

# **SURVEILLANCE FOR INFECTIONS IN LONG-TERM CARE**

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IF YOU WANTED TO COMPARE YOUR INFECTION SURVEILLANCE DATA TO ANOTHER NURSING HOME IN YOUR COMMUNITY THAT CARED FOR A SIMILAR RESIDENT POPULATION, HOW CONFIDENT ARE YOU THAT EVENTS WILL BE TRACKED IN THE SAME WAY

- A. Completely Confident
- B. Slightly Confident
- C. Highly Confident
- D. I'm not even sure I can compare my own surveillance data from year to year

*Tracking Infections in Long-term Care Facilities Using NHSN; Training March 20, 2017*

# Objectives

- Discuss the importance of surveillance
- Describe standardized surveillance definitions
- Discuss ways to implement and apply surveillance definitions

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SHEA/CDC POSITION PAPER

Surveillance Definitions of Infections in Long-Term Care Facilities:  
Revisiting the McGeer Criteria

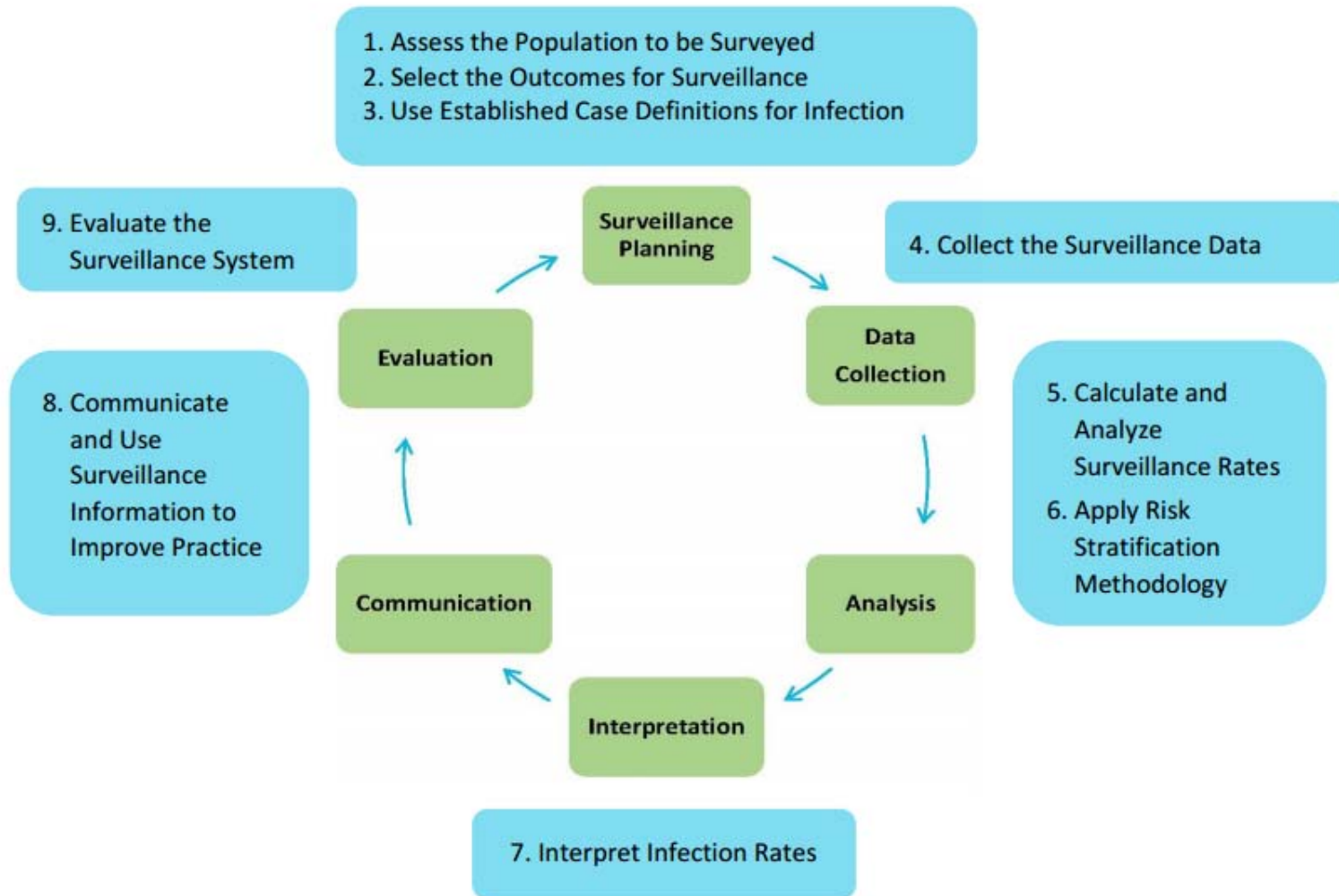


- “Surveillance is a comprehensive method of measuring outcomes and related processes of care, analyzing the data, and providing information to members of the healthcare team to assist in improving those outcomes and processes”

2015



# How is Surveillance Performed?



# Assess the Population

- What is the geographic location of the long-term care facility?
- What types of residents are served?
- What are the most common diagnoses?
- What are the most frequently performed invasive procedures?
- Which services or treatments are utilized most frequently?
- What types of residents are at greatest risk of infection?
- Are there any health concerns emerging from the community?

# Types of Surveillance

- Total (or Whole) House Surveillance
  - All HAIs are monitored in the entire population
  - Calculate rates for specific population (not an overall facility wide rate)
- Targeted Surveillance
  - Particular care units
  - Infections related to medical devices
  - Organisms of epidemiological importance
- Combination Surveillance Strategy
  - Most use a combination and monitor targeted events that occur in defined populations while concurrently monitoring select HAIs and laboratory reports from house-wide locations



*Examples might be MRSA and C difficile house wide but UTIs in residents with indwelling catheters only.*



# Selection of Processes and Outcomes

## *Processes*

- Hand hygiene
- Urinary Catheter insertion/maintenance



## *Outcomes*

- Acute respiratory infections
- Urinary tract infections
- Skin/Soft Tissue Infections
- Gastroenteritis



# Consideration for choosing Outcomes

- Mandatory/required
- Frequency (incidence) of the infection
- Communicability
- System/resident cost (↑mortality, hospitalization)
- Early Detection

*Outcomes selected for surveillance should be re-evaluated annually as a component of the IP risk assessment*

Types of infection prevention surveillance include which of the following?

