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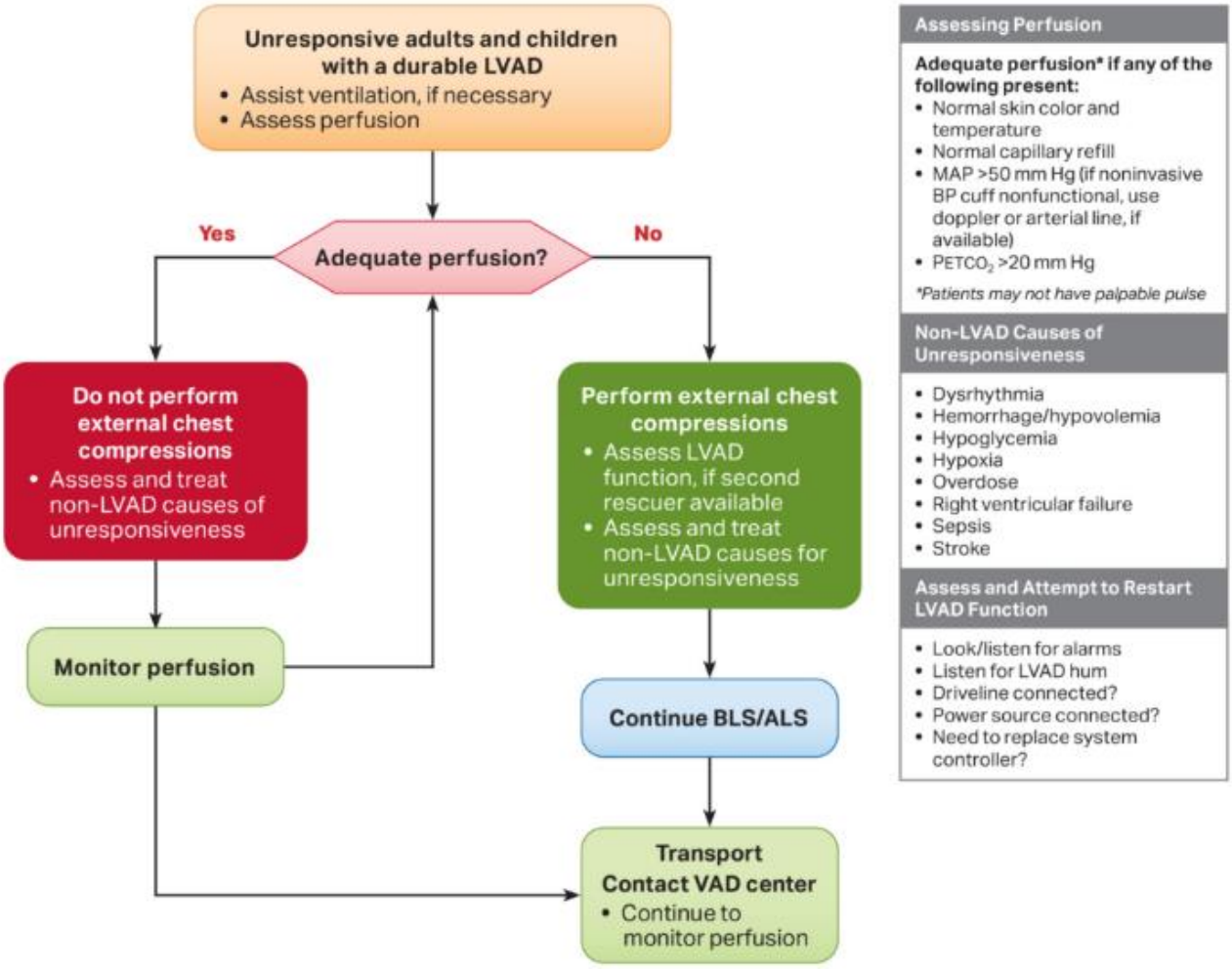
MaineHealth Maine Medical Center LVAD ACLS Protocol

