

Practicing Antibiotic Stewardship in the Detection and Treatment of UTIs

Welcome!

- All lines are muted, please ask your questions in Q&A
- For technical issues, chat to the 'Technical Support' Panelist
- Please actively participate in polling questions that will pop up on the lower righthand side of your screen

We will get
started shortly!

Practicing Antibiotic Stewardship in the Detection and Treatment of UTIs



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Presented by:
Heidi K. White, MD, MHS, MEd
Omid Salaami, M.D



Objectives

Learn Today:

- Explain why urinary tract infections are difficult to diagnose.
- Describe the diagnosis of urinary tract infections.
- Recognize when antibiotics should be started, stopped and reviewed.

Use Tomorrow:

- Review facility UTI clinical pathways and training materials to identify opportunities to incorporate information learned today.

Heidi K. White, MD, MHS, MEd

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DEPARTMENT OF MEDICINE OF THE DUKE UNIVERSITY SCHOOL OF MEDICINE**

Heidi K. White, MD, MHS, MEd is a tenured professor of medicine in the Division of Geriatrics, Department of Medicine of the Duke University School of Medicine. She serves as the vice-chief for Clinical Affairs of the Geriatrics Division. She also serves as the medical director of Croasdaile Village Retirement Community, a continuing care retirement community of over 700 residents, where she provides medical care and precepts geriatric medicine fellows. As a medical director for Duke Connected Care (Duke's accountable care organization), she co-leads post-acute and long-term care strategy, including a skilled nursing facility collaborative of 23 facilities. In addition, she is a member of the interprofessional executive steering committee executing the geriatrics operational plan for Duke University Health System. Dr. White graduated with her medical degree from Washington University in St. Louis, Missouri. She completed her residency in internal medicine at The Jewish Hospital of St. Louis. Her fellowship training in geriatric medicine was at Duke University, where she also received a master's in biomedical science. In 2009, she attained a master's in adult education from North Carolina State University. Dr. White has received several awards, including a New Investigator Award from the American Geriatrics Society in 1995, a Presidential Poster Award for best in Clinical Trial Category in 2005 from the American Geriatrics Society, and the James Pattee Award for Excellence in Education from the AMDA Foundation in 2014. She was a Geriatrics Academic Career Award recipient in 2003 and is now a primary mentor for a current Geriatrics Career Award recipient. Dr. White's academic interests pertain to post-acute and long-term care medicine, curriculum development in long-term care for fellows, residents and medical students, quality improvement and clinical program development in geriatric medicine and clinical research pertaining to dementia and long-term care. She has authored numerous peer-reviewed research, educational curriculum and quality improvement articles, in addition to several book chapters. Dr. White is a past president of AMDA, The Society for Post-Acute and Long-Term Care Medicine, and current board member of the Foundation for Post-Acute and Long-Term care Medicine. She currently serves as Chair of the Clinical Practice and Models of Care Committee for the American Geriatrics Society.



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Pia Couch, RN, Infection Prevention

NEWNAN HEALTH AND REHABILITATION
NEWNAN, GEORGIA

Pia Couch, RN, has been too busy serving as a frontline hero to think about a bio. We appreciate Pia and her team for continuing their focus on important resident safety initiatives during this challenging time and their willingness to share the story of their work to reduce UTIs and Pressure Ulcers in their facility.

