LIST OF ABBREVIATIONS

ASE	adult sepsis event
BSE	bacteremia/fungemia shock event
CDC	Centers for Disease Control and Prevention
CO	community-onset
CPT	current procedural terminology code
eGFR	estimated glomerular filtration rate
ED	emergency department
EHR	electronic health record
HO	hospital-onset
ICD-10	10th Revision of the International Statistical Classification of Diseases and Related Health Problems
ICU	intensive care unit
IV	intravenous
NHSN	National Healthcare Safety Network
QAD	qualifying antimicrobial days
PO	oral administration
RIT	repeat infection timeframe
SEP-1	Centers for Medicare & Medicaid Services Early Management Bundle, Severe Sepsis/Septic Shock
SOFA	Sequential Organ Failure Assessment

The **Bacteremia/Fungemia Shock Event (BSE)** is a simplified definition that tracks a narrower sub-population of patients with a much higher mortality. This definition is based on positive blood cultures (excluding common contaminants), which almost always reflect true infections, and vasopressors, which almost always reflect clinically important hypotension. BSE requires the fewest data elements, and can be determined using only microbiology and medication administration records.

In subsequent analysis of the dataset used by Rhee *et al*., BSE was present in 0.48% of hospital admissions (compared to 6.0% with ASE), and 35.4% of BSE events resulted in death during hospitalization (compared to 15% of ASE). It had a sensitivity of 6.0% and positive predictive value of 100% when using Sepsis-3 criteria as the reference standard (unpublished).

ASE: Adult Sepsis Event

(Must include the 2 components of criteria A AND include one or more organ dysfunction listed among B criteria)

A. Presumed Infection (presence of both 1 and 2):

1. Blood culture obtained (irrespective of the result), AND
2. At least 4 Qualifying Antimicrobial Days (QAD) – starting within the time period 2 calendar days before and after the collection date of a blood culture. See below.

AND

B. Organ Dysfunction (at least 1 of following criteria met within the time period 2 calendar days before and after the collection date of a blood culture.):

1. Initiation of a new vasopressor infusion (norepinephrine, dopamine, epinephrine, phenylephrine, OR vasopressin). To count as a new vasopressor, that specific vasopressor cannot have been administered in the prior calendar day. See Appendix B.
2. Initiation of invasive mechanical ventilation (must be greater than 1 calendar day between mechanical ventilation episodes). Invasive mechanical ventilation can be identified by ICD-10 Procedure Codes (5A1935Z, 5A1945Z, 5A1955Z) or CPT codes (94002, 94003, 94004, 94656, 94657), or by other clinical records.
3. Doubling of serum creatinine OR decrease by ≥50% of estimated glomerular filtration rate (eGFR) relative to baseline (see below), excluding patients with ICD-10 code for end-stage renal disease (N18.6). (If eGFR values are not readily available, creatinine alone can be used to determine renal dysfunction).
4. Total bilirubin ≥ 2.0 mg/dL and increase by 100% from baseline (see below).
5. Platelet count <100 cells/μL AND ≥ 50% decline from baseline (see below) - baseline must be ≥100 cells/μL.
6. **Optional:** Serum lactate ≥ 2.0 mmol/L, note that serum lactate has become an increasingly common test to measure tissue perfusion. When serum lactate is included in the surveillance definition, the likely effect will be to slightly increase the number of sepsis cases identified. However, if serum lactate ordering practices are not stable over time in a particular hospital this will bias the incidence of sepsis. For this reason, serum lactate was not used in the primary analysis of sepsis trends over time in the original study by Rhee *et al*.

BSE: Bacteremia/Fungemia Shock Event

(Must meet BOTH criteria A AND B)

A. Bacteremia OR Fungemia

Patient has a recognized pathogen identified (i.e., an organism which is not a common commensal – see CDC National Healthcare Safety Network list for guidance) from one or more blood specimens by a culture or non-culture based microbiologic testing method.

AND

B. New Vasopressor

Initiation of a new vasopressor (norepinephrine, dopamine, epinephrine, phenylephrine, vasopressin) within the time period 2 calendar days before and after the collection date of a blood culture demonstrating a recognized pathogen (see A). To count as a new vasopressor, that specific vasopressor cannot have been administered in the prior calendar day.

