

## MDCH SHARP NHSN Case Studies Part 2

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These questions and answers are part of a series of case studies developed by Marc-Oliver Wright, MT(ASCP), MS, CIC, from NorthShore University Health System ([MWright@northshore.org](mailto:MWright@northshore.org)). A total of 10 case studies will be published in the June 2012 issue of the *American Journal of Infection Control*.

If you have questions about these case studies, the questions, or answers, please contact Joe Coyle ([CoyleJ@michigan.gov](mailto:CoyleJ@michigan.gov)) in the SHARP Unit. For questions, comments, or suggestions regarding the NHSN user calls coordinated by the SHARP unit, please contact Judy Weber ([WeberJ4@michigan.gov](mailto:WeberJ4@michigan.gov)) or Allison Gibson ([GibsonA4@michigan.gov](mailto:GibsonA4@michigan.gov)).

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### Case Study 1

A 27-year-old man is admitted on 8/22 from another hospital with alcohol-induced pancreatitis. Admission abdominal CT showed severe pancreatitis with peripancreatic inflammatory changes. Patient is ventilator-dependent requiring a tracheostomy and has vascular catheters in place in the right subclavian and right internal jugular (IJ) veins.

On 9/3, an ultrasound-guided aspiration of pancreatic fluid revealed few polymorphonuclear cells and a negative bacterial culture.

On 9/11, a repeat abdominal CT revealed unchanged pancreatitis but interval development of multi-loculated fluid collections in the abdomen.

On 9/14, patient is taken to the OR for pancreatic debridement and placement of drains. Later that evening, patient had a temperature spike to 102° F. The right IJ line was discontinued and the catheter tip and blood specimens x 2 were sent for culture.

On 9/16, culture results were reported as follows:

- Pancreatic fluid = no growth
  - Catheter tip = <15 CFU/ml of *Enterococcus* species
  - Blood cultures = 2 for 2 positive for *Enterococcus faecalis*.
  - No other sites of suspected infection were identified.
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Case Study 1 Question 1: Does this patient have a healthcare-associated infection (HAI)?

- a) Yes, a CLABSI because the blood and catheter tip cultures grew the same organisms
- b) No, these organisms are contaminants
- c) Yes, an intra-abdominal (IAB) infection with secondary bloodstream infection with *Enterococcus* species
- d) Yes, a CLABSI because the blood cultures are positive for a pathogen (*E. faecalis*), there is no evidence of infection at another site, and the patient had a central line in place

Case Study 1 Question 2: In further revising the scenario, let's say that the patient was afebrile on 9/14 (i.e., has no temperature spike). Does this finding change your assessment of the blood culture results?

- a) Yes
- b) No

Case Study 1 Question 3: Finally, let's revise the scenario such that the IJ and subclavian lines are removed on 9/9. Then on 9/13 a femoral catheter is placed. If the pancreatic fluid, catheter tip, and blood collected on 9/14 have the results shown in the initial scenario above on 9/16, what HAI(s) would be reported?

- a) CLABSI with *E. faecalis* associated with the use of the femoral line
  - b) CLABSI with *E. faecalis* associated with the use of the IJ and subclavian lines
  - c) BSI with *E. faecalis*; not central line-associated because a femoral line is not considered a central line
  - d) BSI with *E. faecalis*; not central line-associated because the line was not in place for at least 48 hours before the blood specimen was collected for culture.
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## **Case Study 2**

A 35-year-old man is involved in a multi-vehicular accident and sustains multiple internal and external traumatic injuries. On 12/5 in the emergency department, a triple lumen subclavian line and Foley catheter are placed and the stabilized patient is transferred to the intensive care unit.

On 12/8, the patient spikes a temperature to 101°F and is "pan" cultured, including blood cultures x 2.

On 12/10, the subclavian line is discontinued and the catheter tip is sent for culture. Later that afternoon, the blood culture results from 12/8 are reported as *Staphylococcus hominis* in both sets with identical susceptibility profiles. The physician notes: "Positive blood culture = contaminant; no antibiotics required." All other specimens cultured are negative.

