NHSN Surveillance for Urinary Tract Infections (UTI) and Multidrug-Resistant Organisms (MDRO) in Long-Term Care Facilities

Wisconsin Division of Public Health
September—October 2016

Objectives

- Provide an overview of HAI surveillance in LTC facilities
- Discuss the LTC UTI surveillance protocol and UTI case definitions
- Present UTI case studies to demonstrate practical applications of case definitions
Overview of LTC Surveillance Definitions

- First developed in 1991 by McGeer et al.
- Modified from CDC acute care definitions
- Provide standardized definitions for benchmarking and research activities
- Updated version published in 2012
- Consensus obtained from infectious disease physicians, geriatricians, infection prevention nurses
- Evidence-based review of literature
Overview: LTC Surveillance Definitions

- Intended for use in LTC facilities among older adults who require care for impaired cognition, assistance with activities of daily living or skilled nursing care
- Not designed for use in long-term care hospitals, inpatient rehabilitation facilities or pediatric LTC facilities

Guiding principles:
- Specificity: Increase likelihood that identified events are true healthcare-associated infections (HAIs).
- Sensitivity: Definitions may not be adequate for real-time case finding, diagnosis or clinical decision-making.
- Surveillance is targeted toward identifying preventable events or those with high risk of transmission.
Overview: LTC Surveillance Definitions

- HAIs are those with no evidence of incubation at time of admission to facility, and onset of symptoms occurs > 2 calendar days after admission.
- Diagnosis by a physician alone is not sufficient to meet surveillance definitions.

Consider the following when applying surveillance definitions:
- All symptoms must be new or acutely worse.
- Alternate noninfectious causes should be considered.
- Identification of an infection should not be based on a single piece of evidence but should also include clinical presentation and available microbiological and radiologic information.
Overview: LTC Surveillance Definitions

Constitutional criteria
- Standardized definitions for fever, acute change in mental status and acute functional decline are provided.
- Criteria are consistent with 2008 Infectious Disease Society of America guidelines.
- New lower threshold for fever increases sensitivity.
- Standardizes assessment of mental status and functional change using Minimum Data Set scoring system.

SHEA/CDC Position Paper


SHEA = Society for Healthcare Epidemiology of America
Surveillance for UTI

Background

- 20-30% of reported HAIs among LTC residents are UTIs.
- UTI prevalence is estimated at 25-50%, and accounts for large amount of antibiotic use.
- Risk factors
  - Age-related changes in the urinary tract
  - Co-morbid conditions resulting in neurogenic bladder
  - Instrumentation required to manage bladder voiding
Background

- Complications of catheter-associated urinary tract infections (CAUTI) include functional decline, bacteremia, septic shock, increased mortality.


Background

- UTI protocol is designed for
  - Certified skilled nursing facilities/nursing homes.
  - Intermediate/chronic care facilities for the developmentally disabled.

- Surveillance should be done facility-wide.

- For residents transferred from an acute care facility: Signs/symptoms within first 2 calendar days of admission are considered present at time of transfer and should be reported back to the transferring facility.
UTI Surveillance Protocol

Signs/symptoms of infection occurring within 2 calendar days of admission (date of admission is day 1) are considered present on admission and are not HAIs.

Example: Classification of HAI Events

<table>
<thead>
<tr>
<th>Admission date</th>
<th>June 4</th>
<th>June 5</th>
<th>June 6</th>
<th>June 7</th>
<th>June 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
<td>Day 4</td>
<td>Day 5</td>
<td></td>
</tr>
<tr>
<td>POA—not an HAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential HAI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UTI Surveillance Protocol

- A positive urine culture is necessary for diagnosis of UTI and is required for both CAUTI and non-CAUTI events.
- Voided specimen: need at least $100,000 \times 10^5$ CFU/ml of microorganisms, no more than 2 species, at least one of which is bacteria.
- Indwelling catheter: need at least $100,000 \times 10^5$ CFU/ml of any microorganisms, at least one of which is bacteria.
- If collected by in and out catheter: need at least 100 ($10^2$) CFU/ml of any number of organisms, at least one of which is bacteria.
UTI Surveillance Protocol

- Before urine samples for culture are obtained from residents with chronic catheters (in place for more than 14 days) the original catheter should be replaced and specimen obtained from the new catheter.
- Repeat cultures, or “tests of cure” are not recommended.

