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Health Care-Associated Infections Studies Project: An *American Journal of Infection Control* and National Healthcare Safety Network Data Quality Collaboration 2016 Case #2

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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)'s healthcare-associated infection (HAI) surveillance definitions. These cases reflect some of the complex patient scenarios IPs have encountered in their daily surveillance of HAIs using the NHSN definitions and protocols. Objectives have been previously published.¹

With each case, a link to an online survey is provided, where you may enter answers to questions and receive immediate feedback in the form of correct answers and explanations. All individual participant answers will remain confidential, although it is the authors' intention to share a summary of the survey responses at a later date. Cases, answers, and explanations have been reviewed and approved by NHSN. 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/NHSNCaseStudy2016-2>.

For successful completion of this case study, we strongly recommend that you review/reference the following sections of the NHSN Patient Safety Component Manual:

- Surgical Site Infection (SSI) Event Protocol found at <http://www.cdc.gov/nhsn/pdfs/pscmanual/9pscscscurrent.pdf>
- Surveillance Definitions for Specific Types of Infections found at http://www.cdc.gov/nhsn/pdfs/pscmanual/17pscscsinfdef_current.pdf
- Bloodstream Infection Event (Central Line-Associated Bloodstream Infection and Non-central line-associated Bloodstream Infection) Protocol found at http://www.cdc.gov/nhsn/pdfs/pscmanual/4psc_clabscurrent.pdf

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.

The primary teaching points of this case study are:

- Using the Surgical Site Infection (SSI) criteria along with an SSI site-specific criterion
- Identifying a BSI that is secondary to an SSI
- Applying the NHSN SSI event detail – Present at the Time of Surgery (PATOS)

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

AJIC SSI Case Study

June 1st, 11:30 pm

50-year-old male survives a motor vehicle collision (MVC) with a crash to the driver's side. At the scene the patient is awake, alert and oriented to person, complains of pain in the lower abdomen and left shoulder and arm. The patient is immobilized and is transported to a local emergency department (ED), in stable but guarded condition.

During the ED assessment:

- Vital signs are stable with slight elevation in respiratory rate of 24 bpm
- Patient reports pain level of 8 on a scale of 10 (maximum level) with "pain all over my body"
- Patient scores 18 of 22 on the Acute Concussion Evaluation (ACE)
- A dislocated left shoulder and fractures to the left hand, thumb and forefinger are identified
- Significant bruises are noted on the middle and lower abdomen consistent with seatbelt placement
- Patient's abdomen is tender on palpation with increased pain near bruised area

June 2nd

Emergent computerized tomography (CT) scan with contrast of the abdomen results show possible free air bubbles in close proximity to the ascending colon wall, may suggest bowel perforation. Patient is taken to the operating room (OR) for possible colon repair. Patient is prepped and draped; upon opening the abdomen, fecal-content is observed in abdominal cavity and the area is copiously irrigated. Partial colectomy (COLO) with anastomosis is performed to repair bowel perforation. 5cm of ascending colon is removed. Drains are secured and brought out through the lower right anterior abdominal wall and secured to bulb suction. The midline fascia is closed using retention sutures; subcutaneous tissue and the skin is closed using loosely approximated staples. Dry gauze dressing is placed and patient is transported to recovery in stable condition. ASA score 3; Wound class 3. Intravenous metronidazole and gentamycin are started in the recovery room.

June 5th

Patient is noted to have a maximum temperature of 100.7 °F; blood cultures are collected and reported positive for *Escherichia coli* and *Bacteroides fragilis*. Patient's abdomen is distended and patient reports severe pain on palpation; surgeon suspects an anastomotic leak. Gentamycin is discontinued and cefepime is started.

June 6th

Patient is taken back to OR due to possible anastomotic leak. Upon opening the abdominal cavity a pus-filled intraabdominal abscess is noted adjacent to an anastomotic leak. Colon surgery (COLO) is performed to repair the leak and the abdomen is again copiously irrigated but no cultures are collected. Drains are again placed deep into the abdominal cavity and the abdomen is loosely closed at the skin. The patient is transported to recovery room in stable condition. ASA score 3 and Wound Class 4 are documented. The surgeon's intra-operative note documents the above findings.

