

# 4.1

## Drowning/Submersion Injuries Adult & Pediatric

**SUBMERSION:** When a patient goes under the water immediately, has a hypoxic cardiac arrest and then cools down. Prognosis considered dismal.

**IMMERSION:** Patients are in the water with head above water and they continue to breathe while they cool down before they eventually arrest. Prognosis can be good with patients surviving after prolonged CPR.

### EMT STANDING ORDERS

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- Routine Patient Care.
- Consider spinal motion restriction for suspected spinal injury, see [Spinal Injury Protocol 4.5](#).
- If unresponsive, obtain esophageal or rectal temperature.
- Consider NOT initiating resuscitation efforts with:
  - A clear history of prolonged submersion prior to cooling and/or cardiac arrest prior to submersion, **OR**
  - If esophageal or rectal temperature greater than 32°C (89.6° F) with asystole documented in 2 leads.
- Obtain specific history.
- Consider hypothermia. (Refer to table below)
- Remove wet clothes and warm the patient.
- Conscious patients with submersion injuries should be transported to the hospital.

### ADVANCED EMT/PARAMEDIC STANDING ORDERS

A/P

- Consider CPAP to supplement the patient's own respiratory effort.

STAGE: I Core Temp Treatment:	Conscious, shivering 35 to 32°C Warm environment and clothing, warm sweet drinks, and active movement (if possible)
STAGE: II Core Temp Treatment:	Impaired consciousness, not shivering <32 to 28°C Cardiac monitoring, minimal and cautious movements to avoid arrhythmias, horizontal position and immobilization, full-body insulation, active external and minimally invasive rewarming techniques (warm environment; chemical, electrical, or forced- air heating packs or blankets; warm parenteral fluids)
STAGE: III Core Temp Treatment:	Unconscious, not shivering, vital signs present <28 to 24°C Stage II management plus airway management as required; ECMO or CPB in cases with cardiac instability that is refractory to medical management
STAGE: IV Core Temp Treatment:	No vital signs <24°C Stage II and III management plus CPR and up to three doses of epinephrine (at an intravenous or intraosseous dose of 1 mg) and defibrillation, with further dosing guided by clinical response; rewarming with ECMO or CPB (if available) or CPR with active external and alternative internal rewarming

### PEARLS

- Patients with Stage III or IV hypothermia may benefit from treatment at a facility capable of ExtraCorporeal Membrane Oxygenation (ECMO) or CardioPulmonary Bypass (CPB). Provide a list of these facilities.