Sepsis Measure Information Form and Algorithm Overview

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Purpose

This presentation will provide an overview of the Sepsis Measure Information Form (MIF) and algorithm.

Objectives

Participants will be able to understand the following:

- Sepsis initial patient population (IPP), denominator, numerator, and exclusions
- SEP-1 algorithm
- Measure feedback messages and available reports
- Sepsis bundles

Acronyms and Abbreviations

ASC	Ambulatory Surgical Center	**MB**	megabyte
BP	blood pressure	**MIF**	Measure Information Form
CM	Clinical Modification	**mL**	milliliter
CMS	Centers for Medicare & Medicaid Services	**MM**	month
DD	date	**mmol**	millimoles
HARP	Health Care Quality Information System (HCQIS) Access Roles and Profile	**PDF**	Portable Document Format
HQR	Hospital Quality Reporting	**Q**	quarter
ICD	International Classification of Diseases	**SEP**	sepsis
ID	identification	**UTD**	unable to determine
IPP	Initial patient population	**VAD**	ventricular assist device
IQR	Inpatient Quality Reporting	**VIQR**	Value, Incentives, and Quality Reporting
IV	intravenous	**XML**	Extensible Markup Language
kg	kilogram	**YYYY**	year
L	liter		

Webinar Questions

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- If your question is about a specific slide, please include the slide number.
- If you have a question unrelated to this webinar topic, we recommend that you first search for it in the QualityNet Inpatient Questions and Answers Tool. If you do not find an answer, then submit your question to us via the same tool.

Sepsis Measure Information Form and Algorithm

Sepsis Initial Patient Population

Patients admitted to the hospital for inpatient acute care with an:

- *ICD-10-CM Principal or Other Diagnosis Code* for SEP as defined in Appendix A, Table 4.01
- *ICD-10-CM Principal or Other Diagnosis Code* not equal to U07.1 (COVID-19)
- Patient Age (*Admission Date* minus *Birthdate*) greater than or equal to 18 years
- Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days

are included in the SEP Initial Patient Population and are eligible to be sampled, abstracted, and submitted to the *Hospital Quality Reporting (HQR) Secure Portal.*

Denominator

Inpatients age 18 and over with an *ICD-10-CM Principal or Other Diagnosis Code* of Sepsis, Severe Sepsis, or Septic Shock and not equal to U07.1 (COVID-19).

- Included cases are discharges age 18 and over with an *ICD-10-CM Principal or Other Diagnosis Code* of Sepsis, Severe Sepsis, or Septic Shock as defined in Appendix A, Table 4.01.
- Cases that are included in the denominator but fall out of the numerator will result in a measure outcome of “D” (failed the intent of the measure).

Denominator (continued)

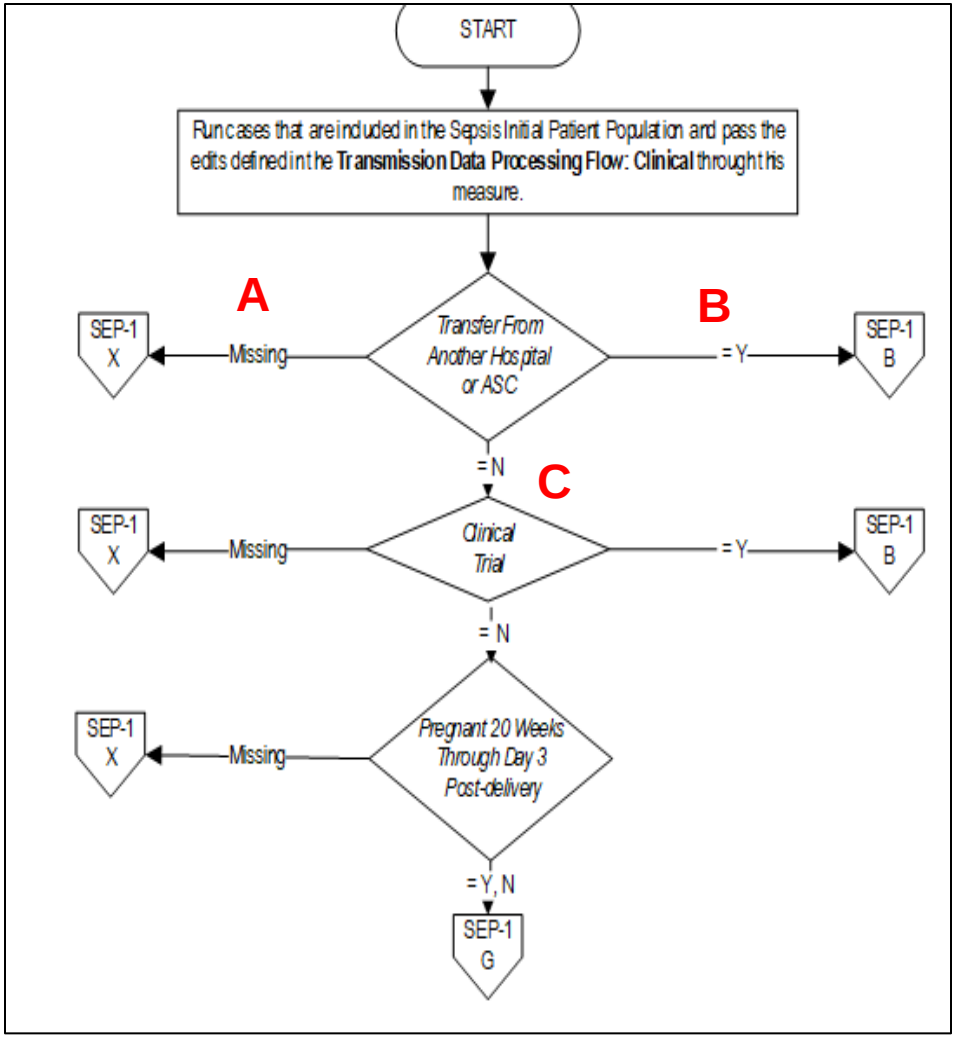
- Excluded Cases
  - Directive for Comfort Care or Palliative Care within 6 hours of presentation of severe sepsis or septic shock
  - Administrative Contraindication to Care within 6 hours of presentation of severe sepsis or septic shock
  - Transfer from another acute care facility or ambulatory surgical center (ASC)
  - Enrolled in a sepsis Clinical Trial
  - Discharged within 6 hours of presentation
  - Receiving IV antibiotics for more than 24 hours prior to presentation of severe sepsis
- Cases that are excluded from the denominator will result in a measure outcome of “B.”
  - These cases still count as part of meeting the sampling thresholds and are submitted to the *HQR Secure Portal*.

Numerator

Patients who received all of the following will have met the intent of the measure (passed), and the case will result in a measure outcome of “E.”

