Coronary revascularization plays an important role in the management of patients with ischemic heart disease. Off-pump coronary artery bypass (OPCAB), is considered as a safe alternative to conventional coronary artery bypass graft (CABG) surgery with cardiopulmonary bypass for myocardial revascularization, because of possible reduction of perioperative morbidity and mortality. During OPCAB, the elimination of traditional myocardial protection strategies such as cardioplegia and hypothermia, and the accumulated myocardial dysfunction associated with hemodynamic instability, as well as coronary flow interruption during graft anastomoses, raise the need for improved myocardial protection, and preservation of contractile function. Therefore, protecting the myocardium from ischemic damage is still one of the main problems that anesthesiologists have to face. In this review, the principles of hemodynamic, mechanical, and pharmacologic maneuvers that may reduce myocardial ischemia during OPCAB are discussed.