Cardiogenic shock is still the leading cause of death of in-hospital patients who have acute myocardial infarction. The shock trial showed a survival improvement in the early intervention group; however the hospital mortality rate remained unacceptable high (47%). In the last decades despite introduction of the thrombolytic therapy and the early intervention the incidence of cardiogenic shock following acute myocardial infarction remained unchanged (7% to 10%).

The IABP modestly augment the cardiac output and the coronary blood flow however it has little or no effect in advanced cardiogenic shock or hemodynamic collapse. Minimally Invasive Rotary Blood Pumps are applied as percutaneous VADS or ECMO to provide partial or total hemodynamic support and offering left ventricular unloading without the need for surgical implantation. Applications of VADs on acute myocardial infarction animal models markedly reduced infarct size. Early use of this technology in refractory cardiogenic shock patients might improve their survival rate. Currently few devices are available for clinical use. This work describes the different device options in regard of the clinical status of cardiogenic shock patients.

TandemHeart:
The TandemHeart percutaneous LVAD is a left atrial-to-femoral bypass system that can provide rapid short-term circulatory support patients who have cardiogenic shock. The TandemHeart has been used in a variety of situations, including in high-risk PCI patients, in acute myocardial infarction patients in cardiogenic shock, and in decompensated heart failure with myocarditis. The TandemHeart has also been used in cardiac surgery patients to preoperatively unload the left ventricle and provide mechanical circulatory support during the perioperative and postoperative period until cardiac function sufficiently recovers or until an LVAD can be surgically implanted for long-term hemodynamic support. TandemHeart pump is a centrifugal pump powered by a direct current brushless electromagnetic motor that operates at a range of 3000 to 7500 rpm. There are generous gaps between the impella and the housing which permits blood to flow freely with low friction, thereby limiting the generation of heat, hemolysis, and thromboembolism. Main disadvantages of this system are: Implantation requires cardiac catheterization laboratory, trans-septal puncture, allows no mobility of patients, limited pump output which limits its use in advanced cardiogenic shock patients with multi-organ dysfunction.

Impeller Recover:
The Impella Recover LP 2.5 System is minimally invasive ventricular unloading catheter. This device have been used in Europe to provide rapid and short-term hemodynamic support in patients who have acute heart failure, acute myocardial infarction, PCI, and during and after cardiac surgery (especially for postcardiotomy low cardiac output syndrome) by aspirating blood from the left ventricle and expelling...
it to the ascending aorta. The Impella Recover LP 2.5 System implements a miniaturized rotary blood pump that provides circulatory assist for up to 5 days. The left ventricular pump can provide up to 2.5 L/min of cardiac output. Main disadvantages of this pump are: implantation requires cardiac catheterization laboratory, limited pump out, duration of support and patient mobility.

CentriMag ECMO: Historically, ECMO has most commonly been used for support of respiratory failure. There is less experience for its use in adults with cardiac failure, and outcomes have been mixed. The CentriMag Blood Pumping System is one of the new generation of magnetically levitated centrifugal pumps that produces unidirectional flow. The device is unique in that the absence of rotating seals or bearings allows for minimal friction and shear stress, resulting in lower complement activation. It also has the potential to produce higher flows (up to 10 liters/min) at lower rotations per minute. The CentriMag ECMO device consists of a single use centrifugal blood pump, a motor, a console, and a flow probe. The low-pressure drop Quadrox D oxygenator is attached in the circuit. Femoral vessels are cannulated percutaneously with 19F arterial and 21F venous cannulas using sterile exchange over wire technique. Before insertion of these cannulas, a wire is inserted into the distal femoral artery, over which a 5F shunt is placed to perfuse the distal leg. Main disadvantages of ECMO: Incomplete unloading of the left ventricle and limited mobility of the patients. Clinical data as well as device patient selection guidelines will be discussed.