Key Terms and Concepts

Blood Culture

Qualifying cultures include those drawn for bacterial (aerobic and/or anaerobic), acid-fast bacilli (AFB), and fungal cultures. Blood cultures for specific viruses (e.g., cytomegalovirus) are excluded. For ASE, blood cultures merely need to have been drawn, regardless of result. For BSE, blood cultures or other bacteremia or fungemia testing of blood must have yielded a recognized pathogen.

Window Period

The date the blood culture is obtained is the center of a window period extending both 2 days before and 2 days after the blood culture for both ASE and BSE. Multiple window periods during a hospitalization are possible. If multiple blood cultures are obtained in a short period of time, window periods may overlap.

Figure 1: Examples Illustrating Window Period

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture	A						A		
Window Period	Window Period A				Window Period B				

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture	A			B					
Window Period	Overlapping Window Periods								

If blood cultures, antimicrobial use, OR any organ dysfunction criteria are obtained on hospital day -1 or day 0 (i.e., up to 2 days prior to admission), these criteria can be used to qualify for events in order to account for medical care in the emergency department prior to admission.

Qualifying Antimicrobial Days (QAD)

For ASE events, the first QAD is the first day in window period extending both 2 days before and 2 days after the patient receives a new antimicrobial (see Appendix A for list of qualifying antimicrobials). A new antimicrobial is defined as an antimicrobial not previously administered in the prior 2 calendar days. Oral and intravenous formulations of the same antimicrobial are counted as the same antimicrobial EXCEPT for vancomycin.

Subsequent QADs can be the same antimicrobial, or a different antimicrobial as long as the first dose of each antimicrobial in the sequence is new (not previously administered in the prior 2 calendar days). A new antimicrobial does not have to be started within the window period to be counted as a QAD.

Figure 2: Examples Illustrating QAD

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
Levofloxacin IV administration				X	X	X	X		
QAD				X	X	X	X	X	

This scenario includes at least 4 QAD that begin within the window period, and therefore meets criteria for presumed infection.

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
Vancomycin IV administration				X	X	X	X	X	
Piperacillin/Tazobactam IV administration	X	X	X	X	X				
QAD				1	2	3	4	5	

This scenario includes at least 4 QAD from Vancomycin that begin within the window period, and therefore meets criteria for presumed infection. Because Piperacillin/Tazobactam administration was administered prior to the window period, it does not qualify towards QADs.

There must be at least one new parenteral (intravenous or intramuscular) antimicrobial administered within the window period for the QADs to satisfy the definition.

Figure 3: Examples Illustrating QAD with Multiple Antimicrobials

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
Vancomycin IV administration				X	X	X			
Piperacillin/Tazobactam IV administration				X	X	X			
Levofloxacin Oral administration						X	X	X	
QAD				1	2	3	4	5	

In this scenario, the first 3 QADs were met by vancomycin IV administration and piperacillin/tazobactam IV administration. QAD 4 and QAD 5 were met by levofloxacin oral administration. Subsequent QADs may be oral as long as at least one QAD in the window period is parenteral. This scenario qualifies for presumed infection.

A gap of a single calendar day between administrations of the same antibiotic (oral or intravenous) count as QADs as long as the gap is not greater than 1 day.

Figure 4: Examples Illustrating QAD with Gaps in Antimicrobial Dosing

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture	X								
Window Period	Window Period								
Levofloxacin IV administration	X		X		X				
QAD	1	2	3	4	5				

Even though levofloxacin is administered every other day, because the gap between doses is only 1 day, this levofloxacin administration counts as consecutive treatment doses, for a total of at least 4 QAD that begin within the window period, and therefore meets criteria for presumed infection.

If a patient's care transitions to comfort measures only, or the patient dies, is discharged to another hospital, or discharged to hospice before 4 QADs have elapsed, then the presumed infection criteria can be met with less than 4 QADs as long as they have consecutive QADs until day of, or 1 day prior to, death or discharge. For a patient only seen in the ED or ED observation unit, a QAD is required each day until day of, or 1 day prior to, death.

QAD does not apply to BSE events since administration of antibiotics is not required to meet the definition.

Figure 5: Example Illustrating QAD with Patient Death

Hospital Day No.	1	2	3	4	5	6	7
Blood Culture				X	X		
Window Period			Window Period				
Levofloxacin IV administration					X	X	
QAD					1	2	
Death							X

Even though only 2 QADs had elapsed before patient death, this scenario counts as an event since there were consecutive QADs until the day prior to death.

