Patient Safety Considerations

1. Performing manual chest compressions in a moving vehicle may pose a clinician safety concern
2. In addition, manual chest compressions during patient movement are less effective in regard to hands on time, depth, recoil and rate
3. Ideally, patients should be resuscitated as close to the scene as operationally possible
4. Risks and benefits should be considered before patient movement in cardiac arrest situations

Notes/Educational Pearls

Key Considerations

1. Effective chest compressions and defibrillation are the most important therapies to the patient in cardiac arrest. Effective chest compressions are defined as:
   a. A rate of greater than 100 and less than 120 compressions/minute
   b. Depth of at least 2 inches (5 cm) and less than 2.4 inches (6 cm) for adults and children or 1.5 inches (4 cm) for infants; adolescents who have entered puberty should receive the same depth of chest compressions as an adult
   c. Allow for complete chest recoil (avoid leaning)
   d. Minimize interruptions in compressions
   e. Avoid rescuer fatigue by rotating rescuers at least every 2 minutes. Some EMS pit crew approaches use a clinician on either side of the chest, alternating compressions every minute or every 100 compressions to avoid fatigue
2. Avoid excessive ventilation and consider delayed airway management – If no advanced airway, consider:
   a. Passive ventilation using an NRB with 3–4 cycles of uninterrupted chest compressions (for arrests of suspected cardiac etiology). Consider BVM ventilation or advanced airway after 3–4 cycles
   b. BVM ventilation every 10–15 compressions with cycles of uninterrupted chest compressions. Upstroke ventilation between compressions.30:2 ventilation to compression ratio for adults, and 15:2 for children when 2 rescuers are present
   c. If an advanced airway is placed, ventilations should not exceed 10 breaths/minute (1 breath every 6 seconds or 1 breath every 10 compressions) in adults. **Pediatric Consideration:** For children with an advanced airway, 1 breath every 3–5 seconds is recommended (equivalent to 12–20 breaths/minute)
3. Quantitative end-tidal capnography ($EtCO_2$) should be used to monitor effectiveness of chest compressions
   a. If $EtCO_2$ less than 10 mmHg during the initial phases of resuscitation, attempt to improve chest compression quality
   b. Consider additional monitoring with biometric feedback which may improve compliance with suggested Resuscitation Section
4. Chest compressions are usually the most rapidly applied therapy for the patient in cardiac arrest and should be initiated as soon as the patient is noted to be pulseless. If the patient is being monitored with pads in place at the time of arrest, immediate defibrillation should take precedence over all other therapies. However, if there is any delay in defibrillation (e.g., in order to place pads), chest compressions should be initiated while the defibrillator is being applied. There is no guidance on how long these initial compressions should be applied; however, it is reasonable to either complete between 30 seconds and 2 minutes of chest