Sole Therapy TMR: A majority of patients with angina related to coronary artery disease (CAD) respond appropriately to medical management, percutaneous coronary interventions (PCI), or coronary artery bypass grafting (CABG). Despite these modalities, however, a growing number of patients develop a pattern of diffuse CAD that is both refractory to medical therapy and not amenable to PCI or CABG. Transmyocardial revascularization (TMR) is a surgical option intended for this difficult patient population who suffer disabling, medically refractory, severe angina as assessed using the Canadian Cardiovascular Society (CCS) scale. Five prospective randomized trials with one-year follow-up have evaluated the safety and efficacy of TMR compared to continued maximal medical management in ‘no option’ patients. These studies found an operative mortality rate in stable patients randomized to receive TMR of 1% to 5% that is similar to the 3% operative mortality rate observed for CABG procedures.

Anesthetic considerations will be discussed to optimize outcomes when performing sole therapy TMR through a thoracotomy or using a minimally invasive technique.

Adjunctive TMR:
Considering the success in treating atherosclerotic heart disease using medical and percutaneous therapies, patients are increasingly being referred for CABG who are older, sicker, and who have a pattern of diffuse CAD. Whereas CABG alone is the established surgical gold standard, incomplete revascularization due to diffusely diseased target vessels occurs in 10% to 25% of these patients and is increasingly being recognized as an important predictor of perioperative adverse events and, particularly in the elderly, has been cited as an independent predictor of operative mortality.

In light of the negative effects caused by diffuse CAD and considering the success of sole therapy TMR in treating patients afflicted by it, CABG/TMR in patients who would be incompletely revascularized by CABG alone has been evaluated in three randomized trials and several non-randomized studies. In the largest trial involving 263-blinded patients, CABG/TMR provided operative and one-year survival benefits (p<0.05) with improved angina relief at five years follow-up.

Anesthetic considerations will be discussed to optimize outcomes when performing TMR in conjunction with CABG either with or without CPB.