

Drowning/Submersion Injury

Drowning is defined as, “A process resulting in primary respiratory impairment from submersion or immersion in a liquid medium.” (American Heart Association, 2010).

Uncertainty exists regarding survival in cold water drowning, however, recent literature suggests the following:

1. In cold water (temperature is less than 43° F (6° C)) and the patient is submerged with evidence of cardiac arrest:
 - A. Survival is possible for submersion time less than 90 minutes and resuscitative efforts should be initiated
 - B. Survival is not likely for submersion time greater than 90 minutes and providers may consider not initiating resuscitation or termination of resuscitation on scene
2. If warm water (temperature is greater than 43° F (6° C)) and the patient is submerged with evidence of cardiac arrest:
 - A. Survival is possible for submersion time less than 30 minutes and resuscitative efforts should be initiated
 - B. Survival is not likely for submersion time greater than 30 minutes and providers may consider not initiating resuscitation or termination of resuscitation on scene.
3. It may often be impractical to determine water temperature; subsurface water temperatures may be considerably colder than surface temperature. When in doubt, consider water to be cold.
4. Time estimation begins when the patient is presumed to be submersed.

If SCUBA incident with rapid ascent, transport the patient in the left lateral recumbent position.

1. Follow **General Pre-hospital Care Protocol**.
 - A. Primary survey should include aggressive airway management and restoration of adequate oxygenation and ventilation.
 - B. Exam should include consideration of possible c-spine injury.
 - C. Assess for other associated injury such as injury to the head or dive-related emergency.
 - D. Assess patient’s temperature.
2. **If pulse is absent:**
 - A. If pulse is absent, consider submersion time and temperatures as indicated above. Refer to the **Dead on Scene Procedure as indicated**.
 - B. In normothermic, (> 34 C or 93F) patients initiate CPR and refer to **Cardiac Arrest – General Protocol (Adult or Pediatric)**.
 - C. If patient is hypothermic, (≤ 34C or 93F) go to **Hypothermia Cardiac Arrest Protocol**.

3. If pulse is present:

- A. If patient is hypothermic, go to **Hypothermia/Frostbite Protocol**.
- B. Prevent further heat loss by transport in a warm environment.
- C. Patient should be dry.
- D. Patients may develop subacute respiratory difficulty after drowning and therefore all victims of drowning should be transported for observation.



- E. Consider **CPAP/BiPAP** (if available) per **CPAP/BiPAP Procedure**.
- F. Contact Medical Control if no transport is considered or requested.

*Note: For SCUBA incident with rapid ascent, medical control can consider contacting the Divers Alert Network (DAN) @ 919-684-9111 to arrange evacuation and hyperbaric re-compression at a properly equipped and staffed chamber.