

# Nursing Home Patient Safety Series: Reducing Facility-Associated Infections and Hospitalizations Related to UTI, Sepsis, Pneumonia and COVID-19



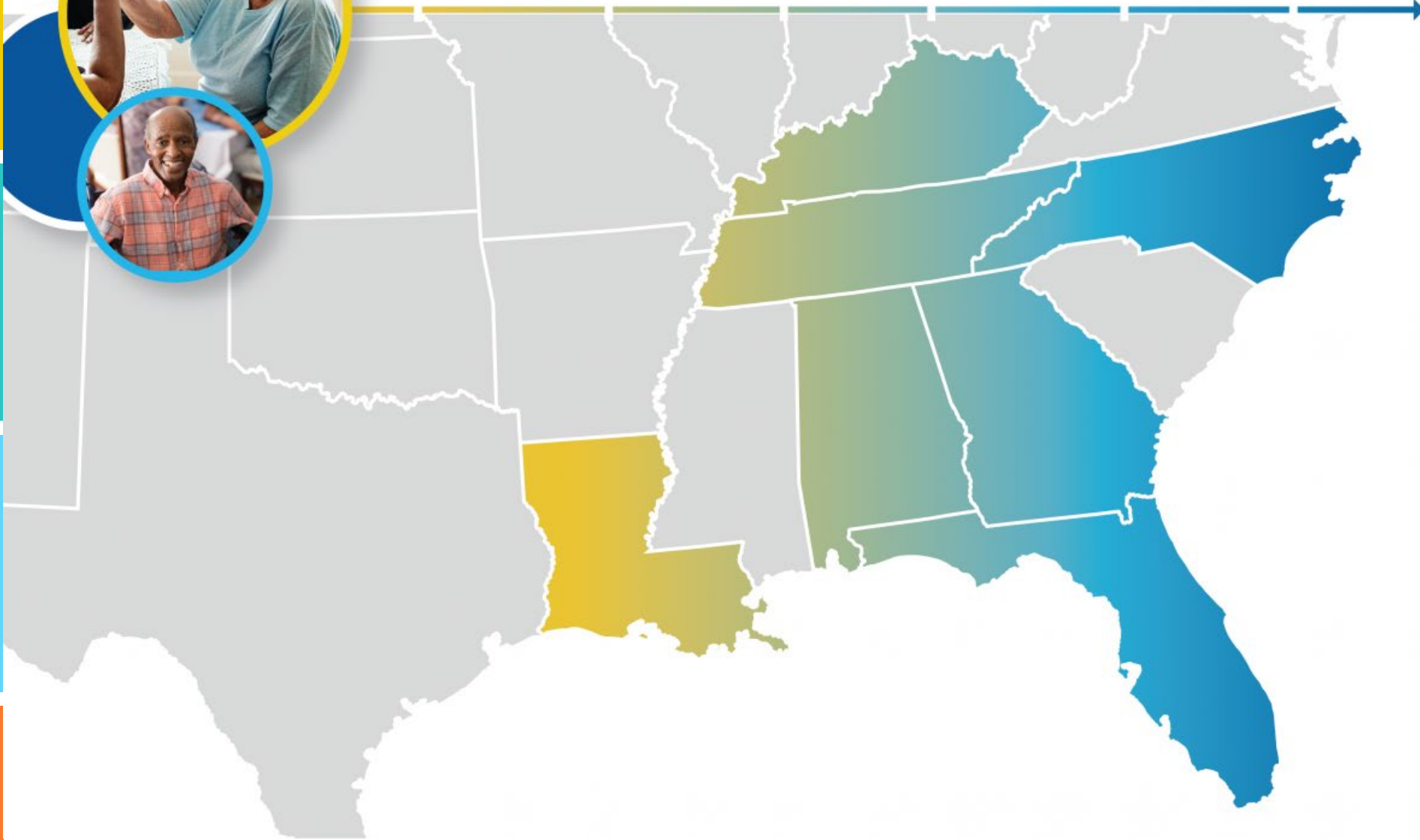
Erica Umeakunne, MSN, MPH, APRN, CIC  
Infection Prevention Specialist

September 21, 2022

 **ALLIANT**  
HEALTH SOLUTIONS

**QIN-QIO**  
Quality Innovation Network -  
Quality Improvement Organizations  
CENTER FOR MEDICARE & MEDICAID SERVICES  
QUALITY IMPROVEMENT & INNOVATION GROUP

# Making Health Care Better *Together*



## About Alliant Health Solutions

# Erica Umeakunne, MSN, MPH, APRN, CIC

## INFECTION PREVENTION SPECIALIST

Erica Umeakunne is an adult-gerontology nurse practitioner and infection preventionist with experience in primary care, critical care, health care administration and public health.

She previously served as the interim hospital epidemiology director for a large health care system in Atlanta and as a nurse consultant in the Center for Disease Control and Prevention's (CDC) Division of Healthcare Quality Promotion. While at CDC, she served as an infection prevention and control (IPC) subject matter expert for domestic and international IPC initiatives and emergency responses, including Ebola outbreaks and, most recently, the COVID-19 pandemic.