- A. Targeted
- B. Total house
- C. Combination surveillance
- D. A and B
- E. A, B and C

# Infections that should be included in routine surveillance

Points to Consider	Infections	Comments
Evidence of transmissibility in a healthcare setting	Viral respiratory tract infections, viral GE, and viral conjunctivitis	Associated with outbreaks among residents and HCP in LTCFs
Processes available to prevent acquisition of infection		
Clinically significant cause of morbidity or mortality	Pneumonia, UTI, GI tract infections, (including <i>C. difficile</i> ) and SSTI	Associated with hospitalization and functional decline in LTCF residents
Specific pathogens causing serious outbreaks	Any invasive group A <i>Streptococcus</i> infection, acute viral hepatitis, norovirus, scabies, influenza	A single laboratory-confirmed case should prompt further investigation

# Infections that could be included in routine surveillance

Points to Consider	Infections	Comments
Infections with limited transmissibility in a healthcare settings	Ear and sinus infections, fungal oral and skin infections and herpetic skin infections	Associated with underlying comorbid conditions and reactivation of endogenous infection
Infections with limited preventability		

# Infections for which other accepted definitions should be applied in LTCF surveillance

Points to Consider	Infections	Comments
Infections with other accepted definitions (may apply to only specific at-risk residents)	Surgical site infections, central-line- associated bloodstream infections and ventilator-associated pneumonia	LTCF-specific definitions were not developed. Refer to the National Healthcare Safety Network's criteria

# Sources of Data for Surveillance

- Clinical ward/unit rounds
- Medical Chart
- Lab reports
- Kardex/Patient Profile/Temperature logs
- Antibiotic Starts



# **IMPLEMENTING AND APPLYING SURVEILLANCE DEFINITIONS AND PRINCIPALS**



SHEA/CDC POSITION PAPER

## Surveillance Definitions of Infections in Long-Term Care Facilities: Revisiting the McGeer Criteria

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# National Healthcare Safety Network (NHSN)

<b>NHSN</b>
NHSN Login
About NHSN +
Enroll Here +
Materials for Enrolled Facilities -
Ambulatory Surgery Centers +
Acute Care Hospitals/Facilities +
Long-term Acute Care Hospitals/Facilities +
Long-term Care Facilities -
<b>Surveillance for C. difficile and MRSA Infections</b>

CDC > NHSN > Materials for Enrolled Facilities > Long-term Care Facilities

## Surveillance for C. difficile, MRSA, and other Drug-resistant Infections



### Resources for NHSN Users Already Enrolled

- > Training
- > Protocol
- > Data Collection Forms
- > Supporting Material
- > Analysis Resources

### New Users - Start Here



- Step 1: Enroll into NHSN
  - Step 2: Set up NHSN
  - Step 3: Report
- [Click here to enroll](#)

Ambulatory Surgery Centers +

Training

Protocol



# National Healthcare Safety Network (NHSN)

- NHSN is an internet-based surveillance system that integrates the surveillance systems previously managed separately in the Division of Healthcare Quality Promotion (DHQP) at CDC
  - National Nosocomial Infections Surveillance (NNIS) system
  - Dialysis Surveillance Network (DSN)
  - National Surveillance System for Healthcare Workers (NaSH)

# Purposes of NHSN

## *Original*

- Collect data from a sample of US healthcare facilities to permit valid estimation of the
  - magnitude of adverse events among patients and healthcare personnel
  - adherence to practices known to be associated with prevention of healthcare-associated infections (HAI)
- Analyze and report collected data to permit recognition of trends

