High-Performance CPR

High-performance CPR refers to providing high-quality chest compressions as part of a well-organized team response to a cardiac arrest. Coordinated, efficient, effective teamwork is essential to minimize the time spent not in contact with the chest to improve patient outcomes.

Think about all of the activities performed during a resuscitation. For example:
- AED pads are applied.
- AED must charge.
- Pocket mask or BVM may need to be repositioned.
- Airway may need to be reopened.
- Other personnel arrive on scene.
- Responders switch positions.
- Advanced airway may need to be inserted.
- Pulse checks may be done, but unnecessarily.

All of these activities could affect your ability to maintain contact with the patient's chest.

**SCIENCE NOTE**

Current research indicates that survival following resuscitation is significantly affected by the quality of CPR performed. One important aspect is minimizing interruptions in chest compressions, which helps to maximize the blood flow generated by the compressions.

**CHEST COMPRESSION FRACTION**

Chest compression fraction, or CCF, is the term used to denote the proportion of time that chest compressions are performed. It represents the fraction of time spent performing compressions, that is, the time that the responders are in contact with the patient's chest, divided by the total time of the resuscitation, beginning with the arrival on scene until the ROSC. Expert consensus identifies a CCF of at least 60 percent to promote optimal outcomes with a goal of 80 percent.

To achieve the best CCF percentage, a coordinated team approach is needed, with each member assuming pre-assigned roles, anticipating the next action steps for yourself and other team members. This coordinated team approach also includes integrating and assimilating additional personnel, such as paramedics or a code team, who arrive on scene.

To further your understanding of high-performance CPR, consider the example of an automotive racing team. Each crew member has a specific role when the race car arrives in the pit area. They are supervised by a leader, who keeps the crew on task and gets the race car back on the track. The quality, efficiency and swiftness of the crew's actions can ultimately affect the outcome of how the race car performs. The same is true for the CPR pit crew. All crew members have specific roles during a resuscitation. Based on available resources, potential roles include the following:
- Team leader
- Compressor
- Responder managing the airway
- Responder providing ventilations
- Responder managing the AED
- Recorder

Keep in mind that there are no national protocols in place for high-performance CPR. How you function within a team setting, including how additional personnel assimilate into the team, may vary depending on your local protocols or practice.
During resuscitation, numerous people may be involved in providing care to the patient. Responders must work together as a team in a coordinated effort to achieve the best outcomes for the patient. Characteristics of effective teamwork include well-defined roles and responsibilities; clear, closed-loop communication; and respectful treatment of others.

Coordination becomes even more important when more advanced personnel such as an advanced life support team or code team arrives on the scene. This coordination of all involved is necessary to:

- Ensure that all individuals involved work as a team to help promote the best outcome for the patient.
- Promote effective perfusion to the vital organs.
- Minimize interruptions of chest compressions, which have been shown to improve survival.

Ultimately, it is the team leader who is responsible for this coordination. When more advanced personnel arrive on scene, it is the team leader who communicates with advanced personnel, providing them with a report of the patient's status and events. The team leader also sets clear expectations, prioritizes, directs, acts decisively, encourages team input and interaction and focuses on the big picture.

Crew resource management helps to promote effective and efficient teamwork. Crew resource management is a communication process that centers around the team leader, who coordinates the actions and activities of team members so that the team functions effectively and efficiently. For example, when new individuals arrive on the scene or when team members switch roles during an emergency, it is the team leader who is responsible for coordinating these activities.

During resuscitation, the team leader directs and coordinates all the working elements, including team members, activities and actions, as well as equipment, to focus on providing high-quality CPR, the goal of any resuscitation effort.

Crew resource management also guides team members to directly and effectively communicate to a team leader about dangerous or time-critical decisions. It was developed as a result of several airline disasters as a way to prevent future incidents. Crew resource management has been shown to help avoid medical errors in healthcare.

To effectively communicate via crew resource management, team members should get the attention of the team leader, and state their concern, the problem as they see it and a solution. Working together, the team should then be sure to obtain direction from the team leader.