On 12/12, catheter tip results are reported as *Staphylococcus epidermidis*.

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Case Study 2 Question 1: Does this patient have a healthcare-associated infection (HAI)?

- a) No, because the ID consulting physician stated that the blood culture results were contaminants and did not treat the patient with antibiotics
- b) No, because the blood cultures grew only common skin contaminant organisms
- c) Yes, a CLABSI because the patient had a central line in place, had a fever, and there were 2 positive blood cultures with common skin contaminant organisms, with the same antibiotic susceptibilities, collected within two days of each other
- d) Yes, a CLABSI because both the blood and catheter tip cultures grew *coagulase-negative staphylococci*

Case Study 2 Question 2: What if additionally the patient has suprapubic tenderness and the urine culture obtained on 12/8 grows >100,000 CFU/ml of *Escherichia coli*. What HAI(s) would be reported?

- a) Both a CLABSI with *S. hominis* & a symptomatic urinary tract infection (SUTI) with *E. coli*
- b) SUTI with secondary BSI with *S. hominis* and *E. coli*
- c) SUTI with *E. coli*
- d) No HAI

Case Study 2 Question 3: In further revising the scenario, the subclavian line tip culture instead grows *Staphylococcus hominis*. Does this finding change your HAI assessment?

- a) Yes
  - b) No
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### **Case Study 3**

A 49 year old woman is admitted postoperatively on 6/29 following an exploratory laparotomy and right hemicolectomy. Medical history is positive for insulin dependent diabetes mellitus and asthma.

On 6/30 the patient's abdominal incision is clean but slightly moist. She is afebrile, her breath sounds are diminished bilaterally, and no bowel sounds are present on auscultation. She has ambulated once in the hallway and is taking ice chips by mouth.

On 7/2 the patient's abdominal incision is slightly red and warm to the touch. Staples are intact. Her temperature has ranged between 37.2°C and 37.6°C and her lungs are clear bilaterally. She is ambulating with assistance. Bowel sounds are present in the 2 upper abdominal quadrants only. She continues to take only ice chips by mouth.

On 7/3 the patient's abdominal incision is more reddened, swollen and hot to touch. She complains of incisional pain. Her temperature has spiked at 38.4°C. Bowel sounds are now present in all 4 quadrants of the abdomen. Her lungs remain clear and her white blood cell count is 15,000/cmm. A peripherally inserted central catheter (PICC) is placed in her right upper arm. She is empirically started on ampicillin.

On 7/4 the patient's incision has dehisced to the fascia. A wound vacuum is placed to the incision. No wound cultures are sent.

On 7/9 the patient continues to run intermittent fevers. The PICC site is clean and dry without redness. She denies suprapubic tenderness or costovertebral angle pain. 2 sets of blood cultures are collected and sent to the laboratory along with a straight-catheter urine culture.

On 7/11 one of two blood cultures are positive for *Bacteroides uniformis*.

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Case Study 3 Question 1: Does this patient have an HAI?

- a) No. Because no culture was taken, this patient does not meet criteria of an HAI. The organism in the blood culture is a common skin contaminant and therefore because only one of the blood culture bottles is positive, this is not a BSI. She has no SSI because the wound was not cultured.
- b) Yes, this patient has a CLABSI as she meets the Laboratory-confirmed Bloodstream Infection (LCBI) criterion 1-recognized pathogen cultured from one or more blood cultures when a central line is present. She has no SSI because the wound was not cultured.
- c) Yes this patient has a superficial incisional primary (SIP) SSI
- d) Yes, this patient meets criterion “b” of deep incisional primary (DIP) SSI. The bloodstream infection is secondary to the SSI.

Case Study 3 Question 2: What is the date of SSI?

- a) 7/2
- b) 7/3
- c) 7/4
- d) 7/11

Case Study 3 Question 3: Which month will the SSI be attributed to?

- a) June
- b) July

Case Study 3 Question 4: In adding to the scenario, the wound dehisces further, beyond the fascia and a fluid collection is aseptically drained and sent for culture where it grows *Bacteroides uniformis*. Does the patient have an HAI?