UTI Definitions

- Date of event: date when the first clinical evidence (signs/symptoms) of the UTI appeared, OR, the date of specimen collection, whichever comes first.
- Symptomatic UTI (SUTI): resident has signs/symptoms localized to the urinary tract (e.g., acute dysuria, new/marked increased frequency, suprapubic tenderness).
UTI Definitions

- CA-SUTI: resident develops signs/symptoms localized to urinary tract while indwelling catheter is in place, OR, removed within the 2 calendar days prior to the date of the event (where day of catheter removal is day 1).
  
  Note: catheter must be in place for a minimum of 2 calendar days prior to onset of infection (date of event).

<table>
<thead>
<tr>
<th></th>
<th>June 1</th>
<th>June 2</th>
<th>June 3</th>
<th>June 4</th>
<th>June 5</th>
<th>June 6</th>
<th>June 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1 insertion</td>
<td>Day 2 insertion</td>
<td>Day 3 insertion</td>
<td>Day 1 removal</td>
<td>Day 2 removal</td>
<td>Day 3 removal</td>
<td>Day 4 removal</td>
<td></td>
</tr>
<tr>
<td>Not CA-SUTI event days</td>
<td>Potential CA-SUTI event days</td>
<td>Not an event day</td>
<td>Not an event day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

June 1 June 2 June 3 June 4 June 5 June 6 June 7
Day 1 insertion Day 2 insertion Day 3 insertion Day 1 removal Day 2 removal Day 3 removal Day 4 removal
Not CA-SUTI event days Potential CA-SUTI event days Not an event day Not an event day
UTI Definitions

- Indwelling urinary catheter: a drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a closed collection system (also called a Foley catheter).
- Straight in and out, condom and suprapubic catheters are not indwelling catheters.
  Note: UTIs in residents managed with non-indwelling catheters will be considered SUTIs, not CA-SUTIs.

Asymptomatic bacteremic UTI (ABUTI): resident has no signs/symptoms localizing to the urinary tract but has urine and blood cultures positive for at least one matching organism, whether or not a catheter is in place.
Examples of Matching Organisms

<table>
<thead>
<tr>
<th>Culture</th>
<th>Companion culture</th>
<th>Report as</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus epidermidis</em></td>
<td>Coagulase-negative staphylococci</td>
<td><em>S. epidermidis</em></td>
</tr>
<tr>
<td><em>Klebsiella oxytoca</em></td>
<td><em>Klebsiella</em> spp.</td>
<td><em>K. oxytoca</em></td>
</tr>
<tr>
<td><em>Streptococcus salivarius</em></td>
<td><em>Strep viridans</em></td>
<td><em>S. salivarius</em></td>
</tr>
</tbody>
</table>

LTCF UTI Protocol 2016 Updates

- Presence of a fever, even if due to another cause, should be counted as part of meeting the surveillance definition of a UTI.
- Yeast and other non-bacterial microorganism are no longer considered UTI-associated pathogens.
- Addition to denominator data: new antibiotic starts for UTI indication.
Resident without an indwelling catheter (Meets criteria 1a OR 2a OR 3a):

**SUTI - Criteria 1a**

Either of the following:
1. Acute dysuria
2. Acute pain, swelling, or tenderness of the testes, epididymis or prostate

**OR**

Either of the following:
1. Fever*^1
2. Leukocytosis^2

**AND**

One or more of the following:
- Costovertebral angle pain or tenderness
- New or marked increase in suprapubic tenderness
- Gross hematuria
- New or marked increase in incontinence
- New or marked increase in urgency
- New or marked increase in frequency