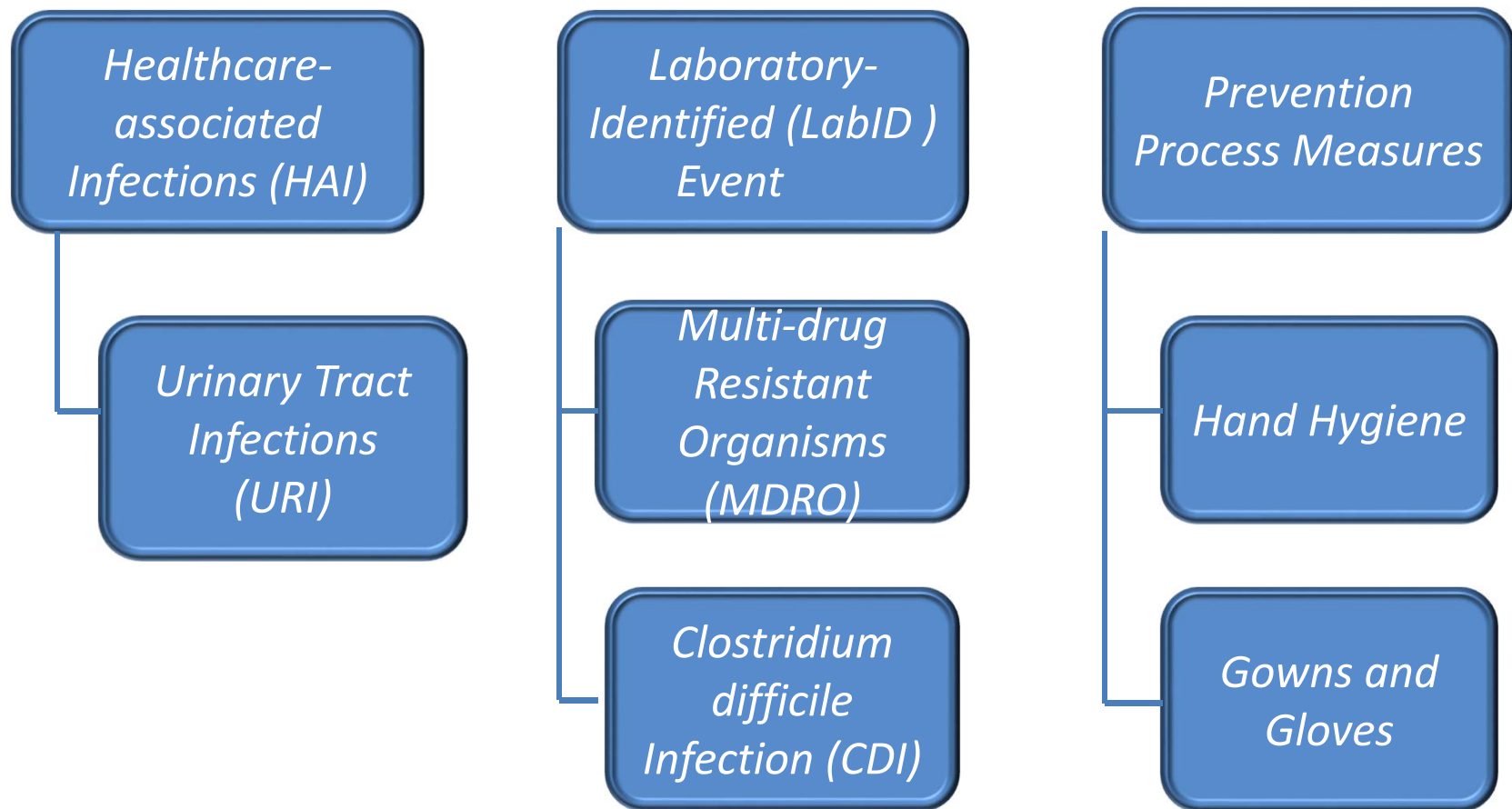
# Purposes of NHSN

- Provide facilities with risk-adjusted data that can be used for inter-facility comparisons and local quality improvement activities
- Assist facilities in developing surveillance and analysis methods that permit timely recognition of patient and healthcare personnel safety problems and prompt intervention with appropriate measures
- Conduct collaborative research studies with members

# Purposes of NHSN “Ongoing”

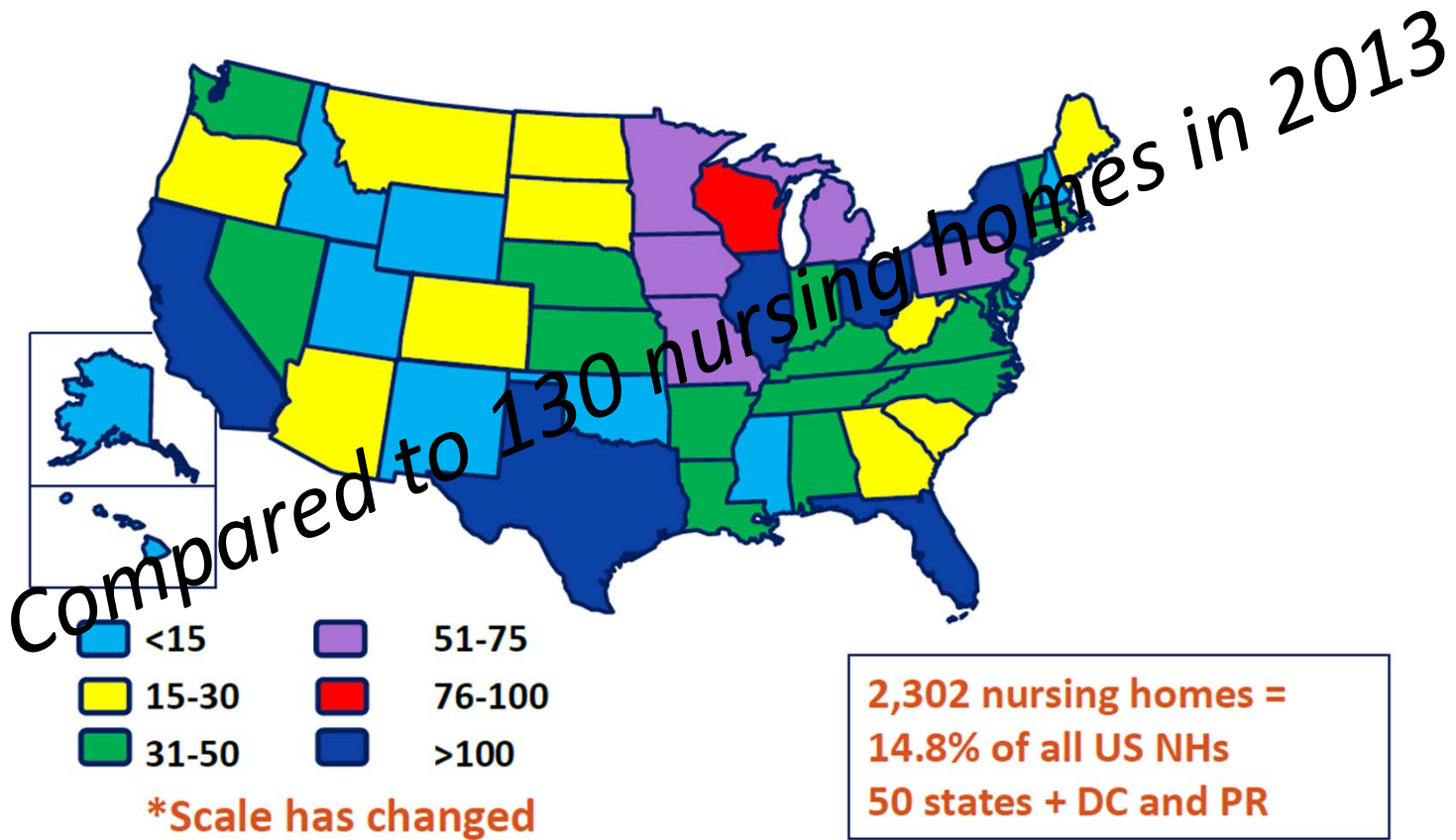
- Facilities that participate in certain reporting programs operated by the Centers for Medicare and Medicaid Services (CMS) do so through use of NHSN.
- Furthermore, some U.S. states use NHSN as a means for healthcare facilities to submit data on healthcare-associated infections (HAIs) mandated through their specific state legislation.

