



# NHSN Definitions



National Healthcare Safety Network Class  
Richmond, California  
August 17-18, 2016

Vicki Keller and Lori Schaumleffel  
Healthcare-Associated Infections Program  
Center for Healthcare Quality  
California Department of Public Health

# Acknowledgment

Information in this presentation is from the  
NHSN training courses  
[www.cdc.gov/nhsn](http://www.cdc.gov/nhsn)



# Objectives

- Review NHSN definitions
- Introduce the NHSN Surveillance Worksheet
- Apply definitions to case-study examples

# NHSN Surveillance Definitions

	SSI	LabID	VAE	BSI	CAUTI
Infection Window Period	N/A	Not Applicable	Not Applicable	Yes	Yes
Date of Event	Yes			Yes	Yes
POA	N/A			Yes	Yes
HAI	N/A			Yes	Yes
Repeat Infection Timeframe	N/A			Yes	Yes
Secondary BSI Attribution Period	*			N/A	Yes

\*See SSI specific guidance



[http://www.cdc.gov/nhsn/PDFs/pscManual/2PSC\\_IdentifyingHAIs\\_NHSNcurrent.pdf](http://www.cdc.gov/nhsn/PDFs/pscManual/2PSC_IdentifyingHAIs_NHSNcurrent.pdf)

# Infection Window Period

- 7-day-period during which all site-specific infection criterion must be met
- Includes the day of the first positive diagnostic test used to meet the infection definition (criterion), and 3 calendar days before and 3 calendar days after
- For infection definitions that do not include a diagnostic test in the criteria, the day of the first documented localized sign or symptom criterion is used

# Infection Window Period (continued)

- Diagnostic test examples\*
  - Laboratory specimen collection
  - Imaging test
  - Procedure or exam
  - Physician diagnosis
  - Initiation of treatment
- Localized sign or symptom examples
  - Diarrhea
  - Site-specific pain
  - Purulent exudate

\*If there is more than one diagnostic test result, the most localizing test result will be used, e.g., if trying to determine MBI-LCBI, use the blood culture as opposed to the ANC level

## Date of Event

- The date the first element used to meet the CDC NHSN site-specific infection criterion occurs for the first time within the 7-day infection window period



## Example: Infection Window Period, UTI

Hospital Day	Criterion
8	
9	
10	
11	
12	
13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	

**Diagnostic  
Test**



## Example: Infection Window Period, UTI

Hospital Day	Criterion
8	
9	
10	Temp = 101.5° F Temp = 102.1° F
11	
12	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
13	
14	
15	
16	
17	