**Erica enjoys reading, traveling, family time and outdoor activities.**

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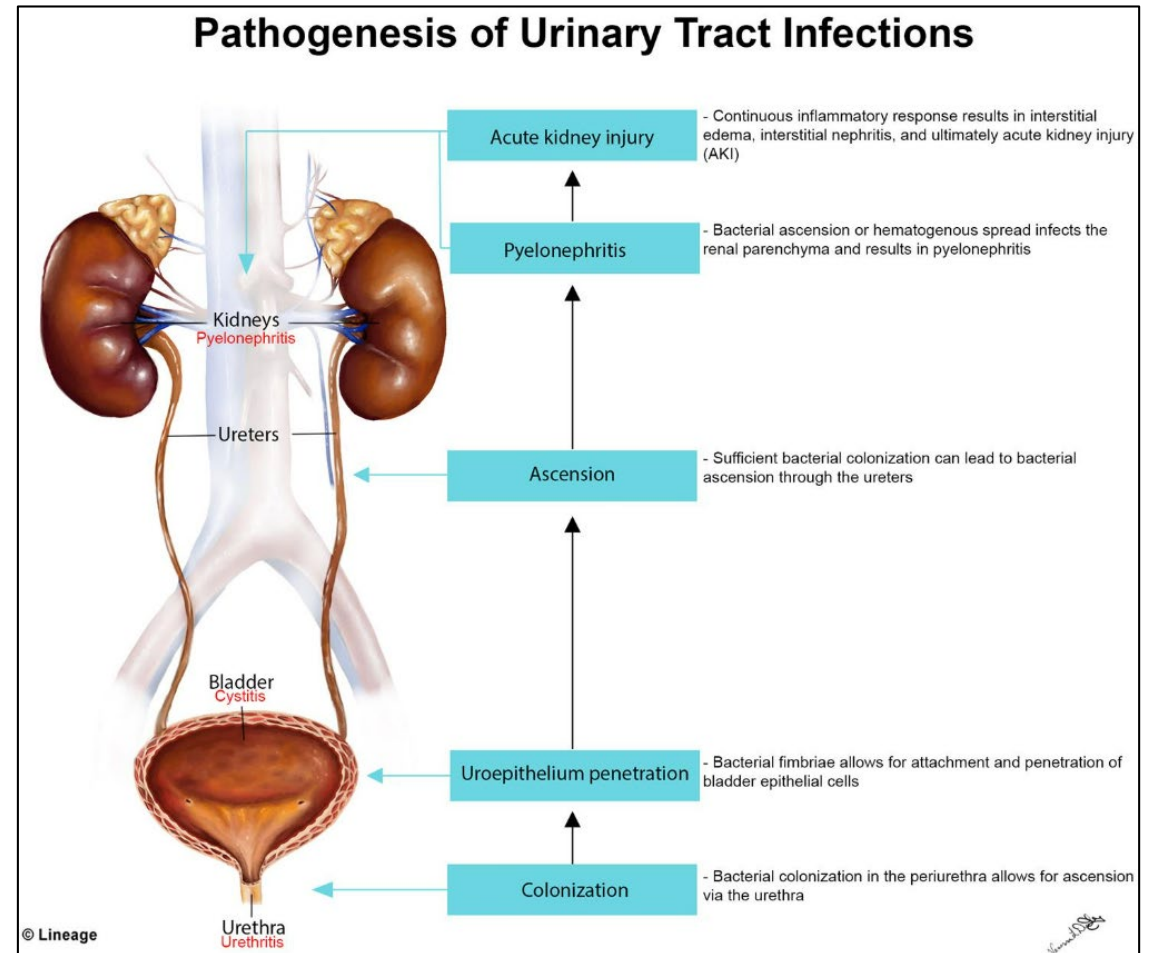
# Objectives

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- Present the prevalence of urinary tract infections (UTIs) and associated complications
- Highlight the importance of UTI surveillance in long-term care facilities
- Discuss surveillance definitions for UTIs
- Examine UTI surveillance case study
- Share Alliant Health Solutions quality improvement resources to support UTI prevention initiatives

# Urinary Tract Infections (UTIs)

- Most common sites of healthcare-associated infections
  - Accounts for up to 20% of infections reported by long-term care facilities (LTCFs)
- Risk factors for developing bacteriuria and UTI:
  - Age-related changes to the genitourinary tract
  - Comorbid conditions resulting in neurogenic bladder
  - Instrumentation required to manage bladder voiding
- Complications:
  - Cystitis
  - Pyelonephritis
  - Bacteremia
  - Septic shock
  - Declined resident function and mobility
  - Acute care hospitalizations
  - Increased mortality



<https://u.osu.edu/utieducation/pathophysiology-of-uti/>

<https://www.cdc.gov/nhsn/pdfs/ltc/lctf-manual-508.pdf>



## **How do you track UTIs in your facility?**

- a) We do not track UTIs in my facility.
- b) We track UTIs based on clinician diagnosis and/or documentation.
- c) We use the McGeer surveillance criteria.
- d) We use the National Healthcare Safety Network (NHSN) UTI surveillance definitions.