# Long-term Care Facility Component NHSN



<https://www.cdc.gov/nhsn/training/ltc/index.html>

## NHSN Enrolled Nursing Homes by State, March 2017





# Guiding Principles for LTCF Criteria

- Infection surveillance only
- Applied retrospectively as it relates to clinical diagnosis/treatment
- Focus on transmissible/preventable infections
  - Not for case finding
  - Not for diagnostic purposes
  - Not for clinical decision making

# Attribution of infection to LTCF

- No evidence of an incubating infection at the time of admission to the facility
  - Basis of clinical documentation of appropriate signs and symptoms and not solely on screening microbiologic data
- Onset of clinical manifestation occurs  $> 2$  calendar days after admission.



# Attribution of infection to LTCF

- All symptoms must be new or acutely worse
- Non-infectious causes of signs and symptoms should always be considered prior to diagnosis
- Identification of an infection should not be based on a single piece of evidence
  - Clinical, microbiologic, radiologic
- Diagnosis by physician insufficient (based on definition)

# Constitutional Requirements

## Fever:

- A single oral temperature  $>37.8^{\circ}\text{C}$  [ $100^{\circ}\text{F}$ ], OR
- Repeated oral temperatures  $>37.2^{\circ}\text{C}$  [ $99^{\circ}\text{F}$ ];  
rectal temperature  $>37.5^{\circ}$  ( $99.5^{\circ}\text{F}$ ) OR
- $>1.1^{\circ}\text{C}$  [ $2^{\circ}\text{F}$ ] over baseline from a temperature taken at any site

No time frame provided??

# Constitutional Requirements

## Leukocytosis

- Neutrophilia  $> 14000$  WBC/mm<sup>3</sup>

OR

- Left shift ( $>6\%$  bands or  $\geq 1500$  bands/mm<sup>3</sup>)

# Constitutional Requirements

## Acute Change in Mental Status from Baseline

- Based on Confusion Assessment Method (CAM) criteria available in MDS

Change	Criteria
Acute Onset	Evidence of acute change in mental status from resident baseline
Fluctuating	Behavior fluctuating (e.g., coming and going or changing in severity during assessment)
Inattention	Resident has difficulty focusing attention (e.g., unable to keep track of discussion or easily distracted)
Disorganized Thinking	Resident's thinking is incoherent (e.g., rambling conversation, unclear flow of ideas)
Altered level of consciousness	Resident's level of consciousness is described as different from baseline (e.g., hyperalert, sleepy, drowsy, difficult arouse, nonresponsive)

Either /or

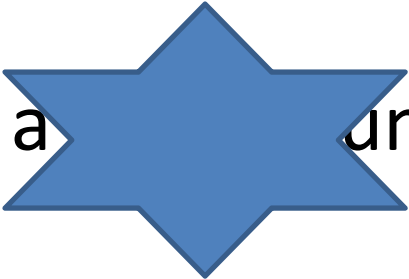
# Constitutional Requirements

## Acute Functional Decline

- New 3 point increase in total ADL score (0-28) from baseline based on 7 ADLs {0 = independent; 4 = total dependence}
  1. Bed mobility
  2. Transfer
  3. Locomotion within LTCF
  4. Dressing
  5. Toilet use
  6. Personal hygiene
  7. Eating

# Question

**Which statement(s) meet constitutional requirements?**

1. The resident must have a temperature  $>101^{\circ}\text{F}$
2. The resident doesn't seem to be herself today
3. The resident hasn't been ambulatory for 3 months
4. The resident has a unt  $15000 \text{ WBC}/\text{mm}^3$



# Respiratory Tract Infections

Criteria	Comments
<p>A. <u>Common cold syndrome/pharyngitis</u></p> <p>At least <b>two</b> criteria present</p> <ol style="list-style-type: none"><li>1. Runny nose or sneezing</li><li>2. Stuffy nose (i.e., congestion)</li><li>3. Sore throat or hoarseness or difficulty swallowing</li><li>4. Dry cough</li><li>5. Swollen or tender glands in neck</li></ol>	<p>Fever may or may not be present. Symptoms must be new, and not attributable to allergies</p>

# Respiratory Tract Infections

Criteria	Comments
<p><i>B. <u>Influenza-like Illness</u></i></p> <p><b>Both</b> criteria 1 and 2 present</p> <ol style="list-style-type: none"><li>1. Fever</li><li>2. At least <b>three</b> of the following symptom sub-criteria (a-f) present<ol style="list-style-type: none"><li>a. Chills</li><li>b. New headache or eye pain</li><li>c. Myalgias or body aches</li><li>d. Malaise or loss of appetite</li><li>e. Sore throat</li><li>f. New or increased dry cough</li></ol></li></ol>	<p>If criteria for influenza-like illness and another upper or lower respiratory tract infection are met at the same time, only the diagnosis of influenza-like illness should be used</p> <p>Due to increasing uncertainty surrounding the timing of the start of influenza season, the peak of influenza activity and the length of the season, 'seasonality' is no longer part of the criteria to define influenza-like illness</p>

# Respiratory Tract Infections

Criteria	Comments
<p>C. <u>Pneumonia</u></p> <p><b>All</b> criteria 1-3 present</p> <ol style="list-style-type: none"><li>1. Interpretation of chest radiograph as demonstrating pneumonia or the presence of <u>new</u> infiltrate</li><li>2. At least <b>one</b> of the following respiratory sub-criteria (a-f) present<ol style="list-style-type: none"><li>a. New or increased cough</li><li>b. New or increased sputum production</li><li>c. O<sub>2</sub> saturation &lt;94% on room air or a reduction in O<sub>2</sub> saturation of more than 3% from baseline</li><li>d. New or changed lung exam abnormalities</li><li>e. Pleuritic chest pain</li><li>f. Respiratory rate of ≥ 25/min</li></ol></li><li>3. At least <b>one</b> constitutional criteria</li></ol>	<p>For both pneumonia and lower respiratory tract infections, presence of underlying conditions which could mimic a respiratory tract infection presentation (congestive heart failure, interstitial lung disease), should be excluded by review of clinical records and an assessment of presenting symptoms and signs</p>

