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

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Overview of LTC Surveillance Definitions

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Overview: 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

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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

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Overview: LTC Surveillance Definitions

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.

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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.

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Overview: LTC 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.

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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.

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SHEA/CDC Position Paper

Stone ND, Ashraf MS, Calder J, et al. Surveillance definitions in long-term care facilities: Revisiting the McGeer criteria. *Infect Control Hosp Epidemiol* 2012;33(10):965-977.

SHEA = Society for Healthcare Epidemiology of America

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Surveillance for UTI

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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

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Background

- Complications of catheter-associated urinary tract infections (CAUTI) include functional decline, bacteremia, septic shock, increased mortality.
- 2009 CDC Guideline for the Prevention of CAUTI can be accessed at

http://www.cdc.gov/hicpac/cauti/002_cauti_toc.html

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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.

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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				
Admission date June 4	June 5	June 6	June 7	June 8
Day 1	Day 2	Day 3	Day 4	Day 5
POA—not an HAI		Potential HAI		

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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 (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 (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.

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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.

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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).

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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).

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UTI Definitions

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

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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.

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UTI Definitions

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.

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Examples of Matching Organisms

Culture	Companion culture	Report as
Staphylococcus epidermidis	Coagulase-negative staphylococci	*S. epidermidis*
Klebsiella oxytoca	*Klebsiella* spp.	*K. oxytoca*
Streptococcus salivarius	*Strep viridans*	*S. salivarius*

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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.

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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

SUTI - Criteria 2a

Either of the following:
1. Fever[+ a]
2. Leukocytosis[b]

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

OR

SUTI - Criteria 3a

TWO 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

AND

Either 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 $\geq 10^5$ CFU/ml
2. Specimen collected from in/out straight catheter and positive culture with any microorganism, at least one of which is bacteria of $\geq 10^2$ CFU/ml

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

SUTI

[+] Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever (e.g., pneumonia)
[a] Fever: Single temperature ≥ 37.8ºC (>100ºF), or > 37.2ºC (>99ºF) on repeated occasions, or an increase of >1.1ºC (>2ºF) over baseline
[b] Leukocytosis: >14,000 cells/mm^3, or Left shift (> 6% or 1,500 bands/mm^3)

Resident *with* an indwelling catheter:

CA-SUTI – Criteria

ONE or more of the following:
- ❑ Fever[+ a]
- ❑ Rigors
- ❑ New onset hypotension, with no alternate noninfectious cause
- ❑ New onset confusion/functional decline **AND** Leukocytosis[b]
- ❑ New costovertebral angle pain or tenderness
- ❑ New or marked increase in suprapubic tenderness
- ❑ Acute pain, swelling or tenderness of the testes, epididymis or prostate
- ❑ Purulent discharge from around the catheter

AND

Any of the following:

If urinary catheter removed within last 2 calendar days:
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 $\geq 10^5$ CFU/ml
2. Specimen collected from in/out straight catheter and positive culture with any microorganism, at least one of which is bacteria of $\geq 10^2$ CFU/ml

If urinary catheter in place:
3. Specimen collected from indwelling catheter[c] and positive culture with any microorganism, at least one of which is bacteria of $\geq 10^5$ CFU/ml

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

CA-SUTI

[+] Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever (e.g., pneumonia)
[a] Fever: Single temperature ≥ 37.8ºC (>100ºF), or > 37.2ºC (>99ºF) on repeated occasions, or an increase of >1.1ºC (>2ºF) over baseline
[b] Leukocytosis: >14,000 cells/mm^3, or Left shift (> 6% or 1,500 bands/mm^3)
[c] 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.*

↓

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 $\geq 10^5$ CFU/ml
2. Specimen collected from in/out straight catheter and positive culture with any microorganism, at least one of which is bacteria of $\geq 10^5$ CFU/ml
3. Specimen collected from indwelling catheter and positive culture with any microorganism, at least one of which is bacteria of $\geq 10^5$ 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

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Form Approved
OMB No. 0920-0666
Exp. Date: 12/31/2018
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Urinary Tract Infection (UTI) for LTCF

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*Facility ID:	Event #:
*Resident ID:	*Social Security #:
Medicare number (or comparable railroad insurance number):	
Resident Name, Last: First:	Middle:
*Gender: M F Other	*Date of Birth: __/__/____
Ethnicity (specify):	Race (specify):

*Resident type: ☐ Short-stay ☐ Long-stay

*Date of First Admission to Facility: __/__/____ *Date of Current Admission to Facility: __/__/____

*Event Type: UTI *Date of Event: __/__/____

*Resident Care Location: _____

*Primary Resident Service Type: (check one)