Timeframe	Requirement
Within 3 hours of severe sepsis presentation	• Lactate level drawn • Appropriate antibiotic administered • Blood cultures drawn prior to antibiotic
Within 6 hours of severe sepsis presentation if initial lactate level was elevated	• Repeat lactate level
Within 3 hours of initial hypotension (low blood pressure)	• Appropriate intravenous fluids
Within 6 hours of septic shock presentation if low BP persists	• Vasopressors administered
Within 6 hours of septic shock presentation if low BP persists and lactate is >= 4	• Repeat volume status and tissue perfusion assessment performed

Algorithm: Measure Outcome of "B"



Data Element: *Transfer From Another Hospital or ASC*

A. If *Transfer From Another Hospital or ASC* is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

B. If *Transfer From Another Hospital or ASC* equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing. Case still counts as part of the sample and is submitted.

C. If *Transfer From Another Hospital or ASC* equals No, continue processing and proceed to Clinical Trial.

Data Element: *Transfer From Another Hospital or ASC*

Data Element Name: *Transfer From Another Hospital or ASC*

Collected For CMS Only: SEP-1

Definition: Documentation that the patient was received as a transfer from an inpatient, outpatient, or emergency/observation department of an outside hospital or from an ambulatory surgery center (ASC).

Suggested Data Collection Question: Was the patient received as a transfer from an inpatient, outpatient or emergency/observation department of an outside hospital or from an ambulatory surgery center?

Format:

Length: 1
Type: Alphanumeric
Occurs: 1

Allowable Values:

Y (Yes)	Patient was received as a transfer from an inpatient, outpatient, or emergency/observation department of an outside hospital or from an ambulatory surgery center.
N (No)	Patient was not received as a transfer from an inpatient, outpatient, or emergency/observation department of an outside hospital or from an ambulatory surgery center, or unable to determine from medical record documentation.

Notes for Abstraction:

- Select "Yes" if a patient is transferred in from any emergency department (ED) or observation unit OUTSIDE of your hospital.

Algorithm: Measure Outcome of "D"

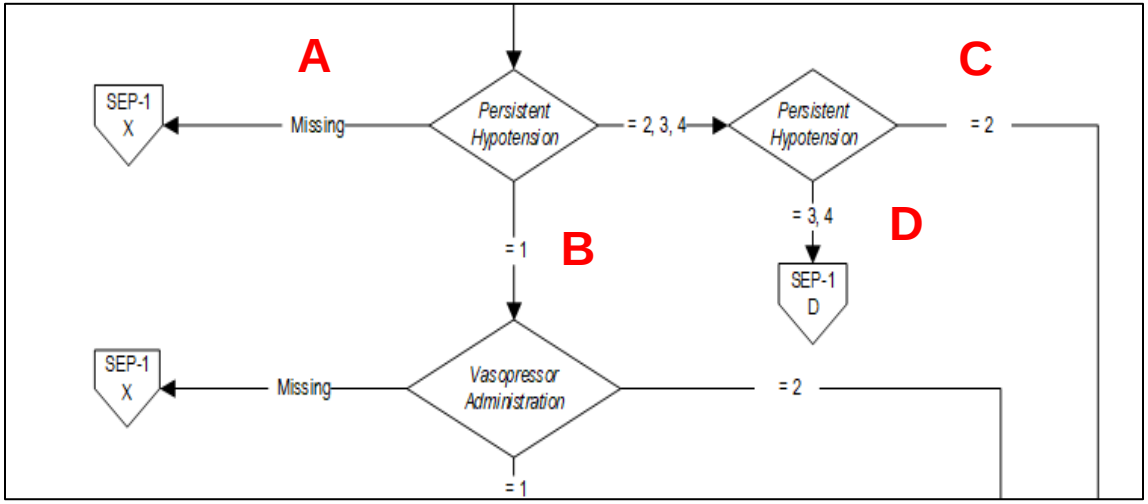
Data Element: *Persistent Hypotension*

A. If *Persistent Hypotension* is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

B. If *Persistent Hypotension* equals 1, continue processing and abstract *Vasopressor Administration*.

C. If *Persistent Hypotension* equals 2, continue processing and proceed to *Repeat Volume Status and Tissue Perfusion Assessment Performed*.

D. If *Persistent Hypotension* equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the measure population (fail the intent of the measure). Stop processing.



Data Element:
Persistent Hypotension

Data Element Name: *Persistent Hypotension*

Collected For CMS: SEP-1

Definition: Documentation of the presence of persistent hypotension or new onset of hypotension following the administration of the target ordered volume of crystalloid fluids.

Suggested Data Collection Question: Was persistent hypotension or new onset of hypotension present within one hour of when the target ordered volume of crystalloid fluids was completely infused?

Format:

Length: 1
Type: Alphanumeric
Occurs: 1

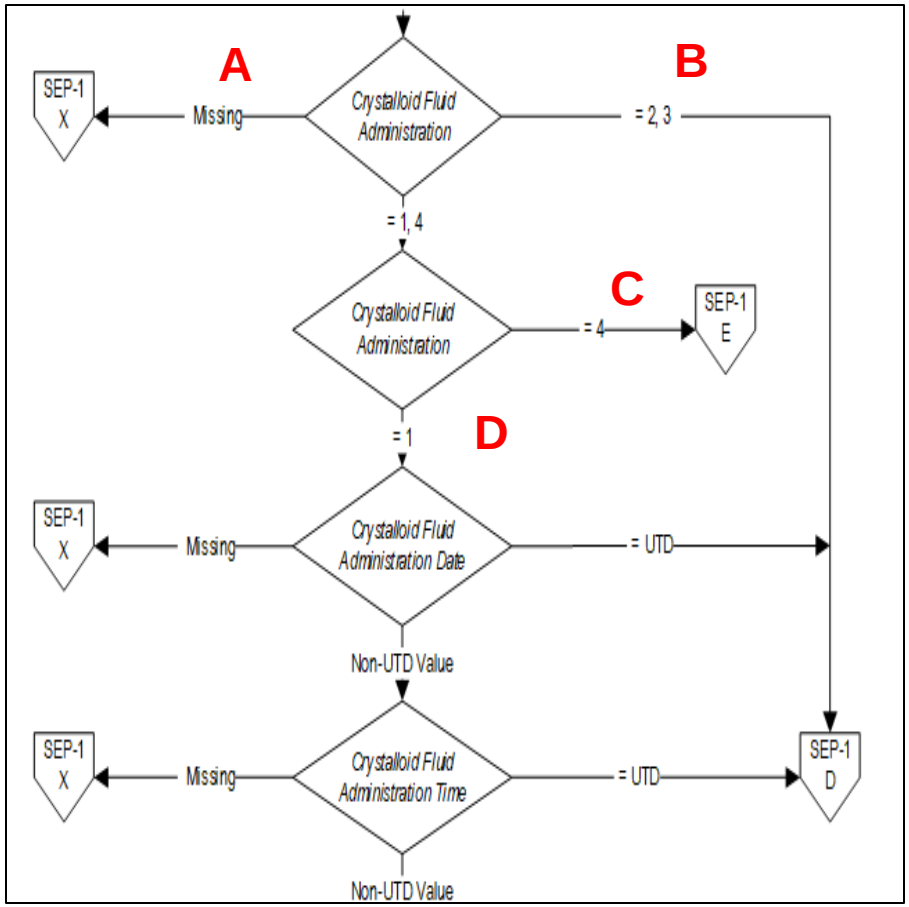
Allowable Values:

1 (Yes)	Persistent hypotension or new onset of hypotension was present within one hour of when the target ordered volume of crystalloid fluids was completely infused.
2 (No or UTD)	Persistent hypotension or new onset of hypotension was not present within one hour of when the target ordered volume of crystalloid fluids was completely infused or unable to determine.
3 (No)	The patient was not assessed for persistent hypotension or new onset of hypotension within one hour of when the target ordered volume of crystalloid fluids was completely infused.
4 (Not applicable)	Crystalloid fluids were administered but at a volume less than the target ordered volume.

Notes for Abstraction:

- Persistent hypotension or new onset of hypotension can be determined by the following criteria:

Algorithm: Measure Outcome of "E"



Data Element: *Crystalloid Fluid Administration*

A. If *Crystalloid Fluid Administration* is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

B. If *Crystalloid Fluid Administration* equals 2 or 3, the case will proceed to a Measure Category Assignment of D and will be in the measure population. Stop processing.

C. If *Crystalloid Fluid Administration* equals 4, the case will proceed to a Measure Category Assignment of E and will be in the numerator population (meets the intent of the measure/passes).
Stop processing.

D. If *Crystalloid Fluid Administration* equals 1, continue processing and proceed to *Crystalloid Fluid Administration Date*.

Data Element:
Crystalloid Fluid Administration

Data Element Name: *Crystalloid Fluid Administration*

Collected For CMS: SEP-1

Definition: Documentation of initiation of crystalloid fluids within the specified time frame AND complete infusion of the target ordered volume.

Suggested Data Collection Question: Were crystalloid fluids inititated within the specified time frame AND completely infused based on the target ordered volume?

Format:

Length: 1
Type: Alphanumeric
Occurs: 1

Allowable Values:

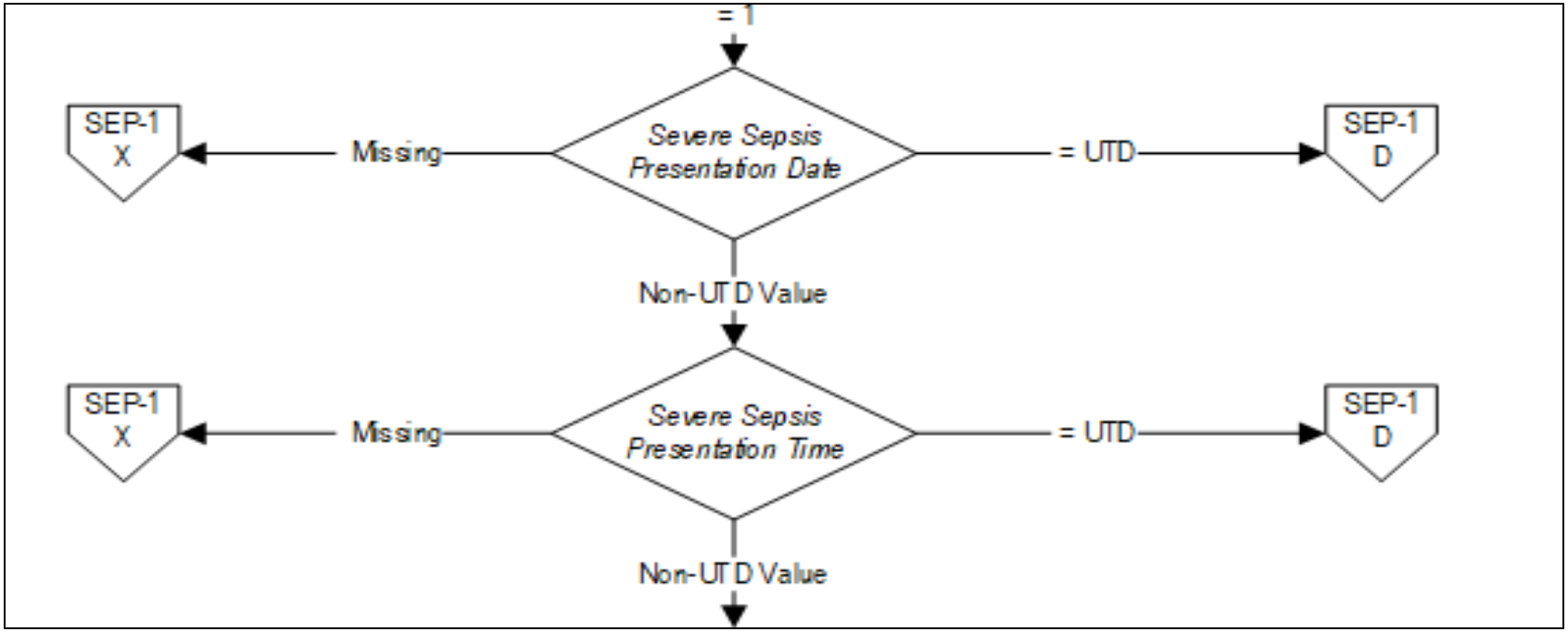
1 (Yes)	Target volume of crystalloid fluids were ordered AND initiated within the specified time frame. Additionally, the target ordered volume was completely infused.
2 (No)	Less than the target volume of crystalloid fluids were ordered OR initiated within the specified time frame. The target ordered volume was not completely infused.
3 (No)	The target volume of crystalloid fluids was NOT initiated within the specified time frame, or unable to determine.
4 (No)	There is documentation the patient has an implanted Ventricular Assist Device (VAD) OR documentation of the patient or authorized patient advocate refusal of IV fluids.

Notes for Abstraction:

- The specified time frame for abstraction of crystalloid fluids is within six hours prior

Algorithm: Date and Time Data Elements

- When a date, time, or numeric data element is abstracted as “UTD,” the case will result in a measure outcome of “D” (failed the intent of the measure).
- A date or time date element with an abstracted value of “UTD” cannot be used in a calculation.



Date and Time Data Elements

Data Element Name: *Severe Sepsis Presentation Date*

Collected For CMS: SEP-1

Definition: The earliest date on which the final criterion was met to establish the presence of severe sepsis.

