Nursing Home Patient Safety Series: HAI Affinity Group

Community-Acquired Pneumonia Update

Cullen Adre, PharmD

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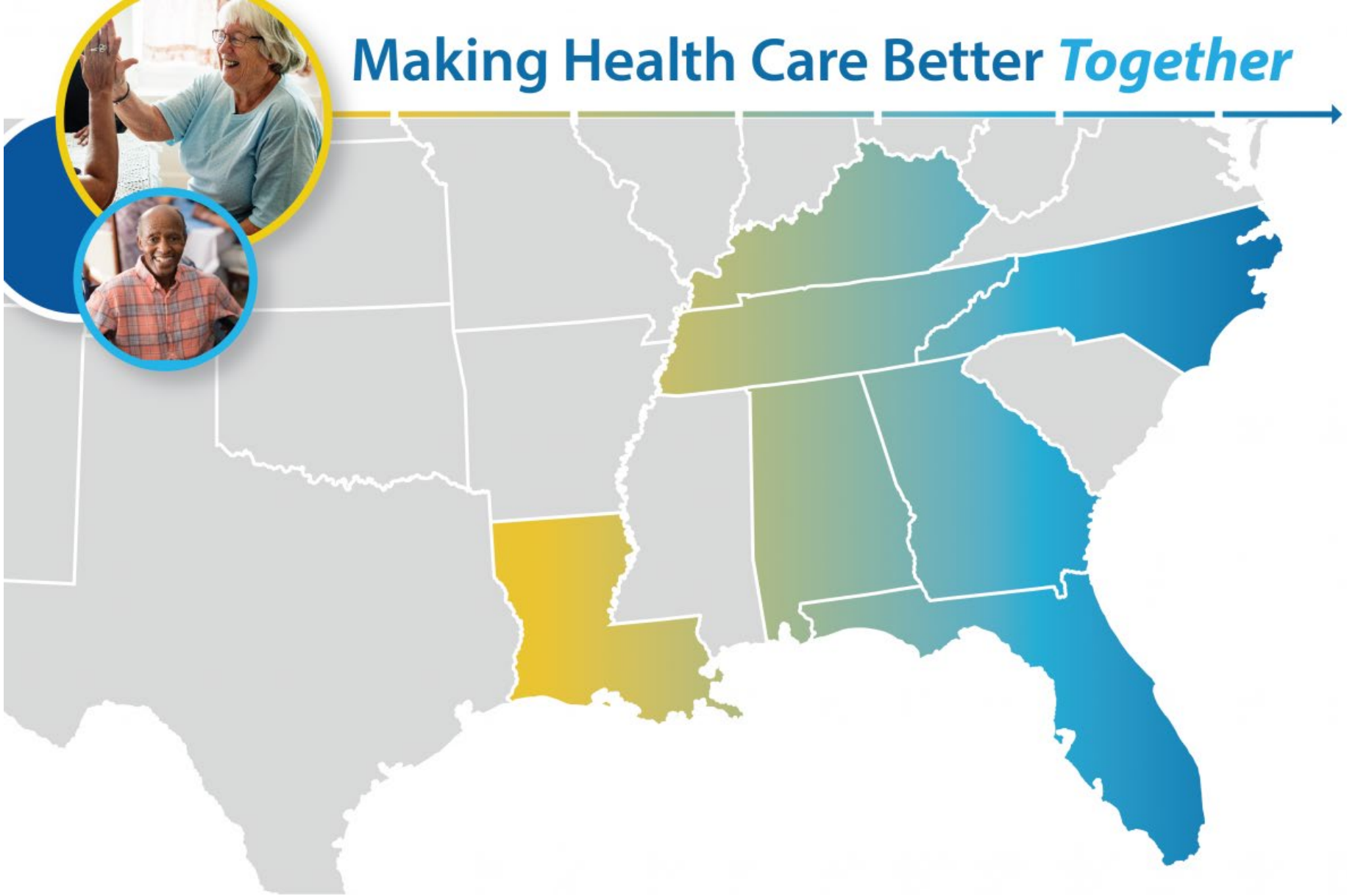

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Dr. Cullen Adre is a pharmacist with the Tennessee Department of Health; his work focuses on antimicrobial stewardship in long term care facilities across the state. He received his Doctor of Pharmacy degree from Nova Southeastern University of Pharmacy in Fort Lauderdale, Florida and completed his pharmacy practice residency at Oklahoma State University Medical Center in Tulsa, Oklahoma.

