

## Michigan TRAUMA AND ENVIRONMENTAL DROWNING/SUBMERSION INJURY

Initial Date: 5/31/2012 Revised Date: 05/23/2023

Section 2-8

## **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).

For patients who have been submerged and in cardiac arrest:

- 1. In cold water (water temperature less than 70° F/21° C)
  - A. Initiate resuscitative efforts if submersion time is less than 90 minutes.



- i. Contact Medical Control for instructions on transport timing and destination for in-hospital rewarming.
- B. For sumbersion time greater than 90 minutes see **Dead on** Scene/Termination of Resuscitation-Procedure Protocol
- 2. In warm water (temperature is greater than 70° F/21° C)
  - A. Initiate resuscitative efforts if submersion time is less than 30 minutes.



- i. Contact Medical Control for futher direction, which may include instructions on transport timing, destination, or termination of resuscitation.
- B. For submersion time greater than 30 minutes see **Dead on** Scene/Termination of Resuscitation-Procedure Protocol
- 3. It may 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.

For patients who have been submerged and NOT in cardiac arrest

- 1. If SCUBA incident with rapid ascent, the maintain the patient in a supine position.
- 2. Follow General Pre-hospital Care-Treatment Protocol.
  - A. Administer high flow oxygen.
  - B. Primary survey should include proactive airway management and restoration of adequate oxygenation and ventilation.
  - C. Exam should include consideration of possible c-spine injury.
  - D. Assess for other associated injury such as injury to the head or dive-related emergency.
  - E. Assess patient's temperature.
  - F. If patient is hypothermic, go to Hypothermia/Frostbite-Treatment Protocol, handle patients gently. Excessive/aggressive movement can precipitate cardiac arrest.
  - G. Prevent further heat loss by transport in a warm environment.
  - H. Patient should be dry and/or wrapped in vapor barrier, as available.
  - I. Patients may develop subacute respiratory difficulty after drowning and therefore all victims of drowning should be transported for observation.
    - 🗱 i. Consider transport to facility with hyperbaric oxygen therapy capability.
  - J. Consider CPAP (Per MCA selection, may be a BLS procedure) follow CPAP-**Procedure Protocol.** 
    - K. Contact Medical Control if no transport is considered or no transport is requested.



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

Protocol Source/References: AHA, National Association of State EMS Officials; cold water temp - https://www.coldwatersafety.org/why-did-we-pick-70f-21c