INFECTIOUS DISEASE EPIDEMIOLOGY SECTION
LOUISIANA OFFICE OF PUBLIC HEALTH

Applying NHSN Infection Site and Field Criteria

Case Study Exercises

[1] Allen-Bridson K. The devil is in the details: applying CAUTI and CLABSI criteria accurately. *Centers for Disease Control and Prevention*. Nov 2009. Available at http://njlmn.rutgers.edu/cdr/docs/Allen-Bridson_CAUTIandCLABSICaseStudies_2009.pdf.

[2] Allen-Bridson K. The devil is in the details: applying NHSN healthcare-associated infection criteria accurately. *Centers for Disease Control and Prevention*. Aug 2009. Available at www.msic-online.org/.../MICase%20studies%20for%20MSIPC2009_%20%20answers%200727091.ppt.

[3] Allen-Bridson K. The devil is in the details: applying surgical site infection criteria accurately. *Centers for Disease Control and Prevention*. Nov 2009. Available at http://njlmn.rutgers.edu/cdr/docs/Allen-Bridson_SSICaseStudies_2009.pdf.

[4] Andrus M. Case studies. *Centers for Disease Control and Prevention.* Available at jeny.ipro.org/attachment.php?attachmentid=2845&d=1194565580.

[5] Applying NHSN infection site and field criteria: case study exercises. *National Healthcare Safety Network (NHSN).*

[6] Melchreit R et al. Applying NHSN infection site criteria: case study exercises for central line associated BSIs. *Connecticut Department of Public Health*.

DEVICE-ASSOCIATED MODULE

Case 1

James is a 28 year old patient with a central line who is 3 days post colon surgery on April 1. He spikes a fever and has blood cultures x2 drawn; on April 2, 1 set is negative, 1 bottle from the second set is positive for Bacillus cereus. His doctor orders antibiotics and notes "postop sepsis" in the chart. How should this be reported?

On April 2nd, another set of blood cultures are collected and ½ bottles grow B. cereus. Susceptibilities of the 2 organisms are shown:

Organism	Azithromycin	Cetriaxone	Gentamycin	Piperacillin	Vancomycin
#1	S	R	S	R	S
#2	S	S	S	R	S

- Is this a BSI? *Yes. The central line in place or removed within 48 hours prior to event onset.*
- If yes, what criteria? *LCBI Criterion 2 – fever > 39^{o}C, not related to another site, same CSC cultured from ≥ blood cultures drawn on separate occasions. Antibiograms do not differ for 2 or more antibiotics.*
- If yes, what date of onset? *April 1 – first date of onset*
- What if the patient was 3 weeks old? *Still a LCBI – criteria 1 and 2 can be used for patients of any age.*

Case 2

A patient with a PICC placed in another facility has been in our hospital for the past week and now has a blood culture growing Acinetobacter baumanii.

Questions:

- Is this a BSI? *Yes, criterion 1*
- Is this a CLABSI? *Yes, central line in place at time of culture*
- Should it be attributed to our hospital or to the facility that placed the PICC? *Our hospital – not present or incubating at the time of admission – apply the 48 hour rule for transfer*

What if the patient also has an increase in his sputum, and developed rales, a fever of 38C and has two chest x-rays with increased consolidation in his right lower lobe, in the two days before his blood culture?

Questions:

- Is this a BSI? *No.*
- Why or why not? *Patient now meets criteria for a PNU2: definitive chest xray, fever, new rales, positive blood culture not related to another infection (blood culture attributed to PNU2)*

Case 3

An 81 year old patient was in MICU for a week with a central line in place the entire time. Just prior to discharge from the MICU to a medical ward, the line was pulled. Within 36 hours, she became disoriented and hypotensive. Blood cultures x 2 were drawn and 3 of 4 bottles grew Micrococci and coagulase-negative staphylococci.

Questions:

- Is this a BSI? *Yes, LCBI*
- Is this a CLABSI? *Yes – central line in place in 48 hours prior to event onset*
- Criteria? *Criterion 2 – hypotension and CSC from ≥ blood cultures*
- Location of attribution? *MICU*
- Organism(s)? *Micrococci and CoNS (coagulase negative staphylococcus)*

Case 4

85-year old female admitted from an extended care facility. Recent onset confusion and urinary incontinence. Started on antibiotics. PMH: Hypertension, recent CVA, Insulin-dependent diabetic

Day 1: Temp 37.5C, pan cultured (blood, urine, sputum). Foley catheter inserted. Blood sugar 198. PICC line inserted. Admitted to ICU.
Day 3: All cultures negative, antibiotics D/Cd. Blood sugar remains unstable.
Day 6: Temp 39.5. Noted to have suprapubic tenderness and shaking chills. Pan cultures repeated, antibiotics restarted, CXR clear. PICC d/c and tip cultured.
Day 8: Urine culture ≥105 MRSA. Blood culture 2 of 3 and PICC tip positive for MRSA.
Day 10: Improving urine clear transferred back to long-term care on antibiotics.

