Transcript for:

National Healthcare Safety Network

Surveillance System

Dialysis Event Surveillance Protocol

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Welcome to the National Healthcare Safety Network Dialysis Event Protocol Training. This presentation will provide you with the information required to start the dialysis event data collection and reporting process.

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The target audience for this training is everyone who is collecting or reporting NHSN dialysis event data. Everyone involved in data collection at the facility should complete this training and read the Dialysis Event Protocol, even if they don't have access to NHSN for data entry. This is important for data quality. This training is also for any NHSN group users who want to understand dialysis event reporting.

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In this presentation we will:

Review the purpose of surveillance.

Describe the details of the Dialysis Event Protocol.

Describe the reporting requirements, including: the survey, Monthly Reporting Plan, Denominators for Outpatient Dialysis form, and Dialysis Event form.

Define the three Dialysis Event types.

We'll also show how the protocol is applied to reporting using a few examples.

Finally, we'll offer some considerations for implementing a data collection and reporting process.

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NHSN Surveillance System

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Let's begin with a quick review of NHSN. NHSN stands for the "National Healthcare Safety Network". It is a secure, internet-based surveillance system. What do we mean by "surveillance"? Public Health

Surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding health-related events for use in public health action to reduce morbidity and mortality and improve health. There is a process for getting started in NHSN. [ANIMATION] The first step is to complete required training. Training requirements depend on your role. Training requirements are listed on the Dialysis Event homepage. Once training is complete, the next step is to enroll the facility. The person who enrolls a facility in NHSN is called the NHSN Facility Administrator. Once the facility is enrolled and has been activated, the NHSN Facility Administrator will need to complete a few brief set-up steps before data collection and reporting. Data collection and reporting is the focus of this presentation, but training for these other NHSN topics are available on the Dialysis Event Homepage.

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Why is dialysis event surveillance important? There were approximately 37-thousand access-related bloodstream infections among hemodialysis patients with central lines in 2008. This shows that data are needed to evaluate the effectiveness of practices and interventions. Surveillance requires the use of specific instructions and definitions so that data are collected uniformly. This allows dialysis facilities to make meaningful comparisons (both between facilities and within their own facility over time), evaluate interventions, identify problems, and engage staff by providing consistent feedback.

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In addition to being an important source of data, engaging in surveillance can prompt better practices without additional interventions. For example, a dialysis unit in London implemented CDC's dialysis surveillance system and then described their experience over 18 months. Without any other intervention, tracking rates and feeding back the data to staff resulted in reductions in access-related bloodstream infections and antibiotic usage. The study authors wrote that "Surveillance raised awareness and provided a cornerstone for improved infection control and line care involving all staff of the dialysis unit."

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Dialysis Event Protocol

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The Dialysis Event Protocol is a document that provides instructions for reporting in NHSN. It describes the surveillance population, key terms, and the required data reporting elements and reporting frequency. It should be the primary reference document for reporting. All users must read the Protocol to become familiar with instructions, definitions and procedures.

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The Protocol describes the four Dialysis Event Reporting Requirements, which are completed at different intervals.

First, there is the Outpatient Dialysis Center Practices Survey, completed annually

Second, is the Monthly Reporting Plan.

Next is the Denominators for Outpatient Dialysis, Census Form, also completed monthly

And finally, the Dialysis Event form, which is completed as required

[ANIMATION] Let's start by reviewing the survey.

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The survey is completed during enrollment and every January thereafter. It should be completed by someone at the facility who is familiar with the facility's practices, but can be entered into NHSN by any user with administrative rights. The Outpatient Dialysis Center Practices Survey includes questions about general facility information, patient and staff census, vaccines, hepatitis B and C, policies and practices, as well as vascular accesses. Some questions are specific to the staff and patients who were present during the first week of January, so it is recommended to complete the survey in January to simplify data collection. After the initial survey is completed during enrollment, subsequent surveys are due by April 1 each year.

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[ANIMATION] Next, let's review the second reporting requirement, the Monthly Reporting Plan.

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The purpose of the Monthly Reporting Plan is to indicate what Patient Safety Component surveillance your facility intends to do each month, as described by NHSN protocol. A Monthly Reporting Plan must be completed before data can be reported to NHSN for that month. To indicate that your facility is

participating in Dialysis Event surveillance, under the Device-Associated Module section, you'll check the Dialysis Event box, which is abbreviated "DE". Checking this box tells CDC that your facility is following the protocol for all Dialysis Event numerator and denominator data reported that month. Up to one year of Monthly Reporting Plans can be entered and saved in advance.