Suggested Data Collection Question: What was the date on which the last criterion was met to establish the presence of severe sepsis?

Format:

Length: 10 – MM-DD-YYYY (includes dashes) or UTD
Type: Date
Occurs: 1

Allowable Values:

MM = Month (01-12)
DD = Day (01-31)
YYYY = Year (20xx)
UTD = Unable to Determine

Notes for Abstraction:

- Use the earliest date the final clinical criterion for severe sepsis was noted (see *Severe Sepsis Present* data element for clinical criteria list) or the earliest date the

Data Element Name: *Severe Sepsis Presentation Time*

Collected For CMS: SEP-1

Definition: The earliest time at which the final criterion was met to establish the presenc of severe sepsis.

Suggested Data Collection Question: What was the time at which the last criterion wa met to establish the presence of severe sepsis?

Format:

Length: 5 - HH:MM (with or without colon) or UTD
Type: Time
Occurs: 1

Allowable Values:

HH = Hour (00-23)
MM = Minutes (00-59)
UTD = Unable to Determine

Time must be recorded in military time format.
With the exception of Midnight and Noon:

- If the time is in the a.m., conversion is not required
- If the time is in the p.m., add 12 to the clock time hour

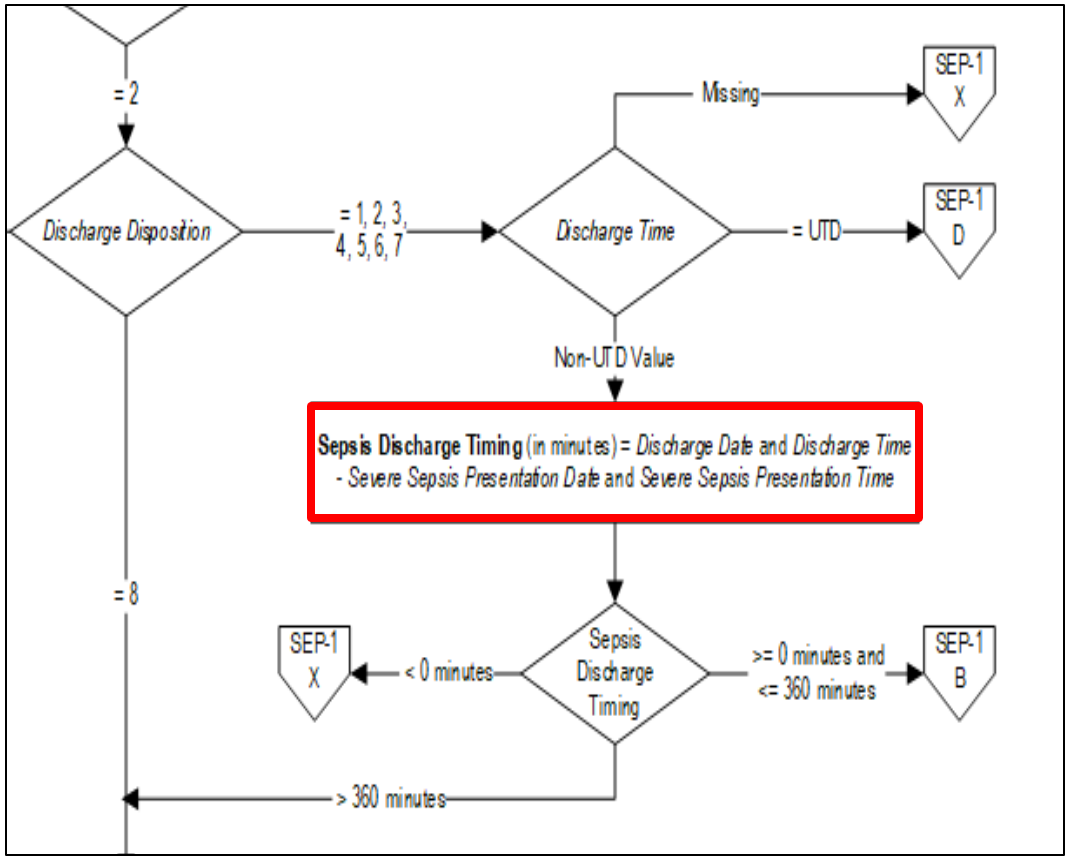
Examples:

Midnight – 00:00	Noon – 12:00
5:31 am – 05:31	5:31 pm – 17:31
11:59 am – 11:59	11:59 pm – 23:59

Notes for Abstraction:

- Use the earliest time the final clinical criterion for severe sepsis was noted (see

Algorithm: Process Boxes



Rectangles or process boxes show when computation or manipulation of the data are required, such as a calculation.

In this process box the Sepsis Discharge Timing is calculated using previously abstracted data elements.

Sepsis Discharge Timing, in minutes, is equal to the *Discharge Date* and *Discharge Time* minus the Severe *Sepsis Presentation Date* and Severe *Sepsis Presentation Time*.

Algorithm Narrative

- Included to meet 508 compliance
- Not intended to be used for programming

Algorithm Narrative
Sepsis (SEP)-1: Severe Sepsis and Septic Shock: Management Bundle Composite Measure

Numerator: Patients who received ALL of the following:
Within three hours of presentation of severe sepsis:

- Initial lactate level measurement
- Broad spectrum or other antibiotics administered
- Blood cultures drawn prior to antibiotics

AND received within six hours of presentation of severe sepsis, ONLY if the initial lactate is elevated:

- Repeat lactate level measurement

AND within three hours of Initial Hypotension:

- Resuscitation with 30 mL/kg crystalloid fluids

OR within three hours of septic shock:

- Resuscitation with 30 mL/kg crystalloid fluids

AND within six hours of septic shock presentation, ONLY if hypotension persists after fluid administration:

- Vasopressors are administered

AND within six hours of septic shock presentation, if hypotension persists after fluid administration or initial lactate >= 4 mmol/L:

- Repeat volume status and tissue perfusion assessment is performed

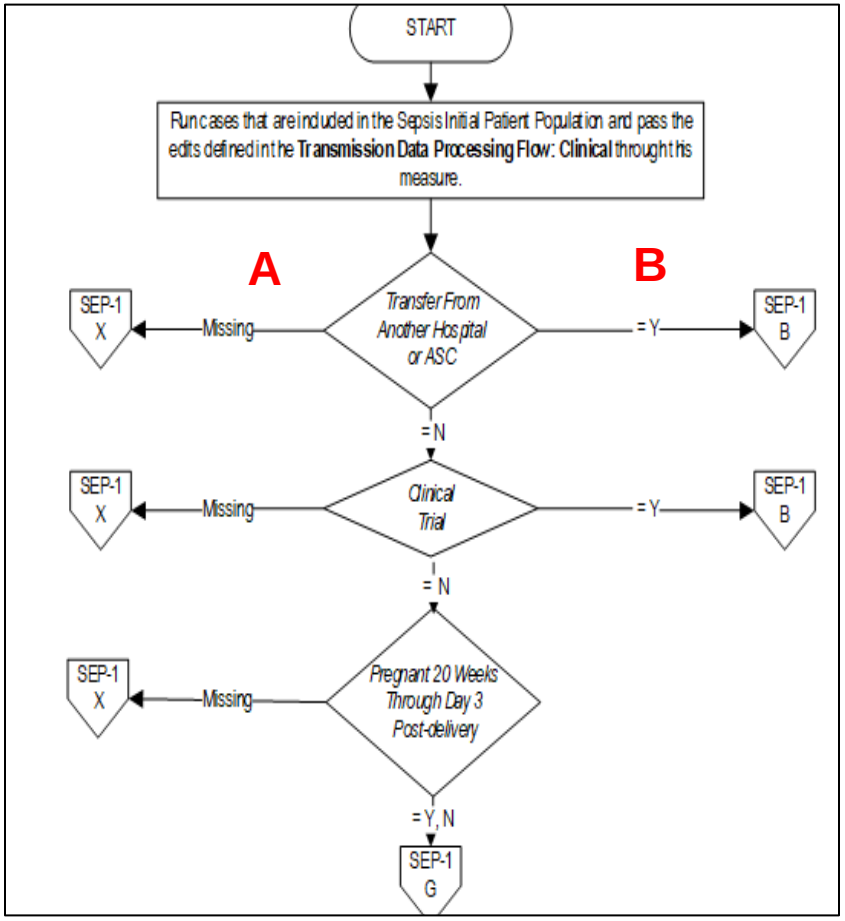
Denominator: Inpatients age 18 and over with an ICD-10-CM Principal or Other Diagnosis Code of Sepsis, Severe Sepsis or Septic Shock as defined in Appendix A, Table 4.01 and not equal to U07.1 (COVID-19)

Variable Key: Sepsis Discharge Timing, Broad Spectrum Antibiotic Timing, Blood Culture Timing, Blood Culture Antibiotic Timing, Initial Lactate Timing, Repeat Lactate Timing, Initial Hypotension Fluid Timing, Shock Presentation Timing, Shock Discharge Timing, Crystalloid Fluid Admin Timing, Vasopressor Timing, Assessment Timing, Assessment Fluid Timing

1. Start processing. Run cases that are included in the Sepsis Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical

Feedback Messages/Edits and Reports

Feedback Messages/Edits



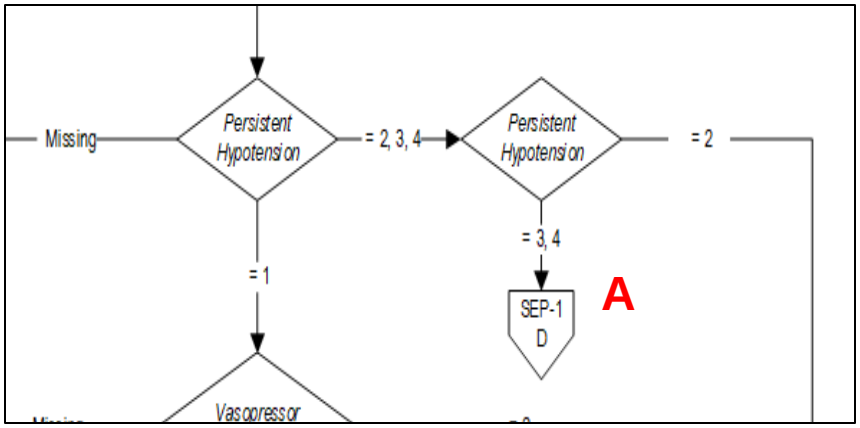
A. Critical Edit:

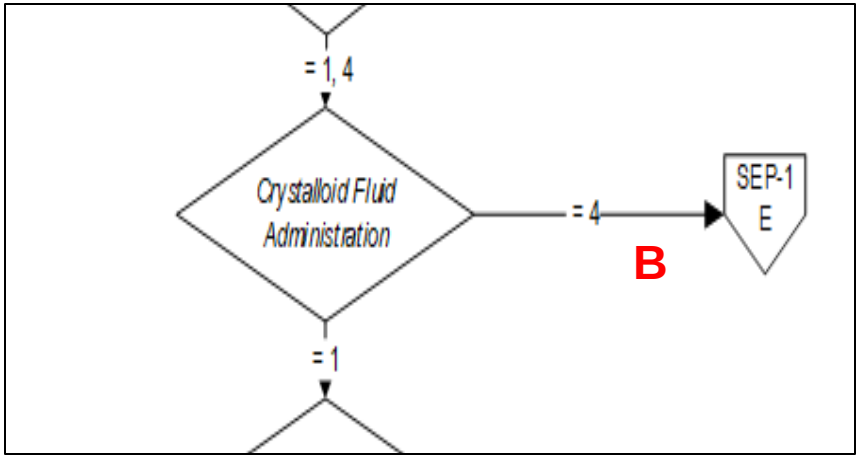
   SEP-1: Rejected (X) – Transfer from another Hospital or ASC is missing.

B. Measure Message:

   SEP-1: EXCLUDED (B) – Patient was received as a transfer from another hospital or ambulatory surgical center.