Questions:

- Does this patient have a HAI UTI? *Yes, SUTI-1a. Fever, (suprapubic tenderness) urine culture ≥ 10^5 with no more than 2 species; catheter in place*
- If so, what type? *SUTI-1a*
- Does the patient have a bacteremia? *Yes. There's also a BSI present because of the positive blood culture*
- If so, what type? *Urosepsis. It's not a CLABSI, however, because positive blood culture due to other recognized cause.*

Case 5

8/14-A 41 year old female presents to the Emergency Room in diabetic coma and with anemia. She has a subclavian catheter inserted in the Emergency Room. The next day, in the ICU, she has a midline central catheter inserted for blood transfusions.

8/21: She develops fever to 39C, and shaking chills. 2 sets of blood cultures sent.
*8/15: Blood cultures positive for Pseudomonas aerginosa. Neither insertion site shows inflammation and there is no other documented infection

Questions:

- Is there a BSI? *Yes*
- If so, what type? *LCBI*
- Criteria? *Criterion 1. Pathogen cultured from 1 or more blood cultures.*
- If so, which line should the BSI be attributed to? *If the tip of the midline catheter does not end in one of the great vessels or at the heart, then it is not considered a central line. Therefore the CLABSI would be attributed to the subclavian line. If two central lines are in place, and if unable to identify one line as source, attribute to the oldest line. If both central lines were inserted at the same time, attribute to the one with the highest risk i.e. temporary v. tunneled, femoral v. subclavian, etc.*
- What unit should be indicated for the Location of Device Insertion field? *The Emergency Department. However, this field is optional. CLABSI will be attributed to the ICU since ED is not an inpatient location and no denominator data are collected there.*

Case 6

Day 1: One-day-old twin male infant admitted and emergently transferred to Neonatal Intensive Care Unit. Vented in isolette during transport. Peripheral IV in scalp, IV fluid at 1cc/hr with Prostin (0.05mcg/kg/min) started prior to transport, and umbilical catheter inserted upon admission to NICU.

Neonatal History: Gestational age-term infant, birth wt. 1810 grams, Apgars 8 & 9. A cardiac echocardiogram showed transposition of the great vessels of the heart.

Day 3: Repair of Patent Ductus Arteriosus and Atrial Septal Defect performed; later that day the umbilical catheter site was noted to be slightly red.
Day 4: Umbilical catheter site remained slightly red and a low grade temperature developed.
Day 5: The umbilical line was pulled, 1 blood culture was drawn and the umbilical catheter tip was sent for culture.
Day 6: Continued elevated temp of 38.1and antibiotics were started.
Day 7: The culture and umbilical catheter tip were both positive for Aerococcus sp. Antibiotics adjusted as needed for coverage. Patient clinically improving.

Questions:

- Does this patient have an HAI? *No. Because the catheter tip is not used for meeting NHSN criteria, there is only one positive blood culture for Aerococcus, a CSC. Therefore patient does not meet criteria*

- If so, what type? *No.*
- Criteria? *The baby does not meet criteria for CSEP. A positive blood culture is not included in the CSEP criteria (blood culture not done, or no growth).*
- What if both cultures were positive for Staphylococcus aureus? *LCBI – criteria 1. 1 blood culture positive for pathogen (catheter tip still not used).*

Case 7

6/4-49 year old diabetic patient admitted in diabetic coma. Patient with left foot with painful swollen, red and warm to touch, but without drainage. Subclavian line inserted in E.R. Patient admitted to MICU. Temp 37.8C. Antibiotics begun for "cellulitis"

6/6: Temp 38.2C. Hypotension. Blood cultures x 2 sets collected.
6/7: Staph aureus cultured from blood x2.

Questions:

- Does this patient have an BSI? *Yes – pathogen recovered from blood culture*
- Primary or secondary? *Secondary*
- What is the primary infection? *SKIN – criteria 2. The patient had pain, swelling, redness, and organisms were cultured form the blod*

Case 8

Carcinoma of Lung → 73 year old male admitted to Hematology/Oncology unit with bilateral upper lobe hilar lesions. Bronchoscopy and cervical spine biopsy to r/o metastatic disease. Bronch showed sqamous cell carcinoma in R. upper lobe and small cell carcinoma in L. upper lobe. Cervical spine biopsy done on 12/5 showed metastatic disease.