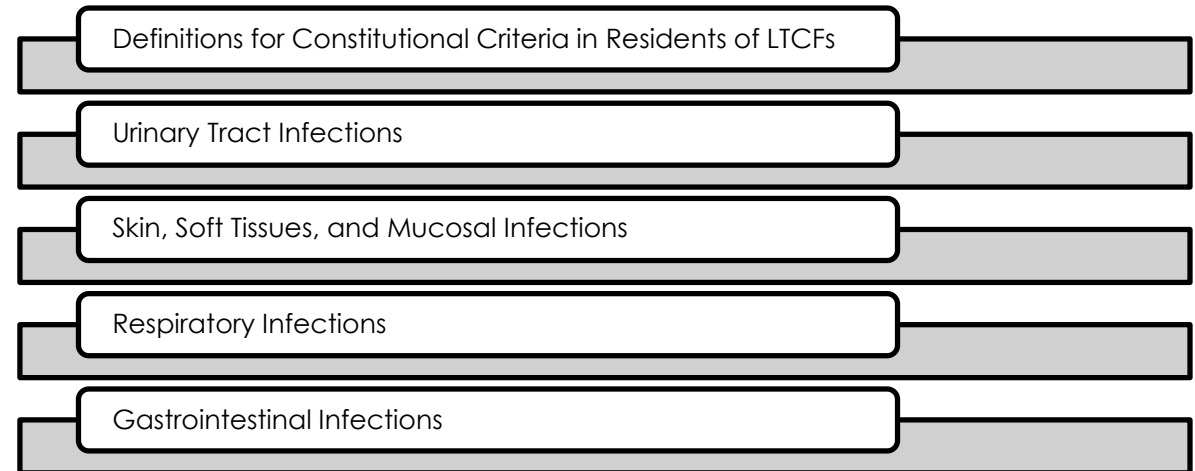
# Why is Surveillance Important?

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- Use of surveillance definitions is essential to ensure the same thing is counted
  - To enable meaningful comparison with others
  - To correctly interpret changes over time
  - To identify factors associated with UTI
  - To inform infection prevention efforts and targeted interventions

# McGeer Criteria

- Evidence-based, standardized guidance for infection surveillance activities in LTCFs
- Designed to define and identify infections for surveillance purposes
- Represented syndromes capture a variety of clinically relevant infections that occur in the LTCF population
  - Infections associated with clear infection prevention and control (IPC) strategies



Stone, N. D., Ashraf, M. S., Calder, J., Crnich, C. J., Crossley, K., Drinka, P. J., Gould, C. V., Juthani-Mehta, M., Lautenbach, E., Loeb, M., Maccannell, T., Malani, P. N., Mody, L., Mylotte, J. M., Nicolle, L. E., Roghmann, M. C., Schweon, S. J., Simor, A. E., Smith, P. W., Stevenson, K. B., ... Society for Healthcare Epidemiology Long-Term Care Special Interest Group (2012). Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infection control and hospital epidemiology*, 33(10), 965–977. <https://doi.org/10.1086/667743>



# McGeer Criteria for Urinary Tract Infections (UTIs)

- **For residents without an indwelling catheter (both criteria 1 and 2 must be present)**
  1. At least one of the following sign or symptom subcriteria:
    - a. Acute dysuria or acute pain, swelling or tenderness of the testes, epididymis or prostate
    - b. Fever\* or leukocytosis and at least one of the following localizing urinary tract subcriteria
      - i. Acute costovertebral angle pain or tenderness
      - ii. Suprapubic pain
      - iii. Gross hematuria
      - iv. New or marked increase in incontinence
      - v. New or marked increase in urgency
      - vi. New or marked increase in frequency
    - c. In absence of fever or leukocytosis, then two or more of the following localizing urinary tract sub-criteria:
      - i. Suprapubic pain
      - ii. Gross hematuria
      - iii. New or marked increase in incontinence
      - iv. New or marked increase in urgency
      - v. New or marked increase in frequency
  2. One of the following microbiologic subcriteria
    - a. At least  $10^5$  cfu/mL of no more than two species of microorganisms in a voided urine sample
    - b. At least  $10^2$  cfu/mL of any number of organisms in a specimen collected by in-and-out catheter

# McGeer Criteria for Urinary Tract Infections (UTIs)

- For residents with an indwelling catheter (both criteria 1 and 2 must be present)
  1. At least one of the following sign or symptom subcriteria:
    - a. Fever, rigors or new-onset hypotension with no alternate site of infection
    - b. Either acute change in mental status or acute functional decline, with no alternate diagnosis and leukocytosis
    - c. New-onset suprapubic pain, costovertebral angle pain or tenderness
    - d. Purulent discharge from around the catheter or acute pain, swelling, or tenderness of the testes, epididymis or prostate
  2. Urinary catheter specimen culture with at least  $10^5$  cfu/mL of any organism(s)

# NHSN Criteria for Symptomatic Urinary Tract Infection (SUTI)

Criterion	For residents without an indwelling catheter in place or removed >2 calendar days prior to the date of event, where day of catheter removal is equal to day 1:
1	<p>Either of the following (Signs &amp; Symptoms):</p> <ol style="list-style-type: none"> <li>1. Acute dysuria</li> <li>2. Acute pain, swelling, or tenderness of the testes, epididymis, or prostate</li> </ol> <p><u>AND</u></p> <p>A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of <math>\geq 10^5</math> CFU/ml</p>
2	<p>Either of the following:</p> <ol style="list-style-type: none"> <li>1. Fever+ [Single temperature <math>\geq 37.8^\circ\text{C}</math> (<math>&gt;100^\circ\text{F}</math>), or <math>&gt;37.2^\circ\text{C}</math> (<math>&gt;99^\circ\text{F}</math>) on repeated occasions, or an increase of <math>&gt;1.1^\circ\text{C}</math> (<math>&gt;2^\circ\text{F}</math>) over baseline]</li> <li>2. Leukocytosis (<math>&gt;14,000</math> cells/mm<sup>3</sup> or Left shift [<math>&gt;6\%</math> or 1,500 bands/mm<sup>3</sup> ])</li> </ol> <p><u>AND</u></p> <p>One or more of the following (New and/or marked increase):</p> <ol style="list-style-type: none"> <li>1. Costovertebral angle pain or tenderness</li> <li>2. Suprapubic tenderness</li> <li>3. Visible (Gross) hematuria</li> <li>4. Incontinence</li> <li>5. Urinary urgency</li> <li>6. Urinary frequency</li> </ol> <p><u>AND</u></p> <p>A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of <math>\geq 10^5</math> CFU/ml</p>
3	<p><u>Two</u> or more of the following (New and/or marked increase):</p> <ol style="list-style-type: none"> <li>1. Costovertebral angle pain or tenderness</li> <li>2. Incontinence</li> <li>3. Urinary urgency</li> <li>4. Urinary frequency</li> <li>5. Suprapubic tenderness</li> <li>6. Visible (gross) hematuria</li> </ol> <p><u>AND</u></p> <p>A positive urine culture with no more than 2 species of microorganisms, at least one of which is a bacterium of <math>\geq 10^5</math> CFU/ml</p> <p>Footnote: + Fever can be used to meet SUTI criteria even if the resident has another possible cause for the fever (for example, pneumonia).</p>