Feedback Messages/Edits





A. Measure Message:

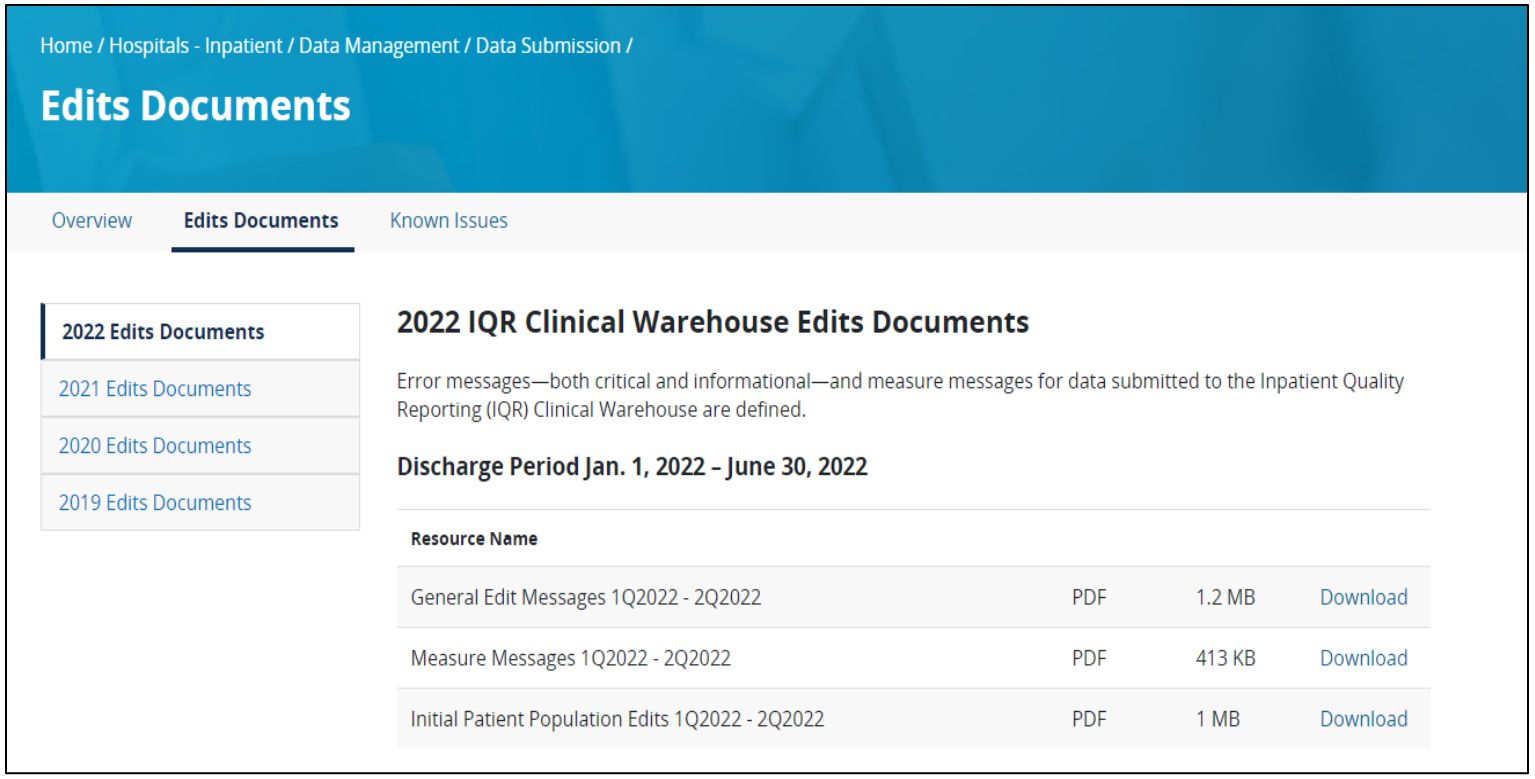
   SEP-1: FAILED (D) – Patient was not assessed for hypotension, crystalloid fluids were not administered at the appropriate rate, or unable to determine.

B. Measure Message:

   SEP-1: PASSED (E) – There is documentation that the patient has an implanted ventricular assist device (VAD) prior to or at time of identifying need for crystalloid fluids.

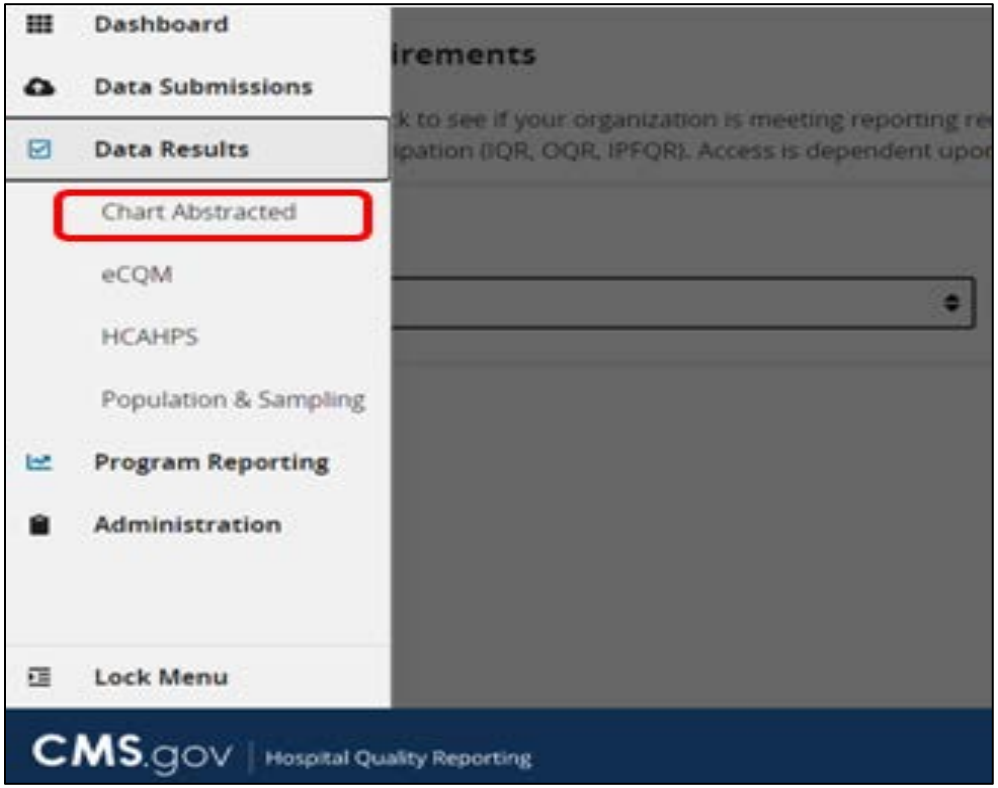
IQR Clinical Warehouse Messages

On QualityNet: https://qualitynet.cms.gov/inpatient/data-management/data-submission/edits-docs



