



American Heart Association®

Cardiogenic Shock Registry

Powered by Get With The Guidelines®

Cardiogenic Shock (CS) Coding Instructions

August 2026

The Cardiogenic Shock Coding Instructions were revised to allow for easier navigation of the data elements present in the tool and to allow for a more uniform format for each data element. This document follows along with each tab in the tool, in the order in which the elements are seen. Each tab contains its own Table of Contents of data elements. Simply click on the tab to view each element within the tab. You can also use Ctrl+F, a keyboard shortcut, to open a find box to find specific data elements or phrases within this document.

Legend:

- **Yellow Highlighted Text** = Updated since last version of the document

Contents

Entry Criteria	9
Include:.....	9
Exclude:	9
Additional guidance for patient identification:	9
Abstraction Guidelines	10
Suggested Sources	12
Admission Data may include:.....	12
Discharge Data may include:	13
Demographics	14
Patient ID.....	14
Sex	14
Patient Gender Identity	15
Patient Identified Sexual Orientation	16
Date of Birth.....	17
Age	18
Patient Postal Code	19
Payment Source:	19
Race and/or Ethnicity	20
Hispanic Ethnicity, If Yes (type)	22
Admission	24

Internal Tracking ID:	24
Arrival Date/Time	24
Point of Origin for admission	25
Referring Hospital	26
Referring Hospital Arrival Date/Time	26
Referring Hospital Discharge Date/Time	27
Initial Point of Hospital Arrival.....	28
Medical History (select all that apply):	29
Medications used prior to admission (select all that apply):	34
P2Y12 Inhibitor prior to admission.....	36
Date/Time of Vital Signs (Initial Vital Signs)	36
Initial Vital Signs.....	37
Admission Labs.....	38
Most favorable neurological status at admission	40
Shock Onset.....	41
Certainty of shock etiology	41
Where was the onset of Cardiogenic Shock present?.....	41
Cardiac arrest prior to shock onset?	42
Most favorable neurological status after the arrest and prior to hospital discharge:	43
Onset of shock (Date/Time):.....	43
Was a multidisciplinary shock team involved in patient management?	44
If multidisciplinary shock team was involved, select the timeframe:.....	45
SCAI Shock Stage at Onset (First 6 hours of Shock):.....	45
SCAI Shock Stage Serial Assessment (Assessed at 6h-12h):.....	46
Signs and Symptoms of Inadequate Perfusion Present?.....	47
Presenting Physiology:	48
Was Left Ventricular Ejection Fraction (LVEF) documented?	49
LVEF – Quantitative	49
Cardiogenic Shock Category:	50
Etiologies and Contributors to Cardiogenic Shock:	50
Medications administered at onset of shock:	51
P2Y12 Inhibitor at onset of shock	52
Exams/Labs at Shock Onset (Enter Values Closest to Shock Onset)	53
Transfer	57
Date/Time of Assessment – Transfer	57

Did a cardiac arrest occur at the referring facility prior to transfer?.....	57
Presence of a Pulmonary Artery Catheter (PAC) - Transfer	58
Presence of a Mechanical Ventilation - Transfer.....	58
Presence of Renal Replacement Therapy - Therapy	58
Exams/Labs at Transfer (Enter Values Closest to Shock assessment at the transferring hospital)	59
Peak Lactate prior to transfer	60
Lowest pH prior to transfer.....	61
Peak ALT prior to transfer	61
Vasoactive Medications at time of assessment- Transfer.....	61
Presence of MCS Device(s) at assessment - Transfer	62
Vascular complication requiring intervention? - Transfer	63
Date/Time of vascular complication requiring intervention - Transfer.....	63
Complications of ECMO - Transfer	64
In-Hospital Care	65
Cardiovascular Procedures during this hospitalization:	65
Was a right heart catheterization or pulmonary artery catheterization performed?	67
Was the PA catheter used for a period of hemodynamic monitoring outside the cath lab/OR?.....	67
Was the patient managed with invasive mechanical ventilation at any time during the hospitalization?	67
Primary indication for advanced respiratory therapy?	68
Date/time of first intubation related to this hospitalization?.....	69
Extubation.....	69
Date/time of extubation	69
Was the patient managed with renal replacement therapy at any time during the hospitalization?	70
If yes, select type of renal replacement therapy used.....	70
Primary indications for advanced renal therapy	71
Was the patient admitted to ICU at any point during hospitalization?	71
Severe/Moderate GUSTO Bleeding Event	72
Intracranial Hemorrhage	72
Cardiac Arrest	73
Stroke	74
Complications from procedures during this admission:.....	75
Mechanical Circulatory Support Form (MCS)	76
Implanted device for this form:	76

Date/Time of implant procedure – VA ECMO:	76
Died with implant in place – VA ECMO	77
Device explant date/time – VA ECMO:	77
Arterial Implant Site – VA ECMO:	78
Venous Implant Site – VA ECMO:.....	79
Receiving CPR at time of Implant – VA ECMO:	79
Reason for device implant- VA ECMO:	80
Vascular closure applied – VA ECMO:.....	82
IABP Manufacturer & Model:	82
IABP Catheter Manufacturer & Model:.....	83
IABP Balloon Size:.....	83
Date/Time of implant procedure – IABP:.....	84
Died with implant in place – IABP:.....	84
Device explant date/time – IABP:.....	85
Implant Site – IABP:	85
Receiving CPR at time of Implant – IABP:	86
Reason for device implant- IABP:	86
Vascular closure applied – IABP:.....	88
Date/Time of implant procedure –Impella:	88
Died with implant in place – Impella.....	89
Device explant date/time – Impella:.....	89
Implant Site – Impella:	90
Receiving CPR at time of Implant – Impella:	90
Reason for device implant- Impella:	91
Vascular closure applied – Impella:.....	92
Date/Time of implant procedure –iVAC:	92
Died with implant in place – iVAC:	93
Device explant date/time – iVAC:	93
Implant Site – iVAC:.....	94
Receiving CPR at time of Implant – iVAC:.....	94
Reason for device implant- iVAC:.....	95
Vascular closure applied – iVAC:	96
Date/Time of implant procedure –TandemHeart:	96
Died with implant in place – TandemHeart:.....	97
Device explant date/time – TandemHeart:.....	97
Implant Site – TandemHeart:	98

Receiving CPR at time of Implant – TandemHeart:	99
Reason for device implant- TandemHeart:	99
Vascular closure applied – TandemHeart:	100
Was a dual lumen venous catheter (e.g. ProtekDuo) used?	100
Date/Time of implant procedure –Temporary Surgical VAD:.....	101
Died with implant in place – Temporary Surgical VAD:.....	101
Device explant date/time – Temporary Surgical VAD:.....	102
Was an oxygenator used with this temporary surgical VAD?	102
Implant Site – Temporary Surgical VAD:	103
Receiving CPR at time of Implant – Temporary Surgical VAD:	103
Reason for device implant- Temporary Surgical VAD:	104
Vascular closure applied – Temporary Surgical VAD:.....	104
Date/Time of implant procedure –Other:.....	105
Died with implant in place – Other:.....	106
Device explant date/time – Other:.....	106
Implant Site – Other:	107
Receiving CPR at time of Implant – Other:	107
Reason for device implant- Other:	108
Vascular closure applied – Other:.....	108
ECMO	109
Pre-ECMO Events.....	109
Select any current device(s) supporting patient pre-ECMO	109
Circumstances of ECMO Cannulation (select all that apply)	110
GCS Score (if assessed immediately pre-ECMO).....	110
Is there an ELSO record for this patient?	111
If yes, enter ELSO Patient Record Number (optional)	111
Vascular Access & Initiation of ECMO	112
Date/Time ECMO started	112
Cannulation Anatomical Site (check all that apply)	112
Cannula size (Fr)	113
Cannula Manufacturer	113
Cannula Model.....	114
Type of Cannulation	114
Purpose	115
Date/Time of Insertion	115

Was the cannula removed for a reason other than death?	115
Date/Time of Removal	116
LV Decompression	116
LV Decompression Procedures (select all that apply) and date/time of procedure, if known	116
Rationale for Decompression on ECLS (select one)	117
ECMO Cannulation Location.....	118
ECMO Cannulation Location (area).....	118
Team Member(s) Performing ECMO Cannulation:.....	118
EMCO Circuit and Components	119
Pump	119
Common Device Used	120
Console/Drive Manufacturer / Name:.....	120
Oxygenator Manufacturer / Name:	120
Safety features incorporated in the ECMO circuit for this event.....	121
Was any component exchanged or replaced?.....	121
Component exchanged.....	122
Reason(s) for exchange.....	122
Date/Time of exchange.....	123
Neurological injury or events detected during ECMO or after ECMO (less than 6 weeks after separation from ECMO or by Hospital Discharge, which ever one comes first).....	123
Other Complications/Events	125
Device-Related Events	125
Other ECMO Complications/Events	125
Outcomes/End of Event.....	126
Date/Time ECMO ended.....	126
SAVE (Survival After Veno-Arterial ECMO Score)	127
Reason(s) ECMO ended.....	127
Serial Shock Assessment.....	129
Date/ Time of Assessment:	129
SCAI Stage:.....	129
Presence of a Pulmonary Artery Catheter (PAC) - Serial Assessment:.....	130
Presence of Mechanical Ventilation - Serial Assessment:	131
Presence of Renal Replacement Therapy - Serial Assessment:	131
Set of Hemodynamics During this Follow Up:	131
Peak Lactate Since the Last Assessment:	133

Lowest pH Since the Last Assessment	133
Peak ALT Since the Last Assessment.....	134
Vasoactive Medications at Time of Assessment (check all that apply)	134
Presence of MCS Device(s) at Assessment (If MCS is present, select all that apply)	135
Was there a device upgrade/escalation since the prior assessment?.....	135
If Yes, Select Reason(s) for Device Upgrade or Escalation since the Prior Assessment	136
Was there a device de-escalation since the prior assessment?.....	136
If Yes, Select Reason(s) for Device Downgrade or De-Escalation Since the Prior Assessment	137
Vascular Complication Requiring Intervention	137
If Yes, Enter Date	138
Complications of ECMO	138
Discharge	140
Discharge Disposition.....	140
Date/Time of Discharge from hospital.....	141
Was the patient placed on Comfort Measures Only at any time during this admission?.....	141
Date/Time of Comfort Measure only:	142
Most favorable neurological status at discharge	143
If patient died, Date/Time of death	143
Primary Cause of Death	144
If Cardiovascular, what was the primary cause of death	144
If Non-Cardiovascular, what was the primary cause of death	145
Other Contributors to Cause of Death (if applicable).....	146
If other health care facility:	146
Transferred to:.....	147
Reason for transfer.....	148
During this admission, was a standardized health related social needs form or assessment completed?	148
If yes, identify the areas of unmet social needs (select all that apply):	149
If unmet social need(s) identified, were resources provided to the patient?	150
If yes, what resources were provided?.....	150
DanGer Like Patient:	151
SHARC Category:	151
Appendix	152
GWTG Guidelines for Abstraction to Determine When to Select Medical History= Smoker...	152
Gusto Bleeding Criteria	152

Other definitions:	153
Vascular Access Site Adverse Events	153
Populations for Cardiogenic Shock Research.....	156
SHARC Working Definition for Clinical Trials or registries.	157
ECMO Abbreviations	157
Cannula Manufacturer & Cannula Model Name List.....	158
ECMO Manufacturer & Pump Name List	161
Descriptors of Shock Stages	163

Entry Criteria

Include:

All patients with:

- A clinical **diagnosis of Cardiogenic Shock** (primary or secondary Dx) AND
- Are at least **18 years** of age.

Cardiogenic shock is defined as a sustained (>30 min) episode of hypoperfusion evidenced by systolic blood pressure < 90 mm Hg and/or, if available, cardiac index < 2.2 L/min per square meter determined to be secondary to cardiac dysfunction and/or the requirement for parenteral inotropic or vasopressor agents or mechanical support (e.g., IABP, extracorporeal circulation, VADs) to maintain blood pressure and cardiac index above those specified levels. The hemodynamic compromise (with or without extraordinary supportive therapy) must persist for at least 30 min.

To meet the definition of shock, the patient must have one or more signs or symptoms of end-organ hypoperfusion. Signs and symptoms of inadequate perfusion include:

- Elevated serum lactate [>2 mmol/L]
- Acute kidney injury (Creatinine $\geq 2 \times$ ULN or oliguria (e.g., urine output <0.5 mL/kg/hour)
- Acute hepatic injury (e.g., alanine aminotransferase [ALT] or aspartate aminotransferase [AST] $>3 \times$ upper limit of normal)
- Cool or mottled extremities
- Altered mental status (in absence of another cause)

Hemodynamic Criteria (optional):

Cardiac Index ≤ 2.2 L/min/m² (from pulmonary artery catheterization, non-invasive cardiac output monitors, or echocardiography)

Exclude:

- Patients under 18 years of age
- Patients not diagnosed with Cardiogenic Shock

See below for the applicable diagnosis, procedure, and billing codes. **Please refer to the above Entry Criteria FIRST to determine which cases to include into the registry.**

Additional guidance for patient identification:

Diagnosis Codes:

- **R57.0 Cardiogenic shock**
- R57 Shock, not elsewhere classified
- R57.8 Other shock
- R57.9 Shock, unspecified
- **T81.11XA Post Procedural Cardiogenic Shock**

CPT Codes:

- **33990** Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; left heart arterial access only
- **33991** Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; left heart, both arterial and venous access, with transseptal puncture
- **33992** Removal of percutaneous left heart ventricular assist device, arterial or arterial and venous cannula(s), at separate and distinct session from insertion
- **33993** Repositioning of percutaneous right or left heart ventricular assist device with imaging guidance at separate and distinct session from insertion
- **33995** Insertion of ventricular assist device, percutaneous, including radiological supervision and interpretation; right heart, venous access only
- Removal of percutaneous right heart ventricular assist device, venous 33997 cannula, at separate and distinct session from insertion

ICD-10 Procedure Codes:

- **5A0221D** Assistance with Cardiac Output using Impella pump, Continuous
- **5A02216** Assistance with Cardiac Output using Other Pump, Continuous

Additional Resources:

- Populations for Cardiogenic Shock **for research**
- SHARC working definition **for clinical trials or registries**

Abstraction Guidelines

- Do not enter any personal health information/protected health information (PHI) in any free text "Comments" fields or any Custom Field or historic Optional Fields.
- Make use of the Suggested Sources for Abstraction as a guide to help find medical documentation for each data element. Only abstract data which is clearly documented in the medical records.
- Date Precisions: Date and Time fields have an additional "Precision" drop-down right above the MM/DD/YYYY HH:MM blanks. The Precision is used to indicate how much of the Date and Time data is known and can be abstracted. For most of the Date and Time fields, there are three Precision levels.
 - The default level is "MM/DD/YYYY HH:MM". This is used if the entire Date and Time information is available. Time should be entered in 24hr/Military format.

MM/DD/YYYY HH:MM ▼

MM

/

DD

/

YYYY

HH

:

MM



- If the Time is ND, select a Precision of "MM/DD/YYYY". The "HH:MM" blanks will become grayed-out.

- c. If the Date is ND, select a Precision of "Unknown". The whole "MM/DD/YYYY HH:MM" field will become grayed-out.

General Notation

- CS = Cardiogenic Shock
- ED = Emergency Department
- ND = Not Documented. Select ND when there is no documentation in the medical record to explain why a treatment or intervention is not performed.
- UTD = Unable to determine

For each element, you will find the following breakdown of information:

- Required or Optional: Whether the element is required to complete the patient entry or optional.
- Tab: The tab the element is located on in the IRP.
- Variable Name: The element's variable name, which can also be found in the CSV uploader manual.
- Definition: The definition of the data element.
- Question: The question the element is asking you to answer.
- Format: The format of the element to be answered. The formats include:
 - Single Select
 - Multi-Select
 - Drop Down
 - Text Field
 - MM/DD/YYYY
 - HH:MM
- Allowable Values: The response options allowable for the data element.
- Notes for Abstraction: Guidance for abstractors specific to the element.
- Suggested Data Sources: Data sources where you might find the information required to respond to the element.
- Change Log: When the coding instructions for this element were last updated.

Please note the severity of validation alerts within IRP:

There are three levels of validation alerts: critical, error, warning. Each severity level displays in a consistent format which is distinct from the other severity levels.

Type of Validation	Appears As	Meaning
Critical	 Patient ID is required. Please enter a value. af1-patient_display_id_reqi	You must address critical validation alerts in order to save a record.

Error	Sex  Sex is required. Please enter a value. QCAD193	You can save a record as incomplete without addressing errors. Records without this information may appear in measures results as applicable. Please refer to measure description documents for the elements needed for measure calculations.
Warning	Height  Please provide the height or select Not documented. QAFIB0046	You can save a record as complete without addressing warnings. Elements with a warning message are not required and will not impact measure calculations. However, data will be more robust if these elements are answered.

Suggested Sources

The suggested sources per element are not exhaustive and may include all other forms of documentation available in different settings:

Admission Data may include:

- Admission Sheet:
 - Physician documentation (including Admitting physician notes, consultation notes, ED physician notes, Physician's hospital admission, transfer, or ED discharge notes, progress notes)
 - ED documentation (including ED nurse notes, ED order sets or pathway documentation, ED physician notes, ED record, ED triage sheet, Registration form, ED vital signs graphical record)
 - Inpatient documentation (including physician notes, history and physical, medication documentation, nurse progress notes, nursing admission assessment note, physical or occupational therapy consultation or progress notes, speech pathology consultation or progress notes, diet or nutrition services consultation or progress notes)
- Hospitalization Data may include:
 - Physician documentation (including Acute physician or nursing notes, Acute Stroke Pathway documentation, Consultation progress notes, Diagnostic report, Physician progress notes, Progress notes)
 - Inpatient documentation (including physician notes, history and physical, medication documentation, nurse progress notes, nursing admission assessment note, physical or occupational therapy consultation or progress notes, speech pathology consultation or progress notes, diet or nutrition services consultation or progress notes)
 - Medication Results (including Medication order sheets, Medication ordering system in the computer)

- Orders (including Physician order sheets, Printed or Electronic order sheets, rt-PA Protocol Sheets)
- Lab Results
- Social services notes

Discharge Data may include:

- Care plans
- Clinical logs
- Clinician encounter sheets
- Consultant reports
- Discharge face sheet
- Discharge form
- Discharge instruction sheet
- Discharge Orders
- Discharge Summary
- Flow sheets
- Multidisciplinary progress notes
- Nursing discharge notes
- Physician summary
- Referral notes
- Teaching sheets
- Transfer note
- Transfer record
- Physical or occupational therapy consultation or progress notes
- Diet or nutrition services consultation or progress notes

Demographics

Patient ID

Tab: Demographics

Variable Name: patient_display_id

Definition: A unique number assigned to the patient by the site for that admission. Identifiers should **NOT** contain personal health information (PHI) such as name, social security or medical record number.

Question: What is the patient ID?

Format: Custom Text

Allowable Values: Alpha- numeric field

- Customized for each site
- Once created, number is case-sensitive

Notes for Abstraction:

- When creating a new Patient ID, do **NOT** use date of birth, social security numbers, and/or other identifiers associated directly with the patient. Recommendation is to create a random number in IRP that corresponds to a specific patient on your end.
 - Example: You might use numbers, letters or any combination, e.g. BMC019.
- If a patient has not been entered in the tool, please follow the mapping rules provided by your site to create a unique number for the patient.

If a Patient ID has previously been entered, access the **Patient Grid** and locate the record(s) by using the Search function. Open the **Action** feature located to the left of the Patient ID you have searched and select **Add New CS Form** to create a new admission for the same patient. Multiple records for a single Patient ID can be entered into the registry.

Suggested Data Sources: Your site coordinator instructions for mapping between internal hospital tool and IRP.

Change Log: March 2023

Sex

Tab: Demographics

Variable name: sex

Definition: The patient's documented sex (at birth) on arrival at the hospital.

Question: What is the patient's sex?

Format: Single Select

Allowable Values:

- Male
- Female
- Unknown

Notes for Abstraction:

- Collect the documented patient gender at admission or the first documentation after arrival.
- Consider the gender to be unable to be determined and select "Unknown" if:
 - The patient refuses to provide their sex.
 - Documentation is contradictory.
 - Documentation indicates the patient is a Transsexual.
 - Documentation indicates the patient is a Hermaphrodite.
 - Documentation indicates the patient is Non-binary.

Suggested Data Sources:

- Admission Sheet
- Registration Form
- Referral Notes

Change Log: March 2023

Patient Gender Identity

Tab: Demographics

Variable Name: patgenid

Definition: The gender identity, self-identified by the patient. This may or may not match sex assigned at birth.

Question: What is the patient's self-identified gender?

Format: Single Select

Allowable Values:

- Male
- Female
- Female-to-Male (FTM)/Transgender Male/Trans Male
- Male-to-Female (MTF)/Transgender Female/Trans Female
- Genderqueer, Neither Exclusively Male nor Female
- Additional Gender Category or Other
- Did not Disclose

Notes for Abstraction:

- Select "Female-to-Male (FTM)/Transgender Male/Trans Man" if the patient was assigned the female sex at birth but currently identifies on the male spectrum. (Also known as a transgender man)
- Select "Male-to-Female (MTF)/Transgender Female/Trans Woman" if the patient was assigned the male sex at birth but identifies on the female spectrum. (Also known as a transgender woman).

- Select "Genderqueer, neither exclusively male nor female" if the patient's sex identity and/or gender expression falls outside the binary categories of male or female. Patient may define their sex as falling somewhere in between male and female, or they may define it as wholly different from these terms.
- Select "Additional Gender Category or Other" if the patient self-identifies with any other gender that is not listed above, then specify in the blank section provided.

References:

- CDC Terminology: Derived from APA's Definitions Related to Sexual Orientation and Gender Diversity and WHO's Gender, Equity and Human Rights – <https://www.cdc.gov/healthyouth/terminology/sexual-and-gender-identity-terms.htm>
- ONC (HealthIT.gov): Includes LOINC and SNOMED Codes – Representing Sexual Orientation and Gender Identity – <https://www.healthit.gov/isa/section/sex-birth-sexual-orientation-and-gender-identity>
- US Dept. Of Health & Human Services/CDC – Sexual Orientation Survey: A Quality Assessment – https://www.cdc.gov/nchs/data/series/sr_02/sr02_169.p

Suggested Data Sources:

- Admission Data
- Care Plans
- Transfer Notes
- History and Physical

Change Log: March 2023

Patient Identified Sexual Orientation

Tab: Demographics

Variable Name: patorien

Definition: The self-reported sexual orientation of the patient. Also defined as the gender(s) to which a person is physically attracted.

Question: What is the patient's self-identified sexual orientation?

Format: Single Select

Allowable Values:

- Straight or heterosexual
- Lesbian or gay
- Bisexual
- Queer, pansexual, and/or questioning
- Something else; please specify
- Don't know
- Declined to answer

Notes for Abstraction:

- Straight or heterosexual – Select this option if the patient reports an orientation of sexual attraction to members of the opposite sex.
- Lesbian or gay – Select this option if the patient reports an orientation of sexual attraction to members of the same sex.
- Bisexual – Select this option if the patient reports an orientation of sexual attraction to both males and females, or where the sexual attraction is not exclusive to people of one particular gender.
- Queer, pansexual, and/or questioning – Select this option if the patient reports any of these options:
 - Pansexual – Refers to a person who is sexually and/or romantically attracted to persons of any gender identity and/or biological sex. Pansexual people may also refer to themselves as gender-blind.
 - Queer – Refers to a person whose attractions and/or romantic relationships are not heterosexual or whose gender identities are not the same as those assigned at birth.
 - Questioning – This term describes someone who is questioning their sexual orientation or gender identity
- Select "Something else; please specify" if the patient self-identifies with any other sexual orientation that is not listed above, then specify in the blank section provided.