**Diagnostic Test**



**3 Before**

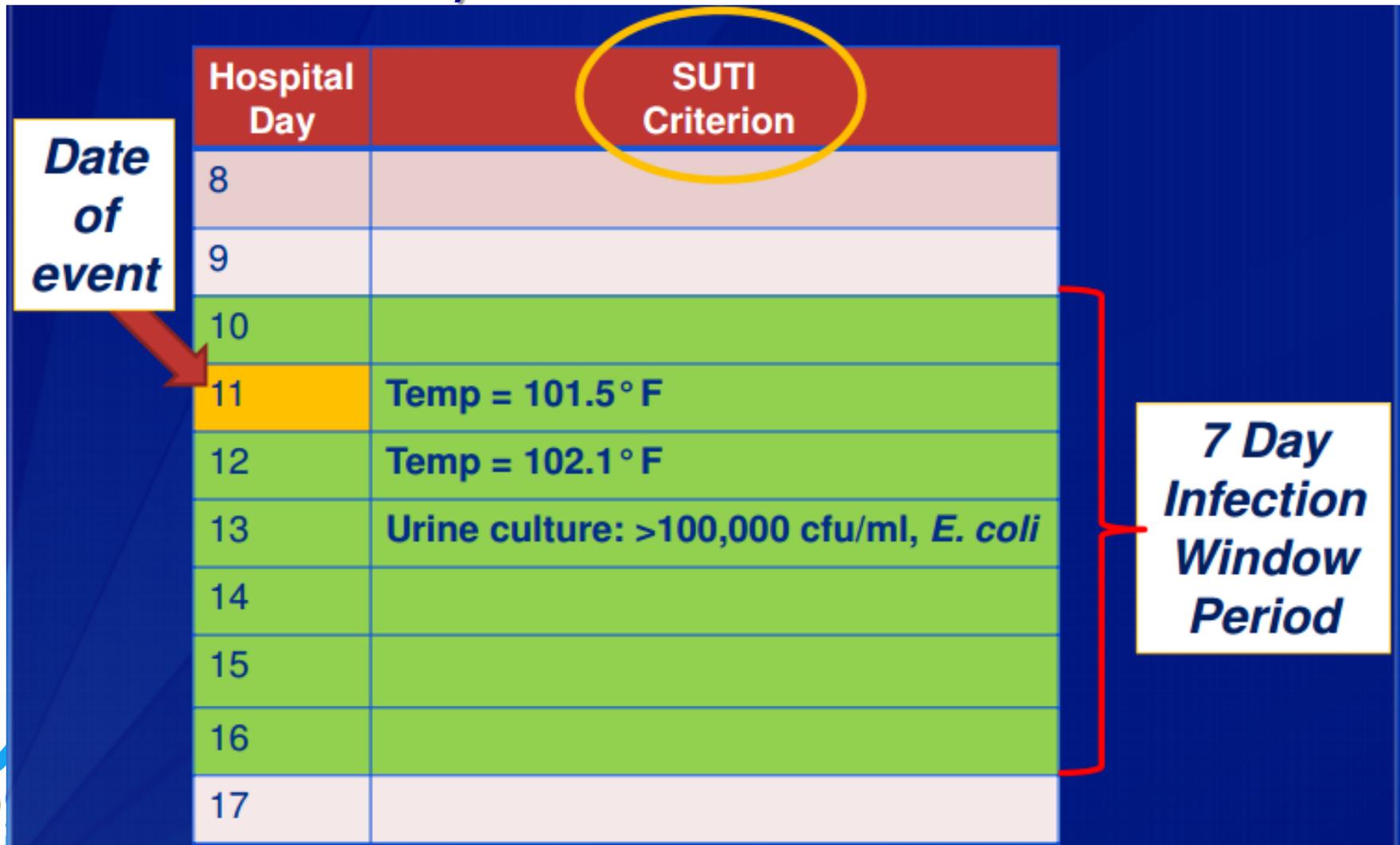
**3 After**

**7 Day Infection Window Period**

# Example 1: Date of Event in the Infection Window Period, SUTI

<b>Date of event</b>	<b>Hospital Day</b>	<b>SUTI Criterion</b>
	8	
	9	
	10	
	11	Temp = 101.5° F
	12	Temp = 102.1° F
	13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
	14	
	15	
	16	
	17	

**7 Day Infection Window Period**



## Example 2: Date of Event in the Infection Window Period, SUTI

Hospital Day	SUTI Criterion
8	
9	Temp = 100.5° F
10	Temp = 100.7° F
11	
12	Temp = 102.1° F
13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	

**Date of event** → 10

7 Day Infection Window Period

# Present on Admission vs. Healthcare-Associated Infection

An infection is considered

- Present on admission (POA) if the date of event occurs on the day of admission or the day after admission to an inpatient location
- Healthcare-associated infection (HAI) if the date of event occurs on or after the 3rd calendar day of admission

	Hospital Day	Criterion
<b>Date of event</b>	1 Date of admission	<b>POA</b>
	2	
	3	<b>HAI</b>
	4	
	5	

The diagram shows a table with two columns: 'Hospital Day' and 'Criterion'. The 'Date of event' is listed on the left. Arrows point from the 'Date of event' to the 'POA' box (covering days 1 and 2) and to the 'HAI' box (covering days 3, 4, and 5).

