Antibiotic Stewardship in Long-Term Care Facilities

NHSN LTC Training 2019

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Speaker Disclosures

The speaker have no financial relationship(s) or disclosures.

The conclusions in this talk are the speaker’s and do not necessarily represent the Centers for Disease Control and Prevention.
Learning Objectives

- By the end of the session, participants will be able to:

1. Discuss ways to track the core elements of antibiotic stewardship implementation using the annual survey
2. Identify opportunities to improve antibiotic use in UTI using the UTI module
3. Monitor outcomes of antibiotic stewardship using LabID event reporting
Antibiotics are frequently prescribed inappropriately in nursing homes.

- An estimated 50% of NH residents will be prescribed one or more courses of systemic antibiotics in a year.\(^1\)
  - Facility-level interquartile range 44-58%

- In nursing homes, small studies have shown an estimated 40-75% of antibiotic prescribing is inappropriate.\(^2,3\)

Antibiotic use (both necessary and unnecessary) can cause harm and adverse drug events.

- Antibiotic use can lead to adverse events and allergic reactions.

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- Antibiotic use can lead to adverse events and allergic reactions.

- **Polypharmacy** is associated with an increased risk of adverse drug events in older adults.¹,²
  - Antibiotics contribute to clinically significant drug interactions.³,⁴
  - In a cohort study at two nursing homes, 13% of adverse drug events were secondary to antibiotic use.¹

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Antibiotic use and microbiome disruption lead to *Clostridioides difficile* infection.

- Risk of *C. difficile* infection, morbidity and mortality is highest in older adults.
  - Cohort study of nursing homes in Canada showed that diarrhea, gastroenteritis and *C. difficile* infection were the most common antibiotic-related adverse events.¹

Antibiotic use and microbiome disruption lead to *Clostridioides difficile* infection.

- Risk of *C. difficile* infection, morbidity and mortality is highest in older adults.
  - Cohort study of nursing homes in Canada showed that diarrhea, gastroenteritis and *C. difficile* infection were the most common antibiotic-related adverse events.¹

- Some evidence suggests higher rates of sepsis in people who have received antibiotics.²
  - Could be secondary to microbiome disruption.

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What is Antibiotic Stewardship?

- Antibiotic stewardship is a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use.
- Antibiotic stewardship is fundamentally about resident safety and high-quality healthcare.
The Core Elements of Antibiotic Stewardship for Nursing Homes.

Questions about the framework for assessing current and new antibiotic stewardship activities are included in the yearly facility survey.

- Leadership Commitment
- Accountability
- Drug Expertise
- Action
- Tracking
- Reporting
- Education

http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Leadership Commitment: Demonstrate support and commitment to safe and appropriate antibiotic use.

*19. Does your facility have a written statement of support from leadership that supports efforts to improve antibiotic use?  □ Yes  □ No

*20. Are antibiotic use and resistance data reviewed by leadership in quality assurance/performance improvement committee meetings?  □ Yes  □ No
Leadership Commitment: Essential First Step for Antibiotic Stewardship Implementation.

- NH leaders commit to improving antibiotic use.
  – Owners, facility administrators, regional and national leaders.

Antibiotics save lives, but are frequently prescribed unnecessarily. Harms from antibiotic overuse can be significant, especially for frail older adults. Potential harms include adverse drug events, drug interactions, and antibiotic-resistant and *Clostridium difficile* infections.

As part of our continuing commitment to provide the best quality care to our residents, we are dedicated to improving antibiotic use through antibiotic stewardship implementation. Antibiotic stewardship refers to a set of commitments and activities designed to "optimize the treatment of infections while reducing the adverse events associated with antibiotic use."

We are committed to improving antibiotic prescribing practices. We will provide staff and resources to support antibiotic stewardship implementation. We are confident that with the support of front-line staff, prescribing clinicians, and residents and families, we will continue to provide residents with the best quality care by improving antibiotic use, and protecting them from the unintended harms of inappropriate antibiotic use.

