**BSWMC – Temple VAD Perioperative TEE Protocol/Checklist**

**1. Preimplantation Perioperative TEE Exam**

Goals: confirm previous echocardiography (TTE or TEE) findings; detect unexpected abnormal findings before and after LVAD implantation

* Blood pressure: via arterial line; for hypotension, consider vasopressor agent to assess AR severity
* LV: size, systolic function, assess for thrombus
* LA: size, assess for LA appendage/LA thrombus
* RV: size, systolic function, catheters/leads
* RA: size, assess for thrombus, catheters/leads
* Interatrial septum: detailed 2D, color Doppler, IV saline contrast; red flag: PFO/ASD
* Systemic veins: assess SVC, IVC
* Pulmonary veins
* Aortic valve: red flags: > mild AR, prosthetic valve
* Mitral valve: red flags: > moderate mitral stenosis, prosthetic mitral valve
* Pulmonary valve: red flags: > mild PS, $ moderate PR, if RVAD planned; prosthetic valve
* Pulmonary trunk: red flags: congenital anomaly (PDA, pulmonary atresia or aneurysm)
* Tricuspid valve: TR, systolic PA pressure by TR velocity; red flags: > moderate TR, > mild TS, prosthetic valve
* Pericardium: screen for effusion; consider constrictive physiology
* Aorta: root, ascending, transverse, and descending thoracic aorta; screen for aneurysm, congenital anomaly, dissection, or complex atheroma at each level

**2. Postimplantation Perioperative TEE Exam**

Goals: monitor for intracardiac air; rule out shunt; confirm device and native heart function

* + Pump type: \_\_\_\_\_\_\_\_\_\_
  + Pump speed: \_\_\_\_\_\_\_\_\_\_
  + Blood pressure: via arterial line; for hypotension (MAP of <60 mmHg), consider vasopressor agent before assessing AR severity and other hemodynamic variables
  + Intracardiac air: left-sided chambers and aortic root during removal from CPB
  + LV: size, inflow-cannula position and flow velocities, septal position; red flags: small LV (over-pumping or RV failure), right-to-left septal shift; large

LV (obstructed or inadequate pump flows)

* + Inflow-cannula position: 2D/3D, assess for possible malposition
  + Inflow-cannula flow: spectral and color Doppler (red flag: abnormal flow pattern/high/low velocities, especially after sternal closure)
  + LA: Assess LA appendage
  + RV: size, systolic function; red flags: signs of RV dysfunction
  + RA: size, assess for thrombus, catheters/leads
  + Interatrial septum: repeat IV saline test and color Doppler evaluation of IAS (red flags: PFO/ASD)
  + Systemic veins: (SVC, IVC)
  + Pulmonary veins: inspect
  + Aortic valve: degree of AV opening and degree of AR (red flags: > mild AR)
  + Mitral valve: exclude inflow-cannula interference with submitral apparatus; assess MR
  + Pulmonary valve: assess PR, measure RVOT SV if able
  + Pulmonary trunk: (if applicable, demonstrate RVAD outflow by color Doppler); assess PR
  + Tricuspid valve: assess TR (red flags: > moderate TR); systolic PA pressure by TR velocity (if not severe TR)
  + Pericardium: screen for effusion/hematoma
  + Aorta: exclude iatrogenic dissection
  + Outflow graft: identify conduit path adjacent to RV/RA with color and spectral Doppler (when able)
  + Outflow graft-to-aorta anastomosis: assess patency/flow by color and spectral Doppler (when able) red flags: kinked appearance/turbulent flow/velocity >2 m/sec, particularly after sternal closure