Dialysis Event Protocol

Introduction

In 2011, more than 395,000 patients were treated with maintenance hemodialysis in the United States.[13] Hemodialysis patients require a vascular access, which can be a catheter, a graft, or an enlarged blood vessel that can be punctured to remove and replace blood. Bloodstream infections and localized infections of the vascular access site cause substantial morbidity and mortality in hemodialysis patients. Hemodialysis vascular access types, in order of increasing risk of infection, include: 1) arteriovenous fistulas created from the patient's own blood vessels; 2) arteriovenous grafts typically constructed from synthetic materials; 3) tunneled central lines; and 4) nontunneled central lines. Other access devices, such as catheter-graft hybrid devices, fall in between grafts and tunneled central lines in terms of risk. Because of frequent hospitalizations and receipt of antimicrobial drugs, hemodialysis patients are also at high risk for infection with antimicrobial-resistant bacteria. Measuring and tracking rates of infection and utilizing this information is an important part of prevention.

Infection prevention information is located at http://www.cdc.gov/dialysis/.

Dialysis Event Surveillance

Overview: Each month, facilities report the number of hemodialysis outpatients who were dialyzed in the facility on the first two working days of the month, using the *Denominators for Dialysis Event Surveillance* form. This count is called the denominator and is used to estimate the number of patient-months that there is risk of healthcare-associated infection. At the facility, throughout the entire month, any and all outpatients who receive maintenance hemodialysis at the facility are monitored for three National Healthcare Safety Network (NHSN)-defined dialysis events. These include: 1) IV antimicrobial starts; 2) positive blood cultures; and 3) evidence of local access site infection. Facilities use a *Dialysis Event Surveillance* form to report the details of each dialysis event that occurred among these patients. Dialysis events are also known as numerators. Before data can be reported, facilities must indicate that they are reporting according to protocol by saving a *Dialysis Monthly Reporting Plan.* Completion of an *Outpatient Dialysis Center Practices Survey* is also required annually.

Setting: Surveillance occurs in outpatient hemodialysis centers. These centers may be attached to or affiliated with a hospital, but should serve hemodialysis outpatients. If other patients (e.g., inpatients or peritoneal dialysis patients) are present, exclude them from Dialysis Event numerator and denominator reporting, unless they are receiving outpatient hemodialysis in lieu of their regular dialysis modality, on a temporary basis.

Population: Hemodialysis outpatients.

[13] *U.S. Renal Data System, USRDS 2013 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2013.* (http://www.usrds.org/adr.htm)

- Include transient patients
- Include peritoneal dialysis patients or transplant patients undergoing temporary, outpatient hemodialysis.

Requirements: Participating facilities are required to report data according to this protocol, using the NHSN definitions described herein, to ensure data are uniformly reported across participating facilities. Report available data to NHSN within 30 days to 60 days of the end of the month for which they were collected. If additional data become available after that period, users are expected to report the additional information retrospectively to ensure NHSN data are complete and accurate. This may involve reporting additional dialysis events and/or editing existing event records.

Event Definitions and Key Terms

Dialysis Event: Three types of dialysis events are reported by users: 1) intravenous (IV) antimicrobial start; 2) positive blood culture; and 3) pus, redness, or increased swelling at the vascular access site. The following measures are also generated from the reported data: bloodstream infection (BSI), local access site infection (LASI), access-related bloodstream infection (ARB), and vascular access infection (VAI).

21 day rule: An event reporting rule which reduces reporting of events that are likely to be related to the same patient problem. The rule is that 21 or more days must pass between two dialysis events of the *same* type for the second occurrence to be reported as a separate dialysis event. If fewer than 21 days have passed since the last reported event of the same type, the subsequent event of the same type is NOT considered a new dialysis event and therefore, should not be reported. The 21 day rule applies across calendar months. Refer to each dialysis event definition for instructions on applying the 21 day rule for each specific event type.

IV antimicrobial start: An IV antimicrobial start is defined as a single outpatient dose or the first outpatient dose of an antibiotic or antifungal course. Report **all** starts of IV antibiotics or antifungals administered in an outpatient setting, regardless of the reason for administration (i.e., include IV antimicrobial starts unrelated to vascular access problems) and regardless of the duration of treatment. Report all IV antibiotic starts, not just vancomycin. Do not report IV antiviral starts. Report outpatient starts that are continuations of inpatient antimicrobial treatment administered at a hospital or physician's office.