Onset Date

For ASE, onset date is defined as the earliest day in the window period extending both 2 days before and 2 days after the blood culture when EITHER the blood culture, first QAD, OR organ dysfunction criteria is met. For BSE, onset date is defined as the earliest day in the window period extending both 2 days before and 2 days after the blood culture when the vasopressor infusion was started.

Figure 6: Examples Illustrating Onset Date

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
QAD				1	2	3	4	5	
Organ Dysfunction			X						
Onset Date			X						

Organ dysfunction takes place on hospital day 3, while blood cultures and QADs begin on hospital-day 4. Because onset date is the date of the first criteria met (in this case organ dysfunction), onset date is hospital day 3.

Community-Onset vs. Hospital-Onset Events

Hospital-Onset Events require onset date to be on hospital day 3 or later, counting the date of admission as hospital day 1. Community-Onset Events require onset date to be on hospital day 2 or earlier, when the date of admission counts as hospital day 1.

Figure 7: Examples Illustrating Community-Onset vs. Hospital-Onset Events

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
QAD				1	2	3	4	5	
Organ Disfunction			X						
Onset Date			X						

Because Onset Date is on hospital day 3, this example qualifies as a Hospital-Onset Event

Hospital Day No.	1	2	3	4	5	6	7	8	9
Blood Culture				X					
Window Period		Window Period							
QAD				1	2	3	4	5	
Organ Disfunction			X						
Onset Date		X							

In this similar scenario, since the Organ Dysfunction was on hospital day 2, the Onset Date is also hospital day 2, and therefore this example qualifies as a Community-Onset Event.

Baseline Organ Function

Community-Onset Events

- Creatinine baseline is the lowest value during hospitalization.
- Estimated Glomerular Filtration Rate (eGFR) baseline is the highest value during the hospitalization. If eGFR value is documented as "≥60", eGFR is treated as 60.
- Bilirubin baseline is the lowest value during hospitalization.
- Platelet baseline is the highest value during hospitalization. If all platelet counts during hospitalization are <100 cells/µL, then platelet count should not be used to satisfy organ dysfunction criteria.

Hospital-Onset Infection Events

- Creatinine baseline is the lowest value within the window period extending both 2 days before and 2 days after the date of blood culture collection.
- Estimated Glomerular Filtration Rate (eGFR) baseline is the highest value within the window period extending both 2 days before and 2 days after the date of blood culture collection. If eGFR value is documented as "≥60", eGFR is treated as 60.
- Bilirubin baseline is the lowest value within the window period extending both 2 days before and 2 days after the date of blood culture collection.
- Platelet baseline is the highest value within the window period extending both 2 days before and 2 days after the date of blood culture collection, AND must be ≥100 cells/µL. If all platelet counts within window period are <100 cells/µL, then platelet count should not be used to satisfy organ dysfunction criteria.

Repeat Infection Timeframe Considerations

The repeat infection timeframe (RIT) is a timeframe after an ASE or BSE onset date when no new events are counted, in order to minimize the chance a single, prolonged episode of ASE or BSE is counted twice. RIT therefore only applies to determination of hospital-onset events.

Note that in Rhee *et al*., only one sepsis episode was counted per hospitalization, and thus no RIT was used.

APPENDICES

Appendix A. Antimicrobials Qualifying for Adult Sepsis Event

For purposes of case finding criteria, the antimicrobials were divided into parenteral (IV) and oral (PO) antimicrobials (where antimicrobial refers to antibacterial, antifungal, or antiviral agents). All PO and IV antimicrobials were considered identical for purposes of determining whether an antimicrobial is "new" or not (meaning that a switch from IV to PO or vice versa does not count as a "new antimicrobial.") The one exception is IV vs PO Vancomycin (meaning that a switch from IV to PO vancomycin, or initiation of PO vancomycin while still on IV vancomycin, and vice versa, all count as "new" antimicrobials). Intramuscular (IM) antimicrobials were treated equivalently as IV antimicrobials. The generic names of the antimicrobials included are listed below. This list represents antibmicrobials commercially available in the U.S. in 2017, and users should update the list as new antimicrobials are introduced into clinical care.