References:

- CDC Terminology: Derived from APA's Definitions Related to Sexual Orientation and Gender Diversity and WHO's Gender, Equity and Human Rights – <https://www.cdc.gov/healthyouth/terminology/sexual-and-gender-identity-terms.htm>
- ONC (HealthIT.gov): Includes LOINC and SNOMED Codes – Representing Sexual Orientation and Gender Identity – <https://www.healthit.gov/isa/section/sex-birth-sexual-orientation-and-gender-identity>
- US Dept. Of Health & Human Services/CDC – Sexual Orientation Survey: A Quality Assessment – https://www.cdc.gov/nchs/data/series/sr_02/sr02_169.pdf

Suggested Data Sources:

- Admission Data
- Care Plans
- Transfer Notes
- History and Physical

Change Log: March 2023

Date of Birth

Tab: Demographics

Variable Name: dob

Definition: The month, day, and year the patient was born.

Note:

- Patient's age (in years) is calculated by Arrival Date minus Birthdate. The algorithm to calculate age must use the month and day portion of arrival date and birthdate to yield the most accurate age.

Question: What is the patient's date of birth?

Format: MM/DD/YYYY

Allowable Values:

- MM = Month (01-12)
- DD = Day (01-31)
- YYYY = Year (1900 - Current Year)

Notes for Abstraction:

- Since this data element is critical, the abstractor should NOT assume that the claim information for the birthdate is correct. If the abstractor determines through chart review that the date is incorrect, she/he should correct and override the downloaded value. If the abstractor is unable to determine the correct birthdate through chart review, she/he should default to the date of birth on the claim information.

Suggested Data Sources:

- Admission Data
- Emergency Department Record
- Face Sheet
- Registration Form
- UB-04

Change Log: March 2023

Age

Automatically calculated

Tab: Demographics

Variable Name: age

Definition: The patient's age is automatically calculated based on the arrival date and the patient's date of birth. The age cannot be amended by an abstractor.

Question: What is the patient's age?

Format: Text Field

Allowable Values:

- Numerical Value

Notes for Abstraction:

- If the abstractor determines through medical record review that the UB-04 day is incorrect, they should correct and override the download value.
- If the abstractor is unable to determine the correct birth date through medical record review, they should default to the UB-04 date of birth.

Suggested Data Sources:

- Patient Registration
- UB-04

Change Log: February 2024

Patient Postal Code

Tab: Demographics

Variable Name: zip

Definition: Record the postal code of the patient's residence. For United States Zip Codes, the hyphen is implied.

Question: What is the patient's zip code?

Format: Custom Text

Allowable Values:

- Numerical Value
- Alpha-Numeric Combination dependent on patients' residence

Notes for Abstraction:

- If the patient is determined to not have a permanent residence, then the patient is considered homeless and *Homeless* should be checked.
- If the patient resides in another country, the zip or postal code from that country should be entered as a string of alpha-numeric characters (e.g. The zip code for a patient who lives in Bras d'Or, Canada should have their zip code entered as, "B1Y3X9" with no spaces.
- If the postal code of the patient is unable to be determined from medical record documentation, enter the provider's postal code.

Suggested Data Sources:

- Admission Data
- Medical Record
- Transfer Notes

Change Log: March 2023

Payment Source:

Variable Name: paysource

Definition: Indicate the health insurance status for this patient.

Question: What is the patient's payment source?

Format: Multi Select

Allowable Values:

- Medicare
- Medicare – Private/ HMO/ PPO/ Other
- Medicaid
- Medicaid – Private/ HMO/ PPO/ Other
- Private/ HMO/ PPO/ Other
- VA/ CHAMPVA/ Tricare
- Self-Pay/ No Insurance
- Indian Health Services
- Other/ Not Documented/ UTD

Notes for Abstraction:

- Medicare – Traditional Fee for Service Medicare parts A, B and D
- Medicaid – State Medicaid or Joint State/Federal Program. This program provides health insurance to individuals who have low income, including persons who are blind or disabled.
- Medicare – Private/ HMO/ PPO/ Other – Medicare Advantage Part C Programs
- Medicaid – Private/ HMO/ PPO/ Other – Medicaid Advantage Programs
- Private/ HMO/ PPO/ Other – Commercial insurance (Not Medicare/ Medicaid) typically tied to employer based plans If checking “Self-Pay/ No Insurance” or “Other/ Not Documented/ UTD” then no other selections should be checked.
- Patients may have a combination of “Medicare,” “Medicaid,” and “Private/ HMO/ PPO/ Other” and “VA/ CHAMPVA/ Tricare.”
- Patients may have a combination of “Medicare Title 18,” “Medicaid Title 19,” “Medicare – Private/ HMO/ PPO/ Other,” “Medicaid – Private/HMO/PPO/Other,” “Private/ HMO/ PPO/ Other,” and “VA/ CHAMPVA/Tricare.”
- States may use alternative names for Medicaid within their respective states. Be mindful of your states’ name for Medicaid (e.g. MassHealth)

Suggested Data Sources:

- Admission Data
- Discharge Data

Change Log: March 2023

Race and/or Ethnicity

Tab: Demographics

Variable Name: race

Definition: Select the patient’s self-assessed race and/or ethnicity, or if not available, the physician or institution’s assessment.

Question: What is the patient’s race and/or ethnicity?

Format: Multi Select

Allowable Values:

- American Indian or Alaska Native – A person having origins in any of the original peoples of North, Central, and South America including, for example, Navajo Nation, Blackfeet Tribe of the Blackfeet Indian Reservation of Montana, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, Aztec, and Maya.

- Asian – A person having origins in any of the original peoples of Central or East Asia, Southeast Asia, or South Asia, including for example, Chinese, Asian Indian, Filipino, Vietnamese, Korean, Japanese, or other including, but not limited to Cambodian, Malaysian, Hmong, and Thai. If Asian, select the specific sub-category (or sub-categories) that apply from the list provided:
 - Asian Indian
 - Chinese
 - Filipino
 - Japanese
 - Korean
 - Vietnamese
 - Other Asian: The patient identified as some other Asian sub-category not provided in the options above or did not identify a sub-category.
- Black or African American – A person having origins in any of the Black racial groups of Africa, including, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, and Somali.
- Hispanic or Latino – A person of Mexican, Puerto Rican, Salvadoran, Cuban, Dominican, Guatemalan, and other South or Central American or Spanish culture or origin.
- Middle Eastern or North African – A person with origins in any of the original peoples of the Middle East or North Africa, including, for example, Lebanese, Iranian, Egyptian, Syrian, Iraqi, and Israeli.
- Native Hawaiian or Pacific Islander – A person having origins in any of the original peoples of Hawaii, Guam or Mariana Islands, Samoa, or other Pacific Islands, including, for example Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, and Marshallese. If Native Hawaiian or Pacific Islander, select the specific sub-category (or sub-categories). Select all that apply from the list provided.
 - Native Hawaiian
 - Guamanian or Chamorro
 - Samoan
 - Other Pacific Islander: The patient identified as some other Native Hawaiian or Pacific Islander subcategory not provided in the options above or did not identify a subcategory.
- White – A person having origins in any of the original peoples of Europe, including, for example, English, German, Irish, Italian, Polish, and Scottish.
- UTD (Unable to Determine) – Unable to determine the patient's race and/or ethnicity or not stated (e.g., not documented, conflicting documentation or patient unwilling to provide).

Notes for Abstraction:

- Assumptions should not be made based on physical characteristics. This data allows for analysis of race and ethnicity-related patterns of care.
- If the patient is multiracial or multiethnic select each race and/or ethnicity they designate. Select all that apply from the list provided.
- Although terms "Hispanic" and "Latino" are actually descriptions of the patient's ethnicity, it is not uncommon to find them referenced as race. If the patient's race is documented only as Hispanic/ Latino, select "Hispanic or Latino." If the race is documented as mixed Hispanic/ Latino with another race, select both "Hispanic or Latino" and whatever race is given (e.g., Black-Hispanic – select "Black or African American" and "Hispanic or Latino"). Other terms for

Hispanic/ Latino include Chicano, Cuban, H (for Hispanic), Latin American, Latina, Mexican, Mexican American, Puerto Rican, South or Central American, and Spanish.

- If the patient is Asian, Native Hawaiian or Pacific Islander, select the specific sub-category (or sub-categories) if known. Selection of a sub-category is optional.
- If the Asian, Native Hawaiian or Pacific Islander patient does not identify a sub-category, leave the sub-category blank.

References:

- Revisions to OMB's Statistical Policy Directive No. 15: Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity - <https://www.federalregister.gov/documents/2024/03/29/2024-06469/revisions-to-ombs-statistical-policy-directive-no-15-standards-for-maintaining-collecting-and>

Suggested Data Sources:

- Admission Data
- Emergency Department Record
- Transfer Notes
- History and Physical

Change Log: April 2025

Hispanic Ethnicity, If Yes (type)

Tab: Demographics

Variable Name: ethnicys

Definition: If the patient is of Hispanic ethnicity or Latino, select the specific sub-category (or sub-categories) identified by the patient.

Question: If patient is of Hispanic ethnicity, what is the sub-category?

Format: Single Select

Allowable Values:

- Mexican, Mexican American, Chicano/a
- Puerto Rican
- Cuban
- Another Hispanic, Latino, or Spanish Origin: The patient identified as some other Hispanic, Latino or Spanish origin not provided in the options above.

Notes for Abstraction:

- If the patient did not identify a sub-category, select "Another Hispanic, Latino or Spanish Origin".

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Transfer Notes

Change Log: March 2023

Admission

Internal Tracking ID:

Tab: Admission

Variable Name: trackid

Definition: An additional non-identifiable number to track the patient.

Question: What is the internal tracking ID?

Format: Custom Text

Allowable Values: Numerical Value

Notes for Abstraction: Enter an additional non-identifiable number to track the patient. Do NOT use patient names, dates of birth, social security numbers, medical record numbers, or any other identifiable information.

Suggested Data Sources:

- Admission Data
- Hospitalization Data

Change Log: March 2023

Arrival Date/Time

Tab: Admission

Variable Name: arrdt

Definition: Record the month, day, and year and the time the patient first arrived at the site (e.g. hospital, emergency room, observation unit, or procedural area).

Question: What was the patient's arrival date and time?

Format: Date/Time (Drop down to select a precision/ unknown)

- **Allowable Values: Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- Time: 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- Unknown

Notes for Abstraction:

- The medical record must be abstracted as documented (taken at "face value").
- When the date documented is obviously in error (not a valid format/range or outside of the parameters of care [after the Discharge Date]) and no other documentation is found that provides this information, the abstractor should select "Unknown."

Change Log: March 2023

Point of Origin for admission

Tab: Admission

Variable Name: admitsource

Definition: The location of the patient prior to arriving at the hospital for this event/episode of care.

Question: What was the point of origin for admission?

Format: Single Select

Allowable Values:

- Home
- Transfer from a Hospital (Different Facility)
- Clinic
- Transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF)
- Transfer from another Health Care Facility
- Non-Healthcare Facility Point of Origin
- Transfer from Hospice and is Under a Hospice Plan of Care or Enrolled in a Hospice Program
- Information not available

Notes for Abstraction:

The intent of this data element is to focus on patients' place or point of origin rather than the source of a physician order or referral.

- The point of origin is the direct source for the particular facility.
 - Example 1: A Skilled Nursing Facility (SNF) patient has chest pain is taken to the emergency department of Hospital A where it is determined that she is suffering an acute myocardial infarction. The patient is then transferred to Hospital B for admission as an inpatient. The Point of Origin for Hospital A would be "Transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF)"; the point of origin code for Hospital B would be (Transfer from a Hospital (Different Facility)).
- For patients transferred from an Emergency Department at another hospital, enter "Transfer from a Hospital (Different Facility)"

Another health care facility: This encompasses any other type of healthcare facility not listed, e.g., a mental institution, a quarantine/aid station, birth center, or adult day care center, etc.

Episode of Care: is defined as a period of healthcare services beginning at admission and continuing through treatment to the time of discharge at the hospital site.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Transfer Notes

Change Log: June 2026

Referring Hospital

Tab: Admission

Variable Name: refhos

Definition: The Name of the Hospital that transferred the patient to your facility.

Question: What is the name of the referring hospital that transferred the patient to your facility?

Format: Single-Select type search

Allowable Values:

- Central list created by the facility in the registry system

Notes for Abstraction:

- For options to appear on this element you must first created a list of hospitals that transfer to you in the "form Management" section of the registry.

Suggested Data Sources:

- Admission Sheet
- Transfer Notes

Change Log: February 2024

Referring Hospital Arrival Date/Time

Tab: Admission

Variable Name: refhosarrdt

Definition: The date and time the patient first arrived at the referring hospital (first hospital).

Question: what was the date and time the patient first arrived at the referring hospital?

Format: Date/Time

Allowable Values:

- Date: MM/DD/YYYY
 - MM = Month (01-12)

- DD = Day (01-31)
- YYYY = Year (2012 – Current Year)
- Time: 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- Unknown

Notes for Abstraction:

- Enter the date and time the patient arrived at the referring (1st) hospital.
- This may be obtained by either reviewing the EMS run sheet, ER record, or from the referring hospital.

If the arrival date/ time for the patient is not in the patient's transfer notes/ medical records, select "Unknown."

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Transfer Notes

Change Log: March 2023

Referring Hospital Discharge Date/Time

Tab: Admission

Variable Name: refhosdschdt

Definition: The date and time the patient left the referring hospital facility.

Question: What was the date and time the patient left the referring hospital?

Format: Date/Time

Allowable Values:

- Date: MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- Time: 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)

- Unknown

Notes for Abstraction:

- Enter the date and time the patient was discharged from the referring hospital.
- For patients transferred via multiple hospitals (e.g., Hospital A for initial care to Hospital B for more advanced care to your hospital for tertiary care), enter the date and time the patient was discharged from the last referring hospital to your site.
- This may be obtained by either reviewing the EMS run sheet, ER record, or from the referring hospital.
- If the discharge date/time for the referring hospital is not in the patient's transfer notes/medical record, select the "Unknown" option.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Transfer Notes

Change Log: March 2023

Initial Point of Hospital Arrival

Tab: Admission

Variable Name: initialarrival

Definition: The department, floor, or area of the hospital that the patient is first received.

Question: What was the initial area of the hospital the patient was received?

Format: Single Select

Allowable Values:

- Emergency Department
- Direct to inpatient unit
 - Intensive Care Unit
 - Non-ICU
- Cath Lab/Operating Room
- Other

Notes for Abstraction:

- Select the department/floor of your site hospital where the patient first arrived.
- In some cases, patients may be admitted directly to ICU while others may arrive directly to the ED or catheterization laboratory.

Medical History (select all that apply):

Tab: Admission

Variable Name: medhist

Definition: Conditions known to exist prior to this episode of care. This includes secondary diagnoses relevant to this episode as well as risk factors.

Question: What is the patient's medical history?

Format: Multi Select

Allowable Values:

- None
- Atherosclerotic vascular disease (choose all that apply)
 - Cerebrovascular disease (including previous TIA/CVA)
 - Coronary Artery Disease (CAD)
 - Peripheral Arterial Disease
 - Prior CABG
 - Prior MI
 - Prior PCI
- Atrial fibrillation or flutter
- Cardiac amyloidosis
- Chronic Kidney Disease
 - Chronic hemodialysis
- Chronic pulmonary disease
- Chronic liver disease
- Diabetes Mellitus
- Hypertension
- Heart Failure - Reduced EF
 - Ischemic Cardiomyopathy
 - Nonischemic Cardiomyopathy
 - History of heart transplantation
 - Presence of durable left ventricular assist device (scai)
 - Presence of Implantable cardioverter-defibrillator (ICD)
 - Presence of biventricular pacemaker (CRT)
- Heart Failure - Preserved EF
- Heart Failure - Moderately Reduced EF
- Congenital Heart Disease
- Hypertrophic cardiomyopathy
- Isolated right ventricular failure
- Pulmonary hypertension
- Smoking/Vaping
 - Cigarette use
 - e-cigarette use
 - Vaping
- Valvular heart disease
- Emerging Infectious Disease

- MERS
- SARS-COV-1
- SARS-COV-2 (COVID-19)
- Other infectious respiratory pathogen
- Unknown

Notes for Abstraction:

Record the patient's medical history prior to this event. Select from the provided list what the patient's past medical history includes. Do not include conditions which are newly diagnosed during this hospitalization and were not previously part of the patient's medical history.

This may include prior secondary diagnoses relevant to this admission, as well as risk factors.

- Select "None" if the patient has no history of any of the listed conditions.
- Make the selection even when a condition is well-controlled or normalized because of ongoing medication or treatment.
- Atherosclerotic vascular disease: Select if patient has a history of any of the listed AVD and/or any of the pertinent clinical sequelae listed in this category.
 - Cerebrovascular disease (including previous TIA/CVA): Select if patient has a history of ischemic stroke, hemorrhagic stroke or TIA prior to this event. This should be a diagnosis that was confirmed by a physician. Do NOT select simply based upon a CT or MRI available in the medical record or ICD codes from prior encounters.
 - Coronary Artery Disease (CAD): Select if there is a history of physician diagnosed Coronary Artery Disease (CAD) – also documented as Coronary Arteriosclerosis, or Coronary Atherosclerosis. CAD is present as documented by invasive coronary angiography at any time before the current admission/event. Additional acceptable evidence documenting the presence of CAD includes:
 - Presence of a diagnosis of prior MI,
 - Hx of prior revascularization procedure (either PCI or CABG), and
 - Coronary CT angiography showing obstructive coronary stenoses and other noninvasive imaging studies showing findings diagnostic of CAD.
 - Peripheral Arterial Disease: Select if there's a history of physician diagnosed peripheral arterial disease (PAD) prior to this event. PAD is also called Peripheral artery disease (includes upper and lower extremity, renal, mesenteric, and abdominal aortic systems).
 - Prior CABG: Select if there is a history of Coronary artery bypass graft (CABG) prior to this event
 - Prior MI: Select if there is a history of physician-diagnosed Myocardial Infarction (MI), or EKG evidence of an old MI prior to this event.
 - Prior PCI: History of the patient having undergone PCI of any type (balloon angioplasty, atherectomy, stent, intracoronary brachytherapy, or other) prior to this event.
- Atrial Fibrillation or Flutter: Select if the patient has ANY prior history of atrial fibrillation OR atrial flutter (i.e., remote, paroxysmal or persistent.) Do not record a history of Atrial Fib/Flutter if the episode was transient AND entirely reversible due to thyrotoxicosis or within 8 weeks of CABG (these are the only two circumstances in which you would not record a history of Atrial fib/flutter). Any patient with a history of Atrial Fib/Flutter who has undergone a procedure for atrial fib/flutter such as pacemaker placement or ablation or who is under medical therapy for

rhythm control *is still considered as having a history of Atrial Fib/Flutter* and you should select Afib/flutter under medical history. Example: Documented history of ablation procedure, select Atrial Fib/Flutter here.

- Cardiac amyloidosis: Select if the patient has physician diagnosed cardiac amyloidosis.
- Chronic Kidney Disease: Select if there is a history of physician diagnosed renal insufficiency or chronic kidney disease. When known, please select if there is a history of Stage 3 or worse chronic kidney disease (eGFR<60 mL/min/1.73 m²) prior to this hospital presentation.
 - Chronic hemodialysis: Select if the patient requires chronic hemodialysis or peritoneal dialysis.
- Chronic pulmonary disease: Select if the patient has a history of chronic pulmonary disease, which can include patients with chronic obstructive pulmonary disease, chronic bronchitis, or emphysema, as well as patients with other chronic parenchymal lung disease (e.g., bronchiectasis or fibrotic lung disease). Patients with asthma or seasonal allergies are not considered to have chronic pulmonary disease.
- Chronic liver disease: Select if the patient has a history of hepatitis B, hepatitis C, cirrhosis, portal hypertension, esophageal varices, or congestive hepatopathy. Exclude Non-Alcoholic Steatohepatitis (NASH) in the absence of cirrhosis.
- Congenital heart disease: Select if there is documentation of a history of congenital heart disease.
- Diabetes Mellitus: Select if there is a history of physician diagnosed diabetes mellitus (type I or II), regardless of duration of disease or use of treatment including the use of diet, need for antidiabetic agents, oral hypoglycemic agents or insulin, or a fasting blood sugar. Do not include diabetes based on a patient's statement of or based on a single value of elevated blood sugar in the chart. In order to select this element, there must be a confirmed diagnosis of diabetes.
- Heart Failure (HF): Select if the patient has a medical history of HF prior to this admission.
 - Reduced EF: Select if the HF was with EF ≤50%. Also referred to as systolic HF.
 - Ischemic Cardiomyopathy: Select if the *primary cause* of the patient's reduced ejection fraction is due to ischemic heart disease.
 - Nonischemic Cardiomyopathy: Select if the *primary cause* of the patient's reduced ejection fraction is *not* related to ischemic heart disease.
 - Presence of biventricular pacemaker (CRT): Select if the patient has a biventricular pacemaker with leads in both the right and the left ventricle (also known as a coronary sinus lead or cardiac resynchronization therapy).
 - Preserved EF: Select if HF was with EF ≥50%. Also referred to as diastolic HF.
 - Moderately Reduced EF: Select if HF was with EF between 41-49%.
- Hypertrophic cardiomyopathy: Select if the patient has physician diagnosed hypertrophic cardiomyopathy.
- Isolated right ventricular failure: Select if the patient has a history of heart failure that is related to right ventricular dysfunction without known left ventricular dysfunction (e.g., Arrhythmogenic right ventricular cardiomyopathy or cor pulmonale due to pulmonary hypertension).
- Pulmonary hypertension: Select if the patient has physician diagnosed pulmonary hypertension.

- Smoking/Vaping: -
 - Do not select "Smoking/Cigarette use" if there is no documentation that the patient smoked cigarettes anytime during the year prior to hospital arrival, smoking history was not addressed or unable to determine from medical record documentation.
 - If there is definitive documentation anywhere that the patient either currently smokes or is an ex-smoker that quit **less than one year prior to arrival**, select "Smoking," regardless of whether there is conflicting documentation.
 - If there is NO definitive documentation of current smoking or smoking within one year prior to arrival in any of the only acceptable sources, select "No." The following examples would not count as inclusions:
 - "Smoked in the last year"
 - "Probable smoker"
 - "Most likely quit 3 months ago"
 - Disregard documentation of smoking history or history of tobacco use if current smoking status or timeframe that patient quit is not defined (e.g., "20 pk/year smoking history", "History of tobacco abuse").
 - If there is documentation of current smoking or tobacco use or smoking or tobacco use within one year prior to arrival, and the type of product is not specified, assume this refers to cigarette smoking and select "Smoking."
 - Do not include documentation of smoking history referenced as a "risk factor" (e.g., "risk factor: tobacco," "risk factor: smoking," "risk factor: smoker"), where current smoking status is indeterminable.

See the **Table in appendix** for more guidance on this abstraction.

- Vaping/e-cigarette use: - select either option if:
 - There is documentation in the patient medical record of current vaping or e-cigarette use by the patient or anytime during **the past 12 months**. Do not select if there is no documentation of use or if the history includes use prior to the past 12 months.
 - Vaping and e-cigarette use includes electronic nicotine delivery system or electronic cigarettes (e-cigarettes), which are battery-operated devices that heat a liquid containing nicotine, propylene glycol, and/or vegetable glycerin and flavorant chemicals to generate an aerosol that the user inhales, or heat-not-burn tobacco products, which are tobacco products that heat tobacco to a lower temperature than required for combustion.

Reference: Dehmer GJ, Badhwar V, Bermudez EA, Cleveland JC Jr, Cohen MG, D'Agostino RS, Ferguson TB Jr, Hendel RC, Isler ML, Jacobs JP, Jneid H, Katz AS, Maddox TM, Shahian DM. 2020 AHA/ACC key data elements and definitions for coronary revascularization: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Data Standards (Writing Committee to Develop Clinical Data Standards for Coronary Revascularization). *Circ Cardiovasc Qual Outcomes*. 2020;13:e000059. doi: 10.1161/HCQ.0000000000000059

- Hypertension: Select if the patient has a history of high blood pressure whether or not the patient is on prescribed medications. Hypertension is considered from a BP of 130/80.