# Date of Admission

- The date the patient is physically admitted to an inpatient location



# Repeat Infection Timeframe

- Uses date of event to determine a 14-day timeframe during which an infection is considered as the same occurrence
  - No new infections of the same type can be reported during this timeframe
- The date of event is day 1 of the 14-day repeat infection timeframe (RIT)

## UTI Example: Repeat Infection Timeframe

Hospital Day	SUTI Criterion
8	
9	
10	
11	Temp = 101.5° F
12	Temp = 102.1° F
13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

**Date of event**

**14 Day Repeat Infection Timeframe (RIT)**

# Repeat Infection Timeframe

- Provides a concrete timeframe for identifying a continuing infection versus a new infection
  - Decreases surveillance subjectivity
  - Increases surveillance consistency
- Why 14-days?
  - No studies available upon which to base decision; NHSN sought expert opinion
  - Consistent with clinical BSI treatment

# Pathogen Assignment During the 14-Day Repeat Infection Timeframe

- When additional pathogens are identified within the 14-day repeat infection timeframe, they are added to the original infection event

## Example:

Patient has a UTI due to the pathogen *E. coli*. 8 days later, patient has >100,000 CFU/ml *Klebsiella oxytoca*. The *Klebsiella* would be added as another pathogen when reporting the infection.

# Repeat Infection Timeframe for BSI, UTI, and PNEU

- The repeat infection timeframe applies to the major type of infection for bloodstream infection (BSI), urinary tract infection (UTI) and pneumonia (PNEU)

Example, during a 14-day timeframe:

- Patient can have only one type of BSI: LCBI1 or LCBI2 or MBI-LCBI1, etc.
- Patient can have only one type of UTI: SUTI or ABUTI
- Patient can have only one type of PNEU: PNU1, PNU2, or PNU3

# Repeat Infection Timeframe Does Not Apply to SSI

- The repeat infection timeframe does not apply to surgical site infections (SSI). SSI can be reported during the entire surveillance period (30 or 90 days, depending on the procedure type)
  - Patient can have no more than one Appendectomy (APPY) SSI but could have a different type of SSI (e.g. HYST)
  - If an SSI that has been reported progresses to a depth greater than what was originally reported, the SSI event record should be changed to report the deeper SSI type
    - Example: SSI reported as superficial incisional should be changed to deep incisional or organ space if criteria are met

# Repeat Infection Timeframe for Other HAI Types

- The repeat infection timeframe applies to most other NHSN-defined infection types
  - During the same 14-day timeframe, a patient could have multiple specific infections, such as intra-abdominal infection (IAB), skin and soft tissue infection (SST), upper respiratory infection (UR), etc.
  - During the same 14-day timeframe, a patient can not have the same type infection type (e.g. only one IAB can be reported, only one SST, only one UR, etc.

# Knowledge Test

- Your facility is performing CAUTI surveillance on your medical ward 5-West
- Patient admitted to 5-West on 1/15/2015 with urine culture positive for >100,000 CFU/ml of *E. coli*. No NHSN UTI clinical symptoms present. Foley inserted at time of urine culture
- 9 days later (1/23/15), Foley remains, and patient has temperature of 38.2° C and positive urine culture of >100,000 CFU/ml of *E. coli*

## True or False:

**A CAUTI should be reported for this patient for 1/23/15**

# True or False: A CAUTI should be reported for this patient for 1/23/15

- A. True
- B. False

True: This patient did not meet UTI criteria related to the 1/15 urine culture, so there was no UTI reported (and no repeat infection timeframe was set.) Patient met criteria for CAUTI on 1/23 which should be reported.