# NHSN Criteria for Catheter-Associated Symptomatic Urinary Tract Infection (CA-SUTI)

For residents **with** an indwelling catheter in place or removed within two calendar days prior to event onset, where the day of catheter removal is equal to Day One:

- One or more of the following (Signs and Symptoms and Laboratory and Diagnostic Testing):
  1. Fever+ [Single temperature  $\geq 37.8^{\circ}\text{C}$  ( $>100^{\circ}\text{F}$ ), or  $>37.2^{\circ}\text{C}$  ( $> 99^{\circ}\text{F}$ ) on repeated occasions, or an increase of  $>1.1^{\circ}\text{C}$  ( $>2^{\circ}\text{F}$ ) over baseline]
  2. Rigors
  3. New onset hypotension, with no alternate non-infectious cause
  4. New onset confusion/functional decline with no alternate diagnosis AND leukocytosis ( $>14,000$  cells/mm<sup>3</sup> or Left shift [ $>6\%$  or 1,500 bands/mm<sup>3</sup> ])
  5. New or marked increase in suprapubic tenderness
  6. New or marked increase in costovertebral angle pain or tenderness
  7. Acute pain, swelling or tenderness of the testes, epididymis or prostate
  8. Purulent discharge from around the catheter insertion site

## AND

- A positive urine culture with no more than two species of microorganisms, at least one of which is a bacterium of  $\geq 10^5$  CFU/ml

*\*Footnote: + Fever can be used to meet CA-SUTI criteria even if the resident has another possible cause for the fever (for example, pneumonia)*

# NHSN Criteria for Asymptomatic Bacteremic Urinary Tract Infection (ABUTI)

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For residents **with or without** an indwelling catheter:

- No qualifying fever or signs or symptoms (specifically, no urinary urgency, urinary frequency, acute dysuria, suprapubic tenderness, costovertebral angle pain or tenderness). If no catheter is in place, a fever alone will not exclude ABUTI if other criteria are met.

## AND

A positive urine culture with no more than two species of microorganisms, at least one of which is a bacterium of  $\geq 10^5$  CFU/ml

