2.04 CARDIAC ARREST

BLS Treatment - ALL Cardiac Arrest

- CPR / AED
- **Oxygen** as indicated.

ALS Treatment - ALL Cardiac Arrest

Current American Heart Association Guidelines concerning Emergency Cardiac Care assessments and interventions shall always take precedence over local protocols when there is a conflict concerning techniques of resuscitation.

- Defibrillation if indicated.
- Advanced airway if indicated.
- IV **Normal Saline** if indicated.
- Provide grief support and referrals for on-site survivors as needed.

ALS Treatment - SPECIFIC Causes of Cardiac Arrest

VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA

- **Defibrillation**
- **Epinephrine**
- **Amiodarone**

REFRACTORY PULSELESS VENTRICULAR FIBRILLATION/VENTRICULAR TACHYCARDIA

- Persistent pulseless VF/VT without ANY prior different rhythm
- Administer Double Simultaneous External Defibrillation (DSED) as follows:
    1. After two shocks have been administered, if a second defibrillator is available, apply a second set of defibrillator pads to the patient in a DIFFERENT vector than the first set, not touching the first set. (If the first set has been applied in the anterior-lateral configuration, apply the second set anterior-posterior, and vice versa).

    2. After at least 2 defibrillation attempts, epinephrine, and amiodarone have been administered, if a shockable rhythm is present on next rhythm check, administer a single defibrillation shock using ONLY the second set of pads (alternate vector). If unsuccessful, this should be repeated once per ACLS algorithm.

    3. After at least 4 shocks have been delivered using at least two vectors with single defibrillators, and epinephrine and amiodarone have been administered, if a shockable rhythm is present on rhythm check, continue CPR and prepare for double simultaneous external defibrillation. Set both defibrillators to maximum energy and charge both defibrillators simultaneously. Once both defibrillators are charged and

all persons are clear, the code leader or other paramedic will push both shock buttons as synchronously as possible.

4. Resume resuscitation as per ACLS guidelines, with all subsequent shocks being DSED.

ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY

- **Epinephrine**

TREAT REVERSIBLE CAUSES

- **Sodium Bicarbonate** for suspected hyperkalemia, DKA, tricyclic or phenobarbital overdose.
- **Calcium Chloride** for suspected hyperkalemia or calcium channel blocker overdose.
- **Magnesium Sulfate** for either Torsades de Pointes or VF/VT with suspected hypomagnesemia.
- **Normal Saline** fluid bolus for an organized rhythm with SBP < 90.
- If hypotension persists, may administer **Dopamine.**

CARDIAC ARREST IN PREGNANCY

- Anticipate difficult airway; experienced provider preferred.
- If SBP < 90 or signs of poor perfusion, **Normal Saline** fluid bolus. Reassess and repeat as indicated.
- If possible, place patient in Left Lateral Decubitus Position or manually displace gravid uterus to patient's left side.
- If patient is receiving IV/IO **Magnesium** pre-arrest, stop infusion and switch to **Normal Saline**. Flush line with Normal Saline prior to giving IV/IO **Calcium Chloride.**

FIELD TREATMENT CONSIDERATIONS FOR PATIENTS WITH A LEFT VENTRICULAR ASSIST DEVICE (LVAD)

1. Attempt to locate a POLST form. Many patients have made end-of-life care decisions.

2. Provide pre-hospital care to the patient in a manner consistent with ALS and BLS treatment protocols for the patient's condition with the following exceptions:
   - Do NOT perform chest compressions since it will dislodge the LVAD and cause internal bleeding.
   - **Arrhythmias**: Do not disconnect power source, defibrillate per ACLS protocol.

- DO follow the directions of the patient's caregiver when moving and transporting the patient.

3. The **HeartMate (HM) II LVAD** replaces the pumping action of the left ventricle via a continuous blood flow mechanism, where there is no filling or emptying phase.
   - As a result, patients commonly have NO PALPABLE PULSE, NO OBTAINABLE PULSE OXIMETRY OR BLOOD PRESSURE, and only a "mean" arterial pressure detectable using a Doppler.
   - An LVAD patient's ECG heart rate will differ from the pulse rate since the LVAD is not synchronized with the native heart rate.

4. Assess the patient's airway and intervene per protocol. If you are unable to obtain pulse oximetry readings, you should assume the patient is hypoxic and place the patient on supplemental oxygen.

5. If the patient has an altered level of consciousness, immediately check for end-tidal CO2 using capnography.

6. Auscultate heart sounds to determine if the device is functioning. You should expect to hear a continuous "whirling" sound for most devices.

7. Assess the device for any alarms / malfunctions. Check with patient or caregivers for device reference materials or contact the VAD Center.

8. Start at least 1 large bore IV, and give a 1L **Normal Saline** fluid bolus if you obtain a low blood pressure (systolic < 100) or are unable to obtain a blood pressure or the patient has an altered level on consciousness.

9. Call the LVAD Center (open 24/7) per patient or patient's caretaker's contact to get advice on caring for the patient.
   - You are authorized to take orders from professionals at the LVAD Center, as long as they are within your scope of practice.
   - Contact the Base Hospital with questions or if directed by patient's caregiver or LVAD Center personnel to do something outside of your protocol.

10. Always transport the patient to the LVAD Center that implanted the device (UCSF or CPMC-Pac). You are authorized to BYPASS the closest San Francisco LVAD Center to get the patient to the LVAD Center that implanted their device no matter the patient's condition. If the LVAD Center that implanted the device is not in San Francisco, take the patient to the closest San Francisco based LVAD Center.
    - Bring ALL of the patient's equipment. Bring the patient's caregiver to act as the information resource on the device. You are authorized to use the caregiver as an information resource on the device.

11. Upon arrival to Emergency Department, immediately plug in the device into an electrical socket.

12. Call the Base Hospital for in-field termination of care in the event there are no signs of life and end-tidal capnography is not consistent with life (< 10).