**SUTI**

* Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever (e.g., pneumonia)

**SUTI - Criteria 2a**

**Resident with an indwelling catheter:**

**CA-SUTI - Criteria**

One or more of the following:
- Fever*^3
- Rigors
- New onset hypotension with no alternate noninfectious cause
- New onset functional decline AND Leukocytosis^4
- New costovertebral angle pain or tenderness
- New or marked increase in suprapubic tenderness
- Acute pain, swelling, or tenderness of the testes, epididymis or prostate
- Persistent drainage from around the catheter

**AND**

Any of the following:

1. Specimen collected from clean catch voided urine and positive culture with no more than 2 species of microorganisms, at least one of which is bacteria of ≥10⁵ CFU/ml
2. Specimen collected from an indwelling catheter and positive culture with any microorganism, at least one of which is bacteria of ≥10⁵ CFU/ml
3. Specimen collected from indwelling catheter and positive culture with any microorganism, at least one of which is bacteria of ≥10⁶ CFU/ml

**CA-SUTI**

* Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever (e.g., pneumonia)

^1 Fever: Single temperature ≥37.8°C (>100°F), or ≥37.2°C (>99°F) on repeated occasions, or an increase of >1.1°C (>2°F) over baseline

^2 Leukocytosis: >14,000 cells/mm³, or Left shift (>6% or 1,500 bands/mm³)

^3 Indwelling urinary catheters which have been in place for >14 days should be changed prior to specimen collection, but failure to change catheter does not exclude a UTI for surveillance purposes
Resident with or without an indwelling catheter:

**ABUTI Criteria**

Resident has no localizing urinary signs or symptoms (i.e., no urgency, frequency, acute dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness). If no catheter is in place, fever as only sign would not exclude ABUTI if other positive culture criteria are met.

Any of the following:
1. Specimen collected from clean catch voided urine and positive culture with no more than 2 species of microorganisms, at least one of which is bacteria of \(10^8\) CFU/ml
2. Specimen collected from in situ straight catheter and positive culture with any microorganism, at least one of which is bacteria of \(10^5\) CFU/ml
3. Specimen collected from indwelling catheter and positive culture with any microorganism, at least one of which is bacteria of \(10^3\) CFU/ml

**NOTE:** Yeast and other microorganisms which are not bacteria, are not acceptable UTI pathogens

AND

Positive blood culture with at least 1 matching organism in urine culture

**ABUTI**
### Event Details

#### Specify Criteria Used: (check all that apply)

- Fever: Single temperature ≥ 37.8°C (>100°F) or ≥ 37.2°C (>99°F) on repeated occasions, or an increase of >1.1°C (>2°F) over baseline
- Rigors
- New onset hypotension
- New onset confusion/fatigue/functional decline
- Acute pain, swelling, or tenderness of the testes, epididymis, or prostate
- Acute dysuria
- Purulent drainage at catheter insertion site
- New and/or marked increase in (check all that apply):
  - Urgency
  - Costovertebral angle pain or tenderness
  - Frequency
  - Suprapubic tenderness
  - Incontinence
  - Visible (gross) hematuria

#### Laboratory & Diagnostic Testing

- Specimen collected from clean catch voided urine and positive culture with ≥ 10^5 CFU/mL of no more than 2 species of microorganisms.
- Specimen collected from indwelling catheter and positive culture with ≥ 10^6 CFU/ml of any microorganisms.
- Leukocytosis (> 14,000 cells/mm^3), or Left shift (> 5% or 1,500 bands/mm^3)
- Positive blood culture with 1 matching organism in urine culture

### Urinary Tract Infection (UTI) for LTCF

#### Gram-positive Organisms

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>S. epidermidis</th>
<th>S. haemolyticus</th>
<th>S. saprophyticus</th>
<th>Enterococcus faecium</th>
<th>Enterococcus faecalis</th>
<th>Enterococcus spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP/LEV/DOX</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>CLIND</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>DAPTO</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>GEN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>MNZ</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>VANC</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
</tbody>
</table>

