Stress-induced (takotsubo) cardiomyopathy

- **Definition:** Stress-induced cardiomyopathy, also called transient left ventricular (LV) apical balloonining, is a syndrome characterized by transient apical or midventricular left ventricular dysfunction, often associated with physical or emotional stress. The diagnosis of stress-induced cardiomyopathy should be suspected in postmenopausal women, particularly in the presence of symptoms that are severe and out of proportion to the coronary risk factors, or when left ventricular dysfunction is observed in the absence of obstructive coronary artery disease. The incidence and prevalence of stress-induced cardiomyopathy is uncertain.

**Clinical Manifestations:**
- **Symptoms:** The symptoms of stress-induced cardiomyopathy are usually severe and out of proportion to the coronary risk factors. The most common symptoms are chest pain, shortness of breath, or dyspnea.
- **EKG findings:** The EKG findings are variable and may include ST segment elevation, T wave inversion, new Q waves, and changes in intraventricular conduction delay. The range of findings from these reports is wide. The specificity of the EKG findings is not high, and the presence of these findings does not rule out other causes of cardiac dysfunction.
- **Echocardiography:** Left ventriculography or echocardiography usually show the characteristic apical ballooning seen on angiography. These findings are consistent with hypokinesis or akinesis of the left ventricular apex.
Patients who survive the acute episode of stress-induced (takotsubo) cardiomyopathy are prone to recurrent events. Thus, we suggest the following approach:

1. **In the acute phase:**
   - **Pharmacological therapy:** Use beta blockers, angiotensin receptor blockers, or statins. Consider antiarrhythmic drugs for high-risk patients. Revascularization is not routinely recommended.
   - **Hydration:** Maintain adequate hydration to prevent hypovolemia.
   - **Inotropic support:** Dobutamine or dopamine may be used for patients with persistent hypotension or shock.

2. **For stable patients:**
   - **Follow-up evaluation:** Perform echocardiography at one month to assess ventricular function and wall motion. Patients with persistent RV dysfunction should be referred for cardiac MRI.
   - **Long-term therapy:** Anticoagulation and secondary prevention measures are suggested for high-risk patients.

**SUMMARY AND RECOMMENDATIONS**

- **Diagnosis of an acute myocardial infarction**
- **Coronary arteriography and revascularization for acute coronary syndromes**
- **Diagnosis and management of heart failure due to systolic dysfunction**
- **Fibrinolytic (thrombolytic) agents in acute ST elevation myocardial infarction**
- **Diagnosis and treatment of unstable angina or non-ST elevation acute myocardial infarction**

**General therapy**

Diseases such as stress-induced cardiomyopathy may present with similar clinical features to acute coronary syndromes. We suggest the following approach:

- **Early risk stratification:** Use clinical and biomarker risk scores to identify high-risk patients.
- **Invasive hemodynamic monitoring:** Consider in patients with severe hypotension or shock.
- **Pharmacological therapy:** Use beta blockers, angiotensin receptor blockers, or statins. Consider antiarrhythmic drugs for high-risk patients. Revascularization is not routinely recommended.
- **Hydration:** Maintain adequate hydration to prevent hypovolemia.
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**Hypotension and shock**

Patients who are in shock should undergo urgent echocardiography to assess LVOT obstruction. Phenytoimine should be avoided in patients with LVOT obstruction. In patients with shock and LVOT obstruction, we suggest the following approach:

- **Invasive hemodynamic monitoring:** Consider in patients with severe hypotension or shock.
- **Pharmacological therapy:** Use beta blockers, angiotensin receptor blockers, or statins. Consider antiarrhythmic drugs for high-risk patients. Revascularization is not routinely recommended.
- **Hydration:** Maintain adequate hydration to prevent hypovolemia.
- **Inotropic support:** Dobutamine or dopamine may be used for patients with persistent hypotension or shock.

**Right ventricular involvement**

Right ventricular involvement is more common in patients with stress-induced cardiomyopathy. RV involvement may be asymptomatic or manifest as chest pain, dyspnea, or syncope. We suggest the following approach:

- **Echocardiography:** Use to assess RV function and wall motion.
- **Pharmacological therapy:** Use beta blockers, angiotensin receptor blockers, or statins. Consider antiarrhythmic drugs for high-risk patients.
- **Hydration:** Maintain adequate hydration to prevent hypovolemia.
- **Inotropic support:** Dobutamine or dopamine may be used for patients with persistent hypotension or shock.

**Supportive therapy**

- **Biventricular pacing:** Consider in patients with severe RV dysfunction and electrical dyssynchrony.
- **Intravenous fluid administration:** Use to maintain preload in patients with hypotension.
- **Inotropic support:** Dobutamine or dopamine may be used for patients with persistent hypotension or shock.
- **Diuresis:** Use to manage pulmonary congestion.

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