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Here is a screenshot of the Monthly Reporting Plan. [ANIMATION] To create a reporting plan, from the blue navigation bar, select "Reporting Plan". [ANIMATION] And then click "Add" to get to this "Add Monthly Reporting Plan" screen. Here, [ANIMATION] select the month [ANIMATION] and year. If a plan has not yet been saved for this month and year, [ANIMATION] then you will see a "No Data Found" confirmation message at the top of the screen. If a Monthly Reporting Plan was already saved, it will open in "View" mode instead. Under Device-Associated Module, [ANIMATION] select your "outpatient hemodialysis clinic" location from the drop down menu, [ANIMATION] and "DE" will be checked automatically, indicating your facility will be doing "Dialysis Event" surveillance. [ANIMATION] The rest of the form is used by other types of healthcare facilities, so you can leave those sections blank, and scroll to the bottom of the page. [ANIMATION] Once the form is completed, click the Save button. [ANIMATION] If your facility is not doing any surveillance that month, [ANIMATION] you would instead select the "No NHSN Patient Safety Module Followed this Month" before saving the plan. Only select this box if your facility is not participating in any type of surveillance that month.

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[ANIMATION] Now that we've covered the Monthly Reporting Plan, let's review the third reporting requirement, the Denominators for Outpatient Dialysis form.

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NHSN data are stratified by the types of accesses that patients have, because the risk of infection varies by vascular access type. The lowest risk for infection are fistulas, and then grafts. "Other access devices" are in the middle of the infection risk spectrum. Following that are tunneled central lines, and the highest infection risk vascular accesses are nontunneled central lines.

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We use 5 vascular access categories, each with their own definition.

[ANIMATION] A “fistula” is defined as a surgically created, direct connection between an artery and a vein to provide vascular access.
[ANIMATION] Next is “graft”, which is a surgically created connection between an artery and a vein using implanted typically synthetic tubing for the purpose of providing a vascular access. This category also includes bovine and cadaveric grafts.
[ANIMATION] Then there are “Tunneled Central Lines”, which are sometimes also referred to as “Permanent Central Lines”. These are defined as central venous catheters that travel a distance under the skin from the point of insertion before terminating at or close to the heart or one of the great vessels. Examples include Hickman® and Broviac® catheters.
[ANIMATION] There are also “Nontunneled Central Lines”, which are sometimes also referred to as “Temporary Central Lines”. These are defined as central venous catheters that travel 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 vascular access.
[ANIMATION] The last category is “Other Access Device”. It includes hybrid access devices, such as the “HeRO®” vascular access device; ports; and any other vascular access devices that do not meet the above definitions.

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To complete the Denominators for Outpatient Dialysis form, report all maintenance hemodialysis outpatients, including transients, who are treated at your facility on the first two working days of the month, separated by vascular access type. [ANIMATION] Count each patient only once. If the patient has more than one vascular access, count that patient under their access with the highest infection risk. So for example, if a patient has both a tunneled central line as well as a fistula, they would be counted under the category of tunneled central line. If the patient is present on both working days, because they have a make-up appointment for example, do not count them twice. Consider ALL the vascular accesses present, not just those being used for dialysis. Complete this form and report it to NHSN once per month.

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Here is what the paper copy of the Denominators for Outpatient Dialysis Census form looks like. Notice there is a place to indicate the Month and year. And below that, there are the five vascular access type

categories: fistula, graft, tunneled central line, nontunneled central line, and other access devices. Once this paper version is filled out, access NHSN to report the information.

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When you are logged into NHSN, this is what the same form looks like. [ANIMATION] The denominator is reported under the “Summary Data” option on the navigation bar.

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[ANIMATION] Finally, we’ll review reporting of Dialysis Events.

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For dialysis event reporting, monitor all maintenance hemodialysis outpatients who are treated at your facility for the three reportable dialysis event types, which include:
IV antimicrobial starts;
positive blood cultures;
And pus, redness or increased swelling at the vascular access site.
[ANIMATION] Any patient who receives maintenance hemodialysis treatment at your facility is monitored for dialysis events, even if they were not counted on the denominator form that month. Also, include transient patients who have a dialysis event while being treated by your facility.

