Implementation of a Cardiogenic Shock Protocol and Data Review Process is Associated With Improved In-Hospital Survival

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**Recommended Citation**

Jones, Adrienne; Swanson, Renee; Spinelli, Kateri; Remick, Joshua; Westerdahl, Daniel; Gelow, Jill M; Hotchkim, David; Wells, Jason; Lewis, Tim; Kim, Robert; Robinson, Jeff; Barr, Roxanna; Ramelli, Sarah; and Abraham, Jacob, "Implementation of a Cardiogenic Shock Protocol and Data Review Process is Associated With Improved In-Hospital Survival" (2020). *Articles, Abstracts, and Reports*. 2726.  
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Background

Despite increasing use of mechanical circulatory support devices (MCS), cardiogenic shock (CS) mortality in hospitals remains persistently high, with worsening outcomes in later stages of CS. Delays in diagnosis and practice variation may contribute to in-hospital mortality.1

Objective

To develop a CS protocol that promotes early CS recognition and rapid notification of a multi-disciplinary specialty team at 2 Providence hospital facilities (PSVMC, PPMC).

Methods

- Quality improvement initiative launched in June 2018 to identify, evaluate, treat and monitor outcomes for CS patients
- CS was defined by widely accepted criteria.2,3
- Team included advanced heart failure (AHF) physicians, hospitalists, interventional cardiologists (IC), ED physicians, intensivists, cardiac surgeons, MCS coordinator, STEMI coordinator and transfer center nurses
- A report was generated in the electronic medical record (EMR) to identify patients with shock in the problem list
- CS diagnosis was confirmed by chart review by a CS RN coordinator and adjudicated by an AHF cardiologist
- Clinical data points abstracted by CS RN coordinator and shared with multi-disciplinary specialty team
- Multiple care units were educated on the CS criteria and treatment protocol

Cardiogenic Shock Collection Form

DOS:

Cardiogenic Shock Team Activation

<table>
<thead>
<tr>
<th>Type</th>
<th>Patient Name</th>
<th>DOB</th>
<th>MRN</th>
<th>RM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer MD</td>
<td>Artrial Hospital</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>PSVMC ED MD</td>
<td>Transfer Center</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>ICU MD</td>
<td>Transfer Center</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>Admitting MD</td>
<td>Arrives to ICU</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>ICU MD</td>
<td>Device</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>Cardiologist</td>
<td>Device</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>ICU</td>
<td>Device</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>Surgeon</td>
<td>Device</td>
<td>NAME</td>
<td>Date</td>
<td>Time</td>
</tr>
</tbody>
</table>

Pathology Care: CVL Team

Additional variables collected: Echo/EF, EKG, labs, VS, drips, heart cath, & cardiac arrest data

CVL = cardiovascular lab, DOB = date of birth, ED = Emergency Department, HF = heart failure, ICU = intensivist on call, MOA = mode of arrival, MRN = medical record number, PPMC = Providence Portland Medical Center, PSV = Providence St. Vincent Medical Center, RM = room

Cardiogenic Shock Protocol

- Identification of CS patients grew from 4 patients at program start to >50 patients per month
- Volume increased by 257% from 2018 (146 cases, annualized volume based on June-Dec) to 2019 (521 total cases)
- CS in-hospital mortality rate decreased from 50% to 21% across the study period, an average of 1.0 percentage point decrease per month

Conclusions

- Following implementation of a CS protocol at two hospitals in a large integrated health system, CS diagnosis increased and mortality decreased
- Ongoing work includes identifying CS diagnosis from discharge stratiﬁcation, stratiﬁng patients by shock stages, and improving the transfer process from other hospitals


Acknowledgement and funding: N/A

Disclosures: None