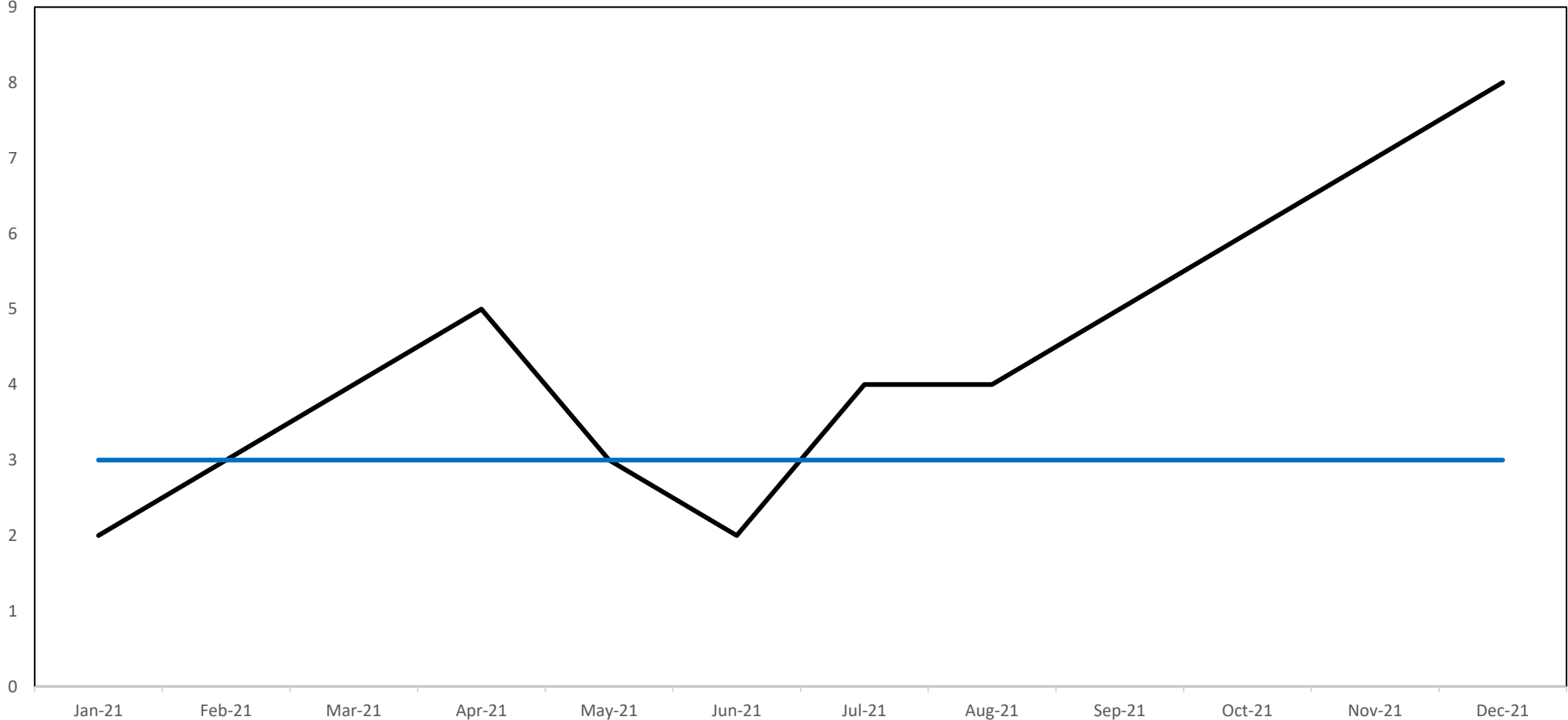
## AND

A positive blood culture with at least one matching bacteria to the urine culture

# Infection Prevention and Control Committee Meeting: Data Table

Infection Type	Numerator (raw number)	Denominator (total resident days)	Rate (per 1000 resident days) YTD	FY 2021 rate (per 1000 resident days)
Urinary Tract Infections (UTIs)	53	15,800	3.4 UTIs	2.5 UTIs
Respiratory Infections	26	15,800	1.6 respiratory infections	4.2 respiratory infections
SSTI (Skin, Soft Tissue Infections)	7	15,800	0.44 SSTIs	0.60 SSTIs
Gastrointestinal Infections	5	15,800	0.32 GI infections	0.75 GI infections
Multi-Drug Resistant Organisms (MDRO)	15	15,800	0.94 MDROs	0.68 MDROs

### Urinary Tract Infections (UTIs)



	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Rate per 1000 Resident days	2	3	4	5	3	2	4	4	5	6	7	8
Mean	3	3	3	3	3	3	3	3	3	3	3	3

— Rate per 1000 Resident days    — Mean

# Fishbone Diagram Worksheet



QUALITY IMPROVEMENT INITIATIVE

## Introduction

The fishbone diagram is a tool to help the RCA team identify the causes and effects of an event and get to the root cause. The problem or effect is identified at the head or mouth of the fish. Contributing causes are listed on the smaller "bones" under various cause categories. A fishbone diagram can be helpful in identifying all causes for a problem. The team looks at the categories and thinks of all the factors affecting the problem or event. Use the fishbone diagram to keep the team focused on the causes of the problem, rather than the symptoms or the solutions.

## How To Use

Use this worksheet to identify possible causes of a problem and to sort ideas into useful categories. The team should include members who have personal knowledge of the processes and systems involved in the problem or event being investigated and follow these steps:

1. Agree on the problem statement, also referred to as the effect. This is written at the mouth of the "fish." Be as clear and specific as you can about defining the problem. Be aware of the tendency to define the problem in terms of a solution. For example, "We need more of something." The problem is what happened.
2. Agree on the major categories of causes of the problem, written as branches or "bones" from the main arrow. Major categories in health care settings often include: equipment/supply factors, environmental factors, rules policy/procedure factors, and people/staff factors.
3. Brainstorm all the possible causes of the problem. Ask, "Why does this happen?" As each idea is given, the facilitator writes on the fishbone diagram under the appropriate category. These are contributing or causal factors leading to the problem. Causes can be written in more than one place if they relate to several categories.
4. The team again asks, "Why does this happen?" about each cause. Write sub-causes branching off the cause bones as they are identified.
5. The team continues to ask, "Why?" and generate deeper levels of causes and organizes them under the related categories. This will help identify and then address root causes to prevent future problems.

