MRSA Bacteremia and *C. difficile* LabID Events – Case Scenarios

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Case 1 – MRSA LabID Event

Case 1

- A facility had a patient present to the emergency department (ED) on 3/1. The patient was admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3. Blood cultures collected in the ED on 3/2 were positive for MRSA.

- The patient transferred to the Medical Ward bed on 3/3. Blood cultures collected in the Medical Ward are positive for MRSA on 3/4. On 3/5 the patient is discharged AMA.

- The patient is re-admitted to the Medical Ward on 3/14. Blood cultures collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 1

Is the positive MRSA blood specimen on 3/2 a LabID event?

- Yes, this is a LabID event
- No, this is not a LabID event since the MRSA was Present on Admission (POA)

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 1 Answer

Is the positive MRSA blood specimen on 3/2 a LabID event?

- **Yes, this is a LabID event**
- No, this is not a LabID event since the MRSA was Present on Admission (POA)

Why?: POA and other Chapter 2 NHSN definition do not apply to LabID event reporting.

This the first MRSA positive for the patient and location, therefore a MRSA LabID event is reported.

Case 1 – Question 2

For which location is the positive MRSA blood specimen on 3/2 reported?

- ED
- Medical Ward

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 2 Answer

For which location is the positive MRSA blood specimen on 3/2 reported?

- **ED**
- Medical Ward

Why?: NHSN LabID events are attributed to the **location where the patient is physically located when the specimen is collected** – although the patient is "admitted" to the Medical Ward, the patient is still physically located in the ED when the MRSA+BC was collected on 3/2. The MRSA event would be reported for the ED.

Case 1 – Question 3

The 3/2 MRSA LabID event in the ED is:

- Community-onset (CO)
- Healthcare-onset (HO)

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 3 Answer

The 3/2 MRSA LabID event in the ED is:

- **Community-onset (CO)**
- Healthcare-onset (HO)

Why?: Events occurring in outpatient locations (such as the ED) are always categorized as community onset (CO). This is automated within the NHSN application.

Let's review the important teaching points so far:

A facility had a patient present to the emergency department (ED) on 3/1. The patient was admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3. ***Blood cultures collected in the ED on 3/2 were positive for MRSA****.*

MRSA community onset LabID event is reported for the ED.

- POA (and other Chapter 2 NHSN definitions) do not apply to LabID event reporting. This the first MRSA positive for the patient and location, therefore a MRSA LabID event is reported.
- NHSN does not use status within the electronic system but where the patient is physically located – although the patient "admitted" to the ICU on 3/2, the patient is still physically located in the ED when the MRSA positive blood culture was collected, so the MRSA event would be reported for the ED.
- Events occurring in outpatient locations (such as the ED) are assigned as community onset (CO).

Back to Case 1

- A facility had a patient present to the emergency department (ED) on 3/1. The patient was admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3. Blood cultures collected in the ED on 3/2 were positive for MRSA.
- The patient transferred to the Medical Ward bed on 3/3. Blood cultures collected in the Medical Ward are positive for MRSA on 3/4. On 3/5 the patient is discharged AMA.
- The patient is re-admitted the Medical Ward on 3/14. Blood cultures collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 4

The MRSA positive on 3/4 is reported to NHSN as a LabID event – first for the patient and location (Medical Ward). How will the NHSN application categorize this event?

- CO – Community-onset
- HO – Healthcare-onset

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 4 Answer

The MRSA positive on 3/4 is reported to NHSN as a LabID event - first for the patient and location (Medical Ward). How will the NHSN application categorize this event?

- **CO – Community-onset**
- HO – Healthcare-onset

Why?: When events are entered into NHSN, they are automatically categorized as CO or HO by the NHSN application. Events occurring on Hospital Day 1 (the day of admission), HD 2, or HD 3 are CO, and events occurring on or after HD 4 are HO.

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.

Case 1 – Question 5

The MRSA positive on 3/14 is reported to NHSN as a LabID event.

- Yes
- No

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 5 Answer

The MRSA positive on 3/14 is reported to NHSN as a LabID event.

- Yes
- **No**

Why?: 14-day rule within LabID Event Reporting which states that no new LabID events are submitted for the patient in the same location until there is greater than 14 days from a prior positive specimen.

Case 1 – Question 5 Further Discussion

The MRSA positive on 3/14 is NOT reported to NHSN as a LabID event.

- No new LabID events are submitted for the patient in the same location until there is greater than 14 days from a prior positive specimen (LabID event 14-day rule)
  - Less than 14 days from the 3/4 positive MRSA for the Medical Ward and the 3/14 positive MRSA for the Medical Ward
  - 14-day rule is applicable across admissions

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 6

The MRSA positive on 3/18 is reported to NHSN as a LabID event.

- Yes
- No

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 6 Answer

The MRSA positive on 3/18 is reported to NHSN as a LabID event.