Antimicrobial					
IV Antibacterials					
amikacin ampicillin ampicillin/ sulbactam azithromycin aztreonam cefamandole cefazolin cefepime cefmetazole cefonicid cefoperazone cefotaxime cefotetan	cefotetan cefoxitin ceftaroline ceftazidime ceftazidime/ avibactam ceftizoxime ceftolozane/ tazobactam ceftriaxone cefuroxime cephalothin cephapirin chloramphenicol	ciprofloxacin clindamycin cloxacillin colistin dalbavancin daptomycin doripenem doxycycline ertapenem gatifloxacin gentamicin mipenem kanamycin	evofloxacin lincomycin linezolid, meropenem meropenem/ vaborbactam linezolid meropenem meropenem/ vaborbactam methicillin metronidazole mezlocillin minocycline	moxifloxacin minocycline moxifloxacin nafcillin oritavancin oxacillin penicillin piperacillin piperacillin/ tazobactam polymyxin B quinupristin/ dalfopristin streptomycin	tedizolid telavancin ticarcillin ticarcillin/ clavulanate tigecycline tobramycin trimethoprim/ sulfamethoxazole vancomycin
PO Antibacterials					
amoxicillin/ clavulanate amoxicillin ampicillin azithromycin cefaclor cefadroxil cefdinir cefditoren cefixime	cefpodoxime cefprozil ceftibuten cefuroxime cephalexin cephradine cefixime cefpodoxime cefprozil ceftibuten	cefuroxime cephalexin cephradine chloramphenicol cinoxacin ciprofloxacin clarithromycin clindamycin cloxacillin dicloxacillin	doxycycline fidaxomicin fosfomycin gatifloxacin levofloxacin lincomycin linezolid metronidazole lincomycin linezolid	metronidazole minocycline moxifloxacin nitrofurantoin norfloxacin ofloxacin penicillin pivampicillin rifampin sulfadiazine	sulfadiazine-trimethoprim sulfamethoxazole sulfisoxazole tedizolid telithromycin tetracycline trimethoprim trimethoprim/ sulfamethoxazole vancomycin
IV Antifungals					
amphotericin B anidulafungin	caspofungin fluconazole	isavuconazonium itraconazole	micafungin	posaconazole	voriconazole
PO Antifungals					
fluconazole	isavuconazoniu	itraconazole	posaconazole	voriconazole	
IV Antivirals					
acyclovir	ganciclovir	cidofovir	foscarnet	peramivir	
PO Antivirals					
oseltamivir					

Appendix B: Vasopressors Included in Adult Sepsis Event Definition

Eligible vasopressors must have been administered via continuous intravenous infusion. Vasopressors administered in an operating room are excluded as these are frequently needed to counteract hypotension induced by sedative medication administration. Since the location of administration may be challenging to identify in an EHR, single bolus injections of vasopressors (a frequent method of delivering perioperative vasopressors) are generally excluded. The following medications were included:

Norepinephrine

Vasopressin

Epinephrine

Phenylephrine

Dopamine

Appendix C: Data Specifications for Direct Sepsis Determination from Electronic Health Records

The following data specifications were adopted from the study by Rhee et al. to assist hospitals with extracting, cleaning, and organizing data during the original study. Some updates have been made to reflect updates in ICD coding, streamlining, or other improvements in the surveillance definition.

Use of a common specification minimized variability in data across hospitals and facilitated analysis across multiple hospitals using a common analytic code. Use of this data specification is optional, but may be useful if your hospital wishes to compare unadjusted data to other hospitals using this toolkit.

Population:

All adult patients (≥18 years old) who were **hospitalized, or died in the Emergency Department (ED).**

The **"denominator"** of hospitalized patients includes:

1. Inpatient hospitalizations
2. "Observation" or "24 Hour" stays (we are also counting this functionally the same as "Inpatient")

Different EHR systems may have different ways of identifying hospitalizations. Possible strategies include looking for patients with inpatient encounter flags or encounters with valid DRG codes. Some datasets include encounters without clinical data (shell encounters) – for this protocol each encounter should have some minimum clinical data to be an eligible encounter (i.e. at least one laboratory procedure, at least one medication, and possibly at least one diagnosis code).

The **"numerator"** definitions for counts of septic patients per different criteria are summarized in the toolkit (page12). In terms of which patients are eligible for inclusion in the numerator please note the following:

1. Include **patients with evidence of sepsis who died in the ED**. (If a patient otherwise meets criteria for this EHR sepsis definition, i.e. IV antibiotic, blood culture, and organ dysfunction) and dies in the ED, the patient would count as a case. (These will not be included in the denominator ("per 100 hospitalizations"); however, it is expected that the number of sepsis patients who die in the ED will be extremely low.

