CARDIAC ARREST MANAGEMENT (CAM)

ADULT

Initial Procedures

Initial Management

- The primary goal in cardiac arrest resuscitation is to establish circulation via high-quality, uninterrupted chest compressions
  - High-performance CPR begins immediately
  - Set metronome at 110 compressions per minute
  - Chest compressions should be 2-2.5 inches deep
  - Allow full chest recoil
  - Limit any pause to 3 seconds or less
  - Switch compressors every 200 compressions

Defibrillation

- Defibrillation should be attempted as soon as possible during the resuscitation
  - Attach defibrillator during compressions
  - Rescuers 2 and 3 should focus initially on attaching electrodes

Compressions

- Compressions Halted:
  - Allow AED to analyze/manually analyze
    - For manual defibrillation, determine if shockable rhythm within 3 seconds
  - Rotate compressors every 2 minutes during each rhythm check
  - If shock indicated:
    - Complete 30 compressions during the charge cycle of the defibrillator
    - Ventilations stop at 20th compression
    - After 30th compressions, the rescuer "hovers" over the chest and calls out "OFF"
    - Defibrillation should occur within 1 second
  - Hover hands over the chest and be prepared to begin compressions as soon as shock is delivered

Airway Management and Ventilation

- Insert OPA
- BVM ventilation after initial AED/manual analysis
- Use "2 thumbs up" jaw thrust technique to open the airway
- Deliver small tidal volume ventilation, one-handed, via small adult BVM on the upstroke of every 10th compression
- Airway adjunct should match the specific patient situation

PEDIATRIC – (14 years and under)

Initial Procedures

Initial Management

- Neonatal Resuscitation (0 to 28 days old)
  - Refer to 533-31 Neonatal Resuscitation
- Primary goal in cardiac arrest resuscitation is to establish circulation via high-quality, uninterrupted chest compressions
  - High-performance CPR begins immediately
  - Set metronome at 110 compressions per minute
  - Compressions should be 1/3 to 1/2 chest depth
    - Child (1-14 years): Use 1 or 2 hands
    - Infant (1 month-1 year): Use 2 fingers
  - Allow full chest recoil
  - Limit any pause to 3 seconds or less
  - Switch compressors every 200 compressions

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Airway Management and Ventilation

- Insert OPA
- BVM ventilation after initial AED/manual analysis
- Use the "2 thumbs up" jaw thrust technique to open the airway
- Deliver small tidal volume ventilation, one-handed, via appropriately-sized BVM on the upstroke of every 10th compression
- Airway adjunct should match the specific patient situation

ALS Prior to Base Hospital Contact

Transition of Care
- Switch to manual cardiac monitor/defibrillator
- Complete compression cycle prior to analyzing rhythm
- ALS care must not interfere with the triangle of life

Establish Vascular Access
- Do not interrupt compressions to accomplish IV/IO
  - Refer to Policy 533-04: Vascular Access

Medication Administration
- Refer to specific policy for resuscitation and medication administration procedures
  - Policy 533-09b: Cardiac Arrest – VF / VT
  - Policy 533-09c: Cardiac Arrest – Asystole / PEA

Advanced Airway Management
- Unless insufficient or compromised, maintain BLS airway
- Place ETCO2 filter line to monitor and attach to BVM
  - End-tidal capnography will be used to determine effectiveness of resuscitation, ROSC, and as a decision tool for termination of resuscitation
- Advanced airway placement should not interfere with continuous chest compressions or defibrillation

Post-ROSC Management
- Focus is on stabilizing the patient causal factors and providing transport
- If ROSC is achieved a BLS airway is preferred but an advanced airway can be considered
- Mix **Push-dose Epinephrine**
  - Refer to Policy 533-10: Push Dose Epinephrine
- Prior to moving the patient:

Initial Actions
- Initiate 5-10-minute continuous femoral pulse check
- Continue rescue breathing
- Confirm monitor settings are correct and visible with ACCURATE WAVEFORM
- Paddles ECG
- SPO2 waveform
- ETCO2 waveform

Circulation
- Assess for palpable radial pulse
- Obtain peripheral IV access (18GA preferred)
- Initiate **IV/IO Normal Saline 1L bolus** unless signs/symptoms of pulmonary edema
- Obtain manual blood pressure
- Maintain systolic of > 90mmHg
  - **1L Normal Saline fluid bolus**
  - **Push-Dose Epinephrine**
    - Refer to Policy 533-10: Push Dose Epinephrine