June 11th

Patient complains of nausea and vomiting with a painful, distended abdomen. Temperature of 101 °F noted and blood cultures are collected which are later reported positive for methicillin-resistant *Staphylococcus aureus* (MRSA). CT performed, shows a loculated fluid collection lateral to the ascending colon. 30cc of serosanguinous fluid is collected for culture via CT-guided aspiration and later reported positive for *B. fragilis*.

June 17th

Patient has begun to show signs of improvement with maximum temperature of 99.5 °F for greater than 48 hours and is able to tolerate clear liquids. Patient is transferred to the inpatient rehabilitation unit for conditioning and strength training.

Questions

(Note: The facility's NHSN Monthly Reporting Plan for the Procedure-Associated Module includes COLO – Colon surgery.)

1. Does the June 2nd COLO procedure qualify for submission into the facility's NHSN denominator data?
 - a. No, because Trauma = yes.
 - b. No, because the Wound Class = 3 and the wound is only loosely closed.
 - c. No, because there was fecal contamination of the abdominal cavity.
 - d. Yes, because there are no exclusions for procedure denominators.
2. Is the June 2nd COLO procedure eligible for SSI surveillance?
 - a. Yes, there is no reason this procedure should be excluded from SSI surveillance.

- b.** No, because the bowel perforation and fecal contamination excludes the case from SSI surveillance.
 - c.** No, because procedures with high wound class are excluded from SSI surveillance.
 - d.** No, because the drains were placed and the abdomen was loosely closed, the case is excluded from SSI surveillance.
- 3.** If an SSI event was identified and attributed to the June 2nd COLO procedure, which type of infection criteria would be met?
 - a.** SSI-DIP - Deep Incisional Primary
 - b.** SSI- Organ/Space, GIT - Gastrointestinal tract (SSI-GIT)
 - c.** SSI-Organ Space, IAB - Intra-abdominal (SSI-IAB), with secondary BSI
 - d.** SSI-Organ Space, IAB - Intra-abdominal (SSI-IAB), and also a primary BSI
 - e.** No SSI criteria are met.
- 4.** If an SSI event was identified and attributed to the June 2nd COLO procedure, how should the infection Present at Time of Surgery (PATOS) field be completed?
 - a.** PATOS = Yes
 - b.** PATOS = No
 - c.** The event is not an SSI and the PATOS field can be left blank.
- 5.** Should the June 6th COLO procedure be included in the facility's SSI denominator data?
 - a.** Yes, the procedure is a new NHSN operative procedure, which carries its own unique surveillance period based on the procedure category assigned to the case, and should be included in the SSI denominator data.
 - b.** No, the June 6th COLO should not be included because infection is present at the time of surgery which disqualifies the procedure from being included in the denominator.
 - c.** No, the procedure is not considered an NHSN operative procedure because this patient has already had a COLO procedure included in the June SSI denominator on June 2nd.
 - d.** No, the surgery is combined with the prior COLO case performed on June 2nd.
- 6.** Is there a new SSI event attributable to the June 6th COLO procedure?

- a. Yes, SSI criteria are met within the appropriate surveillance period following the June 6th COLO.
 - b. No, an SSI has already been cited for this patient on June 5th.
 - c. No, the procedure doesn't qualify for SSI surveillance.
 - d. No, there was an infection present at the time of the surgery (PATOS) on June 6th when the COLO was performed.
7. If there is an Organ/Space SSI for the June 6th COLO procedure, what specific Organ/Space infection site is met?
- a. SSI-Organ/Space, IAB (SSI-IAB) criterion 3b with a secondary BSI with MRSA
 - b. SSI-Organ/Space, IAB (SSI-IAB) criterion 3a without secondary BSI
 - c. SSI-Organ/Space, IAB (SSI-IAB) criterion 1 with a secondary BSI
 - d. SSI-Organ/Space, IAB (SSI-IAB) criterion 2b with a secondary BSI with MRSA
 - e. No SSI criteria are met.
8. If there is an SSI event attributable to the June 6th COLO procedure, how should the PATOS field be completed?
- a. PATOS = Yes
 - b. PATOS = No
 - c. The event is not an SSI and the field can be left blank.

References

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