For the purposes of generating denominator counts, use a dataset that include all inpatient encounters. For numerators (i.e. cases), you can limit the size of the patient level analytic dataset in order to decrease file size and increase efficiency. In particular, the analytic dataset for numerators can be limited to the following way:

1. **EHR Clinical Data Starting Points (use either a. or b.):**
   a. All inpatients who received a **systemic antibiotic, antifungal, or antiviral (PO or IV) for ≥1 calendar day.** If a patient was only seen in the ED and was never admitted, but received antibiotics, they should be included if they died in the ED. Please see appendix for a list of antibiotics, antifungals, and antivirals included in this definition.

OR

   b. All inpatients who had **at least one blood cultures obtained.** If a patient was only seen in the ED and was never admitted, but had a blood culture obtained, they should be included if they died in the ED.

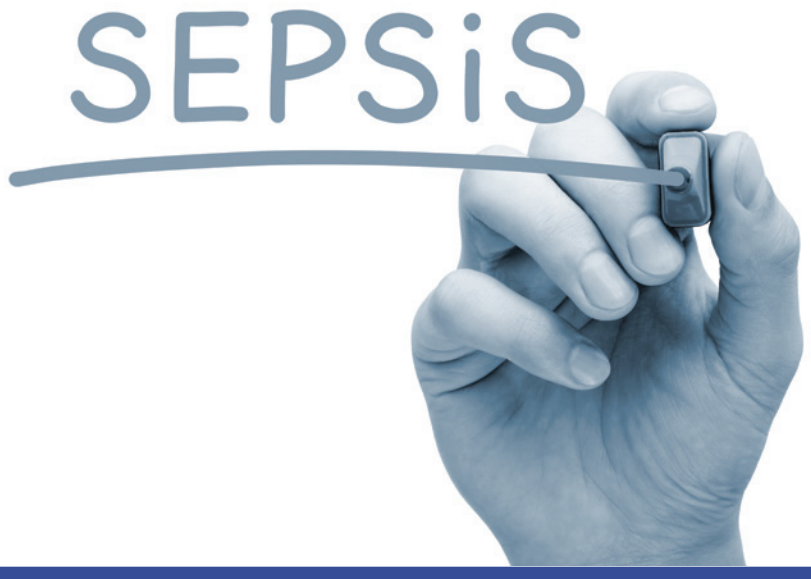
For all patients, data should be provided for their ED stay (if applicable) as well as their inpatient hospitalization. This means that some patients may have date for a "day 0" or "day 1", since day 1 will refer to the inpatient admission date.

Notes:

- For convention, label the day of admission as "day 1".
- Change all dates from actual dates to relative dates. Relative dates are defined relative to date of admission. For example, if a patient is admitted on Monday, and discharged on Wednesday, discharge day would = 3.

Overview of Tables (Files)

Table Name	Description of Contents
Basic	Demographics and basic hospital summary characteristics (i.e. admission source, LOS, discharge disposition)
Diagnosis_Codes	All diagnosis codes and DRGs
Procedure_Codes	All procedure codes
Medications	Medications (Emergency Department and Inpatient meds only)
Laboratory	Laboratory values
Blood_culture	Blood culture dates (and results, if available)
Vent	Dates of mechanical ventilation
Location	Location of patient on each hospitalization day (e.g. ER, ward, ICU)
Hospital	Summary statistics on each hospital



Appendix D: Adult Sepsis Event (ASE) Manual Case Report Template

(* = optional)

Hospital ID: _____ Event #: _____

Patient ID: _____ Social Security #: _____

Secondary ID:_____ Medicare #: _____

Patient Name, Last: _____ First: _____ Middle: _____

Gender: F M Other_____ Date of Birth: _____

Ethnicity (Specify): _____ Race (Specify): _____

Date Admitted to Hospital: _____

Sepsis Onset Date: _____ *Location at Onset Date: _____

Event Details *(must meet Criteria #1 AND #2)*

CRITERIA #1: Presumed Infection

☐ Blood culture obtained **AND**

☐ ≥ 4 Qualifying Antimicrobial Days (starting ± 2 days of blood culture day)

CRITERIA #2: Organ Dysfunction: (*Any one of the following ± 2 days of blood culture*)

☐ Initiation of a new vasopressor infusion[1]

☐ Initiation of invasive mechanical ventilation[2]

