

There Is No “I” in Team: A Multi-Disciplinary Approach to Cardiogenic Shock

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Disclosures

- I do not have any relevant disclosures related to this discussion



What's The Problem

- Typically develops as a result of myocardial ischemia or also acute or acute/chronic heart failure
- Significant mortality, even for in-hospital patients
 - Mortality of greater than 50% historically
 - Multi-system organ failure common
- How can we best identify then treat these patients?



Cardiogenic Shock Teams

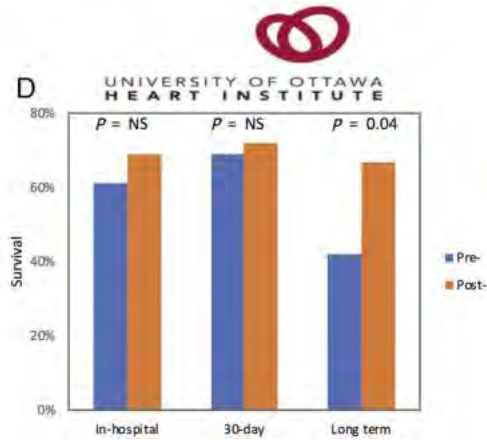
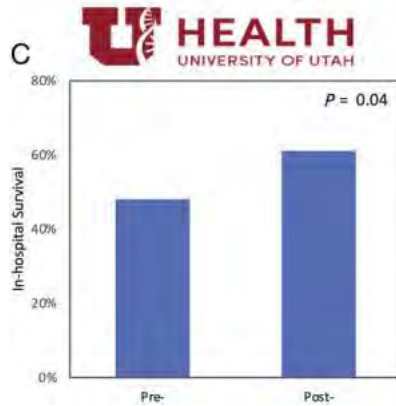
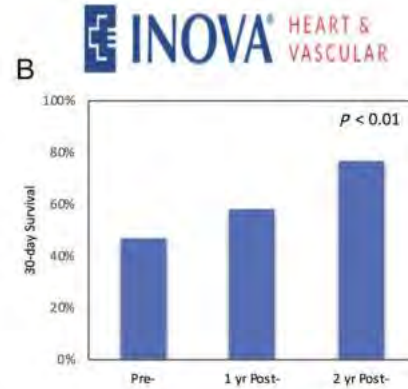
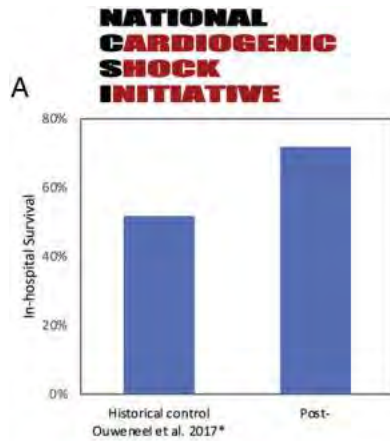
- Multiple studies showcase the success of this approach
- Involves multiple teams
 - Interventional Cardiology
 - Advanced Heart Failure
 - Cardiac Surgery
 - Critical Care Medicine
- Gets patients to invasive approaches sooner
- Streamlined resuscitation, management of rapid changes in status
- Gets patients to high-volume centers



Time is the Enemy!

- More time in shock leads to loss of myocardium = poor chance for recovery
- More need for vasopressor/inotropes = increased myocardial O₂ consumption, further end organ damage
- CST teams shorten this time frame
 - Assess hemodynamics
 - Invasive measurements to guide next steps in therapy
 - Based on data can determine need for MCS – Impella, ECMO, IABP





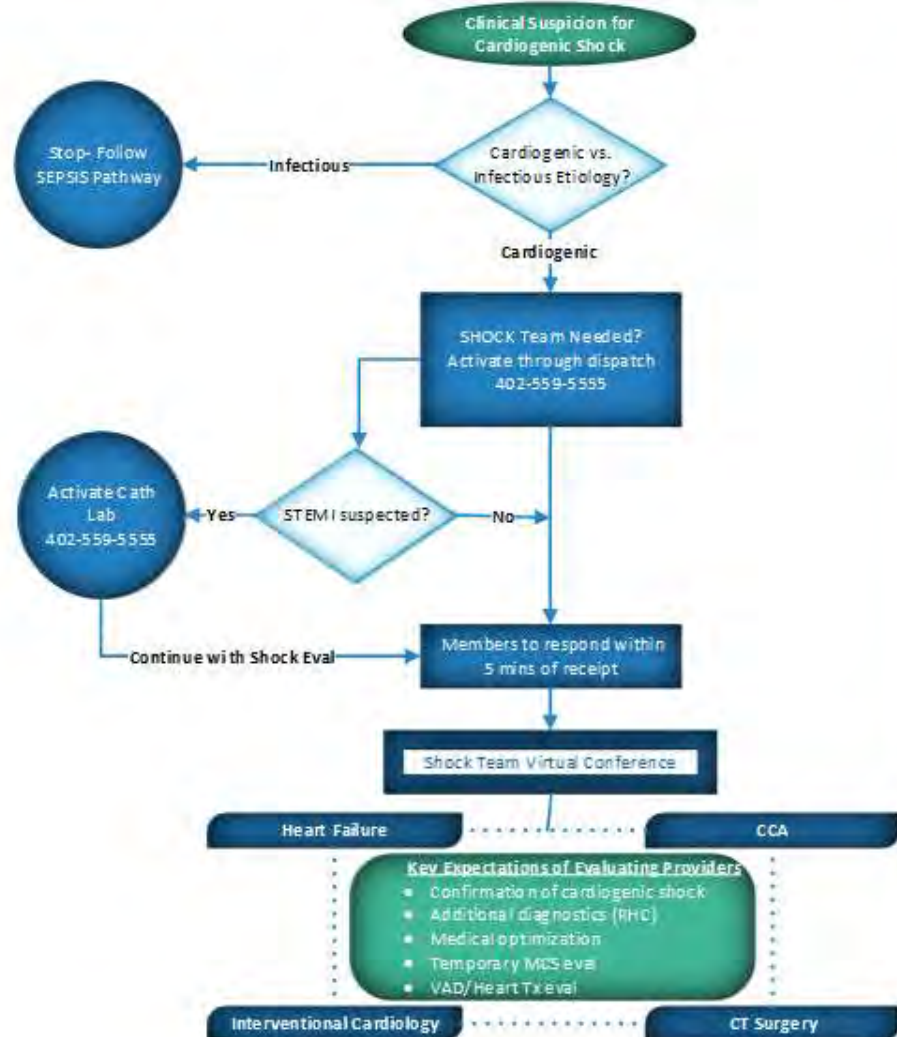
Moghaddam N, et al. Cardiogenic Shock Teams and Centres: a contemporary review of multi-disciplinary care for cardiogenic shock. ESC Heart Fail. 2021 Apr; 8(2): 988–998.



UNMC CS Team

- Made up of multiple teams
 - Cardiology – Heart Failure and Interventional
 - Critical Care
 - Cardiac Surgery
 - Coordinators
 - Nursing
- Team activated either by internal means or after consult from outside facility for transfer to UNMC
- Multi-disciplinary team conference call to discuss patient and next steps





Criteria for Activating Cardiogenic Shock Team

Must meet at least 1 criteria from "Hypotension" and 1 criteria from "Hypoperfusion" categories

HYPOTENSION

- SBP <90mmHg or MAP <60mmHg OR
- Drop in SBP >30mmHg from baseline OR
- Need for inotropes to maintain SBP

HYPOPERFUSION

- CVP > 15 mm Hg via central line* OR
- Wedge/LVEDP >15mmHg* OR
- Evidence of End-Organ Dysfunction:
 - Lactate >2mmol/L
 - Renal: 2x creatinine or drop in GFR
 - Hepatic: increase in LFTs
 - AMS, clammy, mottled skin/extremities
 - Oliguria with UOP <30 mL/hr

*Note: POCUS, CVP and VBG may be useful in differentiating shock states, if able. Do not delay activation to obtain.