☐ Long-term general nursing ☐ Long-term dementia ☐ Long-term psychiatric

☐ Skilled nursing/Short-term rehab (subacute) ☐ Ventilator ☐ Bariatric ☐ Hospice/Palliative

*Has resident been transferred from an acute care facility to your facility in the past 3 months? ☐ Yes ☐ No

If Yes, date of last transfer from acute care to your facility: __/__/____

If Yes, did the resident have an indwelling urinary catheter at the time of transfer to your facility? ☐ Yes ☐ No

*Indwelling Urinary Catheter status at time of event onset (check one):

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☐ In place ☐ Removed within last 2 calendar days ☐ Not in place

If indwelling urinary catheter status in place or removed within last 2 calendar days:

Site where indwelling urinary catheter Inserted (check one): ☐ Your facility ☐ Acute care hospital ☐ Other ☐ Unknown

Date of indwelling urinary catheter Insertion: ___/___/_____

If indwelling urinary catheter not in place, was another urinary device type present at the time of event onset? ☐ Yes ☐ No

If Yes, other device type: ☐ Suprapubic ☐ Condom (males only) ☐ Intermittent straight catheter

Event Details

*Specify Criteria Used: (check all that apply)

Signs & Symptoms

☐ 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/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 in/out straight catheter and positive culture with ≥ 10^2 CFU/ml of any microorganisms

☐ Specimen collected from indwelling catheter and positive culture with ≥ 10^5 CFU/ml of any microorganisms

☐ Leukocytosis (> 14,000 cells/mm^3), or Left shift (> 6% or 1,500 bands/mm^3)

☐ Positive blood culture with 1 matching organism in urine culture

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Urinary Tract Infection (UTI) for LTCF

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Pathogen #	Gram-positive Organisms							
_____	*Staphylococcus* coagulase-negative (specify species if available): _____	VANC S I R N						
_____	____*Enterococcus faecium* ____*Enterococcus faecalis* ____*Enterococcus* spp. (Only those not identified to the species level)	DAPTO S N S N	GENTHL§ S R N	LNZ S I R N	VANC S I R N			
_____	*Staphylococcus aureus*	CIPRO/LEVO/MOXI S I R N	CLIND S I R N	DAPTO S N S N	DOXY/MINO S I R N	ERYTH S I R N	GENT S I R N	LNZ S R N
		OX/CEFOX/METH S I R N	RIF S I R N	TETRA S I R N	TIG S N S N	TMZ S I R N	VANC S I R N	
Pathogen #	Gram-negative Organisms							
_____	*Acinetobacter* (specify species) _____	AMK S I R N	AMPSUL S I R N	AZT S I R N	CEFEP S I R N	CEFTAZ S I R N	CIPRO/LEVO S I R N	COL/PB S I R N
		GENT S I R N	IMI S I R N	MERO/DORI S I R N		PIP/PIPTAZ S I R N	TETRA/DOXY/MINO S I R N	
		TMZ	TOBRA					

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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.

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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

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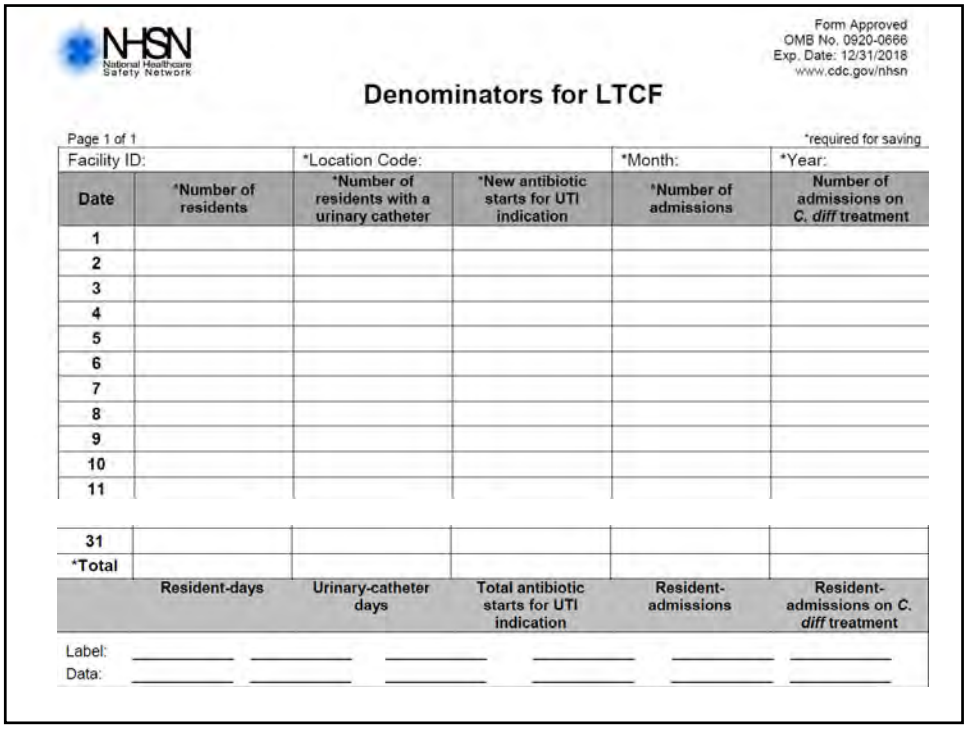

