

Nursing Home Patient Safety Series: Practical Strategies to Prevent Sepsis in Nursing Home Residents



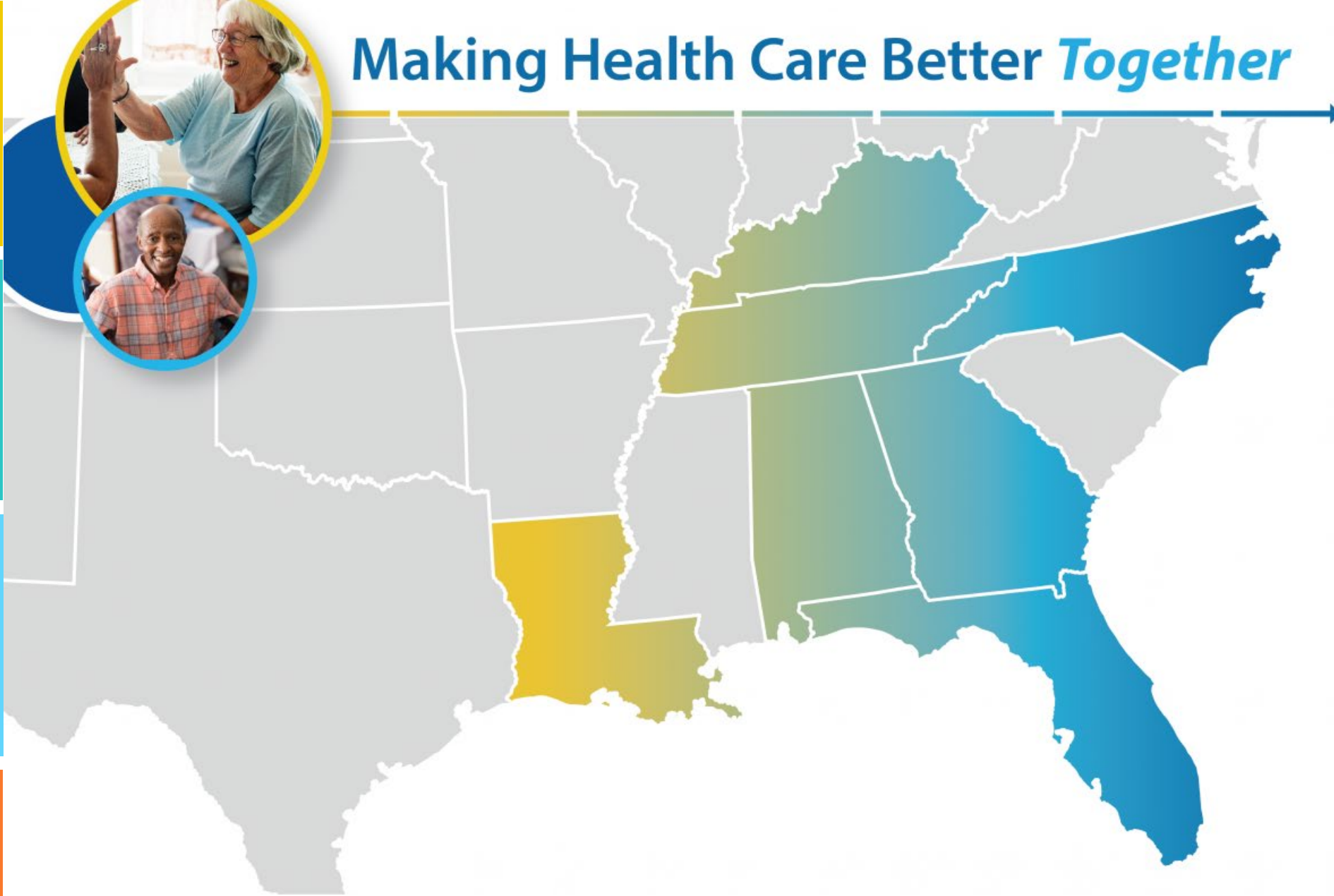
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About Alliant Health Solutions

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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. At the 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 the COVID-19 pandemic.

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

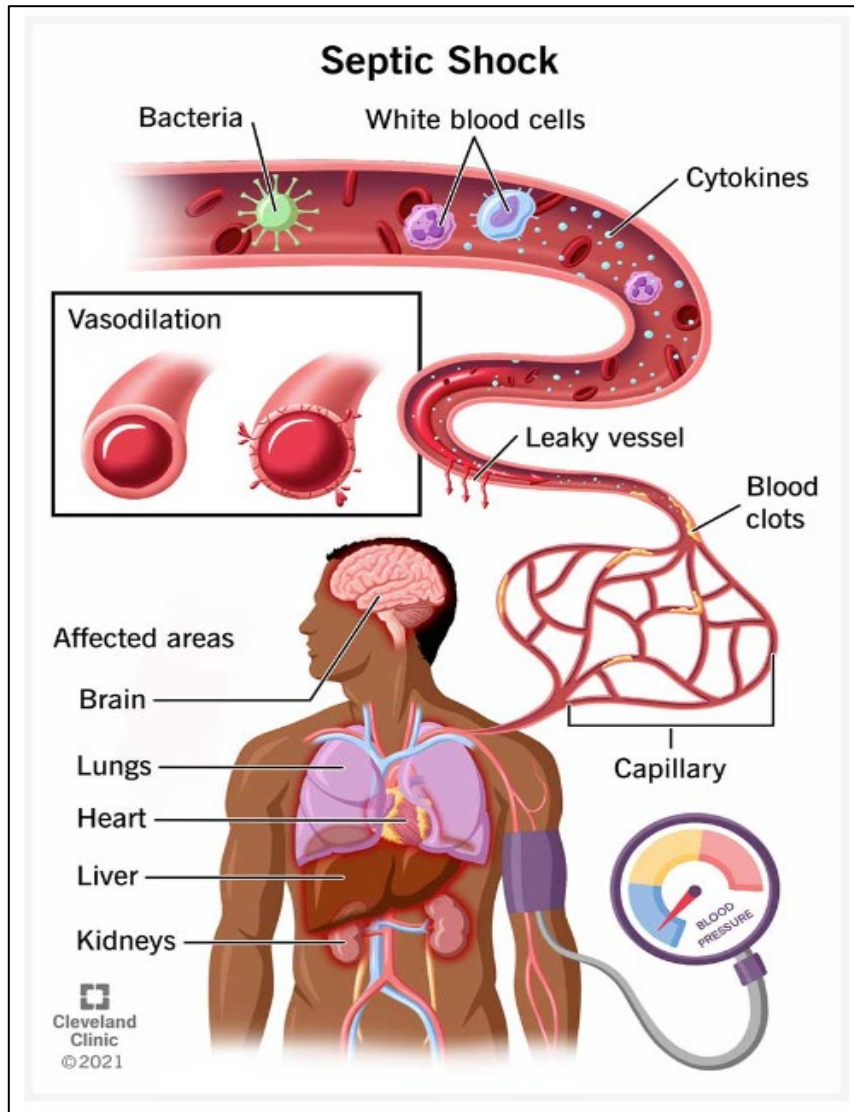
Contact: Erica.Umeakunne@allianthealth.org