- 21 day rule: There must be 21 or more days from the **end** of the first IV antimicrobial course to the **beginning** of the second IV antimicrobial start for both starts to be reported as separate dialysis events, even if different antimicrobials are used. If IV antimicrobials are stopped and restarted within 21 days of each other, then the second start is NOT considered a new dialysis event and should not be reported.

- For outpatient IV antimicrobial starts that are continuations of inpatient antimicrobial treatment, consider the start day to be the first day of outpatient administration.

- Inter-facility patient transfers: If a patient at a dialysis facility has an IV antimicrobial start and then transfers to another facility (as a transient or permanent patient) where the

antimicrobial is continued, the second facility would report the IV antimicrobial start in their facility as well.

Positive blood culture: Report **all** positive blood cultures from specimens collected as an outpatient or collected within one calendar day after a hospital admission. One calendar day after hospital admission includes positive blood cultures collected on the day of or the day following admission to the hospital. Positive blood cultures meeting the criteria above should be reported regardless of whether or not a true infection is suspected or whether the infection is thought to be related to hemodialysis.

- 21 day rule: There must be 21 or more days between positive blood cultures for each positive blood culture to be considered a separate dialysis event, even if organisms are different. If positive blood cultures occur less than 21 days apart, the second positive blood culture is NOT considered a new dialysis event and should not be reported. If different organisms grow from these subsequent positive blood cultures, add the new organisms to the first positive blood culture event.

- Suspected source of the positive blood culture: indicating one of four suspected sources of a positive blood culture is required.

    - Vascular access: Choose "Vascular access" if there is objective evidence of vascular access infection and the vascular access is thought to be the source of the positive blood culture.

    - A source other than the vascular access: Choose "A source other than the vascular access" if either (a) or (b) is true:
        a) a culture from another site (e.g., infected leg wound, urine) shows the same organism found in the blood and the site is thought to be the source of the positive blood culture.
        b) there is clinical evidence of infection at another site which is thought to be the source of the positive blood culture, but the site was not sampled for culture.

    - Contamination: Choose "Contamination" if the organism isolated from the blood culture is thought by the physician, infection preventionist, or nurse manager to be a contaminant. Contamination is more likely if the organism is a common commensal and is isolated from only one of several blood cultures. Examples of common commensals include: diphtheroids [*Corynebacterium* spp., not *C. diphtheriae*]; *Bacillus* spp. [not *B. anthracis*]; *Propionibacterium* spp.; coagulase-negative staphylococci [including *S. epidermidis*]; viridans group streptococci; *Aerococcus* spp.; and *Micrococcus* spp.

    - Uncertain: Choose "Uncertain" only if there is insufficient evidence to decide among the three previous suspected source categories.

Pus, redness, or increased swelling at the vascular access site: Report each new outpatient episode where the patient has one or more symptoms of pus, greater than expected redness or greater than

expected swelling at any vascular access site, regardless of whether the patient received treatment for infection. Report pus, redness, or increased swelling of the central line site even if the central line has already been removed at the time of symptom onset. Pus is always reportable. Report redness or swelling if it is greater than expected **and, suspicious for infection**. Indicate the vascular access site(s) where the symptom(s) occurred.

- 21 day rule: There must be 21 or more days between the **onset** of the first episode and the **onset** of the second episode of pus, redness, or increased swelling at a vascular access site for both dialysis events to be considered separate. If an episode of pus, redness, or increased swelling at a vascular access site resolves and then recurs within 21 days of the first onset, the recurrence is NOT considered a new dialysis event and should not be reported.

Measure Definitions

- Bloodstream infection (BSI): Any positive blood culture.
- Access-related bloodstream infection (ARB): Positive blood culture with the suspected source reported as the vascular access or uncertain.
- Local access site infection (LASI): Pus, redness, or increased swelling of the vascular access site and access-related bloodstream infection is not present.
- Vascular access infection (VAI): Either a local access site infection or an access-related bloodstream infection.

Vascular Access Types

Consider all vascular accesses for hemodialysis and all central venous catheters that are present at the time of the event in Dialysis Event reporting, even if they are abandoned/non-functional and even if they are not used for dialysis (i.e., PICC lines and chemotherapy ports). Exception: If reporting pus, redness, or increased swelling of a central line site that occurred after the central line was removed, report that central line even if it was no longer in place at the time of the event.