Airway/Ventilation
- Assess for responsiveness and spontaneous ventilations
- Assess ETCO2, lung sounds and SPO2
  - Oxygenate to SPO2 > 94-98%
  - Oxygen flow rate titrated to prevent 100% SPO2

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Circulation
- Assess for palpable radial pulse
- Obtain peripheral IV access (18GA preferred)
- Initiate **IV/IO Normal Saline 20mL/kg bolus** unless signs/symptoms of pulmonary edema
- Obtain manual blood pressure
  - **Epi and fluids** to maintain weight-based appropriate SBP
    - For hypotension consider **Push-Dose Epinephrine** administration & consult with the BH for orders
- Refer to Policy 533-10: Push Dose Epinephrine

Airway/Ventilation
- Assess for responsiveness and spontaneous ventilations
- Assess ETCO2, lung sounds and SPO2
  - Oxygenate to SPO2 > 94-98%
  - Oxygen flow rate titrated to prevent 100% SPO2

- Ventilate the patient at 10 breaths per minute until chest begins to rise (approx. 500 mL) to achieve:
  - $ETCO_2$ of 35-45
  - No hyperventilation or hyper-oxygenation
- Maintain BLS airway or place advanced airway as indicated
- Place advanced airway if needed to effectively ventilate while moving patient (consider transport time when determining need for advanced airway)

12-Lead EKG

- Obtain a 12-lead EKG. 5-10 minutes at scene is reasonable to ensure rhythm stability.
  - Refer to Policy 539: 12-Lead ECG

Transport ROSC patients to a STEMI Receiving Center.

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Base Hospital Physician Orders Only

Consult with ED Physician for further treatment measures

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Additional Information

CAM Notes

- CAM focus is on the Triangle of Life
- Rescuer #3 (at the head) should lead the CPR team
- **Timekeeping** is important
  - The *compressor* should count 1-10 and repeat
  - The *ventilator* should count 10, 20, 30, etc. at every 10 compressions

Hypothermic Patients

- Should be transported to the closest hospital;
- Administer only **one (1) round** of medications & limit defibrillation to **six (6) times** prior to Base Hospital contact.

Modifications for Pregnancy

- Circulation
  - Higher hand placement on chest wall
  - Perform left lateral uterine displacement (manual, backboard, pillows) to allow effective compressions
  - AED same as with non-pregnant patient
- Airway
  - May need jaw-thrust to open airway
  - Consider early advanced airway
  - Use smaller ET tube than normal (0.5-1 mm smaller)
  - Provide cricoid pressure when intubating
- Breathing
  - Expect increased resistance if using BVM
  - Increase Ventilation Rate from 10-12 to 16-18 breaths/min

Miscellaneous

- **EMS personnel must contact the BH prior to termination of resuscitation for all cardiac arrests regardless of rhythm.**
- EMS personnel must perform 20 minutes of resuscitation at minimum while on scene of a cardiac arrest except when:
  - Patient is in persistent VF/VT, at which point, resuscitation time must be a minimum of ≥30 minutes;
  - The scene is unsafe/unworkable;
  - EMS is presented with an active DNR/POLST; or
  - Base Hospital Orders have been obtained to terminate outside of parameters mentioned above.
- After minimum resuscitation time and BH contact, EMS personnel may terminate resuscitation efforts.
- **Naloxone** & assessing **BGL** are not indicated for patients in cardiac arrest, but if ROSC is achieved, **Naloxone** & **BGL** may be considered.
- For patients with non-shockable rhythms, the earlier epinephrine is given, the more likely the patient is to survive.

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Modifications for Pregnancy

- Pregnant patient's less than ≤14-years-old:
  - EMS Personnel will follow "Modifications for Pregnancy" under the "Adult – Additional Information" section.

Resuscitation Time

- All pediatric (< 18 y/o) resuscitations will be transported to the closest receiving hospital

Miscellaneous

- **Naloxone** and assessing **BGL** are not indicated for patients in cardiac arrest, but if ROSC is achieved, **Naloxone** and **BGL** may be considered.
- For patients with non-shockable rhythms, the earlier epinephrine is given, the more likely the patient is to survive.

Continuous chest compressions & defibrillation are more important than ventilation, vascular access, & med admin.

Do NOT stop compressions during ventilations, charging of defibrillators, or ALS procedures.

Traumatic Arrest – Withholding Resuscitation ○ Refer to Policy 533-26: Traumatic Arrest ○ Refer to Policy 509: Determination of Death *Continuous chest compressions & defibrillation are more important than ventilation, vascular access, & med admin.* *Do NOT stop compressions during ventilations, charging of defibrillators, or ALS procedures.*	