# Respiratory Tract Infections

Criteria	Comments
<p>D. <u>Lower respiratory tract (Bronchitis or Tracheo-bronchitis)</u></p> <p><b>All</b> criteria 1-3 present</p> <ol style="list-style-type: none"><li>1. Chest radiograph not performed <u>or negative</u> for pneumonia or new infiltrate.</li><li>2. At least <b>two</b> of the following respiratory sub-criteria (a-f) present<ol style="list-style-type: none"><li>a. New or increased cough</li><li>b. New or increased sputum production</li><li>c. O<sub>2</sub> saturation &lt;94% on room air or a reduction in O<sub>2</sub> saturation of more than 3% from baseline</li><li>d. New or changed lung exam abnormalities</li><li>e. Pleuritic chest pain</li><li>f. Respiratory rate of ≥ 25/min</li></ol></li><li>3. At least <b>one</b> constitutional criteria</li></ol>	<p>For both pneumonia and lower respiratory tract infections, presence of underlying conditions which could mimic a respiratory tract infection presentation (congestive heart failure, interstitial lung disease), should be excluded by review of clinical records and an assessment of presenting symptoms and signs</p>

# McGeer Urinary Tract Infections

Criteria		Comments
<p>A. <u>For Residents without an indwelling catheter</u></p> <p>Both criteria 1 and 2 present</p> <p>1. At least one of the following sign/symptom sub-criteria (a-c) present:</p> <p>a) Acute dysuria <u>or</u> acute pain, swelling, or tenderness of the testes, epididymis, or prostate</p> <p>b) Fever <u>or</u> leukocytosis and</p> <p>At least one of the following localizing urinary tract sub-criteria:</p> <p>i. Acute costovertebral angle pain or tenderness</p> <p>ii. Suprapubic pain</p> <p>iii. Gross hematuria</p> <p>iv. New or marked increase in incontinence</p> <p>v. New or marked increase in urgency</p> <p>vi. New or marked increase in frequency</p>	<p>c) In the absence of fever of leukocytosis, then at least two or more of the following localizing urinary symptoms</p> <p>i. Suprapubic pain</p> <p>ii. Gross hematuria</p> <p>iii. New or marked increase in incontinence</p> <p>iv. New or marked increase in urgency</p> <p>v. New or marked increase in frequency</p> <p>2. One of the following microbiologic sub-criteria</p> <p>a) <math>\geq 10^5</math> cfu/ml of no more than 2 species of microorganisms in a voided urine</p> <p>b) <math>\geq 10^2</math> cfu/ml of any number of organisms in a specimen collected by an in and out catheter</p>	<p>UTI should be diagnosed when there are localizing s/s <u>and</u> a positive urinary culture</p> <p>A diagnosis of UTI can be made without localizing symptoms if a blood culture isolate of the same organism isolated from the urine and there is no alternate sight of infection</p> <p>In the absence of a clear alternate source, fever or rigors with a positive urine culture in a non-catheterized resident will often be treated as a UTI. However evidence suggest most of the these episodes are not from a urinary source</p> <p>Pyuria does not differentiate symptomatic UTI from asymptomatic bacteria</p> <p>Absence of pyuria in diagnostic test excludes symptomatic UTI in residents of LTCF</p> <p>Urine specimens should be processed within 1-2 hours, or refrigerated and processed with in 24 hours.</p>

# NHSN Urinary Tract Infections

For Residents without an indwelling catheter

Criteria	Criteria	Comments
<p><b><u>Must meet criteria 1a OR 2a</u></b></p> <p><b><u>1a</u></b></p> <p>Either of the following:</p> <ol style="list-style-type: none"> <li>Acute dysuria</li> <li>Acute pain, swelling or tenderness of the testes, epididymis or prostate</li> </ol> <p><b><u>2a</u></b></p> <p>Either of the following:</p> <ol style="list-style-type: none"> <li>Fever</li> <li>Leukocytosis</li> </ol> <p><b><u>AND</u></b></p> <p>One or more of the following:</p> <ol style="list-style-type: none"> <li>Costovertebral angle pain or tenderness</li> <li>New or marked increase in suprapubic tenderness</li> <li>Gross hematuria</li> <li>New or marked increase in incontinence</li> <li>New or marked increase in urgency</li> <li>New or marked increase in frequency</li> </ol>	<p><b><u>OR 3a</u></b></p> <p><b><u>Two or more of the following:</u></b></p> <ol style="list-style-type: none"> <li>Costovertebral angle pain or tenderness</li> <li>New or marked increase in suprapubic tenderness</li> <li>Gross hematuria</li> <li>New or marked increase in incontinence</li> <li>New or marked increase in urgency</li> <li>New or marked increase in frequency</li> </ol> <p><b><u>AND</u></b></p> <p><b><u>Either of the following:</u></b></p> <ol style="list-style-type: none"> <li>Specimen collected from clean catch voided urine and positive culture <u>with no more than 2 species of microorganisms, at least one of which is bacteria of &gt;10<sup>5</sup> CFU/ml</u></li> <li>Specimen collected from in/out straight catheter and positive culture with any microorganism, at least one of which is bacteria of <math>\geq 10^2</math> CFU/ml</li> </ol>	<ul style="list-style-type: none"> <li>Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever</li> <li>Fever definition same as McGeer</li> <li>Leukocytosis definition same as McGeer</li> </ul> <p><b>Notes:</b></p> <p><i>Yeast and other microorganisms which are not bacteria are not acceptable UTI pathogens</i></p>

