

## Assessment and Emergency Care of Cardiovascular Emergencies

### Scene Size-up

Scene Safety	Ensure scene safety and safe access to the patient. Standard precautions should include a minimum of gloves. Determine the number of patients. ALS should be requested. Assess the need for additional resources.
Mechanism of Injury (MOI)/ Nature of Illness (NOI)	Determine the MOI/NOI. Ensure that the cardiac emergency is not the result of a traumatic event. Dispatch information, observations at the scene, and comments from family or bystanders will help you develop an idea of the NOI. Usually the NOI can be determined by the patient's chief complaint. Chest pain, difficulty breathing, and syncope are some indicators that the NOI may be a cardiac emergency.

### Primary Assessment

Form a General Impression	Observe overall appearance of the patient, age, body position, and responsiveness. Observe work of breathing and circulation. Pale skin and cyanosis are indicators of poor perfusion. Determine the level of consciousness using the AVPU scale. Is the patient calm or anxious? Is the patient able to speak in full sentences? Identify immediate threats to life. Determine priority of care based on the MOI/NOI. If the patient is unconscious, determine whether CPR is needed. If the patient has a poor general impression, call for ALS assistance. A rapid visual examination will help you identify and manage life threats.
Airway and Breathing	Ensure the airway is open, clear, and self-maintained. If needed, open and maintain the airway using a modified jaw-thrust if a cervical-spine injury is suspected or a head-tilt–chin-lift in nontrauma patients. A patient with an altered level of consciousness may need emergency airway management; consider inserting a properly sized oropharyngeal airway in an unconscious patient or use a nasopharyngeal airway if the patient has an intact gag reflex. Assess for gurgling and stridor. Suction as needed. Evaluate the patient's ventilatory status for rate and depth of breathing, respiratory effort, and tidal volume. Quickly assess the chest for DCAP-BTLS, accessory muscle use, and intercostal and abdominal muscle use, and treat any threats to life. Assess lung sounds and determine whether they are normal, decreased, abnormal, or absent. Patients with cardiac problems may present with crackles or rales, indicating fluid (edema) in the lungs. Administer high-flow oxygen at 15 L/min, providing ventilatory support as needed.
Circulation	Evaluate distal pulse rate, quality (strength), and rhythm. Tachycardia may be an indicator of shock or a myocardial infarction. Bradycardia might be due to cardiogenic shock as the heart attempts to reduce oxygen demand. Observe skin color, temperature, and condition and capillary refill time. Look for and treat any external bleeding. The transport of blood and oxygen may be reduced if cardiac output is low. If distal pulses are not palpable, assess for a central pulse.
Transport Decision	If the patient has an airway or a breathing problem, severe chest discomfort, signs and symptoms of internal bleeding, or other life threats, manage the problems immediately, and consider rapid transport, performing the secondary assessment en route to the hospital. Delayed transport in a cardiac emergency will cause more cardiac muscle damage. For patients without life threats and in stable condition, perform a thorough assessment and history on scene. Do not allow the patient to exert himself or herself by walking to the ambulance; a carrying device should be used. Transportation should be to a cardiac care facility if one is close, otherwise take the patient to the nearest hospital for evaluation and stabilization. Do not delay transport to manage non-life-threatening conditions, instead treat en route to the hospital. Lights and sirens might cause anxiety and stress to a patient with a cardiac problem; patient condition and distance from the hospital are factors you can use to evaluate the need to use lights and siren.

**NOTE:** The order of the steps in this section differs depending on whether the patient is conscious or unconscious. The following order is for a conscious patient. For an unconscious patient, perform a primary assessment, perform a full-body scan, obtain vital signs, and obtain the past medical history from a family member or an emergency medical identification device.

## Assessment and Emergency Care of Cardiovascular Emergencies, continued

### History Taking

#### Investigate Chief Complaint

Investigate the chief complaint. Conscious patients can supply you with a brief history, ask OPQRST and SAMPLE questions. Find out when the problem started; if anything makes it feel better or worse; and if the patient has pain, what type of pain it is, and if it radiates. Ask the patient to rate the pain on a scale of 0 to 10, with 10 being the worst pain ever experienced, and how long the pain lasts. Ask the patient about previous heart attacks, heart problems, high blood pressure, aneurysms, lung disorders, diabetes, and kidney disease. Ascertain whether there are any risk factors for coronary disease, and obtain a family history. SAMPLE can also be obtained from family members and medical alert tags. The patient may have more than one complaint, such as chest pain and difficulty breathing; try to determine which presented first. Patients having a cardiac emergency may also complain of dizziness, appear anxious, or have a sense of impending doom. Some patients may deny that the symptoms are cardiac-related, and others may appear frightened. Nausea, vomiting, fatigue, headache, arm pain, jaw pain, and palpitations are other complaints the patient may have. Identify pertinent negatives. Determine if there was any trauma and if the pain increases on inhalation (pleuritic) or movement. Maintain a calm, professional attitude; be honest; and provide reassurance. Place the patient in a position of comfort.

### Secondary Assessment

#### Physical Examinations

Focus primarily on the cardiovascular system. Assess central and peripheral pulse quality. Examine the skin color; pallor and cyanosis are indicators of hypoxia (low oxygen level). Also assess skin temperature and condition. Look for edema in the extremities, which may be an indicator of cardiovascular failure. Inspect, palpate, and auscultate the chest, focusing on the respiratory effort and adequacy of ventilation. Crackles (rales) heard on auscultation of lung sounds and jugular vein distention are indicators of possible heart failure.