- Nontunneled central line: a central venous catheter that is fixed in place at the point of insertion and travels directly from the skin entry site to a vein and terminates close to the heart or one of the great vessels, typically intended for short term use.
- Tunneled central line: a central venous catheter that travels a distance under the skin from the point of insertion before entering a vein, and terminates at or close to the heart or one of the great vessels (e.g., Hickman® or Broviac® catheters[14]).

[14] Use of trade names and commercial sources is for identification only and does not imply endorsement.

- Graft: a surgically created connection between an artery and a vein using implanted material (typically synthetic tubing) to provide a permanent vascular access for hemodialysis (i.e., Gore Acuseal®[15]).

- Fistula: a surgically created direct connection between an artery and a vein to provide vascular access for hemodialysis.

    - Buttonhole: a cannulation technique where a blunt needle (cannula) is inserted into the fistula at the same location each time using an established track. Report how a patient is primarily cannulated.

- Other access device: includes catheter-graft hybrid vascular access devices, ports, and any other vascular access devices that do not meet the above definitions. Do not use this field to report vascular accesses that are grafts, central venous catheters or fistulas. Do not use this field to report peritoneal dialysis accesses.

    - Catheter-graft hybrid: a subcutaneous surgical implant with both a catheter and a graft component that provides blood flow directly from the target artery to the heart, bypassing the patient's central venous system (e.g., HeRO® vascular access device[16]).

REPORTING INSTRUCTIONS

NHSN forms and/or the definitions in this protocol should be used to collect required data. Each form has a corresponding table of instructions.

Complete a Survey Annually: Upon enrollment and annually thereafter, complete the *Outpatient Dialysis Center Practices Survey* (CDC 57.500). After enrollment, the data for the dialysis survey should be collected and reported in February.

Complete Dialysis Monthly Reporting Plans: The *Dialysis Monthly Reporting Plan* (CDC 57.106) is used by NHSN facilities to inform CDC that they are committed to following the NHSN surveillance protocol, in its entirety, for each data type specified on the plan. These data are referred to as "in-plan." A *Dialysis Monthly Reporting Plan* must be completed before data can be entered into NHSN for that month.

To indicate the facility is reporting in accordance with this protocol, save a *Dialysis Monthly Reporting Plan* with the "DE" checkbox selected for the 'outpatient hemodialysis clinic' location, for each month of participation in Dialysis Event surveillance.

Report Denominator Data Monthly: The denominator is the count of patients by their highest risk vascular access type and is reported on the *Denominators for Dialysis Event Surveillance* form (CDC 57.503). The denominator is used to estimate the number of patient-months considered at risk for dialysis events. To report denominator data each month, report the

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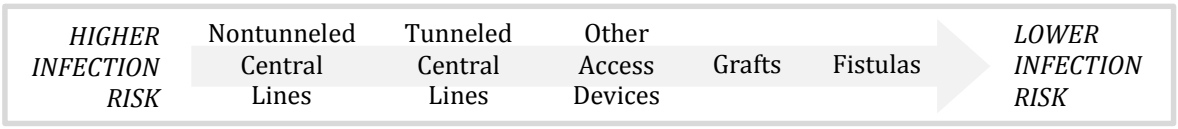
number of unique hemodialysis outpatients, by their highest risk vascular access type, who received hemodialysis at the center during the first two working days of the month.

Report all hemodialysis outpatients, including transient patients. Exclude non-hemodialysis patients (e.g., peritoneal dialysis patients) and exclude inpatients. Report denominator data every month, regardless of whether any dialysis events occur. Count each patient only once; if the patient has multiple vascular accesses, record that patient once, reporting only their vascular access with the highest risk of infection (note: this might not be the vascular access currently in use for dialysis).



See tables of instructions for an explanation of each field of the *Denominators for Dialysis Event Surveillance* form.

First two "working days": The first two "working days" of the month represent the first two days of the month when the facility is open to patients during all regularly scheduled shifts. Sundays are not considered one of the first two "working days" of the month. Reporting the number of hemodialysis outpatients dialyzed on the first two "working days" of the month provides the opportunity to realistically capture all patients expected to be dialyzed during all regularly scheduled shifts.

- For example, if a facility dialyzes patients 6 days a week, Monday through Saturday, and the first day of the month falls on a Sunday, then Monday and Tuesday would be the first two working days of the month for that facility.

