Crisis: Antibiotic Resistance

Success Strategy

WWW.optimistic-care.org
Objectives

Upon completion of this activity, participants will be able to:

▪ Discuss the three core actions to fight resistance
▪ Discuss the importance of antibiotic stewardship in nursing homes
▪ Define antibiotic stewardship
▪ Discuss the core elements of antibiotic stewardship
▪ Discuss implementing activities to improve antibiotic use
Why Are We Discussing Antibiotic Stewardship?

- National Action Plan calls for developing Antibiotic stewardship programs in LTCFs
- Centers for Medicare and Medicaid Services proposed regulations that would require all nursing homes to have an antibiotic stewardship program
  - Require an infection prevention and control officer
  - The antibiotic stewardship program that includes antibiotic use protocols and antibiotic monitoring
- In 2015 CDC issued a recommendation that all nursing homes implement antibiotic stewardship programs

Morrill HJ, et al. JAMDA 2016;183.e1-183.e16
CMS New Requirements of Participation

- Regulation will be implemented in 3 phases
  - Phase 1: Existing requirements, those requirements relatively straightforward to implement, and require minor changes to survey process (November 28, 2016)
  - Phase 2: All Phase 1 requirements, and those that providers need more time to develop, foundational elements, new survey process can assess compliance (November 28, 2017)
    - Infection Control – Facility Assessment and Antibiotic Stewardship
  - Phase 3: All Phase 1 and 2, those requirements that need more time to implement (personnel hiring and training, implementation of systems approaches to quality) (November 28, 2019)
    - Infection Control – Infection Control Preventionist
Definition: Antimicrobial Stewardship

• The optimal selection, dosage, and duration of antimicrobial treatment that results in the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance

★ Should also focus on appropriate diagnosis.

Core Actions to Fight Resistance

• Preventing infections, preventing the spread of resistance
  ▪ Immunization
  ▪ Safe food preparation
  ▪ Handwashing
  ▪ Using antibiotics as directed and only when necessary

▪ Tracking
  ▪ Data gathering (causes of infection and risk factors)

▪ Improving antibiotic prescribing/stewardship

http://www.cdc.gov/drugresistance/about.html
Improvement in hand hygiene compliance from a baseline high level (>80%) to an even higher level (>95%) leads to a decrease in healthcare-associated infections (HAI)

A 10% improvement in hand hygiene, associated with a 6% reduction in overall HAI

http://news.unchealthcare.org/empnews/handhygiene)

Emily E. Sickbert-Bennett EE, et al. Emerging Infectious Diseases. 2016;22(9):1628-1630
FIGURE 1. Schematic Representation of the Process of Antibiotic Prescribing Decision Making and the Role of Antibiotic Stewardship

The Antibiotic Decision-Making Process

- Clinical Situation
- Diagnostic Process and Decision Making
- Decision RE Watchful Waiting or Selection of Antibiotic(s), Dose and Duration
- Monitoring Clinical Situation and Lab Results
- Reassessment at 48-72 Hours: Stop or Change Antibiotic or Duration?

Antibiotic Stewardship

**Goals**: Antibiotics only when needed
- Right drug at the right time for the right duration

**Key Tools and Techniques**: Evidence-based guidelines; monitoring of antibiotic prescriptions, culture ordering and results, and health outcomes; population-specific antibiograms; regular quality feedback to medical providers and nurses; and inclusion of antibiotic stewardship in facility QAPI plan

Note. QAPI, Quality Assurance/Performance Improvement.
Antibiotics Frequently Used

Up to 75% of antibiotic are prescribed incorrectly (prescribing the wrong drug, dose, duration or reason)

Nearly 50% of antibiotics prescribed in nursing homes may be given longer than necessary

Residents in nursing homes with higher antibiotic use have a 24% increased risk of antibiotic-related harm.

Nursing homes with higher antibiotic use, even residents who do not receive antibiotics are at increased risk of indirect-related harms due to spread of resistant bacteria or Clostridium difficile from other patients.

### Top Antibiotic Resistance Threats in Nursing Homes

<table>
<thead>
<tr>
<th>Organism</th>
<th>Est. Hospitalizations per year</th>
<th>Est. deaths per year</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. difficile</td>
<td>250,000</td>
<td>14,000</td>
<td>4-30%</td>
</tr>
<tr>
<td>VRE</td>
<td>20,000</td>
<td>1,300</td>
<td>5-18%</td>
</tr>
<tr>
<td>MRSA</td>
<td>80,000</td>
<td>11,000</td>
<td>30%</td>
</tr>
<tr>
<td>MDR GNR</td>
<td>26,000</td>
<td>1,700</td>
<td>20%</td>
</tr>
</tbody>
</table>

C. Difficile = Clostridium difficile  
VRE = Vancomycin resistant enterococci;  
MDR GNR = multidrug-resistant Gram negative rods  
MRSA = Methicillin-resistant Staphylococcus

Consequences of Antibiotic Resistance

- Antibiotic resistance in long-term care is associated with:
  - Increased risk of hospitalization
  - Increased cost of treatments
  - Increased risk of death

