



Special Articles (or Research Methods)

Health care-associated infections studies project: An American Journal of Infection Control and National Healthcare Safety Network data quality collaboration



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This case study is part of a series centered on the Centers for Disease Control and Prevention/National Healthcare Safety Network (NHSN) health care-associated infection (HAI) surveillance definitions. This specific case study focuses on the definitions and protocols used to make HAI infection determinations, such as the infection window period and secondary bloodstream infection attribution period. The case reflects the real-life and complex patient scenarios that infection preventionists (IPs) face when identifying and reporting HAIs to NHSN. The intent of the case study series is to foster standardized application of the NHSN HAI surveillance definitions among IPs and encourage accurate determination of HAI events. An online survey link is provided where participants may confidentially answer questions related to the case study and receive immediate feedback in the form of correct answers and explanations and rationales. Details of the case study, answers, and explanations have been reviewed and approved by NHSN staff. We hope that participants take advantage of this educational offering and thereby gain a greater understanding of NHSN HAI surveillance definitions.

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This case study is part of a series centered on the Centers for Disease Control and Prevention/ National Healthcare Safety Network (NHSN) health care-associated infection (HAI) surveillance definitions. These cases reflect some of the complex patient scenarios infection preventionists (IPs) encounter in their daily surveillance of HAIs using the NHSN definitions and protocols. Objectives have been previously published.¹

With each case, a link is provided to an online survey where the questions can be answered and participants can receive immediate feedback in the form of answers and explanations. All individual participants' answers will remain confidential, although it is the authors' intention to share a summary of the findings at a later date. Cases, answers, and explanations have been reviewed and approved by NHSN staff. We hope that you will take advantage of this offering, and we look forward to your active participation. The online survey may be found at: <https://www.surveymonkey.com/r/NHSNCaseStudy23>.

We strongly recommend reviewing/referencing the NHSN Patient Safety Component Manual, Device-Associated Module, and computer-based training module for information that may be needed to answer the case study questions. The Website links are:

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www.cdc.gov/nhsn/PDFs/pscManual/2PSC_IdentifyingHAIs_NHSNcurrent.pdf
www.cdc.gov/nhsn/PDFs/pscManual/4PSC_CLABScurrent.pdf
www.cdc.gov/nhsn/acute-care-hospital/vap/index.html
<https://nhsn.cdc.gov/nhsntraining/courses/2016/C05/>

The findings and conclusions in this case study are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

For each question, please select the **most correct answer**.

Scenario:

On March 9, 2016, an 18-year-old patient with cystic fibrosis was admitted to a pediatric medical ward. Coarse breath sounds were heard over the right upper lobe of the lung, Oxygen saturations were at 86% and the patient began oxygen therapy at 4 L/min. Chest radiographs collected on admission showed diffuse bilateral bronchiectasis, worse in the right upper lobe, with parenchymal opacities in the right upper lobe that may represent atelectasis, but most likely represent superimposed pneumonia. The left lung was clear. The patient's white blood cell count was elevated (16,000 cells/mm³).

On March 10, the patient developed a fever of 101.4°F, and pulmonary crackles were heard over the upper right lung. Sputum, which was now blood-tinged, was collected for culture. The patient was tachypneic, oxygen saturation was 80%, and he was intubated and placed on a conventional mode of mechanical ventilation.

On March 11, fever, crackles, and tachypnea continued, and while on the ventilator, the patient continued to produce copious green sputum. Fraction of inspired oxygen settings ranged between 30% and 100%. A triple lumen catheter was placed in the subclavian vein.

On March 12, sputum culture collected on March 10 was determined to be positive for *Staphylococcus aureus* and *Pseudomonas aeruginosa*. Antibiotic therapy was started.

On March 13, another chest radiograph was obtained that showed an increased, confluent opacity in the right upper lobe, and the radiologist identified pneumonia. The patient remained on mechanical ventilation.

Question 1. Which of the following statements is most correct?

NOTE: NHSN has developed an HAI and Present on Admission Worksheet Generator to promote consistent surveillance data collection. That worksheet generator is available in the green navigation bar to the left on the Centers for Disease Control and Prevention site (www.cdc.gov/nhsn/enrolled-facilities/index.html). The worksheet generator does not determine that all NHSN infection criteria

have been met. It is incumbent upon the user to determine that an infection criterion was met as reflected in the dates and information supplied.

- Patient meets clinically defined pneumonia (PNU1) criterion, date of event was March 9, and the event is not ventilator-associated.
- Patient meets PNU1 criterion, date of event was March 9, and the event is ventilator-associated.
- Patient meets pneumonia with common bacterial or filamentous pathogens and specific laboratory findings (PNU2) criterion, with date of event March 10.
- Patient meets PNU2 criterion, with date of event March 12.

On March 15, the patient's white blood cell remained elevated (14,800 cells/mm³).

On March 16, rales were again documented, the patient's fever increased to 103.1°F, and blood was collected for culture. The patient continued to have copious green sputum. A follow-up chest radiograph showed continued dense opacities in the upper lobe of the right lung.

On March 17, blood culture was revealed as positive for *S aureus*.

Question 2. Does this patient have a central line-associated bloodstream infection (CLABSI) with *S aureus*?

- Yes, this patient has a CLABSI with date of event of March 16.
- Yes, this patient has a CLABSI with date of event of March 17.
- No, the bloodstream infection is secondary to PNU1.
- No, the bloodstream infection is secondary to PNU2.

Question 3. What is the date of event and the repeat infection timeframe (RIT) for the pneumonia event now?

- The date of event and repeat infection do not change.
- The date of event for PNU2 is March 10 and the RIT becomes March 10-23.
- The date of event for PNU2 is March 13 and the RIT becomes March 13-26.

Reference

- Wright MO, Hebden JN, Bridson KA, Morrell GC, Horan T. "Healthcare-associated infections studies project: An American Journal of Infection Control and National Healthcare Safety Network data quality collaboration". *Am J Infect Control* 2010;5:416-8.