Arkansas Activities to Address Antibiotic Stewardship

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Secretary of Health

Mission Statement: To protect and improve the health and well-being of all Arkansans
Financial Disclosure

I, Dr. Nathanial Smith, have no financial disclosure or conflicts of interest with the material in this presentation.
Objectives

- Review how the Centers for Disease Control and Prevention (CDC) four core actions to fight antibiotic resistance have been implemented at the Arkansas Department of Health (ADH)
- Report on the statewide summary of antibiotic stewardship practices at long-term care facilities and acute care and critical access hospitals
- Describe current statewide initiatives to improve antibiotic prescribing practices in Arkansas
Four Core Actions to Fight Antibiotic Resistance

• Preventing Infections and preventing the spread of resistance
  • Conducting 130+ Infection Control Assessment and Readiness (ICAR) visits
  • Promoting vaccinations and hand hygiene
  • Targeting outreach to facilities with higher numbers of healthcare-associated infections

• Tracking resistance bacteria
  • Implementing standard surveillance for antibiotic resistant pathogens, especially for those considered urgent
  • Identifying important resistant mechanisms at the state public health laboratory

• Improving the use of today’s antibiotics (antibiotic stewardship)
  • Providing education to prescribers
  • Analyzing antimicrobial prescribing patterns across the state by working with key partners

• Developing new drugs and diagnostic tests
Preventing Infections

KEEP CALM AND WASH YOUR HANDS

Infection Prevention and You

Who are infection preventionists?

- Healthcare workers will wear gloves, gowns, and masks at the right times.
- If you are in isolation, you and your family may need to do this too.

Don’t wait. Vaccinate!

Everyone should stay healthy, including getting vaccinated.
Infection Control Assessment and Response (ICAR) Visits

- Free and confidential on-site visits to assess implementation of infection control programs across the continuum of care in order to provide guidance and resources

- Three primary objectives:
  - Improve infection control capacity for the state and enhance efforts to prevent healthcare-associated infections and antibiotic resistant infections
  - Gather data to develop educational resources and initiatives to mitigate common gaps
  - Build collaboration and communication between ADH and healthcare facilities

- Goal for 2018-2019 is to conduct 50 visits and/or revisits
Number of Facilities Participating in an Initial ICAR visit, by Facility Type and Year

Total = 131 visits
Tracking Resistance Bacteria
### List of Antimicrobial Resistant Pathogens of Interest Based on Level of Concern

**Urgent** –  
*Clostridioides difficile*  
Carbapenem-resistant Enterobacteriaceae (CRE)  
Drug-resistant *Neisseria gonorrhoeae* (cephlasporin resistance)

**Serious** –  
Multidrug-Resistant Acinetobacter  
Drug-Resistant Campylobacter  
Fluconazole-Resistant Candida  
Extended Spectrum Enterobacteriaceae (ESBL)  
Vancomycin-Resistant Enterococcus (VRE)  
Multidrug-Resistant *Pseudomonas aeruginosa*  
Drug-Resistant Non-Typhoidal Salmonella  
Drug-Resistant Salmonella Serotype Typhi  
Drug-Resistant Shigella  
Methicillin-Resistant *Staphylococcus aureus* (MRSA)  
Drug-Resistant *Streptococcus pneumoniae*  
Drug-Resistant *Tuberculosis*  

**Concerning** –  
Vancomycin-Resistant *Staphylococcus aureus* (VRSA)  
Erythromycin-Resistant Group A Streptococcus  
Clindamycin-Resistant Group B Streptococcus

Pathogens listed with a * have been identified in Arkansas and reported to ADH

Unpublished Arkansas Event Reports from CDC’s National Healthcare Safety Network and Communicable Disease Reporting.
Laboratory Identified MRSA Bloodstream Infections from Arkansas Acute Care Hospitals Reported to the National Healthcare Safety Network

