App X	App X: High-Performance Resuscitation	App X
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ALL

I. INTRODUCTION

A. High Performance Resuscitation (HPR) is a coordinated, team-based approach to cardiac arrest management that emphasizes high-quality CPR, early defibrillation, minimal interruptions, and efficient task delegation.

B. HPR is designed to optimize patient outcomes through structured team roles, clear communication, and deliberate choreography of resuscitation efforts.

C. Successful HPR requires preparation, training, and coordination among all responding personnel, regardless of staffing model or resource availability.

D. This appendix provides guidance on team structure, role assignment, and operational principles to support consistent, high-quality resuscitation in the prehospital environment.

II. CORE PRINCIPLES OF HIGH-PERFORMANCE RESUSCITATION

A. High-quality CPR remains the foundation of resuscitation and includes:
   1. Compression rate of 100-120/minute
   2. Adequate compression depth
   3. Full chest recoil
   4. Minimization of interruptions
   5. Avoidance of excessive ventilation

B. Minimize pauses in chest compressions.
   1. Target interruptions of less than 10 seconds, ideally as short as possible.
   2. Coordinate all interventions (rhythm checks, defibrillation) around compression cycles, avoiding any early pauses, with the exception of the first defibrillation.
   3. Do not pause compressions for airway interventions

C. Early defibrillation for shockable rhythms should be prioritized.

D. CPR should be performed in structured 2-minute cycles with coordinated rhythm checks and interventions.

E. End-tidal CO_2 should always be used when available, to monitor CPR quality and perfusion.

F. Resuscitation should be performed on scene whenever feasible, unless otherwise indicated by protocol or operational considerations.

III. TEAM BASED APPROACH

A. High Performance Resuscitation relies on clearly defined roles and responsibilities.

B. Roles should be assigned at the beginning of each shift.

C. Team members should remain in their assigned roles whenever possible to reduce confusion and improve efficiency.

D. Personnel should communicate clearly and concisely, using closed-loop communication when appropriate.

E. The team leader is responsible for maintaining situational awareness, ensuring CPR quality, coordinating interventions, and directing team actions.

IV. ROLE STRUCTURE AND RESPONSIBILITIES

A. The following roles may be utilized during cardiac arrest resuscitation:
   1. **Team Leader / Defibrillator Operator**
      a. Directs overall resuscitation
      b. Monitors rhythm and coordinates defibrillation
      c. Maintains situational awareness (e.g. monitor $EtCO_2$, team performance)
      d. Ensures appropriate timing of interventions
   2. **Compressor**

a. Performs high-quality chest compressions
b. Rotates every 2 minutes, or sooner, if fatigued
c. Maintains proper rate, depth, and recoil
d. Does not pause compressions until team leader confirms team is fully ready for rhythm check (e.g. pre-charge, finger on pulse)

3. **Airway / Ventilation**
   a. Manages the airway and delivers ventilations
      i. In the absence of advanced airway, uses 2-hand mask seal and delegates bag squeeze to a different individual
   b. Ensures appropriate rate and tidal volume
   c. Utilizes waveform capnography and oxygen
4. **IV / IO & Medications**
   a. Establishes vascular access
   b. Administers medications per protocol
   c. Anticipates additional medication needs
5. **Family Liaison**
   a. Gathers the patient's information
   b. Interviews family members or bystanders, and relays findings to the Team Leader to help determine etiology of the cardiac arrest, and to identify reversible causes
   c. Helps maintain scene control
6. **Support/Auxiliary Roles**
   a. Additional personnel on scene may assist with offloading tasks from other roles, such as:
      i. Time keeping
      ii. Operating the defibrillator
      iii. Assisting the Airway / Ventilation role with definitive airway management (intubation)

B. Accurate timekeeping during resuscitation is essential to ensure that pulse and rhythm checks occur every two minutes. Personnel may lose track of time due to task saturation, involvement in other interventions, and the experience of time distortion.
   1. Timekeeping may be accomplished using a variety of methods, depending on available resources, including:
      a. Cardiac monitor timestamping or built-in timers
      b. Use of a stopwatch or timer device
      c. Use of application-based resuscitation tracking tools

C. These role distributions are adapted from structured team-based models, and they should be modified to meet local operational and staffing needs.