Benefits: Antimicrobial Stewardship

• Benefits include:
  • Reduced Mortality
  • Reduced adverse effects including clostridium difficile infections
  • Improvement of rates of antibiotic susceptibilities to targeted antibiotics
  • Optimization of resource utilization across the continuum of care

Unique Challenges of Antibiotic Prescribing in Nursing Homes

- Nursing homes very different from hospitals
  - Staffing is different
  - Decision making is different
  - Patient population is different
Unique Challenges of Antibiotic Prescribing in Nursing Homes

1. Many residents have Alzheimer’s disease or other cognitive impairments

2. Physicians and other prescribers are usually not on site in nursing homes and pharmacists are only peripherally involved in care
   ▪ Decision making and prescribing takes place via telephone, based on observation of and communication by onsite nursing staff

3. Nurses, residents, families have strong roles in decision making in nursing homes
   ▪ Often have misconceptions about infections

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.”
Factors That Influence the Decision to Initiate Antibiotic Therapy in Nursing Homes

CDC Core Elements of Antibiotic Stewardship for Nursing Homes
Call to Action

▪ The implementation may vary based on facility staffing and resources

▪ Before getting started use a checklist as baseline of policies and practices which are in place

▪ Encouraged to work in a step-wise fashion
  ▪ Implementing one or two activities to start and gradually adding new strategies from each element over time

▪ Any action taken to improve antibiotic use is expected to reduce adverse effects, prevent emergence of resistance, and lead to better outcomes

Most Common Infections Treated with Antibiotics in Nursing Homes

May want to focus on the three most common Infections in nursing homes

- Urinary Tract Infections: 32%
- Respiratory Tract Infections: 33%
- Skin and Soft Tissue Infections: 13%
- Other: 10%
- Undocumented: 12%

The Core Element of Antibiotic Stewardship for Nursing Homes

<table>
<thead>
<tr>
<th>Leadership commitment</th>
<th>Demonstrate support and commitment to safe and appropriate antibiotic use in your facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>Identify leaders responsible for promoting and overseeing antibiotic stewardship activities in your facility.</td>
</tr>
<tr>
<td>Drug Expertise</td>
<td>Establish access to consultant pharmacists or other individuals with experience or training in improving antibiotic use.</td>
</tr>
<tr>
<td>Action</td>
<td>Implement at least one policy or practice to improve antibiotic use in your facility.</td>
</tr>
<tr>
<td>Tracking</td>
<td>Monitor use of antibiotics and complications (e.g., <em>C. difficile</em> infections) from antibiotic use in your facility.</td>
</tr>
<tr>
<td>Reporting</td>
<td>Share information with healthcare providers and staff on antibiotic use and resistance in your facility.</td>
</tr>
<tr>
<td>Education</td>
<td>Provide resources to healthcare providers, nursing staff, residents and families about antibiotic resistance and how to improve antibiotic use.</td>
</tr>
</tbody>
</table>

Leadership

▪ Provide written statements in support of improving antibiotic use to be shared with staff, residents and families

▪ Communicate expectations with directors, prescribers, nurses, pharmacists, infection prevention

▪ Make antibiotic stewardship a line-item on the agenda for multidisciplinary quality meetings

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
## Accountability: The Roles of Antibiotic Stewardship Leaders

<table>
<thead>
<tr>
<th>Medical Directors</th>
<th>Directors of Nursing</th>
<th>Consultant Pharmacists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set standards for antibiotic prescribing practices for all healthcare providers prescribing antibiotics</td>
<td>Establish standards for nursing staff to assess (Stop and Watch), monitor and communicate changes (SBAR*) in a residents condition that could impact the need for antibiotics</td>
<td>Provide education to staff about antibiotics and their use</td>
</tr>
<tr>
<td>Oversee adherence to antibiotic prescribing practices</td>
<td>Use their influence as nurse leaders to help ensure antibiotics are prescribed only when appropriate</td>
<td>Review antibiotic prescriptions as part of the drug regimen review and ensure they are ordered appropriately</td>
</tr>
<tr>
<td>Review antibiotic use data and ensure best practices (e.g., right drug at the right dose for the right amount of time) are followed</td>
<td>Educate front line nursing staff about the importance of antibiotic stewardship and explain policies in place to improve antibiotic use</td>
<td>Monitor for adverse events and drug interactions related to use of antibiotics and other high risk medications</td>
</tr>
<tr>
<td></td>
<td>Review microbiology culture results and provide feedback on initial antibiotic selected</td>
<td></td>
</tr>
</tbody>
</table>

*SBAR (Situation; Background of the change; Assessment or appearance; and Request for action)
Partnerships for Accountability

- Infection prevention program coordinator
  - Have data on infections, resistant organisms and/or problematic organisms
  - Use or tie into their data collection systems/processes to monitor and support antibiotic stewardship

- Microbiology/Laboratory Services
  - Negotiate, request or develop
    - Organism notification processes
    - Education on diagnostic testing
    - ANTIBIOGRAMS

- Utilize local and state health department resources and education
  - Healthcare-Associated Infection (HAI) Prevention programs
    - www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
## Example of an Antibiogram