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Here is what the paper Dialysis Event form looks like. It is broken into sections. [ANIMATION] The first part, is the patient demographics section. There are only 3 required fields: a unique identifier, such as a medical record number, and the patient’s date of birth and gender. Completing additional fields, like patient name, may be useful when searching for or identifying a record to review an event or to add more information about an event.
[ANIMATION] The second section is Patient Risk Factors. Here, specify all the vascular accesses that the patient has at the time of the dialysis event.
[ANIMATION] The third section is Other Patient Information. This is a new section on the form to mark if the patient is transient.
[ANIMATION] The fourth section is where you indicate what dialysis event type occurred and the details.

[ANIMATION] The fifth section is where you indicate whether the patient experienced any problems in relation to the event.
[ANIMATION] Finally, the last section is outcomes of either the dialysis event or the problems that were associated with the dialysis event. [ANIMATION]

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This is what the same form looks like in NHSN. [ANIMATION] The event is added by clicking on "Event" then "Add" on the navigation bar.

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When you complete a dialysis event form,
[ANIMATION]
it requests the date the dialysis event occurred.
This date depends on what you are reporting.
[ANIMATION]
For an IV antimicrobial start, it is the date of the first outpatient dose of an antimicrobial course.
For a positive blood culture, it is the date the blood specimen was collected.
For pus, redness, or increased swelling at the vascular access site, it's the date of onset.
If you are reporting more than one of these events on a single form, select the earliest of the three dates.

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If you have completed surveillance for a month and no dialysis events of any kind occurred, return to the Denominators for Outpatient Dialysis form for that month and select:
"Report No Events"
This indicates to NHSN that the number of dialysis events is equal to zero for the month. Failure to report does not equal no events detected. You must report that there were no events.

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Report to NHSN within 30 days from the end of the month that the data were collected. [ANIMATION]
For example, if you were collecting data in March, you would complete the Denominators for Outpatient Dialysis form for March 1st and 2nd [ANIMATION]. Then, through the entire month of March

[ANIMATION], monitor all patients receiving maintenance hemodialysis in your facility for dialysis events. [ANIMATION] Report March's Denominators for Outpatient Dialysis and all Dialysis Events, if any, before April 30.

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Dialysis Event Definitions

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Let's review the exact definitions of each of the three dialysis events. First are IV antimicrobial starts. For these, report all outpatient intravenous antibiotic and antifungal starts regardless of the reason for treatment and regardless of the duration of the treatment. [ANIMATION] Include starts unrelated to vascular access problems. Report outpatient starts that are continuations of inpatient treatment. Report all IV antibiotic starts, not just vancomycin. Do not report IV antiviral starts.

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The next dialysis event type is positive blood culture. For these, Report **all** positive blood cultures collected as an outpatient or collected within 1 calendar day after a hospital admission, [ANIMATION] regardless of whether or not the patient received treatment and even if the infection is not related to dialysis.

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To ensure you are reporting all positive blood cultures, you may need to follow-up on certain hospitalizations. [ANIMATION] So for example, a maintenance hemodialysis outpatient is hospitalized [ANIMATION] for five days and [ANIMATION] then is discharged. A positive blood culture should be reported if it is collected as an outpatient [ANIMATION] or collected within 1 calendar day after a hospital admission [ANIMATION]. The 5^{th} is the day of admission [ANIMATION] so, the 6^{th} is one day after a hospital admission [ANIMATION]. So if a positive blood culture occurred on these two days, it would also be reportable [ANIMATION]. So you would report a positive blood culture collected as an outpatient or within 1 calendar day of hospital admission [ANIMATION]. The 7^{th} is 2 calendar days after the admission [ANIMATION], so beginning this day, the positive blood cultures that occur during the rest of this hospitalization are not reported by the dialysis facility. [ANIMATION]

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When you report a positive blood culture, you'll need to indicate 1 of four suspected sources. [ANIMATION] Choose the "Vascular access" if there is objective evidence of vascular access infection and it's thought to be the source. [ANIMATION] Choose "A source other than the vascular access" if:
A culture from another site has the same organism as in the blood,
OR there is clinical evidence of infection at another site, but that site is not cultured,
AND, that other site is thought to be the source.
[ANIMATION] Choose "Contamination" if the organism is thought by the physician, Infection Preventionist, or nurse manager to be a contaminant. Please refer to the Table of Instructions for guidance. [ANIMATION] Choose "Uncertain" only if there is insufficient evidence to decide among the 3 previous categories