Confirmation of Cardiogenic Shock

From right heart cath (RHC)- Any of the below:

- ✓ Elevated left ventricular end-diastolic pressure (LVEDP >18 mmHg)
- ✓ Elevated pulmonary capillary wedge pressure (PCWP >15 mmHg)
- ✓ Low cardiac index: (<1.8 L/min/m² w/out pressors vs. 2.2 L/min/m² with pressors)
- ✓ Low cardiac output power (<CPO 0.6W)



Shock Team's Emergent Conference:

Response to a CST Activation is STAT = 5-minute response time

| Team Member | Responsibilities of Role |
|--------------------------|---|
| Provider Activating CST | <ul style="list-style-type: none">• Providing background & events that led up to activation |
| HF Attending (On-Call) | <ul style="list-style-type: none">• Facilitator, role call – quorum• Documenting Plan of Care in OneChart & executing pathway• Advanced HF therapy considerations |
| CCA Attending (in-house) | <ul style="list-style-type: none">• Airway considerations• Critical care management considerations |
| CTS Attending (On-Call) | <ul style="list-style-type: none">• Surgical candidacy discussion for temp and durable MCS options |
| IC Attending (On-Call) | <ul style="list-style-type: none">• STEMI Plan of Care considerations• Percutaneous options for temp MCS |
| CVICU Team Lead | <ul style="list-style-type: none">• Bed/staff availability• Equipment availability• Awareness/ visibility to plan |

Assessment

- Multiple avenues can and should be used
 - Echocardiography
 - Laboratory results – lactate, CMP
 - Cardiac catheterization
 - LHC for possible CAD (poss PCI)
 - RHC
 - PAP
 - CVP
 - LVEDP
 - CI/CO
- Most institutions with CST use decision tree and algorithm to determine presence of CS



Need for MCS?

- Typically indicated with refractory shock despite optimized medical therapies
- May be emergent need
- Some evidence that early MCS helps with CS
 - Need more randomized trials
 - No evidence on which type of support is best
- Shock team is crucial for decision making in this arena
 - High resource utilization



Cardiogenic Shock Team – Data Review



Go Live March 2022



68 activations of the
Cardiogenic Shock Team
2022- 39
2023 -29

59 of 68 patient evals
resulting in escalation of care



Conferences identified 9
patients deemed ineligible
for transfer

2022 – 5
2023 – 4



35 of 68 patients went for
RHC

Placed tMCS:
6 IABPs
17 Impella
14 VA ECMO

3 heart transplants
1 durable LVAD

3/1/2022 – 9/11/2023

| | Case Details | Goal |
|--|---|--|
| Patient Location at time of CST activation | | N/A |
| CST Page Sent | Yes | Yes |
| Reason for Activation | Vasoactive meds Elevated Creatinine IABP | Criteria from hypotension category Criteria from hypoperfusion category Transfer with MCS device |
| Time of Activation til CST call started | ~5 min | <5 mins |
| Recommendations from team | Transfer ASAP, needs RV MCS – likely Protek Duo, consult CCA, CTS, Advanced HF | Documented in Note |
| CST Note Utilized | Yes | Yes |
| Documenting Provider Name | Dr. Shumar | CHF Attending, Fellow, NP |
| Duration of call | 18 minute | N/A |
| General Feedback/Opportunities | None, great facilitation by Beds Desk and Heart Failure. Good team communication. | N/A |

Conclusions

- Can save lives and add quality life years for patients
- Better at facilities that deal with CS on frequent basis
- Ready access to MCS
- Earlier the activation the better, improved outcomes
- Multi-disciplinary teams are best





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