Past Medical History

- COPD – 2 packs/day X 30 years. Quit 6 years ago.
- Positive PPD with granuloma R. apex in 1980.
- 12/5/06 Sputum culture – oral flora, no AFB
- Appendectomy – 1965, Bilat. Inguinal herniorrhaphy – 1959
- Allergic: PCN

Operative Procedure

- Procedure: Thorocotomy and bilateral upper lobectomy
- Jack Norton, MD (204) a cardiothoracic surgeon.
- Duration: 3 hrs and 45 minutes
- Wound class 2 (clean contaminated)
- ASA class 3

Questions:

- Is there any evidence that this patient has pneumonia at the time of admission? *No*
- Does the patient have underlying pulmonary or cardiac disease? *Yes – he has lung cancer, a history of COP and a positive PPD*

Day 1: Dec. 16

- Temp 37.1°C
- Lungs with "musical" wheezes and bilateral rhonchi
- CXR – no infiltrates
- EKG – NSR
- Na 138, K 3.7, BUN 14, Creat 1.0, WBC 5.7, Hct 27

Question: Is there any evidence of PNEU? *No*

Day 2: Dec. 17

- To OR – thoracotomy and bil. upper lobectomy
- Returned to Hemonc Unit w/ ventilator and double lumen central in R. internal jugular
- 2 peripheral IV's and R. radial art line
- Foley cath patent
- R and L pleural tubes w/ air leaks

Day 3: Dec. 18

- Temp 39°
- Lungs w/ wheezes and coarse rhonchi
- Ventilator – chest tubes w/ leaks
- CXR – interval change in bilateral perihilar infiltrates, esp. upper lobes. May be postop contusion/atelectasis
- Extubated w/ subsequent respiratory distress – reintubated
- Tracheal aspirate, blood, urine, IV cath tip for culture

Questions:

- Is there any evidence of PNEU? *Yes – the patient has an elevated temp and possible infiltrates?*
- Are the criteria for PNEU met? *No – the patient has underlying pulmonary disease, so 2 positive CXRs are needed*

Day 4: Dec. 19

- Temp 37°
- CXR - ↑ edema. Possible R. pneumothorax
- Suctioned w/ thin tan blood-tinged secretions.
- Chest tubes mod. serous drainage
- R. radial art line intact
- Tracheal aspirate – gm stain – heavy polymorphonuclear leukocytes, mod Gm + cocci, few Gm neg rods

Question: Is there any evidence of PNEU? *Not really – the CXR evidence disappeared and the temp is no longer elevated.*

Day 5: Dec. 20

- Temp 37.4°
- Lungs w/ scattered rhonchi.
- Suctioned q 2-4 hrs for small/mod tan secretions
- No growth on 12/18 blood cultures.
- CXR – sl improvement in perihilar infiltrate or edema. No evidence of pneumothorax.
- Incisions healing well. Urine culture grew 100,000 *E. coli* col/ml

Questions:

- Is there any evidence of PNEU? *No*
- Is there any evidence of another infection? *Yes – the urine culture is positive*

Day 6 – Dec. 21

- Temp 38.6°
- Extubated and reintubated on evening shift
- Foley cath to gravity
- Incisions without redness.
- CXR shows R. pneumothorax and patchy densities at both lung bases
- Bilateral rales in lungs
- IV catheter tip grew 20 colonies of *S. epidermis*.
- Tracheal aspirate (12/19) grew *micrococcus* sp. And a few *P. aeruginosa*.

Questions:

- Is there any evidence of PNEU? *Yes – CXR with patchy densities, Fever = 38.6°, Rales*
- Is the criteria for PNU 1 met? *No – not without 2 CXR's and one more sign/ symptom*

Day 7: Dec. 22

- Temp 38.6°
- Respiratory secretions thick yellow
- Bronchoscopy at bedside to address poor oxygenation
- Tracheal aspirate and sputum culture sent
- CXR shows increased opacity in lower R pleural region. Change has markedly progressed since 12/20
- Episodes of bradycardia, BP in 60s

Questions:

- Is there any evidence of PNEU? *Yes – additional positive CXR, change in the character of sputum, continued rales*
- Are the criteria for PNEU met? *Yes!*
- Which PNEU criteria is met? *PNU 1*
- Is this PNEU a VAP? *Yes! The patient was intubated and ventilated at the time of the PNEU*

