



World Water Safety

INTERNATIONAL LIFE SAVING FEDERATION

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MEDICAL POSITION STATEMENT - MPS 10

POSITIONING A PATIENT ON A SLOPING BEACH

BACKGROUND

The goal of this statement is to recommend the best positioning for a patient on a sloping beach, particularly during resuscitation efforts.

For centuries, people have believed that water should be drained from the lungs of a drowning victim as an essential part of the effort to revive them. In the 18th century, this was the main reason given for placing the victim in a head-down position (HD) on sloping beaches. This position was subsequently adopted by many lifesavers throughout the world. Recent research however, suggests that this is not the best position for optimum patient outcome. Some examples:

- Aspirated water can be drained with active drainage measures (HD position), mainly in salt water, but it does not improve oxygenation of the patient during resuscitation efforts (Werner JZ, Safar P et al – 1982 & Modell JH – 1981 & Ruben A, Ruben H - 1962).
- The time required to drain water from the lungs is short (1-3 minutes), but the value of drainage does not outweigh the benefit of immediate resuscitation efforts (Werner JZ, Safar P et al – 1982 & Orłowski JP – 1987).
- Massive aspiration of water is seldom observed in humans who arrive at the hospital alive (Modell JH & Davis JH - 1969). Approximately 85% of people who die in the water and a much larger number who are resuscitated aspirate 22ml/kg or less and only about 15% of those who die aspirate an amount greater than this (Modell JH - 1967). In animal research, 2,2 ml/kg of water aspiration was enough to drop the arterial oxygen tension to 60 mmHg in the first 3 minutes (normal value is around 90 mmHg) (Gooden BA – 1972). This amount of water aspiration does not justify the time and effort involved in attempting to drain water from the lungs.
- During pre-hospital resuscitation, active drainage measures (HD position) induce vomiting in 87% of cases compared with 16% of patients with their head at the same level as the trunk (HT position). Final mortality is 95% in HD versus 80% in HT (Szpilman D, Idris A. MD, Cruz Filho FES - 2002).
- The HD position increases the likelihood of regurgitation of gastric content (vomit). Presence of vomit in the airway can result in aspiration of vomit by the victim. It obstructs resuscitation efforts. The presence of vomit can be discouraging to rescuers, particularly those using mouth-to-mouth resuscitation (Manolios N, Mackie I – 1988 & Bierens JJLM, et al - 1997).

- During CPR, with the victim in a horizontal position on a rigid surface, cardiac compression provides an average perfusion volume of 30%, as compared to a natural heartbeat (Del Guerio LM et al - 1965). The brain is most effectively perfused with oxygenated blood if the victim is in a horizontal position (Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiac Care - 1992).
- The position of the head higher than trunk (HH), although it is the position least likely to provoke vomiting and regurgitation, is contra-indicated in more severe cases, as they are usually associated with arterial hypotension or shock (Szpilman D - 1997), which can lead to a low cerebral blood flow and hypoxic cerebral damage. Conversely, the HH position is appropriate for normotensive patients as it makes spontaneous ventilation easier and reduces the possibility of vomit.

STATEMENT

On sloping beaches, all patients should initially be placed in a position parallel to the waterline, lying supine (head in the same level as the trunk - HT position), far enough away from the water to avoid incoming waves. This position reduces the incidence of vomiting when compared to the head down (HD) position and improves the chance of a successful resuscitation. Time should not be wasted in attempting to withdraw water from the lungs, as this does not improve patient outcome and delays provision of effective resuscitation. The first lifesaver attending to the victim should kneel with his/her back to the water, so as to facilitate patient evaluation and CPR manoeuvres without falling over the patient. Upon arrival of a second lifesaver the victim should be left in the HT position unless this makes effective CPR impossible for the second rescuer due to the slope of the beach, in which case the patient can be moved to a non-sloping or to a lesser sloping part of the beach.

The victim should be maintained during all assistance in a position parallel to the shoreline (HT), until personnel with the skills and equipment to evaluate blood pressure can make an assessment. Adjustments may then be made to this positioning depending on patient status:

- If CPR or ventilation alone are needed, the victim should be maintained in a position parallel to the shoreline (HT).
- Patients 10 years of age or older with a spontaneous heartbeat and a systolic blood pressure above 90 mmHg (radial pulse felt by palpation), should be placed in a position with the head higher than the trunk (HH). If unconscious or exhausted, the victim should also be placed on their side (recovery position - lateral decubitus).
- Patients with a systolic blood pressure below 90 mmHg (no radial pulse felt by palpation) must be kept parallel to the waterline (HT) until resuscitation is successful, or until hypotension or shock is corrected. After this, the victim can be positioned in HH if no hypotension or shock exists.

Note: In infants and children less than or equal to 9 years of age, hypotension is defined as systolic

blood pressure less than the minimum systolic pressure calculated by the following formula: $70 + (2 \times \text{age in years})(B)$. (Schieber R.A-1990).

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