- Valvular heart disease: Select if there is documentation of any physician-diagnosed valvular heart disease prior to this event. This includes aortic regurgitation, aortic stenosis, mitral regurgitation, mitral stenosis, other pulmonary and tricuspid valve disorders.
- Emerging Infectious Disease: – Select if the patient was confirmed to have any of the following bacterial infection, or emerging infectious disease upon arrival/admission to your hospital, or any time during this episode of care. Do not select if the documentation states only “suspected,” “possible,” “probable” or “inconclusive” infection.
 - MERS – (Middle East Respiratory Syndrome) – May include ICD-10-CM code B97.29; or
 - SARS-COV-1 – (Severe Acute Respiratory Syndrome-associated coronavirus) – May include ICD-10-CM code B97.21; or
 - SARS-COV-2 (COVID-19) – (Severe Acute Respiratory Syndrome-associated coronavirus) – May include ICD-10-CM code U07.1
 - Other infectious respiratory pathogen
 - **Additional Note**: Select one of the allowable values above only when a confirmed diagnosis is documented by the provider or when a positive test result is documented in the patient medial record. A confirmed diagnosis includes a positive RTPCR test or clinical diagnosis

Unknown: – Select if the medical history is unknown, or not available

Suggested Data Sources

- Admission Sheet
- Discharge Data
- Emergency Department Record
- History and Physical
- Transfer Notes

Change Log: August 2026

Medications used prior to admission (select all that apply):

Tab: Admission

Variable Name: medsadm

Definition: The record or list of all known medications used prior to this event.

Question: What medications were used prior to admission?

Format: Multi Select

Allowable Values:

- No meds prior to admission
- ACE Inhibitor
- Angiotensin receptor blocker (ARB)
- Angiotensin Receptor Neprilysin Inhibitor (ARNI)
- Anticoagulation Therapy
 - Direct oral anticoagulant
 - Factor Xla Inhibitor
 - Warfarin
 - Other
- Anti-hyperglycemic medications:
 - Insulin
 - Oral
- Antiplatelet Medication:
 - Aspirin
 - P2Y12 Inhibitors
 - Other Antiplatelet
- Beta-Blocker
- Loop Diuretic
- Mineralocorticoid Receptor Antagonist (MRA)
- SGLT2 Inhibitor
- GLP-1 agonist
- Unknown/Unable to Determine

Notes for Abstraction:

- Select any medication(s) that the patient regularly uses/used at home and prior to this event.
- The intent of this variable is to capture list of meds patient is on prior to this event.

Note: *The AHA is not recommending or endorsing any specific products.*

- **Anticoagulants** – Direct oral anticoagulants include oral Factor Xa antagonists e.g., apixaban [Eliquis], rivaroxaban [Xarelto], edoxaban [Savaysa]) or an oral direct thrombin inhibitor, dabigatran [Pradaxa].
- **Antiplatelet Agents and Dual Antiplatelet Therapy** – Example P2Y12 inhibitors include clopidogrel, prasugrel [Effient], ticagrelor [Brillinta], and cangrelor [Kengreal].
- **ACE Inhibitors** – Examples of Angiotensin-converting enzyme (ACE) inhibitors include ramipril [Altace], captopril [Capoten], enalapril [Vasotec], lisinopril [Prinivil, Zestril] and perindopril [Aceaon].
- **Angiotensin II Receptor Blockers** – Examples of Angiotensin-II receptor blockers (ARBs) include candesartan [Atacand], losartan [Cozaar], telmisartan [Micardis] and valsartan [Diovan].

- **Angiotensin Receptor-Neprilysin Inhibitors** – Examples include sacubitril/valsartan [Entresto]
- **Beta Blockers** – Some examples include metoprolol, carvedilol, atenolol, propranolol, and bisoprolol
- **Diuretics** – Example of Loop Diuretics include bumetanide [bumex], ethacrynic acid [edecrin], furosemide [Lasix], and torsemide [soaanz]
- **Mineralocorticoid Receptor Antagonists (MRA)** are medications used for the treatment of hypertension and heart failure. Some examples include spironolactone [Aldactone] and eplerenone [Inspra].
- **SGLT2 inhibitors** are prescription medicines that are used to lower blood sugar in adults with type 2 diabetes. Examples include canagliflozin [Invokana], dapagliflozin [Farxiga], empagliflozin [Jardiance], and ertugliflozin [Steglatro]. They are available as single-ingredient products and also in combination with other diabetes medicines such as metformin.

If the medication has been prescribed as a combo drug, the SGLT2 Inhibitor option here can be selected.

- **Glucagon-like peptide-1 receptor agonists (GLP-1)** are a class of medicines used for the treatment of type 2 Diabetes. Some examples of the GLP-1 agonists class include: dulaglutide [Trulicity], exenatide [Byetta, Bydureon], semaglutide [Ozempic, Rybelsus], liraglutide [Victoza] and lixisenatide [Adlyxin, Lyxumia].
- If the patient is on medications but the name or type of medication is not known, select **“Unknown/Unable to Determine.”**

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Emergency Department Record
- History and Physical
- Transfer Notes

Change Log: August 2026

P2Y12 Inhibitor prior to admission

Tab: Admission

Variable Name: p2y12adm

Definition: The list of P2Y12 medication(s) used prior to admission.

Question: What P2Y12 medication(s) were used prior to admission?

Format: Multi-Select

Allowable Values:

- clopidogrel (Plavix)
- prasugrel (Effient)
- ticagrelor (Brilinta)
- ticlopidine (Ticlid)

Notes for Abstraction:

- Select which P2Y12 medication(s) was used prior to admission: Clopidogrel (Plavix), Prasugrel (Effient), Ticagrelor (Brilinta), Ticlopidine (Ticlid)

Suggested Data Sources:

Change Log: June 2025

Date/Time of Vital Signs (Initial Vital Signs)

Tab: Admission

Variable Name: viralsadmdt

Definition: The date/time when the patient's vital signs were taken at hospital arrival.

Question: What date and time were the patient's vital signs recorded?

Format: Date/Time (Drop down to select a precision/ unknown)

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- Record the date/time of the first set of reliable vital signs recorded at hospital arrival.
- An "unknown" option is available where the date/time cannot be ascertained.

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data

- History and Physical

Change Log: March 2023

Initial Vital Signs

Tab: Admission

Variable Name:

- Height:
 - Heightadm, heightuadm, heightndadm
- Weight
 - Weightadm, weightuadm, weightndadm
- Body Mass Index (BMI)
 - bmiadm
- Body Surface Area (BSA)
 - bsaadm
- Heart Rate
 - heartrateadm, heartrateadmnd
- Blood Pressure (BP)
 - Systolicadm, diastolicadm, bpndadm
- Temperature
 - Tempadm, tempuadm, tempndadm

Definition: The first (earliest) set of vitals measured upon presentation to your hospital (vitals on arrival).

Question: What were the patient's vital signs that were recorded at admission?

Format: Integers

Allowable Values:

- Height
 - Range: (0.0-999.9)
 - Units: (in, cm)
- Weight
 - Range: (0.0-999.9)
 - Units: (lbs, kg)
- BMI
 - Range: (0.0-999.9)
- BSA
 - Range: (0.0-999.9)
- Heart Rate
 - Range: (0-399)
- BP
 - Range: (0-300)
- Temperature
 - Range: (0-120)
 - Unit: (C°, F°)

Notes for Abstraction:

- Record the first reliable vital signs taken on hospital arrival at presentation to your site/hospital.
- When multiple values are available, include only the values closest to hospital arrival.
- If patient was already in shock at arrival, then these will also be used as the set of vital signs “at shock onset”.
- If variable was not documented, select the corresponding not documented variable.

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data
- History and Physical

Change Log: March 2023

Admission Labs

Tab: Admission

Variable Name:

- Lactate-Admission
 - lactateadm
- Hemoglobin-Admission
 - Hgbadm, hgbuadm, hgbnaadm
- NTProBNP-Admission
 - Ntprobnpadm, ntprobnpuadm, ntprobnpnaadm
- BNP-Admission
 - Bnpadm, bnpuadm, bnpaadm
- Serum Creatinine-Admission
 - Scradm, scruadm, scrnaadm
- ALT-Admission
 - Altadm, altnaadm
- Platelet Count-Admission
 - Plateletadm, plateletnaadm
- Troponin-Admission
 - Tropadm, tropuadm, tropnaadm, tropadmbelowlimit
- Random Blood Glucose-Admission
 - Randombgadm, randombgnaadm

Definition: N/A

Question: What were the results of the admission labs that were performed?

Format: Integers

Allowable Values:

- Lactate
 - Range: (0.2-30.0)
 - Units: (nmol/L)
- Hgb
 - Range: (0-999.9)

- Units: (g/dL, g/L)
- NT-ProBNP
 - Range: (0-200000.0)
 - Units: (pg/mL, ng/L)
- BNP
 - Range: (0-99999.9)
 - Units: (pg/mL, pmol/L, ng/L)
- Serum Creatinine
 - Range: (0.00-999.9)
 - Units: (mg/dL, micromol/L)
- ALT (IU/L)
 - Range: (5-10000)
- Platelet Count
 - Range: (0-999999)
- Troponin
 - Range: (0.000-9999999999.000)
 - Units: (ng/L, ng/mL, ug/L)
- Random Blood Glucose
 - Range: (0-1500.0)
 - Units: (mg/dL)

Notes for Abstraction:

- When multiple values are available, include only the values closest to hospital arrival.
- If variable was not documented, select the corresponding not documented variable.

Suggested Data Sources:

Change Log: March 2023

Most favorable neurological status at admission

Tab: Admission

Variable Name: neurostatadm

Definition: Most favorable neurological status at admission.

Question: What is the most favorable neurological status at admission?

Format: Single Select

Allowable Values:

- Conscious without severe disability
- Conscious with severe disability
- Comatose
- Unable to assess due to sedation
- Unknown/ Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: March 2023

Shock Onset

Certainty of shock etiology

Tab: Shock Onset

Variable Name: certainshock

Definition:

Question: What is the certainty of shock etiology?

Format: Single Select

Allowable Values:

- Cardiogenic shock was a clear contributor to the shock state
- Cardiogenic shock was suspected but with some uncertainty

Notes for Abstraction:

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data

Change Log: March 2023

Where was the onset of Cardiogenic Shock present?

Tab: Shock Onset

Variable Name: shockonset

Definition: Documentation that the patient arrived at your hospital in cardiogenic shock. (i.e., shock was determined to be present at the time of arrival at your hospital.)

Question: Where was the onset of cardiogenic shock determined?

Format: Single Select

Allowable Values:

- Shock present on participating hospital arrival
- Shock onset while in-hospital
- Shock onset at referring hospital

Notes for Abstraction:

- Cardiogenic shock is defined as a sustained (>30 min) episode of hypoperfusion evidenced by systolic blood pressure < 90 mm Hg and/or, if available, cardiac index < 2.2 L/min per square meter determined to be secondary to cardiac dysfunction and/or the requirement for parenteral inotropic or vasopressor agents or mechanical support (e.g., IABP, extracorporeal circulation, VADs) to maintain blood pressure and cardiac index above those specified levels. The hemodynamic compromise (with or without extraordinary supportive therapy) must persist for at least 30 min.

- To meet the definition of shock, the patient must have signs or symptoms of end-organ hypoperfusion. Signs and symptoms of inadequate perfusion include:
- Elevated serum lactate [>2 mmol/L])
- Acute kidney injury (Creatinine $\geq 2 \times$ ULN or oliguria (e.g., urine output <0.5 mL/kg/hour)
- Acute hepatic injury (e.g., alanine aminotransferase [ALT] or aspartate aminotransferase [AST] $>3 \times$ upper limit of normal)
- Cool or mottled extremities
- Altered mental status (in absence of another cause)

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data

Change Log: March 2023

Cardiac arrest prior to shock onset?

Tab: Shock Onset

Variable Name: arrestprior

Definition: Documentation of a cardiac arrest that happened during this episode of care, but prior to the onset of cardiogenic shock.

Question: Did the patient go into cardiac arrest prior to shock onset?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/Not Documented

Notes for Abstraction:

- Cardiac arrest is the sudden cessation of cardiac activity. The victim becomes unresponsive with no normal breathing and no signs of circulation.
- It includes pulseless clinical scenarios that can be brady arrests or tachy arrests requiring cardiopulmonary resuscitation (requiring two or more chest compressions, or open chest massage) and/or requiring emergency defibrillation.

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data
- History and Physical
- Transfer Notes

Change Log: March 2023

Most favorable neurological status after the arrest and prior to hospital discharge:

Tab: Shock Onset

Variable Name: neurostatus

Definition: The best results from neurological observation/assessment performed on a patient after a cardiac arrest, but before the patient is discharged.

Question: What was the most favorable neurological status after the arrest and prior to hospital discharge?

Format: Single Select

Allowable Values:

- Conscious without severe disability
- Conscious with severe disability
- Comatose
- Unable to assess due to sedation
- Unknown/Not Documented

Notes for Abstraction:

- Select the most suitable option either based on an assessment tool, or any other neurological assessment/score (e.g. GCS).
- Severe disability is defined as being depended on others for daily support because of impaired brain function and may include limitations due to poor cognitive function or paralysis.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Hospitalization Data

Change Log: March 2023

Onset of shock (Date/Time):

Tab: Shock Onset

Variable Name: shockonsetdt

Definition: The date/time when cardiogenic shock was detected.

Question: What was the date and time of the onset of shock?

Format: Date/Time (Drop down to select a precision or unknown)

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)

- MM = Minutes (00–59)

- **Unknown**

Notes for Abstraction:

- An approximate time of detection will suffice in this case if the exact time of shock onset is not known.
- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be reasonably estimated.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Hospitalization Data

Change Log: March 2023

Was a multidisciplinary shock team involved in patient management?

Tab: Shock Onset

Variable Name: shockteam

Definition: Documentation of a multidisciplinary shock team involvement during this episode of care.

Question: Was a multidisciplinary shock team involved in patient management?

Format: Single-Select

Allowable Values:

- Yes
- No
- Not Documented

Notes for Abstraction:

- A multidisciplinary “Shock Team” may be comprised of a heart failure cardiologist, an interventional cardiologist, an intensivist, and a cardiothoracic surgeon or ECMO consultant, as a part of the hospital’s Cardiogenic Shock rapid response program. Once activated, all Team members participate in the decisions surrounding patient management and therapeutic options.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Hospitalization Data

Change Log: March 2023

If multidisciplinary shock team was involved, select the timeframe:

Tab: Shock Onset

Variable Name: shockteamtime

Definition: The interval within which a multidisciplinary shock team was involved in this episode of care.

Question: If a multidisciplinary shock team was involved, what was the time frame?

Format: Single-Select

Allowable Values:

- Within 3hrs of shock onset
- Within 6hrs of shock onset
- Within 24hrs of shock onset
- >24hrs of shock onset
- Unknown/not documented

Notes for Abstraction:

- An approximate timespan may be selected from the options listed.
- This element looks at the time interval between the shock onset and involvement of a multidisciplinary shock team in the patient's episode of care for cardiogenic shock.
- If a Shock Team page is used to activate the shock team, use the time of the activation.
- If a mechanism for simultaneous activation of all members is not used, please enter the time of the first documented multidisciplinary evaluation by the shock team members. The aim is to capture when all shock team members that were involved in assessing the patient.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Hospitalization Data

Change Log: March 2023

SCAI Shock Stage at Onset (First 6 hours of Shock):

Tab: Shock Onset

Variable Name: scaiaonset

Definition: The stage classification of cardiogenic shock based on physical examination, biochemical markers, and hemodynamics as defined by the Society for Cardiovascular Angiography and Interventions (SCAI) within the first 6 hours of shock onset.

Question: What was the SCAI shock stage onset in within first 6 hours?

Format: Single-Select

Allowable Values:

- Deceased
- Stage B
- Stage C
- Stage D
- Stage E
- ND/Unable to Determine

Notes for Abstraction:

- The SCAI SHOCK Stage Classification is a five-stage system intended to facilitate communication about the diagnosis, presentation, and evolving nature of cardiogenic shock (CS). For this field, please use only the clinical course during the first 6 hours after Shock onset to make the determination of SCAI Shock Stage.
- This registry lists four stages since the first stage (A) and second stage (B) do not represent true shock but rather a “risk for shock development” or hypotension without yet having signs of hypoperfusion, respectively. Select one stage that best represents the patient’s state at time of shock onset:
 - Stage B – This indicates a patient who has clinical evidence of relative hypotension or tachycardia without hypoperfusion
 - Stage C – A patient presenting with hypoperfusion requiring intervention beyond volume resuscitation (inotrope, pressor, or mechanical support including ECMO)
 - Stage D – A patient who fails to respond to initial interventions. Similar to stage C and getting worse.
 - Stage E – a patient being supported by multiple interventions who may be experiencing cardiac arrest without ongoing CPR and/or ECMO
 - Select “ND/Unable to Determine” if this was not documented, assessed, or if unknown.
- Additional resource: The full table with biochemical markers and hemodynamics is available in the appendix.

Suggested Data Sources:

- Admission Sheet
- Emergency Department Record
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

SCAI Shock Stage Serial Assessment (Assessed at 6h-12h):

Tab: Shock Onset

Variable Name: scaiserial

Definition: The stage classification of cardiogenic shock based on physical examination, biochemical markers, and hemodynamics as defined by the Society for Cardiovascular Angiography and Interventions (SCAI) within 6-12 hours of shock onset.

Question: What was the SCAI shock stage onset in within 6-12 hours?

Format: Single-Select

Allowable Values:

- Deceased
- Stage B
- Stage C
- Stage D
- Stage E
- ND/Unable to Determine

Notes for Abstraction:

- For this field, please use only the clinical course during the period 6–12 hours after Shock onset to make the determination of SCAI Shock Stage.
- There are the four stages adapted by the SCAI Clinical Expert Consensus Statement of Classification of Cardiogenic Shock:
 - **Stage B** – This indicates a patient who has clinical evidence of relative hypotension or tachycardia without hypoperfusion
 - **Stage C** – A patient presenting with hypoperfusion requiring intervention beyond volume resuscitation (inotrope, pressor, or mechanical support including ECMO)
 - **Stage D** – A patient who fails to respond to initial interventions. Similar to stage C and getting worse.
 - **Stage E** – a patient being supported by multiple interventions who may be experiencing cardiac arrest without ongoing CPR and/or ECMO
 - Select “**ND/Unable to Determine**” if this was not documented, assessed, or if unknown.
- The full table with biochemical markers and hemodynamics is available in the **appendix**.

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Signs and Symptoms of Inadequate Perfusion Present?

Tab: Shock Onset

Variable Name: inadequateperf

Definition: The presentation of signs/symptoms indicating that the patient had inadequate perfusion.

Question: Were there signs and symptoms of inadequate perfusion present?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Some of the signs and symptoms of inadequate perfusion may include:

- Elevated serum lactate [>2 mmol/L])
- Acute kidney injury (Creatinine $\geq 2 \times$ ULN or oliguria (e.g., urine output <0.5 mL/kg/hour)

- Acute hepatic injury (e.g., alanine aminotransferase [ALT] or aspartate aminotransferase [AST] >3x upper limit of normal)
- Cool or mottled extremities
- Altered mental status (in absence of another cause)

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data

Change Log: March 2023

Presenting Physiology:

Tab: Shock Onset

Variable Name: prephysiology

Definition: N/A

Question: What was the presenting physiology?

Format: Single-Select

Allowable Values:

- Biventricular Failure
- Left Ventricular Failure
- Right Ventricular Failure
- Primary Other Cardiac (Arrhythmia, Valvular Stenosis, etc.)
- Not Documented

Notes for Abstraction:

- Biventricular failure left ventricular failure, and right ventricular failure includes patients with cardiogenic shock related to **primary myocardial dysfunction** involving both, or one ventricle.

The category “Primary Other Cardiac (Arrhythmia, Valvular Stenosis)” includes patients with cardiogenic shock related to **a primary non-myocardial cardiac cause**. Potential primary non-myocardial cardiac causes include severe valvular heart disease, pericardial disease, and hemodynamically significant pulmonary embolism. Shock due to an ongoing refractory arrhythmia is included in this category but not myocardial dysfunction related to an arrhythmia that is no longer present (e.g., ventricular stunning after sustained VT arrest or tachycardia-induced cardiomyopathy).

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Was Left Ventricular Ejection Fraction (LVEF) documented?

Tab: Shock Onset

Variable Name: lvefdoc

Definition: Determining if Left Ventricular Ejection Fraction was documented.

Question: Was Left Ventricular Ejection Fraction documented?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: August 2026

LVEF – Quantitative

Tab: Shock Onset

Variable Name: lvefvalue

Definition: Determining the quantitative value of LVEF.

Question: What is the quantitative value of LVEF?

Format: Single-Select

Allowable Values:

- Unknown
- <20%
- 20-<30%
- 30-<40%
- 40-<50%
- >=50%
- Not documented

Notes for Abstraction:

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: August 2026

Cardiogenic Shock Category:

Tab: Shock Onset

Variable Name: shockcat

Definition: The classification of Cardiogenic Shock reported by a physician/provider during this event.

Question: What was the Cardiogenic Shock category?

Format: Single-Select

Allowable Values:

- Acute, de novo HF
- Acute-on-chronic HF
- Unable to determine

Notes for Abstraction:

- Acute, de novo HF – Includes those with *de novo* heart failure due to acute myocardial dysfunction that is known or suspected to be new in onset.
- Acute-on-chronic HF – Includes those with acute-on-chronic HF who present with an acute decompensation of chronic HF.
- Unable to Determine – Select this option for patients with newly discovered myocardial dysfunction without sufficient data to determine duration.

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Etiologies and Contributors to Cardiogenic Shock:

Tab: Shock Onset

Variable Name: etiologies

Definition: The etiologies that may have contributed to this episode of cardiogenic shock.

Question: What were the etiologies and contributors to cardiogenic shock?

Format: Multi-Select

Allowable Values:

- None of the causes below
- Acute Transplant Rejection
- ACS/AMI
 - STEMI
 - NSTEMI

- Arrhythmia
 - Bradyarrhythmia
 - Tachyarrhythmia
- COVID-19 related complication
- Isolated Right Heart Failure
 - Acute PE
 - Pulmonary HTN
 - Other Isolated Right Heart Failure
- LVAD complication
- Mechanical complication of MI
- Myocarditis
- Peripartum
- Post-cardiac arrest
- Post-cardiopulmonary bypass
- Takotsubo cardiomyopathy
- Tamponade
- Valvular dysfunction
- Other (Specify): _____
- Unknown

Notes for Abstraction:

- Select all additional applicable significant contributors to the shock state.
- Arrhythmia – Please reserve arrhythmia for those patients in which an arrhythmia itself (e.g., persistent AF with RVR or incessant VT) contributed to the shock. Do not include post-cardiac arrest shock in this category.
- Post-cardiopulmonary arrest – Please use this for patients with shock due to known or presumed ventricular stunning after cardiac arrest.
- Valvular dysfunction (severe) – only select when valvular disease is a significant contributor to the development of shock (e.g., acute aortic insufficiency, or papillary muscle rupture).

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Medications administered at onset of shock:

Tab: Medications at Shock Onset

Variable Name: medsshock

Definition: The medication(s) administered to the patient due to the onset of Cardiogenic Shock.

Question: What were the medication(s) administered at the onset of shock?

Format: Multi-Select

Allowable Values:

- No medications administered at onset of shock
- Anticoagulation Therapy
 - Direct oral anticoagulant
 - **Factor Xla Inhibitor**
 - Warfarin
 - IV heparin
 - Other
- Antiplatelet Medication
 - Aspirin
 - P2Y12 Inhibitors
 - Other Antiplatelet
- Vasoactive Medications (IV Continuous, during first 6 hours after shock onset)
 - Dobutamine
 - Dopamine
 - Epinephrine
 - Levosimendan
 - Milrinone
 - Nitroprusside
 - Norepinephrine
 - Phenylephrine
 - Vasopressin
- Not Documented

Notes for Abstraction:

- Select all that apply from the list provided. Choose “None” if no meds were administered after the onset of shock.
- If medications were administered but can’t be found in the patient’s record, select “Not Documented”

Suggested Data Sources:

Change Log: August 2026

P2Y12 Inhibitor at onset of shock

Tab: Medications at Shock Onset

Variable Name: p2y12shock

Definition: The P2Y12 inhibitor medication(s) administered at the onset of shock.