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For each positive blood culture, report up to 3 microorganisms. If multiple microorganisms are identified, enter the pathogen judged to be the most important cause of infection. Often the order will be indicated on the laboratory report. Do not report the results of cultures from sites other than the blood. For each microorganism, NHSN will prompt you with a list of drugs for which the microorganism was tested for susceptibility. On the form indicate whether the microorganism is susceptible, resistant, or intermediate to each specified drug. If the drug was not tested, choose "N" to indicate not tested. An explanation of the antibiotic abbreviations is available on the bottom of the third page of the Dialysis Event form as well as in the Table of Instructions. We suggest attaching the microbiology lab reports to the paper event form to use as a reference while reporting.

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The last Dialysis Event type is pus, increased redness, or increased swelling at the vascular access site. Report each new outpatient episode of one or more symptoms of pus, greater than expected redness, or greater than expected swelling at a vascular access site [ANIMATION] even if the patient does not receive treatment. Always report pus. Report redness or swelling if they are more than expected and suspicious for infection.

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Additionally, one Dialysis Event form may include a combination of IV antimicrobial start; positive blood culture; and pus, redness or increased swelling at the vascular access site. For example, if a positive blood culture is the reason that a patient is treated with IV antimicrobials, this is part of the same group of events and they are reported together.

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There must be 21 or more days between dialysis events of the same type. The purpose of the rule is to reduce multiple reporting of a single event/problem. For IV antimicrobial starts, there must be 21 or more days from the END of the first start to the BEGINNING of the next start for the second start to be reported separately. For positive blood cultures, there must be 21 or more days between specimen collection dates for subsequent positive blood cultures to be reported separately. For pus, redness, or increased swelling there must be 21 or more days from the ONSET of the first occurrence to the ONSET of a second occurrence in order for the second occurrence to be reported separately. If a second event of the same type DOES occur within 21 days, you would not report that second occurrence.

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So for example, a patient has two positive blood cultures within 21 days as a result of a bloodstream infection. One on January 1st and a second on January 4th. You would report only one dialysis event, with an event date of January 1st. If this patient has a new positive blood culture on February 20th, you would report a second dialysis event, because the event date of this new positive blood culture is 21 or more days after the last reported positive blood culture, which was the first of the three on January 1st.

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Dialysis Event Examples

Let's look at how these instructions and definitions are applied using example scenarios.

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[ANIMATION] In case 1, the patient has symptoms of infection and receives one week of IV antimicrobials as an outpatient. But two weeks after the treatment ends, the IV antimicrobials are restarted. How would this be reported? [ANIMATION] This would be one IV antimicrobial start dialysis event. Why are these two IV antimicrobial starts reported as one dialysis event? [ANIMATION] Because

there is less than 21 days between the end of the first IV antimicrobial course and the beginning of the next IV antimicrobial course. If IV antimicrobials are restarted within 21 days after the end of the first treatment, they are considered the same event for the purpose of Dialysis Event reporting.

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For case 2, the patient has symptoms of a bloodstream infection and is hospitalized. [ANIMATION] Upon admission, the patient's blood is drawn. The next day, the blood culture results are positive. What would be reported? [ANIMATION] Report the positive blood culture, and indicate hospitalization as the outcome. The event date is the date the blood was drawn. Why is it reported this way? [ANIMATION] Remember positive blood cultures that are drawn as an outpatient or those that are drawn within one calendar day following a hospital admission, are reported as a dialysis event. In addition, the patient was hospitalized because of the bloodstream infection, so the hospitalization is listed as an outcome.