- Yes
- **No**

Why?: The LabID event 14-day rule is a “rolling” 14-day timeframe which resets each time a new positive specimen is collected in the same location. The 14-day timeframe is between positive *specimens* in the location (not 14 days between *events*).

Case 1 – Question 6 Further Discussion

The MRSA positive on 3/18 is NOT reported to NHSN as a LabID event.

- The LabID event 14-day rule is a “rolling” 14-day timeframe which resets each time a new positive specimen is collected in the same location, **not** 14 days from a submitted event (3/4).
  - 14-day timeframe resets on 3/14, 3/16, and 3/18 for the Medical Ward.
  - No LabID event because 14 days has not elapsed without a positive specimen for the Medical Ward since 3/4.
  - MDRO LabID event calculator
    - https://www.cdc.gov/nhsn/labid-calculator/index.html

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 7

Would the NHSN application allow submission of a MRSA LabID event for 3/18 in this case?

- Yes
- No

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 7 Answer

Would the NHSN application allow submission of a MRSA LabID event for 3/18 in this case?

- **Yes**
- No

Why?: The business rules within the NHSN application do not allow for submitting additional events within the 14-day time period. The facility must track additional positives to determine when 14 days has elapsed between positive specimens in the location to determine when a new event is reported.

Case 1 – Question 7 Further Discussion

The NHSN application WOULD allow submission of a MRSA LabID event for 3/18

- The NHSN application would allow submission of the 3/18 event since there are > 14 days from the prior submitted event on 3/4.
- The application does not recognize that there has not been greater than 14 days since the 3/4 event since the business rules do not allow entering the 3/14 or 3/16 specimens.
- “NHSN recommends that facilities keep an internal line listing log of all positive isolates for reference in LabID event reporting which will assist in decision making around the 14-day reporting rule which is location specific.”
  - Page 12-11, https://www.cdc.gov/nhsn/pdfs/pscmanual/12pscmdro_cdadcurrent.pdf

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 8 (Final Question!)

How many total MRSA LabID events should be reported to NHSN for this case?

- One
- Two
- Three

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 1 – Question 8 Answer

How many total MRSA LabID events should be reported to NHSN for this case?

- One
- **Two**
- Three

Why?: For LabID event reporting, the first positive blood specimen for the patient and the location is reported to NHSN:

- 3/2 ED
- 3/4 Medical Ward

Case Summary:

- Patient presents to ED on 3/1.
- Admitted as an inpatient to the Medical Ward, but due to bed availability was held in the ED until 3/3.
- Blood cultures collected in the ED on 3/2 were positive for MRSA.
- Transfers to the Medical Ward bed on 3/3.
- BCs collected in the Medical Ward are positive for MRSA on 3/4.
- Patient is discharged AMA on 3/5
- Re-admitted the Medical Ward on 3/14.
- BCs collected in the Medical Ward are positive for MRSA on 3/14, 3/16, and 3/18.

Case 2 – *C. difficile* LabID Event

Case 2

- A patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient developed loose stools on 2/9, and a GDH/EIA test resulted in a toxin positive finding for *C. difficile* from a specimen collected on 2/10.
- The patient improves and is transferred to a step-down unit on 2/15.
- Loose stool is noted again and a PCR test for *C. difficile* is positive from a specimen collected on 2/16.

Case 2 – Question 1

How many *C. diff* LabID events should be reported to NHSN for this case?

- None
- One
- Two

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Question 1

How many total *C. diff* LabID events should be reported to NHSN for this case?

- None
- One
- **Two**

Why?: For LabID event reporting, the first positive specimen for the patient **and the location** is reported to NHSN:

- 2/10 ICU
- 2/16 Step-down

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Question 2

How is 2/10 ICU *C. diff* LabID event categorized by the NHSN application?

- CO and Incident
- CO and Recurrent
- HO and Incident
- HO and Recurrent

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Question 2

How is 2/10 ICU *C. diff* LabID event categorized by the NHSN application?

- **CO and Incident**
- CO and Recurrent
- HO and Incident
- HO and Recurrent

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Why?:

- **Community Onset:** The 2/10 LabID event would be categorized as community onset (CO) for the ICU – hospital day 3 since the patient was admitted to the ICU 2/8.
- **Incident:** Any CDI LabID Event from a specimen obtained more than 56 days after the most recent CDI LabID Event (**or with no previous CDI LabID Event documented**) for that patient.

Case 2 – Question 3

How is 2/16 step-down unit *C. diff* LabID event categorized by the NHSN application?

- CO and Incident
- CO and Recurrent
- HO and Incident
- HO and Recurrent
- None of the above

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Question 3

How is 2/16 step-down unit *C. diff* LabID event categorized by the NHSN application?

