The use of mechanical circulatory assist systems for the treatment of end stage heart failure has evolved as a routine therapy. With an indication as a bridge to transplant, 1 year survival rates in excess of 80% can be achieved. LVAD-therapy for long term support in selected non-transplant candidates can provide similar outcomes. Despite recent advances in device design and improvements in anticoagulant therapy, thromboembolic events, infectious problems and device related issues pose continuous clinical challenges. Prof. Falk will discuss state of the art, current challenges and ongoing research in the field.