1. For the first 10 days immediately following LVAD implant, CALS protocol should be followed as directed by the cardiothoracic surgical team.
    a. The universal algorithm for cardiac arrest after cardiac surgery (Appendix A) should be followed for patients with an implantable LVAD.
    b. There may be difficulty confirming an arrest in these patients. A patient with invasive monitoring should be considered to have arrested if the arterial line reads the same as the central venous pressure line. In extubated patients without invasive monitoring, if the patient has no signs of life and is not breathing normally, then they should be considered to have cardiac arrest.
    c. Transthoracic or transesophageal echocardiography, waveform capnography, or Doppler flow readings in a major artery may assist in determining if there is meaningful perfusion. Also, these devices display pump flow, and that should be used to assist in the diagnosis of whether there has been a genuine loss of blood flow, or whether there is just a low-flow situation with reduced level of consciousness.
2. After the first 10 days post LVAD implant, standard ACLS protocol should be followed in accordance with American Heart Association (AHA) guidelines.
    a. Per the 2025 American Heart Association guidelines, **chest compressions should be performed in unresponsive adults with durable LVADs <u>without</u> adequate perfusion**
        1. Adequate perfusion may be defined as having any of the following present:
            a. MAP > 50 mm Hg
            b. PETCO2 > 20 mm Hg (if available, should only be used when patient is ventilated by ET tube or tracheostomy)
            c. Normal skin color, temperature or capillary refill
    ii. **Patients may not have palpable pulse at baseline; pulse should not be used as a marker of perfusion**
    iii. **It is possible for a patient to have asystole or VF but adequate cerebral blood flow due to continued pump flow**
    iv. Lucas CPR device should NOT be used



b. Device-related reversible causes should be assessed simultaneously
    i. Ensure driveline is connected to the controller
    ii. Ensure the controller is connected to power
    iii. The LVAD Team should assess if there is a need to exchange the controller
c. The Heart Failure APP and/or Attending should always be STAT paged in the event of an LVAD patient code
d. The LVAD does not need to be disconnected from the power module or power source for the patient to undergo defibrillation or cardioversion
    i. Anterior-posterior pad placement is preferred when possible
e. LVAD ACLS Algorithm (displayed above and also in Appendix B) should be hung in all LVAD patient rooms and easily accessible during an emergency situation

3. All LVAD patients should be listed as a Full Code in the EMR, unless code status is otherwise specified

4. Community care (ie. EMS, Cardiac Rehab) should utilize most up to date AHA guidelines as reference

References:

Cao, D., Arens, A. M., Chow, S. L., Easter, S. R., Hoffman, R. S., Lagina, A. T., Lavonas, E. J., Patil, K. D., Sutherland, L. D., Tijssen, J. A., Wang, G. S., Zelop, C. M., Rodriguez, A. J., Drennan, I. R., & McBride, M. E. (2025). Part 10: Adult and Pediatric Special Circumstances of Resuscitation: 2025 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*, *152*(16_suppl_2). https://doi.org/10.1161/cir.0000000000001380

Dunning, J., Levine, A., Ley, J., Strang, T., Lizotte, D. E., Lamarche, Y., Bartley, T., Zellinger, M., Katz, N., Arora, R. C., Dembitsky, W., Cheng, A. M., Lonchyna, V. A., Haft, J., Deakin, C. D., Mitchell, J. D., Firestone, S., & Bakaeen, F. G. (2017). The Society of Thoracic Surgeons Expert Consensus for the Resuscitation of Patients Who Arrest After Cardiac Surgery. The Annals of Thoracic Surgery, 103(3), 1005–1020. https://doi.org/10.1016/j.athoracsur.2016.10.033

