

## San Antonio Shock Initiative: How are we managing

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## Disclosures

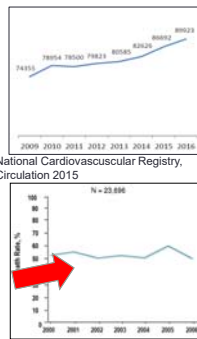
### RESEARCH AND SPEAKERS BUREAU

- Johnson and Johnson
- United Therapeutics
- Bayer

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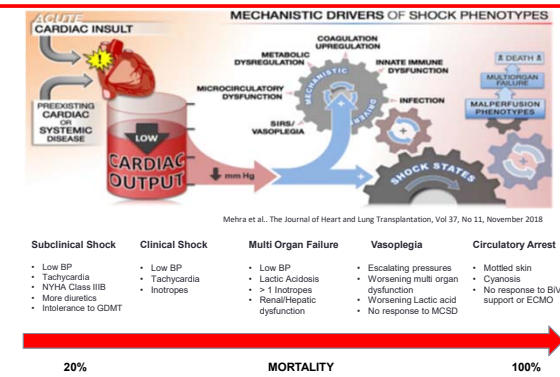
## Outcomes and cardiogenic shock – not much better... Mostly AMI clinical trials

- REMATCH, Nejm 2001
  - Refractory cardiogenic shock on meds: 75% 1 year
- SHOCK, Nejm 1999
  - AMI/cardiogenic shock and emergent CABG: 51% 30d
- SHOCK 2, Nejm 2013
  - AMI, Cardiogenic shock, emergent PCI w/ IABP: 41% 30d
- IMPRESS, JACC 2016
  - AMI/cardiogenic shock, PCI with Impella v IABP: 50% 30d
- CULPRIT SHOCK, Nejm 2017
  - AMI Cardiogenic shock, emergent PCI with optimal MCS: 43% 30 days
- **NATIONAL SHOCK INITIATIVE (Global Study) 2019**  
 STEMI, Emergent PCI, early Impella LVAD and PA cath guidance. 70%. **However, if Lactic > 4 or > 2 inotropes : Survival is 30%**



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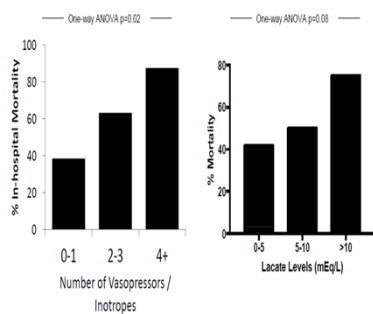
## Heart Failure is not a simple hemodynamic problem



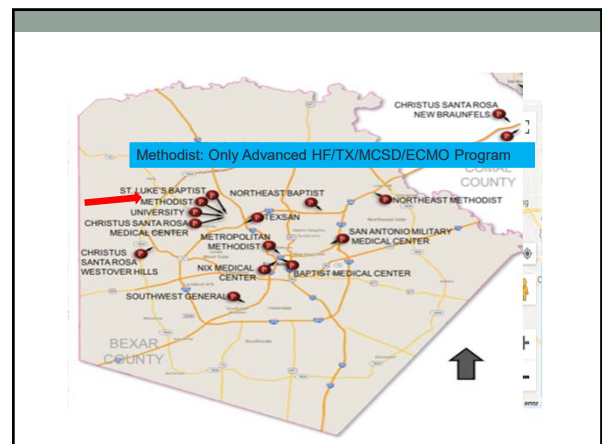
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## Predictors of Shock Mortality