Sincerely,

To learn more about appropriate antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.
Accountability: Identifying Individuals Who Will Lead Antibiotic Stewardship Implementation.

- It is critical to identify a local “champion” who will lead the implementation of antibiotic stewardship actions.¹
  - Medical Director, peer comparison and feedback
  - Nursing Director
  - Consultant Pharmacist
  - Other: IPC coordinator have key expertise and data to improve antibiotic use. Training, dedicated time, and resources can help IPC program coordinators support stewardship activities.


*12. Are there one or more individuals responsible for the impact of activities to improve use of antibiotics at your facility?

   □ Yes  □ No

   If Yes, what is the position of the individual(s)? (select all that apply)
   □ Medical director  □ Director of Nursing
   □ Consultant Pharmacist  □ Other (please specify): ________________________

Drug Expertise: Support for Antibiotic Stewardship Implementation.

- Establishing access to individuals with antibiotic expertise:
  - Engage consultant pharmacists
    - Review AU data and can support tracking of AU
    - Ensure documentation of prescribing elements
    - Limit antibiotic duration
    - Improve prescribing practices (protocol development/review, education, ASB treatment, prophylaxis, fluoroquinolones)
  
- Develop partnerships with antibiotic stewardship leads in referring hospitals or infectious disease consultants in the community

*21. Does your facility have access to individual(s) with antibiotic stewardship expertise (e.g., consultant pharmacist trained in antibiotic stewardship, stewardship team at referral hospital, external infectious disease/stewardship consultant)? □ Yes □ No
Action: Implement at least one policy or practice to improve antibiotic use.

*13. Does your facility have a policy that requires prescribers to document an indication for all antibiotics in the medical record or during order entry?
   If Yes, has adherence to the policy to document an indication been monitored?

*14. Does your facility provide facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic decision making for common clinical conditions?
   If Yes, has adherence to facility-specific treatment recommendations been monitored?

*15. Is there a formal procedure for performing a follow-up assessment 2-3 days after a new antibiotic start to determine whether the antibiotic is still indicated and appropriate (e.g. antibiotic time out)?

*16. Does a physician, nurse, or pharmacist review courses of therapy for specified antibiotic agents and communicate results with prescribers (i.e., audit with feedback) at your facility?
   If Yes, What type of feedback is provided to prescribers? (check all that apply)
   - Feedback on antimicrobial route and/or dosing
   - Feedback on the selection of antimicrobial therapy and/or duration of therapy
   - Other (please specify): ____________________________
Action: Implementing Antibiotic Prescribing Policies to Improve Antibiotic Use.

- Antibiotic prescribing and use policies:
  - Documentation of indication, dose and duration for every antibiotic course.
  - Adherence to the documentation policy

*13. Does your facility have a policy that requires prescribers to document an indication for all antibiotics in the medical record or during order entry? □ Yes □ No
   If Yes, has adherence to the policy to document an indication been monitored? □ Yes □ No
Action: Implementing Antibiotic Prescribing Policies to Improve Antibiotic Use.

- Antibiotic prescribing and use policies:
  - Develop facility-specific treatment guidance for common infections based on practice guidelines.

*14. Does your facility provide facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic decision making for common clinical conditions? □ Yes □ No
  If Yes, has adherence to facility-specific treatment recommendations been monitored? □ Yes □ No
Action: Implementing Antibiotic Prescribing Policies to Improve Antibiotic Use.

- Antibiotic prescribing and use policies:
  - “Antibiotic review”, reassessing treatment after antibiotic start

*15. Is there a formal procedure for performing a follow-up assessment 2-3 days after a new antibiotic start to determine whether the antibiotic is still indicated and appropriate (e.g. antibiotic time out)?