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OMB No. 0920-0666
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Denominators for LTCF

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Facility ID:		*Location Code:		*Month:	*Year:
Date	***Number of residents**	***Number of residents with a urinary catheter**	***New antibiotic starts for UTI indication**	***Number of admissions**	**Number of admissions on *C. diff* treatment**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
31					
*Total					
	Resident-days	**Urinary-catheter days**	**Total antibiotic starts for UTI indication**	**Resident-admissions**	**Resident-admissions on *C. diff* treatment**

Label: _____ _____ _____ _____ _____ _____

Data: _____ _____ _____ _____ _____ _____

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

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UTI Data Calculations

SUTI incidence rate/1,000 resident-days

number of SUTI events/total resident-days minus total catheter-days x 1,000

These events are not catheter-associated.

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UTI Data Calculations

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

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.

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UTI Data Calculations

Urinary catheter utilization ratio

total urinary catheter-days/total resident-days

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UTI Data Calculations

UTI treatment ratio

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

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Links

NHSN LTC UTI protocol
http://www.cdc.gov/nhsn/pdfs/ltc/ltcf-uti-protocol-current.pdf

NHSN UTI event form
http://www.cdc.gov/nhsn/forms/57.140_uti_ltcf_blank.pdf

NHSN denominator form
http://www.cdc.gov/nhsn/forms/57.142_denominatorltcf_blank.pdf

NHSN Table of Instructions
http://www.cdc.gov/nhsn/forms/instr/57.140-toi-uti-toi_final.pdf

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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.

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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

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Surveillance for MDRO

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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.

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Background

- 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: http://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf

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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.

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Prevention Resources

- APIC Guide to the Elimination of MRSA Transmission in Hospital Settings, 2nd Edition.
  http://www.apic.org/Resource_/EliminationGuideForm/631fcd91-8773-4067-9f85-ab2a5b157eab/File/MRSA-elimination-guide-2010.pdf
- APIC Guide to Preventing *C. difficile* Infections
  http://www.apic.org/Resource_/EliminationGuideForm/59397fc6-3f90-43d1-9325-e8be75d86888/File/2013CDiffFinal.pdf

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Prevention Resources

- CDC Management of MDRO in Healthcare Settings, 2006.
  http://www.cdc.gov/hicpac/pdf/MDRO/MDROGuideline2006.pdf
- DPH Guidelines for Prevention and Control of Antibiotic Resistant Organisms in Healthcare Settings, 2005.
  http://www.dhs.wisconsin.gov/publications/P4/P42513.pdf
- DPH Guidance for Prevention of Transmission of CRE in Skilled Nursing Facilities
  https://www.dhs.wisconsin.gov/publications/p0/p00532.pdf

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CRE Surveillance Protocol

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

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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)

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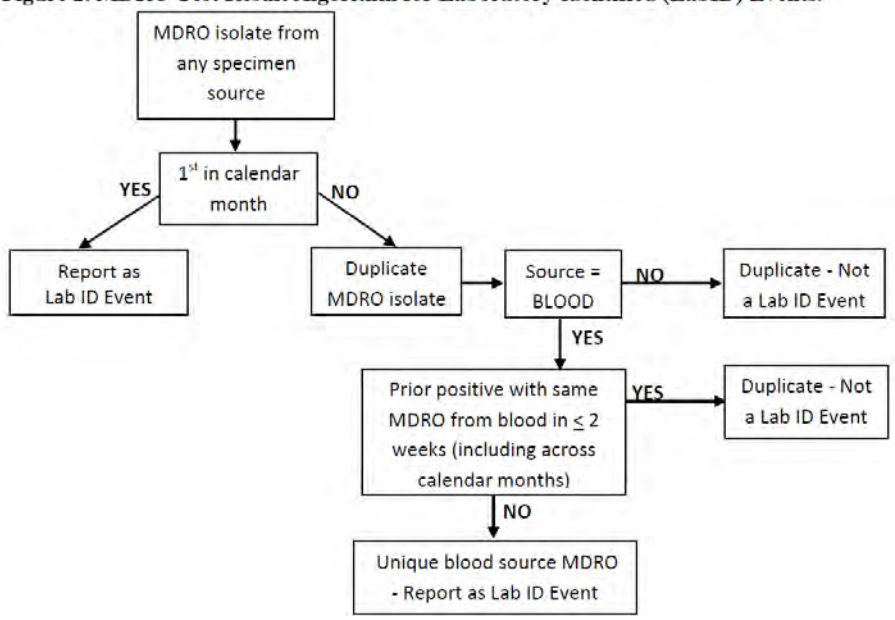
Laboratory-identified MDRO Event in LTCF
NHSN LTCF MDRO/*C. difficile* protocol http://www.cdc.gov/nhsn/PDFs/LTC/LTCF-LabID-Event-Protocol_FINAL_8-24-12.pdf