Day 8: Dec. 23

- Suctioned for mod. to large amts thick yellow secretions.
- Lungs w/ rhonchi throughout.
- CXR shows a progression of the alveolar infiltrative process in both lungs.
- Foley cath intact.
- Remains on pressors for BP support
- Incisions clean and dry without signs of infection
- R. internal jugular swan line and R. femoral art line intact

Day 9: Dec 24

- Tracheal aspirate from 12/22 grew P. aeruginosa.
- Continues to decompensate. Had an episode of bradycardia and hypotension and went asystolic. Pronounced dead at 2:10 am.

Question: Has PNU 1 turned into PNU 2? *No – an endotracheal aspirate does not meet the laboratory criteria*

Case 9

Trauma → 47 year old admitted to the Emergency Department following a motorcycle vs. tree accident

Presented to ED with:

- flail chest
- closed L. leg fractures
- decreasing level of consciousness

Endotracheal tube placed at scene – mechanical ventilation in progress. Peripheral IVs in both antecubital spaces. NS running wide open.

ED Management:

- Rectal exam noted guaiac trace positive.
- Lateral C-spine x-ray negative. CXR showed L. pneumothorax, R. chest contusions, lungs with scattered rhonchi.
- Traction applied to L. leg. L. leg arteriogram performed
- Endotube removed and replaced – ventilator in place.
- L. chest tube inserted to low suction w/ bloody to clear return
- R. subclavian central line inserted w/ CXR confirmation of placement
- L. antecubital IV D/C – R. continued
- Foley catheter inserted
- Type and crossmatch 4 units whole blood.
- Na 141, K 4.0, BUN 17, Creat 0.9, Hct 25

Past Medical History:

- Nonsmoker – biomedical technician
- Wt. 214
- Married w/ 2 teenage children
- Gastric reflux – controlled with OTC medication
- TST negative annually X 6
- Colonoscopy negative 2004

Day 1: Aug. 22 (admission)

- BP 114/62, p. 144, Temp 35.6°C
- WBC 10.6, Hct 25
- CXR – L. pneumonthorax. R chest contusions
- ORIF L. tibia/fibula

Question: Is there any evidence of PNEU? *No*

Day 2: Aug. 23

- Continues on ventilator
- Temp 38.4°C
- Rhonchi in lung bases. Suction q 2 hr. small amt bloody secretions. Chest tubes draining bloody fluid
- Gent and Cefazolin started
- CXR – L. pneumothorax improving – 20%
- Leg incision clean and dry – no redness or edema
- Pan cultures to lab

Day 3 – Aug. 24

- Temp 38.2°
- CXR – L. lung fully expanded. Small area atelectasis R. base
- R. leg incision w/ serous drainage
- Chest tubes removed

Day 4 – Aug. 25

- Temp 37.3°
- Extubated
- CXR – atelectasis R. base
- BS absent R. base
- Trach asp for gm stn – few leukocytes, GPC, occ. Squame, GNR, few yeast

Day 5 – Aug. 26

- Temp 39.2
- Trach asp & blood culture = MRSA
- Reintubated – on vent
- Decreased breath sounds – both bases
- CXR – new patchy infiltrate RLL

- ↑ suctioning – thin brown secretions
- Urine culture no growth – U/A wnl

Day 6: Aug. 27

- Temp 38.8°
- BS – rales R. lung
- Gent and Cefazolin d/c – Vanco started
- Suctioning copious thin yellow secretions
- Sutures removed from leg incision – healing well

Day 7-10 (Aug 28-31)

- Day 7: T. 38.6°, Rhonchi lung bases, suctioning thick tan secretions, CXR RLL infiltrate somewhat improved
- Day 8: T. 38°, some rhonchi noted, extubated, transferred out of Trauma ICU
- Day 9: T. 37°, CXR improved
- Day 10: T. 37°, BS much improved – suctioning infrequently. Leg incision healing

Case 10

62 y.o. male admitted through ED to MICU due to acute respiratory distress; H/O COPD and CAD; smoker x35 yrs, quit 3 yrs ago