Question: What P2Y12 inhibitor medication(s) was the patient administered at the onset of shock?

Format: Multi-Select

Allowable Values:

- cangrelor (Kengreal)
- clopidogrel (Plavix)
- prasugrel (Effient)
- ticagrelor (Brilinta)
- ticlopidine (Ticlid)

Notes for Abstraction:

- These are medications that were given to treat onset of shock.
- Select which P2Y12 medication(s) was administered at onset of shock: Cangrelor (Kengreal), Clopidogrel (Plavix), Prasugrel (Effient), Ticagrelor (Brilinta), Ticlopidine (Ticlid)

Suggested Data Sources:

Change Log: June 2025

Exams/Labs at Shock Onset (Enter Values Closest to Shock Onset)*Date/Time of Vital Signs:*

Tab: Medications at Shock Onset

Variable Name: vitalsshockdt

Definition: The date/time closest to onset of cardiogenic shock when vital signs were assessed.

Question: Date and time of vital signs closest to shock onset?

Format: Date/Time (Drop down to select a precision or unknown).

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- Enter the date/time of assessment for the vital signs obtained closest to onset of cardiogenic shock.
- An “unknown” option is available from the drop-down if the date/time cannot be reasonably estimated.

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Vital Signs:

Tab: Medications at Shock Onset

Variable Name:

- Height:
 - Heightshock, heightushock, heightndshock
- Weight
 - Weightshock, weightushock, weightndshock
- Body Mass Index (BMI)
 - bmishock
- Body Surface Area (BSA)
 - bsashock
- Heart Rate
 - Heartrateshock, heartrateshocknd
- Blood Pressure (BP)
 - Systolicshock, diastolicshock, bpndshock
- Temperature
 - Tempshock, tempushock, tempndshock

Definition: The vital signs assessed immediately before, or after cardiogenic shock was detected.

Question: What were the patient's vital signs that were recorded at shock onset?

Format: Integers

Allowable Values:

- Height
 - Range: (0.0-999.9)
 - Units: (in, cm)
- Weight
 - Range: (0.0-999.9)
 - Units: (lbs, kg)
- BMI
 - Range: (0.0-999.9)
- BSA
 - Range: (0.0-999.9)
- Heart Rate
 - Range: (0-399)
- BP
 - Range: (0-300)
- Temperature
 - Range: (0-120)
 - Unit: (C°, F°)

Notes for Abstraction:

- Enter the values for vital signs obtained closest to onset of cardiogenic shock.
- If cardiogenic shock was present on arrival at the hospital, the vital signs on arrival will be used.

When multiple values are available, include only the values closest to the onset of shock. The "Onset of Shock (Date/Time)" element may be used to identify the closest time(s).

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: March 2023

Labs (closest to shock onset)

Tab: Medications at Shock Onset

Variable Name:

- Lactate-Closest to shock onset
 - Lactateshock, lactatenashock
- Hemoglobin- Closest to shock onset
 - Hgbshock, hgbushock, hgbnashock
- NTProBNP- Closest to shock onset
 - Ntprobnpshock, ntpobnpushock, ntprobnpnashock
- BNP- Closest to shock onset
 - Bnpshock, bnpnushock, bnpnashock
- Serum Creatinine- Closest to shock onset
 - Scrshock, scrushock, scrnashock
- ALT- Closest to shock onset
 - Altshock, altnashock
- Platelet Count- Closest to shock onset
 - Plateletshock, plateletnashock
- Troponin- Closest to shock onset
 - Tropshock, tropushock, tropnashock, tropschockbelowlimit
- Random Blood Glucose- Closest to shock onset
 - Randombgshock, randombgbnashock

Definition: The lab values assessed immediately before, or after cardiogenic shock was detected.

Question: What were the results of the shock onset labs that were performed?

Format: Date/Time (Drop down to select a precision or unknown).

Allowable Values:

- Lactate
 - Range: (0.2-30.0)
 - Units: (nmol/L)
- Hgb
 - Range: (0-999.9)
 - Units: (g/dL, g/L)
- NT-ProBNP

- Range: (0-200000.0)
- Units: (pg/mL, ng/L)
- BNP
 - Range: (0-99999.9)
 - Units: (pg/mL, pmol/L, ng/L)
- Serum Creatinine
 - Range: (0.00-999.9)
 - Units: (mg/dL, micromol/L)
- ALT (IU/L)
 - Range: (5-10000)
- Platelet Count
 - Range: (0-999999)
- Troponin
 - Range: (0.000-200000.000)
 - Units: (ng/L, ng/mL, ug/L)
- Random Blood Glucose
 - Range: (0-1500.0)
 - Units: (mg/dL)

Notes for Abstraction:

- When multiple values are available, include only the values closest to the time of shock onset.
- It is understood that the individual labs may have been drawn at different times.
- With the exception of cardiac troponin, use the instance of each lab closest to shock onset.
- For cardiac troponin, please report the peak value related to shock onset. This may precede or follow the onset of shock. For this question do not enter values of cardiac troponin >4 days after shock onset.

Suggested Data Sources:

- Admission Sheet
- Emergency Department Data
- Hospitalization Data
- Transfer Notes

Change Log: June 2024

Transfer

Date/Time of Assessment – Transfer

Tab: Transfer

Variable Name: transfer_assessdt

Definition: The date and time of the shock assessment at the referring facility.

Question: What was the date/time of shock assessment at the referring hospital prior to transfer?

- **Format: Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Allowable Values: Custom date and time

Notes for Abstraction:

- If multiple assessments were performed at the referring hospital, use the earliest date and time.
- The intent is to collect the date and time the shock assessment was done that provided the data for the transfer tab in the registry.

Suggested Data Sources:

Change Log: February 2024

Did a cardiac arrest occur at the referring facility prior to transfer?

Tab: Transfer

Variable Name: transfer_cardarr

Definition: At time of assessment at the referring hospital, did the patient experience a cardiac arrest?

Question: Did a cardiac arrest occur at the referring facility prior to transfer to this (your) facility?

Format: Date: Single-select

Allowable Values:

- Yes
- No
- ND

Notes for Abstraction:

Suggested Data Sources:

Change Log: April 2026

Presence of a Pulmonary Artery Catheter (PAC) - Transfer

Tab: Transfer

Variable Name: transfer_PAC

Definition: At time of assessment at the referring hospital, did the patient have a PAC in place?

Question: Was there a presence of PAC at the time of assessment at referring hospital?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Presence of a Mechanical Ventilation - Transfer

Tab: Transfer

Variable Name: transfer_mechvent

Definition: At time of assessment at the referring hospital, did the patient have the assistance of mechanical ventilation?

Question: Was there a presence of mechanical ventilation at the referring hospital?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Presence of Renal Replacement Therapy - Therapy

Tab: Transfer

Variable Name: transfer_rrt

Definition: At time of assessment at the referring hospital, did the patient have renal replacement therapy in place?

Question: Was there a presence of renal replacement therapy at the referring hospital?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:**Suggested Data Sources:**

Change Log: February 2024

Exams/Labs at Transfer (Enter Values Closest to Shock assessment at the transferring hospital)

Tab: Transfer

Variable Name:

- BP:
 - transfer_systolic, transfer_diastolic, transfer_bpnd
- Heart Rate
 - transfer_hearttrate , transfer__heartratend
- CVP/RA
 - transfer_cvpra , transfer_cvprand
- PA Pressure
 - transfer_papressuresys, transfer_papressuredia , transfer_papressurend
- PCWP
 - transfer_pcwp, transfer_pcwpnd
- Cardiac Output
 - transfer_cardoutput, transfer_cardoutputnd
- MAP
 - transfer_map
- PAPI
 - transfer_papi
- CPO
 - Transfer_cpo

Definition: The shock assessment parameters (exam/labs) that were done at the closest time of shock assessment at the referring hospital prior to transfer.

Question: What shock assessment vital or lab(s) were performed at the referring hospital?

Format: Multi-select

Allowable Values:

- Blood pressure (BP)
 - Units: (mmHg)
 - Range: (0-300)
- Heart Rate
 - Units: (bpm)
 - Range: (0-399)
- CVP/RA
 - Units: (mmHG)
 - Range: (2-40)
- Pulmonary Artery (PA) pressure

- Units: (mmHG)
 - Range: (0-300)
- PCWP
 - Units: (mmHG)
 - Range: (2-60)
- Cardiac Output
 - Units: (L/min)
 - Range: (0.1-40.0)
- Mean Arterial Pressure (MAP)
 - Units: na, auto-calculated
 - Range: (0-300)
- PAPI
 - Units: na, auto-calculated
 - Range: (0-300)
- CPO
 - Units: na, auto-calculated
 - Range: (0-300)

Notes for Abstraction:

- Record the first reliable vital signs taken during shock assessment at referring hospital:
- For any set of values that cannot be determined, or those that are not documented, select the option “Not Documented”.
- Each vital sign has its own “Not documented” option to allow for ‘element-specific’ entries.
- For the auto-calculated values, the relevant data has to be entered in order for the three values to be auto-calculated.
 - **CVP/RA** = Central Venous Pressure or Right Atrial Pressure
 - **PCWP** = Pulmonary capillary wedge pressure
 - **MAP** = Mean Arterial Pressure (*automatically calculated*)
 - **PAPI** = Pulmonary artery pulsatility index (*automatically calculated*)
 - **CPO** = Cardiac Power Output (*automatically calculated*)

Suggested Data Sources:

Change Log: February 2024

Peak Lactate prior to transfer

Variable Name: transfer_peaklactate, transfer_peaklactatend

Definition: The peak lactate value at the referring hospital.

Question: What was the peak lactate value at the referring hospital prior to transfer?

Format: Integer

Allowable Values:

- Custom integer
 - Range: (0.2-30.0)
 - Units: (nmol/L)
- Not Documented

Notes for Abstraction:

- If the lactate value at the referring hospital cannot be established, select “Not documented”.

Change Log: March 2023

Lowest pH prior to transfer

Variable Name: transfer_lowph, transfer_lowphnd

Definition: The lowest potential hydrogen (pH) test result at the referring facility.

Question: What was the lowest potential hydrogen (pH) test result at the referring hospital prior to transfer?

Format: Integer

Allowable Values:

- Custom integer
 - Range: (0.0-14.0)
 - Units: n/a

Notes for Abstraction:

- If no pH values were obtained at the referring hospital, then enter “Not documented”.

Change Log: February 2024

Peak ALT prior to transfer

Variable Name: transfer_peakalt, transfer_peakaltn

Definition: The peak Alanine aminotransferase (ALT) test recorded at the referring facility.

Question: What was the peak Alanine aminotransferase (ALT) test recorded at the referring hospital prior to transfer?

Format: Integer

Allowable Values:

- Custom integer
 - Range: (1-2500)
 - Units: (IU/L)

Notes for Abstraction:

Change Log: February 2024

Vasoactive Medications at time of assessment- Transfer

Tab: Transfer

Variable Name: transfer_vasomeds, transfer_vasometh

Definition: The vasoactive medications that the patient was receiving at the time of assessment at the referring hospital.

Question: Was the patient on any vasoactive medications at the time of assessment prior to transfer?

Format: Multi Select

Allowable Values:

- None
- Dobutamine
- Dopamine
- Epinephrine
- Levosimendan
- Milrinone
- Nitroprusside
- Norepinephrine
- Phenylephrine
- Vasopressin
- Not Documented
- Other (Specify):_____

Notes for Abstraction: Select all applicable vasoactive medications being administered at the time of shock assessment at the referring hospital from the allowable list provided.

Suggested Data Sources:

Change Log: February 2024

Presence of MCS Device(s) at assessment – Transfer

Tab: Transfer

Variable Name: transfer_mcsdevice, transfer_mcsdeviceoth

Definition: Evidence of the presence of one/more mechanical circulatory support device at the time of shock assessment at the referring hospital.

Question: Was there a presence of a MCS Device(s) at the time of assessment?

Format: Multi Select

Allowable Values:

- None
- Impella
 - Impella 2.5
 - Impella CP
 - Impella ECP
 - Impella 5.0
 - Impella 5.5
 - Impella RP
- VA Ecmo
- IABP
- IVAC
- TandemHeart
 - Left
 - Right
- Temporary surgical VAD (e.g. CentriMag)
 - Left

- Right
- Implanted surgical assist device
 - Pulsatile-Flow Devices
 - Continuous-Flow Devices
- Other (Specify): _____

Notes for Abstraction: Select all devices that apply at the time of shock assessment at the referring hospital from the allowable values provided.

Suggested Data Sources:

Change Log: February 2024

Vascular complication requiring intervention? – Transfer

Tab: Transfer

Variable Name: transfer_vasccomp

Definition: During the assessment at the referring hospital, was there a vascular complication that required intervention?

Question: Was there a vascular complication that required intervention at the time of the assessment at the referring hospital?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Date/Time of vascular complication requiring intervention – Transfer

Tab: Transfer

Variable Name: transfer_vasccompdt

Definition: The date and time of the vascular complication that required intervention.

Question: If yes, what was the date and time of the vascular complication that required intervention?

Format:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)

- MM = Minutes (00–59)
- **Unknown**

Allowable Values: Custom date and time

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Complications of ECMO - Transfer

Tab: Transfer

Variable Name: transfer_othcompecmo, transfer_othcompecmooth

Definition: To determine if there were other complications of ECMO at the time of assessment at the referring hospital.

Question: What were the complications of ECMO?

Format: Multi-Select

Allowable Values:

- No Complications
- Pulmonary hemorrhage requiring intervention
- Refractory pulmonary edema
- Other (specify):_____

Notes for Abstraction:

Suggested Data Sources:

Change Log: June 2024

In-Hospital Care

Cardiovascular Procedures during this hospitalization:

Tab: In-Hospital Care

Variable Name:

- No Cardiac Procedure
 - cardionproc
- Cardiac Cath/Coronary Angiography
 - cardcath
- Cardiac Transplantation
 - Cardtransp, cardtranspdt
- Coronary Artery Bypass Graft (CABG)
 - Cabg, cabgdt
- Electrophysiology (EP) Procedure
 - Ep, epdt
- Percutaneous Cardiac Intervention (PCI)
 - Pci, pcidt
- Pulmonary Embolectomy (Surgical or transcatheter)
 - pulemb
- Targeted temperature management
 - targtempmgt
- Other Procedures/Advanced Therapies
 - othcardioproc, othcardioprocspec
- Mechanical Circulatory Support Device
 - Mcs, firstmcsdt
- Percutaneous Assist Devices
 - Percassistdev
- Surgical Assist Devices
 - surgassistdev, surgassistdevdt

Definition: The cardiovascular procedures that were done as a result of this cardiogenic shock event.

Question: What cardiac procedure(s) were performed during this hospitalization?

Format: Multi-select (Plus dates/times where needed)

Allowable Values:

- No Procedures
- Cardiac Cath/Coronary Angiography
- Percutaneous Cardiac Intervention (PCI)
 - *Date/Time of v*
- Cardiac Transplantation
 - *Date/Time of transplant*
- Coronary Artery Bypass Graft (CABG)
 - *Date/Time of CAB*
- Electrophysiology (EP) procedure
 - *Date/Time of EP:*
- Pulmonary embolectomy (surgical or transcatheter)

- Targeted temperature management
- Other Procedures/Advanced therapies (Specify):
- Mechanical Circulatory Support Device/VAD
 - *Date/Time of MCS:*

Percutaneous Assist Devices

- IABP
- Impella
- TandemHeart
- VA ECMO
- iVAC
- Other

Surgical Assist Devices

- Temporary external device (e.g. CentriMag)
- Implanted surgical assist device
 - *Date/Time of implantation*
- Pulsatile-Flow Devices
- Continuous-Flow Devices

Notes for Abstraction:

- Select all that apply.
- Choose “No Procedures” if there were no procedures done as a result of this Cardiogenic Shock event.
- For each selected procedure, fill out the date/time if the information is available.
 - Drop-down and select unknown where the data is not available or cannot be determined.
- Note that mechanical circulatory support device/VAD includes both temporary catheter-based mechanical circulatory support as well as surgically implanted temporary and durable ventricular assist devices. Other examples of temporary external devices (besides Centrimag) include AB5000 and Thoratec PVAD
- Examples of implanted surgical assist devices include HeartMate 3, HeartMate 2, and HeartWare HVAD.

Suggested Data Sources:

- Admission Sheet
- Hospitalization Data

Change Log: March 2023

Was a right heart catheterization or pulmonary artery catheterization performed?

Tab: In-Hospital

Variable Name: rchpac, rchpacdt

Definition: To determine if a right heart catheterization or pulmonary artery catheterization were performed.

Question: Was a right heart catheterization or pulmonary artery catheterization performed?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Was the PA catheter used for a period of hemodynamic monitoring outside the cath lab/OR?

Tab: In-Hospital

Variable Name: pachemomon

Definition: To determine if there was a PA catheter used for a period of hemodynamic monitoring outside the cath lab/OR.

Question: Was the PA catheter used for a period of hemodynamic monitoring outside the cath lab/OR?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Was the patient managed with invasive mechanical ventilation at any time during the hospitalization?

Tab: In-Hospital

Variable Name: invmechint

Definition: During this hospitalization, was the patient managed with invasive mechanical ventilation.

Question: Was the patient managed with invasive mechanical ventilation at any time during the hospitalization?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/ Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: April 2023

Primary indication for advanced respiratory therapy?

Tab: In-Hospital

Variable Name: advrespind

Definition: The primary indication for the first advanced respiratory intervention.

Question: If the patient was managed with invasive mechanical ventilation, what was the primary indication?

Format: Single Select

Allowable Values:

- Airway protection only (other than cardiac arrest)
- Cardiac arrest without respiratory failure
- Chronic dependence on mechanical ventilation
- Procedural sedation/ anesthesia and recovery
- Respiratory insufficiency
- Other

Notes for Abstraction:

Airway protection only (other than cardiac arrest): Initiated to secure and protect the airway due to risk of compromised patency or aspiration, not due to gas exchange failure.

Cardiac arrest without respiratory failure: Used in the setting of circulatory collapse advanced cardiac life support rather than primary respiratory insufficiency.

Chronic dependence on mechanical ventilation: Patient requires long-term ventilatory support due to underlying conditions and was ventilator-dependent prior to this episode of care.

Procedural sedation/anesthesia and recovery: Temporary support during sedation/anesthesia for a procedure, not due to intrinsic respiratory failure.

Respiratory insufficiency: Initiated due to inability to maintain adequate oxygenation and/or ventilation.

Suggested Data Sources:

Change Log: June 2026

Date/time of first intubation related to this hospitalization?

Tab: In-Hospital

Variable Name: intubationdt

Definition: The date and time of the first intubation for patients that were managed with invasive mechanical ventilation.

Question: What was the date and time of the first intubation related to this hospitalization?

Format:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Allowable Values: Custom date and time

Notes for Abstraction:

Suggested Data Sources:

Change Log: April 2023

Extubation

Tab: In-Hospital

Variable Name: extubation

Definition: Evaluating if an extubation occurred during the hospitalization.

Question: Did an extubation occur during this hospitalization?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources:

Change Log: June 2026

Date/time of extubation

Tab: In-Hospital

Variable Name: extubationdt

Definition: The date and time of the extubation.

Question: What was the date and time of the extubation related to this hospitalization?

Format:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Allowable Values: Custom date and time

Notes for Abstraction: N/A

Suggested Data Sources:

Change Log: June 2026

Was the patient managed with renal replacement therapy at any time during the hospitalization?

Tab: In-Hospital

Variable Name: renalrep

Definition: To determine if renal replacement was used during this hospitalization.

Question: Was the patient managed with renal replacement therapy at any time during the hospitalization?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/ Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: April 2023

If yes, select type of renal replacement therapy used

Tab: In-Hospital

Variable Name: renalreptype

Definition: The type of renal replacement used.

Question: If this patient received renal replacement therapy, select the type of renal replacement therapy used.

Format: Single Select

Allowable Values:

- Accelerated venovenous hemofiltration (AVVH)
- Continuous venovenous hemofiltration (CVVH)
- Emergent or urgent hemodialysis
- Routine hemodialysis for patient with end stage renal dialysis (ESRD)
- Unknown/ Not Documented

Notes for Abstraction:

- If multiple types used, select the first received by the patient.

Suggested Data Sources:

Change Log: April 2023

Primary indications for advanced renal therapy

Tab: In-Hospital

Variable Name: renalrepind

Definition: The primary indications for renal replacement during hospitalization.

Question: If this patient received renal replacement, what were the primary indications for the therapy?

Format: Multi Select

Allowable Values:

- Acidemia
- Hyperkalemia
- Severe uremia
- Volume overload causing hemodynamic or respiratory compromise
- Volume overload in the absence of any of the above
- Other (specify)
- Unknown/ Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: April 2023

Was the patient admitted to ICU at any point during hospitalization?

Tab: In-Hospital

Variable Name: admiticu, icuadmit, icudschdt, icudays

Definition: To determine if the patient was admitted to the ICU at any point during hospitalization.

Question: Was the patient admitted to ICU at any point during hospitalization?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:**Suggested Data Sources:**

Change Log: February 2024

Severe/Moderate GUSTO Bleeding Event

Tab: In-Hospital

Variable Name: gusto, gustodt

Definition: Documentation of Severe/Moderate GUSTO as a clinical outcome for the patient at any time during this admission/episode of care.

Question: Was there a severe or moderate GUSTO bleeding event? If so, record the first date and time recorded.

Format: Single-Select

Allowable Values:

- Yes (If Yes, Date/Time to be entered)
- No

Notes for Abstraction:

- This GUSTO bleeding criteria should be followed:
 - **Severe** – Fatal, or intracranial bleeding, or hemorrhage that caused hemodynamic compromise that required treatment/intervention (e.g., systolic blood pressure <90 mm Hg that required blood or fluid replacement, or vasopressor support, or surgical intervention)
 - **Moderate** – Bleeding that requires blood transfusion but does not result in hemodynamic compromise (as defined above) is classified as moderate.
- Select “no” for this field for either the absence of bleeding or the occurrence of minor bleeding that does not require transfusion or meet any of the criteria for severe.
- The GUSTO bleeding criteria can also be found in the appendix.
 - Document the date/time detected (if available).

Suggested Data Sources:

- Hospitalization Data

Change Log: March 2023

Intracranial Hemorrhage

Tab: In-Hospital

Variable Name: ichemorr, ichemorrtdt

Definition: Documentation of Intracranial Hemorrhage as a clinical outcome for the patient during this event.

Question: Was there an intracranial hemorrhage event? If so, record the first date and time recorded.

Format: Single-Select

Allowable Values:

- Yes (If Yes, Date/Time to be entered)
- No

Notes for Abstraction:

Intracranial hemorrhage includes any of the following:

- Rapidly developing neurologic signs or symptoms (focal or global) caused by an intraparenchymal, intraventricular, spinal cord, or retinal collection of blood, not caused by trauma.
- Rapidly developing neurologic signs or symptoms (focal or global) and/or headache caused by bleeding into the sub-arachnoid space, not caused by trauma.
- An episode of acute focal neurologic signs or symptoms and/or headache accompanied by evidence of bleeding into the subdural space.
- Ischemic stroke with hemorrhagic conversion.
- Neuroimaging or pathologic evidence of CNS hemorrhage within the brain parenchyma, sub-arachnoid space, subdural space, ventricular system, spinal cord, or retina on neuroimaging that is not caused by trauma, without a history of acute neurologic symptoms consistent with the bleeding location.

If this element is selected, the date/time that the intracranial hemorrhage was detected should also be entered (if available).

Intracranial hemorrhage does not include microbleeds.

Suggested Data Sources:

- Hospitalization Data

Change Log: March 2023

Cardiac Arrest

Tab: In-Hospital

Variable Name: cardarrest, cardarrestdt

Definition: Documentation of Cardiac Arrest as a clinical outcome for the patient at any time during this episode of care.

