Acute myocardial infarction and ischemic cardiomyopathy are important causes of heart failure (HF). With ageing populations in developed nations, the incidences can be expected to rise in the coming decades.

Stretch of a left ventricle (LV) scar results in detrimental ventricular remodelling, LV dilatation and a change in geometry from elliptical to spherical. These result in higher wall stress and less effective ventricular contractions.

Surgical techniques to restore the shape of the remodelled ventricle were introduced in early 1980s. The RESTORE registry and others reported favourable outcomes in >5000 patients. However, the NHLBI and NIH-funded prospective randomised STICH Trial found no additional benefit of LV reconstruction in addition to coronary bypass grafting.

The STICH Trial was well conducted. The neutral findings did curb enthusiasm for LV reconstruction surgery. However, the interpretation of STICH was not incontrovertible and had sparked heated debates. Subsequent re-analysis of STICH confirmed significant survival benefit when adequate LV volume reduction was achieved.

New data from experienced centres continued to demonstrate efficacy of LV reconstruction surgery. The 2013 ACCF/AHA Guideline for the Management of Heart Failure recommended LV reconstruction for HF with reduce ejection fraction with a recommendation class IIb, level of evidence B. Unsurprisingly, the field remains confused about the role of this treatment.

In order to facilitate appropriate sizing of the LV during reconstruction, graduated balloons are now available for use as templates. A new device has been developed for less invasive off-pump LV reconstruction and a Phase 2 clinical trial is now underway.

REFERENCES
J-MACS (Japanese registry for mechanically assisted circulatory support) has listed a total of 722 patients between December 2010 and October 2017. Mean age was 43.2 years and mean body surface area was 1.63 m². Aetiology of heart failure was dilated cardiomyopathy in 77% and ischaemic cardiomyopathy in 11%. Pre-operative INTERMACS profile was level 1 in 10%, level 2 in 39%, level 3 in 48%, and level 4 or 5 in 4%. One hundred forty-nine (21%) patients received extracorporeal life support device first for cardiogenic shock or bridge-to-candidacy, and then underwent switch to implantable devices (bridge-to-bridge). Overall survival rate after LVAD implantation was 90% at 1 year and 86% at 2 years. Competing outcome analyses demonstrated that only 10% of patients reached heart transplantation and 60% were still on device therapy at 3 years. Causes of death were cerebrovascular accident in 44%, infection in 18%, bleeding in 6%, and device failure in 6%. Sixty-six per cent of patients required at least 1 hospital admission during an initial 1 year after device implantation.

In conclusion, continuous flow LVAD was effective for bridge-to-Transplant. Although the collected data indicate that the improved survival rate is acceptable, there remains potential for major complications which precludes wider application of LVAD.

Heart transplantation was initiated in Singapore in 1990. Three to six heart transplants are performed annually. The waiting list mortality was about 30%. Hence, mechanical circulatory support was initiated with HeartMate I in 2001. Extracorporeal membrane oxygenation (ECMO) for acute life support became available by 2003. Durable implantable rotary left ventricular assist device (LVAD) with HeartMate II™ (HMII) was introduced in 2007, followed by HeartWare™ HVAD™ in 2012 and HeartMate 3™ (HM3) in 2015. 90 consecutive durable implantable devices (58 HMII, 21 HVAD and 11 HM3), were placed from May 2009 to December 2017. Of these, 65 were placed as bridge-to-Transplant. Overall perioperative mortality was 7 (7.7%). 26 were INTERMACS level 1 patients, bridged with ECMO without perioperative mortality. Median ICU stay and hospital stay were 8 and 31 days, respectively. Mean duration of support was 907 days. The longest support was 8.6 years. 45 had been on ongoing support, and 23 were transplanted. Late mortality occurred in 13 patients, 5 due to stroke. Driveline infection developed in 28.7%. 57.1% were associated with driveline trauma. Pocket infection developed in 5 patients. In the initial 78 patients, 17 (21.7%) experienced gastrointestinal bleeding (GIB); 11 with recurrent GIB were successfully treated with tetradeleomide. 6 developed aortic regurgitation, 5 underwent modified Park stitch. Implantable cardioverter defibrillator placement pre-LVAD did not confer mortality benefit. Issues with hardware occurred in 60%. Cardiac recovery occurred in 2 and their LVADS were decommissioned. Overall survival at 5 years was 84.4%, compared with INTERMACS registry data of 48%.