☐ Acute renal failure (*only for patients without end-stage renal disease*), defined as **EITHER**:

a. Doubling of serum creatinine compared to baseline[3], **OR**

b. Decrease in estimated glomerular filtration rate (eGFR) by ≥ 50% compared to baseline[4]

☐ Hyperbilirubinemia, defined as **BOTH**:

a. Total bilirubin ≥ 2 mg/dL, **AND**

b. Total bilirubin increase of ≥ 50% compared to baseline[5]

☐ Thrombocytopenia (*only for patients with baseline platelet count > 100 cells/μL*) defined as **BOTH**:

a. Platelet count < 100 cells/μL, AND

b. Decrease in platelet count ≥ 50% compared to baseline[6]

☐ *Serum lactate ≥ 2 mg/dL[7]

[1] Vasopressor must not have been administered in prior calendar day. Qualifying vasopressors include: norepinephrine, dopamine, epinephrine, phenylephrine, vasopressin. Single vasopressor doses or those given in an operating room do not quality.

[2] Must be > 1 calendar days after previous invasive mechanical ventilation episode

[3] Baseline creatinine defined as: 1) Community-onset: lowest value during hospitalization, 2) Hospital Onset- lowest value in ± 2 days of blood culture

[4] Baseline eGFR is defined as 1) Community-onset: highest value during hospitalization, 2) Hospital Onset- highest value in ± 2 days of blood culture

[5] Baseline total bilirubin defined as 1) Community-onset: lowest value during hospitalization, 2) Hospital Onset- lowest value in ± 2 days of blood culture

[6] If all platelet counts are < 100, then platelet count should not be used to satisfy organ dysfunction criteria. Baseline platelets defined as 1) Community-onset: highest value during hospitalization, 2) Hospital Onset- highest value in ± 2 days of blood culture AND must be ≥ 100.

[7] Optional criteria

Died: Yes ☐ No ☐ *Sepsis Contributed to Death: Yes ☐ No ☐

Discharge or Death Date:

*Discharge Location: _____

☐ Private residence ☐ Acute care hospital

☐ Long-term acute care hospital (LTACH) ☐ Long-term care/Skilled nursing facility (SNF)

☐ Homeless ☐ Incarcerated ☐ Other

*Pathogens Identified: Yes ☐ No ☐ **If Yes, option to specify on next pages*

Pathogen #	Gram-positive Organisms							
_____	**Staphylococcus coagulase-negative** (specify species if available):	**VANC** S I R N						
_____	**Enterococcus faecium**	**DAPTO** S N S N	**GENTHL**[§] S R N	**LNZ** S I R N	**VANC** S I R N			
_____	**Enterococcus faecalis**							
_____	**Enterococcus spp.** (Only those not identified to the species level)							
_____	**Staphylococcus aureus**	**CIPRO/LEVO/MOXI** S I R N	**CLIND** S I R N	**DAPTO** S N S N	**DOXY/MINO** S I R N	**ERYTH** S I R N	**GENT** S I R N	**LNZ** S R N
_____		**OX/CEFOX/METH** S I R N	**RIF** S I R N	**TETRA** S I R N	**TIG** S I R N	**TMZ** S I R N	**VAC** S I R N	

Pathogen #	Gram-negative Organisms							
_____	**Acinetobacter** (specify species) _____	**AMK** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **MERO/DORI** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N **PIP/PIPTAZ** S I R N	**CIPRO/LEVO** S I R N	**COL/PB** S I R N
_____	**Escherichia coli**	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **CIPRO/ LEVO/MOXI** S I R N **MERO/DORI** S I R N	**CEFAZ** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**† S R N **TETRA/ DOXY/ MINO** S I R N	**CEFOT/ CEFTRX** S I R N
_____	**Enterobacter** (specify species) _____	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**ATZ** S I R N **CIPRO/ LEVO/MOXI** S I R N **MERO/DORI** S I R N	**CEFAZ** S I R N **GENT** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**† S R N **TETRA/ DOXY/ MINO** S I R N	**CEFOT/ CEFTRX** S I R N
_____ _____	**Klebsiella pneumonia** **Klebsiella oxytoca**	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **CIPRO/ LEVO/MOXI** S I R N **MERO/DORI** S I R N	**CEFAZ** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**† S R N	**CEFOT/ CEFTRX** S I R N **CEFTAZ** S I R N **TETRA/ DOXY/** MINO
_____	**Pseudomonas aeruginosa**	**AMK** S I R N **IMI** S I R N	**AZT** S I R N **MERO/DORI** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N **PIP/PIPTAZ** S I R N	**CIPRO/LEVO** S I R N **TOBRA** S I R N	**COL/PB** S I R N	**GENT** S I R N