☐ Yes  ☐ No
Tracking and Reporting of process and measures of antibiotic use

*4. Does your laboratory provide a report summarizing the percent of antibiotic resistance seen in common organisms identified in cultures sent from your facility (often called an antibiogram)?
- [ ] Yes
- [ ] No
If Yes, how often is this summary report or antibiogram provided to your facility? (check one)
- [ ] Once a year
- [ ] Every 2 years
- [ ] Other (specify): __________________________

*17. Does the pharmacy service provide a monthly report tracking antibiotic use (e.g., new orders, number of days of antibiotic treatment) for the facility?
- [ ] Yes
- [ ] No

*16. Does a physician, nurse, or pharmacist review courses of therapy for specified antibiotic agents and communicate results with prescribers (i.e., audit with feedback) at your facility?
- [ ] Yes
- [ ] No
If Yes, What type of feedback is provided to prescribers? (check all that apply)
- [ ] Feedback on antimicrobial route and/or dosing
- [ ] Feedback on the selection of antimicrobial therapy and/or duration of therapy
- [ ] Other (please specify): __________________________
Tracking Antibiotic Use

- Monitoring antibiotic use can help guide practice changes

- Antibiotic use can be tracked using:
  - Long-term Care (LTC) Pharmacies: dispense and deliver medications, provide drug regimen reviews and clinical consulting, can provide antibiotic use reports.
  - Electronic Health Record Systems (EHR): interface and capability of different EHR systems can vary by facility, can provide accurate antibiotic use reports.
  - Manual Chart Review: may be only the possible way to collect antibiotic use data in some facilities.

*17. Does the pharmacy service provide a monthly report tracking antibiotic use (e.g., new orders, number of days of antibiotic treatment) for the facility?  □ Yes  □ No
Tracking: Antibiotic Use Measures

- **Antibiotic starts:** Many nursing home IPC programs track new antibiotic starts as part of their infection surveillance activity.
- **Antibiotic days of therapy (DOT):** Multiple antibiotic orders can be found in the LTC pharmacy or EHR systems for every antibiotic course, tracking DOT may be easier and more accurate when using those data sources.

<table>
<thead>
<tr>
<th>Name</th>
<th>Date of Antibiotic Order or Transaction</th>
<th>Antibiotic Name</th>
<th>Calendar Days Antibiotic was Administered or Dispensed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident A</td>
<td>January 7</td>
<td>Nitrofurantoin</td>
<td>3</td>
</tr>
<tr>
<td>Resident B</td>
<td>January 7</td>
<td>Cephalexin</td>
<td>3</td>
</tr>
<tr>
<td>Resident A</td>
<td>January 10</td>
<td>Nitrofurantoin</td>
<td>2</td>
</tr>
<tr>
<td>Resident C</td>
<td>January 18</td>
<td>Ceftriaxone</td>
<td>7</td>
</tr>
<tr>
<td>Resident D</td>
<td>February 5</td>
<td>Vancomycin</td>
<td>10</td>
</tr>
<tr>
<td>Resident B</td>
<td>February 24</td>
<td>Ciprofloxacin</td>
<td>5</td>
</tr>
<tr>
<td>Resident B</td>
<td>February 24</td>
<td>Metronidazole</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Month</th>
<th>Antibiotic DOT</th>
<th>Monthly Resident-Days</th>
<th>Rate of DOT/1,000 Resident-Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>(3+3+2+7) = 15</td>
<td>200</td>
<td>(15/200) x 1,000 = 75</td>
</tr>
<tr>
<td>February</td>
<td>(10+5+5) = 20</td>
<td>250</td>
<td>(20/250) x 1,000 = 80</td>
</tr>
</tbody>
</table>

**Figure 1: Total Antibiotic Prescribing Rates**

- **Days of Therapy per 1,000 Resident-Days**
- **Year:** 2016, 2017
- **Data Points:** Q1, Q2, Q3, Q4
Tracking and Reporting

- Antibiotic use rates can be also calculated by antibiotic class, specific resident type (short-stay vs. long-stay), indication or type of infection, location within the nursing home, or prescriber.