His research interests include the clinical impact of antimicrobial stewardship programs and antibiotic use and resistance tracking specifically in long term care facilities.

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Objectives

- Review pertinent definitions and categorizations of pneumonia.
- Discuss relevant changes between the 2007 and 2019 community-acquired pneumonia guidelines.

Definitions

- **Community-acquired pneumonia (CAP)**
  - Presence of clinical features with supporting radiographic evidence of pneumonia occurring outside the hospital
- **Hospital-acquired pneumonia (HAP)**
  - Pneumonia > 48 hours after admission
- **Ventilator-associated pneumonia (VAP)**
  - Pneumonia > 48 hours after intubation

Kalil AC et al. *Clin Infect Dis*. 2016;63(5):e61-e111.
Metlay JP et al. *Am J Respir Crit Care Med*. 2019;200(7):e45-e67.

SUPPLEMENT ARTICLE

Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

Clinical Infectious Diseases 2007; 44:S27–72

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AMERICAN THORACIC SOCIETY DOCUMENTS

Diagnosis and Treatment of Adults with Community-acquired Pneumonia

An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America

Joshua P. Metlay*, Grant W. Waterer*, Ann C. Long, Antonio Anzueto, Jan Brozek, Kristina Crothers, Laura A. Cooley, Nathan C. Dean, Michael J. Fine, Scott A. Flanders, Marie R. Griffin, Mark L. Metersky, Daniel M. Musher, Marcos I. Restrepo, and Cynthia G. Whitney; on behalf of the American Thoracic Society and Infectious Diseases Society of America

THIS OFFICIAL CLINICAL PRACTICE GUIDELINE WAS APPROVED BY THE AMERICAN THORACIC SOCIETY MAY 2019 AND THE INFECTIOUS DISEASES SOCIETY OF AMERICA AUGUST 2019

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What About HCAP…??

Metlay JP et al. *Am J Respir Crit Care Med.* 2019;200(7):e45-e67.

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Severe CAP

Requires either 1 major criterion or ≥ 3 minor criteria

Major criteria

- Septic shock with need for vasopressors
- Respiratory failure requiring mechanical ventilation

Minor criteria

- Respiratory rate ⩾ 30 breaths/min
- Pa_{O2}/F_{IO2} ratio ⩽ 250
- Multilobar infiltrates
- Confusion/disorientation
- Uremia (blood urea nitrogen level ⩾ 20 mg/dl)
- Leukopenia* (white blood cell count < 4,000 cells/μl)
- Thrombocytopenia (platelet count < 100,000/μl)
- Hypothermia (core temperature < 36°C)
- Hypotension requiring aggressive fluid resuscitation

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Diagnostic Testing

Cultures, urinary antigen testing, & procalcitonin

Sputum and Blood Cultures

2007 ATS/IDSA Guideline	2019 ATS/IDSA Guideline
Primarily recommended in patients with severe disease	Recommended in patients with severe disease as well as in all inpatients empirically treated for **MRSA or *Pseudomonas aeruginosa***

MRSA = methicillin-resistant *Staphylococcus aureus*

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Urinary Antigen Testing

2007 ATS/IDSA Guideline	2019 ATS/IDSA Guideline
Primarily recommended in patients with one of the following: • Severe CAP • Failure of outpatient antibiotics • Active alcohol abuse • Recent travel (within the past 2 weeks) • Presence of a pleural effusion	Not routinely recommended in adults with CAP except: • Severe CAP • Epidemiological factors (e.g., Legionella outbreak or recent travel)

*Includes pneumococcal and *Legionella* antigen tests

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Other Diagnostic Testing

2007 ATS/IDSA Guideline	2019 ATS/IDSA Guideline
Procalcitonin	
Not covered	Empiric antibiotics should be initiated in patients with suspected CAP **regardless of initial serum procalcitonin levels**
Influenza Virus Testing	
Rapid diagnostic tests may be indicated when the diagnosis is uncertain	Recommend testing for influenza with a rapid influenza molecular assay **(e.g., influenza NAAT)** over a rapid antigen test

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CAP Treatment Strategies

Outpatient, nonsevere and severe inpatient pneumonia

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Outpatient CAP Treatment

Table 3. Initial Treatment Strategies for Outpatients with Community-acquired Pneumonia

	Standard Regimen
No comorbidities or risk factors for MRSA or *Pseudomonas aeruginosa**	Amoxicillin or doxycycline or macrolide (if local pneumococcal resistance is <25%)† **High dose amoxicillin**
With comorbidities‡	Combination therapy with amoxicillin/clavulanate or cephalosporin AND macrolide or doxycycline§ OR monotherapy with respiratory fluoroquinolone‖