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 Facility closed	2 Working day 1	3 Working day 2	4	5	6	7

- If a facility dialyzes patients 3 days a week on a Monday/Wednesday/Friday schedule, the facility should count patients on both of the first 2 working days of the month, but only count new patients on the second day.

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1 Facility closed	2 Working day 1 (count all patients)	3	4 Working day 2 (count new patients)	5	6	7

- For facilities that provide nocturnal hemodialysis, working days should include nocturnal hemodialysis patients. However, all Sunday shifts should be excluded from working days.

- Working days are shift/schedule dependent – the actual patient census is **not** a criterion for determining a working day.

- Select "No NHSN Reporting this Month" on a month's *Dialysis Monthly Reporting Plan* and **do not** complete a denominator form if:

  1. the facility was closed or non-operational for the entire month;
  2. the individual in charge of dialysis event surveillance is out of the office for a given month and no surveillance can be conducted;
  3. the facility will not be adhering to the Dialysis Event Protocol for a given month.

- If the facility was closed the entire month, do not complete a denominator form. Instead, select "No NHSN Reporting this Month" on that month's *Dialysis Monthly Reporting Plan*.

Report Numerator Data Monthly: The numerator is the number of dialysis events that occur during a defined time period. To report numerator data, complete one *Dialysis Event* form (CDC 57.502) per dialysis event among all outpatients who received hemodialysis at the facility during that month.

Any patient who receives outpatient hemodialysis treatment at your facility is monitored for dialysis events, even if they were not counted on the denominator form. Include transient patients at your facility who have a dialysis event. Complete a *Dialysis Event* form only if a hemodialysis outpatient has one or more of the following:

- IV antimicrobial start
- Positive blood culture
- Pus, greater than expected redness or greater than expected swelling at a vascular access site

See tables of instructions for an explanation of each field of the *Dialysis Event* form.

Multiple Dialysis Events: If multiple dialysis events occur together, **as a part of the same patient problem**, they should be reported on the same *Dialysis Event* form, even if the events occur in different months. For example, if a patient has a positive blood culture and begins IV antimicrobials the next day, these two events would be recorded together on one form. When reporting multiple dialysis events together, the "date of event" is always the date that the first event occurred. Refer to dialysis event definitions for the 21 day rule. Do not report unrelated dialysis events on the same form.

Event Type	Date of Event Criterion
IV antimicrobial start	Date of first outpatient dose of an antimicrobial course
Positive blood culture	Date of specimen collection
Pus, redness or increased swelling at vascular access site	Date of onset
Combination	Earliest date of the three types

Report No Events: Each dialysis event type needs to be accounted for every month. Either the event type is reported on one or more *Dialysis Event* forms, or the "report no events" box for that event type must be checked on the *Denominators for Dialysis Event Surveillance* form to confirm no events of that type occurred during the month.

Three options for "report no events" are now available on the *Denominators for Dialysis Event Surveillance* form:

- No IV antimicrobial start events
- No Positive blood culture events
- No Pus, redness or increased swelling at vascular access site events

During months when dialysis events are not reported for a specific event type or combination of event types, the three "report no events" fields will become accessible on the first day of the proceeding month. For example, the "report no events" check boxes on the March 2014 denominator form will remain greyed out until April 1, 2014.

Data Analyses

Dialysis event rates are stratified by vascular access type and expressed per 100 patient-months. Rates are calculated by dividing the number of events by the number of patient-months and multiplying the result by 100. CDC calculates aggregate pooled mean rates for each event type by combining rates from all participating facilities. Facilities can compare their rates with the aggregate rates using NHSN analysis rate table or run chart output options. Facilities are strongly encouraged to analyze the data they report and provide regular feedback to staff about patient outcome event rates.

$$rate = \frac{Dialysis\ Events\ (numerator)}{Patient\text{-}Months\ (denominator)} \times 100$$

Reporting Resources

Data collection and reporting resources are available on the NHSN Dialysis Event website: http://www.cdc.gov/nhsn/dialysis/dialysis-event.html.

Please direct questions to the NHSN Helpdesk at nhsn@cdc.gov and include "Dialysis" in the subject line.

Instructions for the Dialysis Event Surveillance Form

(CDC 57.502)

Complete a dialysis event form for IV antimicrobial starts, positive blood cultures, and onsets of pus, redness or increased swelling at vascular access sites, according to definitions and reporting instructions in the Dialysis Event Protocol.