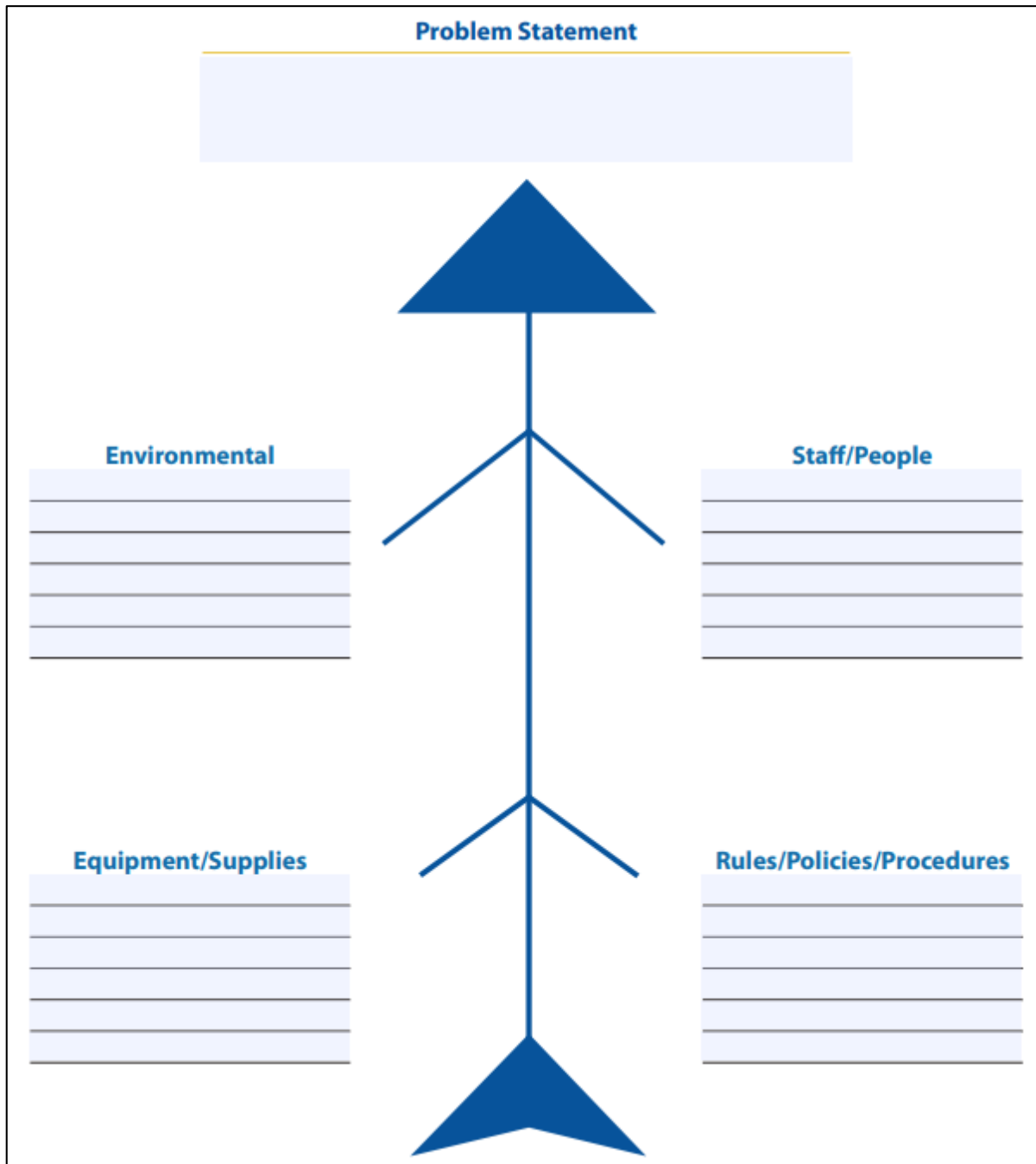
## Tips

- Consider drawing your fishbone diagram on a flip chart or large dry erase board.
- Make sure to leave enough space between the major categories on the diagram so that you can add minor detailed causes later.
- When you are brainstorming causes, consider having team members write each cause they can identify on a sticky note and place it on the diagram. Continue going through the group and identifying more factors until all ideas are exhausted. This encourages each team member to participate in the brainstorming activity and voice their opinions.
- Note that the "five-whys" technique is often used in conjunction with the fishbone diagram. Keep asking why until you get to the root cause.
- Another way to help identify the root causes from all the ideas generated is to consider a multi-voting technique. Have each team member identify the top three causes of the problem or event. Ask each team member to place three tally marks or colored sticky dots on the fishbone next to what they believe are the root causes that could be addressed.

# Root Cause Analysis

- Fishbone diagram
  - Identify cause and effect to get to a root cause
  - Problem at the head or mouth of fish
  - Contributing factors listed under the smaller bones in various categories
- [Fishbone Diagram Worksheet \(allianthealth.org\)](http://allianthealth.org)



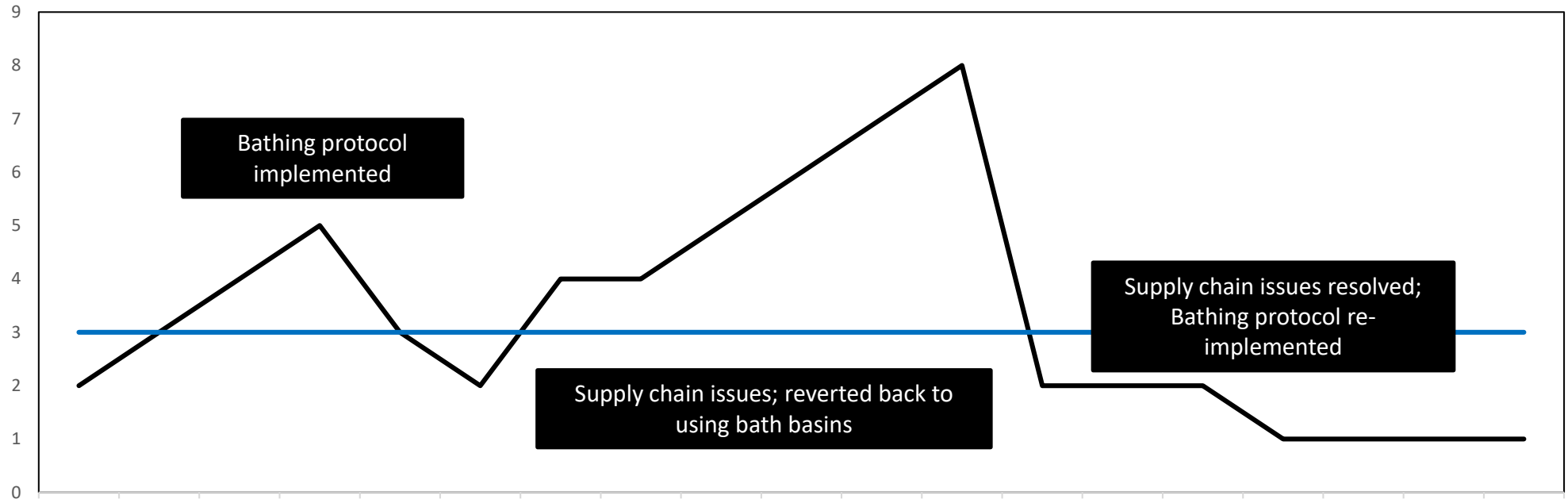


# Root Cause Analysis

- Fishbone diagram
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# Root Cause Analysis: Results

