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BLS Patient Management

- **If you are resuscitating a newly delivered Neonate, please refer to REMSA Policy 4801 *Obstetrical Emergencies/Newborn Deliveries***
- **Establish, maintain, and ensure:**
 - A. A patent and easily managed airway. Use manual maneuvers (head-tilt/chin-lift or jaw thrust), oropharyngeal suction and/or airway adjuncts (OPA/NPAs) as clinically indicated
 - B. Adequate respirations and tidal volume. Use a mouth-to-mask device or bag valve mask (BVM), when clinically indicated. Rescue ventilations via a BVM require the use of a manometer. Waveform/digital capnography is required when paramedics are present
 - C. Controlled bleeding. Use direct pressure and/or pressure dressing(s) and/or tourniquet(s) and/or hemostatic dressing(s), as clinically indicated
- **Oxygen**
Utilize high flow. Optimize ventilation and oxygenation to maintain SpO₂ of 94% or greater but do not hyperventilate
- Attach ECG electrodes/defibrillation pads to the patient. If/when return of spontaneous circulation (ROSC) is achieved, may assist with placement of the 12-lead cables
- **Perform CPR according to current REMSA training and standards**
 - Ensure High Performance (HP) CPR by utilizing assigned roles and tasks during resuscitation (i.e., Pit Crew CPR)
 - Emphasize correct hand placement, compression depth (hard) and rate (fast) with complete chest recoil
 - Minimize interruption of chest compressions
 - Avoid hyperventilation

ALS Patient Management

- **Ensure HP CPR is being performed according to current REMSA training and standards**
Attach, interpret, and continuously monitor EtCO₂ (digital and waveform) If EtCO₂ is less than 10 mmHg, attempt to improve CPR quality
- **Analyze ECG rhythm as soon as possible**
Defibrillate when indicated. In cases of monitored shockable rhythms, stack defibrillations as clinically indicated
 - Adults: use manufacturer's recommended joule setting
 - Pediatrics and Neonates: defibrillate initially at 2 j/kg, all subsequent defibrillations at 4 j/kg.

Resume CPR immediately after each defibrillation

Reanalyze ECG every two (2) minutes and defibrillate when indicated
- **When BLS airway management is inadequate and/or ineffective: Orotacheal Intubation (OTI)**
PATIENTS MUST WEIGH MORE THAN 36 KG (~79 lbs) AND THEIR LENGTH (MEASURED FROM CROWN TO HEEL) MUST EXCEED THAT OF ANY COMMERCIALLY AVAILABLE, STANDARDIZED LENGTH-BASED PEDIATRIC RESUSCITATION TAPE.

Establish, maintain, and ensure a patent airway using orotracheal intubation, as clinically indicated.

Attach, interpret, and continuously monitor EtCO₂. Utilize a colorimetric device immediately after orotracheal intubation to confirm correct placement of the ETT THEN utilize waveform/digital capnography to:

 - Identify ETT dislodgement
 - Assist in monitoring the effectiveness of ventilations and perfusion in any patient
 - Monitor the quality of chest compressions in cardiac arrest patients
 - Confirm ROSC

- **For known or suspected submersion incidents in the presence of unresponsiveness**

If laryngospasms are suspected, give five (5) initial breaths, and provide hand ventilations after the insertion of an airway adjunct. Ventilate through foamy secretions and suction as needed. If symptoms should resolve, encourage transport for continued evaluation

- **Analyze AED as soon as possible**

Defibrillate when indicated

Resume CPR immediately after each defibrillation

Reanalyze AED every 2 minutes and defibrillate when indicated

Use pediatric attenuator (pad-cable system or key) in pediatrics less than 8 years of age

- **Recognize ROSC when one of the following signs is observed**

1. ECG rhythm and skin signs improve
2. EtCO₂ abruptly increases to at least a normal value (between 35-40 mm Hg) or
3. Blood pressure becomes measurable

Use direct laryngoscopy, Magill forceps and suction as clinically indicated. When suctioning, introduce 3 mL normal saline PRN to loosen thick secretions

- **When airway management is required for a patient that is apneic in whom less invasive techniques (BLS airway management) have failed AND OTI has failed: iGel**

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INSERTION OF THE IGEL IN PATIENTS APPEARING, OR KNOWN TO BE, 14 YEARS OF AGE OR YOUNGER IS NOT PERMITTED.

Establish, maintain, and ensure a patent airway using an iGel, as clinically indicated.

Attach, interpret, and continuously monitor EtCO₂.