Objectives

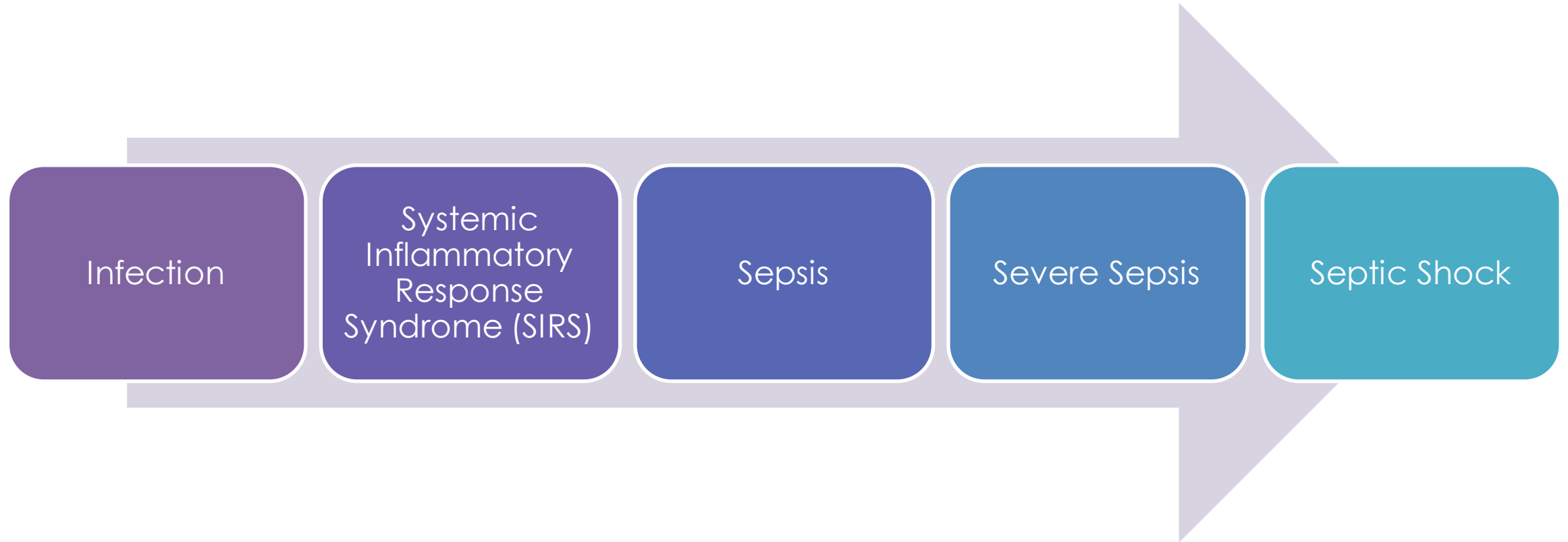
- Review the burden of sepsis and sepsis-related hospitalizations in nursing facilities
- Provide tools and resources to prevent the HAIs that are commonly associated with sepsis in nursing home residents
- Share resources to support nursing facility infection prevention and control programs
- Share Alliant Health Solutions quality improvement resources to support UTI prevention initiatives

Sepsis



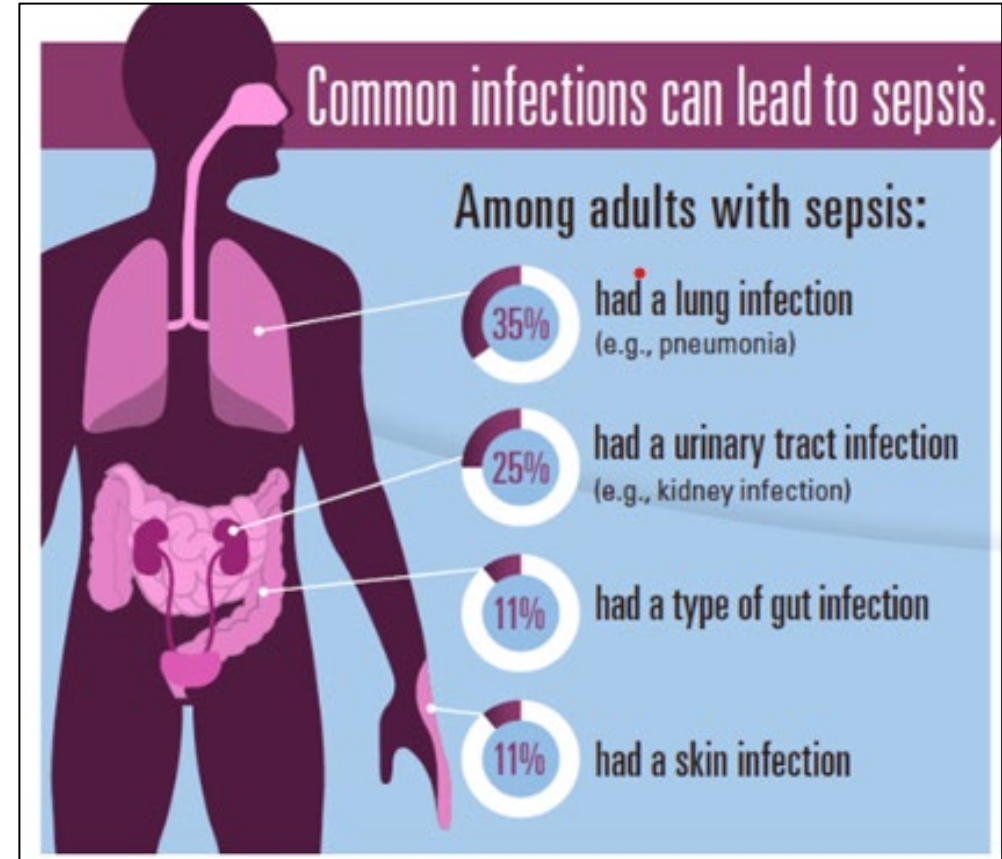
- Sepsis is the body's extreme response to an infection.
 - Happens when an infection triggers a chain reaction throughout the body
 - Life-threatening medical emergency
 - Rapidly leads to tissue damage, organ failure and death