HQR Performance Reports

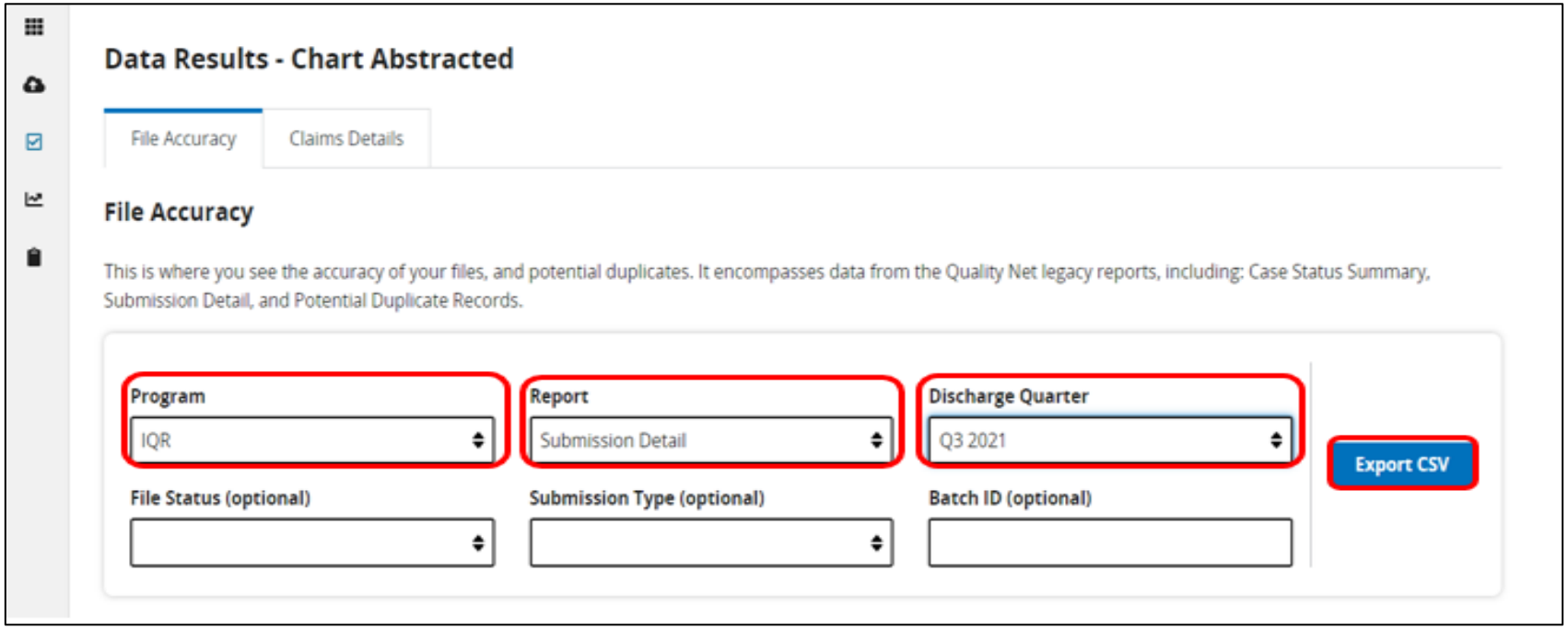
1. Log in to the HQR Secure Portal using your HARP User ID and Password.
2. Go to the Dashboard located on the left-hand side of the screen.
3. Click Data Results.
4. Click Chart Abstracted.



HARP=HCQIS Access Roles and Profile

HQR Performance Reports (continued)

5. Select the File Accuracy tab.
6. Select IQR in the Program drop down.
7. Select Submission Detail under the Report drop down.
8. Select the applicable Discharge Quarter.
9. Click on Export CSV.



Submission Detail Report

IQR - Submission Detail Report
Quarter: 04/01/2021 - 06/30/2021
Provider(s):

Provider ID	Measure Set	Patient ID	Batch ID	Admit Date	Discharge Date	Upload Date	Action Code	File Name	File Status	Test Case	Message
	IQR-SEP	365570617	3297899	3/31/2021	4/14/2021	9/30/2021	ADD	20210929205245440010000001430.xml	ACCEPTED	No	63870 Informational Message: SEP-1: FAILED (D) - Crystalloid fluids were not administered appropriately.
	IQR-SEP	365746358	3297899	3/14/2021	4/21/2021	9/30/2021	ADD	20210929205245440110000001451.xml	ACCEPTED	No	63810 Informational Message: SEP-1: EXCLUDED (B) - Patient was received as a transfer from another hospital or ambulatory surgical center
	IQR-SEP	366107395	3297899	3/25/2021	4/1/2021	9/30/2021	ADD	20210929205245440120000001531.xml	ACCEPTED	No	63890 Informational Message: SEP-1: PASSED (E)- Case has met the intent of the measure

IQR - Submission Detail Report
Quarter: 04/01/2021 - 06/30/2021
Provider(s):

Provider ID	Measure Set	Patient ID	Batch ID	Admit Date	Discharge D	Upload Date	Action Co	File Name	File Status	Test Case	Message
	IQR-SEP	43210870279	3253300	3/28/2021	4/5/2021	6/17/2021	ADD	360170_0279_20210328SEP_87335.xml	REJECTED	No	64745 Critical Error: XML tag <hcoid> is not allowed for CMS in the Clinical Warehouse

Sepsis Bundles

Sepsis Bundles

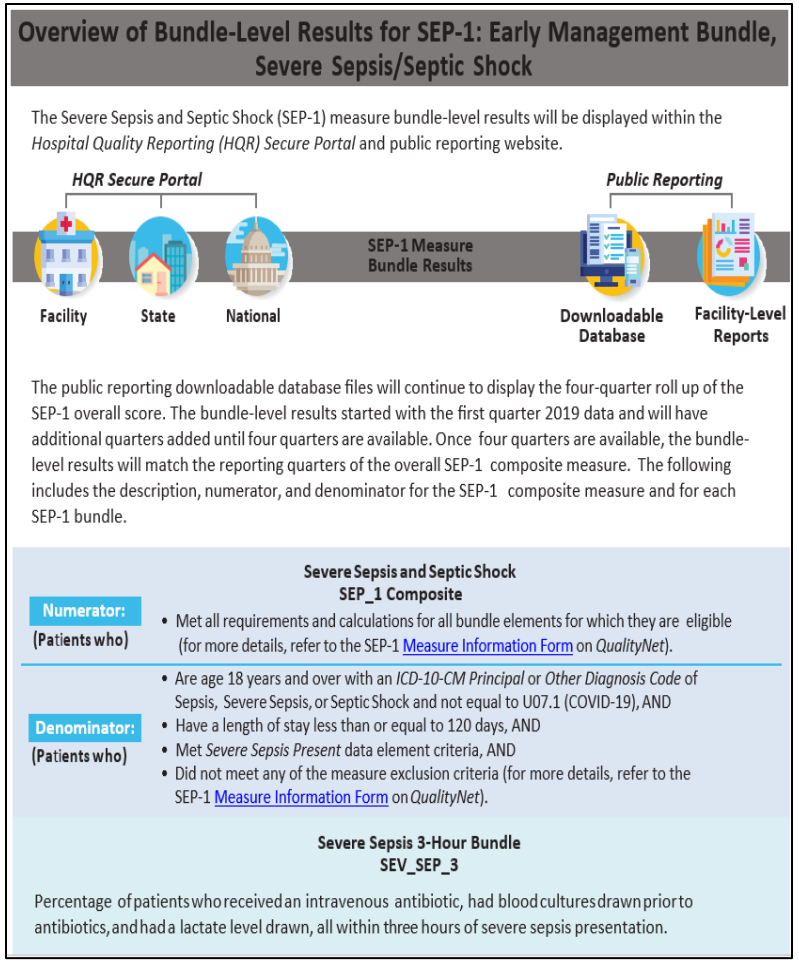
- SEP-1 is a composite measure.
  - A combined measure, or “roll-up” measure, summarizes overall quality of care across multiple measures using one value or piece of information.
  - A combination of two or more measures can provide an even more effective glimpse into the multiple dimensions of quality of care.
- CMS only assesses and requires the composite measure.
- The bundle data are displayed on the Facility, State, and National Report and the Provider Data Catalog.
- Guidance related to the sepsis bundles is not included in the Specifications Manual.