* = required field when reporting in-plan
^ = conditionally required field

Patient Data	
Data Fields	**Instructions for Completion**
Facility ID #	NHSN-assigned facility ID will auto-populate in this field.
Event ID #	Event ID# will auto-populate in this field.
*Patient ID #	**Required**. Enter the alphanumeric patient ID number. This is the patient identifier assigned by the healthcare facility and may consist of any combination of numbers and/or letters.
Social Security #	Optional. Enter the 9-digit numeric patient Social Security Number.
Secondary ID #	Optional. Enter the alphanumeric ID number assigned by the facility.
Medicare #	Optional. Enter the patient's Medicare number.
Patient Name	Optional. Enter last, first and middle name of the patient.
*Gender	**Required**. Select "Female," "Male," or "Other" to indicate the patient's gender.
*Date of Birth	**Required**. Enter the patient's date of birth (format: MM/DD/YYYY).
Ethnicity (specify)	Optional. Specify whether the patient is "Hispanic or Latino," or "Not Hispanic or Not Latino."
Race (specify)	Optional. Specify all of the following that identify the patient's race: American Indian/Alaska Native; Asian; Black or African American; Native Hawaiian/Other Pacific Islander; and White.

General Event Information	
*Event Type	**Required**. Select "DE – Dialysis Event".
*Date of Event	**Required**. Date (format: MM/DD/YYYY) depends on event type: • For IV antimicrobial starts, enter the date the outpatient IV antimicrobial administration was started. • For positive blood cultures, enter the date the blood specimen was collected. • For pus, redness, or increased swelling at the vascular access site, enter the onset date. • If reporting more than one type of dialysis event, using the above criteria select the earliest event date.
*Location	**Required**. Enter the location code of the "outpatient hemodialysis clinic" that is collecting Dialysis Event information.

Was the patient admitted/readmitted to the dialysis facility on this dialysis event date?	**Required.** Select 'yes' if the dialysis event occurred on the same date the patient was admitted or readmitted to your facility (e.g., upon admission or immediately following a hospital discharge).
*Transient Patient	**Required.** Select "Yes" if this patient was temporarily admitted for treatment at your facility for a short time at the time of the event (fewer than 30 days or 13 treatments) due to vacation, emergency, or other short-term displacement. Select "No" if this patient is part of your regular patient census.

Risk Factors	
Data Fields	**Instructions for Completion**
*Vascular accesses	**Required**. Select all vascular accesses that the patient had present at the time of the dialysis event, even if they are not used for dialysis and even if they are abandoned/non-functional.
Fistula ^Buttonhole	Indicate if the patient has a surgically-created direct connection between an artery and a vein for hemodialysis. **Conditionally required** for patients with fistulas. Select "yes" if the patient's fistula is primarily accessed via buttonhole cannulation technique (i.e., a procedure in which a blunt needle (cannula) is inserted into the fistula at the same location each time using an established track). Select "no" if the patient's fistula is primarily accessed by conventional or rope ladder method.
Graft	Indicate if the patient has a connection between an artery and a vein created with surgically implanted material (typically synthetic tubing) for hemodialysis.
Tunneled central line	Indicate if the patient has a central venous catheter that travels a distance under the skin from the point of insertion before entering a vein, and terminates at or close to the heart or one of the great vessels.
Nontunneled central line	Indicate if the patient has a central venous catheter that is fixed in place at the point of insertion and travels directly from the skin entry site to a vein and terminates close to the heart or one of the great vessels.
Other vascular access device	Indicate if the patient has a hybrid vascular access device (e.g., HeRO® vascular access device[14]), port, or any other vascular access device that does not meet the above definitions. Do not use this field to report vascular accesses that are grafts, central venous catheters or fistulas. Do not use this field to report peritoneal dialysis accesses.
Other vascular access device - specify	Optional. Specify the type of "other vascular access."

^Is this a catheter-graft hybrid?	**Conditionally required** for patients with an 'other access device.' Select 'yes' if the patient has a catheter-graft hybrid access device: a subcutaneous surgical implant with both a catheter and a graft component that provides blood flow directly from the target artery to the heart, bypassing the patient's central venous system (e.g., HeRO® vascular access device[5]). Select 'no' if the patient's other access device is not a catheter-graft hybrid.
*Access Placement Date	**Required**. For each access type present, indicate the date (MM/YYYY) the access was placed or check the box if placement date is unknown. If the patient has more than one access of the same type (e.g., two grafts), indicate the access placement date of the access in use, or most recently in use, at the time of the event.
Vascular access comment	Optional. Use this field to add any additional information about the patient's vascular access(es) at the time of the event that would help you to interpret your surveillance data, such as recent surgical revisions. CDC typically does not analyze these data.
Is this patient's dialyzer reused?	Optional. Select "yes" if this patient's dialyzer is reprocessed for reuse. Select "no" if a new dialyzer for each hemodialysis treatment.