- **For passive gastric decompression after OTI or iGel insertion: Orogastric (OG) tube**

- After successful **OTI**, insertion of an appropriately sized OG tube is **highly recommended**.
- After successful placement of the **iGel**, insertion of an appropriately sized OG tube is **MANDATORY**.

- **For cardiac arrest**

Adults: Epinephrine 1 mg (0.1 mg/mL concentration) IVP/IOP. **MAY REPEAT EVERY 5 MINUTES TO A MAX OF 5 MG (50 mL). ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).**

Pediatrics: Epinephrine 0.01 mg/kg (0.1 mg/mL concentration) IVP/IOP. **MAY REPEAT EVERY 5 MINUTES TO A MAX OF FIVE (5) ADMINISTRATIONS.**

INITIAL AND REPEAT ADMINISTRATIONS FOR NEONATE REQUIRE A BASE HOSPITAL ORDER (BHO).

Neonates: Epinephrine 0.01 mg/kg (0.1 mg/mL concentration) IVP/IOP.

INITIAL AND REPEAT ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Adults: Atropine 1 mg IVP/IOP.

ADMINISTRATION OF ATROPINE TO PEDIATRIC AN NEONATE PATIENTS IN CARDIAC ARREST IS NOT PERMITTED.

- For cardiac arrest with ventricular fibrillation (VF) or ventricular tachycardia (VT)

Adults: Amiodarone 300 mg IVP/IOP. **MAY REPEAT ONCE AT 150 MG 5 MINUTES AFTER FIRST (1ST) DOSE, TO A MAX OF 450 MG. **ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).****

INITIAL AND REPEAT PEDIATRIC ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Pediatrics: Amiodarone 5 mg/kg IVP/IOP. **MAX SINGLE DOSE IS 150 MG.**
- For cardiac arrest with ventricular fibrillation (VF) or ventricular tachycardia (VT) WHEN AMIODARONE IS UNAVAILABLE

INITIAL AND REPEAT ADMINISTRATIONS FOR ADULTS AND PEDIATRICS REQUIRE A BASE HOSPITAL ORDER (BHO).

Adults: Lidocaine 1 mg/kg slow IVP/IOP followed by the second dose (0.5 mg/kg) 8-10 minutes later, to a max of 3 mg/kg.

Pediatrics: Lidocaine 1 mg/kg slow IVP/IOP followed by the second dose (1 mg/kg) 8-10 minutes later.
- For cardiac arrest with ventricular fibrillation (VF) or ventricular tachycardia (VT) WHEN ASSOCIATED WITH TORSADES DE POINTES / POLYMORPHIC VT

INITIAL AND REPEAT ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Adults: Magnesium Sulfate 2 gm slow IVP/IOP.

Pediatrics: Magnesium Sulfate 50 mg/kg slow IVP/IOP.
- For cardiac arrest with suspected metabolic acidosis, hyperkalemia, or tricyclic antidepressant overdose

Adults: Sodium Bicarbonate 50 mEq IVP/IOP. **MAY REPEAT ONCE. **ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).****

INITIAL AND REPEAT PEDIATRIC AND NEONATE ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Pediatrics: Sodium Bicarbonate 1 mEq/kg IVP/IOP.

Neonates: Sodium Bicarbonate 1 mEq/kg IVP/IOP.

- **For cardiac arrest with suspected hypocalcemia, hyperkalemia, hypermagnesemia, or calcium channel blocker overdose**
INITIAL AND REPEAT ADMINISTRATIONS FOR ADULTS AND PEDIATRICS REQUIRE A BASE HOSPITAL ORDER (BHO).
Adults: Calcium Chloride 1 gm IVP/IOP.
Pediatrics: Calcium Chloride 20 mg/kg IVP/IOP.
- **For cardiac arrest in a known/suspected dialysis patient**
Adults: Calcium Chloride 1 gm IVP/IOP. **ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).**
INITIAL AND REPEAT PEDIATRIC ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).
Pediatrics: Calcium Chloride 20 mg/kg IVP/IOP.
- **Upon ROSC:**
Perform, interpret, and transmit 12-lead ECG(s), as clinically indicated, when:
 - A STEMI is suspected
 - A STEMI is ECG-monitor identified or
 - The patient's cardiac rhythm is atypical or difficult to interpret
- **For shock following ROSC**
Adults: Normal saline 250 mL IV/IO bolus. **MAY REPEAT AS CLINICALLY INDICATED TO A MAX ADMINISTRATION OF 2 L.**
Pediatrics: Normal saline 20 mL/kg IV/IO bolus. Use a volume control administration set for accurate dosing. **MAY REPEAT AS CLINICALLY INDICATED.**
Neonates: Normal Saline 10 ml/kg IV/IO rapid infusion. Use a volume control chamber device for accurate dosing. **MAY REPEAT AS CLINICALLY INDICATED.**