# McGeer Urinary Tract Infections

Criteria	Comments
<p>B. <u>For the resident with an indwelling catheter</u></p> <p><b>Both</b> criteria 1 and 2 present</p> <p>1. At least <b>one</b> of the following sign/symptom sub-criteria (a-d) present:</p> <ul style="list-style-type: none"><li>a) Fever, rigors, or new onset hypotension, with no alternate site of infection</li><li>b) Either acute change in mental status <u>or</u> acute functional decline with no alternate diagnosis <u>and</u> Leukocytosis</li><li>c) New onset suprapubic pain <u>or</u> costovertebral angle pain or tenderness</li><li>d) Purulent discharge from around the catheter <u>or</u> acute pain, swelling, or tenderness of the testes, epididymis, or prostate</li></ul> <p>2. Urinary catheter culture with <math>\geq 10^5</math> cfu/ml of <b>any organism(s)</b></p>	<p>Recent catheter trauma, catheter obstruction or new onset hematuria are useful localizing signs consistent with UTI, but not necessary for diagnosis</p> <p>Urinary catheter specimens for culture should be collected following the replacement of the catheter (if current catheter has been in place for &gt;14 days)</p>

# NHSN Urinary Tract Infections

*For the resident with an indwelling catheter*

Criteria	Comments
<p><u>CA-SUTI</u></p> <p><b>Both</b> criteria 1 and 2 present</p> <p>1. At least <b>one or more</b> of the following:</p> <ul style="list-style-type: none"><li>a) Fever (same as McGeer)</li><li>b) Rigors</li><li>c) New onset hypotension, with no alternate site of infection</li><li>d) New onset confusion/functional decline <b>AND</b> Leukocytosis</li><li>e) New costovertebral angle pain or tenderness</li><li>f) New or marked increase in suprapubic tenderness</li><li>g) Acute pain, swelling, or tenderness of the testes, epididymis, or prostate</li><li>h) Purulent discharge from around the catheter</li></ul>	<p>And any of the following:</p> <p><u>If urinary catheter removed within last 2 calendar days (day of removal is day 1, so day of removal or following day)</u></p> <ul style="list-style-type: none"><li>1. Specimen collected from clean catch voided urine and positive culture <u>with no more than 2 species of microorganisms, at least one of which is bacteria of <math>&gt;10^5</math> CFU/ml</u></li><li>2. Specimen collected from in/out straight catheter and positive culture with any microorganism, at least one of which is bacteria of <math>\geq 10^2</math> CFU/ml</li></ul> <p><b>AND</b></p> <p><u>If urinary catheter in place:</u></p> <ul style="list-style-type: none"><li>1. Specimen collected from indwelling catheter and positive culture with any microorganism, at least one of which is bacteria of <math>\geq 10^5</math> CFU/ml</li></ul> <p>Notes: <i>Yeast and other microorganisms which are not bacteria are not acceptable UTI pathogens</i></p>



# NHSN Notes

- Indwelling urinary catheter should be in place for a minimum of 2 calendar days before infection onset (day 1 = day of insertion)
- 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. Indwelling urinary catheters do not include straight in-and-out catheters or suprapubic catheters (these would be captures as SUTIs, not CA-SUTIs)
- *Indwelling 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*
-

# What do the Guidelines Say?

- Specimens collected through the catheter present for more than a few days reflect biofilm microbiology. For residents with chronic indwelling catheters and symptomatic infection, changing the catheter immediately prior to instituting antimicrobial therapy allows collection of a bladder specimen, which is a more accurate reflection of infecting organisms.
- Urinary catheters coated with antimicrobial materials have the potential to decrease UTIs but have not been studied in the LTCF setting.

*SHEA/APIC Guideline: Infection prevention and control in the long-term care facility Philip W. Smith, MD, Gail Bennett, RN, MSN, CICb Suzanne Bradley, MD, Paul Drinka, MD, Ebbing Lautenbach, MD, James Marx, RN, MS, CIC, Lona Mody, MD, Lindsay Nicolle, MD and Kurt Stevenson, MD July 2008*

# Skin, Soft Tissue and Mucosal Infections

Criteria	Comments
<p>A. <u>Cellulitis/soft tissue/wound infection</u></p> <p>At least <b>one</b> of the following criteria is present</p> <ol style="list-style-type: none"><li>1. Pus present at a wound, skin, or soft tissue site</li><li>2. New or increasing presence of at least <b>four</b> of the following sign/symptom sub-criteria<ol style="list-style-type: none"><li>a) Heat at affected site</li><li>b) Redness at affected site</li><li>c) Swelling at affected site</li><li>d) Tenderness or pain at affected site</li><li>e) Serous drainage at affected site</li><li>f) <b>One</b> constitutional criteria</li></ol></li></ol>	<p>More than one resident with streptococcal skin infection from the same serogroup (e.g., A, B, C, G) in a LTCF may suggest an outbreak</p> <p>For wound infections related to surgical procedures: LTCF should use the CDC's NHSN surgical site infection criteria and report these infections back to the institution performing the original surgery</p> <p>Presence of organisms cultured from the surface (e.g., superficial swab culture) of a wound is not sufficient evidence that the wound is infected</p>

# Skin, Soft Tissue and Mucosal Infections

Criteria	Comments
<p><i>B. Scabies</i></p> <p><b>Both</b> criteria 1 and 2 present</p> <ol style="list-style-type: none"><li>1. A maculopapular and/or itching rash</li><li>2. At least <b>one</b> of the following sub-criteria:<ol style="list-style-type: none"><li>a) Physician diagnosis</li><li>b) Laboratory confirmation (scrapping or biopsy)</li><li>c) Epidemiologic linkage to a case of scabies with laboratory confirmation</li></ol></li></ol>	<p>Care must be taken to rule out rashes due to skin irritation, allergic reactions, eczema, and other non-infectious skin conditions</p> <p>An epidemiologic linkage to a case can be considered if there is evidence of geographic proximity in the facility, temporal relationship to the onset of symptoms, or evidence of a common source of exposure (i.e., shared caregiver).</p>