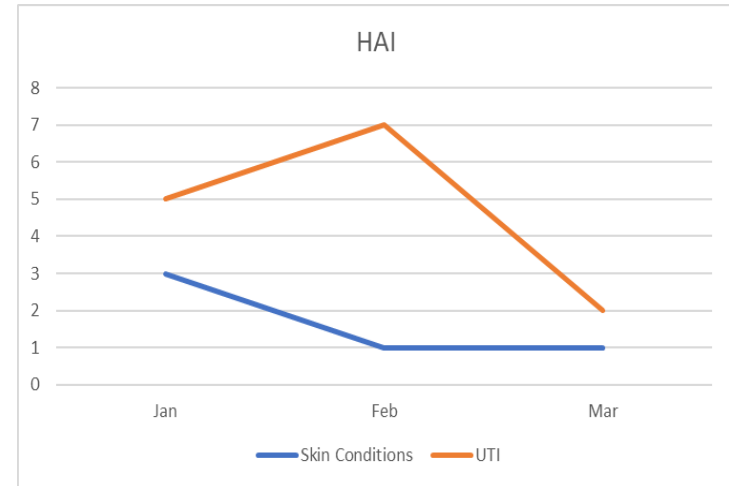
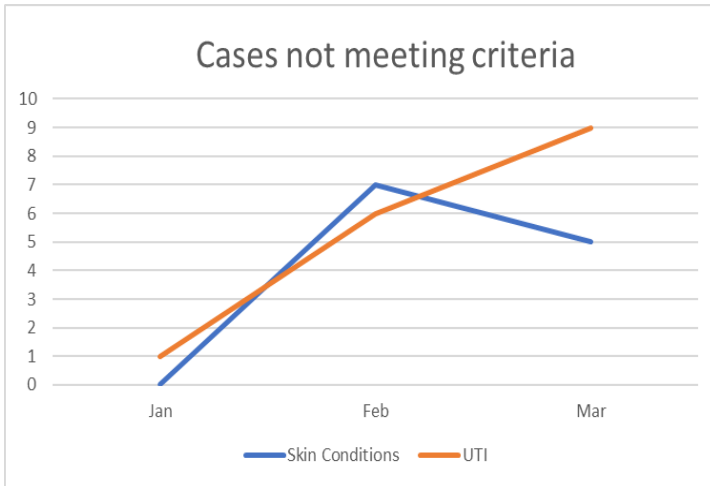
Infection Control & Prevention

UTI Problem Solving

UTI Problem Solving

Problem Description:

UTIs and skin conditions found to be increasing that do not meet criteria.



UTI Problem Solving

5W and 1H:

Who:

Long-stay residents

What:

UTI cases are increasing

When:

Coinciding incontinent skin conditions

Where:

Found in residents with incontinent-related skin conditions

Why:

Pericare-dependent residents have increased exposure to UTI development

How:

Exposure to bacteria/poor pericare practice or frequency of pericare (staffing?)

UTI Problem Solving

New/Refined Problem Description:

UTI rate increasing among incontinent residents in parallel with increasing skin conditions.

UTI Problem Solving

5 Why

Why: Long-term incontinent residents are exposed to bacteria.

Why: Incontinent residents are in contact with waste containing UTI causing bacteria.

Why: Incontinent residents can go without proper or immediate attention.

Why: Poor staffing or poor pericare practices can lead to prolonged exposure.

Why: Operational compliance not audited or mitigated.

Root Cause:

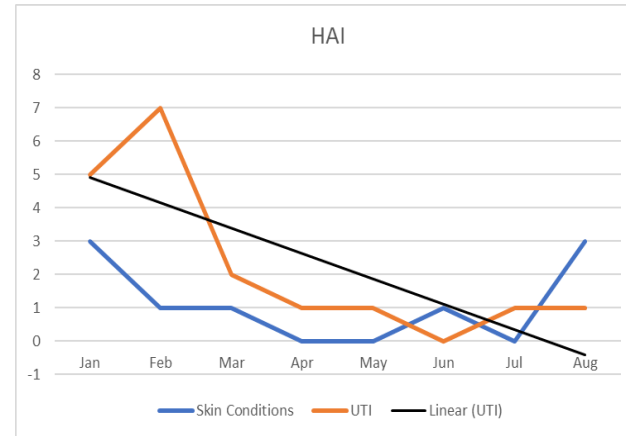
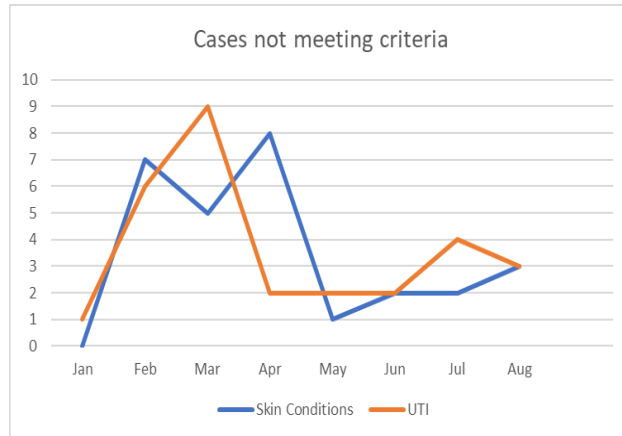
Poor pericare practice found in audits/practices were found to be executed out of standard.

