

**GENERAL CARDIAC ARREST – ADULT
STATEWIDE BLS PROTOCOL**

Initial Patient Contact - See Protocol # 201
Patient pulseless, may have gasping/agonal breathing

**Cardiac arrest witnessed by EMS personnel
OR
Quality CPR in progress on EMS arrival**

NO

YES

DURING UNINTERRUPTED COMPRESSIONS:

Airway Options: ⁵
Naso/oropharyngeal
Airway

Ventilation Options: ⁵
No Ventilation
or
1 ventilation every 15
compressions

Oxygen Options: ⁵
Via NRB
or
Via BVM

Give Compressions
while AED is charging

NO mechanical CPR
device during initial 10
minutes

200 Uninterrupted
Chest Compressions^{1,2}

Analyze with AED
Shock (360 joules^{3,4}) if indicated

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**Return of
Pulse**

**Assess Vital
Signs**

**Provide
Oxygen and
Ventilate as
needed
(Goal= SpO2
95-99%)**

**Place in
Recovery
Position**

**Transport
ASAP**

Continue cycles of 200
compressions followed by AED
analysis/shock^{1,3}
BVM: 1 ventilation/ 15
compressions
May use mechanical CPR
device (optional)

**AWAIT ARRIVAL OF ALS
IF ETA < 15 MIN.⁶
OR**

**Contact Medical
Command
for possible
field
termination of
CPR⁷**

OR

TRANSPORT⁸

**GENERAL CARDIAC ARREST – ADULT
STATEWIDE BLS PROTOCOL****Criteria:**

- A. Adult patient (>14 years old) with cardiac arrest (may have gasping or agonal breathing).

Exclusion Criteria:

- A. If patient meets criteria for DOA (e.g. decapitation, decomposition, rigor mortis in warm environment, etc...) then follow DOA protocol # 322.
- B. Cardiac arrest due to acute traumatic injury – see Cardiac Arrest - Traumatic Protocol #332. AED use is not indicated in traumatic cardiac arrest, but this protocol should be followed if there is the possibility of a medical condition causing cardiac arrest prior to a traumatic incident.
- C. Patient displaying an Out-of-Hospital Do Not Resuscitate (OOH-DNR) original order, bracelet, or necklace - see OOH-DNR Protocol #324.

System Requirements:

- A. Ideally, providers in each EMS agency will use a “pit crew” approach when using this protocol to ensure the most effective and efficient cardiac arrest care. Training should include teamwork simulations integrating QRS, BLS, and ALS crew members who regularly work together. High-performance systems should practice teamwork using “pit crew” techniques with predefined roles and crew resource management principles. For example:
1. Rescuer 1 and 2 set up on opposite sides of patient’s chest and perform continuous chest compressions, alternating after every 100 compressions to avoid fatigue.
 2. Use metronome or CPR feedback device to ensure that compression rate is 100-120/ minute.
 3. Chest compressions are only interrupted during rhythm check (AED analysis or manual) and defibrillation shocks. Continue compressions when AED/ defibrillator is charging.
 4. During the first four cycles of compressions/defibrillation (approximately 10 minutes) do not apply or use mechanical CPR device.
 5. Use of a CPR checklist to ensure that all best practices are followed during CPR.
- B. For efficient “pit crew” style care, the EMS agency medical director should establish whether any ventilation is given during initial compression cycles. If BVM ventilation is used, compressions should not be interrupted when giving a ventilation every 15 compressions.
- C. The EMS agency, overseen by the agency medical director, must perform a QI review of care and outcome for every patient that receives CPR.
1. The QI should be coordinated with involved ALS agency and receiving hospital to include hospital admission, discharge, and condition information. This EMS agency QI can be accomplished by participation in the Cardiac Arrest Registry for Enhanced Survival (CARES) program through the ALS agency.
 2. The QI should be coordinated with local PSAP/dispatch centers to review opportunities to assure optimal recognition of possible cardiac arrest cases and provision of dispatch-assisted CPR (including hands-only CPR when appropriate).

