Severe left ventricular (LV) dysfunction secondary to coronary occlusion may be permanent or temporary (stunned or hibernating myocardium). Improvement in function after low dose dobutamine during a stress test indicates the presence of a hibernating myocardium that will improve with revascularization. The use of TEE during anesthesia for cardiac or non cardiac surgery enables the assessment of regional and global ventricular function, ischemia detection and volume assessment. Causes of hemodynamic instability following induction of anesthesia or upon weaning off cardiopulmonary bypass can be immediately identified by TEE. New wall motion abnormalities or worsening scores could be a result of inadequate myocardial revascularization or preservation that does require immediate surgical correction. Doppler and M-mode assessment of diastolic and systolic function respectively, have significant bearing on therapeutic intervention. Quantification of the severity of ischemic mitral regurgitation by TEE and examination of the mitral valve (MV), have a significant impact on surgical-decision making for either MV repair or replacement. Likewise it plays a significant role in OPCAB surgery whereby it aids in the proper sequence of graft placement. Another important role of TEE in coronary artery surgery is examination of the thoracic aorta for the presence of calcifications or atheromatous plaques. Positive findings will direct the surgeon to choose alternative sites for cannulation and minimize the risk of stroke. More recent developments for endocardial border detection as in myocardial perfusion scans or contrast echo will improve the accuracy and diagnosis of ischemia.