UTI Problem Solving

Countermeasure:

- Direct pericare observations to calibrate staff to the standard
- Ongoing scheduled regimen of auditing pericare
- Skin care inservices performed

Results:



Practicing Antibiotic Stewardship in the Detection of UTIs

Omid Salaami, M.D.

Mentor: Heidi White, M.D.

Clinical Case

- Martha is a 90-year-old woman with moderate-severe dementia (FAST 6b).
- She is a long-term resident in a nursing home who requires assistance with activities of daily living.
- Typical oriented to self and agreeable to care.
- Past medical history is notable for a history of “recurrent UTIs,” which her daughter describes as confusion and feeling tired.

Case-Onset

- Found to have an acute change where she is slightly more confused than normal and appears more tired.
- No localized symptoms of a UTI, but urine is noted to smell bad.
- Vitals show:
 - Laying down – BP142/84, HR 62
 - Sitting after three minutes – BP 118/70, HR 85
- Her daughter notes this happened many times before and wants Martha tested for a UTI.
- Urine is tested and is “dirty.”
 - Urine dipstick is positive for leukocyte esterase and nitrites.

Does Martha Have a UTI?

A. Yes

B. No

C. More testing is needed

Does Martha Have a UTI? - Answer

A. Yes

B. No

C. More testing is needed

Learning Objectives

1. State the definition of urinary tract infections.
2. Explain why urinary tract infections are difficult to diagnosis.
3. Recognize when antibiotics should be started, stopped and reviewed.

UTI: Definition

- A UTI is an infection of the urinary tract.
 - Urinary tract includes: urethra, bladder, kidney, (+/- prostate, testes)
- The diagnosis requires two features:
 1. Signs or symptoms attributable to the urinary tract.
 2. The presence of bacteria in the urine.
- There is no perfect diagnostic criteria!
 - Some overlap between criteria signs and symptoms.
 - Clinical judgement is needed.

Usual UTI Diagnostic Criteria

Localizing signs and symptoms (*new or worsening, without alternative*)

- Costovertebral tenderness
- Dysuria
- Urinary frequency
- Gross hematuria
- Suprapubic pain
- Urethral meatus purulence
- Urinary urgency
- Urinary incontinence

The more signs/symptoms, the more likely a "true" UTI is present

High risk, nonspecific signs/symptoms

- Unstable vitals (suggesting sepsis)
- Fever (or leukocytosis)
- Rigor/chills
- Frank delirium (after other causes have been ruled out)

These features lower the "threshold" to diagnosis and treatment

Bacteriuria

- 100 + CFU for I/O specimen
- >100,000+ CFU of midstream

Note that a higher cutoff = contamination less likely

Voided midstream or clean catch is ideal

- ½ of residents can't provide
- Otherwise consider in and out (I/O) cath OR condom cath for 30-120 minutes in men

You need to get a urine culture for every resident with suspected UTI!