- Reporting can motivate staff and sustain practice changes.
  - Providing feedback on prescribing practices and compliance with facility antibiotic use protocols
    - Provider-specific feedback and peer comparison may be an effective way to change prescribing behavior as demonstrated in the outpatient setting.¹


- Asymptomatic bacteriuria is common in NH residents.¹,²

- **Overtesting** leads to overdiagnosis of UTI, treatment of asymptomatic bacteriuria, risk for adverse drug events (ADE) and delays in diagnosis.³
  - Foul-smelling or cloudy urine frequently leads to unnecessary urine testing and treatment.⁴
  - Up to 1/2 of antibiotics prescribed to treat UTI in older adults are unnecessary or inappropriate.⁴-⁸

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Using the Urinary Tract Infection Module

- Tracking the number of urine cultures, antibiotic starts for UTI and UTI events that meet surveillance definitions can help with tracking of testing and treatment practices for UTI
  - Tracking testing practices
  - Tracking antibiotic use for UTI through the number of antibiotic starts
WHAT REPORTS ARE AVAILABLE TO VIEW MY UTI EVENT DATA?

- **Line list** allow resident-level review of data
- **Rate tables** display an overall facility calculated rates

Available reports may be modified and saved to Custom Reports folder!!
STANDARD LINE LIST – ALL UTI EVENTS

Table headings have:
- Title
- Date of dataset generation
- Date range for the data

Footnotes tell us how the data was sorted and the last date of data generation.

Specifies if table list ALL UTI, SUTI or CASUTI

National Healthcare Safety Network
Line Listing - All UTI Events
As of: July 3, 2019 at 12:14 PM
Date Range: All LTC/ICU EVENTS

<table>
<thead>
<tr>
<th>Facility Org ID</th>
<th>Resident ID</th>
<th>Date of Current Admission</th>
<th>Event ID</th>
<th>Event Date</th>
<th>Specific Event</th>
<th>Urinary Catheter Status</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11106</td>
<td>24689</td>
<td>01/01/2017</td>
<td>1916</td>
<td>09/01/2018</td>
<td>ABUTI</td>
<td>NEITHER</td>
<td>GEN</td>
</tr>
<tr>
<td>11106</td>
<td>123456</td>
<td>03/07/2018</td>
<td>1967</td>
<td>02/05/2019</td>
<td>ABUTI</td>
<td>NEITHER</td>
<td>DEMENTIA</td>
</tr>
<tr>
<td>11106</td>
<td>6468461</td>
<td>03/11/2015</td>
<td>1250</td>
<td>05/11/2015</td>
<td>CA-SUTI</td>
<td>INPLACE</td>
<td>GEN</td>
</tr>
</tbody>
</table>

Sorted by ltcSpcEvent eventDate cathStatus
Data contained in this report were last generated on July 3, 2019 at 12:00 PM.
# RATE TABLES – TOTAL UTI RATE

<table>
<thead>
<tr>
<th>Location</th>
<th>Summary Year/Month</th>
<th>UTI Count</th>
<th>Number of Antibiotic Starts</th>
<th>UTI Treatment Ratio</th>
<th>Number of Resident Days</th>
<th>Total UTI Rate</th>
<th>Urinary Catheter Days</th>
<th>Cath Util Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACWIDEIN</td>
<td>2015M01</td>
<td>0</td>
<td>85</td>
<td>70</td>
<td>500</td>
<td>0.000</td>
<td>260</td>
<td>0.520</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2015M02</td>
<td>0</td>
<td>85</td>
<td>70</td>
<td>500</td>
<td>0.000</td>
<td>150</td>
<td>0.300</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2015M05</td>
<td>2</td>
<td>50</td>
<td>25</td>
<td>100</td>
<td>20.000</td>
<td>0</td>
<td>0.000</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2015M11</td>
<td>0</td>
<td>25</td>
<td>25</td>
<td>300</td>
<td>0.000</td>
<td>50</td>
<td>0.167</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2016M10</td>
<td>1</td>
<td>16</td>
<td>16</td>
<td>300</td>
<td>3.333</td>
<td>25</td>
<td>0.083</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2018M01</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>3,000</td>
<td>0.667</td>
<td>200</td>
<td>0.067</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2018M02</td>
<td>2</td>
<td>1</td>
<td>0.5</td>
<td>3,256</td>
<td>0.614</td>
<td>35</td>
<td>0.011</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2018M03</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3,089</td>
<td>0.914</td>
<td>65</td>
<td>0.021</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2019M04</td>
<td>3</td>
<td>4</td>
<td>1.333</td>
<td>3,269</td>
<td>0.918</td>
<td>10</td>
<td>0.003</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2019M05</td>
<td>2</td>
<td>5</td>
<td>2.5</td>
<td>3,185</td>
<td>0.628</td>
<td>25</td>
<td>0.008</td>
</tr>
<tr>
<td>FACWIDEIN</td>
<td>2019M06</td>
<td>3</td>
<td>1</td>
<td>0.333</td>
<td>3,288</td>
<td>0.912</td>
<td>0</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**Source of aggregate data:** Not available

