



National Cardiogenic Shock Initiative

v 4.0 – January 2020

TREATMENT ALGORITHM FOR PATIENTS WHO PRESENT WITH AMICS

Acute Myocardial Infarction (AMI)

STEMI or NSTEMI

- Ischemic Symptoms
- EKG +/- biomarker evidence of Ischemia

Cardiogenic Shock

Defined by the presence of at least two of the following:

- Hypotension with SBP ≤ 90 or need for inotropes to maintain SBP >90
- Evidence of end organ hypoperfusion (elevated lactate level, cool extremities, oliguria)
- Cardiac Index <2.2 L/min/m², or CPO <0.6 W

ACTIVATE CATH LAB

VASCULAR ACCESS

- Obtain femoral arterial access (via direct visualization with use of ultrasound, fluoroscopy & micropuncture)
- Obtain venous access (Femoral or Internal Jugular)

CONFIRMATION OF CLINICAL DIAGNOSIS

- Clear AMICS diagnosis = Place MCS
- Unclear AMICS diagnosis = Perform RHC/Echo as needed.

MECHANICAL CIRCULATORY SUPPORT

Once AMICS diagnosis confirmed, place MCS

PCI

Perform culprit PCI with the goal of establishing TIMI III flow, careful selective MV-PCI can be considered. Avoid CTO PCI

BEST PRACTICES:

- MCS Pre-PCI
- Door to Support <90 minutes
- Establish TIMI III Flow
- RHC utilization
- Wean Inotropes
- Maintain CPO >0.6 W
- Survival to Hospital Discharge Goal $\geq 80\%$

CPO (Cardiac Power Output)

$$\frac{\text{MAP} \times \text{CO}}{451}$$

PAPI (Pulmonary Artery Pulsatility Index)

$$\frac{\text{sPAP} - \text{dPAP}}{\text{RA}}$$

WEANING OF INOTROPES / ESCALATION OF SUPPORT

1. For patients requiring ≥ 2 inotropes, operators should wean inotropes in the Cath Lab and reassess hemodynamics to determine if patient would benefit from early MCS escalation.
2. If CPO remains ≤ 0.6 (requiring inotropes), operators should consider escalation of MCS in the Cath Lab (**estimated survival $< 50\%$**):
 - If PAPI is ≤ 0.9 & RA pressure > 12 , consider escalation of right-sided MCS
 - If PAPI > 0.9 , escalate left-sided MCS
3. If CPO is > 0.6 without inotropes (or low-moderate doses of a single inotrope), the patient should be transferred to the ICU (**estimated survival $> 70\%$**)

VASCULAR ASSESSMENT

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

ICU CARE

- Initiate multidisciplinary shock team.
- Hemodynamics (RA pressure, PAPI, CPO), laboratory values (Lactate, Cr, PA saturation) and use of inotropes should be monitored every 6-12 hours (or more frequently) for the first 24-48 hours, or until hemodynamic stabilization.
- Patients requiring escalating doses of inotropes, rising lactate levels, worsening hemodynamics (CPO ≤ 0.6 W), and/or the development of RV failure (PAPI ≤ 0.9 , RA pressure > 12 , or frequent diastolic suction alarms despite proper MCS positioning), should be considered for escalation of MCS in suitable candidates.
- Daily vascular assessment.
- Monitor for signs of hemolysis and adjust MCS position as indicated.

DEVICE WEANING

- If CPO is > 0.6 (ideally > 0.8) without inotropes (or low doses of a single inotrope), MCS should be weaned.

BRIDGE TO DECISION

- Patients who do not regain myocardial recovery within 24-72 hours, should be considered for transfer to a LVAD/Transplant center.
- Patients who are not candidates for advanced therapies and cannot be weaned off MCS should have discussions with palliative care as clinically appropriate.