Pathogen #	Fungal Organisms							
______	Candida (specify species) ___________	AMK S I R N	AZT S I R N	AZT S I R N	CEFEP S I R N	CEFTAZ S I R N	CIPRO/LEVO S I R N	COL/PB S I R N

Pathogen #	Other Organisms								
______	Organism 1 (specify) ___________	____ Drug 1 S I R N	____ Drug 2 S I R N	____ Drug 3 S I R N	____ Drug 4 S I R N	____ Drug 5 S I R N	____ Drug 6 S I R N	____ Drug 7 S I R N	____ Drug 8 S I R N	____ Drug 9 S I R N
______	Organism 1 (specify) ___________	____ Drug 1 S I R N	____ Drug 2 S I R N	____ Drug 3 S I R N	____ Drug 4 S I R N	____ Drug 5 S I R N	____ Drug 6 S I R N	____ Drug 7 S I R N	____ Drug 8 S I R N	____ Drug 9 S I R N
______	Organism 1 (specify) ___________	____ Drug 1 S I R N	____ Drug 2 S I R N	____ Drug 3 S I R N	____ Drug 4 S I R N	____ Drug 5 S I R N	____ Drug 6 S I R N	____ Drug 7 S I R N	____ Drug 8 S I R N	____ Drug 9 S I R N

Results Codes

S = Susceptible   I = Intermediate   R = Resistant   NS = Non-susceptible   S-DD = Susceptible-dose dependent
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CEFEP = cefepime
CEFOT = cefotaxime
CEFOX= cefoxitin
CEFTAZ = ceftazidime
CEFTRX = ceftriaxone
CEFUR= cefuroxime
CETET= cefotetan
CIPRO = ciprofloxacin
CLIND = clindamycin
COL = colistin
DAPTO = daptomycin
DORI = doripenem
DOXY = doxycycline
ERTA = ertapenem
ERYTH = erythromycin
FLUCO = fluconazole
FLUCY = flucytosine
GENT = gentamicin
GENTHL = gentamicin –high level test
IMI = imipenem
ITRA = itraconazole
LEVO = levofloxacin
LNZ = linezolid
MERO = meropenem
METH = methicillin
MICA = micafungin
MINO = minocycline
MOXI = moxifloxacin
OX = oxacillin
PB = polymyxin B
PIP = piperacillin
PIPTAZ = piperacillin/tazobactam
RIF = rifampin
TETRA = tetracycline
TIG = tigecycline
TMZ = trimethoprim/sulfamethoxazole
TOBRA = tobramycin
VANC = vancomycin
VORI = voriconazole

Appendix E: Adult Bacteremia/Fungemia Shock Event (BSE) Manual Case Report Template

(* = optional)

Hospital ID: _____ Event #: _____

Patient ID: _____ Social Security #: _____

Secondary ID: _____ Medicare #: _____

Patient Name, Last: _____ First: _____ Middle: _____

Gender: F M Other_____ Date of Birth: _____

Ethnicity (Specify): _____ Race (Specify): _____

Date Admitted to Hospital: _____

Sepsis Onset Date: _____ *Location at Onset Date: _____

Event Type:

☐ Community-Onset *(onset date on hospital day 2 or earlier, when date of admission is hospital day 1)*

☐ Hospital-Onset *(onset date on hospital day 3 or later, when date of admission is hospital day 1)*

Event Details *(must meet Criteria #1 AND #2)*

CRITERIA #1: Presumed Infection

☐ Blood or Fungal culture with non-commensal pathogen identified

AND

CRITERIA #2: Organ Dysfunction: *(± 2 days of blood culture)*

☐ Initiation of a new vasopressor infusion[1]

[1] Vasopressor must not have been administered in prior calendar day.
Qualifying vasopressors include: norepinephrine, dopamine, epinephrine, phenylephrine, vasopressin.
Single vasopressor doses or those given in an operating room do not quality.