Sepsis Bundles (continued)

- Sepsis bundles include the following:
  - Severe Sepsis 3-Hour Bundle
  - Severe Sepsis 6-Hour Bundle
  - Septic Shock 3-Hour Bundle
  - Septic Shock 6-Hour Bundle
- Sepsis Bundle resource documents are:
  - Updated with each specifications manual release.
  - Posted on QualityNet and include the following:
    - Overview of Bundle-Level Results
    - Sepsis Bundle Algorithms

Overview of Bundle-Level Results

This provides an overview of each of the bundles and lists requirements to meet the bundle numerator and denominator.



Overview of Bundle-Level Results for SEP-1: Early Management Bundle, Severe Sepsis/Septic Shock

The Severe Sepsis and Septic Shock (SEP-1) measure bundle-level results will be displayed within the *Hospital Quality Reporting (HQR) Secure Portal* and public reporting website.

The public reporting downloadable database files will continue to display the four-quarter roll up of the SEP-1 overall score. The bundle-level results started with the first quarter 2019 data and will have additional quarters added until four quarters are available. Once four quarters are available, the bundle-level results will match the reporting quarters of the overall SEP-1 composite measure. The following includes the description, numerator, and denominator for the SEP-1 composite measure and for each SEP-1 bundle.

Severe Sepsis and Septic Shock
SEP_1 Composite

Numerator: (Patients who)
- Met all requirements and calculations for all bundle elements for which they are eligible (for more details, refer to the SEP-1 Measure Information Form on *QualityNet*).

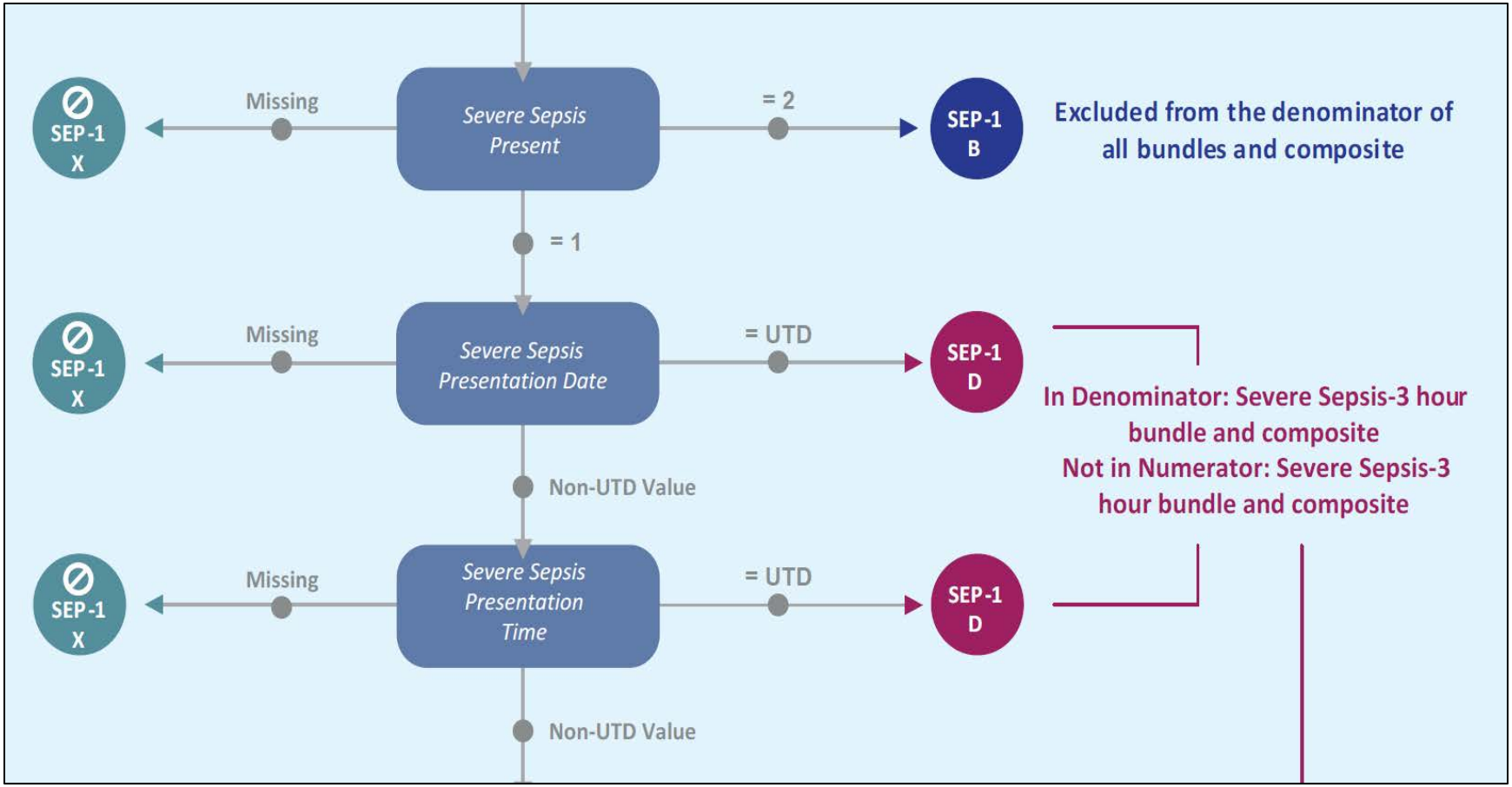
Denominator: (Patients who)
- Are age 18 years and over with an *ICD-10-CM Principal* or *Other Diagnosis Code* of Sepsis, Severe Sepsis, or Septic Shock and not equal to U07.1 (COVID-19), AND
- Have a length of stay less than or equal to 120 days, AND
- Met *Severe Sepsis Present* data element criteria, AND
- Did not meet any of the measure exclusion criteria (for more details, refer to the SEP-1 Measure Information Form on *QualityNet*).

Severe Sepsis 3-Hour Bundle
SEV_SEP_3

Percentage of patients who received an intravenous antibiotic, had blood cultures drawn prior to antibiotics, and had a lactate level drawn, all within three hours of severe sepsis presentation.

Sepsis Bundle Algorithms

They utilize the SEP-1 algorithm and denote which of the bundles are affected by each decision point.



Thank You

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