- a) Yes this patient has a superficial incisional primary (SIP) SSI
  - b) Yes, this patient has an intra-abdominal infection (IAB) organ/space SSI (SSI-IAB)
  - c) Yes, this patient has a deep incisional primary (DIP) SSI
  - d) Yes, this patient has both a DIP SSI and an IAB-SSI
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#### Case Study 4

A 64 year-old man who is status-post orthotopic heart transplant 16 years ago is admitted on 2/1 for an elective percutaneous endoscopic gastrostomy (PEG) tube placement. Medical history is significant for respiratory failure due to H1N1 influenza pneumonia resulting in a tracheostomy and ventilator dependency, end-stage renal disease on hemodialysis three times/week, and hypertension. He was transferred from the ventilator unit of a long-term acute care facility (LTAC). A left internal jugular (IJ) tunneled catheter was in place for dialysis and a condom catheter was present, draining clear amber urine.

On 2/2 patient was taken to the Operating Room for elective placement of a PEG feeding tube and tolerated the procedure well. He was transferred to the Surgical ICU due to his ventilator requirement. Temperature range: 37.2°C - 37.6°C. Lungs clear bilaterally. PEG site oozing serosanguinous drainage. Call received from the LTAC facility that a stool specimen collected for abdominal pain and diarrhea prior to transfer was reported as positive for *C.difficile*. Metronidazole started.

On 2/4 the patient remains in the SICU due to lack of a bed at the LTAC facility. At 2300, the patient has a temperature of 38.3°C. PEG site is clean and dry. No evidence of inflammation or drainage at the left IJ tunneled catheter site. Lungs clear bilaterally. Blood, urine and sputum cultures are sent.

On 2/5 in the AM, the urinalysis is reported as 3+ leukocyte esterase, WBC- too numerous to count and moderate bacteria. Patient continues with fever to 38°C. Co-trimoxazole is initiated. Patient receives hemodialysis.

On 2/6, the urine culture from 2/4 is reported as positive for 60,000 CFU/ml gram-negative bacilli which are subsequently identified as *Providencia stuartii*. Blood and sputum cultures are negative. Plans to send the patient back to the LTAC facility are cancelled due to increasing watery stools and complaints of abdominal pain with an increase in peripheral WBC from 11,000 to 25,000. CT of the abdomen suggestive of colitis. Continues with temperatures of 38°C.

On 2/9 the patient is moved to the intermediate care unit. Late that evening, he has a temperature spike to 38.8°C. Blood cultures are repeated.

On 2/10 the blood culture from 2/9 is reported as positive for gram-negative bacilli, which are subsequently identified as *Providencia stuartii*.

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#### Case Study 4 Question 1: Does this patient have an HAI associated with the SICU?

- a) Yes, this patient meets criterion 2b of symptomatic UTI with *Providencia stuartii*, and the bacteremia is secondary to the UTI.
- b) No, the patient does not have an HAI associated with the SICU. The *C. difficile* infection was present on admission and his positive urine culture had <100,000 CFU/ml of an organism without the necessary clinical symptoms for a UTI. The positive blood culture is related to the intermediate care unit.
- c) Yes, this patient meets criterion 2b of symptomatic UTI with *Providencia stuartii* and also has a CLABSI with *Providencia stuartii* since the BSI occurred 5 days after the UTI.

Case Study 4 Question 2: Does the patient have a CAUTI?

- a) No, the patient wasn't catheterized
- b) Yes, this is a CAUTI
- c) No, there were no symptoms present so the patient does not have a CAUTI

Case Study 4 Question 3: What if we altered the scenario and set the patient's maximum temperature on 2/4 as 38.0°C. Does the patient have an HAI?

- a) Yes, the patient meets criterion 2b of symptomatic UTI (SUTI) with *Providencia stuartii* and the bacteremia secondary to the UTI
- b) Yes, this is an asymptomatic bacteremic UTI (ABUTI)
- c) Yes, this is a CLABSI with *Providencia stuartii*
- d) No, the patient was never symptomatic