Sepsis: Clinical Progression



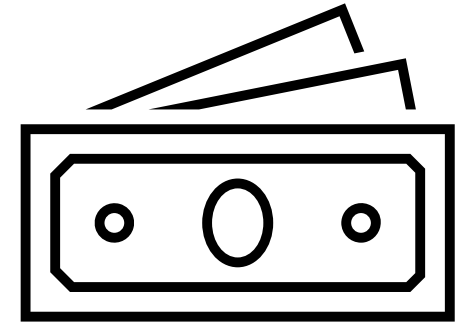
Sepsis Facts

- Sepsis, or the infection causing sepsis, starts before a patient goes to the hospital in nearly **87%** of cases
- Risk factors:
 - Adults 65 or older
 - People with weakened immune systems
 - People with chronic medical conditions, such as diabetes, lung disease, cancer and kidney disease
 - People with recent severe illness or hospitalization, including due to severe COVID-19
 - People who survived sepsis
 - Children younger than one



CMS Quality Improvement

- CMS Value-based Purchasing (VBP) Updates
 - CMS finalized the expansion of the SNF VBP program in FY 2026 and FY 2027 to include three new measures
 - **SNF HAI Requiring Hospitalization (FY2026)**
 - Baseline year (FY2022)
 - Performance year (FY2024)
 - 10/1/2023 - 9/30/2024



<https://www.cms.gov/medicare/quality/nursing-home-improvement/value-based-purchasing/measures>
<https://www.cms.gov/files/document/snf-hai-technical-report.pdf-0>

Prevent Sepsis and Improve Early Recognition



Targeted Prevention Strategies for Sepsis-Related Infections

Lung infections

Urinary tract infections

Gastrointestinal tract infections

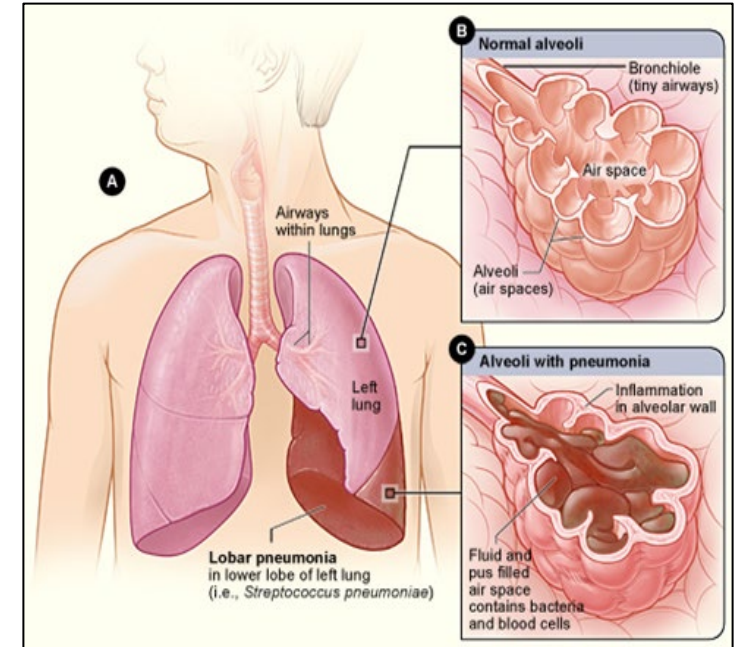
Skin infections

Novosad, S. A., Sapiano, M. R., Grigg, C., Lake, J., Robyn, M., Dumyati, G., ... & Epstein, L. (2016). Vital signs: epidemiology of sepsis: prevalence of health care factors and opportunities for prevention. *Morbidity and Mortality Weekly Report*, 65(33), 864-869.
<https://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6533e1.pdf>

Stone, N. D., Ashraf, M. S., Calder, J., Cmich, C. J., Crossley, K., Drinka, P. J., ... & Bradley, S. F. (2012). Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infection Control & Hospital Epidemiology*, 33(10), 965-977.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3538836/pdf/nihms430715.pdf>

Lung Infections

- Upper respiratory infections (i.e., sinusitis, pharyngitis, epiglottitis, and laryngotracheitis)
- Lower respiratory infections (i.e. bronchitis, bronchiolitis, pneumonia)
 - Pneumonia
 - Infection that affects one or both lungs
 - Causes the air sacs, or alveoli, of the lungs to fill up with fluid or pus
 - Ranges from mild to severe illness in people of all ages
 - Caused by:
 - Bacteria (*Streptococcus pneumoniae*, *Mycoplasma pneumoniae*, *Haemophilus influenzae*, *Legionella* species, etc.)
 - Viruses (Influenza, Respiratory syncytial virus, SARS-CoV-2)
 - Fungi (*Aspergillus*, *Cryptococcus neoformans*, *Pneumocystis jirovecii*)
 - Symptoms
 - Chest pain
 - Fever/Chills
 - Cough
 - Hypoxemia (Low blood oxygen levels)
 - Shortness of breath



<https://www.nhlbi.nih.gov/health/pneumonia>

Respiratory Infection Prevention Strategies



Pneumonia Prevention: Recommended Immunizations

COVID-19

Pneumococcal

Influenza (flu)

Respiratory
syncytial virus
(RSV)

Haemophilus
influenzae type
b (Hib)

Pertussis
(whooping
cough)

Viral Respiratory Pathogens Toolkit for Nursing Homes

Preparing for and responding to nursing home residents or healthcare personnel (HCP) who develop signs or symptoms of a respiratory viral infection

ACTION: PREPARE for respiratory viruses (e.g., SARS-CoV-2, influenza, RSV)

Vaccinate

Provide [recommended vaccines](#) to residents and HCP and provide information (e.g., posted materials, letters) to families and other visitors encouraging them to be vaccinated. Recommended vaccines help prevent infection and complications such as severe illness and death. Utilize pharmacy and public health partners to ensure access to indicated vaccines for residents and HCP.