Antibiograms are usually obtained annually. They provide the % of samples for a given organism which were sensitive to certain antibiotics. These are essential tools for clinicians when treating an infection empirically.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Total Isolates</th>
<th>Ampicillin</th>
<th>Oxacillin</th>
<th>Vancomycin</th>
<th>Ceftriaxone</th>
<th>Ciprofloxacin</th>
<th>TMP/SMX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterococcus facium</td>
<td>619</td>
<td>83</td>
<td></td>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>676</td>
<td>62</td>
<td>100</td>
<td></td>
<td>97</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>780</td>
<td></td>
<td></td>
<td></td>
<td>93</td>
<td>74</td>
<td>72</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>386</td>
<td></td>
<td></td>
<td>89</td>
<td>88</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>404</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>76</td>
<td></td>
</tr>
</tbody>
</table>
Drug Expertise

▪ Work with a consultant pharmacist who is ID- or antibiotic stewardship-trained

▪ Partner with antibiotic stewardship program leads at the hospitals within your referral network

▪ Develop relationships with ID practitioners and/or organizations at the local, state and national levels

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Action

- Prioritize interventions based on the needs of your facility and introduce this process in a step-wise fashion so staff become familiar with and not overwhelmed by new changes in practice.

- Standardize interventions to apply to any resident suspected of an infection or started on an antibiotic and should include:
  - Improving the evaluation and communication of clinical signs and symptoms of an infection (using the SBAR).
  - Antibiotic review process “antibiotic time-out,” for all antibiotics prescribed in your facility.
    - Provides clinicians an opportunity to reassess the ongoing need for and choice of an antibiotic when the clinical picture is clearer and more information is available.

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Actions to Improve Antibiotic Use

- **Antibiotic prescribing**
  - Documentation of dose, duration, and indication (prophylaxis or therapeutic)
    - Should be documented for antibiotics initiated in the nursing home
    - When antibiotics are continued when initiated in the emergency department or transferring facility
  - Establish best practice for use of microbiology testing
    - Inappropriate labs may drive unnecessary antibiotic treatment
    - Develop a specific treatment recommendations for your facility based on national guidelines and local susceptibilities and duration
  - Use an evidence-base guidance to assess residents
  - Utilize a communication tool (SBAR) to convey information to clinical providers

Antibiotic Prescribing Decision-making Process

Pre-Prescribing Decision-Making
- Q1: Are Antibiotics Needed?
- Q2: Which Antibiotic (Drug & Dose)?

Post-Prescribing Decision-Making
- Q3: Can Antibiotic be Stopped?
- Q4: Can Spectrum be Narrowed?
- Q5: How Long to Continue Therapy?

Monitor at least one process measure and at least one outcome measure from antibiotic use in your facility

- Prescribing process measures
  - Adherence to documenting prescribing elements
    - Documentation of dose, duration, and indication (prophylaxis or therapeutic)
    - New antibiotic starts (how and why antibiotics are prescribed)
  - Completeness of resident assessment documentation

- Antibiotic use measures
  - Point prevalence of antibiotic use
  - Antibiotic starts/1,000 resident days
  - Days of antibiotic therapy/1,000 resident days

- Outcome measures
  - C. difficile and multidrug-resistant organisms
  - Adverse events

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Antibiotic Use

Figure 4. Nursing Home Initial Antibiotic Orders, by Infection Site

ANTIBIOTIC CLASS
- Fluoroquinolones
- Cephalosporins
- Other antibiotics, antivirals, or antiparasitics
- Trimethoprim-sulfamethoxazole
- Penicillins
- Aminoglycosides
- Metronidazole (Flagyl®)
- Vancomycin (glycopeptide)
- Tetracyclines
- Nitrofurantoin (Macrobid®, Macrobid®)
- Carbapenems

NO. OF ANTIBIOTIC ORDERS

INFECTION SITE
- Skin and soft tissue: 922, 2,031, 806, 1,170, 1,651, 7, 86, 486, 4, 15
- Respiratory tract: 3,674, 1,161, 1,468, 88, 770, 13, 11, 57, 243, 9, 20
- Urinary tract: 1,689, 843, 50, 771, 608, 87, 2, 30, 82, 731, 68
- Gastrointestinal: 16, 8, 15, 3, 5, 1, 1,269, 660, 0, 1, 1
- Bloodstream: 3, 9, 1, 0, 6, 2, 1, 20, 3, 1, 2

Source: Healthcare-associated infection events reported by Pennsylvania nursing homes to the Pennsylvania Patient Safety Reporting System from April 2014 through March 2015.
Education

- Educate to ALL
  - Clinicians
  - Nursing staff
  - Residents and families
    - Transparency and buy-in are integral parts of the equation
    - Convey outcomes and process improvements to residents and families

- Educate on the goal of an antibiotic stewardship intervention

- Educate on the responsibility of each group for ensuring its implementation

- Provide feedback to nursing staff and providers

www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
Call to Action

▪ Commit now to ensure antibiotic stewardship policies and practices are in place to protect patients and residents and improve clinical care in nursing centers

▪ Select one or two activities from the Core Elements to start with and over time, as improvements are implemented, expand efforts to add new strategies to continue improving antibiotic use