- Day 1: Temp 99.3; nonpurulent cough; rhonchi in LLL and RLL; CXR – cardiomegaly with mild pulmonary edema; L subclavian line inserted; O_2 desats 96%; placed on a ventilator; NG tube feedings initiated; Foley catheter to direct drainage
- Day 2: Temp 100.6; CXR –no new findings; vent continued; urine cloudy
- Day 3: Temp 101.2; frequent suctioning needed for thick, yellow secretions; CXR – diffuse airway disease LLL; new infiltrate RUL; rales noted RUL; protected BAL – specimen to lab for culture; empiric antibiotics started; vent continued; urine cloudy
- Day 4: Temp 100.9; suctioning frequently; CXR – no change; rales continue; urine clearer
- Day 5: Temp 100.9; $\geq 10^4$ CFU/ml *Acinetobacter baumanii;* antibiotics changed
- Day 10: Temp 99.4; much improved; CXR – RUL clearer; LLL unchanged from previous films

Questions:

- Does the patient have an HAI? *Yes*
- Which type? *PNU 2*
- Is it a VAP? *Yes*

PROCEDURE-ASSOCIATED MODULE

Case 1

45 year-old male patient had colon resection (COLO) performed on 6/18

6/22: The upper aspect of the patient's abdominal wound has purulent drainage with some redness and in duration; Wound swabs sent to lab for culture; Patient started on antibiotics
6/24: Wound culture grew Enterobacter spp. and E. coli

Questions:

- Is this an SSI? *Yes*
- What type? *Superficial incisional*

Case 2

Patient is admitted to the hospital on 04/12 for elective surgery and active MRSA screening test is positive. On the same day, patient undergoes small bowel resection (SB).

4/16: Postoperative course is unremarkable; patient discharged
4/29: Patient is readmitted with a red, angry wound that is opened to the fascial level by the surgeon and is cultured.
4/30: Culture positive for MRSA

Questions:

- Is this infection considered healthcare-associated? *Yes*
- If so, what type? *Deep incisional primary*
- If so, what is the date of onset? *When the SSI was detected – 4/29*
- *Just because you're doing screening doesn't mean these aren't HAI. Just because they're colonized doesn't mean they can't get an infection*

Case 3

Which of the following does not meet the criteria for superficial incisional SSI if identified within 30 days after the procedure?

A. Physician documents "superficial wound infection"
B. Purulent drainage noted from upper aspect of incision
C. *Physician documents "cellulitis"*
D. MRSA grows from an aseptically obtained swab of the superficial incision

Case 4

Jane Doe had a spinal fusion (FUSN) on 1/22 performed

2/1: Increased back pain; Temp 38C
2/2: MRI reveals abscess in the spinal epidural space; Surgeon opened wound & drained abscess; specimen to lab for culture; notes 'infected hematoma"; antibiotics begun for epidural abscess; Culture positive for Pseudomonas aeruginosa

Questions:

- Is this an SSI? *Yes*
- If so, what type? *This is an organ space infection, so we check that it meets the SSI criteria and the target/ site criteria*

Case 5

4/8 John Smith had a tunneled central line placed in the OR, due to failure of a hemodialysis fistula during an inpatient hospitalization. He was discharged and continued on outpatient hemodialysis using the line.

8/22: JS readmitted with redness and purulent discharge at the insertion site. Blood cultures are negative.

Questions:

- Would this be an SSI? *No. It's superficial.*
- If not, and in addition to the signs/ symptoms listed, the blood culture was positive for MSSA, would this be called a BSI attributed to your facility? *No, because tunneled lines are not implants and they are accessed routinely. This is likely attributable to the outpatient dialysis facility and you should notify them.*
- What if it hadn't been a dialysis shunt, but instead was a ventricular shunt placed? Let's say the shunt had not been manipulated/ accessed and had been functioning fine. *Then because that's a permanent implant, it would be attributed to your facility because the infection occurred within one year of the operation.*

Case 6

A 66-year-old woman is admitted on Sept 9thas an inpatient having recently noticed blood in her stools.

9/10: Diagnostic investigation reveals a colon carcinoma.
9/11: Operation: hemicolectomy.
9/13: Temperature up to 38.7°C. Abscess of the abdominal wall per U/S.
9/14: I&D of the abdominal wall abscess. According to the operation report, the fascial layer is partially affected. Antibiotics begun.
9/18: Discharge from hospital on oral antibiotics Culture –E.coli.

Questions:

- Is this an HAI? *Yes*
- If Yes, what Type? *Deep incisional SSI*
- If so, what is the date of the infection? *9/13 – date of first onset*

Case 7

A 79-year-old male patient is brought from a nursing home after a fall and is admitted to hospital with a fractured neck of femur. On admission the nursing home indicates that the patient has MRSA colonization. Consequently, while the patient is still in the emergency room cultures are taken from the nose, pharynx, perineum and groin.