- Time: > 10 hours
- Lactic Acid > 4
- Cardio active drugs

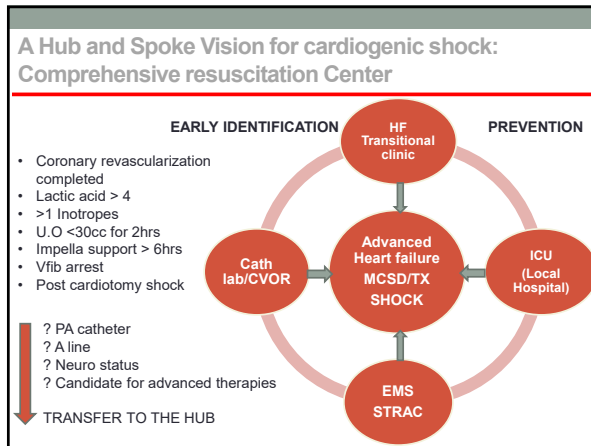


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# Shock Initiative



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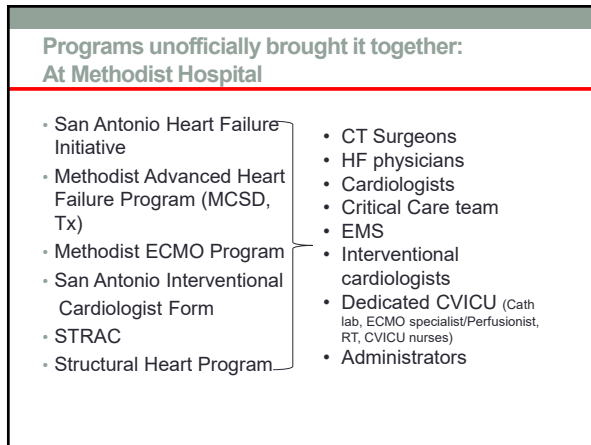
### Cardiogenic Shock Medical and Surgical Support Options

**PERCUTANEOUS**

#### Acute MCS Devices are Not VADs

	Durable MCS	Acute MCS
Primary Objectives	Outpatient Discharge	Inpatient Stabilization
Clinical Scenarios	Stable but sick	Sick and unstable
Technical Implant Features	Cardiotomy	Vascular Puncture
Post-Procedural Management	Surgical	Medical
Outcomes/Metrics of success	OHTx or Dt-VAD	Recovery, Durable MCS, OHTx
Withdrawal of Care	Failure	Success in select cases

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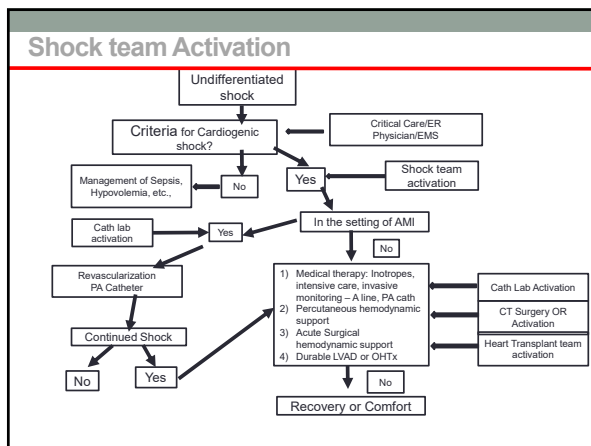


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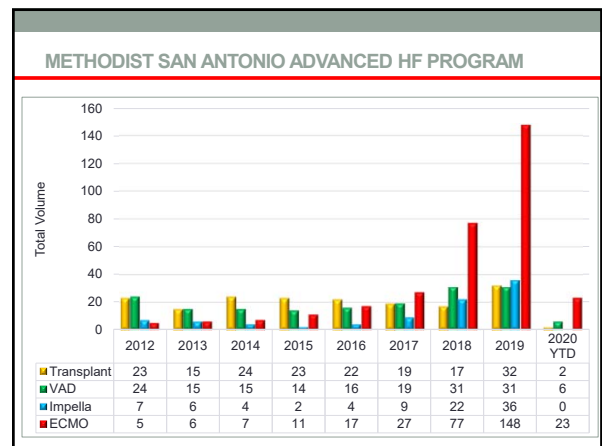
### Elements of Shock Team

Element	On call Physician representative	Responsibilities	Necessary Components
1. Intensive Care Unit	Coordinating physician (intensivist or cardiologist)	<ul style="list-style-type: none"> <li>Diagnosis</li> <li>Triage</li> <li>Activation of additional team members</li> <li>Medical management</li> <li>Invasive hemodynamic monitoring</li> <li>Maintenance of hemodynamic support devices</li> </ul>	<ul style="list-style-type: none"> <li>24 hr onsite physician</li> <li>24 hr nursing support for vasopressor and inotrope infusion, PA catheters and hemodynamic support devices.</li> </ul>
2. Cardiac catheterization laboratory	Interventional cardiologist Advanced Heart Failure cardiologist	<ul style="list-style-type: none"> <li>Revascularization for AMI</li> <li>Percutaneous hemodynamic support device placement</li> </ul>	<ul style="list-style-type: none"> <li>On call nurse and technician team</li> <li>24 hr cathlab availability</li> </ul>
3. Cardiothoracic surgery	Cardiothoracic surgeon	<ul style="list-style-type: none"> <li>ECMO placement</li> <li>Temporary VAD placement</li> <li>Heart transplantation</li> </ul>	<ul style="list-style-type: none"> <li>On call OR staff</li> <li>On call perfusionist team</li> <li>24 hr operating room availability</li> </ul>
4. Advanced heart failure	Advanced heart failure cardiologist	<ul style="list-style-type: none"> <li>Coordinate medical evaluation and listing for heart transplantation and durable VAD</li> <li>Identify treatment options for patients with decompensated CHF</li> </ul>	<ul style="list-style-type: none"> <li>Participation in united network for organ sharing (UNOS)</li> <li>Mature VAD program</li> </ul>