# Skin, Soft Tissue and Mucosal Infections

Criteria	Comments
<p>C. <u>Fungal oral/perioral and skin infections</u></p> <p><u>Oral candidiasis:</u></p> <p><b>Both</b> criteria 1 and 2 present:</p> <ol style="list-style-type: none"><li>1. Presence of raised white patches on inflamed mucosa, or plaques on oral mucosa</li><li>2. Medical or dental provider diagnosis</li></ol> <p><u>Fungal skin Infection:</u></p> <p><b>Both</b> criteria 1 and 2 present:</p> <ol style="list-style-type: none"><li>1. Characteristic rash or lesion</li><li>2. Either a medical provider diagnosis or laboratory confirmed fungal pathogen from scrapping or biopsy</li></ol>	<p>Mucocutaneous candida infections are usually due to underlying clinical conditions such as poorly controlled diabetes or severe immunosuppression. Although not transmissible infections in the healthcare setting, they can be a marker for increased antibiotic exposure</p> <p>Dermatophytes have been known to cause occasional infections, and rare outbreaks, in the LTC setting.</p>

# Skin, Soft Tissue and Mucosal Infections

Criteria	Comments
<p><i>D. <u>Herpes viral skin infections</u></i></p> <p><u>Herpes simplex infection</u></p> <p><b>Both</b> criteria 1 and 2 present:</p> <ol style="list-style-type: none"><li>1. A vesicular rash</li><li>2. Either physician diagnosis or laboratory confirmation</li></ol> <p><u>Herpes zoster infection</u></p> <p><b>Both</b> criteria 1 and 2 present:</p> <ol style="list-style-type: none"><li>1. A vesicular rash</li><li>2. Either physician diagnosis or laboratory confirmation</li></ol>	<p>Reactivation of old herpes simplex (“cold sores”) or herpes zoster (“shingles”) is not considered a healthcare-associated infection</p> <p>Primary herpes viral skin infections are very uncommon in LTCF, except in pediatric populations where it should be considered healthcare-associated.</p>

# Skin, Soft Tissue and Mucosal Infections

Criteria	Comments
<p><i>E. <u>Conjunctivitis</u></i></p> <p>At least <b>one</b> of the following criteria present:</p> <ol style="list-style-type: none"><li>1. Pus appearing from one or both eyes, present for at least 24 hours</li><li>2. New or increasing conjunctival erythema, with or without itching.</li><li>3. New or increased conjunctival pain, present for at least 24 hours.</li></ol>	<p>Conjunctivitis symptoms (“pink eye”) should not be due to allergic reaction or trauma.</p>

# Gastrointestinal Tract Infections

Criteria	Comments
<p>A. <u>Gastroenteritis</u></p> <p>At least <b>one</b> of the following criteria present</p> <ol style="list-style-type: none"><li>1. Diarrhea, three or more liquid or watery stools above what is normal for the resident within a 24 hour period</li><li>2. Vomiting, two or more episodes in a 24 hour period</li><li>3. <b>Both</b> of the following sign/symptom sub-criteria present:<ol style="list-style-type: none"><li>a) A stool specimen positive for a pathogen (such as <i>Salmonella</i>, <i>Shigella</i>, <i>E. coli</i> 0157:H7, <i>Campylobacter</i> species, rotavirus)</li><li>b) At least <b>one</b> of the following GI sub-criteria present<ol style="list-style-type: none"><li>i. Nausea</li><li>ii. Vomiting</li><li>iii. Abdominal pain</li><li>iv. Diarrhea</li></ol></li></ol></li></ol>	<p>Care must be taken to exclude non-infectious causes of symptoms. For instance, new medication may cause diarrhea, nausea/vomiting; initiation of new enteral feeding may be associated with diarrhea; nausea or vomiting may be associated with gallbladder disease.</p> <p>Presence of new GI symptoms in a single resident may prompt enhanced surveillance for additional cases.</p> <p>In the presence of an outbreak, stool from specimens should be sent to confirm the presence of norovirus, or other pathogens (such as rotavirus and <i>E. coli</i> 0157:H7).</p>



# Gastrointestinal Tract Infections

Criteria	Comments
<p>B. <u>Norovirus gastroenteritis</u></p> <p><b>Both</b> criteria 1 and 2 present</p> <ol style="list-style-type: none"><li>At least <b>one</b> of the following GI sub-criteria<ol style="list-style-type: none"><li>Diarrhea, three or more liquid or watery stools above what is normal for the resident within a 24 hour period</li><li>Vomiting, two or more episodes in a 24 hour period</li></ol></li><li>A stool specimen positive for detection of norovirus either by electron microscopy, enzyme immune assay, or by a molecular diagnostic test such as polymerase chain reaction (PCR).</li></ol>	<p>In the absence of laboratory confirmation, an outbreak (2 or more cases occurring in a LTCF) of acute gastroenteritis due to norovirus infection in a LTCF may be assumed to be present if <b>all</b> of the following criteria are present (“Kaplan criteria”)</p> <ol style="list-style-type: none"><li>Vomiting in more than half of affected persons</li><li>A mean (or median) incubation period of 24-48 hours</li><li>A mean (or median) duration of illness of 12-60 hours</li><li>No bacterial pathogen is identified in stool culture.</li></ol>