# Secondary Bloodstream Infection (BSI) Attribution Period

- The period in which a positive blood culture must be collected to be considered as a secondary bloodstream infection to a primary site of infection
- This period includes the infection window period combined with the repeat infection timeframe
- This period is 14–17 days in length, depending on the date of event

# Example: Secondary BSI Attribution Period, UTI

Date of event	Hospital Day	SUTI Criterion
	9	
	10	Temp = 101.5° F
	11	
	12	Temp = 102.1° F
	13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
	14	
	15	
	16	
	17	
	18	
	19	
	20	
	21	
	22	
	23	
	24	

**Secondary BSI Attribution Period=**  
Infection Window Period  
 +  
Repeat Infection Timeframe

14 days

# Example: Secondary BSI Attribution Period, UTI

Hospital Day	SUTI Criterion
9	
10	
11	
12	
13	Urine culture: >100,000 cfu/ml, <i>E. coli</i> ; costovertebral angle pain
14	Temp = 101.5° F
15	
16	
17	
18	
19	
20	
21	
22	
23	
24-26	

**Date of event**

**Secondary BSI Attribution Period=**

Infection Window Period

+

Repeat Infection Timeframe

17 days

# Primary versus Secondary BSI

- A positive blood culture must always be reported to NHSN as an infection (primary or secondary)
- There are only **two ways** a BSI can be secondary to another site of infection:
  1. The blood culture pathogen must match a pathogen found in a culture from another body site and that site must meet criteria as an NHSN-defined infection
    - OR -
  2. The positive blood culture is an element used to meet the primary infection site criterion

NOTE: Secondary BSI may only be attributed to a primary site of infection during the secondary BSI attribution period as described in the NHSN BSI Event protocol, chapter 4, appendix 1

# Example: Secondary BSI Attribution Period, UTI

Day	SUTI Criterion
9	
10	
11	Temp = 101.5° F
12	Temp = 102.1° F
13	Urine culture: >100,000 cfu/ml, <i>E. coli</i>
14	
15	
16	
17	
18	Blood culture: <i>E.coli</i>
19	
20	
21	<b>SUTI with secondary BSI*</b>
22	<b>Pathogen: <i>E.coli</i></b>
23	<b>Date of Event: Day 11</b>
24	

**Secondary BSI Attribution Period**  
Infection Window Period  
 +  
Repeat Infection Timeframe

15 days

\*Per the NHSN Secondary BSI Guide, Appendix 1, Chapter 4

# Pathogens Attributed to Secondary BSI

- When pathogens are excluded from specific infection definitions (e.g. UTI, PNEU) they are also excluded from being assigned as secondary BSI pathogens
- Excluded pathogens in the blood are still infections and must be attributed to another primary site-specific infection type
- Excluded pathogen lists can be found in NHSN protocols for CAUTI, UTI and other urinary system infections, ventilator-associated events (VAE), and PNEU

# Recent Changes to NHSN Surveillance Definitions

Current Definition	<i>Eliminated (Old) Definition</i>
Infection window period	<i>Gap days</i>
Date of event is the date the first element of the definition is met	<i>Date of event was date the last element was met</i>
To be a secondary BSI, the blood culture pathogen must match a pathogen identified by culture of another body site, or the positive blood culture must be an element used to meet another infection site criteria	<i>Used "logical pathogens" to determine secondary BSI</i>

# NHSN Surveillance Worksheet

- To promote consistent surveillance data collection
- Helps in your review to determine if an HAI has occurred or not
- We highly recommend use

See example of a completed worksheet with explanation at [www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html](http://www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html)



## Surveillance for Bloodstream Infections



Central Line-Associated Bloodstream Infection (CLABSI) and non-central line-associated Bloodstream Infection

### Resources for NHSN Users Already Enrolled

> Training

> Protocols

> Frequently Asked Questions

> Data Collection Forms

> CMS Supporting Materials

> Supporting Material

▼ **Worksheet Generator (electronic) and Worksheets (manual)**

# NHSN Surveillance Worksheet

Patient Name: \_\_\_\_\_

Location(s): \_\_\_\_\_

Admission Date: \_\_\_\_\_

Date / Hospital Day	First diagnostic test or first sign/symptom	Infection Window Period	Date of Event	RT (Repeat Infection Time frame)	Secondary BSI Attribution Period	Date / Hospital Day	First diagnostic test or first sign/symptom	Infection Window Period	Date of Event	RT (Repeat Infection Time frame)	Secondary BSI Attribution Period
1						1					
2						2					
3						3					
4						4					
5						5					
6						6					
7						7					
8						8					
9						9					
10						10					

