The use of intraoperative TEE for assessment of hemodynamics is a category I indication in case of unexplained hemodynamics, and a category II in patients at risk of intraoperative hemodynamic instability, according to ASA/SCA guidelines. Apart from being noninvasive, the use of intraoperative TEE compared to invasive hemodynamic measurement, is also described as being more comprehensive and more expedient. Many investigators are now applying continuous or pulsed Doppler echocardiography to estimate different pulmonary pressures, and the usefulness of such methods is widely recognized. In addition, pulsed Doppler flow velocity measurement of the pulmonary artery has been used to estimate a number of qualitative and quantitative assessments. Assessment of pulmonary vascular resistance is of great importance in patients with advanced cardiovascular and pulmonary conditions, and is an essential component during heart-, lung- and liver-transplant, alternative approaches to invasive measurement are suggested using parameters of pulmonary artery flow. Furthermore, pulmonary artery flow intervals can be used to predict accurately right ventricular overall functions. This review explores the relationship between TEE-derived parameters and pulmonary hemodynamics and show the methods used to estimate these hemodynamics referring to its correlation with invasive techniques.