Lack of Diagnostic Criteria Agreement and Performance

- Both surveillance (such as McGeer or CDC) and Loeb (and likely other “minimum” criteria) may underdiagnose compared to experts as the gold standard.
 - For example, of 424 older adults in ED¹:
 - “Physician experts” determined 19 true cases
 - ED physicians diagnosed 24 cases of UTI = 26% overdiagnosis
 - Loeb minimum criteria diagnosed 13 cases = 31% underdiagnosis
 - CDC surveillance diagnosed 5 cases = 73% underdiagnosis!
- **Pearls from JAMDA UTI Consensus statement 2020:**
 - **Surveillance criteria are not recommended for diagnosing or treating UTIs!**
 - **Teamwork! Interprofessional effort using clinical decision making.**

1. Caterino, J.M., Leininger, R., Kline, D.M., Southerland, L.T., Khaliqdina, S., Baugh, C.W., Pallin, D.J. and Stevenson, K.B. (2017), Accuracy of Current Diagnostic Criteria for Acute Bacterial Infection in Older Adults in the Emergency Department. J Am Geriatr Soc, 65: 1802-1809. <https://doi.org/10.1111/jgs.14912>

Back to the Case

Martha's initial presentation did not meet criteria for a UTI.

- No localizing symptoms and no “high risk” features.

“Active monitoring” should be implemented, along with evaluation for other etiologies.

- Requires longitudinal, collaborative practice.

TESTS & TREATMENTS FOR URINARY TRACT INFECTIONS (UTIs)



Our goal is to provide the best care possible for residents by working with residents and their families. Quality care includes not over-testing or over-treating with antibiotics.

- A UTI is an infection in the bladder or kidney – mostly in the bladder
- UTIs are caused by bacteria
- Antibiotics are used to kill bacteria that causes UTIs
- Some side effects from antibiotics include rash, diarrhea, fever, and nausea/vomiting. Antibiotics should only be used when needed.
- Treatment of UTI requires both symptoms of infection and a positive 'urine' test of bacteria.
- Bacteria in urine of older people is common and a completely normal part of aging.
- Bacteria in the urine without symptoms is not a UTI and do not need antibiotics.
- Sometimes other symptoms are confused with a UTI. These symptoms are often caused by other problems like dehydration or medication side effects that require different treatment.

Symptom of UTI – Order Urine Test

- ✓ Pain or burning with urination
- ✓ Pain in the lower belly
- ✓ Pain in the sides and low back
- ✓ New or sudden urine leakage
- ✓ Strong urge to urinate often
- ✓ Fever
- ✓ Blood in the urine that is new

Not a Symptom of UTI – No Urine Test

- ✓ Foul or strong urine odor
- ✓ Confusion, irritability or change in behavior
- ✓ Loss of balance
- ✓ New onset of falls
- ✓ Cloudy or dark urine
- ✓ Poor appetite
- ✓ Long standing incontinence

- If antibiotics are not indicated, the person should receive close monitoring, and extra liquids to drink, and an update in their plan of care.
- The resident and family will be kept aware of plan of care by their health care team.

References: University of Colorado Anschutz Medical Campus, "Why Won't Antibiotics Be Used?" Developing Tools for Education and Communication Concerning Suspected UTI in Long Term Care (LTC), Poster, 2018

This material was prepared by Alliant Quality, the quality improvement group of Alliant Health Solutions (AHS), the Medicare Quality Innovation Network - Quality Improvement Organization for Alabama, Florida, Georgia, Kentucky, Louisiana, North Carolina, and Tennessee, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. Publication No. 1250W-AHSQIN-QIO-T01-20-66



Case Continued – Later That Day

- Martha had an unwitnessed fall thought to be due generalized weakness.
- No change in symptoms, vitals unchanged.
- Due to scrape on head, she is sent to the Emergency Department.
- In the ED:
 - She is given fluids with rapid improvement.
 - I/O cath: Urinalysis is “positive” for pyuria and bacteriuria. Other lab work is reassuring.
 - Given empiric levofloxacin and started on seven-day course.
 - Returns to nursing home back to baseline with urine cultures in progress.

Does Martha Have a UTI?

- A. Yes
- B. No
- C. More testing is needed

Does Martha Have a UTI? - Answer

A. Yes

B. No

C. More testing is needed

Learning Objectives

1. State the definition of urinary tract infections.
2. Explain why urinary tract infections are difficult to diagnosis.
3. Recognize when antibiotics should be started, stopped and reviewed.