Urinary Tract Infections (UTIs)



	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22
— Rate per 1000 Resident days	2	3	4	5	3	2	4	4	5	6	7	8	2	2	2	1	1	1	1
— Mean	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

— Rate per 1000 Resident days — Mean

# Infection Control Resources

## Sepsis

[HQIC Sepsis Gap Assessment and Action Steps](#)

[HQIC Sepsis: Spot the Signs Magnet](#)

[HQIC Sepsis Provider Engagement](#)

[AQ Sepsis-ZoneTool](#)

[Recognition and Management of Severe Sepsis and Septic Shock](#)

[SHOW MORE](#)

## NHSN

[Joining the Alliant Health Solutions NHSN Group](#)

[Instructions for Submitting C. difficile Data into NHSN](#)

[5-Step Enrollment for Long-term Care Facilities](#)

[CDC's National Healthcare Safety Network \(NHSN\)](#)

[NHSN Enrollment/ LAN Event Presentation](#)

## Training

[Options for Infection Control Training in Nursing Homes  
Flyer](#)

## Catheter Associated Urinary Tract Infection (CAUTI)

[CAUTI Gap Assessment Tool](#)

[Urinary Catheter Quick Observation Tool](#)

[CDC-HICPAC Guideline for Prevention of CAUTI 2009](#)

[AHRQ Toolkit for Reducing CAUTI in Hospitals](#)

[CDC TAP CAUTI Implementation Guide](#)

[SHOW MORE](#)

## Clostridioides Difficile Infection (C. difficile)

[C.difficile Training](#)

[Nursing Home Training Sessions Introduction](#)

[Nursing Home C.difficile Infection](#)

## COVID-19

[Invest in Trust \(AHRQ Resource for CNA COVID-19 Vaccines\)](#)

[Nursing Home Staff and Visitor Screening Toolkit – PDF](#)

[Nursing Home Staff and Visitor Screening Toolkit – Excel](#)

## Hand Hygiene

[Handwash the FROG Way – Badges – English](#)

[Handwash the FROG Way – Badges – Spanish](#)

[Handwash the FROG Way – Poster – English](#)

[Handwash the FROG Way – Poster – Spanish](#)

[Frequently Asked Questions – Alcohol Based Hand Rub](#)

## Antibiotic Stewardship

[Antibiotic Stewardship Basics](#)

[A Field Guide to Antibiotic Stewardship in Outpatient Settings](#)

[Physician Commitment Letter](#)

[Be Antibiotics Aware](#)





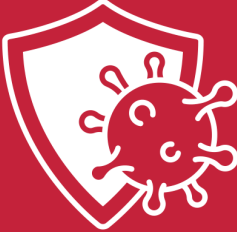


[Taking Your Antibiotics](#)

[SHOW MORE](#)

Questions?




# Nursing Home and Partnership for Community Health: CMS 12th SOW GOALS

						
<p><b>OPIOID UTILIZATION AND MISUSE</b></p> <ul style="list-style-type: none"> <li>Promote opioid best practices</li> <li>Reduce opioid adverse drug events in all settings</li> </ul>	<p><b>PATIENT SAFETY</b></p> <ul style="list-style-type: none"> <li>Reduce hospitalizations due to c. diff</li> <li>Reduce adverse drug events</li> <li>Reduce facility acquired infections</li> </ul>	<p><b>CHRONIC DISEASE SELF-MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>Increase instances of adequately diagnosed and controlled hypertension</li> <li>Increase use of cardiac rehabilitation programs</li> <li>Reduce instances of uncontrolled diabetes</li> <li>Identify patients at high-risk for kidney disease and improve outcomes</li> </ul>	<p><b>CARE COORDINATION</b></p> <ul style="list-style-type: none"> <li>Convene community coalitions</li> <li>Reduce avoidable readmissions, admissions to hospitals and preventable emergency department visits</li> <li>Identify and promote optimal care for super utilizers</li> </ul>	<p><b>COVID-19</b></p> <ul style="list-style-type: none"> <li>Support nursing homes by establishing a safe visitor policy and cohort plan</li> <li>Provide virtual events to support infection control and prevention</li> <li>Support nursing homes and community coalitions with emergency preparedness plans</li> </ul>	<p><b>IMMUNIZATION</b></p> <ul style="list-style-type: none"> <li>Increase influenza, pneumococcal, and COVID-19 vaccination rates</li> </ul>	<p><b>TRAINING</b></p> <ul style="list-style-type: none"> <li>Encourage completion of infection control and prevention trainings by front line clinical and management staff</li> </ul>

# Scan the QR codes or Click the Links to Complete the Assessments!

CMS requested Alliant Health Solutions, your QIN-QIO, to work with select nursing homes to understand emerging healthcare needs in nursing homes. Alliant Health Solutions is engaging nursing home leadership on each of these key areas to ensure plans are in place to achieve and maintain health quality and equity!

Please scan the QR codes below and complete the assessments.