#### Gram-negative Organisms

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>S. marcescens</th>
<th>E. coli</th>
<th>K. pneumoniae</th>
<th>P. aeruginosa</th>
<th>S. aureus</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMK</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>AMP</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>AZT</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>CEF</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>CSF</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>CSPTAZ</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>CIPRO/LEVO</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>COL</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>PR</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>GEN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>MIN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>MER</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>MERO</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>PIP</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>PIP/TAZ</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>TETRA</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
<tr>
<td>DOXY/MMO</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
<td>SIRN</td>
</tr>
</tbody>
</table>

---

29

---

30
UTI Denominator Data

- **Catheter-days**
  - Defined as the number of residents with an indwelling urinary catheter; collected daily for all residents in the facility and totaled at the end of the month.

- **Resident-days**
  - Calculated using the daily census of residents in the facility each day of the month and totaled at the end of the month.

Note: If a resident is transferred to an acute care facility for a suspected UTI, no additional indwelling catheter days are counted after the day of transfer.

---

UTI Denominator Data

- **New antibiotic starts for UTI indication**
  - May be collected daily or summarized at end of month
  - New prescription for an antibiotic ordered for a resident suspected or diagnosed with a UTI regardless of whether the UTI meets the NHSN definition
  - No minimum doses or days of therapy required to count—include all new orders
  - Include only antibiotics started while resident is receiving care in your facility, either by facility providers or outside ER or outpatient physicians
  - Antibiotics started by another facility prior to admission or readmission are not included
UTI Data Calculations

Total UTI incidence rate/1,000 resident-days
number of UTI events (SUTI + CA-SUTI + ABUTI)/total resident-days x 1,000

- % SUTI = number of SUTI events/total number of UTI events x 100
- % CA-SUTI = number of CA-SUTI events/total number of UTI events x 100
- % ABUTI = number of ABUTI events/total number of UTI events x 100
UTI Data Calculations

SUTI incidence rate/1,000 resident-days

\[
\text{number of SUTI events/total resident-days minus total catheter-days x 1,000}
\]

These events are not catheter-associated.

UTI Data Calculations

CA-SUTI incidence rate/1,000 catheter-days

\[
\text{number of CA-SUTI events/total catheter-days x 1,000}
\]

Only symptomatic events which develop at the time an indwelling catheter is in place or recently removed (within last 2 calendar days) will contribute to the CA-SUTI rate.
UTI Data Calculations

**Urinary catheter utilization ratio**

total urinary catheter-days/total resident-days

**UTI Data Calculations**

**UTI treatment ratio**

new antibiotic starts for UTI/total UTI count
(SUTI + ABUTI + CA-SUTI)
UTI Module Test Questions

Question 1:
Incidence for symptomatic urinary tract infections (SUTI) is calculated using:

A. Total number of SUTIs for a given time period in the numerator and total number of resident-days for the same time period in the denominator.
B. Total number of SUTIs for a given time period in the denominator and total number of resident-days for the same time period in the numerator.
C. Total number of SUTIs for a given time period in the numerator and total number of resident-days minus the total number of indwelling catheter-days for the same time period in the denominator.
D. Total number of SUTIs and catheter-associated UTIs for a given time period in the numerator and total number of indwelling catheter-days for the same time period in the denominator.
UTI Module Test Questions

Question 2:

Which of the following is true regarding the 2016 UTI protocol for long-term care facilities?
A. Presence of a fever is no longer a part of the UTI surveillance definition.
B. Yeast and other non-bacterial microorganisms are no longer considered UTI-associated pathogens.
C. The date of event is now considered the first date when ALL signs and symptoms that meet the UTI surveillance definition are present.
D. A and B

Surveillance for MDRO
Background

MDRO module includes surveillance for
- *C. difficile* infections (CDI)
- Methicillin sensitive *S. aureus* (MSSA)
- Methicillin-resistant *S. aureus* (MRSA)
- Vancomycin-resistant *Enterococcus* spp. (VRE)
- Cephalosporin-resistant *Klebsiella* spp.
- Carbapenem-resistant *E. coli* and *Klebsiella* spp. (CRE)
- Multidrug-resistant *Acinetobacter* spp.