Question: Was there a cardiac arrest event? If so, record the first date and time recorded.

Format: Single-Select

Allowable Values:

- Yes (If Yes, Date/Time to be entered)

- No

Notes for Abstraction:

- Cardiac arrest includes pulseless clinical scenarios that can be bradycardia arrests or tachycardia arrests requiring cardiopulmonary resuscitation (requiring ≥ 2 chest compressions, or open chest massage) and/or requiring emergency defibrillation.
- Document the date/time of cardiac arrest (if available).

Suggested Data Sources:

- Hospitalization Data

Change Log: March 2023

Stroke

Tab: In-Hospital

Variable Name: stroke, strokedt

Definition: Documentation of Stroke as a clinical outcome for the patient at any time during this admission/episode of care.

Question: Was there a stroke documented? If so, record the first date and time recorded

Format: Single-Select

Allowable Values:

- Yes (If Yes, Date/Time to be entered)
- No

Notes for Abstraction:

- Sudden onset of neurologic signs or symptoms fitting a focal or multifocal vascular territory within the brain, spinal cord, or retina, that:
 - I. Persist for ≥ 24 hours or until death, with pathology or neuroimaging evidence that demonstrates either:
 - (a) CNS infarction in the corresponding vascular territory (with or without hemorrhage); or
 - (b) absence of other apparent causes (including hemorrhage), even if no evidence of acute ischemia in the corresponding vascular territory is detected.
 - OR**
 - II. Symptoms lasting < 24 hours with pathology or neuroimaging confirmation of CNS infarction in the corresponding vascular territory. Note: when CNS infarction location does not match the transient symptoms, the event would be classified as covert CNS infarction (Type 2a) and a TIA (Type 3a), but not an ischemic stroke.
- Signs and symptoms consistent with stroke typically include an acute onset of one of the following: focal weakness and/or numbness, impaired language production or comprehension, homonymous hemianopia or quadrantanopia, diplopia, altitudinal monocular blindness, hemispatial neglect, dysarthria, vertigo, or ataxia.
- Document the date/time that Stroke was detected (if available).

Suggested Data Sources:

- Hospitalization Data

Change Log: March 2023

Complications from procedures during this admission:

Tab: In-Hospital

Variable Name: proccomp, proccompoth

Definition: The complications that occurred from procedures performed on the patient during this admission.

Question: Were there any complications from procedures during this admission?

Format: Multi-Select

Allowable Values:

- No complications
- Acute Limb ischemia
 - Amputation
 - Fasciotomy
- Arterial non-CNS thrombosis
- Bleeding – Vascular access site – MCS Related
- Bleeding – Vascular access site – Other access site
- Bleeding – Other site
- Cardiac tamponade
- Vascular injury (any)
- Venous thromboembolism
- Other (Specify)

Notes for Abstraction:

- Select all that apply from the list provided (allowable values). Choose “None” if no complication occurred as a result of procedures done during this episode of care.
- Record bleeding that requires endoscopic, endovascular, or surgical intervention to halt the bleeding or meets the definition of GUSTO moderate or severe bleeding, including the need for transfusion or pressors for hypotension related to bleeding.
- Vascular injury can include any of the following:
 - Arterial pseudoaneurysm
 - Arteriovenous fistula
 - Vessel dissection, perforation, or rupture
 - Iatrogenic vessel stenosis

See **additional resource** for vascular access site events in the appendix.

Suggested Data Sources:

- Admission Sheet
- Discharge Data
- Hospitalization Data

Change Log: March 2023

Mechanical Circulatory Support Form (MCS)

Implanted device for this form:

Tab: MCS

Variable Name: idecmo, idiabp, idimpella, idivac, idtanhr, idtempsurgvad, idoth

Definition: The type/make of device that was implanted on the patient during this episode of care.

Question: Was there a device implanted on the patient during this episode of care? If so, what was the type and make?

Format: Single-Select

Allowable Values:

- ECMO (VA)
- IABP
- Impella
 - Impella CP
 - Impella ECP
 - Impella 5.5
 - Impella RP
 - Impella RP Flex
- iVAC
- TandemHeart
- Temporary surgical VAD (e.g. CentriMag)
- Other (Specify)

Notes for Abstraction:

- Depending on the number of mechanical circulatory support device(s) implanted on a patient, each device will then have its own section to be filled out separately.
- This section is activated based on the data element "Cardiovascular Procedures during this hospitalization".

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure – VA ECMO:

Tab: MCS

Variable Name: iddtecmo

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: March 2023

Died with implant in place – VA ECMO

Tab: MCS

Variable Name: iddiedecmo

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

Device explant date/time – VA ECMO:

Tab: MCS

Variable Name: idexpecmo

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: March 2023

Arterial Implant Site – VA ECMO:

Tab: MCS

Variable Name: idsiteecmo

Definition: The anatomical site that was cannulated for implantation.

Question: Where was the implant site?

Format: Single-Select

Allowable Values:

Dependent on device selected:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous
 - Right
 - Axillary
 - Femoral
 - Jugular
 - Left
 - Axillary

- Femoral
- Jugular

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: February 2024

Venous Implant Site – VA ECMO:

Tab: MCS

Variable Name: idsiteecmo2

Definition: The anatomical site that was cannulated for implantation.

Question: Where was the implant site?

Format: Single-Select

Allowable Values:

Dependent on device selected:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous
 - Right
 - Axillary
 - Femoral
 - Jugular
 - Left
 - Axillary
 - Femoral
 - Jugular

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: February 2024

Receiving CPR at time of Implant – VA ECMO:

Tab: MCS

Variable Name: idcprecmo

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select "Yes" if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select "No" if they were not.
- Select "Unknown/ND" if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: March 2023

Reason for device implant- VA ECMO:

Tab: MCS

Variable Name: idreasecmo

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multit-Select

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under "Other reason for device implant".

Suggested Data Sources: N/A

Change Log: March 2023

Vascular closure applied - VA ECMO:

Tab: MCS

Variable Name: idecmovasclose, idreasothecmo

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

IABP Manufacturer & Model:

Tab: MCS

Variable Name: idiabpman, idiabpmod

Definition: IABP Manufacturer & model type.

Question: What is the IABP manufacturer & model type?

Format: Single Select

Allowable Values:

- MAQUET (Getinge)
 - Cardiosave rescue
 - Cardiosave IABP Hybrid
- Teleflex Corporation
 - Arrow AutoCAT 2 WAVE IABP
 - Arrow AC# Optimus IABP
- Datascope (Getinge)
 - CS100
 - CS100i
 - 97E
 - 90T
 - 98XT
 - CS300
- Abiomed
 - iPulse
- Edwards Lifesciences

- Aquarius
- Unknown

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

IABP Catheter Manufacturer & Model:

Tab: MCS

Variable Name: idiabpcatman, idiabpcatmod

Definition: IABP Catheter Manufacturer & model type.

Question: What is the IABP catheter manufacturer & model type?

Format: Single Select

Allowable Values:

- Getinge
 - Linear
 - Mega
 - Sensation
 - Sensation Plus
- Teleflex
 - Arrow RediGuard IAB catheters
 - Arrow Ultra 8 Fiber-Optic IAB Catheter
 - Arrow Ultra 8 Fluid-Filled IAB Catheter
 - Arrow UltraFlex 7.5 IAB Catheter

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

IABP Balloon Size:

Tab: MCS

Variable Name: idiapbbalsize

Definition: Evaluating the IABP balloon size.

Question: What is the IABP balloon size?

Format: Single Select

Allowable Values:

- 25cc
- 30cc
- 34cc
- 40cc
- 50cc

- Unknown

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure – IABP:

Tab: MCS

Variable Name: iddtiabp

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – IABP:

Tab: MCS

Variable Name: iddiediabp

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – IABP:

Tab: MCS

Variable Name: idexpdiabp

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – IABP:

Tab: MCS

Variable Name: idsiteiabp

Definition: The anatomical site that was cannulated for IABP implantation.

Question: Where was the IABP implant site?

Format: Single-Select

Allowable Values:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – IABP:

Tab: MCS

Variable Name: idcpriabp

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select “Yes” if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select “No” if they were not.
- Select “Unknown/ND” if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- IABP:

Tab: MCS

Variable Name: idreasiabp

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multiselect

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under "Other reason for device implant".

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - IABP:

Tab: MCS

Variable Name: idiabpvasclose, idreasothiabp

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure –Impella:

Tab: MCS

Variable Name: iddtimpellacp, iddtimpellaecp, iddtimpella55, iddtimpellarp, iddtimpellarpf

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.

- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – Impella

Tab: MCS

Variable Name: iddiedimpellaacp, iddiedimpellaecp, iddiedimpella55, iddiedimpellarp, iddiedimpellarpf

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – Impella:

Tab: MCS

Variable Name: idexpdimpellacp, idexpdimpellaecp, idexpdimpella55, idexpdimpellarp, idexpdimpellarpf

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – Impella:

Tab: MCS

Variable Name: idsiteimpellacp, idsiteimpellaecp, idsiteimpella55, idsiteimpellarp, idsitevimpellarpf

Definition: The anatomical site that was cannulated for Impella implantation.

Question: Where was the Impella implant site?

Format: Single-Select

Allowable Values:

- Arterial (Impella CP, ECP, or 5.5)
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous (Impella RP or RP Flex)
 - Right
 - Right- Femoral
 - Right-Internal Jugular
 - Left
 - Left- Femoral
 - Left- Internal Jugular
 - Other

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – Impella:

Tab: MCS

Variable Name: idcprimpellacp, idcprimpellaecp, idcprimpella55, idcprimpellarp, idcprimpellarpf

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select “Yes” if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select “No” if they were not.
- Select “Unknown/ND” if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- Impella:

Tab: MCS

Variable Name: idreasimpellacp, idreasimpellaecp, idreasimpella55, idreasimpellarp, idreasimpellarpf

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multiselect

Allowable Values:

- Critical Left Main/Severe CAD (**will not appear for Impella RP or RP Flex*)
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO (**will not for Impella RP or RP Flex*)
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.

- For any reason(s) not listed in allowable values, please specify in the free-text section provided under “Other reason for device implant”.

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - Impella:

Tab: MCS

Variable Name: idimpellacpvasclose, idreasothimpellacp, idimpella55vasclose, idreasothimpella55, idimpellarpvasclose, idreasothimpellarp, idreasothimpellarpf, idimpellarpfvasclose

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure -iVAC:

Tab: MCS

Variable Name: iddtivac

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – iVAC:

Tab: MCS

Variable Name: iddiedivac

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – iVAC:

Tab: MCS

Variable Name: idexpdivac

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)

- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – iVAC:

Tab: MCS

Variable Name: idsiteivac

Definition: The anatomical site that was cannulated for iVAC implantation.

Question: Where was the iVAC implant site?

Format: Single-Select

Allowable Values:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – iVAC:

Tab: MCS

Variable Name: idcprivac

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select "Yes" if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select "No" if they were not.
- Select "Unknown/ND" if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- iVAC:

Tab: MCS

Variable Name: idreasivac

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multit-Select

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under "Other reason for device implant".

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - iVAC:

Tab: MCS

Variable Name: idivacvasclose, idreasothivac

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure –TandemHeart:

Tab: MCS

Variable Name: iddttanhrt

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.

- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – TandemHeart:

Tab: MCS

Variable Name: iddiedtanhrt

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – TandemHeart:

Tab: MCS

Variable Name: idexpdtanhrt

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – TandemHeart:

Tab: MCS

Variable Name: idsitetanhrt, idsitetanhrt2

Definition: The anatomical site that was cannulated for TandemHeart implantation.

Question: Where was the TandemHeart implant site?

Format: Single-Select

Allowable Values:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous
 - Right
 - Axillary
 - Femoral
 - Jugular
 - Left
 - Axillary
 - Femoral
 - Jugular
 - Central
 - N/A

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – TandemHeart:

Tab: MCS

Variable Name: idcprtanhrt

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select “Yes” if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select “No” if they were not.
- Select “Unknown/ND” if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- TandemHeart:

Tab: MCS

Variable Name: idreastanhrt

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multiselect

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.

- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under "Other reason for device implant".

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - **TandemHeart:**

Tab: MCS

Variable Name: idtanhrtvasclose, idreasothtanhrt

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

Was a dual lumen venous catheter (e.g. ProtekDuo) used?

Tab: MCS

Variable Name: duallumen

Definition: Determining if a dual lumen venous catheter (e.g. ProtekDuo) was used.

Question: Was a dual lumen venous catheter (e.g. ProtekDuo) used?

Format: Single-Select

Allowable Values:

- Yes
- No
- Unknown

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure –Temporary Surgical VAD:

Tab: MCS

Variable Name: iddttemp surgvad

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – Temporary Surgical VAD:

Tab: MCS

Variable Name: iddiedsurgvad

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – Temporary Surgical VAD:

Tab: MCS

Variable Name: idexpdtempsurgvad

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Was an oxygenator used with this temporary surgical VAD?

Tab: MCS

Variable Name: idoxytempsurgvad

Definition: Evaluating if an oxygenator was used during this temporary surgical VAD.

Question: Was an oxygenator used with this temporary surgical VAD?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – Temporary Surgical VAD:

Tab: MCS

Variable Name: idsitetempsurgvad, idsitetempsurgvad2

Definition: The anatomical site that was cannulated for TandemHeart implantation.

Question: Where was the TandemHeart implant site?

Format: Single-Select

Allowable Values:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Other
 - Left
 - Axillary
 - Femoral
 - Other
 - Central
- Venous
 - Right
 - Femoral
 - Jugular
 - Subclavian
 - Left
 - Femoral
 - Jugular
 - Subclavian
 - Central

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – Temporary Surgical VAD:

Tab: MCS

Variable Name: idcprtempsurgvad

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes

- No
- Unknown/ND

Notes for Abstraction:

- Select “Yes” if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select “No” if they were not.
- Select “Unknown/ND” if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- Temporary Surgical VAD:

Tab: MCS

Variable Name: idreastempsurgvad

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multiselect

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under “Other reason for device implant”.

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - Temporary Surgical VAD:

Tab: MCS

Variable Name: idtempsurgvadvasclose, idreasothtempsurgvad

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

Date/Time of implant procedure –Other:

Tab: MCS

Variable Name: iddtoth

Definition: The Date/Time the device was implanted.

Question: When was the device implanted on the patient during this episode of care?

Format: Single-Select

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Died with implant in place – Other:

Tab: MCS

Variable Name: iddiedoth

Definition: To determine if the patient died with an implant in place.

Question: Did the patient die with implant in place?

Format: Single-Select

Allowable Values:

- Yes
- No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Device explant date/time – Other:

Tab: MCS

Variable Name: idexpdoth

Definition: Date when the mechanical circulatory support device (MCS/MCSD) was explanted.

Question: What was the device explant date and time?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: August 2025

Implant Site – Other:

Tab: MCS

Variable Name: idsiteoth

Definition: The anatomical site that was cannulated for TandemHeart implantation.

Question: Where was the TandemHeart implant site?

Format: Single-Select

Allowable Values:

- Arterial
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central
- Venous
 - Right
 - Axillary
 - Femoral
 - Left
 - Axillary
 - Femoral
 - Central

Notes for Abstraction:

- Select the anatomical site that was cannulated for implantation.

Suggested Data Sources: N/A

Change Log: August 2025

Receiving CPR at time of Implant – Other:

Tab: MCS

Variable Name: idcproth

Definition: Documentation that the patient was receiving CPR during an MCS implantation.

Question: Was the patient receiving CPR at the time of implantation?

Format: Multi-Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select “Yes” if the patient was receiving cardiopulmonary resuscitation (CPR) during an MCS implantation.
- Select “No” if they were not.
- Select “Unknown/ND” if the status was unknown, or not documented (ND).

Suggested Data Sources: N/A

Change Log: August 2025

Reason for device implant- Other:

Tab: MCS

Variable Name: idreasoth

Definition: The rationale/reason why the device was implanted.

Question: What was the reason why the device was implanted?

Format: Multiselect

Allowable Values:

- Critical Left Main/Severe CAD
- Incessant Arrhythmia
- Refractory Ischemia
- Shock
- Severe Heart Failure without Shock
- Severe Valvular Dysfunction
- Supported PCI
- Ventricular Septal Defect
- Left-ventricular venting during VA-ECMO
- Other reason for device implant (Specify):

Notes for Abstraction:

- Select reason(s) why the device was implanted.
- This is a multi-select field, so if there were multiple reasons, select all that apply.
- For any reason(s) not listed in allowable values, please specify in the free-text section provided under “Other reason for device implant”.

Suggested Data Sources: N/A

Change Log: August 2025

Vascular closure applied - Other:

Tab: MCS

Variable Name: idothvasclose, idreasothoth

Definition: Type of vascular closure that was applied.

Question: What type of vascular closure was applied?

Format: Mutli Select

Allowable Values:

- Collagen-based plug with MANTA
- Dry-based
- Manuel compression (Femostop)
- Planned open surgical repair
- Suture-based (Proglide, Prostar XL)
- Other (Specify):_____

Notes for Abstraction:

Suggested Data Sources: N/A

Change Log: August 2025

ECMO

Pre-ECMO Events

Select any current device(s) supporting patient pre-ECMO

Tab: ECMO

Variable Name: currentdevice

Definition: The mechanical circulatory support device that supports the patient prior to the start of ECMO.

Question: What device(s) if any did the patient have as support pre-ECMO?

Format: Multi-Select

Allowable Values:

- None
- Intra-Aortic Balloon Pump (IABP)
- Impella (any)
- iVAC
- Tandem Heart
 - Left
 - Right
- Temporary surgical VAD (e.g. CentriMag)
 - Left
 - Right
- Other (Specify):

Notes for Abstraction:

- Select any mechanical circulatory support device(s) supporting the patient pre-ECMO cannulation
- If an MCS device was pre-selected in the Main form or MCS form, this field will be pre-populated.
- If it is pre-populated and the patient is no longer on this device, deselect the device and choose any other that the patient currently has **pre-ECMO**.
- If the device on a patient is not listed, select the option "Other", then specify which device the patient is on prior to ECMO.

Suggested Data Sources: N/A

Change Log: March 2023

Circumstances of ECMO Cannulation (select all that apply)

Tab: ECMO

Variable Name: circecmo

Definition: The reason(s) why the patient requires ECMO.

Question: What was the reason(s) why the patient requires ECMO?

Format: Multi-Select

Allowable Values:

- Planned for patient deterioration (Prophylactic)
- Emergent (ECPR or Salvage)
- Failure to Wean from CPB
- Progression of Illness Despite Established VAD/ Temporary Mechanical Circulatory Support / IABP

Notes for Abstraction:

- Multiple options may be available here

Suggested Data Sources: N/A

Change Log: March 2023

GCS Score (if assessed immediately pre-ECMO)

Tab: ECMO

Variable Name: gcs, gcsna

Definition: The Glasgow comma scale score (if assessed)

Question: What was the Glasgow comma scale score?

Format: Custom List

Allowable Values: Custom List

Notes for Abstraction:

- Enter the Glasgow comma scale score if assessed on the patient prior to this ECMO run.

Suggested Data Sources: N/A

Change Log: March 2023

Is there an ELSO record for this patient?

Tab: ECMO

Variable Name: elso

Definition: Indicate if an ELSO record was created for this patient during this ECMO run.

Question: Is there an ELSO record for this patient?

Format: Single Select

Allowable Values:

- Yes
- No
- Unknown/ND

Notes for Abstraction:

- Select Yes only if the ELSO record was created for this ECMO run, and NOT for prior ECMO runs.
- Extracorporeal Life Support Organization (ELSO) maintains a registry of ECMO use in active ELSO centers.
- If your site is an active ELSO center, there may be an ELSO number set up for the patient.

Suggested Data Sources: N/A

Change Log: March 2023

If yes, enter ELSO Patient Record Number (optional)

Tab: ECMO

Variable Name: elsonum

Definition: If yes was selected in the previous question above, this element indicates a patient record number unique to the patient and assigned at designated active ELSO centers.

Question: If yes, what was the ELSO patient record number?

Format: Custom List

Allowable Values: Custom List

Notes for Abstraction:

- Record the ELSO record number for this patient if this information is available. This number is created for patients undergoing ECMO at sites designated as ELSO centers. The number uniquely identifies each patient in the ELSO registry.

- **NOTE:** If the site is not an ELSO center and/or has not created an ELSO record number for the patient, then this section can be left blank.

Suggested Data Sources: N/A

Change Log: March 2023

Vascular Access & Initiation of ECMO

Date/Time ECMO started

Tab: ECMO

Variable Name: ecmostdt

Definition: Indicates the Date/Time the ECMO started – (when flow was initiated).

Question: What was the date and time ECMO was started?

Format: Date/Time (Drop down to select a precision/ unknown)

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- Enter the Date/Time ECMO device was connected and pump with blood flow started. This is a required field and refers to the time that extracorporeal blood flow was established through cannulas attached to an ECMO circuit.
- Multiple ECMO runs can be captured by entering multiple cannula information (insertion and removal times) (i.e., record multiple runs by capturing the time/date of each new catheter as if it were a single run).

Suggested Data Sources: N/A

Change Log: March 2023

Cannulation Anatomical Site (check all that apply)

Tab: ECMO

Variable Name: cannsite

Definition: The anatomical site where a cannula was placed on a patient.

Question: Where was the cannular placed on the patient?

Format: Multi-Select

Allowable Values:

- Right internal jugular vein
- Right Femoral Artery
- Left Femoral Artery
- Right Femoral Vein
- Left Femoral Vein
- Other (Specify)
- Aorta (Central)
- Right Atrium (Central)
- Left Atrium (Central)
- Pulmonary Artery (Central)
- Unknown/Not Documented

Notes for Abstraction:

- With each choice of an anatomical site, enter a corresponding cannula *French size*, *manufacturer*, and *model*. Refer to the Cannula Manufacturer and Model Name in the appendix.
- Multiple anatomical sites may be selected.
- “**Other**” indicates a site/vessel that is not listed. Please specify the “other” anatomical site selected (if known).
- If the **anatomical** cannulation site is unknown, select unknown/Not Documented.

Suggested Data Sources: N/A

Change Log: March 2023

Cannula size (Fr)

Tab: ECMO

Variable Name: cannsize

Definition: The size of the cannula selected (in French units).

Question: What was the size of cannula selected?

Format: Custom List

Allowable Values: Custom List

Notes for Abstraction: With each choice of an anatomical site, select the corresponding cannula *French size* (if known). Refer to the Cannula Manufacturer and Model Name table in the appendix.

Suggested Data Sources: N/A

Change Log: March 2023

Cannula Manufacturer

Tab: ECMO

Variable Name: cannmanu_els

Definition: The manufacturer of the cannula selected.

Question: What was the manufacturer of the cannula selected?

Format: Single-Select

Allowable Values: Refer to the Cannula Manufacturer and Model Name table in the appendix.

Notes for Abstraction: With each choice of an anatomical site, enter the corresponding cannula manufacturer (if known).

Suggested Data Sources: N/A

Change Log: March 2023

Cannula Model

Tab: ECMO

Variable Name: cannmodel_elsa

Definition: The model of the cannula selected.

Question: What was the model of the cannula selected?

Format: Single-Selected

Allowable Values: Refer to the Cannula Manufacturer and Model Name table in the appendix.

Notes for Abstraction: With each choice of an anatomical site, enter the corresponding cannula model (if known).

Suggested Data Sources: N/A

Change Log: March 2023

Type of Cannulation

Tab: ECMO

Variable Name: typecann

Definition: The type of cannulation used for this ECMO run.

Question: What was the type of cannulation used for this ECMO?

Format: Single-Select

Allowable Values:

- Central
- Peripheral
- Unknown/Not Documented

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: March 2023

Purpose

Tab: ECMO

Variable Name: purpose

Definition: The purpose of this ECMO run.

Question: What was the purpose of this ECMO run?

Format: Single-Select

Allowable Values:

- Drainage
- Reinfusion
- Unknown/Not Documented

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: March 2023

Date/Time of Insertion

Tab: ECMO

Variable Name: insertdt

Definition: The date and time each cannula was successfully inserted.

