

Medical Control Guideline : CARDIAC MONITORING / 12 –LEAD ECG

PRINCIPLES:

1. Continuous cardiac monitoring is a key component of a thorough patient assessment and treatment in the prehospital setting.
2. Continuous observation of a patient's cardiac rhythm ensures early identification of potentially lethal dysrhythmias and provides other information about the patient's condition to guide treatment and destination decisions.
3. The 12-lead electrocardiogram (ECG) in the prehospital care setting plays a key role in identifying ST-Elevation Myocardial Infarction (STEMI) patients and determining the most appropriate treatment and destination for patients with Chest Pain - Suspected Cardiac and Chest Pain - STEMI.
4. Prehospital identification and communication of ST-elevation myocardial infarction (STEMI) reduces critical "door-to-intervention" times for STEMI patients and saves lives.
5. When a 12-lead ECG is indicated, it should be obtained as early as possible in the assessment.
6. A good quality 12-lead ECG is a key component of a thorough patient assessment. A good quality 12-lead ECG includes the presence of all 12-leads on the ECG tracing and absence of artifact and wavy baseline.
7. Complete and accurate ECG documentation is essential for patient care and quality improvement purposes.

GUIDELINES:

1. Once cardiac monitoring is determined to be necessary, observe the rhythm continuously and leave the monitor in place until care has been transferred to appropriate hospital personnel or as directed by the base hospital.
2. Document the ECG interpretation on the appropriate section in the EMS Report Form or Electronic Patient Care Report (ePCR). If a dysrhythmia is identified, provide an ECG strip labeled with the patient's name, sequence number, date and time to the receiving facility (in either paper or electronic format) as part of the patient's prehospital medical record. Retain a copy per the provider agency's departmental policy.
3. Perform a prehospital 12-lead ECG on patients with any of the following:
 - a. Chest pain or discomfort in all patients ≥ 35 years or any suspected cardiac etiology
 - b. Dysrhythmia (in order to capture rhythm and possible etiology)
 - c. Syncope in all patients ≥ 35 years or any suspected cardiac etiology
 - d. Return of spontaneous circulation (ROSC) after a cardiac arrest
 - e. Other symptoms with paramedic suspicion of cardiac etiology (e.g., non-traumatic shoulder, jaw or upper arm pain, shortness of breath, epigastric pain)

- f. Vague or unexplained symptoms (e.g. general weakness, lightheadedness, nausea, malaise) in patients at high risk of acute cardiac ischemia (e.g. coronary artery disease, myocardial infarction, elderly diabetic patients, stroke, peripheral vascular disease)
4. To obtain a good quality 12-Lead ECG:
 - a. Minimize electrode exposure to air prior to use; ideally they should be removed from the packaging immediately before application
 - b. Ensure that all electrodes are in good contact with the patient's skin (wipe sweat with a dry towel before applying and shave hair if necessary as per manufacturer's guidelines)
 - c. Place electrodes according to the diagram below in order to observe all aspects of the left heart
 - d. For female patients or obese patients of either gender, electrodes should be attached in the same anatomic location; this may require placement on the breast if lifting the breast places the electrodes too low on the chest
 - e. Attach the limb leads to the extremities (distal to the deltoid and to the inguinal line)
 - f. Stabilize the ECG fan-out (i.e., cable management / junction point) on the patient
 - g. Lay the patient supine or as recumbent as possible
 - h. Instruct the patient relax, remain still, and close their eyes prior to acquisition
 - i. Obtain the 12-Lead ECG prior to transport so that the ambulance is not in motion
 - j. Leave the electrodes and leads in place for continuous monitoring and repeat ECGs
5. Treat symptoms and rhythms identified according to applicable treatment protocols.
6. Maintain the patient's privacy and dignity while performing the 12-lead ECG.
7. For patients in which at least two of the following are true:
 - a. Paramedic interpretation of the ECG is STEMI. The 12-lead ECG tracing has greater than 1mm ST-segment elevation in 2 or more contiguous leads
 - b. The software interpretation indicates "**ST Elevation** Acute MI" or "STEMI".
 - c. The patient's clinical condition is consistent with STEMI

Transmit the ECG tracing to the SRC receiving the patient. Discuss with receiving SRC ED physician. Transport the patient to the closest SRC.

8. For software interpretations of STEMI for which the paramedic disagrees, due to the patient's clinical presentation and paramedic ECG interpretation, paramedics should contact the Base Hospital for online medical direction, to discuss destination decision.
9. Report to the SRC physician and/or Base Hospital the software interpretation, paramedic interpretation, any quality issues, the rate on the ECG, whether the QRS is wide or narrow, and whether there is a paced rhythm. Document this information on the appropriate EMS Report Form/ePCR.
10. Provide prehospital 12-lead ECGs that are labeled with the patient's name, sequence number, date and time to the receiving facility (in either paper or electronic format) as part of the patient's prehospital medical record.