Allocate resources

Ensure that resource limitations (e.g., personal protective equipment (PPE), alcohol-based hand sanitizer (ABHS)) do not prevent HCP from adhering to recommended infection prevention and control (IPC) practices. Plan for situations (e.g., multiple symptomatic individuals) that may require increased supplies. Have a process for monitoring supplies availability and access.

Monitor and Mask

Be aware when levels of [respiratory virus spread](#) are increasing in the community. When levels in the community are higher, consider having visitors and HCP [wear a mask](#) at all times in the facility and at a minimum, consider having residents wear a mask when outside of their room.

Educate

Ensure everyone, including residents, visitors, and HCP, are aware of recommended [IPC practices in the facility](#), including when specific IPC actions are being implemented in response to new infections in the facility or increases in respiratory virus levels in the community. Encourage visitors with respiratory symptoms to delay non-urgent in-person visitation until they are no longer infectious. Following close contact with someone with SARS-CoV-2, [testing is recommended](#) and [visitors should wear](#) a mask while in the facility.

Ventilate

In consultation with facility engineers, explore options to improve ventilation delivery and indoor air quality in resident rooms and all shared spaces.

Test and Treat:

Develop plans to provide rapid clinical evaluation and intervention to ensure residents receive timely treatment and/or prophylaxis when indicated.

- Ensure access to respiratory viral testing with rapid results (i.e., onsite or send-out testing with results available within 24 hours). Testing results can inform recommended treatment and IPC actions.
- Establish pharmacy connections to enable the use of any available respiratory virus treatments or prophylaxis.

ACTION: RESPOND when a resident or HCP develops signs or symptoms of a respiratory viral infection

When an acute respiratory infection is identified in a resident or HCP, it is important to take rapid action to prevent the spread to others in the facility. While decisions about treatment, prophylaxis, and the recommended duration of isolation vary depending on the pathogen, IPC strategies, such as placement of the resident in a single-person room, use of a facemask for source control, and physical distancing, are the same regardless of the pathogen.

Prevent Spread

Residents apply appropriate Transmission-Based Precautions for symptomatic residents based on the suspected cause of their infection.

- When available, residents can be placed in a single-person room to minimize the risk of transmission to roommates. Moving residents to a single room is often not practical (e.g., limited rooms available), and in those situations, residents could remain in their current location. In shared rooms, consider ways to increase ventilation; the use of [in-room HEPA air cleaners](#) could also be considered. Use of facemasks at all times by both residents while in the room might also reduce the risk of transmission but is often impractical and not routinely recommended.
 - Symptomatic residents should not be placed in a room with a new roommate unless they have both been confirmed to have the same respiratory infection.
 - Roommates of symptomatic residents – who have already been potentially exposed – should not be placed with new roommates, if possible. They should be considered exposed and wear a facemask for source control around others.
 - Residents placed in Transmission-Based Precautions for acute respiratory infection should primarily remain in their rooms except for medically necessary purposes. If they must leave their room, they should practice physical distancing and wear a facemask for source control. The resident should be removed from Transmission-Based Precautions as soon as they are deemed no longer infectious to others.
 - HCP who enter the room of a resident with signs or symptoms of an unknown respiratory viral infection that is consistent with SARS-CoV-2 infection should adhere to Standard Precautions and use a NIOSH-approved* particulate respirator with N95* filters or higher, gown, gloves, and eye protection (i.e., goggles or a face shield that covers the front and sides of the face). This PPE can be adjusted once the cause of the infection is identified. Recommendations on PPE for respiratory viruses are available in [Appendix A of the 2007 Guideline for Isolation Precautions](#).
- Healthcare Personnel:** Develop sick leave policies for HCP that are non-punitive, flexible, and consistent with public health guidance to discourage presenteeism and allow HCP with respiratory infection to stay home for the [recommended duration of work restriction](#).

Test

Test anyone with respiratory illness signs or symptoms

- Selection of diagnostic tests will depend on the suspected cause of the infection (e.g., which respiratory viruses are circulating in the community or the facility, recent contact with someone confirmed to have a specific respiratory infection) and if the results will inform clinical management (e.g., treatment, duration of isolation). At a minimum, testing should include [SARS-CoV-2 and influenza viruses](#) with consideration for other causes (e.g., RSV).

Treatment and Prophylaxis

Provide recommended **treatment and prophylaxis** to infected and exposed residents when indicated.

■ For Influenza:

- [Provide antiviral treatment immediately](#) for all residents who have confirmed or suspected influenza.
- Provide chemoprophylaxis to exposed residents on units or wards with influenza cases (currently impacted wards) as soon as an influenza outbreak is determined. See the [guidance](#) for additional chemoprophylaxis recommendations.

■ For SARS-CoV-2 infection:

- [Provide COVID-19 treatment](#) for eligible residents with [mild-to-moderate COVID-19](#) with one or more risk factors for severe COVID-19; be aware of potential drug interactions. Treatment must be started as soon as possible and within five days of symptom onset to be effective.