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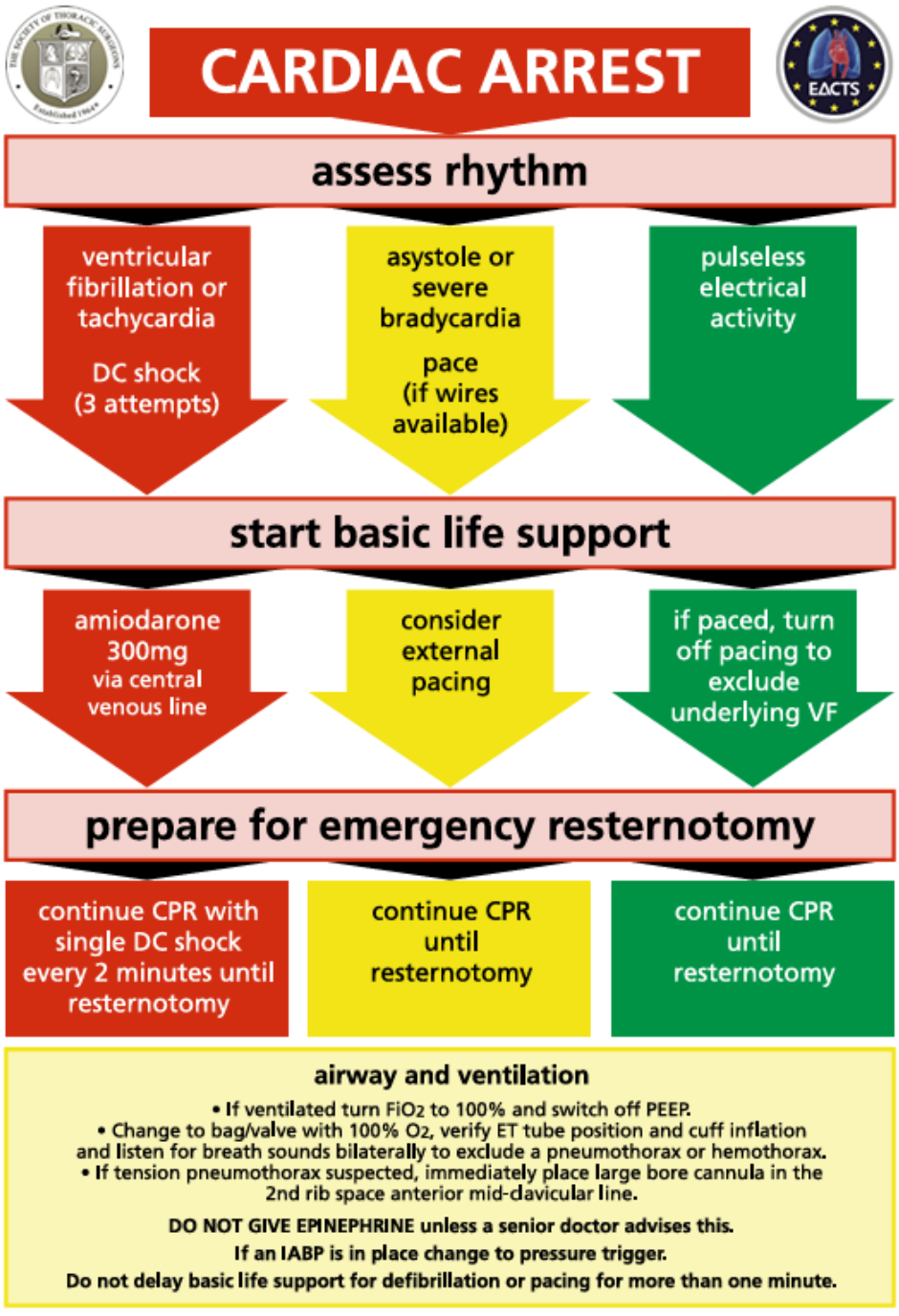
Appendix A: CALS Algorithm



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Appendix B: AHA Adult and Pediatric Durable Left Ventricular Assist Device Algorithm

Adult and Pediatric Durable Left Ventricular Assist Device Algorithm