Day 1: HPRO completed. Antibiotic prophylaxis is administered peri-operatively.
Day 2: The patient is very confused. Temperature normal. Wound condition good.
Day 3: The results of the admission cultures of the nose and groin are positive for MRSA. The following entry is found in the patient's notes: "Patient removed the dressing several times. Recurrent confused condition. Wound edges very red and taut."
Day 5: Entry in the patient's notes: "Abscess lanced by the attending surgeon". A wound culture sent to lab. Antibiotics begun.
Day 6: Wound culture: MRSA
Day 9: Improvement in wound condition. Sent to Rehab.

Questions:

- Does this patient have an SSI? *Yes*
- If so, what Type? *Superficial incisional – lanced the wound*

Case 8

7/7 Mrs. Jones has a saphenous endoscopic harvest and a internal mammary vein used for her CAB. The ICD codes as entered are 36.12 and 36.15, both CBGB and CBGC.

Questions:

- If the saphenous vein was harvested endoscopically, what NHSN operative procedure code(s) should be entered into NHSN? *36.12*
- If Mrs. Jones develops both a leg donor site infection and a chest incision infection, do you count both as infections or only one? *Both are different infections.*
- If only one, which one? *No.*

Case 9

75 year old patient admitted for small bowel obstruction. 5/15 taken to OR and SB resection and appendectomy performed.

5/19: Patient spikes temp to 38C, has abdominal pain and emesis. Ultrasound shows fluid collection in abdominal cavity. Needle aspiration of fluid collection. Fluid sent for culture.
5/20: Culture positive for E. faecium, many neutrophils seen.

Questions:

- What surgeries are recorded in NHSN? *The small bowel only. Don't count the appendectomy because it was an incidental procedure.*
- Is this an HAI? *Yes*
- If so, what type? *Organ space*
- To what surgery is an SSI attributed if applicable? *SB resection*

Case 10

If more than one NHSN operative procedure was done through a single incision, attempt to determine the procedure that is thought to be associated with the infection. If it is not clear (as is often the case when the infection is a superficial incisional SSI), or if the infection site being reported is not an SSI, use the NHSN Principal Operative Procedure Selection Lists (Table 3) to select which operative procedure to report.

The following lists are derived from Table 1, NHSN Operative Procedure Categories. The operative procedures with the highest risk of surgical site infection are listed before those with a lower risk.

Priority	Code	Abdominal Operations
1	SB	Small bowel surgery
2	KTP	Kidney transplant
3	LTP	Liver transplant
4	BILI	Bile duct, liver or pancreatic surgery
5	REC	Rectal surgery
6	COLO	Colon surgery
7	GAST	Gastric surgery
8	CSEC	Cesarean section
9	SPLE	Spleen surgery
10	APPY	Appendix surgery
11	HYST	Abdominal hysterectomy
12	OVRY	Ovarian surgery
13	HER	Herniorrhaphy
14	CHOL	Gall bladder surgery
15	AAA	Abdominal aortic aneurysm repair
16	NEPH	Kidney surgery

17	XLAP	Laparotomy

MDRO/CDAD MODULE

Case 1

Your facility is participating in the Infection Surveillance option of the MDRO/CDAD module for *C. difficile* in your Cardiac ICU. Patient P is admitted to the hospital on Sept. 1 for a CBGB. The patient transfers from the Cardiac ICU to the Cardiac Step-down unit on Sept 3. On Sept. 5 the patient has 3 liquid stools over a 6-hour period but no other complaints or abnormal findings.

On Sept 6, the patient is complaining of abdominal pain and he is now febrile to 38.0°C. A stool sample sent for antigen testing yesterday is now positive for *C. difficile. He is started on oral Flagyl.*

Questions:

- Does this patient now have an HAI? *Yes*
- If so what type? *Gastroenteritis (GI-GE) criteria 2*
- To which unit will the infection be attributed? *To the Cardiac ICU because of the 48-hour transfer rule.*

Case 2

Your facility is participating in the Facility-Wide LabID Event option for *C. difficile.* Mrs. M is admitted April 15th to your medical ward. She had been discharged from your hospital on March 25th (i.e. 3 weeks prior). A stool sample culture sent April 15th is positive for *C. difficile* . There were no previous *C. difficile* test results for this patient.