# Gastrointestinal Tract Infections

Criteria	Comments
<p data-bbox="136 446 766 479"><i>C. Clostridium difficile gastroenteritis</i></p> <p data-bbox="136 511 598 544"><b>Both</b> criteria 1 and 2 present</p> <p data-bbox="136 576 777 609"><b>1. One</b> of the following GI sub-criteria</p> <ul data-bbox="231 641 1018 925" style="list-style-type: none"><li data-bbox="231 641 1018 763">a) Diarrhea, three or more liquid or watery stools above what is normal for the resident within a 24 hour period</li><li data-bbox="231 795 1018 925">b) The presence of toxic megacolon (abnormal dilation of the large bowel documented on radiology)</li></ul> <p data-bbox="136 958 903 990"><b>2. One</b> of the following diagnostic sub-criteria</p> <ul data-bbox="231 1023 1029 1453" style="list-style-type: none"><li data-bbox="231 1023 1029 1242">a) The stool sample yields a positive laboratory test result for <i>C. difficile</i> toxin A or B, or a toxin-producing <i>C. difficile</i> organism is identified in a stool culture or by a molecular diagnostic test such as PCR</li><li data-bbox="231 1274 1029 1453">b) Pseudomembranous colitis is identified during endoscopic examination or surgery, or in histopathologic examination of a biopsy specimen.</li></ul>	<p data-bbox="1060 446 1963 625">A “primary episode” of <i>C. difficile</i> infection (CDI) is defined as one that has occurred without any previous history of CDI., or that has occurred more than 8 weeks after the onset of a previous episode of CDI.</p> <p data-bbox="1060 714 1921 893">A “recurrent episode” of CDI is defined as an episode of CDI that occurs 8 weeks or less after the onset of previous episode, provided the symptoms from the earlier (previous) episode resolved</p> <p data-bbox="1060 982 1890 1112">Individuals previously infected with <i>C. difficile</i> may continue to remain colonized even after symptoms resolve</p> <p data-bbox="1060 1209 1911 1477">In the setting of a GI outbreak, individuals could test positive for <i>C. difficile</i> toxin due to ongoing colonization and also be co-infected with another pathogen. It is important that other surveillance criteria are used to differentiate infections in this situation.</p>

# Why is *C. difficile* Surveillance Important?

- *C. difficile* is the leading cause of acute diarrhea in nursing home residents
- *C. difficile* infections contribute to approximately 14,000 deaths/year
  - ~ 90% elderly
- Prevention activities, like antimicrobial stewardship programs and hand hygiene are shown to prevent the spread of *C. difficile* and other infections

# CDI LabID Event

- *C. difficile* positive laboratory assay, tested on a loose-unformed stool specimen, and collected while a resident is receiving care from the LTCF, and the resident has no prior *C. difficile* positive laboratory assay collected in the previous two weeks (<15 days) while receiving care from the LTCF

# **CASE STUDIES**

## **PRACTICE APPLYING THE DEFINITIONS**

# Case # 1

Mr. Unforgettable, a long term resident from your facility has a urinary catheter in place for 3 days for acute urinary retention.

On day 3 of catheter, he spikes a fever of 100.9° F and has a cough with shortness of breath. The physician orders a chest x-ray and urine culture.

X-ray positive for infiltrate in the right upper lobe and urine culture positive for  $>10^5$  CFU/ml of *Pseudomonas aeruginosa* and *Candida albicans*.

# Questions

- Has the resident been in your facility for > 2 calendar day?
- Has the resident had an invasive device for > 2 calendar days?
- Are clinical signs and symptoms present?
- Are there positive diagnostic test(s)
- Does the resident have a HAI and if so what site

Does Mr. Unforgettable have a  
catheter-associated urinary tract  
infection

A. Yes

B. No



# Case # 2

- Day 1: Mrs. Doubtful, one of your residents, complains of burning when she urinates and states that her urine looks and smells funny. She has not had an indwelling urinary device in the past month. However a straight catheter was used 3 days ago for urinary retention.  
Day 2: A clean catch voided urine specimen is collected.
- Day 3: No symptoms documented
- Day 4: The urine culture is positive for mixed flora, *E. coli* and *Candida glabrata*  $10^5$  CFU/ml

# Questions

- Has the resident been in your facility for > 2 calendar day?
- Has the resident had an indwelling urinary catheter for > 2 calendar days?
- Are clinical signs and symptoms present?
- Are there positive diagnostic test(s)
- Does the resident have a HAI and if so what site

# Is this a Urinary Tract Infection

- Yes
- No

## Case # 3

- Mr. Do Little has multiple co-morbidities including hypertension and acute respiratory failure. Vitals on admission WNL
- On days seven after admission, the daughter tells the nurse “dad in not responding like he used to. He can not hold a conversation, tires easily and is not able to brush his teeth, eat or dress without assistance.”

- Physical exam:
  - Temp 100.7, pulse 107, RR 26 and O2 sat 93%
  - Ronchi noted on auscultation of the chest the resident is confused
- MD notified and orders urine and chest x-ray
- Results:
  - Culture + E. coli  $10^2$  cfu/ml and
  - chest x-ray: no new findings

# Questions

- Has the resident been in your facility for > 2 calendar day?
- Has the resident had an invasive device for > 2 calendar days?
- Are clinical signs and symptoms present?
- Are there positive diagnostic test(s)
- Does the resident have a HAI and if so what site

# What Surveillance Criteria are Met

- A. Resident has a cold
- B. Resident has pneumonia
- C. Resident has a lower respiratory tract infection
- D. Resident is just “faking” to get daughter’s attention

# Case # 4

- Mrs. Hammer is admitted to your facility for rehab after having hip replacement surgery at the local hospital. While in the hospital she received treatment for *C. difficile* infection
- Two weeks later, resident complains that she has had multiple episodes of vomiting and diarrhea
- Stool specimen is tested and is toxin negative for *C difficile* but PCR + *C. difficile*



- The nurse remembers that this is the 8<sup>th</sup> such case of diarrhea and vomiting and that the resident's roommate had similar symptoms 2 days ago.
- When completing the line listing of infected cases the following data was noted:
  - 6/8 residents had vomiting
  - 5/8 residents had diarrhea
  - Most symptoms occurred within 48 hours of each other
  - Symptoms lasted on average of 36 hours (range 24-48 hrs)

# Questions

- Has the resident been in your facility for > 2 calendar day?
- Has the resident had an invasive device for > 2 calendar days?
- Are clinical signs and symptoms present?
- Are there positive diagnostic test(s)
- Does the resident have a HAI and if so what site

# What HAI Surveillance Criteria are Met

- A. Resident has a recurrent C difficile infection
- B. Resident has a C. difficile LabID event
- C. Resident has gastroenteritis
- D. Resident has norovirus
- E. Both A and B

# Questions?

