Diagnosis Specific Treatment

- Bleeding
  - Resuscitate: if poor hemodynamics, consider blood products but avoid reversal if possible given risk of pump thrombosis (discuss with VAD team)
  - Consider GI consult

- Pump Thrombosis
  - Have increased suspicion if clinical/laboratory evidence of hemolysis
  - IVF bolus
  - Consider anticoagulation with Heparin drip

- Infection (sepsis)
  - IF bolus in 500mL aliquots Q15min and reassess via ultrasonography
  - Broad spectrum antibiotics according to local resistance patterns
  - Strongly consider antifungal agent

- Right Ventricular Failure
  - If suspected, avoid IVF boluses. Use sonography to guide therapy. If IVC >2cm, diurese patient.
  - Early addition of pressors: inotropes + beta agonists
  - (rare in ED)

- Suck Down Event
  - Suck down events are more often a symptom rather than the problem
  - 1L IVF bolus
  - Reassess via sonography

- Dysrhythmia
  - Use standard anti-arrhythmics as if the patient did not have a VAD, patients often rhythm controlled
  - If unstable, cardiovert per ACLS guidelines but avoid placing pads directly over device

- Pump Stop
  - Recent stop: (minutes)
    - If alarming and no whir, press "test select" or "alarm reset" button to restart VAD (depends on model)
  - Longer stop: (hours)
    - Do not restart due to risk of ischemic CVA - discuss with VAD team
    - Verify batteries charged and connect device to AC power

- Cardiac Arrest
  - Patients do not have pulses!
    - Clarify via doppler, cap refill, and low flow alarm
    - Treat arrest per ACLS protocols (including compressions if necessary)
    - Empiric IV fluid bolus

Disclaimer:
The recommendations above are general guidelines meant to assist in workup and management. Working closely with the cardiothoracic surgery and heart failure teams who manage the VAD is paramount to ongoing resuscitation and patient care - particularly decisions such as administration of blood products or reversal of anticoagulation.

Hypertension:
MAPs greater than 90 also represent an emergency as an LVAD is very afterload sensitive. These patients also merit early discussion with VAD coordinators and aggressive afterload reduction.