Questions:

- How would this LabID Event be characterized in NHSN? *Community-onset healthcare facility-associated*
- What if during Mrs. M's previous admission, she HAD had an initial positive stool sample for *C. difficile* toxin A a week after her admission, for which she was treated with Metronidazole with resolution of her diarrhea? How would this current event now be characterized in NHSN? *Recurrent CDI assay; community-onset healthcare facility-associated*
- Would the April 15th LabID Event be included in your Admission Prevalence Rate? *Yes; number of non-duplicate CDI events per patient per month identified less than 3 days after admission to the location or facility / number of patient admissions to the location or facility x 100.*

This second positive C. diff test will be recognized as a recurrent CDI Assay and the LabID Event will again be characterized as a community-onset healthcare facility-associated LabID Event.

The initial LabID Event during her first admission would have been characterized as a healthcare-facility onset.

Case 3

For the month of Aug '09 your facility is following the MDRO/CDAD module of NHSN for MDR-*Klebsiella* in all of its ICUs. Both the LabID Event and Infection Surveillance options are being followed. Additionally, VAPs are included in your monthly plan for ICUS.

A previously healthy 45-year-old patient was admitted to your Trauma ICU on 8/12/09 after an MVA. The patient has suffered an open brain injury and was placed on a ventilator on admission and remains so. On 8/20 the patient has a temp of 38.3° C and has an increase in sputum which has turned dark yellow.

Questions:

- Are there HAI events which must be entered into NHSN? *Yes.*
- If so, what are they? *Although symptoms do not yet meet criteria for a VAP HAI, a LabID event (specimen source = sputum) should be entered. This will be characterized by NHSN as a healthcare facility-onset event.Klebsiella.*

Three days later on 8/23, a CXR shows opacification in his left lower lobe and his vent settings have increased. Also, 2/3 blood cultures are positive for MDR-*Klebsiella* (R- Ceftazidime).

Questions:

- Are there HAI events which must be entered into NHSN?
- If so, what are they?
- *Yes. Both the VAP (Event Type+PNEU) and a second LabID event (Specimen Source=blood) should be entered. (MDRO Infection Surveillance monitoring will be covered by entry of the VAP.) (Note: A second LabID event can only be entered if the specimen source=blood and if there are at least 14 days between a previous reported LabID blood event)*

Case 4

Patient with end stage pancreatic cancer with liver & bone mets admitted to hospital with advance directive for comfort care and antibiotics only; peripheral IV and nasal cannula inserted

- Day 4: patient is febrile and has suprapubic tenderness; IV ampicillin started after urine obtained for culture
- Day 5: difficulty breathing; CXR=infiltrate L lung base
- Day 6: urine culture results = 10^5 CFU/ml *E coli*
- Day 7: WBC/mm^3 = 3400; patchy infiltrates in both lung bases; continued episodes of dyspnea; rales noted in LLL
- Day 11: Patient expired

Questions:

- Does this patient have an HAI? *Yes*

- What type? *PNU 1, SUTI-1a*
- Device associated? *No*

Case 5

- POD 3: 66 y.o. patient in the ICU with a Foley catheter s/p exploratory lap; patient noted to be febrile (38.9°) and complained of diffuse abdominal pain
- WBC increased to 19,000. He had cloudy, foul-smelling urine and urinalysis showed 2+ protein, + nitrite, 2+ leukocyte esterase, wbc – TNTC, and 3+ bacteria. Culture was 10,000 CFU/ml *E. coli*. The abdominal pain was secondary to his surgery.

Question: Is this a UTI? *Yes – SUTI 2a*

Case 6

- 84 year old patient is hospitalized with GI bleed
- Day 3: Patient has catheter in place and no signs or symptoms of infection
- Day 9: Patient becomes unresponsive, is intubated and CBC shows WBC of 15,000. Afebrile. Patient is pan-cultured. Blood culture and urine both grow *Streptococcus pyogenes* – urine $>10^5$ CFU/ml.

Question: Is this a UTI? *Yes – ABUTI. No signs or symptoms, and positive blood culture with at least 1 matching uropathogen to the urine culture. Fever is not diagnostic for UTI in the elder, therefore fever in this age group does not disqualify from ABUTI. What if the organism in both cultures had been Micrococcus? Is it still an ABUTI? – No. Micrococcus is not on uropathogen list.*

Case 7

- 3 week old infant born at 27 weeks gestation. Umbilical catheter in place. HR 100, RR 32, and core temperature ranges between 96.5° and 95.8°. Straight cath urine culture yields $>10^5$ CFU/ml *Staphylococcus epidermidis.*
- 1 blood culture sent same day, also positive for *S. epi*. No susceptibilities provided.