Unpublished Arkansas aggregate data from CDC’s National Healthcare Safety Network.
Laboratory Identified *Clostridiodes difficile* Infections (CDI) from Arkansas Acute Care Hospitals Reported to the National Healthcare Safety Network

<table>
<thead>
<tr>
<th>Year</th>
<th>Community Onset</th>
<th>Community Onset-Healthcare Facility Associated</th>
<th>Healthcare Onset</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1211 (53%)</td>
<td>355 (16%)</td>
<td>720 (32%)</td>
<td>2286</td>
</tr>
<tr>
<td>2016</td>
<td>1346 (54%)</td>
<td>344 (14%)</td>
<td>779 (31%)</td>
<td>2469</td>
</tr>
<tr>
<td>2017</td>
<td>1648 (59%)</td>
<td>351 (13%)</td>
<td>795 (28%)</td>
<td>2794</td>
</tr>
<tr>
<td>2018</td>
<td>1572 (56%)</td>
<td>481 (17%)</td>
<td>763 (27%)</td>
<td>2816</td>
</tr>
</tbody>
</table>

Unpublished Arkansas aggregate data from CDC’s National Healthcare Safety Network.
New Mandatory Reportable Conditions

• **Carbapenem-resistant Enterobacteriaceae (CRE)**
  • Any Enterobacteriaceae species that is found to be resistant to at least one carbapenem antibiotic from any source (not screening cultures)

• **Candida auris**
  • Any report of *Candida auris* or *Candida haemulonii* from any source
  • Submit isolate to state public health laboratory
New Capacity at State Public Health Laboratory

- Availability to identify and confirm drug-resistant pathogens of concern at State Public Health Laboratory
  - Species identification using MALDI-TOF for bacteria and fungus (*Candida auris* rule out)
  - Phenotypic screening for carbapenemase production
    - mCIM method (modified Carbapenem Inactivation Method)
  - Molecular detection of carbapenemase mechanism
    - Cepheid CarbaR platform
    - Detects the 5 most common plasmids
- Connected to the Antibiotic Resistance Laboratory Network
  - Resources to deal with pan-resistant organisms and manage outbreaks and clusters

### 2019 Arkansas CRE Data from State Public Health Lab

<table>
<thead>
<tr>
<th>Organism</th>
<th>Submitted</th>
<th>Carbapenemase Producer</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>27</td>
<td>1 (7%)</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>12</td>
<td>5 (42%)</td>
</tr>
<tr>
<td><em>Klebsiella species</em></td>
<td>12</td>
<td>8 (73%)</td>
</tr>
<tr>
<td><em>Enterobacter cloacae</em></td>
<td>17</td>
<td>10 (59%)</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>4 (44%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>77</strong></td>
<td><strong>28 (36%)</strong></td>
</tr>
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</table>
Antimicrobial Stewardship Core Elements

- **Leadership Commitment**
  - Dedicating necessary human, financial, and IT resources

- **Accountability**
  - Appointing a single leader responsible for program outcomes

- **Drug Expertise**
  - Appointing a single pharmacist leader to improve antibiotic use

- **Action**
  - Implementing at least one recommended action

- **Tracking**
  - Monitoring antibiotic prescribing and resistance patterns

- **Reporting**
  - Regular reporting information on antibiotic use and resistance to staff

- **Education**
  - Educating staff about resistance and providers on optimal prescribing

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Percentage of Hospitals (N=78) by Number of Core Elements Met and Facility Type, 2018

Largest Gaps in Elements:
- Reporting: 7 Facilities
- Accountability: 5 Facilities
- Drug Expertise: 5 Facilities

Unpublished Arkansas aggregate data from CDC’s National Healthcare Safety Network.
Percentage of Hospitals in Arkansas That Met All 7 Core Elements, by Facility Type and Year

Unpublished Arkansas aggregate data from CDC’s National Healthcare Safety Network.
Percentage of Long-Term Care Facilities (N=63) by Number of Core Elements Met, ICAR Data (2017-2019)