Died: Yes ☐ No ☐ *Sepsis Contributed to Death: Yes ☐ No ☐

Discharge or Death Date: _____

*Discharge Location: _____

☐ Private residence ☐ Long-term care/Skilled nursing facility (SNF)

☐ Acute care hospital ☐ Homeless

☐ Long-term acute care hospital (LTACH) ☐ Incarcerated ☐ Other

*Pathogens Identified: Yes ☐ No ☐ **If Yes, option to specify on next pages*

Pathogen #	Gram-positive Organisms							
_____	**Staphylococcus coagulase-negative** (specify species if available):	**VANC** S I R N						
_____ _____ _____	**Enterococcus faecium** **Enterococcus faecalis** **Enterococcus spp.** (Only those not identified to the species level)	**DAPTO** S N S N	**GENTHL**[§] S R N	**LNZ** S I R N	**VANC** S I R N			
_____ _____	**Staphylococcus aureus**	**CIPRO/LEVO/ MOXI** S I R N **OX/CEFOX/ METH** S I R N	**CLIND** S I R N **RIF** S I R N	**DAPTO** S N S N **TETRA** S I R N	**DOXY/ MINO** S I R N **TIG** S I R N	**ERYTH** S I R N **TMZ** S I R N	**GENT** S I R N **VAC** S I R N	**LNZ** S R N

Pathogen #	Gram-negative Organisms							
_____	**Acinetobacter** (specify species) _____	**AMK** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **MERO/DORI** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N **PIP/ PIPTAZ** S I R N	**CIPRO/LEVO** S I R N	**COL/PB** S I R N **TETRA/ DOXY/ MINO** S I R N
_____	**Escherichia coli**	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **CIPRO/ LEVO/ MOXI** S I R N **MERO/ DORI** S I R N	**CEFAZ** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**[†] S R N **TETRA/ DOXY/MINO** S I R N	**CEFOT/ CEFTRX** S I R N
_____	**Enterobacter** (specify species) _____	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**ATZ** S I R N **CIPRO/ LEVO/ MOXI** S I R N **MERO/ DORI** S I R N	**CEFAZ** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**[†] S R N **TETRA/ DOXY/MINO** S I R N	**CEFOT/ CEFTRX** S I R N
_____ _____	**Klebsiella pneumonia** **Klebsiella oxytoca**	**AMK** S I R N **CEFTAZ** S I R N **ERTA** S I R N **TIG** S I R N	**AMP** S I R N **CEFUR** S I R N **GENT** S I R N **TMZ** S I R N	**AMPSUL/ AMXCLV** S I R N **CEFOX/ CETET** S I R N **IMI** S I R N **TOBRA** S I R N	**AZT** S I R N **CIPRO/ LEVO/ MOXI** S I R N **MERO/ DORI** S I R N	**CEFAZ** S I R N **PIPTAZ** S I R N	**CEFEP** S I/S-DD R N **COL/PB**[†] S R N	**CEFOT/ CEFTRX** S I R N **CEFTAZ** S I R N **TETRA/ DOXY/** MINO
_____	**Pseudomonas aeruginosa**	**AMK** S I R N **IMI** S I R N	**AZT** S I R N **MERO/ DORI** S I R N	**CEFEP** S I R N	**CEFTAZ** S I R N **PIP/PIPTAZ** S I R N	**CIPRO/ LEVO** S I R N **TOBRA** S I R N	**COL/PB** S I R N	**GENT** S I R N

Pathogen #	Fungal Organisms									
_______	Organism 1 (specify) _______	_____ Drug 1 SIRN	_____ Drug 2 SIRN	_____ Drug 3 SIRN	_____ Drug 4 SIRN	_____ Drug 5 SIRN	_____ Drug 6 SIRN	_____ Drug 7 SIRN	_____ Drug 8 SIRN	_____ Drug 9 SIRN
_______	Organism 1 (specify) _______	_____ Drug 1 SIRN	_____ Drug 2 SIRN	_____ Drug 3 SIRN	_____ Drug 4 SIRN	_____ Drug 5 SIRN	_____ Drug 6 SIRN	_____ Drug 7 SIRN	_____ Drug 8 SIRN	_____ Drug 9 SIRN
_______	Organism 1 (specify) _______	_____ Drug 1 SIRN	_____ Drug 2 SIRN	_____ Drug 3 SIRN	_____ Drug 4 SIRN	_____ Drug 5 SIRN	_____ Drug 6 SIRN	_____ Drug 7 SIRN	_____ Drug 8 SIRN	_____ Drug 9 SIRN

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