Data contained in this report were last generated on July 3, 2019 at 12:00 PM.

*UTI treatment ratio (column 5) = (column 4/ column 3)*

*UTI rate (column 7) = (column 3/ column 6) x 1,000*

*Catheter utilization ratio (column 9) = (column 8/ column 6)*
Active Monitoring of Health Outcomes.

- Monitor antibiotic use and **health outcomes** to guide practice changes
  - Health outcomes:
    - Rates of *C. difficile* infection
    - Antibiotic susceptibility profiles

*4. Does your laboratory provide a report summarizing the percent of antibiotic resistance seen in common organisms identified in cultures sent from your facility (often called an antibiogram)?

- [ ] Yes
- [ ] No

If Yes, how often is this summary report or antibiogram provided to your facility? (check one)

- [ ] Once a year
- [ ] Every 2 years
- [ ] Other (specify): ___________________________
Integrating Quality Improvement Initiatives

- Implementing infection control practices, antibiotic stewardship and vaccination policies can prevent infections in nursing home residents.

- Education is key for infection prevention, antibiotic stewardship implementation and early sepsis detection.
  - Front line nursing staff are critical in building a team working to improve communication and implementing any quality improvement initiative.

1. [https://www.cdc.gov/sepsis/education/hcp-resources.html](https://www.cdc.gov/sepsis/education/hcp-resources.html)
Education and Improving Communication with Residents and Families.

- Provide ongoing education to residents and families to set expectations and address concerns about antibiotic prescribing.
  - Start the conversation early with residents and families.

*18. Has your facility provided education to clinicians and other relevant staff on improving antibiotic use in the past 12 months? □ Yes □ No
Education and Improving Communication with Residents and Families.

- Provide ongoing education to residents and families to set expectations and address concerns about antibiotic prescribing.
  - Start the conversation early with residents and families.

- Elements that should be included in effective communication:
  - Making the case for the diagnosis (reviewing findings).
  - Explaining why an antibiotic is not needed, combined with a positive treatment recommendation followed by a negative one.
  - Providing a contingency plan.

Training Resources

- Training Resources:
  - CDC Training on Antibiotic Stewardship, includes a module on the treatment of urinary tract infections and stewardship in nursing homes
    - [https://www.train.org/cdctrain/course/1075730](https://www.train.org/cdctrain/course/1075730)
  - Infection Prevention and Control training course: included a module on antibiotic stewardship
    - [https://www.train.org/cdctrain/training_plan/3814](https://www.train.org/cdctrain/training_plan/3814)
Percent of U.S. Nursing Homes Reporting Implementation of All CDC Core Elements on 2016 Annual NHSN Survey*

Palms et al, Clinical Infectious Diseases, April 4 2019
Summary

- Antibiotic stewardship is a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use.

- The annual facility survey can help you identify opportunities to implement the core elements of antibiotic stewardship at your facility.

- Using the urinary tract infection module you can track testing and treatment practices for urinary tract infections and improve antibiotic use.
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.