Urinary Tract Infections or Asymptomatic Bacteriuria?

- Urinary tract infections are common in older adults.
- *But so is asymptomatic bacteriuria!*
 - IDSA definition: Presence of bacteria in the absence of symptoms.
 - Irrespective of the presence of pyuria
 - Rates as high as 50%!
 - Treating asymptomatic bacteriuria has no benefit and has real harms.

Table 1. Prevalence of Asymptomatic Bacteriuria Reported for Different Populations

Population	Prevalence, %	Reference
Children		
Boys	<1	[7]
Girls	1–2	[8–10]
Healthy women		
Premenopausal	1.0–5.0	[11]
Pregnant	1.9–9.5	[11]
Postmenopausal (age 50–70 y)	2.8–8.6	[11]
Persons with diabetes		
Women	10.8–16	[12]
Men	0.7–11	[12]
Elderly persons in the community (age ≥70 y)		
Women	10.8–16	[13]
Men	3.6–19	[13]
Elderly persons in a long-term care facility		
Women	25–50	[13]
Men	15–50	[13]
Persons with spinal cord injury		
Intermittent catheter use	23–69	[14]
Sphincterotomy/condom catheter	57	[15]
Persons with kidney transplant		
First month posttransplant	23–24	[16, 17]
1 mo–1 y post-transplant	10–17	[16]
>1 y post-transplant	2–9	[16]
Persons with indwelling catheter use		
Short-term	3%–5%/day catheter	[18]
Long-term	100	[19]

Is the Urine Sterile? No!

- We used to think (and many clinicians still do) that the urine is sterile.
- We now know that urine is **NOT** sterile.
 - Using advanced culture methods, there are many growing bacteria that are reported as no growth.¹
- We now know that urine is also has a virome²!
 - Raises the possibility of urinary *viral* infections.

Pearl: We cannot only use the presence of bacteria or white blood cells to make the diagnosis of a UTI! Signs and symptoms are key.

1. Urine is not Sterile: Use of Enhanced Urine Culture Techniques to Detect Resident Bacterial Flora in the Adult Female Bladder. Hilt et al. Journal of Clinical Microbiology
2. The human urine virome in association with urinary tract infections. Santiago- Rodriguez et al. Frontiers in Microbiology

UTIs and Older Adults

- Ability to communicate may be limited by cognitive impairment +/- dementia.
- Older patients tend to present atypically.
- Frail, older adults are increasingly vulnerable to stress/illness, which can manifest with nonspecific signs and symptoms.
 - Examples: Fatigue, malaise, weakness, nausea, confusion, falls, delirium

What Is Not a UTI?

1. Appearance or smell of urine

- “Dark, cloudy, or foul-smelling urine is not sufficient to indicate a UTI and may instead reflect mild dehydration or changes to diet or medications.” (JAMDA – Diagnosis of UTI)

In the absence of “high risk signs” and localizing symptoms:

1. Nonspecific symptoms – change in cognition, agitation, decreased appetite, falls

- “Nonspecific symptoms... are not symptoms of UTI, especially when genitourinary tract specific signs and symptoms are absent.” (JAMDA – Role of Behavioral Change)

2. Delirium or falls

- “In older patients... who experience delirium or a fall, we recommend assessment for other causes and careful observation rather than antimicrobial treatment.” (IDSA Asymptomatic Bacteriuria Guidelines 2019)

Back to the Case

After the fall, Martha still did not meet criteria for a UTI.

- A fall is not specific and she did not have “high risk” features.
- Orthostatic vitals and improvement to baseline suggests dehydration.

Case Continued – Two Days Later

- Martha continues her levofloxacin.
- After two days, urine cultures return no growth.
- Martha has been at baseline since returning from the emergency room.

What Should Be Done with Martha's Antibiotics?

- A. Finish course of levofloxacin.
- B. Change to a “narrow” antibiotic like nitrofurantoin.
- C. Stop current antibiotic (levofloxacin) for UTI.