Event Details	
Specify Dialysis Event	**Required**. Select all that apply:
IV antimicrobial start	Report **any** starts of intravenous (IV) antibiotics or antifungals administered in an outpatient setting, regardless of the reason for administration and regardless of the duration of treatment. Do **not** report IV antiviral starts. Report outpatient starts that are continuations of inpatient antimicrobial treatment. A start is defined as a single outpatient dose or first outpatient dose of a course. 21 day rule: There must be 21 or more days from the **end** of one IV antimicrobial course to the **beginning** of a second IV antimicrobial start for both starts to be reported as separate dialysis events, even if different antimicrobials are used. If IV antimicrobials are stopped and restarted within 21 days of each other, then the second IV antimicrobial start is NOT considered a new dialysis event and should not be reported. For outpatient IV antimicrobial starts that are continuations of inpatient antimicrobial treatment, consider the start day to be the first day of outpatient administration.
^Was vancomycin the antimicrobial used for this start? Was this a new outpatient start or a continuation of an inpatient course?	**Conditionally required** for IV antimicrobial start dialysis events. Indicate whether IV vancomycin was started by selecting "Yes" or "No." If multiple IV antimicrobials were used, select "Yes" if one of them was vancomycin. Optional. Select "New antimicrobial start" if the first dose in a course of treatment was administered in the dialysis facility. Select "Continuation of antimicrobial" if the patient is continuing a course of IV antimicrobials that were initiated in an inpatient setting.

[5] Use of trade names and commercial sources is for identification only and does not imply endorsement.

Positive blood culture	Report **any** positive blood cultures from specimens collected as an outpatient or collected within one calendar day after a hospital admission. Positive blood cultures meeting this definition should be reported regardless of whether or not the patient was determined to have a bloodstream infection. 21 day rule: There must be 21 or more days between positive blood cultures for each positive blood culture to be considered a separate dialysis event, even if organisms are different. If positive blood cultures occur less than 21 days apart, the second positive blood culture is NOT considered a new dialysis event and therefore, should not be reported. However, if different organisms grow from these subsequent positive blood cultures, add the new organisms to the first dialysis event.
^Specify pathogen(s) and antimicrobial susceptibilities	**Conditionally required** for a positive blood culture. See the following section for additional instructions.

Pathogens and Antimicrobial Susceptibilities	
Data Fields	**Instructions for Completion**
^Pathogens	**Conditionally required.** Select each organism identified in the positive blood culture from the pathogen dropdown menu (up to three organisms can be selected). Microorganisms do not have to be listed in a specific order when positive blood culture events are reported. The species should be entered once it becomes available on the final lab report. Do not report preliminary results (such as Gram stain). If the species is not indicated on the final lab report or is not listed in the NHSN pathogen dropdown list, then select the "spp" choice for the genus (e.g., *Bacillus natto* is not on the list so it would be reported as *Bacillus* spp.). Note that the pathogen dropdown menu opens to display an abbreviated list of the most common pathogens. If the microorganism cannot be found in the NHSN pathogen dropdown list, select "*All Pathogens"* at the top of the menu to search through a more complete list of pathogens.
^Antimicrobial agent and susceptibility results	**Conditionally required** if ≥1 pathogen is identified. • For organisms shown on the back of the event form, susceptibility results are required only for the antimicrobial agents listed. • For organisms that are not listed on the back of an event form, susceptibility results are optional. • (Optional) Report up to a maximum of 20 additional antimicrobials and susceptibility results, per microorganism.
	Select the organism's susceptibility result code for each antimicrobial agent.