Question: What was the date and time the cannula was successfully inserted?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction: If the date/time is unknown, use the drop-down function to select “Unknown” for precision.

Suggested Data Sources: N/A

Change Log: March 2023

Was the cannula removed for a reason other than death?

Tab: ECMO

Variable Name: cannrevdeath

Definition: Indicate if the cannula was removed for any reason besides death.

Question: Was the cannula removed for any reason besides death?

Format: Single-Select

Allowable Values:

- Yes
- No
- Not Documented

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: March 2023

Date/Time of Removal

Tab: ECMO

Variable Name: cannrev

Definition: The date and time the cannula was removed.

Question: What was the date and time of removal?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- This date/time is specific to each cannula that was inserted in a patient.
- If the date/time is unknown, use the drop-down function to select “Unknown” for precision.

Suggested Data Sources: N/A

Change Log: March 2023

LV Decompression

LV Decompression Procedures (select all that apply) and date/time of procedure, if known

Tab: ECMO

Variable Name: lvdecomproc, lvdecomprocoth, atseptdt, laventdt, lvventdt, paventdt, iabpdt, tvimpelladt, lvaddt, rvaddt, lvdecomprocothdt

Definition: The left ventricular decompression procedure(s) done during this ECMO, and their corresponding occurrence date and time.

Question: What was the left ventricular decompression procedure performed during ECMO and what was the respective date and time?

Format: Multit-Select

Allowable Values (see appendix for abbreviations):

- None/Not performed
- Atrial Septostomy
 - Date/Time:
- LA Vent:-Date/Time:
- LV Vent:- Date/Time:
- PA Vent:- Date/Time:
- Intra-Aortic Balloon Pump:-
 - Date/Time:
- Transaortic Valve Impella
- L-VAD
- R-VAD
- Transaortic Valve Impella
 - Date/Time:
- L-VAD:- Date/Time:
- R-VAD:- Date/Time:
- Other (specify):

Notes for Abstraction:

- Select the reason(s) why a left ventricular decompression was done during this ECMO, as well as the date/time for each procedure (if available).
- If no LV decompression procedure was done, select "None/Not performed".
- If a procedure was done but not listed in the allowable values, select "Other", then specify in the free-text area which procedure was done.

Suggested Data Sources: N/A

Change Log: March 2023

Rationale for Decompression on ECLS (select one)

Tab: ECMO

Variable Name: ratdecomp, ratdecompoth

Definition: The rationale/reason for decompression on the Extra-Corporeal Life Support (ECLS).

Question: What was the rationale and reason for decompression on the Extra-Corporeal Life Support?

Format: Single-Select

Allowable Values:

- Decreased pulse pressure on Arterial Waveform
- Evidence of Ischemia
- Institutional routine
- Lack of native ejection
- Progressive Pulmonary Edema on CXR
- Other (Specify):

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: March 2023

ECMO Cannulation Location**ECMO Cannulation Location (area)**

Tab: ECMO

Variable Name: ecmocannloc, ecmocannlocoth

Definition: Indicate the location (in the facility) where the procedure was performed.

Question: Where was the ECMO cannulation performed?

Format: Single-Select

Allowable Values:

- Another hospital (pre-transfer)
- Ambulatory/Outpatient Area
- Adult cardiac ICU (CICU)
- Adult general ICU
- Cardiac Catheterization Lab
- Cardiac Surgery ICU
- Delivery Suite
- Diagnostic/Intervention. Area (excluding Cath lab)
- Emergency Department (ED)
- Operating Room (OR)
- Post-Anesthesia Recovery Unit (PACU)
- Same-day Surgical Area
- Telemetry unit or Step-down unit
- Other (Specify)
- Unknown/Not Documented

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: August 2025

Team Member(s) Performing ECMO Cannulation:

Tab: ECMO

Variable Name: ecmocannteam

Definition: Indicate the team member(s) performing the ECMO cannulation. More than one title(s) may be selected where applicable.

Question: What team members were present during the ECMO cannulation?

Format: Multit-Select

Allowable Values:

- Anesthesiologist
- ER Physician
- Intensive care physician
- Interventional cardiologist
- Perfusionist
- Registered Nurse (RN)
- Surgeon (cardiac/cardiothoracic)
- Mobile ECMO team (from receiving hospital)
- Other (specify)
- Unknown/Not Documented

Notes for Abstraction:

- Select the clinicians/specialists that performed the ECMO procedure.
- This is a multi-select element, so multiple team members may be selected.

Suggested Data Sources: N/A

Change Log: February 2026

EMCO Circuit and Components

Pump

Tab: ECMO

Variable Name: ecmopumpman_elsa, ecmopump_elsa

Definition: The pump that was part of this ECMO run.

Question: What was the name and manufacturer of the pump used during the ECMO run?

Format: Single-Select

Allowable Values:

- Pump Manufacturer
- Pump Name

Notes for Abstraction: Enter the appropriate details in each allowable value if available – i.e., the name of the pump, as well as the name of the pump manufacturer. Refer to the ECMO Manufacturer & Pump Name list table in the appendix.

Suggested Data Sources: N/A

Change Log: February 2024

Common Device Used

Tab: ECMO

Variable Name: commondev

Definition: Indicate if a common device was used in this ECMO run. "Common device" refers to commonly used integrated ECMO systems (e.g., cardiohelp) that combine the pump and oxygenator into a single platform, rather than individual separate components.

Question: Was a common device used during the ECMO run?

Format: Single-Select

Allowable Values:

- ☐ Yes
- ☐ No

Notes for Abstraction: N/A

Suggested Data Sources: N/A

Change Log: March 2023

Console/Drive Manufacturer / Name:

Tab: ECMO

Variable Name: consolemanuname

Definition: The console/drive unit that was utilized in this ECMO.

Question: N/A

Format: Text

Allowable Values:

- ☐ Console/Drive Manufacturer / Name:

Notes for Abstraction: Enter the appropriate details in text box i.e., the console type or name, as well as the manufacturer.

Suggested Data Sources: N/A

Change Log: February 2024

Oxygenator Manufacturer / Name:

Tab: ECMO

Variable Name: oxymanuname

Definition: The oxygenator that was part of (or used).

Question: What was the manufacturer and name of the oxygenator that was used?

Format: Text

Allowable Values:

- Oxygenator Manufacturer / Name:

Notes for Abstraction: Enter the appropriate details in text box – i.e., the oxygenator type or name, as well as the manufacturer.

Suggested Data Sources: N/A

Change Log: February 2024

Safety features incorporated in the ECMO circuit for this event

Tab: ECMO

Variable Name: safefeature, safefeatureoth

Definition: Indicate any safety features that were part of this ECMO circuit.

Question: Were there any safety features that were part of the ECMO circuit?

Format: Multiselect

Allowable Values:

- Bridge
- Bubble detectors
- O2 saturation monitor
- Pressure alarms
- Transonic flow meter
- Venous bladder and pump controller
- Other (Specify)

Notes for Abstraction: This element has multi-select allowable values, so all applicable options can be selected.

Suggested Data Sources: N/A

Change Log: March 2023

Was any component exchanged or replaced?

Tab: ECMO

Variable Name: compexch

Definition: Indicate if any ECMO component was exchanged or replaced.

Question: Was any component exchanged or replaced?

Format: Single-Select

Allowable Values:

- Yes
- No
- Unknown/Not Documented

Notes for Abstraction: If unknown, select “unknown/not documented”

Suggested Data Sources: N/A

Change Log: March 2023

Component exchanged

Tab: ECMO

Variable Name: exchange_rg, exchcomponent, exchcomponentoth

Definition: The specific ECMO component that was exchanged or replaced.

Question: What was the specific ECMO component that was exchanged or replaced?

Format: Single-Select

Allowable Values:

- Console
- Heat Exchanger
- Oxygenator
- Other (Specify)

Notes for Abstraction:

- This will only be needed if the preceding question was answered “yes”, indicating that an ECMO component was replaced or exchanged.
- Select one of the listed components (at a time). If there was any replacement/exchange. For multiple components exchanged, select “*Add instance*” to enter additional details.

Suggested Data Sources: N/A

Change Log: March 2023

Reason(s) for exchange

Tab: ECMO

Variable Name: exchreason

Definition: The reason(s) why a component was exchanged – if an exchange occurred.

Question: What was the reason(s) why a component was exchanged?

Format: Custom List

Allowable Values: Custom List

Notes for Abstraction:

- If there are any known reason(s)for exchanging or replacing a component, enter the details under each exchanged/replaced component.
- To add a reason for a different component, select “*Add instance*”.

Suggested Data Sources: N/A

Change Log: March 2023

Date/Time of exchange

Tab: ECMO

Variable Name: exchdt

Definition: The date/time when the ECMO component was exchanged or replaced.

Question: What was the date and time of when the ECMO component was exchanged or replaced?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- Record the date/time when the ECMO component was exchanged or replaced.
- An “unknown” option is available where the date/time cannot be ascertained.

Suggested Data Sources: N/A

Change Log: March 2023

Neurological injury or events detected during ECMO or after ECMO (less than 6 weeks after separation from ECMO or by Hospital Discharge, which ever one comes first)

Tab: ECMO

Variable Name: noneuroinj, anoxbring, anoxbringjdt, braindeath, braindeathdt, cermicbleed, cermicbleeddt, ichemorrecmo, ichemorrecmodt, newseizure, newseizuredt, spincdisch, spincdischdt, strokeecmo, strokeecmodt, neuroinjecmo, neuroinjoth, neuroinjthdt

Definition: The neurologic injuries or events that might have occurred during or after ECMO, but less than 6 weeks after separation from ECMO or by Hospital Discharge.

Question: Were there any neurological injuries or events that might have occurred during or after ECMO, but less than 6 weeks after separation from ECMO or by hospital discharge?

Format: Single Select

Allowable Values:

- No Neurological injury or events detected during ECMO or after ECMO
- Anoxic Brain Injury
 - Yes / No
 - Date/Time detected:
- Brain death

- Yes/No
 - Date/Time detected:
- Cerebral Microbleeds
 - Yes/No
 - Date/Time detected:
- Intracranial hemorrhage
 - Yes/No
 - Date/Time detected:
- New clinical seizure(s)
 - Yes/No
 - Date/Time detected:
- Spinal cord ischemia
 - Yes/No
 - Date/Time detected:
- Stroke
 - Yes/No
 - Date/Time detected:
- Other
 - Yes/No
 - Date/Time detected:

Notes for Abstraction:

- For each selected injury/event, include a date and time if available
- If the date/time is unknown, use the drop-down function to select “Unknown” for precision.
- If no neurologic injury/event was detected, select “No Neurological injury or events detected during ECMO or after ECMO”
- If injury or event detected select “Yes” for the appropriate options and “No” to the others
- Only record events that happened less than 6 weeks after separation from ECMO or by Hospital Discharge, whichever comes first.

Suggested Data Sources:

- Imaging Notes
- Physician Notes

Change Log: February 2024

Other Complications/Events

Device-Related Events

Tab: ECMO

Variable Name: devrelevent, devreleventoth

Definition: The events that happened as a direct result of an issue/complication with the ECMO device.

Question: What events happened as a direct result of an issue or complication with the ECMO device?

Format: Multi-Select

Allowable Values:

- ☐ None
- ☐ Air embolism
- ☐ Circuit clots
- ☐ Oxygenator failure
- ☐ Pump failure
- ☐ Tubing rupture
- ☐ Other (specify)

Notes for Abstraction:

- ☐ Select any other complications/events that occurred during this ECMO run.
- ☐ Multiple events may be selected.
- ☐ Select "None" if no other complications/events occurred.
- ☐ Specify in "Other" if an event occurred but was not listed under the allowable values.

Suggested Data Sources: N/A

Change Log: March 2023

Other ECMO Complications/Events

Tab: ECMO

Variable Name: othecmoevent, othecmoeventoth

Definition: Any other complications/events that occurred during this ECMO run.

Question: Were there any other complications and events that occurred during this ECMO run?

Format: Multi-Select

Allowable Values:

- ☐ None
- ☐ Differential hypoxia (Harlequin syndrome)
- ☐ Left ventricular distention
- ☐ Pulmonary hemorrhage

- Pulmonary edema
- Other (Specify)

Notes for Abstraction:

- Select any other complications/events that occurred during this ECMO run.
- Multiple events may be selected
- Select “None” if no other complications/events occurred
- Specify in “Other” if an event occurred but was not listed under the allowable values.

Suggested Data Sources: N/A

Change Log: March 2023

Outcomes/End of Event

Date/Time ECMO ended

Tab: ECMO

Variable Name: ecmoenddt

Definition: The date/time when the ECMO ended.

Question: What was the date and time when the ECMO ended?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- This refers to the time that ECMO flow is stopped for final time during a given run. An ECMO run ends when ECMO cannulas are removed.
- An “unknown” option is available where the date/time cannot be ascertained.
- This date/time cannot be:
 - Earlier than the Date of Birth.
 - Before date/time ECMO started.
 - Before any date/time of component exchange/replacement

Suggested Data Sources: N/A

Change Log: March 2023

SAVE (Survival After Veno-Arterial ECMO Score)

Tab: ECMO

Variable Name: savescore, savescoreend

Definition: The total score (if assessed), of Survival After Veno-Arterial ECMO (SAVE).

Question: What was the total score of SAVE?

Format: Custom List

Allowable Values: Custom List

Notes for Abstraction:

- The SAVE Score (developed by ELSO), is designed to assist the prediction of survival for adult patients undergoing Extra-Corporeal Membrane Oxygenation for refractory cardiogenic shock.
- This score should not be considered a substitute for clinical assessment.

Suggested Data Sources: N/A

Change Log: March 2023

Reason(s) ECMO ended

Tab: ECMO

Variable Name: ecmoendreas, ecmoendreasoth

Definition: The reason(s) why ECMO ended.

Question: What was the reason(s) why ECMO ended?

Format: Multi-Select

Allowable Values:

- Converted to other support
- ECMO complication
- Limited resources
- Patient (or family) refused treatment
- Patient recovered/improved
- Significant deterioration
- Transition to surgical LVAD
- Transplant (Heart/Lung)
- Patient died
- Other (specify)
- Unknown

Notes for Abstraction:

- Enter the reason(s) why this ECMO run was stopped/ended.
- More than one reason may be selected.
- If there's a reason besides those listed in the list of allowable values, select "Other" and specify.

- If unknown or not documented, select “Unknown”.

Suggested Data Sources: N/A

Change Log: March 2023

Serial Shock Assessment

Date/ Time of Assessment:

Variable Name: ssa_assessdt

Definition: Date when the patient was assessed as follow-up post-shock.

Question: What was the date and time the patient was assessed as follow-up post shock?

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- If both date and time are available (MM/DD/YYYY HH:MM), then the first option to enter all these data elements should be selected.
- If only the date is available (MM/DD/YYYY), select the pertinent option from the drop-down list for this precision.
- An “unknown” option is also available from the drop-down if the date/time cannot be ascertained.

Change Log: March 2023

SCAI Stage:

Variable Name: ssa_scaistage

Definition: The stage classification of cardiogenic shock based on physical examination, biochemical markers, and hemodynamics as defined by the Society for Cardiovascular Angiography and Interventions (SCAI) ascertained during this assessment.

Question: What was the SCAI stage ascertained during the assessment?

Format: Single Select

Allowable Values:

- Stage A
- Stage B
- Stage C

- Stage D
- Stage E
- ND/Unable to Determine

Notes for Abstraction:

- The SCAI SHOCK Stage Classification is a five-stage system intended to facilitate communication about the diagnosis, presentation, and evolving nature of cardiogenic shock (CS). For this field, please use only the classification assessed at a time that was closest to the follow-up assessment (after shock) to determine the SCAI Shock Stage.
- It is expected that all patients recorded in the registry will have Stage C at some time to meet our entry definition of cardiogenic shock. However, during follow-up, it is possible that their shock stage may improve to stage B or even stage A.
- This registry lists four stages since the first stage (A) and second stage (B) do not represent true shock but rather a “risk for shock development” or hypotension without yet having signs of hypoperfusion, respectively. Select one stage that best represents the patient’s state at time of shock onset:
 - Stage A – A hemodynamically stable patient who is NOT experiencing signs or symptoms of CS, but is at risk for its development (i.e. large AMI or decompensated HF)
 - Stage B – Select this for a patient who has clinical evidence of hemodynamic instability (including hypotension or tachycardia, or abnormal systemic hemodynamics) without hypoperfusion
 - Stage C – Select this for a patient who has clinical evidence of hypoperfusion that initially requires pharmacologic or mechanical support. Hypotension is usually present.
 - Stage D – Select this for a patient who has clinical evidence of shock that worsens or fails to improve despite escalation of therapy.
 - Stage E – Select this for a patient with refractory shock or actual/impending circulatory collapse.
- Select “ND/Unable to Determine” if the SCAI stage was not documented, assessed, or if unknown.

Additional resource: The full table with biochemical markers and hemodynamics is available in the appendix.

Change Log: March 2023

Presence of a Pulmonary Artery Catheter (PAC) - Serial Assessment:

Variable Name: ssa_pac

Definition: Evidence that a pulmonary artery catheter exists/existed for a patient (during this follow-up)

Question: Was there evidence that a pulmonary artery catheter exists/existed for a patient during this follow-up?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction: Select “Yes” if a pulmonary artery catheter (PAC) was present during this follow-up assessment, or “No” if there was no PAC.

Change Log: March 2023

Presence of Mechanical Ventilation - Serial Assessment:

Variable Name: ssa_mechvent

Definition: Evidence that the patient is on mechanical ventilation (during this follow-up)

Question: Was there presence of mechanical ventilation during this follow-up?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction: The mechanical ventilator refers to invasive mechanical ventilation via an endotracheal tube or tracheostomy. Select one of the two allowable values, “Yes”, or “No”.

Change Log: March 2023

Presence of Renal Replacement Therapy - Serial Assessment:

Variable Name: ssa_rrt

Definition: Evidence of life-supporting treatments for renal failure (at the time of follow-up assessment)

Question: Was there evidence of life-supporting treatments for renal failure at the time of follow-up assessment?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction: Renal replacement therapy techniques include intermittent hemodialysis, continuous veno-venous hemofiltration and hemodialysis (CVVH), accelerated veno-venous hemofiltration (AVVH), and peritoneal dialysis.

Change Log: March 2023

Set of Hemodynamics During this Follow Up:

Variable Name:

- Blood pressure (BP)
 - Fu_systolic, ssa_diastolic, ssa_bpnd
- Heart Rate
 - ssa_heartrate, ssa_heartratend
- CVP/RA

- ssa_cvpra, ssa_cvprand
- Pulmonary Artery (PA) pressure
 - ssa_papressuresys, ssa_papressuredia, ssa_papressureend
- PCWP
 - ssa_pcwp, ssa_pcwpnd
- Cardiac Output
 - ssa_cardoutput, ssa_cardoutputnd
- Mean Arterial Pressure (MAP)
 - ssa_map
- PAPI
 - ssa_papi
- CPO
 - ssa_cpo

Definition: The interaction of various aspects of the heart and blood vessels to maintain adequate perfusion to body organs

Question: What were the set of hemodynamics during this follow up?

Format: Integer

Allowable Values:

- Blood pressure (BP)
 - Units: (mmHg)
 - Range: (0-300)
- Heart Rate
 - Units: (bpm)
 - Range: (0-399)
- CVP/RA
 - Units: (mmHG)
 - Range: (2-40)
- Pulmonary Artery (PA) pressure
 - Units: (mmHG)
 - Range: (0-300)
- PCWP
 - Units: (mmHG)
 - Range: (2-60)
- Cardiac Output
 - Units: (L/min)
 - Range: (0.1-40.0)
- Mean Arterial Pressure (MAP)
 - Units: na, auto-calculated
 - Range: (0-300)
- PAPI
 - Units: na, auto-calculated
 - Range: (0-300)
- CPO
 - Units: na, auto-calculated
 - Range: (0-300)

Notes for Abstraction:

- Record the first reliable vital signs taken at each **follow-up assessment**:
- For each follow-up form, use values that are approximately 24hrs apart.
- Most devices will have auto-generated reports that can be tracked retrospectively for the q24hr values.
- For any set of values that cannot be determined, or those that are not documented, select the option “Not Documented”.
- Each vital sign has its own “Not documented” option to allow for ‘element-specific’ entries.
- For the auto-calculated values, the relevant data has to be entered in order for the three values to be auto-calculated.
 - **CVP/RA** = Central Venous Pressure or Right Atrial Pressure
 - **PCWP** = Pulmonary capillary wedge pressure
 - **MAP** = Mean Arterial Pressure (*automatically calculated*)
 - **PAPi** = Pulmonary artery pulsatility index (*automatically calculated*)
 - **CPO** = Cardiac Power Output (*automatically calculated*)

Change Log: March 2023

Peak Lactate Since the Last Assessment:

Variable Name: ssa_peaklactate, ssa_peaklactatend

Definition: The lactate values assessed post-shock onset since the last assessment.

Question: What was the lactate value assessed post-shock onset since the last assessment?

Format: Integer

Allowable Values:

- Custom integer
 - Range: (0.2-30.0)
 - Units: (nmol/L)
- Not Documented

Notes for Abstraction:

- Enter the highest since the last follow-up assessment and before this follow-up assessment time. If no new lactate values were obtained since the last follow-up assessment, then enter “Not documented”. If the lactate value cannot be established, select “Not documented”.

Change Log: March 2023

Lowest pH Since the Last Assessment

Variable Name: ssa_lowph, ssa_lowphnd

Definition: The lowest potential hydrogen (pH) test result.

Question: What was the lowest potential hydrogen (pH) test result?

Format: Integer

Allowable Values:

- Custom integer

- Range: (0.0-14.0)
- Units: na

Notes for Abstraction:

- Enter the lowest pH value since the last follow-up assessment and before this follow-up assessment time. If no new pH values were obtained since the last follow-up assessment, then enter "Not documented".

Change Log: March 2023

Peak ALT Since the Last Assessment

Variable Name: ssa_peakalt, ssa_peakaltnd

Definition: The peak Alanine aminotransferase (ALT) test recorded.

Question: What was the peak Alanine aminotransferase test recorded?

Format: Integer

Allowable Values:

- Custom integer
 - Range: (1-2500)
 - Units: (IU/L)

Notes for Abstraction: N/A

Change Log: March 2023

Vasoactive Medications at Time of Assessment (check all that apply)

Variable Name: ssa_vasomeds, ssa_vasometh

Definition: The vasoactive medications that the patient was receiving at the time of assessment.

Question: What vasoactive medications was the patient receiving at the time of assessment?

Format: Multi Select

Allowable Values:

- None
- Dobutamine
- Dopamine
- Epinephrine
- Levosimendan
- Milrinone
- Nitroprusside
- Norepinephrine
- Phenylephrine
- Vasopressin
- Not Documented
- Other (Specify)

Notes for Abstraction: Select all applicable vasoactive medications being administered at the time of this follow-up assessment from the allowable list provided.

Change Log: March 2023

Presence of MCS Device(s) at Assessment (If MCS is present, select all that apply)

Variable Name: ssa_mcsdevice

Definition: Evidence of the presence of one/more mechanical circulatory support device.

Question: Was there evidence of the presence of one or more mechanical circulatory support devices?

Format: Multi Select

Allowable Values:

- None
- Impella
 - Impella 2.5
 - Impella CP
 - Impella ECP
 - Impella 5.0
 - Impella 5.5
 - Impella RP
- ECMO (VA)
- IABP
- iVAC
- TandemHeart
 - Left
 - Right
- Temporary surgical VAD (e.g. CentriMag)
 - Left
 - Right
- Other (Specify): _____

Notes for Abstraction:

- Select all devices that apply at the time of this follow-up assessment from the allowable values provided.

Change Log: March 2023

Was there a device upgrade/escalation since the prior assessment?

Variable Name: ssa_deviceup

Definition: Confirmation of a device upgrade/escalation since the prior assessment.

Question: Was there a device upgrade or escalation since the prior assessment?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

- Was there a mechanical circulatory device escalation between the time of the last follow-up assessment and this current one. If a device escalation occurred for the patient in the interval between follow-up assessments, select "Yes". Otherwise, if the opposite is the case, select "No".

