala 2014, Abelairas 2014] in water rescue made by lifeguards independently of the rescue method but slightly lower in some rescue board studies [Barcala 2015]. After CPR, lactate values were quite similar in all groups. Nevertheless, subjective perception of effort (Borg' score)[Borg 1982] and lactate results suggest that the use of a rescue board is less demanding and this may mean better aptness for the extra effort required to perform CPR.

Regarding quality of CPR, a study [Barcala 2015] demonstrates that there was no difference in performance between basal and after rescue techniques, indicating that the rescue effort using different techniques had no effect on CPR quality when applied for 5 minutes after a single rescue. However, results should be carefully considered as preliminary since lifeguards are usually physically fit and just one rescue was tested.

Basal quality cardiac compression measurements were considered good (> 70%) [Barcala 2015] supported by other studies that all lifeguards were well trained [Barcala 2013, Abelairas 2013, Perkins 2004]. Chest compression maybe faster after rescue and this may be a result of the rescue effort to speed things up. Quality ventilations showed to be lower than 70%, at basal and after all 4 different rescues trials [Barcala 2015]. This may suggest poor-quality ventilation training as the pre-rescue phase showed the same low results. [Barcala 2013, 2014, 2015, Abelairas 2013, Claesson 2011].

STATEMENT

Literature suggests that a well-trained lifeguard is able to deliver good-quality CPR even after a strenuous challenge of water rescue. However, this relies on the lifeguard having high levels of fitness as per required fitness standards and that CPR training is up to date and practiced regularly.

1. Understanding the advantages and disadvantages associated with each rescue method, and the available equipment, helps the rescuer select the most appropriate rescue method in the circumstances.
2. The key factors that may influence the course of action in a rescue situation are the number of victims, the distance to the victim(s), the prevailing weather and water (surf) conditions as well as the type of equipment available to the lifeguard.
3. The use of a powered rescue boat and/or floating water rescue equipment such as a rescue board, is recommended. This reduces the time taken in reaching the victim, reduces the effort required by the lifeguard in effecting the rescue, protects lifeguards from a panicking victim, provides floatation support for both the lifeguard and the victim as well as a faster return to a position where CPR can be performed

(if necessary). Note that in some cases the lifeguard may choose to stay with the victim and wait for backup provided backup is available and will provide a faster return to a position where the victim can be treated.

4. Rescues without equipment are not recommended as they pose a significant risk to the lifeguard. However, a lifeguard may find him/herself in a situation which calls for a rescue without equipment, especially while off-duty. For this reason, all lifeguards should be trained in both release and escape techniques as well as victim tow techniques. Additionally, all rescues of such nature should begin with measures to reach, throw, or row an object to the patient or to use verbal communication to calm or direct a victim to safety."
5. The most appropriate rescue equipment is the type that the lifeguard has had the appropriate training and feels most comfortable with.
6. Water rescue requires physical effort which can be quite demanding, even for trained lifeguards. The amount of effort required depends on the type of equipment used and the rescue technique applied.
7. If more than one lifeguard is available, it is recommended that the lifeguard not involved in the rescue performs CPR. However, if the rescuer is required to perform CPR, this is not a handicap to perform good-quality CPR.
8. The lifeguard needs to balance the effort required (speed demand) in effecting the rescue against the requirement to perform CPR. This may minimize the tendency to perform too fast compressions or ventilations post rescue.
9. Lifeguards need to maintain minimum fitness standards as well as regular CPR training, especially when considering the importance of efficient ventilation for the drowned victim as well as being able to perform CPR in a post rescue situation.

LEVEL OF EVIDENCE

This document is based on expert consensus.

POTENTIAL CONFLICT OF INTEREST STATEMENT

None of the participants in the consensus process leading to this position statement has a conflict of interest with the stakeholder industry, technology, persons or organisations that are identified and/or impacted by the position statement.

REFERENCES

- Szpilman D, Webber J, Quan L, et al. Creating a drowning chain of survival. Resuscitation 2014;85:1149–52.
- Szpilman D, Bierens JJLM, Handley AJ, et al. Drowning. N Engl J Med 2012;366:2102–10.
- United States Lifeguard Standards: An Evidence-Based Review and Report by the United States Lifeguard Standards Coalition. Int J Aquatic Res Educ 2011;61–129.
- Barcala-Furelos R, Abelairas-Gomez C, Romo-Perez V, et al. Effect of physical fatigue on the quality CPR: a water rescue study of lifeguards: physical fatigue and quality CPR in a water rescue. Am J Emerg Med 2013;31:473–7.
- Abelairas Gómez C, Romo Pérez V, Barcala Furelos R, et al. Effect of lifeguard fatigue on the first 4 minutes of cardiopulmonary resuscitation after water rescue. Emergencias 2013;25:184–90.
- Barcala-Furelos R, Abelairas-Gómez C, Romo-Perez V, et al. Influence of automatic compression device and water rescue equipment in quality lifesaving and cardiopulmonary resuscitation. Hong Kong J Emerg Med 2014;21:291-7.
- Perkins GD, Colquhoun M, Simons R. Training manikins. In Colquhoun M, Handley A, Evans TR, editors. ABC of resuscitation. 5th ed. London, BMJ books; 2004, p. 97-101.
- Barcala-Furelos R, Abelairas Gómez C, Domínguez-Vila, et al. Coastal police of Vigo. a quasi-experimental pilot study about cpr and rescue. Rev Int Med Cienc Ac 2014;In press.
- Abelairas-Gómez C, Rodríguez-Núñez A, Casillas-Cabana M, et al. Schoolchildren as life savers: At what age do they become strong enough? Resuscitation 2014;85:814–9.
- Barcala-Furelos R, Abelairas-Gomez C, Queiroga AC, et al. CPR quality reduced due to physical fatigue after a water rescue in a swimming pool. Signa Vitae 2014;9:25–31.
- Borg G a. v. Psychophysical bases of perceived exertion. / Les bases psychophysiques de la perception de l’ effort. Med Sci Sports Exerc 1982;14:377–81.

- Prieto Saborit JA, del Valle Soto M, Díez VG, et al. Physiological response of beach lifeguards in a rescue simulation with surf. Ergonomics. 2010;53:1140–50.
- Michniewicz R, Walczuk T, Rostkowska E. An assessment of the effectiveness of various variants of water rescue. Kineziologija 2008;40:96–106.
- Claesson A, Karlsson T, Thorén A-B, Physiological response of beach lifeguards in a rescue simulation with surf. Ergonomics. Delay and performance of cardiopulmonary resuscitation in surf lifeguards after simulated cardiac arrest due to drowning. Am J Emerg Med 2011;29:1044–50.
- Abelairas-Gomez C, Palacios-Aguilar J, Costas-Veiga J, Physiological response of beach lifeguards in a rescue simulation with surf. Ergonomics. Physiological analysis of an aquatic rescue: How a rescuer faces a CPR? Resuscitation 2012;83:e54.
- Barcala-Furelos Roberto, Szpilman David, Palacios-Aguilar, Jose, Costas-Veiga Javier, Abelairas-Gomez Cristian, Bores-Cerezal Antonio, L´opez-Garcıa Sergio, Rodrıguez-Nunez Antonio, Assessing the efficacy of rescue equipment in lifeguard resuscitation efforts for drowning, American Journal of Emergency Medicine (2015), doi: 10.1016/j.ajem.2015.12.006

APPROVAL

Position Statement approved by the ILS Board of Directors on 03/09/2016.