Question: Is this a UTI? *Yes – ABUTI*

Case 8

45 year-old male patient had colon resection (COLO) performed on 6/18

6/22:

- The upper aspect of the patient's abdominal wound has purulent drainage with some redness and induration
- Wound swabs sent to lab for culture
- Patient started on antibiotics

6/24:

- Wound culture grew *Enterobacter* spp. and *E. coli*

Questions:

- Is this an SSI? *Yes*
- What type? *Superficial incisional primary (SIP)*

Case 9

- Patient is admitted to the hospital on 04/12 for elective surgery and active MRSA screening test is positive.
- On the same day, patient undergoes colon surgery (COLO).
- On 4/16, a deep incisional SSI is identified, and is culture positive for MRSA.

Question: Is this infection considered healthcare-associated?
Yes. The reason to try to detect colonization with MRSA (or other MDRO or C diff) is to perhaps decolonize the patient prior to certain operations to avoid the potential for subsequent infection, and to initiate prompt isolation precautions to minimize the spread of the organism. Only patients who come into the hospital with active or incubating MRSA infection (eg, have signs and symptoms of infection on admission) would not be counted as acquiring their MRSA infection in the hospital.

Case 10 **[REPEAT]**

Which of the following does not meet the criteria for superficial incisional SSI if identified within 30 days after the procedure?

a) Physician documents "superficial wound infection"
b) Purulent drainage noted from upper aspect of incision
c) Physician documents "cellulitis"
d) MRSA grows from an aseptically obtained swab of the superficial incision

Case 11

Jane Doe had a spinal fusion (FUSN) performed. 50 days later increased back pain.

MRI revealed abscess in the spinal epidural space. Surgeon opened wound & drained abscess; specimen to lab for culture. Culture positive for *Pseudomonas aeruginosa*

Example number 2 is a bit more complicated. Jane Doe had a spinal fusion procedure performed. A few days later she experienced increased back pain. An MRI revealed an abscess in the spinal epidural space. The surgeon opened the wound and the abscess was drained. A specimen was sent to the lab for culture. The culture was positive for Pseudomonas aeruginosa.

This example demonstrates using the criteria for an SSI-Spinal Abscess infection. First, since this is an organ/space SSI, we must meet the organ/space criterion first. This event meets the first two portions: infection occurs within 30 days (or 1 year if implant) and involves an organ or space. Please note that these first two criteria met are not written in the criteria section of the form, but are assumed to be met if you select this specific event type.

This event meets part c of the organ/space criterion, which is "an abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination".

Further, we must also look at the definition for Spinal abscess. Jane Doe meets both criteria 1 and 3(b). The patient had organisms cultured from an abscess in the spinal epidural space, and the patient had back pain and radiographic evidence of a spinal abscess.

Case 12

James is a 28 year old patient with a central line who is 3 days post colon surgery. He spikes a fever and has blood cultures x2 drawn; 1 set is negative, 1 bottle from the second set is positive for *Bacillus cereus*. His doctor orders antibiotics and notes "postop sepsis" in the chart.

Question: How should this be reported? *Not an HAI. Does not meet any criteria for BSI – common skin contaminant recovered from one bottle only.*

COLLECTING SUMMARY DATA

MICU – collecting patient days and device days on June 8 at noon:

Patient	ADT	Vascular	Urinary	Respiratory
101 Smith	Home @ 9 am	PICC home w/ pt	Indwelling foley at DD	02 @ 2L/min cont
102 Washington	Day 3	Peripheral IV	Bedpan – cath spec to lab	IPPB q 6 hours
103 Doe	Adm 10 am	IJ CL inserted at 2pm	Voiding	02 @ 2L/min pm
104 ----				
105 Chen	Day 2	Swan Ganz and PICC	Suprapubic to direct drainage	Intubated/ vent
106 Jones	Day 8	Subclavian CL cont	Indwelling foley to DD	Trach/ vent
107 Gonzales	D/C to nursing home @ 4pm	Peripheral line d/c at 1pm	Incontinent	Suctioned pm

1. How many patient days are counted for this MICU on June 8?
    a. 7
    b. 6
    c. 5
    d. 4
    e. 3
2. How many central line days?
    a. 6
    b. 5
    c. 3
    d. 2
    e. 0
3. How many indwelling catheter days?
    a. 6
    b. 5
    c. 4
    d. 3
    e. 2
    f. 1
4. How many ventilator days?
    a. 5
    b. 4
    c. 3
    d. 2
    e. 1