Notes:

1. Excellent CPR is a priority:
 - a. Push hard (at least 2 inches deep) and fast (100-120/min) and allow full recoil of chest during compressions.
 - b. Change rescuer doing compressions every 1-2 minutes (100-200 compressions) to avoid fatigue

- c. Restart CPR immediately after any defibrillation attempts.
 - d. Keep pauses in CPR to a minimum. Immediately after AED recommends shock resume compressions until AED is fully charged, then immediately after shock, resume compressions without checking pulse or rhythm. Avoid pauses in CPR during airway management.
 - e. CPR sequence is CAB (Compressions, Airway, Ventilation) for all ages, except the ABC sequence should be used in drowning.
 - f. For pregnant patients, a rescuer should manually displace the uterus to the patient's left during CPR.
2. Do not move or package patient for transport at this time. Chest compressions are much less effective during patient transportation/movement, and any possible interventions by medical command will be less effective without optimal CPR.
 3. Shock at maximum output of defibrillator, up to maximum of 360 joules, for initial and subsequent defibrillation attempts.
 4. Patient with severe hypothermia (if available, core temperature < 90° F or 32° C) see Hypothermic Protocol # 681. For hypothermic patients, no more than 1 shock should be delivered. Further action will be directed by medical command. Begin transport immediately after initial countershock. Transport to center with capability of cardiopulmonary bypass surgery if possible.
 5. The optimal airway management/ventilation during initial cycles of uninterrupted compressions has not been established. Agency medical director can set agency policy using the following approaches:
 - a. Open airway with manual technique or naso/oropharyngeal airway – with or without passive oxygen
 - b. Provide either no active ventilation (passive ventilation from compressions) or bag ventilate (one ventilation every 15 compressions) without interrupting compressions
 - c. If BVM ventilation, consider 2-thumbs-up 2-person BVM technique
 6. If the AED continues to indicate that shocks are advised, it is best to focus on excellent chest compressions and use AED to reanalyze every 2 minutes until ALS arrives. Packaging or moving the patient at this point will decrease the effectiveness of CPR. After three AED messages of “no shock advised”, contact medical command. If unable to contact medical command, transport patient as soon as possible while continuing CPR.
 7. AHA Guidelines suggest that the following are reliable and valid criteria for BLS termination of resuscitation. Before moving the patient to the ambulance, consider contact with medical command for orders to terminate CPR in the field if ALL of the following apply:
 - a. Arrest not witnessed by EMS personnel, AND
 - b. No return of spontaneous circulation/ pulse (prior to transport), AND
 - c. No AED shock was delivered (prior to transport).
 8. During packaging and transport, minimize interruptions of CPR and reanalyze rhythm about every 10 minutes, and deliver additional shocks if advised.
 - a. The vehicle and all patient movement should stop before reanalyzing the rhythm.
 - b. Practitioners must be familiar with the AED used by their agency. AEDs that automatically analyze every 2 minutes should be temporarily disabled during patient movement and transport, since the motion of transport may lead to inappropriate shocks. In many machines, this can be accomplished by disconnecting the electrodes from the machine. Avoid turning the AED off, since this may reset all of the data collection within the device.
 - c. Transport without lights or siren to minimize chance of injury to EMS personnel providing CPR and patient care, unless unusual circumstances exist.

Performance Parameters:

- A.** EMS agency should document patient outcome and QI indicators for cardiac arrest, including ROSC during EMS care, ROSC on arrival to ED, admitted to hospital, discharged from hospital alive, and neurologic function on discharge.
- B.** Review of number of cardiac arrest patients that received bystander CPR. [Benchmark may be set with the goal of increasing community CPR classes to improve this percentage.]
- C.** System review of time from dispatch to arrival on scene of initial responder with access to AED. [Possible benchmark of response of 5 minutes or less to 90% of cardiac arrests.]