DROWNING OR SUBMERSION

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, core body temperature and oxygen saturation assessment.
  - Assess the scene for other environmental issues or possible toxins.
- ❑ Cardiac monitor, ETCO2, pulse oximetry monitoring, blood pressure when available.
- ❑ **Treatment Plan**
  - Safely remove patient from the water
  - Place patient supine
  - Remove wet clothing and wrap in blankets
  - Ensure patient warmth
  - If concern for spinal injury refer to ***Spinal Motion Restriction Guideline.***
  - Scuba divers "Dive Computer" or Dive Log Book should be transported with the patient.
- ❑ **Key Considerations**
  - Airway maintenance is the primary consideration.
  - Unlike the "CAB" strategy used in standard cardiac arrest, patients suffering cardiac arrest from drowning require an "ABC" approach with emphasis prompt airway management and supplemental ventilations.
  - There can be co-existing conditions depending on the type of submersion injury including trauma, hypothermia, and intoxication.
  - Hypotension is associated with a worse outcome, monitor closely and treat with ***Shock and Fluid Therapy Guideline***
  - Initiation of in-water ventilations may increase survival; however, in-water chest compressions are futile.
  - Submersion in cold water will often cause severe hypothermia, notify receiving hospital so that appropriate resources can be mobilized.
  - Pediatric cardiac arrest due to drowning and hypothermia (temperature <30 C/86 F): consider direct transport to Primary Children's Medical Center and do NOT rewarm this patient.
  - Adult cardiac arrest due to drowning and hypothermia (temperature <30 C/86 F): consider direct transport to University of Utah Medical Center and do NOT rewarm this patient.

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMT	**EMT**
❑ If breathing spontaneously apply oxygen at 15 LPM via non-rebreather mask to maintain oxygen saturations >95%	❑ If breathing spontaneously apply oxygen at 15 LPM via non-rebreather mask to maintain oxygen saturations >95%
❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider a nasal or oral airway	❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider a nasal or oral airway
❑ Initiate 5 rescue breaths followed by 30 chest compressions, then use a 30:2 compression: ventilation ratio	❑ Initiate 5 rescue breaths followed by 30 chest compressions, then use a 15:2 compression: ventilation ratio
AEMT	**AEMT**

- ❑ Advanced airway, vascular access and fluid therapy
  - Albuterol 2.5 every 10 minutes via nebulization for bronchospasm/wheezing until symptoms subside
  - Reassess patient after each dose to determine need for additional dosing
- ❑ Consider CPAP in awake patients with respiratory distress

PARAMEDIC

- ✆ **Epinephrine 2–10 mcg/min** IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ✆ **Push Dose Epinephrine 10mcg** as needed to maintain a SBP >100 mmHg after fluid bolus
- ✆ **Norepinephrine** initial dose: **0.05 – 1 mcg/kg/min** IV/IO for hypoperfusion. Titrate to maintain a SBP > 100 mmHg. For patients in refractory shock: 8-30 mcg/minute **(Agency Specific Option)**

- ❑ Advanced airway, vascular access and fluid therapy
  - Albuterol 2.5 every 10 minutes via nebulization for bronchospasm/wheezing until symptoms subside. Start with 1.25 mg if age <1yr
  - Reassess patient after each dose to determine need for additional dosing
- ❑ Consider CPAP in awake patients with respiratory distress

PARAMEDIC

- ✆ **Epinephrine 0.1–1 mcg/kg/min** IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg
- ✆ **Push Dose Epinephrine 1mcg/kg** as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus
- ✆ **Norepinephrine** initial dose: **0.05 - 0.1 mcg/kg/min**, titrate to max of 2 mcg/kg/min to maintain SBP >70 + (age in years x 2) mmHg **(Agency Specific Option)**