**COVID-19**

- Support nursing homes by establishing a safe visitor policy and cohort plan
- Provide virtual events to support infection control and prevention
- Support nursing homes and community coalitions with emergency preparedness plans

## Nursing Home Emergency Preparedness Program (NH EPP) Self-Assessment



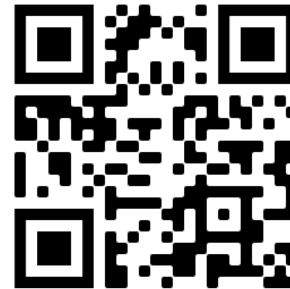
[https://bit.ly/AHS\\_NHEPPAssessment](https://bit.ly/AHS_NHEPPAssessment)




**TRAINING**

Encourage completion of infection control and prevention trainings by front line clinical and management staff

## Nursing Home Infection Prevention (NHIP) Initiative Training Assessment



<https://bit.ly/NHIPAssessment>



**COVID-19**

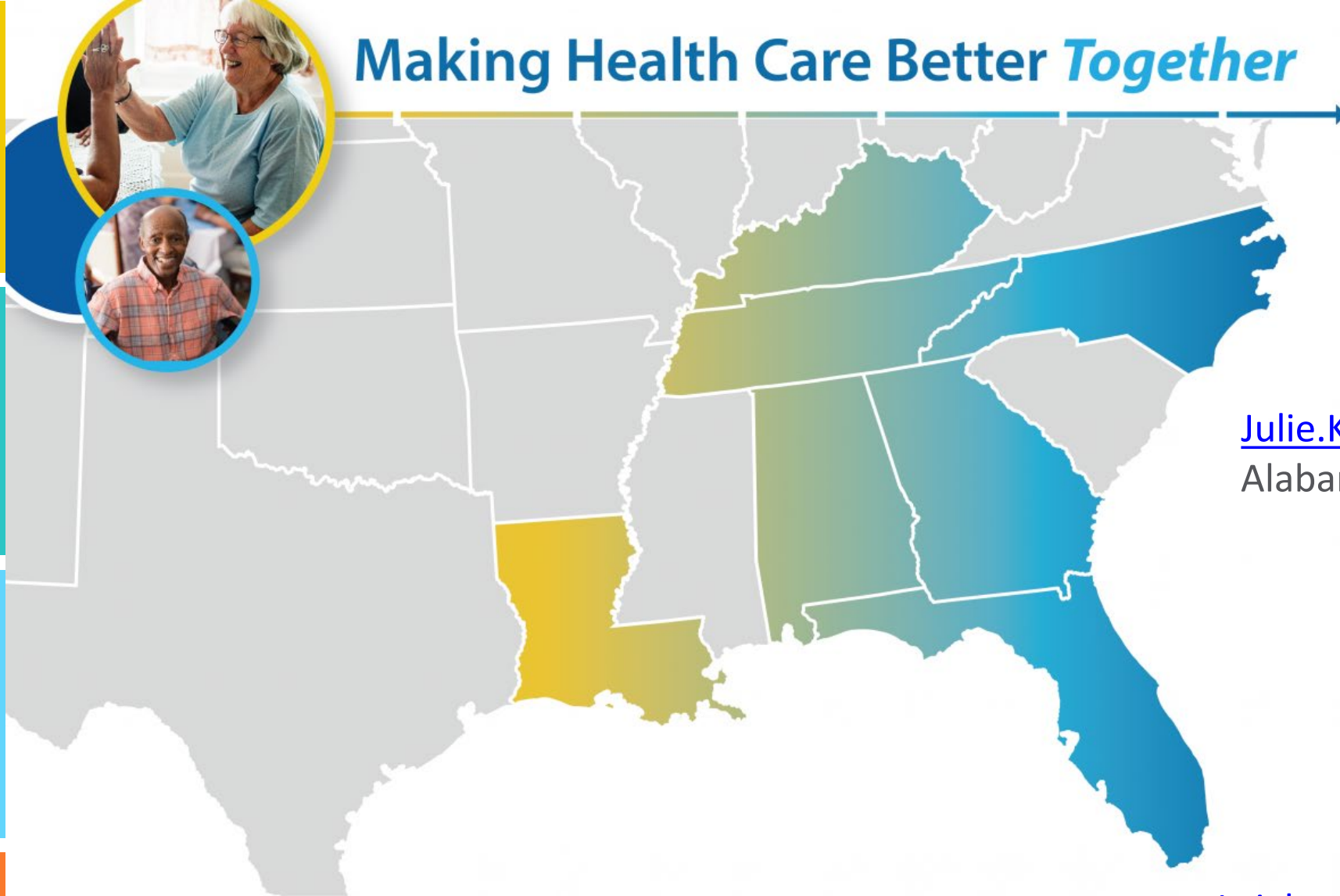
- Support nursing homes by establishing a safe visitor policy and cohort plan
- Provide virtual events to support infection control and prevention
- Support nursing homes and community coalitions with emergency preparedness plans

## Nursing Home Safe Visitor Policy and Cohorting Plan Verification



<https://bit.ly/SafeVisitorVerification>

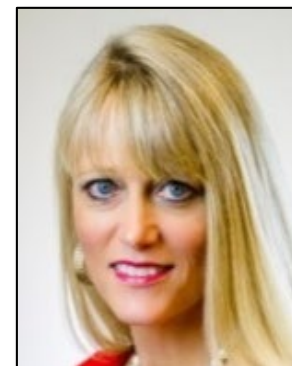
# Making Health Care Better *Together*



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## Program Directors

# Making Health Care Better Together



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