Investigate

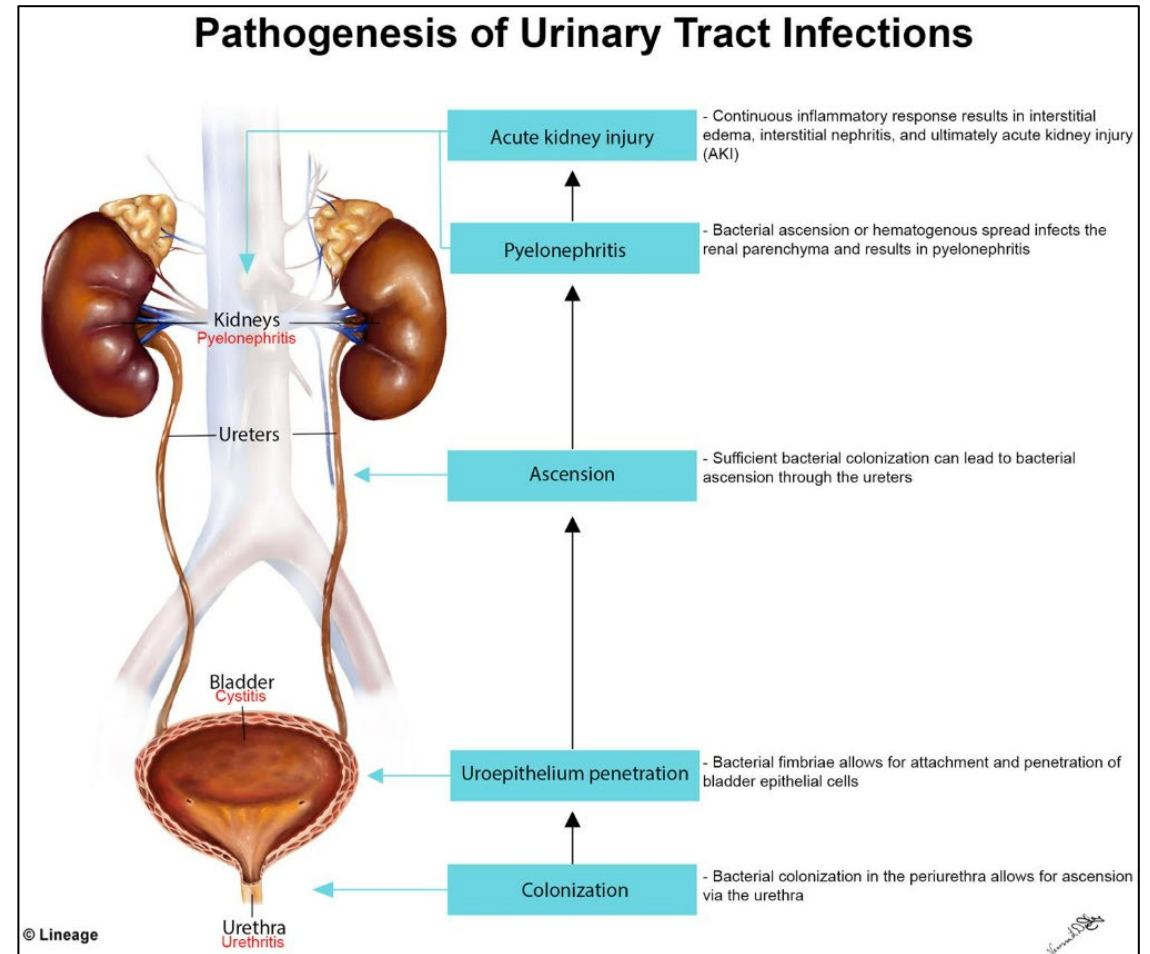
Investigate for potential respiratory virus spread among residents and HCP.

- Perform active surveillance to identify any additional ill residents or HCP using symptom screening and evaluating potential exposures.
- For SARS-CoV-2 infection, [testing of exposed individuals](#) is recommended, even if they are asymptomatic.

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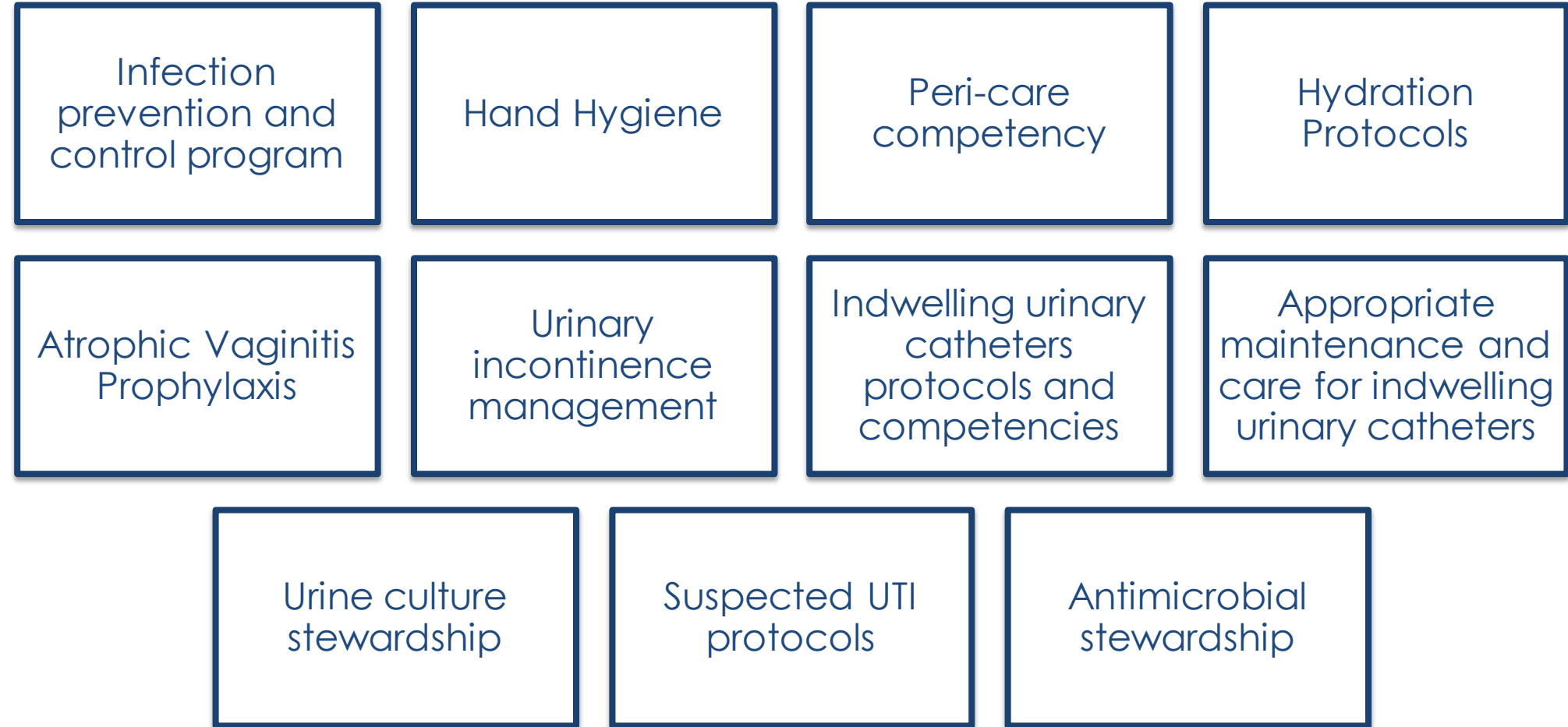
Urinary Tract Infections (UTIs)