What Should Be Done With Martha's Antibiotics? - Answer

- A. Finish course of levofloxacin.
- B. Change to a “narrow” antibiotic like nitrofurantoin.
- C. Stop current antibiotic (levofloxacin) for UTI.

Learning Objectives

1. State the definition of urinary tract infections.
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Starting an Antibiotic for UTIs

Assuming concordant with goals of care:

1. Start right away - When the patient is unstable/high risk features*
 - **Patient context and specific considerations*
 - Fever, chills/rigor, unstable vitals
 2. Start before urine cultures - When the patient has high chance of UTI due to clear/strong localizing signs/symptoms
 3. Start after urine cultures - When the UTI diagnosis has been made
- If resident stable and diagnosis is in doubt:
 - Implement “active monitoring”
 - Frequent vital signs, improving hydration status, repeated physical exam
 - Wait to order urine studies and consider other etiologies/evaluation

Stopping an Antibiotic

1. If urinalysis is negative for bacteriuria (nitrites) and pyuria (leukocyte esterase).
 - The absence of both has been shown to have a 100% negative predictive value for UTI in residents of nursing homes suspected of having a UTI (JAMDA UTI 2020).
2. If negative urine culture:
 - Assuming the urine specimen was collected properly and before antibiotics.
 - No growth to-date: no bacteria detectable bacteria is present.
 - In general, mixed flora is suggestive of contaminated sample because multiple organisms found are growing.

Reviewing Antibiotic Selection

1. When a care transition occurs (such as from the ED to PALTC).
2. When culture results are known.
3. Lack of improvement after 48-72 hours or worsening condition.

Back to the Case

Antibiotics could be stopped upon returning from ED, and should be stopped with urine cultures having no growth.

Summary

1. State the definition of urinary tract infections.
 1. A UTI is an infection of the urinary tract resulting in localizing symptoms and bacteriuria.
2. Explain why urinary tract infections are difficult to diagnosis.
 1. Older adults will often have nonspecific signs and symptoms (falls, delirium, etc.) that may be misattributed to as UTIs due to high rates of asymptomatic bacteriuria.
3. Recognize when antibiotics should be started, stopped and reviewed.
 1. Start: If, within goals of care, a UTI has been diagnosed or when there are high-risk features.
 2. Stop: When the diagnosis of UTI has been ruled out due to lack of bacteria.
 3. Review: Care transition, culture result, lack of improvement/worsening condition.

CMS 12th SOW Goals



Behavioral Health Outcomes & Opioid Misuse

- ✓ Promote opioid best practices
- ✓ Decrease high dose opioid prescribing and opioid adverse events in all settings
- ✓ Increase access to behavioral health services



Patient Safety

- ✓ Reduce risky medication combinations
- ✓ Reduce adverse drug events
- ✓ Reduce C. diff in all settings



Chronic Disease Self-Management

- ✓ Increase performance on ABCS clinical quality measures (i.e., aspirin use, blood pressure control, cholesterol management, cardiac rehab)
- ✓ Identify patients at high-risk for developing kidney disease & improve outcomes
- ✓ Identify patients at high risk for diabetes-related complications & improve outcomes



Quality of Care Transitions

- ✓ Convene community coalitions
- ✓ Identify and promote optical care for super utilizers
- ✓ Reduce community-based adverse drug events



Nursing Home Quality

- ✓ Improve the mean total quality score
- ✓ Develop national baselines for healthcare related infections in nursing homes
- ✓ Reduce emergency department visits and readmissions of short stay residents

Upcoming Events



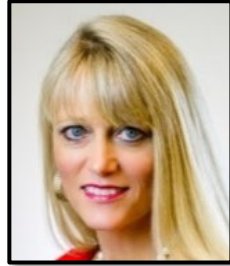
Learning and Action Webinars

SPECIAL EVENTS

October 26, 2021: HQIC & CC LAN: Applying A Framework to Advance Health Equity	November 23, 2021: HQIC LAN: Planning for Health Equity/Social Determinants of Health
November 18, 2021: Organizational Trauma, Resiliency & the Holidays 12:30 – 1:30pm ET/ 11:30am – 12:30pm CT	December 14, 2021: Combined Community Coalition & Nursing Home LAN: Readmissions

Link to register for events in chat!