- CO and Incident
- CO and Recurrent
- HO and Incident
- HO and Recurrent
- None of the above

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Why?:

- The 2/16 event in the step-down unit is **hospital onset** (first for the patient and location; HD 9). However, the second level of categorization is "**cdiAssay unassigned**" since the 2/16 event occurred less than or equal to 14 days after the most recent CDI LabID event for the patient (2/10 ICU event).

Let’s review Case 2 teaching points:

Patient is admitted to ICU on 2/8. While in the ICU, the patient develops loose stools on 2/9. PCR test for C. difficile is positive on 2/10. Transfer to a step-down unit on 2/15. PCR test for C. difficile is positive on 2/16 in step-down.

CO and Incident C. diff LabID event reported for ICU. HO and cdiAssay unassigned C. diff LabID event reported for the step-down unit.

- Although the 2/16 event was less than 14 days from the 2/10 event, the patient was in a new location. The 14-day rule applies to patients in the same location.

Let's review Case 2 teaching points (continued):

Patient is admitted to ICU on 2/8. While in the ICU, the patient develops loose stools on 2/9. PCR test for C. difficile is positive on 2/10. Transfer to a step-down unit on 2/15. PCR test for C. difficile is positive on 2/16 in step-down.

CO and Incident *C. diff* LabID event reported for ICU. HO and cdiAssay unassigned *C. diff* LabID event reported for the step-down unit.

- Two levels of assignment for *C. diff* events:
  - Location-level categorization (CO, HO, or CO-HCFA) based on the date of the occurrence. Events occurring on day of admission (hospital day [HD] 1), HD 2 or HD 3 are categorized as CO. Events occurring on or after HD 4 using day of admission as HD 1 are categorized as HO. Events occurring greater than 14 days after a previous positive are also categorized as HO.
  - The second assignment corresponds to the "cdiAssay" variable and includes the categories of Incident, Recurrent, or no variable assigned.

CdiAssay Variable Categorization

See protocol page 12-29:

https://www.cdc.gov/nhsn/pdfs/pscmanual/12pscmdro_cdadcurrent.pdf

In addition to the onset categorization, CDI LabID Events are further categorized by NHSN as Incident or Recurrent. Refer to the 'cdiAssay' variable in the NHSN Line List.

- Incident CDI LabID Event: Any CDI LabID Event from a specimen obtained more than 56 days after the most recent CDI LabID Event (or with no previous CDI LabID Event documented) for that patient. Note: the date of first specimen collection is considered day 1.
- Recurrent CDI LabID Event: Any CDI LabID Event from a specimen obtained more than 14 days and less than or equal to 56 days after the most recent CDI LabID Event for that patient. Note: the date of first specimen collection is considered day 1.
- CdiAssay will be unassigned, or "blank", for any CDI LabID event that was collected less than or equal to 14 days after the most recent CDI LabID event for that patient.

Note: CdiAssay is assigned based on prior events from a patient that occurred in an inpatient location, emergency department, or 24-hour observation location.

Case 2 – Bonus Question!

The facility's standard testing method for CDI reported to NHSN quarterly is GDH/EIA, but the 2/16 positive was a PCR test.
Does this impact the submission of the 2/16 CDI event to NHSN?

- Yes
- No

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Bonus Question!

The facility's standard testing method for CDI is GDH/EIA but the 2/16 positive was a PCR test.
Does this impact the submission of the 2/16 CDI event to NHSN?

- Yes
- **No**

Case Summary:

- Patient is admitted to the facility ICU on 2/8.
- While in the ICU, the patient develops loose stools on 2/9.
- Toxin positive finding for *C. difficile* on 2/10.
- Patient is transferred to a step-down unit on 2/15.
- PCR test for *C. difficile* is positive on 2/16 in step-down.

Case 2 – Bonus Question!

*The facility's standard testing method for CDI is GDH/EIA but the 2/16 positive was a PCR test. This **does not** impact the submission of the 2/16 CDI event to NHSN.*

Why?

- NHSN does not endorse or recommend any specific testing methodology and the standard testing method a facility reports quarterly does not impact whether a positive result would be reported as a LabID event.
- The standard test type or algorithm used to identify CDI should reflect the testing method routinely performed, but any positive CDI findings meeting the definition are reportable as LabID events for the facility, if the first for the patient and location or non-duplicate.
    - CDI LabID event: a positive laboratory test result for *C. difficile* toxin A and/or toxin B OR any detection of toxin-producing *C. difficile* organisms by culture or other laboratory means on an unformed stool specimen that conforms to the container. Testing methods include, but are not limited to, molecular assays such as PCR and/or toxin assays such as EIA.

Contact the NHSN Helpdesk

- **NHSN-ServiceNow** to submit questions to the NHSN Help Desk.
- Access new portal at **https://servicedesk.cdc.gov/nhsncsp**.
- If you do not have a SAMS login, or are unable to access ServiceNow, you can still email the NHSN Help Desk at nhsn@cdc.gov.

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov