For centuries, people falsely believed that draining water from the lungs of drowning victims was an essential part of the resuscitation process. In the eighteenth century, this was the main reason why victims were positioned hanging vertically head down. Even today, many theories about positioning are offered but few with hard data to back them. In the following chapter, an attempt is made to provide the most logical rationale for positioning based on the available information, recent studies and consensus. In turn, this discussion will focus on issues such as water in the lungs and positioning during rescue in the water and on land and positioning during resuscitation and recovery for the drowning victim (Table 97.1).

### 97.1 Water in the Lungs

Massive aspiration during the drowning process is seldom observed in humans [1]. Placing the victim head down does result in the drainage of some aspirated fluid, mainly after salt water drowning, but the disadvantages outweigh the benefits. In particular, such action does not improve oxygenation of the patient during a resuscitation attempt [2–4]. Although it does not take longer than 1–3 min, in the usual sense, to drain water from the lungs, such delay before resuscitative efforts is significant as far as outcome is concerned because most of the significant electrolyte and fluid shifts have already taken place [1, 2, 5].

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In addition, inappropriate positioning has other consequences that outweigh any theoretical advantage. During pre-hospital resuscitation, attempts at active drainage by placing the victim in a head-down position increases the risk of vomiting more than fivefold and leads to a significant increase (19%) in mortality when compared with keeping the victim in a horizontal position [6]. The presence of vomit in the airway can result in further aspiration and impairment of oxygenation by obstructing the airways. It can also discourage rescuers from attempting mouth-to-mouth resuscitation [7, 8].

Although recommended by some, the abdominal thrust (Heimlich manoeuvre) should not be used as a means of expelling water from the lungs. It is ineffective and carries significant risks [9].

### Table 97.1

Recommendations for positioning a drowning victim without suspected spinal injury according to setting and the condition of the victim. If cervical spine injury is suspected, see Chap. 96

<table>
<thead>
<tr>
<th>Setting</th>
<th>Condition of the drowning victim</th>
</tr>
</thead>
<tbody>
<tr>
<td>In water (during rescue)</td>
<td>Exhausted, confused or unconscious victim</td>
</tr>
<tr>
<td>Conscious victim</td>
<td>Position according to the rescue technique chosen</td>
</tr>
<tr>
<td>Recovery on land</td>
<td>Transport vertically with head up. Keep horizontal if prolonged immersion or immersion in cold water (Fig. 97.2)</td>
</tr>
<tr>
<td>Recovery on land</td>
<td>Transport in as near a horizontal position as possible but with the head still maintained above body level. The airway should be kept open, and the victim should be kept horizontal if prolonged immersion or cold water is involved</td>
</tr>
<tr>
<td>On land</td>
<td>Maintain the victim in a supine position with head up</td>
</tr>
<tr>
<td>On land</td>
<td>If cardiopulmonary resuscitation is required: place victim supine, as horizontal as possible, and parallel with the waterline (Fig. 97.3) Unconscious but breathing: place in recovery position (Fig. 97.4)</td>
</tr>
</tbody>
</table>

In addition, inappropriate positioning has other consequences that outweigh any theoretical advantage. During pre-hospital resuscitation, attempts at active drainage by placing the victim in a head-down position increases the risk of vomiting more than fivefold and leads to a significant increase (19%) in mortality when compared with keeping the victim in a horizontal position [6]. The presence of vomit in the airway can result in further aspiration and impairment of oxygenation by obstructing the airways. It can also discourage rescuers from attempting mouth-to-mouth resuscitation [7, 8].

Although recommended by some, the abdominal thrust (Heimlich manoeuvre) should not be used as a means of expelling water from the lungs. It is ineffective and carries significant risks [9].

### 97.2 In-Water Rescue

If resuscitation is started whilst the drowning victim is still in the water, the chance of survival without sequelae is increased threefold [10]. Chest compression is not a practical option, but rescue breathing can be undertaken, preferably with support, in deep water (Fig. 97.1) or at the edge of the water.

### 97.3 Rescue from the Water

Maintaining the victim in a head-up vertical position during rescue from the water reduces the incidence of vomiting [10] and facilitates spontaneous respiration (Fig. 97.2). When hypotension or shock is suspected, the victim should be rescued in a near-horizontal position but with the head still maintained above body level.
Horizontal recovery is important after prolonged immersion, particularly in cold water, as a combination of the release of hydrostatic pressure and the effect of the cold may result in severe, sometimes irreversible, hypotension [12].

### 97.4 On-Land Resuscitation

All victims should initially be placed in a position parallel to the waterline [6], as horizontal as possible, lying supine, far enough away from the water to avoid incoming waves. During CPR, the brain is most effectively perfused with oxygenated blood if the victim is in a horizontal position [13].
On sloping beaches or riverbanks, rescuers attending the victim should kneel with their backs towards the water so as to facilitate evaluation and CPR manoeuvres, if needed, without falling over the victim (Fig. 97.3).

![Fig. 97.3](image1) On sloping beaches, the victim should be placed parallel to the waterline, and the rescuer should be with the back to the water

![Fig. 97.4](image2) On sloping beaches, the victim should be placed parallel to the waterline in the lateral position during recovery

On sloping beaches or riverbanks, rescuers attending the victim should kneel with their backs towards the water so as to facilitate evaluation and CPR manoeuvres, if needed, without falling over the victim (Fig. 97.3).

### 97.5 The Unconscious but Breathing Victim

On land the airway of an unconscious victim who is breathing spontaneously is at risk of obstruction by the tongue and from inhalation of mucus and vomit. Placing the victim on the side in the recovery position helps to prevent these problems and allows fluid to drain easily from the mouth (Fig. 97.4). The person should be placed in a position that is horizontal and parallel to the shoreline if there is an incline. It is not known whether it is preferable to have the left or right side down.

### Conclusion

The Basic Life Support Working Group of the International Liaison Committee on Resuscitation (ILCOR) has agreed on six principles that should be followed when managing the unconscious, spontaneously breathing victim [14]:

- The victim should be in as near a true lateral position as possible with the head dependant to allow free drainage of fluid.
- The position should be stable.
- Any pressure on the chest that impairs breathing should be avoided.
- It should be possible to turn the victim onto the side and return to the back easily and safely, having particular regard to the possibility of cervical spine injury.
• Good observation of, and access to, the airway should be possible.
• The position itself should not give rise to any injury to the victim.

References