ADULT ACUTE CORONARY SYNDROMES

Suspected or known ACS

Prehospital Assessment and Care

- Monitor and support airway, breathing, circulation
- Be ready to provide CPR and defibrillation as needed
- Administer **aspirin**; consider **oxygen**, **nitroglycerin** and **morphine** if needed
- Obtain IV access; do not delay transport for IV
- Obtain 12-lead ECG
  - Transmit ECG or share findings with receiving hospital
  - Receiving hospital activates STEMI team per protocol as appropriate
- If considering fibrinolysis, complete fibrinolytic checklist
- Transport to emergency department or catheterization suite per protocol

Immediate Assessment and General Treatment

Within 10 minutes:

- If STEMI, activate STEMI team per protocol
- Assess and support airway, breathing, circulation
- Obtain vital signs, oxygen saturation
  - Provide supplemental oxygen if SpO_2 < 90% to increase SpO_2 to ≥ 90%
- Obtain 12-lead ECG
- Order cardiac markers, complete blood count, electrolytes and coagulation studies
- Obtain brief medical history
- Conduct focused physical examination
- Review/complete fibrinolytic checklist
- Obtain chest radiograph (<30 min; do not delay cardiac interventions)

Immediate General Treatment

- **Aspirin**
  - 162 to 325 mg, chewed (if not previously taken or contraindicated)
- **Nitroglycerin**
  - 0.4 or 0.8 mg SL every 5 min up to 3 times
- **Morphine**
  - 1 to 5 mg IV (only if discomfort not relieved by nitroglycerin)
- **Fentanyl**
  - 25 to 50 ug IV/IO (up to 100 ug IV/IO) (if discomfort not relieved by nitroglycerine)
- Consider administration of **$P2Y_{12}$ platelet receptor inhibitors**

Evaluate ECG

STEMI or new/presumably new LBBB

- Activate STEMI team if not already done
- Provide adjuvant therapies

≤ 12 hours since symptom onset?

YES

Start reperfusion therapy

- PCI (goal: ≤ 90 min of first medical contact)
- Fibrinolysis (goal: ≤ 30 min of arrival)

NO

NSTE-ACS

Complete risk score using validated tool

High risk ECG finding highly suspicious of ischemia and/or high risk score

Elevated troponin or high risk

- Consider early invasive strategy for:
  - Refractory ischemic chest discomfort
  - Recurrent or persistent ST-segment deviation
  - Ventricular tachycardia
  - Hemodynamic instability
  - Signs/symptoms of heart failure
- Consider dual antiplatelet therapy and anticoagulant therapy (aspirin, $P2Y_{12}$ inhibitor, anticoagulant)
- Provide adjuvant therapies
- Cardiology consultation

Low or intermediate risk Normal ECG, nondiagnostic ECG or low risk score

Consider:

- Admission for monitoring, further testing and/or intervention
- Outpatient follow-up/testing

American Red Cross
Training Services

ADULT ACUTE CORONARY SYNDROMES

ECG Findings in Acute Coronary Syndromes

STEMI (ST-segment elevation or new or presumably new LBBB)	NSTE-ACS	
	High Risk (ST-segment depression, dynamic T-wave inversion or transient ST-segment elevation strongly suspicious of ischemia)	**Intermediate or Low Risk** (normal or nondiagnostic ST-segment or T-wave changes)
▪ New ST-segment elevation at the J point in leads V2 and V3 of: • ≥ 0.2 mV (≥ 2 mm) in men > 40 years • ≥ 0.25 mV (≥ 2.5 mm) in men ≤ 40 years • ≥ 0.15 mV (≥ 1.5 mm) in women ▪ New ST-segment elevation ≥ 0.1 mV (≥ 1 mm) in two or more contiguous leads other than V2 and V3 ▪ New or presumed new left bundle branch block (LBBB)	▪ Changes suggestive of ischemia, such as ST-segment depression or T-wave inversion, in two or more contiguous leads ▪ Transient ST-segment elevation ≥ 0.05 mV (≥ 0.5 mm) lasting < 20 min	▪ No ECG changes, or nondiagnostic ST-segment or T-wave changes ▪ ST-segment deviation < 0.05 mV (0.5 mm) in either direction or T-wave inversion ≤ 0.2 mV (2 mm)

Normal or nonspecific ECG findings do not rule out the possibility of acute coronary syndromes. Always evaluate ECG findings in the context of the patient's overall clinical presentation.

Clinical Presentation of Acute Coronary Syndromes

Consider in all patients presenting with chest pain or discomfort:

- Retrosternal pressure, squeezing, tightness, aching or heaviness
- May radiate to one or both arms or shoulders, the back, neck, jaw or epigastric region
- Persistent (more than 3 to 5 min); may be intermittent

Other possible signs and symptoms:

- Dizziness, light-headedness or syncope
- Sudden, unexplained dyspnea, which may occur without chest pain or discomfort
- Nausea or vomiting
- Pale, ashen or slightly cyanotic skin, especially on the face and fingers
- Diaphoresis
- Anxiety or a feeling of impending doom
- Extreme fatigue
- Loss of consciousness

Note: Women, patients < 40 years or > 75 years, and those with medical conditions may present with atypical symptoms of ischemia (e.g., patients with diabetes may experience ischemia without pain, or "silent ischemia").

Medications

Drug Class	Use/Considerations
$P2Y_{12}$ platelet receptor inhibitors ▪ Clopidogrel ▪ Ticagrelor	For use in combination with aspirin for PCI for high-risk patients, or for patients with aspirin allergy
Glycoprotein IIb/IIIa inhibitors	For patients allergic or intolerant of $P2Y_{12}$ inhibitors, or undergoing PCI in combination with $P2Y_{12}$ inhibitors and high risk for thrombus, and for aspirin allergy
Anticoagulants ▪ Unfractionated heparin ▪ Enoxaparin ▪ Fondaparinux	For anticoagulation therapy following fibrinolytic therapy or PCI
Bivalirudin	An alternative to combination therapy with heparin and a glycoprotein IIb/IIIa inhibitor for anticoagulation after PCI
ß-Blockers	Initiate within the first 24 hours unless there are contraindications (e.g., acute heart failure, low cardiac output)
Intravenous nitroglycerin	For recurrent or refractory chest pain, pulmonary edema or hypertension accompanying STEMI
Aspirin	Antiplatelet aggregate Avoid with active bleeding or allergy
Nitroglycerin	Myocardial ischemia May cause hypotension and paradoxical bradycardia
Morphine	For pain not relieved by nitroglycerin May cause nausea and hypotension
Fentanyl	Synthetic medication for pain not relieved by nitroglycerin May cause nausea and hypotension