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Inpatient CAP Treatment

	Standard Regimen
Nonsevere inpatient pneumonia	*B*-lactam plus macrolide **OR** respiratory fluoroquinolone
Severe inpatient pneumonia	*B*-lactam plus macrolide **OR** *B*-lactam plus a respiratory fluoroquinolone

B-lactams: ampicillin-sulbactam, cefotaxime, ceftriaxone, or ceftaroline
Macrolides: azithromycin or clarithromycin
Respiratory fluoroquinolones: levofloxacin or moxifloxacin

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Requires either 1 major criterion or ≥ 3 minor criteria

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MRSA and *P. aeruginosa* Risk Factors

- Prior pathogen isolation (especially from the respiratory tract)
- Recent hospitalization **AND** use of parental antibiotics within the last 90 days
- Locally validated risk factors

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Treatment Strategies for Drug-Resistant CAP

	Prior Respiratory Isolation of MRSA or *P. aeruginosa*	Recent Hospitalization and Use of Parental Antibiotics within 90 days
Nonsevere inpatient pneumonia	Add MRSA or *P. aeruginosa* coverage and obtain cultures	Obtain cultures but **WITHHOLD** empiric MRSA or *P. aeruginosa* coverage
Severe inpatient pneumonia	Add MRSA or *P. aeruginosa* coverage and obtain cultures	Add MRSA or *P. aeruginosa* coverage and obtain cultures

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Influenza-Positive CAP

- "**We recommend** that anti-influenza treatment be prescribed for adults with CAP who test positive for influenza in the *inpatient* setting, independent of the duration of illness before diagnosis."
  - Strong recommendation, moderate quality of evidence

- "**We suggest** that anti-influenza treatment be prescribed for adults with CAP who test positive for influenza in the *outpatient* setting, independent of the duration of illness before diagnosis."
  - Conditional recommendation, low-quality of evidence

- "**We recommend** that standard antibacterial treatment be initially prescribed for adults with clinical and radiographic evidence of CAP who test positive for influenza in the inpatient and outpatient settings."
  - Strong recommendation, low-quality of evidence

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Duration of Therapy

- Guided based on clinical stability and resolution of the following:
  - Vital sign abnormality (e.g., tachycardia, tachypnea, hypotension)
  - Ability to eat
  - Normal mentation

- Continue antibiotic therapy for **no less than five days** and until the patient achieves stability.

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Case Example

Case Presentation

- A 70-year-old woman presents with a dry cough, progressing to rusty-colored sputum, sudden onset of chills the previous evening, fever and malaise.

- No previous hospitalizations or IV antibiotics in the past 90 days.

Exam

- Temp (F): 101.3
- Blood pressure (mmHg): 128/76
- HR (bpm): 102
- RR (bpm): 30
- SpO2 (%): 94
- Infiltrates are present on chest X-ray
- Lab findings:
  - WBC 10,000 (80% PMNs)

Severe CAP

Requires either 1 major criterion or ≥ 3 minor criteria

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Macrolides: azithromycin or clarithromycin
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2019 CAP Guideline Update

- Comorbidities: chronic heart, lung, liver, renal disease, diabetes, alcoholism, malignancies, asplenia
- Regional rate of macrolide-resistant *Streptococcus pneumoniae*
- Expanded coverage based on the severity of disease, risk factors for MRSA and *Pseudomonas*
  - Previous isolation
  - Hospitalized 90d and IV antibiotics
  - Locally validated risk factors

Length of Treatment

- Continue antibiotic therapy for **no less than five days** and until the patient achieves clinical stability.
- Criteria for clinical stability:
  - Temp <= 37.8 C
  - HR <=100 bpm
  - RR <= 24 bpm
  - SBP >= 90mmHg
  - O2 saturation >= 90% or pO2 >=60mmHg on room air
  - Ability to maintain oral intake
  - Normal mental status

Take-Home Points

- Healthcare-associated pneumonia (HCAP) should be abandoned as a categorization of pneumonia.
- It is important to distinguish between nonsevere and severe CAP.
- Evaluate patient-specific factors to determine the need for MRSA or *P. aeruginosa* coverage.

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Questions?