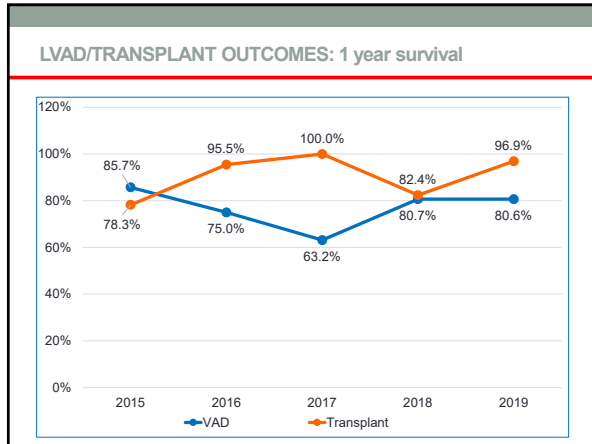
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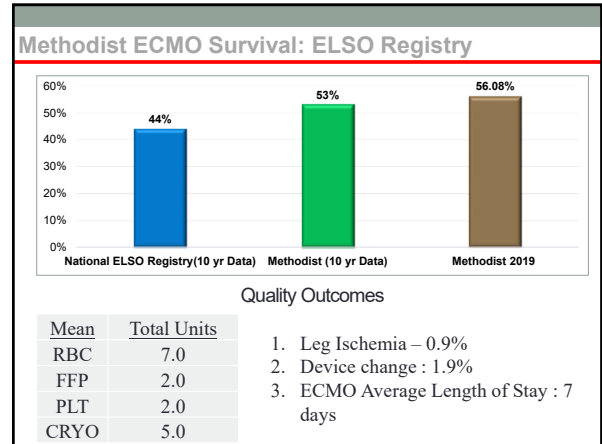
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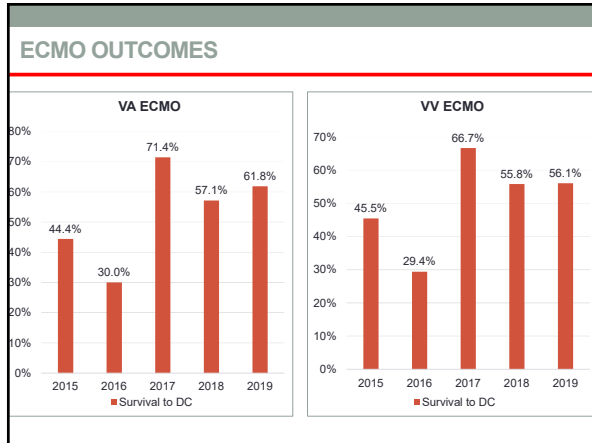
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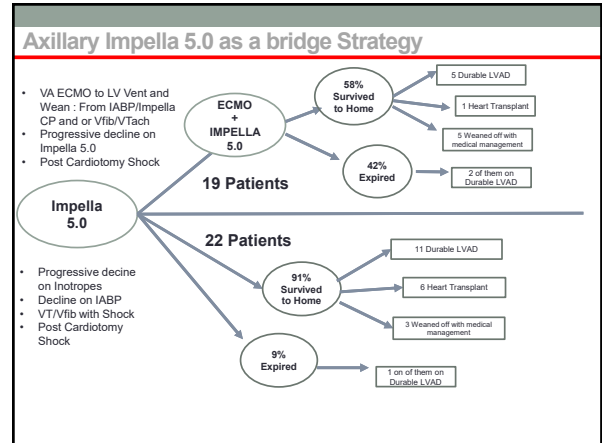
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### CASE REVIEW

H.Y. 17 yr old female with no medical history. Awoke at 05:00 clutching chest, collapsed, and stopped breathing, witnessed by her mother. The mother initiated 911 at neighbors house, then began CPR at three min post arrest.