- 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/>

UTI Prevention Strategies



Ashraf, M. S., Gaur, S., Bushen, O. Y., Chopra, T., Chung, P., Clifford, K., ... & Medicine, L. T. C. (2020). Diagnosis, treatment, and prevention of urinary tract infections in post-acute and long-term care settings: A consensus statement from AMDA's Infection Advisory Subcommittee. *Journal of the American Medical Directors Association*, 21(1), 12-24.

Christmas, M. M., Iyer, S., Daisy, C., Maristany, S., Letko, J., & Hickey, M. (2023). Menopause hormone therapy and urinary symptoms: a systematic review. *Menopause (New York, N.Y.)*, 30(6), 672-685. <https://doi.org/10.1097/GME.0000000000002187>

Meddings, J., Saint, S., Krein, S. L., Gaies, E., Reichert, H., Hickner, A., McNamara, S., Mann, J. D., & Mody, L. (2017). Systematic Review of Interventions to Reduce Urinary Tract Infection in Nursing Home Residents. *Journal of hospital medicine*, 12(5), 356-368. <https://doi.org/10.12788/jhm.2724>

UTI Resources

Bite-sized Learnings

- [Ensuring High-Quality UTI Surveillance Data](#)
- [Implementing UTI Surveillance](#)
- [Revised McGeer Criteria Checklist Tool](#)
- [Enhanced Barrier Precautions](#)
- [HAI Surveillance Dashboard & Tool](#)
- [Urine Specimen Collection Resource](#)
- [Antibiogram & Empiric Treatments](#)
- [UTIs & Antibiotic Time-outs](#)
- [UTI Treatment Guidance](#)

Resources

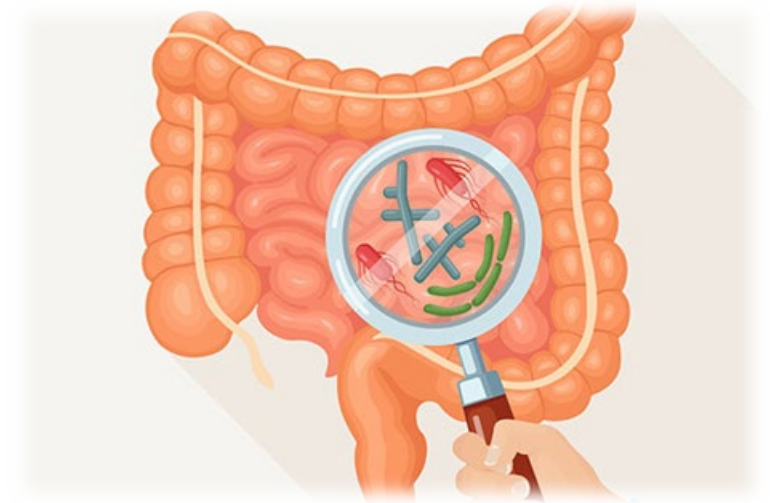
- [HAI Surveillance Dashboard Tool](#) (Click Handout)
- [Revised McGeer Criteria Checklist Tool](#) (Click Handout)
- [Urine Specimen Collection Resource](#) (Click Handout)
- [Communication Checklist for Suspected UTIs](#) (Click Handout)

Webinar Playlist

- [Comprehensive Approaches to Prevent & Manage UTIs in Nursing Facilities Playlist](#)
 - Includes UTI-related webinars and bite-sized learnings

Gastrointestinal (GI) Tract Infections

- Gastroenteritis
 - Infections commonly caused by enteric pathogens (i.e., *Salmonella*, *Shigella*, *Escherichia coli* O157:H7, *Campylobacter* species, rotavirus)
- Norovirus gastroenteritis
 - Causes acute gastroenteritis, inflammation of the stomach or intestines
 - Very contagious
 - Transmission via fecal-oral route, either by direct person-to-person spread or fecally contaminated food or water; also spread via a droplet route from vomitus.
 - Can lead to dehydration, especially in young children, older adults, and people with other illnesses
- *Clostridioides diffable* (*C. diff*)
 - Spore-forming, Gram-positive anaerobic bacillus that produces two exotoxins: toxin A and toxin B
 - Common cause of antibiotic-associated diarrhea (AAD) and accounts for 15 to 25% of all episodes of AAD
 - Colonization (asymptomatic + positive test/toxin)
 - Infection (clinical symptoms present + positive test/toxin)



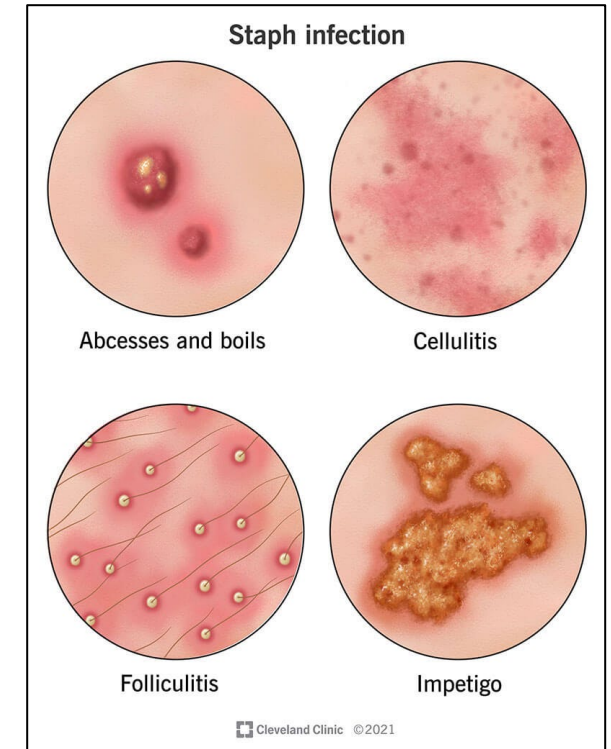
<https://www.health.harvard.edu/blog/preventing-emc-diffem-in-and-out-of-the-hospital-202207192783>