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The next few examples focus on the "suspected source" of a positive blood culture. Remember that we have four options for suspected source: it could be the "vascular access", "a source other than the vascular access", "contamination", or "uncertain". [ANIMATION] In this case, the patient's vascular access site has pus, redness, and swelling. Their blood is cultured and it grows Enterococcus. The patient also has a visibly infected leg wound and the wound culture grows Staph. So, what is reported? [ANIMATION] Report one dialysis event which includes pus, redness and increased swelling as well as a positive blood culture. You would report only the Enterococcus, not the Staph. Also, indicate the suspected source of the positive blood culture is the vascular access site. Why is it reported this way? [ANIMATION] First, only positive blood cultures are reported. With respect to the suspected source of the positive blood culture, always check if there is objective evidence of infection at the vascular access site first. In this case there is pus, redness, and swelling, so we attribute the positive blood culture to the vascular access site. Although the patient has an infected leg wound, it is growing a different organism, so we cannot attribute the positive blood culture to that site in this case.

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[ANIMATION] In Case 4, the patient again has a leg wound with pus, redness and swelling. But this time, their vascular access site looks normal. The wound culture grows staph aureus and the blood culture is positive with staph aureus. What is reported? [ANIMATION] Again, report only the positive blood

culture. The suspected source of the positive blood culture Dialysis Event would be “A source other than the vascular access site” in this case. Why do we attribute the positive blood culture to “A source other than the vascular access”? [ANIMATION] First we check for objective evidence of infection at the vascular access site. In this case, there is none, since the access looks normal. The infected wound is positive for the same organism as is growing in the blood. Therefore, we attribute the source of the positive blood culture to “A source other than vascular access site” which in this case is the patient’s leg wound.

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Finally, case 5: the patient reports chills, but does not have a fever. Two blood specimens are collected for culture. [ANIMATION] Only one of the two blood cultures is positive, and it grows coagulase negative staph. The patient’s symptoms resolve without treatment. What will be reported? [ANIMATION] You would report the positive blood culture, but in this case indicated that the suspected source is contamination. Why is the source of the positive blood culture contamination? [ANIMATION] Generally, you want someone with experience with clinical microbiology to help assist in determining contamination, such as a physician, infection preventionist, or nurse manager. Although there were two blood cultures, only one was positive, and the organism that it grew, coagulase negative staph, is a common skin organism. You can find a list of common contaminants in the Tables of Instructions that go with the Dialysis Event form. In this case, the physician confirmed that it is reasonable to attribute the source of this one positive blood culture to contamination. When trying to determine the suspected source of a positive blood culture, you should first rule out that it is not the vascular access site, before considering if it is a another source or contamination.

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Implementation

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Depending on what information is available to your facility, you’ll need to determine how you will capture all dialysis events, as well as the problem and outcome information needed for the event form. [ANIMATION] Consider that if frontline staff are aware of the dialysis event definitions, they can record event information and inform the primary data collector or reporter that an event has occurred. Involving staff can also increase their engagement in quality improvement. [ANIMATION] Also, the

facility must have a way to determine if a positive blood culture was collected within 1 calendar day after hospital admission.

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If you are not sure about how to report a dialysis event, there are several ways to get help:
First, refer to the Protocol and Table of Instructions for the forms. All of these documents can be found on the Dialysis Event Homepage.
You may also want to get the opinion of a physician, infection preventionist, or nurse manager who is familiar with the Dialysis Event Protocol.
If you are logged into NHSN, you can search the online manual by selecting the "Help" option in the upper right corner. [ANIMATION]
As always, additional assistance is available by emailing the NHSN Helpdesk at nhsn@cdc.gov.

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Your next steps to prepare to collect data and report include: reading the Dialysis Event Protocol and reviewing the data collection forms, specifically the Dialysis Event form and the Denominators for Outpatient Dialysis form. Also consider how to best collect the surveillance data at your facility and then implement a process to collect and submit that data.

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Summary

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In summary, NHSN is a secure, internet-based surveillance system. Through surveillance and staff engagement, you can improve practice and patient outcomes in your facility. In order for surveillance data to be informative, it must be collected and reported in a standardized way, which is described by the Dialysis Event protocol. Reporting Requirements include:

- The Outpatient Dialysis Center Practices Survey
- Monthly Reporting Plan
- Denominators for Outpatient Dialysis form
- And the Dialysis Event Form

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There are three types of dialysis events you need to monitor for. They are: IV antimicrobial starts; Positive blood cultures; and finally, episodes of pus, redness, or swelling at the vascular access site. Please refer to the protocol for the specific definitions for each event.

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If you have questions about this presentation you can email the NHSN Helpdesk at nhsn@cdc.gov. Thank you for your time.