# NHSN Worksheet Generator

- NHSN developed an HAI versus POA Worksheet Generator for CAUTI and CLABSI\*
- Will provide an electronically-generated worksheet that identifies
  - 7-day infection window period
  - Date of event
  - POA or HAI determination
  - 14-day repeat infection timeframe
  - Secondary BSI Attribution Period

\*Note: There are separate calculators for VAE and MDRO/CDI labID

# Worksheet Generator Example

Based on the information you provided:

Admit Date: Fri Jul 08 2016

The event is: **HAI**

Date of Event: Wed Jul 13 2016

Infection Window Period: Sun Jul 10 2016 - Sat Jul 16 2016

Repeat Infection Timeframe (RIT): Wed Jul 13 2016 - Tue Jul 26 2016

Event Type: BSI

Hospital Day/Date	First Diagnostic Test	Infection Window Period (*)	Date of Event	Repeat Infection Timeframe (*)
3. - 7/10/2016		<input type="checkbox"/>	-	
4. - 7/11/2016		<input type="checkbox"/>	-	
5. - 7/12/2016		<input type="checkbox"/>	-	
6. - 7/13/2016	✓	<input checked="" type="checkbox"/>	- HAI	
7. - 7/14/2016		<input type="checkbox"/>	-	
8. - 7/15/2016		<input type="checkbox"/>	-	
9. - 7/16/2016		<input type="checkbox"/>	-	
10. - 7/17/2016			-	
11. - 7/18/2016			-	
12. - 7/19/2016			-	

# Case Example

Your facility is performing surveillance for ALL HAI types

- January 1: 45-year-old patient with Guillain-Barre' syndrome admitted to ICU
- January 12: Temp 102.1°F
- January 14: Blood culture collected; positive for *E. coli* and *C. albicans*
- January 11: Temp 101.5°F
- January 13: Urine culture collected; positive for >100,000 CFU/ml *E. coli*
- January 18: Urine culture collected; positive for >100,000 CFU/ml Enterococcus

# Which of the following is true for NHSN reporting?

- A. Patient has only a laboratory-confirmed BSI (LCBI) on January 14 with *E. coli* and *C. albicans*
- B. Patient has a symptomatic UTI (SUTI 1a) on January 11 with *E. coli* and *Enterococcus* with a secondary BSI –AND– an LCBI with *C. albicans* on January 14

# Temperature / Fever

When temperature is included in HAI surveillance definitions

- Core temperatures are no longer required
- Use temperature documented in the medical record
- Use temperature as recorded, regardless of site (i.e., do not convert temperatures)

# Summary

- It is important to make sure infection window rules are used on for reviewing each potential infection
- Use the date when the first element of the definition occurs as the date of event.
- Use surveillance worksheets and generators; they are helpful tools

# Resources

- NHSN website: [www.cdc.gov/nhsn](http://www.cdc.gov/nhsn)
- CLABSI and CAUTI worksheets (under supporting materials):  
[www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html](http://www.cdc.gov/nhsn/acute-care-hospital/clabsi/index.html)  
[www.cdc.gov/nhsn/acute-care-hospital/cauti/index.html](http://www.cdc.gov/nhsn/acute-care-hospital/cauti/index.html)
- 2016 NHSN Patient Safety Component manual:  
[http://www.cdc.gov/nhsn/pdfs/pscmanual/pscmanual\\_current.pdf](http://www.cdc.gov/nhsn/pdfs/pscmanual/pscmanual_current.pdf)



For more information, please contact  
the HAI Program at  
[HAIProgram@cdph.ca.gov](mailto:HAIProgram@cdph.ca.gov)

Thank you!