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
AND
□ Specimen is collected for clinical assessment purposes (not active surveillance testing)
AND
□ 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)

Figure 2. MDRO Test Result Algorithm for Laboratory-identified (LabID) Events.



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.

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CRE Data Calculations

Total CRE rate

number of CRE LabID events per month/number of resident-days per month x 1,000

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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
- DPH CRE toolkit for skilled nursing facilities https://www.dhs.wisconsin.gov/publications/p0/p00532.pdf

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CRE Report

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

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Links

NHSN MDRO/CDI protocol

http://www.cdc.gov/nhsn/PDFs/LTC/LTCF-LabID-Event-Protocol_FINAL_8-24-12.pdf

NHSN denominator form

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

DPH MDRO/CDI surveillance worksheet

http://www.dhs.wisconsin.gov/communicable/HAI/Worksheets/LTCFMDROCdiff.pdf

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Surveillance for CDI

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CDI Surveillance

- 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).

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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

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CDI Definitions

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.

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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.

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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).

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CDI Definitions

Example: Classification of CDI LabID Events as CO or LO				
Admission date June 4	June 5	June 6	June 7	June 8
Day 1	Day 2	Day 3	Day 4	Day 5
Community-onset (CO)			Long-term care facility-onset (LO)	

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Laboratory-identified *C. difficile* Infection Event in LTCF
NHSN LTCF MDRO/*C. difficile* protocol http://www.cdc.gov/nhsn/PDFs/LTC/LTCF-LabID-Event-Protocol_FINAL_8-24-12.pdf

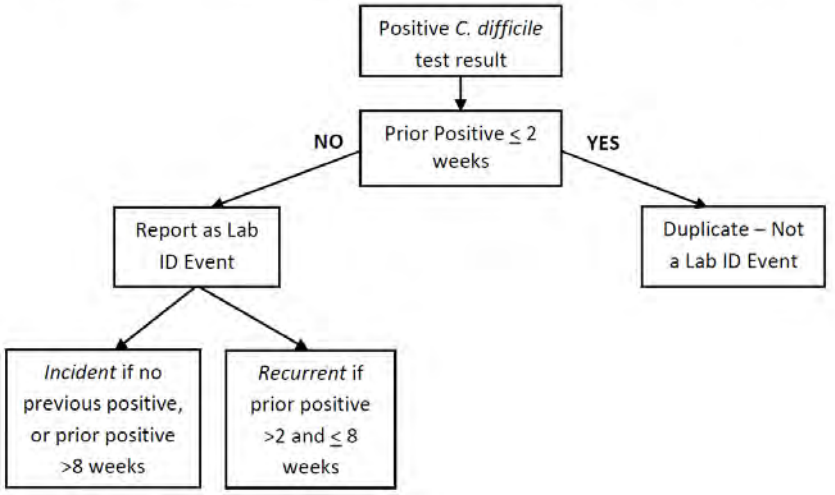
Resident name _____
Record number_____Date of admission_____Date of previous positive *C. difficile* test result_____
Date of review_____Date of event_____ (date of specimen collection)

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

□ Individual is receiving care at the LTCF at the time of specimen collection
AND
□ Stool specimen to be tested conforms to the collection container
AND
□ A positive *C. difficile* test result is obtained by at least one of the following laboratory methods
- o detection of *C. difficile* toxin A or B by enzyme immunoassay (EIA)
- o detection of a toxin-producing *C. difficile* organism by stool culture or by other laboratory means (e.g., nucleic acid amplification by PCR)

AND
□ Any previous *C. difficile* positive test result was obtained >14 days prior to the current test result

Figure 1. *C. difficile* Test Result Algorithm for Laboratory-identified (LabID) Events.



CDI Denominator Data

Monthly totals for:

- Resident-days
- Resident admissions

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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

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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.)

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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

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