Antimicrobial agent and susceptibility results (continued)	S – Susceptible I – Intermediate R – Resistant N – Not Tested NS- Non-susceptible S-DD- Susceptible-dose dependent	For gentamicin and streptomycin high level tests only, use: S – Susceptible/Synergistic R – Resistant/Not Synergistic

Antimicrobial Drug Code Table

AMK = amikacin
AMP = ampicillin
AMPSUL = ampicillin/sulbactam
AMXCLV = amoxicillin/clavulanic acid
ANID = anidulafungin
AZT = aztreonam
CASPO = caspofungin
CEFAZ= cefazolin
CEFEP = cefepime
CEFOT = cefotaxime
CEFOX= cefoxitin
CEFTAZ = ceftazidime
CEFTRX = ceftriaxone
CEFUR= cefuroxime
CTET= cefotetan
CHLOR= chloramphenicol
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
NITRO = nitrofurantoin
OX = oxacillin
PB = polymyxin B
PIP = piperacillin
PIPTAZ = piperacillin/tazobactam
QUIDAL = quinupristin/dalfopristin
RIF = rifampin
STREPHL = streptomycin-high level test
TETRA = tetracycline
TICLAV = ticarcillin/clavulanic acid
TIG = tigecycline
TMZ = trimethoprim/sulfamethoxazole
TOBRA = tobramycin
VANC = vancomycin
VORI = voriconazole

Event Details (continued)	
Data Fields	**Instructions for Completion**

^Suspected source of positive blood culture	**Conditionally required** for positive blood culture dialysis events. Select one suspected source of the positive blood culture: • Vascular access: Choose "Vascular access" if there is objective evidence of vascular access infection and the vascular access is thought to be the source of the positive blood culture. • A source other than the vascular access: Choose "A source other than the vascular access" if either (a) or (b) is true: a) a culture from another site (e.g., infected leg wound) shows the same organism found in the blood and is thought to be the source of the positive blood culture. b) there is clinical evidence of infection at another site which is thought to be the source of the positive blood culture, but the site was not sampled for culture. • Contamination: Choose "Contamination" if the organism isolated from the blood culture is thought by the physician, infection preventionist, or nurse manager to be a contaminant. Contamination is more likely if the organism is a common commensal and is isolated from only one of several blood cultures. Examples of some common commensals include: diphtheroids [*Corynebacterium* spp., not C. diphtheriae], *Bacillus* spp. [not *B. anthracis*], *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridians group streptococci, *Aerococcus* spp., and *Micrococcus* spp. • Uncertain: Choose "Uncertain" only if there is insufficient evidence to decide among the three previous categories.
Where was the positive blood culture collected?	Optional. Indicate the patient's location when the blood culture was drawn.
Pus, redness, or increased swelling at the vascular access site	Report each new outpatient episode where the patient has one or more symptoms of pus, greater than expected redness or greater than expected swelling at any vascular access site. Pus is always reportable. Cellulitis at the vascular access site is also reportable as a pus, redness, or increased swelling event. Report redness or swelling if it is greater than expected and suspicious for infection. 21 day rule: 21 or more days must pass between the **onset** of one episode and the **onset** of a second episode of pus, redness, or increased swelling at a vascular access site to be considered separate dialysis events. If an episode of pus, redness, or increased swelling at a vascular access site resolves and then recurs within 21 days of the first onset, the recurrence is NOT considered a new dialysis event and therefore, should not be reported.
^Check the access site(s) with pus, redness, or increased swelling:	**Conditionally required** if there is pus, redness, or increased swelling at the vascular access site. Select vascular access site(s) with these findings. Note, the corresponding access should be selected under "Risk Factors."

	Exception: if reporting pus, redness, or increased swelling of a central line site occurred after the central line was removed, report that central line, even if it was no longer in place at the time of the event.

Event Details (continued)	
Data Fields	**Instructions for Completion**
*Specify Problem(s)	**Required.** Indicate all problems present at the time of the event.
Fever	Select if a fever of ≥37.8°C (100°F) (tested orally) is present.
Chills or rigors	Select if chills or rigors are present.
Drop in Blood Pressure	Select if abnormal drop in blood pressure occurs.
Wound with pus or increased redness	Select if a wound that is unrelated to the vascular access site has pus or increased redness.
Cellulitis	Select if cellulitis is present at a site other than the vascular access and without open wound.
Pneumonia or respiratory infection	Select if pneumonia or another respiratory tract infection is present.
Urinary Tract Infection	Select if a urinary tract infection is present.
Other Problem	Select if another problem related to the dialysis event (IV antimicrobial start; positive blood culture; and/or pus, redness, or increased swelling at vascular access site) is present. Specify the problem.
None	Select "none" if there are no related problems.
*Outcome(s)	**Required**.
Loss of Vascular Access	Select "Yes" if the patient had a complete loss of the vascular access (i.e., the vascular access became unusable and/or had to be removed) and this outcome was either definitely or possibly related to the event(s) or problem(s). Select "No" if this outcome did not occur, or if loss of vascular access occurred, but it was definitely **not** related to the event(s) or problem(s). Also select "No" if there was only a partial loss of the vascular access (i.e., the access needs revision or intervention to gain patency). Check "Unknown" if uncertain about whether or not loss of the vascular access occurred (e.g., patient was lost to follow-up).
Hospitalization	Select "Yes" if the patient was admitted to a hospital and this outcome was either definitely or possibly related to the event(s) or problem(s).