GI Tract Infection Prevention Strategies



Skin and Mucosal Infections

- Cellulitis, soft tissue, or wound infections
 - Redness, swelling, and pain in the infected area of the skin
 - Caused by bacteria
 - Opportunistic
 - Multi-drug resistant organisms (MDROs)
 - Methicillin-resistant *Staphylococcus aureus* (MRSA)
 - Extended beta spectrum lactamase (ESBL) organisms
- Fungal oral or perioral skin infections
 - *Candida* species
 - MDRO (i.e. *Candida auris*)
- Herpesvirus skin infections
 - Herpes zoster
 - Reactivation of varicella-zoster virus (VZV)
 - People with compromised or suppressed immune systems
 - More likely to have a severe, long-lasting rash and experience more severe complications from herpes zoster
 - Transmission via direct contact with vesicular fluid or through breathing in virus particles from the blisters until they dry and scab over
- Parasites
 - Bedbugs
 - Scabies



<https://my.clevelandclinic.org/health/diseases/21165-staph-infection-staphylococcus-infection>

Skin and Mucosal Infection Prevention Strategies



Improve Early Recognition

Educate residents and their families

Think sepsis

Act fast

Reassess resident management/treatment

SEPSIS EARLY IDENTIFICATION AND TREATMENT PATHWAY

Assess for Infection and SIRS

Does the patient have a possible or active infection?

Symptoms or signs of infection can include:

- Fever/chills
- Cough/shortness of breath
- Cellulitis/wound drainage
- Changes in urine (volume, painful urination, color, odor)

Does the patient have 2 or more of the SIRS criteria?
(SIRS= Systemic Inflammatory Response Syndrome)

SIRS Criteria include:

- Hyperthermia $>38.3^{\circ}\text{C}$ or $>101.0^{\circ}\text{F}$
- Hypothermia $<36^{\circ}\text{C}$ or $<96.8^{\circ}\text{F}$
- Change in mental status
- Tachycardia >90 bpm
- Tachypnea >20 bpm
- Leukocytosis (WBC $>12\text{K}$)
- Leukopenia (WBC $<4\text{K}$)

Yes to both? Think SEPSIS!

Prepare to contact medical provider:

- Review the record for medications, allergies, recent infections or antibiotic use
- Note the patient's advance directive or care wishes (if comfort care, suggested interventions below)
- Complete sepsis SBAR

Comfort Care Interventions:

- Pain control
- Medications to lower fever
- Frequent repositioning
- Frequent oral care
- Offer fluids (if tolerated)

Contact the medical provider

Prepare for these possible interventions to be completed as soon as possible:

- Transfer to higher level of care
- Draw Labs: Lactate, CBC w/ diff, blood cultures
- Establish IV access
- Administer broad spectrum intravenous antibiotics

For hypotension SBP less than 90 mmHg or lactate greater than 4:

- Administer IV fluid bolus at 30 ml/kg

Monitor the patient and notify the medical provider of any worsening or progression of sepsis.



SBAR FOR SEPSIS

S
(describe the situation)

- My name is _____ and I am calling from _____.
- I need to speak to you about patient Mr. or Mrs. _____.
- This patient is showing signs and symptoms of infection and sepsis.

B
(provide background)

- The patient was admitted on _____ (date) with the diagnosis of _____ (original condition).
- The patient now is showing these signs of a possible infection _____ (describe the signs and potential source of infection).
- This started on _____ (date).
- The patient is allergic to _____.
- The patient's advance care directive is _____.

A
(describe the key assessment findings)

- My assessment of the situation is that the patient may be experiencing a new or worsening of his/her infection. Here are my assessment findings:
- The current vital signs:
- BP _____ HR _____ RR _____
- Temp _____ SPO2 _____ (on room air or supplemental O2)
- The patient has voided _____ times in the last 8 hours
- Mental status is (changed or unchanged) from baseline _____
- Other physical assessment findings that are related to possible infection or sepsis (lung sounds, wound assessments, etc): _____

R
(recommendation)

- I am concerned this patient has sepsis. I recommend that you see the patient as soon as possible and that we order a serum lactate, blood cultures and a basic metabolic panel. Do you agree?
- If the patient is hypotensive: Should I start an IV and give a fluid bolus?
- The physician should confirm, clarify and request additional information and then work with the nurse to take appropriate action with this patient.

Before Calling the Physician / NP / PA/other Healthcare Professional:

Evaluate the patient and complete this form

Check vital signs- be alert for the early sepsis warning signs

Review the patient record: recent hospitalization, lab values, medications, and progress notes

Note any allergies

Be aware of the patient's advance care wishes

Early Sepsis Warning Signs

Report any of these Findings:

Temp $>38.3^{\circ}\text{C}$ (101.0°F)
Temp $<36.0^{\circ}\text{C}$ (96.8°F)
Heart rate >90 bpm
Respiratory rate >20 bpm

White Blood Cell Count
 $>12,000 \mu\text{L}^{-1}$ or
 $<4,000 \mu\text{L}^{-1}$

Altered mental status

SPO2 $<90\%$

Decreased urine output

From recently drawn labs

(within 24 hours):

Creatinine >2.0 mg/dl

($176.8 \mu\text{mol/L}$)

Bilirubin >2 mg/dl

($34.2 \mu\text{mol/L}$)

Platelet count $<100,000$

μL

Lactate >2 mmol/L

(18.0 mg/dl)

Coagulopathy (INR >1.5 or aPTT >60 secs)



Sepsis Education Tools, Resources and Printables

- [Sepsis: Educational Information for Residents and Families](#)
- [Long-Term Care Nurses: Protect your Residents from Sepsis](#)
- [Long-Term Care Certified Nurse Assistants: Protect Residents from Sepsis](#)
- [Sepsis: Technical Resources & Guidelines](#)
- [Surviving Sepsis Campaign: Protocols and Checklists](#)
- [CDC Sepsis Educational Information](#)

FOR LONG-TERM CARE NURSES

GET AHEAD OF SEPSIS
KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.