- Initial Arrest 05:00
- Min 3 – CPR initiated
- Min 9 – EMT at bedside
- Min 13 – First defibrillation
- Min 13 – LUCAS applied
- Intermittent ROSC
- Min 50 – Arrival at Methodist
- Min 53 – Cath lab arrival
- Min 63 – Art and Vein access (On LUCAS)
- Min 72 –initiation of VA ECMO**

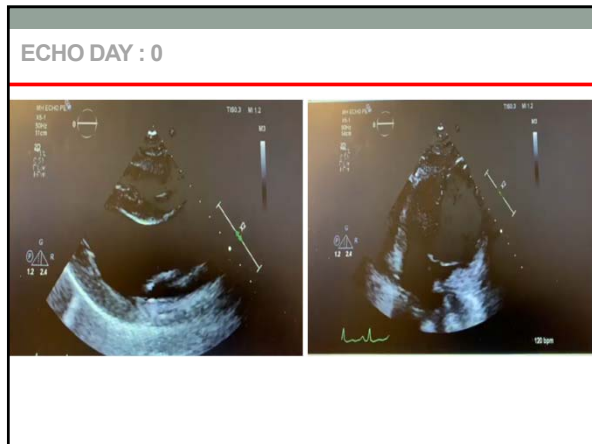
- Amio given 4 times with 4 separate defibrillations

Pre-Labs	
pH	7.1
PaCO2	70.8
HCO3	22
SaO2	91
SpO2	93
FI02	100
Lactate	8.8
BP	Lucus
Hemoglobin	16

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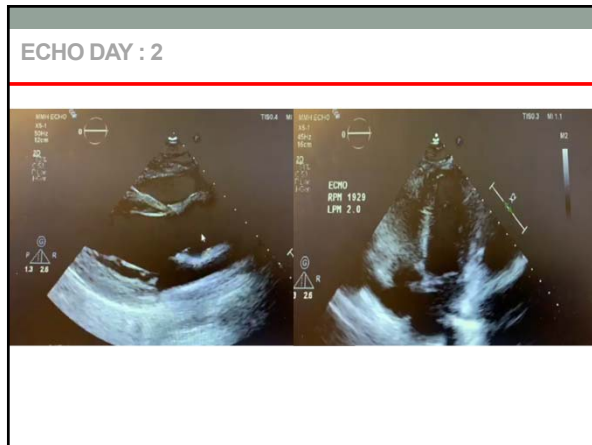


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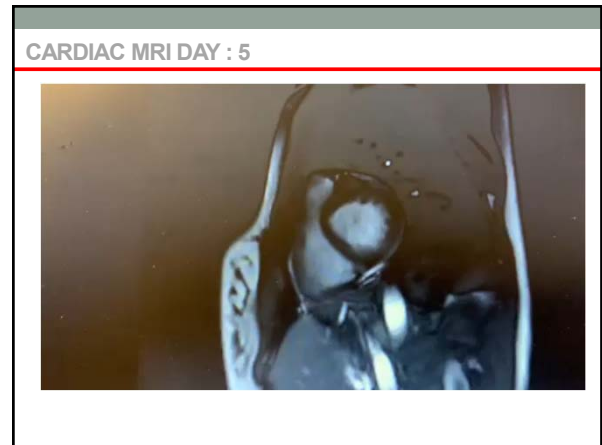
### HOSPITAL COURSE

VA ECMO ECPR	Implant 9/27 0615	Explant 9/29 1349	Discharge 10/5 1718
	Pre-Labs	6 Hr Post-Labs	24 Hr Post-Labs
pH	7.1	pH 7.52	pH 7.47
PaCO2	70.8	PaCO2 26.6	PaCO2 33
HCO3	22	HCO3 21.5	HCO3 23.9
SaO2	91	SaO2 127.5	SaO2 154.8
SpO2	93	SpO2 98.9	SpO2 99.1
SVO2		SVO2 49	SVO2 87
FIO2	100	FIO2 40	FIO2 40
Lactate	8.8	Lactate 3	Lactate 1.3
BP	Lucus	BP 84/70	BP 131/77
MAP		MAP 75	MAP 95
WBC		WBC 17.5	WBC 17.4
Creatinine		Creatinine 0.74	Creatinine 0.72
Hemaglobin	16	Hemaglobin 12	Hemaglobin 10
		EF <20%	

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### Cardiogenic Shock

- Early identification
- Risk stratification
- Optimization of Meds
- Multidisciplinary Team approach
- Screening for advanced therapies
- Palliation

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