Adults: Epinephrine Push Dose 0.01 mg (1 mL, 0.01 mg/mL concentration) IVP/IOP. **MAY REPEAT AS CLINICALLY INDICATED EVERY 1-5 MIN TO MAINTAIN A SBP > 90**
Pediatrics: Epinephrine Push Dose 0.01 mg (1 mL, 0.01 mg/ml concentration) IVP/IOP. **MAY REPEAT AS CLINICALLY INDICATED TO MAINTAIN A SBP > [70 + (AGE X2)]**

WHEN PATIENT'S SYSTOLIC BP IS LESS THAN 90 MMHG:

EPINEPHRINE INFUSION

Adults: Epinephrine 0.4 mg (1:1,000) IV, infused in 100 mL normal saline

****OR****

Epinephrine 0.2 mg (1:1,000) IV, infused in 50 mL normal saline.

RATE WILL BE CONTROLLED VIA DIAL-A-FLOW. INCREASE DOSING EVERY 2-3 MINUTES, TO MAX 10 MCG/MIN, TO ACHIEVE OR MAINTAIN SYSTOLIC BP OF 90 MMHG OR GREATER.

- Begin infusion at 1 mcg/min (15 ml/hr) **OR** 1.33 mcg/min (20 ml/hr) then increase to
- 2 mcg/min (30 ml/hr) then increase to
- 4 mcg/min (60 ml/hr) then increase to
- 10 mcg/min (150 ml/hr)

IF MAX DOSING HAS BEEN REACHED AND A SYSTOLIC BP OF 90 MMHG HAS NOT BEEN ACHIEVED, BEGIN ADMINISTERING PUSH DOSE EPINEPHRINE (0.01 MG / 1 mL) PRN EVERY 1-5 MINUTES IN ADDITION TO THE DRIP UNTIL A SYSTOLIC BP OF 90 MMHG OR GREATER IS ATTAINED

ADMINISTRATION OF EPINEPHRINE BY IV INFUSION TO PEDIATRIC PATIENTS IS NOT PERMITTED

- **For anxiety following ROSC**
INITIAL AND REPEAT ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Adults: Midazolam 1 mg slow IVP/IOP or IM/IN.

ADMINISTRATION OF MIDAZOLAM TO PEDIATRIC PATIENTS FOR POST-ROSC ANXIETY IS NOT PERMITTED.

- **For pain following ROSC**
INITIAL AND REPEAT ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO).

Adults: Fentanyl slow IVP/IOP or IM/IN with dosing dependent on pain. Patient's systolic BP must be greater than or equal to 90 mmHg at the time of administration.

ADMINISTRATION OF FENTANYL TO PEDIATRIC PATIENTS FOR POST-ROSC PAIN IS NOT PERMITTED.

- For **MEDICAL** cardiac arrest patients, **discontinue resuscitation if all of the following steps have been taken**
 1. A minimum of 20 minutes of HP CPR have been performed but ROSC has not been achieved
 2. IV or IO access has been established
 3. The patient's airway has been successfully managed with a clinically indicated airway device
 4. Rhythm-appropriate medications, and defibrillations, have been administered according to applicable protocol(s) with no ROSC
 5. Persistent asystole or agonal rhythm is present (greater than 20 minutes). Reversible causes have been identified and treated, as clinically indicated, with no positive neurologic response or ROSC
 6. The patient's cardiac rhythm is not refractory VF or VT
 7. Spontaneous circulation (palpable pulse) was not achieved at any point during resuscitation

DISCONTINUING RESUSCITATION OF A PEDIATRIC OR NEONATAL PATIENT REQUIRES A BASE HOSPITAL PHYSICIAN ORDER (BHPO).

Patient Disposition

- **OHCA WITH ROSC PATIENTS OF UNKNOWN OR SUSPECTED CARDIAC ETIOLOGY SHALL BE TRANSPORTED TO THE CLOSEST STEMI CENTER (SRC)**
- **In cases where the closest SRC is greater than 30 minutes away and EMS aircraft transport is not available, consider transporting to the closest receiving facility**
- **Consider transporting patients with an obvious, non-cardiac etiology to the closest receiving facility**