Largest Gaps in Elements:
- Tracking: 52 Facilities
- Drug Expertise: 49 Facilities
- Reporting: 47 Facilities

2017 Antibiotic Stewardship Practices (ASP) Survey

- A survey of pharmacists was conducted in 2017 to assess the needs and current practices for antibiotic stewardship
- Data from this survey was used to validate CDC Core Elements reports
- Survey results guided development of interventions and resources to address commonly reported needs and gaps
  - Pharmacist scholarships
  - NHSN AUR assistance
  - Collaborative content
  - SASI visits

Q32. What areas do you envision ADH helping with your institution’s ASP?

<table>
<thead>
<tr>
<th>Area of Interest</th>
<th># of Respondents (N=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection to resources</td>
<td>31 (91%)</td>
</tr>
<tr>
<td>Education and training</td>
<td>30 (88%)</td>
</tr>
<tr>
<td>Antimicrobial monitoring processes</td>
<td>22 (65%)</td>
</tr>
<tr>
<td>Data feedback to clinicians</td>
<td>20 (59%)</td>
</tr>
<tr>
<td>Patient and community engagement</td>
<td>19 (56%)</td>
</tr>
<tr>
<td>Data feedback to administration</td>
<td>17 (50%)</td>
</tr>
<tr>
<td>Implementing evidenced-based guidelines</td>
<td>15 (44%)</td>
</tr>
<tr>
<td>Data Interpretation</td>
<td>14 (41%)</td>
</tr>
<tr>
<td>Leadership buy-in</td>
<td>11 (32%)</td>
</tr>
<tr>
<td>Evaluation of diagnostic testing methods</td>
<td>9 (26%)</td>
</tr>
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Statewide Antibiotic Stewardship Initiative (SASI)

- Developed at ADH to be a complimentary on-site visit such as the ICAR
- Key partner is the facility’s antibiotic stewardship pharmacist
- Utilizes a standardized tool for evaluation
  - Modified version available for long-term care
- Followed up with a letter detailing recommendations
- Allows for sharing of applicable resources
- 29 Visits completed in last grant year
Antibiotic Stewardship and Infection Prevention Collaborative

- Funded by the Arkansas Department of Health HAI program
- Completed by the Arkansas Foundation for Medical Care

Who
- 58 Arkansas hospitals and nursing homes (120+ facilities interacted)
  - Pharmacists
  - Infection preventionist
  - Quality staff or any other team members

What
- Statewide collaborative
  - Antibiotic stewardship collaborative
  - Clostridium difficile infection (CDI) transitions of care collaborative
  - Multidrug resistant organism (MDRO) prevention collaborative
    - Methicillin-resistant staphylococcus aureus (MRSA)
    - CDI
    - Carbapenem-resistant enterobacteriaceae (CRE)

When
- Aug. 1, 2018, through July 31, 2019

www.afmc.org/drugsandbugs
Prevention Collaborative Summary of Outcomes

- 14 Educational Events with 46 hours of content available on the project website
  - [www.afmc.org/drugsandbugs](http://www.afmc.org/drugsandbugs)
- Online toolkit from project has 140+ resources on best practices and shared tools from participants
- 60 scholarships to pharmacists to get certificate training in antibiotic stewardship
  - 45 hospital-based
  - 15 long-term care-based
- Increase in 30% of facilities that report education is provided to physicians, APN/PAs, pharmacists, and nurses on antibiotic stewardship
- 72% of facilities implemented at least one new initiative to improve antibiotic stewardship
Participated in a national initiative to develop partnerships between public health and state Medicaid programs

Supported by CDC and the Center for Healthcare Strategies

Arkansas plan:
- Establish an on-going meeting to discuss stewardship priorities
- Analyze and review outpatient prescribing data from the Arkansas Medicaid population
- Develop and distribute an antibiotic prescribing commitment poster
- Participate in the all-payers monthly roundtable