Change Log: March 2023

If Yes, Select Reason(s) for Device Upgrade or Escalation since the Prior Assessment

Variable Name: ssa_deviceupreas

Definition: The reason(s) why a device was upgraded/escalated since the prior assessment.

Question: If yes, select reason(s) for device upgrade or escalation since the prior assessment/

Format: Multi Select

Allowable Values:

- None/Not Documented
- Device-related complication or failure
- Inadequate response to vasoactive medications
- Need for escalation to greater hemodynamic support from MCS
- Switch to alternative MCS access site (e.g. fem to axillary)
- Other (Specify):

Notes for Abstraction:

- If "Yes" was selected in the previous question, then this will be prompted to ascertain the reason(s) why there was a device upgrade/escalation.
- This is a multi-select option, so multiple reasons may be selected.

Change Log: March 2023

Was there a device de-escalation since the prior assessment?

Variable Name: ssa_devicedeesc

Definition: Confirmation of a device de-escalation since the prior assessment.

Question: Was there a device de-escalation since the prior assessment?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

- Was there a mechanical circulatory device de-escalation (i.e., removal) between the time of the last follow-up assessment and this current one. If a device de-escalation occurred for the patient in the interval between follow-up assessments, select “Yes”. Otherwise, if the opposite is the case, select “No”.

Change Log: March 2023

If Yes, Select Reason(s) for Device Downgrade or De-Escalation Since the Prior Assessment

Variable Name: ssa_devicedeesreas, ssa_devicedeescreasoth

Definition: Confirmation of a device de-escalation since the prior assessment.

Question: If yes, select the reason(s) for device upgrade or escalation since the prior assessment.

Format: Multi Select

Allowable Values:

- Change in goals of care
- Durable LVAD or heart transplant
- MCS no longer needed
- Transition to central cannulated device (e.g. CentriMag)
- Other (specify):

Notes for Abstraction:

- If “Yes” was selected in the previous question, then this will be prompted to ascertain the reason(s) why there was a device de-escalation.
- This is a multi-select option, so multiple reasons may be selected.

Change Log: March 2023

Vascular Complication Requiring Intervention

Variable Name: ssa_vasccomp

Definition: Evidence of (any) vascular complication that requires intervention

Question: Was there a vascular complication that required intervention?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

- Select “Yes” if there was any evidence of vascular complication(s) that is new at the time of this follow-up assessment (i.e., not recorded on a prior follow-up assessment). If there was none, selecting “No” will suffice. More details are in the appendix about vascular complications.

Change Log: March 2023

If Yes, Enter Date

Variable Name: ssa_vasccompdt

Definition: The date when vascular complication was detected (if there was any at all).

Question: If yes, enter the date and time of the intervention performed.

Format: Date/Time

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)

- **Unknown**

Notes for Abstraction:

- If the patient had vascular complication requiring intervention that occurred between the time of the last follow-up assessment and the present one, then this element will be activated. A date when the vascular complication was first detected should be entered here.

Change Log: March 2023

Complications of ECMO

Variable Name: ssa_othcompecmo

Definition: Other complications of ECMO that occurred.

Question: Were there other complications of ECMO? If so select them.

Format: Multi Select

Allowable Values:

- None
- Pulmonary hemorrhage requiring intervention.
- Refractory pulmonary edema
- Other (Specify):

Notes for Abstraction:

- Select any of the adjacent reasons if they were relevant to the patient as at the time of follow-up, post cardiogenic shock.
- If there were other complications, check the **appendix** for extra details.

Change Log: March 2023

Discharge

Discharge Disposition

Tab: Discharge

Variable Name: dschstat

Definition: The final place or setting to which the patient was discharged on the day of discharge.

Question: Where was the final place or setting the patient was discharged on the day of discharge?

Format: Single-Select

Allowable Values:

- Home
- Hospice – Home
- Hospice – Health Care Facility
- Acute Care Facility
- Other Health Care Facility
- Expired
- Left Against Medical Advise/AMA
- Not documented or Unable to Determine (UTD)

Notes for Abstraction:

- Only use documentation from the day of or the day before discharge when abstracting this data element.
- **Example:** Documentation in the Discharge Planning notes on 04-01-20xx state that the patient will be discharged back home. On 04-06-20xx the physician orders and nursing discharge notes on the day of discharge reflect that the patient was being transferred to skilled care. The documentation from 04-06-20xx would be used to select “Other Healthcare Facility”.
- Consider discharge disposition documentation in the discharge summary or a post-discharge addendum as day of discharge documentation, regardless of when it was dictated/written.
- If documentation is contradictory, use the latest documentation. If there is documentation that further clarifies the level of care that documentation should be used to determine the correct option to abstract.
- **Example:** Nursing discharge note documentation reflects that the patient is being discharged to “XYZ” Hospital. The Social Service notes from the day before discharge further clarify that the patient will be transferred to the rehab unit of “XYZ” Hospital, select “Other Healthcare Facility.”
 - If the medical record states only that the patient is being discharged to another hospital and does not reflect the level of care that the patient will be receiving, select “Acute Care Facility.”
 - To select the option “Left Against Medical Advise/AMA” there must be explicit documentation that the patient left against medical advice.
- **Examples:**
 - Progress notes state that patient requests to be discharged but that discharge was medically contraindicated at this time. Nursing notes reflect that patient left against

medical advice and AMA papers were signed, select the option "Left Against Medical Advise/AMA."

- Physician order written to discharge to home. Nursing notes reflect that patient left before discharge instructions could be given, select the option "Home."

Suggested Data Sources:

- Discharge Data

Change Log: March 2023

Date/Time of Discharge from hospital

Tab: Discharge

Variable Name: disdate

Definition: The date and time the patient was discharged from acute care hospital, left against medical advice, or expired during this event.

Question: What was the date and time the patient was discharged from acute care hospital, left against medical advice, or expired during this event?

Format: Date/Time (Drop down to select a precision or unknown)

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

- The discharge date is the day that the patient is discharged from your institution's acute care hospital OR the date of the patient's expiration OR the date of the patient's discharge OR date patient left against medical advice (AMA) OR date of transfer to, a rehabilitating, skilled nursing, or hospice unit in your institution OR transfer to an acute in-patient unit outside of your own institution, even if that hospital is affiliated with your own OR expired.
- If the abstractor is unable to determine the discharge time, select the MM/DD/YYYY format and enter only the date.

Suggested Data Sources:

- Discharge Data

Change Log: March 2023

Was the patient placed on Comfort Measures Only at any time during this admission?

Tab: Discharge

Variable Name: comfort

Definition: The patient's care and treatment restricted to "comfort measures only" or "comfort care only".

Question: Is there any documentation that the patient's care was restricted to "Comfort Measures Only"?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

- Select "Yes" if there is any evidence that the patient's care was restricted to "Comfort Measures Only" during this hospital admission. Comfort measures must be documented by a physician/APN/PA.
- Comfort measures is commonly referred to as "comfort care" in the medical community and by the general public. Comfort care includes attention to the psychological and spiritual needs of the patient and support for the dying patient and the patient's family. Comfort Measures Only are not equivalent to the following: Do Not Resuscitate (DNR), living will, no code, no heroic measure, or a physician order to withhold emergency resuscitative measures such as Do Not Resuscitate.

Change Log: August 2025

Date/Time of Comfort Measure only:

Tab: Discharge

Variable Name: comfortdt

Definition: What month, day, year, and time were comfort measures documented?

Question: If so, when was the earliest day of this episode when this was documented?

Format: MM/DD/YYYY HH:MM or MM/DD/YYYY or Unknown

Allowable Values:

- Date: MM/DD/YYYY
 - MM = Month (01-12)
 - DD = Day (01-31)
 - YYYY = Year (1900 – Current Year)
- Time: 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)

Notes for Abstraction:

- Enter the day and time when comfort care was documented for this episode of care.
- Select the MM/DD/YYYY HH24:MI format to record both the date and time.
- Time should be recorded using the 24-hour clock (military time).

- If only the date is known, select the MM/DD/YYYY format and enter only the date.
- Select unknown if the date is not documented.

Change Log: August 2025

Most favorable neurological status at discharge

Tab: Discharge

Variable Name: neurostatdsch

Definition: Identify the patient's most favorable neurological status at the time of discharge.

Question: What was the patient's most favorable neurological status at discharge?

Format: Single Select

Allowable Values:

- Conscious without severe disability
- Conscious with severe disability
- Comatose
- Unable to assess due to sedation
- Unknown/Not Documented

Notes for Abstraction:

Suggested Data Sources:

Change Log: February 2024

If patient died, Date/Time of death

Tab: Discharge

Variable Name: deathdt

Definition: The date/time when the patient was declared dead.

Question: What was the date and time the patient was declared dead?

Format: Date/Time (Drop down to select a precision or unknown)

Allowable Values:

- **Date:** MM/DD/YYYY
 - MM = Month (01-12)
- DD = Day (01-31)
 - YYYY = Year (2012 – Current Year)
- **Time:** 24 Hour Clock (Military Time)
 - HH = Hour (00-23)
 - MM = Minutes (00-59)
- **Unknown**

Notes for Abstraction:

An "unknown" option is available where the date/time cannot be ascertained

Suggested Data Sources:

- Discharge Data

Change Log: March 2023

Primary Cause of Death

Tab: Discharge

Variable Name: pricausedeath

Definition: The first significant abnormal event which ultimately led to the patient's death.

Question: What was the primary cause of the patient's death?

Format: Single-Select

Allowable Values:

- Cardiovascular
- Non-Cardiovascular
- Primary Cause of Death Unknown

Notes for Abstraction:

- Select the primary cause of death of the patient.
- Additional contributors to death can be captured under "Other Contributors to Cause of Death (if applicable)."
- A non-cardiovascular cause of death is whereby the patient's death is not thought to be the result of any cardiovascular cause, including malignancy, pulmonary causes, infection (includes sepsis), GI causes, accident/trauma, and other non-cardiovascular organ failure.
- If the primary cause of death is unknown, select, "Primary Cause of Death Unknown."

Source: Garcia-Garcia HM, McFadden EP, Farb A, et al. Standardized end point definitions for coronary intervention trials: The Academic Research Consortium-2 consensus document. *Circulation*. 2018;137:2635–50.13

Suggested Data Sources:

- Discharge Data

Change Log: April 2026

If Cardiovascular, what was the primary cause of death

Tab: Discharge

Variable Name: cardcausedeath

Definition: The specific documented cardiovascular issue that led to the patient's death.

Question: If the patient's death was a cardiovascular issue, what was the primary cause of death?

Format: Single-Select

Allowable Values:

- Acute Coronary Syndrome

- Cardiogenic Shock/HF
- Stroke
- Sudden Cardiac Death
- Other Cardiovascular
- Unknown Cardiovascular

Notes for Abstraction:

- Specify the primary cardiovascular-related cause of death.
- Additional contributors to death can be captured under “Other Contributors to Cause of Death (if applicable).”
- Death due to Heart Failure or Cardiogenic Shock refers to a death occurring in the context of clinically worsening symptoms and/or signs of heart failure, regardless of heart failure etiology.
- Death due to Stroke refers to death after a cerebrovascular event that is either a direct consequence of or substantially contributed to by the stroke.
- Sudden cardiac death is defined as a sudden, unexpected death that was witnessed, occurring within 60 min from the onset of new symptoms, in the absence of a clear cause other than cardiac.
- Other Cardiovascular Death refers to a cardiovascular death not included in the above categories but with a specific, known cause (e.g., cardiovascular procedure, cardiovascular hemorrhage, pulmonary embolism, limb ischemia).
- If the primary cardiovascular-related cause of death is unknown, “Unknown Cardiovascular.”

Suggested Data Sources:

- Discharge Data

Change Log: April 2026

If Non-Cardiovascular, what was the primary cause of death

Tab: Discharge

Variable Name: noncardcausedeath

Definition: The specific documented non-cardiovascular issue that led to the patient’s death

Question: If the patient’s death was a non-cardiovascular issue, what was the primary cause of death?

Format: Single-Select

Allowable Values:

- Anoxic Brain Injury
- Other non-cardiovascular

Notes for Abstraction:

- Specify the primary non-cardiovascular-related cause of death.
- Additional contributors to death can be captured under “Other Contributors to Cause of Death (if applicable).”

- Death due to anoxic brain injury is considered non-cardiovascular. Death due to Anoxic Brain Injury refers to death following cardiopulmonary arrest with evidence of severe neurological injury (e.g., bilateral absence of pupillary and corneal reflexes ≥ 96 hours after cardiac arrest, highly malignant EEG pattern, global ischemic pattern on CT brain or brain MRI), including withdrawal of life-sustaining therapies due to poor neurological prognosis.
- If the primary non-cardiovascular-related cause of death is unknown, "Unknown non-cardiovascular."

Suggested Data Sources:

- Discharge Data

Change Log: April 2026

Other Contributors to Cause of Death (if applicable)

Tab: Discharge

Variable Name: causeddeathcontrib

Definition: The specific documented issue(s) that contributed to the patient's death.

Question: If applicable, what were the other contributors to the patient's death?

Format: Multi-Select

Allowable Values:

- Acute Coronary Syndrome
- Cardiogenic Shock/Heart Failure
- Stroke
- Sudden Cardiac Death
- Anoxic Brain Injury
- Other Cardiovascular
- Other Non-Cardiovascular
- Unknown Cardiovascular

Notes for Abstraction:

Suggested Data Sources:

- Discharge Data

Change Log: April 2026

If other health care facility:

Tab: Discharge

Variable Name: dschothfac

Definition: Documentation of the type of other healthcare facility the patient was discharged to.

Question: If the patient was discharged to another healthcare facility, what type of facility was it?

Format: Single-Select

Allowable Values:

- Skilled Nursing Facility (SNF)
- Inpatient Rehabilitation Facility (IRF)
- Long Term Care Hospital (LTCH)
- Intermediate Care Facility (ICF)
- Other

Notes for Abstraction:

- Skilled Nursing Facility (SNF): Patient was discharged or transferred to a skilled nursing facility (SNF) This would include patients discharged to:
 - Skilled nursing facility (SNF)
 - SNF rehabilitation unit (a unit within the SNF)
 - Sub-Acute Care or Transitional Care Unit (TCU)
 - Swing Bed (patients discharged/ transferred to a SNF level of care within the hospital's approved swing bed arrangement)
 - Skilled nursing facility with hospice referral only (has not accepted hospice care by a hospice organization)
- Inpatient Rehabilitation Facility (IRF): Patient was discharged or transferred to an inpatient rehabilitation facility (IRF) including rehabilitation distinct part units of a hospital
- Long Term Care Hospital (LTCH): Patient was discharged or transferred to a Medicare certified long term care hospital (LTCH or LTACH), or a nursing facility certified under Medicaid but not certified under Medicare. LTCH Usage Note: For hospitals that meet the Medicare criteria for LTCH certification. A Long-term care hospital or long-term care facilities provide acute inpatient care with an average length of stay greater than 25 days.
- Intermediate Care facility (ICF): Patient was discharged or transferred to an intermediate care facility (ICF). This would include patients discharged to:
 - ECF (Extended Care Facility)
 - ICF (Intermediate Care Facility)
 - Nursing Home
 - Nursing facility for non-skilled/custodial/residential level of care
 - Veteran's Administration Nursing Facility

Suggested Data Sources:

- Discharge Data

Change Log: March 2023

Transferred to:

Tab: Admission

Variable Name: transhos

Definition: The Name of the Hospital that you transferred this patient to.

Question: What is the name of the receiving hospital of this patient transferred from your facility?

Format: Single-Select type search

Allowable Values:

- Central list created by the facility in the registry system

Notes for Abstraction:

- For options to appear on this element you must first create a list of hospitals that you transfer to you in the “form Management” section of the registry.

Suggested Data Sources:

- Discharge
- Transfer Notes

Change Log: February 2024

Reason for transfer

Tab: Discharge

Variable Name: reastransfer

Definition: To determine the reason for the patient’s transfer upon discharge.

Question: What was the reason for transfer?

Format: Single-Select

Allowable Values:

- Administrative
- De-escalation of care
- Escalation of care
- Need for transplant services
- Patient/Family request
- Other

Notes for Abstraction:

Change Log: February 2024

During this admission, was a standardized health related social needs form or assessment completed?

Tab: Discharge

Variable Name: socdetassess

Definition: Any standardized tool was used to assess the patient for potential barriers to accessing health care services.

Question: During this admission, was a standardized health related social needs form or assessment completed?

Format: Single-Select

Allowable Values:

- Yes
- No/Not documented

Notes for Abstraction:

- An assessment should be completed using a standardized screening tool which allows for uniform data collection and evaluating outcomes. Each hospital should develop a strategy to determine the questions on an assessment, where the assessment is completed and the staff who performs and documents the findings.
- Some useful resources for Health-Related Social Needs Assessments can be found at
 - <https://innovation.cms.gov/files/worksheets/ahcm-screeningtool.pdf>
 - <https://www.aha.org/system/files/media/file/2019/09/screening-for-social-needs-tool-value-initiative-rev-9-26-2019.pdf>

Change Log: March 2023

If yes, identify the areas of unmet social needs (select all that apply):

Tab: Discharge

Variable Name: socdetareas

Definition: The barrier(s) that were identified as preventing or limiting the patient's ability to receive further health care services

Question: If yes, which barrier(s) were identified as preventing or limiting the patient's ability to receive further health care services?

Format: Multi-Select

Allowable Values:

- None of the areas of unmet social needs listed were identified.
- Education
- Employment
- Financial Strain
- Food
- Living Situation/Housing
- Mental Health
- Personal Safety
- Substance Use
- Transportation Barriers
- Utilities

Notes for Abstraction:

- Select all barriers that were identified.
 - Select "None of the areas of the unmet social need listed" if none of the listed social needs were
- identified in the assessment.

Change Log: March 2023

If unmet social need(s) identified, were resources provided to the patient?

Tab: Discharge

Variable Name: socdetresprov

Definition: Documentation that resources were provided to the patient based on the identified unmet social need(s).

Question: If unmet social need(s) identified, were any resources provided to the patient related to the social need(s) identified?

Format: Single Select

Allowable Values:

- Yes
- No

Notes for Abstraction:

- Select "Yes" if any resources related to the identified unmet social need(s) were provided to the patient.
- Select "No" if no resources are documented.

Change Log: August 2025

If yes, what resources were provided?

Tab: Discharge

Variable Name: socdetrestype, socdetresoth

Definition: Resources that were provided to the patient based on the identified unmet social need(s).

Question: What resources were provided to the patient based on their identified unmet social need(s)?

Format: Multi-Select

Allowable Values:

- Access to a Community Health Worker
- Access to a Social Worker
- Access to another Case Worker/Support Specialist
- Resources for a digital-based community platform (e.g., findhelp.org)
- Other (specify)

Notes for Abstraction:

- Select all that apply.
- If "Other," please specify the resource(s) provided.

Change Log: August 2025

DanGer Like Patient:

Tab: Discharge

Variable Name: dangerlike

Definition: This variable identifies if a patient meets the DanGer criteria.

Question: Does the patient meet the DanGer criteria?

Format: Text Field

Allowable Values:

- Auto calculated
 - Yes
 - No

Notes for Abstraction:

- The purpose of this category is to automatically assign whether a patient meets “DanGer” like criteria. This score will be auto calculated based on the criteria below and cannot be manually entered.
 - **DanGer Criteria:**
 1. Yes = if the patient meets the following criteria:
 - Etiologies and Contributors to CS= AMI-CS (STEMI)
 - AND**
 - Shock Onset (SO) Time:
 - <24 hours before arrival (SO at referring hospital) **OR** <12 hours after arrival (SO in-hospital)
 - AND**
 - Admission Lactate ≥ 2.5 **OR** Shock Onset Lactate ≥ 2.5
 2. No = if they do not meet criteria (above)

Change Log: April 2025

SHARC Category:

Tab: Discharge

Variable Name: sharccat

Definition: This variable looks at what SHARC category patients are in.

Question: What SHARC category does the patient fall into?

Format: Text Field

Allowable Values:

- Auto calculated
 - AMI-CS
 - Secondary-CS
 - Post-Cardiotomy CS
 - HF-CS

Notes for Abstraction:

- The purpose of this category is to automatically assign a patient into one of the four SHARC categories. This score will be auto calculated based on the criteria below and cannot be manually entered.
 - SHARC Categories:**
 - AMI-CS
 - Etiologies & Contributors to CS* = ACS/AMI

OR

 - Mechanical Complications of MI
 - Secondary-CS
 - Presenting Physiology* = Primary other cardiac (Arrythmia, Valvular Stenosis, etc.)

OR

 - Etiologies & Contributors to CS* = Isolated Right Heart Failure-acute PE or Pulmonary Hypertension

OR

 - Etiologies & Contributors to CS* = Tamponade **AND NOT** ACS/AMI **OR** Mechanical complications of MI
 - Post-Cardiotomy CS
 - Etiologies & Contributors to CS* = ACS/AMI **AND** Post-Cardiopulmonary Bypass

AND

 - CABG time precision* = minute (must be in minutes)

AND

 - Shock onset time* > CABG time
 - HF-CS
 - Etiologies & Contributors to CS* = All others not mentioned above

Change Log: April 2025

Appendix

GWTC Guidelines for Abstraction to Determine When to Select Medical History= Smoker

<u>Inclusion</u>	<u>Exclusion</u>
Cigarette smoker, type of product not identified. If there is documentation of current smoking or tobacco use, or a history of smoking or tobacco use, and the type of product is not specified, assume this refers to cigarette smoking.	Use of only chewing tobacco
Tobacco user, type of product not identified	Use of only cigar or pipe smoking
History of smoking and documentation that the patient quit & "several months ago" or "recent smoker"	Use of only oral tobacco
History of smoking or use of tobacco within one year prior to arrival, type of product not identified	Use of only illegal drugs use (e.g., marijuana)
History of cigarette use without mention of time frame, if no indication that patient quit	Remote Smoker (previous use was greater than one year)

Gusto Bleeding Criteria

GUSTO Bleeding Criteria	Description

Severe (or life-threatening)	Fatal or intracranial bleeding or hemorrhage that causes hemodynamic compromise and requires treatment/intervention
Moderate	Bleeding that requires intervention (like blood transfusion) but does not result in hemodynamic compromise
Mild/Minor	Bleeding that does not meet either of the above (moderate or severe) criteria

Other definitions:

- These are for our complications list that relate either to the MCS/ECMO modules or our planned revisions to the main CRF:
- MCS-ARC Venous Thromboembolism: Evidence of venous thromboembolic event (e.g., deep vein thrombosis, pulmonary embolism) by standard clinical and laboratory testing.
- MCS-ARC Arterial non-CNS Thromboembolism: An acute systemic arterial perfusion deficit in any non-cerebrovascular organ system due to thromboembolism confirmed by 1 or more of the following: This definition *excludes* neurologic events.
 - standard clinical and laboratory testing
 - operative findings
 - autopsy findings
- Device Failure: Unexpected and sudden stop of the functioning of the pump that cannot be corrected by restarting the pump following recommended instructions. It can be caused by the failure of any of the components of the system and impacts negatively on the treatment of the patient. Includes device malfunction due to device thrombus.
- Device Malfunction: Unexpected change in device performance that is contradictory to the labeling and/or negatively impacts the treatment of the patient, when the device is used in adherence to the instructions for use (IFU). A stoppage that can be corrected by restarting the pump would fall under this category. Includes device malfunction due to device thrombus.
- Minor Hemolysis: a plasma-free Hgb value >20 but < 40 mg/dl or a serum lactate dehydrogenase (LDH) level greater than 2.5x the upper limits of the normal range at the implanting center occurring after the first 72 hours post-implant in the absence of clinical symptoms or findings of hemolysis or abnormal pump function
- Major Hemolysis: Two plasma-free Hgb values > 40 mg/dl with the 2 readings taken within a single 48-hour period. If plasma-free Hgb not available, hemolysis will be defined by the combination of clinical signs (see below) and laboratory testing including increased LDH, increased bilirubin and decreased hemoglobin (all 3 required). It requires the presence of one or more of the following conditions:
 - Hemoglobinuria
 - Anemia
 - Hyperbilirubinemia
 - Pump malfunction and/or abnormal pump parameters

Vascular Access Site Adverse Events

These adverse events (AEs) related only to devices inserted through the percutaneous route.