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

OPIOID UTILIZATION AND MISUSE

Promote opioid best practices

•

Reduce opioid adverse drug events in all settings

PATIENT SAFETY

Reduce hospitalizations due to c. diff

•

Reduce adverse drug events

•

Reduce facility acquired infections

CHRONIC DISEASE SELF-MANAGEMENT

Increase instances of adequately diagnosed and controlled hypertension

•

Increase use of cardiac rehabilitation programs

•

Reduce instances of uncontrolled diabetes

•

Identify patients at high-risk for kidney disease and improve outcomes

CARE COORDINATION

Convene community coalitions

•

Reduce avoidable readmissions, admissions to hospitals and preventable emergency department visits

•

Identify and promote optimal care for super utilizers

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

IMMUNIZATION

Increase influenza, pneumococcal, and COVID-19 vaccination rates

TRAINING

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

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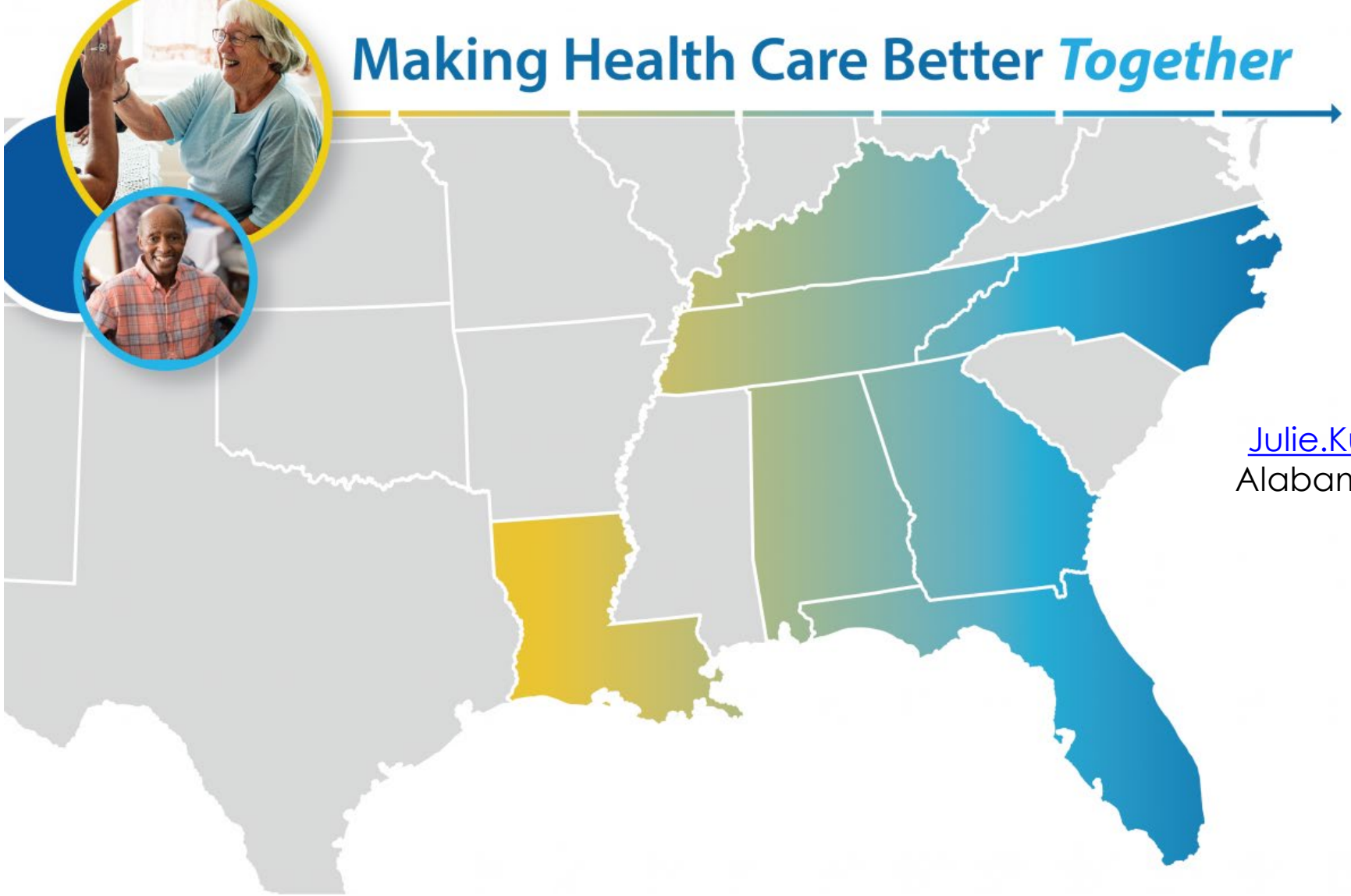

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