A large proportion of LTC residents are at risk for MDRO carriage; infections with MDRO are associated with increased lengths of stay, hospitalizations, readmissions, healthcare costs and mortality.

- Both MDRO and CDI prevalence is increasing.
- CDC Threat Report 2013:
Background

- Purpose of CDI/MDRO protocol is to enable facilities to collect, report and analyze data that will inform infection prevention strategies.
- Two components of the protocol:
  - CDI
  - MDRO
- Protocols based on laboratory test data to be used without clinical evaluation of the resident.
- Data are collected facility-wide.

Prevention Resources


- APIC Guide to Preventing C. difficile Infections
Prevention Resources

  [Link](http://www.cdc.gov/hicpac/pdf/MDRO/MDROGuideline2006.pdf)

  [Link](http://www.dhs.wisconsin.gov/publications/P4/P42513.pdf)

- DPH Guidance for Prevention of Transmission of CRE in Skilled Nursing Facilities  
  [Link](https://www.dhs.wisconsin.gov/publications/p0/p00532.pdf)

CRE Surveillance Protocol

- Laboratory-based, with no clinical evaluation of the resident.
- Surveillance is conducted facility-wide.
CRE Definition

CRE: Any *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, or *Enterobacter* spp. determined to produce a carbapenemase (i.e., KPC, NDM, VIM, IMP, OXA-48) using a recognized test (e.g., polymerase chain reaction, metallo-β-lactamase test, modified-Hodge test, Carba-NP).

Source: National Healthcare Safety Network (NHSN)

Laboratory-identified MDRO Event in LTCF


Resident name ___________________
Record number_________________ Date of admission_________ Date of previous MDRO culture result_________
Date of review_______________ Date of event___________ (date of specimen collection)

MDRO laboratory-identified event (MDRO LabID)

- Individual is receiving care at the LTCF at time of specimen collection
- Specimen is collected for clinical assessment purposes (not active surveillance testing)
- One of the following definitions of a unique laboratory event is met
  - MDRO isolate is the first one obtained in the calendar month from any specimen source (e.g., urine, wound, sputum, blood) for the resident (if source is blood, a prior positive blood culture with the same MDRO must not occur ≤14 days before the current blood culture, even if in different calendar months)
  - MDRO isolate the first obtained from a blood source in the calendar month (with no prior positive blood culture with the same MDRO ≤14 days before the current blood culture). A prior MDRO may or may not have been obtained from another source (e.g., urine, wound, sputum)
CRE Denominator Data

Resident-days

- Calculated using the daily census of residents in the facility each day of the month and totaled at the end of the month.
**CRE Data Calculations**

**Total CRE rate**

\[
\text{number of CRE LabID events per month/number of resident-days per month} \times 1,000
\]

---

**CRE Response**

- Report to DPH HAI Prevention Program.
- Follow DPH CRE response protocol in the nursing home toolkit.
- DPH CRE webpage [http://www.dhs.wisconsin.gov/communicable/ARO/CRE.htm](http://www.dhs.wisconsin.gov/communicable/ARO/CRE.htm)
- DPH CRE toolkit for skilled nursing facilities [https://www.dhs.wisconsin.gov/publications/p0/p00532.pdf](https://www.dhs.wisconsin.gov/publications/p0/p00532.pdf)
CRE Report

http://www.dhs.wisconsin.gov/publications/P0/P00578.pdf

Links

NHSN MDRO/CDI protocol

NHSN denominator form
http://www.cdc.gov/nhsn/PDFs/LTC/forms/57.142_DenominatorLTCF_BLANK.pdf