D. Below are a few examples of team role structures based on varying staffing models. Additional roles may be added depending on the availability of personnel, such as a dedicated timekeeper, or a dedicated monitor operator.

		Roles					
		Lead medic	**Role #2**	**Role #3**	**Role #4**	**Role #5**	**Role #6+**
5-7+ personnel *Optimal*	**Tasks**	-Defibrillator -Direct team	-Compres-sions	-Airway / Ventilations -Monitor CPR quality -Time keeper	-IV/IO access -Meds	-Family liaison	-Flexible role -Offload roles from other personnel
4 personnel *Consider calling for additional resources*	**Tasks**	-Defibrillator -Direct team	- Compres-sions	-Airway / Ventilations -Monitor CPR quality -Time keeper	-IV/IO access -Meds		
3 personnel ***STRONGLY CONSIDER*** *calling for additional resources*	**Tasks**	-Defibrillator -IV/IO access -Meds -Direct team	- Compres-sions	-Airway / Ventilations -Monitor CPR quality -Time keeper			
2 personnel ***STRONGLY CONSIDER*** *calling for additional resources*	**Tasks**	-Defibrillator -Secure SGA -IV/IO access -Meds	- Compres-sions -Squeeze Bag (30:2)				

V. TEAM PERFORMANCE AND CHOREOGRAPHY

A. Resuscitation should be approached as a coordinated, choreographed effort.

B. Key priorities include:
   1. Immediate initiation of high-quality CPR
   2. Rapid defibrillation when indicated
   3. Early airway and ventilation management
   4. Timely vascular access (preferably IV) and medication administration
   5. Identification and treatment of reversible causes

C. The Team Leader should:
   1. Anticipate upcoming interventions and communicate these interventions with the team
   2. Use clear, concise, and uniform communication to help facilitate rapid pulse/rhythm checks and other inventions

D. Interruptions in chest compressions should be minimized through:
   1. Pre-charging the defibrillator at the 1:45 minute mark, in anticipation of a pulse check at the 2:00 minute mark
      a. To minimize the duration of rhythm check, the person operating the defibrillator should keep their eyes on the monitor and their finger near the red defibrillate button before the pause of compressions.
   2. Coordinated rhythm checks
      a. The pulse should be palpated while CPR is ongoing so that its location is known prior to stopping CPR
         i. If you are unsure if you feel a pulse, assume you don't, defibrillate if indicated, and immediately begin CPR
      b. Upon performing a pulse and rhythm check, all other personnel should proactively clear the patient in anticipation of a defibrillation being delivered
   3. For agencies with access to "see-through" CPR technology that allows rhythm analysis during compressions, consideration can be given to defibrillation during ongoing chest compressions without interruptions, when safe and feasible.

E. Personnel should monitor for fatigue, and rotate roles as needed to maintain performance. For example, a decreasing EtCO2 may indicate worsened CPR quality as a result of fatigue.

VI. TRAINING AND IMPLEMENTATION

A. Agencies should incorporate High Performance Resuscitation principles into initial and ongoing training.
B. Training should emphasize:
    1. Role familiarity
    2. Team communication
    3. Real-time feedback
    4. Scenario-based practice
C. Agencies are encouraged to pre-assign roles at the beginning of shifts to improve efficiency and performance.
D. Ongoing quality improvement processes should evaluate:
    1. Resuscitation quality metrics
        a. Metrics may include:
            i. Time to first defibrillation
            ii. Time to first epinephrine dose
            iii. Timing between rhythm checks
            iv. Duration of pauses
            v. Timing between epinephrine doses
            vi. Missed defibrillation opportunities
    2. Team performance
    3. Adherence to protocol

VII. OPERATIONAL CONSIDERATIONS

A. Scene management should allow adequate space for team positioning and role execution.
B. **Mechanical CPR (mCPR) devices may be considered in accordance with protocol, but these should not replace high-quality manual CPR and should not interfere with early evidence-based, time-sensitive priorities as described above**. Teams who choose to incorporate mCPR devices should have a well-defined and well-rehearsed procedure to avoid degrading quality of their CPR.
C. Family presence during resuscitation may be considered when appropriate and safe.