Making Health Care Better *Together*

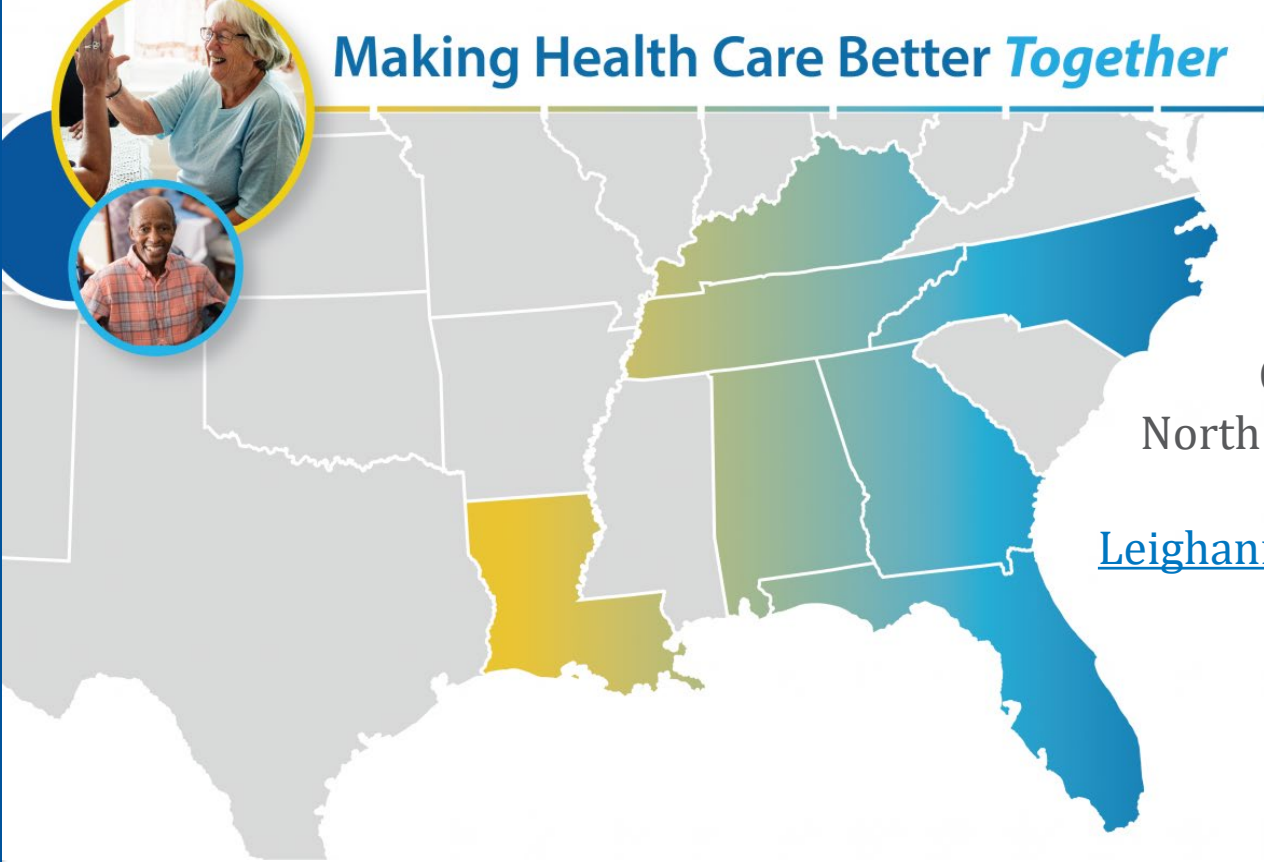


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