PROTECT YOUR RESIDENTS FROM SEPSIS.

Sepsis is a medical emergency. You play a critical role. Protect your residents by **ACTING FAST**. Infections put your residents at risk for sepsis. Anyone can get an infection, and **almost any infection, including COVID-19, can lead to sepsis.** With your fast recognition and treatment, most residents survive.

WHAT CAUSES SEPSIS?

Bacterial infections cause most cases of sepsis. Sepsis can also be a result of other infections, including viral infections, such as COVID-19 or influenza, or fungal infections. The most frequently identified pathogens that cause infections that can develop into sepsis include *Staphylococcus aureus* (staph), *Escherichia coli* (E. coli), and some types of *Streptococcus*. COVID-19 can have a similar presentation and a similar clinical course to some forms of sepsis. Many residents who require hospitalization for COVID-19 have signs or symptoms that meet the definition of sepsis. Infections that lead to sepsis most often start in the:

- Lung
- Urinary tract
- Skin
- Gastrointestinal tract

WHO IS AT RISK?
Anyone can develop sepsis, but some people are at higher risk for sepsis:

- 65+
Adults 65 or older
- People with weakened immune systems
- People with chronic medical conditions, such as diabetes, lung disease, cancer, and kidney disease
- People with recent severe illness or hospitalization, including due to severe COVID-19
- People who survived sepsis
- Children younger than one

WHAT ARE THE SIGNS AND SYMPTOMS OF SEPSIS?

A resident with sepsis might have one or more of the following signs or symptoms:

- High heart rate or low blood pressure
- Fever, shivering, or feeling very cold
- New onset or increased confusion or disorientation
- Shortness of breath
- Extreme pain or discomfort
- Clammy or sweaty skin

Residents with sepsis should be urgently evaluated and treated by a healthcare professional.

Questions?



Thank You for Your Time!
Contact the AHS Patient Safety Team
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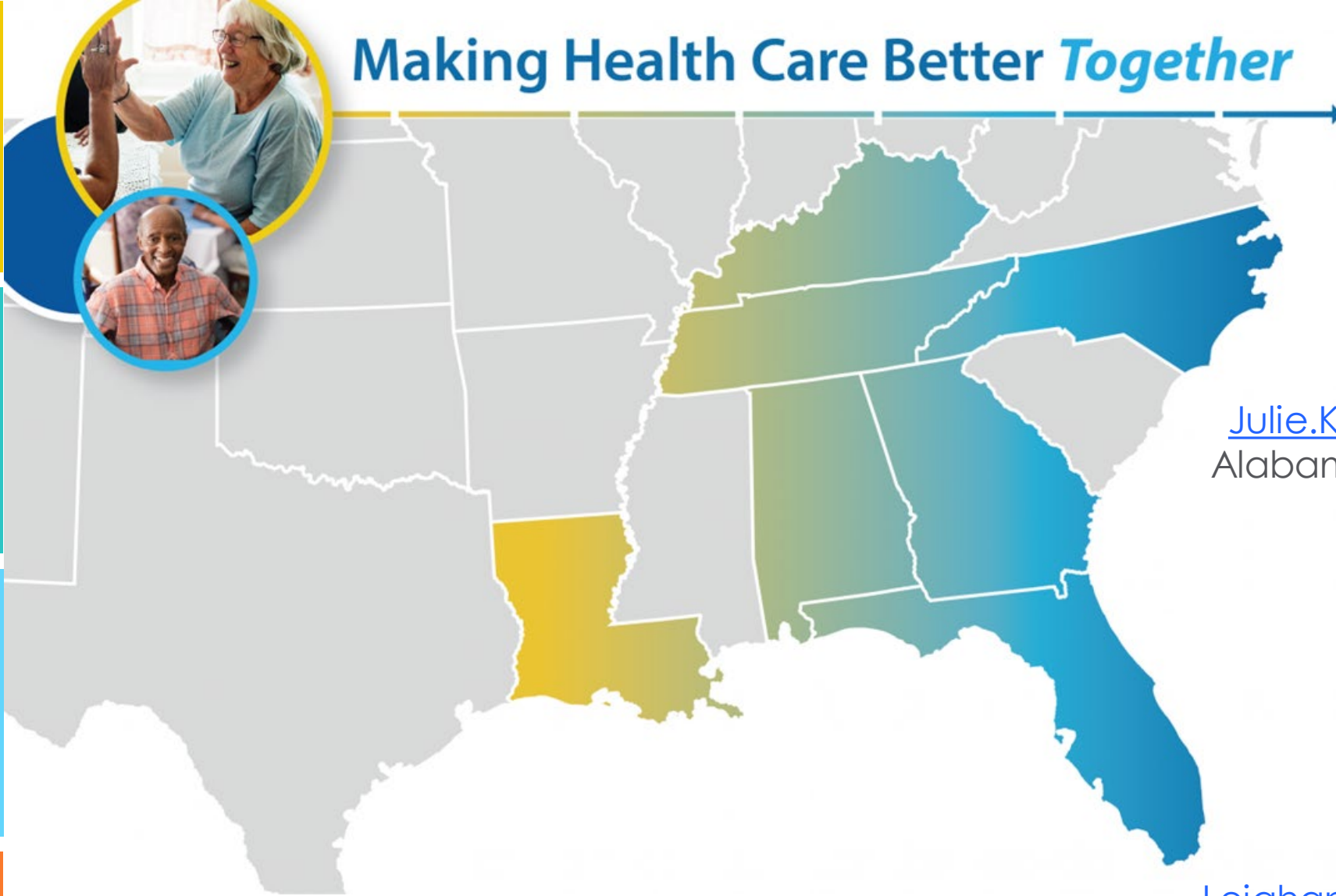


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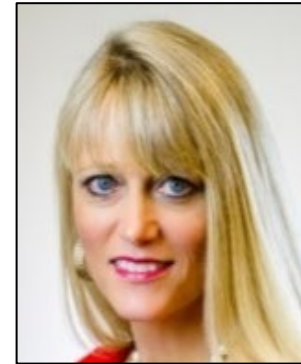
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