** NATIONAL CARDIOGENIC SHOCK INITIATIVE **

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** NATIONAL CARDIOGENIC SHOCK INITIATIVE ALGORITHM **

** INCLUSION CRITERIA **
- Acute Myocardial Infarction: STEMI or NSTEMI
- Ischemic Symptoms
- EKG and/or biomarker evidence of AMI (STEMI or NSTEMI)
- Cardiogenic Shock
- Hypotension (<90/60) or the need for vasopressors or inotropes to maintain systolic blood pressure >90
- Evidence of end organ hypoperfusion (cool extremities, oliguria, lactic acidosis)

** INSTRUCTION: ACTIVATE CATH LAB **

** EXCLUSION CRITERIA **
- Evidence of Anoxic Brain Injury
- Unwitnessed out of hospital cardiac arrest or any cardiac arrest in which ROSC is not achieved in 36 minutes
- IABP placed prior to Impella
- Septic, anaphylactic, hemorrhagic, and neurologic causes of shock
- Non-ischemic causes of shock/hypotension (Pulmonary Embolism, Pneumothorax, Myocarditis, Tamponade, etc.)
- Active Bleeding
- Recent major surgery
- Mechanical Complications of AMI
- Known left ventricular thrombus
- Patient who did not receive revascularization
- Contraindication to intravenous systemic anticoagulation
- Mechanical aortic valve

** QUALITY MEASURES **
- Impella Pre-PCI
- Door to Support Time < 90 minutes
- Establish TIMI III Flow
- Right Heart Cath
- Wean off Vasopressors & Inotropes
- Maintain CPO >0.6 Watts
- Improve survival to discharge to >80%

** ACCESS & HEMODYNAMIC SUPPORT **

- Obtain femoral arterial access (via direct visualization with use of ultrasound and fluoroscopy)
- Obtain venous access (Femoral or Internal Jugular)
- Obtain either Fick calculated cardiac index or LVEDP

** IF LVEDP >15 or Cardiac Index < 2.2 AND anatomy suitable, place IMPELLA **

** Coronary Angiography & PCI **
- Attempt to provide TIMI III flow in all major epicardial vessels other than CTO
- If unable to obtain TIMI III flow, consider administration of intra-coronary vasodilators

** Perform Post-PCI Hemodynamic Calculations **

1. Cardiac Power Output (CPO):
   \[
   \text{MAP x CO} = \frac{451}{sPAP - dPAP} 
   \]

2. Pulmonary Artery Pulsatility Index (PAPI):
   \[
   xPAP - dPAP
   \]

** Wean OFF Vasopressors and Inotropes **

If CPO is >0.6 and PAPI >0.9, operators should wean vasopressors and inotropes and determine if Impella can be weaned and removed in the Cath Lab or left in place with transfer to ICU.

** Escalation of Support **

If CPO remains <0.6 operators should consider the following options:
- PAPI is <0.9 consider right sided hemodynamic support
- PAPI >0.9 consideration for addition hemodynamic support

Local practice patterns should dictate the next step to:
- Placement of more robust MCS device(s)
- Transfer to LVAD/Transplant center

If CPO is >0.6 and PAPI >0.9 consider providing right sided hemodynamic support if clinical suspicion for RV dysfunction/failure

** Vascular Assessment **

- Prior to discharge from the Cath Lab, a detailed vascular exam should be performed including femoral angiogram and Doppler assessment of the affected limb.
- If indicated, external bypass should be performed.

** ICU Care **

- Daily hemodynamic assessments should be performed, including detailed vascular assessment
- Monitor for signs of hemolysis and adjust Impella position as indicated

** Device Weaning **

- Impella should only be considered for explantation once the following criteria are met:
  - Weaning off from all inotropes and vasopressors
  - CPO >0.6 and PAPI > 0.9

** Bridge to Decision **

- Patients who do not regain myocardial recovery within 3-5 days, as clinically indicated, should be transferred to an LVAD/Transplant center. If patients are not candidates, palliative care options should be considered.