Proposed definitions:

Minor Complications: Any of the events below that required diagnostic investigation to be confirmed and were treated without the need for surgical intervention.

- Pseudo-aneurysm
- Arteriovenous fistula
- Vessel thrombosis/Distal embolization
- Vessel dissection, perforation, or rupture
- Vessel stenosis
- Cannulation site bleeding (would have to fulfill durable device bleeding definition)
- Limb Ischemia
- Vascular access site infection

Source: Kormos RL et al. Updated definitions of adverse events for trials and registries of mechanical circulatory support: A consensus statement of the mechanical circulatory support academic research consortium. J Heart Lung Transplant. 2020 Aug;39(8):735-750

TABLE 3 Descriptors of Shock Stages: Physical Examination, Biochemical Markers, and Hemodynamics

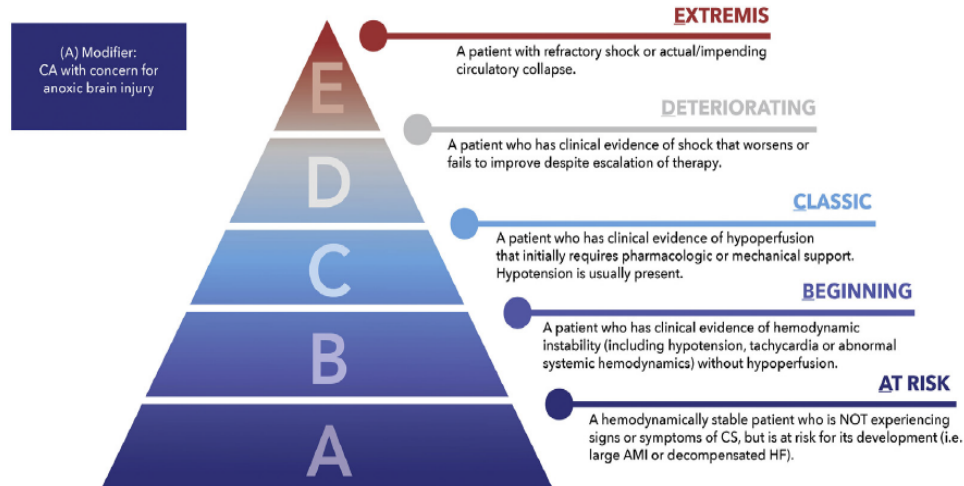
Stage	Description	Physical examination/ bedside findings		Biochemical markers		Hemodynamics	
		Typically includes	May include	Typically includes	May include	Typically includes	May include
A At risk	A patient who is not currently experiencing signs or symptoms of CS, but is at risk for its development. These patients may include those with large acute myocardial infarction or prior infarction and/or acute or acute-on-chronic heart failure symptoms.	Normal JVP Warm and well-perfused - Strong distal pulses - Normal mentation	Clear lung sounds	Normal lactate	Normal labs Normal (or at baseline) renal function	Normotensive (SBP ≥ 100 mmHg or at baseline)	If invasive hemodynamics are assessed: - Cardiac Index ≥ 2.5 L/min/m² (if acute) - CVP ≤ 10 mmHg - PCWP ≤ 15 mmHg - PA saturation $\geq 65\%$
B Beginning CS	A patient who has clinical evidence of hemodynamic instability (including relative hypotension or tachycardia) without hypoperfusion.	Elevated JVP Warm and well-perfused - Strong distal pulses - Normal mentation	Rales in lung fields	Normal lactate	Minimal acute renal function impairment Elevated BNP	Hypotension - SBP < 90 mmHg - MAP < 60 mmHg > 30 mmHg drop from baseline Tachycardia - Heart rate ≥ 100 bpm	
C Classic CS	A patient who manifests with hypoperfusion and who requires one intervention (pharmacological or mechanical) beyond volume resuscitation. These patients typically present with relative hypotension (but hypotension is not required).	Volume overload	Looks unwell Acute alteration in mental status Feeling of impending doom Cold and clammy Extensive rales Ashen, mottled, dusky, or cool extremities Delayed capillary refill Urine Output < 30 mL/h	Lactate ≥ 2 mmol/L	Creatinine increase to 1.5 x baseline (or 0.3 mg/dL) or $> 50\%$ drop in GFR Increased LFTs Elevated BNP	If invasive hemodynamics assessed (strongly recommended) - Cardiac index < 2.2 L/min/m² - PCWP > 15 mmHg	
D Deteriorating	A patient who is similar to category C but is getting worse. Failure of initial support strategy to restore perfusion as evidenced by worsening hemodynamics or rising lactate.	Any of stage C and worsening (or not improving) signs/symptoms of hypoperfusion despite the initial therapy.		Any of stage C and lactate rising and persistently > 2 mmol/L	Deteriorating renal function Worsening LFTs Rising BNP	Any of stage C and requiring escalating doses or increasing numbers of pressors or addition of a mechanical circulatory support device to maintain perfusion	
E Extremis	Actual or impending circulatory collapse	Typically unconscious	Near pulselessness Cardiac collapse Multiple defibrillations	Lactate ≥ 8 mmol/L^a	CPR (A-modifier) Severe acidosis - pH < 7.2 - Base deficit	Profound hypotension despite maximal hemodynamic support	Need for bolus doses of vasopressors

Acronyms/Key for Table 3:

- BNP – B-type natriuretic peptide
- CPR – cardiopulmonary resuscitation
- CVP – central venous pressure
- GFR – glomerular filtration rate
- JVP – jugular venous pressure
- LFT – liver function tests
- MAP – mean arterial pressure
- PA – pulmonary artery
- PCWP – pulmonary capillary wedge pressure
- SVP – systolic ventricular pressure.

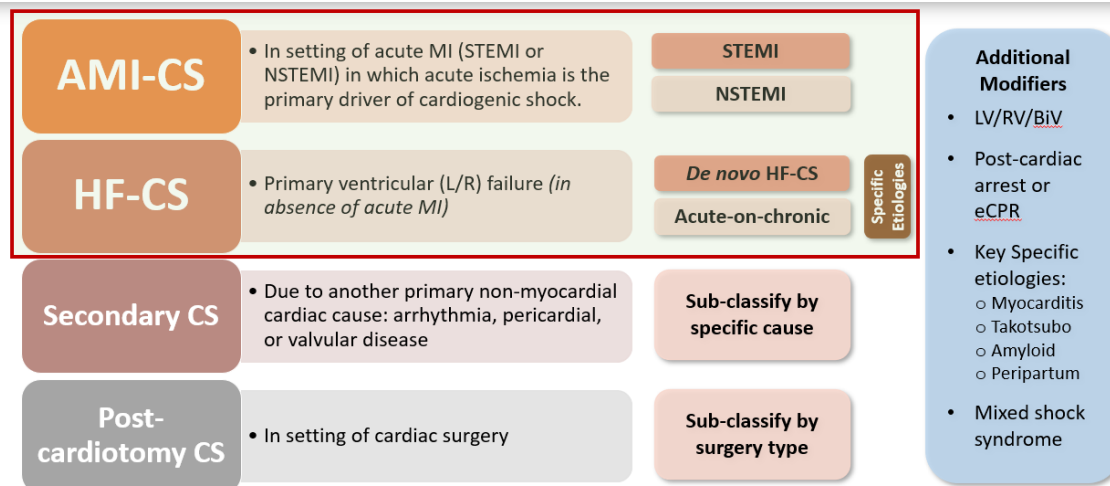
Stage E prospectively is a patient with cardiovascular collapse or ongoing CPR.

FIGURE 4 Updated SCAI SHOCK Classification Pyramid



AMI = acute myocardial infarction; CS = cardiogenic shock; HF = heart failure; SCAI = Society for Cardiovascular Angiography and Interventions.

Populations for Cardiogenic Shock Research



Denotes initial focus of AHA Registry. Aim is all consecutive patients in these categories.

SHOCK ARC Session II
Lawler, Mebazaa, Morrow 2021

SHARC Working Definition for clinical trials or registries:

Cardiac disorder that results in a SBP <90 mmHg for ≥ 30 min (or the need for vasopressors, inotropes and/or mechanical circulatory support to maintain SBP ≥ 90 mmHg) with evidence of hypoperfusion[†]

[†]Hypoperfusion criteria (≥ 1 of the following):

- Elevated serum lactate [>2 mmol/L])
- Acute kidney injury (Creatinine $\geq 2 \times$ ULN or oliguria (e.g., urine output <0.5 mL/kg/hour)
- Acute hepatic injury (e.g., ALT or AST $>3 \times$ upper limit of normal)
- Cool or mottled extremities
- Altered mental status

Hemodynamic Criteria (optional):

- Cardiac Index ≤ 2.2 L/min/m² (from pulmonary artery catheterization, non-invasive cardiac output monitors, or echocardiography)

Normotensive Cardiogenic Shock Subtype: Cardiac disorder with SBP ≥ 90 mmHg without vasopressors, inotropes &/or MCS with evidence of hypoperfusion[†] and other potential causes of markers of hypoperfusion have been excluded (Hemodynamic Criteria (optional): CI ≤ 2.2 L/min/m² and SVR >2200 dynes/cm/sec⁵/m² m²)

ECMO Abbreviations

V-V: Venovenous support is the application of extracorporeal circulation primarily for respiratory support, in which the extracorporeal circuit drains blood from the venous system and reinfuses into the venous system (or pre-lung). VV ECMO operates in series with the heart and lungs and does not provide bypass of these organs.

V-A: Venarterial is the application of extracorporeal circulation often for cardiac or circulatory support, in which the extracorporeal circuit drains blood from the venous system and returns into the systemic arterial system. Without qualification, V-A ECMO refers to support that returns blood to the systemic arterial system, operating in parallel with and providing partial or complete bypass of, the heart and lungs.

V-VA Venovenarterial is a hybrid configuration of V-V and V-A extracorporeal support in which the extracorporeal circuit drains blood from the venous system and reinfuses into both the venous and systemic arterial systems. V-VA ECMO provides both pulmonary (V-V component) and cardiac support (V-A component) in patients with combined cardiopulmonary failure.

A-VCO₂R Arteriovenous carbon dioxide removal (A-VCO₂R) is the provision of pumpless carbon dioxide exchange through the use of an extracorporeal circuit consisting of an artificial lung, and venous and arterial vascular access cannulas using lower blood flows. Blood flow is driven by the patient's arteriovenous pressure gradient.

V-V ECCO₂R Venovenous extracorporeal carbon dioxide removal (V-V CO₂R) is the provision of carbon dioxide exchange through the use of an extracorporeal circuit consisting of a blood pump, artificial lung, and venous drain and venous return cannulas using lower blood flows Other Indicates a support not listed

Anatomical Site Abbreviations:

RCCA – Right Common Carotid Artery	RA – Right Atrium
LCCA – Left Common Carotid Artery	LA – Left Atrium
RIJV – Right Internal Jugular Vein	LV – Left Ventricle
RIJVC – Right Internal Jugular Vein Cephalic	LPV – Left Pulmonary Vein
LIJV – Left Internal Jugular Vein	PA – Pulmonary Artery
RFA – Right Femoral Artery	LSA – Left Subclavian Artery
LFA – Left Femoral Artery	LSV – Left Subclavian Vein
RFV – Right Femoral Vein	RSA – Right Subclavian Artery
LFV – Left Femoral Vein	RSV – Right Subclavian Vein

Cannula Manufacturer & Cannula Model Name List

Cannula Manufacturer	Cannula Model Name
Alung	Hemolung Catheter
Arrow	Arrow Sheath
	Super Arrow Flex
Baxter	Baxter
Berlin Heart	Berlin Heart EXCOR
Chalice	Paraglide dual lumen
Cook Critical Care	Cook
	Cook Access Plus
	Cook Catheter
Cordis	Avanti Introducer
Edwards	Edwards EZ Glide
	Edwards Renal Guiding Sheath
	Edwards VFEM
	ELS
	ELS AViD dual stage
	ELS dual stage
	ELS Thin Flex Dual Stage
	FemTrak
	Quickdraw
	RM dual stage
Free Life Medical	CruraSave
	NovaPort Twin
	REVAS Arterial Femoral Cannula PU Rheopax coated
	REVAS Universal ECLS Cannula V/A, 3/8" connector
	REVAS Venous Femoral Cannula short version, ECMO/ ECLS Rheopax coated
	REVAS Arterial Femoral Cannula "BALANCE"
	REVAS Arterial Femoral Cannula "BALANCE" Rheopax coated
	REVAS Arterial Femoral Cannula PU
	REVAS Arterial Femoral Cannula PU long

	REVAS Arterial Femoral Cannula PU long Rheopax coated
	REVAS Arterial Femoral Cannula PU Rheopax coated
	Revas Pediatric Arterial
	Revas Pediatric Venous
	REVAS arterial Femoral Cannula PU Rheopax coated
	REVAS Universal ECLS Cannula V/A, 3/8" connector
	REVAS Universal ECLS Cannula V/A, 3/8" Connector, Rheopax coated
	REVAS Universal ECLS Cannula V/A, 3/8" Connector, Rheopax coated
	REVAS Veno venous Dual Lumen Cannula Rheopax coated
	REVAS Venous Femoral Cannula short version, ECMO/ ECLS
	REVAS Venous Femoral Cannula short version, ECMO/ ECLS Rheopax coated
	REVAS Venous Femoral Cannula with bent tip
	REVAS Venous Femoral Cannula with bent tip, Rheopax coated
	REVAS Venous Femoral Cannula,ECMO/ ECLS
	REVAS Venous Femoral Cannula,ECMO/ ECLS Rheopax coated
	REVAS Venous Femoral Cannula,ECMO/ ECLS, Rheopax coated
	REVASA Arterial Femoral Cannula PU
Fresenius	Medos Femoral Cannula Arterial
	Medos Femoral Cannula Venous
	NovaPort One
Gesco	Gesco
Geringe	Geringe (Maquet) Avalon Elite Bi Caval
	Geringe (Maquet) HLS Cannula Arterial
	Geringe (Maquet) HLS Cannula Arterial Bioline
	Geringe (Maquet) HLS Cannula Arterial Softline
	Geringe (Maquet) HLS Cannula Venous Bioline
	Geringe (Maquet) HLS Cannula Venous Softline
	Geringe (Maquet) HLS Cannulae Venous
Kurare	Kurare
Livanova	Livanova arterial
	Livanova Bi-Flow
	Livanova EasyFlow Duo
	Livanova RAP
	Livanova straight tip
	RAP Femoral Venous
	Sorin Arterial
	Sorin Arterial Sideholes
	Sorin Femoral Arterial
	Sorin Pediatric Arterial Cannula
	Sorin right angle Venous
	Sorin Stockert Arterial
MC3 (distributed by Medtronic)	MC3 Crescent dual lumen catheter
	MC3 Crescent RA dual lumen catheter
	MC3 Soft Flow
	3D EOPA

Medtronic Cardiopulmonary/DLP	Biomedicus
	Bio-Medicus 10 cm Drainage Catheter and Introducers
	Bio-Medicus 10 cm Return Catheter and Introducers
	Bio-Medicus 10.5 cm Drainage Catheter and Introducers
	Bio-Medicus 10.5 cm Return Catheter and Introducers
	Bio-Medicus 11 cm Drainage Catheter and Introducers
	Bio-Medicus 11 cm Return Catheter and Introducers
	Bio-Medicus 11.5 cm Drainage Catheter and Introducers
	Bio-Medicus 11.5 cm Return Catheter and Introducers
	Bio-Medicus 18 cm Catheter and Introducers
	Bio-Medicus 38 cm Drainage Catheter and Introducers
	Bio-Medicus 55 cm Drainage Catheter and Introducers
	Biomedicus Arterial/Jugular
	Biomedicus Carmeda Arterial
	Biomedicus Femoral Arterial
	Biomedicus Femoral Venous
	Biomedicus Multi-Stage Femoral Venous
	Biomedicus NextGen
	Biomedicus NextGen Arterial
	Biomedicus NextGen Arterial/Jugular
	Biomedicus NextGen Femoral Arterial
	Biomedicus NextGen Venous
	Biomedicus Venou
	Biomedicus Femoral Venous
	Carmeda Biomedicus
	Carmeda Biomedicus Arterial/Jugular
	Carmeda Biomedicus Venous
	Carpentier Bi-Caval Femoral Venous Cannula
	Cortiva Biomedicus Femoral Arterial
	Cortiva Biomedicus Femoral Venous
	Cortiva EOPA
	DLP
	DLP Carmeda
	DLP Carmeda Venous
	DLP Malleable
	DLP right angle single stage venous plastic
	DLP single stage rt angle metal
	EOPA
	Medtronic single stage venous
	Medtronic 2 stage venous
	Medtronic 23/25 Femoral venous
	Medtronic DLP vent
	Medtronic Input Introducer Sheath
	Medtronic MC2 2 stage venous
	Medtronic MC2X 3 stage venous
	Medtronic single stage venous

	VC2 Atrial caval spiral tip
Medwest	Medwest
Origen	Origen
	Origen DL non-reinforced still available
	Origen reinforced
Other	Klein-Baker
	Other
	Pharmaseal
Pediavascular	Pediavascular SuperSheath
Research Medical/Edwards	Fem-flex II
	Research Medical
Senko/Mera	MERA Arterial
	MERA NSH Percutaneous Cannula (Hepalin coated)
	MERA NSH Percutaneous Cannula for cutdown (Hepalin coated)
	MERA Percutaneous Cannula /reinforced type for Venus
	MERA Percutaneous Cannula for Venus
	MERA reinforced NSH Percutaneous Cannula (Hepalin coated)
	MERA Venous
Sherwood Medical	Argyle
SMART	SMART
Spectrum Medical	Spectrum Medical Dual Lumen Cannula
Surge Cardiovascular	Alpine Femoral Venous Cannula
	PEAK LV vent
Tandem Life/Livanova	Protek Duo
	Protek Solo Venous cannula
	Tandem Heart Arterial Cannula
	Tandem Heart Transseptal Cannula
	Terumo Arterial
	Terumo Pinnacle Sheath
	Terumo Venous
Various Dacron Grafts	Dacron Graft

ECMO Manufacturer & Pump Name List

ECMO Manufacturer	ECMO Pump Name
Abbott	CentriMag Blood Pump
	PediMag Blood Pump / PediVAS Blood Pump
Abiomed	Abiomed Breethe
	Impella
Alung	Hemolung
	Hemolung Cartridge
	Hemolung Cartridge integrated pump head
	Hemolung Pumphead
Baxter	Baxter Century Roller Pump
Braile Biomedica	Braile Safyre
Eurosets	Eurosets ECMOLIFE
Fresenius	iLA

	Medos DP3 Centrifugal
Gambro	Gambro Prizma Flex
Getinge	Cardiac Intervention Set (CiSet)
	Getinge (Maquet) HIT Set Advanced 5.0 Softline
	Getinge (Maquet) HIT Set Advanced 7.0 Softline
	Getinge (Maquet) HL 40 Roller
	Getinge (Maquet) HLS Set Advanced 5.0 Bioline
	Getinge (Maquet) HLS Set Advanced 7.0 Bioline
	Getinge (Maquet) PLS Set Bioline
	Getinge (Maquet) PLS Set Plus Bioline
	Getinge (Maquet) PLS Set Plus Softline
	Getinge (Maquet) PLS Set Softline
	Getinge (Maquet) Rotaflow Bioline
	Getinge (Maquet) Rotaflow Softline
	Getinge (Maquet) Rotaflow Uncoated
	Jostra HL-20 Roller
Hospal	Hospal RP06 Roller
Lifemotion	Lifemotion disposable ECMO set
Livanova	Alcard ALC 250
	Cobe 6 Roller"
	Sorin Revolution Centrifugal
	Stockert Roller
	Stockert S3 Roller
	Stockert S5 Roller
Medtronic Cardiopulmonary/DLP	Biomedicus BP-50 Centrifugal
	Biomedicus BP-80 Centrifugal
	Medtronic Affinity (AP-40)-uncoated
	Medtronic Affinity (BBAP-40)- Balanced
	Medtronic Affinity (CBAP-40)- Cortiva
Origen	FloPump 32
Other	Drake Willock
	Other
Rhone-Poulenc	Rhone-Poulenc
Senko/Mera	MERA Centrifugal Pump Head
	MERA Centrifugal Pump Head NSH-R (heparin coated)
	MERA Centrifugal Pump Head NSH-R (TPC/polymer coated)
	Senko MPS-15
	Senko UNIMOS
Spectrum Medical	Spectrum CP37
	Spectrum Quantum CP22
	Spectrum Quantum Roller Pump
Tandem Life/Livanova	LifeSPARC
	Tandem Heart
Terumo	Sarns 8000 Roller
	Sarns 9000 roller
	Sarns/3M Delphin II Centrifugal

	Terumo Capiiox
	Terumo/Sarns System 1 Roller

Descriptors of Shock Stages

TABLE 3 Descriptors of Shock Stages: Physical Examination, Biochemical Markers, and Hemodynamics

Stage	Description	Physical examination/ bedside findings		Biochemical markers		Hemodynamics	
		Typically includes	May include	Typically includes	May include	Typically includes	May include
A At risk	A patient who is not currently experiencing signs or symptoms of CS, but is at risk for its development. These patients may include those with large acute myocardial infarction or prior infarction and/or acute or acute-on-chronic heart failure symptoms.	Normal JVP Warm and well-perfused • Strong distal pulses • Normal mentation	Clear lung sounds	Normal lactate	Normal labs • Normal (or at baseline) renal function	Normotensive (SBP ≥ 100 mmHg or at baseline)	If invasive hemodynamics are assessed: • Cardiac Index ≥ 2.5 L/min/m² (if acute) • CVP ≤ 10 mmHg • PCWP ≤ 15 mmHg • PA saturation $\geq 65\%$
B Beginning CS	A patient who has clinical evidence of hemodynamic instability (including relative hypotension or tachycardia) without hypoperfusion.	Elevated JVP Warm and well-perfused • Strong distal pulses • Normal mentation	Rales in lung fields	Normal lactate	Minimal acute renal function impairment Elevated BNP	Hypotension • SBP < 90 mmHg • MAP < 60 mmHg • > 30 mmHg drop from baseline Tachycardia • Heart rate ≥ 100 bpm	
C Classic CS	A patient who manifests with hypoperfusion and who requires one intervention (pharmacological or mechanical) beyond volume resuscitation. These patients typically present with relative hypotension (but hypotension is not required).	Volume overload	Looks unwell Acute alteration in mental status Feeling of impending doom Cold and clammy Extensive rales Ashen, mottled, dusky, or cool extremities Delayed capillary refill Urine Output < 30 mL/h	Lactate ≥ 2 mmol/L	Creatinine increase to 1.5 x baseline (or 0.3 mg/dL) or $> 50\%$ drop in GFR Increased LFTs Elevated BNP	If invasive hemodynamics assessed (strongly recommended) • Cardiac index < 2.2 L/min/m² • PCWP > 15 mmHg	
D Deteriorating	A patient who is similar to category C but is getting worse. Failure of initial support strategy to restore perfusion as evidenced by worsening hemodynamics or rising lactate.	Any of stage C and worsening (or not improving) signs/symptoms of hypoperfusion despite the initial therapy.		Any of stage C and lactate rising and persistently > 2 mmol/L	Deteriorating renal function Worsening LFTs Rising BNP	Any of stage C and requiring escalating doses or increasing numbers of pressors or addition of a mechanical circulatory support device to maintain perfusion	
E Extremis	Actual or impending circulatory collapse	Typically unconscious	Near pulselessness Cardiac collapse Multiple defibrillations	Lactate ≥ 8 mmol/L^a	CPR (A-modifier) Severe acidosis • pH < 7.2 • Base deficit	Profound hypotension despite maximal hemodynamic support	Need for bolus doses of vasopressors