	Select "No" if this outcome did not occur, or the patient was hospitalized, but it was definitely **not** related to the event(s) or problem(s). Also select "No" if the patient only visited the emergency department without admission and/or was placed under hospital observation without admission. Select "Unknown" if uncertain about whether or not the patient was hospitalized (e.g., patient was lost to follow-up).
Death	Select "Yes" if the patient died and this outcome was either definitely or possibly related to the event(s) or problem(s). Select "Yes" if cause of death is unknown. Select "No" if this outcome did not occur, or if the patient did die, but it was definitely **not** related to the event(s) or problem(s). Select "Unknown" if uncertain about whether or not the patient died (e.g., patient was lost to follow-up).

Custom Fields	
Custom fields	Optional. Add up to 50 alphanumeric, numeric, and/or date fields to this form for local use. **NOTE:** Each custom field must be added in advance. Within NHSN, select "Facility," then "Customize Forms," and then follow on-screen instructions. The Form Type is "CDC-Defined – DIAL – Event" and form is "DE – Dialysis Event."

Comments	
Comments	Optional. Use this field to add any additional information about the dialysis event that would help you to interpret your surveillance data. CDC typically does not analyze these data.

Instructions for the Denominators for Dialysis Event Surveillance Form

(CDC 57.503)

** Indicates a required field when reporting in-plan.*

Data Field	Instructions for Data Collection
Facility ID #	The NHSN-assigned facility ID will auto-populate in this field.
*Location code	**Required**. Select the location code for the outpatient hemodialysis clinic location from which you will collect data about dialysis events.
*Month	**Required**. Select the month during which the data were collected for this location from the dropdown menu.
*Year	**Required**. Select the 4-digit year during which the data were collected for this location from the dropdown menu.
*Number of Maintenance Hemodialysis Patients by Vascular Access Type	**Required**. For each type of vascular access listed, enter the number of outpatients who received in-center hemodialysis at this location on the first two working days of the month, including transient patients. Consider all vascular accesses the patient has, even if they are not used for dialysis and even if they are abandoned and/or are non-functional. A patient must be physically present for in-center hemodialysis on one of these days to be counted on this form (exclude patients who are hospitalized). Record each patient **only once**. If a patient has more than one vascular access, record the access type with highest risk for infection, using the following hierarchy: **Lowest Risk** Fistula Graft Other vascular access device (e.g., catheter-graft hybrid access) Tunneled Central Line Nontunneled Central Line **Highest Risk** For example, if a patient has a fistula and a tunneled central line, count this patient under the category of tunneled central line. If the patient has a fistula and a "jump graft" record the patient as having a graft. If the patient has only a catheter-graft hybrid or a port, record as "other access device".
Number of these Fistula Patients who undergo Buttonhole Cannulation	Conditionally required. Out of the fistula patients counted above, count the number of patients who are primarily cannulated with buttonhole cannulation technique, where a blunt needle (cannula) is inserted into the fistula at the same location each time using an established track.
*Total patients	**Required**. The sum of all patients listed above will auto-populate in this field.
Number of these patients for whom dialyzers are reused.	**Optional**. Of the "Total patients" counted above, count the number of patients whose dialyzers are reprocessed for reused. If dialyzers are not reused, enter 0.
Custom fields	Optional. Add up to 50 alphanumeric, numeric, and/or date fields to this form for local use.

Data Field	Instructions for Data Collection
	NOTE: Each custom field must be added in advance. Within NHSN, select "Facility," then "Customize Forms," and then follow on-screen instructions. The Form Type is "CDC-Defined – DIAL – Summary Data" and form is "DIAL – Denominators for Dialysis Event Surveillance form."