DPH MDRO/CDI surveillance worksheet
Surveillance for CDI

- Report positive *C. difficile* laboratory assays obtained from any resident receiving care at the facility.
- Do not include tests obtained when the resident was not admitted to the facility.
- Number of resident admissions and number of resident-days are recorded for each month.
- Testing should be done only on liquid or watery stool samples (i.e., conforming to the shape of the container).
CDI Definitions

- *C. difficile* positive laboratory assay: a positive result for *C. difficile* toxin A or B by enzyme immunoassay (EIA), OR, a toxin-producing organism detected in the stool by culture or other laboratory means (nucleic acid amplification testing by PCR)
- Duplicate *C. difficile* positive laboratory assay: any *C. difficile* positive test from the same resident following a previous positive test within the past two weeks

CDI laboratory-identified (LabID) event: all non-duplicate positive assays obtained while a resident is receiving care in the LTC facility. Laboratory results obtained from outside facilities should not be considered LabID events.
CDI Definitions

- Incident CDI LabID event: the first event ever reported for a resident, OR, a subsequent event reported > 8 weeks after the most recent LabID event reported.
- Recurrent CDI LabID event: any LabID event reported > 2 weeks and ≤ 8 weeks after the most recent LabID event reported.

CDI Definitions

- Community-onset (CO) LabID event: date specimen collected is ≤ 3 calendar days from the date of current admission to the facility (i.e., days 1, 2, or 3 of admission).
- Long-term care facility-onset (LO) LabID event: date specimen collected is > 3 calendar days after current admission to the facility (i.e., on or after day 4).
### CDI Definitions

**Example: Classification of CDI LabID Events as CO or LO**

<table>
<thead>
<tr>
<th>Admission date</th>
<th>June 5</th>
<th>June 6</th>
<th>June 7</th>
<th>June 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 2</td>
<td>Day 3</td>
<td>Day 4</td>
<td>Day 5</td>
</tr>
</tbody>
</table>

- **Community-onset (CO)**
- **Long-term care facility-onset (LO)**

---

**Laboratory-identified *C. difficile* Infection Event in LTCF**


<table>
<thead>
<tr>
<th>Resident name</th>
<th>Record number</th>
<th>Date of admission</th>
<th>Date of previous positive <em>C. difficile</em> test result</th>
<th>Date of review</th>
<th>Date of event (date of specimen collection)</th>
</tr>
</thead>
</table>

**C. difficile infection laboratory-identified event (CDI LabID)**

- Individual is receiving care at the LTCF at the time of specimen collection
- Stool specimen to be tested conforms to the collection container
- A positive *C. difficile* test result is obtained by at least one of the following laboratory methods
  - Detection of *C. difficile* toxin A or B by enzyme immunoassay (EIA)
  - Detection of a toxin-producing *C. difficile* organism by stool culture or by other laboratory means (e.g., nucleic acid amplification by PCR)
- Any previous *C. difficile* positive test result was obtained >14 days prior to the current test result
CDI Denominator Data

Monthly totals for:
- Resident-days
- Resident admissions
CDI Data Calculations

Total CDI rate/10,000 resident-days

number of CDI LabID events per month/number of resident days per month x 10,000

CDI Data Calculations

CDI LTC facility-onset incidence rate/10,000 resident days

number of all incident LO CDI LabID events per month/number of resident days x 10,000

(This formula excludes recurrent CDI events.)
CDI Data Calculations

Percent community-onset
number of CO CDI LabID events/total number of CDI LabID events x 100

Percent LTC facility-onset
number of LO CDI LabID events/total number of CDI LabID events x 100

Percent recurrent CDI
number of recurrent CDI LabID events/total number of CDI LabID events x 100

DPH HAI Prevention Program

Gwen Borlaug, CIC, MPH
HAI Program Coordinator
1 West Wilson Street Room 272
Madison, Wisconsin 53702
608-267-7711
gwen.borlaug@wi.gov

Ashlie Dowdell
HAI Surveillance Coordinator
1 West Wilson Street Room 272
Madison, Wisconsin 53702
608-266-1122
ashlie.dowdell@wi.gov