#### Vital Signs

Obtain baseline vital signs, and repeat depending on patient impression, monitoring trends. Vital signs should include blood pressure by auscultation, pulse rate and quality, respiratory rate and quality, and skin assessment for perfusion. Use pulse oximetry, if available, to assess the patient's perfusion status, keeping in mind that readings for patients with poor circulation may not be accurate.

### Reassessment

#### Interventions

Patients who are unresponsive, without breathing or a pulse, need CPR. An automated external defibrillator (AED) should be applied as soon as it becomes available. Airway control using adjuncts may be necessary. Patients who are conscious should be placed in a position of comfort, usually sitting up. Loosen any tight clothing. Reassess the primary assessment findings, vital signs, and chief complaint. Assist breathing as required, administering high-flow oxygen. CPAP might be indicated for patients with congestive heart failure (CHF). If permitted, administer 162 to 324 mg of chewable low-dose aspirin, and if the blood pressure is adequate, assist the patient in taking his or her prescribed nitroglycerin. Do not delay transport.

#### Communications and Documentation

Contact medical control and/or the receiving hospital with a radio report. Include a thorough description of the MOI/NOI, the position in which the patient was found, and vital signs. Include treatments performed and patient response. Document interventions performed and any changes in patient status and the time the interventions and changes occurred. Follow local protocols. Document the reasoning for your treatment and the patient's response. Obtain a signature from the hospital physician or nurse on patient transfer.

**NOTE:** Although the following steps are widely accepted, be sure to consult and follow your local protocols. Follow standard precautions when treating all patients.

## Assessment and Emergency Care of Cardiovascular Emergencies, continued

### Cardiovascular Emergencies

#### General Management of Cardiovascular Emergencies

Managing life threats to the patients ABCs and ensuring the delivery of high-flow oxygen are primary concerns with any cardiovascular emergency. If the patient is unconscious, determine whether CPR is needed. In conscious patients, obtain a thorough history. "Time is muscle," so rapid transport will be needed to a cardiac care facility for patients presenting with signs and symptoms of a myocardial infarction. If local protocols allow, administer aspirin and assist the patient in taking his or her prescribed nitroglycerin. Be prepared to defibrillate if the patient becomes pulseless.

#### Cardiogenic Shock

Shock is a state of hypoperfusion. The hypoperfusion from cardiogenic shock is due to failure of the pump (heart). The container (blood vessels) is intact, and the fluid (blood) is still present within the container. EMTs need to be able to recognize cardiogenic shock over other types of shock because the management is different. The first clue is that there is no mechanism of injury. Chest pain is usually the chief complaint. The pulse may be irregular. The patient may have respiratory distress due to fluid buildup in the lungs (pulmonary edema) due to poor cardiac output. As with other shocks, the blood pressure is low. *Do not* place this patient in the shock or Trendelenburg's position because it will increase the workload of the heart and cause increased fluid collection in the lungs. Place the patient in a position of comfort. Administer high-concentration oxygen. Request ALS support if transport is delayed. *Do not* give nitroglycerin; the blood pressure is already low. If a specialty center is close by, transport there; if not, transport to the nearest hospital.

#### Congestive Heart Failure

Fluid in the lungs is called pulmonary edema. Pulmonary edema can be caused by cardiac failure after an AMI (CHF) or a noncardiogenic cause such as a toxic inhalation. In either case, the outcome is the same, fluid in the lungs prevents the efficient exchange of oxygen and carbon dioxide. The patient will present with respiratory distress, usually severe, and appear very anxious. The skin will be cool, pale, and moist. The patient's blood pressure is often high unless the AMI is so severe as to cause cardiogenic shock. Patients with a history of CHF will often sleep with multiple pillows or upright in a recliner. Jugular vein distention is common. The patient needs high-flow oxygen. Assisted ventilation or CPAP is often helpful. Assist the patient in taking his or her prescribed nitroglycerin if medical control or protocol allows, ensuring the systolic blood pressure is more than 100 mm Hg before giving the nitroglycerin. Patients experiencing pulmonary edema may require positive-pressure ventilation with a bag-mask device or CPAP. CPAP is the most effective way to assist a person with CHF to breathe effectively and prevent an invasive airway management technique. Transport promptly to the closest emergency department.

## Assessment and Emergency Care of Cardiovascular Emergencies, continued

### Cardiovascular Emergencies

#### Cardiac Arrest

When cardiac activity ceases completely, the condition is called cardiac arrest. The patient will not be breathing and will not have a palpable pulse. The most common cause of sudden cardiac death is an electrical disturbance (arrhythmia) called ventricular fibrillation. Treatment of ventricular fibrillation requires defibrillation with an AED. If you witness the cardiac arrest, immediately apply the AED and follow the voice commands. If shock (defibrillation) is indicated, clear everyone from around the patient, including yourself, and deliver the shock. Immediately begin CPR for 2 minutes, performing 30 compressions and then two breaths, and repeat for five cycles. If you did not witness the cardiac arrest, open the airway; if the patient is not breathing, deliver two breaths, and check for a pulse. If the patient is without a pulse, begin CPR. Support from ALS should be requested as soon as possible. While performing CPR, it is important that compressions are not interrupted, that they are delivered at a rate of 100 per minute, and that they are of adequate depth. Ventilations can be delivered using a pocket mask or other barrier device or a bag-mask device. If using a bag-mask device, ensure that you have an open airway and a good mask seal. It is best to have a second rescuer, if one is available, assist when using a bag-mask device.